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# Bibliography of North American Geology, 1970

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**UNITED STATES DEPARTMENT OF THE INTERIOR**

**ROGERS C. B. MORTON, *Secretary***

**GEOLOGICAL SURVEY**

**V. E. McKelvey, *Director***

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# BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY

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### INTRODUCTION

The current annual volume of the "Bibliography of North American Geology" lists publications that appeared during 1970 concerning the geology of the North American continent, Greenland, the West Indies and adjacent islands, Hawaii, Guam, and other island possessions but not the trust territories of the United States. Articles by American authors published in foreign journals are cited if they deal with North American localities or are of a general nature, but not if they deal only with foreign areas. Articles on North America by foreign authors are included regardless of place of publication, while those of a general nature are included only if they appeared in North American journals.

The citations are listed alphabetically by author, with full title and publication data. There follows a subject index to the papers cited. Geologic names in the index are those used by the individual authors, and their listing here does not imply approval by the Geological Survey.

The numbers assigned to the abstracts in this publication are for reference in using the index; they are not order numbers. Publications cited are available in most geological libraries or through interlibrary loan.

The principal contributors to this volume were James W. Clarke, Georgianna D. Conant, Howard R. Cramer, Bettie S. Hackman, Virginia M. Jussen, Elisabeth S. Loud, Mildred C. Mead, Virginia S. Neuschel, and Dorothy B. Vitaliano.

The "Bibliography of North American Geology" comprises the following bulletins: 746-747 (1785-1918), 823 (1919-28), 937 (1929-39), 1049 (1940-49), 1195 (1950-59), 1196 (1960), 1197 (1961), 1232 (1962), 1233 (1963), 1234 (1964), 1235 (1965), 1266 (1966), 1267 (1967), 1268 (1968), and 1269 (1969).





## BIBLIOGRAPHY

---

- CLAYTON, R. H.** *See* Donohoo, H. V. 09847
- Davey, C. B.** *See* Losche, C. K. 02724
- Aadland, Rolf.** *See* Picard, M. Dane. 02703
- 05299 **Aalto, K. R.; Dott, R. H., Jr.** Late Mesozoic conglomeratic flysch in southwestern Oregon, and the problem of transport of coarse gravel in deep water [with French abs.], in *Flysch sedimentology in North America: Geol. Assoc. Canada Spec. Paper 7*, p. 53-65, illus., 1970.
- 08211 **Aamot, Haldor W. C.** Self-contained thermal probes for remote measurements within an ice sheet, in *Internat. Symposium on Antarctic Glaciological Exploration (ISAGE)*, Hanover, N.H., 1968 [Proc.]: Internat. Assoc. Sci. Hydrology (and Sci. Comm. Antarctic Research) Pub. 86, p. 63-68, illus., 1970.
- Aaron, John M.** *See* McIntyre, David H. 00130
- Aaronson, Michael.** *See* Maddaus, William O. 10501
- Abakumov, O. N.** *See* Solopov, S. G. 08256
- 02031 **Abbey, Sydney.** Analysis of rocks and minerals by atomic absorption spectroscopy — Pt. 3, A lithium-fluoborate scheme for seven major elements [with French abs.]: *Canada Geol. Survey Paper 70-23*, 20 p., tables, 1970.
- Abbott, Agatin T.** *See* Macdonald, Gordon A. 05856
- 07384 **Abdel-Aal, Farouk Mostafa.** Extension of bed-load formulas to high sediment rates [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 4, p. 1989B, 1970.
- Abdel-Gawad, M.** *See* Housley, R. M. 06286
- 01906 **Abdel-Gawad, Monem; Silverstein, Joel.** Displacement of San Andreas by active transverse faults [abs.]: *EOS*, v. 51, no. 4, p. 352, 1970.
- Abdel-Hady, M.** *See* Matalucci, R. V. 06732
- 07248 **Abdel-Hady, M.; Abdel-Hafez, M. A.; Karbs, Harlan H.** Subsurface drainage mapping by airborne infrared imagery techniques: *Oklahoma Acad. Sci. Proc.* 1970, v. 50, p. 10-18, illus., 1970.
- Abdel-Hady, Mohamed.** *See* Matalucci, Rudolph V. 00909
- Abdel-Hady, Mohamed.** *See* Matalucci, Rudolph V. 02306
- Abdel-Hafez, M. A.** *See* Abdel-Hady, M. 07248
- Abdel-Khalek, M. Lotfi.** *See* Khoury, S. G. 00163

- 08463 **Abegglen, Donn E.; Wallace, Alfred T.; Williams, Roy E.** The effects of drain wells on the ground-water quality of the Snake River plain: Idaho Bur. Mines and Geology Pamph. 148, 51 p., illus., tables, 1970.
- 04468 **Abel, John F.** Rock mechanics—Can it pay its way? *in* Third symposium on salt, V. 2 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 197-207, illus., 1970.
- 03336 **Abele, Gunars.** Deformation of snow under rigid plates at a constant rate of penetration: U.S. Army Corps Engineers Cold Regions Research and Eng. Lab. Research Rept. 273, 67 p., illus., tables, 1970.
- 05734 **Abell, P. I.; Draffan, C. H.; Eglinton, G.; Hayes, J. M.; Maxwell, J. R.; Pillinger, C. T.** Organic analysis of the returned Apollo 11 lunar sample, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1757-1773, illus., tables, 1970.
- 02225 **Abelson, P. H.; Hare, P. E.** Uptake of amino acids by kerogen: Carnegie Inst. Washington Year Book 68, 1968-69, p. 297-303, tables, 1970.
- Abelson, P. H.** *See* Hare, P. E. 07010
- Abey, A. E.** *See* Giardini, A. A. 01763
- 08012 **Abranson, Christian E.** A discussion of the alternating field method and new paleointensity measurements of the Miocene geomagnetic field in Oregon: Pure and Appl. Geophysics, v. 82, p. 189-221, illus., tables, 1970.
- 09010 **Abson, Gene; Burton, Conway.** Physical tests and range of properties, [chap.] 5 *in* Bituminous materials—Asphalts, tars, and pitches, A. J. Hoiberg, editor—v. 1: New York, Intersci. Publishers, p. 213-288, illus., tables, 1964.
- 00440 **Abu-moustafa, Adel A.; Skehan, James W.** Petrography and geochemistry of the Nashoba Formation of the Wachusett-Marlborough Tunnel, Massachusetts [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 9, 1970.
- 08286 **Acad. Ciencias de Cuba; Acad. Ciencias URSS.** Atlas nacional de Cuba [National atlas of Cuba]: Havana, Cuba, Acad. Ciencias de Cuba, 132 p., illus., 1970.
- Acar, K. Z.** *See* King, M. S. 04470
- 04358 **Acker, Louis L.; Hatcher, Robert D., Jr.** Relationships between structure and topography in northwest South Carolina: South Carolina Div. Geology Geol. Notes, v. 14, no. 2, p. 35-48, illus., 1970.
- 07338 **Adachi, Toshihisa.** Construction of continuum theories for rock by tensor testing [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 1939B, 1970.
- 07449 **Adachi, Toshihisa; Serata, Shosei; Sakurai, Shunsuke.** Determination of underground stress field based on inelastic properties of rocks, Chap. 18 *in* Rock mechanics, theory and practice — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 293-328, illus., tables, 1970.
- Adami, Lanford H.** *See* O'Neil, James R. 05713
- 06038 **Adams, Herbert G.; Cohen, Lewis H.; Rosenfeld, John L.** Solid inclusion piezothermometry, experimental calibration of quartz-almandine and sillimanite-almandine [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 479, 1970.
- 02886 **Adams, J. I.** Effect of groundwater levels on stress history of the St. Clair clay till deposit — Discussion [of paper by L. G. Soderman and Y. D. Kim, 1970]: Canadian Geotech. Jour., v. 7, no. 2, p. 190-193, illus., 1970.

- 02542 **Adams, James W., Jr.** *Glomar Challenger* continues its exciting mission: Ocean Industry, v. 5, no. 7, p. 34-37, illus., 1970.
- Adams, John A. S.** See Baldwin, Otha D. 00482
- Adams, John A. S.** See Hartung, Jack B. 06393
- 07859 **Adams, John A. S.; Gasparini, Paolo.** Gamma-ray spectrometry of rocks: Amsterdam, London, New York, Elsevier Publishing Co., 295 p., illus., tables, 1970.
- 06266 **Adams, John B.; McCord, Thomas B.** Remote sensing of lunar surface mineralogy — Implications from visible and near-infrared reflectivity of Apollo 11 samples, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1937-1942, illus., 1970.
- 09102 **Adams, John W.; Sharp, William N.** A convenient nonoxidizing heating method for metamict minerals: *Am. Mineralogist*, v. 55, nos. 7-8, p. 1440-1442, 1970.
- 02428 **Adams, Samuel S.** Geology in potash mining and exploration [abs.]: *Mining Eng.*, v. 22, no. 1, p. 41, 1970.
- 04574 **Adams, Samuel S.** Ore controls, Carlsbad potash district, southeast New Mexico, in *Third symposium on salt*, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 246-257, illus., 1970.
- 06643 **Adams, W. M.; Furumoto, A. S.** Features of tsunamigenic earthquakes, in *Tsunamis in the Pacific Ocean — Internat. Symposium on Tsunamis and Tsunami Research*, Honolulu, Hawaii, 1969, Proc.: Honolulu, Hawaii, East-West Center Press, p. 57-68, illus., 1970.
- 10534 **Adams, W. M.; Nishioka, R.; Malina, J., Jr.** Automatic seismic triggering of tsunami sirens [abs.]: *EOS*, v. 51, no. 11, p. 776-777, 1970.
- 09279 **Adams, W. P.; Jones, J. A. A.** Crystallography of ice on Knob Lake, in *Field research in Labrador-Ungava [1965-66]*: McGill Univ. Dept. Geography Sub-Arctic Research Paper 23, p. 108-117, illus., 1967.
- 09283 **Adams, W. P.** (editor). Ten years (1954-1964) of field research in Labrador-Ungava: McGill Univ. Dept. Geography Sub-Arctic Research Paper 20, 289 p., illus., tables, 1966.
- 09284 **Adams, W. P.** The Laboratory in 1964, in *Ten years (1954-1964) of field research in Labrador-Ungava*: McGill Univ. Dept. Geography Sub-Arctic Research Paper 20, p. 9-20, illus., table, 1966.
- 09807 **Adams, William; Lepley, L.; Warren, C.; Chang, S.** Coastal and urban surveys with IR: *Photogramm. Eng.*, v. 36, no. 2, p. 173-180, illus., 1970.
- 03947 **Adams, William H.** Some possible causes for late-Pleistocene faunal extinctions: *Indiana Acad. Sci. Proc.* 1969, v. 79, p. 65-68, 1970.
- Adams, William M.** See Walling, James M. 06722
- 08595 **Adams, William M.; Mathur, Surendra P.; Huber, Richie D.** Aeromagnetic, gravity, and electrical resistivity exploration between Pahala and Punaluu, Hawaii: Hawaii Univ. Water Resources Research Center Tech. Rept. 28, 60 p., illus., tables, 1970.
- 10613 **Adams, William M.** An electrical resistivity profile from Mahukona to Kawaihae, Hawaii: Hawaii Univ. Water Resources Research Center Tech. Rept. 23, 32 p., illus., tables, 1968.
- 10615 **Adams, William M.; Lepley, Larry K.** Infrared images of the Kau and Puna coastlines on Hawaii: Hawaii Univ. Water Resources Research Center Tech. Rept. 26, 51 p., illus., 1968.

- 10616 **Adams, William M.** (and others). A hydrogeophysical survey from Kawaihae to Kailua-Kona, Hawaii: Hawaii Univ. Water Resources Research Center Tech. Rept. 32, 156 p., illus., tables, 1969.
- Adams, William M.** See Lao, Chester. 11264
- Adams, William M.** See Lepley, Larry K. 11265
- Adams, William Mansfield.** See Huber, Richie. 01926
- Adams, William Mansfield.** See Zetler, Bernard D. 02279
- 05228 **Adams, William Mansfield.** (editor). Engineering seismology — The works of man: Geol. Soc. America Eng. Geology Case Histories, no. 8, 70 p., illus., tables, 1970.
- 05229 **Adams, William Mansfield.** Quasi-permanent deformation in the elastic zone near explosions, in Engineering seismology — The works of man: Geol. Soc. America Eng. Geology Case Histories, no. 8, p. 5-9, illus., table, 1970.
- 05233 **Adams, William Mansfield.** Tsunami effects and risk at Kahuku Point, Oahu, Hawaii, in Engineering seismology — The works of man: Geol. Soc. America Eng. Geology Case Histories, no. 8, p. 63-70, illus., tables, 1970.
- 06641 **Adams, William Mansfield.** (editor). Tsunamis in the Pacific Ocean — Internat. Symposium on Tsunamis and Tsunami Research, Honolulu, Hawaii, 1969, Proc.: Honolulu, Hawaii, East-West Center Press, 513 p., illus., tables, 1970.
- 07782 **Adams, William Mansfield.** An electrical resistivity profile in Hawaii with novel elevation correction: Geophys. Prosp. [Netherlands], v. 18, suppl., p. 728-737, illus., 1970.
- 10372 **Adams, Wm. Mansfield.** Prediction of tsunami inundation from real-time seismic data: Marine Technology Soc. Jour., v. 4, no. 4, p. 7-26, illus., tables, 1970.
- 01602 **Addicott, W. O.** Tertiary climatic change in San Joaquin basin, California — Evidence from shallow-water mollusks [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 3, p. 561, 1970.
- 04590 **Addicott, W. O.** Miocene gastropods and biostratigraphy of the Kern River area, California: U.S. Geol. Survey Prof. Paper 642, 174 p., illus., tables, 1970.
- 08327 **Addicott, W. O.** Latitudinal gradients in Tertiary molluscan faunas of the Pacific coast: Palaeogeography, Palaeoclimatology, Palaeoecology, v. 8, no. 4, p. 287-312, illus., tables, 1970.
- 05450 **Addicott, Warren O.** Tertiary paleoclimatic trends in the San Joaquin basin, California: U.S. Geol. Survey Prof. Paper 644-D, p. D1-D19, illus., tables, 1970.
- 09392 **Addicott, Warren O.** Bibliography of Leo George Hertlein for the period of 1925-1970: Nautilus, v. 84, no. 2, p. 43-52, 1970.
- 04914 **Addie, George G.** The Metaline district, Pend Oreille County, Washington, [Chap.] 6 in Lead-zinc deposits in the Kootenay Arc, northeastern Washington and adjacent British Columbia — Soc. Econ. Geologists, 1970 Northwest Field Conf. Guidebook: Washington Div. Mines and Geology Bull. 61, p. 65-78, illus., 1970.
- 04915 **Addie, George G.** The Reeves MacDonald mine, Nelway, British Columbia, [Chap.] 7 in Lead-zinc deposits in the Kootenay Arc, northeastern Washington and adjacent British Columbia — Soc. Econ. Geologists, 1970 Northwest Field Conf. Guidebook: Washington Div. Mines and Geology Bull. 61, p. 79-88, illus., 1970.
- 06595 **Adegoke, Sylvester.** Stratigraphy and paleontology of the Neogene formations of the Coalinga region, California [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 755B-756B, 1970.



**Ade-Hall, J.** See Baksi, A. K. 01887

07855 **Adelman, M. A.** Economics of exploration for petroleum and other minerals: *Geoexploration*, v. 8, nos. 3-4, p. 131-150, 1970.

03092 **Adeyeri, Joseph Babalola.** Multiple integral description of the viscoelastic response of cohesive soils [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 10, p. 4604B-4605B, 1970.

**Adham, Samy A.** See Werner, Stuart D. 04394

**Adkison, W. L.** See U.S. Geological Survey. 07074

08196 **Adler, H. H.** Interpretation of colour relations in sandstone as a guide to uranium exploration and ore genesis, *in* *Uranium exploration geology — Panel on uranium exploration geology*, Vienna, 1970, *Proc.: Vienna, Austria, Internat. Atomic Energy Agency*, p. 331-344, incl. discussion, illus., table, 1970.

02575 **Adler, Lawrence.** Rock as a granulating material and mass: *Soc. Mining Engineers AIME Trans.*, v. 247, no. 2, p. 180-186, illus., 1970.

00430 **Adrian, Donald Dean.** Infiltration induced soil instabilities: *Ground Water*, v. 8, no. 1, p. 29-36, illus., 1970.

02581 **Adshead, Patricia C.** Similarities between dental microstructures of scutellid echinoids and primitive vertebrates [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 833, 1970.

08321 **AEC Grand Junction Office.** Preliminary reconnaissance for uranium in New Mexico, 1950 to 1958: Washington, D.C., U.S. Atomic Energy Comm., RME-160, 221 p., illus., 1970.

05037 **Affleck, James.** Definition of regional structures by magnetics, [Chap.] 1 *in* *The megatectonics of continents and oceans* (Helgi Johnson and Bennett L. Smith, editors): New Brunswick, N. J., Rutgers Univ. Press, p. 3-11, illus., 1970.

**Afghan, B. K.** See Goulden, P. D. 07784

07305 **Affifi, Sherif El-Sayed Ahmed.** Effects of stress history on the shear modulus of soils [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 5, p. 2660B-2661B, 1970.

**Agarwal, R. G.** See Kanasewich, E. R. 04275

02166 **Agarwal, R. K.; Boshkov, Stefan.** Theory and practice gap closes in rock mechanics: *Mining Eng.*, v. 22, no. 2, p. 74-76, illus., 1970.

09148 **Agarwal, R. K.** Comparative study of the assumptions in determining secondary principal stresses in the rock mass [with French and German summ.], *in* *Internat. Soc. Rock Mechanics Cong.*, 2d, Belgrade, Yugoslavia, 1970, *Proc.*, V. 2: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 397-401, illus., tables, 1970.

04794 **Agashe, Shripad N.; Tilak, S. T.** Occurrence of fungal elements in the bark of arborescent calamite roots from the American Carboniferous: *Torrey Bot. Club Bull.*, v. 97, no. 4, p. 216-218, illus., 1970.

**Agnihotri, N. P.** See Dixon, J. B. 07433

04291 **Agterberg, F. P.** Toward a probability index for detecting favourable geological environments [abs.]: *Canadian Mining and Metall. Bull.*, v. 63, no. 696, p. 445, 1970.

08616 **Agterberg, F. P.** Autocorrelation functions in geology, *in* *Geostatistics — A colloquium* (D. F. Merriam, editor), Lawrence, Kan., 1970, *Proc.*: New York, Plenum Press, p. 113-141, illus., tables, 1970.

- 10627 **Agterberg, F. P.; Cabilio, P.** Two-stage least-squares model for the relationship between mappable geological variables: *Internat. Assoc. Math. Geology Jour.*, v. 1, no. 2, p. 137-153, illus., 1969.
- 06315 **Ahmad, Moid Uddin.** A hydrological approach to control acid mine pollution for Lake Hope: *Ground Water*, v 8, no. 6, p. 19-24, illus., 1970.
- Ahmad, N.** See Davis, C. E. 02838
- Ahmed, S.** See El-Swaify, S. A. 11021
- Ahmed, S. M.** See Walsh, J. H. 04561
- 10419 **Ahmed, Wase.** Additional comments on "technique for estimating thickness of a thin section" [discussion of papers by P. S. Nicholson, E. G. Ehlers, and B. H. Bieler in various issues of *Am. Ceramic Soc. Jour.*, 1969]: *Am. Ceramic Soc. Jour.*, v. 53, no. 8, p. 477-478, 1970.
- 09897 **Ahnert, Frank.** An approach towards a descriptive classification of slopes [with German and French abs.], in *New contributions to slope evolution: Zeitschr. Geomorphologie*, supp. 9, p. 71-84, illus., 1970.
- 09899 **Ahnert, Frank.** A comparison of theoretical slope models with slopes in the field [with German and French abs.], in *New contributions to slope evolution: Zeitschr. Geomorphologie*, supp. 9, p. 88-101, illus., 1970.
- 06913 **Ahrens, L. H.** The composition of stony meteorites — [Pt.] [!6], The special significance of eucrites Stannern and Nuevo Laredo in lunar-meteorite comparative studies: *Earth and Planetary Sci. Letters*, v. 9, no. 4, p. 341-344, table, 1970.
- 08334 **Ahrens, L. H.** The composition of stony meteorites — [Pt.] 9, Abundance trends of the refractory elements in chondrites, basaltic achondrites, and Apollo 11 fines: *Earth and Planetary Sci. Letters*, v. 10, no. 1, p. 1-6, illus., tables, 1970.
- 00006 **Ahrens, Thomas J.; Takahashi, Taro; Davies, Geoffrey F.** A proposed equation of state of stishovite: *Jour. Geophys. Research*, v. 75, no. 2, p. 310-316, tables, 1970.
- Ahrens, Thomas J.** See Gaffney, Edward S. 02817
- 03363 **Ahrens, Thomas J.; Fleischer, Robert L.; Price, P. Buford; Woods, Richard T.** Easure of fission tracks in glasses and silicates by shock waves: *Earth and Planetary Sci. Letters*, v. 8, no. 6, p. 420-426, illus., tables, 1970.
- 07905 **Ahrens, Thomas J.** Directivity of seismic radiation from a series of line charges, in *Symposium on engineering with nuclear explosives* — *Am. Nuclear Soc. and U.S. Atomic Energy Comm., Las Vegas, Nev., 1970, Proc.*, V. 2: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., p. 1150-1159, illus., 1970.
- 10584 **Ahrens, Thomas J.; Gaffney, Edward S.** Shock compression of enstatite [abs.]: *EOS*, v. 51, no. 11, p. 827, 1970.
- 03567 **Aitken, James D.** The northern Great Plains, in *Geological provinces of Canada, exploration and outlook: Canadian Mining and Metall. Bull.*, v. 63, no. 694, p. 187-190, 1970.
- Aitken, James D.** See Cook, Donald G. 10026
- 00507 **Aiyer, Arunachalam Kulathu.** An analytical study of the time-dependent behavior of underground openings [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 7, p. 3159B, 1970.
- 05465 **Akersten, William A.** Interpretation of sediments and vertebrate fossils in fill of Red Light Bolson, southeastern Hudspeth County, Texas, in *Geology of the southern Quitman Mountains area, Trans-Pecos Texas* — *S.E.P.M. Permian Basin Sec.*, 1970

Biennial Field Trip, Symposium and Guidebook: Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub. 70-12, p. 82-87, illus., 1970.

- 06039 **Aki, K.; Tsai, Y. B.** Comparison of SH waves from large and small explosions [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 479-480, 1970.
- 00219 **Aki, Keiiti; DeFazio, Thomas; Reasenberg, Paul; Nur, Amos.** Active experiment with earthquake fault for an estimation of the in situ stress [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 65, 1970.
- 00834 **Aki, Keiiti.** Geophysics, *in* Seismic design for nuclear power plants (Robert J. Hansen, editor): Cambridge, Mass., M.I.T. Press, p. 91-113, illus., 1970.
- Aki, Keiiti.** See Tsai, Yi-Ben. 01992
- Aki, Keiiti.** See Tsai, Yi-Ben. 04276
- Aki, Keiiti.** See Tsai, Yi-Ben. 04333
- 04337 **Aki, Keiiti; DeFazio, Thomas; Reasenberg, Paul; Nur, Amos.** An active experiment with earthquake fault for an estimation of the in situ stress: Seismol. Soc. America Bull., v. 60, no. 4, p. 1315-1336, illus., tables, 1970.
- Aki, Keiiti.** See Boore, David M. 10551
- 02447 **Akili, W.** On the stress-creep relationship for a frozen clay soil: Materials Research and Standards, v. 10, no. 1, p. 16-22, illus., tables, 1970.
- Akimoto, S.** See Mizutani, H. 02138
- 06138 **Akin, R. H., Jr.; Graves, R. W., Jr.** Reply [to discussion by Curt Teichert of "Reynolds oolite of southern Arkansas," 1969]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 9, p. 1749, 1970.
- 07801 **Akker, F. B. van den; Harrison, C. G. A.; Mudie, John D.** Even more on the direct interpretation of magnetic anomalies: Earth and Planetary Sci. Letters, v. 9, no. 5, p. 405-406, illus., 1970.
- Al Shaieb, Zuhair.** See Mantel, Erwin. 04666
- 07735 **Alabama Geological Society; Bentley, Robert D.; Neathery, Thornton L.** Geology of the Brevard fault zone and related rocks of the Inner Piedmont of Alabama — Alabama Geol. Soc. field trip, 8th Ann., 1970, guidebook: University, Ala., Alabama Geol. Soc., 119 p., illus., tables, 1970.
- 07260 **Al-Agidi, Waleed Khalid Hassan.** A chronolithosequence of soils on Pleistocene terraces along Maple River in northeastern Clinton County, Michigan, U.S.A. (their morphologic, genetic and geomorphic interrelationship) [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2411B, 1970.
- 07082 **Alaska Geological Society.** (Stratigraphic Committee). The Sag River Sandstone and Kuparuk River sands, two important subsurface units in the Prudhoe Bay field, *in* Geological seminar on the North Slope of Alaska, Palo Alto, Calif., 1970, Proc.: Los Angeles, Calif., Am. Assoc. Petroleum Geologists Pacific Sec., p. P1-P3, illus., 1970.
- 04774 **Alba, Roy S.; Pierce, Charles.** Phoenix Lake Field, Calcasieu Parish, Louisiana, *in* Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 23-23c, illus., 1970.
- 05943 **Albee, Arden L.; Chodos, Arthur A.** Semiquantitative electron microprobe determination of  $\text{Fe}^{2+}/\text{Fe}^{3+}$  and  $\text{Mn}^{2+}/\text{Mn}^{3+}$  in oxides and silicates and its application to petrologic problems: Am. Mineralogist, v. 55, nos. 3-4, p. 491-501, illus., 1970.

- 06040 **Albee, Arden L.** Reaction relations of chloritoid and staurolite in pelitic schists [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 480-481, 1970.
- 09460 **Albee, Arden L.; Ray, Lily.** Correction factors for electron probe microanalysis of silicates, oxides, carbonates, phosphates, and sulfates: *Anal. Chemistry*, v. 42, no. 12, p. 1408-1414, illus., tables, 1970.
- 10998 **Albee, Arden L.; Zen, Ean.** Zavisimost' fatsiy tseolitov ot khimicheskikh potentsialov  $\text{CO}_2$  i  $\text{H}_2\text{O}$  [Chemical potentials of carbon dioxide and water in the zeolite facies], in *Ocherki fiziko-khimicheskoy petrologii*, V. 1: Moscow, Acad. Sciences USSR "Nauka", p. 249-260, illus., tables, 1969.
- 04240 **Albers, John P.; Kleinhampl, Frank J.** Spatial relation of mineral deposits to Tertiary volcanic centers in Nevada, in *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C1-C10, illus., table, 1970.
- Albers, John P.** See Stewart, John H. 11022
- 00666 **Alberstadt, Leonard P.; Maniatis, Jessie; Moore, Nelson K.** Carbonate rock types of the Middle and Upper Ordovician formations in the central basin of Tennessee [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 191, 1970.
- 00667 **Alberstadt, Leonard P.** Some Middle and Upper Ordovician brachiopods from Oklahoma, Missouri, and Tennessee [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 191-192, 1970.
- 09124 **Alberti, Alberto.** Variation in diffractometer profiles of powder with a gaussian dispersion of the chemical composition: *Am. Mineralogist*, v. 55, nos. 9-10, p. 1772-1779, illus., tables, 1970.
- 00220 **Alcock, Edward D.** Dynamic amplification spectra of thin layers of alluvium [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 65, 1970.
- 00860 **Aldrich, Merritt J., Jr.** Stress orientation during uplift of basement rocks [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 266, 1970.
- Alexander, C. C.** See Thorpe, A. N. 06298
- Alexander, Charles S.** See Patton, Clyde P. 04126
- Alexander, E. C., Jr.** See Srinivasan, R. 01836
- 02066 **Alexander, E. C., Jr.; Srinivasan, B.; Manuel, O. K.** I-Xe dating of meteorites [abs.]: *EOS*, v. 51, no. 4, p. 340, 1970.
- 06852 **Alexander, E. C., Jr.** Rare gases from stepwise heating of lunar rock 12013: *Earth and Planetary Sci. Letters*, v. 9, no. 2, p. 201-207, illus., tables, 1970.
- 07914 **Alexander, Emmitt Calvin, Jr.** Noble gases, record of the early solar system [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 6, p. 3478B, 1970.
- 02842 **Alexander, Robert H.** Mission 73 and associated tests, in *Earth resources aircraft program status review*, NASA, Houston, 1968 — V. 1, *Geology, geography, and sensor studies*: Houston, Tex., Manned Spacecraft Center, p. 3-1 — 3-33, illus. [1970].
- Alexander, Shelton S.** See Toksöz, M. Nafi. 10289
- 10542 **Alexander, Shelton S.** Energy partitioning among phases for earthquakes and explosions [abs.]: *EOS*, v. 51, no. 11, p. 778, 1970.
- 09004 **Alexander, Stephen H.; Tarver, Gilbert W.** Permeability and water absorption [chap.] 7 in *Bituminous materials—Asphalts, tars, and pitches*, A. J. Hoiberg, Editor—v. 2, *Asphalts*, pt. 1: New York, Intersci. Publishers, p. 223-247, illus., tables, 1965.

**Alexander, T. K.** See Ollerhead, R. W. 06559

- 07495 **Alf, Raymond M.** A preliminary report on a Miocene flora from the Barstow Formation, Barstow, California: Southern California Acad. Sci. Bull., v. 69, nos. 3-4, p. 183-188, illus., 1970.
- 00825 **Alford, Donald.** Mass-balance studies — Grasshopper Glacier, Montana: Arctic and Alpine Research, v. 2, no. 1, p. 75-79, illus., tables, 1970.
- Alger, R. P.** See Tixier, M. P. 00962
- 00221 **Algermissen, S. T.; Stepp, J. C.; Rinehart, W. A.; Arnold, E. P.** The estimation of earthquake losses to wood frame structures in California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 66, 1970.
- 00222 **Algermissen, S. T.; Brown, Robert D.** The Managua, Nicaragua earthquake of January 4, 1968 [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 66, 1970.
- 06891 **Al-Hashimi, Abdul Razak K.; Brownlow, Arthur H.** Copper content of biotites from the Boulder Batholith, Montana: Econ. Geology, v. 65, no. 8, p. 985-992, illus., tables, 1970.
- 07225 **Alizai, Hamid Ullah; Hulbert, L. C.** Effects of soil texture on evaporative loss and available water in semi-arid climates: Soil Sci., v. 110, no. 5, p. 328-332, illus., tables, 1970.
- 06252 **Allaart, J. H.** Field investigations in the Ketilidian rocks of the Nanortalik-Tasermiut region, in Report of activities, 1969: Grönlands Geol. Undersögelse Rap. 28, p. 37-38, illus., 1970.
- Allan, J. R.** See Schopf, Thomas J. M. 03345
- Allan, R. J.** See Hornbrook, E. H. W. 03022
- 04660 **Allan, R. J.; Hornbrook, E. H. W.** Development of geochemical techniques in permafrost, Coppermine River region: Canadian Mining Jour., v. 91, no. 4, p. 45-48, illus., 1970.
- 00501 **Allan, Roderick James.** Clay mineralogy and geochemistry of soils and sediments with permafrost in interior Alaska [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 2984B-2985B, 1970.
- 06368 **Allard, Gilles O.** Geology of the northwest quarter of Lemoine Township, Abitibi-East County [also French edition]: Quebec Dept. Nat. Resources Prelim. Rept. 589, 16 p., tables, geol. map, 1970.
- 09327 **Allard, Gilles-O.; Caty, Jean-Louis.** Geology of the northeast quarter and part of the southeast quarter of Lemoine Township, Abitibi-East and Roberval Counties [also French edition]: Quebec Dept. Nat. Resources Prelim. Rept. 566, 20 p., tables, geol. map, 1969.
- 07577 **Al-Layla, Mohamad Tayeb Hussain.** Study of certain geotechnical properties of Beaumont Clay [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 3, p. 1258B, 1970.
- Allégre, Claude J.** See Montigny, Raymond. 01636
- 05607 **Allen, Alan A.; Schlueter, Roger S.; Mikolaj, Paul G.** Natural oil seepage at Coal Oil Point, Santa Barbara, California: Science, v. 170, no. 3961, p. 974-977, illus., table, 1970.
- Allen, B. L.** See Ratliff, L. F. 07221



- 10563 **Allen, Clarence R.; Matsuda, Tokihiko; Arabasz, Walter J.; Okada, Atsumasa.** Comparison of features of active faulting in northern Chile, California, and Japan [abs.]-Internat. Symposium on Recent Crustal Movements and Associated Seismicity, Wellington, N.Z., 1970, Proc.: Wellington, N.Z., Royal Soc. of New Zealand, p. 1-2, 1970.
- Allen, Clarence R.** See Lomnitz, Cinna. 10888
- Allen, David.** See Norton, Norman J. 01093
- 06688 **Allen, David William.** Sedimentary texture — A key to interpret deep-marine dynamics [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 828B-829B, 1970.
- 01164 **Allen, Gary Wayne.** A sedimentary analysis of the Sustut and Bowser Formations of north-central British Columbia, Canada [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 323-324, 1970.
- Allen, George E.** See Socolow, Arthur A. 07487
- Allen, J.** See Taylor, S. R. 05725
- Allen, J. H.** See Martin, J. R. 02266
- 03465 **Allen, J. M.; Wynne, F. L.; Richardson, J.** Valley Copper, a case history [abs.]: Canadian Mining and Metall. Bull., v. 63, no. 695, p. 295, 1970.
- 01539 **Allen, J. R. L.** Studies in fluvialite sedimentation — A comparison of fining-upwards cyclothems, with special reference to coarse-member composition and interpretation: Jour. Sed. Petrology, v. 40, no. 1, p. 298-323, illus., tables, 1970.
- 02015 **Allen, J. R. L.** The avalanching of granular solids on dune and similar slopes: Jour. Geology, v. 78, no. 3, p. 326-351, illus., tables, 1970.
- 03426 **Allen, James E.** New species of Eocene Mollusca from the Gulf Coast: Tulane Studies Geology and Paleontology, v. 8, no. 2, p. 69-78, 1970.
- 00812 **Allen, Joe H.; Bailey, Leslie F.** Earthquakes and nuclear detonations: Science, v. 167, no. 3920, p. 1012, 1970.
- 01426 **Allen, John Eliot.** Art and geology: Geotimes, v. 15, no. 4, p. 16-17, illus., 1970.
- 02807 **Allen, John Eliot.** Mount Rainier, our only glacial volcanic national park: Sci. and Children (Washington, D.C., Natl. Sci. Teachers Assoc.), v. 7, no. 6, p. 12-14, illus., 1970.
- 08320 **Allen, John R.** Physical processes of sedimentation: New York, American Elsevier Publishing Company, 248 p., illus., tables, 1970.
- 04421 **Allen, R. J.; Martin, D. F.; Taft, W. H.** A study of the effects of selected amino acids on the recrystallization of aragonite to calcite: Jour. Inorganic and Nuclear Chemistry, v. 32, no. 9, p. 2963-2970, illus., tables, 1970.
- 07907 **Allen, R. O.; Haskin, L. A.; Anderson, M. R.; Müller, O.** Neutron activation analysis for 39 elements in small or precious geologic samples: Jour. Radioanal. Chemistry, v. 6, no. 1, p. 115-137, illus., tables, 1970.
- Allen, Ralph O.** See Haskin, Larry A. 05698
- 07380 **Allen, Ralph Orville, Jr.** Multi-element neutron activation analysis — Development and application to a trace element study of the Bruderheim chondrite [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 1772B, 1970.

- 07835 **Allingham, John W.** Structural implication of aeromagnetic patterns in Mississippi-Valley type lead-zinc deposits [abs.]: *Mining Eng.*, v. 22, no. 9, p. 52, 1970.
- Allison, David E.** See Edmondson, W. T. 02443
- Allison, E. C.** See Peterson, G. L. 02995
- Allison, E. C.** See Lonsdale, P. F. 09648
- Allison, Edwin C.** See Hawkins, James W., Jr. 00280
- 00223 **Allison, Richard C.** Turrillids of the genus *Woodsalia* Olsson from the Americas [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 66-67, 1970.
- Allison, Richard C.** See Blake, D. Bryan. 04715
- Allman, R. L.** See Igarashi, Y. 08623
- Allmann, Rudolf.** See Donnay, Gabrielle. 06513
- 11006 **Alonso E., Hector.** La energia geotermica en El Salvador, America Central y en Cerro Prieto, Mexico [Geothermal energy in El Salvador, Central America and in Cerro Prieto, Mexico (with Spanish and English abs.)], in *Trabajos tecnicos presentados en la segunda reunion de geologos de America Central*: Inst. Centroamericano Inv. y Tecnologia Indus. Pubs. Geol., no. 2, p. 31-39, 1969.
- 08037 **Alper, Allen M.** (editor). Phase diagrams, materials science and technology — V. 1, Theory, principles, and techniques of phase diagrams: New York and London, Academic Press, 358 p., illus., tables, 1970.
- Alpha, Tau R.** See Carlson, Paul R. 03078
- Alpha, Tau Rho.** See Marlow, M. S. 01365
- Alpha, Tau Rho.** See Scholl, David W. 03531
- Alpha, Tau Rho.** See Nelson, C. Hans. 03532
- Alptekin, Omer.** See Sanford, Allan. 00354
- 05989 **Al-Rawi, Amin Hamad.** Quantitative mineralogical analysis of some soils in Iraq and of Antigo silt loam catena in Menominee County, Wisconsin [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5323B, 1970.
- Al-Rawi, Y.** See Christensen, M. N. 00244
- 03103 **Al-Rawi, Yehya Tawfeq.** Cenozoic history of the northern part of Mono Basin, California and Nevada [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 10, p. 4660B, 1970.
- Alsop, L. E.** See Knopoff, L. 03679
- 06041 **Alsop, L. E.; Goodman, A.; Ash, E.** Surface wave dispersion in elastic half spaces with surface mass loading [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 482, 1970.
- 10142 **Alt, D.; Chambers, R. L.** Repetition of the Spokane flood [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 1, 1970.
- Altgelt, K. H.** See Hirsch, E. 09459

- 02212 **Althaus, Voy.** Computer program for constructing abnormal formation fluid pressure prediction charts, in SPWLA Logging Symposium, 11th Ann., Los Angeles, Calif., 1970, Trans.: Houston, Tex., Soc. Prof. Well Log Analysts, p. L1-L18, illus., tables, 1970.
- Altinbilek, Hilmi D.** See LeFeuvre, Albert R. 05234
- 04974 **Alverson, Roy M.** Deep well disposal study for Baldwin, Escambia and Mobile Counties, Alabama: Alabama Geol. Survey Circ. 58, 49 p., illus., table, 1970.
- 01189 **Alwin, John A.; Scott, W. Frank.** Clastic dikes of the Touchet Beds, southeastern Washington [abs.]: Northwest Sci., v. 44, no. 1, p. 58, 1970.
- 09509 **Am. Assoc. Adv. Sci.; Singer, S. Fred.** (editor). Global effects of environmental pollution—Symposium, Dallas, Texas, 1968: New York, Springer-Verlag, and Dordrecht-Holland, D. Reidel Pub. Co., 218 p., illus., tables, 1970.
- 10409 **Am. Assoc. Petroleum Geologists.** (Committee on Preparation of Projection Slides). Slide manual—A guide to the preparation and use of projection slides, revised edition: Tulsa, Okla., Am. Assoc. Petroleum Geologists, 32 p., illus., tables, 1970; originally published 1960.
- Am. Association of Petroleum Geologists.** See U.S. Geological Survey. 07074
- 03877 **Am. Comm. Stratigraphic Nomenclature.** Code of stratigraphic nomenclature [as amended from the 1961 code]: Tulsa, Okla., Am. Assoc. Petroleum Geologists, 22 p., 1970.
- 02774 **Am. Geological Institute.** (Committee on Manpower). Manpower supply and demand in earth science, 1969-1974: Washington, D.C., Am. Geol. Inst., 36 p., illus., 1970.
- Am. Geological Institute.** See Geological Society of America. 04791
- 07996 **Am. Geological Institute.** Environmental geology — AGI short course lecture notes, Milwaukee, Wis., 1970: Washington, D. C., Am. Geol. Inst., sections pagged separately, 1970.
- 06224 **Am. Geological Institute Staff.** American Geological Institute: Geotimes, v. 17, no. 8, p. 17-21, 1970.
- 05070 **Am. Geophysical Union.** The geodynamics project: EOS, v. 51, no. 11, p. 712-713, 1970.
- 01525 **Am. Soc. Civil Engineers.** (Task Comm. on Preparation of Sedimentation Manual). Sediment measurement techniques — [Pt.] C, Accelerated valley deposits: Am. Soc. Civil Engineers Proc., v. 96, paper 7269, Jour. Hydraulics Div., no. HY 5, p. 1157-1166, illus., tables, 1970.
- 03622 **Am. Soc. Civil Engineers.** (Task Comm. on Preparation of Sedimentation Manual). Sediment sources and sediment yields, Chap. 4: Am. Soc. Civil Engineers Proc., v. 96, paper 7337, Jour. Hydraulics Div., no. HY 6, p. 1283-1329, illus., tables, 1970.
- 03685 **Am. Soc. Civil Engineers.** (Comm. on Tidal Hydraulics). Research needs on thermal and sedimentary pollution in tidal waters: Am. Soc. Civil Engineers Proc., v. 96, paper 7426, Jour. Hydraulics Div., no. HY 7, p. 1539-1548, 1970.
- 05241 **Am. Soc. Civil Engineers.** (Task Comm. on Preparation of Sedimentation Manual). Sediment measurement techniques — [Pt.] F, Laboratory procedures — Closure [to discussion of paper 6757, 1969]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Hydraulics Div., no. HY 11, p. 2377-2379, 1970.

- 05271 **Am. Soc. Testing and Materials.** (Subcommittee 6). Suggested method for estimating specific surface, *in* Special procedures for testing soil and rock for engineering purposes (5th edition): Am. Soc. Testing and Materials Spec. Tech. Pub. 479, p. 279-285, 1970.
- 09307 **Am. Soc. Testing and Materials.** Determination of the *in situ* modulus of deformation of rock (Symposium, ASTM, Winter Mtg., Denver, Colo., 1969): Am. Soc. Testing and Materials Spec. Tech. Pub. 477, 198 p., illus., tables, 1970.
- Amburgey, J. W., Jr.** See Francis, C. W. 02553
- Amein, Michael.** See Langfelder, Leonard J. 03718
- 00136 **Amenta, Roddy V.** Sequence of deformation and metamorphism near Philadelphia [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 10, 1970.
- 10378 **American Geological Institute; Heller, Robert L.** (editor). Geology and earth sciences sourcebook for elementary and secondary schools, second edition [revised]: New York, Holt, Rinehart and Winston, 459 p., illus., tables, 1970; first edition, 1962.
- Ames, H. T.** See Traverse, A. 03702
- Ames, H. T.** See Traverse, A. 03886
- Ames, H. Tate.** See Ryder, Robert T. 02409
- 03242 **Ames, Roger Lyman.** Sulfur isotope study of the Tintic mining district, Utah [abs.]: Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 5096B, 1970.
- 04816 **Amoruso, John J.** Possible future petroleum provinces of Gulf Coast Jurassic [abs.]: Am. Assoc. Petroleum Geologists, v. 54, no. 9, p. 1781-1782, 1970.
- 05398 **Amos, Dewey H.** Geologic map of the Blackford quadrangle, western Kentucky: U.S. Geol. Survey Geol. Quad. Map GQ-873, scale 1:24,000, text, 1970.
- 06452 **Amos, Dewey H.** Geologic map of parts of the Alton and Derby quadrangles, Meade and Breckinridge Counties, Kentucky: U.S. Geol. Survey Geol. Quad. Map GQ-845, scale 1:24,000, section, text, 1970.
- 08496 **Amos, Dewey H.; Desborough, George A.** Mafic intrusive rocks of Precambrian age in southeast Missouri (Contribution to Precambrian geology No. 3): Missouri Geol. Survey and Water Resources Rept. Inv., no. 47, 22 p., illus., tables, geol. map, 1970.
- Amos, Nur.** See Kanamori, Hiroo. 06288
- 06042 **Amsden, Thomas W.** A late Ashgillian (Ordovician) brachiopod fauna from the Edgewood Formation, Illinois and Missouri [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 482-483, 1970.
- Anders, E.** See Laul, J. C. 06854
- 00969 **Anders, Edward; Heymann, Dieter; Mazor, Emanuel.** Isotopic composition of primordial helium in carbonaceous chondrites: Geochim. et Cosmochim. Acta, v. 34, no. 1, p. 127-131, illus., table, 1970.
- Anders, Edward.** See Larimer, J. W. 01862
- Anders, Edward.** See Mazor, Emanuel. 03159
- 05085 **Anders, Edward.** Water on the Moon?: Science, v. 169, no. 3952, p. 1309-1310, 1970.
- Anders, Edward.** See Jeffery, Peter M. 05225

**Anders, Edward.** *See* Lancet, Michael S. 05609

**Anders, Edward.** *See* Ganapathy, R. 05679

**Anders, Edward.** *See* Ganapathy, R. 05692

- 03996 **Andersen, N. R.; Gassaway, J. D.; Maloney, W. E.** The relationship of the strontium:chlorinity ratio to water masses in the tropical Atlantic Ocean and Caribbean Sea: *Limnology and Oceanography*, v. 15, no. 3, p. 467-472, illus., tables, 1970.

- 02420 **Andersland, O. B.; Douglas, A. G.** Soil deformation rates and activation energies [with French abs.]: *Geotechnique*, v. 20, no. 1, p. 1-16, illus., table, 1970.

- 03027 **Andersland, Orlando B.; Douglas, Arthur G.; Ramanatha Iyer, T. S.; Mohamed, S. M. M.** Bonding, effective stresses, and strength of soils — Discussion [of paper 6786 by J. K. Mitchell, A. Singh, and R. G. Campanella, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, Jour. Soil Mechanics and Found. Div., no. SM 3, p. 1073-1077, 1970.

**Anderson, A. T.** *See* Smith, J. V. 05753

- 06044 **Anderson, A. T.; Gottfried, David.** The significance of phosphorous, titanium, and niobium for the origin of calc-alkaline magma series [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 483-484, 1970.

- 06043 **Anderson, Alfred T.** The hybrid andesite of East Sand Butte, Modoc County, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 483, 1970.

- 01733 **Anderson, Alfred T., Jr.** Nickel in basaltic olivine and glass [abs.]: *EOS*, v. 51, no. 4, p. 443-444, 1970.

- 02954 **Anderson, B. J.; Jenne, E. A.** Free-iron and -manganese oxide content of reference clays: *Soil Sci.*, v. 109, no. 3, p. 163-169, illus., table, 1970.

- 08070 **Anderson, C. D.; Sherwood, H. G.** Ore-densities of thirty-seven Canadian base-metal sulfide deposits: *Canadian Jour. Earth Sci.*, v. 7, no. 3, p. 1012-1017, illus., tables, 1970.

**Anderson, C. H.** *See* Halliday, W. R. 04004

**Anderson, C. N.** *See* Vogt, P. R. 03670

**Anderson, C. P.** *See* Gibbs, G. V. 09050

**Anderson, C. W., 3d.** *See* Reitzel, J. S. 01856

**Anderson, Charles H., Jr.** *See* Halliday, William R. 09244

**Anderson, Charles H., Jr.** *See* Halliday, William R. 09785

- 06843 **Anderson, D. H.** Introduction — The preliminary examination and preparation of lunar sample 12013: *Earth and Planetary Sci. Letters*, v. 9, no. 2, p. 94-102, illus., tables, 1970.

**Anderson, D. L.** *See* Hofmann, R. B. 00286

**Anderson, Daniel.** *See* Fryxell, Roald. 06276

- 01162 **Anderson, David N.; Land, P. E.** Cymric oil field: California Oil Fields — *Summ. Operations* 1969, v. 55, no. 1, p. 5-21, illus., tables, 1970.

**Anderson, Don.** *See* Sammis, Charles. 03561

- 00413 **Anderson, Don L.** Velocity-density relations: *Jour. Geophys. Research*, v. 75, no. 8, p. 1623-1624, table, 1970.



- 00811 **Anderson, Don L.; Archambeau, Charles B.; Brune, James N.; Richter, Charles F.; Smith, Stewart W.** Earthquakes and nuclear detonations: Science, v. 167, no. 3920, p. 1011-1012, 1970.

**Anderson, Don L.** See Jackson, David D. 02102

- 02811 **Anderson, Don L.; Jordan, T.** The composition of the lower mantle, in Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969, Proc.: Physics Earth and Planetary Interiors, v. 3, p. 23-35, illus., tables, 1970.

- 02871 **Anderson, Don L.; Sammis, Charles.** Partial melting in the upper mantle, in Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969, Proc.: Physics Earth and Planetary Interiors, v. 3, p. 41-50, illus., tables, 1970.

- 03697 **Anderson, Don L.; Anderson, Orson L.** The bulk modulus-volume relationship for oxides: Jour. Geophys. Research, v. 75, no. 17, p. 3494-3500, illus., tables, 1970.

**Anderson, Don L.** See Whitcomb, James H. 04661

- 09941 **Anderson, Don L.** Petrology of the mantle, in Symposium on the mineralogy and petrology of the upper mantle—Fiftieth Anniversary Symposia (Benjamin A. Morgan, editor): Mineralog. Soc. America Spec. Paper 3, p. 85-93, illus., tables, 1970.

**Anderson, Don L.** See Sammis, Charles. 10589

- 00815 **Anderson, Duwayne M.; Brown, Jerry.** Bentonite landslides [reply to discussion by D. B. Prior and C. Ho of 1969 paper]: Science, v. 167, no. 3920, p. 1015, 1970.

**Anderson, Duwayne M.** See McGaw, Richard W. 10075

- 10121 **Anderson, Duwayne M.; Tice, Allen R.** Low-temperature phases of interfacial water in clay-water systems: U.S. Army Corps Engineers Cold Regions Research and Eng. Lab. Research Rept. 290, 17 p., illus., tables, 1970.

- 02711 **Anderson, Edward K.** Surveys for materials and foundation studies: Surveying and Mapping, v. 30, no. 2, p. 257-262, illus., 1970.

- 02582 **Anderson, Edwin J.** Environment and synthesis of community models [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 833-834, 1970.

- 06691 **Anderson, Elaine.** Quaternary evolution of the genus *Martes* (Carnivora, Mustelidae): Acta Zool. Fennica 130, 132 p., illus., tables, 1970.

**Anderson, F. A.** See Wallace, G. B. 09308

- 00137 **Anderson, F. D.** The Catamaran Fault of north central New Brunswick [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 10, 1970.

- 04080 **Anderson, F. D.** Geology, Big Bald Mountain, New Brunswick: Canada Geol. Survey Map 1220A, scale 1:50,000, text, 1970.

- 05461 **Anderson, F. D.; Williams, H.** Geology, Gander Lake (west half), Newfoundland: Canada Geol. Survey Map 1195A, scale 1:250,000, text, 1970.

- 06309 **Anderson, F. D.** Geology of McKendrick Lake map-area, New Brunswick (21 J/16) (with a contribution by George D. Hobson): Canada Geol. Survey Paper 69-12, p. 1-9, illus., geol. map, 1970.

**Anderson, Franz E.** See Gaudette, Henri E. 01548

- 08547 **Anderson, Franz E.** The periodic cycle of particulate matter in a shallow, temperate estuary: Jour. Sed. Petrology, v. 40, no. 4, p. 1128-1135, illus., 1970.

**Anderson, Fred A.** See Wallace, George B. 07455

- 04629 **Anderson, G. M.** Some thermodynamics of dehydration equilibria: *Am. Jour. Sci.*, v. 269, no. 4, p. 392-401, illus., table, 1970.
- Anderson, G. M.** See Nriagu, J. O. 09695
- 10780 **Anderson, G. M.** Physical geochemistry, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 268-275, 1970.
- 01529 **Anderson, G. S.** Hydrologic reconnaissance of the Tanana basin, central Alaska: U.S. Geol. Survey Hydrol. Inv. Atlas HA-319, 4 sheets, scale 1:1,000,000, text, 1970.
- Anderson, Garry G.** See Huffman, Samuel F. 00721
- 07915 **Anderson, Harold Dean.** The geochemistry and mineralogy of the Pennsylvanian clays of Mahaska County [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 6, p. 3478B, 1970.
- Anderson, I. H.** See Brooker, E. W. 09831
- 01047 **Anderson, James H.** Holocene environments in the Atlin Valley, northwestern British Columbia, as determined by palynology [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 373, 1970.
- 00019 **Anderson, Jay Earl, Jr.** Recognition and time distribution of texturally altered welded tuff: *Geol. Soc. America Bull.*, v. 81, no. 1, p. 287-291, illus., 1970.
- 00593 **Anderson, John B.** Stratigraphy of the western margin of the Nacimiento uplift, New Mexico [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 324, 1970.
- 04251 **Anderson, L. A.; Johnson, G. R.** Application of magnetic and electrical resistivity methods to placer investigations in the Fairbanks district, Alaska, in *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C107-C113, illus., 1970.
- 06174 **Anderson, Lennart A.; Johnson, Gordon R.** Induced polarization and resistivity surveys on Cleary Summit, Alaska, in *Geological Survey research 1970*, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D125-D128, illus., 1970.
- 06175 **Anderson, Lennart A.; Reed, Bruce L.; Johnson, Gordon R.** Geologic interpretation of a residual aeromagnetic map of the Nixon Fork district, Alaska, in *Geological Survey research 1970*, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D129-D133, illus., 1970.
- Anderson, M. R.** See Allen, R. O. 07907
- 04516 **Anderson, Michael M.** South Jennings Field, Jefferson Davis Parish, Louisiana, in *Typical oil and gas fields of southwestern Louisiana*, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 26-26d, illus., 1970.
- Anderson, Michael R.** See Haskin, Larry A. 05698
- Anderson, Orson L.** See Demarest, Harold H., Jr. 02009
- 02011 **Anderson, Orson L.; Demarest, Harry.** The pressure derivatives of the sound velocities, and Poissons ratios from lattice theory [abs.]: *EOS*, v. 51, no. 4, p. 418, 1970.
- 02814 **Anderson, Orson L.; Liebermann, Robert C.** Equations for the elastic constants and their pressure derivatives for three cubic lattices and some geophysical applications, in *Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969*, Proc.: *Physics Earth and Planetary Interiors*, v. 3, p. 61-85, illus., tables, 1970.

**Anderson, Orson L.** See Anderson, Don L. 03697

- 06267 **Anderson, Orson L.; Scholz, Christopher; Soga, Naohiro; Warren, Nicholas; Schreiber, Edward.** Elastic properties of a micro-breccia, igneous rock and lunar fines from Apollo 11 mission, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1959-1973, illus., tables, 1970.

- 08425 **Anderson, Orson L.** Elastic constants of the central force model for three cubic structures — Pressure derivatives and equations of state: *Jour. Geophys. Research*, v. 75, no. 14, p. 2719-2740, illus., tables, 1970.

**Anderson, Orson L.** See Sykes, Lynn R. 09432

- 08366 **Anderson, Peter W.** Occurrence and distribution of trace elements in New Jersey streams: New Jersey Div. Water Policy and Supply Water-Resources Circ., no. 24, 24 p., illus., tables, 1970.

- 10008 **Anderson, R. Ernest.** Tectonic overview of Bering Sea-Aleutian Ridge region [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2467, 1970.

- 07519 **Anderson, Raymond J.; Egleson, G. C.** Discovery of potash in the A-1 Salina salt in Michigan, in *Forum on Geology of Industrial Minerals*, 6th, Ann Arbor, Mich., 1970, Proc.: Michigan Geol. Survey Miscellany 1, p. 15-19, illus., table, 1970.

- 07520 **Anderson, Raymond J.; Majeske, E. C.** Detection of potash zones by drilling fluid analysis, in *Forum on Geology of Industrial Minerals*, 6th, Ann Arbor, Mich., 1970, Proc.: Michigan Geol. Survey Miscellany 1, p. 34-36, illus., 1970.

- 02909 **Anderson, Richard R.** Remote sensing of marshlands and estuaries using color infrared photography, in *Earth resources aircraft program status review*, NASA, Houston, 1968 — V. 3, Hydrology, oceanography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 26-1 — 26-23, illus., table [1970].

- 09331 **Anderson, Richard R.** Spectral reflectance characteristics and automated data reduction techniques which identify wetlands and water quality conditions in the Chesapeake Bay, Sec. 53 of *Earth Resources Program*, 3d ann., review — v. 3, Hydrology and oceanography: Houston, Tex., NASA Manned Spacecraft Center, Msc-03742, p. 53-1 — 53-29, illus., tables, 1970.

- 10518 **Anderson, Rockne S.** A comparison of sound velocity measurements on board ship and in the laboratory [abs.]: *EOS*, v. 51, no. 11, p. 763, 1970.

**Anderson, Roger N.** See VonHerzen, Richard P. 01994

**Anderson, Roger Y.** See Kirkland, Douglas W. 05189

**Anderson, Roger Y.** See Holser, William T. 07026

**Anderson, Roger Y.** See Sarjeant, William Antony S. 09175

- 05510 **Anderson, Roy A., Jr.; Schuster, Robert L.** Stability of slopes in clay shales interbedded with Columbia River basalt, in *Engineering geology and soils engineering symposium*, 8th Ann., Pocatello, Idaho, 1970, Proc.: Boise, Idaho, Idaho Dept. Highways, p. 273-284, illus., 1970.

- 01190 **Anderson, T. D.** Seasonal variation in physical and chemical properties of two central Washington soils [abs.]: *Northwest Sci.*, v. 44, no. 1, p. 58, 1970.

**Anderson, T. W.** See Terasmae, J. 07711

- 02499 **Anderson, Thomas B.** Cambrian and Ordovician stratigraphy of the southern Mosquito Range, Colorado: *Mtn. Geologist*, v. 7, no. 1, p. 51-64, illus., 1970.

- 06045 **Anderson, Thomas H.; Silver, Leon T.** Reconnaissance survey of Precambrian rocks, northwestern Sonora, Mexico [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 484, 1970.
- 08383 **Anderson, V. H.** Sea ice pressure ridge study — An airphoto analysis: *Photogrammetria*, v. 26, no. 5-6, p. 201-228, illus., 1970.
- Anderson, Warren.** See Snell, L. J. 03382
- 07727 **Anderton, Peter W.** Deformation of surface ice at a glacier confluence, Kaskawulsh Glacier, in Icefield Ranges Research Project, scientific results, V. 2 (V. C. Bushnell and R. H. Ragle, editors): New York, *Am. Geog. Soc., and Montreal, Quebec, Arctic Inst. No. America*, p. 59-76, illus., table, 1970.
- 10436 **Andre, H.; Bennion, D. W.** A transform approach to the simulation of transient gas flow in porous media: *Soc. Petroleum Engineers Jour.*, v. 10, no. 2, p. 135-139, illus., 1970.
- Andreassen, Gordon E.** See Zietz, Isidore. 03672
- 05835 **Andrew, E. M.; Smith, D. Masson; Robson, G. R.** Gravity anomalies in the Lesser Antilles: [Great Britain] *Inst. Geol. Sci. Geophys. Paper* 5, 21 p., illus., tables, 1970.
- 10590 **Andrews, Dudley Jo.** Equation of state of the alpha and epsilon phases of iron [abs.]: *EOS*, v. 51, no. 11, p. 828, 1970.
- 04134 **Andrews, George W.** Late Miocene nonmarine diatoms from the Kilgore area, Cherry County, Nebraska: *U.S. Geol. Survey Prof. Paper* 683-A, p. A1-A24, illus., table, 1970.
- 01880 **Andrews, Henry N., Jr.** Index of generic names of fossil plants, 1820-1965: *U.S. Geol. Survey Bull.* 1300, 354 p., 1970.
- Andrews, Henry N., Jr.** See Kasper, Andrew E., Jr. 04164
- 05460 **Andrews, J. T.; Barry, R. G.; Drapier, Lyn.** An inventory of the present and past glacierization of Home Bay and Okoa Bay, east Baffin Island, N.W.T., Canada, and some climatic and palaeoclimatic considerations [with French and German abs.]: *Jour. Glaciology*, v. 9, no. 57, p. 337-362, illus., tables, 1970.
- 00032 **Andrews, J. E.** Structure and sedimentary development of the outer channel of the Great Bahama Canyon: *Geol. Soc. America Bull.*, v. 81, no. 1, p. 217-225, illus., 1970.
- 01244 **Andrews, J. T.; Buckley, Jane T.; England, J. H.** Late-glacial chronology and glacio-isostatic recovery, Home Bay, east Baffin Island, Canada: *Geol. Soc. America Bull.*, v. 81, no. 4, p. 1123-1148, illus., tables, 1970.
- 02173 **Andrews, J. T.** Differential crustal recovery and glacial chronology (6,700 to 0 BP), west Baffin Island, N.W.T., Canada: *Arctic and Alpine Research*, v. 2, no. 2, p. 115-134, illus., tables, 1970.
- 05970 **Andrews, J. T.; Dugdale, R. E.** Age prediction of glacio-isostatic strandlines based on their gradients: *Geol. Soc. America Bull.*, v. 81, no. 12, p. 3769-3771, illus., table, 1970.
- 07695 **Andrews, J. T.** Present and postglacial rates of uplift for glaciated northern and eastern North America derived from postglacial uplift curves, in *Symposium on recent crustal movements*, Ottawa, Canada, 1969, *Papers: Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 2, p. 703-715, illus., tables, 1970; erratum, *ibid.*, no. 7, p. 1184, 1970.

**Andrews, J. T.** See Webber, P. J. 07708

- 01137 **Andrews, James E.; Shepard, Francis P.; Hurley, Robert J.** Great Bahama Canyon: Geol. Soc. America Bull., v. 81, no. 4, p. 1061-1078, illus., 1970.
- 06319 **Andrews, John T.** A geomorphological study of post-glacial uplift, with particular reference to Arctic Canada: Inst. British Geographers Spec. Pub. 2, 156 p., illus., tables, 1970.
- 06728 **Andrews, Peter B.** Facies and genesis of a hurricane-washover fan, St. Joseph Island, central Texas coast: Texas Univ. Austin Bur. Econ. Geology Rept. Inv. 67, 147 p., illus., tables, 1970.
- 06618 **Andrews, Peter William.** The effect of import quotas on the United States zinc industry [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 826B, 1970.
- 10517 **Andrews, Robert S.** Seismic reflectivity from marine sediment models [abs.]: EOS, v. 51, no. 11, p. 763, 1970.
- Andrichuk, J. M.** See Nelson, S. J. 10751
- Andrieux, Pierre.** See Weber, J. R. 01451
- 07263 **Anessi, Thomas Joseph.** Strength and consolidation properties of raw and stabilized Oklahoma shales [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2661B, 1970.
- 05063 **Angino, Ernest E.** Selective element recovery from oil field brines, in Saline water symposium: Water Resources Research, v. 6, no. 5, p. 1501-1504, illus., table, 1970.
- Anglin, F. M.** See Basham, P. W. 00417
- 00138 **Anibal, Espejo C.; Mattson, Peter H.** Textural evidence for synorogenic intrusion of the Peekskill pluton, New York [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 10-11, 1970.
- 04817 **Anisgard, Harry W.** Causes of dominantly arenaceous foraminiferal assemblages in downdip Wilcox of Louisiana [abs.]: Am. Assoc. Petroleum Geologists, v. 54, no. 9, p. 1782, 1970.
- 07325 **Anisgard, Harry W.** Causes of dominantly arenaceous foraminiferal assemblages in downdip Wilcox of Louisiana, in Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Soc. Trans., v. 20, p. 210-217, illus., 1970.
- 02220 **Annambhotla, Venkata Subramanya S.** Statistical properties of bed forms in alluvial channels in relation to flow resistance [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 9, p. 4147B, 1970.
- 05682 **Annell, Charles S.; Helz, Armin W.** Emission spectrographic determination of trace elements in lunar samples from Apollo 11, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 991-994, tables, 1970.
- 06470 **Annells, R. N.** Keweenaw volcanic geology of Michipicoten Island, Lake Superior [abs.], in Inst. Lake Superior Geology, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 7, 1970.
- 09791 **Anson, Abraham.** Color aerial photos in the reconnaissance of soils and rocks: Photogramm. Eng., v. 36, no. 4, p. 343-354, illus., 1970.
- 01213 **Anstey, Robert L.; Perry, T. G.** Biometric procedures in taxonomic studies of Paleozoic bryozoans: Jour. Paleontology, v. 44, no. 2, p. 383-398, illus., tables, 1970.

- 07378 **Anstey, Robert Leland.** The trepostome bryozoan fauna of the Eden Shale (Ordovician) in southeastern Indiana and adjacent areas in Kentucky and Ohio [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 4, p. 2157B, 1970.
- Anthony, E. H.** See Vilks, G. 08755
- 07303 **Anthony, Gaylord Dean.** Studies of the thermal decomposition of kaolin and sediments [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 5, p. 2519B, 1970.
- 06574 **Anthony, John W.; Laughon, Robert B.** Kinoite, a new hydrous copper calcium silicate mineral from Arizona: *Am. Mineralogist*, v. 55, nos. 5-6, p. 709-715, illus., tables, 1970.
- Anthony, John W.** See Williams, Sidney A. 06575
- Anthony, John W.** See Williams, Sidney A. 09045
- Anthony, John W.** See McLean, W. John. 09046
- 08599 **Antoine, J. W.; Pyle, T. E.** Crustal studies in the Gulf of Mexico, in *The structure of the crust and mantle beneath inland and marginal seas — Internat. Upper Mantle Comm. Upper Mantle Project, Sci. Rept. No. 29: Tectonophysics*, v. 10, no. 5-6, p. 477-494, illus., 1970.
- Antoine, J. W.** See Ewing, J. I. 09719
- 00861 **Antoine, John W.; Pyle, Thomas E.** Crustal studies in the Gulf of Mexico [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 266-267, 1970.
- 02540 **Antoine, John W.; Gilmore, James C.** Geology of the Gulf of Mexico: *Ocean Industry*, v. 5, no. 5, p. 34-38, illus., 1970.
- 02583 **Antoine, John W.** Geology and hydrocarbon potential, deep Gulf of Mexico [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 834, 1970.
- 09755 **Antweiler, J. C.; Sutton, A. L., Jr.** Spectrochemical analyses of native gold samples: Springfield, Va., U.S. Natl. Tech. Inf. Service PB 194 809 (USGS GD-70-003), 28 p., illus., tables, 1970.
- 06339 **Anuta, Paul E.** Spatial registration of multispectral and multitemporal digital imagery using fast Fourier transform techniques: *IEEE Trans. Geosci. Electronics*, v. GE-8, no. 4, p. 353-368, illus., tables, 1970.
- 01907 **Anzoleaga, Rodolfo; Ocola, Leonidas C.; Meyer, Robert P.** Western Lake Superior revisited, crustal structure from the integration of gravity and seismic data [abs.]: *EOS*, v. 51, no. 4, p. 356, 1970.
- Aoki, Ken-Ichiro.** See Kuno, Hisashi. 03767
- 05057 **Appleby, F. Victor.** Recession and the baseflow problem: *Water Resources Research*, v. 6, no. 5, p. 1398-1403, illus., 1970.
- 01266 **Applegate, Shelton P.** Digging fossil whales in Mississippi with southern hospitality: *Los Angeles County Mus. Nat. History Quart.*, v. 8, no. 3, p. 26-31, illus., 1969-70.
- 02832 **Applegate, Shelton P.** The vertebrate fauna of the Selma Formation of Alabama — Pt. 8, The fishes: *Fieldiana — Geology Mem.*, v. 3, no. 8, p. [383]-433, illus., 1970.
- Appleman, D. E.** See Dowty, Eric. 06959
- 08284 **Appleman, Philip.** (editor). Darwin, a Norton critical edition: New York, W. W. Norton and Company, 674 p., illus., 1970.
- Applin, Esther R.** See Cole, W. Storrs. 04658

- 03512 **Arabasz, Walter J.; Brune, James N.; Engen, Gladys R.** Locations of small earthquakes near the trifurcation of the San Jacinto fault southeast of Anza, California: *Seismol. Soc. America Bull.*, v. 60, no. 2, p. 617-627, illus., table, 1970.
- Arabasz, Walter J.** *See* Allen, Clarence R. 10563
- Aratake, Nagaharu.** *See* Uchida, Kinsuke. 02474
- Arbingast, Stanley A.** *See* Bonine, Michael E. 07191
- Archambault, G.** *See* Ladanyi, B. 07508
- Archambault, Ginette.** *See* Valiquette, Guy. 06214
- 03977 **Archambeau, Charles; Sammis, Charles.** Seismic radiation from explosions in prestressed media and the measurement of tectonic stress in the Earth: *Rev. Geophysics and Space Physics*, v. 8, no. 3, p. 473-499, illus., 1970.
- Archambeau, Charles B.** *See* Anderson, Don L. 00811
- Archambeau, Charles B.** *See* Smith, Stewart W. 01625
- 06046 **Archambeau, Charles B.; Sammis, Charles.** Seismic radiation from explosions in prestressed media and the measurement of tectonic stress in the Earth [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 484-485, 1970.
- Archambeau, Charles B.** *See* Smith, Stewart W. 09580
- Archambeau, Charles B.** *See* Minster, Jean B. 10634
- 03217 **Archbold, N. L.; Paul, Richard R.** Geology and mineral deposits of the Pamlico mining district, Mineral County, Nevada: *Nevada Bur. Mines Bull.* 74, 12 p., illus., geol. map, 1970.
- 02423 **Archer, A. A.** Standardization of the size classification of naturally occurring particles: *Geotechnique*, v. 20, no. 1, p. 103-107, table, 1970.
- 04142 **Arem, Joel E.** Preserving mineral localities: *Mineralog. Rec.*, v. 1, no. 2, p. 39, 67, 1970.
- Arem, Joel E.** *See* Ito, Jun. 06580
- Arhelger, Martin.** *See* Kinney, Patrick J. 10737
- 00838 **Arias, Arturo.** A measure of earthquake intensity, *in* *Seismic design for nuclear power plants* (Robert J. Hansen, editor): Cambridge, Mass., M.I.T. Press, p. 438-483, illus., tables, 1970.
- 01122 **Aristarain, L. F.** Chemical analyses of caliche profiles from the high plains, New Mexico: *Jour. Geology*, v. 78, no. 2, p. 201-212, 1970.
- Arita, Masafumi.** *See* Okada, Hakuyu. 05664
- 10477 **Arkani-Hamed, Jafar.** Free oscillations of the laterally heterogeneous Earth [abs.]: *EOS*, v. 51, no. 11, p. 739, 1970.
- Armando Diez, J.** *See* DelCastillo G., Luis. 09353
- 00444 **Armington, A. F.; O'Connor, J. J.** Recrystallization by shifting the equilibrium of chemical complexes — The growth of cinnabar: *Jour. Crystal Growth*, v. 6, no. 3, p. 278-280, illus., 1970.
- Armstrong, A. K.** *See* Dutro, J. T., Jr. 11278

- 00406 **Armstrong, Augustus K.** Mississippian dolomites from the Lisburne Group, Killik River, Mount Bupto region, Brooks Range, Alaska: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 2, p. 251-264, illus., 1970.
- 01687 **Armstrong, Augustus K.** Foraminifera and rugose coral zones of Mississippian-Pennsylvanian Lisburne Group, Brooks Range, Arctic Alaska [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 3, p. 559, 1970.
- 02072 **Armstrong, Augustus K.; Mamet, Bernard L.; Dutro, J. Thomas, Jr.** Foraminiferal zonation and carbonate facies of Carboniferous (Mississippian and Pennsylvanian) Lisburne Group, central and eastern Brooks Range, Arctic Alaska: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 687-698, illus., 1970.
- 04922 **Armstrong, Augustus K.** Mississippian rugose corals, Peratrovich Formation, west coast, Prince of Wales Island, southeastern Alaska: *U.S. Geol. Survey Prof. Paper* 534, 44 p., illus., table, 1970.
- 06805 **Armstrong, Augustus K.** Carbonate facies and the lithostrotionid corals of the Mississippian Kogruk Formation, DeLong Mountains, northwestern Alaska: *U.S. Geol. Survey Prof. Paper* 664, 38 p., illus., table, 1970.
- 07081 **Armstrong, Augustus K.; Mamet, Bernard L.** Biostratigraphy and dolomite porosity trends of the Lisburne Group, in Geological seminar on the North Slope of Alaska, Palo Alto, Calif., 1970, *Proc.: Los Angeles, Calif., Am. Assoc. Petroleum Geologists Pacific Sec.*, p. N1-N16, illus., discussion, 1970.
- Armstrong, Augustus K.** See Greenwood, Eugene. 08649
- 08657 **Armstrong, Augustus K.** Mississippian stratigraphy and geology of the northwestern part of the Klondike Hills, southwestern New Mexico, in Guidebook of the Tyrone-Big Hatchet Mountains-Florida Mountains region — New Mexico Geol. Soc. Field Conf., 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, p. 59-63, illus., 1970.
- 06413 **Armstrong, Baxter H.** Reply to "Comments on rock bursts, outbursts, and earthquake prediction": *Seismol. Soc. America Bull.*, v. 60, no. 6, p. 2087-2088, 1970.
- Armstrong, C. W.** See Broadbent, C. D. 09832
- Armstrong, D. E.** See Sommers, L. E. 04061
- Armstrong, E. F.** See Egbert, R. L. 08153
- Armstrong, Frank C.** See Society of Economic Geologists. 04909
- Armstrong, Joseph E.** See Williams, Dennis A. 05498
- 06217 **Armstrong, R. L.; Barton, J. M.; Carmalt, S. W.; Crowley, W. P.** Geochronologic studies of the Prospect, Ansonia, and Milford Formations, southern Connecticut, in Contributions to geochronology in Connecticut: Connecticut Geol. and Nat. History Survey Rept. Inv. 5, p. 19-27, illus., tables, 1970.
- 00478 **Armstrong, Richard Lee.** Geochronology of Tertiary igneous rocks, eastern Basin and Range Province, western Utah, eastern Nevada, and vicinity, U.S.A.: *Geochim. et Cosmochim. Acta*, v. 34, no. 2, p. 203-232, illus., tables, 1970.
- 00479 **Armstrong, Richard Lee.** K-Ar dating using neutron activation for Ar analysis — Comparison with isotope dilution Ar analyses: *Geochim. et Cosmochim. Acta*, v. 34, no. 2, p. 233-236, illus., tables, 1970.
- 00566 **Armstrong, Richard Lee.** Mantled gneiss domes in the Albion Range, southern Idaho — A revision: *Geol. Soc. America Bull.*, v. 81, no. 3, p. 909-910, 1970.



- 04016 **Armstrong, Richard Lee; Besancon, James.** A Triassic time scale dilemma — K-Ar dating of Upper Triassic mafic igneous rocks, eastern U.S.A. and Canada and post-Upper Triassic plutons, western Idaho, U.S.A.: *Eclogae Geol. Helvetiae*, v. 63, no. 1, p. 15-28, illus., tables, 1970.
- Arnold, Allan.** See Walton, Brian J. 08353
- 01048 **Arnold, Chester A.** Eocene age plantbearing chert in the northwestern United States and adjacent Canada [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 373-374, 1970.
- Arnold, E. P.** See Algermissen, S. T. 00221
- Arnold, K.** See Ostrem, G. 06828
- Arnold, R. W.** See Witty, J. E. 03936
- 06188 **Arnow, Ted.; VanHorn, Richard; LaPray, Reed.** The pre-Quaternary surface in the Jordan Valley, Utah, in *Geological Survey research 1970*, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D257-D261, illus., table, 1970.
- 08427 **Arnow, Ted.; Feth, J. H.; Mower, R. W.** Ground water in deltas of the Bonneville Basin, the Great Basin, U.S.A. [with French abs.], in *Symposium on the Hydrology of Deltas*, V. 2: Internat. Assoc. Sci. Hydrology-Unesco Pub. 91, p. 396-407, illus., table, discussion, 1970.
- 08715 **Aronovici, V. S.; Schneider, Arland D.; Jones, Ordie, R.** Basin recharging the Ogallala aquifer through Pleistocene sediments, in *Ogallala Aquifer Symposium*, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, p. 182-192, illus., 1970.
- 00481 **Aronow, Saul.** Critical features of the Pleistocene Beaumont Clay surface in Jefferson and Chambers Counties of southeast Texas [abs.]: *Texas Jour. Sci.*, v. 21, no. 3, p. 334, 1970.
- 00862 **Aronow, Saul.** Regional contrasts in the deterioration of relict fluvial surfaces [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 267, 1970.
- 03695 **Aronson, J. R.; Bellotti, L. H.; Eckroad, S. W.; Emslie, A. G.; McConnell, R. K.; vonThuna, P. C.** Infrared spectra and radiative thermal conductivity of minerals at high temperatures: *Jour. Geophys. Research*, v. 75, no. 17, p. 3443-3456, illus., tables, 1970.
- 07336 **Arora, Harpal Singh.** Clay dispersion as influenced by chemical environment and mineralogical properties [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 4, p. 1646B, 1970.
- 10192 **Arredondo, Oscar.** Dos nuevas especies subfósiles de mamíferos (Insectivora: Nesophontidae) del Holoceno precolombiano de Cuba [two new subfossil species of mammals (Insectivora: Nesophontidae) of the pre-Colombian Holocene of Cuba (with English summ.)]: *Soc. Ciencias Nat. La Salle Mem.*, v. 30, no. 86, p. 122-152, illus., tables, 1970.
- Arrhenius, G.** See Asunmaa, S. K. 06268
- Arrhenius, G.** See Bonatti, E. 09996
- Arriens, P. A.** See Compston, W. 05760
- Arrigoni, Enrico L.** See Bell, James M. 05508
- 09757 **Arthur, Don R.** Man and his environment: New York, Am. Elsevier Publishing Co., 218 p., illus., tables, 1969.
- Artus, D. S.** See Pickett, G. R. 00842

- 02223 **Artyunova, N. M.** Novyye dannyye o krupnykh mestorozhdeniyakh nefti i gaza v SShA [New data on the major oil and gas fields in the U.S.A.]: *Geologiya Nefti i Gaza* 1970, no. 2, p. 58-59, tables, 1970.
- Asada, Tetsutaro.** See Ohta, Yutaka. 00327
- Ash, E.** See Alsop, L. E. 06041
- 04717 **Ash, Sidney R.** *Pagiophyllum simpsonii*, a new conifer from the Chinle Formation (Upper Triassic) of Arizona: *Jour. Paleontology*, v. 44, no. 5, p. 945-952, illus., 1970.
- 07807 **Ash, Sidney R.** *Dinophyton*, a problematical new plant genus from the Upper Triassic of the south-western United States: *Palaeontology*, v. 13, pt. 4, p. 646-663, illus., table, 1970.
- 09128 **Ashby, Carl T.; Berry, James W.; Deutschman, Archie J., Jr.** A variable-volume silver liner for high pressure hydrothermal crystal growth: *Am. Mineralogist*, v. 55, nos. 9-10, p. 1800-1802, illus., 1970.
- Ashcroft, Gaylen L.** See Jeppson, Roland W. 09902
- 07198 **Asher, R. R.** Geochemistry and geology, Boundary area, Fortymile district, Eagle A-1 quadrangle, Alaska: Alaska Div. Mines and Geology Geochem. Rept. 23, 35 p., illus., tables, 1970.
- 09431 **Asher, R. R.** Geology and geochemistry of part of the Iron Creek area, Solomon D-6 quadrangle, Seward Peninsula, Alaska: Alaska Div. Mines and Geology Geochem. Rept. 18, 18 p., illus., tables, 1969.
- 09517 **Asher, R. R.** Geology and geochemistry of the Belt-Creek-Libby River area, Seward Peninsula, Alaska: Alaska Div. Mines and Geology Geochem. Rept. 22, 26 p., illus., tables, 1970.
- Ashley, R. P.** See Silberman, M. L. 04322
- 02522 **Ashmun, Tod.** The mineralogy and some thoughts concerning the concentrating mechanisms for a mineral suite found as cavity fillings in limestone near Holmesville, Nebraska [abs.]: *Nebraska Acad. Sci. Proc.*, 80th Ann. Mtg., p. 33, 1970.
- 10812 **Ashton, Ken.** Hydrological analysis applied to tropical karst, in *Internat. Cong. Speleology*, 4th, Yugoslavia, 1965, Proc., V. 3: Ljubljana, Yugoslavia, *Speleolog. Soc. Yugoslavia*, p. 13-16, illus., 1968.
- 02417 **Asquith, D. O.** Depositional topography and major marine environments, Late Cretaceous, Wyoming: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 7, p. 1184-1224, illus., table, 1970.
- 06047 **Asseez, L. O.** Design of earth roads in developing countries [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 485, 1970.
- 10388 **Assoc. Bay Area Governments.** [California]. Ocean coastline study—Bay area regional planning program: Berkeley, Calif., Assoc. Bay Area Govts. Supp. Rept. Is-5, 125 p., illus., tables, 1970.
- 10226 **Association Eng. Geologists; Geol. Soc. Puerto Rico.** Engineering geology in Puerto Rico—[Guidebook to post-meeting] field trip 6, Assoc. Eng. Geologists, 1970 Ann. Mtg., [Washington, D. C.]; [Sacramento, Calif.] Assoc. Eng. Geologists, 24 p., illus., 1970.
- 10227 **Association Eng. Geologists.** Engineering geology in northeastern Pennsylvania and New Jersey—[guidebook to] Field trip 2, 1970 Ann. Mtg., [Washington, D. C.]: [Sacramento, Calif.] Assoc. Eng. Geologists, 32 p., illus., tables, 1970.

- 11236 **Association Eng. Geologists.** Engineering geology of the Rayston Dam and the historical engineering geology of the Chesapeake and Ohio Canal — [Guidebook to] Field trips 1 and 5, 1970 Ann. Mtg., [Washington, D.C.]: [Sacramento, Calif.] Assoc. Eng. Geologists, 16 p., illus., 1970.
- 09231 **Association of Missouri Geologists; Myers, Harold E.** Bonne Terre, Missouri — Assoc. Missouri Geologists field trip, 16th Ann., October 1969: n.p., Assoc. Missouri Geologists [16] p., illus., 1969.
- 06268 **Asunmaa, S. K.; Liang, S. S.; Arrhenius, G.** Primordial accretion, inferences from the lunar surface, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1975-1985, illus., 1970.
- 02360 **Atakol, Kenan; Larew, H. Gordon.** Dynamic shearing resistance of dry Ottawa sand: Am. Soc. Civil Engineers Proc., v. 96, paper 7186, Jour. Soil Mechanics and Found. Div., no. SM2, p. 705-720, illus., table, 1970.
- Atkins, Edward G.** See West, Robert M. 00942
- 05990 **Atkinson, Ian Athol Edward.** Rates of ecosystem development on some Hawaiian lava flows [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5323B-5324B, 1970.
- Atkinson, Lee C.** See Fowler, Michael L. 00702
- 10707 **Atlantic Development Board.** Mineral resources in the Atlantic provinces: Ottawa, Atlantic Devel. Board, Background Study 4, 94 p., tables, 1969.
- Atlasov, I. P.** See Egiazarov, B. Kh. 10036
- Atlasov, I. P.** See Tkatchenko, B. V. 10108
- 03411 **Attaway, David; Parker, P. L.** Sterols in recent marine sediments: Science, v. 169, no. 3946, p. 674-676, illus., 1970.
- 01702 **Atwater, Tanya; Menard, H. W.** Magnetic lineations in the northeast Pacific: Earth and Planetary Sci. Letters, v. 7, no. 5, p. 445-450, illus., 1970.
- Atwater, Tanya.** See Grow, John A. 06118
- 06124 **Atwater, Tanya.** Implications of plate tectonics for the Cenozoic tectonic evolution of western North America: Geol. Soc. America Bull., v. 81, no. 12, p. 3513-3535, illus., 1970.
- Atwell, B. Houston.** See Stern, Daniel H. 11255
- 03788 **Atwood, D. K.; Bubb, J. N.** Distribution of dolomite in a tidal flat environment, Sugarloaf Key, Florida: Jour. Geology, v. 78, no. 4, p. 499-505, illus., table, 1970.
- 03129 **Atwood, George L.** Bulldozers peel waste to 3-inch tolerance from steep  $P_2O_5$  beds: World Mining, v. 6, no. 5, p. 46-49, illus., 1970.
- 06130 **Aubert de la Rüe, E.** Les îles Saint-Pierre et Miquelon, une enclave subarctique meridionale [The Saint-Pierre and Miquelon islands, a southern subarctic enclave (with English abs.)], in Ecology of the subarctic regions (Ecologie des régions subarctiques) — Helsinki, Symposium, Proc.: Paris, UNESCO, p. 289-293, discussion, 1970.
- Aue, Walter A.** See Gehrke, Charles W. 05742
- 10469 **Auffenberg, Walter.** The fossil snakes of Florida: Plaster Jacket, no. 3, [7] p., illus., table, 1967.
- 10471 **Auffenberg, Walter.** Fossil crocodilians of Florida: Plaster Jacket, no. 5, [6] p., illus., 1967.

- 10931 **Auffenberg, Walter.** What is a plaster jacket?: Plaster Jacket, no. 6, [7] p., illus., 1967.
- 05501 **Aughenbaugh, N. B.; Meisenheimer, J. K.** The application of photoelasticity to soils testing, in Engineering geology and soils engineering symposium, 8th Ann., Pocatello, Idaho, 1970, Proc.: Boise, Idaho, Idaho Dept. Highways, p. 147-158, illus., 1970.
- Auh, Keunho.** See Hummel, F. A. 02446
- 08384 **Ault, C. H.; Carr, D. D.** Locations of crushed stone operations in Indiana: Indiana Geol. Survey Misc. Map 11, scale 1:1,000,000, sections, revised 1970; originally published 1965.
- Ault, Curtis H.** See Rooney, Lawrence F. 03787
- Ault, Curtis H.** See Rooney, Lawrence F. 07484
- Ault, W. U.** See Richter, D. H. 06692
- 03153 **Aumento, F.** Serpentine mineralogy of ultrabasic intrusions in Canada and on the Mid-Atlantic Ridge: Canada Geol. Survey Paper 69-53, 51 p., illus., tables, 1970.
- Aumento, F.** See Irving, E. 05285
- Aumento, F.** See Irving, E. 07702
- 07721 **Aumento, F.** Improved positioning of dredges on the sea floor: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 1, p. 534-539, illus., 1970.
- Aumento, F.** See Barrett, D. L. 08131
- 09428 **Aune, Quintin A.** Glaciation in Mt. Shasta-Castle Crags: California Div. Mines and Geology Mineral Inf. Service, v. 23, no. 7, p. 145-148, illus., 1970
- 09429 **Aune, Quintin A.** A trip to Castle Crags: California Div. Mines and Geology Mineral Inf. Service, v. 23, no. 7, p. 139-144, illus., 1970.
- 02014 **Austin, Charles Thomas.** Analysis of an aeromagnetic profile across the Mill Creek syncline, Anadarko basin, southern Oklahoma: Shale Shaker, v. 20, no. 8, p. 144-160, illus., 1970.
- 07990 **Austin, G. S.** Deep stratigraphic test well near Hollandale, Minnesota: Minnesota Geol. Survey Rept. Inv. 12, 52 p., illus., tables, 1970.
- 08291 **Austin, G. S.; Grant, J. A.; Ikola, R. J.; Sims, P. K.** Geologic map of Minnesota — New Ulm sheet, bedrock geology: Minneapolis, Minn., Minnesota Geol. Survey, scale 1:250,000, 1970.
- 03492 **Austin, George.** A teacher's guide for geologic field investigations in southwestern Minnesota: [St. Paul, Minn.] Minnesota Dept. Education, 10 p., illus. [n.d.].
- 01536 **Austin, George S.** Weathering of the Sioux Quartzite near New Ulm, Minnesota, as related to Cretaceous climates: Jour. Sed. Petrology, v. 40, no. 1, p. 184-193, illus., 1970.
- Austin, Ronald L.** See Rhodes, Frank H. T. 01101
- 01185 **Austin, Ronald L.** Phylogeny and homeomorphy of conodonts in the Lower Carboniferous [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 374, 1970.
- 02200 **Austin, S. R.; Hetland, D. L.; Sharp, B. J.** Mineralogy of the Lemhi Pass thorium and rare-earth deposits: Idaho Bur. Mines and Geology Mineral Resources Rept. 11, 10 p., illus., 1970.
- 04181 **Austin, S. Ralph.** Some patterns of sulfur isotope distribution in uranium deposits: Earth Sci. Bull., v. 3, no. 2, p. 5-22, illus., table, 1970.
- Austin, T. Al.** See Claborn, B. J. 08710

- 10597 **Austria, B. S.; Burt, D. M.** The influence of wollastonite on copper and zinc ore mineralogy in Ca-Fe-Si skarn deposits [abs.]: EOS, v. 51, no. 11, p. 830, 1970.
- 03160 **Austria, V. B., Jr.** The Cu, Pb, Zn, Mn, and Mo content of stream and spring sediments, southwestern New Brunswick, N.T.S. 21-G/6, 7, 8W, 10, 11: New Brunswick Dept. Nat. Resources Mineral Resources Br. Rept. Inv. 11, 19 p., illus., geol. map, 1970.
- 10808 **Auvil, J. H., Jr.** (director). List of publications of the Geological Survey of Georgia, 12th edition: Georgia Geol. Survey Circ. 1, 24 p., 1970
- Auzende, Jean-Marie.** See Pautot, Guy. 03395
- 06446 **Auzende, Jean-Marie; Olivet, Jean-Louis; Bonnin, Jean.** La marge du Grand Banc et la fracture de Terre-Neuve [The margin of the Grand Banks and the Newfoundland fracture]: Acad. Sci. Comptes Rendus, ser. D, v. 271, no. 13, p. 1063-1066, illus., 1970.
- Ave'Lallemant, Hans G.** See Carter, Neville L. 03774
- 03775 **Ave'Lallemant, Hans G.; Carter, Neville L.** Syntectonic recrystallization of olivine and modes of flow in the upper mantle: Geol. Soc. America Bull., v. 81, no. 8, p. 2203-2220, illus., 1970.
- 08537 **Avent, Jon C.** Correlation of the Steens-Columbia River Basalts — Some tectonic and petrogenetic implications, in Columbia River Basalt Symposium, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 135-156, illus., tables, 1970.
- 03878 **Averitt, Paul; Carter, M. Devereux.** Selected sources of information on United States and world energy resources, an annotated bibliography: U.S. Geol. Survey Circ. 641, 21 p., 1970.
- 04028 **Averitt, Paul.** Stripping coal resources of the United States — January 1, 1970: U.S. Geol. Survey Bull. 1322, 34 p., illus., tables, 1970.
- 07543 **Avery, Gleason G.; Luther, Edward T.** Mineral resources summary of the Norma quadrangle, Tennessee: Nashville, Tenn., Tennessee Div. Geology, 18 p., tables, 1970.
- Avery, Gleason G.** See Luther, Edward T. 07546
- Avignone, Joseph M.** See McLaughlin, R. E. 04043
- Avignone, N. F.** See Swift, D. J. P. 10337
- Avignone, Nicholas F.** See Swift, Donald J. P. 04724
- 01191 **Aviolo, Gennara; Baggs, Don W.** Paleogeography of the Prune Hill area, Camas, Washington, and its relation to the geologic history of the Portland area [abs.]: Northwest Sci., v. 44, no. 1, p. 58, 1970.
- 02436 **Awald, John T.** Regional geochemical reconnaissance of the Bradshaw Mountains, Arizona [abs.]: Mining Eng., v. 22, no. 1, p. 44, 1970.
- 06797 **Axelrod, Daniel I.** Mesozoic paleogeography and early agniosperm history: Bot. Rev., v. 36, no. 3, p. 277-319, illus., 1970.
- Axley, J. H.** See Woolson, E. A. 02866
- Ayer, N. J.** See Gross, D. L. 02118
- Ayer, N. J.** See Lineback, J. A. 03917

- 06048 **Ayer, Nathan.** X-radiography of intact sediment cores from southern Lake Michigan [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 484-485, 1970.
- Ayer, Nathan J.** See Collinson, Charles. 01064
- Ayre, R. S.** See Gibson, R. E. 00268
- Ayre, R. S.** See Gibson, R. E. 00269
- 06471 **Ayres, Lorne D.** Synthesis of Early Precambrian stratigraphy north of Lake Superior [abs.], in *Inst. Lake Superior Geology*, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 8, 1970.
- 06596 **Ayres, Lorne Dale.** Early Precambrian stratigraphy of part of Lake Superior Provincial Park, Ontario, Canada, and its implications for the origin of the Superior Province [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 2, p. 756B, 1970.
- 03893 **Baadsgaard, H.; vanBreemen, O.** Thermally-induced migration of Rb and Sr in an adamellite: *Eclogae Geol. Helvetiae*, v. 63, no. 1, p. 31-44, illus., tables, 1970.
- Baadsgaard, H.** See Koster, F. 08063
- Baadsgaard, Halfdan.** See Folinsbee, Robert E. 03923
- 05035 **Baar, C. A.** Correct interpretation of data for better understanding of salt pillar behaviour in mines, in *Third symposium on salt*, V. 2 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 280-289, illus., tables, 1970.
- 02073 **Baars, D. L.; Seager, W. R.** Stratigraphic control of petroleum in White Rim Sandstone (Permian) in and near Canyonlands National Park, Utah: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 709-718, illus., 1970.
- 02584 **Baars, D. L.; Bush, John; Nadeau, Joseph; Girdley, W. Arch.** Pre-Pennsylvanian paleotectonic framework of Ancestral Rockies of Colorado [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 834, 1970.
- 04751 **Babcock, Clarence.** Oil and gas activities in Florida, 1967: *Florida Bur. Geology Inf. Circ.* 63, 32 p., illus., tables, 1970.
- 00224 **Babcock, Elkanah A.** Basement structure and faulting along the northeast margin of the Salton Sea [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 68, 1970.
- 07341 **Babcock, Elkanah Andrew.** Structural geology and geophysics of the Durmid area, Imperial Valley, California [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 4, p. 2056B-2057B, 1970.
- 00594 **Babcock, Randall Scott.** Metasomatism, metamorphic segregation and fusion in the migmatitic Skagit Gneiss complex, Washington State [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 324-325, 1970.
- 10143 **Bachhuber, F. W.** A preliminary report on the Quaternary history of the Estancia valley, central New Mexico [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., an Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 3, 1970.
- 06049 **Bachhuber, Frederick W.** The effects of differential preservation in a pollen analytical study [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 486, 1970.

- 01612 **Bachman, George O.; Harbour, Robert L.** Geologic map of the northern part of the San Andres Mountains, central New Mexico: U.S. Geol. Survey Misc. Inv. Map I-600, scale 1:62,500, section, 1970.
- 01714 **Bachmat, Y.; Elrick, D. E.** Hydrodynamic instability of miscible fluids in a vertical porous column: *Water Resources Research*, v. 6, no. 1, p. 156-171, illus., tables, 1970.
- 01584 **Back, William.** Chemical hydrogeology of the carbonate peninsulas of Florida and Yucatan [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 9, p. 4241B, 1970.
- 04129 **Back, William; Hanshaw, Bruce B.** Comparison of chemical hydrogeology of the carbonate peninsulas of Florida and Yucatan: *Jour. Hydrology*, v. 10, no. 4, p. 330-368, illus., tables, 1970.
- 05323 **Back, William; Hanshaw, Bruce B.; Rubin, Meyer.** Carbon-14 ages related to occurrence of salt water: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7702, *Jour. Hydraulics Div.*, no. HY 11, p. 2325-2336, illus., tables, 1970.
- 01730 **Backus, G.; Gilbert, F.** Uniqueness in the inversion of inaccurate gross Earth data: *Royal Soc. London Philos. Trans., sec. A*, v. 226, no. 1173, 192 p., illus., tables, 1970.
- 04067 **Backus, George.** A geometrical picture of anisotropic elastic tensors: *Rev. Geophysics and Space Physics*, v. 8, no. 3, p. 633-671, illus., 1970.
- 04992 **Bada, Jeffrey L.; Luyendyk, Bruce P.; Maynard, J. Barry.** Marine sediments — Dating by the racemization of amino acids: *Science*, v. 170, no. 3959, p. 730-732, illus., table, 1970.
- Baddehausen, H.** See Wanke, H. 05730
- 07392 **Bader, John W.** When to stop drilling: *Mining Eng.*, v. 22, no. 7, p. 115-117, illus., 1970.
- 06657 **Bader, Richard G.; Gerard, Robert D.; Benson, William E.; Bolli, Hans M.; Hay, William W.; Rothwell, W. Thomas, Jr.; Ruef, Michael H.; Riedel, William R.; Sayles, Fred L.** Initial reports of the Deep Sea Drilling Project — V. 4, covering Leg 4 of the cruises of the Drilling Vessel *Glomar Challenger*, Rio de Janeiro, Brazil to San Cristobal, Panama, February-March, 1969: Washington, D. C., U.S. Govt. Printing Office, 753 p., illus., tables, 1970.
- 06658 **Bader, Richard G.** (and others). Sites 27-31, Chaps. 6-10, in Initial reports of the Deep Sea Drilling Project — V. 4, Leg 4 of cruises of *Glomar Challenger*, Rio de Janeiro, Brazil, to San Cristobal, Panama, Feb.-Mar. 1969 (R. G. Bader, and others): Washington, D. C., U.S. Govt. Printing Office, p. 93-243, illus., tables, 1970.
- Baecher, Gregory B.** See Einstein, Herbert H. 09141
- Baedecker, M. J.** See Brown, Frederick S. 06073
- Baedecker, P. A.** See Ehmann, W. D. 02019
- 01901 **Baedecker, Philip A.; Wasson, John T.** The distribution of some major and trace elements in enstatite chondrites [abs.]: *EOS*, v. 51, no. 4, p. 341, 1970.
- Baedecker, Philip A.** See Wasson, John T. 05732
- 03649 **Baer, A. J.** The Grenville province, in *Geological provinces of Canada, exploration and outlook: Canadian Mining and Metall. Bull.*, v. 63, no. 694, p. 200-203, illus., 1970.

- 08626 **Baer, A. J.** (editor). Basins and geosynclines of the Canadian Shield — Symposium, Ottawa, 1970, Papers: Canada Geol. Survey Paper 70-40, 265 p., illus., tables, 1970.
- Baer, A. J.** See Money, P. L. 08631
- 05942 **Baer, N. S.; Lewin, S. Z.** The replacement of calcite by fluorite, a kinetic study: *Am. Mineralogist*, v. 55, nos. 3-4, p. 466-476, illus., tables, 1970.
- 01217 **Baer, Norbert Sebastian.** Topochemical studies on calcite [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 8, p. 3581B, 1970.
- Baerreis, David A.** See Bender, Margaret M. 01328
- Baerreis, David A.** See Bender, Margaret M. 03188
- Baerreis, David A.** See Bryson, Reid A. 08045
- 09883 **Baffa, John J.** Injection well experience at Riverhead, N. Y.: *Am. Water Works Assoc. Jour.*, v. 62, no. 1, p. 41-46, illus., 1970
- Baggs, Don W.** See Aviolo, Gennara. 01191
- Bagley, Jay M.** See Jeppson, Roland W. 09902
- 05797 **Baie, Lyle F.** Possible structural link between Yucatan and Cuba: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 11, p. 2204-2207, illus., 1970.
- 07296 **Baie, Lyle Frederick.** Post-Cretaceous structures and sediment of the northeast Campeche Platform, Gulf of Mexico [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 5, p. 2858B, 1970.
- Baier, D. C.** See Wesner, G. M. 09886
- Bailes, A. H.** See Campbell, F. H. A. 11258
- 10884 **Bailey, Darrel G. Fallen.** Exploration for geothermal energy in El Salvador [with Spanish and English abs.], in *Trabajos tecnicos presentados en la segunda reunion de geologos de America Central*: *Inst. Centroamericano Inv. y Tecnologia Indus. Pubs. Geol.*, no. 2, p. 25-31, illus., 1969.
- 00225 **Bailey, Edgar H.; Blake, M. C., Jr.; Jones, David L.** Character and significance of the ophiolitic oceanic crust that forms the base of the Great Valley sequence in western California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 68-69, 1970.
- 04418 **Bailey, Edgar H.; Blake, M. C., Jr.; Jones, David L.** On-land Mesozoic oceanic crust in California Coast Ranges, in *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C70-C81, illus., tables, 1970.
- Bailey, H. H.** See Blevins, R. L. 05411
- Bailey, Leslie F.** See Allen, Joe H. 00812
- 02585 **Bailey, N. J. L.; Krouse, H. Roy.** Chemical aspects of crude oil preservation [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 834-835, 1970.
- Bailey, Palmer K.** See Clayton, Lee. 01062
- Bailey, R. A.** See Smith, R. L. 01204
- 09129 **Bailey, S. W.** Refinement of an intermediate microcline structure — erratum [to Bailey, S. W., *ibid.*, v. 54, p. 1540, 1969]: *Am. Mineralogist*, v. 55, nos. 9-10, p. 1809, 1970.



- 05492 **Bain, George L.** Salty ground water in West Virginia with a discussion of the Pocatalico River basin above Sissonville: West Virginia Geol. and Econ. Survey Circ. 11, 31 p., illus., 1970.
- 08466 **Bain, George L.** Geology and ground-water resources of New Hanover County, North Carolina: North Carolina Div. Ground Water, Ground Water Bull., no. 17, 79 p., illus., tables, 1970.
- Bain, I.** See Oka, Y. 05593
- 00668 **Bain, Roger J.** Weathering pattern in the Cambrian Catoclin Greenstone, Virginia [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 192, 1970.
- 06050 **Bain, Roger J.** Alteration and replacement of chert by carbonates in Ordovician limestone near Staunton, Virginia [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 486-487, 1970.
- 00226 **Baird, A. K.; Welday, E. E.; Baird, K. W.** Chemical variations in batholithic rocks of southern California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 69, 1970.
- Baird, A. K.** See Morton, D. M. 00320
- 03468 **Baird, D. M.** Sand: Canadian Geog. Jour., v. 80, no. 6, p. 194-201, illus., 1970.
- 09398 **Baird, Donald.** Type specimen of the Oligocene frog *Zaphrissa eurytelis* Cope, 1866: Copeia, no. 2, 384-385, 1970.
- Baird, K. W.** See Baird, A. K. 00226
- Baird, Ralph W.** See Knisel, Walter G., Jr. 10981
- Baker, Arthur A.** See Bromfield, Calvin S. 04511
- Baker, Bruce L.** See Peake, Eric., 09710
- 03191 **Baker, C. H., Jr.** Water resources of the Heber-Kamas-Park City area, north-central Utah: Utah Dept. Nat. Resources Tech. Pub. 27, 79 p., illus., tables, geol. map, 1970.
- Baker, D. W.** See Wenk, H. R. 01870
- 09030 **Baker, David C.** Glacial lake levels in the Middle Rondout Valley [abs.], in Guidebook to field excursions, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., p. 145, 1969.
- 04049 **Baker, David W.** On the symmetry of orientation distribution in crystal aggregates, in Advances in X-ray analysis, V. 13 — Applications of X-ray analysis, 18th Ann. Conf., 1969, Proc.: New York, Plenum Press, p. 435-454, illus., tables, 1970.
- 07342 **Baker, David Warren.** X-ray analysis and representation of preferred orientations in crystal aggregates [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2057B, 1970.
- 01126 **Baker, Donald R.; Claypool, George E.** Effects of incipient metamorphism on organic matter in mudrock: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 3, p. 456-468, illus., 1970.
- 05451 **Baker, Donald R.; Buddington, A. F.** Geology and magnetite deposits of the Franklin quadrangle and part of the Hamburg quadrangle, New Jersey: U.S. Geol. Survey Prof. Paper 638, 73 p., illus., tables, geol. maps, 1970.
- 06051 **Baker, Donald R.** Organic geochemistry and geological interpretations [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 487, 1970.

- 06668 **Baker, Earl W.** Tetrapyrrole pigments, Chap. 21 in Initial reports of the Deep Sea Drilling Project — V. 4, Leg 4 of cruises of *Glomar Challenger*, Rio de Janeiro, Brazil, to San Cristobal, Panama, Feb.-Mar. 1969 (R. G. Bader, and others): Washington, D. C., U.S. Govt. Printing Office, p. 431-438, illus., table, 1970.
- 08272 **Baker, I.; Ridley, W. I.** Field evidence and K, Rb, Sr data bearing on the origin of the Mt. Taylor volcanic field, New Mexico, U.S.A.: *Earth and Planetary Sci. Letters*, v. 10, no. 1, p. 106-114, illus., tables, 1970.
- 06052 **Baker, Ian; Ridley, William I.** Field and geochemical data bearing on the origin of the Mount Taylor volcanic field, New Mexico [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 487-488, 1970.
- 07506 **Baker, L. E.; Sandhu, R. S.; Shieh, W. Y.** Application of elasto-plastic analysis in rock mechanics by finite element method, Chap. 14 in *Rock mechanics, theory and practice* — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, *Proc.*: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 237-251, illus., tables, 1970.
- 01416 **Baker, R. A.** Oscillation ripplemarks and orbital diameter: *Geol. Soc. America Bull.*, v. 81, no. 5, p. 1589-1590, 1970.
- 06411 **Baker, R. G.** Determining magnitude from Lg: *Seismol. Soc. America Bull.*, v. 60, no. 6, p. 1907-1919, illus., tables, 1970.
- 02796 **Baker, Richard G.** Pollen sequence from late Quaternary sediments in Yellowstone Park: *Science*, v. 168, no. 3938, p. 1449-1450, illus., 1970.
- 06156 **Baker, Richard G.** A radiocarbon-dated pollen chronology for Wisconsin — Disterhaft Farm Bog revisited [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 488, 1970.
- 10144 **Baker, Richard G.** Late-Quaternary vegetation history in Yellowstone Park [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, *Abs.*: [Bozeman, Mont., Montana State Univ.?], p. 4-5, illus., 1970.
- 07581 **Baker, Richard Graves.** Late Quaternary pollen and plant macrofossils from abandoned-lagoon sediments near Yellowstone Lake, Wyoming [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 3, p. 1348B-1349B, 1970.
- 07343 **Baker, Robert Allison, 3d.** Stratigraphy and sedimentology of the Cañon del Tule Formation (Upper Cretaceous), Parras Basin, northeastern Mexico [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 4, p. 2057B-2058B, 1970.
- 07806 **Baker, Simon; Dill, Henry W., Jr.** (compiler). The look of our land, an airphoto atlas of the rural United States — North-central: U.S. Dept. Agriculture, *Agriculture Handb.* 384, 64 p., illus., 1970.
- 07061 **Bakker, Robert T.** Ecology of the brontosaurus: *Nature*, v. 229, no. 5281, p. 172-174, illus., 1970.
- 01734 **Baksi, A. K.** K-Ar dating of a "Recent" lava flow [abs.]: *EOS*, v. 51, no. 4, p. 432, 1970.
- 01887 **Baksi, A. K.; York, D.; Ade-Hall, J.** Data on the Pliocene geomagnetic polarity time scale [abs.]: *EOS*, v. 51, no. 4, p. 271, 1970.
- 10546 **Bakun, William H.** Focal depths of the 1966 Parkfield, California, earthquakes [abs.]: *EOS*, v. 51, no. 11, p. 779, 1970.
- Balacescu, A. See Wanke, H.** 05730
- 04405 **Baldwin, Andrew B.** Uranium and thorium occurrences on the north shore of the Gulf of St. Lawrence: *Canadian Mining and Metall. Bull.*, v. 63, no. 698, p. 699-707, illus., geol. maps, 1970.

- 01334 **Baldwin, Brewster.** The creative curriculum: Jour. Geol. Education, v. 18, no. 2, p. 91-93, 1970.
- 03927 **Baldwin, Brewster.** Problem-approach guidelines applied to Dolores Peak quadrangle: Jour. Geol. Education, v. 18, no. 4, p. 155-160, illus., 1970.
- Baldwin, Ewart M.** See Boggs, Sam, Jr. 01721
- 00482 **Baldwin, Otha D.; Adams, John A. S.** K<sup>40</sup>/Ar<sup>40</sup> ages of the alkalic igneous rocks of the Balcones Province of Texas [abs.]: Texas Jour. Sci., v. 21, no. 3, p. 334, 1970.
- 06840 **Baldwin, Ralph B.** Summary of arguments for a hot Moon: Science, v. 170, no. 3964, p. 1297-1300, table, 1970.
- 04769 **Bales, J. R.** Lewisburg Field, Acadia Parish, Louisiana, in Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 17-17c, illus., 1970.
- 03374 **Balkwill, H. R.; Yorath, C. J.** Simpson Lake map-area, District of Mackenzie (97B): Canada Geol. Survey Paper 69-10, 10 p., illus., table, geol. map, 1970.
- 11237 **Balkwill, H. R.; Yorath, C. J.** Brock River map-area, District of Mackenzie (97D): Canada Geol. Survey Paper 70-32, 25 p., illus., tables, geol. map, 1970.
- 00516 **Balkwill, Hugh Robert.** Structural analysis of the Western Ranges, Rocky Mountains, near Golden, British Columbia [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3236B, 1970.
- 09003 **Ball, John S.** Crude oil analysis as a guide to asphalt potential, [chap.] 3 in Bituminous materials — Asphalts, tars, and pitches, A. J. Hoiberg, Editor — v. 2, Asphalts, pt. 1: New York, Intersci. Publishers, p. 59-79, illus., tables, 1965.
- 00947 **Ball, M. M.; Harrison, C. G. A.** Crustal plates in the Central Atlantic: Science, v. 167, no. 3921, p. 1128-1129, illus., 1970.
- Ball, Mahlon.** See Bonatti, Enrico. 01694
- Ball, Mahlon M.** See Neumann, A. Conrad. 04943
- 08169 **Ball, N. L.** (compiler). Oil and gas pools of western Canada — Southern Alberta (information to March 31, 1970): Canada Geol. Survey Map 1316A, scale 1:760,320, 1970.
- 08170 **Ball, N. L.** (compiler). Oil and gas pools of western Canada — Northern Alberta and northeastern British Columbia (information to March 31, 1970): Canada Geol. Survey Map 1317A, scale 1:760,320, 1970.
- 08171 **Ball, N. L.** (compiler). Oil and gas pools of western Canada — Southern Saskatchewan and southwestern Manitoba with Yukon Territory and part of Northwest Territories (information to March 31, 1970): Canada Geol. Survey Map 1318A, scale 1:760,320, legend on 1316A, 1970.
- 02570 **Ballagh, T. M.; Runge, E. C. A.** Clay-rich horizons over limestone, illuvial or residual?: Soil Sci. Soc. America Proc., v. 34, no. 3, p. 534-536, illus., table, 1970.
- Ballard, G. E.** See Blevins, R. L. 05411
- 00105 **Ballard, J. Alan; Feden, Robert H.** Diapiric structures on the Campeche shelf and slope, western Gulf of Mexico: Geol. Soc. America Bull., v. 81, no. 2, p. 505-512, illus., 1970.
- 04490 **Ballard, Robert D.; Uchupi, Elazar.** Morphology and Quaternary history of the continental shelf of the gulf coast of the United States: Bull. Marine Sci., v. 20, no. 3, p. 547-559, illus., 1970.

- 00139 **Balsam, William L.** Reinterpretation of a Lower Cambrian archaeocyathid reef [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 11, 1970.
- Balsiger, H.** See Pelly, I. Z. 04524
- Balster, C. A.** See Parsons, R. B. 02568
- 00843 **Baltosser, R. W.; Lawrence, H. W.** Application of well logging techniques in metallic mineral mining: *Geophysics*, v. 35, no. 1, p. 143-152, illus., tables, 1970.
- Bambach, Richard K.** See Levinton, Jeffrey S. 00961
- Bambach, Richard K.** See Holbrook, Sally Jean. 07024
- 07600 **Bambach, Richard Karl.** Bivalvia of the Siluro-Devonian Arisaig Group, Nova Scotia [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 3, p. 1433B, 1970.
- Bamber, E. W.** See Taylor, G. C. 07897
- 07977 **Bamber, E. W.** (and others). Biochronology — Standard of Phanerozoic time, Chap. 11 in *Geology and economic minerals of Canada*: Canada Geol. Survey Econ. Geology Rept. 1 (5th edition), p. 591-674, illus., tables, 1970.
- 07269 **Bamford, Robert Wendell.** Genesis of the magnesite deposits of Stevens County, Washington [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 5, p. 2761B-2762B, 1970.
- Bandermann, L. W.** See Singer, S. F. 05678
- 02586 **Bandy, Orville L.; Casey, Richard E.** Quaternary paleoclimatic variations [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 835, 1970.
- 04204 **Bandy, Orville L.** (editor). Radiometric dating and paleontologic zonation: *Geol. Soc. America Spec. Paper* 124, 247 p., illus., tables, 1970.
- 04388 **Bandy, Orville L.; Ingle, James C., Jr.** Neogene planktonic events and radiometric scale, California, in *Radiometric dating and paleontologic zonation*: *Geol. Soc. America Spec. Paper* 124, p. 131-172, illus., table, 1970.
- 04874 **Bandy, Orville L.; Wilcoxon, James A.** The Pliocene-Pleistocene boundary, Italy and California: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 2939-2947, illus., 1970.
- 04959 **Bandy, Orville L.** Upper Cretaceous-Cenozoic paleobathymetric cycles, eastern Panama and northern Colombia [abs.]: *Am. Assoc. Petroleum geologists*, v. 54, no. 9, p. 1782, 1970.
- 07324 **Bandy, Orville L.** Upper Cretaceous-Cenozoic paleobathymetric cycles, eastern Panama and northern Colombia, in *Exploration concepts for the Seventies*: *Gulf Coast Assoc. Geol. Soc. Trans.*, v. 20, p. 181-193, illus., table, 1970.
- 10009 **Bandy, Orville L.** Bipolar synchronicity of Late Cenozoic paleoclimatic cycles [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, *Abs. Papers*: *Am. Assoc. Petroleum geologists Bull.*, v. 54, no. 12, p. 2468, 1970.
- 10145 **Bandy, Orville L.** Paleoclimatological synchronicity, Atlantic and Pacific Oceans [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, *Abs.*: [Bozeman, Mont., Montana State Univ.?], p. 6, 1970.
- Banerjee, Subir K.** See Day, R. 00067
- Banerjee, Subir K.** See Liebermann, Robert C. 01947
- 07965 **Banerjee, Subir K.** Reliability of paleomagnetic data from basalts: *Comments Earth Sci.* — *Geophysics*, v. 1, no. 2, p. 43-46, illus., 1970.

- 10484 **Banerjee, Subir K.** A revised superparamagnetic threshold for hematite — Implications for paleomagnetism [abs.]: EOS, v. 51, no. 11, p. 744, 1970.
- 03894 **Banghar, A. R.** New tables of angles of incidence of P waves as a function of epicentral distance: Earthquake Notes, v. 41, no. 2, p. 45-58, table, 1970.
- 09359 **Banino, George M.** Origin of Roaring Brook: Trenton, N.J., New Jersey Geol. Survey, 8 p., illus., 1969.
- 04934 **Banister, D'Arcy P.** Geochemical investigations for gold, antimony, and silver at Stibnite, Idaho: U.S. Bur. Mines Rept. Inv. 7417, 7 p., illus., 1970.
- 08598 **Bank, H.** Durchsichtiger blassgelblicher Plagioklase aus den U.S.A. [A transparent pale-yellow plagioclase from the U.S.A.]: Deutsch. Gemmol. Gesell. Zeitschr., v. 19, nos. 3-4, p. 134-136, illus., 1970.
- 10257 **Banks, Carlie E.** Precambrian gneiss at Sheephead Mountain, Carbon County, Wyoming, and its relationship to Laramide structure: Wyoming Univ. Contr. Geology, v. 9, no. 2, p. 54-64, illus., 1970.
- 04367 **Banks, E.; Greenblatt, M.; Post, B.** The crystal structures of synthetic spodiosites,  $\text{Ca}_2\text{VO}_4\text{Cl}$  and  $\text{Ca}_2\text{AsO}_4\text{Cl}$ : Inorganic Chemistry, v. 9, no. 10, p. 2259-2264, illus., tables, 1970.
- Banks, H. P.** See Scheckler, S. E. 04165
- 08675 **Banks, Harlan P.** Evolution and plants of the past: Belmont, Calif., Wadsworth Publishing Co., 170 p., illus., tables, 1970.
- 09332 **Banks, Harlan P.** (chairman). Major evolutionary events and the geological record of plants — Symposium, Internat. Bot. Cong., 11th, Seattle, Wash., 1969: Cambridge Philos. Soc. Biol. Rev., v. 45, no. 3, p. 317-454, illus., tables, 1970.
- 09338 **Banks, Harlan P.** Summary and time scale, in Major evolutionary events and the geological record of plants — Symposium, Internat. Bot. Cong., 11th, Seattle, Wash., 1969: Cambridge Philos. Soc. Biol. Rev., v. 45, no. 3, p. 451-454, 1970.
- 04878 **Banks, Norman G.** Nature and origin of early and late cherts in the Leadville Limestone, Colorado: Geol. Soc. America Bull., v. 81, no. 10, p. 3033-3048, illus., 1970.
- Banks, Robey.** See Couch, Richard. 10565
- Bankston, Donald C.** See Thompson, Geoffrey. 00853
- Bankston, Donald C.** See Thompson, Geoffrey. 02964
- Bankston, Donald C.** See Thompson, Geoffrey. 04084
- Bannatyne, B. B.** See Klassen, R. W. 07862
- 09628 **Bannatyne, B. B.; Zoltai, S. C.; Tamplin, M. J.** Annotated bibliography of the Quaternary in Manitoba and the adjacent Lake Agassiz region (including archaeology of Manitoba); Manitoba Dept. Mines and Nat. Resources Geol. Paper 2/70, 142 p., 1970.
- Bannatyne, B. B.** See McCabe, H. R. 10261
- 10254 **Bannatyne, Barry B.** The clays and shales of Manitoba: Manitoba Dept. Mines and Nat. Resources Mines Br. Pub. 67-1, 107 p., illus., tables, 1970.
- Banner, J. A.** See Freeze, R. A. 05812
- Banner, James.** See Freeze, R. Allan. 01715

**Bannister, R. G.** See Rushton, K. R. 03572

**Baragar, W. R. A.** See Dimroth, E. 08629

- 04295 **Barakso, J. J.; Tarnocai, C.** A mercury determination method and its use for exploration in British Columbia: Canadian Mining and Metall. Bull., v. 63, no. 696, p. 501-505, illus., tables, 1970.

**Bararova, T. Y.** See Sobolev, V. S. 03577

- 00830 **Barash, M. S.; Kharin, G. S.; Yemel'yanov, Ye. M.** Asfal'tovoye ozero na ostrove Trinidad [Asphalt lake on the island of Trinidad]: Priroda, 1970, no. 2, p. 65-69, illus., 1970.

**Barazangi, Muawia.** See Seeber, Leonardo. 01976

- 04624 **Barazangi, Muawia; Dorman, James.** Seismicity map of the Arctic compiled from ESSA, Coast and Geodetic Survey, epicenter data January 1961 through September 1969: Seismol. Soc. America Bull., v. 60, no. 5, p. 1741-1743, illus., 1970.

**Barazangi, Muawia.** See Seeber, Leonard. 04687

**Barazangi, Muawia.** See Sbar, Marc L. 09558

- 09365 **Barber, C. A.** The iron ores of East Texas and Lone Star Steel Company, in Lone Star, Texas, iron deposits, SEPM Gulf Coast Sec., 1970 field trip guidebook: Soc. Econ. Paleontologists and Mineralogists Gulf Coast Sec., p. 16-22, illus., 1970.

- 11215 **Barbera, Mark J.** The evolution of the Earth: New York Paleont. Soc. Notes, no. 2, p. 2-7, 1970.

- 09455 **Barbour, F. A.; Dorrence, S. M.; Petersen, J. C.** Inverse gas-liquid chromatographic studies of asphalt — variations in experimental parameters: Anal. Chemistry, v. 42, no. 6, p. 668-670, tables, 1970.

- 08635 **Bardack, David.** A new teleost from the Oldman Formation (Cretaceous) of Alberta [with French abs.]: Canada Natl. Mus. Nat. Sci. Pubs. Palaeontology, no. 3, 8 p., illus., 1970.

- 08251 **Barden, L.; Berry, P. L.** Model of the consolidation process in peat soils [with French abs.], in International Peat Congress, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 119-127, illus., 1970.

- 03627 **Barden, Laing; Sides, Geoffrey R.** Engineering behavior and structure of compacted clay: Am. Soc. Civil Engineers Proc., v. 96, paper 7397, Jour. Soil Mechanics and Found. Div., no. SM 4, p. 1171-1200, illus., table, 1970.

- 05308 **Bardwell, George E.** Some statistical features of the relationship between Rocky Mountain Arsenal waste disposal and frequency of earthquakes, in Engineering seismology — The works of man: Geol. Soc. America Eng. Geology Case Histories, no. 8, p. 33-37, illus., tables, 1970.

- 03195 **Bare, Janét E.; McGregor, Ronald L.** An introduction to the phytogeography of Kansas: Kansas Univ. Sci. Bull., v. 48, no. 26, p. 869-949, illus., tables, 1970.

**Barefoot, R. R.** See Foscolos, A. E. 04200

**Barefoot, R. R.** See Foscolos, A. E. 04384

**Barefoot, R. R.** See Foscolos, A. E. 06220

**Barger, R. L.** See Boyne, H. S. 06627

**Barghoorn, Elso S.** See Grew, Edward S. 00954

- 05735 **Barghoorn, Elso S.** Micropaleontological study of lunar material from Apollo 11, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1775-1777, illus., 1970.
- 01202 **Barghusen, Herbert R.; Hopson, James A.** Dentary-squamosal joint and the origin of mammals: *Science*, v. 168, no. 3931, p. 573-575, illus., 1970.
- 06053 **Barker, Colin.** The gases in rocks and their contribution to the Earth's atmosphere [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 489, 1970.
- 06054 **Barker, Colin.** The importance of temperature in abnormal pressure zones [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 489-490, 1970.
- 05193 **Barker, Daniel S.** Compositions of granophyre, myrmekite, and graphic granite: *Geol. Soc. America Bull.*, v. 81, no. 11, p. 3339-3350, illus., tables, 1970.
- 05206 **Barker, Daniel S.** North American feldspathoidal rocks in space and time — Reply [to discussion by M. N. Bass of 1969 paper]: *Geol. Soc. America Bull.*, v. 81, no. 11, p. 3501-3502, 1970.
- 06785 **Barker, Daniel S.; Burmester, Russell F.** Leaching of quartz from Precambrian hypabyssal rhyolite porphyry, Llano County, Texas: *Contr. Mineralogy and Petrology*, v. 28, no. 1, p. 1-8, illus., tables, 1970.
- 00132 **Barker, Fred; Peterman, Z. E.; Marvin, R. F.** Precambrian melasyenite of Ute Creek, San Juan Mountains, Colorado — Chemistry, petrology, and strontium isotopes: *U.S. Geol. Survey Bull.* 1311-C, p. C1-C15, illus., tables, 1970.
- 01296 **Barker, Fred.** Ortega Quartzite and the Big Rock and Jawbone Conglomerate Members of the Kiawa Mountain Formation, Tusas Mountains, New Mexico, *in* Changes in stratigraphic nomenclature by the U.S. Geological Survey, 1968: *U.S. Geol. Survey Bull.* 1294-A, p. A21-A22, 1970.
- Barker, J. M.** See Cloud, Preston. 05737
- 02469 **Barker, James C.** Willard L. Day (1899-1970): *Houston Geol. Soc. Bull.*, v. 12, no. 10, p. 20, 1970.
- 01283 **Barla, G.; Wane, M. T.** Stress-relief method in anisotropic rocks by means of gauges applied to the end of a borehole: *Internat. Jour. Rock Mechanics and Mining Sci.*, v. 7, no. 2, p. 171-182, illus., 1970.
- 07445 **Barla, Giovanni.** Some constitutive equations for rock materials, Chap. 13 *in* Rock mechanics, theory and practice — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 221-236, illus., tables, 1970.
- 02186 **Barlai, Zoltan.** Some principal questions of well logging evaluation of hydrocarbon-bearing sandstones with a high silt/and clay/content — Experience gained by the field application of a new method, *in* SPWLA Logging Symposium, 11th Ann., Los Angeles, Calif., 1970, Trans.: Houston, Tex., Soc. Prof. Well Log Analysts, p. O1-O64, illus., table, 1970.
- 00669 **Barlow, James A.** Age and lithostratigraphic correlatives of the youngest Pennsylvanian strata in Tennessee [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 192-193, 1970.
- Barlow, James A., Jr.** See Haun, John D. 02627
- Barlow, James A., Jr.** See Haun, John D. 04649
- 07759 **Barlow, James A., Jr.; Haun, John D.** Regional stratigraphy of Frontier Formation and relation to Salt Creek field, Wyoming, *in* Geology of giant petroleum fields —

Symposium, AAPG, 53d Ann. Mtg., Oklahoma City, Okla., 1968: Am. Assoc. Petroleum Geologists Mem. 14, p. 147-157, illus., table, 1970.

- 03243 **Barlow, James Arthur.** Stratigraphy and paleobotany of the youngest Pennsylvanian strata in the Caryville, Tennessee area [abs.]: Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 5096B, 1970.
- 05958 **Barnard, Walther M.** Memorial of Harold Douglas Wright — November 11, 1921-July 7, 1969: Am. Mineralogist, v. 55, nos. 3-4, p. 614-619, portrait, 1970.
- 09480 **Barnes, Burton B.** Marine phosphorite deposit delineation techniques tested on the Coronado Bank, Southern California, in Offshore Technology Conference, 2d Ann., Houston, Tex., 1970, Preprints — v. 2: Dallas, Tex., Offshore Technology Conf., p. II-315 — II-350, illus., table, 1970.
- 05553 **Barnes, C. R.; Tuke, M. F.** Conodonts from the St. George Formation (Ordovician), northern Newfoundland [with French abs.], in Contributions to Canadian paleontology: Canada Geol. Survey Bull. 187, p. 79-97, illus., table, 1970.
- Barnes, C. R.** See Uyeno, T. T. 05554
- 01049 **Barnes, Christopher R.; Rexroad, Carl B.; Miller, James F.** Lower Paleozoic conodont provincialism [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 374-375, 1970.
- 01050 **Barnes, Christopher R.; Sass, Daniel B.; Monroe, Eugene A.** Ultrastructure of some Ordovician conodonts [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 375, 1970.
- 07110 **Barnes, David F.** Gravity and other regional geophysical data from northern Alaska, in Geological seminar on the North Slope of Alaska, Palo Alto, Calif., 1970, Proc.: Los Angeles, Calif., Am. Assoc. Petroleum Geologists Pacific Sec., p. II-120, illus., discussion, 1970.
- 05259 **Barnes, David J.** Coral skeletons — An explanation of their growth and structure: Science, v. 170, no. 3964, p. 1305-1308, illus., 1970.
- Barnes, H. L.** See Helz, G. R. 01780
- Barnes, H. L.** See Romberger, S. B. 07066
- 07404 **Barnes, Hubert L.; Lavery, Norman G.** Primary metal dispersion as an indicator of mineralization [abs.]: Mining Eng., v. 22, no. 9, p. 50, 1970.
- 10606 **Barnes, I. L.; Murphy, T. J.; Sappenfield, K. M.; Shields, W. R.** The mass spectrometric determination of sub-nanogram samples of lead [abs.]: EOS, v. 51, no. 11, p. 832, 1970.
- Barnes, I. L.** See Murphy, T. J. 10607
- 01673 **Barnes, Ivan.** Metamorphic waters from the Pacific tectonic belt of the west coast of the United States: Science, v. 168, no. 3934, p. 973-975, table, 1970.
- Barnes, Ivan.** See White, D. E. 05559
- 08380 **Barnes, Lawrence G.** A re-evaluation of mandibles of *Allodesmus* (Otariidae, Carnivora) from the Round Mountain Silt, Kern County, California: PaleoBios, no. 10, 24 p., illus., tables, 1970.
- 07270 **Barnes, Marvin Peterson.** Porphyry copper deposits — A computer analysis of significance of geological parameters [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2762B, 1970.

**Barnes, Peter W.** See Gorsline, Donn S. 10169



**Barnes, Robert H.** See Wilson, Charles W., Jr. 04077

- 07099 **Barnes, Robert H.; Wilson, Charles W., Jr.; McCary, Charles E. L.** Geologic map of the Boonshill quadrangle, Tennessee: Tennessee Div. Geology Geol. Map GM 73-NW, scale 1:24,000, separate text, 1970.

**Barnes, V. E.** See Cloud, Preston. 05737

- 07691 **Barnett, D. M.** An amendment and extension of tide gauge data analysis for Churchill, Manitoba, in Symposium on recent crustal movements, Ottawa, Canada, 1969, Papers: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 2, p. 626-627, table, 1970.

**Barnett, George.** See Gisler, Patrick. 00271

**Barnett, J. Dean.** See Bassett, William A. 02813

- 01051 **Barnett, Stockton G.** Biometric analysis of the conodont species *Spathognathodus remscheidensis* in eastern New York and northern New Jersey [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 375-376, 1970.

- 05863 **Barnett, Stockton G.** A new stage for orienting microfossils: Jour. Paleontology, v. 44, no. 6, p. 1133-1134, illus., 1970.

**Barnett, Stockton G.** See New York State Geol. Assoc. 09019

- 03827 **Barnett, Stockton Gordon.** Upper Cayugan and Helderbergian stratigraphy of southeastern New York and northern New Jersey: Geol. Soc. America Bull., v. 81, no. 8, p. 2375-2402, illus., 1970.

**Barnette, D. E.** See Hamilton, J. B. 06383

**Barnhisel, R. I.** See Ellis, J. H. 07624

**Barnwell, Franklin H.** See Thompson, Idaho L. 10275

- 08235 **Barnwell, W. W.** Hydrological applications of remote sensing in Alaska, in The use of remote sensing . . . of natural resources of Alaska: Juneau, Alaska, Dept. of Econ. Devel., p. 103-104, illus., table [1970].

**Baroffio, James R.** See Wanless, H. R. 06708

- 02863 **Bar-On, P.; Shainberg, I.** Hydrolysis and decomposition of Na-montmorillonite in distilled water: Soil Sci., v. 109, no. 4, p. 241-246, illus., table, 1970.

- 07234 **Barr, D. J.; Swanston, D. N.** Measurement of creep in a shallow, slide-prone till soil: Am. Jour. Sci., v. 269, no. 5, p. 467-480, illus., tables, 1970.

- 09802 **Barr, David J.; Miles, Robert D.** SLAR imagery and site selection: Photogramm. Eng., v. 36, no. 11, p. 1155-1170, illus., tables, 1970.

- 01661 **Barr, Jim L.; Dinkelman, M. G.; Sandusky, C. L.** Large epoxy peels: Jour. Sed. Petrology, v. 40, no. 1, p. 445-449, illus., 1970.

**Barr, K. G.** See Robson, G. R. 10357

- 10856 **Barr, K. W.; Escalante, G.** Contribucion al esclarecimiento del problema de la edad del complejo de Nicoya, Costa Rica [clarification of the problem of the age of the Nicoya Complex, Costa Rica (with Spanish and English abs.)2, in Trabajos tecnicos presentados en la segunda reunion de geologos de America Central: Inst. Centroamericano Inv. y Tecnologia Indus. Pubs. Geol., no. 2, p. 43-47, illus., tables, 1969.

**Barr, S.** See Chase, R. L. 06093

**Barrer, R. M.** See Kerr, I. S. 05940

- 08131 **Barrett, D. L.; Aumento, F.** The Mid-Atlantic Ridge near 45° N. — [Pt.] 11, Seismic velocity, density, and layering of the crust: *Canadian Jour. Earth Sci.*, v. 7, no. 4, p. 1117-1124, illus., table, 1970.
- Barrett, P. J.** See *Lindsay, John F.* 01550
- 00557 **Barringer, A. R.; McNeill, J. D.** Recent developments in remote sensing for geophysical applications: *Canadian Petroleum*, v. 11, no. 2, p. 35-40, illus., 1970.
- 02920 **Barringer, A. R.** Regional reconnaissance techniques applied to exploration [with French abs.], in *Mining and groundwater geophysics, 1967*: *Canada Geol. Survey Econ. Geology Rept.* 26, p. 202-210, illus., 1970.
- 04646 **Barringer, A. R.** Remote-sensing techniques for mineral discovery, in *Mining and petroleum geology — Commonwealth Mining and Metall. Cong.*, 9th, United Kingdom, 1969, *Proc.*, V. 2: London, Inst. Mining and Metallurgy, p. 649-690, illus., tables, 1970.
- 07724 **Barringer, A. R.; Davies, J. H.** Experimental results in the remote sensing of gases from high altitudes, in *Earth Resources Aircraft Program, status review*, 2d Ann., Houston, Tex., 1969 — V. 2, Agriculture, Forestry, and sensor studies: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 34-1 — 34-31, illus., [1970?].
- 08232 **Barringer, A. R.** Remote sensing techniques for mineral discovery, in *The use of remote sensing . . . of natural resources of Alaska*: Juneau, Alaska, Dept. of Econ. Devel., p. 66-81, illus., tables [1970].
- 09144 **Barron, K.** Criteria for brittle fracture initiation in and ultimate failure of rocks and their application to fracture zone prediction [with French and German summ.], in *Internat. Soc. Rock Mechanics Cong.*, 2d, Belgrade, Yugoslavia, 1970, *Proc.*, V. 2: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 251-259, illus., tables, 1970.
- 01735 **Barron, L. M.** Thermodynamic multicomponent silicate phase equilibrium calculations [abs.]: *EOS*, v. 51, no. 4, p. 437-438, 1970.
- Barron, T. H. K.** See *Harris, J. W.* 04409
- 03244 **Barrows, Allan Geer, Jr.** Geology of the Hamburg-McGuffy Creek area, Siskiyou County, California, and petrology of the Tom Martin ultramafic complex [abs.]: *Dissect. Abs. Internat.*, Sec. B., Sci. and Eng., v. 30, no. 11, p. 5096B-5097B, 1970.
- 10671 **Barry, George S.; Freyman, Andrew J.** Mineral endowment of the Canadian Northwest — A subjective probability assessment: *Canadian Mining and Metall. Bull.*, v. 63, no. 701, p. 1031-1042, illus., table, 1970.
- 05217 **Barshad, Isaac; Foscolos, Anthony E.** Factors affecting the rate of the interchange reaction of adsorbed  $H^+$  on the 2:1 clay minerals: *Soil Sci.*, v. 110, no. 1, p. 52-60, illus., 1970.
- 05404 **Barshad, Isaac; Foscolos, Anthony E.** Factors affecting the rate of the interchange reaction of adsorbed  $H^+$  on the 2:1 clay minerals: *Soil Sci.*, v. 110, no. 1, p. 52-60, illus., 1970.
- Barsky, Constance K.** See *Condie, Kent C.* 01751
- 07755 **Barss, D. L.; Copland, A. B.; Ritchie, W. D.** Geology of Middle Devonian reefs, Rainbow area, Alberta, Canada, in *Geology of giant petroleum fields — Symposium*, AAPG, 53d Ann. Mtg., Oklahoma City, Okla., 1968: *Am. Assoc. Petroleum Geologists Mem.* 14, p. 19-49, illus., 1970.
- Bartel, A. J.** See *Rosholt, J. N.* 08423

- 04956 **Bartholomew, M. J.** San Jacinto fault zone in the northern Imperial Valley, California: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 3161-3166, illus., table, 1970.
- 04609 **Bartholomew, R. L.; Matten, L. C.; Wheeler, E. F.** Staining silicified woods: *Jour. Paleontology*, v. 44, no. 5, p. 905-907, illus., 1970.
- 05414 **Bartlett, C. S., Jr.** Geologic wonders of Washington Co., Virginia — Precambrian(?) brachiopods [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 131, 1970.
- Bartlett, Grant A.** See King, Lewis H. 07674
- 07704 **Bartlett, Grant A.; Greggs, Robert G.** The Mid-Atlantic Ridge near 45°00' north — [Pt.] 8, Carbonate lithification on oceanic ridges and seamounts: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 257-267, illus., 1970.
- 07705 **Bartlett, Grant A.; Greggs, Robert G.** A reinterpretation of stylolitic solution surfaces deduced from carbonate cores from San Pablo Seamount and the Mid-Atlantic Ridge: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 274-279, illus., 1970.
- Barton, J. M.** See Armstrong, R. L. 06217
- 09949 **Barton, Paul B., Jr.** Sulfide petrology, in *Symposium on sulfides — fiftieth Anniversary Symposia* (Benjamin A. Morgan, editor): *Mineralog. Soc. America Spec. Paper* 3, p. 187-198, illus., 1970.
- 10118 **Barwin, John R.** Arizona — best prospects still lie in Paradox Basin: *Independent Petroleum Monthly*, v. 40, no. 5, p. 26-27, illus., 1969.
- 08644 **Basalt Symposium.** Field trip guidebook, [abs.], in *Columbia River Basalt Symposium*, 2nd, Cheney, Wash., 1969, *Proc.*: Cheney, Eastern Washington State College Press, p. 331-333, 1970.
- 00670 **Basan, Paul B.** Aspects of sedimentation and development of a carbonate bank in the Barracuda Keys, Florida [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 193, 1970.
- 00417 **Basham, P. W.; Weichert, D. H.; Anglin, F. M.** An analysis of the 'Benham' aftershock sequence using Canadian recordings: *Jour. Geophys. Research*, v. 75, no. 8, p. 1545-1556, illus., tables, 1970.
- 07720 **Basham, P. W.** Seismic magnitudes of high-yield underground explosions: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 531-534, illus., 1970.
- 05204 **Bass, Manuel N.** North American feldspathoidal rocks in space and time — Discussion [of paper by D. S. Barker, 1969]: *Geol. Soc. America Bull.*, v. 81, no. 11, p. 3493-3499, 1970.
- Bass, Manuel N.** See Reid, Arch M. 05309
- 10515 **Bass, Manuel N.** Variation of ocean ridge basalts with spreading rate [abs.]: *EOS*, v. 51, no. 11, p. 762, 1970.
- 08433 **Bassaget, Jean-Pierre.** Geology of Natashquan area, Duplessis County — Preliminary report [also French edition]: *Quebec Dept. Nat. Resources Prelim. Rept. P.R.-582*, 13 p., tables, geol. map, 1970.
- 08435 **Bassaget, Jean-Pierre.** Geology of Kégashka area, Duplessis County — Preliminary report [also French edition]: *Quebec Dept. Nat. Resources Prelim. Rept. P.R.-597*, 18 p., table, geol. map, 1970.
- Bassett, W. A.** See Liu, L. G. 01949
- Bassett, W. A.** See Mao, H. K. 02254

**Bassett, W. A.** See Mao, H. K. 02255

**Bassett, William A.** See Hammond, Douglas E. 02012

**Bassett, William A.** See Mao, H. K. 02812

- 02813 **Bassett, William A.; Barnett, J. Dean.** Isothermal compression of stishovite and coesite up to 85 kilobars at room temperature by X-ray diffraction, in *Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969, Proc.: Physics Earth and Planetary Interiors*, v. 3, p. 54-60, illus., tables, 1970.
- 10587 **Bassett, William A.; Takahashi, Taro.** Disproportionation of  $\text{Fe}_2\text{SiO}_4$  to  $2\text{FeO} + \text{SiO}_2$  at high pressure and high temperature [abs.]: *EOS*, v. 51, no. 11, p. 828, 1970.
- 00972 **Basson, Philip W.; Wood, Joseph M.** *Algites enteromorphoides* sp. nov., a filamentous alga of Devonian age from Missouri: *Am. Midland Naturalist*, v. 83, no. 1, p. 283-290, illus., 1970.
- Basov, V. A.** See Saks, V. N. 10094
- 06269 **Bastin, J. A.; Clegg, P. E.; Fielder, G.** Infrared and thermal properties of lunar rock, in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1)*, p. 1987-1991, illus., reprinted 1970.
- 09801 **Bastuscheck, C. P.** Ground temperature and thermal infrared: *Photogramm. Eng.*, v. 36, no. 10, p. 1064-1072, illus., 1970.
- Basu, Debabrata.** See Sclar, Charles B. 09562
- 10146 **Batchelder, George L.** Post-glacial fluctuations of lake level in Adobe Valley, Mono County, California [abs.], in *American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.], p. 7, 1970.*
- 07595 **Bateman, Barry Lynn.** Generation of representative geologic strata suitable for simulation of fluid flow [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 3, p. 1382B, 1970.
- 00210 **Bateman, P. C.; Dodge, F. C. W.** Variations of major chemical constituents across the central Sierra Nevada batholith: *Geol. Soc. America Bull.*, v. 81, no. 2, p. 409-420, illus., table, 1970.
- Bateman, P. C.** See Dodge, F. C. W. 00255
- 04014 **Bateman, Paul C.; Lockwood, John P.** Kaiser Peak quadrangle, central Sierra Nevada, California — Analytic data: *U.S. Geol. Survey Prof. Paper 644-C*, p. C1-C15, illus., table, 1970.
- 04757 **Bates, Fred W.; Copeland, Robert R.; Bates, Marc W.** Belle Isle Field, St. Mary Parish, Louisiana, in *Typical oil and gas fields of southwestern Louisiana*, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 5-5c, illus., 1970.
- Bates, R. G.** See Cohee, G. V. 04694
- Bates, Robert G.** See Cohee, George V. 01362
- 00427 **Bates, T. R.; Reeves, C. C., Jr.; Parry, W. T.** Late Pleistocene history of pluvial Lake Mound, Lynn and Terry Counties, Texas: *Texas Jour. Sci.*, v. 21, no. 3, p. 245-259, illus., 1970.
- Bateson, J. Howard.** See Kesler, Stephen E. 10735
- Bath, Gordon D.** See Crandell, Dwight R. 00248

- Batsanova, L. R.** See Novoselova, A. V. 09305
- Batten, James W.** See Gibson, J. Sullivan. 02757
- 05477 **Batten, R. Wesley.** The role of the mathematics and science center in earth science education [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 131, 1970.
- Battey, M. H.** See Runcorn, S. K. 06292
- Battles, Richard F.** See Comm. on Subsoils of Boston. 07865
- Bauer, A.** See Calder, Peter N. 03457
- 09835 **Bauer, Alan; Calder, P. N.** Projectile penetration in rock, in *Canadian Rock Mechanics Symposium*, 5th, Toronto, 1968, Proc.: Ottawa, Canada Dept. Energy, Mines and Resources Mines Br., p. 157-170, illus., table, discussion, 1969.
- 01199 **Bauleke, Maynard P.; Hladik, William B.** Expansion characteristics of Calvert volcanic ash (Pliocene) in Kansas, in *Short papers in research in 1969: Kansas Geol. Survey Bull.* 199, pt. 1, p. 9-10, illus., tables, 1970.
- Bauleke, Maynard P.** See Tien, Pei-lin. 06915
- Bauman, A. J.** See Rho, Joon H. 05749
- 06567 **Baur, Werner H.** Bond length variation and distorted coordination polyhedra in inorganic crystals, in *Symposium on intermolecular forces and packing in crystals*, New Orleans, La., 1970, Proc.: Am. Cryst. Assoc. Trans., v. 6, p. 129-155, illus., tables, 1970.
- 07569 **Baxter, Franklin Paul.** Sedimentology of Woodfordian glacial materials and subsequent biocycling in derived soils in a mixed forest of northeastern Wisconsin; ant pedoturbation in a prairie soil of southwestern Wisconsin [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 3, p. 1005B, 1970.
- 02465 **Baxter, James W.** Limestone and dolomite resources of Jersey County, Illinois: *Illinois Geol. Survey Circ.* 448, 28 p., illus., tables, geol. map, 1970.
- 04160 **Baxter, Robert W.** A comparison of the Pennsylvanian seed genera *Mitrospermum* and *Kamaraspermum* [abs.]: *Am. Jour. Botany*, v. 57, no. 6, pt. 2, p. 758, 1970.
- 04168 **Baxter, Robert W.** A new lycopod cone genus from the Middle Pennsylvanian of Kansas [abs.]: *Am. Jour. Botany*, v. 57, no. 6, pt. 2, p. 756, 1970.
- 08261 **Bay, R. R.** The hydrology of several peat deposits in northern Minnesota, U.S.A. [with French abs.], in *International Peat Congress*, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 212-218, illus., table, 1970.
- 08428 **Bay, Roger R.** Water table relationships on experimental basins containing peat bogs [with French abs.], in *Symposium on the Results of Research on Representative and Experimental Basins: Internat. Assoc. Sci. Hydrology-Unesco Pub.* 96, p. 360-368, illus., 1970.
- 01363 **Bayley, R. W.** Structure and mineralization of Precambrian rocks in the Galena-Roubaix district, Black Hills, South Dakota: *U.S. Geol. Survey Bull.* 1312-E, p. E1-E15, illus., table, geol. map, 1970.
- 01471 **Bayley, Richard W.** Iron deposits of the Estes Creek area, Lawrence County, South Dakota, in *Geological Survey research 1970*, Chap. B: *U.S. Geol. Survey Prof. Paper* 700-B, p. B93-B101, illus., table, 1970.
- 02157 **Bayliss, P.; Levinson, A. A.** Clay-mineralogy and boron determinations of the shales from the Reindeer well, Mackenzie River delta, N.W.T., Canada: *Bull. Canadian Petroleum Geology*, v. 18, no. 1, p. 80-83, illus., 1970.

- 08413 **Bayliss, P.; Levinson, A. A.; Klován, J. E.** Mineralogy of bottom sediments, Hudson Bay, Canada: *Bull. Canadian Petroleum Geology*, v. 18, no. 4, p. 469-473, illus., tables, 1970.
- 05412 **Bayly, M. Brian.** Viscosity and anisotropy estimates from measurements on chevron folds: *Tectonophysics*, v. 9, no. 5, p. 459-474, illus., table, 1970.
- Bazarov, L. Sh.** See Sobolev, V. S. 03577
- Be, A. W. H.** See Ruddiman, W. F. 01643
- Bé, Allan W. H.** See McIntyre, Andrew. 06697
- 10683 **Beal, M. Allan.** The floor of the Arctic Ocean, physiographic diagram, geographic names: San Diego, Calif., U.S. Navy Electronics Laboratory, 2 sheets, scale from about 1 in = 100 km to 1 in = 50 km, 1966.
- 05328 **Beales, F. W.; Onasick, E. P.** Stratigraphic habitat of Mississippi Valley type orebodies: *Inst. Mining and Metall. Trans., sec. B*, v. 79, *Bull.* 765, p. B145-B154, illus., tables, 1970.
- 00196 **Beall, Arthur O., Jr.** Textural differentiation within the fine sand grade: *Jour. Geology*, v. 78, no. 1, p. 77-93, illus., table, 1970.
- 06055 **Beall, Arthur O., Jr.** Turbidites of the Gulf of Mexico abyssal plain [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 490, 1970.
- 00090 **Beals, C. S.** Impact craters and the relative ages of Earth and Moon: *Nature*, v. 225, no. 5230, p. 368-369, illus., 1970
- 08459 **Beals, C. S.; Hitchen, A.** On the deposition of sediments in craters [with French abs.]: *Dominion Observatory Ottawa Pubs.*, v. 39, no. 4, p. 105-118, illus., table, 1970.
- 09462 **Beaman, D. R.; Isasi, J. A.** A critical examination of computer programs used in quantitative electron microprobe analysis: *Anal Chemistry*, v. 42, no. 13, p. 1540-1568, tables, 1970.
- 05105 **Bean, Alan L.; Conrad, Charles, Jr.; Gordon, Richard F.** Crew observations, *in* Apollo 12 preliminary science report: U.S. Natl. Aeronautics and Space Adm. Spec. Pub. SP-235, p. 29-38, 1970.
- 01423 **Bear, Melvern F.** Everett L. Bradley (1897-1969): *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 4, p. 665-666, portrait, 1970.
- 00671 **Bearce, Denny N.** Stratigraphy of a conglomerate in the Silurian Red Mountain Formation of Alabama [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 193-194, 1970.
- Bearce, Denny N.** See Thomas, William A. 10274
- 07553 **Beard, David B.** Cumulative interplanetary dust concentration on the lunar surface: *Modern Geology*, v. 1, no. 4, p. 301-304, 1970.
- Beardsley, George F., Jr.** See Pak, Hasong. 06727
- 00058 **Beaty, Chester B.** Age and estimated rate of accumulation of an alluvial fan, White Mountains, California, U.S.A.: *Am. Jour. Sci.*, v. 268, no. 1, p. 50-77, illus., tables, 1970.
- 03301 **Beaudet, Paul R.** Elastic wave propagation in heterogeneous media: *Seismol. Soc. America Bull.*, v. 60, no. 3, p. 769-784, illus., 1970.

- 07304 **Beaulieu, Patrick Leo.** Determination of aluminum, chromium, magnesium, and silicon in trace amounts in iron meteorites [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2519B, 1970.
- 03408 **Beaumont, C.; Hyndman, R. D.; Keen, M. J.** A new technique for the installation of tiltmeters: Earth and Planetary Sci. Letters, v. 8, no. 5, p. 337-340, illus., 1970.
- 10908 **Becher, A. E.** Ground water in Pennsylvania: Pennsylvania Geol. Survey Educ. Ser. 3, 42 p., illus., table [1970?].
- 02221 **Becher, Albert E.; Meisler, Harold.** High-calcium limestone deposits in Lancaster County, southeastern Pennsylvania, in Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B102-B104, illus., tables, 1970.
- Becher, Albert E.** See Meisler, Harold. 08365
- Beck, A. E.** See Schloessin, H. H. 02013
- 07966 **Beck, A. E.** Non-equivalence of oceanic and continental heat flows and other geothermal problems: Comments Earth Sci. — Geophysics, v. 1, no. 2, p. 29-35, 1970.
- Beck, A. E.** See Mansinha, L. 09956
- 04162 **Beck, C. B.** Stellar morphology in some progymnosperms [abs.]: Am. Jour. Botany, v. 57, no. 6, pt. 2, p. 755, 1970.
- 04163 **Beck, C. B.; Chase, N. L.** On the anatomy and morphology of *Archaeopteris* fronds [abs.]: Am. Jour. Botany, v. 57, no. 6, pt. 2, p. 755, 1970.
- 08510 **Beck, Charles B.** Problems of generic delimitation in paleobotany, in The genus, a basic concept in paleontology — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc., Pt. C: Lawrence, Kans., Allen Press, p. 173-193, illus., 1970.
- 09335 **Beck, Charles B.** The appearance of gymnospermous structure, in Major evolutionary events and the geological record of plants — Symposium, Internat. Bot. Cong., 11th, Seattle, Wash., 1969: Cambridge Philos. Soc. Biol. Rev., v. 45, no. 3, p. 379-400, illus., 1970.
- 09477 **Beck, Frederick M.** Marine challenges encountered by a small mine on the Maine coast, in Offshore Technology Conference, 2d Ann., Houston, Tex., 1970, Preprints — v. 2: Dallas, Tex., Offshore technology Conf., p. II-279 — II-286, Illus., 1970.
- 03529 **Beck, L. S.** Genesis of uranium in the Athabasca region and its significance in exploration: Canadian Mining and Metall. Bull., v. 63, no. 695, p. 367-377, illus., table, 1970.
- 03966 **Beck, Myrl E., Jr.** Paleomagnetism of Keweenaw intrusive rocks, Minnesota: Jour. Geophys. Research, v. 75, no. 26, p. 4985-4996, illus., tables, 1970.
- 03245 **Beck, Myrl Emil, Jr.** Paleomagnetism and magnetic intensities of Keweenaw intrusive rocks from northeastern Minnesota [abs.]: Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 5106B, 1970.
- 04215 **Becker, Herman F.** A proposed new catalogue of Cenozoic and Mesozoic plants of North America [abs.]: Am. Jour. Botany, v. 57, no. 6, pt. 2, p. 759, 1970.
- 01052 **Becker, Leroy E.; Dawson, T. A.; Patton, John B.** The Precambria-to-Ordovician transition in Indiana [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 376, 1970.
- 01904 **Becker, V. J.** Halogens and uranium content of tektites [abs.]: EOS, v. 51, no. 4, p. 342, 1970.

- 08690 **Beckinsale, Robert D.; Brooks, C. Kent; Rex, David C.** K-Ar ages for the Tertiary of East Greenland: *Geol. Soc. Denmark Bull., Dansk Geol. Foren. Medd., English edition*, v. 20, pt. 1, p. 27-37, illus., table, 1970.
- 01878 **Becraft, George E.; Kiilsgaard, Thor H.; VanNoy, Ronald M.** Mineral resources of the Jack Creek basin, Madison County, Montana: U.S. Geol. Survey Bull. 1319-B, p. B1-B24, illus., tables, geol. map, 1970.
- 05473 **Bedinger, M. S.; Reed, J. E.; Wells, C. J.; Swafford, B. F.** Methods and applications of electrical simulation in ground-water studies in the lower Arkansas and Verdigris River valleys, Arkansas and Oklahoma: U.S. Geol. Survey Water Supply Paper 1971, 71 p., illus., tables, geol. map, 1970.
- 11238 **Bedinger, M. S.; Sniegocki, R. T.** An approach to systems studies of Arkansas water resources [abs.]: *EOS*, v. 51, no. 11, p. 749, 1970.
- 03146 **Beebe, B. W.** Natural gas, oil's principal competitor [abs.]: *Corpus Christi Geol. Soc. Bull.*, v. 10, no. 8, p. 4-5, 1970; *South Texas Geol. Soc. Bull.*, v. 10, no. 7, p. 2-3, 1970.
- 08142 **Beecham, A. W.** The ABC Fault, Beaverlodge, Saskatchewan: *Canadian Jour. Earth Sci.*, v. 7, no. 5, p. 1264-1274, illus., 1970.
- 09927 **Beeks, Clifford H., Jr.** Hatton water supply survey, Steele, Traill and Grand Forks Counties, North Dakota: *North Dakota Water Comm., North Dakota Ground-Water Studies*, no. 66, 34 p., illus., tables, 1967.
- 09929 **Beeks, Clifford H., Jr.** Investigation of ground-water conditions at Lake Metigoshe State Park, Bottineau County, North Dakota: *North Dakota Water Comm., North Dakota Ground-Water Studies*, no. 68, 18 p., illus., tables, 1967.
- 08501 **Beerbower, James R.** Graduate paleobiology — The search for futures, in *Teaching paleontology* — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc., Pt. A: Lawrence, Kans., Allen Press, p. 23-27, 1970.
- 04675 **Beeson, Marvin H.** Age dating and radioactive isotopes [summ.]: *Geol. Soc. Oregon Country News Letter*, v. 36, no. 2, p. 8-9, table, 1970.
- 01571 **Beeson, Marvin Howard.** A trace element study of silicic volcanic rocks [abs.]: *Desert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 9, p. 4204B-4205B, 1970.
- 09942 **Beeson, Melvin H.; Jackson, Everett D.** Origin of the garnet pyroxenite xenoliths at Salt Lake Crater, Oahu, in *Symposium on the mineralogy and petrology of the upper mantle — Fiftieth Anniversary Symposia* (Benjamin A. Morgan, editor): *Mineralog. Soc. America Spec. Paper* 3, p. 95-112, illus., tables, 1970.
- Beg, M. A.** See Clarke, W. B. 06403
- Begemann, F.** See Craig, H. 00845
- 05683 **Begemann, F.; Vilcsek, E.; Rieder, R.; Born, W.; Wänke, H.** Cosmic-ray produced radioisotopes in lunar samples from the Sea of Tranquility (Apollo 11), in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc.* — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 995-1005, illus., tables, 1970.
- Begemann, F.** See Hintenberger, H. 05702
- 06821 **Begemann, F.; Vilcsek, E.; Nyquist, L. E.; Signer, P.** The exposure history of the Pitts meteorite: *Earth and Planetary Sci. Letters*, v. 9, no. 4, p. 317-321, illus., tables, 1970.
- 06056 **Beger, Richard M.; Burnham, Charles W.; Hays, James Fred.** Structural changes in sillimanite at high temperature [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 490-491, 1970



**Begg, E. L.** See Hansen, R. O. 03406

- 01331 **Behre, Charles H., Jr.** Necessary curricula for careers in applied economic geology: Jour. Geol. Education, v. 18, no. 2, p. 77-80, 1970.

**Behrendt, J. C.** See Popenoe, Peter. 01171

- 00863 **Behrens, E. William.** Holocene high stands of relative sea level in the western Gulf of Mexico [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 267-268, 1970.

- 00864 **Behrens, E. William.** Stable carbon isotope in Gulf of Mexico cores [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 268, 1970.

- 06057 **Behrens, E. William; Land, Lynton S.** Subtidal, Holocene dolomite in Baffin Bay, Texas [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 491-492, 1970.

**Behunin, Homer.** See Tidwell, William D. 01677

- 09232 **Beklemishev, W. N.** Principles of comparative anatomy of invertebrates — v. 1, Promorphology: Chicago, Ill., Chicago Univ. Press, 490 p., illus., 3d edition, 1969.

- 03327 **Belcher, Donald J.** Successful computerization for resources mapping: Jour. Remote Sensing, v. 1, no. 1, p. 7-10, illus. p. 4-5, 1970.

**Belichenko, V. P.** See Povarennykh, A. S. 08295

- 09861 **Bell, A. M.** The Newman project: Western Miner, v. 43, no. 11, p. 22-29, illus., 1970.

**Bell, C. Keith.** See Quirke, Terence T., Jr. 09606

- 07995 **Bell, Curtis C.; Forward, Robert L.; Williams, Harvell P.** Simulated terrain mapping with the rotating gravity gradiometer, in *Advances in dynamic gravimetry* (Wilbur T. Kattner, editor) — Symposium, Fort Worth, Texas, 1970, Proc.: Pittsburgh, Pa., Instrument Society of America, p. 115-129, illus., 1970.

- 05472 **Bell, J. J.** Ancient gravel near Indian Hot Springs, Hudspeth County, Texas, in *Geology of the southern Quitman Mountains area, Trans-Pecos Texas* — S.E.P.M. Permian Basin Sec., 1970 Biennial Field Trip, Symposium and Guidebook: Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub. 70-12, p. 91-95, illus., table, 1970.

- 06058 **Bell, J. S.** Tertiary global tectonics in the southern Caribbean area [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 492, 1970.

- 05508 **Bell, James M.; Arrigoni, Enrico L.** Shape influence on triaxial strengths, in *Engineering geology and soils engineering symposium, 8th Ann.*, Pocatello, Idaho, 1970, Proc.: Boise, Idaho, Idaho Dept. Highways, p. 237-254, illus., 1970.

- 04758 **Bell, John; Holmes, John; Schoelen, John.** West Cameron Block 180 Field, West Cameron area, offshore Cameron Parish, Louisiana, in *Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La.*, Lafayette Geol. Soc., p. 6-6d, illus., 1970.

**Bell, Keith.** See Powell, J. L. 03771

**Bell, Kenneth G.** See Harshman, E. N. 04483

- 02226 **Bell, P. M.; Mao, H. K.** Crystal-field spectra at high pressure: Carnegie Inst. Washington Year Book 68, 1968-69, p. 253-256, 1970.

- 02227 **Bell, P. M.; Chao, E. T. C.** Annealing experiments with naturally and experimentally shocked feldspar glasses: Carnegie Inst. Washington Year Book 68, 1968-69, p. 336-339, illus., table, 1970.

- 02228 **Bell, P. M.; Kullerud, G.** Acanthite-type compounds: Carnegie Inst. Washington Year Book 68, 1968-69, p. 276-277, illus., 1970.
- 02229 **Bell, P. M.; El Goresy, A.; England, J. L.; Kullerud, G.** Pressure-temperature diagram for  $\text{Cr}_2\text{FeS}_4$ : Carnegie Inst. Washington Year Book 68, 1968-69, p. 277-278, illus., 1970.
- Bell, P. R.** See O'Kelley, G. Davis. 05712
- 01736 **Bell, Peter M.; Chao, E. T. C.** Annealment of synthetic and natural feldspar glass [abs.]: EOS, v. 51, no. 4, p. 439, 1970.
- 05880 **Bell, R. T.** Preliminary notes on the Hurwitz Group, Padlei map-area, Northwest Territories: Canada Geol. Survey Paper 69-52, 13 p., illus., table, geol. map, 1970.
- 08659 **Bell, R. T.** The Hurwitz Group — A prototype for deposition on metastable cratons, in Basins and geosynclines of the Canadian Shield (A. J. Baer, editor) — Symposium, Ottawa, 1970, Papers: Canada Geol. Survey Paper 70-40, p. 159-169, illus., table, 1970.
- 04517 **Bellamy, James J.** Topsy-Thompson Bluff-Indian Village Fields, Jefferson Davis Parish, Louisiana, in Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 28-28d, illus., 1970.
- Bellotti, L. H.** See Aronson, J. R. 03695
- 07803 **Belousov, I. M.** O nekotorykh geomorfologicheskikh osobennostyakh yuzhnoy chasti Meksikanskogo zaliva i prikubinskogo rayona [Some geomorphological features of the southern part of the Gulf of Mexico and the Cuban region (with English and Spanish abs.)], in Okeanologicheskiye issledovaniya, Sbornik statey, no. 20 — Rezul'taty issledovaniy po mezhdunarodnym geofizicheskim proyektam: Moscow, Izdatel'stvo "Nauka," p. 11-21, illus., 1970.
- Belov, N. A.** See Lapina, N. N. 10071
- 01864 **Belsky, T.; Kaplan, I. R.** Light hydrocarbon gases,  $\text{C}^{13}$ , and origin of organic matter in carbonaceous chondrites: Geochim. et Cosmochim. Acta, v. 34, no. 3, p. 257-278, illus., tables, 1970.
- 07344 **Belt, Edward Scudder.** Stratigraphy and sedimentology of the Mabou Group (Middle Carboniferous), Nova Scotia, Canada [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2058B, 1970.
- Belyea, H. R.** See Douglas, R. J. W. 07974
- Belyea, H. R.** See Little, H. W. 07975
- 07566 **Belz, David J.** Allegheny County soils, in Geology of the Pittsburgh area: Pennsylvania Geol. Survey, 4th ser., [Bull.] G 59 (General Geology Rept.), p. 93-103, illus., tables, 1970.
- Benander, Laurence E.** See Ramsey, Elmer W. 05486
- 01738 **Bence, A. E.; Cameron, K. L.; Papke, J. J.** Sector zoning in calcic clinopyroxenes [abs.]: EOS, v. 51, no. 4, p. 435, 1970.
- 02136 **Bender, M. L.; Ku, Teh-Lung; Broecker, W. S.** Accumulation rates of manganese in pelagic sediments and nodules: Earth and Planetary Sci. Letters, v. 8, no. 2, p. 143-148, illus., tables, 1970.
- 01328 **Bender, Margaret M.; Bryson, Reid A.; Baerreis, David A.** University of Wisconsin radiocarbon dates VII: Radiocarbon, v. 12, no. 1, p. 335-345, 1970.
- 03188 **Bender, Margaret M.; Bryson, Reid A.; Baerreis, David A.** University of Wisconsin radiocarbon dates VIII: Radiocarbon, v. 12, no. 2, p. 640-643, 1970.

- 01893 **Bender, Michael; Broecker, Wallace; Gornitz, Vivian; Middel, Ursula.** Accumulation rate of manganese and related elements in sediments from the East Pacific Rise [abs.]: *EOS*, v. 51, no. 4, p. 327, 1970.

**Bender, P. L.** See Boyne, H. S. 06627

- 04183 **Benedict, James B.** Downslope soil movement in a Colorado alpine region, rates, processes and climatic significance: *Arctic and Alpine Research*, v. 2, no. 3, p. 165-226, illus., tables, 1970.

- 06826 **Benedict, James B.** Frost cracking in the Colorado Front Range: *Geog. Annaler*, v. 52A, no. 2, p. 87-93, illus., 1970.

**Benedict, L. G.** See Thompson, R. R. 10277

- 02986 **Benham, Milford J.** The nature of the deeper crust of central Arizona suggested by geophysical data [abs.]: *Arizona Acad. Sci. Jour.*, v. 6, 1970 *Proc. Supp.*, p. 66, 1970.

- 00672 **Benham, Steven R.; Boyce, Robert L.; Drexler, Wallace W.; Hamilton, Michael M; Smith, Lester B., Jr.** A carbonate sand beach, Bahia Honda Key, Florida [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 194, 1970.

- 03069 **Ben-Menahem, Ari; Gillon, Allon.** Crustal deformation by earthquakes and explosions: *Seismol. Soc. America Bull.*, v. 60, no. 1, p. 193-215, illus., tables, 1970.

- 04339 **Ben-Menahem, Ari; Rosenman, Martin; Harkrider, David G.** Fast evaluation of source parameters from isolated surface-wave signals — Pt. 1, Universal tables: *Seismol. Soc. America Bull.*, v. 60, no. 4, p. 1337-1387, illus., tables, 1970.

- 09959 **Ben-Menahem, Ari; Singh, Sarva Jit.** Deformation of a spherical earth model by finite dislocations, *in* Earthquake displacement fields and the rotation of the Earth (L. Mansinha, D. E. Smylie, A. E. Beck, editors) - NATO advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 39-42, 1970.

**Bennett, D.** See Taylor, S. R. 05725

**Bennett, E. O.** See Schneider, H. 01635

- 02513 **Bennett, G.; McNally, N. K.** Strathcona Township, District of Timiskaming: Ontario Dept. Mines Prelim. Geol. Map P. 596, scale 1 in. to 1/4 mi., text, 1970.

- 02733 **Bennett, G.; McNally, N. K.** Briggs Township, District of Timiskaming: Ontario Dept. Mines Prelim. Geol. Map P. 595, scale 1 in. to 1/4 mi., text, 1970.

- 09275 **Bennett, G.; Riley, R. A.** Operation Lingman Lake: Ontario Dept Mines Misc. Paper 27, 52 p., illus., tables, geol. map, 1969.

- 03140 **Bennett, G. A.; Manuel, O. K.** Xenon in natural gases: *Geochim. et Cosmochim. Acta*, v. 34, no. 5, p. 593-610, illus., tables, 1970.

**Bennett, Lee C., Jr.** See Grim, Muriel S. 10923

- 05661 **Bennett, Richard H.; Keller, George H.; Busby, Roswell F.** Mass property variability in three closely-spaced deep-sea sediment cores: *Jour. Sed. Petrology*, v. 40, no. 3, p. 1038-1043, illus., tables, 1970.

**Bennett, Richard H.** See Keller, George H. 06764

**Bennett, Theron J.** See Gordon, David W. 03309

**Bennin, Robert.** See Brier, Chester. 08559

**Bennion, D. W.** See Andre, H. 10436

- 10708 **Bennison, Allan P.; Chenoweth, Philip A.** Geology of the Tulsa Metropolitan Area — Guidebook and roadlog: Tulsa, Okla., Tulsa Geol. Soc., 27 p., illus., geol. map, 1968.
- Benson, A. L.** See Burgess, R. J. 01279
- 08695 **Benson, Carl S.** Comparative snow studies on the Antarctic and Greenland ice sheets, in *Internat. Symposium on Antarctic Glaciological Exploration (ISAGE)*, Hanover, N.H., 1968 [Proc.]: Internat. Assoc. Sci. Hydrology (and Sci. Comm. Antarctic Research) Pub. 86, p. 242-253, illus., tables, 1970.
- 07178 **Benson, D. G.** Notes to accompany geological maps of Antigonish and Cape George map-areas, Nova Scotia (11 F/13 W/12, 11 F/12): Canada Geol. Survey Paper 70-8, 2 p., geol. maps, 1970.
- 07179 **Benson, D. G.** Notes to accompany maps of the geology of Merigomish and Malignant Cove map-areas, Nova Scotia (11 E/16 E1/2, 11 E/9): Canada Geol. Survey Paper 70-9, 5 p., geol. maps, 1970.
- Benson, R.** See Berggren, W. A. 06160
- 09155 **Benson, R. P.; Kierans, T. W.; Sigvaldason, O. T.** In situ and induced stresses at the Churchill Falls underground powerhouse, Labrador [with French and German summ.], in *Internat. Soc. Rock Mechanics Cong.*, 2d, Belgrade, Yugoslavia, 1970, Proc., V. 2: Belgrade, Jaroslav Černi Inst. Devel. Water Resources, p. 821-832, illus., 1970.
- 09312 **Benson, R. P.; Murphy, D. K.; McCreath, D. R.** Modulus testing of rock at the Churchill Falls underground powerhouse, Labrador, in *Determination of the in situ modulus of deformation of rock* (Symposium, Astm, Winter Mtg., Denver, Colo., 1969): Am. Soc. Testing and Materials Spec. Tech. Pub. 477, p. 89-116, illus., 1970.
- 06674 **Benson, W. E.; Gerard, R. D.; Hay, W. W.** Summary and conclusions, Chap. 27 in *Initial reports of the Deep Sea Drilling Project — V. 4, Leg 4 of cruises of Glomar Challenger, Rio de Janeiro, Brazil, to San Cristobal, Panama, Feb.-Mar. 1969* (R. G. Bader, and others): Washington, D. C., U.S. Govt. Printing Office, p. 659-673, illus., 1970.
- Benson, William E.** See Bader, Richard G. 06657
- 06018 **Bentley, Eugene Macke, 3d.** The effect of marshes on water quality [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5576B, 1970.
- 00673 **Bentley, Robert D.; Neathery, Thornton L.** Brevard fault zone of Alabama [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 194-195, 1970.
- Bentley, Robert D.** See Neathery, Thornton L. 00742
- 01903 **Bentley, Robert D.; Neathery, Thornton L.; Lines, Gregory C.** A probable impact-type structure near Wetumpka, Alabama [abs.]: *EOS*, v. 51, no. 4, p. 342, 1970.
- 06059 **Bentley, Robert D.; Neathery, Thornton L.** Southern terminus of the inner Piedmont zone, Alabama [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 492-493, 1970.
- Bentley, Robert D.** See Wampler, J. Marion. 07734
- Bentley, Robert D.** See Alabama Geological Society. 07735
- 07582 **Bentley, Robert Donald.** Geologic evolution of the Beartooth Mountains, Montana and Wyoming, Pt. 9 — Cloverleaf Lakes area [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 3, p. 1349B, 1970.
- Benton, L. F.** See Cardwell, L. E. 00078

**Benton, L. F.** See Cardwell, L. E. 03165

04486 **Bentzen, Edwin H., 3d.** Chemical composition of some North Carolina chromite: *Econ. Geology*, v. 65, no. 7, p. 883-885, table, 1970.

02883 **Berard, J.** Black shale heaving at Ottawa, Canada — Discussion [of paper by R. M. Quigley and R. W. Vogan, 1970]: *Canadian Geotech. Jour.*, v. 7, no. 2, p. 113-114, 1970.

**Berberian, Paul.** See Estes, Richard. 02754

00674 **Berdan, Jean M.** Ostracodes from the Lexington Limestone in Kentucky [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 195, 1970.

08760 **Berdan, Jean M.; Martinsson, Anders.** Ostracodes — American ostracode zonation; Correlation with Europe, in *Correlation of the North American Silurian rocks*: *Geol. Soc. America Spec. Paper* 102, p. 39-44, 1970.

04607 **Berg, H. C.** Alaska's mineral resources — Past, present, and future: *Canadian Mining Jour.*, v. 91, no. 4, p. 53-56, 1970.

00227 **Berg, Henry C.** Paleozoic plutonism and contrasting metamorphic terranes, Annette Island, Alaska [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 70, 1970.

**Berg, Joseph W., Jr.** See Thiruvathukal, John V. 00558

08387 **Berg, Norman A.** Urban sediment can be controlled, in *National Conference on Sediment Control*, Washington, D.C., 1969, *Proc.* Washington, D.C., U.S. Dept. Housing and Urban Development Environmental Planning Division, p. 8-17, 1970.

02471 **Berg, R. B.** (compiler). Current geological and geophysical studies in Montana: *Montana Bur. Mines and Geology Spec. Pub.* 50, 24 p., 1970.

04699 **Berg, R. B.; Lawson, D. C.; Jones, F. P.; Smith, R. I.** Progress report on clays and shales of Montana, 1968-1969 (samples 636-727): *Montana Bur. Mines and Geology Bull.* 80, 27 p., illus., tables, 1970.

04620 **Berg, Richard B.** Bentonite deposits in the Ingomar-Vananda area, Treasure and Rosebud Counties, Montana: *Montana Bur. Mines and Geology Spec. Pub.* 51, 5 p., illus., tables, 1970.

02587 **Berg, Robert R.; Davies, David K.** Depositional environments of Muddy reservoir sandstones (Lower Cretaceous) in Powder River basin, Montana and Wyoming [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 835, 1970.

**Berg, Robert R.** See *Geol. Soc. America So.-Central Sec.* 02798

02800 **Berg, Robert R.** Stratigraphy of the Claiborne Group, in *Outcrops of the Claiborne Group in the Brazos Valley, southeast Texas* — *Geol. Soc. America South-Central Sec., 4th Ann. Mtg.*, 1970, *Guidebook*: [College Station, Tex.] Texas A and M Univ., Dept. Geology, p. 12-16, illus., 1970.

04818 **Berg, Robert R.** Criteria for identification of sedimentary environments in reservoir sandstones [abs.]: *Am. Assoc. Petroleum Geologists*, v. 54, no. 9, p. 1782-1783, 1970.

07321 **Berg, Robert R.** Identification of sedimentary environments in reservoir sandstones, in *Exploration concepts for the Seventies*: *Gulf Coast Assoc. Geol. Socs. Trans.*, v. 20, p. 137-143, illus., 1970.

07334 **Berg, Robert R.** Method for determining permeability from reservoir rock properties, in *Exploration concepts for the Seventies*: *Gulf Coast Assoc. Geol. Socs. Trans.*, v. 20, p. 303-317, illus., table, 1970.

- 06830 **Berg, Thomas M.** A new fossil locality for Clearfield County: Pennsylvania Geology, v. 1, no. 9, p. 8-9, illus., 1970.
- Bergenback, R. E.** See Eason, J. E. 03972
- 02588 **Bergendahl, Maximilian M.** Expanded need for mineral economics in exploration for metals [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 835, 1970.
- Berger, G. W.** See York, D. 01169
- 01737 **Berger, Glen W.; York, Derek.** Precision of the Ar-40/Ar-39 dating technique [abs.]: EOS, v. 51, no. 4, p. 432, 1970.
- 05338 **Berger, Glenn W.; York, Derek.** Precision of the  $^{40}\text{Ar}/^{39}\text{Ar}$  dating technique: Earth and Planetary Sci. Letters, v. 9, no. 1, p. 39-44, illus., tables, 1970.
- 06626 **Berger, J.** Design considerations of laser strain meters, in Laser applications in the geosciences (J. Gauger and F. F. Hall, Jr., editors) — Symposium, Huntington Beach, Calif., 1969, Proc.: North Hollywood, Calif., Western Periodicals Co., p. 203-213, illus., 1970.
- 04548 **Berger, Jon; Lovberg, R. H.** Earth strain measurements with a laser interferometer: Science, v. 170, no. 3955, p. 296-303, illus., 1970.
- 07364 **Berger, Jonathan.** A laser earth strain meter [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2068B, 1970.
- Berger, Rainer.** See Bucha, V. 00952
- 11239 **Berger, Rainer; Libby, Willard F.** Exchange of  $\text{CO}_2$  between atmosphere and sea water — Possible enzymatic control of the rate, in Global effects of environmental pollution — Symposium, Am. Assoc. Adv. Sci., Dallas, Texas, 1968: New York, Springer-Verlag, and Dordrecht-Holland, D. Reidel Pub. Co., p. 30-33, illus., tables, 1970.
- 00085 **Berger, Wolfgang H.; Soutar, Andrew.** Preservation of plankton shells in an anaerobic basin off California: Geol. Soc. America Bull., v. 81, no. 1, p. 275-282, illus., tables, 1970.
- 01337 **Berger, Wolfgang H.** Planktonic Foraminifera — Selective solution and the lysocline: Marine Geology, v. 8, no. 2, p. 111-138, illus., tables, 1970.
- 01410 **Berger, Wolfgang H.** Biogenous deep-sea sediments — Fractionation by deep-sea circulation: Geol. Soc. America Bull., v. 81, no. 5, p. 1385-1401, illus., tables, 1970.
- 03343 **Berger, Wolfgang H.; Parker, Frances L.** Diversity of planktonic foraminifera in deep-sea sediments: Science, v. 168, no. 3937, p. 1345-1347, illus., 1970.
- 04059 **Berger, Wolfgang H.** Planktonic foraminifera, differential production and expatriation off Baja California: Limnology and Oceanography, v. 15, no. 2, p. 183-204, illus., tables, 1970.
- Bergeron, R.** See Pourret, G. 08562
- Bergeron, R.** See Dimroth, E. 08629
- Berggren, W. A.** See Cordey, W. G. 02016
- 06160 **Berggren, W. A.; Laughton, A. S.; Davies, T. A.; Franz, Ulrich; Musich, Lillian; Ruffman, A.; Whitmarsh, Robert; Benson, R.; vanHinte, J. E.; Perch-Nielsen, Katharina.** Preliminary results of J.O.I.D.E.S. Deep Sea Drilling Project leg 12, North Atlantic [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 493, 1970.

- 06548 **Bergh, H. W.** Paleomagnetism of the Stillwater Complex, Montana, Chap. 17 in *Palaeogeophysics* (S. K. Runcorn, editor): London and New York, Academic Press, p. 143-158, illus., tables, 1970.
- Bergin, M. J.** See Hosterman, John W. 04248
- 10010 **Bergquist, H. R.** Foraminiferal biostratigraphy of Mesozoic of northern Alaska [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2468-2469, 1970.
- 01053 **Bergstrom, Robert E.** Environmental geology — A state of mind [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 376-377, 1970.
- 04237 **Bergstrom, Robert E.** (compiler). *Geology for planning at Crescent City, Illinois*: Illinois Geol. Survey Environmental Geology Note 36, 15 p., illus., 1970.
- Bergström, Stig.** See Sweet, Walter C. 09593
- Bergström, Stig M.** See Sweet, Walter C. 00764
- 01054 **Bergström, Stig M.; Sweet, Walter C.** Evolutionary trends in Ordovician prioniodid conodonts [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 377, 1970.
- Bergström, Stig M.** See Sweet, Walter C. 08509
- 02997 **Berkes, John S.; Roy, Rustum.** Use of ion properties for the prediction of the phase relations in a binary system [with German abs.]: *Zeitschr. Kristallographie*, v. 131, nos. 1-2, p. 60-72, illus., tables, 1970.
- 00228 **Berkland, James O.** New occurrence of Tertiary marine strata indicates middle to late Miocene age for the Quien Sabe volcanics of Pacheco Peak, Santa Clara County, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 71, 1970.
- Berkoff, E. W.** See Crew, M. E. 05831
- 10672 **Berkowitz, N.** Coal research and development in Canada — 1969: *Canadian Mining and Metall. Bull.*, v. 63, no. 702, p. 1203-1209, 1970.
- 06157 **Berkson, J. M.; Clay, C. S.** A side-scan sonar study of the morphology of Lake Superior near Freda, Michigan [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 493-494, 1970.
- 06472 **Berkson, J. M.; Clay, C. S.** Side-scan sonar survey of the Lake Superior floor near Freda, Michigan [abs.], in *Inst. Lake Superior Geology*, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 9, 1970.
- 05211 **Berman, David S.** Vertebrate fossils from the Lueders Formation, Lower Permian of north-central Texas: *California Univ. Pubs. Geol. Sci.*, v. 86, 39 p., illus., 1970.
- Bermingham, John J.** See Bretsky, Peter W. 04714
- 06240 **Bermúdez, Pedro J.; Seiglie, George A.** Age, paleoecology, correlation and foraminifers of the uppermost Tertiary formation of northern Puerto Rico: *Caribbean Jour. Sci.*, v. 10, nos. 1-2, p. 17-33, illus., 1970.
- Bernard, Claude.** See Laverdière, Camille. 03128
- 05896 **Bernard, Hugh A.; Major, C. F., Jr.; Parrott, B. S.; LeBlanc, Rufus J., Sr.** Recent sediments of Southeast Texas — A field guide to the Brazos alluvial and deltaic plains and the Galveston barrier island complex: *Texas Univ. Austin Bur. Econ. Geology Guidebook* 11, [83] p., illus., 1970.

- 05897 **Bernard, Hugh A.; Major, C. F., Jr.; Parrott, B. S.** The Galveston barrier island and environs — A model for predicting reservoir occurrence and trend [summ.], *in* Recent sediments of Southwest Texas — A field guide to the Brazos alluvial and deltaic plains and Galveston barrier island complex: Texas Univ. Austin Bur. Econ. Geology Guidebook 11, 4 p., paged separately, reprinted 1970; originally published 1959.
- 05898 **Bernard, Hugh A.; LeBlanc, Rufus J.** Résumé of the Quaternary geology of the northwestern Gulf of Mexico Province, App. *in* Recent sediments of Southwest Texas — A field guide to the Brazos alluvial and deltaic plains and Galveston barrier island complex: Texas Univ. Austin Bur. Econ. Geology Guidebook 11, 62 p., paged separately, illus., reprinted 1970; originally published 1965.
- 05590 **Bernat, Michel; Bieri, Rudolf H.; Koide, Minoru; Griffin, John J.; Goldberg, Edward D.** Uranium, thorium, potassium and argon in marine phillipsites: *Geochim. et Cosmochim. Acta*, v. 34, no. 10, p. 1053-1071, illus., tables, 1970.
- 00037 **Berner, Robert A.** Sedimentary pyrite formation: *Am. Jour. Sci.*, v. 268, no. 1, p. 1-23, illus., tables, 1970.
- 04679 **Berner, Robert A.; Scott, Martha R.; Thomlinson, Catherine.** Carbonate alkalinity in the pore waters of anoxic marine sediments: *Limnology and Oceanography*, v. 15, no. 4, p. 544-549, illus., tables, 1970.
- 06060 **Berner, Robert A.** Chemical kinetic models of early diagenesis [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 494, 1970.
- 05281 **Bernhard, R. K.** Some notes on vibratory test techniques for determination of properties of soils *in situ*, *in* Special procedures for testing soil and rock for engineering purposes (5th edition): *Am. Soc. Testing and Materials Spec. Tech. Pub.* 479, p. 552-561, illus., 1970.
- Bernstein, Hyman.** *See* Inouye, George T. 06859
- 09370 **Beroza, Morton.** Determination of the chemical structure of organic compounds at the microgram level by gas chromatography: *Accounts Chem. Research*, v. 3, no. 1, p. 33-40, illus., 1970.
- 08721 **Berrange, Jevan P.** The geology of two small layered hornblende peridotite (picrite) plutons in South Greenland: *Medd. Grönland*, v. 192, no. 1, 43 p., illus., tables, 1970; *Grönlands Geol. Undersøgelse Bull.* 92, 1970.
- Berrios, Héctor H.** *See* Picó, Rafael. 10722
- 10915 **Berry, Cameron G.; Inwood, Robin.** New methods in exploration and evaluation using mechanical logs, *in* Ontario Petroleum Inst. Conf., 7th, Windsor, 1968 [proc.]; Chatham (Ontario), Ontario Petroleum Inst., Tech. Paper No. 3, 25 p., illus., table, 1968.
- 08343 **Berry, Edward L.** Ground water quality in Stanly County, North Carolina: *North Carolina Div. Ground Water Ground-Water Circ.* 15, 24 p., illus., tables, 1970.
- Berry, F. A. F.** *See* Turner, D. L. 00382
- Berry, James W.** *See* Ashby, Carl T. 09128
- 00229 **Berry, Michael J.** Deconvolution of refraction records obtained during Project Edzoe [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 71, 1970.
- Berry, P. L.** *See* Barden, L. 08251
- 08500 **Berry, W. B. N.** On teaching stratigraphic paleontology — The application of paleontology in earth history, *in* Teaching paleontology — North Am. Paleont. Con-



vention, Chicago, Ill., 1969, Proc., Pt. A: Lawrence, Kans., Allen Press, p. 12-22, 1970.

- 08748 **Berry, W. B. N.; Boucot, A. J.** (editors, with contributions by Jean M. Berdan, Gilbert Klapper, Anders Martinsson, Carl B. Rexroad, Richard P. Sheldon, and Alfred M. Ziegler). Correlation of the North American Silurian rocks: Geol. Soc. America Spec. Paper 102, 289 p., illus., tables, geol. map, 1970.

**Berry, W. B. N.** See Klapper, Gilbert. 08749

- 00216 **Berry, William B. N.** The base of the Devonian and an Early Devonian graptolite succession in central Nevada: Geol. Soc. America Bull., v. 81, no. 2, p. 513-520, illus., table, 1970.

- 00230 **Berry, William B. N.** Depositional environment of some Silurian graptolite-bearing rocks in Nevada [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 72, 1970.

- 00549 **Berry, William B. N.; Takagi, Robert S.** Electron microscope investigation of *Orthograptus quadrimucronatus* from the Maquoketa Formation (Late Ordovician) in Iowa: Jour. Paleontology, v. 44, no. 1, p. 117-124, illus., 1970.

- 01207 **Berry, William B. N.** Late Ordovician graptolites from northern Michigan: Jour. Paleontology, v. 44, no. 2, p. 270-275, illus., 1970.

- 02095 **Berry, William B. N.** A local system of automated paleontologic data retrieval and its potential contribution to an eventual nationwide system: Jour. Paleontology, v. 44, no. 3, p. 527-535, illus., 1970.

- 04521 **Berry, William B. N.** Review of late Middle Ordovician graptolites in eastern New York and Pennsylvania: Am. Jour. Sci., v. 269, no. 3, p. 304-313, table, 1970.

- 06168 **Berry, William B. N.** Pendent didymograptids from northern Arkansas, in Geological Survey research 1970, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D62-D70, illus., 1970.

**Berryhill, Henry L., Jr.** See Garrison, Louis E. 00898

- 07216 **Berryhill, Henry L., Jr.; Schweinfurth, Stanley P.; Kent, Bion H.** Coal-bearing Upper Pennsylvanian and Lower Permian rocks, Washington area, Pennsylvania: U.S. Geol. Survey Prof. Paper 621, 47 p., illus., tables, geol. maps, 1970.

- 07775 **Berryhill, Henry L., Jr.** Remote sensing techniques as applied to coastal sedimentation, south Texas, in Earth Resources Aircraft Program, V. 1: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 6-1—6-15, illus., [1970?].

**Berteau, George C.** See SE Wisconsin Regional Plan. Comm. 10399

- 02760 **Bertin, Eugene P.** Principles and practice of X-ray spectrometric analysis: New York and London, Plenum Press, 679 p., illus., tables, 1970.

- 03641 **Bertine, K. K.; Chan, L. H.; Turekian, K. K.** Uranium determinations in deep-sea sediments and natural waters using fission tracks: Geochim. et Cosmochim. Acta, v. 34, no. 6, p. 641-648, illus., tables, 1970.

**Besancon, James.** See Armstrong, Richard Lee. 04016

- 06312 **Besancon, James R.** A Rb-Sr isochron for the Nonewaug Granite, in Contributions to geochronology in Connecticut: Connecticut Geol. and Nat. History Survey Rept. Inv. 5, p. 1-9, illus., table, 1970.

- 00675 **Best, David M.; Geddes, Wilburt H.; Hu, Tse-Chuang; Watkins, Joel S.; Walz, David H.** Gravity investigation of the contact between the Carolina slate belt and Charlotte belt of central North Carolina [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 195-196, 1970.
- 03828 **Best, M. G.** Kaersutite-peridotite inclusions and kindred megacrysts in basanitic lavas, Grand Canyon, Arizona: *Contr. Mineralogy and Petrology*, v. 27, no. 1, p. 25-44, illus., tables, 1970.
- Best, M. G.** See Hamblin, W. K. 06923
- 06926 **Best, M. G.; Brimhall, W. H.** Late Cenozoic basalt types in the western Grand Canyon region, in *The western Grand Canyon district: Utah Geol. Soc. Guidebook to Geology of Utah*, no. 23, p. 57-74, illus., tables, 1970.
- 06927 **Best, M. G.; Hamblin, W. K.** Implications of tectonism and volcanism in the western Grand Canyon, in *The western Grand Canyon district: Utah Geol. Soc. Guidebook to Geology of Utah*, no. 23, p. 75-79, illus., 1970.
- Best, M. G.** See Hamblin, W. K. 07073
- 04767 **Bethke, W. M.** Kings Bayou Field, Cameron Parish, Louisiana, in *Typical oil and gas fields of southwestern Louisiana*, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 15-15d, illus., 1970.
- 04743 **Betzer, Peter R.; Pilson, M. E. Q.** The Nansen bottle, a major contributor to reported concentrations of particulate iron in sea water: *Deep-Sea Research*, v. 17, no. 3, p. 671-674, illus., table, 1970.
- 10633 **Beus, A. A.** Fe and Mg distribution in ultrabasic rocks [abs.]: *EOS*, v. 51, no. 11, p.: 829, 1970.
- 00595 **Beus, Stanley.** Stratigraphy of the Martin Formation in northwestern Arizona [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 325, 1970.
- 06894 **Beutner, E. L.** Genesis of Precambrian iron deposits, Rio Arriba County, New Mexico [discussion of paper by D. F. McLeroy, 1970]: *Econ. Geology*, v. 65, no. 8, p. 1008, 1970.
- 05347 **Beveridge, Thomas R.** Geologic map of the Bassville quadrangle, Greene County, Missouri: *Missouri Geol. Survey and Water Resources Geol. Quad. Map Ser.*, no. 4, scale 1:24,000, section, 1970.
- Beyer, Robert L.** See Goles, Gordon G. 05695
- 04662 **Bhasin, Rakhishwar N.** Erodibility of channels with cohesive boundary — Discussion [of paper 7156 by E. Partheniades and R. E. Paaswell, 1970]: *Am. Soc. Civil Engineers Proc.*, v. 96, Jour Hydraulics Div., no. HY 9, p. 1918-1919, 1970.
- 06061 **Bhattacharji, S.** Scale models for natural and forced thermal convection in basaltic and syenitic magmas [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 494-495, 1970.
- 07680 **Bhattacharji, S.; Nehru, C. E.** Igneous structures and mechanism of emplacement of Mount Johnson, a Monteregian intrusion, Quebec — Discussion [of paper by A. R. Philpotts, 1968]: *Canadian Jour. Earth Sci.*, v. 7, no. 1, p. 191-194, illus., table, 1970.
- 10598 **Bhattacharji, S.; Schleifer, S.** Mechanics of stoping and stope-melting by natural thermal convection in cylindrical necks [abs.]: *ECOS*, v. 51, no. 11, p. 830, 1970.
- 02914 **Bhattacharyya, B. K.** Semiautomatic methods of interpretation of magnetic data [with French abs.], in *Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26*, p. 32-45, illus., 1970.

- 04288 **Bhattacharyya, B. K.; Holroyd, M. T.** Numerical treatment and automatic mapping of two-dimensional data in digital form [abs.]: Canadian Mining and Metall. Bull., v. 63, no. 696, p. 441, 1970.
- Bhattacharyya, B. K.** See Holroyd, M. T. 06303
- 06905 **Bhattacharyya, B. K.** Some important considerations in the acquisition and treatment of high-resolution aeromagnetic data, in Colloquium on basement mapping by magnetics — Aarhus, Denmark, 1969 [with Italian abs.]: Boll. Geofisica Teor. ed Appl., v. 12, nos. 45-46 (spec. issue), p. 21-44, illus., 1970.
- 09159 **Bhattacharyya, K. K.; Boshkov, S. H.** Determination of the stresses and the displacements in slopes by the finite element method [with French and German summ.], in Internat. Soc. Rock Mechanics Cong., 2d, Belgrade, Yugoslavia, 1970, Proc., V. 3: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 339-344, illus., 1970.
- 01890 **Bhattacharyya, P. J.** Spectral analysis of the magnetic profiles across the Mid-Atlantic Ridge at 45°N [abs.]: EOS, v. 51, no. 4, p. 274, 1970.
- Bianchi, W. C.** See Nightingale, H. I. 07220
- 03699 **Bicker, Alvin R., Jr.** Economic minerals of Mississippi: Mississippi Geol., Econ. and Topog. Survey Bull. 112, 80 p., illus., tables, 1970.
- 06062 **Bickford, M. E.; Turner, Brian B.** Rb-Sr geochronology of gneisses in structural domes, southeastern Adirondack Mountains, New York [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 495, 1970.
- 01055 **Bickley, William B., Jr.; Cvancara, Alan M.** Paleolimnology and paleoecology of a Pleistocene-Holocene lacustrine deposit, southeastern North Dakota [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 377-378, 1970.
- 04038 **Bickley, William B., Jr.** Gigantism in a recent gastropod, *Gyraulus parvus* (Say), from south-central Alaska: Compass, v. 47, no. 3, p. 183-184, table, 1970.
- 02748 **Bideaux, Richard A.** A multiple Japan law quartz twin: Mineralog. Rec., v. 1, no. 1, p. 33, illus., 1970.
- 08347 **Bideaux, Richard A.** Mineral rings and cylinders: Mineralog. Rec., v. 1, no. 3, p. 105-112, illus., 1970.
- 03003 **Bidgood, D. E. T.; Blanchard, J. E.** Geophysical investigations of evaporites in Nova Scotia [with French abs.], in Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 497-503, illus., table, 1970.
- 05649 **Bidgood, D. E. T.** The distribution and diapiric nature of some Nova Scotia evaporites, a geophysical evaluation, in Third symposium on salt, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 298-305, illus., 1970.
- Bidwell, L. E.** See Winter, T. C. 05490
- 07049 **Bidwell, L. E.; Winter, T. C.; Maclay, R. W.** Water resources of the Red Lake River watershed, northwestern Minnesota: U.S. Geol. Survey Hydrol. Inv. Atlas HA-346, 4 sheets, scales 1:500,000 and 1:250,000, text, 1970.
- 03441 **Bieberman, Robert A.** (compiler). Index to samples from oil and gas well tests in library at Socorro, New Mexico, July 1, 1966 to June 1, 1970: New Mexico Bur. Mines and Mineral Resources Circ. 109, 10 p., tables, 1970.
- 07885 **Bieberman, Robert A.** San Juan Basin — Synonym for energy: Interstate Oil Compact Comm. Comm. Bull., v. 12, no. 2, p. 1-6, illus., 1970.
- Biehler, Shawn.** See Sleep, Norman H. 02188

- 04819 **Biel, Ralph.** Composition of some Miocene and Holocene planktonic foraminiferal assemblages [abs.]: *Am. Assoc. Petroleum Geologists*, v. 54, no. 9, p. 1783, 1970.
- 07331 **Biel, Ralph.** Observations on the composition of some Miocene and recent planktonic foraminiferal assemblages, *in* Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Soc. Trans., v. 20, p. 275-279, illus., 1970.
- Bielenstein, H. U.** See Eisbacher, G. H. 07686
- Biemann, K.** See Murphy, R. C. 05746
- 02836 **Bieniewski, Carl L.** Demand and supply of molybdenum in the United States: U.S. Bur. Mines Inf. Circ. 8446, 61 p., illus., tables, 1970.
- Bieri, Rudolf H.** See Bernat, Michel. 05590
- 10417 **Biggar, G. M.; O'Hara, M. J.** Retrograde solubility of periclase, forsterite, and dicalcium silicate: *Am. Ceramic Soc. Jour.*, v. 53, no. 10, p. 538-540, illus., table, 1970.
- 10418 **Biggar, G. M.; O'Hara, M. J.** Melting of forsterite, monticellite, merwinite, spinel and periclase assemblages: *Am. Ceramic Soc. Jour.*, v. 53, no. 10, p. 534-537, illus., 1970.
- Biggs, Charles A.** See McGregor, Alexander A. 07758
- 06345 **Biggs, R. B.** Sources and distribution of suspended sediment in northern Chesapeake Bay: *Marine Geology*, v. 9, no. 3, p. 187-201, illus., tables, 1970.
- 00051 **Bigham, Robert E.; LoPinto, Victor J.** Performance of embankments constructed over peat — Discussion [of paper 6333, by W. G. Weber, Jr., 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, Jour. Soil Mechanics and Found. Div., no. SM 1, p. 309-310, 1970.
- Bigier, Gaston.** See Londe, Pierre. 00042
- 02296 **Bihl, Gerhard.** New evidence on the age of the Sheerness badlands, east-central Alberta: *Bull. Canadian Petroleum Geology*, v. 18, no. 2, p. 216-237, illus., 1970.
- Bikerman, Michael.** See Elston, Wolfgang E. 09262
- 09263 **Bikerman, Michael.** The geology of the Roskrige Mountains — a brief summary, App. A-V of Correlation and chronology of ore deposits and volcanic rocks, Damon, Paul E.: n.p., U.S. Atomic Energy Comm. Research Div., p. 183-191, illus., tables, 1968.
- 09819 **Bikerman, Michael.** K-Ar ages of Laurel Hill pluton and dike, Oregon: *Ore Bin*, v. 32, no. 11, p. 211-215, illus., table, 1970.
- 00865 **Billings, Gale K.** Some chemical characteristics of the Mississippi River plume [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 268, 1970.
- Billings, Gale K.** See Hitchon, Brian. 02630
- 02555 **Bilyavs'kiy, G. O.; Mitropols'kiy, O. Yu.; Romanov, V. I.** Pro kharakter rozpodilu luzhnikh zemel' i lugiv y donnikh osadkakh Pivnichno-Zakhidnoy Atlantiki [The distribution of alkali earth and alkali metals in bottom sediments of the northwestern Atlantic Ocean]: *Geol. Zhur.*, v. 30, no. 2, p. 135-141, illus., 1970.
- Bing, Donald E.** See Wilson, Edward C. 07614
- Bingham, Douglas.** See Kienle, Jurgen. 10594
- Bingham, Elizabeth.** See Nichiporuk, Walter. 04990

- 08539 **Bingham, J. W.** Several probable source vents for the Roza and Priest Rapids type basalts in Whitman and Adams Counties, Washington, *in* Columbia River Basalt Symposium, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 171-172, 1970.
- 02815 **Birch, Francis.** Interpretations of the low-velocity zone, *in* Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969, Proc: Physics Earth and Planetary Interiors, v. 3, p. 178-181, illus., table, 1970.
- Birch, Francis.** See Mao, Nai-Hsien. 03730
- 07640 **Birch, Francis S.** The Barracuda fault zone in the western North Atlantic — Geological and geophysical studies: Deep-Sea Research, v. 17, no. 5, p. 847-859, illus., table, 1970.
- 03246 **Birch, Francis Sylvanus.** Geological and geophysical studies of the Barracuda fault zone in western North Atlantic Ocean [abs.]: Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 5107B, 1970.
- Bird, J. B.** See Schumm, S. A. 09898
- 05881 **Bird, J. Brian.** Some aspects of the geomorphology of the Eastern Townships of Quebec [with French and Russian abs.]: Rev. Geographie Montreal, v. 24, no. 4, p. 417-429, illus., 1970.
- 07095 **Bird, J. Brian.** The final phase of the Pleistocene ice sheet north of Hudson Bay, *in* Problemy Czwartorzędu: Acta Geog. Lodziensia 24, p. 75-87, illus., table, 1970.
- 01136 **Bird, John M.; Dewey, John F.** Lithosphere plate-continental margin tectonics and evolution of the Appalachian orogen: Geol. Soc. America Bull., v. 81, no. 4, p. 1031-1059, illus., 1970.
- Bird, John M.** See Dewey, John F. 02141
- Bird, John M.** See Dewey, John F. 08665
- 10320 **Bird, John M.** General concepts of orogenesis in terms of lithosphere plate tectonics [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 733-734, 1970.
- Bird, M. L.** See Duke, M. B. 06963
- Bird, S. J. Glenn.** See Hunter, Gary T. 09796
- 04541 **Bird, Samuel C.** Shallow-marine and estuarine benthic molluscan communities from area of Beaufort, North Carolina: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 9, p. 1651-1676, illus., tables, 1970.
- 06270 **Birkebak, R. C.; Cremers, C. J.** Directional spectral and total reflectance of lunar material, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1993-2000, illus., tables, 1970.
- Birkebak, R. C.** See Cremers, C. J. 06273
- 06063 **Birkeland, Peter W.** Late Quaternary sea-level changes along the Malibu Coast, Santa Monica Mountains, California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 495-496, 1970.
- 10011 **Birkelund, Tove.** Mesozoic geology of East Greenland [abs.], *in* Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2469, 1970.

- 06758 **Birkhead, Paul K.; Murray, James W.** *Actinostroma papillosum* (Bargatzky, 1881), a stromatoporoid from the Swan Hills Member of the Waterways Formation (Upper Devonian) of Alberta: Jour. Paleontology, v. 44, no. 6, p. 1067-1070, illus., 1970.
- 01141 **Birman, J. H.** Geothermal exploration for ground water — Reply [to discussion by K. Cartwright of 1969 paper]: Geol. Soc. America Bull., v. 81, no. 4, p. 1283, 1970.
- Birmingham, T. F.** See Cameron, A. R. 05821
- 00981 **Bischoff, James L.; Greer, Randall E.; Luistro, Antonio O.** Composition of interstitial waters of marine sediments — Temperature of squeezing effect: Science, v. 167, no. 3922, p. 1245-1246, illus., table, 1970.
- 01898 **Bischoff, James L.; Ku, Teh-Lung.** Pore water geochemistry of Mid-Atlantic Ridge sediments [abs.]: EOS, v. 51, no. 4, p. 333-334, 1970.
- 06867 **Bishko, Donald.** Planning for common mineral resources in the urban-suburban environment, a computer simulation approach [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 1, p. 164B-165B, 1970.
- 02336 **Bishop, B. A.** Stratigraphy of Sierra de Picachos and vicinity, Nuevo Leon, Mexico: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 7, p. 1245-1270, illus., 1970.
- 10799 **Bishop, Bobby A.** Stratigraphic study of the Kiamichi Formation of the Lower Cretaceous of Texas, in Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas (Leo Hendricks, editor): Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub., no. 67-8, p. 158-180, illus., tables, 1967.
- 06064 **Bishop, Donald; Morris, Hugh C.; Edmunds, Frederick R.** Turbidites and depositional features in the Lower Belt-Purcell Supergroup [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 497, 1970.
- 09922 **Bishop, Margaret S.; Lewis, Phyllis G.; Bronaugh, Richmond L.** (consultant). Focus on earth science — Teacher's annotated edition and solutions manual: Columbus, Ohio, Charles E. Merrill Publishing Co., 534 p. (teachers manual, 96 p.), illus., tables, 1969.
- Bishop, W. Don.** See Youmans, A. H. 02214
- 11279 **Biske, S. F.** Correlation of Tertiary nonmarine sediments in Alaska and northeastern Asia, in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2469-2470, 1970.
- Bisque, Ramon E.** See Ong, H. Ling. 04256
- Bisque, Ramon E.** See Pyrih, Roman Z. 04324
- 00407 **Bissell, H. J.** Realms of Permian tectonism and sedimentation in western Utah and eastern Nevada: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 2, p. 285-312, illus., tables, 1970.
- 04851 **Bissell, H. J.** General geology of the High Plateaus and eastern Basin Ranges, Utah, in Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region — Natl. Assoc. Geology Teachers, Southwest Sec., Field Conf. Earth Sci., Cedar City, Utah, 1970: Socorro, N. Mex., New Mexico Inst. Mining and Technology, p. 42-52, illus., table, 1970.
- 05888 **Bissell, H. J.** Petrology and petrography of Lower Triassic marine carbonates of southern Nevada (U.S.A.): Leiden, Netherlands, E. J. Brill (Internat. Sedimentary Petrographical Ser., V. 14), 27 p., 82 plates, 1970.
- 06713 **Biswas, Asit K.** History of hydrology: Amsterdam and London, North-Holland Publishing Co., and New York, American Elsevier Publishing Co., 336 p., illus., table, 1970.

- 06694 **Bjork, Philip Reese.** The Carnivora of the Hagerman local fauna (late Pliocene) of southwestern Idaho: Am. Philos. Soc. Trans., new ser., v. 60, pt. 7, 54 p., illus., tables, 1970.
- Bjorklund, L. J.** See Sumsion, C. T. 03063
- Black, B. Allen.** See Rigby, J. Keith. 04706
- 10246 **Black, C. D. G.** Phillips Gully cobalt prospect: Geol. Soc. Jamaica Jour., v. 11, p. 24-35, illus., tables, 1970.
- Black, Craig C.** See Dawson, Mary R. 02094
- Black, Craig C.** See Dawson, Mary R. 03011
- 03646 **Black, Craig C.** A new *Pareumys* (Rodentia: Cylindrodontidae) from the Duchesne River Formation, Utah: Fieldiana — Geology, v. 16, no. 17, p. 453-459, illus., 1970.
- 00820 **Black, David C.** Trapped helium-neon isotopic correlations in gas-rich meteorites and carbonaceous chondrites: Geochim. et Cosmochim. Acta, v. 34, no. 1, p. 132-140, illus., tables, 1970.
- Black, David C.** See Pepin, R. O. 05715
- 07301 **Black, David Charles.** Trapped helium, neon, and argon in meteorites — Boundary conditions on the formation and evolution of the solar system [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2439B, 1970.
- 00676 **Black, Douglas F. B.** Structural features in part of central Kentucky [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 196, 1970.
- Black, J. D. F.** See West, D. W. 05406
- Black, Lance P.** See Kohman, Truman P. 06436
- 07065 **Black, R. F.** Glacial geology [summ.] in Geology of the Baraboo district, Wisconsin: Wisconsin Univ. Geol. and Nat. History Survey Inf. Circ. 14, p. 65-77, illus., 1970.
- Black, R. F.** See Geyne, A. R. 09738
- 05833 **Black, Robert F.** Glacial geology of Two Creeks Forest Bed, Valderan Type Locality, and Northern Kettle Moraine State Forest — Geol. Soc. America, Ann. Mtg., Milwaukee, Wis., 1970: Wisconsin Univ. Geol. and Nat. History Survey Inf. Circ. 13, 40 p., illus., tables, 1970.
- 06809 **Black, Robert F.** (and others). Pleistocene geology of southern Wisconsin — Geol. Soc. America, Ann. Mtg., Milwaukee, Wis., 1970, Field Trip Guide: Wisconsin Univ. Geol. and Nat. History Survey Inf. Circ. 15, papers paged separately, illus., tables, 1970.
- 06810 **Black, Robert F.; Bleuer, Ned K.; Hole, Francis D.; Lasca, Norman P.; Maher, Louis J., Jr.** Field trip guide, Pt. A in Pleistocene geology of southern Wisconsin — Geol. Soc. America, Ann. Mtg., Milwaukee, Wis., 1970, Field Trip Guide: Wisconsin Univ. Geol. and Nat. History Survey Inf. Circ. 15, p. A1-A38, illus., 1970.
- 06814 **Black, Robert F.** Cross Plains terminal moraine and related features, Pt. G in Pleistocene geology of southern Wisconsin — Geol. Soc. America, Ann. Mtg., Milwaukee, Wis., 1970, Field Trip Guide: Wisconsin Univ. Geol. and Nat. History Survey Inf. Circ. 15, p. G1-G15, illus., 1970.
- 06815 **Black, Robert F.** Blue Mounds and the erosional history of southwestern Wisconsin, Pt. H in Pleistocene geology of southern Wisconsin — Geol. Soc. America, Ann. Mtg., Milwaukee, Wis., 1970, Field Trip Guide: Wisconsin Univ. Geol. and Nat. History Survey Inf. Circ. 15, p. H1-H11, illus., 1970.

- 06911 **Black, Robert F.** Residuum and ancient soils of the the Driftless Area of southwestern Wisconsin, Pt. I in Pleistocene geology of southern Wisconsin — Geol. Soc. America, Ann. Mtg., Milwaukee, Wis., 1970, Field Trip Guide: Wisconsin Univ. Geol. and Nat. History Survey Inf. Circ. 15, p. 11-112, illus., tables, 1970.
- 10147 **Black, Robert F.** Chronology and climate of Wisconsin and upper Michigan — 14,000 to 9,000 radiocarbon years ago [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.], p. 12, 1970.
- 00001 **Blackadar, R. G.** (editor and compiler). Report of activities — Pt. A, April to October, 1969: Canada Geol. Survey Paper 70-1, pt. A, 251 p., illus., tables, 1970.
- 01459 **Blackadar, R. G.** Precambrian geology, northwestern Baffin Island, District of Franklin (47 E, F, G, H; 48 A, B, C, D; 57 E, H; 58 A, D) [with French abs.]: Canada Geol. Survey Bull. 191, 89 p., illus., tables, geol. map, 1970.
- 07513 **Blackburn, G.; Taylor, R. M.** Limestones and red soils of Bermuda — Reply [to 1970 discussion by O. P. Bricker and F. T. Mackenzie of 1969 paper]: Geol. Soc. America Bull., v. 81, no. 8, p. 2525-2526, 1970.
- Blackburn, W. H.** See Hunt, Graham. 00788
- 00677 **Blackburn, William H.** Dendritic crystallization in silicate systems [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 196-197, 1970.
- Blackburn, William H.** See Moore, Bruce R. 00741
- Blackburn, William H.** See Dennen, William H. 05618
- Blackford, M. E.** See Major, M. W. 00307
- 01630 **Blackford, M. E.; Major, M. W.; Butler, D. L.** Strain steps from the nuclear explosion MILROW [abs.]: EOS, v. 51, no. 3, p. 203, 1970.
- 01899 **Blackman, Abner; Wolaver, Thomas G.** Geophysical studies of the seamount Balanus [abs.]: EOS, v. 51, no. 4, p. 334, 1970.
- 04784 **Blackmore, A. V.** The Poiseuille analogue for flow of water in Wyoming bentonite: Jour. Hydrology, v. 11, no. 1, p. 59-68, illus., 1970.
- 10376 **Blackstock, Charles G.; Gavin, James E.** Cobb Seamount model: Marine Technology Soc. Jour., v. 3, no. 5, p. 59-62, illus., table, 1969.
- 02743 **Blackstone, D. L., Jr.** Structural geology of the Rex Lake quadrangle, Laramie basin, Wyoming: Wyoming Geol. Survey Prelim. Rept. 11, 17 p., illus., tables, geol. map, 1970.
- 10574 **Blackwell, David D.** Heat flow near Marysville, Montana [abs.]: EOS, v. 51, no. 11, p. 824, 1970.
- Blair, G. R.** See Chaklader, A. C. D. 06929
- 06271 **Blair, I. M.; Edgington, J. A.** Luminescence and thermoluminescence under 159 MeV proton bombardment of the lunar material returned by Apollo 11, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 2001-2012, illus., table, 1970.
- Blair, Robert W., Jr.** See Donnell, John R. 02424
- Blair, Robert W., Jr.** See Donnell, John R. 10903



- 04632 **Blair, W. Frank.** Genetically fixed characters and evolutionary divergence, in Ecology and the origin of species — Am. Soc. Zoologists and Ecol. Soc. America, Symposium, Dallas, Tex., 1968: Am. Zoologist, v. 10, no. 1, p. 41-46, illus., 1970.
- 10755 **Blais, Roger A.** Economic geology, in Background papers on the earth sciences in Canada (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 54-68, illus., tables, 1970.
- 04715 **Blake, D. Bryan; Allison, Richard C.** A new west American Eocene species of the Recent Australian ophiuroid *Ophiocrossota*: Jour. Paleontology, v. 44, no. 5, p. 925-927, illus., 1970.
- Blake, M. C., Jr.** See Bailey, Edgar H. 00225
- 00231 **Blake, M. C., Jr.** Different facies in Franciscan rocks and their significance in the late Mesozoic history of western California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 73, 1970.
- Blake, M. C., Jr.** See Bailey, Edgar H. 04418
- Blake, W., Jr.** See Lowdon, J. A. 03183
- 08407 **Blake, Weston, Jr.** Studies in glacial history in Arctic Canada — [Pt.] I, Pumice, radiocarbon dates, and differential postglacial uplift in the eastern Queen Elizabeth Islands, in Symposium on recent crustal movements, Ottawa, Canada, 1969, Papers: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 2, p. 634-664, illus., tables, 1970.
- 07453 **Blake, Wilson; Leighton, Fred.** Recent developments and applications of the microseismic method in deep mines, Chap. 23 in Rock mechanics, theory and practice — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 429-443, illus., 1970.
- 10490 **Blakely, Richard J.; Cox, Allan** A search technique for modeling sea-floor magnetic lineations [abs.]: EOS, v. 51, no. 11, p. 745, 1970.
- Blakely, Robert F.** See Carr, Donald D. 07529
- Blanc, Daniel.** See Guedelia, Daniel. 00069
- Blanchard, J. E.** See Bidgood, D. E. T. 03003
- Blanchard, M. B.** See Cunningham, G. 00249
- 10602 **Blanchard, Maxwell B.** Artificial meteor ablation studies of iron oxide minerals [abs.]: EOS, v. 51, no. 11, p. 831, 1970.
- 00678 **Blancher, Donald W.; Brown, William R.** Origin of the Hazel Patch Sandstone Member of the Lee Formation (Pennsylvanian) of eastern Kentucky [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 197, 1970.
- Blander, M.** See Housley, R. M. 06286
- 04119 **Blander, Milton; Keil, Klaus; Nelson, Lloyd S.; Skaggs, Samuel R.** Heating of basalts with a carbon dioxide laser: Science, v. 170, no. 3956, p. 435-438, illus., table, 1970.
- 05677 **Blander, Milton; Keil, Klaus; Nelson, Lloyd S.; Skaggs, Samuel R.** Heating of basalts with a carbon dioxide laser: Science, v. 170, no. 3956, p. 435-438, illus., table, 1970.
- 00866 **Blank, Horace R.** Incised meanders in Mason County, Texas [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 269, 1970.

- 04948 **Blank, Horace R.** Incised meanders in Mason County, Texas: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 3135-3140, illus., 1970.
- Blankenberg, J.** See Bostrom, K. 09130
- Blankenship, Terry L.** See Neff, James R. 00743
- Blasing, Terence J.** See Fritts, Harold C. 10166
- 00022 **Blatt, Harvey.** Determination of mean sediment thickness in the crust — A sedimentologic method: *Geol. Soc. America Bull.*, v. 81, no. 1, p. 255-262, illus., tables, 1970.
- 02974 **Blazey, Edward B.** Fossil flora of the Mogollon Rim of Arizona [abs.]: *Arizona Acad. Sci. Jour.*, v. 6, 1970 Proc. Supp., p. 23, 1970.
- 00517 **Blecha, Matthew.** The origin of the Breton Breccia, Batchawana area, Ontario [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 7, p. 3237B, 1970.
- 05239 **Blevins, R. L.; Bailey, H. H.; Ballard, G. E.** The effect of acid mine water on flood-plain soils in the western Kentucky coalfields: *Soil Sci.*, v. 110, no. 3, p. 191-196, illus., 1970.
- 07797 **Bleuer, N. K.** Geologic considerations in planning solid-waste disposal sites in Indiana — Environmental study No. 1: *Indiana Geol. Survey Spec. Rept.* 5, 7 p., illus., 1970.
- Bleuer, Ned K.** See Black, Robert F. 06810
- 06912 **Bleuer, Ned K.** Glacial stratigraphy of south-central Wisconsin, Pt. J in Pleistocene geology of southern Wisconsin — *Geol. Soc. America, Ann. Mtg., Milwaukee, Wis., 1970, Field Trip Guide: Wisconsin Univ. Geol. and Nat. History Survey Inf. Circ.* 15, p. J1-J35, 1970.
- 05411 **Blevins, R. L.; Bailey, H. H.; Ballard, G. E.** The effect of acid mine water on flood-plain soils in the western Kentucky coalfields: *Soil Sci.*, v. 110, no. 3, p. 191-196, illus., 1970.
- 02851 **Blinn, John C., 3d; Chapman, Peter; Quade, Jack.** Airborne multifrequency microwave radiometric sensing of an exposed volcanic province, in *Earth resources aircraft program status review*, NASA, Houston, 1968 — V. 1, *Geology, geography, and sensor studies: Houston, Tex., Manned Spacecraft Center*, p. 18-1 — 18-39, App. p. 18A1-18A8, p. 18B1-18B8, p. 18C1, illus., tables, reprinted [1970]; originally published, 1968.
- Blinn, John C., 3d.** See Chapman, Peter. 07793
- 08085 **Blinn, John C., 3d.** Microwave studies and instrumentation for the Earth Resources Program, in *Earth Resources Aircraft Program, status review*, 2d Ann., Houston, Tex., 1969 — V. 2, *Agriculture, Forestry, and sensor studies: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center*, p. 30-1—30-3, [1970?].
- 02130 **Block, Barry; Dratler, Jay, Jr.; Moore, Robert D.** Earth normal modes from a 6.5 magnitude earthquake: *Nature*, v. 226, no. 5243, p. 343-344, illus., 1970.
- Blomquist, D. S.** See Schuyler, P. B. 09865
- 04696 **Blondel, Fernand; Lasky, Samuel G.** Concepts of mineral reserves and resources, in *Survey of world iron ore resources, occurrence and appraisal: New York, United Nations Dept. Econ. and Social Affairs*, p. 53-58, table, 1970.
- 02501 **Blood, W. A.** Upper portion of the Fountain Formation and Lyons Formation at Morrison, Colorado: *Mtn. Geologist*, v. 7, no. 1, p. 33-48, illus., 1970.

- 07698 **Bloom, A. L.** Panel discussion [on isostasy], in Symposium on recent crustal movements, Ottawa, Canada, 1969, Papers: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 2, p. 731-733, illus., 1970.
- 02589 **Bloom, Arthur L.** Geomorphology of reef complexes [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 836, 1970.
- 06065 **Bloom, Arthur L.** Decreasing area and volume of Wisconsin-age ice sheets correlated with rising sea level [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 497-498, 1970.
- Bloom, D. N.** See DeVoto, R. H. 02556
- 02435 **Bloom, Harold; Hawkes, Herbert E.** The continuing education of the exploration geochemist, a report of an experimental workshop [abs.]: Mining Eng., v. 22, no. 1, p. 44, 1970.
- 09168 **Bloomer, Robert O.** Garnets in various rock types in the Canton area in northern New York: New York Acad. Sci. Annals, v. 172, art. 3, p. 31-48, illus., tables, geol. map, 1969.
- Bloor, James W.** See Diamond, Sidney. 08699
- Bloss, F. D.** See Mitchell, J. T. 09678
- 10467 **Blount, Don N.** Stratigraphy and petrology of the Chiantla area, Guatemala [with Spanish and English abs.], in Trabajos tecnicos presentados en la segunda reunion de geologos de America Central: Inst. Centroamericano Inv. y Tecnologia Indus. Pubs, Geol., no. 2, 67-72, illus., 1969.
- 01345 **Blow, W. H.** Deep Sea Drilling Project, Leg 2, Foraminifera from selected samples, [Chap.] 14 in Initial reports of the Deep Sea Drilling Project — V. 2, Leg 2 of cruises of *Glomar Challenger*, Hoboken, N. J., to Dakar, Senegal, Oct.-Nov. 1968: Washington, D. C., U.S. Govt. Printing Office, p. 357-365, table, 1970.
- 04704 **Blow, W. H.** Validity of biostratigraphic correlations based on the Globigerinacea: Micropaleontology, v. 16, no. 3, p. 257-268, 1970.
- 06665 **Blow, W. H.** Deep Sea Drilling Project, Leg 4 foraminifera from selected samples, Chap. 18 in Initial reports of the Deep Sea Drilling Project — V. 4, Leg 4 of cruises of *Glomar Challenger*, Rio de Janeiro, Brazil, to San Cristobal, Panama, Feb.-Mar. 1969 (R. G. Bader, and others): Washington, D. C., U.S. Govt. Printing Office, p. 383-400, tables, 1970.
- 07608 **Bloxham, W. M.; Siple, George E.; Cummings, T. Ray.** Water resources of Spartanburg County, South Carolina: South Carolina Water Resources Comm. Rept. 3, 112 p., illus., tables, 1970.
- 00596 **Bluemle, John P.** Anomalous hills and associated depressions in central North Dakota [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 325-326, 1970.
- 02480 **Bluemle, John P.; Kume, Jack.** Guide to the geology of Burleigh County, North Dakota: North Dakota Geol. Survey Misc. Ser., no. 42, 35 p., illus., geol. map, 1970.
- 03358 **Blume, John A.** An engineering intensity scale for earthquakes and other ground motion: Seismol. Soc. America Bull., v. 60, no. 1, p. 217-229, illus., tables, 1970.
- 01892 **Blumentritt, Russel; Dowling, John J.** A resistivity survey of the southern High Plains of west Texas, rechargeable aquifer thickness [abs.]: EOS, v. 51, no. 4, p. 286, 1970.
- 08564 **Blumer, M.; Rudrum, M.** High molecular weight fossil porphyrins — Evidence for monomeric and dimeric tetrapyrroles of about 1100 molecular weight: Inst. Petroleum Jour., v. 56, no. 548, p. 99-106, tables, 1970; reprinted in Woods Hole Oceanographic Inst. Ref. No. 70-27, 6 p., tables, 1970.

**Blundell, D. J.** See Shotton, F. W. 03182

- 08512 **Boardman, R. S.; Cheetham, A. H.; Cook, P. L.** Intracolony variation and the genus concept in Bryozoa, in *The genus, a basic concept in paleontology* — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc., Pt. C: Lawrence, Kans., Allen Press, p. 294-320, illus., tables, 1970.
- 04994 **Bock, Wayne D.** *Hyalinea baltica* and the Plio-Pleistocene boundary in the Caribbean Sea: Science, v. 170, no. 3960, p. 847-848, illus., 1970.
- 08765 **Bodenlos, Alfred J.** Cap-rock development and salt-stock movement, in *Geology and technology of Gulf Coast salt* — Symposium, Baton Rouge, La., 1967, Proc.: Baton Rouge, La., Louisiana State Univ. School of Geoscience, p. 73-86, illus., table, 1970.
- 03230 **Bodily, Norman M.** An armored dinosaur from the Lower Cretaceous of Utah: Brigham Young Univ. Geology Studies, v. 16, pt. 3, p. 35-60, illus., tables, 1969 [1970].
- Bodkin, J. B.** See Medlin, J. H. 04083
- 02139 **Bodvarsson, Gunnar.** Confined fluids as strain meters: Jour. Geophys. Research, v. 75, no. 14, p. 2711-2718, table, 1970.
- Bodvarsson, Gunnar.** See Emilia, David A. 03939
- 08255 **Boelter, D. H.** Important physical properties of peat materials [with French abs.], in *International Peat Congress, 3d, Quebec, Canada, 1968, Proc.*: Ottawa, Canada, National Research Council of Canada, p. 150-154, illus., tables, 1970.
- 00867 **Boenig, Charles M.** Temporal and spatial relationships of lower Eocene deltaic and coastal interdeltic environments, east central Texas [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 269, 1970.
- Boettcher, A. L.** See Hill, Robin E. T. 00809
- Boettcher, A. L.** See Hill, Robin E. T. 01781
- 03766 **Boettcher, A. L.** Hydrothermal melting relationships in silicate-H<sub>2</sub>O systems at vapor pressures greater than 10 kbars [abs.], in *Phase transformations and the Earth's interior* — Symposium, Canberra, Australia, 1969, Proc.: Physics Earth and Planetary Interiors, v. 3, p. 331, 1970.
- 04347 **Boettcher, A. L.** The system CaO-Al<sub>2</sub>O<sub>3</sub>-SiO<sub>2</sub>-H<sub>2</sub>O at high pressures and temperatures: Jour. Petrology, v. 11, no. 2, p. 337-379, illus., tables, 1970.
- Boettcher, A. L.** See Modreski, Peter J. 09679
- Boettner, Edward A.** See Weiss, Benjamin. 00011
- 02270 **Bogard, D. D.; Clark, R.; Hart, W.; Keith, J.; Reynolds, M.** Noble gas determinations and gamma ray spectroscopy of the Lost City chondrite [abs.]: EOS, v. 51, no. 7, p. 581, 1970.
- Bogard, D. D.** See Funkhouser, J. G. 05691
- Bogard, D. D.** See Schaeffer, O. A. 06437
- 01721 **Boggs, Sam, Jr.; Baldwin, Ewart M.** Distribution of placer gold in the Sixes River, southwestern Oregon — A preliminary report: U.S. Geol. Survey Bull. 1312-1, p. 11-127, illus., tables, 1970.
- Boggs, Sam, Jr.** See Clifton, H. Edward. 05654

- 09809 **Boggs, Sam, Jr.; Swanson, Frederick J.** Unusual slump structure from Cretaceous (?) sandstones northern Klamath Mountain region, Oregon: *Ore Bin*, v. 32, no. 2, p. 25-29, illus., 1970.
- 03192 **Bogorov, G. V.** Morphometric features of the northern part of the Mid-Atlantic Ridge: *Oceanology*, v. 9, no. 6, p. 833-842, illus., 1969 [1970]; originally published in Russian, 1969.
- 10013 **Bogush, E. I.; Yuferev, O. V.** Carboniferous deposits of northeastern Asia, Alaska, and Yukon [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2470, 1970.
- Bogyo, Thomas P.** See *Mastrogioseppe, Joy D.* 04926
- 02546 **Bohn, H. L.** Comparisons of measured and theoretical  $Mn^{2+}$  concentrations in soil suspensions: *Soil Sci. Soc. America Proc.*, v. 34, no. 2, p. 195-197, illus., tables, 1970.
- Bohn, Joyce.** See *Raleigh, C. Barry.* 01969
- Bohn, Joyce.** See *Raleigh, C. B.* 09532
- Bohnenberger, Otto.** See *Dengo, Gabriel.* 06229
- Bohnenberger, Otto H.** See *Bonis, Samuel.* 08376
- 10883 **Bohnenberger, Otto H.** Los focos eruptivos cuaternarios de Guatemala [quaternary eruptive vents of Guatemala (with Spanish and English abs.)], in *Trabajos tecnicos presentados en la segunda reunion de geologos de America Central*: *Inst. Centroamericano Inv. y Tecnologia Indus. Pubs. Geol.*, no. 2, p. 23-24, illus., tables, 1969.
- Bohor, Bruce.** See *Hughes, Randall.* 09125
- Boilard, Lise.** See *Murty, T. S.* 06646
- Boisen, B. P.** See *Deklotz, E. J.* 09313
- Boitano, Joseph D.** See *Miller, Eugene A.* 05504
- Boland, Geoffrey.** See *Rutherford, William A.* 09031
- 01293 **Bold, W. A. van den.** The genus *Costa* (Ostracoda) in the upper Cenozoic of the Caribbean region: *Micropaleontology*, v. 16, no. 1, p. 61-75, illus., table, 1970.
- 06342 **Bold, W. A. van den.** Ostracoda of the lower and middle Miocene of St. Croix, St. Martin and Anguilla: *Caribbean Jour. Sci.*, v. 10, nos. 1-2, p. 35-61, illus., tables, 1970.
- Bolke, E. L.** See *Sumsion, C. T.* 03063
- Bolke, E. L.** See *Price, Don.* 05824
- 07559 **Bolles, William H.; Lapham, Davis M.** Quartz roses for your rock garden: *Pennsylvania Geology*, v. 1, no. 8, p. 11-12, illus., 1970.
- Bolli, Hans M.** See *Bader, Richard G.* 06657
- 06672 **Bolli, Hans M.** The foraminifera of sites 23-31, Leg 4, Chap. 25 in Initial reports of the Deep Sea Drilling Project — V. 4, Leg 4 of cruises of *Glomar Challenger*, Rio de Janeiro, Brazil, to San Cristobal, Panama, Feb.-Mar. 1969 (R. G. Bader, and others): Washington, D. C., U.S. Govt. Printing Office, p. 577-643, illus., 1970.

- 07425 **Bollin, E. M.** Chalcogenides, Chap. 7 in *Differential thermal analysis — V. 1, Fundamental aspects* (R. C. Mackenzie, editor): London and New York, Academic Press, p. 193-236, illus., 1970.
- 02305 **Bollinger, G. A.; Hopper, Margaret G.** The Elgood, West Virginia earthquake of November 20, 1969: *Earthquake Notes*, v. 41, no. 1, p. 19-30, illus., tables, 1970.
- 03681 **Bollinger, G. A.** Travel-time study of six central Appalachian earthquakes: *Seismol. Soc. America Bull.*, v. 60, no. 2, p. 629-637, illus., tables, 1970.
- Bollinger, G. A.** See Hopper, Margaret G. 04018
- 05415 **Bollinger, G. A.** Seismicity of Virginia [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 131, 1970.
- Bollinger, G. A.** See Hopper, Margaret. 05431
- 06066 **Bollinger, G. A.** Microearthquake activity associated with underground coal-mining in Buchanan County, Virginia [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 498, 1970.
- 01679 **Bolt, Bruce A.; Niazi, Mansour; Somerville, M. R.** Diffracted ScS and the shear velocity at the core boundary: *Royal Astron. Soc. Geophys. Jour.*, v. 19, no. 3, p. 299-305, illus., tables, 1970.
- 03041 **Bolt, Bruce A.** Causes of earthquakes, Chap. 2 in *Earthquake engineering* (R. L. Wiegel, editor): Englewood Cliffs, N.J., Prentice-Hall, p. 21-45, illus., 1970.
- 03444 **Bolt, Bruce A.** Elastic waves in the vicinity of the earthquake source, Chap. 1 in *Earthquake engineering* (R. L. Wiegel, editor): Englewood Cliffs, N.J., Prentice-Hall, p. 1-20, illus., 1970.
- 04115 **Bolt, Bruce A.; Qamar, A.** Upper bound to the density jump at the boundary of the Earth's inner core: *Nature*, v. 228, no. 5267, p. 148-150, illus., 1970.
- 04539 **Bolt, Bruce A.** PdP and PKiKP waves and diffracted PcP waves: *Royal Astron. Soc. Geophys. Jour.*, v. 20, no. 4, p. 367-382, illus., tables, 1970.
- 10557 **Bolt, Bruce A.; Qamar, Anthony.** An upper bound to the density jump at the boundary of the Earth's inner core [abs.]: *EOS*, v. 51, no. 11, p. 782, 1970.
- Bolter, Ernst.** See Mantel, Erwin. 04666
- Bolton, Gerald C.** See McGregor, Keith C. 09253
- Bolton, Gerald C.** See McGregor, Keith C. 09360
- 02492 **Bolton, R. J.** Computers interpret aeromagnetic maps: *Oilweek*, v. 20, no. 50, p. 42, 45-46, illus., 1970.
- 05549 **Bolton, Thomas E.** Subsurface Ordovician fauna, Anticosti Island, Quebec [with French abs.], in *Contributions to Canadian paleontology: Canada Geol. Survey Bull.* 187, p. 31-41, illus., 1970.
- 05551 **Bolton, Thomas E.** Echinodermata from the Ordovician (*Pleurocystites*, *Cremacrinus*) and Silurian (*Hemicystites*, *Protaxocrinus*, *Macnamaratylus*) of Lake Timiskaming region, Ontario and Quebec [with French abs.], in *Contributions to Canadian paleontology: Canada Geol. Survey Bull.* 187, p. 59-66, illus., 1970.
- Boltz, D. F.** See Likussar, W. 06349
- 03662 **Bolyard, Dudley W.** Muddy Sand oil potential in South Dakota [summ.]: *Houston Geol. Soc. Bull.*, v. 12, no. 7, p. 18, 1970.

- 00868 **Bombolakis, Emanuel G.; Rizer, William D.; Rainville, George D.** Study of closed crack behavior during preliminary stages of brittle fracture in uniaxial compression [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 269-270, 1970.
- 03891 **Bonatti, E.** Deep sea volcanism: *Naturwissenschaften*, v. 57, no. 8, p. 379-384, illus., table, 1970.
- 09996 **Bonatti, E.; Arrhenius, G.** Acidic rocks on the Pacific Ocean floor, in *The sea — v. 4*, New concepts of sea floor evolution, Pt. 1, General observations (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 445-464, illus., table, 1970.
- 01694 **Bonatti, Enrico; Ball, Mahlon; Schubert, Carl.** Evaporites and continental drift: *Naturwissenschaften*, v. 57, no. 3, p. 107-108, illus., 1970.
- Bonatti, Enrico.** See Gomberg, David N. 03758
- 09458 **Bond, A. M.; O'Donnell, T. A.; Waugh, A. B.; McLaughlin, R. J. W.** Use of polarographic methods for the determination of tin in geologic samples: *Anal. Chemistry*, v. 42, no. 11, p. 1168-1172, illus., tables, 1970.
- 10665 **Bond, D. C.; Cartwright, Keros.** Pressure observations and water densities in aquifers and their relation to problems in gas storage: *Jour. Petroleum Technology*, v. 22, December, p. 1492-1498, illus., 1970.
- Bond, Gerard C.** See Manheim, Frank T. 00056
- 10014 **Bond, Gerard C.** Early Permian sedimentation and paleogeography in east-central Alaska Range, and regional implications [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2470-2471, 1970.
- 07345 **Bond, Gerard Clark.** Permian volcanics, volcanoclastics, and limestones in the Cordilleran eugeosyncline, east central Alaska Range, Alaska [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 4, p. 2058B-2059B, 1970.
- 01369 **Bond, T. A.** Preliminary pollen analysis and radiocarbon dates from Okefenokee Swamp, Charlton County, Georgia [abs.]: *Georgia Acad. Sci. Bull.*, v. 28, no. 2, p. s18, 1970.
- 02579 **Bond, T. A.** Radiocarbon dates of peat from Okefenokee Swamp, Georgia: *Southeastern Geology*, v. 11, no. 3, p. 199-201, tables, 1970.
- Bond, Thomas A.** See Scrudato, Ronald J. 00761
- Bondar', L. N.** See Troitskiy, V. S. 05096
- Bondarev, V. I.** See Tkatchenko, B. V. 10108
- 06244 **Bondesen, E.** Field work in the Agto-Nordre Strömfjord region, in *Report of activities*, 1969: *Grönlands Geol. Undersøgelse Rap.* 28, p. 17-19, 1970.
- Bone, M. N.** See Rogers, G. C. 10677
- 03948 **Boneham, Roger F.** Acritarchs (*Leiosphaeridia*) in the New Albany Shale of southern Indiana: *Indiana Acad. Sci. Proc.* 1969, v. 79, p. 254-262, illus., table, 1970.
- 05080 **Boneham, Roger F.** Devonian plant remains in a Pleistocene glacial deposit: *Am. Midland Naturalist*, v. 84, no. 1, p. 252-253, illus., 1970.
- Bonem, Rena Mae.** See Renault, Jacques. 04116
- 07789 **Bonet, F.; Riva-Palacio, E.** *Bonetocardiella cardüiformis* en el Maestrichtiano de Mexico [*Bonetocardiella cardüiformis* in the Maestrichtian of Mexico]: *Inst. Mexicano Petroleo Rev.*, v. 2, no. 4, p. 72-75, illus., table, 1970.

- 06381 **Bonham, Harold F.** Geologic map and sections of a part of the Shoshone Mountains, Lander and Nye Counties, Nevada: Nevada Bur. Mines Map 38, scale 1:62,500, text, 1970.
- Bonham-Carter, Graeme.** See Harbaugh, John W. 04790
- 03042 **Bonilla, M. G.** Surface faulting and related effects, Chap. 3 in *Earthquake engineering* (R. L. Wiegel, editor): Englewood Cliffs, N.J., Prentice-Hall, p. 47-74, illus., table, 1970.
- Bonilla, Manuel G.** See McCulloch, David S. 02316
- 07191 **Bonine, Michael E.; Holz, Robert K.; Gill, Clark C.; Weiler, James P.; Arbingast, Stanley A.** Atlas of Mexico: Austin, Tex., Univ. Texas Austin, Bur. Business Research, 138 p., illus., tables, 1970.
- Bonis, S. B.** See Rose, W. I., Jr. 06916
- Bonis, Samuel.** See Dengo, Gabriel. 06229
- 08376 **Bonis, Samuel; Bohnenberger, Otto H.; Dengo, Gabriel.** Mapa geologico de la Republica de Guatemala: Guatemala City, Guatemala Inst. Geog. Nac., 4 sheets, scale 1:500,000, 1970.
- 11263 **Bonis, Samuel B.** A summary of the geology of Guatemala [with Spanish and English abs.], in *Trabajos tecnicos presentados en la segunda reunion de geologos de America Central: Inst. Centroamericano Inv. y Tecnologia Indus. Pubs. Geol.*, no. 2, p. 76-80, 1969.
- Bonner, James.** See Rho, Joon H. 05749
- Bonner, W. P.** See Francis, C. W. 02553
- Bonnet, C. W.** See Gabrysch, R. K. 07205
- Bonnet, C. W.** See Gabrysch, R. K. 08031
- Bonnett, Richard B.** See Neff, James R. 00743
- 10148 **Bonnett, Richard B.** Wisconsin glaciation of the upper Boulder Creek Drainage Basin, Colorado Front Range [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, abs.: [Bozeman, Mont., Montana State Univ.?], p. 13, 1970.
- 07346 **Bonnett, Richard Brian.** Glacial sequence of the upper Boulder Creek drainage basin in the Colorado Front Range [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 4, p. 2059B, 1970.
- 06067 **Bonnichsen, Bill.** Principal rock types in the southern part of the Duluth Complex, Minnesota [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 498-499, 1970; *Econ. Geology*, v. 65, no. 6, p. 736, 1970.
- 06473 **Bonnichsen, Bill.** The southern part of the Duluth Complex and associated Keweenaw rocks, Minnesota [abs.], in *Inst. Lake Superior Geology*, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 10-11, 1970.
- Bonnin, Jean.** See LePichon, Xavier. 01946
- Bonnin, Jean.** See Auzende, Jean-Marie. 06446
- Bonta, Bruce D.** See Pestana, Harold R. 00564
- 10551 **Boore, David M.; Aki, Keiiti; Todd, Terry.** A two-dimensional moving dislocation model for a strike-slip fault [abs.]: *EOS*, v. 51, no. 11, p. 780, 1970.



- 05360 **Boos, C. M.; Nance, J. W.; Raymond, Lon; Reid, Fred.** First day's road log — Denver to Palmer Lake to Canon City, *in* Dakota and related rocks of the Front Range — Guidebook issue: Mtn. Geologist, v. 7, no. 3, p. 218-227, illus., 1970.
- 05363 **Boos, C. M.; Nance, J. W.** Supplementary road log — Plainview section, *in* Dakota and related rocks of the Front Range — Guidebook issue: Mtn. Geologist, v. 7, no. 3, p. 251-252, 1970.
- 01596 **Booth, James S.** Sediment dispersion in northern Channel Island passages, California [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 3, p. 557, 1970.
- Boothroyd, Jon C.** See Hayes, Miles O. 00161
- 02590 **Boothroyd, Jon C.** Recent braided-stream sedimentation, south-central, Alaska [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 836, 1970.
- Boothroyd, Jon C.** See Hayes, Miles O. 02628
- Boozer, Otha Wayne.** See Gupta, Sujoy. 10928
- Borbereky, Horst.** See Comm. on Subsoils of Boston. 07865
- Borchardt, G. A.** See Norgren, J. A. 01196
- 07851 **Borchardt, G. A.; Hoagland, G. W.; Schmitt, R. A.** Spectra — A computer program for gamma-ray analysis: Jour. Radioanal. Chemistry, v. 6, no. 1, p. 241-271, tables, 1970.
- 03026 **Borchardt, Glenn Arnold.** Neutron activation analysis for correlating volcanic ash soils [abs.]: Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 4870B-4871B, 1970.
- 03352 **Borcherdt, R. D.** Effects of local geology on ground motion near San Francisco Bay: Seismol. Soc. America Bull., v. 60, no. 1, p. 29-61, illus., tables, 1970.
- Boreman, Judith A.** See Chao, E. C. T. 07547
- Boresi, Arthur P.** See Nair, Keshavan. 09151
- 01739 **Borg, I. Y.** Mechanical < 110 > twinning in shocked sphene [abs.]: EOS, v. 51, no. 4, p. 424, 1970.
- 05514 **Borg, I. Y.** Survey of Piledriver results and preliminary interpretation of three postshot cores in and near the cavity — UCRL-50865: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., 67 p., illus., tables, 1970.
- 06121 **Borg, I. Y.; Heard, H. C.** Experimental deformation of plagioclases [with German abs.], *in* Experimental and natural rock deformation — Internat. Symposium, Darmstadt, Germany, 1969, Proc. (P. Paulitsch, editor): Berlin and Heidelberg, Germany, Springer-Verlag, p. 375-403, illus., tables, 1970.
- 07984 **Borg, I. Y.** Microfracturing in postshot Gasbuggy core GB-3: California Univ., Livermore, Lawrence Radiation Lab. Rept. UCRL-50893, 16 p., illus., tables, 1970.
- 09052 **Borg, I. Y.** Mechanical (110) twinning in shocked sphene: Am. Mineralogist, v. 55, nos. 11-12, p. 1876-1888, illus., table, 1970.
- 05053 **Borgeson, O. W.** Wabush story — Pt. 2, Mining and geology, Scully mine, *in* Mining Symposium, 31st Ann., and AIME, Minnesota Sec., 43d Ann. Mtg., Duluth, 1970: Minneapolis, Minn., Univ. Minnesota, p. 13-16, illus., 1970.
- 04289 **Borgman, L. E.** The use of non-stationary stochastic processes in ore reserve reliability estimation [abs.]: Canadian Mining and Metall. Bull., v. 63, no. 696, p. 441, 1970.

- 05660 **Bork, Kennard B.** Use of textural parameters in evaluating the genesis of the Berne Conglomerate (Mississippian) in central Ohio: *Jour. Sed. Petrology*, v. 40, no. 3, p. 1007-1017, illus., table, 1970.
- 01245 **Born, Stephen M.; Ritter, Dale F.** Modern terrace development near Pyramid Lake, Nevada and its geologic implications: *Geol. Soc. America Bull.*, v. 81, no. 4, p. 1233-1241, illus., 1970.
- 06068 **Born, Stephen M.** The role of hydrogeology in lake management [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 499, 1970.
- Born, W.** See Begemann, F. 05683
- 00789 **Bornhold, Brian D.** Carbonate turbidites in Columbus Basin, Bahamas [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 197-198, 1970.
- Bornhold, Brian D.** See Pilkey, Orrin H. 04243
- 00140 **Borns, Harold W., Jr.; Calkin, P. E.** Multiple glaciation and dissipation of the last ice sheet in northwestern Maine [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 12, 1970.
- 06069 **Borns, Harold W., Jr.** Late Wisconsin fluctuations of the Laurentide ice sheet in New England [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 499-500, 1970.
- Borovec, Z.** See Modrý, S. 10420
- 09092 **Borst, Roger L.; Katz, J. Lawrence.** Epigenetic chlorite crystals in faulted Lower Devonian mudstones, Kingston, New York: *Am. Mineralogist*, v. 55, nos. 7-8, p. 1359-1373, illus., tables, 1970.
- Bos, C.** See Matwe, L. 07893
- Bose, A.** See Ghosh, A. K. 10930
- Boshkov, S. H.** See Bhattacharyya, K. K. 09159
- Boshkov, Stefan.** See Agarwal, R. K. 02166
- 02753 **Boss, Kenneth Jay.** *Fimbria* and its lucinoid affinities (Mollusca; Bivalvia): *Breviora*, no. 350, 16 p., illus., table, 1970.
- 02916 **Bosschart, Robbert A.** Ground electromagnetic methods [with French abs.], in *Mining and groundwater geophysics, 1967*: Canada Geol. Survey Econ. Geology Rept. 26, p. 67-80, illus., 1970.
- 00232 **Bostick, Neely H.** Measured alteration of organic particles (phytoclasts) as an indicator of contact and burial metamorphism in sedimentary rocks [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 74, 1970.
- 06158 **Bostick, Neely H.** Clastic organic particles (phytoclasts) as indicators of thermal metamorphism in Franciscan and Great Valley Sequence Upper Mesozoic strata, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 500, 1970.
- 01305 **Bostick, Neil H.** Electronic data processing applied to uranium resource prediction and exploration: *Soc. Mining Engineers AIME Trans.*, v. 247, no. 1, p. 4-10, illus., 1970.
- 07969 **Bostock, H. S.** Physiographic subdivisions of Canada, Chap. 2 in *Geology and economic minerals of Canada*: Canada Geol. Survey Econ. Geology Rept. 1 (5th edition), p. 9-30, illus., 1970.

- 09130 **Boström, K.; Frazier, J.; Blankenberg, J.** Subsolidus phase relations and lattice constants in the system  $\text{BaSO}_4\text{-SrSO}_4\text{-PbSO}_4$ : *Arkiv mineralogi och Geologi*, v. 4, no. 6, art. 27, p. 477-485, illus., 1969.
- 01894 **Boström, Kurt.** Origin of iron-rich sediments on the East Pacific Rise [abs.]: *EOS*, v. 51, no. 4, p. 327, 1970.
- 02132 **Boström, Kurt.** Deposition of manganese rich sediments during glacial periods: *Nature*, v. 226, no. 5246, p. 629-630, illus., table, 1970.
- 10015 **Boström, Kurt.** Origin of manganese-rich layers in Arctic sediments [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists bull.*, v. 54, no. 12, p. 2471-2472, 1970.
- 04114 **Bostrom, R. C.; Sherif, M. A.** Disposal of waste material in tectonic sinks: *Nature*, v. 228, no. 5267, p. 154-156, illus., 1970.
- 06392 **Bostrom, R. C.** Relationship of the world rift system to the fiord regions in Chile and British Columbia: *Modern Geology*, v. 1, no. 4, p. 261-273, illus., 1970.
- 09870 **Bostrom, R. C.; Sherif, M. A.** A microseismic zoning technique employing a base station [with French abs.], in *Internat. Assoc. Eng. Geology Internat. Congress*, 1st, Paris, 1970, V. 2: Paris, Comité Français de Géologie de l'Ingenieur, p. 1334-1341, illus., 1970.
- 09974 **Bostrom, R. C.** The measurement of small earth strains, in *Earthquake displacement fields and the rotation of the Earth* (L. Mansinha, D. E. Smylie, A. E. Beck, editors) — *NATO Advanced Study Inst. Conf.*, London, Ontario, 1969: New York, Springer-Verlag New York, p. 191-205, illus., 1970.
- 10514 **Bostrom, R. C.; Sherif, M. A.** Disposing of waste, its incorporation in the tectonic sinks [abs.]: *EOS*, v. 51, no. 11, p. 762, 1970.
- Bostrom, R. C.** See Sherif, M. A. 10747
- 10822 **Bostrom, R. C.; Vali, V.** Strain transference between regions having different viscosity characteristics [abs.]: *Internat. Symposium on Recent Crustal Movements and Associated Seismicity*, Wellington, N.Z., 1970, *Proc.*: Wellington, N.Z., Royal Soc. of New Zealand, p. 3-4, 1970.
- 02765 **Boswell, E. H.; Thomson, F. H.; Shattles, D. E.** Water for industrial development in Clarke, Jasper, Lauderdale, Newton, Scott, and Smith Counties: Jackson, Miss., Mississippi Research and Devel. Center, 62 p., illus., tables, 1970.
- Boswell, E. H.** See Cushing, E. M. 04550
- Botbol, J. M.** See Pierce, A. P. 05556
- 02222 **Botbol, Joseph Moses.** A model way to analyze the mineralogy of base metal mining districts: *Mining Eng.*, v. 22, no. 3, p. 56-59, illus., tables, 1970.
- 00141 **Bothner, Wallace A.** Gravity study of the Exeter pluton, southeastern New Hampshire [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 12-13, 1970.
- 03938 **Bott, M. H. P.; Hutton, M. A.** Limitations on the resolution possible in the direct interpretation of marine magnetic anomalies (*Comment on "Numerical methods in the direct interpretation of marine magnetic anomalies," by D. A. Emilia and G. Bodvarsson [1969]*): *Earth and Planetary Sci. Letters*, v. 8, no. 4, p. 317-319, illus., 1970.
- Bottinga, Y.** See Weill, D. F. 00964

- 01740 **Bottinga, Y.; Weill, D. F.** Viscosity of anhydrous silicate melts [abs.]: EOS, v. 51, no. 4, p. 439, 1970.
- 04659 **Bottinga, Y.; Weill, Daniel F.** Densities of liquid silicate systems calculated from partial molar volumes of oxide components: Am. Jour. Sci., v. 269, no. 2, p. 169-182, illus., tables, 1970.
- 06128 **Bottino, M. L.; Fullagar, P. D.; Fairbairn, H. W.; Pinson, W. H. Jr.; Hurley, P. M.** The Blue Hills igneous complex, Massachusetts — Whole-rock Rb-Sr open systems: Geol. Soc. America Bull., v. 81, no. 12, p. 3739-3745, illus., tables, 1970.
- Bottino, M. L.** See Schnetzler, C. C. 06850
- Bottino, Michael L.** See Fullagar, Paul D. 00703
- Bottino, Michael L.** See Fullagar, Paul D. 04866
- 01741 **Bottino, Michael R.; Fullagar, Paul D.; French, Bevan M.** Rb-Sr study of shock-metamorphosed inclusions from the Onaping Formation, Sudbury, Ontario [abs.]: EOS, v. 51, no. 4, p. 433, 1970.
- 06391 **Botz, M. K.** Development of a statewide system for computer processing of hydrogeological data: Montana Bur. Mines and Geology Spec. Pub. 49, 35 p., illus., tables, 1970.
- Boucher, Gary.** See Ryall, Alan. 00944
- 10537 **Boucher, Gary.** Evidence for secondary seismic events immediately following large underground nuclear explosions [abs.]: EOS, v. 51, no. 11, p. 777, 1970.
- 01626 **Boucher, Gary W.; Ryall, Alan; Homuth, E. F.; Savage, W. U.** Strain and field-seismic observations of effects due to the Nevada underground nuclear test JORUM [abs.]: EOS, v. 51, no. 3, p. 203, 1970.
- 07365 **Boucher, Gary Wynn.** Three studies of microearthquakes — [Pt.] 1, The microearthquake seismicity of the Denali fault; [Pt.] 2, Microearthquake investigations in Nevada; [Pt.] 3, Earthquakes associated with underground nuclear explosions [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2068B-2069B, 1970.
- 05444 **Boucher, P. R.** Sediment transport by streams in the Palouse River basin, Washington and Idaho, July 1961-June 1965: U.S. Geol. Survey Water Supply Paper 1899-C, p. C1-C37, illus., tables, 1970.
- Boucot, A. J.** See Gauri, K. L. 00550
- Boucot, A. J.** See Johnson, J. G. 01206
- 04713 **Boucot, A. J.; Johnson, J. G.** Redescription of *Clintonella* Hall (Silurian, Brachiopoda): Jour. Paleontology, v. 44, no. 5, p. 893-897, illus., 1970.
- 04721 **Boucot, A. J.** *Glypterina*, new genus, the Ordovician ptychopleurellid: Jour. Paleontology, v. 44, no. 5, p. 984-985, 1970.
- Boucot, A. J.** See Gray, Jane. 06993
- Boucot, A. J.** See Berry, W. B. N. 08748
- Boucot, A. J.** See Klapper, Gilbert. 08749
- Boucot, A. J.** See Ziegler, A. M. 08762

- 08184 **Boucot, Arthur J.; Gauri, K. Lal; Southard, John.** Silurian and Lower Devonian brachiopods, structure and stratigraphy of the Green Pond Outlier in southeastern New York [with German abs.]: *Palaeontographica*, ser. A, v. 135, nos. 1-2, p. 1-59, illus., table, 1970.
- 10016 **Boucot, Arthur J.** Silurian biogeography and lithofacies of Arctic [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2472, 1970.
- 02120 **Boudin, Andre; Deutsch, Sarah.** Geochronology — Recent development in the lutetium-176/hafnium-176 dating method: *Science*, v. 168, no. 3936, p. 1219-1220, tables, 1970.
- Boulogne, A. R.** See Corey, J. C. 02216
- Bouma, A. H.** See Chmelik, F. B. 09491
- Bouma, Arnold H.** See Chmelik, Frank B. 02541
- Boureau, Edouard.** See Prakash, Uttam. 04365
- 07530 **Bourne, H. L.** The challenge for the geologist in the extractive industry, in *Forum on Geology of Industrial Minerals*, 6th, Ann Arbor, Mich., 1970, Proc.: Michigan Geol. Survey Miscellany 1, p. 138-141, 1970.
- 07407 **Bourne, Harold L.** A new sand and gravel deposit — From perception to production [abs.]: *Mining Eng.*, v. 22, no. 9, p. 52-53, 1970.
- Bourne, S. A.** See Pallister, A. E. 10086
- Bourne, W. Clinton.** See Campos Morataya, Ernesto. 10282
- Bourque, Pierre-Andre.** See Lesperance, Pierre J. 05178
- 02843 **Bowden, Leonard W.** Southern California regional resources studies, in *Earth resources aircraft program status review*, NASA, Houston, 1968 — V. 1, Geology, geography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 4-1 — 4-29, illus., table [1970].
- 07188 **Bowen, R. G.; Peterson, N. V.** (Compilers). Thermal springs and wells in Oregon: Oregon Dept. Geology and Mineral Industries Msc. Paper 14, 1 sheet, scale about 1 in. to 16 mi., 1970.
- 10953 **Bowen, Richard L.** Epi-Paleozoic hypersalinity and marine biotic extinctions [abs.]; Am. Assoc. Petroleum Geologists, v. 54, no. 9, p. 1783, 1970; Gulf Coast Assoc. Geol. Soc. Trans., v. 20, p. 228, 1970.
- Bowen, Zeddie P.** See Sutton, Robert G. 04950
- 10149 **Bower, John R. F.** Climatic fluctuations at lower latitudes — their relationship to high latitude cycles [abs.], in *American quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 14, table, 1970.
- Bowie, A. J.** See Willis, J. C. 10381
- 06144 **Bowie, S. H. U.** Uranium — The present and the future, in *Mining and petroleum geology — Commonwealth Mining and Metall. Cong.*, 9th, 1969, Proc., V. 2: London, Inst. Mining and Metallurgy, p. 405-420, illus., tables, 1970.
- Bowin, C. O.** See Emery, K. O. 00099
- Bowin, Carl O.** See Bunce, Elizabeth T. 09720

- 10398 **Bowles, Joseph E.** Engineering properties of soils and their measurement: New York and London, McGraw-Hill Book Company, 187 p., illus., tables, 1970.
- 04859 **Bowman, Frank O., Jr.; Smith, Clay T.** (compilers). Sixth day road log from Cedar City, Utah to Durango, Colorado via Long Valley Junction, Kanab, Jacob Lake, Marble Canyon, Tuba City, Mexican Hat, Aneth, and Cortéz, in *Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region* — Natl. Assoc. Geology Teachers, Southwest Sec., Field Conf. Earth Sci., Cedar City, Utah, 1970: Socorro, N. Mex., New Mexico Inst. Mining and Technology, p. 132-135, 1970.
- 04864 **Bowman, Frank O., Jr.** (compiler). Seventh day road log from Durango to Denver, Colorado via Ouray, Montrose, Gunnison, Nathrop, Fairplay, and Morrison, in *Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region* — Natl. Assoc. Geology Teachers, Southwest Sec., Field Conf. Earth Sci., Cedar City, Utah, 1970: Socorro, N. Mex., New Mexico Inst. Mining and Technology, p. 168-181, 1970.
- Bown, M. G.** See Gay, P. 06845
- 06070 **Bowser, Carl J.; Callender, Edward; Rossmann, Ronald.** Electron probe and X-ray studies of fresh water ferromanganese nodules from Wisconsin and Michigan [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 500-501, 1970.
- Boyce, R. E.** See Marlow, M. S. 01365
- Boyce, Robert L.** See Benham, Steven R. 00672
- Boyd, C. C.** See Hasan, S. M. 07656
- 02921 **Boyd, David.** The contribution of airborne magnetic surveys to geological mapping [with French abs.], in *Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26*, p. 213-227, illus., 1970.
- Boyd, Donald W.** See Newell, Norman D. 07866
- 02230 **Boyd, F. R.** The system  $\text{CaSiO}_3\text{-MgSiO}_3\text{-Al}_2\text{O}_3$ : Carnegie Inst. Washington Year Book 68, 1968-69, p. 214-221, illus., table, 1970.
- 09939 **Boyd, F. R.** Garnet peridotites and the system  $\text{CaSiO}_3\text{-MgSiO}_3\text{-Al}_2\text{O}_3$ , in *Symposium on the mineralogy and petrology of the upper mantle — Fiftieth Anniversary Symposia* (Benjamin A. Morgan, editor): Mineralog. Soc. America Spec. Paper 3, p. 63-75, illus., tables, 1970.
- Boyd, J. B.** See Walcott, R. I. 09781
- 07916 **Boyer, Paul Slayton.** Actinopaleontology of the larger invertebrates of the coast of Louisiana [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3592B-3593B, 1970.
- Boyer, Robert E.** See Dupre, William R. 00483
- 00869 **Boyer, Robert E.** Environmental pattern recognition from Apollo photography of the Dallas-Fort Worth area [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 270, 1970.
- 08281 **Boyer, Robert E.; Higgins, Jon L.** Activities and demonstrations for earth science: West Nyack, N. Y., Parker Publishing Co., 286 p., illus., tables, 1970.
- 01697 **Boyle, R. W.; Garrett, R. G.** Geochemical prospecting, a review of its status and future: *Earth-Sci. Rev.*, v. 6, no. 1, p. 51-75, 1970.
- 03478 **Boyle, R. W.; Wanless, R. K.; Stevens, R. D.** Sulfur isotope investigation of the lead-zinc-silver-cadmium deposits of the Keno Hill-Galena Hill area, Yukon, Canada: *Econ. Geology*, v. 65, no. 1, p. 1-10, illus., tables, 1970.

- 05076 **Boyle, R. W.; Wanless, R. K.; Stevens, R. D.** Sulfur isotope investigations of the lead-zinc-silver-cadmium deposits of the Keno Hill-Galena Hill area, Yukon, Canada — A reply [to discussion by D. J. Templeman-Kluit, 1970]: *Econ. Geology*, v. 65, no. 6, p. 731-732, 1970.
- Boyle, R. W.** See Land, A. H. 07972
- 08731 **Boyle, R. W.** The source of metals and gangue elements in hydrothermal deposits, *in* Problems of hydrothermal ore deposition; the origin, evolution and control of ore-forming fluids — Symposium, St. Andrews, Scotland, 1967: Stuttgart, Germany, E. Schweizerbart'sche Verlagsbuchhandlung (Internat. Union Geol. Sci., Ser. A, no. 2), p. 3-6, 1970.
- 08759 **Boyle, R. W.** Regularities in wall-rock alteration phenomena associated with epigenetic deposits, *in* Problems of hydrothermal ore deposition; the origin, evolution and control of ore-forming fluids — Symposium, St. Andrews, Scotland, 1967: Stuttgart, Germany, E. Schweizerbart'sche Verlagsbuchhandlung (Internat. Union Geol. Sci., Ser. A, no. 2), p. 233-259, 1970.
- 10778 **Boyle, R. W.** Exploration geochemistry, *in* Background papers on the earth sciences in Canada (C. H. Smith, editor); Canada Geol. Survey Paper 69-56, p. 254-261, 1970.
- 10779 **Boyle, R. W.** Basic geochemistry (organic and inorganic), *in* Background papers on the earth sciences in Canada (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 262-267, 1970.
- 06627 **Boyne, H. S.; Hall, J. L.; Barger, R. L.; Bender, P. L.; Ward, J.; Levine, J.; Faller, J.** Absolute strain measurements with a 30 meter vacuum interferometer, *in* Laser applications in the geosciences (J. Gauger and F. F. Hall, Jr., editors) — Symposium, Huntington Beach, Calif., 1969, Proc.: North Hollywood, Calif., Western Periodicals Co., p. 215-225, illus., 1970.
- 10670 **Boyum, B. H.; Hartviksen, R. C.** General geology and ore-grade control at the Sherman Mine, Temagami, Ontario: Canadian Mining and Metall. Bull., v. 63, no. 701, p. 1059-1068, illus., 1970.
- 04966 **Boyum, Burton H.** The Marquette mineral district, Michigan, *in* Geol. Soc. America field trip to Marquette Iron Range, Michigan, Nov. 1970: [n.p.] 21 p., paged separately, illus., 1970.
- Brabb, Earl E.** See Brosge, William P. 00467
- 06379 **Brabb, Earl E.** (compiler). Preliminary geologic map of the Black River quadrangle, east-central Alaska: U.S. Geol. Survey Misc. Geol. Inv. Map I-601, scale 1:250,000, 1970.
- Brabb, Earl E.** See Foster, Helen L. 10041
- 02437 **Brabec, Dragan.** Aqua regia-extractable vs. total copper and zinc content of granitic rock [abs.]: *Mining Eng.*, v. 22, no. 1, p. 44, 1970.
- Brace, W. F.** See Byerlee, J. D. 01743
- 03344 **Brace, W. F.; Byerlee, J. D.** California earthquakes — Why only shallow focus?: *Science*, v. 168, no. 3939, p. 1573-1575, illus., 1970.
- 00870 **Brace, William F.; Ernst, W. Gary; Kallberg, Razel Wittels.** An experimental study of tectonic overpressure in Franciscan rocks [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 271, 1970.
- 01409 **Brace, William F.; Ernst, W. G.; Kallberg, Razel Wittels.** An experimental study of tectonic overpressure in Franciscan rocks: *Geol. Soc. America Bull.*, v. 81, no. 5, p. 1325-1338, illus., tables, 1970.

- 01742 **Brace, William F.** Some effects of high temperature on the frictional sliding of granite [abs.]: EOS, v. 51, no. 4, p. 423, 1970.
- Brace, William F.** See Wawersik, Wolfgang R. 01848
- Bracey, D. R.** See Vogt, P. R. 03670
- 05634 **Bracey, Dewey R.; Vogt, Peter R.** Plate tectonics in the Hispaniola area: Geol. Soc. America Bull., v. 81, no. 9, p. 2855-2859, illus., 1970.
- 04167 **Brack, S. D.; Taylor, T. N.** Transmission and scanning electron microscopy of *Endosporites* [abs.]: Am. Jour. Botany, v. 57, no. 6, pt. 2, p. 756, 1970.
- 01670 **Brack, Sheila D.** On a new structurally preserved arborescent lycopsid fructification from the Lower Pennsylvanian of North America: Am. Jour. Botany, v. 57, no. 3, p. 317-330, illus., 1970.
- Brackin, W. P.** See Langenheim, R. L., Jr. 00303
- 06321 **Bradbury, J. C.; Hester, N. C.; Ruch, R. R.** Analyses of some Illinois rocks for gold: Illinois Geol. Survey Indus. Minerals Note 44, 14 p., illus., tables, 1970.
- 06651 **Braddock, R. D.** Tsunami propagation over large distances, in Tsunamis in the Pacific Ocean — Internat. Symposium on Tsunamis and Tsunami Research, Honolulu, Hawaii, 1969, Proc.: Honolulu, Hawaii, East-West Center Press, p. 285-303, illus., tables, 1970.
- 00202 **Braddock, William A.** The origin of slaty cleavage — Evidence from Precambrian rocks in Colorado: Geol. Soc. America Bull., v. 81, no. 2, p. 589-600, illus., geol. map, 1970.
- 04507 **Braddock, William A.; Nutalaya, Prinya; Gawarecki, Stephen J.; Curtin, Gary C.** Geologic map of the Drake quadrangle, Larimer County, Colorado: U.S. Geol. Survey Geol. Quad. Map GQ-829, scale 1:24,000, 1970.
- 06415 **Braddock, William A.; Calvert, Ronald H.; Gawarecki, Stephen J.; Nutalaya, Prinya.** Geologic map of the Masonville quadrangle, Larimer County, Colorado: U.S. Geol. Survey Geol. Quad. Map GQ-832, scale 1:24,000, sections, 1970.
- 04916 **Bradley, O. E.** Geology of the Jersey lead-zinc mine, Salmo, British Columbia, [Chap.] 8 in Lead-zinc deposits in the Kootenay Arc, northeastern Washington and adjacent British Columbia — Soc. Econ. Geologists, 1970 Northwest Field Conf. Guidebook: Washington Div. Mines and Geology Bull. 61, p. 89-98, illus., 1970.
- Bradley, Paul G.** See Kaufman, Gordon M. 10064
- Bradley, Reta E.** See Dutton, Carl E. 07499
- Bradley, W. F.** See Henderson, G. V. 04279
- 05830 **Bradley, W. F.** Diskussionnye aspekty kristallokhimii sloistykh silikatov [Discus-sional aspects of the crystallochemistry of layered silicates (with English abs.)], in Problemy petrologii i geneticheskoy mineralogii, V. 2: Moscow, Akad. Nauk SSSR Sibir. Otdeleniye (Izdatel'stvo "Nauka"), p. 152-155, illus., 1970.
- 01243 **Bradley, W. H.** Green River oil shale — Concept of origin extended, an inter-disciplinary problem being attacked from both ends: Geol. Soc. America Bull., v. 81, no. 4, p. 985-1000, illus., tables, 1970.
- 04197 **Bradley, W. H.** Eocene algae and plant hairs from the Green River Formation of Wyoming: Am. Jour. Botany, v. 57, no. 7, p. 782-785, illus., 1970.
- 00033 **Bradley, William C.** Effect of weathering on abrasion of granitic gravel, Colorado River (Texas): Geol. Soc. America Bull., v. 81, no. 1, p. 61-80, illus., 1970.



- 00597 **Bradley, William C.; Fahnestock, Robert K.; Rowekamp, Edward T.** Size-sorting and shape-sorting along Knik River, Alaska [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 326, 1970.
- 01056 **Bradshaw, L. E.; Noel, J. A.; Larson, R. J.** Trace-element composition of bone material in conodonts [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 378, 1970.
- 01728 **Bradshaw, Peter M. D.; Clews, D. Richard; Walker, John L.** Exploration geochemistry — Pt. 2, Detailed surveys: *Mining in Canada*, February 1970, p. 22-32, illus., 1970.
- 04663 **Bradshaw, Peter M. D.; Clews, D. Richard; Walker, John L.** Exploration geochemistry — Pt. 5, Field and laboratory procedures: *Mining in Canada*, August 1970, p. 25-33, illus., tables, 1970.
- 04672 **Bradshaw, Peter M. D.; Clews, D. Richard; Walker, John L.** Exploration geochemistry — Pt. 4, Primary dispersion: *Mining in Canada*, June 1970, p. 24-31, illus., tables, 1970.
- Bradshaw, R. L.** See Empson, F. M. 04639
- 08739 **Bradshaw, R. L.; Lomenick, T. F.** Rheology of salt in mine workings, in *Geology and technology of Gulf Coast salt* — Symposium, Baton Rouge, La., 1967, Proc.: Baton Rouge, La., Louisiana State Univ. School of Geoscience, p. 109-123, illus., 1970.
- Bradshaw, R. L.** See McClain, W. C. 10745
- 07447 **Brady, B. T.** Effect of the intermediate principal stress on the fracture of brittle rock, Chap. 16 in *Rock mechanics, theory and practice* — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 267-279, illus., 1970.
- Brady, Michael J.** See Wilson, James Lee. 03607
- 03914 **Brady, Philip.** Prowling America's oldest mica mine: *Gems and Minerals*, no. 396, p. 28-29, illus., 1970.
- Brady, W. B.** See Wright-Broughton, C. 08677
- 00142 **Bragonier, William A.; Williams, Eugene G.** Genesis and geologic relations of the high-alumina Mercer fireclay, western Pennsylvania [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 13, 1970.
- 06587 **Brahma, Chandra Sekhar.** Analysis of granular soil deformation as a stochastic process [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 2, p. 662B, 1970.
- Braidech, Lawrence L.** See Herdendorf, Charles E. 07527
- 00795 **Brainerd, Arthur E.** Memorial to Carroll Edward Dobbin (1892-1967): *Geol. Soc. America Proc.* 1967, p. 197-201, portrait, 1970.
- Bramlette, M. N.** See Bukry, David. 07149
- 04143 **Brannock, Kent C.** Specimen cleaning reagents: *Mineralog. Rec.*, v. 1, no. 2, p. 45, 1970.
- Bransby, Peter L.** See Finn, W. D. Liam. 06773
- 03071 **Branson, F. A.; Owen, J. B.** Plant cover, runoff, and sediment yield relationships on Mancos shale in western Colorado: *Water Resources Research*, v. 6, no. 3, p. 783-790, illus., table, 1970.

- 03910 **Branson, F. A.; Miller, R. F.; McQueen, I. S.** Plant communities and associated soil and water factors on shale-derived soils in northeastern Montana: *Ecology*, v. 51, no. 3, p. 391-407, illus., 1970.
- 10523 **Brass, Garret W.; Turekian, Karl K.** The distribution of strontium in sea water [abs.]: *EOS*, v. 51, no. 11, p. 769, 1970.
- Bratt, J. G.** See Swain, F. M. 04095
- Bratt, Judy M.** See Swain, Frederick W. 00435
- 01660 **Braun, Moshe; Friedman, Gerald M.** Dedolomitization fabric in peels, a possible clue to unconformity surfaces: *Jour. Sed. Petrology*, v. 40, no. 1, p. 417-419, illus., 1970.
- Braun, R. L.** See Ramspott, L. D. 05516
- 07200 **Braun, Robert L.; Ramspott, Lawrence D.** Quantitative phase analysis of rocks by X-ray diffractometry: California Univ. Livermore, Lawrence Radiation Lab., [Rept.] UCRL-50921, 19 p., illus., tables, 1970.
- Braun, W. K.** See Norford, B. S. 04100
- 03731 **Braunstein, Jules.** (editor). Bibliography of Gulf Coast geology (based on compilations by Walter E. Hallgarth and others), V. 1-2: Gulf Coast Assoc. Geol. Soc. Spec. Pub. 1, v. 1, p. 1-681, illus.; v. 2, p. 683-1045, 1970.
- 05509 **Brawner, C. O.; Gilchrist, H. G.** Case studies of rock slope stability on mining projects, in *Engineering geology and soils engineering symposium*, 8th Ann., Pocatello, Idaho, 1970, Proc.: Boise, Idaho, Idaho Dept. Highways, p. 255-271, illus., 1970.
- 09158 **Brawner, C. O.** Stability investigations of rock slopes in Canadian mining projects [with French and German summ.], in *Internat. Soc. Rock Mechanics Cong.*, 2d, Belgrade, Yugoslavia, 1970, Proc., V. 3: Belgrade, Jaroslav Cerni Inst. Dev. Water Resources, p. 317-327, illus., 1970.
- 09828 **Brawner, C. O.** The influence and control of groundwater in open pit mining, in *Canadian Rock Mechanics Symposium*, 5th, Toronto, 1968, Proc.: Ottawa, Canada Dept. Energy, Mines and Resources Mines Br., p. 1-13, illus., 1969.
- 09855 **Brawner, C. O.** Stability investigations of rock slopes in Canadian mining projects: *Western Miner*, v. 43, no. 9, p. 31-41, illus., 1970.
- Bray, Ellis E.** See Nelson, Henry F. 07662
- Bray, J. G.** See Naldrett, A. J. 04413
- 01675 **Bray, J. R.** Solar activity index — Validity supported by oxygen isotope dating: *Science*, v. 168, no. 3931, p. 571-572, table, 1970.
- 04520 **Bray, J. R.** Temporal patterning of post-Pleistocene glaciation: *Nature*, v. 228, no. 5269, p. 353, 1970.
- 00423 **Bray, Martha Coleman.** Joseph Nicolas Nicollet, geologist: *Am. Philos. Soc. Proc.*, v. 114, no. 1, p. 37-59, illus., 1970.
- Brebner, A.** See Law, L. 09350
- 06737 **Brede, E. C.; Johnston, R. C.; Sullivan, L. B.; Viger, H. L.** A pneumatic seismic energy source for shallow water/marsh areas: *Geophys. Prosp.*, v. 18, no. 4, p. 581-599, illus., 1970.
- Bredehoeft, J.** See Raleigh, C. B. 09532

- 03075 **Bredehoeft, J. D.; Pinder, G. F.** Digital analysis of areal flow in multiaquifer groundwater systems, a quasi three-dimensional model: *Water Resources Research*, v. 6, no. 3, p. 883-888, illus., 1970.
- 01718 **Bredehoeft, John D.; Young, Robert A.** The temporal allocation of ground water, a simulation approach: *Water Resources Research*, v. 6, no. 1, p. 3-21, illus., 1970.
- 05517 **Bredehoeft, John D.** Digital computer simulation for solving conjunctive stream-aquifer management problems [abs.]: *Water Well Jour.*, v. 24, no. 9, p. 53, 1970.
- 04849 **Breed, Carol S.** Two hypotheses of the origin and geologic history of the Colorado River, *in* Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region — Natl. Assoc. Geology Teachers, Southwest Sec., Field Conf. Earth Sci., Cedar City, Utah, 1970: Socorro, N. Mex., New Mexico Inst. Mining and Technology, p. 31-34, illus., table, 1970.
- Breed, William J.** *See* Mamay, Sergius H. 01474
- Breed, William J.** *See* Ford, Trevor D. 03372
- Breed, William J.** *See* Ford, Trevor D. 05662
- 06506 **Breger, Irving A.; Chandler, John C.; Zubovic, Peter.** An infrared study of water in heulandite and clinoptilolite: *Am. Mineralogist*, v. 55, nos. 5-6, p. 825-840, illus., tables, 1970.
- Brekke, Tor L.** *See* Goodman, Richard E. 00053
- Bremer, Conrad G.** *See* Wells, Oliver C. 10414
- Bremner, J. M.** *See* Tabatabai, M. A. 03932
- 04782 **Brenden, B. B.; Neeley, V. I.; Garlick, G. F.** Borehole seismics multiply drill data: *Eng. and Mining Jour.*, v. 171, no. 2, p. 93-96, illus., 1970.
- Brennan, Daniel J.** *See* Galbraith, Frederic W. 06766
- Brennan, J. A.** *See* Taylor, P. T. 01988
- Brennan, Peter.** *See* Chapman, Peter. 07793
- Brent, Gayle.** *See* Golubic, Stjepko. 03872
- Breton, R. G.** *See* Burke, J. D. 01287
- Breslau, Lloyd.** *See* Grantz, Arthur. 07076
- 09484 **Breslau, Lloyd R.; James, James E.; Trammell, Michael D.** The underwater shape of a grounded ice island off Prudhoe Bay, Alaska, *in* Offshore Technology Conference, 2d Ann., Houston, Tex., 1970, Preprints — v. 2: Dallas, Tex., Offshore Technology Conf., p. II-753 — II-766, illus., 1970.
- 10941 **Bretsky, Peter.** Late Ordovician benthic marine communities in north-central New York: *New York State Mus. and Sci. Service Bull.* 414, 34 p., illus., tables, 1970.
- 02725 **Bretsky, Peter W.** Late Ordovician benthic community structures in St. Lawrence Lowlands, Quebec [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 837, 1970.
- 03779 **Bretsky, Peter W.; Lorenz, Douglas M.** An essay on genetic-adaptive strategies and mass extinctions: *Geol. Soc. America Bull.*, v. 81, no. 8, p. 2449-2456, illus., 1970.

- 04714 **Bretsky, Peter W.; Bermingham, John J.** Ecology of the Paleozoic scaphopod genus *Plagioglypta* with special reference to the Ordovician of eastern Iowa: Jour. Paleontology, v. 44, no. 5, p. 908-924, illus., tables, 1970.
- 06155 **Bretsky, Peter W.** Benthic community structure of Middle Ordovician epeiric seas, upper Mississippi Valley [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 501, 1970.
- Bretsky, Peter W.** See Snyder, Jeremy E. 09581
- 07462 **Bretsky, Peter William, Jr.** Upper Ordovician ecology of the central Appalachians [with German and Russian abs.]: Yale Univ. Peabody Mus. Nat. History Bull. 34, 150 p., illus., tables, 1970.
- 01241 **Bretsky, Sara Stewart.** Phenetic and phylogenetic classifications of the Lucinidae (Mollusca, Bivalvia) [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 8, p. 3789B-3790B, 1970.
- Brett, George W.** See Weld, Betsy A. 02036
- Brett, Robin.** See Reid, Arch M. 06841
- 02939 **Breusse, J. J.** La prospection géophysique et la recherche des eaux souterraines [Geophysical prospecting and the search for ground water (with English abs.)], in Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 638-640, 1970.
- 02561 **Brew, Douglas C.** The Naco Formation (Pennsylvanian) in central Arizona: Plateau, v. 42, no. 4, p. 126-138, illus., 1970.
- 01640 **Brewer, P. G.; Spencer, D. W.; Wilkiss, P. E.** Anomalous fluoride concentrations in the North Atlantic: Deep-Sea Research, v. 17, no. 1, p. 1-7, illus., tables, 1970.
- 10390 **Brezonik, Patrick Lee.** Eutrophication in Florida lakes, in Florida's Environmental Eng. Conf. on Water Pollution Control, Gainesville, 1969, Proc.: Florida Univ. Eng. and Indus. Exp. Sta. Bull. Ser. 135, p. 124-129, illus., tables, 1970.
- 06071 **Bricker, O. P.** Mineral equilibria, disequilibria and reaction rates in nature [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 502, 1970.
- 07512 **Bricker, O. P.; Mackenzie, F. T.** Limestones and red soils of Bermuda — Discussion [of paper by G. Blackburn and R. M. Taylor, 1969]: Geol. Soc. America Bull., v. 81, no. 8, p. 2523-2524, 1970.
- Bricker, Owen P.** See Cleaves, Emery T. 04877
- Bricker, Owen P.** See Ginsburg, Robert N. 10328
- 07669 **Brideaux, Wayne W.; Radforth, Norman W.** Upper Devonian miospores from the Escuminac Formation, eastern Quebec, Canada: Canadian Jour. Earth Sci., v. 7, no. 1, p. 29-45, illus., tables, 1970.
- 05911 **Bridges, L. W. Dan.** Paleozoic history of the southern Chihuahua tectonic belt [summ.], in The geologic framework of the Chihuahua tectonic belt — Symposium in honor of Ronald K. De Ford, Midland, Tex., 1970: Midland, Tex., West Texas Geol. Soc., p. 30-32, 1970.
- 06347 **Bridgwater, D.** A compilation of K/Ar age determinations on rocks from Greenland carried out in 1969, in Report of activities, 1969: Grönlands Geol. Undersögelse Rap. 28, p. 47-55, 1970.
- 06771 **Bridgwater, D.** Observations on the Precambrian rocks of Scandinavia and Labrador and their implications for the interpretation of the Precambrian of Green-

- land, in Report of activities, 1969: Grönlands Geol. Undersögelse Rap. 28, p. 43-47, 1970.
- 07472 **Bridgwater, D.; Coe, K.** The role of stoping in the emplacement of the giant dykes of Isortoq, South Greenland, in *Mechanism of igneous intrusion* (Geoffrey Newall and Nicholas Rast, editors) — Liverpool Geol. Soc. Symposium, Liverpool, England, 1969, Proc.: Geol. Jour., Spec. Issue no. 2, p. 67-78, illus., 1970.
- 10017 **Bridgwater, D.; Escher, A.; Jackson, G. D.; Taylor, F. C.; Windley, B. F.** Development of Precambrian shield in southwestern Greenland, Labrador, and Baffin Island [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2472, 1970.
- 08559 **Brier, Chester; Bennin, Robert; Rona, Peter A.** "Preliminary evaluation of a core scintillation counter for bulk density measurement in marine sediment cores," a reply [to a discussion by V. C. Rose and J. R. Roney, 1970, 1969]: Jour. Sed. Petrology, v. 40, no. 4, p. 1370, 1970.
- 02591 **Briggs, Darinka Z.; Briggs, Louis I.** Geologic-information system — Methodology, design, and objectives [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 837, 1970.
- 03062 **Briggs, Darinka Zigic; Briggs, Louis I.** Design of information systems in a laboratory of subsurface geology: Michigan Academician, v. 2, no. 4, p. 73-86, illus., tables, 1970.
- Briggs, Darinka Zigic.** See Briggs, Louis I. 08767
- Briggs, Frank.** See O'Leary, Brian. 06259
- 03341 **Briggs, John C.** A faunal history of the North Atlantic Ocean: Systematic Zoology, v. 19, no. 1, p. 19-34, illus., 1970.
- Briggs, Louis I.** See Briggs, Darinka Z. 02591
- Briggs, Louis I.** See Gill, Dan. 02620
- Briggs, Louis I.** See Briggs, Darinka Zigic. 03062
- 07524 **Briggs, Louis I.** Geology of gypsum in the Lower Peninsula, Michigan, in *Forum on Geology of Industrial Minerals*, 6th, Ann Arbor, Mich., 1970, Proc.: Michigan Geol. Survey Miscellany 1, p. 66-76, illus., 1970.
- 08767 **Briggs, Louis I.; Briggs, Darinka Zigic.** Digital simulation models of evaporite sedimentation, in *Geology and technology of Gulf Coast salt — Symposium*, Baton Rouge, La., 1967, Proc.: Baton Rouge, La., Louisiana State Univ. School of Geoscience, p. 3-23, illus., table, 1970.
- Brimhall, G.** See Wenk, H. R. 01870
- Brimhall, W. H.** See Best, M. G. 06926
- Brindley, G. W.** See Hang, Pham Thi. 07617
- 07847 **Brindley, G. W.; Pedro, G.** Rapport du Comité International de Nomenclature AIPEA, Tokyo, 1969 [Report of the International Committee on Nomenclature, AIPEA, Tokyo, 1969]: Groupe Français Argiles Bull., v. 22, no. 1, p. 1-3, 1970.
- 07906 **Brindley, G. W.; Thompson, T. D.** Methylene blue absorption by montmorillonites; determination of surface areas and exchange capacities with different initial cation saturations (clay-organic studies XIX): Israel Jour. Chemistry, v. 8, no. 3, p. 409-415, illus., table, 1970.

- 09089 **Brindley, G. W.; Wardle, Ronald.** Monoclinic and triclinic forms of pyrophyllite and pyrophyllite anhydride: *Am. Mineralogist*, v. 55, nos. 7-8, p. 1259-1272, illus., tables, 1970.
- 11240 **Brindley, G. W.** The fascination of clays and clay minerals: *Earth and Mineral Sci.*, v. 39, no. 8, p. 57-60, illus., 1970.
- 00536 **Brinkmann, Robert Terry.** The photodissociation of water vapor, evolution of oxygen and escape of hydrogen in the Earth's atmosphere [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 7, p. 3246B, 1970.
- 01118 **Brinkmann, Roland.** Memorial to Hans Stille (1876-1966): *Geol. Soc. America Proc.* 1967, p. 263-267, portrait, 1970.
- Brinkworth, G. L.** See Popenoe, Peter. 01171
- 05991 **Briones, Angelina Mariano.** Nature and distribution of organic nitrogen in tropical soils [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5324B-5325B, 1970.
- 06474 **Brisbin, W. C.** The structure of the northern Lake of the Woods greenstone belt, a deformational mosaic [abs.], in *Inst. Lake Superior Geology*, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 12, 1970.
- 07819 **Bristol, C. C.** Geology of the Leftbrook Lake area (east half), The Pas mining district, Manitoba: *Manitoba Dept. Mines and Nat. Resources Mines Br. Pub.* 64-3, 19 p., illus., tables, geol. map, 1970.
- 04967 **British Columbia Department of Mines.** (and Petroleum Geology). Geology, exploration, and mining in British Columbia, 1969: Vancouver, B.C., British Columbia Dept. Mines and Petroleum Geology, 466 p., illus., tables, 1970.
- 04118 **British Columbia University.** (Department of Geology). Abstracts of published papers, theses, and oral presentations of the students and faculty, Department of Geology, July 1, 1969 to June 30, 1970: *British Columbia Univ. Dept. Geology Rept.* 11, 67 p. [1970].
- 09832 **Broadbent, C. D.; Armstrong, C. W.** Design and application of microseismic devices, in *Canadian Rock Mechanics Symposium*, 5th, Toronto, 1968, *Proc.*: Ottawa, Canada Dept. Energy, Mines and Resources Mines Br., p. 91-103, illus., table, 1969.
- 04027 **Brobst, Donald A.** Barite — World production, reserves and future prospects: *U.S. Geol. Survey Bull.* 1321, 46 p., illus., tables, 1970.
- 05071 **Brochu, Michel.** Teneur en quartz filonien et minéralisation au Québec, au Labrador et dans le Nord-Est de l'Arctique canadien [Percentage of vein quartz and mineralization in Quebec, in Labrador and into the northeastern Canadian Arctic (with English abs.)]: *Cahiers Geol.*, no. 86, p. 1090-1127, tables, 1970.
- 05882 **Brochu, Michel.** Présentation commentée d'un formulaire d'observation pétrographique de terrain [An annotated presentation of a formulary for petrographic observations of the ground]: *Rev. Géographie Montréal*, v. 24, no. 4, p. 462-467, 1970.
- Brockman, Stanley R.** See Engdahl, Eric R. 01631
- Brockman, Stanley R.** See Mickey, Wendell V. 09673

- 06072 **Brocoum, Stephan J.** Structural and metamorphic history of the major Precambrian gneiss belt, northwest Adirondacks, New York [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 502-503, 1970.
- 09497 **Broding, R. A.** The continuous sweep VIBROSEIS method, *in* Offshore Tech-Conference, 2d Ann., Houston, Tex., 1970, Preprints — v. 1: Dallas, Tex., Offshore Technology Conf., p. I-595 — I-600, illus., 1970.
- 03911 **Brodkorb, Pierce.** The generic position of a Cretaceous bird: Florida Acad. Sci. Quart. Jour. 1969, v. 32, no. 3, p. 239-240, 1970.
- 07239 **Brodkorb, Pierce.** An Eocene puffbird from Wyoming: Wyoming Univ. Contr. Geology, v. 9, no. 1, p. 13-15, illus., tables, 1970.
- Broecker, W. S.** See Bender, M. L. 02136
- Broecker, W. S.** See Wolgemuth, K. 04449
- 07697 **Broecker, W. S.** Panel discussion [on isostasy], *in* Symposium on recent crustal movements, Ottawa, Canada, 1969, Papers: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 2, p. 730, 1970.
- Broecker, W. S.** See Thurber, D. L. 08744
- Broecker, Wallace.** See Bender, Michael. 01893
- 06405 **Broecker, Wallace; Kaufman, Aaron; Ku, Teh-Lung; Chung, Yu-Chia; Craig, Harmon.** Radium 226 measurements from the 1969 North Pacific Geosecs station: Jour. Geophys. Research, v. 75, no. 36, p. 7682-7685, illus., table, 1970.
- 02142 **Broecker, Wallace S.; vanDonk, Jan.** Insolation changes, ice volumes, and the O<sup>18</sup> record in deep-sea cores: Rev. Geophysics and Space Physics, v. 8, no. 1, p. 169-198, illus., tables, 1970.
- 04441 **Broecker, Wallace S.** A boundary condition on the evolution of atmospheric oxygen: Jour. Geophys. Research, v. 75, no. 18, p. 3553-3557, illus., tables, 1970.
- 06404 **Broecker, Wallace S.; Kaufman, Aaron.** Near-surface and near-bottom radon results for the 1969 North Pacific Geosecs station: Jour. Geophys. Research, v. 75, no. 36, p. 7679-7681, illus., tables, 1970.
- Broecker, Wallace S.** See Imbrie, John. 07031
- Broecker, Wallace S.** See Mathieu, Guy G. 09661
- Broenkow, William W.** See Conomos, T. John. 00247
- 00233 **Brogan, George E.; Slemmons, David B.** Late Quaternary fault patterns along the Death Valley-Furnace Creek fault zones, Death Valley and Fish Lake Valley, California and Nevada [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 74-75, 1970.
- Broise, Y.** See Thorley, A. 04177
- 04511 **Bromfield, Calvin S.; Baker, Arthur A.; Crittenden, Max D., Jr.** Geologic map of the Heber quadrangle, Wasatch and Summit Counties, Utah: U.S. Geol. Survey Geol. Quad. Map GQ-864, scale 1:24,000, sections, 1970.
- 09444 **Bromley, R. G.; Bruun-Petersen, J.; Perch-Nielsen, K.** Preliminary results of mapping in the Palaeozoic and Mesozoic sediments of Scoresby Land and Jameson Land, *in* Report on the 1969 geological expedition to Scoresby Sund, East Greenland: Grönlands Geol. Undersøgelse Rap. 30, p. 17-30, illus., geol. map, 1970.
- Bronaugh, Richmond L.** See Bishop, Margaret S. 09922

- 05636 **Brongersma-Sanders, Margaretha; Groen, Pier.** Wind and water depth and their bearing on the circulation in evaporite basins, *in* Third symposium on salt, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 3-7, illus., 1970.
- 04494 **Brook, R. P., Jr.** (compiler). Ira Rinehart's 1969 structure maps of new Texas oil-gas fields: Dallas, Tex., Rinehart Oil News, 184 p., illus., 1970.
- 03009 **Brooke, J.; Irving, E.; Park, J.** Remanent magnetism of bore-core in basalt from the Mid-Atlantic Ridge at 45°N [abs.]: EOS, v. 51, no. 4, p. 273, 1970.
- 04549 **Brooke, J.; Pelletier, B. R.** Sea drilling techniques of the Bedford Institute: Underwater Sci. and Technology Jour., v. 2, no. 3, p. 165-167, illus., 1970.
- 08168 **Brooke, J.; Irving, E.; Park, J. K.** The Mid-Atlantic Ridge near 45°N — [Pt.] 13, Magnetic properties of basalt bore-core: Canadian Jour. Earth Sci., v. 7, no. 6, p. 1515-1527, illus., tables, 1970.
- Brooke, John.** See Schafer, Charles. 02105
- 05979 **Brooker, E. W.; Hayley, D. W.** A new look at the permafrost problem: Oilweek, v. 21, no. 37, p. 47-52, illus., 1970.
- 09831 **Brooker, E. W.; Anderson, I. H.** Rock mechanics in damsite location, *in* Canadian Rock Mechanics Symposium, 5th, Toronto, 1968, Proc.: Ottawa, Canada Dept. Energy, Mines and Resources Mines Br., p. 75-90, illus., tables, 1969.
- 02885 **Brooker, Elmer W.** Riverbank stability study at the University of Alberta, Edmonton — Discussion [of paper by S. Thomson, 1970]: Canadian Geotech. Jour., v. 7, no. 2, p. 170-172, 1970.
- 08122 **Brookes, Ian A.** New evidence for an independent Wisconsin-age ice cap over Newfoundland: Canadian Jour. Earth Sci., v. 7, no. 6, p. 1374-1382, illus., 1970.
- 00460 **Brookins, D. G.; Voss, J. D.** Age dating of muscovites from Pennsylvanian sandstones near Wamego, Kansas: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 2, 1970.
- Brookins, D. G.** See Laughlin, A. W. 01792
- 05017 **Brookins, D. G.; Spooner, C. M.** The isotopic ages of the Oak Point and Stonington granites, eastern Penobscot Bay, Maine: Jour. Geology, v. 78, no. 5, p. 570-576, illus., tables, 1970.
- 09067 **Brookins, D. G.** Metastibnite from The Geysers, Sonoma County, California: Am. Mineralogist, v. 55, nos. 11-12, p. 2103-2104, 1970.
- Brookins, D. G.** See Rosenberg, P. E. 09549
- 09615 **Brookins, D. G.; McDermott, V. J.** The mineralogy of the Randolph kimberlites, Riley County Kansas: Kansas Acad. Sci. Trans., 1970, v. 73, no. 1, p. 31-39, tables, 1970.
- 00108 **Brookins, Douglas G.** Kimberlite at Winkler Crater, Kansas: Geol. Soc. America Bull., v. 81, no. 2, p. 541-545, illus., 1970.
- 00871 **Brookins, Douglas G.** Mechanism(s) of emplacement of Riley County, Kansas kimberlites [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 271, 1970.
- 00872 **Brookins, Douglas G.; Chaudhuri, Sambhudas.** Potassium-argon and rubidium-strontium geochronologic investigation of calcareous shales (Lower Permian) near Manhattan, Kansas [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 272, 1970.



- 04112 **Brookins, Douglas G.; Chaudhuri, Sambudhas; Dulekoz, Erhan.** Rb-Sr isotopic age of Eskridge Shale (Lower Permian), eastern Kansas: *Sed. Geology*, v. 4, no. 2, p. 103-115, illus., tables, 1970.
- Brookins, Douglas G.** See Chaudhuri, S. 06094
- 06216 **Brookins, Douglas G.** A summary of geochronological data for pegmatites of the Middletown, Connecticut, area accumulated mainly since 1952, in *Contributions to geochronology in Connecticut: Connecticut Geol. and Nat. History Survey Rept. Inv. 5*, p. 10-18, tables, 1970.
- 06555 **Brookins, Douglas G.; Woods, Michael J.** Rb-Sr geochronologic investigation of basic and ultrabasic xenoliths from the Stockdale kimberlite, Riley County, Kansas: *Kansas Geol. Survey Bull.* 199, pt. 2, 12 p., illus., table, 1970.
- 06556 **Brookins, Douglas G.; Woods, Michael J.** High pressure mineral reactions in a pyroxenite granulite nodule from the Stockdale kimberlite, Riley County, Kansas: *Kansas Geol. Survey Bull.* 199, pt. 3, 6 p., illus., 1970.
- 06557 **Brookins, Douglas G.** Factors governing emplacement of Riley County, Kansas, kimberlites: *Kansas Geol. Survey Bull.* 199, pt. 4, 17 p., illus., tables, 1970.
- 06558 **Brookins, Douglas G.** The kimberlites of Riley County, Kansas: *Kansas Geol. Survey Bull.* 200, 32 p., illus., tables, 1970.
- Brooks, C.** See Krogh, T. E. 01614
- 01615 **Brooks, C.; Hart, S. R.** Discussion of the use of Rb-Sr isochron regression treatments: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 413-417, illus., 1970.
- 01616 **Brooks, C.; Krogh, T. E.; Hart, S. R.; Davis, G. L.** Carbonate contents and Sr-87/Sr-86 ratios of calcites from Archaean metavolcanics: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 420-422, illus., 1970.
- 01617 **Brooks, C.; Krogh, T. E.; Hart, S. R.; Davis, G. L.** The initial Sr-87/Sr-86 ratios of the upper and lower series, Michipicoten metavolcanics, Ontario, Canada: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 422-425, illus., 1970.
- 01618 **Brooks, C.; Hart, S. R.; Krogh, T. E.; Davis, G. L.** Initial Sr-87/Sr-86 ratios of regionally sampled metavolcanics from the Canadian shield: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 425-426, illus., 1970.
- Brooks, C.** See Hart, S. R. 01619
- Brooks, C.** See Hart, S. R. 01620
- Brooks, C.** See Krogh, T. E. 02248
- Brooks, C.** See Hart, S. R. 08270
- Brooks, C. Kent.** See Beckinsale, Robert D. 08690
- 10018 **Brooks, C. Kent.** Tertiary of Greenland [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2473, 1970.
- 09753 **Brooks, H. K.** The Plio-Pleistocene of Florida, with special reference to the strata outcropping on the Caloosahatchee River, in *Late Cenozoic stratigraphy of southwestern Florida* — [guidebook], Field Trip no. 4 [19th] Ann. Mtg. Gulf Coast Assoc. Geol. Socs., with SEPM Gulf Coast Sec., Miami Beach, Fla., 1969: [New Orleans, La.], Gulf Coast Assoc. Geol. Socs., p. 87-121, illus., 1969.
- Brooks, Howard C.** See Vallier, Tracy L. 09811

**Brooks, R. H.** See Chang, H. Y. 10503

- 00873 **Brooks, Robert A.** Clay mineralogy and geochemistry of interstitial waters of recent sediments west of the Mississippi River delta [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 272, 1970.

- 05650 **Brooks, Robert A.; Ferrell, Ray E., Jr.** The lateral distribution of clay minerals in Lakes Pontchartrain and Maurepas, Louisiana: Jour. Sed. Petrology, v. 40, no. 3, p. 855-863, illus., tables, 1970.

- 01197 **Brooks, William H.** Quantitative vegetational differences along the Sevier fault in the Red Canyon area of southern Utah [abs.]: Northwest Sci., v. 44, no. 1, p. 59-60, 1970.

- 09002 **Broome, D. C.** Native bitumens, [Chap.] 1 in Bituminous materials — Asphalts, tars, and pitches, A. J. Hoiberg, Editor — v. 2, Asphalts, pt. 1: New York, Intersci. Publishers, p. 1-25, illus., tables, 1965.

- 03145 **Brooner, Frank I., Jr.** Shale diapirs of the Lower Texas Gulf Coast as typified by the North LaWard diapir: Corpus Christi Geol. Soc. Bull., v. 10, no. 6, p. 6-10, 14-24, illus., 1970.

**Brosgé, Mary M.** See U.S. Geological Survey. 07074

**Brosgé, W. P.** See Tailleux, I. L. 07075

- 07104 **Brosgé, W. P.; Tailleux, I. L.** Depositional history of northern Alaska, in Geological seminar on the North Slope of Alaska, Palo Alto, Calif., 1970, Proc.: Los Angeles, Calif., Am. Assoc. Petroleum Geologists Pacific Sec., p. D1-D18, illus., discussion, 1970.

- 00467 **Brosgé, William P.; Brabb, Earl E.; King, Elizabeth R.** Geologic interpretation of reconnaissance aeromagnetic survey of northeastern Alaska: U. S. Geol. Survey Bull. 1271-F, p. F1-F14, illus., 1970.

- 02592 **Brosgé, William P.; Tailleux, Irvin L.** Depositional history of northern Alaska [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 837-838, 1970.

- 10019 **Brosgé, William P.; Dutro, J. T., Jr.** Paleozoic of northern and central Alaska [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2473, 1970.

- 09981 **Broten, N. W.** The role of long base-line interferometry in the measurements of Earth's rotation, in Earthquake displacement fields and the rotation of the Earth (L. Mansinha, D. E. Smylie, A. E. Beck, editors) - NATO advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 279-283, 1970.

**Broughton, W. A.** See Heyl, A. V. 07202

- 04770 **Broussard, Francis A.** Mamou Field, Evangeline Parish, Louisiana, in Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 18-18c, illus., 1970.

**Broussard, W. L.** See Hosman, R. L. 00448

**Broussard, W. L.** See Calandro, A. J. 08185

**Broussard, W. L.** See Whiteman, C. D., Jr. 08698

- 10321 **Brower, James C.** Crinoid fauna of the Girardeau Limestone [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 734-736, 1970.

- 10194 **Browman, David L.; Munsell, David A.** Columbia Plateau prehistory — Cultural development and impinging influences: Am. Antiquity, v. 34, no. 3, p. 249-264, illus., tables, 1969.

- 03464 **Brown, A. Sutherland; Cathro, R.; Panteleyev, A.; Ney, C. S.** Metallogeny of the Canadian Cordillera [abs.]: Canadian Mining and Metall. Bull., v. 63, no. 695, p. 293, 295, 1970.
- 03483 **Brown, Alexander C.** Environments of generation of some base-metal ore deposits — Discussion [of paper by D. E. White, 1968]: Econ. Geology, v. 65, no. 1, p. 60-61, illus., 1970.
- 00874 **Brown, Anton.** Measurement of recoverable strain in rocks from Llano, Texas, and Cody, Wyoming [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 273, 1970.
- 04284 **Brown, Bahngrell W.** Error in lead anomalous stream sediments: Econ. Geology, v. 65, no. 4, p. 514-515, 1970.
- 06179 **Brown, C. Ervin.** A sphalerite vein and associated geochemical anomalies in St. Lawrence County, New York, in Geological Survey research 1970, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D162-D168, illus., 1970.
- 09133 **Brown, Dennis; Earnshaw, D. G.; McDonald, F. R.; Jensen, H. B.** Gas-liquid chromatographic separation and spectrometric identification of nitrogen bases in hydrocracked shale oil naphtha: Anal. Chemistry, v. 42, no. 2, p. 146-151, illus., tables, 1970.
- 04635 **Brown, Donald.** Instrumentation on the 'Gulfrex': UnderSea Technology, v. 11, no. 10, p. 16-17, 20, 24, illus., 1970.
- 08016 **Brown, Donald L.** Geologic map of the Buena Vista quadrangle, Tennessee: Tennessee Div. Geology Geol. Map GM 10-NE, scale 1:24,000, separate text, 1970.
- 04351 **Brown, E. T.; Hudson, J. A.** The operational strength of fissured clays — Discussion [of paper by K. Y. Lo, 1970]: Géotechnique, v. 20, no. 3, p. 334-336, 1970.
- 06159 **Brown, Edwin H.** Phase relations of stilpnomelane in the greenschist facies [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 503, 1970.
- 02359 **Brown, Edwin T.; Trollope, D. Hugh.** Strength of a model of jointed rock: Am. Soc. Civil Engineers Proc., v. 96, paper 7185, Jour. Soil Mechanics and Found. Div., no. SM2, p. 685-704, illus., tables, 1970.
- 06772 **Brown, Edwin T.** Strength of models of rock with intermittent joints: Am. Soc. Civil Engineers Proc., v. 96, paper 7697, Jour. Soil Mechanics and Found. Div., no. SM 6, p. 1935-1949, illus., tables, 1970.
- 08199 **Brown, Eugene; Skougstad, M. W.; Fishman, M. J.** Methods for collection and analysis of water samples for dissolved minerals and gases: U.S. Geol. Survey Water-Resources Inv. Techniques, Book 5, Chap. A1, 160 p., illus., tables, 1970.
- Brown, F. F.** See Hogarth, D. D. 06638
- 09119 **Brown, F. H.** Zoning in some volcanic nephelines: Am. Mineralogist, v. 55, nos. 9-10, p. 1670-1680, illus., table, 1970.
- 08388 **Brown, F. Raymond.** A case history in Contra Costa County, California, in National Conference on Sediment Control, Washington, D.C., 1969, Proc: Washington, D.C., U.S. Dept. Housing and Urban Development Environmental Planning Division, p. 20-25, 1970.
- Brown, Floyd W.** See Dorrzapf, Anthony F., Jr. 03887
- Brown, Frederick S.** See Kvenvolden, Keith A. 00300
- Brown, Frederick S.** See Kvenvolden, Keith A. 03164

- 06073 **Brown, Frederick S.; Baedeker, M. J.; Nissenbaum, A.; Kaplan, I. R.** Diagenetic changes in organic matter from marine sediment [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 503-504, 1970.
- 06074 **Brown, G. E.; Novak, G. A.; Robinson, K. G.; Gibbs, G. V.; Ribbe, P. H.** Crystal chemistry of the orthosilicates [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 504-505, 1970.
- 09113 **Brown, G. E.; Gibbs, G. V.** Stereochemistry and ordering in the tetrahedral portion of silicates: *Am. Mineralogist*, v. 55, nos. 9-10, p. 1587-1607, illus., table, 1970.
- Brown, G. L.** See Payton, C. E. 05665
- 06346 **Brown, G. Malcolm.** Petrology, mineralogy, and genesis of lunar crystalline igneous rocks: *Jour. Geophys. Research*, v. 75, no. 32, p. 6480-6496, illus., table, 1970.
- 02207 **Brown, H. D.; Grijalva, V. E.; Raymer, L. L.** New developments in sonic wave train display and analysis in cased holes, in *SPWLA Logging Symposium*, 11th Ann., Los Angeles, Calif., 1970, Trans.: Houston, Tex., Soc. Prof. Well Log Analysts, p. F1-F24, illus., table, 1970.
- 07979 **Brown, I. C.** Groundwater geology, Chap. 13 in *Geology and economic minerals of Canada: Canada Geol. Survey Econ. Geology Rept. 1* (5th edition), p. 765-791, illus., table, 1970.
- 06636 **Brown, J. B.** A chemical study of some synthetic potassium-hydronium jarosites: *Canadian Mineralogist*, v. 10, pt. 4, p. 696-703, tables, 1970.
- 03959 **Brown, J. D.** Some observations on the undrained shearing strength used to analyze a failure — Discussion [of paper by F. A. DeLory and R. J. Salvas, 1969]: *Canadian Geotech. Jour.*, v. 7, no. 3, p. 343-344, 1970.
- 02940 **Brown, J. M.** Geophysics in United Nations projects [with French abs.], in *Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26*, p. 651-657, illus., table, 1970.
- Brown, J. M.** See Mabey, D. 02941
- Brown, Jerry.** See Anderson, Duwayne M. 00815
- Brown, Jerry.** See Lewellen, Robert. 04108
- Brown, Jerry.** See McGaw, Richard W. 10075
- 01057 **Brown, Jim McCaslin.** Deformation and movement within mylonitic rocks of the Grenville front, southeast of Sudbury, Ontario [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 378-379, 1970.
- 05128 **Brown, John S.** Mississippi Valley type lead-zinc ores — A review and sequel to the "Behre Symposium" [with French abs.]: *Mineralium Deposita*, v. 5, no. 2, p. 103-119, illus., tables, 1970.
- Brown, Karen E.** See Davis, Darrell E. 07335
- Brown, L. F., Jr.** See McGowen, J. H. 05464
- 07039 **Brown, L. F., Jr.; Eifler, Gus K., Jr.; Garner, L. Edwin; Maxwell, Ross A.** The state parks in Geologic and historic guide to the state parks of Texas: *Texas Univ. Austin Bur. Econ. Geology Guidebook 10*, p. 28-197, illus., table, 1970.
- 08003 **Brown, L. F., Jr.; Fisher, W. L.** An approach to environmental geology with examples from the Texas coastal zone, in *Environmental geology — AGI short course lecture notes*, Milwaukee, Wis., 1970: Washington, D. C., Am. Geol. Inst., 39 p., paged separately, illus., tables, 1970.

- 08492 **Brown, L. F., Jr.** North Texas (eastern shelf) Pennsylvanian delta systems, *in* Delta systems in the exploration for oil and gas — A research colloquium, Austin, Texas, 1969, Syllabus [No. 1] (W. L. Fisher; L. F. Brown, Jr.; A. J. Scott; J. H. McGowen, leaders): Austin, Texas, Univ. Texas at Austin Bur. Econ. Geology, p. 40-53, illus. [1970?].
- Brown, L. F., Jr.** *See* Fisher, W. L. 08493
- 08494 **Brown, L. F., Jr.; Fisher, W. L.** Delta systems in other basins, *in* Delta systems in the exploration for oil and gas — A research colloquium, Austin, Texas, 1969, Syllabus [No. 1] (W. L. Fisher; L. F. Brown, Jr.; A. J. Scott; J. H. McGowen, leaders): Austin, Texas, Univ. Texas at Austin Bur. Econ. Geology, p. 67-78, illus. [1970?].
- Brown, L. F., Jr.** *See* Fisher, W. L. 08570
- Brown, L. F., Jr.** *See* Hayward, O. T. 10791
- Brown, L. Frank, Jr.** *See* Flawn, Peter T. 01372
- 04102 **Brown, Lynn A.** Strain distribution around underground openings — Tech. Rept. 3, Data bank — Underground openings rock deformation measurements (abstracts) (Advanced Research Projects Agency Contract DACA 73-68-C-0002(P002)): Washington, D.C., Office Chief of Engineers, Dept. Army, 256 p., illus., tables, 1970.
- 01891 **Brown, M. C.** Two new methods in karst hydrology [abs.]: EOS, v. 51, no. 4, p. 285, 1970.
- Brown, Merle J.** *See* Smith, R. M. 02728
- Brown, R. F.** *See* Keys, W. S. 08770
- 02979 **Brown, R. G.** A biogeochemical survey of the Oracle vicinity, southern Arizona [abs.]: Arizona Acad. Sci. Jour., v. 6, 1970 Proc. Supp., p. 62, 1970.
- 05922 **Brown, R. J. E.** Permafrost as an ecological factor in the Subarctic [with French abs.]; *in* Ecology of the subarctic regions (Écologie des régions subarctiques) — Helsinki, Symposium, Proc.: Paris, UNESCO, p. 129-140, illus., table, discussion, 1970.
- 08258 **Brown, R. J. E.** Occurrence of permafrost in Canadian peatlands [with French abs.], *in* International Peat Congress, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 174-181, illus., table, 1970.
- 09203 **Brown, R. J. E.** (editor). Proceedings of the Third Canadian Conference on Permafrost, 14 and 15 January, 1969: Natl. Research Council Canada, Associate Comm. Geotech. Research Tech. Memo. 96 [207]p., illus., tables, 1969.
- 09204 **Brown, R. J. E.** Distribution of permafrost in Canada (summary), *in* Canadian Conf. on Permafrost, 3d, 1969, Proc. (R. J. E. Brown, editor): Natl. Research Council Canada, Associate Comm. Geotech. Research Tech. Memo. 96, p. 1-8, illus., 1969.
- Brown, R. J. E.** *See* Harwood, T. A. 09765
- 10021 **Brown, R. J. E.; Johnston, G. H.** Permafrost and engineering problems associated with petroleum development in sedimentary basins of northern Canada [abs.], *in* Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2473, 1970.
- Brown, R. J. E.** *See* Harwood, T. A. 10765
- 08055 **Brown, R. L.; Helmstaedt, H.** Deformation history in part of the Lubec-Belleisle zone of southern New Brunswick: Canadian Jour. Earth Sci., v. 7, no. 3, p. 748-767, illus., tables, 1970.
- 00598 **Brown, Randall E.** Some effects of irrigation in the Pasco Basin, Washington [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 326-327, 1970.

- 08542 **Brown, Randall E.** Some suggested rates of deformation of the basalts in the Pasco Basin, and their implications, *in* Columbia River Basalt Symposium, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 179-187, illus., 1970.
- Brown, Robert D.** See Algermissen, S. T. 00222
- 04345 **Brown, Robert D., Jr.** Map showing recently active breaks along the San Andreas and related faults between the northern Gabilan Range and Cholame Valley, California: U.S. Geol. Survey Misc. Geol. Inv. Map I-575, scale 1:62,5000, text, 1970.
- 04553 **Brown, Roger J. E.** Permafrost in Canada, its influence on northern development: Toronto, Ontario, Canada, Univ. Toronto Press, 234 p., illus., 1970.
- 02167 **Brown, Severn P.** Burgeoning exploration activity highlights metal mining geology in 1969: Mining Eng., v. 22, no. 2, p. 77-79, 1970.
- 06739 **Brown, W. G.; Johnston, G. H.** Dikes on permafrost — Predicting thaw and settlement [with French abs.]: Canadian Geotech. Jour., v. 7, no. 4, p. 365-371, illus., 1970.
- Brown, William R.** See Blancher, Donald W. 00678
- 00679 **Brown, William R.; Griswold, Thomas B.** Superposed folding in the Arvonite Slate district, Virginia [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 198, 1970.
- Browne, Ivan D.** See Mason, Curtis C. 10521
- 02093 **Browne, Ruth G.; Bryant, Albert L.** Plant fossils from the St. Louis Formation in Kentucky: Jour. Paleontology, v. 44, no. 3, p. 520-521, illus., 1970.
- 08172 **Brownell, G. M.** Justin Sarsfield DeLury, 1884-1968: Royal Soc. Canada Minutes Proc. 1970, ser. 4, v. 8, p. 61-63, portrait, 1970.
- Brownlow, Arthur H.** See Al-Hashimi, Abdul Razak K. 06891
- 05823 **Bruch, John C., Jr.** Capillarity and seepage from an array of channels — Closure [to paper 6972, 1969]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Eng. Mechanics Div., no. EM5, p. 792, 1970.
- Brucker, Roger.** See White, William B. 00012
- 06075 **Brucker, Roger W.; Hess, John W.; White, William B.** Role of vertical shafts in the movement of ground water in carbonate aquifers [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 505-506, 1970.
- Bruhn, R. W.** See Einstein, H. H. 07439
- Brummer, J. J.** See Karup-Möller, S. 05122
- Brummer, J. J.** See Coats, C. J. A. 06890
- 01565 **Brumund, William Frank.** Subsidence of sand due to surface vibration [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 9, p. 4122B, 1970.
- 03984 **Brune, Gunnar.** How much underground water storage capacity does Texas have?: Water Resources Bull., v. 6, no. 4, p. 588-601, illus., tables, 1970.
- 08718 **Brune, Gunnar.** The Texas Water Development Board cooperative studies of the Ogallala underground reservoir, *in* Ogallala Aquifer Symposium, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, p. 217-242, illus., 1970.
- Brune, J. N.** See Hanks, T. C. 01921

- 06076 **Brune, James; Tucker, Brian.** Spectra of seismic waves from small earthquakes [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 506, 1970.
- 00234 **Brune, James N.** Tectonic stress and the spectra of seismic shear waves from earthquakes [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 75, 1970.
- Brune, James N.** *See* Anderson, Don L. 00811
- Brune James N.** *See* Wyss, Max. 02005
- Brune, James N.** *See* Trifunac, Mihailo D. 03356
- Brune, James N.** *See* Arabasz, Walter J. 03512
- 04651 **Brune, James N.** Tectonic stress and the spectra of seismic shear waves from earthquakes: *Jour. Geophys. Research*, v. 75, no. 26, p. 4997-5009, illus., table, 1970.
- Brune, James N.** *See* Davies, Geoffrey F. 10823
- Brune, James N.** *See* Lomnitz, Cinna. 10888
- 03234 **Brunel, Pierre.** Bibliographie choisie sur l'océanographie de l'estuaire du Saint-Laurent [Selected bibliography on the oceanography of the Saint Lawrence estuary (with English and Russian abs.)]: *Rev. Géographie Montréal*, v. 24, no. 3, p. 277-282, 1970.
- 04056 **Bruscato, Frank N.; McHenry, J. Roger.** Evaluation of selected cobalt-60 complexes as tracers of groundwater: *Jour. Hydrology*, v. 10, no. 4, p. 406-417, illus., tables, 1970.
- Brutsaert, Wilfried.** *See* Verma, Rameshwar D. 03684
- 00453 **Bruun, P.** Use of tracers in harbor, coastal and ocean engineering: *Eng. Geology*, v. 4, no. 1, p. 73-88, illus., table, 1970.
- Bruun-Petersen, J.** *See* Bromley, R. G. 09444
- Bryan, C. A.** *See* Reisenauer, A. E. 10512
- Bryan, G. M.** *See* Markl, R. G. 03637
- 03562 **Bryan, George M.** Hydrodynamic model of the Blake outer ridge: *Jour. Geophys. Research*, v. 75, no. 24, p. 4530-4537, illus., 1970.
- 09287 **Bryan, M. L.** The morphology and morphometry of lakes in the Schefferville, Quebec, area, in *Hydrological studies in Labrador-Ungava*: McGill Univ. Dept. Geography Sub-Arctic Research Paper 22, p. 154-182, illus., tables, 1966.
- 03903 **Bryan, M. Leonard.** Sedimentation in Kluane Lake, Yukon Territory, Canada: *Assoc. Am. Geographers Proc.*, v. 2, p. 31-35, illus., tables, 1970.
- 08116 **Bryan, Rorke B.** An improved rainfall simulator for use in erosion research: *Canadian Jour. Earth Sci.*, v. 7, no. 6, p. 1552-1561, illus., table, 1970.
- 02231 **Bryan, W. B.** Mineralogy of a mugarite from Clarion Island, Mexico: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 190-194, tables, 1970.
- 02232 **Bryan, W. B.** Alkaline and peralkaline rocks of Socorro Island, Mexico: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 194-200, tables, 1970.
- Bryant, Albert L.** *See* Browne, Ruth G. 02093
- Bryant, Bruce.** *See* Tweto, Ogden. 02416

- 03205 **Bryant, Bruce.** Geologic map of the Hayden Peak quadrangle, Pitkin and Gunnison Counties, Colorado: U.S. Geol. Survey Geol. Quad. Map GQ-863, scale 1:24,000, sections, 1970.
- 08176 **Bryant, Bruce; Reed, John C., Jr.** Geology of the Grandfather Mountain window and vicinity: U.S. Geol. Survey Prof. Paper 615, 188 p., illus., tables, geol. map, 1970.
- Bryant, E. A.** See McCann, S. B. 09825
- 00468 **Bryant, Leonard C.** West Terryville field, Dewitt County, Texas: South Texas Geol. Soc. Bull., v. 10, no. 5, p. 6-12, illus., table, 1970.
- Bryant, Paul J.** See Gutshall, Paul L. 09099
- 05993 **Bryant, Vaughn Motley, Jr.** Late full-glacial and postglacial pollen analysis of Texas sediments [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5382B, 1970.
- Bryant, W. R.** See Morelock, Jack. 02660
- Bryant, William R.** See Cernock, Paul J. 01897
- Bryant, William R.** See Delflache, Andre P. 09492
- Bryson, Reid A.** See Bender, Margaret M. 01328
- Bryson, Reid A.** See Bender, Margaret M. 03188
- 08045 **Bryson, Reid A.; Baerreis, David A.; Wendland, Wayne M.** The character of late-glacial and post-glacial climatic changes, in Pleistocene and recent environments of the central Great Plains: Kansas Univ. Dept. Geology Spec. Pub. 3, p. 53-74, illus., tables, 1970.
- 09515 **Bryson, Reid A.; Wendland, Wayne M.** Climatic effects of atmosphere pollution, in Global effects of environmental pollution — Symposium, Am. Assoc. Adv. Sci., Dallas, Texas, 1968: New York, Springer-Verlag, and Dordrecht-Holland, D. Reidel Pub. Co., p. 130-138, illus., 1970.
- 10150 **Bryson, Reid A.** The character of climatic change, and the end of the Pleistocene [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ. ?], p. 20-22, illus., table, 1970.
- Bubb, J. N.** See Atwood, D. K. 03788
- Bucci, D. R.** See Whalin, R. W. 06723
- 00952 **Bucha, V.; Taylor, R. E.; Berger, Rainer; Haury, E. W.** Geomagnetic intensity — Changes during the past 3000 years in the Western Hemisphere: Science, v. 168, no. 3927, p. 111-114, illus., table, 1970.
- Buchan, R.** See Coats, C. J. A. 06890
- 06337 **Buchanan, Chester L.** Optical and magnetic instruments for mapping the ocean floor: IEEE Trans. Geosci. Electronics, v. GE-8, no. 4, p. 320-325, illus., 1970.
- 00143 **Buchanan, Hugh; Streeter, S. Stephen.** Determination of biofacies through examination of foraminiferal wall structures — Great Bahama Bank, B. W. I. [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 13-14, 1970.
- Buchanan, R. M.** See Wayman, R. A. 03742
- 00235 **Buchbinder, Goetz G. R.** Direction of initial motion of PcP [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 76, 1970.



- Buck, A. D.** *See* Saucier, K. L. 10237
- 01222 **Bucke, David Perry, Jr.** Effect of diagenesis upon clay mineral content of inter-laminated Desmoinesian sandstones and shales in Oklahoma [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 8, p. 3704B-3705B, 1970.
- Bucker, H. P.** *See* Hamilton, E. L. 03725
- Bucker, H. P.** *See* Hamilton, E. L. 10646
- Buckley, D. E.** *See* Walker, D. A. 03746
- 01325 **Buckley, James D.; Willis, Eric H.** ISOTOPES' radiocarbon measurements VIII: *Radiocarbon*, v. 12, no. 1, p. 87-129, 1970.
- Buckley, Jane T.** *See* Andrews, J. T. 01244
- Bucknam, R. C.** *See* McKeown, F. A. 01629
- 06077 **Bucknam, R. C.; Dickey, D. D.; McKeown, F. A.** Near-source ground deformation from the Handley nuclear explosion, Nevada Test Site [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 506, 1970.
- Bucknam, R. C.** *See* McKeown, F. A. 09657
- 03247 **Buddemeier, Robert Worth.** A radiocarbon study of the varved marine sediments of Saanich Inlet, British Columbia [abs.]: *Dissert. Abs. Internat.*, Sec. B., Sci. and Eng., v. 30, no. 11, p. 5107B, 1970.
- Buddington, A. F.** *See* Baker, Donald R. 05451
- Buddington, A. F.** *See* Hargraves, R. B. 08457
- 00236 **Budge, David R.** Paleocology of Late Ordovician and Silurian corals, eastern Great Basin [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 76, 1970.
- 03057 **Buell, Murray F.** Time of origin of New Jersey Pine Barrens bogs: *Torrey Bot. Club Bull.*, v. 97, no. 2, p. 105-108, illus., 1970.
- 04492 **Buerger, Martin J.** *Contemporary crystallography*: New York, McGraw-Hill Book Co., 364 p., illus., tables, 1970.
- 06078 **Bufe, Charles G.; Gedney, Larry D.; Tocher, Don.** Local deformations near the San Andreas fault [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 507, 1970.
- 06808 **Bufe, Charles G.** Frequency-magnitude variations during the 1970 Danville earthquake swarm: *Earthquake Notes*, v. 41, no. 3, p. 3-7, 1970.
- Bufe, Charles G.** *See* Thomas, Lloyd K. 10570
- 01581 **Bufe, Charles Glenn.** An estimate of the configuration of the surface of the Earth's core from the consideration of surface focus PcP travel times [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 9, p. 4211B-4212B, 1970.
- Buffington, E. C.** *See* Marlow, M. S. 01365
- Buffington, Edwin C.** *See* Scholl, David W. 03531
- Buffington, Edwin C.** *See* Scholl, David W. 10095
- 07502 **Bugel'skiy, Yu. Yu.; Formel'-Kortina, F.** Nekotoryye osobennosti gidrogeokhimii nikelenosnykh kor vyvetrivaniya [Hydrogeochemical characteristics of Cuban nickeliferous weathering profiles]: *Kora Vyvetrivaniya* 1970, no. 11, p. 246-257, illus., 1970.

**Buhl, P.** See Houtz, R. 03968

**Buitrago de Santiago, Zayda.** See Pico, Rafael. 10722

- 05332 **Buitron, Blanca Estela.** Equinoides del Cretacico Inferior de la region de San Juan Raya-Zapotitlan, estado de Puebla [Lower Cretaceous echinoids from the San Juan Raya-Zapotitlan region, state of Puebla]: Mexico Univ. Nac. Autonoma Inst. Geologia Paleontologia Mexicana, no. 30, 64 p., illus., 1970.
- 09138 **Bukovansky, Michal.** Determination of elastic properties of rocks using various on-site and laboratory methods [with French and German summ.], in Internat. Soc. Rock Mechanics Cong., 2d, Belgrade, Yugoslavia, 1970, Proc., V. 1: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 329-332, table, 1970.
- 02723 **Bukry, D.; Douglas, R. G.; Kling, S. A.; Krasheninnikov, V.** Deep-sea drilling in northern Pacific, paleontology and biostratigraphy [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 838, 1970.
- 00556 **Bukry, David.** *Biscutum kennedyi* nom. nov. pro *Biscutum asymmetricum* Bukry, 1969, non Perch-Nielsen, 1968 (Plantae, Coccolithophyceae): Jour. Paleontology, v. 44, no. 1, p. 167, 1970.
- 01344 **Bukry, David.** Coccolith age determinations, Leg 2, Deep Sea Drilling Project, [Chap.] 13 in Initial reports of the Deep Sea Drilling Project — V. 2, Leg 2 of cruises of *Glomar Challenger*, Hoboken, N. J., to Dakar, Senegal, Oct.-Nov. 1968: Washington, D. C., U.S. Govt. Printing Office, p. 349-355, illus., 1970.
- 07149 **Bukry, David; Bramlette, M. N.** Coccolith age determinations Leg 5, Deep Sea Drilling Project, Chap. 18 in Initial reports of the Deep Sea Drilling Project — V. 5, Leg 5 of cruises of *Glomar Challenger*, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office, p. 487-494, illus., tables, 1970.
- 07643 **Bukry, David.** Coccolith age determinations Leg 4, Deep Sea Drilling Project, Chap. 17 in Initial reports of the Deep Sea Drilling Project — V. 4, Leg 4 of cruises of *Glomar Challenger*, Rio de Janeiro, Brazil, to San Cristobal, Panama, Feb.-Mar. 1969 (R. G. Bader, and others): Washington, D. C., U.S. Govt. Printing Office, p. 375-381, illus., 1970.
- 00237 **Bull, William B.** Effect of climatic and tectonic changes on denudation rates in part of the Diablo Range, California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 77, 1970.
- 00875 **Bullard, Fred M.; Rylander, Don L.** Holocene volcanism in Craters of the Moon National Monument and adjacent areas, south-central Idaho [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 273-274, 1970.
- 02869 **Bullen, K. E.; Press, F.; Runcorn, S. K.; Collinson, D. W.** (editors). Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969, Proc.: Physics Earth and Planetary Interiors, v. 3, 518 p., illus., tables, 1970.
- 10130 **Bullen, Ripley P.; Webb, S. David; Waller, Benjamin I.** A worked mammoth bone from Florida: Am. Antiquity, v. 35, no. 2, p. 203-205, illus., 1970.
- 10141 **Bullen, Ripley P.** Further comments on [K. O.] Emery and Edwards' "Archaeological potential of the Atlantic [continental] shelf" [1966]: Am. Antiquity, v. 34, no. 3, p. 331-332, 1969.
- Bullock, Jim.** See Hall, Gary. 05362
- 07741 **Bullock, Kenneth C.** Iron deposits of Utah: Utah Geol. and Mineralog. Survey Bull. 88, 101 p., illus., tables, geol. map, 1970.

- 08179 **Bulman, O. M. B.; Rickards, R. B.** Classification of the graptolite family Monograptidae Lapworth, 1873 [addendum], in *Treatise on invertebrate paleontology* pt. V, Graptolithina, . . . (2d edition): Boulder, Colo., Geol. Soc. America (and Univ. Kansas), p. V149-V157, illus., 1970.
- 08197 **Bulman, O. M. B.** *Treatise on invertebrate paleontology — Pt. V., Graptolithina, with sections on Enteropneusta and Pterobranchia* (2d edition): Boulder, Colo., Geol. Soc. America (and Univ. Kansas), p. V1-V163, illus., revised and enlarged, 1970; originally published 1955.
- Bulman, Oliver Meredith Boone.** See Jackson, Dennis Edward. 05642
- 06079 **Buma, Grant; Frey, F. A.; Wones, D. R.** Trace element abundances and the origin of some Massachusetts and Rhode Island granites [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 508, 1970.
- Bunce, E. T.** See Emery, K. O. 00099
- 09720 **Bunce, Elizabeth T.; Phillips, Joseph D.; Chase, Richard L.; Bowin, Carl O.** The Lesser Antilles arc and the eastern margin of the Caribbean Sea, in *The sea — v. 4, New concepts of sea floor evolution, Pt. 2, Regional observations* (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 359-385, illus., 1970.
- 04438 **Bunch, T. E.; Keil, Klaus; Olsen, E.** Mineralogy and petrology of silicate inclusions in iron meteorites: *Contr. Mineralogy and Petrology*, v. 25, no. 4, p. 297-340, illus., tables, 1970.
- Bunch, T. E.** See Olsen, Edward. 06576
- Bunch, T. E.** See Olsen, Edward. 09702
- Bunker, Carl M.** See Sainsbury, C. L. 10093
- Bunnenberg, Edward.** See Hodgson, Gordon W. 05741
- 07957 **Bunting, B. T.; Jackson, R. H.** Studies of patterned ground on SW Devon Island, N.W.T. — A method for collecting undisturbed megasamples from dry Arctic polygons, and observations on some physical properties of the material in a sorted polygon: *Geog. Annaler, Ser. A, Phys. Geog.*, v. 52A, no. 3-4, p. 194-208, illus., tables, 1970.
- 07959 **Bunting, B. T.; Hathout, S. A.** Observations on the organic matter associated with the surface organic layers of arctic polygons: *Geog. Annaler, Ser. A, Phys. Geog.*, v. 52A, no. 3-4, p. 209-212, tables, 1970.
- Buol, S. W.** See Collins, J. F. 05409
- Buol, S. W.** See Collins, J. F. 05483
- 04368 **Buravas, S.; Gaines, A. F.; Hasadsri, T.; Prasertwitayakij, A.; Sucharitakul, Mrs. N.** The infra-red spectra of Tertiary lignites: *Fuel*, v. 49, no. 2, p. 180-187, illus., table, 1970.
- Burbank, Nathan C., Jr.** See Hori, Daniel H. 10840
- Burbridge, P. P.** See Felix, C. J. 09174
- 01432 **Burch, Stephen H.; Durham, David L.** Complete Bouguer gravity and general geology of the Bradley, San Miguel, Adelaida, and Paso Robles quadrangles, California: U.S. Geol. Survey Prof. Paper 646-B, p. B1-B14, illus., tables, geol. map, 1970.
- 09043 **Burchett, R. R.** Directory of Nebraska quarries, pits and mines: *Nebraska Geol. Survey Resource Rept. 1*, unpagged, illus., tables, 1970.

- 09363 **Burchett, R. R.** Occurrence of gypsum in the Johnson Shale (Permian) in Nemaha County, Nebraska: Nebraska Univ. Conserv. and Survey Div. Resource Rept. 3, 23 p., illus., tables, geol. maps, 1970.
- 09918 **Burchett, R. R.** Stratigraphic sequences in the Pennsylvanian of Nebraska in relationship to the Middle River traverse, App. 3 of Field trip No. 4, Middle River traverse of Iowa Pennsylvanian stratigraphy, in Geol. Soc. America, North-Central Sec., Ann. Mtg., 2d, May 1968, guidebook: Iowa City, Iowa, Univ. Iowa, p. 4-42 to 4-46, illus. [1968].
- 00026 **Burchfiel, B. C.; Pelton, P. J.; Sutter, J.** An early Mesozoic deformation belt in south-central Nevada-southeastern California: Geol. Soc. America Bull., v. 81, no. 1, p. 211-216, illus., table, 1970.
- 00876 **Burchfiel, B. C.; Davis, Gregory A.** Basement involvement in southeastern Cordilleran thrust faulting — A regional synthesis [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 274, 1970.
- 00877 **Burchfiel, B. C.; Davis, Gregory A.** A zwischengebirge in the Cordilleran orogen and its tectonic significance [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 274-275, 1970.
- Burchfiel, B. C.** See Sargent, K. A. 05400
- Burckle, L. H.** See Opdyke, N. D. 09703
- 07555 **Burdick, D. W.; Strimple, H. L.** The occurrence of *Pterotocrinus* in Oklahoma: Oklahoma Geology Notes, v. 30, no. 5, p. 121-123, illus., 1970.
- 02348 **Burek, Peter J.** Magnetic reversals, their application to stratigraphic problems: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 7, p. 1120-1139, illus., tables, 1970.
- Burford, R. O.** See Savage, J. C. 06464
- Burford, Robert O.** See Savage, James C. 01827
- 08414 **Burgat, Virgil A.; Fowler, Lowell W.; Fredericksen, Walter F.; O'Connor, Howard G.; Stallard, Alvis H.** Geo-engineering in northeastern Kansas — Highway Geology Symposium, 21st Ann., 1970, Field Trip: Lawrence, Kans., State Geol. Survey Kansas, 57 p., illus., 1970.
- 02376 **Burger, H. Robert, 3d.; Thompson, Margaret D.** Fracture analysis of the Carmichael Peak Anticline, Madison County, Montana: Geol. Soc. America Bull., v. 81, no. 6, p. 1831-1835, illus., 1970.
- 06080 **Burgess, Jack D.** Microscopic examination of kerogen (dispersed organic matter) in petroleum exploration [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 508-509, 1970.
- 07917 **Burgess, Lawrence Charles Norman.** The application of airphoto interpretation to watershed planning and development with special reference to flood susceptibility and frequency determinations [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3471B, 1970.
- 01279 **Burgess, R. J.; Benson, A. L.** Exploration for Niagaran reefs in Michigan, Pts. 1-2: Oil and Gas Jour., v. 67, no. 51, p. 80-82, illus., 1969; *ibid.*, no. 52, p. 180, 183-184, 187-188, illus., 1969; *ibid.*, v. 68, no. 1, p. 122-127, illus., 1970.
- 10504 **Burgy, Robert H.; Storm, David R.** Short term suspended sediment rates in watershed tributaries subjected to soil and vegetation disturbance [abs.]: EOS, v. 51, no. 11, p. 754, 1970.
- 02491 **Burk, Cornelius F., Jr.** Geoscience Data Index available: Oilweek, v. 20, no. 51, p. 10-11, 1970.

- 02593 **Burk, Cornelius F., Jr.** Devonian reefs in west-central Alberta as revealed by structural analysis of shallow Cretaceous horizon [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 839, 1970.
- 10783 **Burk, Cornelius F., Jr.; Sharp, Dennis A.** Computer applications in the earth sciences, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor): *Canada Geol. Survey Paper* 69-56, p. 304-312, 1970.
- 00238 **Burke, Dennis B.** Permo-Triassic non-marine deposition and coeval block faulting, west-central Nevada [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 77-78, 1970.
- 00239 **Burke, Dennis B.** Reinterpretation of the "Tobin Thrust", west-central Nevada [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 78, 1970.
- 01287 **Burke, J. D.; Brereton, R. G.; Muller, P. M.** Desert stream channels resembling lunar sinuous rilles: *Nature*, v. 225, no. 5239, p. 1234-1236, illus., 1970.
- 00443 **Burke, J. J.** Some ornamented erisocrinids from the Ames Limestone: *Kirtlandia*, no. 9, 17 p., illus., 1970.
- 03289 **Burke, J. J.** Observations on the Pennsylvanian crinoid *Endelocrinus armatura* (Strimple): *Kirtlandia*, no. 11, 10 p., illus., 1970.
- 02936 **Burke, Kenneth B. S.** A review of some problems of seismic prospecting for groundwater in surficial deposits [with French abs.], in *Mining and groundwater geophysics, 1967*: *Canada Geol. Survey Econ. Geology Rept.* 26, p. 569-578, illus.; discussion, p. 578-579, 1970.
- Burke, W. E. F.** See *Hornal, R. W.* 09779
- 06081 **Burkett, David H.; Scott, Robert B.; Leaird, James D.** Experimental alteration of basaltic glass in low temperature aqueous environments [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 509, 1970.
- 05574 **Burkham, D. E.** Depletion of streamflow by infiltration in the main channels of the Tucson basin, southeastern Arizona: *U.S. Geol. Survey Water Supply Paper* 1939-B, p. B1-B36, illus., tables, 1970.
- Burlingame, A. L.** See *Simoneit, B. R.* 00943
- 05736 **Burlingame, A. L.; Calvin, Melvin; Han, J.; Henderson, W.; Reed, W.; Simoneit, B. R.** Study of carbon compounds in Apollo 11 lunar samples, in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc.* — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1779-1791, illus., table, 1970.
- Burlingame, A. L.** See *Schnoes, H. K.* 10400
- Burmester, Russell F.** See *Barker, Daniel S.* 06785
- 05274 **Burmister, D. M.** Suggested methods of test for identification of soils, in *Special procedures for testing soil and rock for engineering purposes* (5th edition): *Am. Soc. Testing and Materials Spec. Tech. Pub.* 479, p. 311-323, illus., tables, 1970.
- Burnett, D. S.** See *Eugster, O.* 01701
- Burnett, D. S.** See *Eugster, O.* 02137
- Burnett, D. S.** See *Sanz, H. G.* 05314
- Burnett, D. S.** See *Tera, F.* 05726

- 06846 **Burnett, D. S.; Monnin, M.; Seitz, M.; Walker, R.; Woolum, D.; Yuhas, D.** Charged particle track studies in lunar rock 12013: *Earth and Planetary Sci. Letters*, v. 9, no. 2, p. 127-136, illus., 1970.

**Burnett, J. L.** See Geological Society Sacramento. 09910

- 02821 **Burnham, C. Wayne; Davis, N. F.** Thermodynamic properties of water-bearing magmas [abs.], in *Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969, Proc.: Physics Earth and Planetary Interiors*, v. 3, p. 332, 1970.

**Burnham, Charles W.** See Beger, Richard M. 06056

- 07827 **Burnham, J. B.; Stewart, D. H.** The economics of Plowshare geothermal power, in *Symposium on engineering with nuclear explosives — Am. Nuclear Soc. and U.S. Atomic Energy Comm., Las Vegas, Nev., 1970, Proc., V. 2: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf.*, p. 1376-1383, illus., 1970.

**Burns, R.** See Malahoff, Alexander. 01952

**Burns, Robert E.** See McManus, Dean A. 07143

- 07157 **Burns, Robert E.** Heat-flow operations at holes 35.0 and 35.1, Chap. 28 in *Initial reports of the Deep Sea Drilling Project — V. 5, Leg 5 of cruises of Glomar Challenger, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office*, p. 551-554, illus., tables, 1970.

**Burns, Robert E.** See McManus, Dean A. 07249

- 06082 **Burns, Roger G.; Greaves, C.; Law, A. D.; Tew, M. J.; Prentice, F. Jean.** Assessment of the reliability of the Mössbauer and infrared methods in site population studies of amphiboles [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 509-511, 1970.

- 06083 **Burns, Roger G.; Huggins, Frank E.** Cation determinative curves and evidence of ordering in Mg-Fe-Mn olivines from vibrational spectra [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 511-512, 1970.

- 09112 **Burns, Roger G.; Vaughan, David J.** Interpretation of the reflectivity behavior of ore minerals: *Am. Mineralogist*, v. 55, nos. 9-10, p. 1576-1586, illus., table, 1970.

- 09114 **Burns, Roger G.** Crystal field spectra and evidence of cation ordering in olivine minerals: *Am. Mineralogist*, v. 55, nos. 9-10, p. 1608-1632, illus., tables, 1970.

**Burns, Roger G.** See Vaughan, David J. 10291

**Burns, Virginia Mee.** See Vaughan, David J. 10291

**Burrell, D. C.** See Sharma, G. D. 01421

**Burrell, D. C.** See Naidu, A. S. 01957

**Burrell, D. C.** See O'Brien, Néal R. 03599

**Burrell, D. C.** See Naidu, A. S. 10081

- 10522 **Burrell, D. C.; Hadley, R. S.** The liquid-solid partition of a trace transition metal across a fresh water-marine interface [abs.]: *EOS*, v. 51, no. 11, p. 769, 1970.

**Burt, D. M.** See Austria, B. S. 10597

**Burton, Conway.** See Abson, Gene. 09010

- 08143 **Burwash, R. A.; Krupicka, J.** Cratonic reactivation in the Precambrian basement of western Canada — Pt. 2, Metasomatism and isostasy: *Canadian Jour. Earth Sci.*, v. 7, no. 5, p. 1275-1294, illus., tables, 1970.
- Busby, Roswell F.** See Bennett, Richard H. 05661
- Busch, Carl R.** See Dirks, Richard A. 03654
- 02594 **Busch, Daniel A.** Principles of deltaic prospecting [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 839, 1970.
- 03701 **Busch, F. E.; Hudson, J. D.** Ground-water levels in New Mexico, 1968: Santa Fe, N.Mex., New Mexico State Engineer, 77 p., illus., tables, 1970.
- 09725 **Buschbach, T. C.** Cambrian and Ordovician strata of north-central Illinois, in *Tri-State Geol. Field Conf.*, 34th Ann., 1970, Guidebook (I. E. Odom and M. P. Weiss, editors): De Kalb, Ill., Northern Illinois Univ. Dept. Geology, p. 27-31, illus., 1970.
- 01058 **Buschbach, Thomas C.** Cambrian strata of Illinois [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 379, 1970.
- 00121 **Buseck, Peter R.** Tinker Toys, crystallography, and the introductory mineralogy course: *Jour. Geol. Education*, v. 18, no. 1 p. 26-30, illus., 1970.
- Buseck, Peter R.** See McNerney, John J. 02980
- 10658 **Bush, Darrell C.; Jenkins, Ralph E.** Proper hydration of clays for rock property determinations: *Jour. Petroleum Technology*, v. 22, July, p. 800-804, illus., table, 1970.
- 07892 **Bush, Gordon L.; Dooge, Jasper.** (editors). Peace River, Pine Pass, Yellowhead 1970 — Edmonton Geol. Soc. Field Conf., 12th, Guidebook: Edmonton, Alberta, Edmonton Geological Society, 143 p., illus., tables, geol. maps, 1970.
- Bush, John.** See Baars, D. L. 02584
- 05388 **Bush, P. R.** Chloride-rich brines from sabkha sediments and their possible role in ore formation: *Inst. Mining and Metall. Trans.*, sec. B, v. 79, Bull. 765, p. B137-B144, illus., table, 1970.
- 03905 **Bush, W. R.; Hafner, S. S.; Virgo, D.** Some ordering of iron and magnesium at the octahedrally coordinated sites in a magnesium-rich olivine: *Nature*, v. 227, no. 5265, p. 1339-1341, illus., tables, 1970.
- 07725 **Bushnell, Vivian C.; Ragle, Richard H.** (editors). Icefield Ranges Research Project, scientific results, V. 2: New York, Am. Geog. Soc., and Montreal, Quebec, Arctic Inst. No. America, 138 p., illus., tables, 1970.
- 03937 **Bushue, L. J.; Fehrenbacher, J. B.; Ray, B. W.** Exhumed paleosols and associated modern till soils in western Illinois: *Soil Sci. Soc. America Proc.*, v. 34, no. 4, p. 665-669, illus., table, 1970.
- 06568 **Busing, William R.** (editor). Symposium on intermolecular forces and packing in crystals, New Orleans, La., 1970, Proc.: *Am. Cryst. Assoc. Trans.*, v. 6, 155 p., illus., tables, 1970.
- 09964 **Busse, F. H.** The dynamical coupling between inner core and mantle of the Earth and the 24-year libration of the pole, in *Earthquake displacement fields and the rotation of the Earth* (L. Mansinha, D. E. Smylie, A. E. Beck, editors) - NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 88-89, illus., 1970.
- Butcher, William S.** See Cochran, Gilbert F. 09502

- 06704 **Butera, Anthony W.; DeMatteo, John J.; Goclowski, John C.** Direct measurement of deflection of the vertical using a ship's inertial navigation system (SINS), in *Marine geodesy, a practical view — Symposium on Marine Geodesy*, 2d, 1969: Washington, D. C., Marine Technology Soc., p. 129-136, illus., table, 1970.
- 03338 **Butler, B. Robert.** A report on the 1967-69 archaeological survey of the National Reactor Testing Station, Idaho: Tebiwa, v. 13, no. 1, p. 58-68, tables, 1970.
- 03339 **Butler, B. Robert.** A surface collection from Coyote Flat, southeastern Oregon: Tebiwa, v. 13, no. 1, p. 34-57, illus., 1970.
- Butler, D. L.** See Blackford, M. E. 01630
- Butler, David.** See Major, M. W. 00307
- 04568 **Butler, Godfrey P.** Secondary anhydrite from a sabkha, northwest Gulf of California, Mexico, in *Third symposium on salt*, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 153-155, illus., 1970.
- 07347 **Butler, Godfrey Philip.** Holocene supratidal evaporites — An analogue of ancient evaporites [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 4, p. 2059B-2060B, 1970.
- Butler, J. C.** See Cameron, K. L. 06509
- 00680 **Butler, J. Robert.** Brevard zone and adjacent rocks east of Ashville, North Carolina [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 198-199, 1970.
- Butler, R. G.** See Sumsion, C. T. 03063
- Butterfield, D.** See Lovering, J. F. 06434
- 07406 **Buttgereit, Charles D.; Wrathall, Don M.** A digital processing system for aeromagnetic maps [abs.]: *Mining Eng.*, v. 22, no. 9, p. 52, 1970.
- 00823 **Buturla, Frank, Jr.** Geology and ground water resources of Wells County — Pt. 3, Ground water resources: North Dakota Geol. Survey Bull. 51, pt. 3 (North Dakota Water Comm. County Ground Water Study 12), 57 p., illus., table, 1970.
- 08506 **Buzas, Martin A.** On the quantification of biofacies, in *Computers in paleontology — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc., Pt. B: Lawrence, Kans., Allen Press*, p. 101-116, 1970.
- Byerlay, J. R.** See Doonan, C. J. 07106
- 01692 **Byerlee, J. D.; Peselnick, L.** Elastic shocks and earthquakes: *Naturwissenschaften*, v. 57, no. 2, p. 82-85, illus., 1970.
- 01743 **Byerlee, J. D.; Brace, W. F.** Modification of sliding characteristics by fluid injection and its significance for earthquake prevention [abs.]: *EOS*, v. 51, no. 4, p. 423, 1970.
- Byerlee, J. D.** See Brace, W. F. 03344
- 05413 **Byerlee, J. D.** The mechanics of stick-slip: *Tectonophysics*, v. 9, no. 5, p. 475-486, illus., 1970.
- 06317 **Byerlee, J. D.** Static and kinetic friction of granite at high normal stress: *Internat. Jour. Rock Mechanics and Mining Sci.*, v. 7, no. 6, p. 577-582, illus., 1970.
- 00063 **Byerlee, James D.** Comments on paper by C. H. Scholz, M. Wyss, and S. W. Smith, "Seismic and aseismic slip on the San Andreas fault" [1969]: *Jour. Geophys. Research*, v. 75, no. 2, p. 499-500, illus., 1970.



- 00878 **Byerlee, James D.** Sliding characteristics of finely ground surfaces of gabbro and dunite [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 275, 1970.
- Byers, F. M., Jr.** See Marvin, Richard F. 05646
- 02840 **Byrd, William D., 2d.** P. R. Spring oil-impregnated sandstone deposit, Uintah and Grand Counties, Utah: *Utah Geol. and Mineralog. Survey Spec. Studies* 31, 34 p., illus., tables, 1970.
- 04110 **Byrd, William J.** Geology of the Ely Springs Range, Lincoln County, Nevada: *Earth Sci. Bull.*, v. 3, no. 2, p. 23-32, illus., 1970.
- Byrne, J. V.** See Nelson, C. Hans. 03532
- 01566 **Byrne, Peter Michael.** Elastic-viscoplastic response of earth structures to earthquake motion [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 9, p. 4122B, 1970.
- 02595 **Byrnes, John B.; Colquhoun, Donald J.; Pierce, Jack W.** Importance of tidal-inlet sedimentation in barrier-island systems [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 839, 1970.
- 10479 **Cabaniss, G. H.; McConnell, R. K., Jr.; Simon, I.** Crustal tilt in coastal New England from borehole tiltmeters [abs.]: *EOS*, v. 51, no. 11, p. 740, 1970.
- Cabillio, P.** See Agterberg, F. P. 10627
- Cable, Lewis W.** See Daniel, James F. 01489
- Cabrera, Jose G.** See Smalley, Ian J. 01502
- Cabri, L. J.** See Petruk, W. 03494
- Cabri, L. J.** See Harris, D. C. 03497
- 03500 **Cabri, L. J.; Harris, D. C.; Stewart, J. M.** Paracostibite (CoSbS) and nisbite (NiSb<sub>2</sub>), new minerals from the Red Lake area, Ontario, Canada: *Canadian Mineralogist*, v. 10, pt. 2, p. 232-246, illus., tables, 1970.
- Cabri, L. J.** See Harris, D. C. 06753
- 06084 **Cacchione, David A.; Southard, John B.** Incipient motion of oceanic bottom sediment by internal gravity waves [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 513, 1970.
- 05557 **Cadigan, R. A.** Mercury in sedimentary rocks of the Colorado Plateau region, *in* Mercury in the environment: U.S. Geol. Survey Prof. Paper 713, p. 17-18, illus., 1970.
- 01744 **Cadle, Richard D.** Variation in the nature of particles in Kilauea volcanic fume [abs.]: *EOS*, v. 51, no. 4, p. 440, 1970.
- 00879 **Cadot, H. Meade, Jr.** Statistical analysis of intraspecific variation in carapace morphology of selected Recent Ostracoda from Bermuda [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 275-276, 1970.
- Cady, J. G.** See Daniels, R. B. 03935
- Cady, W. M.** See Tabor, R. W. 00377
- Cady, Wallace M.** See Gilluly, James. 00102
- 04159 **Cahoon, E. J.** *Paraphyllanthoxylon* from Alabama [abs.]: *Am. Jour. Botany*, v. 57, no. 6, pt. 2, p. 759, 1970.

- 03024 **Cailleux, André.** Dénomination descriptive et génétique des fentes de cryoturbation [Descriptive and genetic designation of ice wedges (with English and Russian abs.)]: *Rev. Géographie Montréal*, v. 24, no. 3, p. 310-313, 1970.
- Cain, Joseph C.** See Zietz, Isidore. 03672
- Caine, T. W.** See Lovell, H. L. 09255
- 08185 **Calandro, A. J.; Broussard, W. L.; Hosman, R. L.** Water resources of the Belmont-Marthaville-Robeline area, Louisiana: Louisiana Geol. Survey and Dept. Public Works Water Resources Pamph., no. 25, 21 p., illus., tables, 1970.
- Calandro, A. J.** See Whiteman, C. D., Jr. 08698
- Calandro, J. J.** See Hosman, R. L. 00448
- 00540 **Calder, John Archer.** Carbon isotope effects in biochemical and geochemical systems [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 7, p. p. 3265B, 1970.
- Calder, P. N.** See Bauer, Alan. 09835
- 03457 **Calder, Peter N.; Bauer, A.; MacDougall, A. R.** Stereo-photography in open-pit mine design [abs.]: *Canadian Mining and Metall. Bull.*, v. 63, no. 695, p. 285, 1970.
- 04296 **Calder, Peter N.** Slope stability in jointed rock: *Canadian Mining and Metall. Bull.*, v. 63, no. 697, p. 586-590, illus., 1970.
- 07389 **Caldwell, A. Blake.** Twin Buttes — Anaconda's concept for mining and processing a low-grade copper ore: *Mining Eng.*, v. 22, no. 4, p. 51-66, illus., 1970.
- Caldwell, Donald.** See Sanders, John E. 09555
- 04473 **Caldwell, John W.; Strabala, J. M.** Application of modern well logging methods to salt solution cavities, in *Third symposium on salt*, V. 2 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 341-352, illus., 1970.
- Caldwell, R. L.** See Zemanek, Joe. 01249
- 10020 **Caldwell, W. G. E.** Middle and Upper Devonian biostratigraphy in Canadian Northwest Territories [abs.], in *Internat. Arctic geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2473-2474, 1970.
- 10391 **Calgary Univ. Archaeol. Assoc.** (R. A. Smith and J. W. Smith, editors). Early man and environments in northwest North America, Univ. Calgary Archaeol. Assoc. Ann. Paleoenvironmental Workshop, 2nd, Proc.: Calgary, Alberta, Univ. Calgary Students' Press, 136 p., illus., tables, 1970.
- Calhoon, M. L.** See Thorley, A. 04177
- 00422 **California Dept. Water Resources.** Ground water quality, App. E in *Hydrologic data*, 1968 — V. 5, Southern California: California Dept. Water Resources Bull. 130-68, v. 5, app. D-F, p. 59-169, illus., tables, 1970.
- 02967 **California Dept. Water Resources.** Hydrologic data, 1968 — V. 1, North Coastal area: California Dept. Water Resources Bull. 130-68, v. 1, 73 p., illus., tables, 1970.
- 02968 **California Dept. Water Resources.** Ground water measurement, App. C in *Hydrologic data*, 1968 — V. 5, Southern California, App. A-C: California Dept. Water Resources Bull. 130-68, v. 5, app. A-C, p. 85-423, illus., tables, 1970.
- 07863 **California Dept. Water Resources.** Hydrologic data, 1968 — V. 2, Northeastern California — App. C, Ground water measurements; App. D, Surface water quality;

App. E, Ground water quality: California Dept. Water Resources Bull. 130-68, V. 2, p. 3255-66, illus., tables, 1970.

- 07864 **California Dept. Water Resources.** Hydrologic data, 1969 — V. 4, San Joaquin Valley — App. C, Ground water measurements; App. D, Surface water quality; App. E, Ground water quality: California Dept. Water Resources Bull. 130-69, V. 4, p. 149-249, illus., tables, 1970.

- 09173 **California Dept. Water Resources; Cummings, John R.; Carville, Chester A.; Ramstedt, Eugene C.; Mukae, Michitoshi.** Sea-water intrusions — Bolsa-Sunset area, Orange County: California Dept. Water Resources Bull. 63-2, 167 p., illus., tables, 1968.

- 09504 **California Dept. Water Resources.** North Coastal Area Investigation, South Fork Eel River study — Preliminary edition: California Dept. Water Resources Bull. 173, 183 p., illus., tables, 1968.

- 09923 **California Div. Mines and Geology.** Geologic map of California, Olaf P. Jenkins edition, 1958-1969 — Geologic legend, formation index, State map unit-State map sheet cross index: San Francisco, Calif.] California Div. Mines. and Geology, 4 sheets, 1969.

**Calio, A. J.** See Simmons, Gene. 05103

**Calkin, P. E.** See Borns, Harold W., Jr. 00140

- 01373 **Calkin, Parker E.** Strand lines and chronology of the Glacial Great Lakes in northwestern New York: Ohio Jour. Sci., v. 70, no. 2, p. 78-96, illus., tables, 1970.

**Callaghan, Eugene.** See Pratt, Alan R. 07036

**Callahan, J. A.** See Shattles, D. E. 03888

- 05455 **Callahan, James E.** Geologic reconnaissance of a possible powersite at Takatz Creek, southeastern Alaska: U.S. Geol. Survey Bull. 1211-D, p. D1-D18, illus., table, geol. map, 1970.

- 02565 **Callahan, John.** Determination of source rocks from heavy minerals in residual soils of saprolite Piedmont of North Carolina: Southeastern Geology, v. 11, no. 4, p. 237-251, illus., tables, 1970.

- 02927 **Callahan, William H.; McMurry, H. V.** Geophysical exploration of Mississippi Valley-Appalachian type strata-bound zinc-lead deposits [with French abs.], in Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 350-360, illus., table, 1970.

**Callender, Edward.** See Edgington, David N. 02134

**Callender, Edward.** See Bowser, Carl J. 06070

- 06085 **Callender, Edward; Rossmann, Ronald.** Sedimentary geochemistry of Green Bay, Lake Michigan [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 513-514, 1970.

- 07523 **Callender, Edward.** The economic potential of ferromanganese nodules in the Great Lakes, in Forum on Geology of Industrial Minerals, 6th, Ann Arbor, Mich., 1970, Proc.: Michigan Geol. Survey Miscellany 1, p. 56-65, illus., tables, 1970.

- 02707 **Callison, George.** Trace fossils of trilobites from the Deadwood Formation (Upper Cambrian) of western South Dakota: Southern California Acad. Sci. Bull., v. 69, pt. 1, p. 20-26, illus., 1970.

- 08720 **Callomon, J. H.** Geological map of Carlsberg Fjord-Fossilbjerget area: Medd Grönland, v. 168, no. 4, 9 p., illus., geol. map, scale 1:100,000, 1970.

**Calvert, Ronald H.** See Braddock, William A. 06415

- 01223 **Calvert, Ronald Harold.** Stratigraphy of a Chester cycle in the Kentucky part of the Eastern Interior Basin [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 8, p. 3705B, 1970.

**Calvin, Melvin.** See Burlingame, A. L. 05736

- 10244 **Cambray, F. W.; Jung, Peter.** Provenance of the Richmond Formation from sole marks: Geol. Soc. Jamaica Jour., v. 11, p. 13-18, illus., 1970.

- 06086 **Cambray, F. William.** Early Tertiary sedimentation and structure in the Wagwater trough, Jamaica, W. I. [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 514, 1970.

**Cambray, W.** See Watkins, N. D. 01997

- 11020 **Cambridge, Thomas R.** Potential of Marmaton oil production: Oil and Gas Jour., v. 68, no. 14, p. 179-183, illus., reprinted 1970; originally published 1969.

- 05081 **Cameron, A. G. W.** Formation of the Earth-Moon system: EOS, v. 51, no. 9, p. 628-633, illus., 1970.

- 05821 **Cameron, A. R.; Birmingham, T. F.** Radioactivity in western Canadian coals: Canada Geol. Survey Paper 70-52, 35 p., illus., tables, 1970.

**Cameron, A. R.** See Hacquebard, P. A. 10752

- 08249 **Cameron, C. C.** Relation of commercial quality of peat to bedrock and geologic structure [with French abs.], in International Peat Congress, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 98-101, illus., 1970.

- 02776 **Cameron, Christopher P.; Stone, David B.** Outline geology of the Aleutian Islands with paleomagnetic data from Shemya and Adak Islands — Natl. Sci. Found. Grant GA-1216, Sci. Rept.: Alaska Univ. Geophys. Inst. [Rept.] UAG R-213, 153 p., illus., tables, 1970.

**Cameron, Christopher P.** See Stone, David B. 04179

- 07642 **Cameron, Christopher P.; Stone, David B.** Paleomagnetic data from the margin of a hypabyssal andesite in the western Aleutians, Alaska: Earth and Planetary Sci. Letters, v. 9, no. 5, p. 388-390, illus., table, 1970.

- 00681 **Cameron, Cornelia C.** Geologic factors related to peat resources near the Allegheny Front south of the glacial border [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 199, 1970.

- 04900 **Cameron, Cornelia C.** Peat deposits of southeastern New York: U.S. Geol. Survey Bull. 1317-B, p. B1-B32, illus., tables, 1970.

- 06178 **Cameron, Cornelia C.** Peat resources of the unglaciated uplands along the Allegheny structural front in West Virginia, Maryland, and Pennsylvania, in Geological Survey research 1970, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D153-D161, illus., 1970.

- 06698 **Cameron, Cornelia C.** Peat deposits of northeastern Pennsylvania: U.S. Geol. Survey Bull. 1317-A, p. A1-A90, illus., tables, 1970.

- 07834 **Cameron, I. G.; Scorgie, G. C.** Theoretical model of the early phases of an underground explosion, in Symposium on engineering with nuclear explosives — Am. Nuclear Soc. and U.S. Atomic Energy Comm., Las Vegas, Nev., 1970, Proc., V. 1: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., p. 221-229, illus., 1970.

**Cameron, K. L.** See Bence, A. E. 01738

- 06509 **Cameron, K. L.; Carman, M. F.; Butler, J. C.** Rhönite from Big Bend National Park, Texas: *Am. Mineralogist*, v. 55, nos. 5-6, p. 864-874, tables, 1970.
- Cameron, Maryellen.** See Carman, Max F. 06088
- 02065 **Camfield, P. A.; Gough, D. I.; Porath, H.** Preliminary results from geomagnetic deep sounding studies in the northwestern United States and southwest Canada [abs.]: *EOS*, v. 51, no. 4, p. 268, 1970.
- 11270 **Camp, Charles L.** Earth song — A prologue to history: Palo Alto, Calif., Am. West Publishing Co., 192 p., illus., 1970.
- 05984 **Camp, Frederick W.** The tar sands of Alberta, Canada: [Denver, Colo.] Cameron Engineers, 78 p., illus., tables, 1970.
- Camp, Mark J.** See Hatfield, Craig B. 00567
- 05416 **Campana, M. E.** Jointing and foliation in Petersburg granite near Richmond [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 132, 1970.
- Campbell, D. L.** See Edgington, A. N. 10035
- 07366 **Campbell, David Lowell.** The loading problem for a viscoelastic earth [abs.]: *Disert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 4, p. 2069B, 1970.
- 05469 **Campbell, Donald H.** Depositional environments of the Mountain facies in the Yucca Formation, southern Quitman Mountains, Hudspeth County, Texas, in *Geology of the southern Quitman Mountains area, Trans-Pecos Texas — S.E.P.M. Permian Basin Sec.*, 1970 Biennial Field Trip, Symposium and Guidebook: Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub. 70-12, p. 70-75, illus., 1970.
- 11258 **Campbell, F. H. A.; Bailes, A. H.; Ruttan, G. D.; Spooner, A.** Comparative geology and mineral deposits of the Flin Flon-Snow Lake and Lynn Lake-Fox Lake areas — Guidebook, Field Trip No. 2 of Geol. Assoc. Canada — Mineralog. Assoc. Canada Joint Ann. Mtg., 23d. Winnipeg, 1970: [Winnipeg (?), Manitoba Dept. Mines and Nat. Resources Geol. Div.], 80 p., illus., geol. maps, 1970.
- 07163 **Campbell, G. E.** Southeast portion of East area, Strand oil field: *California Oil Fields — Summ. Operations* 1970, v. 56, no. 1, p. 25-32, illus., tables, 1970.
- 03314 **Campbell, Ian A.** Micro-relief measurements on unvegetated shale slopes: *Prof. Geographer*, v. 22, no. 4, p. 215-220, illus., table, 1970.
- 04929 **Campbell, Ian A.** Erosion rates in the Steeple Badlands, Alberta [with French abs., p. 269]: *Canadian Geographer*, v. 14, no. 3, p. 202-216, illus., tables, 1970.
- 04489 **Campbell, J. F.; Coulbourn, W. T.; Moberly, R., Jr.; Rosendahl, B. R.** Reconnaissance sand inventory, off leeward Oahu: *Hawaii Inst. Geophysics [Rept.]* HIG-70-16, 14 p., illus., tables, 1970.
- Campbell, J. F.** See Furumoto, A. S. 04925
- Campbell, J. R.** See Igarashi, Y. 08623
- 00408 **Campbell, John A.** Stratigraphy of Chaffee Group (Upper Devonian), west-central Colorado: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 2, p. 313-325, illus., table, 1970.
- 03155 **Campbell, John A.** Petrology of Devonian shelf carbonates of west central Colorado: *Mtn. Geologist*, v. 7, no. 2, p. 89-97, illus., table, 1970.
- 01186 **Campbell, K. Vincent; Miers, John H.; Nichols, Bruce M.; Oliphant, Jerrellyn; Pytlak, Shirley; Race, Ronald W.; Shaw, George H.; Gresens, Randall L.** A survey of thermal springs in Washington State: *Northwest Sci.*, v. 44, no. 1, p. 1-11, illus., tables, 1970.

**Campbell, Lyle.** See Kauffman, Marvin E. 02637

**Campbell, M. J.** See Gold, T. 06278

- 10283 **Campbell, P. I.; Reid, I. A.; Shastal, J.** Glacier survey in Alberta: Canada Dept. Energy, Mines and Resources Inland Waters Br. Rept. Ser. 4, 15 p., illus., tables, 1969.
- 03277 **Campbell, R. B.** Structural and metamorphic transitions from infrastructure to suprastructure, Cariboo Mountains, British Columbia, *in* Structure of the southern Canadian Cordillera: Geol. Assoc. Canada Spec. Paper 6, p. 67-72, illus., 1970.
- 07899 **Campbell, R. B.; Charlesworth, H. A. K.** Geology of the region between Prince George and Jasper, *in* Peace River, Pine Pass, Yellowhead, 1970 — Edmonton Geol. Soc. Field Conf., 12th, Guidebook: Edmonton, Alberta, Edmonton Geological Society, p. 84-93, illus., table, 1970.
- 04302 **Campbell, Richard B.; Tipper, Howard W.** Geology and mineral exploration potential of the Quesnel Trough, British Columbia: Canadian Mining and Metall. Bull., v. 63, no. 699, p. 785-790, illus., geol. maps, 1970.
- 02171 **Campbell, Robert E.** Geophysical exploration moves ahead on two planets [sic]: Mining Eng., v. 22, no. 2, p. 82-87, illus., table, 1970.
- Campbell, Robert, Jr.** See Lyon, R. J. P. 09803
- 08213 **Campbell, William J.; Rasmussen, Lowell A.** A heuristic numerical model for three-dimensional time-dependent glacier flow, *in* Internat. Symposium on Antarctic Glaciological Exploration (ISAGE), Hanover, N.H., 1968 [Proc.]: Internat. Assoc. Sci. Hydrology (and Sci. Comm. Antarctic Research) Pub. 86, p. 177-190, illus., 1970.
- Campbell, William J.** See Green, Thomas E. 09463
- Campbell, William J.** See Johnson, Noye M. 10725
- 10282 **Campos Morataya, Ernesto; Bourne, W. Clinton.** Levantamiento general de suelos, cuadrante 2557-III sesori [general survey of soils, quadrant 2557-III Sesori]; [San Salvador] el Salvador, Ministerio de Agricultura y Ganaderia, scale 1:50,000, with text, 1967.
- 02828 **Canada Dept. Indian Affairs** (and Northern Development). Recent and future mineral developments in northern Canada: Polar Rec., v. 15, no. 95, p. 151-166, illus., tables, 1970.
- 09185 **Canada Dept. Energy, Mines, Resources.** (Observatories Branch). Bouguer gravity anomaly map of Canada: Ottawa, Canada Dept. Energy, Mines and Resources, Observatories Br., scale 1:5,000,000, 1969.
- 00395 **Canada Geological Survey.** Geological maps published by the Geological Survey of Canada — Index sheet 43, Ontario-District of Keewatin: Ottawa, Ontario, Geol. Survey Canada, scale 1:1,000,000, 1970.
- 00396 **Canada Geological Survey.** Geological maps published by the Geological Survey of Canada — Index sheet 66, 76, District of Mackenzie-District of Keewatin: Ottawa, Ontario, Geol. Survey Canada, scale 1:1,000,000, 1970.
- 00397 **Canada Geological Survey.** Geological maps published by the Geological Survey of Canada — Index sheet 72, Saskatchewan-Alberta: Ottawa, Ontario, Geol. Survey Canada, scale 1:1,000,000, 1970.
- 00398 **Canada Geological Survey.** Geological maps published by the Geological Survey of Canada — Index sheet 82, British Columbia-Alberta: Ottawa, Ontario, Geol. Survey Canada, scale 1:1,000,000, 1970.

- 00399 **Canada Geological Survey.** Geological maps published by the Geological Survey of Canada — Index sheet 86, 96, District of Mackenzie: Ottawa, Ontario, Geol. Survey Canada, scale 1:1,000,000, 1970.
- 00662 **Canada Geological Survey.** Geological maps published by the Geological Survey of Canada — Index Sheet 53, Ontario-Manitoba: Ottawa, Ontario, Geol. Survey Canada, scale 1:1,000,000, 1970.
- 00663 **Canada Geological Survey.** Geological maps published by the Geological Survey of Canada — Index Sheets 62 and 64, Manitoba-Saskatchewan: Ottawa, Ontario, Geol. Survey Canada, scale 1:1,000,000, 1970.
- 00664 **Canada Geological Survey.** Geological maps published by the Geological Survey of Canada — Index Sheet 73, Saskatchewan-Alberta: Ottawa, Ontario, Geol. Survey Canada, scale 1:1,000,000, 1970.
- 00665 **Canada Geological Survey.** Geologic maps published by the Geological Survey of Canada — Index Sheet 87,97, District of Franklin-District of Mackenzie: Ottawa, Ontario, Geol. Survey Canada, scale 1:1,000,000, 1970.
- 00982 **Canada Geological Survey.** Aeromagnetic series, Codroy, Newfoundland: Canada Geol. Survey Geophysics Paper 4489, scale 1:63,360, 1970.
- 00983 **Canada Geological Survey.** Aeromagnetic series, Grandys Lake, Newfoundland: Canada Geol. Survey Geophysics Paper 4490, scale 1:63,360, 1970.
- 00984 **Canada Geological Survey.** Aeromagnetic series, Sound Island, Newfoundland: Canada Geol. Survey Geophysics Paper 4499, scale 1:63,360, 1970.
- 00985 **Canada Geological Survey.** Aeromagnetic series, Sunnyside, Newfoundland: Canada Geol. Survey Geophysics Paper 4500, scale 1:63,360, 1970.
- 00986 **Canada Geological Survey.** Aeromagnetic series, Heart's Content, Newfoundland: Canada Geol. Survey Geophysics Paper 4501, scale 1:63,360, 1970.
- 00987 **Canada Geological Survey.** Aeromagnetic series, Pouch Cove, Newfoundland: Canada Geol. Survey Geophysics Paper 4502, scale 1:63,360, 1970.
- 00988 **Canada Geological Survey.** Aeromagnetic series, Port aux Basques, Newfoundland: Canada Geol. Survey Geophysics Paper 4503, scale 1:63,360, 1970.
- 00989 **Canada Geological Survey.** Aeromagnetic series, Rose Blanche, Newfoundland: Canada Geol. Survey Geophysics Paper 4504, scale 1:63,360, 1970.
- 00990 **Canada Geological Survey.** Aeromagnetic series, La Poile, Newfoundland: Canada Geol. Survey Geophysics Paper 4505, scale 1:63,360, 1970.
- 00991 **Canada Geological Survey.** Aeromagnetic series, Burgeo, Newfoundland: Canada Geol. Survey Geophysics Paper 4506, scale 1:63,360, 1970.
- 00992 **Canada Geological Survey.** Aeromagnetic series, Ramea, Newfoundland: Canada Geol. Survey Geophysics Paper 4507, scale 1:63,360, 1970.
- 00993 **Canada Geological Survey.** Aeromagnetic series, La Hune, Newfoundland: Canada Geol. Survey Geophysics Paper 4508, scale 1:63,360, 1970.
- 00994 **Canada Geological Survey.** Aeromagnetic series, Facheux Bay, Newfoundland: Canada Geol. Survey Geophysics Paper 4509, scale 1:63,360, 1970.
- 00995 **Canada Geological Survey.** Aeromagnetic series, Gaultois, Newfoundland: Canada Geol. Survey Geophysics Paper 4510, scale 1:63,360, 1970.
- 00996 **Canada Geological Survey.** Aeromagnetic series, Belleoram, Newfoundland: Canada Geol. Survey Geophysics Paper 4511, scale 1:63,360, 1970.

- 00997 **Canada Geological Survey.** Aeromagnetic series, Terrenceville, Newfoundland: Canada Geol. Survey Geophysics Paper 4512, scale 1:63,360, 1970.
- 00998 **Canada Geological Survey.** Aeromagnetic series, Harbour Buffet, Newfoundland: Canada Geol. Survey Geophysics Paper 4513, scale 1:63,360, 1970.
- 00999 **Canada Geological Survey.** Aeromagnetic series, Dildo, Newfoundland: Canada Geol. Survey Geophysics Paper 4514, scale 1:63,360, 1970.
- 01000 **Canada Geological Survey.** Aeromagnetic series, Harbour Grace, Newfoundland: Canada Geol. Survey Geophysics Paper 4515, scale 1:63,360, 1970.
- 01001 **Canada Geological Survey.** Aeromagnetic series, St. John's, Newfoundland: Canada Geol. Survey Geophysics Paper 4516, scale 1:63,360, 1970.
- 01002 **Canada Geological Survey.** Aeromagnetic series, Sandy Narrows, Saskatchewan: Canada Geol. Survey Geophysics Paper 4584, scale 1:63,360, 1970.
- 01003 **Canada Geological Survey.** Aeromagnetic series, Pelican Narrows, Saskatchewan: Canada Geol. Survey Geophysics Paper 4585, scale 1:63,360, 1970.
- 01004 **Canada Geological Survey.** Aeromagnetic series, Attitti Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4586, scale 1:63,360, 1970.
- 01005 **Canada Geological Survey.** Aeromagnetic series, Strange Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4617, scale 1:63,360, 1970.
- 01006 **Canada Geological Survey.** Aeromagnetic series, Crean Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4618, scale 1:63,360, 1970.
- 01007 **Canada Geological Survey.** Aeromagnetic series, Montreal Lake South, Saskatchewan: Canada Geol. Survey Geophysics Paper 4619, scale 1:63,360, 1970.
- 01008 **Canada Geological Survey.** Aeromagnetic series, Whiteswan Lakes, Saskatchewan: Canada Geol. Survey Geophysics Paper 4620, scale 1:63,360, 1970.
- 01009 **Canada Geological Survey.** Aeromagnetic series, Summit Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4621, scale 1:63,360, 1970.
- 01010 **Canada Geological Survey.** Aeromagnetic series, Scarth River, Saskatchewan: Canada Geol. Survey Geophysics Paper 4622, scale 1:63,360, 1970.
- 01011 **Canada Geological Survey.** Aeromagnetic series, Red Bobs Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4623, scale 1:63,360, 1970.
- 01012 **Canada Geological Survey.** Aeromagnetic series, Erickson Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4624, scale 1:63,360, 1970.
- 01013 **Canada Geological Survey.** Aeromagnetic series, Pinebluff Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4625, scale 1:63,360, 1970.
- 01014 **Canada Geological Survey.** Aeromagnetic series, Archibald Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4626, scale 1:63,360, 1970.
- 01015 **Canada Geological Survey.** Aeromagnetic series, Sheet 37 C/16, District of Franklin, Northwest Territories: Canada Geol. Survey Geophysics Paper 4729, scale 1:63,360, 1970.
- 01016 **Canada Geological Survey.** Aeromagnetic series, Sheet 37 F/1, District of Franklin, Northwest Territories: Canada Geol. Survey Geophysics Paper 4730, scale 1:63,360, 1970.
- 01017 **Canada Geological Survey.** Aeromagnetic series, Sheet 37 F/8, District of Franklin, Northwest Territories: Canada Geol. Survey Geophysics Paper 4731, scale 1:63,360, 1970.



- 01018 **Canada Geological Survey.** Aeromagnetic series, Sheet 37 F/9, District of Franklin, Northwest Territories: Canada Geol. Survey Geophysics Paper 4732, scale 1:63,360, 1970.
- 01019 **Canada Geological Survey.** Aeromagnetic series, Sheet 37 F/16, District of Franklin, Northwest Territories: Canada Geol. Survey Geophysics Paper 4733, scale 1:63,360, 1970.
- 01020 **Canada Geological Survey.** Aeromagnetic series, Sheet 37 G/1, District of Franklin, Northwest Territories: Canada Geol. Survey Geophysics Paper 4734, scale 1:63,360, 1970.
- 01021 **Canada Geological Survey.** Aeromagnetic series, Sheet 37 G/8, District of Franklin, Northwest Territories: Canada Geol. Survey Geophysics Paper 4735, scale 1:63,360, 1970.
- 01022 **Canada Geological Survey.** Aeromagnetic series, Sheet 37 G/9, District of Franklin, Northwest Territories: Canada Geol. Survey Geophysics Paper 4736, scale 1:63,360, 1970.
- 01023 **Canada Geological Survey.** Aeromagnetic series, Settee Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4791, scale 1:63,360, 1970.
- 01024 **Canada Geological Survey.** Aeromagnetic series, Kelly Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4792, scale 1:63,360, 1970.
- 01025 **Canada Geological Survey.** Aeromagnetic series, Steephill Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4793, scale 1:63,360, 1970.
- 01026 **Canada Geological Survey.** Aeromagnetic series, Scimitar Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4794, scale 1:63,360, 1970.
- 01027 **Canada Geological Survey.** Aeromagnetic series, Sheet 63 M/16, Saskatchewan: Canada Geol. Survey Geophysics Paper 4795, scale 1:63,360, 1970.
- 01028 **Canada Geological Survey.** Aeromagnetic series, Glennie Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4802, scale 1:63,360, 1970.
- 01029 **Canada Geological Survey.** Aeromagnetic series, Conjuring River, Saskatchewan: Canada Geol. Survey Geophysics Paper 4803, scale 1:63,360, 1970.
- 01030 **Canada Geological Survey.** Aeromagnetic series, Wintego Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4804, scale 1:63,360, 1970.
- 01031 **Canada Geological Survey.** Aeromagnetic series, Island Falls, Saskatchewan: Canada Geol. Survey Geophysics Paper 4805, scale 1:63,360, 1970.
- 01032 **Canada Geological Survey.** Aeromagnetic series, Trade Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4812, scale 1:63,360, 1970.
- 01033 **Canada Geological Survey.** Aeromagnetic series, Manawan Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4813, scale 1:63,360, 1970.
- 01034 **Canada Geological Survey.** Aeromagnetic series, Marchel Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4814, scale 1:63,360, 1970.
- 01035 **Canada Geological Survey.** Aeromagnetic series, Nemei Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4815, scale 1:63,360, 1970.
- 01036 **Canada Geological Survey.** Aeromagnetic series, Maynard Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4822, scale 1:63,360, 1970.
- 01037 **Canada Geological Survey.** Aeromagnetic series, Kenny Creek, British Columbia: Canada Geol. Survey Geophysics Paper 5261, scale 1:63,360, 1970.

- 01038 **Canada Geological Survey.** Aeromagnetic series, Ankwill Creek, British Columbia: Canada Geol. Survey Geophysics Paper 5262, scale 1:63,360, 1970.
- 01039 **Canada Geological Survey.** Aeromagnetic series, Nilkitkwa River, British Columbia: Canada Geol. Survey Geophysics Paper 5263, scale 1:63,360, 1970.
- 01040 **Canada Geological Survey.** Aeromagnetic series, Gunanoot Lake, British Columbia: Canada Geol. Survey Geophysics Paper 5264, scale 1:63,360, 1970.
- 01041 **Canada Geological Survey.** Aeromagnetic series, Kisgegas, British Columbia: Canada Geol. Survey Geophysics Paper 5265, scale 1:63,360, 1970.
- 01042 **Canada Geological Survey.** Aeromagnetic series, Shedrin Creek, British Columbia: Canada Geol. Survey Geophysics Paper 5274, scale 1:63,360, 1970.
- 01043 **Canada Geological Survey.** Aeromagnetic series, Hilary Lake, British Columbia: Canada Geol. Survey Geophysics Paper 5283, scale 1:63,360, 1970.
- 01044 **Canada Geological Survey.** Aeromagnetic series, Kotsine River, British Columbia: Canada Geol. Survey Geophysics Paper 5284, scale 1:63,360, 1970.
- 01045 **Canada Geological Survey.** Aeromagnetic series, Lion Creek, British Columbia: Canada Geol. Survey Geophysics Paper 5285, scale 1:63,360, 1970.
- 01046 **Canada Geological Survey.** Aeromagnetic series, Ogden Creek, British Columbia: Canada Geol. Survey Geophysics Paper 5286, scale 1:63,360, 1970.
- 01256 **Canada Geological Survey.** Geological maps published by the Geological Survey of Canada — Index sheet 23, Quebec-Newfoundland: Ottawa, Ontario, Geol. Survey Canada, scale 1:1,000,000, revised 1970.
- 01257 **Canada Geological Survey.** Geological maps published by the Geological Survey of Canada — Index sheet 67, 77, District of Franklin-District of Mackenzie-District of Keewatin: Ottawa, Ontario, Geol. Survey Canada, scale 1:1,000,000, revised 1970.
- 01258 **Canada Geological Survey.** Geological maps published by the Geological Survey of Canada — Index sheet 83, Alberta-British Columbia: Ottawa, Ontario, Geol. Survey Canada, scale 1:1,000,000, revised 1970.
- 01259 **Canada Geological Survey.** Geological maps published by the Geological Survey of Canada — Index sheets 94 and 103, British Columbia: Ottawa, Ontario, Geol. Survey Canada, scale 1:1,000,000, revised 1970.
- 01355 **Canada Geological Survey.** Geological maps published by the Geological Survey of Canada — Index sheets 48, 58 and 59, 69, 79, District of Franklin: Ottawa, Ontario, Geol. Survey Canada, scale 1:1,000,000, revised 1970.
- 01387 **Canada Geological Survey.** Aeromagnetic series, Sheets 16 K/5 and K/6, 16K/11 and 16 K/12, 16 K/13 and K/14, Baffin Island, District of Franklin: Canada Geol. Survey Geophysics Papers 5434-5436, scale 1:63,360, 1970.
- 01388 **Canada Geological Survey.** Aeromagnetic series, Sheet 16 N/3 and 16 N/4, Baffin Island, District of Franklin: Canada Geol. Survey Geophysics Paper 5437, scale 1:63,360, 1970.
- 01389 **Canada Geological Survey.** Aeromagnetic series, Sheet 16 L/1 and Sheet 16 L/2 and part of 16 K/4, Baffin Island, District of Franklin: Canada Geol. Survey Geophysics Paper 5438, scale 1:63,360, 1970.
- 01390 **Canada Geological Survey.** Aeromagnetic series, Sheets 16 L/7 and 16 L/8, 16 L/9 and 16 L/10, 16 L/15 and 16 L/16, 16 L/3 and 16 L/4, 16 L/5 and 16 L/6, 16 L/11, and 16 L/12, 16 L/13 and 16 L/14, Baffin Island, District of Franklin: Canada Geol. Survey Geophysics Papers 5439-5447, scale 1:63,360, 1970.

- 01391 **Canada Geological Survey.** Aeromagnetic series, Sheets 16 M/1 and 16 M/2, 16 M/7 and 16 M/8, 16 M/3 and 16 M/4, 16 M/5 and 16 M/6, 16 M/11 and 16 M/12, Baffin Island, District of Franklin: Canada Geol. Survey Geophysics Papers 5442-5443, 5448-5450, scale 1:63,360, 1970.
- 01392 **Canada Geological Survey.** Aeromagnetic series, Sheets 26 L/1 and 26 L/2, 26 L/7 and 26 L/8, 26 L/9 and 26 L/10, 26 L/15 and 26 L/16, Baffin Island, District of Franklin: Canada Geol. Survey Geophysics Papers 5516-5519, scale 1:63,360, 1970.
- 01393 **Canada Geological Survey.** Aeromagnetic series, Sheets 26 M/1 and 26 M/2, 26 M/7 and 26 M/8, 26 M/9 and 26 M/10, 26 M/15 and 26 M/16, 26 M/3 and 26 M/4, 26 M/5 and 26 M/6, 26 M/11 and 26 M/12, 26 M/13 and 26 M/14, Baffin Island, District of Franklin: Canada Geol. Survey Geophysics Papers 5520-5523, 5528-5531, scale 1:63,360, 1970.
- 01394 **Canada Geological Survey.** Aeromagnetic series, Sheets 27 B/3, 27 B/6, 27 B/11, 27 B/14, 27 B/4, 27 B/5, 27 B/12, 27 B/13, Baffin Island, District of Franklin: Canada Geol. Survey Geophysics Papers 5524-5527, 5532-5533, scale 1:63,360, 1970.
- 01395 **Canada Geological Survey.** Aeromagnetic series, Sheets 36 P/1 and 36 P/2, 36 P/7 and 36 P/8, 36 P/9 and 36 P/10, 36 P/15 and 36 P/16, Baffin Island, District of Franklin: Canada Geol. Survey Geophysics Papers 5536-5539, scale 1:63,360, 1970.
- 01396 **Canada Geological Survey.** Aeromagnetic series, Sheets 37 A/1, 37 A/8, 37 A/9, 37 A/16, 37 A/7 and part of 37 A/2, 37 A/10, 37 A/15, 37 A/11, 37 A/14, Baffin Island, District of Franklin: Canada Geol. Survey Geophysics Papers 5540-5548, scale 1:63,360, 1970.
- 01397 **Canada Geological Survey.** Aeromagnetic series, Bonavista, Newfoundland: Canada Geol. Survey Geophysics Paper 7047, scale 1:253,440, 1970.
- 01398 **Canada Geological Survey.** Aeromagnetic series, Wesleyville, Newfoundland: Canada Geol. Survey Geophysics Paper 7347, scale 1:253,440, 1970.
- 01399 **Canada Geological Survey.** Aeromagnetic series, Botwood, Newfoundland: Canada Geol. Survey Geophysics Paper 7348, scale 1:253,440, 1970.
- 01400 **Canada Geological Survey.** Aeromagnetic series, Sandy Lake, Newfoundland: Canada Geol. Survey Geophysics Paper 7349, scale 1:253,440, 1970.
- 01401 **Canada Geological Survey.** Aeromagnetic series, Bay of Islands, Newfoundland: Canada Geol. Survey Geophysics Paper 7350, scale 1:253,440, 1970.
- 01402 **Canada Geological Survey.** Aeromagnetic series, Port Saunders, Newfoundland: Canada Geol. Survey Geophysics Paper 7357, scale 1:253,440, 1970.
- 01403 **Canada Geological Survey.** Aeromagnetic series, St. Anthony, Newfoundland: Canada Geol. Survey Geophysics Paper 7366, scale 1:253,440, 1970.
- 01404 **Canada Geological Survey.** Aeromagnetic series, McBeth Fiord, District of Franklin, Northwest Territories: Canada Geol. Survey Geophysics Paper 7956, scale 1:253,440, 1970.
- 01405 **Canada Geological Survey.** Aeromagnetic series, Lake Gillian, District of Franklin, Northwest Territories: Canada Geol. Survey Geophysics Paper 7957, scale 1:253,440, 1970.
- 01406 **Canada Geological Survey.** Aeromagnetic series, Conn Lake, District of Franklin, Northwest Territories: Canada Geol. Survey Geophysics Paper 7978, scale 1:253,440, 1970.
- 01407 **Canada Geological Survey.** Aeromagnetic series, Buchan Gulf, District of Franklin, Northwest Territories: Canada Geol. Survey Geophysics Paper 7999, scale 1:253,440, 1970.

- 01458 **Canada Geological Survey.** Physiographic regions of Canada: Canada Geol. Survey Map 1254A, scale 1:5,000,000, 1970.
- 02319 **Canada Geological Survey.** Aeromagnetic series, Iskwasum Lake, Manitoba (2d edition): Canada Geol. Survey Geophysics Paper 2461, scale 1:63,360, 1970; originally published 1963.
- 02320 **Canada Geological Survey.** Aeromagnetic series, Elbow Lake, Manitoba (2d edition): Canada Geol. Survey Geophysics Paper 2462, scale 1:63,360, 1970; originally published 1963.
- 02321 **Canada Geological Survey.** Aeromagnetic series, Tramping Lake, Manitoba (2d edition): Canada Geol. Survey Geophysics Paper 2465, scale 1:63,360, 1970; originally published 1963.
- 02322 **Canada Geological Survey.** Aeromagnetic series, Sheets 26 I/1 and 26 I/2, 26 I/7 and 26 I/8, 26 I/9 and 26 I/10, 26 I/15 and 26 I/16, Baffin Island, District of Franklin: Canada Geol. Survey Geophysics Papers 5451-5454, scale 1:63,360, 1970
- 02323 **Canada Geological Survey.** Aeromagnetic series, Sheets 26 P/1 and 26 P/2, 26 P/7 and 26 P/8, 26 P/9 and 26 P/10, 26 P/15 and 26 P/16, Baffin Island, District of Franklin: Canada Geol. Survey Geophysics Papers 5455-5458, scale 1:63,360, 1970
- 02324 **Canada Geological Survey.** Aeromagnetic series, Sheet 27 A/1, Baffin Island, District of Franklin: Canada Geol. Survey Geophysics Paper 5459, scale 1:63,360, 1970
- 02325 **Canada Geological Survey.** Aeromagnetic series, Cormorant Lake, Manitoba-Saskatchewan (2d edition): Canada Geol. Survey Geophysics Paper 7024, scale 1:253,440, 1970; originally published 1965.
- 02326 **Canada Geological Survey.** Aeromagnetic series, Hazelton, British Columbia: Canada Geol. Survey Geophysics Paper 7768, scale 1:253,440, 1970.
- 02327 **Canada Geological Survey.** Aeromagnetic series, File Lake, Manitoba: Canada Geol. Survey Geophysics Paper 8455, scale 1:63,360, 1970.
- 02768 **Canada Geological Survey.** Geological maps published by the Geological Survey of Canada — Index Sheet 93, British Columbia: Ottawa, Ontario, Geol. Survey Canada, scale 1:1,000,000, revised 1970.
- 02769 **Canada Geological Survey.** Geological maps published by the Geological Survey of Canada — Index Sheets 29, 39, 49, and 68, 78, District of Franklin: Ottawa, Ontario, Geol. Survey Canada, scale 1:1,000,000, revised 1970.
- 03050 **Canada Geological Survey.** Abstracts of publications in scientific journals by officers of the Geological Survey of Canada, April 1969 to March 1970: Canada Geol. Survey Paper 70-4, 42 p., 1970.
- 03054 **Canada Geological Survey.** Geological Survey of Canada field activities, 1970: Canada Geol. Survey [Prelim. Ser.] Map 1-1970, scale about 1 in. to 222 mi., 1970.
- 03335 **Canada Geological Survey.** Aeromagnetic series, Bentley Bay, Saskatchewan: Canada Geol. Survey Geophysics Paper 4786, scale 1:63,360, 1970.
- 03836 **Canada Geological Survey.** Aeromagnetic series, Belanger, Saskatchewan: Canada Geol. Survey Geophysics Paper 4787, scale 1:63,360, 1970.
- 03837 **Canada Geological Survey.** Aeromagnetic series, Pinehouse Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4796, scale 1:63,360, 1970.
- 03838 **Canada Geological Survey.** Aeromagnetic series, Sandfly Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4797, scale 1:63,360, 1970.
- 03839 **Canada Geological Survey.** Aeromagnetic series, Black Bear Island Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4798, scale 1:63,360, 1970.

- 03840 **Canada Geological Survey.** Aeromagnetic series, Agumik Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4806, scale 1:63,360, 1970.
- 03841 **Canada Geological Survey.** Aeromagnetic series, Bar Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4807, scale 1:63,360, 1970.
- 03842 **Canada Geological Survey.** Aeromagnetic series, Clam Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4808, scale 1:63,360, 1970.
- 03843 **Canada Geological Survey.** Aeromagnetic series, McLurg Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4816, scale 1:63,360, 1970.
- 03844 **Canada Geological Survey.** Aeromagnetic series, Moose Portage, Saskatchewan: Canada Geol. Survey Geophysics Paper 4817, scale 1:63,360, 1970.
- 03845 **Canada Geological Survey.** Aeromagnetic series, Morin Lake, Saskatchewan: Canada Geol. Survey Geophysics Paper 4818, scale 1:63,360, 1970.
- 03846 **Canada Geological Survey.** Aeromagnetic series, La Ronge, Saskatchewan: Canada Geol. Survey Geophysics Paper 4819, scale 1:63,360, 1970.
- 03847 **Canada Geological Survey.** Aeromagnetic series, Hunter Bay, Saskatchewan: Canada Geol. Survey Geophysics Paper 4820, scale 1:63,360, 1970.
- 03848 **Canada Geological Survey.** Aeromagnetic series, Sheets 65 L/5, 65 L/6, 65 L/7, 65 L/8, District of Mackenzie, Northwest Territories: Canada Geol. Survey Geophysics Papers 6886-6889, scale 1:63,360, 1970.
- 03849 **Canada Geological Survey.** Aeromagnetic series, Sheets 65 K/5, 65 K/6, 65 K/7, 65 K/8, District of Keewatin, Northwest Territories: Canada Geol. Survey Geophysics Papers 6890-6893, scale 1:63,360, 1970.
- 03850 **Canada Geological Survey.** Aeromagnetic series, Sheets 65 J/5, 65 J/6, 65 J/7, 65 J/8, District of Keewatin, Northwest Territories: Canada Geol. Survey Geophysics Papers 6894-6897, scale 1:63,360, 1970.
- 03895 **Canada Geological Survey.** Aeromagnetic series, Sheets 13 C/1, 13 C/8, 13 C/9, 13 C/16, 13 K/8, 13 K/16, Newfoundland: Canada Geol. Survey Geophysics Papers 5922, 5942, 5973, 5992, 6091, 6136, 6180, scale 1:63,360, 1970.
- 03896 **Canada Geological Survey.** Aeromagnetic series, Traverspine River, Newfoundland: Canada Geol. Survey Geophysics Paper 6023, scale 1:63,360, 1970.
- 03897 **Canada Geological Survey.** Aeromagnetic series, Goose Bay, Newfoundland: Canada Geol. Survey Geophysics Paper 6042, scale 1:63,360, 1970.
- 03898 **Canada Geological Survey.** Aeromagnetic series, North West River, Newfoundland: Canada Geol. Survey Geophysics Paper 6073, scale 1:63,360, 1970.
- 03899 **Canada Geological Survey.** Aeromagnetic series, Mulligan River, Newfoundland: Canada Geol. Survey Geophysics Paper 6122, scale 1:63,360, 1970.
- 03900 **Canada Geological Survey.** Aeromagnetic series, West Micmac Lake, Newfoundland: Canada Geol. Survey Geophysics Paper 6167, scale 1:63,360, 1970.
- 04098 **Canada Geological Survey.** Report of activities — Pt. B., November 1969 to March 1970: Canada Geol. Survey Paper 70-1, pt. B, 99 p., illus., tables, 1970.
- 04099 **Canada Geological Survey.** 1969-1970 index of publications of the Geological Survey of Canada: Canada Geol. Survey Paper 70-3, 76 p., 1970.
- 04190 **Canada Geological Survey.** Nickel in Canada: Canada Geol. Survey Map 1258A, scale 1:5,000,000, text, 1970.

- 05131 **Canada Geological Survey.** Aeromagnetic series, Toronto, Ontario: Canada Geol. Survey Geophysics Paper 7334, scale 1:253,440, 1970.
- 05132 **Canada Geological Survey.** Aeromagnetic series, Kitchener, Ontario: Canada Geol. Survey Geophysics Paper 7335, scale 1:253,440, 1970.
- 05133 **Canada Geological Survey.** Aeromagnetic series, Bruce, Ontario: Canada Geol. Survey Geophysics Paper 7341, scale 1:253,440, 1970.
- 05134 **Canada Geological Survey.** Aeromagnetic series, Tichborne, Ontario: Canada Geol. Survey Geophysics Paper 8380, scale 1:63,360, 1970.
- 05135 **Canada Geological Survey.** Aeromagnetic series, Westport, Ontario: Canada Geol. Survey Geophysics Paper 8381, scale 1:63,360, 1970.
- 05136 **Canada Geological Survey.** Aeromagnetic series, Brockville, Ontario: Canada Geol. Survey Geophysics Paper 8382, scale 1:63,360, 1970.
- 05137 **Canada Geological Survey.** Aeromagnetic series, Port Elgin, Ontario: Canada Geol. Survey Geophysics Paper 8383, scale 1:63,360, 1970.
- 05138 **Canada Geological Survey.** Aeromagnetic series, Markdale, Ontario: Canada Geol. Survey Geophysics Paper 8384, scale 1:63,360, 1970.
- 05139 **Canada Geological Survey.** Aeromagnetic series, Collingwood, Ontario: Canada Geol. Survey Geophysics Paper 8385, scale 1:63,360, 1970.
- 05140 **Canada Geological Survey.** Aeromagnetic series, Barrie, Ontario: Canada Geol. Survey Geophysics Paper 8386, scale 1:63,360, 1970.
- 05141 **Canada Geological Survey.** Aeromagnetic series, Beaverton, Ontario: Canada Geol. Survey Geophysics Paper 8387, scale 1:63,360, 1970.
- 05142 **Canada Geological Survey.** Aeromagnetic series, Lindsay, Ontario: Canada Geol. Survey Geophysics Paper 8388, scale 1:63,360, 1970.
- 05143 **Canada Geological Survey.** Aeromagnetic series, Peterborough, Ontario: Canada Geol. Survey Geophysics Paper 8389, scale 1:63,360, 1970.
- 05144 **Canada Geological Survey.** Aeromagnetic series, Campbellford, Ontario: Canada Geol. Survey Geophysics Paper 8390, scale 1:63,360, 1970.
- 05145 **Canada Geological Survey.** Aeromagnetic series, Tweed, Ontario: Canada Geol. Survey Geophysics Paper 8391, scale 1:63,360, 1970.
- 05146 **Canada Geological Survey.** Aeromagnetic series, Sydenham, Ontario: Canada Geol. Survey Geophysics Paper 8392, scale 1:63,360, 1970.
- 05147 **Canada Geological Survey.** Aeromagnetic series, Gananoque, Ontario: Canada Geol. Survey Geophysics Paper 8393, scale 1:63,360, 1970.
- 05148 **Canada Geological Survey.** Aeromagnetic series, Mallorytown, Ontario: Canada Geol. Survey Geophysics Paper 8394, scale 1:63,360, 1970.
- 05149 **Canada Geological Survey.** Aeromagnetic series, Durham, Ontario: Canada Geol. Survey Geophysics Paper 8395, scale 1:63,360, 1970.
- 05150 **Canada Geological Survey.** Aeromagnetic series, Dundalk, Ontario: Canada Geol. Survey Geophysics Paper 8396, scale 1:63,360, 1970.
- 05151 **Canada Geological Survey.** Aeromagnetic series, Alliston, Ontario: Canada Geol. Survey Geophysics Paper 8397, scale 1:63,360, 1970.

- 05152 **Canada Geological Survey.** Aeromagnetic series, Newmarket, Ontario: Canada Geol. Survey Geophysics Paper 8398, scale 1:63,360, 1970.
- 05153 **Canada Geological Survey.** Aeromagnetic series, Scugog, Ontario: Canada Geol. Survey Geophysics Paper 8399, scale 1:63,360, 1970.
- 05154 **Canada Geological Survey.** Aeromagnetic series, Rice Lake, Ontario: Canada Geol. Survey Geophysics Paper 8400, scale 1:63,360, 1970.
- 05155 **Canada Geological Survey.** Aeromagnetic series, Trenton, Ontario: Canada Geol. Survey Geophysics Paper 8401, scale 1:63,360, 1970.
- 05156 **Canada Geological Survey.** Aeromagnetic series, Belleville, Ontario: Canada Geol. Survey Geophysics Paper 8402, scale 1:63,360, 1970.
- 05157 **Canada Geological Survey.** Aeromagnetic series, Bath, Ontario: Canada Geol. Survey Geophysics Paper 8403, scale 1:63,360, 1970.
- 05158 **Canada Geological Survey.** Aeromagnetic series, Palmerston, Ontario: Canada Geol. Survey Geophysics Paper 8404, scale 1:63,360, 1970.
- 05159 **Canada Geological Survey.** Aeromagnetic series, Orangeville, Ontario: Canada Geol. Survey Geophysics Paper 8405, scale 1:63,360, 1970.
- 05160 **Canada Geological Survey.** Aeromagnetic series, Bolton, Ontario: Canada Geol. Survey Geophysics Paper 8406, scale 1:63,360, 1970.
- 05161 **Canada Geological Survey.** Aeromagnetic series, Markham, Ontario: Canada Geol. Survey Geophysics Paper 8407, scale 1:63,360, 1970.
- 05162 **Canada Geological Survey.** Aeromagnetic series, Oshawa, Ontario: Canada Geol. Survey Geophysics Paper 8408, scale 1:63,360, 1970.
- 05163 **Canada Geological Survey.** Aeromagnetic series, Port Hope, Ontario: Canada Geol. Survey Geophysics Paper 8409, scale 1:63,360, 1970.
- 05164 **Canada Geological Survey.** Aeromagnetic series, Guelph, Ontario: Canada Geol. Survey Geophysics Paper 8410, scale 1:63,360, 1970.
- 05165 **Canada Geological Survey.** Aeromagnetic series, Brampton, Ontario: Canada Geol. Survey Geophysics Paper 8411, scale 1:63,360, 1970.
- 05166 **Canada Geological Survey.** Aeromagnetic series, Toronto, Ontario: Canada Geol. Survey Geophysics Paper 8412, scale 1:63,360, 1970.
- 05167 **Canada Geological Survey.** Aeromagnetic series, Hamilton, Ontario: Canada Geol. Survey Geophysics Paper 8413, scale 1:63,360, 1970.
- 05985 **Canada Geological Survey.** Geological maps published by the Geological Survey of Canada — Index sheet 35, Quebec-District of Franklin-District of Keewatin: Ottawa, Ontario, Geol. Survey Canada, scale 1:1,000,000, 1970.
- 05986 **Canada Geological Survey.** Geological maps published by the Geological Survey of Canada — Index sheet 75, District of Mackenzie: Ottawa, Ontario, Geol. Survey Canada, scale 1:1,000,000, 1970.
- 06193 **Canada Geological Survey.** Aeromagnetic series, Gowganda, Timiskaming District, Ontario: Canada Geol. Survey Geophysics Paper 284 (revised), scale 1:63,360, 1970; originally published 1956.
- 06194 **Canada Geological Survey.** Aeromagnetic series, Shinning Tree, Sudbury and Timiskaming Districts, Ontario: Canada Geol. Survey Geophysics Paper 285 (revised), scale 1:63,360, 1970; originally published 1957.

- 06195 **Canada Geological Survey.** Aeromagnetic series, Sinclair Lake, Sudbury and Timiskaming Districts, Ontario: Canada Geol. Survey Geophysics Paper 286 (revised), scale 1:63,360, 1970; originally published 1957.
- 06196 **Canada Geological Survey.** Aeromagnetic series, Matachewan, Timiskaming District, Ontario: Canada Geol. Survey Geophysics Paper 287 (revised), scale 1:63,360, 1970; originally published 1956.
- 06197 **Canada Geological Survey.** Aeromagnetic series, Kirkland Lake, Timiskaming District, Ontario: Canada Geol. Survey Geophysics Paper 289 (revised), scale 1:63,360, 1970; originally published 1956.
- 06198 **Canada Geological Survey.** Aeromagnetic series, Radisson Lake, Timiskaming District, Ontario: Canada Geol. Survey Geophysics Paper 290 (revised), scale 1:63,360, 1970; originally published 1956.
- 06199 **Canada Geological Survey.** Aeromagnetic series, Peterlong Lake, Sudbury and Timiskaming Districts, Ontario: Canada Geol. Survey Geophysics Paper 291 (revised), scale 1:63,360, 1970; originally published 1956.
- 06200 **Canada Geological Survey.** Aeromagnetic series, Timmins, Cochrane and Timiskaming Districts, Ontario: Canada Geol. Survey Geophysics Paper 293 (revised), scale 1:63,360, 1970; originally published 1956.
- 06201 **Canada Geological Survey.** Aeromagnetic series, Watabeag River, Cochrane and Timiskaming Districts, Ontario: Canada Geol. Survey Geophysics Paper 294 (revised), scale 1:63,360, 1970; originally published 1956.
- 06202 **Canada Geological Survey.** Aeromagnetic series, Ramore, Cochrane and Timiskaming Districts, Ontario: Canada Geol. Survey Geophysics Paper 295 (revised), scale 1:63,360, 1970; originally published 1956.
- 06203 **Canada Geological Survey.** Aeromagnetic series, Matheson, Cochrane District, Ontario: Canada Geol. Survey Geophysics Paper 296 (revised), scale 1:63,360, 1970; originally published 1956.
- 06204 **Canada Geological Survey.** Aeromagnetic series, Porquis Junction, Cochrane District, Ontario: Canada Geol. Survey Geophysics Paper 297 (revised), scale 1:63,360, 1970; originally published 1956.
- 06205 **Canada Geological Survey.** Aeromagnetic series, Pamour, Cochrane District, Ontario: Canada Geol. Survey Geophysics Paper 298 (revised), scale 1:63,360, 1970; originally published 1956.
- 06469 **Canada Geological Survey.** Aeromagnetic series, Hazelton, British Columbia: Canada Geol. Survey Geophysics Paper 7768, scale 1:253,440, 1970.
- 06529 **Canada Geological Survey.** Principal mineral areas of Canada: Canada Geol. Survey Map 900A, 20th edition, scale 1:7,603,200, 1970.
- 06530 **Canada Geological Survey.** Isotopic age map of Canada: Canada Geol. Survey Map 1256A, scale 1:5,000,000, 1970.
- 07113 **Canada Geological Survey.** Aeromagnetic series, Sheet 13 C/2, Newfoundland: Canada Geol. Survey Geophysics Paper 5921, scale 1:63,360, 1970.
- 07114 **Canada Geological Survey.** Aeromagnetic series, Sheet 13 C/7, Newfoundland: Canada Geol. Survey Geophysics Paper 5943, scale 1:63,360, 1970.
- 07115 **Canada Geological Survey.** Aeromagnetic series, Sheet 13 C/10, Newfoundland: Canada Geol. Survey Geophysics Paper 5972, scale 1:63,360, 1970.
- 07116 **Canada Geological Survey.** Aeromagnetic series, Sheet 13 C/15, Newfoundland: Canada Geol. Survey Geophysics Paper 5993, scale 1:63,360, 1970.



- 07117 **Canada Geological Survey.** Aeromagnetic series, McKenzie River, Newfoundland: Canada Geol. Survey Geophysics Paper 6022, scale 1:63,360, 1970.
- 07118 **Canada Geological Survey.** Aeromagnetic series, Goose River, Newfoundland: Canada Geol. Survey Geophysics Paper 6043, scale 1:63,360, 1970.
- 07119 **Canada Geological Survey.** Aeromagnetic series, Cape Caribou River, Newfoundland: Canada Geol. Survey Geophysics Paper 6072, scale 1:63,360, 1970.
- 07120 **Canada Geological Survey.** Aeromagnetic series, Sheet 13 F/15, Newfoundland: Canada Geol. Survey Geophysics Paper 6092, scale 1:63,360, 1970.
- 07121 **Canada Geological Survey.** Aeromagnetic series, Sheet 13 K/2, Newfoundland: Canada Geol. Survey Geophysics Paper 6121, scale 1:63,360, 1970.
- 07122 **Canada Geological Survey.** Aeromagnetic series, Sheet 13 K/7, Newfoundland: Canada Geol. Survey Geophysics Paper 6137, scale 1:63,360, 1970.
- 07123 **Canada Geological Survey.** Aeromagnetic series, Sheet 13 K/10, Newfoundland: Canada Geol. Survey Geophysics Paper 6166, scale 1:63,360, 1970.
- 07124 **Canada Geological Survey.** Aeromagnetic series, Sheet 13 K/15, Newfoundland: Canada Geol. Survey Geophysics Paper 6181, scale 1:63,360, 1970.
- 07798 **Canada Geological Survey.** Index of publications, Geological Survey of Canada (1959-1969) [with French introduction]: Ottawa, Canada, Canada Geol. Survey, 123 p., 1970.
- 08086 **Canada Geological Survey.** Aeromagnetic series, Gogama, Nipissing, Timiskaming and Sudbury Districts, Ontario: Canada Geol. Survey Geophysics Paper 7076, scale 1:253,440, 1970.
- 08087 **Canada Geological Survey.** Aeromagnetic series, Timmins, Cochrane, Timiskaming and Sudbury Districts, Ontario: Canada Geol. Survey Geophysics Paper 7085, scale 1:253,440, 1970.
- 08088 **Canada Geological Survey.** Aeromagnetic series, Kirkland Lake, east half, Timiskaming District, Ontario: Canada Geol. Survey Geophysics Paper 8429, scale 1:31,680, 1970.
- 08089 **Canada Geological Survey.** Aeromagnetic series, Ramore, east half, Cochrane and Timiskaming Districts, Ontario: Canada Geol. Survey Geophysics Paper 8430, scale 1:31,680, 1970.
- 08090 **Canada Geological Survey.** Aeromagnetic series, Matheson, east half, Cochrane District, Ontario: Canada Geol. Survey Geophysics Paper 8431, scale 1:31,680, 1970.
- 08091 **Canada Geological Survey.** Aeromagnetic series, Kirkland Lake, west half, Timiskaming District, Ontario: Canada Geol. Survey Geophysics Paper 8432, scale 1:31,680, 1970.
- 08092 **Canada Geological Survey.** Aeromagnetic series, Ramore, west half, Cochrane and Timiskaming Districts, Ontario: Canada Geol. Survey Geophysics Paper 8433, scale 1:31,680, 1970.
- 08093 **Canada Geological Survey.** Aeromagnetic series, Matheson, west half, Cochrane District, Ontario: Canada Geol. Survey Geophysics Paper 8434, scale 1:31,680, 1970.
- 08094 **Canada Geological Survey.** Aeromagnetic series, Gowganda, east half, Timiskaming District, Ontario: Canada Geol. Survey Geophysics Paper 8435, scale 1:31,680, 1970.

- 08095 **Canada Geological Survey.** Aeromagnetic series, Matachewan, east half, Timiskaming District, Ontario: Canada Geol. Survey Geophysics Paper 8436, scale 1:31,680, 1970.
- 08096 **Canada Geological Survey.** Aeromagnetic series, Radisson Lake, east half, Timiskaming District, Ontario: Canada Geol. Survey Geophysics Paper 8437, scale 1:31,680, 1970.
- 08097 **Canada Geological Survey.** Aeromagnetic series, Watabeag River, east half, Cochrane and Timiskaming Districts, Ontario: Canada Geol. Survey Geophysics Paper 8438, scale 1:31,680, 1970.
- 08098 **Canada Geological Survey.** Aeromagnetic series, Porquis Junction, east half, Cochrane District, Ontario: Canada Geol. Survey Geophysics Paper 8439, scale 1:31,680, 1970.
- 08099 **Canada Geological Survey.** Aeromagnetic series, Gowganda, west half, Timiskaming District, Ontario: Canada Geol. Survey Geophysics Paper 8440, scale 1:31,680, 1970.
- 08100 **Canada Geological Survey.** Aeromagnetic series, Matachewan, west half, Timiskaming District, Ontario: Canada Geol. Survey Geophysics Paper 8441, scale 1:31,680, 1970.
- 08101 **Canada Geological Survey.** Aeromagnetic series, Radisson Lake, west half, Timiskaming District, Ontario: Canada Geol. Survey Geophysics Paper 8442, scale 1:31,680, 1970.
- 08102 **Canada Geological Survey.** Aeromagnetic series, Watabeag River, west half, Cochrane and Timiskaming Districts, Ontario: Canada Geol. Survey Geophysics Paper 8443, scale 1:31,680, 1970.
- 08103 **Canada Geological Survey.** Aeromagnetic series, Porquis Junction, west half, Cochrane District, Ontario: Canada Geol. Survey Geophysics Paper 8444, scale 1:31,680, 1970.
- 08104 **Canada Geological Survey.** Aeromagnetic series, Shinning Tree, east half, Sudbury and Timiskaming Districts, Ontario: Canada Geol. Survey Geophysics Paper 8445, scale 1:31,680, 1970.
- 08105 **Canada Geological Survey.** Aeromagnetic series, Sinclair Lake, east half, Timiskaming and Sudbury Districts, Ontario: Canada Geol. Survey Geophysics Paper 8446, scale 1:31,680, 1970.
- 08106 **Canada Geological Survey.** Aeromagnetic series, Peterlong Lake, east half, Sudbury and Timiskaming Districts, Ontario: Canada Geol. Survey Geophysics Paper 8447, scale 1:31,680, 1970.
- 08107 **Canada Geological Survey.** Aeromagnetic series, Timmins, east half, Cochrane and Timiskaming Districts, Ontario: Canada Geol. Survey Geophysics Paper 8448, scale 1:31,680, 1970.
- 08108 **Canada Geological Survey.** Aeromagnetic series, Pamour, east half, Cochrane District, Ontario: Canada Geol. Survey Geophysics Paper 8449, scale 1:31,680, 1970.
- 08109 **Canada Geological Survey.** Aeromagnetic series, Shinning Lake, west half, Sudbury District, Ontario: Canada Geol. Survey Geophysics Paper 8450, scale 1:31,680, 1970.
- 08110 **Canada Geological Survey.** Aeromagnetic series, Sinclair Lake, west half, Sudbury District, Ontario: Canada Geol. Survey Geophysics Paper 8451, scale 1:31,680, 1970.

- 08111 **Canada Geological Survey.** Aeromagnetic series, Peterlong Lake, west half, Sudbury and Timiskaming Districts, Ontario: Canada Geol. Survey Geophysics Paper 8452, scale 1:31,680, 1970.
- 08112 **Canada Geological Survey.** Aeromagnetic series, Timmins, west half, Cochrane and Timiskaming Districts, Ontario: Canada Geol. Survey Geophysics Paper 8453, scale 1:31,680, 1970.
- 08113 **Canada Geological Survey.** Aeromagnetic series, Pamour, west half, Cochrane District, Ontario: Canada Geol. Survey Geophysics Paper 8454, scale 1:31,680, 1970.
- 10427 **Canada Geological Survey.** Geological maps published by the Geological Survey of Canada — Index Sheet 42, Ontario: Ottawa, Ontario, Canada Geol. Survey, scale 1:1,000,000, 1970.
- 10695 **Canada Natl. Research Council.** Selected bibliography of hydrology — Canada, 1965-1967: Ottawa, Canada, Natl. Research Council and Dept. Energy, Mines and Resources, 131 p., 1968.
- 10669 **Canadian Advis.Comm.Rock Mechanics.** Bibliography of Canadian contributions in the field of rock mechanics, 6th Supp., January to December, 1969: Canadian Mining and Metall. Bull., v. 63, no. 700, p. 929-930, 1970.
- 06801 **Canadian Hydrographic Service.** (compiler). Bathymetric chart, Lake Ontario (881): Ottawa, Ontario, Canada Dept. Energy, Mines and Resources, Marine Sci. Br., scale 1:400,000, 1970.
- 04503 **Caner, B.** Electrical conductivity structure in western Canada and petrological interpretation, in Symposium on multidisciplinary studies of unusual regions of the upper mantle, Madrid, Spain, 1969, Proc.: Jour. Geomagnetism and Geoelectricity, v. 22, nos. 1-2, p. 113-129, illus., 1970.
- Caner, B.** See Lajoie, J. J. 08700
- 10483 **Caner, B.; Clarke, G. K. C.; Lajoie, J. J.** Sharp lateral discontinuities in the electrical conductivity structure of the lower crust and upper mantle [abs.]: EOS, v. 51, no. 11, p. 743, 1970.
- 06885 **Caner, Bernard.** Electrical conductivity structure of the lower crust and upper mantle in western Canada [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 1, p. 258B, 1970.
- 07776 **Canney, F. C.** Remote detection of geochemical soil anomalies, in Earth Resources Aircraft Program, status review, V. 1: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 7-1—7-8, illus., tables, [1970?].
- 09297 **Canney, F. C.; Wenderoth, Sondra; Yost, Edward.** Relationship between vegetation reflectance spectra and soil geochemistry — New data from Catheart Mountain, Maine, Sec. 18 of Earth Resources Program, 3d ann., review — v. 1, Geology and geography: Houston, Tex., NASA manned Spacecraft Center, Msc-03742, p. 18-1-18-9, illus., table, 1970.
- 06087 **Cannon, Helen L.** Lithium in sediments and plants of the Basin and Range Province [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 514-515, 1970.
- 07420 **Cannon, Helen L.** Trace element excesses and deficiencies in some geochemical provinces of the United States, in Trace substances in environmental health III — Conf. on Trace Substances in Environmental Health, 3d Ann., Columbia, Mo., 1969, Proc.: Columbia, Mo., Univ. Missouri, p. 21-43, illus., tables, 1970.
- Cannon, P. J.** See Rowan, L. C. 05960
- Cannon, P. J.** See Rowan, L. C. 06236

**Cannon, P. J.** See Rowan, L. C. 07774

- 04464 **Cannon, W. F.; Gair, J. E.** A revision of stratigraphic nomenclature for middle Precambrian rocks in northern Michigan: *Geol. Soc. America Bull.*, v. 81, no. 9, p. 2843-2846, illus., 1970.
- 10480 **Cannon, Wayne H.** Feasibility of making laser strain measurements over long distances [abs.]: *EOS*, v. 51, no. 11, p. 740, 1970.
- 00034 **Cannon, William F.** Plutonic evolution of the Cutler area, Ontario: *Geol. Soc. America Bull.*, v. 81, no. 1, p. 81-94, illus., 1970.
- 08311 **Canright, James E.** Spores and associated macrofossils from the Devonian of Arizona, in Perkins, B. F., editor, *Geoscience and Man — V. 1, Proceedings of Am. Assoc. Stratig. Palynologists, Ann. Mtg., 1st, 1968: Baton Rouge, La., Louisiana State Univ., School of Geoscience*, p. 83-88, illus., 1970.

**Capelle, J. F.** See Tavenas, F. 03756

- 02461 **Capon, Jack.** Applications of detection and estimation theory to large array seismology: *IEEE Proc.*, v. 58, no. 5, p. 760-770, illus., 1970.
- 04623 **Capon, Jack.** Analysis of Rayleigh-wave multipath propagation at LASA: *Seismol. Soc. America Bull.*, v. 60, no. 5, p. 1701-1731, illus., tables, 1970.
- 00050 **Cappleman, Homer L., Jr.** Horizontal movements related to subsidence — Discussion [of paper 6336, by K. L. Lee and C. K. Chen, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, Jour. Soil Mechanics and Found. Div., no. SM 1, p. 310-317, illus., table, 1970.
- 04037 **Caramanica, Frank P.** Sedimentary control of Middle Devonian corals: *Compass*, v. 47, no. 3, p. 174-182, illus., tables, 1970.

**Card, K. D.** See McIlwaine, W. H. 02508

**Card, K. D.** See McIlwaine, W. H. 02509

- 06420 **Card, K. D.; Palonen, P.; Siemiatkowska, K.** Eden Township and parts of Bevin and Caen Townships, Louise-Eden area, District of Sudbury: Ontario Dept. Mines and Northern Affairs Prelim. Geol. Map P. 612, scale 1 in. to 1/4 mi., text, 1970.
- 06421 **Card, K. D.; Palonen, P.; Siemiatkowska, K.; Masson, S.** Dunlop Township, District of Sudbury: Ontario Dept. Mines and Northern Affairs Prelim. Geol. Map P. 613, scale 1 in. to 1/4 mi., text, 1970.
- 06422 **Card, K. D.; Palonen, P.; Siemiatkowska, K.; Masson, S.** Shakespeare Township, District of Sudbury: Ontario Dept. Mines and Northern Affairs Prelim. Geol. Map P. 614, scale 1 in. to 1/4 mi., text, 1970.

**Card, K. D.** See Robertson, J. A. 09257

- 00240 **Carder, D. S.** Trans-California seismic profile — Owens Valley to Monterey [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 78, 1970.
- 06410 **Carder, D. S.; Qamar, Anthony; McEvilly, T. V.** Trans-California seismic profile — Pahute Mesa to San Francisco Bay: *Seismol. Soc. America Bull.*, v. 60, no. 6, p. 1829-1846, illus., tables, 1970.
- 05230 **Carder, Dean S.** Seismic ground effects from nuclear explosions, in *Engineering seismology — The works of man: Geol. Soc. America Eng. Geology Case Histories*, no. 8, p. 11-17, illus., 1970.
- 05232 **Carder, Dean S.** Reservoir loading and local earthquakes, in *Engineering seismology — The works of man: Geol. Soc. America Eng. Geology Case Histories*, no. 8, p. 51-61, illus., 1970.

- 05354 **Cardinal, D. F.** Lower Cretaceous stratigraphy and its relationship to oil production in the Laramie basin, *in* Dakota and related rocks of the Front Range — Guidebook issue: Mtn. Geologist, v. 7, no. 3, p. 123-138, illus., 1970.
- 07199 **Cardwell, Dudley H.; Patchen, Douglas G.; Woodfork, Larry D.** (and others). Oil and gas fields of West Virginia, showing gas storage fields, pipelines, gasoline plants, propane plants, compressor stations, refineries, structural axes, depths to producing zones, and important wildcat wells: Morgantown, W.Va., West Virginia Geol. Survey, scale 1:250,000, separate text, 1970.
- 00078 **Cardwell, L. E.; Benton, L. F.** Analyses of natural gases, 1968: U.S. Bur. Mines Inf. Circ. 8443, 169 p., tables, 1970.
- 03165 **Cardwell, L. E.; Benton, L. F.** Analyses of natural gases, 1969: U.S. Bur. Mines Inf. Circ. 8475, 134 p., tables, 1970.
- 05240 **Carey, Walter C.** Formation of flood plain lands — Closure [to discussion by Woodyer and Neill of paper 6574, 1969]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Hydraulics Div., no. HY 10, p. 2119-2120, 1970.
- 03776 **Carl, James D.** Block faulting and development of drainage, northern Madison Mountains, Montana: Geol. Soc. America Bull., v. 81, no. 8, p. 2287-2297, illus., 1970.
- 07054 **Carlisle, V. W.; Schoon, C. L.** Stratification in a Spodosol: Soil and Crop Sci. Soc. Florida Proc. 1969, v. 29, p. 332-336, table, 1970.
- 07740 **Carlquist, Sherwin John.** Hawaii — A natural history: Garden City, New York, The Natural History Press, 463 p., illus., 1970.
- 10241 **Carlson, C. A.** Apparatus and tests for determining negative pore water pressure characteristics of desiccated clays: U.S. Army Corps Engineers Waterways Expt. Sta. Misc. Paper S-69-20, 23 p., illus., tables, 1969.
- 01059 **Carlson, Marvin P.** Lithostratigraphy of the Cambrian in the subsurface of Nebraska [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 379-380, 1970.
- 01572 **Carlson, Marvin Paul.** Stratigraphic framework of Precambrian and lower and middle Paleozoic rocks in the subsurface of Nebraska [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 9, p. 4205B, 1970.
- Carlson, P. R.** See Nelson, C. Hans. 03532
- 00241 **Carlson, Paul R.; McCulloch, David S.; Peterson, David H.; Castle, Robert W.** Comparison of acoustic reflectors and bore hole lithologies — Southern San Francisco Bay [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 78-79, 1970.
- Carlson, Paul R.** See Conomos, T. John. 00247
- 03078 **Carlson, Paul R.; Alpha, Tau R.; McCulloch, David S.** The floor of central San Francisco Bay: California Div. Mines and Geology Mineral Inf. Service, v. 23, no. 5, p. 97-107, illus., tables, 1970.
- 09296 **Carlson, Paul R.** Remote sensing in marine geology — Arctic to Caribbean, Sec. 17 of Earth Resources Program, 3d ann., review — v. 1, Geology and geography: Houston, Tex., NASA Manned Spacecraft Center, Msc-03742, p. 17-1 — 17-17, illus., 1970.
- Carlson, Richard C.** See Hearst, Joseph R. 07218
- Carlson, Robert F.** See Hartman, Charles W. 07877
- Carlson, V.** See Lennox, D. H. 02935

- 02771 **Carlson, V. A.** Bedrock topography of the Oyen map-area, NTS 72M, Alberta: [Edmonton, Alberta] Research Council Alberta, scale 1:250,000, 1970.
- 07196 **Carlson, V. A.** Bedrock topography of the Medicine Hat map-area, NTS 72L, Alberta, west of fourth meridian: Edmonton, Alberta, Research Council Alberta, scale 1:250,000, 1970.
- Carmalt, S. W.** See Armstrong, R. L. 06217
- Carman, John H.** See Gaffey, Michael J. 06987
- Carman, John H.** See Ghose, Subrata. 06988
- 03248 **Carman, John Homer.** The study of the system  $\text{NaAlSi}_3\text{O}_8\text{-Mg}_2\text{SiO}_4\text{-SiO}_2\text{-H}_2\text{O}$  from 200 to 5,000 bars and 800°C to 1100°C and its petrologic implications [abs.]: Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 5167B, 1970.
- Carman, M. F.** See Cameron, K. L. 06509
- 06088 **Carman, Max F.; Cameron, Maryellen.** Crystallization of feldspars in some alkaline rocks from the Big Bend region of Texas [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 515, 1970.
- Carmichael, C. M.** See Hayatsu, A. 02123
- 06544 **Carmichael, C. M.** The intensity of the Earth's paleomagnetic field from  $2.5 \times 10^9$  years ago to the present, Chap. 9 in *Palaeogeophysics* (S. K. Runcorn, editor): London and New York, Academic Press, p. 73-77, illus., 1970.
- 07703 **Carmichael, C. M.** The Mid-Atlantic Ridge near 45° N. — [Pt.] 7, Magnetic properties and opaque mineralogy of dredged samples: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 1, p. 239-256, illus., tables, 1970.
- Carmichael, C. M.** See Killeen, P. G. 08129
- Carmichael, C. M.** See Lilley, F. E. M. 08144
- 10772 **Carmichael, C. M.** Geomagnetism, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 200-212, 1970.
- 01453 **Carmichael, Dugald M.** Intersecting isograds in the Whetstone Lake area, Ontario: Jour. Petrology, v. 11, no. 1, p. 147-181, illus., tables, 1970.
- 01865 **Carmichael, Dugald M.; Trzcinski, W. E., Jr.** Matrix analysis of metamorphic reactions [abs.]: EOS, v. 51, no. 4, p. 445, 1970.
- Carmichael, I. S. E.** See Peterman, Zell E. 00038
- Carmichael, I. S. E.** See Peterman, Zell E. 01698
- Carmichael, I. S. E.** See Stormer, J. C., Jr. 03172
- 03177 **Carmichael, I. S. E.; Nicholls, J.; Smith, A. L.** Silica activity in igneous rocks: Am. Mineralogist, v. 55, nos. 1-2, p. 246-263, illus., table, 1970.
- Carmichael, I. S. E.** See Stormer, J. C., Jr. 06787
- Carmichael, I. S. E.** See Stormer, John C., Jr. 09590
- Carothers, James E.** See Porter, Christopher R. 02190
- Carozzi, A. V.** See Roche, J. E. 06908
- 00020 **Carozzi, Albert V.** New historical data on the origin of the theory of continental drift: Geol. Soc. America Bull., v. 81, no. 1, p. 283-285, 1970.

**Carozzi, Albert V.** See Jansa, Lubomir F. 03603

- 06678 **Carozzi, Albert V.** Robert Hooke, Rudolf Erich Raspe, and the concept of "earthquakes": *Isis*, v. 61, pt. 1, no. 206, p. 85-91, illus., 1970.

**Carpenter, David.** See Motts, Ward S. 06520

- 01308 **Carpenter, Robert H.; Hughes, Thomas C.** Geophysical and geochemical study of the Gladesville Norite in southern Jasper County, Georgia [abs.]: *Georgia Acad. Sci. Bull.*, v. 28, no. 2, p. s19, 1970.

**Carpenter, Robert H.** See Hughes, Thomas C. 01312

- 02170 **Carpenter, Robert H.** USGS leads in the maturing science of geochemical exploration: *Mining Eng.*, v. 22, no. 2, p. 88-90, illus., 1970.

- 05255 **Carpenter, Robert H.; Hughes, Thomas C.** A geochemical and geophysical survey of the Gladesville Norite, Jasper County, Georgia: *Georgia Geol. Survey Inf. Circ.* 37, 7 p., illus., 1970.

- 00682 **Carpenter, Robert Heron; Fagan, James.** Stream sediment geochemistry — A valuable tool for locating zinc mineralization in the Knox Dolomite [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 199-200, 1970.

- 00753 **Carpenter, Robert Heron.** Metamorphic history of the Blue Ridge province of Tennessee and North Carolina: *Geol. Soc. America Bull.*, v. 81, no. 3, p. 749-761, illus., 1970.

**Carr, D. D.** See Ault, C. H. 08384

- 07529 **Carr, Donald D.; French, Robert R.; Blakely, Robert F.** Relationships between physical and chemical properties of the Brassfield Limestone (Silurian) in Indiana, Ohio, and Kentucky, in *Forum on Geology of Industrial Minerals*, 6th, Ann Arbor, Mich., 1970, *Proc.: Michigan Geol. Survey Miscellany* 1, p. 127-137, illus., tables, 1970.

- 10901 **Carr, Donald D.; Webb, William M.** Sand and gravel resources of Indiana: *Indiana Geol. Survey Bull.* 42-D, 31 p., illus., tables, 1970.

- 03249 **Carr, Donald Dean.** Geometry and origin of oolite bodies in the Ste. Genevieve Limestone (Mississippian) in the Illinois basin [abs.]: *Dissert. Abs. Internat.*, Sec. B., Sci. and Eng., v. 30, no. 11, p. 5097B, 1970.

- 02263 **Carr, M. H.** Atmospheric collection of debris from the Lost City fireball [abs.]: *EOS*, v. 51, no. 7, p. 580, 1970.

- 03636 **Carr, M. H.** Atmospheric collection of debris from the Revelstoke and Allende fireballs: *Geochim. et Cosmochim. Acta*, v. 34, no. 6, p. 689-700, illus., tables, 1970.

- 07548 **Carr, Michael H.** Geologic map of the Maskelyne DA region of the Moon — Lunar Orbiter site II P-2, southeastern Mare Tranquillitatis, including Apollo landing site 1: U.S. Geol. Survey Misc. Geol. Inv. Map I-616 [ORB II-2 (100)], scale 1:100,000, text, 1970.

**Carr, Roderick A.** See Wilkniss, Peter E. 02000

- 04062 **Carr, Roderick A.** Salinity effects on the determination of strontium in seawater by atomic absorption spectrophotometry: *Limnology and Oceanography*, v. 15, no. 2, p. 318-320, tables, 1970.

- 04690 **Carr, W. J.; Quinlivan, W. D.; Gard, L. M., Jr.** Age and stratigraphic relations of Amchitka, Banjo Point, and Chitka Point Formations, Amchitka Island, Aleutian Islands, Alaska, in *Changes in stratigraphic nomenclature by the U.S. Geological Survey*, 1969: *U.S. Geol. Survey Bull.* 1324-A, p. A16-A22, illus., tables, 1970.

**Carrier, David.** See Fryxell, Roald. 06276

- 06653 **Carrier, G. F.; Shaw, R. P.** Response of narrow-mouthed harbors to tsunamis, *in* Tsunamis in the Pacific Ocean — Internat. Symposium on Tsunamis and Tsunami Research, Honolulu, Hawaii, 1969, Proc.: Honolulu, Hawaii, East-West Center Press, p. 377-398, illus., 1970.

**Carrier, W. D.** See Scott, R. F. 05110

- 02294 **Carrigy, M. A.** Proposed revision of the boundaries of the Paskapoo Formation in the Alberta Plains: Bull. Canadian Petroleum Geology, v. 18, no. 2, p. 156-165, illus., 1970.

- 02706 **Carrigy, M. A.** Silica sand in the vicinity of Edmonton, Alberta: Research Council Alberta Rept. 70-1, 30 p., illus., tables, 1970.

- 02596 **Carrigy, Maurice A.** Deltaic sedimentation in Athabasca tar sands [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 840, 1970.

- 06233 **Carrigy, Maurice A.** Experiments on the angles of repose of granular materials: Sedimentology, v. 14, nos. 3-4, p. 147-158, illus., tables, 1970.

**Carrillo, Fred V.** See Kingston, Gary A. 02023

**Carrillo, Fred V.** See Kingston, Gary A. 03208

**Carriveau, A. R.** See Duke, C. M. 04667

- 02116 **Carroll, Dorothy.** Clay minerals — A guide to their X-ray identification: Geol. Soc. America Spec. Paper 126, 80 p., illus., tables, 1970.

- 05620 **Carroll, Dorothy.** Clay minerals in Arctic Ocean sea-floor sediments, *in* Symposium on environmental aspects of clay minerals: Jour. Sed. Petrology, v. 40, no. 3, p. 814-821, illus., tables, 1970.

- 06151 **Carroll, Dorothy.** Rock weathering: New York and London, Plenum Press, 203 p., illus., tables, 1970.

**Carroll, Henry C.** See Jenkins, Charles R. 07091

**Carron, M. K.** See Rose, Harry J., Jr. 05719

- 04152 **Carsey, J. Ben.** Livingston Pierson Teas: Houston Geol. Soc. Bull., v. 13, no. 1, p. 27, 1970.

- 01456 **Carskedden, Jeff.** A petrographic study of flint from aboriginal quarrying sites in southeastern Ohio [abs.]: Denison Univ. Sci. Lab. Jour., v. 50, art. 1-4, p. 22-23, 1969 [1970].

**Carsola, Alfred J.** See Inderbitzen, Anton L. 09478

- 02571 **Carson, C. D.; Kunze, G. W.** New occurrences of tabular halloysite: Soil Sci. Soc. America Proc., v. 34, no. 3, p. 538-540, illus., tables, 1970.

**Carson, C. D.** See Naghshineh-Pour, B. 05407

- 07348 **Carson, David John Temple.** Metallogenic study of Vancouver Island [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2060B, 1970.

- 01192 **Carson, Robert J., 3d.** The Quaternary geology of the south-central Olympic Peninsula, Washington [abs.]: Northwest Sci., v. 44, no. 1, p. 60, 1970.

- 07349 **Carson, William Pierce.** Computerized lineament tectonics and porphyry copper deposits in S.E. Arizona and S.W. New Mexico [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2060B-2061B, 1970.



- 02569 **Carstea, D. D.; Harward, M. E.; Knox, E. G.** Comparison of iron and aluminum hydroxy interlayers in montmorillonite and vermiculite — Pt. 1, Formation; Pt. 2, Dissolution: *Soil Sci. Soc. America Proc.*, v. 34, no. 3, p. 517-526, illus., tables, 1970.
- 07618 **Carstea, D. D.; Harward, M. E.; Knox, E. G.** Formation and stability of hydroxy-Mg interlayers in phyllosilicates [with French, German, and Russian abs.]: *Clays and Clay Minerals*, v. 18, no. 4, p. 213-222, illus., tables, 1970.
- Carstens, Marion R.** See LeFeuvre, Albert R. 05234
- 01745 **Carter, Bruce.** Structure of the San Gabriel anorthosite massif, California [abs.]: *EOS*, v. 51, no. 4, p. 446, 1970.
- Carter, C.** See Churkin, M., Jr. 05004
- Carter, Claire.** See Churkin, Michael, Jr. 02084
- Carter, Claire.** See Churkin, Michael, Jr. 10978
- 02391 **Carter, James L.** Mineralogy and chemistry of the Earth's upper mantle based on the partial fusion-partial crystallization model: *Geol. Soc. America Bull.*, v. 81, no. 7, p. 2021-2034, illus., tables, 1970.
- 06770 **Carter, John L.; Carter, Ruth C.** Bibliography and index of North American Carboniferous brachiopods (1898-1968): *Geol. Soc. America Mem.* 128, 382 p., 1970.
- Carter, M. Devereux.** See Averitt, Paul. 03878
- Carter, M. W.** See Thurston, P. C. 03791
- Carter, Melvan D.** See Hofer, Helmut. 09373
- 04530 **Carter, N. C.** Copper and molybdenum porphyry deposits in central British Columbia: *Canadian Mining Jour.*, v. 91, no. 4, p. 74-76, 1970.
- 03774 **Carter, Neville L.; Ave'Lallemant, Hans G.** High temperature flow of dunite and peridotite: *Geol. Soc. America Bull.*, v. 81, no. 8, p. 2181-2202, illus., 1970.
- Carter, Neville L.** See Ave'Lallemant, Hans G. 03775
- 04741 **Carter, Neville L.; Heard, Hugh C.** Temperature and rate dependent deformation of halite: *Am. Jour. Sci.*, v. 269, no. 3, p. 193-249, illus., tables, 1970.
- Carter, R. W.** See Fleisher, R. L. 05334
- Carter, Ruth C.** See Carter, John L. 06770
- 06332 **Cartmill, John C.; Dickey, Parke A.** Flow of a disperse emulsion of crude oil in water through porous media: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2438-2443, illus., table, 1970.
- 01142 **Cartwright, Keros.** Geothermal exploration for ground water — Discussion [of paper by J. H. Birman, 1969]: *Geol. Soc. America Bull.*, v. 81, no. 4, p. 1281-1282, illus., 1970.
- 03077 **Cartwright, Keros.** Groundwater discharge in the Illinois basin as suggested by temperature anomalies: *Water Resources Research*, v. 6, no. 3, p. 912-918, illus., table, 1970.
- 06089 **Cartwright, Keros.** Tracing shallow ground-water flow systems by soil temperatures [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 515-516, 1970.
- Cartwright, Keros.** See Bond, D. C. 10665

- 00683 **Carver, Robert E.** Late Pleistocene and Holocene sediments sources, continental shelf of Georgia [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 200, 1970.
- Carville, Chester A.** See California Dept. Water Resources. 09173
- 07426 **Casanova, Richard.** An illustrated guide to fossil collecting (revised edition): Healdsburg, Calif., Naturegraph Publishers, 128 p., illus., 1970; originally published 1957.
- Case, D. R.** See Laul, J. C. 00955
- Case, D. R.** See Laul, J. C. 03651
- Case, Gerard R.** See Lundberg, John G. 02150
- Casey, Richard E.** See Bandy, Orville L. 02586
- 10322 **Casey, Richard E.** Paleotemperature analyses based on radiolarian ratios [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 736-738, illus., 1970.
- Cashion, W. W.** See Cooper, Byron N. 02165
- Casida, L. E.** See Given, P. H. 04091
- 09115 **Caslavsky, J. L.; Vedam, K.** Muscovites with isotropic and anisotropic elasticity in the basal plane: *Am. Mineralogist*, v. 55, nos. 9-10, p. 1633-1638, illus., 1970.
- 03250 **Caslavsky, Jaroslav Ladislav.** Dislocation structures and the mechanical properties of mica [abs.]: *Dissert. Abs. Internat., Sec. B., Sci. and Eng.*, v. 30, no. 11, p. 5098B, 1970.
- 10684 **Cason, James H.** Lake Alice — A study of potential pollution of the Floridan Aquifer: *Compass*, v. 47, no. 4, p. 206-210, illus., 1970.
- 01060 **Caspall, Fred C.; Dort, Wakefield, Jr.** Late Pleistocene loess deposits of northeastern Kansas — A preliminary report [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 380-381, 1970.
- Cassie, Robert M.** See Gates, Robert M. 10676
- Castano Beltran, Leopoldo.** See Franco, Alvaro. 10214
- 06090 **Castano, John R.; Sparks, Dennis M.** Interpretation of vitrinite reflectance measurements in sedimentary rocks and determination of burial history using vitrinite reflectance and authigenic minerals [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 516-517, 1970.
- 10135 **Casteel, Richard W.** Core and column sampling: *Am. Antiquity*, v. 35, no. 4, p. 465-467, 1970.
- 07804 **Castillo Tejero, C.** La percepcion remota como auxiliar en la exploracion de recursos naturales [Remote sensing as an aid in exploration for natural resources (with Spanish abs.)]: *Rev. Inst. Mexicano Petroleo Rev.*, v. 2, no. 4, p. 5-19, illus., 1970.
- Castillo-Tejero, Carlos.** See Viniegra O., Francisco. 07848
- Castle, Robert O.** See Youd, T. Leslie. 03626
- Castle, Robert W.** See Carlson, Paul R. 00241
- 03518 **Caswell, Charles A.** Underground waste disposal — Concepts and misconceptions: *Environmental Sci. and Technology*, v. 4, no. 8, p. 642-647, illus., 1970.

- 00537 **Caswell, William Bradford, Jr.** The hydrogeology of thin-limestone layers in east-central Ohio [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3260B-3261B, 1970.
- 07561 **Cate, Addison S.; Heyman, Louis.** Regional geologic setting of western Pennsylvania, [Chap.] 2 in *Geology of the Pittsburgh area*: Pennsylvania Geol. Survey, 4th ser., [Bull.] G 59 (General Geology Rept.), p. 3-7, illus., 1970.
- Cater, F. W.** See Hopson, C. A. 00288
- 07491 **Cater, Fred W.** Geology of the salt anticline region in southwestern Colorado, *with a section on Stratigraphy* by Fred W. Cater and Lawrence C. Craig: U.S. Geol. Survey Prof. Paper 637, 80 p., illus., geol. map, 1970.
- 07492 **Cater, Fred W.; Craig, Lawrence C.** Stratigraphy, in *Geology of the salt anticline region, southwestern Colorado*: U.S. Geol. Survey Prof. Paper 637, p. 5-50, illus., 1970.
- Cathro, R.** See Brown, A. Sutherland. 03464
- 00599 **Cattermole, J. M.; McGregor, E. E.** Tertiary and Quaternary gravels in the Rapid City area [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 327, 1970.
- Caty, Jean-Louis.** See Allard, Gilles-O. 09327
- Caulfield, David D.** See Faas, Richard W. 02615
- Causey, J. D.** See Laughlin, A. W. 01792
- Causey, J. D.** See Laughlin, A. William. 01793
- 03453 **Cavalero, R. A.** Geology of the Anaconda Caribou deposit, Restigouche County, N.B. [abs.]: Canadian Mining and Metall. Bull., v. 63, no. 695, p. 281, 1970.
- Cavallero, Lillian.** See Krinsley, David. 08625
- Cavaroc, Victor V., Jr.** See Ferm, John C. 09921
- 03251 **Cavaroc, Victor Viosca, Jr.** Geology of some Carboniferous lower deltaic plain sediments of western Pennsylvania [abs.]: Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 5098B, 1970.
- 04630 **Cavender, Ted M.; Lundberg, John G.; Wilson, Richard L.** Two new fossil records of the genus *Esox* (Teleostei, Salmoniformes) in North America: Northwest Sci., v. 44, no. 3, p. 176-183, illus., 1970.
- 04613 **Cawley, J. T.** Saskatchewan mineral development — Past, present, and future: Canadian Mining Jour., v. 91, no. 4, p. 72-74, illus., 1970.
- Cazeau, Charles J.** See Peterson, Robert W. 06716
- 10510 **Cearlock, D. B.; Foote, H. P.; Mudd, R. D.; Reisenauer, A. E.** A computer routine for calculating transmissibility distributions from a minimum number of field measurements [abs.]: EOS, v. 51, no. 11, p. 756, 1970.
- Cearlock, D. B.** See Reisenauer, A. E. 10512
- 05177 **Cebull, S. E.** Bedrock geology and orogenic succession in southern Grant Range, Nye County, Nevada: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 10, p. 1828-1842, illus., geol. map, 1970.
- 00518 **Cecil, Charles Blaine.** Silica in experimental diagenesis of sandstones [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3237B-3238B, 1970.

- 01897 **Cernock, Paul J.; Bryant, William R.** Porosity, bulk density, and the velocity of compressional waves in Gulf of Mexico sediments at simulated depths [abs.]: EOS, v. 51, no. 4, p. 333, 1970.
- 07297 **Cernock, Paul John.** Sound velocities in Gulf of Mexico sediments as related to physical properties and simulated overburden pressures [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2858B-2859B, 1970.
- 06632 **Cerný, Petr.** Compositional variations in cookeite: Canadian Mineralogist, v. 10, pt. 4, p. 636-647, illus., tables, 1970.
- Cervione, Michael A., Jr.** See Ryder, Robert B. 04536
- 03934 **Cescas, Michel P.; Tyner, Edward H.; Harmer, Richard S., 3d.** Ferromanganiferous soil concretions — A scanning electron microscope study of their micropore structures: Soil Sci. Soc. America Proc., v. 34, no. 4, p. 641-644, illus., 1970.
- Chadbourne, Robert L.** See Wright, Ruth V. 08696
- 04778 **Chadeayne, Dennis.** Tigre Lagoon Field, Vermilion Parish, Louisiana, in Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 27-27c, illus., 1970.
- 00021 **Chadwick, Robert A.** Belts of eruptive centers in the Absaroka-Gallatin volcanic province, Wyoming-Montana: Geol. Soc. America Bull., v. 81, no. 1, p. 267-273, illus., table, 1970.
- 06185 **Chaffee, M. A.** Determination of acid-soluble and total manganese in geological and botanical materials by atomic absorption, in Geological Survey research 1970, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D217-D221, tables, 1970.
- 10252 **Chaffin, Herbert S., Jr.** Sedimentary history of a Middle Oligocene valley in northwestern Nebraska [abs.]: Alabama Acad. Sci. Jour., v. 40, no. 3, p. 166, 1969.
- Chagnon, J. Y.** See LaRochelle, P. 02898
- 08288 **Chagnon, J. Y.** Quinze Lake — Barriere Lake area, Rouyn-Noranda and Temiscamingue Counties: Quebec Dept. Nat. Resources Map 1643 (map of Geol. Rept. 134), scale 1:63,360, 1970.
- 09176 **Chagnon, Jean -Y.** Région des lacs des quinze et Barrière, Comté de Témiscamingue [The area of Lakes des Quinze and Barriere, Témiscaming County]: Quebec Dept. Nat. Resources Geol. Rept. 134, 106 p., illus., tables, 1968.
- 05293 **Chagnon, Jean-Y.** Geotechnique — A regional approach applied to landslide investigation [with French abs.]: Geol. Assoc. Canada Proc., v. 22, p. 37-43, illus., 1970.
- 06929 **Chaklader, A. C. D.; Blair, G. R.** Differential thermal study of FeO and Fe<sub>3</sub>O<sub>4</sub> [with French, German, and Russian abs.]: Jour. Thermal Analysis, v. 2, no. 2, p. 165-179, illus., tables, 1970.
- 02730 **Chalcraft, Richard G.** Petrography and geophysics of the Rock Hill gabbro pluton, York County, South Carolina: Southeastern Geology, v. 11, no. 3, p. 153-171, illus., table, 1970.
- 10195 **Chalmers, Bruce; Jackson, Kenneth A.** Experimental and theoretical studies of the mechanism of frost heaving: U.S. Army Corps Engineers Cold Regions Research and Eng. Lab. Research Rept. 199, 23 p., illus., 1970.
- 09334 **Chaloner, W. G.** The rise of the first land plants, in Major evolutionary events and the geological record of plants — Symposium, Internat. Bot. Cong., 11th, Seattle, Wash., 1969: Cambridge Philos. Soc. Biol. Rev., v. 45, no. 3, p. 353-377, illus., table, 1970.

- 08310 **Chaloner, William G.** The evolution of miospore polarity, in Perkins, B. F., editor, *Geoscience and Man* — V. 1, Proceedings of Am. Assoc. Stratig. Palynologists, Ann. Mtg., 1st, 1968: Baton Rouge, La., Louisiana State Univ., School of Geoscience, p. 47-56, illus., 1970.
- Chamberlain, C. Kent.** See Rigby, J. Keith. 04706
- 05864 **Chamberlain, C. Kent.** Permian trilobite species from central Wyoming and west Texas: *Jour. Paleontology*, v. 44, no. 6, p. 1049-1054, illus., 1970.
- 06091 **Chamberlain, C. Kent.** Vertical succession of trace fossils in the Pennsylvanian-lower Permian of central Utah [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 517, 1970.
- 06869 **Chamberlain, Charles Kent.** Trace fossils and paleoecology of the Ouachita Mountains of southeastern Oklahoma [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 1, p. 248B, 1970.
- 00023 **Chamberlain, E. W.; Stanley, R. S.** Mechanical analog calculator for three-dimensional rotation problems: *Geol. Soc. America Bull.*, v. 81, no. 1, p. 247-253, illus., table, 1970.
- Chamberlain, J. A.** See Land, A. H. 07972
- 01595 **Chambers, Charles E.** California digital mapping [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 3, p. 557, 1970.
- Chambers, M. J.** See Nelson, J. G. 10216
- Chambers, R. L.** See Alt, D. 10142
- Chamney, T. P.** See Norford, B. S. 04100
- Chamney, T. P.** See Wright-Broughton, C. 08677
- 00120 **Champlin, Robert F.** A review of the research related to ESCP: *Jour. Geol. Education*, v. 18, no. 1 p. 31-39, illus., 1970.
- Chan, Frank L.** See Johnson, Gerald G., Jr. 04052
- 01658 **Chan, K. M.; Manheim, F. T.** Interstitial water studies on small core samples, Deep Sea Drilling Project, Leg 2, [Chap.] 15 in *Initial reports of the Deep Sea Drilling Project* — V. 2, Leg 2 of cruises of *Glomar Challenger*, Hoboken, N. J., to Dakar, Senegal, Oct.-Nov. 1968: Washington, D. C., U.S. Govt. Printing Office, p. 367-371, tables, 1970.
- Chan, K. M.** See Manheim, F. T. 02652
- Chan, K. M.** See Sayles, F. L. 06666
- Chan, K. M.** See Manheim, F. T. 07151
- Chan, Kwan M.** See Sayles, Fred L. 01972
- Chan, L. H.** See Bertine, K. K. 03641
- Chan, R. K. C.** See Street, R. L. 06655
- 09143 **Chan, Samuel S. M.** A proposed method to obtain actual strength parameters of mine rocks and rock masses [with French and German summ.], in *Internat. Soc. Rock Mechanics Cong.*, 2d, Belgrade, Yugoslavia, 1970, *Proc.*, V. 2: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 83-88, tables, 1970.
- Chan, Sunney I.** See Manatt, Stanley L. 06290

- 06426 **Chandler, F. W.** McMahon Township, District of Algoma: Ontario Dept. Mines and Northern Affairs Prelim. Geol. Map P. 620, scale 1 in. to 1/4 mi., text, 1970.
- 06468 **Chandler, F. W.** Morin Township, District of Algoma: Ontario Dept. Mines and Northern Affairs Prelim. Geol. Map P. 621, scale 1 in. to 1/4 mi., text, 1970.
- Chandler, John C.** See Breger, Irving A. 06506
- 03578 **Chandra, Umesh.** Analysis of body-wave spectra for earthquake energy determination: Seismol. Soc. America Bull., v. 60, no. 2, p. 539-563, illus., tables, 1970.
- 03693 **Chandra, Umesh.** Correction for focal mechanism in body-wave magnitude determination: Jour. Geophys. Research, v. 75, no. 17, p. 3421-3430, tables, 1970.
- 03720 **Chandra, Umesh.** Comparison of focal mechanism solutions obtained from P- and S-wave data: Jour. Geophys. Research, v. 75, no. 17, p. 3411-3420, illus., tables, 1970.
- 04422 **Chandra, Umesh.** Stationary phase approximation in focal mechanism determination: Seismol. Soc. America Bull., v. 60, no. 4, p. 1221-1229, illus., tables, 1970.
- 07881 **Chandra, Umesh.** Table for the angles of incidence at the focus for S waves based on Randall's revised S tables: Earthquake Notes, v. 41, no. 4, p. 35-43, table, 1970.
- 03093 **Chang, Chin-Yung.** Finite element analyses of soil movements caused by deep excavation and dewatering [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 10, p. 4605B-4606B, 1970.
- 04220 **Chang, Chin-Yung; Duncan, James M.** Analyses of soil movement around a deep excavation: Am. Soc. Civil Engineers Proc., v. 96, paper 7512, Jour. Soil Mechanics and Found. Div., no. SM5, p. 1655-1681, illus., tables, 1970.
- Chang, Chin-Yung.** See Duncan, James M. 04221
- 00115 **Chang, Fred F. M.** Ripple concentration and friction factor: Am. Soc. Civil Engineers Proc., v. 96, paper 7067, Jour. Hydraulics Div., no. HY 2, p. 417-430, illus., table, 1970.
- 10503 **Chang, H. Y; Simons, D. B.; Brooks, R. H.** Mechanics of aggrading and degrading channels [abs.]: EOS, v. 51, no. 11, p. 754, 1970.
- 06092 **Chang, Luke L. Y.** Subsolidus phase relations in ternary systems of aragonite-type carbonates [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 517-518, 1970.
- 05743 **Chang, S.; Smith, J. W.; Kaplan, I.; Lawless, J.; Kvenvolden, K. A.; Ponnamperna, C.** Carbon compounds in lunar fines from Mare Tranquillitatis — [Pt.] 4, Evidence for oxides and carbides, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1857-1869, illus., tables, 1970.
- Chang, S.** See Adams, William. 09807
- 02715 **Chang, T. P.; Toebe, G. H.** A statistical comparison of meander planforms in the Wabash Basin: Water Resources Research, v. 6, no. 2, p. 557-578, illus., tables, 1970.
- Channell, J. K.** See Kruger, P. 08477
- 09399 **Chantell, Charles J.** Upper Pliocene frogs from Idaho: Copeia, no. 4, p. 646-664, illus., table, 1970.

- 07547 **Chao, E. C. T.; Boreman, Judith A.; Minkin, Jean A.; James, Odette B.; Desborough, George A.** Lunar glasses of impact origin — Physical and chemical characteristics and geologic implications: *Jour. Geophys. Research*, v. 75, no. 35, p. 7445-7479, illus., tables, 1970.
- Chao, E. T. C.** See Bell, Peter M. 01736
- Chao, E. T. C.** See Bell, P. M. 02227
- 09097 **Chao, Edward C. T.; Minkin, Jean A.** A device for the transfer of an optically oriented mineral fragment to a single-crystal X-ray, goniometer head: *Am. Mineralogist*, v. 55, nos. 7-8, p. 1416-1423, illus., 1970.
- Chao, G. Y.** See Hounsflow, A. W. 03502
- Chao, Pao-Chin.** See Cruft, Edgar F. 04638
- 05843 **Chapman, C. H.; Phinney, R. A.** Diffraction of P waves by the core and an inhomogeneous mantle: *Royal Astron. Soc. Geophys. Jour.*, v. 21, no. 2, p. 185-205, illus., 1970.
- 02763 **Chapman, Carleton A.** The geology of Acadia National Park: New York, Viking Press, 128 p., illus., geol. map, 1970.
- Chapman, Peter.** See Blinn, John C., 3d. 02851
- 07793 **Chapman, Peter; Quade, Jack; Brennan, Peter; Blinn, John C., 3d.** Ground truth/sensor correlation, in *Earth Resources Aircraft Program, status review*, 2d Ann., Houston, Tex., 1969 — V. 2, Agriculture, Forestry, and sensor studies: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 31-1—31-28, illus., tables, [1970?].
- Chapman, Sherl L.** See Ralston, Dale R. 04013
- 10450 **Chapman, Sherl L.; Ralston, Dale R.** Ground-water resource of the Blue Gulch area in eastern Owyhee and western Twin Falls Counties: Idaho Dept. Water Admin. Water Inf. Bull., no. 20, 36 p., illus., tables, 1970.
- Chappell, B. W.** See Compston, W. 05760
- 00880 **Chapple, William M.** The initiation and spacing of folds in viscous multilayered media [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 276, 1970.
- 07713 **Chapple, William M.** The finite-amplitude instability in the folding of layered rocks: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 457-466, illus., 1970.
- Chapple, William M.** See Spang, John H. 10335
- Charbonneau, B. W.** See Darnley, A. G. 04528
- 01570 **Charles, Michel.** Velocity and stress distributions in the Earth's mantle due to secular variation of the geomagnetic field [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 9, p. 4154B, 1970.
- Charlesworth, H. A. K.** See Campbell, R. B. 07899
- 01133 **Charm, Walter B.** Microfossils and the sea floor: *Sea Frontiers*, v. 16, no. 2, p. 71-76, illus., 1970.
- Charnell, Robert L.** See Fenske, Paul R. 10511
- 08434 **Charre, Roger.** Geology of the Lake Lagacé area — Preliminary report [also French edition]: Quebec Dept. Nat. Resources Prelim. Rept. P.R.-593, 11 p., table, geol. map, 1970.

- 10201 **Chase, C. G.; Menard, H. W.; Larson, R. L.; Sharman, G. F., 3d.; Smith, S. M.** History of sea-floor spreading west of Baja California: *Geol. Soc. America Bull.*, v. 81, no. 2, p. 491-497, illus., 1970.
- Chase, Clement G.** *See* Larson, Roger L. 01699
- Chase, N. L.** *See* Beck, C. B. 04163
- 06093 **Chase, R. L.; Barr, S.; Thomlinson, A. G.** Deformation revealed by CSP on margins of the northern sector of Juan de Fuca lithospheric plate, northeast Pacific Ocean [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 518-519, 1970.
- Chase, Richard L.** *See* Bunce, Elizabeth T. 09720
- Chase, Ronald B.** *See* Gerhard, Lee C. 05361
- 08323 **Chase, T. E.; Menard, H. W.; Mammerickx, J.** Bathymetry of the North Pacific (with diagrammatic abyssal topography): San Diego, Calif., California Univ. Inst. Marine Resources, 10 sheets, scale about 1:6,000,000, with text, 1970.
- Chase, T. E.** *See* Menard, H. W. 09994
- Chatelain, A.** *See* Weeks, R. A. 06300
- 04402 **Chatterlain, A.; Kline, D.; Kolopus, J. L.; Weeks, R. A.** Electron and nuclear magnetic resonance of three chondritic meteorites: *Jour. Geophys. Research*, v. 75, no. 29, p. 5681-5692, illus., 1970.
- 06094 **Chaudhuri, S.; Brookins, Douglas G.; Twiss, Page C.; Spooner, Charles M.** The effect of acid-leaching process on the strontium isotopic composition of sedimentary rocks [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 518-519, 1970.
- Chaudhuri, Sambhudhas.** *See* Brookins, Douglas G. 00872
- Chaudhuri, Sambudhas.** *See* Brookins, Douglas G. 04112
- Chave, K. E.** *See* Smith, S. V. 09579
- 04616 **Chave, Keith E.; Suess, Erwin.** Calcium carbonate saturation in seawater — Effects of dissolved organic matter: *Limnology and Oceanography*, v. 15, no. 4, p. 633-637, illus., tables, 1970.
- 06095 **Chave, Keith E.** Carbonate-organic interactions in the oceans [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 519, 1970.
- 02233 **Chayes, F.** The simplified or idealized "Skaergaard" model: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 200-201, 1970.
- 02234 **Chayes, F.** Experimentation in the electronic storage and manipulation of large numbers of rock analyses: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 174-186, illus., table, 1970.
- 01144 **Chayes, Felix.** On deciding whether trend surfaces of progressively higher order are meaningful: *Geol. Soc. America Bull.*, v. 81, no. 4, p. 1273-1278, tables, 1970.
- 01455 **Chayes, Felix.** On estimating the magnitude of the hidden zone and the compositions of the residual liquids of the Skaergaard layered series: *Jour. Petrology*, v. 11, no. 1, p. 1-14, illus., tables, 1970.
- Cheatum, Elmer P.** *See* Schultz, Gerald E. 04708
- Cheetham, A. H.** *See* Boardman, R. S. 08512



- 06439 **Chemekov, Yu. F.** Problema drevnikh oledeneniy i pliotzen-chetvertichnoy granitsy v svete absolyutnoy geokhronologii [The problem of old glaciations and the Pliocene-Quaternary boundary in the light of absolute geochronology]: Akad. Nauk SSSR Izv. Ser. Geol. 1970, no. 9, p. 110-116, 1970.
- Chen, Albert T-F.** See Schiffman, Robert L. 04226
- 08751 **Chen, J. C.** Mineralogy and chemistry of hydrothermally altered rocks from Puerto Rico: Acta Geol. Taiwanica, no. 14, p. 53-62, illus., tables, 1970.
- 03252 **Chen, John Teh-Jen.** A rheological stress-strain-time relationship for Seattle soils [abs.]: Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 5033B, 1970.
- 01746 **Chen, Ju-chin.** Some chemical aspects of eclogites [abs.]: EOS, v. 51, no. 4, p. 447, 1970.
- Chen, Kuan-Lin.** See Konrad, John G. 06373
- 10663 **Chenevert, M. E.** Shale control with balanced-activity oil-continuous muds: Jour. Petroleum Technology, v. 22, 1309-1316, illus., 1970.
- 07458 **Chenevert, Martin E.** Adsorptive pore pressures of argillaceous rocks, Chap. 30 in Rock mechanics, theory and practice — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 599-627, illus., tables, 1970.
- 10661 **Chenevert, M. E.** Shale alteration by water adsorption: Jour. Petroleum Technology, v. 22, September, p. 1141-1148, illus., tables, 1970.
- 00144 **Cheney, E. S.; Oliphant, J. D.; Jones, M. B.** Geology of the Blue Hill-Castine mining district, southwestern Hancock County, Maine [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 14, 1970.
- Cheney, E. S.** See Vredenburg, L. D. 03206
- Cheney, Philip B.** See Ellis, Robert H. 09494
- Cheng, C. N.** See Stevenson, F. J. 00818
- 02788 **Chenoweth, Philip A.** Geology of oil and gas occurrence in Pennsylvanian rocks, Mid-Continent region [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 840, 1970.
- Chenoweth, Philip A.** See Bennison, Allan P. 10708
- 10022 **Cherkosova, S. V.** Silurian-Devonian boundary and correlation of Lower Devonian of Soviet and Canadian Arctic [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2474, 1970.
- Cherkis, Norman Z.** See Fleming, Henry S. 05214
- 09326 **Cherkis, Norman Z.** A glossary of world bathymetric terms and their English language equivalents: Springfield, Va., Natl. Tech. Inf. Service (Ad 710 992) (U.S. Naval Research Lab. Rept. 7094), 30 p., 1970.
- Chernyak, G. E.** See Ustritskiy, V. I. 10111
- Cherry, J. T.** See Terhune, R. W. 05515
- 07908 **Cherry, J. T.; Petersen, F. L.** Numerical simulation of stress wave propagation from underground nuclear explosions, in Symposium on engineering with nuclear explosives — Am. Nuclear Soc. and U.S. Atomic Energy Comm., Las Vegas, Nev., 1970,

Proc., V. 1: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., p. 142-220, illus., 1970.

**Cherry, J. T., Jr.** See Kisslinger, Carl. 01940

- 03383 **Cherry, R. N.; Stewart, J. W.; Mann, J. A.** General hydrology of the Middle Gulf area, Florida: Florida Bur. Geology Rept. Inv. 56, 96 p., illus., tables, 1970.

**Cherry, R. N.** See Mann, J. A. 03912

**Cherry, R. N.** See Hunn, J. D. 08075

**Chessman, Mary.** See Horai, Ki-iti. 00015

**Chesterman, W. D.** See Loring, D. H. 03707

**Chesters, G.** See Konrad, J. G. 06930

**Chesters, Gordon.** See Keeney, Dennis R. 03330

**Chesters, Gordon.** See Konrad, John G. 06373

- 08269 **Chesworth, Ward.** A chemical study of sodium-rich gneisses from Glamorgan Township, Ontario (Canada): Chem. Geology, v. 6, no. 4, p. 297-303, illus., tables, 1970.

- 04722 **Chiang, Kam.** The use of acetate peels in graptolite studies: Jour. Paleontology, v. 44, no. 5, p. 988, illus., 1970.

- 06389 **Chiang, S. L.; Petersen, G. W.** Soil catena concept for hydrologic interpretations: Jour. Soil and Water Conserv., v. 25, no. 6, p. 225-227, tables, 1970.

- 04278 **Chichester, F. W.; Harward, M. E.; Youngberg, C. T.** pH dependent ion exchange properties of soils and clays from Mazama pumice [with French, German, and Russian abs.]: Clays and Clay Minerals, v. 18, no. 2, p. 81-90, illus., tables, 1970.

**Chigareva, O. G.** See Fedoseev, A. D. 06508

- 07037 **Childers, Barbara S.; Smith, Bernice Y.** (compilers and editors). Abstracts of theses concerning the geology of Utah to 1966: Utah Geol. and Mineralog. Survey Bull. 86, 233 p., 1970.

- 07350 **Chinn, William.** Structural and mineralogical studies at the Homestake mine, Lead, South Dakota [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2061B, 1970.

- 09958 **Chinnery, Michael A.** Earthquake displacement fields, in Earthquake displacement fields and the rotation of the Earth (L. Mansinha, D. E. Smylie, A. E. Beck, editors) — NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 17-38, illus., tables, 1970.

- 07160 **Chipp, E. R.** Geology and geochemistry of the Chandalar area, Brooks Range, Alaska: Alaska Div. Mines and Geology Geol. Rept. 42, 39 p., illus., tables, geol. map, 1970.

- 00433 **Chipping, David H.** Late Cretaceous and Eocene paleogeography of the La Panza, southern Santa Lucia, and Sierra Madre Ranges, California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 80, 1970.

- 06096 **Chipping, David H.** High density grain flows in flysch deposits [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 519-520, 1970.

- 00113 **Chitale, Shrikrishna V.** River metamorphosis — Discussion [of paper 6352 by S. A. Schumm, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, Jour. Hydraulics Div., no. HY 2, p. 586-688, 1970.
- 01706 **Chitale, Shrikrishna V.** River channel patterns: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7038, Jour. Hydraulics Div., no. HY 1, p. 201-221, illus., tables, 1970.
- 09491 **Chmelik, F. B.; Bouma, A. H.** Electrical logging in recent sediments, in *Offshore Technology Conference*, 2d Ann., Houston, Tex., 1970, Preprints — v. 1: Dallas, Tex., Offshore Technology Conf., p. 1-49 — 1-56, illus., 1970.
- 02541 **Chmelik, Frank B.; Bouma, Arnold H.** New logging technique will speed ocean bottom surveys: *Ocean Industry*, v. 5, no. 5, p. 56-59, illus., 1970.
- 07596 **Chmelik, Frank Bernard.** An investigation of changes induced in macrostructures of pelitic sediments during primary consolidation [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 3, p. 1431B, 1970.
- 05099 **Choate, R.** Lunar soil density as determined from Surveyor data and laboratory tests, in *Analysis of Surveyor data: California Inst. Technology Jet Propulsion Lab. Tech. Rept. 32-1443*, p. 35-65, illus., 1970.
- 05100 **Choate, R.** Lunar soil coefficient of friction determined from Surveyor data and laboratory tests, in *Analysis of Surveyor data: California Inst. Technology Jet Propulsion Lab. Tech. Rept. 32-1443*, p. 67-99, illus., 1970.
- 05101 **Choate, R.** Depths of Surveyor footpad penetrations at first impact — Their relation to the bearing strength of the lunar soil, in *Analysis of Surveyor data: California Inst. Technology Jet Propulsion Lab. Tech. Rept. 32-1443*, p. 101-124, illus., 1970.
- Chodos, A. A.** See McGetchin, T. R. 00064
- Chodos, A. A.** See McGetchin, T. R. 01799
- Chodos, Arthur A.** See Albee, Arden L. 05943
- 04369 **Chomnanti, S.** (and others). A study of an oil shale: *Fuel*, v. 49, no. 2, p. 188-196, illus., table, 1970.
- 00405 **Choquette, Philip W.; Pray, Lloyd C.** Geologic nomenclature and classification of porosity in sedimentary carbonates: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 2, p. 207-250, illus., tables, 1970.
- Chorley, Richard J.** See Haggett, Peter. 08581
- 04082 **Chow, T. J.; Earl, J. L.** Lead and uranium in Pennsylvanian anthracite: *Chem. Geology*, v. 6, no. 1, p. 43-49, illus., tables, 1970.
- Chow, Ven Te.** See Heidari, Manoutchehr. 10342
- 00047 **Chowdhury, R. N.; Richards, Rowland, Jr.; Coates, Donald F.** Slopes in stiff-fissured clays and shales — Discussion [of paper 6449 by J. M. Duncan and P. Dunlop, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, Jour. Soil Mechanics and Found. Div., no. SM 1, p. 336-344, illus., table, 1970.
- 08469 **Chown, E. H.; Laurin, A.-F.** Geological reconnaissance of Lac à la Croix area, Chicoutimi and Saguenay Counties [also French edition]: *Quebec Dept. Nat. Resources Prelim. Rept. P.R.-588*, 7 p., table, geol. map, 1970.
- 08470 **Chown, E. H.** Preliminary report on Geology of Pluto Lake area, Dubuc and Roberval Counties and Mistassini Territory [also French edition]: *Quebec Dept. Nat. Resources Prelim. Rept. P.R.-584*, 24 p., table, geol. map, 1970.

- 01309 **Chowns, T. M.** A chamosite-hematite oolite from the Sequatchie Formation in northwest Georgia [abs.]: Georgia Acad. Sci. Bull., v. 28, no. 2, p. s19, 1970.
- 09493 **Chramiec, M. A.; Morton, R. W.** High resolution near sub-bottom profiling, *in* Offshore Technology Conference, 2d Ann., Houston, Tex., 1970, Preprints — v. 1: Dallas, Tex., Offshore Technology Conf., p. I-247-I-258, illus., 1970.
- Christmas, L. P.** See Latour, B. A. 04117
- 02194 **Christ, C. L.; Hostetler, P. B.** Studies in the system  $MgO-SiO_2-CO_2-H_2O$  — [Pt.] 2, The activity-product constant of magnesite: Am. Jour. Sci., v. 268, no. 5, p. 439-453, illus., tables, 1970.
- 06097 **Christ, C. L.** Some contributions of crystal chemistry to geology [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 520, 1970.
- Christ, C. L.** See Konnert, Judith A. 09055
- Christ, C. L.** See Konnert, Judith A. 10608
- Christ, Charles L.** See Hostetler, Paul B. 01783
- 06563 **Christensen, Cleo M.; Stephens, Jerry C.** Geology and water resources of Clay County, South Dakota — Pt. 3, Basic data: South Dakota Geol. Survey Bull. 19, pt. 3, 107 p., illus., tables, 1970.
- 10873 **Christensen, Cleo M.** Sand and gravel resources in Bon Homme County, South Dakota: South Dakota Geol. Survey Circ. 39, 4 p., illus., table, 1970.
- 05093 **Christensen, E. M.** Lunar surface mechanical properties — Surveyor results, *in* Symposium on planetary atmospheres and surfaces, Woods Hole, Mass., 1969: Radio Sci., v. 5, no. 2, p. 171-180, illus., 1970.
- Christensen, E. M.** See Ko, H. Y. 05102
- 00244 **Christensen, M. N.; Gilbert, C. M.; Al-Rawi, Y.; Lajoie, K. R.** Late Cenozoic denudation rates in eastern California and northern Chile [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 81, 1970.
- 03677 **Christensen, M. N.; Gilbert, C. M.** Reply [to "Structure of Mono Basin, California," by L. C. Pakiser (1970)]: Jour. Geophys. Research, v. 75, no. 20, p. 4081-4082, 1970.
- 00565 **Christensen, Nikolas I.** Possible greenschist facies metamorphism of the oceanic crust: Geol. Soc. America Bull., v. 81, no. 3, p. 905-907, illus., tables, 1970.
- 01336 **Christensen, Nikolas I.** Composition and evolution of the oceanic crust: Marine Geology, v. 8, no. 2, p. 139-154, illus., tables, 1970.
- 02203 **Christensen, Nikolas I.** Compressional-wave velocities in basalts from the Juan de Fuca Ridge: Jour. Geophys. Research, v. 75, no. 14, p. 2773-2775, illus., tables, 1970.
- 10579 **Christensen, Nikolas I.** Seismic anisotropy in the Twin Sisters dunite [abs.]: EOS, v. 51, no. 11, p. 826, 1970.
- Christensen, O. A.** See Forbis, R. G. 10647
- Christensen, Robert L.** See Lipman, Peter W. 00306
- 05117 **Christian, Louis B.** Ancient windblown terrains of central California: California Div. Mines and Geology Mineral Inf. Service, v. 23, no. 9, p. 175-179, illus., 1970.
- Christian, R. P.** See Rose, Harry J., Jr. 05719

- 07533 **Christiansen, E. A.** Geology and groundwater resources of the Wynyard area (72P), Saskatchewan: Saskatchewan Research Council Geology Div. Map 10, scale 1:250,000, sections, text, 1970.
- 06354 **Christiansen, Earl A.** (editor). Physical environment of Saskatoon, Canada: Natl. Research Council Canada Pub. 11378, 68 p., illus., geol. maps, 1970.
- 06355 **Christiansen, Earl A.** Geology, *in* Physical environment of Saskatoon, Canada: Natl. Research Council Canada Pub. 11378, p. 3-17, illus., geol. maps, 1970.
- 06357 **Christiansen, Earl A.; Meneley, W. A.** Slope stability, *in* Physical environment of Saskatoon, Canada: Natl. Research Council Canada Pub. 11378, p. 51-52, illus., 1970.
- 06359 **Christiansen, Earl A.** Sand and gravel resources, *in* Physical environment of Saskatoon, Canada: Natl. Research Council Canada Pub. 11378, p. 56, illus., 1970.
- 09613 **Christiansen, F. W.** Isotropic planar stress field reorientation — a possible cause of arcuate and orthogonal strain patterns [abs.]: Utah Acad. Sci., Arts, and Letters Proc., v. 47, pt. 1, p. 275-276, 1970.
- 09136 **Christiansen, Francis W.** Isotropic tensional and compressional strain patterns in tabular shaped solid bodies [with French and German summ.], *in* Internat. Soc. Rock Mechanics Cong., 2d, Belgrade, Yugoslavia, 1970, Proc., V. 1: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 265-269, illus., 1970.
- Christiansen, R. L.** See Doe, B. R. 06955
- 00432 **Christiansen, Robert L.; Lipman, Peter W.** Cenozoic volcanism and tectonism in the western United States and adjacent parts of the spreading ocean floor — Pt. 2, Late Cenozoic [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 81-82, 1970.
- Christiansen, Robert L.** See Pierce, Kenneth L. 04693
- Christie, J. M.** See Green, H. W., 2d. 06759
- 03475 **Christie, R. L.** The Arctic islands, *in* Geological provinces of Canada, exploration and outlook: Canadian Mining and Metall. Bull., v. 63, no. 693, p. 31-33, 1970.
- Christodoulides, C.** See Durrani, S. A. 00585
- 06443 **Christodoulides, Costas; Durrani, Saeed A.; Ettinger, Kamil V.** Study of thermoluminescence in some stony meteorites: Modern Geology, v. 1, no. 4, p. 247-259, illus., tables, 1970.
- Chronic, John.** See Goebel, Edwin D. 01073
- 03117 **Chukhrov, F. V.** Analogues of flint clays in Soviet literature [with French, German and Russian abs.]: Clays and Clay Minerals, v. 18, no. 1, p. 1-5, illus., table, 1970.
- 03969 **Chung, D. H.; Wang, Herbert; Simmons, Gene.** On the calculation of the seismic parameter  $\phi$  at high pressure and high temperatures: Jour. Geophys. Research, v. 75, no. 26, p. 5113-5120, illus., tables, 1970.
- 05315 **Chung, D. H.** Effects of iron/magnesium ratio on P- and S-wave velocities in olivine: Jour. Geophys. Research, v. 75, no. 35, p. 7353-7361, illus., table, 1970.
- Chung, D. H.** See Kanamori, Hiroo. 06288
- 06350 **Chung, D. H.; Westphal, W. B.; Simmons, Gene.** Dielectric properties of Apollo 11 lunar samples and their comparison with Earth materials: Jour. Geophys. Research, v. 75, no. 32, p. 6524-6531, illus., tables, 1970.

- 10586 **Chung, D. H.** Effects of (Fe/Mg) ratio on the elastic properties of olivine [abs.]: EOS, v. 51, no. 11, p. 827, 1970.
- 02010 **Chung, Dae-Hyun.** Method for estimating the pressure coefficients of P and S velocities in solids [abs.]: EOS, v. 51, no. 4, p. 418, 1970.
- Chung, S.** See Favreau, R. F. 09829
- Chung, Yu-Chia.** See Broecker, Wallace. 06405
- 01747 **Church, Stanley E.; Tilton, G. R.** Lead and strontium isotopes and their bearing on the genesis of andesitic magmas in the Cascades [abs.]: EOS, v. 51, no. 4, p. 442, 1970.
- 08062 **Church, W. R.; Young, G. M.** Discussion of the progress report of the Federal-Provincial Committee on Huronian Stratigraphy: Canadian Jour. Earth Sci., v. 7, no. 3, p. 912-918, table, 1970.
- 08072 **Churcher, C. S.; Stalker, A. MacS.** A late, postglacial horse from Pashley, Alberta: Canadian Jour. Earth Sci., v. 7, no. 3, p. 1020-1026, illus., tables, 1970.
- 05004 **Churkin, M., Jr.; Carter, C.; Eberlein, G. D.** Graptolite succession across the Ordovician-Silurian boundary in south-eastern Alaska [abs.]: Geol. Soc. London Proc. 1970, no. 1663, p. 194, 1970.
- Churkin, Michael, Jr.** See Eberlein, G. Donald. 01298
- 02084 **Churkin, Michael, Jr.; Carter, Claire.** Early Silurian graptolites from southeastern Alaska and their correlation with graptolitic sequences in North America and the Arctic: U.S. Geol. Survey Prof. Paper 653, 51 p., illus., tables, 1970.
- 02311 **Churkin, Michael, Jr.** Canada basin-speculations on origin: Oil and Gas Jour., v. 68, no. 16, p. 186-187, 190, 194, 196, illus., 1970.
- Churkin, Michael, Jr.** See Eberlein, G. Donald. 02332
- 02597 **Churkin, Michael, Jr.** Correlation of fold belts of Alaska, Canada, and Siberia [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 841, 1970.
- 07102 **Churkin, Michael, Jr.** Fold belts of Alaska and Siberia and drift between North America and Asia, in Geological seminar on the North Slope of Alaska, Palo Alto, Calif., 1970, Proc.: Los Angeles, Calif., Am. Assoc. Petroleum Geologists Pacific Sec., p. G1-G14, illus.; discussion, p. G15-G17, 1970.
- 10023 **Churkin, Michael, Jr.** Geologic concepts of Arctic Ocean basin [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2474, 1970.
- 10978 **Churkin, Michael, Jr.; Carter, Claire.** Devonian tentaculitids of east-central Alaska; systematics and biostratigraphic significance: Jour. Paleontology, v. 44, no. 1, p. 51-68, illus., tables, 1970.
- 11015 **Churkin, Michael, Jr.; Jaeger, Herman; Eberlein, G. Donald.** Lower Devonian graptolites from southeastern Alaska: Lethaia, v. 3, no. 2, p. 183-202, illus., 1970
- 03253 **Chute, John Lawrence, Jr.** Polarization studies of geomagnetic rapid variations [abs.]: Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 5098B-5099B, 1970.
- 04399 **Cifelli, Richard.** Age relationships of Mid-Atlantic Ridge sediments, in Radiometric dating and paleontologic zonation: Geol. Soc. America Spec. Paper 124, p. 47-69, illus., 1970.

- 06505 **Cifrutlak, S. David.** High pressure mid-infrared studies of calcium carbonate: *Am. Mineralogist*, v. 55, nos. 5-6, p. 815-824, illus., tables, 1970.
- 02143 **Cisne, John L.** *Constantina pulchra*, an unusual proetid trilobite from the Devonian of Pennsylvania: *Jour. Paleontology*, v. 44, no. 3, p. 522-523, illus., 1970.
- 06098 **Cisne, John L.** Feeding and trail production in a trinucleid trilobite [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 520, 1970.
- 01348 **Cita, Maria B.; Nigrini, Catherine; Gartner, Stefan.** Biostratigraphy, Chap. 19 in Initial reports of the Deep Sea Drilling Project — V. 2, Leg 2 of cruises of *Glomar Challenger*, Hoboken, N. J., to Dakar, Senegal, Oct.-Nov. 1968: Washington, D. C., U.S. Govt. Printing Office, p. 391-411, illus., tables, 1970.
- 06362 **Cita, Maria Bianca.** Observations sur quelques aspects paléocéologiques de sondages subocéaniques effectués dans l'Atlantique nord [Observations on some paleoecological aspects of deep-sea borings in the North Atlantic]: *Rev. Micropaléontologie*, v. 12, no. 4, p. 187-201, illus., 1970.
- 08710 **Claborn, B. J.; Austin, T. Al; Wells, D. M.** Numerical model of the Ogallala as a management tool, in *Ogallala Aquifer Symposium*, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, p. 89-110, illus., tables, 1970.
- 02598 **Clack, W. J. F.** Transport and deposition of carbonate-reef sand, windward coast, Carriacou, West Indies [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 841, 1970.
- Claerbout, Jon.** See Landers, Tom. 10532
- 08283 **Claiborne, Robert.** Climate, man, and history: New York, W. W. Norton and Company, 444 p., illus., 1970.
- 01177 **Clapham, W. B., Jr.** Nature and paleogeography of middle Permian floras of Oklahoma as inferred from their pollen record: *Jour. Geology*, v. 78, no. 2, p. 153-171, illus., tables, 1970.
- 01294 **Clapham, W. B., Jr.** Permian miospores from the Flowerpot Formation of western Oklahoma: *Micropaleontology*, v. 16, no. 1, p. 15-36, illus., table, 1970.
- 08516 **Clapham, W. B., Jr.** Evolution of upper Permian terrestrial floras in Oklahoma as determined from pollen and spores, in *Evolution of communities — North Am. Paleont. Convention*, Chicago, Ill., 1969, Proc., Pt. E: Lawrence, Kans., Allen Press, p. 411-427, illus., 1970.
- 01278 **Clark, A. H.** Compositional differences between hexagonal and rhombohedral molybdenite: *Neues Jahrb. Mineralogie Monatsh.* 1970, no. 1, p. 33-38, 1970.
- 03506 **Clark, Alan H.** Quantitative determination of hexagonal and monoclinic pyrrhotites by X-ray diffraction — A discussion [of paper by A. R. Graham, 1969]: *Canadian Mineralogist*, v. 10, pt. 2, p. 278-280, 1970.
- Clark, Alan H.** See Takeno, Setsuo. 09596
- 01748 **Clark, Bruce R.** Stress-controlled orientation of microlites in obsidian [abs.]: *EOS*, v. 51, no. 4, p. 425, 1970.
- 04625 **Clark, Bruce R.** Mechanical formation of preferred orientation in clays: *Am. Jour. Sci.*, v. 269, no. 3, p. 250-266, illus., tables, 1970.
- 04879 **Clark, Bruce R.** Origin of slaty cleavage in the Coeur d'Alene district, Idaho: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 3061-3071, illus., 1970.

- 04946 **Clark, David L.** Magnetic reversals and sedimentation rates in the Arctic Ocean: Geol. Soc. America Bull., v. 81, no. 10, p. 3129-3134, illus., table, 1970.
- 10024 **Clark, David L.; Mullen, Ruth E.; Fagerlin, Stanley C.** Arctic Ocean foraminifera and correlation of pleistocene climatic changes [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists bull., v. 54, no. 12, p. 2474-2475, 1970.
- Clark, David L.** See Mullen, Ruth E. 10080
- 04010 **Clark, George B.; Rupert, G. B.** Comments on paper by R. F. Favreau, 'Generation of strain waves in rock by an explosion in a spherical cavity' [1969]: Jour. Geophys. Research, v. 75, no. 26, p. 5138-5140, 1970.
- 06099 **Clark, George R., 2d.** Daily growth ridge accretion in the scallop *Pecten diegensis* [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 521-522, 1970.
- 00519 **Clark, George Richmond, 2d.** Shell characteristics of the Family Pectinidae as environmental indicators [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3238B, 1970.
- 00881 **Clark, H. C.; Hickcox, Alice E.** Remanent magnetic stability and cooling history of the Mary's Peak sill, Oregon [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 276-277, 1970.
- Clark, J. R.** See Coleman, R. G. 05895
- Clark, Joan R.** See Finney, J. J. 06500
- Clark, Joan R.** See Konnert, Judith A. 09055
- Clark, Joan R.** See Konnert, Judith A. 10608
- 10207 **Clark, John; Guensburg, Thomas E.** Population dynamics of *Leptomeryx*: Fieldiana - Geology, v. 16, no. 16, p. 411-451, illus., tables, 1970.
- 05884 **Clark, John H.** Geology of the carbonate rocks in western Franklin County, Pennsylvania: Pennsylvania Geol. Survey Prog. Rept. 180, 1 sheet, scale 1:24,000, sections, text, 1970.
- 02440 **Clark, K. F.** Characteristics of disseminated molybdenum deposits in the western Cordillera of North America [abs.]: Mining Eng., v. 22, no. 1, p. 45, 1970.
- 08653 **Clark, K. F.** Zoning, paragenesis, and temperatures of formation in the Lordsburg district, in *Guidebook of the Tyrone-Big Hatchet Mountains-Florida Mountains region* - New Mexico Geol. Soc. Field Conf., 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, p. 107-113, illus., 1970.
- Clark, Kenneth F.** See Duskin, Douglas J. 09035
- Clark, L. A.** See Petruk, W. 03494
- Clark, L. A.** See Shimazaki, Hidehiko. 06633
- Clark, L. A.** See Coats, C. J. A. 06890
- Clark, L. A.** See Shewman, R. W. 07671
- Clark, L. D.** See James, H. L. 02780
- 06583 **Clark, Lee Jay.** Hydration characteristics of K-depleted mica [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 474B, 1970.
- Clark, Lloyd A.** See Shimazaki, Hidehiko. 09565



- 08182 **Clark, Lorin D.** Geology of the San Andreas 15-minute quadrangle, Calaveras County, California: California Div. Mines and Geology Bull. 195, 23 p., illus., tables, geol. map, 1970.
- 10824 **Clark, M. M.; Grantz, Arthur.** Geologic effects of the Borrego Mountain, southern California, earthquake of April 9, 1968 [abs.] — Internat. Symposium on Recent Crustal Movements and Associated Seismicity, Wellington, N.Z., 1970, Proc.: Wellington, N.Z., Royal Soc. of New Zealand, p. 14-15, 1970.
- 00245 **Clark, Malcolm M.** Some characteristics of the most recently active traces of the Garlock fault [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 82, 1970.
- 07777 **Clark, Malcolm M.** Geologic utility of small-scale airphotos, in Earth Resources Aircraft Program, status review, V. 1: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 8-1—8-31, illus., [1970,].
- Clark, R.** See Bogard, D. D. 02270
- Clark, R. G., Jr.** See Hatch, Norman L., Jr. 06695
- 08078 **Clark, R. H.; Persoage, N. P.** Some implications of crustal movement in engineering planning, in Symposium on recent crustal movements, Ottawa, Canada, 1969, Papers: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 2, p. 628-633, illus., table, 1970.
- 07339 **Clark, Robert Owen.** The morphology of slope profiles — A statistical method to critically analyze the slope hypotheses of William M. Davis, Walther Penck, and Lester C. King [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2048B-2049B, 1970.
- 02599 **Clark, Robey H.; Rouse, John T.** Closed system for generation and entrapment of hydrocarbons in Cenozoic deltas, Louisiana Gulf Coast [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 841, 1970.
- 04905 **Clark, Robey H.** Closed system for generation and entrapment of hydrocarbons in Cenozoic deltas, Louisiana gulf coast [abs.]: Corpus Christi Geol. Soc. Bull., v. 11, no. 1, p. 2-3, 1970.
- Clark, S. F., Jr.** See Hatch, N. L., Jr. 04029
- Clark, Sandra H. B.** See Foster, Helen L. 01295
- 02077 **Clark, Stuart K.** Fritz Love Aurin (1891-1969): Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 807-808, portrait, 1970.
- 02777 **Clark, William B.** Gold districts of California: California Div. Mines and Geology Bull. 193, 186 p., illus., tables, 1970.
- 02969 **Clark, William B.** Platinum: California Div. Mines and Geology Mineral Inf. Service, v. 23, no. 6, p. 115-122, illus., 1970.
- 03863 **Clark, William B.** Mines and mineral deposits of the Death Valley area, in Geologic guide to the Death Valley area, California — Geol. Soc. Sacramento, Ann. Field Trip Guidebook 1970: Sacramento, Calif., Geol. Soc. Sacramento, p. 29-32, illus., 1970.
- 03386 **Clarke, D. B.** Tertiary basalts of Baffin Bay, possible primary magma from the mantle: Contr. Mineralogy and Petrology, v. 25, no. 3, p. 203-224, illus., tables, 1970.
- Clarke, D. B.** See Manchester, K. S. 10074
- 09186 **Clarke, E. de C.; Prider, R. T.; Teichert, C.** Elementary practical geology, 4th edition [revised by R. T. Prider]: Nedlands, Western Australia, University of Western Australia Press, 212 p., illus., tables, 1968.
- Clarke, G. K. C.** See Smylie, D. E. 09965

**Clarke, G. K. C.** *See* Caner, B. 10483

- 04424 **Clarke, Garry C.; Classen, David F.** The Fox Glacier Project: Canadian Geog. Jour., v. 81, no. 1, p. 26-29, illus., 1970.

**Clarke, Garry K. C.** *See* Crossley, David J. 05218

**Clarke, Murray K.** *See* Moore, Bruce R. 05305

- 08678 **Clarke, Otis M., Jr.; Daniel, Thomas W., Jr.; Szabo, Michael W.** Mineral resources of Wilcox County, Alabama: Alabama Geol. Survey Circ. 66, 26 p., illus., tables, 1970.

- 02265 **Clarke, R. S., Jr.; Jarosewich, E.; Nelen, J.** The Lost City, Oklahoma, meteorite [abs.]: EOS, v. 51, no. 7, p. 580, 1970.

- 10268 **Clarke, Roy S., Jr.; Jarosewich, Eugene; Mason, Brian; Nelen, Joseph; Gomez, Manuel; Hyde, Jack R.** The Allende, Mexico, meteorite shower: Smithsonian Contr. Earth Sci., no. 5, 53 p., illus., tables, 1970.

- 00008 **Clarke, W. B.; deLaeter, J. R.; Schwarcz, H. P.; Shane, K. C.** Aluminum-26 — magnesium 26 dating of feldspar in meteorites: Jour. Geophys. Research, v. 75, no. 2, p. 448-462, illus., tables, 1970.

- 06403 **Clarke, W. B.; Beg, M. A.; Craig, Harmon.** Excess helium 3 at the North Pacific Geosecs station: Jour. Geophys. Research, v. 75, no. 36, p. 7676-7678, illus., table, 1970.

**Classen, David F.** *See* Clarke, Garry C. 04424

- 06019 **Clausen, George Samuel.** Optimal operation of water-supply systems [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5576B-5577B, 1970.

**Clausen, H.** *See* Langway, C. C., Jr. 09635

**Clausen, H. B.** *See* Johnson, S. J. 04072

**Clausen, H. B.** *See* Dansgaard, W. 08743

**Clavier, C.** *See* Poupon, A. 10657

**Clay, C. S.** *See* Berkson, J. M. 06157

**Clay, C. S.** *See* Berkson, J. M. 06472

- 07918 **Clay, Donald Wayne.** Stratigraphy and petrology of the Mineta Formation in Pima and eastern Cochise Counties, Arizona [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3478B-3479B, 1970.

**Claypool, George E.** *See* Baker, Donald R. 01126

**Clayton, A. G.** *See* Oliver, R. T. 04149

- 07636 **Clayton, Keith.** Apollo looks at the U.S.A.: Geog. Mag., v. 43, no. 3, p. 177-182, illus., 1970.

- 00600 **Clayton, Lee; Hagmaier, J. Ladd.** Tertiary lakes in the Williston basin [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 327-328, 1970.

- 01061 **Clayton, Lee.** Bison trails and their geologic significance [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 381, 1970.

- 01062 **Clayton, Lee; Bailey, Palmer K.** Tundra polygons in the northern Great Plains [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 382, 1970.

- Clayton, Lee.** See Harrison, Samuel S. 01140
- Clayton, Lee.** See Moran, Stephen R. 02502
- 02503 **Clayton, Lee.** Olfactory factors in landscape evolution [abs.]: North Dakota Acad. Sci. Proc., v. 24, pt. 1, p. 4, 1970.
- 03384 **Clayton, Lee.** Geologic map of Dunn County: North Dakota Geol. Survey Misc. Map 11, scale [1:125,000], text, 1970.
- Clayton, Lee.** See Moran, S. R. 09682
- Clayton, R. N.** See Schwarcz, H. P. 04650
- Clayton, Robert N.** See Muehlenbachs, Karlis. 01804
- Clayton, Robert N.** See Onuma, Naoki. 01963
- Clayton, Robert N.** See Onuma, Naoki. 05714
- 03360 **Cleary, John; Hales, Anton L.** PKIKP residuals at stations in North America and Europe: Earth and Planetary Sci. Letters, v. 8, no. 4, p. 279-282, illus., table, 1970.
- 00684 **Cleary, W. J.** Petrology of Coastal Plain and Piedmont river sands, southeastern United States [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 200-201, 1970.
- 02600 **Cleary, W. J.; Conolly, J. R.** Provenance model studies, Piedmont rivers to Atlantic deep-sea floor [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 841-842, 1970.
- 04877 **Cleaves, Emery T.; Godfrey, Andrew E.; Bricker, Owen P.** Geochemical balance of a small watershed and its geomorphic implications: Geol. Soc. America Bull., v. 81, no. 10, p. 3015-3032, illus., tables, 1970.
- 05545 **Clegg, Kenneth E.** The La Salle anticlinal belt in Illinois, *in* Depositional environments in parts of the Carbonate Formation, western and northern Illinois — Francis Creek Shale and associated strata and Mazon Creek biota — Geol. Soc. America, Coal Geology Div., Ann. Field Trip, Milwaukee, Wis., 1970: Illinois Geol. Survey Guidebook Ser. 8, p. 106-110, illus., 1970.
- Clegg, Michael W.** See Howitt, Frank. 10056
- Clegg, P. E.** See Bastin, J. A. 06269
- 09740 **Cleghorn, Arthur, Sr.** "Crazy balls of Nevada," a western states oddity: Rocks and Minerals, v. 45, no. 2, p. 144-145, 1970.
- Cleland, N. A.** See Edgington, A. N. 10035
- 05359 **Clement, James H.; Dolton, Gordon L.** A chronicle of exploration in South Park basin, Park County, Colorado, *in* Dakota and related rocks of the Front Range — Guidebook issue: Mtn. Geologist, v. 7, no. 3, p. 205-216, illus., 1970.
- 05417 **Clement, S. C.** Petrology of metamorphosed volcanic rocks near Hylas, Virginia [abs.]: Virginia Jour. Sci., v. 21, no. 3, p. 132, 1970.
- Clements, J. R.** See Cook, J. C. 04474
- 07168 **Clements, T. H., Jr.; Sandy, John.** Gravity survey of Marion County, Alabama: Alabama Geol. Survey Circ. 61, 58 p., illus., tables, 1970.
- 07170 **Clements, T. H., Jr.; Sandy, John.** Gravity survey of Winston County, Alabama: Alabama Geol. Survey Circ. 63, 52 p., illus., tables, 1970.

- 10861 **Clemons, Russell E.** Geologic history of the Chiquimula region, [with Spanish and English abs.], in *Trabajos tecnicos presentados en la segunda reunion de geologos de America Central: Inst. Centroamericano Inv. y Tecnologia Indus. Pubs. Geol.*, no. 2, p. 72-75, 1969.
- 03546 **Clendening, John A.** *Laevigatosporites dunkardensis*, new name for *Laevigatosporites plicatus* Clendening, 1969: *Jour. Paleontology*, v. 44, no. 4, p. 788, 1970.
- 06834 **Clendening, John A.** Historical review of the age designations of the Dunkard strata in West Virginia: *West Virginia Geol. Survey Newsletter*, issue 14, p. 3-5, illus., 1970.
- Clendening, John A.** See Gillespie, William H. 09269
- 07271 **Clendening, John Albert.** Sporological evidence on the geological age of the Dunkard strata in the Appalachian Basin [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 5, p. 2762B, 1970.
- Clews, D. Richard.** See Bradshaw, Peter M. D. 01728
- Clews, D. Richard.** See Bradshaw, Peter M. D. 04663
- Clews, D. Richard.** See Bradshaw, Peter M. D. 04672
- 00882 **Clifford, Paul M.; Rector, Roger J.** Fabric and compositional effects on strain in rocks [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 277, 1970.
- 06475 **Clifford, Paul M.** Behaviour of an Archaean granite diapir [abs.], in *Inst. Lake Superior Geology, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ.*, p. 13, 1970.
- 06476 **Clifford, Paul M.** Mt. St. Joseph, an Archaean volcano [abs.], in *Inst. Lake Superior Geology, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ.*, p. 14-15, 1970.
- Clifford, Paul M.** See Hsu, Mao-Yang. 06481
- 05654 **Clifton, H. Edward; Boggs, Sam, Jr.** Concave-up pelecypod (*Psephidia*) shells in shallow marine sand, Elk River beds, southwestern Oregon: *Jour. Sed. Petrology*, v. 40, no. 3, p. 888-897, illus., 1970.
- Clifton, H. Edward.** See Hunter, Ralph E. 09817
- 05301 **Cline, L. M.** Sedimentary features of late Paleozoic flysch, Ouachita Mountains, Oklahoma [with French abs.], in *Flysch sedimentology in North America: Geol. Assoc. Canada Spec. Paper 7*, p. 85-101, illus., tables, 1970.
- Cline, Lewis M.** See Ostrom, Meredith E. 07422
- 03991 **Cloud, Preston.** Lunar science and planetary history: *Science*, v. 169, no. 3951, p. 1159, 1970.
- 05737 **Cloud, Preston; Margolis, Stanley V.; Moorman, Mary; Barker, J. M.; Licari, G. R.; Krinsley, David; Barnes, V. E.** Micromorphology and surface characteristics of lunar dust and breccia, in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc.* — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1793-1798, illus., 1970.
- 05893 **Cloud, Preston.** Adventures in earth history: San Francisco, Calif., W. H. Freeman and Co., 992 p., illus., tables, 1970.
- 04932 **Cloud, Preston E., Jr.** Älteste Zellkern-Mikroorganismen 1,2 bis 1,4 Milliarden Jahre alt! [The oldest eucaryote microorganisms 1.2 to 1.4 billion years old!]: *Umschau*, v. 70, no. 5, p. 150-151, illus., 1970.

- 09472 **Cloud, Preston E., Jr.** Realities of mineral distribution, *in* Limitations of the earth, a compelling focus for geology (Texas Univ. Austin Bur. Econ. Geology) — A symposium held at the dedication of the new Geology Building, Austin, Tex., 1967, *Proc.: Texas Quart.*, v. 11, no. 2, p. 103-126, illus., 1968.
- 00858 **Cloud, W. K.; Hill, D. M.; Huffman, M. E.; Jennings, C. W.; McEvilly, T. V.; Nason, R. D.; Steinbrugge, K. V.; Tocher, D.; Unger, J. D.; Youd, T. L.** The Santa Rosa earthquakes of October, 1969: California Div. Mines and Geology Mineral Inf. Service, v. 23, no. 3, p. 43-63, illus., tables, 1970.
- 08637 **Cloud, William K.** Strong-motion instrument results, Santa Rosa, California, earthquakes, October 1, 1969, *in* The Santa Rosa, California, earthquakes of October 1, 1969: Rockville, Md., U.S. Coast and Geodetic Survey, p. 64-93, illus., tables, 1970.
- 03047 **Clough, Ray W.** Earthquake response of structures, Chap. 12 *in* Earthquake engineering (R. L. Wiegel, editor): Englewood Cliffs, N.J., Prentice-Hall, p. 307-334, illus., 1970.
- Clowes, R. M.** See Kanasewich, E. R. 01937
- 04734 **Clowes, R. M.; Kanasewich, E. R.** Seismic attenuation and the nature of reflecting horizons within the crust: *Jour. Geophys. Research*, v. 75, no. 32, p. 6693-6705, illus., 1970.
- Cluff, L. S.** See Lundgren, Raymond. 05325
- 10961 **Cluff, Lloyd S.** The Caracas earthquake and Salt Lake City, *in* Governor's conference on geologic hazards in Utah, December 14, 1967: Utah Geol. and Mineralog. Survey Spec. Studies 32, p. 7-10, illus., 1970.
- Coakley, J. M.** See Unger, J. D. 10593
- Coakley, John P.** See Rust, Brian R. 08061
- 06318 **Coates, D. F.; Yu, Y. S.** A note on the stress concentrations at the end of a cylindrical hole: *Internat. Jour. Rock Mechanics and Mining Sci.*, v. 7, no. 6, p. 583-588, illus., tables, 1970.
- 09157 **Coates, D. F.; Yu, Y. S.** Three-dimensional stress distributions around a cylindrical hole and anchor [with French and German summ.], *in* Internat. Soc. Rock Mechanics Cong., 2d, Belgrade, Yugoslavia, 1970, *Proc.*, V. 3: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 175-182, illus., tables, 1970.
- Coates, D. F.** See Hedley, D. G. F. 09833
- 10763 **Coates, D. F.** Rock mechanics, *in* Background papers on the earth sciences in Canada (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 113-118, 1970.
- Coates, Donald F.** See Chowdhury, R. N. 00047
- Coates, Donald F.** See Gill, Denis E. 09152
- 00145 **Coates, Donald R.** Topographic basins in the uplands of the Appalachian Plateau [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 15, 1970.
- 03321 **Coates, Donald R.** Mastodon bone in Bradford Co.: *Pennsylvania Geology*, v. 1, no. 6, p. 4-5, illus., 1970.
- 09187 **Coates, Donald R.; Doehring, Donald O.; Morisawa, Marie.** (Executive Committee). Environmental geomorphology — First annual geomorphology symposium, 1970, Program: Binghamton, N.Y., State Univ. New York Binghamton Geology Dept., 18 p., 1970.

- 00146 **Coates, H. J.; Kennedy, M. J.** Major recumbent folds between Ming's Bight and Grand Cove, Burlington Peninsula, Newfoundland [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 15, 1970.
- 03283 **Coates, J. A.** Stratigraphy and structure of Manning Park area, Cascade Mountains, British Columbia, in *Structure of the southern Canadian Cordillera*: *Geol. Assoc. Canada Spec. Paper* 6, p. 149-154, 1970.
- 06890 **Coats, C. J. A.; Clark, L. A.; Buchan, R.; Brummer, J. J.** Geology of the copper-zinc deposits of Stall Lake Mines Lts., Snow Lake area, N. Manitoba: *Econ. Geology*, v. 65, no. 8, p. 970-984, illus., tables, 1970.
- Coats, Colin J. A.** See Quirke, Terence T., Jr. 09606
- 06427 **Cobb, Edward H.** (compiler). Antimony occurrences in Alaska: U.S. Geol. Survey Mineral Inv. Resource Map MR-52, scale 1:2,500,000, separate reference list, 1970.
- 06428 **Cobb, Edward H.** (compiler). Bismuth occurrences in Alaska: U.S. Geol. Survey Mineral Inv. Resource Map MR-53, scale 1:2,500,000, separate reference list, 1970.
- 06429 **Cobb, Edward H.** (compiler). Mercury occurrences in Alaska: U.S. Geol. Survey Mineral Inv. Resource Map MR-54, scale 1:2,500,000, separate reference list, 1970.
- 06430 **Cobb, Edward H.** (compiler). Uranium, thorium, and rare-earth elements in Alaska: U.S. Geol. Survey Mineral Inv. Resource Map MR-56, scale 1:2,500,000, separate reference list, 1970.
- Cobb, Glen E.** See Gumert, William R. 07993
- Cobban, W. A.** See Gill, J. R. 01430
- 06169 **Cobban, W. A.** Occurrence of the Late Cretaceous ammonites *Didymoceras stevensoni* (Whitfield) and *Exiteloceras jenneyi* (Whitfield) in Delaware, in *Geological Survey research 1970*, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D71-D76, illus., 1970.
- 10848 **Cobban, William A.** The Late Cretaceous ammonites *Scaphites leei* Reeside and *Scaphites hippocrepis* (DeKay) in the western interior of the United States: U.S. Geol. Survey Prof. Paper 619, 29 p., illus., tables, 1969.
- 09015 **Coble, Ronald W.** The chemical quality of Iowa's water resources, in *Water resources of Iowa — A symposium*, Paul J. Horick, editor: Cedar Falls, Iowa, Iowa Acad. Sci., Geology Sec., p. 50-67, illus., tables, 1970.
- 09502 **Cochran, Gilbert F.; Butcher, William S.** Dynamic programming for optimum conjunctive use: *Water Resources Bull.*, v. 6, no. 3, p. 311-322, illus., table, 1970.
- 01886 **Cochrane, N. A.** Geomagnetic deep sounding in western Canada, a reinterpretation [abs.]: *EOS*, v. 51, no. 4, p. 268, 1970.
- 08139 **Cochrane, N. A.; Hyndman, R. D.** A new analysis of geomagnetic depth-sounding data from western Canada: *Canadian Jour. Earth Sci.*, v. 7, no. 5, p. 1208-1218, illus., 1970.
- 07871 **Cocke, J. M.** Dissepimental rugose corals of Upper Pennsylvanian (Missourian) rocks of Kansas: *Kansas Univ. Paleont. Contr. Art.* 54 (Coelenterata 4), 67 p., illus., tables, 1970.
- 07598 **Cocke, Julius Marion.** Dissepimental rugose corals of Pennsylvanian Missourian rocks of Kansas [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 3, p. 1432B, 1970.
- 03608 **Cody, Robert D.** Anomalous boron content of two continental shales in eastern Colorado: *Jour. Sed. Petrology*, v. 40, no. 2, p. 750-754, illus., table, 1970.

- 09888 **Coe, Jack J.** Effect of solid waste disposal on ground water quality: Am. Water Works Assoc. Jour., v. 62, no. 12, p. 776-783, illus., tables, 1970.
- Coe, K.** See Bridgwater, D. 07472
- Coe, Mary Jordan.** See McJunkin, Frederick Eugene. 10441
- 01749 **Coe, Robert S.** Thermodynamic effect of shear stress on inversion in enstatite [abs.]: EOS, v. 51, no. 4, p. 435, 1970.
- 03770 **Coe, Robert S.** The thermodynamic effect of shear stress on the ortho-clino inversion in enstatite and other coherent phase transitions characterized by a finite simple shear: Contr. Mineralogy and Petrology, v. 26, no. 3, p. 247-264, illus., tables, 1970.
- 06864 **Coen, Gerald Marvin.** Clay mineral genesis in some New York Spodosols [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 1, p. 17B-18B, 1970.
- 04938 **Coffeen, J. A.** How to migrate seismic dips: Oil and Gas Jour., v. 68, no. 45, p. 125-128, 132-134, illus., 1970.
- 09372 **Coffeen, J. A.** A seismic technique for finding small oil fields: Canadian Soc. Explor. Geophysicists Jour., v. 5, no. 1, p. 24-34, illus., 1969.
- 05445 **Coffin, Donald L.** A preliminary evaluation of bank storage associated with Libby Reservoir in northwestern Montana: U.S. Geol. Survey Water Supply Paper 1899-L, p. L1-L25, illus., tables, 1970.
- Coffman, C. B.** See Fanning, D. S. 07629
- 03855 **Coffman, Daniel M.** Parameter measurement in fluvial morphology: Indiana Acad. Sci. Proc. 1969, v. 79, p. 333-344, illus., tables, 1970.
- 06100 **Coffman, Daniel M.; Melhorn, Wilton N.** Division ratio, a new parameter in stream analysis [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 522-523, 1970.
- Coffman, Joseph S.** See Kiilsgaard, Thor H. 03207
- 03470 **Coggon, J. H.; Morrison, H. F.** Electromagnetic investigation of the sea floor: Geophysics, v. 35, no. 3, p. 476-489, illus., 1970.
- 04694 **Cohee, G. V.; Bates, R. G.; Wright, W. B.** Changes in stratigraphic nomenclature by the U.S. Geological Survey, 1969: U.S. Geol. Survey Bull. 1324-A, p. A1-A41, illus., 1970.
- 01362 **Cohee, George V.; Bates, Robert G.; Wright, Wilna B.** Changes in stratigraphic nomenclature by the U.S. Geological Survey, 1968: U.S. Geol. Survey Bull. 1294-A, p. A1-A55, illus., 1970.
- 05953 **Cohee, George V.** Memorial of Hugh Dinsmore Miser — December 18, 1884-August 1, 1969: Am. Mineralogist, v. 55, nos. 3-4, p. 583-591, portrait, 1970.
- 07657 **Cohee, George V.** Stratigraphic nomenclature — Principles and procedures, in Geological seminar on the North Slope of Alaska, Palo Alto, Calif., 1970, Proc.: Los Angeles, Calif., Am. Assoc. Petroleum Geologists Pacific Sec., p. H1-H3, illus., discussion, 1970.
- Cohen, A.** See Given, P. H. 04091
- 03783 **Cohen, Arthur D.** An allochthonous peat deposit from southern Florida: Geol. Soc. America Bull., v. 81, no. 8, p. 2477-2482, illus., table, 1970.
- Cohen, Lewis H.** See Adams, Herbert G. 06038
- Cohen, Lewis H.** See Jayaraman, A. 07749

- 06191 **Cohen, Philip; Kimmel, G. E.** Status of salt-water encroachment in 1969 in southern Nassau and southeastern Queens Counties, Long Island, New York, *in* Geological Survey research 1970, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D281-D286, illus., tables, 1970.
- 07488 **Cohen, Philip; Franke, O. L.; Foxworthy, B. L.** Water for the future of Long Island, New York: New York Water Resources Bull. 62A, 36 p., illus., abridged, 1970; originally published 1968.
- 10844 **Cohen, Philip M.** Bathymetric navigation and charting: Annapolis, Md., U.S. Naval Instr. Ser. in Oceanography, 138 p., illus., tables, 1970.
- 04111 **Cohen, T. J.** Source-depth determinations using spectral, pseudo-autocorrelation and cepstral analysis: Royal Astron. Soc. Geophys. Jour., v. 20, no. 2, p. 223-231, illus., 1970.
- 02365 **Cohenour, Robert E.** Sheeprock granite, *in* Radioactive and isotopic age determinations of Utah rocks: Utah Geol. and Mineralog. Survey Bull. 81 (Utah Univ. Bull., v. 61, no. 18; Utah Eng. Expt. Sta. Bull. 135), p. 31, 1970.
- 02905 **Coker, A. E.** Application of remote sensing to occurrence of collapse sinkholes in the Alafia and Peace River basins, Florida, *in* Earth resources aircraft program status review, NASA, Houston, 1968 — V. 3, Hydrology, oceanography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 22A1-22A14, illus. [1970].
- 08410 **Coker, A. E.; Marshall, R.; Thomson, N. S.** Application of computer processed multispectral data to the discrimination of land collapse (sinkhole) prone areas in Florida, *in* Earth Resources Aircraft Program, status review, V. 1: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 2-1—2-17, illus., tables, [1970].
- Coker, D. T.** See Ottaway, J. M. 04234
- 07982 **Colbert, Edwin Harris.** The Triassic gliding reptile *Icarosaurus*: Am. Mus. Nat. History Bull., v. 143, art. 2, p. 85-142, illus., tables, 1970.
- 00246 **Colburn, Ivan P.** The trench concept as a model for central California Cretaceous basin of deposition [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 82-83, 1970.
- 01605 **Colburn, Ivan P.; Rodine, James.** Paleocurrent and basin analysis of Late Cretaceous "Chico" Formation, Simi Hills, California [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 3, p. 562, 1970.
- 04815 **Coldwell, Charles H.** Charles Herbert Row (1895-1970): Am. Assoc. Petroleum Geologists Bull., v. 54, no. 9, p. 1758-1759, portrait, 1970.
- 09219 **Cole, Dale W.** Factors affecting percolation in a forest soil, *in* Water balance in North America — Symposium, Baniff, Alberta, 1969, Proc.: Am. Water Resources Assoc. Proc. Ser., no. 7, p. 101-109, tables, 1969.
- Cole, E. R.** See Shuey, R. T. 08206
- Cole, George M.** See Gutshall, Paul L. 09099
- 05418 **Cole, J. E.** A flame photometric determination of Ca-Mg percentages in coquina-coquinite facies of Yorktown Formation near Chuckatuck, Va. [abs.]: Virginia Jour. Sci., v. 21, no. 3, p. 132, 1970.
- 07101 **Cole, J. Glenn.** Marmaton Group, east flank of the Nemaha Ridge, north-central Oklahoma: Shale Shaker, v. 21, no. 3, p. 52-67, illus., 1970.
- Cole, Mark R.** See Yeats, Robert S. 00392
- Cole, T. J. S.** See Shafiqullah, M. 06115



- 04658 **Cole, W. Storrs; Applin, Esther R.** Analysis of some American Upper Cretaceous larger Foraminifera: *Bulls. Am. Paleontology*, v. 58, no. 258, p. 39-80, illus., 1970.
- 07748 **Coleman, L. C.** Rb/Sr isochrons for some Precambrian rocks in the Hanson Lake area, Saskatchewan: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 338-345, illus., tables, 1970.
- 06101 **Coleman, Leslie C.** Kenoran orogeny in the Churchill province of the Canadian shield [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 523-524, 1970.
- 03072 **Coleman, Neil L.** Flume studies of the sediment transfer coefficient: *Water Resources Research*, v. 6, no. 3, p. 801-809, illus., tables, 1970.
- Coleman, R. G.** See Sainsbury, C. L. 01464
- 05895 **Coleman, R. G.; Clark, J. R.** Pirokseny v goluboslantsevoy fatsii Kalifornii [Pyroxenes in the blueschist facies of California (with English abs.)], in *Problemy petrologii i geneticheskoy mineralologii*, V. 2: Moscow, Akad. Nauk SSSR Sibir. Otdeleniye (Izdatel'stvo "Nauka"), p. 41-53, illus., tables, 1970.
- Coleman, Robert G.** See Lanphere, Marvin A. 09636
- 05221 **Colhoun, Eric A.** Early record and interpretation of ice-wedge pseudomorph in County Londonderry, Northern Ireland, by J. R. Kilroe [with French and German abs.]: *Jour. Glaciology*, v. 9, no. 57, p. 391-392, 1970.
- 07729 **Coll de Hurtado, Atlantida.** Aspectos de morfologia litoral en Mexico [Aspects of coastal morphology in Mexico]: *Mexico Univ. Nac. Autonoma Inst. Geografia Bol.*, v. 3, p. 197-199, illus., 1970.
- 07730 **Coll de Hurtado, Atlantida.** Carta geomorfológica de la region costera de los Tuxtlas, Estado de Veracruz [Geomorphologic map of the coastal region of los Tuxtlas, State of Veracruz]: *Mexico Univ. Nac. Autonoma Inst. Geografia Bol.*, v. 3, p. 23-28, 1970.
- 03761 **Collett, L. S.** Resistivity mapping by electromagnetic methods [with French abs.], in *Mining and groundwater geophysics, 1967*: Canada Geol. Survey Econ. Geology Rept. 26, p. 615-624, illus., tables; discussion, p. 624-625, 1970.
- 09194 **Collett, L. S.** Remote sensing geophysical applications to hydrology, in *Instrumentation and observation techniques*, V. I. — Hydrology Symposium, 7th, Victoria, B. C., 1969, Proc.: [Ottawa] Canada Dept. Energy, Mines and Resources Inland Waters Br., p. 237-260, illus., table [1970?].
- 05324 **Collette, B. J.; Schouten, J. A.** Bifurcating and wandering ocean ridges — A progress report: *Marine Geophys. Researches*, v. 1, no. 1, p. 46-60, illus., 1970.
- 05449 **Collier, C. R.; Pickering, R. J.; Musser, J. J.** (editors). Influences of strip mining on the hydrologic environment of parts of Beaver Creek basin, Kentucky, 1955-66: U.S. Geol. Survey Prof. Paper 427-C, p. C1-C80, illus., tables, 1970.
- 05452 **Collier, C. R.** Erosion and sedimentation, in *Influences of strip mining on the hydrologic environment of parts of Beaver Creek basin, Kentucky, 1955-66*: U.S. Geol. Survey Prof. Paper 427-C, p. C31-C46, illus., 1970.
- 05479 **Collier, F. J.** Geosciences at the Smithsonian Institution [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 132, 1970.
- Collings, R. K.** See Wayman, R. A. 03742
- 05380 **Collins, A. Gene.** Geochemistry of some petroleum-associated waters from Louisiana: U.S. Bur. Mines Rept. Inv. 7326, 31 p., illus., tables, 1970.

- 06102 **Collins, Desmond.** The microstructure and function of the connecting ring of *Nautilus*, *Spirula* and fossil nautiloids [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 524, 1970.
- Collins, Earl M.** See Kesler, Stephen E. 05192
- 04053 **Collins, I. F.** A slip-line field analysis of the deformation at the confluence of two glacier streams [with German and French abs.]: Jour. Glaciology, v. 9, no. 56, p. 169-193, illus., 1970.
- 05409 **Collins, J. F.; Buol, S. W.** Patterns of iron and manganese precipitation under specified Eh-pH conditions: Soil Sci., v. 110, no. 3, p. 157-162, illus., 1970.
- 05483 **Collins, J. F.; Buol, S. W.** Effects of fluctuations in the Eh-pH environment on iron and/or manganese equilibria: Soil Sci., v. 110, no. 2, p. 111-118, illus., 1970.
- 01063 **Collinson, Charles.** Geographic variation in Paleozoic conodont faunas [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 382, 1970.
- 01064 **Collinson, Charles; Gross, David L.; White, W. Arthur; Lineback, Jerry A.; Ayer, Nathan J.** Stratigraphy of lacustrine sediments in southwestern Lake Michigan [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 382-383, 1970.
- Collinson, Charles.** See Gross, D. L. 02118
- Collinson, D. W.** See Bullen, K. E. 02869
- Collinson, D. W.** See Runcorn, S. K. 06292
- 05038 **Collinson, David W.** Paleomagnetism and continental drift, [Chap.] 2 in The megatectonics of continents and oceans (Helgi Johnson and Bennett L. Smith, editors): New Brunswick, N. J., Rutgers Univ. Press, p. 13-23, illus., 1970.
- 05900 **Colmet-Daage, F.; Gautheyrou J.; Gautheyrou, M.; deKimpe, C.; Sieffermann, G.; Delaune, M.; Fusil, G.** Caractéristiques de quelques sols dérivés de cendres volcaniques de la cote pacifique du Nicaragua [Characteristics of some soils derived from volcanic ash from the Pacific coast of Nicaragua (with German and English abs.)]: [France] Office Recherche Sci. et Tech. Outre-Mer Cahiers, Ser. Pedologie, v. 8, no. 2, p. 113-169, illus., tables, 1970.
- Colp, John L.** See Thompson, Louis J. 09496
- Colquhoun, D. J.** See Pierce, J. W. 00749
- Colquhoun, D. J.** See Pierce, J. W. 03748
- Colquhoun, D. J.** See Pierce, J. W. 05966
- Colquhoun, Donald J.** See Byrnes, John B. 02595
- 09127 **Colucci, Stephen L.** A new technique in thermoluminescence photography: Am. Mineralogist, v. 55, nos. 9-10, p. 1797-1800, illus., 1970.
- 07637 **Colvin, John M., Jr.** Geologic map of the Sunrise quadrangle, Tennessee: Tennessee Div. Geology Geol. Map GM 50-NW, scale 1:24,000, separate text, 1970.
- Colvin, John M., Jr.** See Stearns, Richard G. 08607
- 09793 **Colvocoresses, Alden P.** ERTS-A satellite imagery: Photogramm. Eng., v. 36, no. 6, p. 555-560, illus., tables, 1970.
- 08225 **Colwell, Robert N.** Gains to be made in natural resource management through the use of remote sensing systems, in The use of remote sensing . . . of natural resources of Alaska: Juneau, Alaska, Dept. of Econ. Devel., p. 5-26, illus., tables [1970].

- 01750 **Combs, Jim; Simmons, Gene.** Heat flow in north central United States [abs.]: EOS, v. 51, no. 4, p. 426, 1970.
- 07865 **Comm. on Subsoils of Boston; Borberek, Horst; Battles, Richard F.; Haley, James F.; LeCount, Peter F.; Linehan, Daniel.** (compilers). Boring data from greater Boston — Sec. 2, Roxbury: Boston Soc. Civil Engineers Jour., v. 57, no. 3, p. 185-291, illus., table, 1970.
- 10717 **Committee on Tidal Hydraulics.** Special analytic study of methods for estuarine water resources planning: U.S. Army Corps Engineers Comm. Tidal Hydraulics Tech. Bull., no. 15, 53 p., appendixes 31 p., 1969.
- 09513 **Commoner, Barry.** Threats to the integrity of the nitrogen cycle — nitrogen compounds in soil, water, atmosphere and precipitation, in Global effects of environmental pollution — Symposium, Am. Assoc. Adv. Sci., Dallas, Texas, 1968: New York, Springer-Verlag, and Dordrecht-Holland, D. Reidel Pub. Co., p. 70-95, illus., table, 1970.
- 05760 **Compston, W.; Chappell, B. W.; Arriens, P. A.; Vernon, M. J.** The chemistry and age of Apollo 11 lunar material, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1007-1027, illus., tables, 1970.
- 10954 **Conatser, W. E.** Grand Isle, barrier island in Gulf of Mexico [abs.]: Am. Assoc. Petroleum Geologists, v. 54, no. 9, p. 1783, 1970; Gulf Coast Assoc. Geol. Socs. Trans., v. 20, p. 274, 1970.
- Condie, K.** See Haach, U. 04285
- Condie, K. C.** See Rogers, J. J. W. 01167
- 01751 **Condie, Kent C.; Barsky, Constance K.** The origin of Sr-depleted basalts [abs.]: EOS, v. 51, no. 4, p. 443, 1970.
- 05480 **Condit, C. D.** Mineralogy of the Petersburg granite exposed in the Tidewater Stone quarry, Richmond, Va. [abs.]: Virginia Jour. Sci., v. 21, no. 3, p. 132, 1970.
- 09797 **Condit, H. R.** The spectral reflectance of American soils: Photogramm. Eng., v. 36, no. 9, 955-966, illus., tables, 1970.
- Condrate, R. A., Sr.** See Levitt, S. R. 02998
- Condrate, R. A., Sr.** See Levitt, S. R. 05946
- Condrate, R. A., Sr.** See Levitt, S. R. 09111
- Cone, G. C.** See Lovering, T. G. 01461
- 00500 **Coney, Peter J.** The geotectonic cycle and the new global tectonics: Geol. Soc. America Bull., v. 81, no. 3, p. 739-747, illus., table, 1970.
- Coney, Peter J.** See Elston, Wolfgang E. 08651
- Coney, Peter J.** See Powell, Robert E. 09033

- 08489 **Conference Field Trip Committee.** An environmental geology field trip road log, in Governor's Conf. on Environmental Geology: Colorado Geol. Survey Spec. Pub., no. 1, p. 68-78, illus. [1970?].
- Conil, Raphael.** See Hewitt, Philip C. 09183
- Conkin, Barbara M.** See Conkin, James E. 01648
- Conkin, Barbara M.** See Conkin, James E. 04515
- 01648 **Conkin, James E.; Conkin, Barbara M.** Middle Devonian arenaceous foraminifera of central Ohio — Pt. 1, Revision of the genus *Webbinelloidea* Stewart and Lampe, 1947: Micropaleontology, v. 16, no. 1, p. 1-14, illus., 1970.
- 03536 **Conkin, James E.; Fuson, Michael L.** *Archimedes kentuckiensis*, a new fenestrate bryozoan from the Floyds Knob Formation (Upper Osagean) of Kentucky: Jour. Paleontology, v. 44, no. 4, p. 669-672, illus., tables, 1970.
- 04515 **Conkin, James E.; Conkin, Barbara M.; Sawa, Takashi; Kern, John M.** Middle Devonian *Moellerina greenei* Zone and suppression of the genus *Weikkoella* Summerston, 1958: Micropaleontology, v. 16, no. 4, p. 399-406, illus., 1970.
- 08183 **Conklin, Kathleen.** Post-Columbian birds from Abaco Island, Bahamas: Florida Acad. Sci. Quart. Jour., v. 33, no. 3, p. 237-240, 1970.
- 03762 **Conley, James F.; Henika, William S.** Geology of the Philpott Reservoir quadrangle, Virginia: Virginia Div. Mineral Resources Rept. Inv. 22, 46 p., illus., geol. map, 1970.
- Conley, Robert F.** See Lloyd, Mary K. 03120
- 03760 **Conn, H. M. K.** Geophysics and asbestos exploration [with French abs.], in Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 485-491, illus., 1970.
- 04742 **Connally, G. Gordon.** Discussion — Caribou and Paleoindian in New York State, a presumed association [of paper by R. E. Funk, D. W. Fisher, and E. M. Reilly, 1970]: Am. Jour. Sci., v. 269, no. 3, p. 314-315, 1970.
- 05191 **Connally, G. Gordon; Sirkin, Leslie A.** Late glacial history of the upper Wallkill Valley, New York: Geol. Soc. America Bull., v. 81, no. 11, p. 3297-3305, illus., table, 1970.
- 06103 **Connally, G. Gordon; Sirkin, Leslie A.** The Wisconsinan history of the Hudson-Champlain lobe [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 524-525, 1970.
- 09036 **Connally, G. Gordon; Sirkin, Leslie A.** Deglacial history of the Lake Champlain-Lake George lowland — Trip 1 in Guidebook to field excursions, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., 20 p., illus., table, 1969.
- Connolly, J. R.** See Needham, H. D. 09693
- 00685 **Connor, J. J.; Cressman, E. R.** Carbonate geochemistry of the Lexington Limestone and associated clays, Ferry Formation [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 201, 1970.
- Connor, J. J.** See Tidball, R. R. 00768
- 06165 **Connor, J. J.; Trace, R. D.** Outlier of Caseyville Sandstone near Princeton, Kentucky, may be Bethel Sandstone, in Geological Survey research 1970, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D33-D35, illus., 1970.

- 09601 **Connor, J. J.; Erdman, J. E.; Sims, J. D.; Ebens, R. J.** Roadside effects on trace metal content in some rocks, soils, and plants of Missouri, *in* Univ. Missouri Ann. Conf. on Trace Substances in Environmental Health, 4th, Columbia, Mo., 1970, Abs.: Columbia, Mo., Univ. Missouri, P. 8, 1970
- Connors, Roland A.** *See* Karner, Frank R. 02736
- Conoboy, John T.** *See* Valentine, James W. 00385
- Conolly, J. R.** *See* Cleary, W. J. 02600
- 08523 **Conolly, J. R.; Ewing, M.** Ice-rafted detritus in North Pacific deep-sea sediments *in* Geological Investigations of the North Pacific (James D. Hays, editor): Geol. Soc. America Mem. 126, p. 219-231, illus., tables, 1970.
- 00686 **Conolly, John R.** A model for eugeosynclinal deposition [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 201-202, 1970.
- 00247 **Conomos, T. John; Broenkow, William W.; Peterson, David H.; Carlson, Paul R.** Seasonal variations in hydrographic properties of the ocean adjacent to San Francisco, California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 83, 1970.
- Conrad, Charles, Jr.** *See* Bean, Alan L. 05105
- 02911 **Conrod, A. C.; Short, H. A.** Ocean bottom surveying with aerial photography, *in* Earth resources aircraft program status review, NASA, Houston, 1968 — V. 3, Hydrology, oceanography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 46A1-46A17, illus. [1970].
- 10211 **Conselman, Frank B.** The significance of the Ogallala Formation in Texas, *in* Ogallala Aquifer Symposium, Lubbock, Texas, 1970 [proc.]: Lubbock, Tex., Texas Tech Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, p. 2-4, 1970.
- 05629 **Coogan, Alan H.** Measurements of compaction in oolitic grainstone: Jour. Sed. Petrology, v. 40, no. 3, p. 921-929, illus., 1970.
- 05846 **Cook, A. H.** Geodesy, *in* Global geophysics: New York, American Elsevier Publishing Company, p. 27-66, illus., table, 1970.
- Cook, Beverly Gatlin.** *See* Schwarzer, Theresa F. 09561
- 07919 **Cook, Beverly Kay Gatlin.** Petrochemistry of the Buck Hill volcanic series, Cathedral Mountain quadrangle, Brewster County, Texas [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3479B, 1970.
- Cook, C. F.** *See* Lawson, B. L. 02184
- 04814 **Cook, Carroll L.** Lyman Coleman Reed (1900-1970): Am. Assoc. Petroleum Geologists Bull., v. 54, no. 9, p. 1758, portrait, 1970.
- 06340 **Cook, David O.** The occurrence and geologic work of rip currents off southern California: Marine Geology, v. 9, no. 3, p. 173-186, illus., table, 1970.
- 07351 **Cook, David Olney.** Sand transport by shoaling waves [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2061B, 1970.
- 03029 **Cook, Donald G.** A Cambrian facies change and its effect on structure, Mount Stephen-Mount Dennis area, Alberta-British Columbia, *in* Structure of the southern Canadian Cordillera: Geol. Assoc. Canada Spec. Paper 6, p. 27-39, illus., table, geol. map, 1970.
- Cook, Donald G.** *See* Norris, D. K. 03477

- 10026 **Cook, Donald G.; Aitken, James D.** Tectonics of northern Franklin Mountains and Colville Hills, District of Mackenzie, Canada [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2475, 1970.
- Cook, Earl F.** See Tieh, Thomas T. 00933
- Cook, Frances.** See Hays, James D. 01429
- 02790 **Cook, H. E.** Miette platform evolution and relation to overlying bank ("reef") localization, Upper Devonian, Alberta [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 842, 1970.
- Cook, Harry.** See Hays, James D. 01429
- 04474 **Cook, J. C.; Clements, J. R.** NQR borehole logging for evaporite minerals, in *Third symposium on salt*, V. 2 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 353-356, illus., 1970.
- 04477 **Cook, John C.** Electromagnetic exploration within salt domes, in *Third symposium on salt*, V. 2 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 386-390, illus., 1970.
- 07516 **Cook, John C.** RF electrical properties of bituminous coal samples: *Geophysics*, v. 35, no. 6, p. 1079-1085, illus., tables, 1970.
- 09012 **Cook, Kenneth L.** Strainmeter measurements near the Wasatch fault, Utah [abs.], in *Geologic hazards and public problems* (R. A. Olson and M. M. Wallace, editors)-[U.S.] Office Emergency Preparedness, Region 7, Conf., San Francisco, Calif., Proc.: Washington, D.C., U.S. Govt. Printing Office, p. 249 [1970].
- 10964 **Cook, Kenneth L.** Earthquake hazards in Utah, in *Governor's conference on geologic hazards in Utah*, December 14, 1967: Utah Geol. and Mineralog. Survey Spec. Studies 32, p. 22-27, illus., tables, 1970.
- 02385 **Cook, P. J.** Repeated diagenetic calcitization, phosphatization, and silicification in the Phosphoria Formation: *Geol. Soc. America Bull.*, v. 81, no. 7, p. 2107-2116, illus., 1970.
- Cook, P. L.** See Boardman, R. S. 08512
- 00687 **Cook, Robert B., Jr.** Gold mineralization at the Latimer mine, Wilkes County, Georgia [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 202, 1970.
- 09894 **Cook, Theodore D.** The sand sheet of South Texas, in *Spring field trip, 1970, Hidalgo Canyon and La Popa Valley [Mexico]*: [Corpus Christi, Texas, Corpus Christi Geol. Soc.], p. 77-78, illus. [1970].
- 04888 **Cooke, C. Wythe.** Quaternary terraces of the Ouachita Valley — Discussion [of 'Origin and chronologic significance of Late Quaternary terraces, Ouachita River, Arkansas and Louisiana' by R. T. Saucier and A. R. Fleetwood, 1970]: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 3167-3169, table, 1970.
- 04889 **Cooke, C. Wythe.** Carolina Bays — Discussion [of 'Carolina Bays in Horry and Marion Counties, South Carolina' by B. G. Thom, 1970]: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 3171, 1970.
- 04398 **Cooke, Ronald U.** Morphometric analysis of pediments and associated landforms in the western Mohave desert, California: *Am. Jour. Sci.*, v. 269, no. 1, p. 26-38, illus., tables, 1970.

- 08726 **Cooke, Ronald U.** Stone pavements in deserts: Assoc. Am. Geographers Annals, v. 60, no. 3, p. 560-577, illus., table, 1970.
- 09869 **Coombs, A.** Geologic problems at Ross and Gorge Dams, Skagit River, Washington [with French abs.], in *Internat. Assoc. Eng. Geology Internat. Congress*, 1st, Paris, 1970, V. 2: Paris, Comité Français de Géologie de l'Ingénieur, p. 1197-1203, illus., 1970.
- 00848 **Coombs, D. S.; Horodyski, R. J.; Naylor, R. S.** Occurrence of prehnite-pumpellyite facies metamorphism in northern Maine: *Am. Jour. Sci.*, v. 268, no. 2, p. 142-156, illus., 1970.
- 06148 **Coombs, Howard A.** Geologic problems in raising Ross Dam, Skagit River, Washington [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 526, 1970.
- 09316 **Coon, R. F.; Merritt, A. H.** Predicting *in situ* modulus of deformation using rock quality indexes, in *Determination of the in situ modulus of deformation of rock* (symposium, ASTM, Winter Mtg., Denver, Colo., 1969); *am. Soc. Testing and Materials Spec. Tech. Pub.* 477, p. 154-173, illus., tables, 1970.
- Cooper, Alan K.** See Scholl, David W. 00359
- 10513 **Cooper, Alan K.** Structure of the continental shelf off San Francisco, California [abs.]: *EOS*, V. 51, no. 11, p. 761, 1970.
- Cooper, Arthur W.** See Sechrest, Cynthia G. 09040
- Cooper, B. N.** See Lowry, W. D. 05182
- 00688 **Cooper, Byron N.** Southern Appalachian Middle Ordovician succession [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 202-203, 1970.
- 02165 **Cooper, Byron N.; Cashion, W. W.** Relation of the Pulaski and Seven Springs faults in southwestern Virginia: *Am. Jour. Sci.*, v. 268, no. 5, p. 385-396, illus., 1970.
- Cooper, Fred G.** See Kessler, L. G., 2d. 07330
- 02100 **Cooper, G. Arthur; Grant, Richard E.** New name for brachiopod homonym and citation of types: *Jour. Paleontology*, v. 44, no. 3, p. 579, 1970.
- 08511 **Cooper, G. Arthur.** Generic characters of brachiopods, in *The genus, a basic concept in paleontology* — North Am. Paleont. Convention, Chicago, Ill., 1969, *Proc.*, Pt. C: Lawrence, Kans., Allen Press, p. 194-263, illus., 1970.
- 01224 **Cooper, Gustav Arthur.** Stratigraphy of the Hamilton Group of New York [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 8, p. 3705B-3706B, 1970.
- Cooper, Hilton H., Jr.** See Pinder, George F. 03074
- Cooper, J. A.** See Rancitelli, L. A. 02272
- Cooper, J. A.** See Perkins, R. W. 05716
- 02432 **Cooper, J. D.** The demand picture for high-quality clays [abs.]: *Mining Eng.*, v. 22, no. 1, p. 42, 1970.
- Cooper, J. R.** See Lovering, T. G. 01461
- Cooper, L. R.** See Wallace, D. E. 04130
- Cooper, Laurence C.** See Smith, Clay T. 04856
- 04720 **Cooper, R. A.** Tectonic distortion of a syntype of *Isograptus forcipiformis latus* Ruedemann: *Jour. Paleontology*, v. 44, no. 5, p. 980-983, illus., table, 1970.

- 00488 **Cooper, W. A.** Chemical limnology of a developing reservoir (Lake Meredith) in the Texas Panhandle [abs.]: *Texas Jour. Sci.*, v. 21, no. 3, p. 341, 1970.
- Copeland, C. W.** See Powell, W. J. 01427
- Copeland, C. W.** See Powell, W. J. 01611
- Copeland, Charles W.** See Drahovzal, James A. 00694
- 00547 **Copeland, M. J.** Redescription of the Middle Silurian leperditicopid ostracod *Dihogmochilina latimarginata* (Jones) [with French abs.], in *Contributions to Canadian paleontology: Canada Geol. Survey Bull.* 187, p. 9-14, illus., 1970.
- 00548 **Copeland, M. J.** Ostracoda from the Vauréal Formation (Upper Ordovician) of Anticosti Island, Quebec [with French abs.], in *Contributions to Canadian paleontology: Canada Geol. Survey Bull.* 187, p. 15-29, illus., 1970.
- 00566 **Copeland, M. J.** Two new genera of beyrichiid Ostracoda from the Niagaran (Middle Silurian) of eastern Canada [with French abs.], in *Contributions to Canadian paleontology: Canada Geol. Survey Bull.* 187, p. 1-7, illus., 1970.
- 006104 **Copeland, Richard A.** Selenium and mercury distribution in Lake Michigan invertebrates [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 526, 1970.
- Copeland, Robert R.** See Bates, Fred W. 04757
- Copland, A. B.** See Barss, D. L. 07755
- 04747 **Coppock, Ray.** (editor). Research on water quality: California Univ. Water Resources Center Rept. 19, 36 p., 1970.
- 08201 **Corbel, J.; Muxart, R.** Karsts des zones tropicales humides [Karst of tropical humid zones (with English and German summaries)]: *Zeitschr. Geomorphologie*, v. 14, no. 4, p. 411-474, illus., tables, 1970.
- 09171 **Corbett, Don M.** Acid mine-drainage problem of the Patoka River watershed, southwestern Indiana: Indiana Univ. Water Resources Research Center Rept. Inv., no. 4, 173 p., illus., tables, 1969.
- 08009 **Corbishley, Derek J.** Structure under seismic arrays: *Royal Astron. Soc. Geophys. Jour.*, v. 21, no. 5, p. 415-425, illus., table, 1970.
- 08650 **Corbitt, L. L.; Woodward, Lee A.** Thrust faults of Florida Mountains, New Mexico, and their regional tectonic significance, in *Guidebook of the Tyrone-Big Hatchet Mountains-Florida Mountains region* — New Mexico Geol. Soc. Field Conf., 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, p. 69-74, illus., 1970.
- Cordes, Eugene.** See Meinschein, W. G. 05762
- 02016 **Cordey, W. G.; Berggren, W. A.; Olsson, R. K.** Phylogenetic trends in the planktonic foraminiferal genus *Pseudohastigerina* Banner and Blow, 1959: *Micropaleontology*, v. 16, no. 2, p. 235-242, illus., 1970.
- Cording, E. J.** See Deere, Don U. 05512
- 05913 **Cordoba, Diego A.; Rodriguez-Torres, Rafael; Guerrero-Garcia, Jose.** Mesozoic stratigraphy of the northern portion of the Chihuahua Trough [abs.], in *The geologic framework of the Chihuahua tectonic belt* — Symposium in honor of Ronald K. De Ford, Midland, Tex., 1970: Midland, Tex., West Texas Geol. Soc., p. 40-41, 1970.
- Cordova, R. M.** See Sumsion, C. T. 03063
- 05825 **Cordova, R. M.** Ground-water conditions in southern Utah Valley and Goshen Valley, Utah: Utah Dept. Nat. Resources Tech. Pub. 28, 74 p., illus., tables, 1970.



- 02216 **Corey, J. C.; Boulogne, A. R.; Horton, J. H.** Determination of soil density and water content by fast neutrons and gamma rays: *Water Resources Research*, v. 6, no. 1, p. 223-229, illus., tables, 1970.
- 06819 **Corey, J. C.; Hayes, D. W.** Determination of density and water content of marine sediment in an unextruded core using fast neutron and gamma ray attenuation: *Deep-Sea Research*, v. 17, no. 5, p. 917-922, illus., 1970.
- 10987 **Corey, J. C.; Hawkins, R. H.; Overman, R. F.; Green, R. E.** Miscible displacement measurements within laboratory columns using the gamma-photon neutron method: *Soil Sci. Soc. America Proc.*, v. 34, no. 6, p. 854-858, illus., tables, 1970.
- 03970 **Corgan, James H.** Public awareness of earthquakes in Tennessee [abs.]: *Tennessee Acad. Sci. Jour.*, v. 45, no. 2, p. 53, 1970.
- 06937 **Corliss, John B.** Regional chemical diversity of Mid-Atlantic Ridge basaltic liquids [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 526-527, 1970.
- 05870 **Corneliussen, Eric F.; Perry, T. G.** The ectoproct *Batostoma? cornula* (Cumings and Galloway) and its enigmatic intrazoecial spines [Fort Atkinson Limestone (Cincinnatian), Wilmington, Illinois]: *Jour. Paleontology*, v. 44, no. 6, p. 997-1008 illus., tables, 1970.
- 09077 **Cornett, James E.** Calculating type and amount of in-place hydrocarbons: *Oil and Gas Jour.*, v. 68, no. 50, p. 138-139, illus., 1970.
- 09889 **Corpus Christi Geological Society.** Spring field trip, 1970, Hidalgo Canyon and La Popa Valley [Mexico]: [Corpus Christi, Texas, Corpus Christi Geol. Soc.], 78 p., illus. [1970].
- 03154 **Correa, Aderbal Caetano.** Borrego Pass Lentil, a new member of the Crevasse Canyon Formation, southern San Juan basin, New Mexico: *Mtn. Geologist*, v. 7, no. 2, p. 99-102, illus., 1970.
- 09479 **Corwin, R. F.; Ebersole, W. C.; Wilde, P.** A self-potential detection system for the marine environment, in *Offshore Technology Conference*, 2d Ann., Houston, Tex., 1970, Preprints — v. 2: Dallas, Tex., Offshore Technology Conf., p. II-305 — II-314, illus., 1970.
- 08676 **Cory, R. L.; Forster, W. O.; Renfro, W. C.; Nauman, J. W.** Radioactivity of three fresh-water molluscs of the tidal Columbia River and their associated sediments, in *Hydrobiology, 'Bioresources of shallow water environments'* — Am. Water Resources Assoc. Symposium, Miami Beach, Florida, 1970, Proc.: Illinois, Urbana, American Water Resources Assoc., p. 162-172, table, 1970.
- Coscio, M. R., Jr.** See Murthy, V. Rama. 05711
- Cosgrove, J. F.** See Persiani, C. 02965
- 03671 **Costain, John K.** Probe response and continuous temperature measurements: *Jour. Geophys. Research*, v. 75, no. 20, p. 3969-3975, illus., 1970.
- 02933 **Costello, J. T.; Norquay, I. P.** Logging the Prairie evaporite formation in Saskatchewan [with French abs.], in *Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26*, p. 492-496, illus., 1970.
- 07963 **Costello, W. R.** River channel and tidal bar deposits Gaspé Nord, Quebec: *Maritime Sediments*, v. 6, no. 2, p. 68-71, illus., 1970.
- Costes, N. C.** See Scott, R. F. 05110
- 06272 **Costes, N. C.; Mitchell, J. K.** Apollo 11 soil mechanics investigation, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 2025-2044, illus., tables, 1970.

- 00541 **Coston, Wendell Ray.** Clay mineralogy and engineering properties of a shale-derived soil [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3308B, 1970.
- 02988 **Cotera, Augustus S.** Wave tank experiment for beach models [abs.]: Arizona Acad. Sci. Jour., v. 6, 1970 Proc. Supp., p. 75-76, 1970.
- Cotter, R. D.** See Holt, C. L. R., Jr. 05617
- 09251 **Couch, E. J.; Keller, H. H.; Watts, J. W.** Permafrost thawing around producing oil wells: Jour. Canadian Petroleum Technology, v. 9, no. 2, p. 107-111, illus., 1970.
- 10565 **Couch, Richard; Johnson, Stephen; Gemperle, Michael; Banks, Robey.** Preliminary results of a seismic refraction study in western British Columbia and southeast Alaska [abs.]: EOS, v. 51, no. 11, p. 782, 1970.
- 01896 **Couch, Richard W.** Geophysical observations of Explorer ridge and trough [abs.]: EOS, v. 51, no. 4, p. 331, 1970.
- Couch, Richard W.** See Gemperle, Michael. 01913
- Couch, Richard W.** See Johnson, Stephen H. 04334
- 03254 **Couch, Richard William.** Gravity and structures of the crust and subcrust in the northeast Pacific Ocean west of Washington and British Columbia [abs.]: Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 5107B-5108B, 1970.
- 01684 **Coughran, Edward H.** Shipboard computers: Oceanology Internat., v. 5, no. 2, p. 28-31, illus., 1970.
- 04436 **Coughran, Edward H.** Shipboard computers: Oceanology Internat., v. 5, no. 1, p. 28-31, illus., 1970.
- Coulbourn, W. T.** See Campbell, J. F. 04489
- 10694 **Coulson, A.** (editor). Soil moisture — Hydrology Symposium, 6th, Saskatoon, Sask., 1967, Proc.: Ottawa, Queen's Printer, 336 p., illus., tables, 1968.
- 08406 **Coveney, Raymond M.; Kelly, William C.** Quartz as a geologic barometer: Michigan Academician, v. 3, no. 2, p. 45-56, illus., table, 1970.
- 04452 **Cowan, Darrel S.; Mansfield, Charles F.** Serpentinite flows on Joaquin Ridge, southern Coast Ranges, California: Geol. Soc. America Bull., v. 81, no. 9, p. 2615-2628, illus., 1970.
- Cowan, W. R.** See Hewitt, D. F. 09367
- 08328 **Cowen, Richard.** Analogies between the recent bivalve *Tridacna* and the fossil brachiopods Lytoniacea and Richthofeniacea: Palaeogeography, Palaeoclimatology, Palaeoecology, v. 8, no. 4, p. 329-344, illus., 1970.
- 09879 **Cowie, J. W.; Spencer, A. M.** Trace fossils from the late Precambrian Lower Cambrian of East Greenland, in Trace fossils — Liverpool Geol. Soc. and Internat. Union Geol. Sci., Internat. Conf., Liverpool, England, 1970, Proc.: Geol. Jour. Spec. Issue, no. 3, p. 91-100, illus., 1970.
- 06560 **Cowley, E. R.** Refractive indices of some carbonate minerals in the point dipole approximation: Canadian Jour. Physics, v. 48, no. 1, p. 297-302, tables, 1970.
- Cowperthwaite, Michael.** See Petersen, Carl F. 01446
- 03392 **Cox, Allan.** Palaeolatitudes from JOIDES deep sea sediment cores: Nature, v. 226, no. 5249, p. 934-935, illus., 1970.

- 04546 **Cox, Allan.** Latitude dependence of the angular dispersion of the geomagnetic field: Royal Astron. Soc. Geophys. Research Jour., v. 20, no. 3, p. 253-269, illus., tables, 1970.
- 05223 **Cox, Allan.** Reconciliation of statistical models for reversals: Jour. Geophys. Research, v. 75, no. 35, p. 7501-7503, 1970.
- Cox, Allan.** See Wahrhaftig, Clyde. 10338
- Cox, Allan.** See Denham, Charles R. 10488
- Cox, Allan.** See Marshall, Monte. 10489
- Cox, Allan** See Blakely, Richard J. 10490
- 10000 **Cox, C. S.; Filloux, J. H.; Larsen, J. C.** Electromagnetic studies of ocean currents and electrical conductivity below the ocean-floor, in *The sea* — v. 4, New concepts of sea floor evolution, Pt. 1, General observations (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 637-693, illus., tables, 1970.
- 00133 **Cox, Dennis P.** Lead-zinc-silver deposits related to the White Mountain Plutonic Series in New Hampshire and Maine: U.S. Geol. Survey Bull. 1312-D, p. D1-D18, illus., 1970.
- 06725 **Cox, Doak.** Ecumenical tsunamigaku, in *Tsunamis in the Pacific Ocean* — Internat. Symposium on Tsunamis and Tsunami Research, Honolulu, Hawaii, 1969, Proc.: Honolulu, Hawaii, East-West Center Press, p. 489-493, 1970.
- 10619 **Cox, Doak C.** (and others). Coastal evidences of ground water conditions in the vicinity of Anaehoomalu and Lalamilo, South Kohala, Hawaii: Hawaii Univ. Water Resources Research Center Tech. Rept. 24, 53 p., illus., tables, 1969.
- Cox, Doak C.** See Lao, Chester. 10621
- 08077 **Cox, Edward R.** Preliminary report on remote sensing in water-resources studies in Yellowstone National Park, Wyoming, in *Earth Resources Aircraft Program, status review*, 2d Ann., Houston, Tex., 1969 — V. 3, Hydrology and oceanography: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 45-1—45-9, illus., [1970,].
- 03084 **Cox, Gordon L.** Zama reef model predicts reservoir performance: Oilweek, v. 21, no. 26, p. 2, 4, 7, illus., 1970.
- 02189 **Cox, John W.** The high resolution dipmeter reveals dip-related borehole and formation characteristics, in *SPWLA Logging Symposium*, 11th Ann., Los Angeles, Calif., 1970, Trans.: Houston, Tex., Soc. Prof. Well Log Analysts, p. D1-D25, illus., 1970.
- Coxey, James R.** See Socolow, Arthur A. 07487
- 03228 **Coyle, Harry M.; Gibson, Gary C.** Empirical damping constants for sands and clays: Am. Soc. Civil Engineers Proc., v. 96, paper 7296, Jour. Soil Mechanics and Found. Div., no. SM 3, p. 949-965, illus., 1970.
- 00601 **Crabb, D. E.; Mowatt, T. C.** Preliminary mineralogic investigation of some clay horizons in the Fort Union and Ludlow Formations, North Dakota and South Dakota [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 328, 1970.
- 03393 **Cracraft, Joel.** Mandible of *Archaeopteryx* provides an example of mosaic evolution: Nature, v. 226, no. 5252, p. 1268, illus., 1970.
- Craddock, Campbell.** See Mooney, Harold M. 04007

- 04382 **Craddock, Campbell; Mooney, Harold M.; Kolehmainen, Victoria.** Simple Bouguer gravity map of Minnesota and northwestern Wisconsin: Minnesota Geol. Survey Misc. Map M-10, scale 1:1,000,000, separate text, 1970.
- Craddock, Campbell.** See Mooney, Harold M. 05876
- Craddock, Campbell.** See Mooney, Harold M. 06582
- 06938 **Craddock, Campbell; Mooney, Harold M.** Geologic structure under the northern midcontinent gravity high [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 527-528, 1970.
- 09025 **Craft, Jesse L.** Surficial geology and geomorphology of Whiteface Mountain and Keene Valley — Trip G in Guidebook to Field excursions, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., p. 135-137, 1969.
- 09026 **Craft, Jesse L.** Surficial geology of the International Lead Company McIntyre Development at Tahawas, N.Y. — Trip J in Guidebook to field excursions, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., p. 138-140, 1969.
- 10151 **Craft, Jesse L.** Late Pleistocene local glaciation and glacial climate in the high peaks region, Adirondack Park, New York [abs.], in American Quaternary Assoc. Mtg., 1st Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 23, 1970.
- 04529 **Craig, D. B.; Kelly, J. A.** A critical review of northern mineral potential: Canadian Mining Jour., v. 91, no. 4, p. 76, 93-98, illus., tables, 1970.
- 00845 **Craig, H.; Begemann, F.** Oxygen-18 variations in atmospheric carbon dioxide — The HASL data: Jour. Geophys. Research, v. 75, no. 9, p. 1723-1726, illus., 1970.
- 06399 **Craig, H.; Weiss, R. F.** The Geosecs 1969 intercalibration station — Introduction, hydrographic features, and total CO<sub>2</sub>-O<sub>2</sub> relationships: Jour. Geophys. Research, v. 75, no. 36, p. 7641-7647, illus., tables, 1970.
- Craig, H.** See Kroopnick, P. 06760
- Craig, Harmon.** See Clarke, W. B. 06403
- Craig, Harmon.** See Broecker, Wallace. 06405
- 06510 **Craig, James R.** Livingstonite, HgSb<sub>4</sub>S<sub>8</sub>, synthesis and stability: Am. Mineralogist, v. 55, nos. 5-6, p. 919-924, tables, 1970.
- 06939 **Craig, James R.** Violarite stability relations [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 528, 1970.
- Craig, Lawrence C.** See Cater, Fred W. 07492
- 08573 **Crain, Leslie J.** Hydrology of delta deposits in glaciated valleys in New York [with French abs.], in Symposium on the Hydrology of Deltas, V. 1: Internat. Assoc. Sci. Hydrology-Unesco Pub. 90, p. 29-37, illus., 1970.
- 00951 **Cramer, C. H.** Viscosity of the Atlantic Ocean bottom: Science, v. 167, no. 3921, p. 1123-1124, illus., 1970.
- 03197 **Cramer, Fritz H.; Díez de Cramer, María del Carmen R.** Rejuvenation of Silurian chitinozoans from Florida [with Spanish abs.]: Rev. Española Micropaleontología, v. 2, no. 1, p. 45-54, illus., 1970.
- 05789 **Cramer, Fritz H.** Acritarchs and chitinozoans from the Silurian Ross Brook Formation, Nova Scotia: Jour. Geology, v. 78, no. 6, p. 745-749, illus., table, 1970.

- 08165 **Cramer, Fritz H.; Díez de Cramer, María del Carmen.** Acritarchs from the Lower Silurian Neahga Formation, Niagara Peninsula, North America: *Canadian Jour. Earth Sci.*, v. 7, no. 4, p. 1077-1085, illus., 1970.
- 08271 **Cramer, Fritz H.** Middle Silurian continental movement estimated from phytoplankton-facies transgression: *Earth and Planetary Sci. Letters*, v. 10, no. 1, p. 87-93, illus., 1970.
- 08727 **Cramer, Fritz H.** Distribution of selected Silurian acritarchs: *Rev. Española Micropaleontología*, no. extraordinario, 203 p., illus., 1970.
- 02580 **Cramer, Howard Ross.** Structural features of the Coastal Plain of Georgia — A correction [to 1969 paper]: *Southeastern Geology*, v. 11, no. 3, p. 203, 1970.
- 00248 **Crandell, Dwight R.; Mullineaux, Donal R.; Bath, Gordon D.** Late glacial and post-glacial dacitic volcanism near Lassen Peak, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 83-84, 1970.
- 05522 **Crandell, Dwight R.; Waldron, Howard H.** Volcanic hazards in the Cascade Range, in *Geologic hazards and public problems* (R. A. Olson and M. M. Wallace, editors) [U.S.] Office Emergency Preparedness, Region 7, Conf., San Francisco, Calif., 1969, Proc.: Washington, D.C., U.S. Govt. Printing Office, p. 5-18, illus. [1970].
- 01370 **Crane, H. R.; Griffin, James B.** University of Michigan radiocarbon dates XIII: *Radiocarbon*, v. 12, no. 1, p. 161-180, 1970.
- 03115 **Crane, Robert Lee.** A study of the crystal structure of lāngbanite [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 10, p. 4728B, 1970.
- 01065 **Cranson, K. R.; Yarger, Richard D.** Field laboratories in introductory physical geology [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 383, 1970.
- Cranstone, Donald A.** See Quirke, Terence T., Jr. 09606
- 03479 **Crawford, Arthur Raymond.** Continental drift and un-continental thinking: *Econ. Geology*, v. 65, no. 1, p. 11-16, illus., 1970.
- Crawford, C. B.** See Mitchell, R. J. 02894
- 06940 **Crawford, María Luisa.** Phase relations of feldspars in contact metamorphic rocks [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 528-529, 1970.
- Cray, E. J., Jr.** See Mudie, J. D. 01413
- Creager, Joe S.** See Scholl, David W. 00359
- 10025 **Creager, Joe S.; Echols, Ronald J.; Holmes, Mark L.; McManus, Dean.** Chukchi Sea continental shelf sedimentation, in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, *Abs. Papers: Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2475, 1970.
- Creager, Joe S.** See Grantz, Arthur. 10045
- Creager, Joe S.** See Knebel, Harley J. 10068
- Creager, Joe S.** See Kummer, John T. 10070
- 09184 **Creighton, Reginald; King, Richard.** The Smithsonian Institution Information Retrieval (SIIR) system for biological and petrological data: *Smithsonian Inst. Inf. Systems Innovations*, v. 1, no. 1, 25 p., illus., 1969.
- Crelling, John C.** See Dutcher, Russell R. 06964
- Cremer, Marcelyn.** See Gulbrandsen, R. A. 04254

**Cremers, C. J.** See Birkebak, R. C. 06270

- 06273 **Cremers, C. J.; Birkebak, R. C.; Dawson, J. P.** Thermal conductivity of fines from Apollo 11, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 2045-2050, illus., table, 1970.

- 04374 **Cress, Glynn.** Ohm's law and rock samples, a plane complex convenience: *Mines Mag.*, v. 60, no. 6, p. 9-10, illus., 1970.

- 05460 **Cress, J. P.; Lattery, J. E.; Andrews, J. B.; Warden, F. F.; Vortman, L. J.** Project Pre-Gondola III, Phase 1, summary report, Fort Peck Reservoir, Montana — PNE 1114: Livermore, Calif., U.S. Army Engineer Nuclear Cratering Group, 78 p., illus., tables, 1970.

**Cressman, E. R.** See Connor, J. J. 00685

- 05394 **Cressman, E. R.; Hrabar, S. V.** Geologic map of the Wilmore quadrangle, central Kentucky: U.S. Geol. Survey Geol. Quad. Map GQ-847, scale 1:24,000, sections, text, 1970.

- 00689 **Cressman, Earle R.** Facies and paleogeography of the Lexington Limestone of central Kentucky [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 203, 1970.

- 03857 **Cressman, Earle R.; Karklins, Olgerts L.** Field trip No. 2, Lithology and fauna of the Lexington Limestone (Ordovician) of central Kentucky, in *Guidebook for field trips* — *Geol. Soc. America, Southeastern Sec.*, 18th Ann. Mtg., Lexington, Ky., 1970: Lexington, Ky., Kentucky Geol. Survey, p. 17-28, illus., 1970.

- 02271 **Cressy, Philip J., Jr.** Cosmogenic radionuclides in the Lost City meteorite [abs.]: *EOS*, v. 51, no. 7, p. 581, 1970.

- 03399 **Cressy, Philip J., Jr.** Multiparameter analysis of gamma radiation from the Barwell, St. Séverin and Tatliith meteorites: *Geochim. et Cosmochim. Acta*, v. 34, no. 7, p. 771-779, illus., tables, 1970.

- 05831 **Crew, M. E.; Berkoff, E. W.** TWO PIT, a different approach to calibration of gamma-ray logging equipment: *Log Analyst*, v. 11, no. 6, p. 26-32, illus., tables, 1970.

- 10410 **Crewe, A. V.; Isaacson, M.; Johnson, D.** Secondary electron detection in a field emission scanning microscope: *Rev. Sci. Instruments*, v. 41, no. 1, p. 20-24, illus., 1970.

- 02156 **Crickmay, C. H.** Ramparts, Beavertail, and other Devonian formations: *Bull. Canadian Petroleum Geology*, v. 18, no. 1, p. 67-79, illus., 1970.

- 00116 **Crickmore, Maurice J.** Effect of flume width on bed-form characteristics: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7077, *Jour. Hydraulics Div.*, no. HY 2, p. 473-496, illus., tables, 1970.

**Cridland, Arthur A.** See Mastrogiuseppe, Joy D. 04926

- 09878 **Crimes, T. P.; Harper, J. C.** (editors). Trace fossils—Liverpool Geol. Soc. and Internat. Union Geol. Sci., Internat. Conf., Liverpool, England, 1970, Proc.: *Geol. Jour. Spec. Issue*, no. 3, 547 p., illus., tables, 1970.

- 03056 **Crippen, J. R.; Pavelka, B. R.** The Lake Tahoe basin, California-Nevada: U.S. Geol. Survey Water-Supply Paper 1972, 56 p., illus., table, 1970.

- 10225 **Crisp, R. W.** Tests of rock cores Pembine study area, Michigan and Wisconsin: U.S. Army Corps Engineers Waterways Expt. Sta. Misc. Paper C-70-14, 126 p., illus., tables, 1970.

- 10233 **Crisp, R. W.** Tests of rock cores Machias study area, Maine: U.S. Army Corps Engineers Waterways Expt. Sta. Misc. Paper C-70-16, 136 p., illus., tables, 1970.
- 10235 **Crisp, R. W.** Tests of rock cores Michigamme study area, Michigan: U.S. Army Corps Engineers Waterways Expt. Sta. Misc. Paper C-70-10, 130 p., illus., tables, 1970.
- 10236 **Crisp, R. W.** Tests of rock cores Pease study area, New Hampshire: U.S. Army Corps Engineers Waterways Expt. Sta. Misc. Paper C-70-11, 124 p., illus., tables, 1970.
- 10238 **Crisp, R. W.; Saucier, K. L.** Tests of rock cores Duluth-Vermillion study area, Minnesota: U.S. Army Corps Engineers Waterways Expt. Sta. Misc. Paper C-70-9, 114 p., illus., tables, 1970.
- 10239 **Crisp, R. W.; Hallford, C. R.** Tests of rock cores Scott study area, Missouri: U.S. Army Corps Engineers Waterways Expt. Sta. Misc. Paper C-70-6, 126 p., illus., tables, 1970.
- Crisp, R. W.** See Saucier, K. L. 10240
- 07696 **Crittenden, M. D., Jr.** Panel discussion [on isostasy], in Symposium on recent crustal movements, Ottawa, Canada, 1969, Papers: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 2, p. 727-729, illus., 1970.
- Crittenden, Max D., Jr.** See Bromfield, Calvin S. 04511
- Crocket, James H.** See Keays, Reid R. 04417
- 00602 **Croft, Mack G.; Wesolowski, E. A.** Transmissivity and storage coefficient of aquifers in the Fox Hills Sandstone and Hell Creek Formation, Mercer and Oliver Counties, North Dakota [abs]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 328-329, 1970.
- 01484 **Croft, Mack G.; Wesolowski, E. A.** Transmissivity and storage coefficient of aquifers in the Fox Hills Sandstone and the Hell Creek Formation, Mercer and Oliver Counties, North Dakota, in Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B190-B195, illus., table, 1970.
- 01261 **Crompton, A. W.; Hiimae, Karen.** Molar occlusion and mandibular movements during occlusion in the American opossum, *Didelphis marsupialis* L.: Linnean Soc. Zool. Jour., v. 49, no. 1, p. 21-47, illus., 1970.
- 06941 **Cronan, D. S.; Thomas, R. L.** Geochemistry of ferromanganese oxide concretions in Lake Ontario [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 529, 1970.
- 08150 **Cronan, D. S.; Thomas, R. L.** Ferromanganese concretions in Lake Ontario: Canadian Jour. Earth Sci., v. 7, no. 5, p. 1346-1349, illus., table, 1970.
- Cronan, D. S.** See Tooms, J. S. 10786
- 06942 **Cronin, J. F.; Williams, R. S., Jr.** Volcanism and the upper atmosphere [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 529-530, 1970.
- 03747 **Cronin, John F.** Radiometric studies, Bay of Fundy: Maritime Sediments, v. 5, no. 3, p. 119-122, illus., 1969 [1970].
- 08684 **Cronon, Bill.** The sandstone caves of Wisconsin: Wisconsin Speleologist, v. 9, no. 3, p. 53-99, illus., 1970.
- 10027 **Crory, Frederick E.** Settlement associated with thawing of permafrost, [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2475-2476, 1970.

- 05205 **Crosby, G. W.** Radial movements in the western Wyoming salient of the Cordilleran overthrust belt — Reply [to discussion by E. W. Tooker of 1969 paper]: *Geol. Soc. America Bull.*, v. 81, no. 11, p. 3507-3512, illus., 1970.
- 01752 **Crosby, Gary W.** Tectonic models for structural regimes [abs.]: *EOS*, v. 51, no. 4, p. 430-431, 1970.
- 00147 **Crosby, Percy.** Electron probe microanalysis of iridescent intermediate plagioclase and coexisting feldspars from Adirondack anorthosite [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 16, 1970.
- 01066 **Crosby, Percy.** Major element variation across an Adirondack anorthosite-charnockite contact [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 383-384, 1970.
- 02601 **Cross, Aureal T.; Thompson, Gary G.** Some aspects of paleoecology and stratigraphy of lower Mancos Shale (Upper Cretaceous) of Colorado and Utah, based on palynologic analysis [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 842, 1970.
- 06943 **Cross, Aureal T.** The evaluation of an Allegheny (Pennsylvanian) coal seam, West Virginia [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 530, 1970.
- Cross, Aureal T.** See Kosanke, Robert M. 10864
- Cross, Aureal T.** See Zaitzeff, James B. 10871
- Cross, C. H.** See Warren, H. V. 09863
- Cross, Christine H.** See Warren, Harry V. 07419
- 08050 **Cross, Frank B.** Fishes as indicators of Pleistocene and recent environments in the Central Plains, in *Pleistocene and recent environments of the central Great Plains: Kansas Univ. Dept. Geology Spec. Pub.* 3, p. 241-257, illus., 1970.
- 05218 **Crossley, David J.; Clarke, Garry K. C.** Gravity measurements on "Fox Glacier," Yukon Territory, Canada [with French and German abs.]: *Jour. Glaciology*, v. 9, no. 57, p. 363-374, illus., 1970.
- 08194 **Crossman, E. J.; Harington, C. R.** Pleistocene pike, *Esox lucius*, and *Esox* sp., from the Yukon Territory and Ontario: *Canadian Jour. Earth Sci.*, v. 7, no. 4, p. 1130-1138, illus., table, 1970.
- 06944 **Crosson, Robert S.; Peters, David C.** Crustal structure inversion of local array data [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 530, 1970.
- 10548 **Crosson, Robert S.** Small earthquakes in the Puget Sound region [abs.]: *EOS*, v. 51, no. 11, p. 779, 1970.
- 07532 **Crosthwaite, E. G.; Mundorff, M. J.; Walker, E. H.** Ground-water aspects of the lower Henrys Fork region, eastern Idaho: *U.S. Geol. Survey Water-Supply Paper* 1879-C, p. C1-C22, illus., 1970.
- Crowder, D. F.** See Hopson, C. A. 00288
- 00960 **Crowell, John C.; Frakes, Lawrence A.** Phanerozoic glaciation and the causes of ice ages: *Am. Jour. Sci.*, v. 268, no. 3, p. 193-224, illus., 1970.
- Crowell, John C.** See White, David A. 05201
- Crowl, G. H.** See Frankel, L. 04097
- 05820 **Crowl, G. H.; Frankel, L.** Surficial geology of Rustico map-area, Prince Edward Island (11 L/6): *Canada Geol. Survey Paper* 70-39, 15 p., illus., geol. map, 1970.



**Crowley, W. P.** See Armstrong, R. L. 06217

- 05827 **Crowley, William.** Introduction, in New interpretations of eastern Piedmont geology of Maryland, *or* granite and gabbro or graywacke and greenstone?—35th Ann. Field Conf. Pennsylvania Geologists, 1970, Guidebook: Harrisburg, Pa., Pennsylvania Topog. and Geol. Survey, *also* Baltimore, Md., Maryland Geol. Survey, p. 1-4, illus., 1970.
- Crowley, William.** See Higgins, Michael W. 05828
- 05829 **Crowley, William; Olsen, Saki.** Introduction to field trip, second day, and road log, in New interpretations of eastern Piedmont geology of Maryland, *or* granite and gabbro or graywacke and greenstone?—35th Ann. Field Conf. Pennsylvania Geologists, 1970, Guidebook: Harrisburg, Pa., Pennsylvania Topog. and Geol. Survey, *also* Baltimore, Md., Maryland Geol. Survey, p. 37-60, illus., 1970.
- 01753 **Cruden, D. M.** A theory of the static fatigue of rock under uniaxial compression [abs.]: EOS, v. 51, no. 4, p. 424, 1970.
- 03694 **Cruden, D. M.** A theory of brittle creep in rock under uniaxial compression: Jour. Geophys. Research, v. 75, no. 17, p. 3431-3442, illus., table, 1970.
- 04638 **Cruft, Edgar F.; Chao, Pao-Chin.** Nucleation kinetics of the gypsum-anhydrite system, in Third symposium on salt, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 109-118, illus., tables, 1970.
- 08221 **Cruickshank, Michael J.** Mining and mineral recovery 1969, Chap. 2 in UnderSea Technology Handbook Directory 1970: Arlington, Va., Compass Publications, p. A11-A21, illus., 1970.
- 05365 **Cruz, Rafael B.** Deconvolution, fact and fancy: Oilweek, v. 21, no. 33, p. 39-41, illus., 1970.
- 07450 **Cruz, Rodolfo V. de la; Goodman, Richard E.** Theoretical basis of the borehole deepening method of absolute stress measurement, Chap. 20 in Rock mechanics, theory and practice — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 353-376, illus., tables, discussion, 1970.
- 00603 **Csejtey, Bela, Jr.** Thrusting and overturning in the southeastern portion of the Flint Creek Range, Montana [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 329, 1970.
- 05396 **Csejtey, Bela, Jr.** Geologic map of the Nolansburg quadrangle, southeastern Kentucky: U.S. Geol. Survey Geol. Quad. Map GQ-868, scale 1:24,000, section, text, 1970.
- 04180 **Cserna, Zoltan de; Rincon Orta, Cesar; Solorio-Munguia, Jose; Schmitter-Villada, Eduardo.** Una edad radiometrica Permica temprana de la region de Placer de Guadalupe, noreste de Chihuahua [An early Permian radiometric age for the Placer de Guadalupe area, northeastern Chihuahua]: Soc. Geol. Mexicana Bol. 1968, v. 31, no. 1, p. 65-73, illus., table, 1970.
- 05914 **Cserna, Zoltan de.** Tectonics of northern Mexico [summ.], in The geologic framework of the Chihuahua tectonic belt — Symposium in honor of Ronald K. De Ford, Midland, Tex., 1970: Midland, Tex., West Texas Geol. Soc., p. 42-43, 1970.
- 06029 **Cserna, Zoltan de.** The Precambrian of Mexico, in The geologic systems — The Precambrian, V. 4 (Kalervo Rankama, editor): New York and London, Interscience-John Wiley and Sons, p. 253-270, illus., table, 1970.
- 09449 **Cserna, Zoltan de.** Paleobotanica y geologia de Tecamatlan, Estado de Puebla — pt. 2, Notas sobre la geologia del area de Tecamatlan, Estado de Puebla [Paleobotany and geology of Tecamatlan, State of Puebla—pt. 2, Notes on the

geology of the Tecomatlan area, State of Puebla]: Mexico Univ. Nac. Autonomia Inst. Geologia Paleontologia Mexicana, no. 27, p. 79-88, illus., 1969.

- 02445 **Cubit, John.** A simple piston corer for sampling sand beaches: *Limnology and Oceanography*, v. 15, no. 1, p. 155-156, illus., 1970.

- 09760 **Cuffey, Roger J.** Bryozoan-environment interrelationships — an overview of bryozoan paleoecology and ecology: *Earth and Mineral Sci.*, v. 39, no. 6, p. 41-45, 48, illus., table, 1970.

**Cukor, P.** See Lublin, P. 04128

- 03293 **Culberson, Charles; Pytkowicz, R. M.; Hawley, J. E.** Seawater alkalinity determination by the pH method: *Jour. Marine Research*, v. 28, no. 1, p. 15-21, tables, 1970.

**Culberson, Charles.** See Heath, G. Ross. 04886

- 01492 **Culbertson, J. K.; Scott, C. H.** Sandbar development and movement in an alluvial channel, Rio Grande near Bernardo, New Mexico, in *Geological Survey research 1970*, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B237-B241, illus., 1970.

- 10904 **Culbertson, William J.; Nevens, Thomas D.; Hollingshead, Robert D.** Disposal of oil shale ash: *Colorado School Mines Quart.*, v. 65, no. 4, p. 89-132, illus., tables, 1970.

- 01149 **Culler, R. C.** (and others). Objectives, methods, and environment — Gila River Phreatophyte Project, Graham County, Arizona: U.S. Geol. Survey Prof. Paper 655-A, p. A1-A25, illus., 1970.

- 01754 **Cullers, R. L.; Medaris, L. G., Jr.; Haskin, L. A.** Rare-earth partition between aqueous fluid, silicate minerals, and silicate glasses [abs.]: *EOS*, v. 51, no. 4, p. 451, 1970.

- 03349 **Cullers, Robert L.; Medaris, L. Gordon, Jr.; Haskin, Larry A.** Gadolinium, distribution between aqueous and silicate phases: *Science*, v. 169, no. 3945, p. 580-583, illus., table, 1970.

- 05339 **Cumming, G. L.; Tsong, F.; Gudjurgis, P. J.** Fractional removal of lead from rocks by volatilization: *Earth and Planetary Sci. Letters*, v. 9, no. 1, p. 49-54, illus., tables, 1970.

**Cumming, George L.** See Folinsbee, Robert E. 03923

- 11023 **Cummings, John P.; Simonsen, Stanley H.** The crystal structure of calcium niobate ( $\text{CaNb}_2\text{O}_6$ ): *Am. Mineralogist*, v. 55, nos. 1-2, p. 90-97, illus., tables, 1970.

**Cummings, John R.** See California Dept. Water Resources. 09173

**Cummings, T. Ray.** See Bloxham, W. M. 07608

- 00249 **Cunningham, G.; Blanchard, M. B.** A method for determining refractive indices of microsize particles [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 84, 1970.

**Cunningham, R. L.** See Petersen, G. W. 07428

- 11261 **Cunningham, R. L.; Ng-Yelum, Joyce.** An optical device for the direct production and viewing of stereographic and gnomonic projections: *Jour. Appl. Crystallography*, v. 1, pt. 5, p. 320-321, illus., 1968.

**Cunningham, Richard R.** See Hinds, Jim S. 02038

**Curl, Herbert.** See Pak, Hasong. 06727

- 03290 **Curl, Rane L.** Specific-gravity identification of aragonite: *Natl. Speleol. Soc. NSS News*, v. 28, no. 2, p. 18-19, illus., 1970.
- 10813 **Curl, Rane L.** Solution kinetics of calcite, *in* *Internat. Cong. Speleology*, 4th, Yugoslavia, 1965, *Proc.*, V. 3: Ljubljana, Yugoslavia, *Speleolog. Soc. Yugoslavia*, p. 61-66, illus., 1968.
- 00690 **Curran, H. Allen.** Subsurface Cretaceous stratigraphy of the southeastern North Carolina coastal plain [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 203-204, 1970.
- 10152 **Currey, Donald R.** Holocene glaciation in the Southwest [abs.], *in* *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, *Abs.*: [Bozeman, Mont., Montana State Univ.?], p. 24, table, 1970.
- 03391 **Currie, K. L.** New Canadian cryptoexplosion crater at Lake St. Martin, Manitoba: *Nature*, v. 226, no. 5248, p. 839-841, illus., 1970.
- 06111 **Currie, K. L.** An hypothesis on the origin of alkaline rocks suggested by the tectonic setting of the Montereian Hills, *in* *Alkaline rocks, the Montereian Hills — Symposium*, Montreal, 1969, *Proc.*: *Canadian Mineralogist*, v. 10, pt. 3, p. 411-420, illus., tables, 1970.
- 07050 **Currie, K. L.; Ferguson, J.** The mechanism of intrusion of lamprophyre dikes indicated by "offsetting" of dikes: *Tectonophysics*, v. 9, no. 6, p. 525-535, illus., table, 1970.
- Currie, K. L.** *See* Stockwell, C. H. 07971
- 05047 **Currie, Kenneth L.** Uniformity, uniformitarianism, and the foundations of science, [Chap.] 3 *in* *Rock strata and the Bible record* (P. A. Zimmerman, editor): St. Louis, Mo., and London, England, Concordia Publishing House, p. 40-51, 1970.
- 05048 **Currie, Kenneth L.** Scientific methods of determining the age of the Earth, [Chap.] 5 *in* *Rock strata and the Bible record* (P. A. Zimmerman, editor): St. Louis, Mo., and London, England, Concordia Publishing House, p. 68-92, 1970.
- 05049 **Currie, Kenneth L.** Overview of the geological record, [Chap.] 7 *in* *Rock strata and the Bible record* (P. A. Zimmerman, editor): St. Louis, Mo., and London, England, Concordia Publishing House, p. 116-123, 1970.
- Curro, Joseph R., Jr.** *See* Kolb, Charles R. 10232
- 05580 **Curry, Robert R.** Santa Barbara and beyond, *in* *Geologic hazards and public problems* (R. A. Olson and M. M. Wallace, editors) — [U.S.] Office Emergency Preparedness, Region 7, Conf., San Francisco, Calif., 1969, *Proc.*: Washington, D.C., U.S. Govt. Printing Office, p. 251-263 [1970].
- 10153 **Curry, Robert R.** Altithermal precipitation maximum [abs.], *in* *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, *Abs.*: [Bozeman, Mont., Montana State Univ.?], p. 25, 1970.
- Curtin, Gary C.** *See* Shacklette, Hansford T. 01876
- 04255 **Curtin, Gary C.; Lakin, Hubert W.; Hubert, Arthur E.** The mobility of gold in mull (forest humus layer), *in* *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C127-C129, illus., tables, 1970.
- Curtin, Gary C.** *See* Braddock, William A. 04507
- 06712 **Curtis, Doris Malkin.** Miocene deltaic sedimentation, Louisiana Gulf Coast, *in* *Deltaic sedimentation, modern and ancient: Soc. Econ. Paleontologists and Mineralogists Spec. Pub.* 15, p. 293-308, illus., 1970.

**Curtis, G. H.** *See* Turner, D. L. 00382

**Curtis, Garniss H.** *See* Savage, Donald E. 04387

- 04550 **Cushing, E. M.; Boswell, E. H.; Speer, P. R.; Hosman, R. L.** (and others). Availability of water in the Mississippi embayment: U.S. Geol. Survey Prof. Paper 448-A, p. A1-A13, illus., tables, 1970.

- 10154 **Cushing, Edward J.** Vegetational change near the Laurentide ice sheet from 14,000 to 9,000 years ago [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 27-28, 1970.

**Cushley, R. J.** *See* Lipsky, S. R. 05744

**Custard, H. C.** *See* Davis, J. B. 06333

- 07479 **Cutcliffe, William E.** The role of applied geology in producing high friction aggregate, in Forum on geology of industrial minerals, 5th, Harrisburg, Pa., 1969, Proc.: Pennsylvania Geol. Survey, 4th ser., Bull. M64 (Mineral Resources Rept.), p. 105-117, illus., table, 1970.

**Cuttitta, Frank.** *See* Rose, Harry J., Jr. 05719

**Cvancara, A. M.** *See* Moran, Stephen R. 02502

**Cvancara, Alan M.** *See* Bickley, William B., Jr. 01055

- 07808 **Cvancara, Alan M.** Teredinid (Bivalvia) pallets from the Palaeocene of North America: Palaeontology, v. 13, pt. 4, p. 619-622, illus., 1970.

- 08389 **Cywin, Allen; Hendricks, Ernest L.** An overview of U.S. Department of Interior's role in sediment control, in National Conference on Sediment Control, Washington, D.C., 1969, Proc.: Washington, D.C., U.S. Dept. Housing and Urban Development Environmental Planning Division, p. 34-40, 1970.

- 06945 **Czamanske, Gerald K.; Wones, David R.** Amphiboles as indicators of oxidation during magmatic differentiation [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 531, 1970.

- 09070 **Czamanske, Gerald K.; Ingamells, C. O.** Selective chemical dissolution of sulfide minerals—A method of mineral separation: Am. Mineralogist, v. 55, nos. 11-12, p. 2131-2134, 1970.

**Czamanske, Gerald K.** *See* Mihalik, Peter. 09674

**Dabiri, Hassan.** *See* Green, Don W. 03073

**Dacey, Michael F.** *See* Krumbein, W. C. 10625

- 10640 **Dacey, Michael F.; Krumbein, W. C.** Markovian models in stratigraphic analysis: Internat. Assoc. Math. Geology Jour., v. 2, no. 2, p. 175-191, illus., 1970.

**Dachille, Frank.** *See* Gigl, Paul D. 00191

**Dachille, Frank.** *See* Simons, P. Y. 05938

**Dagis, A. A.** *See* Saks, V. N. 10094

**Dagis, A. S.** *See* Saks, V. N. 10094

- 04250 **D'Agostino, John P.; Hanshaw, Penelope M.** Malachite- and specularite-bearing Triassic sandstone localities near Chantilly, Virginia, in Geological Survey research 1970, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C103-C106, illus., table, 1970.

**Dahl, H. D.** See Voight, Barry. 08056

**Dahl, H. D.** See Pariseau, W. G. 09146

- 06592 **Dahl, Hilbert Douglas.** A finite element model for anisotropic yielding in gravity loaded rock [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 718B-719B, 1970.

**Dahlberg, Eric C.** See Rose, Arthur W. 04310

- 04314 **Dahlberg, Eric C.** Generalized Bayesian classification functions, K classes — Discussion [of paper by K. Wignall, 1969]: Econ. Geology, v. 65, no. 2, p. 220-221, 1970.

**Dahlem, D. H.** See Shoemaker, E. M. 06294

- 05290 **Dahlstrom, Clinton D. A.** Structural geology in the eastern margin of the Canadian Rocky Mountains: Bull. Canadian Petroleum Geology, v. 18, no. 3, p. 332-406, illus., 1970.

- 02741 **Dailey, Donald H.** Some new Cretaceous foraminifera from the Budden Canyon Formation, northwestern Sacramento Valley, California: Cushman Found. Foram. Research Contr., v. 21, pt. 3, p. 100-111, illus., 1970.

- 03851 **Daily, Fay Kenoyer.** Some charophytes from the Pleistocene [abs.]: Indiana Acad. Sci. Proc. 1969, v. 79, p. 84, 1970.

- 04633 **Daily, Fay Kenoyer.** Fossil charophytes from South Dakota and Iowa with a review of modern species: Am. Midland Naturalist, v. 84, no. 2, p. 365-375, illus., table, 1970.

- 05381 **Dalquest, Walter W.; Roth, Edward.** Late Pleistocene mammals from a cave in Tamaulipas, Mexico: Southwestern Naturalist, v. 15, no. 2, p. 217-230, illus., 1970.

- 10220 **Dalquest, Walter W.** Pliocene carnivores of the Coffee Ranch: Texas Memorial Mus. Bull. 15, 44 p., illus., tables, 1969.

- 06274 **Dalrymple, G. Brent; Doell, Richard R.** Thermoluminescence of lunar samples from Apollo 11, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Suppl. 1), p. 2081-2092, illus., 1970.

- 06832 **Dalziel, I. W. D.; Dott, R. H., Jr.** Geology of the Baraboo district, Wisconsin — A description and field guide incorporating structural analysis of the Precambrian rocks and sedimentologic studies of the Paleozoic strata, *with summaries*. . . by R. F. Black and J. H. Zimmerman: Wisconsin Univ. Geol. and Nat. History Survey Inf. Circ. 14, 164 p., illus., tables, geol. maps, 1970.

- 00884 **Dalziel, Ian W. D.** Mylonites and mylonitic belts [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 278, 1970.

- 05534 **Damberger, H. H.; Hopkins, M. E.; Johnson, R. G.; Nance, R. B.; Richardson, E. S., Jr.; Shabica, C. W.; Smith, W. H.** (leaders). Field trip road log, first day — Peoria to Starved Rock State Park, in Depositional environments in parts of the Carbondale Formation, western and northern Illinois — Francis Creek Shale and associated strata and Mazon Creek biota — Geol. Soc. America, Coal Geology Div., Ann. Field Trip, Milwaukee, Wis., 1970: Illinois Geol. Survey Guidebook Ser. 8, p. 3-21, illus., 1970.

- 05535 **Damberger, H. H.** (and others) (leaders). Field trip road log, second day — Starved Rock State Park to South Wilmington: Illinois Geol. Survey Guidebook Ser. 8, p. 22-30, illus., 1970.

- 05544 **Damberger, Heinz H.** Petrographic character of the Colchester (No. 2) Coal Member at the Banner Mine, Peoria and Fulton Counties, Illinois, in Depositional en-

vironments in parts of the Carbondale Formation, western and northern Illinois — Francis Creek Shale and associated strata and Mazon Creek biota — Geol. Soc. America, Coal Geology Div., Ann. Field Trip, Milwaukee, Wis., 1970: Illinois Geol. Survey Guidebook Ser. 8, p. 99-105, illus., 1970.

- 05546 **Damberger, Heinz H.** Clastic dikes and related impurities in Herrin (No. 6) and Springfield (No. 5) Coals of the Illinois Basin, *in* Depositional environments in parts of the Carbondale Formation, western and northern Illinois — Francis Creek Shale and associated strata and Mazon Creek biota — Geol. Soc. America, Coal Geology Div., Ann. Field Trip, Milwaukee, Wis., 1970: Illinois Geol. Survey Guidebook Ser. 8, p. 111-119, illus., 1970.
- 06946 **Damberger, Heinz H.** Coalification patterns of Pennsylvanian coal basins of the U.S.A. [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 532, 1970.
- 05684 **D'Amico, J.; DeFelice, J.; Fireman, E. L.** The cosmic-ray and solar-flare bombardment of the Moon, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1029-1036, illus., tables, 1970.
- 04493 **Damon, Norman; Wiggins, Jack L.** (editors). International oil and gas development, yearbook 1970 (review of 1969) — V. 40, Pt. 1, Exploration (annual review of geological and geophysical prospecting, land and leasing activities, wildcat exploration, and proven field development in United States and Canada): Austin, Tex., Internat. Oil Scouts Assoc., 486 p., illus., tables, 1970.
- 08747 **Damon, P. E.** Radiocarbon as an example of the unity of science, *in* Radiocarbon variations and absolute chronology — Nobel Symposium, 12th, Uppsala, 1969, Proc.: New York, John Wiley and Sons, and Stockholm, Almquist and Wiksell, p. 641-644, 1970.
- 08764 **Damon, P. E.** Climatic versus magnetic perturbation of the atmospheric C-14 reservoir, *in* Radiocarbon variations and absolute chronology — Nobel Symposium, 12th, Uppsala, 1969, Proc.: New York, John Wiley and Sons, and Stockholm, Almquist and Wiksell, p. 571-593, illus., tables, 1970.
- Damon, Paul.** See Hashad, A. H. 02367
- 03920 **Damon, Paul E.** A theory of "real" K-Ar clocks, *in* Geochronology of Phanerozoic orogenic belts — Colloquium, Switzerland, 1969, Papers: Eclogae Geol. Helveticae, v. 63, no. 1, p. 69-76, illus., 1970.
- Damon, Paul E.** See Elston, Wolfgang E. 09262
- 11271 **Damon, Paul E.** (and others). Correlation and chronology of ore deposits and volcanic rocks (Ann. Progress Rept. No. C00-689-120, Contract AT(11-1)689): U.S. Atomic Energy Comm. Research Div. [137] p., illus., tables, 1969.
- 11273 **Damon, Paul E.** (and others). Correlation and chronology of ore deposits and volcanic rocks (Ann. Progress Rept. No. C00-689-100 Contract AT(11-1)-689): U.S. Atomic Energy Comm. Research Div., [245] p., illus., tables, 1968.
- 00057 **Danes, Z. F.** Earthquake occurrence in the state of Washington: Science, v. 167, no. 3917, p. 396, 1970.
- 08639 **Danes, Z. F.** Gravity results in the state of Washington [abs.], *in* Columbia River Basalt Symposium, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 327, 1970.
- 09126 **Dangel, Philip N.; Wuensch, B. J.** The crystallography of colusite: Am. Mineralogist, v. 55, nos. 9-10, p. 1787-1790, tables, 1970.

- 00691 **Daniel, Charles C.** Alteration of clays and associated minerals within the contact aureole of a diabase dike [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 204, 1970.
- 01489 **Daniel, James F.; Cable, Lewis W.; Wolf, Ronald J.** Ground water-surface water relation during period of overland flow, *in* Geological Survey research 1970, Chap. B. U.S. Geol. Survey Prof. Paper 700-B, p. B219-B223, illus., 1970.
- Daniel, Thomas W., Jr.** *See* Clarke, Otis M., Jr. 08678
- 10437 **Daniel, Thomas W., Jr.; Fies, Milton H.** Strippable coal in the Fabius area, Jackson County, Alabama: *Alabama Geol. Survey Bull.* 96, 97 p., illus., tables, 1970.
- Daniels, Paul A.** *See* Hoskins, Earl R. 10581
- Daniels, R. B.** *See* Gamble, E. E. 02548
- Daniels, R. B.** *See* Gamble, E. E. 02577
- 03935 **Daniels, R. B.; Gamble, E. E.; Cady, J. G.** Some relations among coastal plain soils and geomorphic surfaces in North Carolina: *Soil Sci. Soc. America Proc.*, v. 34, no. 4, p. 648-653, illus., 1970.
- 03990 **Daniels, R. B.; Nelson, L. A.; Gamble, E. E.** A method of characterizing nearly level surface [with French and German abs.]: *Zeitschr. Geomorphologie*, v. 14, no. 2, p. 175-185, illus., tables, 1970.
- Daniels, R. B.** *See* Touchet, B. A. 07041
- Danilchik, Walter.** *See* Rogers, C. L. 04246
- 07625 **Dankert, Wayne N.; Drew, James V.** Pedogenic distribution of zinc in Mollisols and associated Entisols in Nebraska: *Soil Sci. Soc. America Proc.*, v. 34, no. 6, p. 916-919, tables, 1970.
- 00250 **Danner, W. R.** Paleontologic and stratigraphic evidence for and against sea floor spreading and opening and closing oceans in the Pacific Northwest [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 84-85, 1970.
- Danner, W. R.** *See* Nestell, M. K. 02664
- 05298 **Danner, W. R.** Western Cordilleran flysch sedimentation, southwestern British Columbia, Canada, and northwestern Washington and central Oregon, U.S.A. [with French abs.], *in* Flysch sedimentology in North America: *Geol. Assoc. Canada Spec. Paper* 7, p. 37-51, illus., 1970.
- Dansgaard, W.** *See* Johnson, S. J. 04072
- 08209 **Dansgaard, W.; Johnsen, S. J.; Möller, J.; Langway, C. C., Jr.** Oxygen isotope analysis of a core representing a complete vertical profile of a polar ice sheet [abs.], *in* Internat. Symposium on Antarctic Glaciological Exploration (ISAGE), Hanover, N.H., 1968 [Proc.]: *Internat. Assoc. Sci. Hydrology (and Sci. Comm. Antarctic Research)* Pub. 86, p. 93-94, illus., 1970.
- 08743 **Dansgaard, W.; Johnsen, S. J.; Clausen, H. B.; Langway, C. C., Jr.** Ice cores and paleoclimatology, *in* Radiocarbon variations and absolute chronology — Nobel Symposium, 12th, Uppsala, 1969, Proc.: New York, John Wiley and Sons, and Stockholm, Almquist and Wiksell, p. 337-348, discussion, p. 348-351, illus., table, 1970.
- Dansgaard, W.** *See* Langway, C. C., Jr. 09635
- 01067 **Dapples, E. C.** Environments influencing deposition of the Franconia Formation [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 384, 1970.

- 10028 **Darby, Dennis A.** Carbonate cycles in Arctic Ocean sediment cores [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2476, 1970.
- Darby, Dennis A.** See Mullen, Ruth E. 10080
- Darnell, Richard P.** See Meeves, Henry C. 02738
- 03565 **Darnley, A. G.** Airborne gamma-ray spectrometry: Canadian Mining and Metall. Bull., v. 63, no. 694, p. 145-154, illus., tables, 1970.
- 04528 **Darnley, A. G.; Grasty, R. L.; Charbonneau, B. W.** Highlights of GSC airborne gamma spectrometry in 1969: Canadian Mining Jour., v. 91, no. 4, p. 98-101, illus., tables, 1970.
- 03822 **Darrell, James H., 2d; Hart, George F.** Environmental determinations using absolute miospore frequency, Mississippi River delta: Geol. Soc. America Bull., v. 81, no. 8, p. 2513-2518, illus., tables, 1970.
- Das, H. A.** See Weijden, C. H. van der. 05598
- Dasch, E. Julius.** See Reynolds, Peter H. 09536
- 01179 **Dasgupta, H. C.** Influence of temperature and oxygen fugacity on the fractionation of manganese between coexisting titaniferous magnetite and ilmenite: Jour. Geology, v. 78, no. 2, p. 243-249, 1970.
- Dash, B. P.** See Mabey, D. 02941
- 00542 **Dastidar, Priyabrata Ghosh.** A study of trace elements in selected Appalachian sulphide deposits [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3308B-3309B, 1970.
- Daugherty, K. I.** See Woollard, G. P. 06323
- Davey, C. B.** See Losche, C. K. 03763
- 08672 **Davey, Roger Jack.** Non-calcareous microplankton from the Cenomanian of England, northern France and North America, Pt. 2: British Mus. (Nat. History) Bull., Geology, v. 18, no. 8, p. 333-397, illus., 1970.
- David, David.** See Komornik, Amos. 04225
- 04293 **David, Michel.** Geostatistical ore estimation, a step-by-step case study [abs.]: Canadian Mining and Metall. Bull., v. 63, no. 696, p. 447, 1970.
- 08119 **David, Peter P.** Discovery of Mazama ash in Saskatchewan, Canada [with French abs.]: Canadian Jour. Earth Sci., v. 7, no. 6, p. 1579-1583, illus., table, 1970.
- 04191 **Davidson, A.** Precambrian geology, Kaminak Lake map-area, District of Keewatin (55L): Canada Geol. Survey Paper 69-51, 27 p., illus., tables, geol. map, 1970.
- 04447 **Davidson, A.** Nepheline-K-feldspar intergrowth from Kaminak Lake, Northwest Territories: Canadian Mineralogist, v. 10, pt. 2, p. 191-206, illus., tables, 1970.
- 07180 **Davidson, A.** Eskimo Point and Dawson Inlet map-areas (north halves), District of Keewatin, 55E and 55F (north parts) [with French abs.]: Canada Geol. Survey Paper 70-27, 21 p., illus., geol. maps, 1970.
- 01645 **Davidson, E. S.; Weist, W. G., Jr.** Geohydrology, in Objectives, methods, and environment — Gila River Phreatophyte Project, Graham County, Arizona: U.S. Geol. Survey Prof. Paper 655-A, p. A8-A11, illus., 1970.



- 08392 **Davidtz, John C.; Low, Philip.** Relation between crystal-lattice configuration and swelling of montmorillonites [with French, German, and Russian abs.]: *Clays and Clay Minerals*, v. 18, no. 6, p. 325-332, illus., tables, 1970.
- 00885 **Davies, David K.** Distribution and basinward transportation of Pleistocene sands and silts in the Gulf of Mexico [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 278-279, 1970.
- 00886 **Davies, David K.; Ethridge, Frank G.** A recent model for marine bar deposition, and the recognition of bar environments through a study of sedimentary structures, textures and composition [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 279, 1970.
- 01541 **Davies, David K.; Moore, W. Richard.** Dispersal of Mississippi sediment in the Gulf of Mexico: *Jour. Sed. Petrology*, v. 40, no. 1, p. 339-353, illus., tables, 1970.
- Davies, David K.** See Berg, Robert R. 02587
- 02789 **Davies, David K.; Ethridge, Frank G.** Recognition of depositional environments through thin-section analysis of detrital sediments [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 843, 1970.
- 02801 **Davies, David K.** Environments of sandstone deposition in the Claiborne Group, *in* Outcrops of the Claiborne Group in the Brazos Valley, southeast Texas — *Geol. Soc. America South-Central Sec., 4th Ann. Mtg., 1970, Guidebook*: [College Station, Tex.] Texas A and M Univ., Dept. Geology, p. 17-21, illus., 1970.
- Davies, Geoffrey F.** See Ahrens, Thomas J. 00006
- 10823 **Davies, Geoffrey F.; Brune, James N.** Global fault activity from seismic moments of large earthquakes [abs.] - *Internat. Symposium on Recent Crustal Movements and Associated Seismicity*, Wellington, N.Z., 1970, *Proc.*: Wellington, N.Z., Royal Soc. of New Zealand, p. 8, 1970.
- Davies, J. A.** See Ottaway, J. M. 04234
- 02519 **Davies, J. C.** Western Peninsula area (east sheet), District of Kenora: Ontario Dept. Mines Prelim. Geol. Map P. 604, scale 1 in. to 1/4 mi., text, 1970.
- Davies, J. H.** See Barringer, A. R. 07724
- 04532 **Davies, J. L.** Geology and exploration opportunities in northern New Brunswick: *Canadian Mining Jour.*, v. 91, no. 4, p. 63-65, illus., 1970.
- Davies, T. A.** See Berggren, W. A. 06160
- 00692 **Davies, Tudor T.; Sayre, J. G.** The effect of environmental stress on pelecypod shell ultrastructure [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 204-205, 1970.
- 10229 **Davies, William E.** Historical engineering geology of the Chesapeake and Ohio Canal—field trip 5, *in* *Assoc. Eng. Geologists, 1970 Ann. Mtg.* [Washington, D. C.] [Guidebook to field trips 1 and 5: [Sacramento, Calif.] *Assoc. Eng. Geologists*, p. 7-16, illus., 1970.
- 05927 **Davis, Briant L.** Calculation of X-ray diffraction patterns for anisotropic mineral aggregates, *in* *Experimental and natural rock deformation — Internat. Symposium, Darmstadt, Germany, 1969, Proc.* (P. Paulitsch, editor): Berlin and Heidelberg, Germany, Springer-Verlag, p. 19-37, illus., tables, 1970.
- 02838 **Davis, C. E.; Ahmad, N.; Jones, Robert L.** Weight loss on ignition and K fixation in clays: *Soil Sci. Soc. America Proc.*, v. 34, no. 2, p. 345-347, illus., tables, 1970.

- 07869 **Davis, C. E.; Thompson, B. E.; Taylor, W. A.; Holdridge, D. A.** Dickite from Job's Hill, St. Mary, Jamaica: *Clay Minerals*, v. 8, no. 4, p. 461-469, illus., tables, 1970.
- 09339 **Davis, C. E.; Taylor, W. A.; Thompson, B. E.; Holdridge, D. A.** Dickite from Job's Hill, St. Mary Parish: *Sci. Research Council Jamaica Jour.*, v. 1, no. 1, p. 41-51, illus., tables, 1970.
- 09340 **Davis, C. E.; Thompson, B. E.; Holdridge, D. A.** The mineralogy of clays of the Nassau and Oxford Valleys, St. Elizabeth and Manchester Parishes: *Sci. Research Council Jamaica Jour.*, v. 1, no. 2, p. 53-70, illus., tables, 1970.
- 09341 **Davis, C. E.; Taylor, W. A.; Thompson, B. E.; Holdridge, D. A.** Two Jamaican bentonite clays: *Sci. Research Council Jamaica Jour.*, v. 1, no. 2, p. 71-81, illus., tables, 1970.
- 09342 **Davis, C. E.** C.e.c. [Cation exchange capacity] - Surface area relationships in clays: *Sci. Research Council Jamaica Jour.*, v. 1, no. 2, p. 93-97, illus., table, 1970.
- 09343 **Davis, C. E.** Quantitative clay mineral determination of the quartz-kaolinite and quartz-calcite systems by X-ray diffraction: *Sci. Research Council Jamaica Jour.*, v. 1, no. 2, p. 98-104, illus., tables, 1970.
- 09344 **Davis, C. E.** Quantitative determination of mixtures of goethite and gibbsite by d.t.a. [differential thermal analysis]: *Sci. Research Council Jamaica Jour.*, v. 1, no. 2, p. 105-110, illus., table, 1970.
- 10356 **Davis, C. E.; Holdridge, D. A.** Quantitative clay mineral estimation in Jamaica clays by differential thermal analysis: *Information—Jamaica Sci. Research Council Bull.*, v. 9, nos. 1-4, p. 39-42, table, 1969.
- Davis, Catherine C.** See Johnson, Richard D. 05739
- 07335 **Davis, Darrell E.; Taylor, Ronald S.; Brown, Karen E.; Russell, E. E.; Keady, D. M.; Welby, Charles W.; Dodge, C. F.** Type locality descriptions, *in* Exploration concepts for the Seventies: *Gulf Coast Assoc. Geol. Soc. Trans.*, v. 20, p. 318-335, illus., 1970.
- Davis, E. Mott.** See Valastro, S., Jr. 01329
- Davis, E. Mott.** See Valastro, S., Jr. 03187
- Davis, Edward H.** See Viggiani, Carlo. 00048
- 01358 **Davis, Fenelon F. (and others).** Some highlights of 1969, California mining review: *California Div. Mines and Geology Mineral Inf. Service*, v. 23, no. 4, p. 67-78, illus., 1970.
- Davis, G. L.** See Krogh, T. E. 01614
- Davis, G. L.** See Brooks, C. 01616
- Davis, G. L.** See Brooks, C. 01617
- Davis, G. L.** See Brooks, C. 01618
- Davis, G. L.** See Hart, S. R. 01620
- Davis, G. L.** See Krogh, T. E. 01789
- Davis, G. L.** See Krogh, T. E. 02246
- Davis, G. L.** See Krogh, T. E. 02247
- Davis, G. L.** See Krogh, T. E. 02248

**Davis, G. L.** See Hart, S. R. 08270

**Davis, Gregory A.** See Burchfiel, B. C. 00876

**Davis, Gregory A.** See Burchfiel, B. C. 00877

04309 **Davis, J. B.; Kirkland, D. W.** Native sulfur deposition in the Castile formation, Culberson County, Texas: *Econ. Geology*, v. 65, no. 2, p. 107-121, illus., tables, 1970.

06333 **Davis, J. B.; Stanley, J. P.; Custard, H. C.** Evidence against oxidation of hydrogen sulfide by sulfate ions to produce elemental sulfur in salt domes: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2444-2447, 1970.

10636 **Davis, John C.** Information contained in sediment-size analysis: *Internat. Assoc. Math. Geology Jour.*, v. 2, no. 2, p. 105-112, illus., table, 1970.

01128 **Davis, John Clements.** Petrology of Cretaceous Mowry Shale of Wyoming: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 3, p. 487-502, illus., table, 1970.

**Davis, L. B.** See Forbis, R. G. 10647

00251 **Davis, L. L.; Lynch, R. D.** Seismic response in Las Vegas, Nevada, from nuclear detonations at the Nevada Test Site [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 85, 1970.

**Davis, L. L.** See Weetman, Bruce G. 01998

**Davis, L. L.** See Williams, Spencer L. 02001

10155 **Davis, Leslie B.** Prehistoric utilization of Yellowstone Park obsidian within the Yellowstone, Madison and Gallatin drainages and the northern Wyoming basin, 12,000 to 200 years B.P. [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 29-30, 1970.

10219 **Davis, M. E.; Gordon, J. D.** Records of water levels and chemical analyses from selected wells in parts of the Trans-Pecos region, Texas, 1965-68: *Texas Water Devel. Board Rept.* 114, 49 p., illus., tables, 1970.

06947 **Davis, Margaret B.** Erosion rates and land use history in southern Michigan [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 533, 1970.

10156 **Davis, Margaret B.** Pollen evidence of climatic events in northeastern United States between 14,000 and 9,000 years ago [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 31-32, illus., 1970.

05959 **Davis, Mary W.; Ehrlich, Robert.** Relationship between measures of sediment-size-frequency distributions and the nature of sediments: *Geol. Soc. America Bull.*, v. 81, no. 12, p. 3537-3548, illus., 1970.

**Davis, N. F.** See Burnham, C. Wayne. 02821

**Davis, P. K.** See Hohenberg, C. M. 05703

02268 **Davis, Raymond, Jr.** The argon radioactivities in the Lost City meteorite and the spatial intensity of cosmic radiation [abs.]: *EOS*, v. 51, no. 7, p. 581, 1970.

**Davis, Raymond, Jr.** See Stoenner, R. W. 05722

01068 **Davis, Richard A., Jr.** Beach dynamics in southeastern Lake Michigan [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 384-385, 1970.

- 06948 **Davis, Richard A., Jr.** Sedimentation in beach and nearshore environments of eastern Lake Michigan [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 533-534, 1970.
- 06949 **Davis, Richard A., Jr.; Fox, William T.** Sediments, processes, and topography in the nearshore environment [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 534, 1970.
- Davis, Richard A., Jr.** See Ostrom, Meredith E. 07422
- 07840 **Davis, Richard A., Jr.** Prairie du Chien Group in the Upper Mississippi Valley, in *Field trip guidebook for Cambrian-Ordovician geology of western Wisconsin* — *Geol. Soc. America, Ann. Mtg., Milwaukee, Wis., 1970: Wisconsin Geol. and Nat. History Survey Inf. Circ.* 11, p. 35-44, illus., 1970.
- 10618 **Davis, Stanley N.** Silica in streams and ground water of Hawaii: *Hawaii Univ. Water Resources Research Center Tech. Rept.* 29, 31 p., illus., tables, 1969.
- Davis, T. E.** See Sinha, A. K. 01833
- 07500 **Davis, W. E.; Stewart, J. H.** Aeromagnetic and generalized geologic map of the Austin area, Lander County, Nevada: *U.S. Geol. Survey Geophys. Inv. Map GP-694*, scale 1:125,000, separate text, 1970.
- 06677 **Davis, W. M.** River terraces in New England, [Chap.] 2 in *Rivers and river terraces* (G. H. Dury, editor): London, Macmillan and Co. Ltd., p. 36-72, illus., condensed 1970, originally published 1902.
- Dawe, G. L.** See Rodda, Peter U. 06375
- 02104 **Dawes, Peter R.** Grönlandske granater som smykkesten [Greenlands garnets as ornaments (with English abs.)]: *Grönland* 1970, no. 4, p. 113-119, illus., 1970.
- 06242 **Dawes, Peter R.; Soper, N. J.** Geological investigations in northern Peary Land, in *Report of activities, 1969: Grönlands Geol. Undersögelse Rap.* 28, p. 9-15, illus., 1970.
- 06343 **Dawes, Peter R.** Quaternary studies in northern Peary Land, in *Report of activities, 1969: Grönlands Geol. Undersögelse Rap.* 28, p. 15-16, 1970.
- 08188 **Dawes, Peter R.** Bedrock geology of the nunataks and semi-nunataks in Frederikshaabs Isblink area of southern West Greenland: *Greenland Geol. Survey Rept. [Grönlands Geol. Undersögelse Rap., English edition]* 29, 60 p., illus., tables, geol. map, 1970.
- 08354 **Dawes, Peter R.** The plutonic history of the Tasiussaq area, south Greenland, with special reference to a high-grade gneiss complex: *Grönlands Geol. Undersögelse Bull.*, no. 88, 125 p., illus., table, geol. map, 1970; *Medd. Grönland*, v. 189, no. 3, 1970.
- 10029 **Dawes, Peter R.; Soper, N. J.** Pre-Quaternary geology of North Greenland [abs.], in *Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2476, 1970.
- Dawson, J. P.** See Cremers, C. J. 06273
- 06950 **Dawson, James Clifford.** The sedimentology and stratigraphy of the Morrison Formation (Upper Jurassic) in northwestern Colorado and northeastern Utah [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 534-535, 1970.
- Dawson, K. M.** See White, William H. 08135
- 02094 **Dawson, Mary R.; Black, Craig C.** The North American cricetid rodent "*Eumys*" *exiguus*, once more: *Jour. Paleontology*, v. 44, no. 3, p. 524-526, illus., 1970.

**Dawson, T. A.** See Becker, Leroy E. 01052

- 06951 **Day, Howard W.** Redetermination of the stability of muscovite + quartz [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 535, 1970.
- 08247 **Day, J. H.** The classification of organic soils in Canada [with French abs.], in International Peat Congress, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 80-84, 1970.
- 09349 **Day, John C.** Managing the lower Rio Grande: Chicago Univ. Dept. Geography Research Paper 125, 274 p., illus., tables, 1970.
- 06714 **Day, Michael H.** Fossil man: New York, Grosset and Dunlap, 159 p., illus., 1970.
- 00067 **Day, R.; O'Reilly, W.; Banerjee, Subir K.** Rotational hysteresis study of oxidized basalts: Jour. Geophys. Research, v. 75, no. 2, p. 375-386, illus., tables, 1970.
- 08541 **Dayharsh, Fred L.** Distribution of ring dike-like structures near Odessa, Washington, in Columbia River Basalt Symposium, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 176-178, illus., 1970.
- 02504 **Deal, D. E.; Huff, D. M.** Hydrodynamic interpretations of Holocene sediments along the Turtle River, northeastern North Dakota [abs.]: North Dakota Acad. Sci. Proc., v. 24, pt. 1, p. 6, 1970.
- 00604 **Deal, Dwight E.** Karst development and associated mineralization in the Black Hills [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 329-330, 1970.
- 00605 **Deal, Dwight E.** Solution breccias in Mississippian and Pennsylvanian limestones on the west flank of the Black Hills [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 330, 1970.

**Deal, Dwight E.** See Moran, Stephen R. 01091

- 10157 **Deal, Dwight E.** Thin till sheets and palimpsest glacial topography [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 33, 1970.
- 10814 **Deal, Dwight E.** Origin and secondary mineralization of caves in the Black Hills of South Dakota, U.S.A., in Internat. Cong. Speleology, 4th, Yugoslavia, 1965, Proc., V. 3: Ljubljana, Yugoslavia, Speleolog. Soc. Yugoslavia, p. 67-70, illus., 1968.

**Dean, Roberta B.** See Lloyd, Orville B., Jr. 09503

**Dean, Roberta B.** See Wyrick, Granville G. 10944

- 03376 **Dean, W. T.** Lower Ordovician trilobites from the vicinity of South Catcher Pond, northeastern Newfoundland: Canada Geol. Survey Paper 70-44, 15 p., illus., 1970.
- 05260 **Dean, W. T.** A new Lower Ordovician trilobite faunule from Random Island, eastern Newfoundland: Canada Geol. Survey Paper 70-19, 10 p., illus., 1970.
- 06952 **Dean, Walter E., Jr.** A module system of instruction for introductory earth science courses [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 535-536, 1970.
- 03722 **Dear, P. S.** Isomorphism of åkermanite and strontio-gehlenite: Lithos, v. 3, no. 1, p. 13-16, table, 1970.

**DeBremaecker, J. C.** See Pan, Poh-Hsi. 07781

- 10566 **DeBremaecker, Jean-Claude.** Convection in the upper mantle [abs.]: EOS, v. 51, no. 11, p. 822, 1970.

- 06802 **DeBruin, Richard.** 100 topographic maps illustrating physiographic features: Northbrook, Ill., Hubbard Press, 128 p., illus., 1970.
- 01905 **Decker, Robert W.; Harlow, David.** Microearthquakes at Cascade volcanoes [abs.]: *EOS*, v. 51, no. 4, p. 351, 1970.
- Decker, Robert W.** See Unger, John D. 06462
- 01374 **Deep Sea Drilling Project.** (East Coast Repository). Carbon carbonate results, [Chap.] 9 in Initial reports of the Deep Sea Drilling Project — V. 2, Leg 2 of cruises of *Glomar Challenger*, Hoboken, N. J., to Dakar, Senegal, Oct.-Nov. 1968: Washington, D. C., U.S. Govt. Printing Office, p. 319-321, tables, 1970.
- 01647 **Deep Sea Drilling Project.** (East Coast Repository). Leg 2 grain size analysis and composition of the coarse fraction, [Chap.] 8 in Initial reports of the Deep Sea Drilling Project — V. 2, Leg 2 of cruises of *Glomar Challenger*, Hoboken, N. J., to Dakar, Senegal, Oct.-Nov. 1968: Washington, D. C., U.S. Govt. Printing Office, p. 307-317, illus., tables, 1970.
- 03294 **Deep Sea Drilling Project.** (Scientific Staff). Deep Sea Drilling Project, Leg 10: *Geotimes*, v. 15, no. 6, p. 11-14, illus., table, 1970.
- 04023 **Deep Sea Drilling Project.** (Scientific staff). Deep Sea Drilling Project — Leg 11: *Geotimes*, v. 15, no. 7, p. 14-16, illus., table, 1970.
- 06221 **Deep Sea Drilling Project.** (Scientific Staff). Deep Sea Drilling Project, Leg 12: *Geotimes*, v. 15, no. 9, p. 10-14, illus., table, 1970.
- Deer, W. A.** See Kempe, D. R. C. 07059
- Deer, W. A.** See Kempe, D. R. C. 08404
- Deere, D. U.** See Nair, K. 05029
- Deere, Don U.** See Nordlund, Raymond L. 02358
- 05512 **Deere, Don U.; Cording, E. J.** Interrelationships of soil mechanics, rock mechanics, and engineering geology, in Engineering geology and soils engineering symposium, 8th Ann., Pocatello, Idaho, 1970, Proc.: Boise, Idaho, Idaho Dept. Highways, p. 295-313, illus., 1970.
- DeFazio, Thomas.** See Aki, Keiiti. 00219
- DeFazio, Thomas.** See Aki, Keiiti. 04337
- DeFelice, J.** See Fireman, E. L. 04555
- DeFelice, J.** See D'Amico, J. 05684
- 05042 **Deffeyes, Kenneth S.** The axial valley, a steady-state feature of the terrain, [Chap.] 9 in The megatectonics of continents and oceans (Helgi Johnson and Bennett L. Smith, editors): New Brunswick, N. J., Rutgers Univ. Press, p. 194-222, illus., table, 1970.
- Defleur-Schenus, Muriel.** See Jedwab, Jacques. 06518
- 05919 **DeFord, Ronald K.; Haenggi, Walter T.** Stratigraphic nomenclature of Cretaceous rocks in northeastern Chihuahua [abs.], in The geologic framework of the Chihuahua tectonic belt — Symposium in honor of Ronald K. De Ford, Midland, Tex., 1970: Midland, Tex., West Texas Geol. Soc., p. 60, 1970.
- 05527 **Degenkolb, H. J.** An engineer's perspective on geologic hazards, in Geologic hazards and public problems (R. A. Olson and M. M. Wallace, editors) — [U.S.] Office Emergency Preparedness, Region 7, Conf., San Francisco, Calif., 1969, Proc.: Washington, D.C., U.S. Govt. Printing Office, p. 183-195, illus. [1970].

- 03988 **DeGeoffroy, J.; Wu, S. M.; Heins, R. W.** Some observations on springs in southwest Wisconsin: Water Resources Research, v. 6, no. 4, p. 1235-1238, illus., tables, 1970.
- 04282 **DeGeoffroy, J.; Wu, S. M.** A statistical study of ore occurrences in the greenstone belts of the Canadian Shield: Econ. Geology, v. 65, no. 4, p. 496-504, illus., tables, 1970.
- 04432 **DeGeoffroy, J.; Wu, S. M.** Design of a sampling plan for regional geochemical surveys: Econ. Geology, v. 65, no. 3, p. 340-347, illus., tables, 1970.
- 04480 **DeGeoffroy, J.; Wignall, T. K.** Statistical decision in regional exploration — Application of regression and Bayesian classification analysis in the southwest Wisconsin zinc area: Econ. Geology, v. 65, no. 7, p. 769-777, illus., tables, 1970.
- 10668 **DeGeoffroy, J.; Wignall, T. K.** Application of statistical decision techniques to the selection of prospecting areas and drilling targets in regional exploration: Canadian Mining and Metall. Bull., v. 63, no. 700, p. 893-899, illus., tables, 1970.
- 00606 **DeGraw, Harold M.** Structure of the northern Denver basin and adjacent uplifts [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 330-331, 1970.
- 10005 **Dehlinger, Peter, Couch, R. W.; McManus, D. A.; Gemperle, Michael.** Northeast Pacific structure, in *The sea* — v. 4, New concepts of sea floor evolution, Pt. 2, Regional observations (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 133-189, illus., 1970.
- 07817 **Deines, P.** The principles of spark source mass spectrography and its application to the determination of trace element concentrations: Pennsylvania State Univ. Earth and Mineral Sci. Expt. Sta. Circ. 78, 111 p., illus., 1970.
- 05226 **Deines, Peter.** The carbon and oxygen isotopic composition of carbonates from the Oka carbonatite complex, Quebec, Canada: Geochim. et Cosmochim. Acta, v. 34, no. 11, p. 1199-1225, illus., tables, 1970.
- deKimpe, C.** See Colmet-Daage, F. 05900
- 09313 **Deklotz, E. J.; Boisen, B. P.** Development of equipment for determining deformation modulus and *in situ* stress by means of large flat-jacks, in *Determination of the in situ modulus of deformation of rock* (Symposium, ASTM, Winter Mtg., Denver, Colo., 1969): Am. Soc. Testing and Materials Spec. Tech. Pub. 477, p. 117-125, illus., 1970.
- 11269 **del Castillo G., Luis; Martinez Baca, Alfonso; Marquez Calderon, Rafael.** Levantamiento magnetometrico y gravimetrico en el area de Ixtlan de los Hervores y "Los Negritos," Michoacan [A magnetic and gravity survey in the Ixtlan de los Hervores and "Los Negritos" area, Michoacan (with Spanish abs.)]: Mexico Univ. Nac. Autonomia Inst. Geofisica Anales 1969, v. 15, p. 109-143, illus., table, 1970.
- Delabio, R. N.** See Wanless, R. K. 04096
- Delach, M. N.** See Horn, D. R. 08445
- DelaCruz, Catalino del Rosario.** See Silvester, Richard. 10209

- 10889 **delacruz Reyna, Servando.** Conveccion asimetrica en el manto superior [asymmetric convection in the upper mantle (with Spanish and English abs.)]: *Geofisica Internac.*, v. 10, no. 2, p. 49-56, illus., 1970.
- 03094 **delacruz, Rodolfo Vilorio.** The borehole deepening method of absolute stress measurement [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 10, p. 4606B, 1970.
- deLaeter, J. R.** See *Clarke, W. B.* 00008
- Delaune, M.** See *Colmet-Daage, F.* 05900
- Delavault, Robert E.** See *Warren, Harry V.* 07419
- Delavault, Robert E.** See *Warren, H. V.* 10781
- 08452 **DelCastillo G., Luis; Mendive A., Lazaro.** Barreras mentales y sus consecuencias en la geofisica de exploracion (Mental blocks and their consequences in exploration geophysics): *Geologia y Metalurgia*, v. 5, no. 32, p. 35-44, 1970.
- 09353 **DelCastillo G., Luis; Armando Diez, J.** Estudio por sismologia de refraccion de una zona geotermica [Refraction study of a geothermal zone (with Spanish abs.)]: *Mexico Univ. Nac. Autonoma Inst. Geofisica Anales* 1969, v. 15, p. 83-106, illus., tables, 1970.
- 05955 **DeLeenheer, L.** Memorial of Prof. Alfred Schoep — June 6, 1881-June 1, 1966: *Am. Mineralogist*, v. 55, nos. 3-4, p. 597-602, portrait, 1970.
- 04155 **Delevoryas, T.; Hope, R. C.** Contributions to our knowledge of Triassic Cycadales [abs.]: *Am. Jour. Botany*, v. 57, no. 6, pt. 2, p. 758, 1970.
- 09492 **Delflache, Andre P.; Bryant, William R.** Compressional behavior of high-void ratio marine sediments, in *Offshore Technology Conference*, 2d Ann., Houston, Tex., 1970, Preprints—v. 1: Dallas, Tex., Offshore Technology Conf., p. I-57—I-64, illus., 1970.
- Dellwig, L. F.** See *Wing, R. S.* 00040
- Dellwig, L. F.** See *Wing, R. S.* 00941
- 02848 **Dellwig, L. F.** Pluses and minuses of radar in geological exploration, in *Earth resources aircraft program status review*, NASA, Houston, 1968 — V. 1, Geology, geography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 14-1 — 14-17, App. p. 14A1-14A25, illus., tables [1970].
- Dellwig, Louis F.** See *Rau, Jon L.* 04466
- Dellwig, Louis F.** See *Rau, Jon L.* 04562
- Dellwig, Louis F.** See *Wing, Richard S.* 05202
- 09798 **Dellwig, Louis F.; MacDonald, Harold C.; Kirk, Jon N.** Technique for producing a pseudo three-dimensional effect with monoscopic radar imagery: *Photogramm. Eng.*, v. 36, no. 9, p. 987-988, illus., 1970.
- Dellwig, Louis F.** See *Wing, Richard S.* 10309
- Delo, David M.** See *Reeves, Robert G.* 04588



- 00887 **DeLong, Stephen E.; Long, Leon E.** Approximate concentrations of trace elements in parent magmas [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 279-280, 1970.
- 09843 **Delorme, L. D.** Freshwater ostracodes of Canada — pt. 1, Subfamily Cypridinae; Pt. 2, Subfamily Cypridopsinae and Herpetocypridinae, and family Cyclocyprididae; Pt. 3, Family Candonidae; Pt. 4, Families Ilyocyprididae, Notodromadidae, Darwinulidae, Cytherideidae, and Entocytheridae: *Canadian Jour. Zoology*, v. 48, no. 1, p. 153-168, illus.; no. 2, p. 253-266, illus.; no. 5, p. 1099-1127, illus.; no. 6, p. 1251-1259, illus., 1970.
- 04009 **DeLory, F. A.; Salvias, R. J.** Some observations on the undrained shearing strength used to analyze a failure — Reply [to 1970 discussion by J. D. Brown of 1969 paper]: *Canadian Geotech. Jour.*, v. 7, no. 3, p. 345-346, illus., table, 1970.
- 00554 **DeMar, Robert.** A primitive pelycosaur from the Pennsylvanian of Illinois: *Jour. Paleontology*, v. 44, no. 1, p. 154-163, illus., 1970.
- 02009 **Demarest, Harold H., Jr.; Anderson, Orson L.** Phase changes and their effect on shear and P-wave velocities [abs.]: *EOS*, v. 51, no. 4, p. 418, 1970.
- Demarest, Harry.** See Anderson, Orson L. 02011
- DeMatteo, John J.** See Butera, Anthony W. 06704
- 05207 **deMedicis, Rinaldo.** Cubic FeS, a metastable iron sulfide: *Science*, v. 170, no. 3963, p. 1191-1192, table, 1970.
- Demenitskaya, R. M.** See Grachev, A. F. 03449
- 10007 **Demenitskaya, R. M.; Hunkins, K. L.** Shape and structure of the Arctic Ocean, in *The sea* — v. 4, New concepts of sea floor evolution, Pt. 2, Regional observations (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 223-249, illus., 1970.
- 10030 **Demenitskaya, R. M.; Kiselev, Yu. G.; Gaponenko, G. I.; Ivanov, S. S.** Features of sedimentary cover of Arctic Ocean [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971. Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2476-2477, 1970.
- Demenitskaya, R. M.** See Egiazarov, B. Kh. 10036
- 02603 **DeMille, George.** Geology of hydrocarbon occurrence in Woodbend reefs (Devonian) of western Canada [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 843-844, 1970.
- Demirel, Turgut.** See Lohnes, Robert A. 09647
- 08268 **Den Besten, I. E.; Mancuso, J. J.** Geochemical applications of electrodelessly discharged oxygen (low temperature ashing): *Chem. Geology*, v. 6, no. 4, p. 245-253, table, 1970.
- 01902 **Dence, M. R.; vonEngelhardt, W.; Walter, L. S.; Plant, A. G.** Spheroids in impact glass from Clearwater Lake crater, Quebec [abs.]: *EOS*, v. 51, no. 4, p. 342, 1970.
- 10758 **Dence, Michael R.** Meteorite crater investigations, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor): *Canada Geol. Survey Paper* 69-56, p. 79-83, 1970.
- 08697 **Denechaud, E. B.; Helmke, P. A.; Haskin, L. A.** Analysis for the rare-earth elements by neutron activation and Ge(Li) spectrometry: *Jour. Radioanal. Chemistry*, v. 6, no. 1, p. 97-113, tables, 1970.

- 06154 **Denechaud, E. Barton.** Rare-earth activation analysis — Development and application to Stretishorn dike and Duluth Complex [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 12, pt. 1, p. 5396B, 1970.
- 00466 **Dengo, Gabriel; Levy, Enrique.** Anotaciones al mapa metalogenetico de America Central [with English abs.], in *Mapa metalogenetico de America Central*, 1:2,000,000; *Estudios metalogeneticos de America Central*: Inst. Centroamericano Inv. y Tecnologia Indus. Pubs. Geol., no. 3, p. 1-15, illus., 1970.
- 06229 **Dengo, Gabriel; Bohnenberger, Otto; Bonis, Samuel.** Tectonics and volcanism along the Pacific marginal zone of Central America [with German, Spanish, and Russian summ.]: *Geol. Rundschau*, v. 59, no. 3, p. 1215-1232, illus., 1970.
- Dengo, Gabriel.** See Bonis, Samuel. 08376
- 10488 **Denham, Charles R.; Cox, Allan.** Paleomagnetic evidence that the Laschamp polarity event did not occur between 30,000 and 12,000 years ago [abs.]: *EOS*, v. 51, no. 11, p. 745, 1970.
- 03462 **Denham, G. M.** Instrumentation for airborne radiometric surveying [abs.]: *Canadian Mining and Metall. Bull.*, v. 63, no. 695, p. 291, 1970.
- 07883 **Denison, Robert H.** Revised classification of Pteraspidae with description of new forms from Wyoming: *Fieldiana — Geology*, v. 20, no. 1, p. 1-41, illus., 1970.
- 05905 **Denison, Rodger.** Basement rock framework of parts of Texas, southern New Mexico and northern Mexico [summ.], in *The geologic framework of the Chihuahua tectonic belt — Symposium in honor of Ronald K. De Ford*, Midland, Tex., 1970: Midland, Tex., West Texas Geol. Soc., p. 4-6, 1970.
- 05618 **Dennen, William H.; Blackburn, William H.** Aluminum in quartz as a geotermometer: *Contr. Mineralogy and Petrology*, v. 27, no. 4, p. 3323-42 illus., tables, 1970.
- Dennen, William H.** See Moore, Bruce R. 08549
- 04754 **Denning, Ellis.** Bayou Pigeon Field, Iberia Parish, Louisiana, in *Typical oil and gas fields of southwestern Louisiana*, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 2-2b, illus., 1970.
- Dennis, L. S.** See Vogt, Peter R. 01993
- 06791 **Dennison, J. M.; Textoris, D. A.** Devonian Tioga tuff in northeastern United States: *Bull. Volcanol.*, v. 34, no. 1, p. 289-294, illus., 1970.
- 00693 **Dennison, John M.; Johnson, Robert W.** Effects of Tertiary intrusions and the thirty-eighth parallel fracture zone in Virginia and West Virginia [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 205, 1970.
- Dennison, John M.** See Textoris, Daniel A. 01175
- 02604 **Dennison, John M.** Petroleum related to Middle and Upper Devonian deltaic facies in central Appalachians [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 844, 1970.
- Dennison, John M.** See Jones, Michael L. 03598
- 05606 **Dennison, John M.** Stratigraphic divisions of Upper Devonian Greenland Gap Goup ("Cemung Fomaton") along Allegheny Front in West Virginia, Maryland, and Highland County, Virginia: *Southeastern Geology*, v. 12, no. 1, p. 53-82, illus., table, 1970.
- Denny, Charles S.** See Ray, Clayton E. 00036

- 05170 **Denny, Charles S.** Surficial geologic map of the Mooers quadrangle and part of the Rouses Point quadrangle, Clinton County, New York: U.S. Geol. Survey Misc. Geol. Inv. Map I-630, scale 1:62,500, 1970.
- 09376 **Densmore, A. A.** An interpretation of some magneto telluric data recorded in Northeast British Columbia during 1969: Canadian Soc. Explor. Geophysicists Jour., v. 6, no. 1, p. 34-38, illus., 1970.
- Denson, N. M.** See Izett, G. A. 04259
- 03157 **Denton, G. H.; Porter, S. C.** Neoglaciation: Sci. American, v. 222, no. 6, p. 100-110, illus., 1970.
- 10158 **Denton, George H.** Late Wisconsin glaciation in northwestern North America — ice recession and origin of Paleo-Indian Clovis complex [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.], p. 34-35, 1970.
- deQuervain, M.** See Federer, B. 03644
- 03570 **Der, Zoltan A.** Some data processing results for a vertical array of triaxial seismometers: Geophysics, v. 35, no. 2, p. 337-343, illus., table, 1970.
- 08377 **deRömer, H. S.** Geology of the Madeleine Nord River area, Gaspé North County: Quebec Dept. Nat. Resources Prelim. Rept. 594, 19 p., illus., tables, geol. map, 1970.
- Derr, J.** See Latham, G. V. 05758
- 00252 **Derr, John S.** Surface wave spectra for earthquakes and explosions from the MIT tiltmeter [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 85-86, 1970.
- 04622 **Derr, John S.** Discrimination of earthquakes and explosions by the Rayleigh-wave spectral ratio: Seismol. Soc. America Bull., v. 60, no. 5, p. 1653-1668, illus., tables, 1970.
- 09149 **Desai, Chandrakant S.; Reese, Lymon C.** Stress-deformation and stability analyses of deep boreholes [with French and German summ.], in Internat. Soc. Rock Mechanics Cong., 2d, Belgrade, Yugoslavia, 1970, Proc., V. 2: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 475-484, illus., 1970.
- 06206 **Desai, Jyotindra I.** Petrography of the Kaibab and Plympton formations (Permian), near Ferguson Mountain, Elko County, Nevada: Brigham Young Univ. Geology Studies, v. 17, pt. 2, p. 67-81, illus., 1970.
- 05242 **Desaulniers, G.; Frenette, Marcel.** Bed topography effect on flow in a meander — Discussion [of paper 7003 by Chin-Lien Yen, 1970]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Hydraulics Div., no. HY 11, p. 2380-2383, illus., 1970.
- Desborough, G. A.** See Izett, G. A. 00622
- 04319 **Desborough, George A.** Silver depletion indicated by microanalysis of gold from placer occurrences, Western United States: Econ. Geology, v. 65, no. 3, p. 304-311 illus., 1970.
- 04904 **Desborough, George A.; Larson, Richard R.** Nickel-bearing iron sulfides in the Onaping Formation, Sudbury Basin, Ontario: Econ. Geology, v. 65, no. 6, p. 728-730, tables, 1970.
- 06176 **Desborough, George A.; Raymond, William H.; Soule, Courtney.** Placer gold of unique fineness in Douglas and Elbert Counties, Colorado, in Geological Survey research 1970, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D134-D139, illus., table, 1970.

- 06893 **Desborough, George A.; Sainsbury, C. L.** Cassiterite as an exsolution product in magnetite, Lost River tin mine, Alaska: *Econ. Geology*, v. 65, no. 8, p. 1004-1006, illus., 1970.
- 06897 **Desborough, George A.; Raymond, William H.; Iagmin, Paula J.** Distribution of silver and copper in placer gold derived from the northeastern part of the Colorado Mineral Belt: *Econ. Geology*, v. 65, no. 8, p. 937-944, illus., table, 1970.
- Desborough, George A.** See **Chao, E. C. T.** 07547
- Desborough, George A.** See **Amos, Dewey H.** 08496
- 02479 **Deschenes, Jean-Marc.** The history of the genus *Acer*, a review [with French abs.]: *Naturaliste Canadien*, v. 97, no. 1, p. 51-59, table, 1970.
- 04996 **Deshwar, K. H. S.** Determining in-situ rock strength: *Eng. and Mining Jour.*, v. 171, no. 5, p. 84-85, illus., tables, 1970.
- 09150 **Deshwar, K. H. S.** A statistical approach to the design of underground roadways and other structures [with French and German summ.], in *Internat. Soc. Rock Mechanics Cong.*, 2d, Belgrade, Yugoslavia, 1970, *Proc.*, V. 2: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 515-519, illus., tables, 1970.
- 04796 **Detterman, Robert L.** Early Holocene warm interval in northern Alaska: *Arctic*, v. 23, no. 2, p. 130-132, illus., 1970.
- 07658 **Detterman, Robert L.** Sedimentary history of Sadlerochit and Shublik Formations in northeastern Alaska, in *Geological seminar on the North Slope of Alaska*, Palo Alto, Calif., 1970, *Proc.*: Los Angeles, Calif., Am. Assoc. Petroleum Geologists Pacific Sec., p. O1-O13, illus., 1970.
- 10031 **Detterman, Robert L.** Mesozoic sequence in Arctic Alaska [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, *Abs. Papers*: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2477, 1970.
- 02135 **Deuser, W. G.** Extreme  $^{13}\text{C}/^{12}\text{C}$  variations in Quaternary dolomites from the continental shelf: *Earth and Planetary Sci. Letters*, v. 8, no. 2, p. 118-124, tables, 1970.
- Deuser, W. G.** See **Kroopnick, P.** 06760
- 07875 **Deuser, W. G.** Hypothesis of the formation of the Scotia and Caribbean Seas: *Tectonophysics*, v. 10, no. 4, p. 391-401, illus., tables, 1970.
- 01888 **Deutsch, Ernst R.; Rao, Kunduri V.** Paleomagnetism of Ordovician sedimentary rocks from Bell Island, Newfoundland [abs.]: *EOS*, v. 51, no. 4, p. 272, 1970.
- 10810 **Deutsch, Morris; Dove, George D.; Jordan, Paul R.; Wallace, Joe C.** Preliminary survey of ground-water distribution and potential in the Ohio River basin, in *Ohio River basin comprehensive survey*, V. 6, App. E, Ground water: Cincinnati, Ohio, U.S. Army Engineer Div. Ohio River, 197 p., illus. [1966].
- Deutsch, Sarah.** See **Boudin, Andre.** 02120
- Deutschman, Archie J., Jr.** See **Ashby, Carl T.** 09128
- Dever, Garland R., Jr.** See **Philleby, John C.** 00748
- 00520 **deVilliers, Johan Pieter Roos.** The crystal structures of aragonite, strontianite, and witherite [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 7, p. 3238B, 1970.
- 09454 **DeVoe, J. R.; Spijkerman, J. J.** Mössbauer spectroscopy, in *Analytical reviews*, 1970 — Fundamentals: *Anal. Chemistry*, v. 42, no. 5, p. 366R-388R, illus., tables, 1970.

- 03712 **DeVore, George W.** Elastic compliances of minerals related to crystallographic orientation and elastic strain energy relations in twinned crystals: *Lithos*, v. 3, no. 3, p. 193-208, illus., table, 1970.
- 02556 **DeVoto, R. H.; Stevens, D. N.; Bloom, D. N.** Dawsonite and gibbsite in the Green River Formation: *Mines Mag.*, v. 60, no. 5, p. 17-21, 1970.
- DeVries, B.** See Jenkins, R. H. 09164
- 09064 **DeWaard, Dirk.** The anorthosite-charnockite suite of rocks of Roaring Brook valley in the eastern Adirondacks (Marcy Massif): *Am. Mineralogist*, v. 55, nos. 11-12, p. 2063-2075, illus., table, 1970.
- 00538 **DeWalle, David Russell.** Disposition of selected late-lying snowpacks in forests of the Colorado Rockies [abs.]: *Dissert. Abs. Internat., Secc. B, Sci. and Eng.*, v. 30, no. 7, p. 3261B, 1970
- 07728 **Dewart, Gilbert.** Seismic investigation of ice properties and bedrock topography at the confluence of the north and central arms of the Kaskawulsh Glacier, in *Icefield Ranges Research Project, scientific results, V. 2* (V. C. Bushnell and R. H. Ragle, editors): New York, Am. Geog. Soc., and Montreal, Quebec, Arctic Inst. No. America, p. 77-102, illus., tables, modified 1970; originally published 1968.
- Dewey, John F.** See Bird, John M. 01136
- 02141 **Dewey, John F.; Bird, John M.** Mountain belts and the new global tectonics: *Jour. Geophys. Research*, v. 75, no. 14, p. 2625-2647, illus., 1970.
- 08665 **Dewey, John F.; Bird, John M.** Plate tectonics and geosynclines, in *The structure of the crust and mantle beneath inland and marginal seas — Internat. Upper Mantle Comm. Upper Mantle Project, Sci. Rept. No. 29: Tectonophysics*, v. 10, nos. 5-6, p. 625-638, illus., 1970.
- 08472 **DeWiest, Roger J. M.** Hydrology of the Pamlico estuary in the State of North Carolina [with French abs.], in *Symposium on the hydrology of deltas, V. 2: Internat. Assoc. Sci. Hydrology-Unesco Pub. 91*, p. 375-385, illus., tables, 1970.
- deWit, C. T.** See Wierenga, P. J. 07621
- 04075 **deWit, M. J.** Evidence for salt deposits in the Appalachian/Caledonian orogen: *Nature*, v. 227, no. 5260, p. 829-830, illus., 1970.
- 00131 **deWitt, Wallace, Jr.** Age of the Bedford Shale, Berea Sandstone, and Sunbury Shale in the Appalachian and Michigan basins: *U.S. Geol. Survey Bull.* 1294-G, p. G1-G11, illus., 1970.
- 01297 **deWitt, Wallace, Jr.** Reasons for abandonment of the Portage Group, in *Changes in stratigraphic nomenclature by the U.S. Geological Survey, 1968: U.S. Geol. Survey Bull.* 1294-A, p. A23-A25, 1970.
- 00490 **Dexter, William A.** Teaching earth science through the process of inquiry [abs.]: *Texas Jour. Sci.*, v. 21, no. 3, p. 371-372, 1970.
- 06774 **Dezfulian, Houshang; Seed, H. Bolton.** Seismic response of soil deposits underlain by sloping rock boundaries: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7659, *Jour. Soil Mechanics and Found. Div.*, no. SM 6, p. 1893-1916, illus., tables, 1970.
- 03061 **Dial, Don C.** Pumpage of water in Louisiana, 1970: *Louisiana Geol. Survey and Dept. Public Works Water Resources Pamph.* 26, 10 p., illus., table, 1970.
- 05585 **Dial, Don C.** Public water supplies in Louisiana — Basic Records Rept. 3: Baton Rouge, La., Louisiana Dept. Public Works, 460 p., illus., tables, 1970.
- Diamond, H.** See Fields, P. R. 05689

- 03118 **Diamond, Sidney.** Pore size distributions in clays [with French, German and Russian abs.]: *Clays and Clay Minerals*, v. 18, no. 1, p. 7-23, illus., tables, 1970.
- 08699 **Diamond, Sidney; Bloor, James W.** Globular cluster microstructure of endellite (hydrated halloysite)[with French, German, and Russian abs.]: *Clays and Clay Minerals*, v. 18, no. 6, p. 309-312, illus., 1970.
- 00452 **Dibblee, T. W., Jr.** Geology of the Transverse Ranges: California Div. Mines and Geology Mineral Inf. Service, v. 23, no. 2, p. 35-37, illus., 1970.
- 04806 **Dibblee, T. W., Jr.; Hewett, D. F.** Geology of the Mojave Desert: California Div. Mines and Geology Mineral Inf. Service, v. 23, no. 9, p. 180-185, illus., 1970.
- 05615 **Dibblee, T. W., Jr.** Geologic map of the Daggett quadrangle, San Bernardino County, California: U.S. Geol. Survey Misc. Geol. Inv. Map I-592, scale 1:62,500, sections, separate text, 1970.
- 08015 **Dibblee, T. W., Jr.; Warne, A. H.** Geologic map of the Cummings Mountain quadrangle, Kern County, California: U.S. Geol. Survey Misc. Geol. Inv. Map I-611, sections, separate text, 1970.
- 08028 **Dibblee, T. W., Jr.; Louke, Gladys P.** Geologic map of the Tehachapi quadrangle, Kern County, California: U.S. Geol. Survey Misc. Geol. Inv. Map I-607, scale 1:62,500, sections, separate text, 1970.
- 00253 **Dibblee, Thomas W., Jr.** Stratigraphy of the southern Coast Ranges near the San Andreas fault from Cholame to Maricopa, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 86, 1970.
- 04294 **Dibbs, H. P.** The application of neutron activation analysis to the determination of copper in minerals: *Canadian Mining and Metall. Bull.*, v. 63, no. 696, p. 493-499, illus., tables, 1970.
- Dibner, V. D.** See Kulakov, Y. H. 10069
- 06953 **Dickas, Albert B.** Depositional environments of western Lake Superior sands through grain size analysis [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 536-537, 1970.
- Dickerson, J. D.** See Lyles, Leon. 02862
- Dickey, D. D.** See McKeown, F. A. 01629
- Dickey, D. D.** See Bucknam, R. C. 06077
- Dickey, J. S., Jr.** See Marvin, Ursula B. 00958
- 05419 **Dickey, N.** A preliminary study of mineralogic trends in a portion of the Petersburg granite, Richmond [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 132, 1970.
- Dickey, Parke A.** See Cartmill, John C. 06332
- 00888 **Dickinson, Kendell A.; Hunter, Ralph E.** Grain size distribution and depositional history of northern Padre Island, Texas [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 280, 1970.
- 04906 **Dickinson, Kendell A.** The voyage of the Glomar Challenger on Leg X of the Deep Sea Drilling Project [abs.]: *Corpus Christi Geol. Soc. Bull.*, v. 11, no. 2, p. 3, 1970.
- Dickinson, Kendell A.** See Hunter, Ralph E. 05252
- 02205 **Dickinson, W. R.** Global tectonics: *Science*, v. 168, no. 3936, p. 1250-1259, 1970.
- Dickinson, William R.** See Swe, Win. 00027

- 00254 **Dickinson, William R.** Tectonic setting and sedimentary petrology of the Great Valley sequence [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 86-87, 1970.
- Dickinson, William R.** See Gilbert, Wyatt G. 00614
- 01428 **Dickinson, William R.** The new global tectonics — 2d Penrose Conference: *Geotimes*, v. 15, no. 4, p. 18-20, 22, 1970.
- 03688 **Dickinson, William R.** Interpreting detrital modes of graywacke and arkose: *Jour. Sed. Petrology*, v. 40, no. 2, p. 695-707, illus., tables, 1970.
- 04982 **Dickinson, William R.** Relations of andesitic volcanic chains and granitic batholith belts to the deep structures of orogenic arcs: *Geol. Soc. London Proc.* 1969, no. 1662, p. 27-30, discussion, 1970.
- 04999 **Dickinson, William R.** Geology for the masses: *Jour. Geol. Education*, v. 18, no. 5, p. 194-197, 1970.
- 06364 **Dickinson, William R.** Relations of andesites, granites, and derivative sandstones to arc-trench tectonics: *Rev. Geophysics and Space Physics*, v. 8, no. 4, p. 813-860, illus., tables, 1970.
- 10323 **Dickinson, William R.** Geology and geologists in regional planning [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 738-739, 1970.
- 11228 **Dickinson, William R.; Page, Benjamin M.** Field Trip No. 1, Central California Coast Ranges: *Geol. Soc. America, Cordilleran Sec., Ann. Mtg.*, March, 1970, 26 p., illus., 1970.
- 01755 **Dieterich, James H.** Time dependence in stick-slip sliding [abs.]: *EOS*, v. 51, no. 4, p. 423, 1970.
- 07714 **Dieterich, James H.** Computer experiments on mechanics of finite amplitude folds: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 467-476, illus., 1970.
- Dieterich, John W.** See Maxwell, Ross A. 07206
- 03749 **Dieterich, R. V.; Hall, M. R.; Ragland, P. C.** Damming action of xenoliths and segregates within the Mount Airy "granite": *Southeastern Geology*, v. 11, no. 4, p. 205-214, 1970.
- 09163 **Dieterich, Richard V.** Geology and Virginia: Charlottesville, Va., Univ. Virginia Press, 213 p., illus., tables, 1970.
- 08693 **Dietz, R. S.; Sproll, W. P.** Overlaps and underlaps in the North American to Africa continental drift fit [with French and German abs.], in *The geology of the East Atlantic continental margin — ICSU/SCOR Working Party 31 Symposium*, Cambridge, England, 1970, [Pt.] 1, General and Economic Papers: [Great Britain] *Inst. Geol. Sci. Rept.*, no. 70-13, p. 143-151, illus., 1970.
- 02490 **Dietz, Robert S.; Holden, John C.; Sproll, Walter P.** Geotectonic evolution and subsidence of Bahama platform: *Geol. Soc. America Bull.*, v. 81, no. 7, p. 1915-1927, illus., 1970.
- 03963 **Dietz, Robert S.; Holden, John C.** Reconstruction of Pangaea — Breakup and dispersion of continents, Permian to present: *Jour. Geophys. Research*, v. 75, no. 26, p. 4939-4956, illus., 1970.
- 04657 **Dietz, Robert S.** Continental drift in space and time [abs.]: *Houston Geol. Soc. Bull.*, v. 13, no. 2, p. 3, 1970.
- 04798 **Dietz, Robert S.** Continents and ocean basins, [Chap.] 3 in *The megatectonics of continents and oceans* (Helgi Johnson and Bennett L. Smith, editors): New Brunswick, N. J., Rutgers Univ. Press, p. 24-46, illus., table, 1970.

- Diez de Cramer, Maria del Carmen.** See Cramer, Fritz H. 08165
- Diez de Cramer, Maria del Carmen R.** See Cramer, Fritz H. 03197
- Diffenbach, Robert.** See Mauger, Richard L. 01798
- Digby, P. J.** See Murrell, S. A. F. 02718
- Digby, P. J.** See Murrell, S. A. F. 03318
- 01671 **Dilcher, David L.; Dolph, Gary E.** Fossil leaves of *Dendropanax* from Eocene sediments of southeastern North America: Am. Jour. Botany, v. 57, no. 2, p. 153-160, illus., 1970.
- 02876 **Dilcher, David L.; Pavlick, Raphael J.; Mitchell, James.** Chlorophyll derivatives of middle Eocene sediments: Science, v. 168, no. 3938, p. 1447-1449, illus., 1970.
- Dill, Charles E., Jr.** See Swift, Donald J. P. 04724
- Dill, Henry W., Jr.** See Baker, Simon. 07806
- 04631 **Dillon, Lawrence S.** Speciation and changing environment, in Ecology and the origin of species — Am. Soc. Zoologists and Ecol. Soc. America, Symposium, Dallas, Tex., 1968: Am. Zoologist, v. 10, no. 1, p. 27-39, illus., 1970.
- 00096 **Dillon, William P.** Submergence effects on a Rhode Island barrier and lagoon and inferences on migration of barriers: Jour. Geology, v. 78, no. 1, p. 94-106, illus., 1970.
- 03680 **Dillon, William P.; Zimmerman, Herman B.** Erosion by biological activity in two New England submarine canyons: Jour. Sed. Petrology, v. 40, no. 2, p. 542-547, illus., 1970.
- 08629 **Dimroth, E.; Baragar, W. R. A.; Bergeron, R.; Jackson, G. D.** The filling of the Circum-Ungava geosyncline, in Basins and geosynclines of the Canadian Shield (A. J. Baer, editor) — Symposium, Ottawa, 1970, Papers: Canada Geol. Survey Paper 70-40, p. 45-142, illus., tables, 1970.
- 01722 **Dimroth, Erich.** Meimechites and carbonatites of the Castignon Lake complex, New Quebec: Neues Jahrb. Mineralogie Abh., v. 112, no. 3, p. 239-278, illus., tables, 1970.
- 04456 **Dimroth, Erich.** Evolution of the Labrador geosyncline: Geol. Soc. America Bull., v. 81, no. 9, p. 2717-2742, illus., tables, 1970.
- 06954 **Dimroth, Erich.** The ophiolite complex of the Labrador geosyncline and global tectonics [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 538, 1970.
- 07780 **Dimroth, Erich.** The evolution of the central segment of the Labrador geosyncline — Pt. 2, The ophiolitic suite (with German and French abs.): Neues Jahrb. Geologie u. Paläontologie Abh., v. 137, no. 2, p. 209-248, illus., tables, 1970.
- 02467 **Dinga, Carl F.** A quantitative analysis of the effect of Earth rotation of certain parameters of meandering alluvial rivers: Illinois Geog. Soc. Bull. v. 12, no. 2, p. 1-28, illus., table, 1970.
- Dinkelmann, M. G.** See Barr, Jim L. 01661
- 03233 **Dionne, Jean-Claude.** Structures sédimentaires dans du fluvio-glaciaire, Lac-Saint-Jean, Québec [Sedimentary structures in stratified drift, Lac-Saint-Jean, Quebec (with English and Russian abs.)]: Rev. Géographie Montréal, v. 24, no. 3, p. 255-263, illus., 1970.



- 03236 **Dionne, Jean-Claude.** Fentes en coin fossiles dans la région de Québec [Fossil ice wedges in the Quebec region (with English and Russian abs.)]: *Rev. Géographie Montréal*, v. 24, no. 3, p. 313-318, illus., 1970.
- 03764 **Dionne, Jean-Claude.** Tidal-flat erosion and sedimentation by ice, St. Lawrence estuary [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 844, 1970.
- 09823 **Dionne, Jean-Claude.** Exotic pebbles in Quaternary deposits from the south coast of the St. Lawrence Estuary, Quebec: *Maritime Sediments*, v. 6, no. 3, p. 110-112, illus., table, 1970.
- 11275 **Dionne, Jean-Claude.** Aspects morpho-sédimentologiques de glaciels, en particulier des côtes du Saint-Laurent [Morphologic and sedimentologic aspects of drift-ice action, particularly of the banks of the St. Lawrence]: [Quebec], Service Canadien des Forêts, Ministère des Pêches et des Forêts, 324 p., illus., tables, 1970.
- 03654 **Dirks, Richard A.; Busch, Carl R.** The giant boulders of the Iowan drift and a consideration of their origin: *Iowa Acad. Sci. Proc.* 1969, v. 76, p. 282-295, illus., tables, 1970.
- DiScala, L.** See Viramonte, J. G. 06793
- Disrud, L. A.** See Lyles, Leon. 02862
- 09241 **Diven, B. C.** Nuclear explosions as a nuclear physics tool, in *Annual review of nuclear science*, V. 20: Palo Alto, Calif., Annual Reviews, Inc., p. 79-104, illus., tables, 1970.
- Divoky, David.** See Hwang, Li-San. 05624
- 07433 **Dixon, J. B.; Moore, D. E.; Agnihotri, N. P.; Lewis, D. E., Jr.** Exchange of diquat<sup>2+</sup> in soil clays, vermiculite, and smectite: *Soil Sci. Soc. America Proc.*, v. 34, no. 5, p. 805-808, illus., tables, 1970.
- 10802 **Dixon, James W.** Georgetown Limestone, central Texas, including discussion of *Kingena wacoensis*, in *Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas* (Leo Hendricks, editor): *Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub.*, no. 67-8, p. 240-255, illus., 1967.
- 07412 **Dixon, Jay D.** Analysis of tunnel support structure with consideration of support/rock interaction [abs.]: *Mining Eng.*, v. 22, no. 9, p. 55, 1970.
- 08737 **Dixon, Mark A.** Basement structures in and under Gulf Coast salt masses [summ.], in *Geology and technology of Gulf Coast salt* — Symposium, Baton Rouge, La., 1967, *Proc.*: Baton Rouge, La., Louisiana State Univ. School of Geoscience, p. 67-71, with discussion, 1970.
- 03687 **Dixon, Owen A.** Nautiloids and current ripples as paleocurrent indicators in Upper Ordovician limestones, Anticosti Island, Canada: *Jour. Sed. Petrology*, v. 40, no. 2, p. 682-687, illus., 1970.
- 09314 **Dixon, S. J.** Pressure meter testing of soft bedrock, in *Determination of the in situ modulus of deformation of rock* (Symposium, Astm, Winter Mtg., Denver, Colo., 1969): *Am. Soc. Testing and Materials Spec. Tech. Pub.* 477, p. 126-136, illus., table, 1970.
- Dmitriyev, L. V.** See Udintsev, G. B. 09997
- Doan, Arthur S., Jr.** See Walter, Louis S. 02267
- 03956 **Dobbins, David A.; Ragland, Paul C.; Johnson, J. Donald.** Water-clay interactions in North Carolina's Pamlico estuary: *Environmental Sci. and Technology*, v. 4, no. 9, p. 743-748, illus., tables, 1970.

- 04766 **Dobie, C. Walter.** Jeanerette Field, St. Mary Parish, Louisiana, in Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 14-14e, illus., 1970.
- Dobrin, M. B.** See Fitton, J. C. 08181
- 05865 **Dobrin, Milton B.** Geophysics — Key to understanding of geologic processes: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 11, p. 1984-1988, illus., 1970.
- 00607 **Dobrovolsky, Ernest.** Geology applied to urban planning in Anchorage and vicinity, Alaska [abs.]: Geol. Soc. Abs. with Programs, v. 2, no. 5, p. 331, 1970.
- 01069 **Dodd, J. Robert; Stanton, Robert J., Jr.** Combined faunal and biogeochemical analysis in paleoecology — An example [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 385, 1970.
- Dodd, J. Robert.** See Stanton, Robert J., Jr. 05806
- 02929 **Dodd, Philip H.; Drouillard, Robert F.; Lathan, Carl P.** Borehole logging methods for exploration and evaluation of uranium deposits [with French abs.], in Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 401-415, illus., 1970.
- 01900 **Dodd, R. T.** Calc-aluminous inclusions in olivine of the Sharps (H-3) chondrite [abs.]: EOS, v. 51, no. 4, p. 341, 1970.
- 05284 **Dodds, R. K.** Suggested method of test for *in situ* shear strength of rock, in Special procedures for testing soil and rock for engineering purposes (5th edition): Am. Soc. Testing and Materials Spec. Tech. Pub. 479, p. 618-628, illus., 1970.
- 08544 **Dodds, R. Kenneth.** The age of the "Columbia River Basalts" near Astoria, Oregon, in Columbia River Basalt Symposium, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 239-269, illus., table, 1970.
- 07382 **Dodds, Robert Brian.** Stress wave propagation in prepared clay specimens [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 1943B, 1970.
- Dodge, C. F.** See Davis, Darrell E. 07335
- Dodge, F. C. W.** See Bateman, P. C. 00210
- 00255 **Dodge, F. C. W.; Bateman, P. C.; Wollenberg, H. A.** Compositional variations within intrusive sequences of granitic rocks of the central Sierra Nevada [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 87, 1970.
- Dodge, F. C. W.** See Naeser, C. W. 00410
- Dodge, F. C. W.** See Tilling, Robert I. 01411
- 06211 **Dodge, F. C. W.; Fabbri, B. P.; Ross, D. C.** Potassium and rubidium in granitic rocks of central California, in Geological Survey research 1970, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D108-D115, illus., tables, 1970.
- 00256 **Dodge, Harry W., Jr.** Klippen of Devonian eastern carbonates on upper Paleozoic clastics in central Nevada [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 87-88, 1970.
- 05227 **Dodson, M. H.** Simplified equations for double-spiked isotopic analyses: Geochim. et Cosmochim. Acta, v. 34, no. 11, p. 1241-1244, illus., table, 1970.
- Dodson, Martin H.** See Rex, David C. 03919
- 06955 **Doe, B. R.; Christiansen, R. L.; Hedge, C. E.** Radiogenic tracers and the basalt-rhyolite association, Yellowstone National Park and vicinity [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 538-539, 1970.

**Doe, Bruce R.** See Peterman, Zell E. 03826

- 03921 **Doe, Bruce R.** Evaluation of U-Th-Pb whole-rock dating on Phanerozoic sedimentary rocks, in *Geochronology of Phanerozoic orogenic belts* — Colloquium, Switzerland, 1969, *Papers: Eclogae Geol. Helvetiae*, v. 63, no. 1, p. 79-82, illus., table, 1970.
- 04945 **Doehring, Donald O.** Discrimination of pediments and alluvial fans from topographic maps: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 3109-3115, illus., tables, 1970.
- 06956 **Doehring, Donald O.; Vierbuchen, Richard C.** Cave development during a catastrophic flood in the Great Valley of Virginia [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 539, 1970.
- Doehring, Donald O.** See Coates, Donald R. 09187
- 03138 **Doell, Richard R.** U.S.-Japan Science program: *EOS*, v. 51, no. 7, p. 551-552, 1970.
- Doell, Richard R.** See Dalrymple, G. Brent. 06274
- 06275 **Doell, Richard R.; Grommé, C. Sherman.** Magnetic studies of Apollo 11 lunar samples, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, *Proc.* — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Suppl.* 1), p. 2097-2102, illus., table, 1970.
- 07257 **Doell, Richard R.** Preliminary paleomagnetic results, Leg 5, Chap. 22 in Initial reports of the Deep Sea Drilling Project — V. 5, Leg 5 of cruises of *Glomar Challenger*, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office, p. 523-524, table, 1970.
- 03190 **Dogan, Nevzat.** Subsurface study of Pennsylvanian rocks in east central Oklahoma (from the Brown Limestone to the Checkerboard Limestone): *Shale Shaker*, v. 20, no. 10, p. 192-213, illus., 1970.
- Doherty, Patrick C.** See Wright, Thomas L. 02389
- 06647 **Dohler, G.** Tide-gauge data telemetry between the tsunami warning center at Honolulu, Hawaii and selected stations in Canada, in *Tsunamis in the Pacific Ocean* — Internat. Symposium on Tsunamis and Tsunami Research, Honolulu, Hawaii, 1969, *Proc.*: Honolulu, Hawaii, East-West Center Press, p. 191-206, illus., 1970.
- 07690 **Dohler, G. C.; Ku, L. F.** Presentation and assessment of tides and water level records for geophysical investigations, in *Symposium on recent crustal movements*, Ottawa, Canada, 1969, *Papers: Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 2, p. 607-625, illus., tables, 1970.
- 02928 **Doig, Ronald.** Current research in the application of natural and induced radioactivity to mineral exploration [with French abs.], in *Mining and groundwater geophysics*, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 389-400, illus., tables, 1970.
- 07668 **Doig, Ronald.** An alkaline rock province linking Europe and North America: *Canadian Jour. Earth Sci.*, v. 7, no. 1, p. 22-28, illus., tables, 1970.
- 03614 **Dolan, Robert.** Dune reddening along the outer banks of North Carolina — Discussion [of "Dune reddening and time" by R. M. Norris, 1969]: *Jour. Sed. Petrology*, v. 40, no. 2, p. 765, 1970.
- 09772 **Dolan, Robert.** Sand waves, Cape Hatteras, North Carolina: *Shore and Beach*, v. 38, no. 4, p. 23-25, illus., 1970.
- 02926 **Dolan, William M.** Geophysical detection of deeply buried sulfide bodies in weathered regions [with French abs.], in *Mining and groundwater geophysics*, 1967:

- Canada Geol. Survey Econ. Geology Rept. 26, p. 336-343, illus.; discussion, p. 343-344, 1970.
- 04674 **Dolcater, D. L.; Syers, J. K.; Jackson, M. L.** Titanium as free oxide and substituted forms in kaolinites and other soil minerals [with French, German, and Russian abs.]: *Clays and Clay Minerals*, v. 18, no. 2, p. 71-79, illus., tables, 1970.
- 06865 **Dolcater, David Lee.** Cation exchange selectivity and mineralogy of soil clay materials [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 1, p. 18B, 1970.
- 02606 **Dole, Hollis M.** 1970's, now or never decade for minerals and fuels [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 844, 1970.
- 08226 **Dole, Hollis M.** General remarks, in *The use of remote sensing . . . of natural resources of Alaska*: Juneau, Alaska, Dept. of Econ. Devel., p. 27-29, illus. [1970].
- 06584 **Dole, Robert Malcolm, Jr.** Postglacial vegetation of northern Vermont [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 2, p. 543B, 1970.
- Dolence, J. D.** See Mancuso, J. D. 06485
- Dolgov, Yu. A.** See Sobolev, V. S. 03577
- 06701 **Dollase, W. A.** Least-squares refinement of the structure of a plutonic nepheline [with German abs.]: *Zeitschr. Kristallographie*, v. 132, nos. 1-2, p. 27-44, illus., tables, 1970.
- 04739 **Dolling, Raymond H.** Structural variation in river channel characteristics, Bronte Creek, Ontario [abs.]: *Ontario Geography*, no. 5, p. 84, 1970.
- 00521 **Dolly, Edward Dawson.** Stratigraphic, structural, and geomorphological factors controlling oil accumulation in Upper Cambrian strata of central Ohio [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 7, p. 3238B-3239B, 1970.
- Dolph, Gary E.** See Dilcher, David L. 01671
- 05289 **Dolphin, Dale R.; Klován, J. E.** Stratigraphy and paleoecology of an Upper Devonian carbonate bank, Saskatchewan River Crossing, Alberta: *Bull. Canadian Petroleum Geology*, v. 18, no. 3, p. 289-331, illus., tables, 1970.
- Dolton, Gordon L.** See Clement, James H. 05359
- Dolukhanov, P. M.** See Grachev, A. F. 07215
- 10324 **Domenico, Patrick A.** Notes on the interpretation and application of information theory in hydrogeologic research [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 739-740, 1970.
- 09776 **Dominion Observatory, Ottawa.** Bouguer anomaly map, Queen Elizabeth Islands west, Northwest Territories: Canada Dept. Energy, Mines and Resources, Surveys and Mapping Br. Gravity Map Ser., no. 116, scale 1:1,000,000, 1970.
- 09777 **Dominion Observatory, Ottawa.** Bouguer anomaly map, Queen Elizabeth Islands east, Northwest Territories: Canada Dept. Energy, Mines and Resources, Surveys and Mapping Br. Gravity Map Ser., no. 115, scale 1:1,000,000, 1970.
- 07651 **Donahue, Jack; Wexler, James A.** Worm burrowing in north-central Pacific [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 539-540, 1970.
- Donahue, Jack.** See Habib, Daniel. 08521
- Donaldson, A. C.** See Swartz, Frank M. 09903

- 02607 **Donaldson, Alan C.; Kanes, William H.** Tectonic controls on late Paleozoic sedimentation in western West Virginia [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 844, 1970.
- 06748 **Donaldson, Alan C.; Martin, Richard H.; Kanes, William H.** Holocene Guadalupe delta of Texas Gulf Coast, *in* Deltaic sedimentation, modern and ancient: *Soc. Econ. Paleontologists and Mineralogists Spec. Pub.* 15, p. 107-137, illus., tables, 1970.
- Donaldson, J. A.** See Stockwell, C. H. 07971
- Donaldson, J. A.** See Fraser, J. A. 08662
- Donaldson, J. A.** See Fraser, J. A. 08664
- Donaldson, J. R.** See Hacquebard, P. A. 08133
- Donaldson, J. Roger.** See Hacquebard, Peter A. 07001
- 00122 **Donath, Fred A.** Rock deformation apparatus and experiments for dynamic structural geology: *Jour. Geol. Education*, v. 18, no. 1 p. 3-12, illus., tables, 1970.
- 00889 **Donath, Fred A.** Contribution of platy minerals to strength variation in anisotropic rock [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 280-281, 1970.
- 00890 **Donath, Fred A.** Evaluation of apparatus effects in experimental rock deformation [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 281, 1970.
- 08583 **Donath, Fred A.** Some information squeezed out of rock: *Am. Scientist*, v. 58, no. 1, p. 54-72, illus., 1970.
- 01493 **Dong, Alex E.** Spectrochemical determination of microgram quantities of germanium in natural water containing high concentrations of heavy metals, *in* Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B242-B244, illus., tables, 1970.
- 02235 **Donnay, G.; Preston, H.** Progress report on ewaldite: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 288-290, illus., table, 1970.
- 02236 **Donnay, G.; Pawson, D. L.** X-ray study of echinoderm skeletons: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 296-297, 1970.
- 02237 **Donnay, Gabrielle.** Further use of the Pauling-bond concept: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 292-295, illus., table, 1970.
- 02238 **Donnay, Gabrielle.** Fifty years of X-ray crystallography at the Geophysical Laboratory, 1919-1969: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 278-283, 1970.
- 02708 **Donnay, Gabrielle; Stewart, J. M.; Preston, H.** The crystal structure of sonoraite,  $\text{Fe}^{3+}\text{Te}^{4+}\text{O}_3(\text{OH})\text{H}_2\text{O}$  [with German abs.]: *Tschermaks Mineralog. u. Petrog. Mitt.*, 3d ser., v. 14, no. 1, p. 27-44, illus., tables, 1970.
- 06513 **Donnay, Gabrielle; Allmann, Rudolf.** How to recognize  $\text{O}^{2-}$ ,  $\text{OH}^-$ , and  $\text{H}_2\text{O}$  in crystal structures determined by X-rays: *Am. Mineralogist*, v. 55, nos. 5-6, p. 1003-1015, illus., tables, 1970.
- 06515 **Donnay, Gabrielle; Fleischer, Michael.** Suggested outline for new mineral descriptions: *Am. Mineralogist*, v. 55, nos. 5-6, p. 1017-1019, 1970.
- 02424 **Donnell, John R.; Blair, Robert W., Jr.** Oil shale resources of selected rich zones in the Green River Formation [abs.]: *Mining Eng.*, v. 22, no. 1, p. 39, 1970.
- 10903 **Donnell, John R.; Blair, Robert W., Jr.** Resource appraisal of three rich oil-shale zones in the Green River Formation, Piceance Creek Basin, Colorado: *Colorado School Mines Quart.*, v. 65, no. 4, p. 73-87, illus., tables, 1970.

- 00891 **Donnellan, Monica S.** Ca-rich feldspars, unique minerals in Holocene sediments of the Louisiana continental shelf [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 282, 1970.
- Donnelly, Thomas W.** *See* Murphy, Andrew J. 01956
- Donnelly, Thomas W.** *See* Murphy, Andrew J. 03829
- 09847 **Donohoo, H. V.; Podolsky, George; Clayton, R. H.** Early geophysical exploration at Kidd Creek mine: *Mining Cong. Jour.*, v. 56, no. 5, p. 44-53, illus., 1970.
- Dooge, Jasper.** *See* Bush, Gordon L. 07892
- Dooley, J. R., Jr.** *See* Szabo, B. J. 01470
- 07106 **Doonan, C. J.; Hendrickson, G. E.; Byerlay, J. R.** Ground water and geology of Keweenaw Peninsula, Michigan: *Michigan Geol. Survey Water Inv.* 10, 40 p., illus., tables, geol. map, 1970.
- 02808 **Dorf, Erling.** The fossil forests of Yellowstone Park: *Sci. and Children* (Washington, D.C., Natl. Sci. Teachers Assoc.), v. 7, no. 6, p. 15-17, illus., 1970.
- 08513 **Dorf, Erling.** Paleobotanical evidence of Mesozoic and Cenozoic climatic changes, in *Paleoclimatology — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc.*, Pt. D: Lawrence, Kans., Allen Press, p. 323-346, illus., 1970.
- 06804 **Dorheim, Fred H.** Mineral resources of Iowa: Iowa City, Iowa, Iowa Geol. Survey, scale 1:500,000, text, 1970.
- Dorheim, Fred H.** *See* Parker, Mary C. 09915
- Dorjes, Jurgen.** *See* Reineck, Hans-Erich. 02672
- Dorman, J.** *See* Latham, G. V. 05758
- Dorman, James.** *See* Barazangi, Muawia. 04624
- Dorman, James.** *See* Oliver, Jack. 07687
- Dorman, LeRoy M.** *See* Kosalos, James G. 01942
- 03733 **Dorman, LeRoy M.; Lewis, Brian T. R.** Experimental isostasy — [Pt.] 1, Theory of the determination of the Earth's isostatic response to a concentrated load: *Jour. Geophys. Research*, v. 75, no. 17, p. 3357-3365, illus., 1970.
- Dorman, LeRoy M.** *See* Lewis, Brian T. R. 03736
- 06957 **Dorman, LeRoy M.; Sacks, I. Selwyn; Evertson, Dale.** Atmospherically induced earth strain noise in borehole strainmeters in the period range 20-3000 seconds [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 540, 1970.
- 06958 **Dorman, LeRoy M.; Lewis, Brian T. R.** Correlation of seismic and gravity data with upper mantle properties [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 540-541, 1970.
- 07646 **Dorman, LeRoy Myron.** The theory of the determination of the Earth's isostatic response to a concentrated load [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 3, p. 1354B, 1970.
- 02113 **Dorr, John A., Jr.; Eschman, Donald F.** Geology of Michigan: Ann Arbor, Mich., Univ. Michigan Press, 476 p., illus., tables, 1970.
- 05210 **Dorr, John A., Jr.; Steidtmann, James R.** Stratigraphic-tectonic implications of a new, earliest Eocene, mammalian faunule from central western Wyoming: *Michigan Academician*, v. 3, no. 1, p. 25-41, illus., 1970.

**Dorrence, S. M.** *See* Barbour, F. A. 09455

- 03887 **Dorrsapf, Anthony F., Jr.; Brown, Floyd W.** Direct spectrographic analysis for platinum, palladium, and rhodium in gold beads from fire assay: *Appl. Spectroscopy*, v. 24, no. 4, p. 415-418, tables, 1970.

**Dort, Doris Stage.** *See* Dort, Wakefield, Jr. 04570

- 00892 **Dort, Wakefield, Jr.** A kame of middle Kansan age, Doniphan County, Kansas [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 282, 1970.

**Dort, Wakefield, Jr.** *See* Ratzlaff, John R. 00928

**Dort, Wakefield, Jr.** *See* Caspall, Fred C. 01060

- 01070 **Dort, Wakefield, Jr.** Multiple early Pleistocene tills, loesses, and soils, Doniphan County, northeasternmost Kansas [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 385-386, 1970.

- 04570 **Dort, Wakefield, Jr.; Dort, Doris Stage.** Low temperature origin of sodium sulfate deposits, particularly in Antarctica, *in* Third symposium on salt, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 181-203, illus., 1970.

- 08040 **Dort, Wakefield, Jr.; Jones, J. Knox, Jr.** (editors). Pleistocene and recent environments of the central Great Plains: Kansas Univ. Dept. Geology Spec. Pub. 3, 433 p., illus., tables, 1970.

- 08041 **Dort, Wakefield, Jr.** Recurrent climatic stress on Pleistocene and recent environments, *in* Pleistocene and recent environments of the central Great Plains: Kansas Univ. Dept. Geology Spec. Pub. 3, p. 3-7, 1970.

- 10682 **Dort, Wakefield, Jr.** Guidebook — pleistocene geology of Doniphan County, Kansas — GSA( South-Central Sec., 3d Ann. Mtg., Lawrence, Kansas, 1969: Lawrence, Kansas, Univ. of Kansas, 16 p., illus. [1969].

- 02608 **Dott, R. H., Jr.** Limitations in paleocurrent analysis of trough cross-stratification [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 844-845, 1970.

**Dott, R. H., Jr.** *See* Medaris, L. G., Jr. 03416

**Dott, R. H., Jr.** *See* Aalto, K. R. 05299

**Dott, R. H., Jr.** *See* Dalziel, I. W. D. 06832

**Dott, Robert H., Sr.** *See* Halbouty, Michel T. 07768

**Douglas, A. G.** *See* Andersland, O. B. 02420

- 04193 **Douglas, A. G.; Douraghi-Zadeh, K.; Eglinton, G.; Maxwell, J. R.; Ramsay, J. N.** Fatty acids in sediments including the Green River Shale (Eocene) and Scottish Torbanite (Carboniferous), *in* Advances in organic geochemistry — Internat. Cong., 3d, Proc. (G. D. Hobson and G. C. Speers, editors): London and New York, Pergamon Press (Internat. Ser. Mons. Earth Sci., V. 32), p. 315-334, illus., tables, 1970.

**Douglas, Arthur G.** *See* Andersland, Orlando B. 03027

- 04685 **Douglas, Bruce M.; Ryall, Alan; Williams, Ray.** Spectral characteristics of central Nevada microearthquakes: *Seismol. Soc. America Bull.*, v. 60, no. 5, p. 1547-1559, illus., tables, 1970.

- 09433 **Douglas, Dale.** Midwest fossils, Pt. 11, Ostracodes and graptolites: *Earth Sci.*, v. 23, no. 6, p. 297-299, illus., 1970.
- 09434 **Douglas, Dale.** Midwest fossils — pt. 10, Tribolites: *Earth Sci.*, v. 23, no. 5, p. 250-253, illus., 1970.
- 09435 **Douglas, Dale.** Midwest fossils — pt. 9, Foraminifera and sponges: *Earth Sci.*, v. 23, no. 4, p. 191-194, illus., 1970.
- 09436 **Douglas, Dale.** Midwest fossils — pt. 8, Worm fossils, conodonts: *Earth Sci.*, v. 23, no. 3, p. 127-134, illus., 1970.
- 09437 **Douglas Dale.** Midwest fossils — pt. 7, Mollusks: *Earth Sci.*, v. 23, no. 1, p. 23-28, illus., 1970.
- 02121 **Douglas, G.; McDougall, D. J.** Some preliminary observations on the relationship of moisture-activated thermoluminescence to specific surface: *Modern Geology*, v. 1, no. 2, p. 119-121, illus., table, 1970.
- 03086 **Douglas, G.; Morency, M.; McDougall, D. J.** Detection of strain in rocks using an intrinsic "semi-insulator" characteristic of some minerals: *Modern Geology*, v. 1, no. 3, p. 211-217, illus., 1970.
- Douglas, R. G.** *See* Bukry, D. 02723
- 07974 **Douglas, R. J. W.; Gabrielse, H.; Wheeler, J. O.; Stott, D. F.; Belyea, H. R.** Geology of western Canada, Chap. 8 in *Geology and economic minerals of Canada: Canada Geol. Survey Econ. Geology Rept. 1* (5th edition), p. 365-488, illus., tables, 1970.
- Douglas, R. J. W.** *See* Little, H. W. 07975
- 08007 **Douglas, R. J. W.** (editor). *Geology and economic minerals of Canada: Canada Geol. Survey Econ. Geology Rept. 1* (5th edition), [V. 1] text, 838 p.; [V.2] maps and charts, 1970.
- 10761 **Douglas, R. J. W.** Tectonics and geotectonics, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor): *Canada Geol. Survey Paper* 69-56, p. 95-98, 1970.
- Douglas, Richard F.** *See* Robertson, David S. 04669
- 00783 **Douglas, Robert G.** Planktonic foraminifera described from the Upper Cretaceous of California: *Cushman Found. Foram. Research Contr.*, v. 21, pt. 1, p. 18-27, illus., tables, 1970.
- 05448 **Douglass, R. C.** Register of late Paleozoic fusulinid collecting localities in the Oquirrh Mountains, Utah, in *Upper Paleozoic rocks in the Oquirrh Mountains and Bingham mining district: U.S. Geol. Survey Prof. Paper* 629-A, p. A66-A70, 1970.
- 02609 **Douglass, Raymond C.** Pennsylvanian fusulinids from southeastern Alaska [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 845, 1970.
- Douraghi-Zadeh, K.** *See* Douglas, A. G. 04193
- Dove, George D.** *See* Deutsch, Morris. 10810
- Dowdy, Emily.** *See* Tully, Philip C. 02839
- 02196 **Dowling, Forrest L.** Magnetotelluric measurements across the Wisconsin arch: *Jour. Geophys. Research*, v. 75, no. 14, p. 2683-2698, illus., tables, 1970.
- Dowling, John J.** *See* Blumentritt, Russel. 01892
- 04733 **Dowling, John J.** Uncertainties in velocities determined by seismic refraction: *Jour. Geophys. Research*, v. 75, no. 32, p. 6690-6692, illus., table, 1970.



- 01476 **Downey, Joe S.** Middle Pleistocene Leporidae from the San Pedro Valley, Arizona, in Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B131-B136, illus., table, 1970.
- 05491 **Downey, Joe S.** Ground-water resources of Nelson County, northeastern North Dakota: U.S. Geol. Survey Hydrol. Inv. Atlas HA-428, scale 1:126,720, text, 1970.
- 10560 **Downs, Charles E.** Artificial ground water recharge of the Upper Mojave River Basin using nuclear subsidence craters [abs.]: EOS, v. 51, no. 11, p. 756, 1970.
- 02925 **Dowsett, John S.** Geophysical exploration methods for nickel [with French abs.], in Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 310-319, illus., tables; discussion, p. 310-321, 1970.
- 06959 **Dowty, Eric; Appleman, D. E.** X-ray refinement and Mössbauer study of Ti-Zr garnets, tetrahedral  $\text{Fe}^{2+}$ ? [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 541, 1970.
- 07352 **Dowty, Eric.** Crystal chemistry of titanian garnet, site distribution and valence of cations [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2062B-2063B, 1970.
- 03038 **Dozier, Jeff.** Studies of morphology and stream action on ablating ice — Pt. 2, Channel adjustments in supraglacial streams: Arctic Inst. North America Research Paper 57, p. 67-117, illus., tables, 1970.
- 05384 **Dozy, J. J.** A geological model for the genesis of the lead-zinc ores of the Mississippi Valley, U.S.A.: Inst. Mining and Metallurgy Trans., sec. B, v. 79, Bull. 765, p. B163-B170, illus., 1970.
- Dracup, John A.** See Hall, Warren A. 08397
- Draffan, C. H.** See Abell, P. I. 05734
- 00469 **Dragsted, Ove.** Tugtupite: Jour. Gemmology, v. 12, no. 1, p. 10-11, illus., 1970.
- Drahovzal, J. A.** See Powell, W. J. 01427
- Drahovzal, J. A.** See Powell, W. J. 01611
- 00694 **Drahovzal, James A.; Copeland, Charles W.** Geologic and hydrologic interpretations of multispectral Apollo 9 space photographs in Alabama [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 206, 1970.
- Drahovzal, James A.** See Thomas, William A. 10274
- 00424 **Drake, Charles L.** A long-range program of solid-earth studies: EOS, v. 51, no. 2, p. 152-159, 1970.
- Drake, Charles L.** See Grim, Muriel S. 00577
- 06918 **Drake, Charles L.** The geological revolution: Eugene, Oreg., Oregon State System of Higher Education (Condon lectures), 55 p., illus., 1970.
- Drake, Charles L.** See Mayhew, Michael A. 07700
- Drake, Charles L.** See Ludwig, William J. 09985
- 10520 **Drake, David E.; Fleischer, Peter; Kolpack, Ronald L.** Transport and deposition of flood sediment, Santa Barbara Basin, California [abs.]: EOS, v. 51, no. 11, p. 767, 1970.
- 07087 **Drake, Gerald.** Experimental study of quartz growth [abs.]: West Virginia Acad. Sci. Proc. 1969, v. 41 (West Virginia Univ. Bull., ser. 70, no. 11-3), p. 188, 1970.

**Drake, J. J.** See Ford, D. C. 01726

- 04055 **Drake, J. J.; Ford, D. C.** Distorted ice stalactites as indicators of glacier movement: *Jour. Glaciology*, v. 9, no. 56, p. 286-287, illus., 1970.

**Drake, John.** See Mao, Nai-Hsien. 03730

- 01273 **Drake, John C.** Mineralogical relationships in Seymour, a coarse octahedrite: *Meteoritics*, v. 5, no. 1, p. 19-31, illus., 1970.

- 10529 **Drake, Lawrence; Lysmer, John.** The propagation of Love waves across non-horizontally layered structures [abs.]: *EOS*, v. 51, no. 11, p. 775, 1970.

- 08556 **Drake, Lon D.** Rock texture — An important factor for clast shape studies: *Jour. Sed. Petrology*, v. 40, no. 4, p. 1356-1361, illus., tables, 1970.

- 06844 **Drake, M. J.; McCallum, I. S.; McKay, G. A.; Weill, D. F.** Mineralogy and petrology of Apollo 12 sample no. 12013 — A progress report: *Earth and Planetary Sci. Letters*, v. 9, no. 2, p. 103-123, illus., tables, 1970.

- 08019 **Dran, J. C.; Durrieu, L.; Jouret, C.; Maurette, M.** Habit and texture studies of lunar and meteoritic materials with a 1 MeV electron microscope: *Earth and Planetary Sci. Letters*, v. 9, no. 5, p. 391-400, illus., 1970.

- 09821 **Drapeau, Georges.** Sand waves on Browns Bank observed from the Shelf Diver: *Maritime Sediments*, v. 6, no. 3, p. 90-101, illus., tables, 1970.

**Drapier, Lyn.** See Andrews, J. T. 05217

**Dratler, Jay, Jr.** See Block, Barry. 02130

- 08042 **Dreeszen, Vincent H.** The stratigraphic framework of Pleistocene glacial and periglacial deposits in the Central Plains, in *Pleistocene and recent environments of the central Great Plains*: Kansas Univ. Dept. Geology Spec. Pub. 3, p. 9-22, illus., table, 1970.

- 02520 **Dreimanis, A.** Pleistocene geology of the St. Thomas area (east half), southern Ontario: Ontario Dept. Mines Prelim. Geol. Map P. 606, scale 1:50,000, text, 1970.

- 02887 **Dreimanis, A.** Effect of groundwater levels on stress history of the St. Clair clay till deposit — Discussion [of paper by L. G. Soderman and Y. D. Kim, 1970]: *Canadian Geotech. Jour.*, v. 7, no. 2, p. 188-189, illus., 1970.

- 06960 **Dreimanis, Aleksis; Goldthwait, Richard P.** Wisconsin glaciation in the Huron, Erie and Ontario lobal areas [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 541-542, 1970.

**Dreimanis, Aleksis.** See Möerner, Nils-Axel. 09685

- 10159 **Dreimanis, Aleksis.** Recession of the Laurentide ice sheet and the significance of the Two Creeks Interstadial — Discussion [abs.], in *American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970*, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 37, 1970.

- 10160 **Dreimanis, Aleksis.** Stratigraphy and correlation of the late Quaternary — discussion [abs.], in *American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970*, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 38, 1970.

- 10193 **Dreimanis, Aleksis.** Criteria for distinction of till from other diamictons — Discussion [abs.], in *American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970*, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 36, 1970.

- 07738 **Dresch, Jean.** A propos du désert de Chihuahua [The Chihuahua desert]: *Annales Géographie*, v. 79, no. 431, p. 51-57, illus., 1970.

- 06961 **Drever, James I.** Magnesium removal from sea water by diagenesis in a reducing environment [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 542, 1970.
- Drew, Charles M.** See Murphy, Mary E. 05745
- 04329 **Drew, David P.** The significance of percolation water in limestone catchments: *Ground Water*, v. 8, no. 5, p. 8-11, illus., table, 1970.
- Drew, Isabella M.** See Kerr, Paul F. 05794
- Drew, James V.** See Dankert, Wayne N. 07625
- 00017 **Drewes, Harald.** Tertiary tectonics of the White Pine-Grant Range region, east-central Nevada, and some regional implications — Discussion [of paper by E. M. Moores, R. B. Scott, and W. W. Lumsden, 1968]: *Geol. Soc. America Bull.*, v. 81, no. 1, p. 319-321, 1970.
- 00418 **Drewes, Harald.** Structural control of geochemical anomalies in the Greaterville mining district, southeast of Tucson, Arizona: *U. S. Geol. Survey Bull.* 1312-A, p. A1-A49, illus., tables, geol. map, 1970.
- Drewes, Harald.** See Lovering, T. G. 01461
- Drexler, Wallace W.** See Benham, Steven R. 00672
- 02429 **Dreyer, Robert M.** Evaluation of lateritic bauxite and nickel deposits [abs.]: *Mining Eng.*, v. 22, no. 1, p. 41, 1970.
- 06962 **Dreyer, Robert M.** Fifty years of industrial minerals [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 542-543, 1970; *Econ. Geology*, v. 65, no. 6, p. 736-737, 1970.
- 05655 **Driscoll, Egbert G.** Selective bivalve shell destruction in marine environments, a field study: *Jour. Sed. Petrology*, v. 40, no. 3, p. 898-905, illus., tables, 1970.
- 10325 **Driscoll, Egbert G.** Destruction of potential fossils by boring organisms and abrasion [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 740-741, 1970.
- 10203 **Driver, Edgar S.** Review of Gulfex program for marine exploration [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 16, 1970.
- 02356 **Drnevich, Vincent P.; Richart, F. E., Jr.** Dynamic prestraining of dry sand: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7160, *Jour. Soil Mechanics and Found. Div.*, no. SM2, p. 453-469, illus., 1970.
- Drouillard, Robert F.** See Dodd, Philip H. 02929
- 09147 **Drozd, Karel; Goodman, Richard E.; Heuzé, Francois E.; Van, Tran K.** On the problem of borehole strength testing [with French and German summ.], in *Internat. Soc. Rock Mechanics Cong.*, 2d, Belgrade, Yugoslavia, 1970, *Proc.*, V. 2: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 325-333, illus., tables, 1970.
- 01071 **Druce, Edric.** Upper Paleozoic conodont distribution [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 386, 1970.
- 02751 **Drugg, Warren S.** Two new Neogene species of *Tuberculodinium* and one of *Xenicodinium* (Pyrrhophyta): *Biol. Soc. Washington Proc.*, v. 83, no. 9, p. 115-121, illus., 1970.
- Druilhet, Aime.** See Guedelia, Daniel. 00069
- 03993 **Drummond, A. H., Jr.** Mastodons at sea: *Sea Frontiers*, v. 16, no. 3, p. 151-153, illus., 1970.

- 02610 **Drummond, Kenneth J.** Geology and oil potential of Canadian Arctic Islands [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 845, 1970.
- 10032 **Drummond, Kenneth J.** Geology and petroleum potential of Canadian Arctic Islands [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2478, 1970.
- 11241 **Duane, David B.** Tracing sand movement in the littoral zone — Progress in the radioisotopic sand tracer (RIST) study July 1968 — February 1969: *U.S. Army Corps Engineers Coastal Eng. Research Center Misc. Paper 4-70*, 46 p., illus., table, 1970.
- Duba, A.** See Schock, R. N. 10582
- Duba, Al.** See Olinger, Bart. 10585
- 09751 **DuBar, J. R.** Vertebrate assemblages of the Caloosahatchee Formation, in *Late Cenozoic stratigraphy of southwestern Florida* — [Guidebook], Field Trip no. 4 [19th] Ann. Mtg. Gulf Coast Assoc. Geol. Socs., with SEPM, Gulf Coast Sec., Miami Beach, Fla., 1969: [New Orleans, La.], Gulf Coast Assoc. Geol. Socs., p. 65-69, table, 1969.
- DuBar, Jules R.** See Gulf Coast Assoc. Geol. Societies. 09749
- 09750 **DuBar, Jules R.** Notes on the Neogene stratigraphy of south Florida, in *Late Cenozoic stratigraphy of southwestern Florida* — [Guidebook], Field Trip no. 4 [19th] Ann. Mtg. Gulf Coast Assoc. Geol. Socs., with SEPM, Gulf Coast Sec., Miami Beach, Fla., 1969: [New Orleans, La.], Gulf Coast Assoc. Geol. Socs., p. 48-64, illus., 1969.
- DuBar, Susan S.** See Gulf Coast Assoc. Geol. Societies. 09749
- Dubberke, W.** See Welp, T. L. 09916
- Dubuc, Fernand.** See Vallee, Marcel. 03527
- Dubuc, Fernand.** See Vallee, Marcel. 10675
- 07517 **Duckworth, K.** Electromagnetic depth sounding applied to mining problems: *Geophysics*, v. 35, no. 6, p. 1086-1098, illus., 1970.
- 04682 **Duda, Seweryn J.** The earthquake volume: *Seismol. Soc. America Bull.*, v. 60, no. 5, p. 1479-1489, illus., tables, 1970.
- 03227 **Dudley, John H.** Review of collapsing soils: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7278, *Jour. Soil Mechanics and Found. Div.*, no. SM 3, p. 925-947, illus., tables, 1970.
- 04266 **Dudley, W. W., Jr.** Nonsteady inflow to a chamber within a thick aquitard, in *Geological Survey research 1970*, Chap. C.: *U.S. Geol. Survey Prof. Paper 700-C*, p. C206-C211, illus., tables, 1970.
- Duennebier, F.** See Latham, G. V. 05758
- Duennebier, Frederick K.** See Northrop, John. 03726
- 02313 **Duff, Denny E.** Thoughts on petroleum prospects in The Maritimes, Pts. 1-2: *Oil and Gas Jour.*, v. 68, no. 11, p. 218-224; *ibid.*, no. 12, p. 98, 100, 102, illus., table, 1970.
- Duffield, Alan.** See Gehrke, Charles W. 05742
- 07920 **Duffield, Lathel Flay.** Some Panhandle Aspect sites, their vertebrates and paleoecology [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 6, p. 3123B-3124B, 1970.

- 00257 **Duffield, Wendell A.; Sharp, Robert V.** Stratigraphy and structure of pre-Tertiary rocks between the Melones and Bear Mountains fault zones, Amador County, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 88, 1970.
- Dugas, J.** *See* Laurin, A. F. 04610
- 09620 **Dugas, J.** (compiler). Metallic mineralization in part of the Labrador Trough [also French edition]: Quebec Dept. Nat. Resources Spec. Paper 5, 23 p., mineral resources maps, 1970.
- Dugdale, R. E.** *See* Andrews, J. T. 05970
- 04667 **Duke, C. M.; Luco, J. E.; Carrière, A. R.; Hradilek, P. J.; Lastrico, R.; Ostrom, D.** Strong earthquake motion and site conditions, Hollywood: *Seismol. Soc. America Bull.*, v. 60, no. 4, p. 1271-1289, illus., tables, 1970.
- 06963 **Duke, M. B.; Sellers, G. A.; Woo, C. C.; Bird, M. L.** Genesis of lunar fines [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 543, 1970.
- Dulekoz, Erhan.** *See* Brookins, Douglas G. 04112
- Dumanoir, J.** *See* Poupon, A. 10657
- DuMontelle, P. B.** *See* Swann, D. H. 03059
- 02463 **DuMontelle, Paul B.** Geologic investigation of the site for an environmental pollution study: Illinois Geol. Survey Environmental Geology Note 31, 19 p., illus., tables, 1970.
- 09871 **Dumore, J. M.** Development of gas-saturation during solution-gas drive in an oil layer below a gas cap: *Soc. Petroleum Engineers Jour.*, v. 10, no. 3, p. 211-218, illus., 1970.
- 05421 **Dumper, T. A.; Waller, J. O.** The input of environmental geology to land use and urban design in the Gainsboro Community, Roanoke, Virginia [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 133, 1970.
- Duncan, Floyd R.** *See* Tackett, Stanford L. 01274
- Duncan, Helen M.** *See* Gordon, Mackenzie, Jr. 05447
- Duncan, J. R.** *See* Griggs, G. B. 01338
- Duncan, James M.** *See* Dunlop, Peter. 02357
- Duncan, James M.** *See* Chang, Chin-Yung. 04220
- 04221 **Duncan, James M.; Chang, Chin-Yung.** Nonlinear analysis of stress and strain in soils: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7513, *Jour. Soil Mechanics and Found. Div.*, no. SM5, p. 1629-1653, illus., table, 1970.
- 04227 **Duncan, James M.; Dunlop, Peter.** Slopes in stiff-fissured clays and shales — Closure [to discussion of paper 6449, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, *Jour. Soil Mechanics and Found. Div.*, no. SM5, p. 1795-1799, illus., 1970.
- 00437 **Duncan, John R.; Fowler, Gerald A.; Kulm, L. D.** Planktonic foraminiferan-radiolarian ratios and Holocene-late Pleistocene deep sea stratigraphy off Oregon: *Geol. Soc. America Bull.*, v. 81, no. 2, p. 561-566, illus., 1970.
- 01121 **Duncan, John R.; Kulm, L. D.; Griggs, G. B.** Clay mineral composition of late Pleistocene and Holocene sediments of Cascadia Basin, northeastern Pacific Ocean: *Jour. Geology*, v. 78, no. 2, p. 213-221, illus., 1970.
- 01895 **Duncan, John R.; Kulm, L. D.** Vertical tectonic movements in the Blanco Fracture Zone [abs.]: *EOS*, v. 51, no. 4, p. 331, 1970.

- 05653 **Duncan, John R.; Kulm, L. D.** Mineralogy, provenance, and dispersal history of late Quaternary deep-sea sands in Cascadia Basin and Blanco Fracture Zone off Oregon: *Jour. Sed. Petrology*, v. 40, no. 3, p. 874-887, illus., tables, 1970.
- 07090 **Duncan, William M.; Eddy, Greg E.; Jones, Michael L.; Williamson, Douglas B.** An igneous dike in Pendleton County, West Virginia: *West Virginia Acad. Sci. Proc.* 1969, v. 41 (West Virginia Univ. Bull., ser. 70, no. 11-3), p. 197-200, illus., 1970.
- Dunham, A. C.** See Dunham, K. C. 10208
- Dunham, Don.** See Haskell, E. E., Jr. 02112
- 10208 **Dunham, K. C.; Dunham, A. C.; Gallagher, M. J.; Solomon, M.; Ford, T. D.** Some aspects of genesis of zinc-lead-barite-fluorite deposits in the Mississippi Valley, U.S.A. — Discussions and contributions [on paper by A. V. Heyl, 1969]: *Inst. Mining and Metallurgy Trans., Sec. B*, v. 79, Bull. 762, p. B91-B96, illus., 1970.
- 05180 **Dunham, R. J.** Stratigraphic reefs versus ecologic reefs: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 10, p. 1931-1932, illus., 1970.
- 02611 **Dunham, Robert J.** Keystone vugs in carbonate beach deposits [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 845, 1970.
- 07332 **Dunlap, John B., Jr.** Paleocology as an exploration tool, in *Exploration concepts for the Seventies*: *Gulf Coast Assoc. Geol. Soc. Trans.*, v. 20, p. 280-283, illus., 1970.
- 03414 **Dunlop, D. J.** Hematite — Intrinsic and defect ferromagnetism: *Science*, v. 169, no. 3948, p. 858-860, illus., 1970.
- 02357 **Dunlop, Peter; Duncan, James M.** Development of failure around excavated slopes: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7162, *Jour. Soil Mechanics and Found. Div.*, no. SM2, p. 471-493, illus., table, 1970.
- Dunlop, Peter.** See Duncan, James M. 04227
- 09857 **Dunlop, W. Bruce.** Geophysical anomalies as detailed and drilled in the Saskatchewan Precambrian: *Western Miner*, v. 43, no. 4, p. 42-50, illus., 1970.
- 01211 **Dunn, D. L.** Middle Carboniferous conodonts from western United States and phylogeny of the platform group: *Jour. Paleontology*, v. 44, no. 2, p. 312-342, illus., 1970.
- 00608 **Dunn, Darrel E.** The probability of anomalies on contour maps [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 331-332, 1970.
- 03571 **Dunn, Darrel E.** Ground-water velocity partition: *Ground Water*, v. 8, no. 4, p. 14, 1970.
- 06754 **Dunn, Darrel E.** The probability of anomalies on contour maps: *Ground Water*, v. 8, no. 6, p. 33-38, illus., tables, 1970.
- Dunn, David E.** See Roper, Paul J. 00760
- Dunn, David E.** See Fish, Johnnie E. 00896
- Dunn, David E.** See Roper, Paul J. 06433
- 04875 **Dunn, David L.** Conodont zonation near the Mississippian-Pennsylvanian boundary in western United States: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 2959-2974, illus., 1970.
- 10487 **Dunn, J.; Fuller, M.; Ito, H.; Schmidt, V.** Paleomagnetic studies of reversals of the Earth's magnetic field [abs.]: *EOS*, v. 51, no. 11, p. 745, 1970.

- 07482 **Dunn, James R.; Wallace, William A.** Mineral resources, computers and the environmental context, in *Forum on geology of industrial minerals*, 5th, Harrisburg, Pa., 1969, Proc.: Pennsylvania Geol. Survey, 4th ser., Bull. M64 (Mineral Resources Rept.), p. 153-163, illus., tables, 1970.
- Dunn, James R.** See Socolow, Arthur A. 07487
- 10878 **Dunster, D. E.; Miller, D. E.** A research study to determine the occurrence and structural competency of deep rock formations by the use of surface vibrators: U.S. Army Corps Engineers Waterways Exp. Sta. Contract Rept. S-68-2, 78 p., illus., 1968.
- 01280 **Duplessy, J. C.; Lalou, C.; Vinot, A. C.** Differential isotopic fractionation in benthic foraminifera and paleotemperatures reassessed: *Science*, v. 168, no. 3928, p. 250-251, illus., table, 1970.
- 00483 **Dupré, William R.; Boyer, Robert E.** Orbital photography over Texas and northern Mexico — Some geologic applications [abs.]: *Texas Jour. Sci.*, v. 21, no. 3, p. 334-335, 1970.
- 06145 **Dupuy, Leon W.** Mineral resources, App. K in *Potomac River basin report*, V. 4: U.S. Cong., 91st, 2d sess., House Doc. 91-343, 15 p., paged separately, 1970.
- 06367 **Duquette, Gilles; Mathieu, Arthur.** Preliminary report on the south half of Obalski Township, Abitibi East County [also French edition]: Quebec Dept. Nat. Resources Prelim. Rept. 585, 17 p., tables, geol. maps, 1970.
- 06757 **Duquette, Gilles; Mathieu, Arthur.** Preliminary report on the south half of Obalski Township, Abitibi East County [also French edition]: Quebec Dept. Nat. Resources Prelim. Rept. 585, 17 p., tables, geol. maps, 1970.
- 11242 **Duquette, Gilles.** Archean stratigraphy and ore relationships in the Chibougamau district: Quebec Dept. Nat. Resources Spec. Paper 8, 16 p., geol. map, 1970.
- Durham, David L.** See Burch, Stephen H. 01432
- 02333 **Durham, David L.** Geology of the Sycamore Flat and Paraiso Springs quadrangles, Monterey County, California: U.S. Geol. Survey Bull. 1285, 34 p., illus., tables, geol. maps, 1970.
- 00585 **Durrani, S. A.; Christodoulides, C.; Ettinger, K. V.** Thermoluminescence in tektites: *Jour. Geophys. Research*, v. 75, no. 5, p. 983-995, illus., tables, 1970.
- Durrani, Saeed A.** See Christodoulides, Costas. 06443
- Durrieu, L.** See Dran, J. C. 08019
- 06535 **Dury, G. H.** (editor). *Rivers and river terraces*: London, Macmillan and Co. Ltd., 283 p., illus., tables, 1970.
- 06682 **Dury, G. H.** General theory of meandering valleys and underfit streams, [Chap.] 9 in *Rivers and river terraces* (G. H. Dury, editor): London, Macmillan and Co. Ltd., p. 264-275, illus., condensed 1970; originally published 1964-65.
- Duschatko, Robert W.** See Pittman, Edward D. 08621
- 09035 **Duskin, Douglas J.; Clark, Kenneth F.** Late Cayugan gypsum deposits at Union Springs, New York [abs.], in *Guidebook to field excursions*, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., p. 150, 1969.
- 02890 **Dussault, R.; Larocque, G. S.; Oulmet, J. M.** Outardes 4, barrage principal [Outardes 4, main dam (with English abs.)]: *Canadian Geotech. Jour.*, v. 7, no. 1, p. 16-36, illus., tables, 1970.

- 10494 **Dutcher, L. C.** Criterion for designing a data-collection system for ground-water hydrology in California. 1970-2000 [abs.]: EOS, v. 51, no. 11, p. 748, 1970.
- Dutcher, R. R.** See Vastola, F. J. 04093
- Dutcher, Russell R.** See Newton, Geoffrey B. 05625
- 06964 **Dutcher, Russell R.; Crelling, John C.; Podwysocki, Melvin H.** Thermal alteration of coals and coal materials [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 543-544, 1970.
- Dutro, J. T., Jr.** See Brosge, William P. 10019
- 10034 **Dutro, J. T., Jr.; Saldukas, R. B.** Permian paleogeography of Arctic [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2478, 1970.
- 11278 **Dutro, J. T., Jr.; Armstrong, A. K.** Biostratigraphy of carboniferous of northern Alaska [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2478, 1970.
- Dutro, J. Thomas, Jr.** See Armstrong, Augustus K. 02072
- 07080 **Dutro, J. Thomas, Jr.** Pre-Carboniferous carbonate rocks, northeastern Alaska, in Geological seminar on the North Slope of Alaska, Palo Alto, Calif., 1970, Proc.: Los Angeles, Calif., Am. Assoc. Petroleum Geologists Pacific Sec., p. M1-M8, illus., discussion, 1970.
- Dutta, N. K.** See Mookherjee, Asoke. 04901
- 07499 **Dutton, Carl E.; Bradley, Reta E.** Lithologic, geophysical, and mineral commodity maps of Precambrian rocks in Wisconsin: U.S. Geol. Survey Misc. Geol. Inv. Map I-631, 6 sheets, scale 1:500,000, separate text, 1970.
- 08769 **Dvoracek, Marvin J.; Peterson, Sam H.** Recharging the Ogallala Formation using shallow holes, in Ogallala Aquifer Symposium, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, p. 205-218, illus., table, 1970.
- 05420 **Dvorak, W. E., Jr.** The role of the geologist in Virginia's highway program [abs.]: Virginia Jour. Sci., v. 21, no. 3, p. 133, 1970.
- Dwornik, Edward J.** See Rose, Harry J., Jr. 05719
- 05107 **Dyal, P.; Parkin, C. W.; Sonett, C. P.** Lunar surface magnetometer experiment, in Apollo 12 preliminary science report: U.S. Natl. Aeronautics and Space Adm. Spec. Pub. SP-235, p. 55-73, illus., 1970.
- 08240 **Dyal, R. S.** Peat resources and activities of the United States, in International Peat Congress, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 20-21, table, 1970.
- 01220 **Dyck, John Henry.** The detection of subsurface resistive zones — A study of groundwater geophysics in Saskatchewan [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 8, p. 3639B-3640B, 1970.
- Dygas, Joe.** See Naidu, A. S. 10081
- Dymond, J. R.** See Garlick, G. D. 02397
- 01135 **Dymond, Jack.** Excess argon in submarine basalt pillows: Geol. Soc. America Bull., v. 81, no. 4, p. 1229-1232, illus., table, 1970.



- 04569 **Dyni, John R.; Hite, Robert J.; Raup, Omer B.** Lacustrine deposits of bromine-bearing halite, Green River Formation, northwestern Colorado, *in* Third symposium on salt, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 166-180, illus., tables, 1970.
- 00780 **Dziewonski, A.; Landisman, M.** Great circle Rayleigh and Love wave dispersion from 100 to 900 seconds: Royal Astron. Soc. Geophys. Jour., v. 19, no. 1, p. 37-91, illus., tables, 1970.
- 01885 **Dziewonski, Adam; Porath, Hartmut.** Sedimentary conductivity anomalies in the Great Plains Province [abs.]: EOS, v. 51, no. 4, p. 268, 1970.
- 03300 **Dziewonski, Adam M.** Correlation properties of free period partial derivatives and their relation to the resolution of gross earth data: Seismol. Soc. America Bull., v. 60, no. 3, p. 741-768, illus., table, 1970.
- 07197 **Eakins, Gilbert R.** Geology and geochemistry at Kontrashibuna Lake, Lake Clark region, southwestern Alaska: Alaska Div. Mines and Geology Geochem. Rept. 20, 29 p., illus., tables, geol. map, 1970.
- 07251 **Eakins, Gilbert R.** An experiment in geobotanical prospecting for uranium, Bokan Mountain area, southeastern Alaska: Alaska Div. Mines and Geology Geol. Rept. 41, 52 p., illus., tables, 1970.
- 11223 **Eakins, Gilbert R.** A geochemical investigation of the Wood River — Tikchik Lakes area: Alaska Div. Mines and Geology Geochem. Rept. 17, Suppl., 3 p., illus., table, 1969.
- Eardley, A. J.** See Shuey, R. T. 01977
- 05633 **Eardley, A. J.** Salt economy of Great Salt Lake, Utah, *in* Third symposium on salt V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 78-105, illus., tables, 1970.
- 09610 **Eardley, A. J.** Erosion surfaces of the Wasatch Mountains [abs.]: Utah Acad. Sci., Arts, and Letters Proc., v. 47, pt. 1, p. 272-273, 1970.
- 01719 **Eargle, D. Hoyer.** Recent developments in uranium in South Texas: South Texas Geol. Soc. Bull., v. 10, no. 6, p. 3-6, illus., 1970.
- 04154 **Eargle, D. Hoyer.** Uranium in Texas: Houston Geol. Soc. Bull., v. 13, no. 2, p. 18-27, illus., 1970.
- 08738 **Eargle, D. Hoyer; Herbst, Emmett L.** Regional geology and the Salmon event, *in* Geology and technology of Gulf Coast salt — Symposium, Baton Rouge, La., 1967, Proc.: Baton Rouge, La., Louisiana State Univ. School of Geoscience, p. 87-107, illus., 1970.
- Earl, J. L.** See Chow, T. J. 04082
- Earnshaw, D. G.** See Brown, Dennis. 09133
- 07882 **Earthquake Notes.** A note on the San Fernando, California, earthquake of February 9, 1971: Earthquake Notes, v. 41, no. 4, p. 44, 1970 [1971].
- 03972 **Eason, J. E.; Bergenback, R. E.** Reflections on the significance of crossbedding in ancient sandstones [abs.]: Tennessee Acad. Sci. Jour., v. 45, no. 2, p. 53, 1970.
- 05977 **Easterbrook, Don J.; Rahn, David A.** Landforms of Washington — The geologic environment: Bellingham, Wash., Western Washington State College, Dept. Geology, 156 p., illus., tables, 1970.

- 10161 **Easterbrook, Don J.** Glacial events in the Puget Lowland, Washington between 14,000 and 10,000 years ago [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 39, illus., 1970.
- 01756 **Eastwood, R. L.** Origin of basaltic andesites of the Tucson Mountains-Roskrige Mountains region, Arizona [abs.]: EOS, v. 51, no. 4, p. 443, 1970.
- 05997 **Eastwood, Raymond Lester.** A geochemical-petrological study of Mid-Tertiary volcanism in parts of Pima and Pinal Counties, Arizona [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5554B, 1970.
- 00609 **Eaton, Gordon P.; Peterson, Donald L.; Schumann, Herbert H.** Luke dome — A halokinetic salt mass near Phoenix, Arizona [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 332, 1970.
- 02999 **Eaton, Gordon P.; Watkins, Joel S.** The use of seismic refraction and gravity methods in hydrogeological investigations [with French abs.], in Mining and ground-water geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 544-568, illus., tables, 1970.
- Eaton, Gordon P.** See Ericksen, George E. 03818
- Eaton, J. P.** See Lee, W. H. K. 00304
- Eaton, J. P.** See Stewart, S. W. 00372
- 03975 **Eaton, J. P.; Lee, W. H. K.; Pakiser, L. C.** Use of microearthquakes in the study of the mechanics of earthquake generation along the San Andreas fault in central California, in Earthquake mechanics (T. Rikitake, editor), a symposium, Madrid, Spain, 1969: Tectonophysics, v. 9, nos. 2-3, p. 259-282, illus., 1970.
- 04420 **Eaton, J. P.; O'Neill, M. E.; Murdock, J. N.** Aftershocks of the 1966 Parkfield-Cholame, California, earthquake — A detailed study: Seismol. Soc. America Bull., v. 60, no. 4, p. 1151-1197, illus., tables, 1970.
- Eaton, J. P.** See Richter, D. H. 06692
- Eaton, J. P.** See Stewart, S. W. 10832
- Eaton, Jerry P.** See Unger, John D. 00384
- Eaton, M. S.** See Lee, W. H. K. 10547
- 04719 **Eaton, Theodore H.** The stem-tail problem and the ancestry of chordates: Jour. Paleontology, v. 44, no. 5, p. 969-979, illus., 1970.
- Ebens, R. J.** See Connor, J. J. 09601
- 05685 **Eberhardt, P.; Geiss, J.; Graf, H.; Grögler, N.; Krähenbühl, U.; Schwaller, H.; Schwarzmüller, J.; Stettler, A.** Trapped solar wind noble gases, exposure age and K/Ar-age in Apollo 11 lunar fine material, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1037-1070, illus., tables, 1970.
- Eberlein, G. D.** See Churkin, M., Jr. 05004
- 01298 **Eberlein, G. Donald; Churkin, Michael, Jr.** Tlevak Basalt, west coast of Prince of Wales Island, southeastern Alaska, in Changes in stratigraphic nomenclature by the U.S. Geological Survey, 1968: U.S. Geol. Survey Bull. 1294-A, p. A25-A28, illus., 1970.

- 02332 **Eberlein, G. Donald; Churkin, Michael, Jr.** Paleozoic stratigraphy in the northwest coastal area of Prince of Wales Island, southeastern Alaska: U.S. Geol. Survey Bull. 1284, 67 p., illus., geol. map, 1970.
- Eberlein, G. Donald.** See Churkin, Michael, Jr. 11015
- Ebersole, W. C.** See Corwin, R. F. 09479
- Ebert, Janet.** See Hornberger, George M. 02716
- 02484 **Ebright, J. R.** Ohio wells head for the cellar: Oil and Gas Jour., v. 68, no. 21, p. 108-109, 112-114, illus., 1970.
- 05998 **Ebtehadj, Khosrow.** Palynology of the subsurface Frio Formation in Liberty and Chambers Counties, Texas [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5554B, 1970.
- 03661 **Eby, J. Brian.** Carleton D. Speed, Jr., 1903-1970: Houston Geol. Soc. Bull., v. 12, no. 7, p. 20-21, 1970.
- Eccles, J. K.** See Wright-Broughton, C. 08677
- Echols, Ronald J.** See Creager, Joe S. 10025
- 10924 **Echols, Ronald J.** Foraminiferal trends within the inner sublittoral zone off the coast of Washington, in Research on the continental shelf off Washington and western Alaska from August 1968 through June 1969 — Univ. Washington Dept. Oceanography Spec. Rept. 41: Seattle, Wash., Univ. Washington, p. 114-131, illus., 1969.
- 04594 **Eckel, Edwin B.** The Alaska earthquake, March 27, 1964 — Lessons and conclusions: U.S. Geol. Survey Prof. Paper 546, 57 p., illus., 1970.
- 04962 **Eckel, Edwin B.; Schaem, William E.** The work of the scientific and engineering task force, in The great Alaska earthquake of 1964 — Human ecology: Washington, D. C., Natl. Acad. Sci., p. 168-182, illus., 1970.
- 00610 **Eckerty, Donald G.; Vitaliano, Charles J.** Elkhorn Mountains Volcanics — Southernmost facies [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 332-333, 1970.
- Eckroad, S. W.** See Aronson, J. R. 03695
- 06258 **Economou, Thanasis E.; Turkevich, Anthony L.; Sowinski, Kenneth P.; Patterson, James H.; Franzgrote, Ernest J.** The alpha-scattering technique of chemical analysis: Jour. Geophys. Research, v. 75, no. 32, p. 6514-6523, illus., tables, 1970.
- 07089 **Eddy, Greg E.** The Geologic Data System of the West Virginia Geological and Economic Survey: West Virginia Acad. Sci. Proc. 1969, v. 41 (West Virginia Univ. Bull., ser. 70, no. 11-3), p. 194-196, 1970.
- Eddy, Greg E.** See Duncan, William M. 07090
- 08640 **Eddy, P. A.** Geohydrology of the Columbia Basin project area, Washington [abs.], in Columbia River Basalt Symposium, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 327, 1970.
- Edelstein, T.** See Illiman, W. I. 08686
- 03941 **Eden, W. J.; Mitchell, R. J.** The mechanics of landslides in Leda clay [with French abs.]: Canadian Geotech. Jour., v. 7, no. 3, p. 285-296, illus., table, 1970.
- Eden, W. J.** See Jarrett, P. M. 03944

**Eden, W. J.** *See* Penner, E. 03945

**Edgar, A. D.** *See* Piotrowski, J. M. 02557

**Edgar, A. D.** *See* Mottana, A. 03710

**Edgar, A. D.** *See* Sood, M. K. 04986

**Edgar, A. D.** *See* Sood, M. K. 06109

**Edgar, A. D.** *See* Piotrowski, J. M. 08352

**Edgar, N. T.** *See* Ewing, J. I. 09719

- 02612 **Edgar, N. Terence.** Deep-Sea Drilling Project, future program [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 845-846, 1970.

- 03225 **Edge, Duane E.; Turnbull, J. MacNeil.** Standardization of particle-size ranges — Discussion [of paper 6795 by Am. Soc. Civil Engineers, Soil Mechanics and Found. Div. Comm. Soil Properties, 1969]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Soil Mechanics and Found. Div., no. SM 3, p. 1077-1079, 1970.

**Edge, R. A.** *See* Macdonald, Raymond. 08218

**Edgerton, A. T.** *See* Meier, M. 08076

- 09293 **Edgerton, A. T.** A study of passive microwave techniques applied to geologic problems, Sec. 14 of Earth Resources Program, 3d ann., review — v. 1, Geology and geography: Houston, Tex., NASA Manned Spacecraft Center, Msc-03742, p. 14-1 — 14-12, illus., 1970.

**Edgerton, A. T.** *See* Meier, Mark F. 09330

- 09623 **Edgerton, A. T.; Trexler, D. T.** A study of passive microwave techniques applied to geologic problems — Final report No. 1361R-1: El Monte Calif., Aerojet-General Corporation, Microwave Div. [250 p.], illus., tables, 1970.

**Edgerton, Curtis D.** *See* Heyman, Louis. 07568

- 04001 **Edgerton, Harold E.** Seismic profiling with sonar: Oceanology Internat., v. 5, no. 8, p. 22-24, illus., 1970.

- 10035 **Edgington, A. N.; Cleland, N. A.; Campbell, D. L.** Exploration and production in Canadian Arctic Archipelago [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2478-2479, 1970.

- 02134 **Edgington, David N.; Callender, Edward.** Minor element geochemistry of Lake Michigan ferromanganese nodules: Earth and Planetary Sci. Letters, v. 8, no. 2, p. 97-100, illus., table, 1970.

**Edgington, J. A.** *See* Blair, I. M. 06271

- 06917 **Edmond, John M.; Gieskes, J. M. T. M.** On the calculation of the degree of saturation of sea water with respect to calcium carbonate under *in situ* conditions: Geochim. et Cosmochim. Acta, v. 34, no. 12, p. 1261-1291, illus., tables, 1970.

**Edmond, John M.** *See* Gieskes, Joris M. 06989

- 02443 **Edmondson, W. T.; Allison, David E.** Recording densitometry of X-radiographs for the study of cryptic laminations in the sediment of Lake Washington: Limnology and Oceanography, v. 15, no. 1, p. 138-144, illus., 1970.

**Edmunds, Frederick R.** *See* Bishop, Donald. 06064

- 09298 **Edson, Dean T.** Automatic cartography techniques for earth resources research, Sec. 22 of Earth Resources Program, 3d ann., review — v. 2, Agriculture, forestry, and sensor studies: Houston, Tex., NASA Manned Spacecraft Center, Msc-03742, p. 22-1 — 22-12, illus., 1970.
- Edwards, G. S.** See Rezak, R. 00929
- 07810 **Edwards, Jonathan, Jr.** Deep wells of Maryland: Maryland Geol. Survey Basic Data Rept., no. 5, 162 p., illus., table, 1970.
- 08153 **Egbert, R. L.; Armstrong, E. F.** The use of computer prepared residual maps as an aid in determining sedimentary environments of the Muddy Formation, northeastern Wyoming: Mtn. Geologist, v. 7, no. 4, p. 253-268, illus., 1970.
- Eggert, D. A.** See Rothwell, G. W. 04665
- Eggert, D. A.** See Millay, M. A. 04668
- Eggert, D. A.** See Rothwell, G. W. 07902
- Eggert, Donald A.** See Millay, Michael A. 01672
- 01757 **Eggler, David H.** Compositions of coexisting olivines, orthopyroxenes, magnetites, and plagioclase in the system  $\text{NaAlSi}_3\text{CaAl}_2\text{Si}_2\text{O}_8\text{-SiO}_2\text{-MgO-FeO-Fe}_2\text{O}_3$  [abs.]: EOS, v. 51, no. 4, p. 438-439, 1970.
- 06965 **Eggler, David H.** Water-saturated and undersaturated melting relations in two natural andesites [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 544, 1970.
- 07552 **Eggleton, R. E.; Offield, T. W.** Geologic maps of the Fra Mauro region of the Moon — Apollo 14 pre-mission maps: U.S. Geol. Survey Misc. Geol. Inv. Map I-708, 2 sheets, scales 1:250,000 and 1:25,000, separate texts, 1970.
- 07921 **Eggleton, Richard Elton.** Recognition of volcanoes and structural patterns in the Rumker and Montes Rhipaeus quadrangles of the Moon [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3479B, 1970.
- 10036 **Egiazarov, B. Kh.; Atlasov, I. P.; Ravich, M. G.; Grikurov, G. E.; Demenitskaya, R. M.; Znachko-Yavorsky, G. A.; Puminov, A. P.; Romanovich, B. S.; Solovyev, D. S.** Tectonic map of Arctic Polar regions of Earth [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2479, 1970.
- 10037 **Egiazarov, B. Kh.** (and others). Main tectonic features of northern part of Pacific mobile belt [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2479-2480, 1970.
- Egiazarov, B. Kh.** See Tkatchenko, B. V. 10108
- Egleson, G. C.** See Anderson, Raymond J. 07519
- Eglinton, G.** See Douglas, A. G. 04193
- Eglinton, G.** See Abell, P. I. 05734
- 05734 **Ehmann, W. D.; Morgan, J. W.** Oxygen, silicon and aluminum in Apollo 11 rocks and fines by 14 MeV neutron activation, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1071-1079, illus., tables, 1970.
- Ehlers, Ernest G.** See Lyon, Stephen R. 03171

- 08306 **Ehlers, George M.; Kesling, Robert V.** (compilers). Devonian strata of Alpena and Presque Isle Counties, Michigan, *in* Guidebook for field trips — Geol. Soc. America North-Central Sec., May 1970: [East Lansing, Mich.], Michigan Basin Geol. Soc., p. 1-30, illus., tables, 1970.
- 03166 **Ehlmann, Arthur J.; Mitchell, Richard S.** Behoite,  $\beta$ -Be(OH)<sub>2</sub>, from the Rode Ranch pegmatite, Llano County, Texas: *Am. Mineralogist*, v. 55, nos. 1-2, p. 1-9, illus., tables, 1970.
- Ehlmann, Arthur J.** See Gibson, Shirley J. 03178
- 02019 **Ehmann, W. D.; Baedeker, P. A.; McKown, D. M.** Gold and iridium in meteorites and some selected rocks: *Geochim. et Cosmochim. Acta*, v. 34, no. 4, p. 493-507, illus., tables, 1970.
- 03550 **Ehmann, W. D.; Rebagay, T. V.** Zirconium and hafnium in meteorites by activation analysis: *Geochim. et Cosmochim. Acta*, v. 34, no. 6, p. 649-658, tables, 1970.
- Ehmann, W. D.** See Rebagay, T. V. 04268
- 04781 **Ehmann, W. D.; Gillum, D. E.; Morgan, J. W.; Nadkarni, R. A.; Rabagay, T. V.; Santoliquido, P. M.; Showalter, D. L.** Chemical analyses of the Murchison and Lost City meteorites: *Meteoritics*, v. 5, no. 3, p. 131-136, tables, 1970.
- 05686 **Ehmann, W. D.; Morgan, J. W.** Oxygen, silicon and aluminum in Apollo 11 rocks and fines by 14 MeV neutron activation, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1071-1079, illus., tables, 1970.
- Ehmann, W. D.** See Morgan, J. W. 06847
- Ehmann, William D.** See Goles, Gordon G. 05694
- Ehring, T. W.** See Holbert, D. R. 10343
- 04378 **Ehrlich, M.** Unique geophysical seismic tool: Mining in Canada, July 1970, p. 25-28, illus., 1970.
- Ehrlich, Marvin.** See Snow, D. T. 02433
- 01537 **Ehrlich, Robert; Weinberg, Bernhard.** An exact method for characterization of grain shape: *Jour. Sed. Petrology*, v. 40, no. 1, p. 205-212, illus., table, 1970.
- Ehrlich, Robert.** See Davis, Mary W. 05959
- Ehrlich, Robert.** See Orr, Patricia. 09704
- Ehrlich, Robert.** See Vogel, Thomas A. 10286
- 07246 **Ehrlinger, H. P., 3d; Jackman, H. W.** Lower Mississippi River terrace sands as a commercial source of feldspar: *Illinois Geol. Survey Indus. Mineral Notes* 43, 17 p., illus., tables, 1970.
- 00258 **Ehrreich, Albert L.; Winchell, Robert E.** Diopside and andradite in amygdules in an ignimbrite [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 88-89, 1970.
- 00259 **Ehrreich, Albert L.; Winchell, Robert E.** Rapakivi texture in rhyolite [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 89, 1970.
- 01291 **Eicher, Don L.; Worstell, Paula.** *Lunatriella*, a Cretaceous heterohelcid foraminifer from the western interior of the United States: *Micropaleontology*, v. 16, no. 1, p. 117-121, illus., 1970.

- 04705 **Eicher, Don L.; Worstell, Paula.** Cenomanian and Turonian foraminifera from the Great Plains, United States: *Micropaleontology*, v. 16, no. 3, p. 269-324, illus., 1970.
- 09252 **Eickmeier, J. R.; Ersoy, D.; Ramey, H. J., Jr.** Wellbore temperatures and heat losses during production or injection operations: *Jour. Canadian Petroleum Technology*, v. 9, no. 2, p. 115-121, illus., 1970.
- Eifler, Gus K., Jr.** See Brown, L. F., Jr. 07039
- 06966 **Elmon, Paul I.** Fifty years, worldwide porphyry copper discoveries [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 544-545, 1970; *Econ. Geology*, v. 65, no. 6, p. 737, 1970.
- 06516 **Einaudi, Marco T.** An iron-sensitive stain for iron-rich sphalerite: *Am. Mineralogist*, v. 55, nos. 5-6, p. 1048-1054, illus., table, 1970.
- 09071 **Einaudi, Marco T.** An iron-sensitive stain for iron-rich sphalerite — erratum [to Einaudi, Marco T., *ibid.*, v. 55, p. 1051, 1970]: *Am. Mineralogist*, v. 55, nos. 11-12, p. 2134, 1970.
- 00112 **Einstein, H. A.** Deposition of suspended particles in a gravel bed — Closure [to discussion of paper 6039, 1968]: *Am. Soc. Civil Engineers Proc.*, v. 96, *Jour. Hydraulics Div.*, no. HY 2, p. 581-582, 1970.
- 07439 **Einstein, H. H.; Nelson, R. A.; Bruhn, R. W.; Hirschfeld, R. C.** Model studies of jointed-rock behavior, Chap. 6 in *Rock mechanics, theory and practice* — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, *Proc.*: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 83-103, illus., table, 1970.
- 09141 **Einstein, Herbert H.; Baecher, Gregory B.; Hirschfeld, Ronald C.** The effect of size on strength of a brittle rock [with French and German summ.], in *Internat. Soc. Rock Mechanics Cong.*, 2d, Belgrade, Yugoslavia, 1970, *Proc.*, V. 2: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 7-13, illus., tables, 1970.
- 01908 **Einwich, Anna M.; Higgs, Robert H.; Lowry, H. Michael.** Magnetic anomalies in the "smooth zone", western North Atlantic [abs.]: *EOS*, v. 51, no. 4, p. 274, 1970.
- 02390 **Eisbacher, G. H.** Deformation mechanics of mylonitic rocks and fractured granites in Cobequid Mountains, Nova Scotia, Canada: *Geol. Soc. America Bull.*, v. 81, no. 7, p. 2009-2020, illus., 1970.
- 07686 **Eisbacher, G. H.; Bielenstein, H. U.** Interpretation of elastic-strain-recovery measurements near Elliot Lake, Ontario, in *Symposium on recent crustal movements*, Ottawa, Canada, 1969, *Papers: Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 2, p. 576-578, illus., 1970.
- 07701 **Eisbacher, G. H.** Contemporaneous faulting and clastic intrusions in the Quirke Lake Group, Elliot Lake, Ontario: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 215-225, illus., 1970.
- 01134 **Eitel, Dean F.; Yeager, Joan E.; Holmes, Robert F.; Footen, Joseph J. (compilers).** Selected bibliography of the terrain sciences (4th edition): Alexandria, Va., Raytheon Co., 96 p., 1970; originally published 1967.
- Eittreim, S. L.** See Jones, E. J. W. 00846
- 07922 **Eittreim, Stephen Lawrence.** Suspended particulate matter in the deep waters of the northwest Atlantic Ocean [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 6, p. 3490B, 1970.
- El Goresy, A.** See Bell, P. M. 02229

- 09756 **El Paso Geological Society; Hawley, John W.** (editor and compiler). Cenozoic stratigraphy of the Rio Grande Valley area, Doña Ana County, New Mexico-Guidebook, 4th Annual Field Trip: [El Paso, Tex., El Paso Geol. Soc.], 49 p., illus., 1970.
- 05951 **El-Baz, Farouk; Gheith, Mohamed A.** Memorial of Riad Abdel-Megid Higazy — September 13, 1919-March 7, 1967: *Am. Mineralogist*, v. 55, nos. 3-4, p. 569-573, portrait, 1970.
- Elder, J. H.** See Pettry, D. E. 05436
- 04671 **Elder, J. L.; Kube, W. R.** (compilers). Technology and use of lignite — A symposium, Bureau of Mines-University of North Dakota, Grand Forks, N. Dak., 1969, *Proc. U.S. Bur. Mines Inf. Circ.* 8471, 174 p., illus., tables, 1970.
- 10120 **Elder, John A.** Soils of Nebraska: Nebraska Univ. Conserv. and Survey Div. Resources Rept. 2, 60 p., illus., tables, 1969.
- 01758 **Elders, Wilfred A.; Robinson, Paul T.** Possible sea-floor spreading in the Imperial Valley of California — [Pt.] 4, A model for magma generation [abs.]: *EOS*, v. 51, no. 4, p. 422, 1970.
- Elders, Wilfred A.** See Robinson, Paul T. 01823
- 06967 **Elders, Wilfred A.; Meidav, Tsvi; Rex, Robert W.; Robinson, Paul T.** The Imperial Valley of California, the product of oceanic spreading centers acting on a continent [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 545, 1970.
- 11218 **Eldredge, Niles.** Reconstruction of feeding mechanisms in phacopid trilobites: *New York Paleont. Soc. Notes*, no. 2, p. 9, 1970.
- 07601 **Eldredge, Robert Niles.** Geographic variation and evolution in *Phacops rana* (Green, 1832) and *Phacops iowensis* Delo, 1935, in the Middle Devonian of North America [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 3, p. 1433B-11434B, 1970.
- Eldridge, James S.** See O'Kelley, G. Davis. 05712
- 05484 **Elgabaly, M. M.; Elghamry, W. M.** Air permeability as related to particle size and bulk density in sand systems: *Soil Sci.*, v. 110, no. 1, p. 10-12, illus., 1970.
- ElGoresy, Ahmed.** See Ramdohr, Paul. 05757
- Elleman, Daniel D.** See Manatt, Stanley L. 06290
- Ellert, Ruben.** See Pawley, Julian K. 09476
- 03819 **Elliot, David.** Determination of finite strain and initial shape from deformed elliptical objects: *Geol. Soc. America Bull.*, v. 81, no. 8, p. 2221-2236, illus., tables, 1970.
- 09439 **Elliott, Charles M.** Potamology data collection on Lower Mississippi River: *Am. Soc. Civil Engineers Proc., Jour. Waterways, Harbors and Coastal Eng. Div.*, v. 96, paper 7466, no. WW3, p. 601-622, illus., 1970.
- 10379 **Elliott, Charles M.** Mississippi River potamology studies, in *Mississippi Water Resources Conf.*, 4th, 1969, Jackson, *Proc.: State College, Miss. Water Resources Research Inst.*, p. 139-154, illus., 1969.
- Elliott, D. E.** See Wickham, J. S. 01849
- 10854 **Elliott, D. E.** El levantamiento geológico en los estudios de recursos naturales basado en el actual catastro rural de Panama [geologic surveying in studies of natural resources, based on the present rural cadastral survey of Panama (with Spanish and English abs.)], 2, in *Trabajos tecnicos presentados en la segunda reunion de geologos*



de America Central: Inst. Centroamericano Inv. y Tecnología Indus. Pubs. Geol., no. 2, p. 18-22, 1969.

- 01759 **Elliott, David.** The flow of basement into nappes [abs.]: EOS, v. 51, no. 4, p. 431, 1970.

- 07649 **Elliott, David.** Determination of flow laws in naturally deformed quartzites [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 546, 1970.

**Elliott, G. K.** See Sheridan, R. E. 05792

**Elliott, James E.** See Wells, John D. 08465

- 06451 **Ellis, J. G.; Stonehouse, H. B.** Pedology, in Physical environment of Saskatoon, Canada: Natl. Research Council Canada Pub. 11378, p. 19-20, illus., 1970.

**Ellis, J. H.** See Phillips, R. E. 07231

- 07624 **Ellis, J. H.; Barnhisel, R. I.; Phillips, R. E.** The diffusion of copper, manganese, and zinc as affected by concentration, clay mineralogy, and associated anions: Soil Sci. Soc. America Proc., v. 34, no. 6, p. 866-870, illus., 1970.

- 09494 **Ellis, Robert H.; Cheney, Philip B.** An information system for marine resource planning and management, in Offshore Technology Conference, 2d Ann., Houston, Tex., 1970, Preprints — v. 1: Dallas, Tex., Offshore Technology Conf., p. I-341—I-344, 1970.

**Ellis, Robert M.** See Ishii, Hiroshi. 03351

**Ellis, Robert M.** See Ishii, Hiroshi. 04400

**Ellis, W. R.** See Wiebenga, William A. 03986

- 00782 **Ellison, Robert L.; Nichols, Maynard M.** Estuarine foraminifera from the Rapahannock River, Virginia: Cushman Found. Foram. Research Contr., v. 21, pt. 1, p. 1-17, illus., tables, 1970.

- 06241 **Ellitsgaard-Rasmussen, K.** General review of the Survey's activities in 1969, in Report of activities, 1969: Grönlands Geol. Undersögelse Rap. 28, p. 5-9, illus., 1970.

- 07901 **Elloy, R.; Tixier, M.** Phénomènes sédimentaires et diagenétiques en milieu de dépôt haut-intertidal à supratidal dans la Silurien du forage de Pen 1, Ontario (Canada) [Sedimentary and diagenetic phenomena of a high-intertidal and supratidal depositional environment in the Silurian of the Pen 1 bore hole, Ontario (Canada) (with French and English abs.)]: Centre Recherches Pau Bull., v. 4, no. 2, p. 465-483, illus., 1970.

- 00059 **Ells, Garland D.** New oil strikes boost interest in Michigan: World Oil, v. 170, no. 1, p. 72-74, illus., 1970.

- 11243 **Ells, Garland D.** Architecture of the Michigan Basin, in Studies of the Precambrian of the Michigan Basin — Michigan Basin Geol. Soc. Ann. Field Excursion, 1969: [East Lansing, Mich.], Michigan Basin Geol. Soc., p. 60-68, illus., 1969.

**Elrick, D. E.** See Bachmat, Y. 01714

- 09193 **Elrick, D. E.; Lawson, D. W.** Tracer techniques in hydrology, in Instrumentation and observation techniques, V. 1 — Hydrology Symposium, 7th, Victoria, B. C., 1969, Proc.: [Ottawa] Canada Dept. Energy, Mines and Resources Inland Waters Br., p. 155-187, illus., tables [1970, 2].

- 10346 **Elrick, D. E.** The microhydrological characterization of soils, in Water in the unsaturated zone, V. 1: Internat. Assoc. Sci. Hydrology Pub. 82, p. 311-317, illus., table, 1968.

- 00412 **Elsasser, Walter M.** The so-called folded mountains: *Jour. Geophys. Research*, v. 75, no. 8, p. 1615-1618, illus., 1970.
- 10569 **Elsasser, Walter M.** Non-uniformity of crustal growth [abs.]: *EOS*, v. 51, no. 11, p. 823, 1970.
- 05003 **Elsdon, R.** The Kap Edvard Holm complex, east Greenland [abs.]: *Geol. Soc. London Proc.* 1970, no. 1663, p. 158-160, discussion, 1970.
- 02746 **El-Shatoury, H. M.; Whelan, J. A.** Mineralization in the Gold Hill mining district, Tooele County, Utah: *Utah Geol. and Mineralog. Survey Bull.* 83, 37 p., illus., tables, 1970.
- 02286 **El-Shatoury, Hamad.** Gold Hill mining district, in *Radioactive and isotopic age determinations of Utah rocks*: *Utah Geol. and Mineralog. Survey Bull.* 81 (*Utah Univ. Bull.*, v. 61, no. 18; *Utah Eng. Expt. Sta. Bull.* 135), p. 27, 1970.
- 00893 **Elsik, William C.** Fungal spores in stratigraphy [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 283, 1970.
- 04354 **Elsik, William C.** Palynology of a Paleocene Rockdale lignite, Milam County, Texas — [Pt.] 3, Errata and taxonomic revisions: *Pollen et Spores*, v. 12, no. 1, p. 99-101, 1970.
- 05327 **Elston, Wolfgang E.; Smith, Eugene I.** Determination of flow direction of rhyolitic ash-flow tuffs from fluidal textures: *Geol. Soc. America Bull.*, v. 81, no. 11, p. 3393-3406, illus., 1970.
- 08651 **Elston, Wolfgang E.; Coney, Peter J.; Rhodes, Rodney C.** Progress report on the Mogollon Plateau volcanic province, southwestern New Mexico — No. 2, in *Guidebook of the Tyrone-Big Hatchet Mountains-Florida Mountains region — New Mexico Geol. Soc. Field Conf.*, 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, p. 75-86, illus., 1970.
- 08681 **Elston, Wolfgang E.** Volcano-tectonic control of ore deposits, southwestern New Mexico, in *Guidebook of the Tyrone-Big Hatchet Mountains-Florida Mountains region — New Mexico Geol. Soc. Field Conf.*, 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, p. 147-153, illus., 1970.
- 09262 **Elston, Wolfgang E.; Bikerman, Michael; Damon, Paul E.** Significance of new K-Ar dates from southwestern New Mexico, App. A-IV of Correlation and chronology of ore deposits and volcanic rocks, Damon, Paul E.: n.p., U.S. Atomic Energy Comm. Research Div., p. AIV 1-AIV 20, illus., table, 1968.
- 02547 **El-Swaify, S. A.; Swindale, L. D.** Effects of saline water on the chemical properties of some tropical soils: *Soil Sci. Soc. America Proc.*, v. 34, no. 2, p. 207-211, illus., tables, 1970.
- 02861 **El-Swaify, S. A.** The stability of saturated soil aggregates in certain tropical soils as affected by solution composition: *Soil Sci.*, v. 109, no. 3, p. 197-202, illus., 1970.
- 11021 **El-Swaify, S. A.; Ahmed, S.; Swindale, L. D.** Effects of adsorbed cations on physical properties of Tropical Red and Tropical Black Earths — [Pt.] 2, Liquid limit, degree of dispersion, and moisture retention: *Jour. Soil Sci.*, v. 21, no. 1, p. 188-198, illus., table, 1970.
- 10855 **Elvir A., Reniery.** Industria minera de Honduras [the mining industry of Honduras (with Spanish and English abs.) 2, in *Trabajos técnicos presentados en la segunda reunión de geólogos de América Central*: *Inst. Centroamericano Inv. y Tecnología Indus. Pubs. Geol.*, no. 2, p. 1-7, illus., 1969.

**Elwell, J. H.** See Simon, D. E. 03659

**Elwell, J. H.** See Simon, D. E. 04451

- 04744 **Embley, R. W.; Ewing, J. I.; Ewing, M.** The Vidal deep-sea channel and its relationship to the Demerara and Barracuda Abyssal Plains: *Deep-Sea Research*, v. 17, no. 3, p. 539-552, illus., 1970.
- 04138 **Embree, Glenn F.** Lateral and vertical variations in a Quaternary basalt flow — Petrography and chemistry of the Gunlock flow, southwestern Utah: *Brigham Young Univ. Geology Studies*, v. 17, pt. 1, p. 67-115, illus., tables, geol. map, 1970.
- 02613 **Embry, A. F., 3d; Klován, J. E.** Upper Devonian biostromes and bioherms on northeastern Banks Island, Northwest Territories [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 846, 1970.
- Embry, Ashton F.** See Klován, J. Edward. 10067
- 06249 **Emeleus, C. H.; Stephenson, D.** Field work between Tunugdliarfik and Tasiussaq, in Report of activities, 1969: *Grönlands Geol. Undersøgelse Rap.* 28, p. 30-32, illus., table, 1970.
- 06969 **Emerson, John W.** Consequences of artificial stream channel alteration, Johnson County, Missouri [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 547, 1970.
- 00099 **Emery, K. O.; Uchupi, Elazar; Phillips, J. D.; Bowin, C. O.; Bunce, E. T.; Knott, S. T.** Continental rise off eastern North America: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 1, p. 44-108, illus., table, 1970.
- 08402 **Emery, K. O.** Continental margins of the world [with French and German abs.], in *The geology of the East Atlantic continental margin — ICSU/SCOR Working Party 31 Symposium, Cambridge, England, 1970, [Pt.] 1, General and Economic Papers: [Great Britain] Inst. Geol. Sci. Rept.*, no. 70-13, p. 3-29, illus., 1970.
- 04122 **Emery, Philip A.** Electric analog model evaluation of a water-salvage plan, San Luis Valley, south-central Colorado: *Colorado Water Conserv. Board Ground-Water Ser. Circ.* 14, 11 p., illus., table, 1970.
- 03939 **Emilia, David A.; Bodvarsson, Gunnar.** More on the direct interpretation of magnetic anomalies (reply to M. H. P. Bott and M. A. Hutton) [of 1969 discussion of 1969 paper]: *Earth and Planetary Sci. Letters*, v. 8, no. 4, p. 320-321, 1970.
- 01678 **Emiliani, C.** Pleistocene paleotemperatures: *Science*, v. 168, no. 3933, p. 822-825, illus., table, 1970.
- 00813 **Emiliani, Cesare; Harrison, Christopher G. A.; Swanson, Mary.** Earthquakes and nuclear detonations: *Science*, v. 167, no. 3920, p. 1013-1014, tables, 1970.
- 01530 **Emmett, L. F.; Jeffery, H. G.** Reconnaissance of the ground-water resources of the Missouri River alluvium between Miami and Kansas City, Missouri: *U.S. Geol. Survey Hydrol. Inv. Atlas HA-344*, scale 1:125,000, text, 1970.
- 01352 **Emmett, William W.** The hydraulics of overland flow on hillslopes: *U.S. Geol. Survey Prof. Paper* 662-A, p. A1-A68, illus., tables, 1970.
- Emond, Pierre L.** See Morency, Maurice. 01200
- 04639 **Empson, F. M.; Bradshaw, R. L.; McClain, W. C.; Houser, B. L.** Results of the operation of project Salt Vault, a demonstration of disposal of high level radioactive solids in salt, in *Third symposium on salt*, V. 1 (J. L. Rau and L. F. Dellwig, editors): *Cleveland, Ohio, Northern Ohio Geol. Soc.*, p. 455-462, illus., 1970.
- 00149 **Emrich, Grover H.; Merritt, Gary L.; Rhindress, Richard C.** Geocriteria for solid waste disposal sites [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 17, 1970.
- 07981 **Emry, Robert J.** A North American Oligocene pangolin and other additions to the Pholidota: *Am. Mus. Nat. History Bull.*, v. 142, art. 6, p. 455-510, illus., 1970.

**Emslie, A. G.** See Aronson, J. R. 03695

- 01723 **Emslie, R. F.** The geology of the Michikamau Intrusion, Labrador (13L, 23I): Canada Geol. Survey Paper 68-57, 85 p., illus., geol. maps, 1970.

**Emslie, R. F.** See Stockwell, C. H. 07971

**Emslie, R. F.** See Roeder, P. L. 08276

**Eng. Inst. Canada Geotech. Eng. Div.** See Natl. Research Council Canada. 09763

- 02280 **Eng, Morris.** Gravel, gift of the glaciers: Conserv. Volunteer, v. 33, no. 190, p. 15-21, illus., 1970.

- 06970 **Engdahl, E. R.; Tarr, A. C.** Seismicity of the Amchitka Island region [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 547, 1970.

**Engdahl, E. R.** See Spence, W. J. 10543

- 10545 **Engdahl, E. R.** Aftershocks of the Aleutian Trench earthquake of February 27, 1970 [abs.]: EOS, v. 51, no. 11, p. 779, 1970.

- 00260 **Engdahl, Eric R.; Flinn, Edward A.; Romney, Carl F.** Inner core reflections [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 89-90, 1970.

- 01631 **Engdahl, Eric R.; Brockman, Stanley R.; King, Kenneth W.** MILROW seismic effects [abs.]: EOS, v. 51, no. 3, p. 204, 1970.

- 01347 **Engel, A. E. J.; Engel, C. G.** Igneous rock samples recovered on Leg 2, [Chap.] 18 in Initial reports of the Deep Sea Drilling Project — V. 2, Leg 2 of cruises of *Glomar Challenger*, Hoboken, N. J., to Dakar, Senegal, Oct.-Nov. 1968: Washington, D. C., U.S. Govt. Printing Office, p. 387, 1970.

- 05687 **Engel, A. E. J.; Engel, Celeste G.** Lunar rock compositions and some interpretations, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1081-1084, illus., tables, reprinted 1970.

- 09995 **Engel, A. E. J.; Engel, Celeste G.** Mafic and ultramafic rocks, in The sea — v. 4, New concepts of sea floor evolution, Pt. 1, General observations (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 465-519, illus., tables, 1970.

- 10934 **Engel, Albert E.; Engel, Celeste G.** Gornyye porody lozha okeana [rocks of the ocean floor], in Osnovnyye problemy okeanologii — (Internat. Oceanog. Cong., 2d, Moscow, 1966): Moscow, Vtoroy Mezhdunarodnyy Okeanograf. Kong., p. 183-217, illus., tables, 1968; reprinted in Scripps Inst., Oceanography Contrs., new ser. V. 39, Pt. 2, p. 1023-1057, illus., tables, 1969.

**Engel, C. G.** See Engel, A. E. J. 01347

**Engel, Celeste G.** See Engel, A. E. J. 05687

**Engel, Celeste G.** See Engel, A. E. J. 09995

**Engel, Celeste G.** See Engel, Albert E. 10934

**Engel, Gunter.** See Merker, Ludwig. 09100

**Engelhardt, Donald W.** See Hedlund, Richard W. 07056

**Engels, J. C.** See Naeser, C. W. 00410

- 04526 **Engels, J. C.; Ingamells, C. O.** Effect of sample inhomogeneity in K-Ar dating: Geochim. et Cosmochim. Acta, v. 34, no. 9, p. 1007-1017, illus., tables, 1970.

- Engels, Joan C.** *See* Forbes, Robert B. 10202
- Engels, Joan C.** *See* Yates, Robert S. 10317
- Engen, Gladys R.** *See* Arabasz, Walter J. 03512
- 04518 **Engineering-Science, Inc.** Annotated bibliography on hydrology and sedimentation, 1966-1968, United States and Canada: Joint Hydrology-Sedimentation Bull. 10, 613 p., 1970.
- 05005 **England, C. B.; Stephenson, G. R.** Response units for evaluating the hydrologic performance of rangeland watersheds: Jour. Hydrology, v. 11, no. 1, p. 89-97, illus., tables, 1970.
- England, J. H.** *See* Andrews, J. T. 01244
- England, J. L.** *See* Bell, P. M. 02229
- Engstrom, J. C.** *See* Fraunfelter, G. H. 05862
- 02523 **Eno, Gene.** The contribution of the amateur to earth science education in the mid-west [abs.]: Nebraska Acad. Sci. Proc., 80th Ann. Mtg., p. 33, 1970.
- 01225 **Enright, Richard Louis Charles, Jr.** The stratigraphy, micropaleontology, and paleoenvironmental analysis of the Eocene sediments of the New Jersey Coastal Plain [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 8, p. 3706B, 1970.
- 02024 **Enslinger, H. Robert.** Seismic profiling in the Gulf of Mexico: UnderSea Technology, v. 11, no. 2, p. 22-25, illus., tables, 1970.
- Enslinger, H. Robert.** *See* Walker, Jack R. 05873
- 04272 **Epp, David; Grim, Paul J.; Langseth, Marcus G., Jr.** Heat flow in the Caribbean and Gulf of Mexico: Jour. Geophys. Research, v. 75, no. 29, p. 5655-5669, illus., tables, 1970.
- Eppley, R. A.** *See* Murphy, L. M. 06650
- 00496 **Epps, Lawrence W.** Calculated size of ancient Brazos River from terrace gravel and meander geometry [abs.]: Texas Jour. Sci., v. 21, no. 3, p. 335-336, 1970.
- 00695 **Epstein, Claude M.** Brachiopod shell morphology and its relationship to environment — A Q-mode factor analysis of the brachiopods of the Helderberg Group (Lower Devonian) of New York [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 206, 1970.
- Epstein, S.** *See* Land, Lynton S. 06235
- Epstein, Samuel.** *See* Savin, Samuel M. 00949
- Epstein, Samuel.** *See* Savin, Samuel M. 00974
- Epstein, Samuel.** *See* Savin, Samuel M. 01732
- Epstein, Samuel.** *See* Suzuoki, Tetsuro. 01869
- Epstein, Samuel.** *See* Sheppard, Simon M. F. 05389
- 05688 **Epstein, Samuel; Taylor, Hugh P., Jr.** The concentration and isotopic composition of hydrogen, carbon and silicon in Apollo 11 lunar rocks and minerals, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis:

New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1085-1096, illus., tables, 1970.

**Epstein, Samuel.** See Taylor, Hugh P., Jr. 05724

**Epstein, Samuel.** See Taylor, Hugh P., Jr. 06853

- 05934 **Erd, Richard C.; McAllister, James F.; Vlisidis, Angelina C.** Wardsmithite,  $5\text{CaOM-gO}12\text{B}_2\text{O}_3\cdot 30\text{H}_2\text{O}$ , a new borate mineral from the Death Valley region, California: Am. Mineralogist, v. 55, nos. 3-4, p. 349-357, illus., tables, 1970.

**Erdman, J. E.** See Connor, J. J. 09601

- 02614 **Erdoğan, Solmaz Z.; Perkins, Bob F.** Biofacies relations in Buda Limestone (Comanche Series, Cretaceous) of west and Trans-Pecos Texas, paleogeographic and paleobathymetric implications [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 846, 1970.

- 07264 **Erel, Bilgin.** Physico-chemical model analysis for compressibility of pure clay [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2662B-2663B, 1970.

- 03818 **Ericksen, George E.; Wedow, Helmuth, Jr.; Eaton, Gordon P.; Leland, George R.** Mineral resources of the Black Range Primitive area, Grant, Sierra, and Catron Counties, New Mexico: U.S. Geol. Survey Bull. 1319-E, p. E1-E162, illus., tables, geol. map, 1970.

**Ericksen, George E.** See Mrose, Mary E. 09106

- 09107 **Ericksen, George E.; Mrose, Mary E.** Mineralogical studies of the nitrate deposits of Chile — [Pt.] 2, Darapskite,  $\text{Na}_3\text{NO}_3(\text{SO}_4)\cdot\text{H}_2\text{O}$ : Am. Mineralogist, v. 55, nos. 9-10, p. 1500-1517, illus., tables, 1970.

- 04032 **Erickson, A. Kirth.** Structural origin of the Nesson and Antelope anticlines, North Dakota: Compass, v. 47, no. 3, p. 134-140, illus., 1970.

**Erickson, Barrett H.** See Peter, George. 10006

- 04000 **Erickson, Bruce R.** The colossal lizard, mosasaur: Mus. Observer, v. 6, no. 2, p. 2-6, illus., 1970.

**Erickson, J. Mark.** See Stone, William J. 04035

- 04036 **Erickson, J. Mark.** A floating coring platform for use on sheltered lakes: Compass, v. 47, no. 3, p. 169-173, illus., 1970.

- 09261 **Erickson, Rolfe.** Welded intrusive volcanic breccias in the Dos Cabezas Mountains, Arizona, App. A-III of Correlation and chronology of ore deposits and volcanic rocks, Damon, Paul E.: n.p., U.S. Atomic Energy Comm. Research Div., p. AIII1-AIII41, illus., 1968.

- 09264 **Erickson, Rolfe C.** Geology and geochronology of the Dos Cabezas Mountains, Cochise County, Arizona, App. A-VI of Correlation and logy of ore deposits and volcanic rocks, Damon, Paul E.: n.p., U.S. Atomic Energy Comm. Research Div., p. 192-198, illus., 1968.

**Ericson, David B.** See Wollin, Goesta. 09227

- 04684 **Ericsson, Ulf A.** Event identification for test ban control: Seismol. Soc. America Bull., v. 60, no. 5, p. 1521-1546, illus., 1970.

- 01621 **Erlank, A. J.; Kushiro, I.** Potassium contents of synthetic pyroxenes at high temperatures and pressures: Carnegie Inst. Washington Year Book 68, 1968-69, p. 439-442, table, 1970.

- 01690 **Erlank, A. J.** Distribution of potassium in mafic and ultramafic nodules: Carnegie Inst. Washington Year Book 68, 1968-69, p. 433-439, illus., 1970.
- 02239 **Erlank, A. J.; Kushiro, I.** Potassium contents of synthetic pyroxenes at high temperatures and pressures: Carnegie Inst. Washington Year Book 68, 1968-69, p. 233-236, table, 1970.
- 02953 **Ermanovics, I. F.** Precambrian geology of Hecla-Carroll Lake map-area, Manitoba-Ontario (62P E1/2, 52M W1/2): Canada Geol. Survey Paper 69-42, 33 p., illus., tables, geol. map, 1970.
- 06477 **Ermanovics, I. F.** A model for tectonic variation of 'granitic terrain' in southeastern Manitoba [abs.], in Inst. Lake Superior Geology, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 16, 1970.
- 07181 **Ermanovics, I. F.** Geology of Berens River-Deer Lake map-area, Manitoba and Ontario and a preliminary analysis of tectonic variations in the area: Canada Geol. Survey Paper 70-29, 24 p., illus., table, geol. map, 1970.
- 07712 **Ermanovics, I. F.** Zonal structure of the Perth Road monzonite, Grenville Province, Ontario: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 1, p. 414-434, illus., tables, 1970.
- 00659 **Ernst, W. G.** Tectonic contact between the Franciscan melange and the Great Valley sequence — Crustal expression of a late Mesozoic Benioff zone: Jour. Geophys. Research, v. 75, no. 5, p. 886-901, illus., 1970.
- Ernst, W. G.** See Brace, William F. 01409
- 01760 **Ernst, W. G.** Petrologic reconnaissance of Franciscan metagraywackes from the Diablo Range, California Coast Ranges [abs.]: EOS, v. 51, no. 4, p. 445, 1970.
- 05079 **Ernst, W. G.; Seki, Yotaro; Onuki, H.; Gilbert, M. C.** Comparative study of low-grade metamorphism in the California Coast Ranges and the Outer Metamorphic Belt of Japan: Geol. Soc. America Mem. 124, 276 p., illus., tables, geol. maps, 1970.
- 05894 **Ernst, W. G.** Pasipedeleniye elementov v tektonicheskikh vklucheniyaх golubykh slantsev iz serpentinitov v Kaliforniyskikh Beregovykh Khrebtakh i diskussiya o tektonike golubykh slantsev [Element partitioning in blueschist tectonic inclusions from serpentinites in California Coast Ranges, and a discussion of blueschist tectonics (with English abs.)], in Problemy petrologii i geneticheskoy mineralogii, V. 2: Moscow, Akad. Nauk SSSR Sibir. Otdeleniye (Izdatel'stvo "Nauka"), p. 5-23, illus., tables, 1970.
- 09088 **Ernst, W. G.; Wai, C. M.** Mössbauer, infrared, X-ray and optical study of cation ordering and dehydrogenation in natural and heat-treated sodic amphiboles: Am. Mineralogist, v. 55, nos. 7-8, p. 1226-1258, illus., tables, 1970.
- 10996 **Ernst, W. G.** Do Diablo Range mineral parageneses reflect high-pressure conditions of Franciscan recrystallization? [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 90, 1970.
- Ernst, W. Gary.** See Brace, William F. 00870
- Erskine, W. S.** See Rozendal, R. A. 01424
- Ersoy, D.** See Eickmeier, J. R. 09252
- 06382 **Erwin, John W.** Gravity map of the Yerington, Como, Wabuska, and Wellington quadrangles, Nevada: Nevada Bur. Mines Map 39, scale 1:125,000, text, 1970.
- Escalante, G.** See Barr, K. W. 10856

- 06763 **Escher, A.; Escher, J.; Watterson, J.** The Nagssugtoqidian boundary and the deformation of the Kangâmiut dyke swarm in the Sondre Stromfjord area, *in* Report of activities, 1969: Grönlands Geol. Undersøgelse Rap. 28, p. 21-23, 1970.
- Escher, A.** See Bridgwater, D. 10017
- Escher, J.** See Escher, A. 06763
- Eschman, Donald F.** See Dorr, John A., Jr. 02113
- Eschman, Donald F.** See Wagner, W. Philip. 05975
- Eschman, Donald F.** See Ferrand, William R. 06975
- 08302 **Eschman, Donald F.; Farrand, William R.** Glacial history of the Glacial Grand Valley, *in* Guidebook for field trips — Geol. Soc. America North-Central Sec., May 1970: [East Lansing, Mich.], Michigan Basin Geol. Soc., p. 131-158, illus., tables, 1970.
- 10162 **Eschman, Donald F.** A minimum age for maximum Wisconsinan ice, southwestern Alberta [abs.], *in* American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970. Abs.: [Bozeman, Mont., Montana State Univ.?], p. 40, 1970.
- 11012 **Esfandiari, Bijan.** Geochemistry and geology of helium [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 8, p. 3787B, 1970.
- 10466 **Esler, George C., 3d.** Upper Cretaceous planktonic Foraminifera from Guatemala [with Spanish and English abs.], *in* Trabajos tecnicos presentados en la segunda reunion de geologos de America Central: Inst. Centroamericano Inv. y Tecnologia Indus. Pubs. Geol., no. 2, p. 56-57, illus., 1969
- Eslinger, Eric V.** See Huffman, Samuel F. 00721
- 06016 **Esmail, Omar Jubran.** Ultrasonic reflection and transmission by submerged composite plates [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5564B, 1970.
- 02719 **Espach, Ralph.** O.C.G.S.-A.I.P.G. introductory geology course for secondary teachers, a volunteer public service effort: Shale Shaker, v. 20, no. 6, p. 116-117, illus., 1970.
- 00696 **Espenshade, Gilbert H.; Rankin, Douglas W.** Probable Precambrian crystalline rocks in the Sauratown Mountains anticlinorium, a major structural feature in the Piedmont of North Carolina [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 207, 1970.
- 09207 **Espley, G. H.** Experience with permafrost in gold mining, *in* Canadian Conf. on Permafrost, 3d, 1969, Proc. (R. J. E. Brown, editor): Natl. Research Council Canada, Associate Comm. Geotech. Research tech. Memo. 96, p. 59-64, 1969.
- 06971 **Essene, Eric; Ware, N. G.** The low temperature xenolithic origin of eclogites in diatremes, N.E. Arizona [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 547-548, 1970.
- 00262 **Estavillo, William; Rogers, Mark.** Potassium-argon dating of metamorphic and plutonic igneous rocks from San Matias Pass, Baja California, Mexico [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 90-91, 1970.
- 00552 **Estes, Richard.** The status of *Palaeosiren beinerti*, a supposed Permian aistopod amphibian: Jour. Paleontology, v. 44, no. 1, p. 140-141, 1970.
- 02754 **Estes, Richard; Berberian, Paul.** Paleocology of a Late Cretaceous vertebrate community from Montana: Breviora, no. 343, 35 p., illus., tables, 1970.



- 02835 **Estes, Richard.** New fossil pelobatid frogs and a review of the genus *Eopelobates*: Harvard Univ. Mus. Comp. Zoology Bull., v. 139, no. 6, p. 293-340, illus., tables, 1970.
- 03915 **Estes, Richard; Frazzetta, T. H.; Williams, Ernest E.** Studies on the fossil snake *Dinilysia patagonica* Woodward — Pt. 1, Cranial morphology: Harvard Univ. Mus. Comp. Zoology Bull., v. 140, no. 2, p. 25-73, illus., 1970.
- Ethridge, Frank G.** See Davies, David K. 00886
- Ethridge, Frank G.** See Davies, David K. 02789
- Ettinger, K. V.** See Durrani, S. A. 00585
- Ettinger, Kamil V.** See Christodoulides, Costas. 06443
- 03553 **Eugster, H. P.** The thermal and ionic stability of muscovite [abs.]: Fortschr. Mineralogie, v. 47, no. 1, p. 18-19, 1970.
- Eugster, Hans P.** See Hardie, Lawrence A. 09954
- Eugster, Hans P.** See Williams, Richard J. 10305
- 01701 **Eugster, O.; Tera, F.; Burnett, D. S.; Wasserburg, G. J.** Neutron capture effects in Gd from the Norton County meteorite: Earth and Planetary Sci. Letters, v. 7, no. 5, p. 436-440, illus., table, 1970.
- 02137 **Eugster, O.; Tera, F.; Burnett, D. S.; Wasserburg, G. J.** Isotopic composition of gadolinium and neutron-capture effects in some meteorites: Jour. Geophys. Research, v. 75, no. 14, p. 2753-2768, illus., tables, 1970.
- 05726 **Evans, David M.** The Denver area earthquakes and the Rocky Mountain Arsenal disposal well, in Engineering seismology — The works of man: Geol. Soc. America Eng. Geology Case Histories, no. 8, p. 25-32, illus., table, 1970.
- 02971 **Euler, Robert C.** Late Pleistocene paleoclimatology of Grand Canyon [abs.]: Arizona Acad. Sci. Jour., v. 6, 1970 Proc. Supp., p. 22, 1970.
- 00697 **Eutsler, Robert L.** Algal borings, homogenization, and porosity in Recent limestone of the lower Florida Keys [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 297-208, 1970.
- 03554 **Evans, B. W.; Okrusch, M.** Minor element relationships in coexisting andalusite and sillimanite [abs.]: Fortschr. Mineralogie, v. 47, no. 1, p. 20-21, 1970.
- Evans, Bernard W.** See Okrusch, Martin. 03715
- 03666 **Evans, C. A., Jr.; Guidoboni, R. J.; Leipziger, F. D.** Routine analysis of metals using a spark source mass spectrograph with electrical detection: Appl. Spectroscopy, v. 24, no. 1, p. 85-91, illus., tables, 1970.
- Evans, D. S.** See Meyer, W. T. 04323
- 05231 **Evans, David M.** The Denver area earthquakes and the Rocky Mountain Arsenal disposal well, in Engineering seismology — The works of man: Geol. Soc. America Eng. Geology Case Histories, no. 8, p. 25-32, illus., table, 1970.
- 05519 **Evans, Gomer E.** Proposed plotter applications for groundwater engineers [abs.]: Water Well Jour., v. 24, no. 9, p. 56, 1970.
- 00841 **Evans, Hilton B.** Status and trends in logging: Geophysics, v. 35, no. 1, p. 93-112, illus., 1970.

- 06972 **Evans, Howard T., Jr.; Staples, Lloyd W.** The crystal structure of cavansite, a novel layer silicate [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 548, 1970.
- 09951 **Evans, Howard T., Jr. (and others).** Observations on the Symposium on sulfides — Fiftieth Anniversary Symposia (Benjamin A. Morgan, editor): *Mineralog. Soc. America Spec. Paper* 3, p. 211-212, 1970.
- Evans, Ian.** See Stanton, Robert J., Jr. 09587
- 03957 **Evans, James O.** The soil as a resource renovator: *Environmental Sci. and Technology*, v. 4, no. 9, p. 732-735, illus., 1970.
- 09908 **Evans, James R.** Geology of the McCloud Limestone in the South Gray Rocks area, Shasta County, California, with a section on the operation of the Gray Rocks cement plant, in *Geologic guide to the Lassen Peak, Burney Falls, and Lake Shasta area, California — Geol. Soc. Sacramento Ann. Field Trip, 1969: Davis, Calif., Univ. California, Geology Dept.*, p. 79-92, illus., geol. map, 1969.
- 03053 **Evans, John W.** A method for measurement of the rate of intertidal erosion [with Spanish abs.]: *Bull. Marine Sci.*, v. 20, no. 2, p. 305-314, illus., 1970.
- 06822 **Evans, M. E.; Wayman, M. L.** An investigation of small magnetic particles by means of electron microscopy: *Earth and Planetary Sci. Letters*, v. 9, no. 4, p. 365-370, illus., 1970.
- 04573 **Evans, Robert.** Genesis of sylvite- and carnallite-bearing rocks from Wallace, Nova Scotia, in *Third symposium on salt*, V. 1 (J. L. Rau and L. F. Dellwig, editors): *Cleveland, Ohio, Northern Ohio Geol. Soc.*, p. 239-245, illus., 1970.
- 04578 **Evans, Robert; Linn, Kurt O.** Fold relationships within evaporites of the Cane Creek anticline, Utah, in *Third symposium on salt*, V. 1 (J. L. Rau and L. F. Dellwig, editors): *Cleveland, Ohio, Northern Ohio Geol. Soc.*, p. 286-297, illus., 1970.
- 08151 **Evans, Robert.** Sedimentation of the Mississippian evaporites of the Maritimes, an alternative model: *Canadian Jour. Earth Sci.*, v. 7, no. 5, p. 1349-1352, tables, 1970.
- 01127 **Evans, W. E.** Imbricate linear sandstone bodies of Viking Formation in Dodsland-Hoosier area of southwestern Saskatchewan, Canada: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 3, p. 469-486, illus., 1970.
- Evensen, N. M.** See Murthy, V. Rama. 05711
- 03612 **Evenson, Edward B.** A method for 3-dimensional microfabric analysis of tills obtained from exposures or cores: *Jour. Sed. Petrology*, v. 40, no. 2, p. 762-764, illus., 1970.
- Everhart, Donald L.** See Inderbitzen, Anton L. 09478
- 00207 **Evernden, J. F.; Kistler, R. W.** Chronology of emplacement of Mesozoic batholithic complexes in California and western Nevada: *U.S. Geol. Survey Prof. Paper* 623, 42 p., illus., tables, 1970.
- 00588 **Evernden, J. F.** Magnitude versus yield of explosions: *Jour. Geophys. Research*, v. 75, no. 5, p. 1028-1032, illus., tables, 1970.
- 03579 **Evernden, J. F.** Study of regional seismicity and associated problems: *Seismol. Soc. America Bull.*, v. 60, no. 2, p. 393-446, illus., 1970.
- 04207 **Evernden, Jack F.; Evernden, Roberta K. Smith.** The Cenozoic time scale, in *Radiometric dating and paleontologic zonation: Geol. Soc. America Spec. Paper* 124, p. 71-90, illus., table, 1970.

- 01563 **Everts, James Mitchell.** Fatty acid analysis of some fossil and recent bones and teeth [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 9, p. 3970B, 1970.
- Evertson, D. W.** *See* Sacks, I. S. 01622
- Evertson, Dale.** *See* Dorman, LeRoy M. 06957
- 08309 **Evitt, William R.** Dinoflagellates — A selective review, *in* Perkins, B. F., editor, *Geoscience and Man — V. 1, Proceedings of Am. Assoc. Stratig. Palynologists, Ann. Mtg., 1st, 1968: Baton Rouge, La., Louisiana State Univ., School of Geoscience*, p. 29-45, illus., tables, 1970.
- 02524 **Evrenos, A. I.** Operations research in petroleum exploration [abs.]: *Nebraska Acad. Sci. Proc.*, 80th Ann. Mtg., p. 33, 1970.
- Ewing, G. N.** *See* Keen, M. J. 09717
- Ewing, J.** *See* Houtz, R. 03968
- 04271 **Ewing, J.; Windisch, C.; Ewing, M.** Correlation of horizon A with JOIDES bore-hole results: *Jour. Geophys. Research*, v. 75, no. 29, p. 5645-5653, illus., 1970.
- Ewing J. I.** *See* Jones, E. J. W. 00846
- Ewing, J. I.** *See* Markl, R. G. 03637
- Ewing, J. I.** *See* Embley, R. W. 04744
- 09719 **Ewing, J. I.; Edgar, N. T.; Antoine, J. W.** Structure of the Gulf of Mexico and Caribbean Sea, *in* *The sea — v. 4, New concepts of sea floor evolution, Pt. 2, Regional observations* (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 321-358, illus., 1970.
- 09984 **Ewing, John; Ewing, Maurice.** Seismic reflections, *in* *The sea — v. 4, New concepts of sea floor evolution, Pt. 1, General observations* (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 1-51, illus., 1970.
- 03039 **Ewing, Karen.** Studies of morphology and stream action on ablating ice — Pt. 3, Supraglacial streams on the Kaskawulsh Glacier, Yukon Territory: *Arctic Inst. North America Research Paper* 57, p. 119-167, illus., 1970.
- Ewing, M.** *See* Jones, E. J. W. 00846
- Ewing, M.** *See* Kuo, J. T. 01674
- Ewing, M.** *See* Ewing, J. 04271
- Ewing, M.** *See* Embley, R. W. 04744
- Ewing, M.** *See* Conolly, J. R. 08523
- Ewing, Maurice.** *See* Miyashiro, Akiho. 01642
- Ewing, Maurice.** *See* Kuo, J. T. 05611
- Ewing, Maurice.** *See* Latham, G. V. 05758
- Ewing, Maurice.** *See* Ewing, John. 09984
- Ewing, Maurice.** *See* Hayes, Dennis E. 10003
- Ewing, Maurice.** *See* Kent, Dennis. 10733

- 00522 **Eyrich, Henry Theodore.** Economic geology of part of the New World mining district, Park County, Montana [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 7, p. 3239B, 1970.
- 00698 **Faas, Richard W.** Consolidation characteristics of estuarine sediments [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 208, 1970.
- 02615 **Faas, Richard W.; Caulfield, David D.** Determination of bulk properties of saturated sediments through spectral analysis [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 846, 1970.
- Fabbi, B. P.** See Dodge, F. C. W. 06211
- 01555 **Fabbi, Brent P.** A die for pelletizing samples for X-ray fluorescence analysis, in *Geological Survey research 1970*, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B187-B189, illus., 1970.
- 03326 **Fabbi, Brent P.; Moore, William J.** Rapid X-ray fluorescence determination of sulfur in mineralized rocks from the Bingham mining district, Utah: *Appl. Spectroscopy*, v. 24, no. 4, p. 426-428, table, 1970.
- Fabbi, Brent P.** See Volborth, Alexis. 09351
- 09352 **Fabbi, Brent P.; Volborth, Alexis.** Total instrumental analysis of rocks — Pt. C. Sec. 2, Quantitative X-ray fluorescent trace analysis for 20 elements in igneous rocks: *Nevada Bur. Mines Rept.* 6, Pt. C, p. C31-C48, illus., 1970.
- 10443 **Fabregat G., Francisco J.** Los minerales mexicanos — Pt. 7, Vanadinita y endlichita: *Mexico Univ. Nac. Autonoma Inst. Geologia Bol.* 85. 85, 132 p., illus., tables, 1970.
- 04787 **Facer, R. A.** Continental drift — Implications of paleomagnetic studies, meteorology, physical oceanography, and climatology (a discussion [of paper by A. A. Meyerhoff, 1970]): *Jour. Geology*, v. 78, no. 5, p. 630-633, 1970.
- 00894 **Facundus, Michael R.; Moore, Clyde H., Jr.** Model for solution brecciation and attendant calcitization of dolomite [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 283, 1970.
- 04230 **Faddick, Robert R.** Effect of unit weight and slope on erosion — Discussion [of paper 6984 by R. L. Foster and G. L. Martin, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, *Jour. Irrigation and Drainage Div.*, no. IR3, p. 372-373, 1970.
- Fagan, James.** See Carpenter, Robert Heron. 00682
- Fagan, James M.** See Maher, Stuart W. 03981
- Fagerlin, Stanley C.** See Clark, David L. 10024
- 08034 **Fagerstrom, J. A.** Cryptalgal structures in the Detroit River Group (Devonian), southwestern Ontario: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 548-550, 1970.
- Fahey, Joseph J.** See Mrose, Mary E. 09106
- Fahnestock, Robert K.** See Bradley, William C. 00597
- 06973 **Fahnestock, Robert K.** Channel form, pattern, and activity of gravel-bearing streams [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 548-549, 1970.
- 02394 **Fähraeus, Lars E.** Conodont-based correlations of Lower and Middle Ordovician strata in western Newfoundland: *Geol. Soc. America Bull.*, v. 81, no. 7, p. 2061-2076, illus., tables, 1970.
- Fahrig, W. F.** See Stockwell, C. H. 07971

- Fahrig, W. F.** See Fraser, J. A. 08662
- Fahrig, W. F.** See Fraser, J. A. 08664
- 10038 **Fahrig, W. F.; Irving, E.; Jackson, G. D.** Franklin igneous events, tension faulting, and possible Hadrynian opening of Baffin Bay, Canada [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, *Abs. Papers: Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2480, 1970.
- Faile, S. P.** See Roy, D. M. 03834
- 01248 **Faill, Rodger T.; Wells, Richard B.** A fault near Hazelton: *Pennsylvania Geology*, v. 1, no. 5, p. 1-2, illus., 1970.
- Fairbairn, H. W.** See Spooner, C. M. 04626
- Fairbairn, H. W.** See Bottino, M. L. 06128
- 03922 **Fairbairn, Harold W.; Hurley, Patrick M.** Northern Appalachian geochronology as a model for interpreting ages in older orogens, in *Geochronology of Phanerozoic orogenic belts — Colloquium, Switzerland, 1969, Papers: Eclogae Geol. Helvetiae*, v. 63, no. 1, p. 83-90, illus., 1970.
- Fairbairn, Harold W.** See Spooner, Charles M. 05964
- Fairbridge, Rhodes W.** See Richards, Horace G. 08190
- Fairhurst, C.** See Wawersik, W. R. 05595
- Fairhurst, C.** See Haimson, B. 07505
- Fairhurst, C.** See Rummel, F. 07779
- 08338 **Fairhurst, C.** Borehole methods of stress determination [with French and German abs.], in *International Symposium on Rock Mechanics* [2d], Madrid, 1968, *Proc.: Madrid, Spain, Soc. Española de Mecánica de Rocas*, p. 273-279, illus., 1970.
- Faller, J.** See Boyne, H. S. 06627
- 00699 **Falls, Darryl L.; Textoris, Daniel A.** Size, grain type, and mineralogical relationships in Recent marine calcareous beach sands [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 208, 1970.
- 10426 **Falvey, Arthur E.** A water diversion tunnel driven in coal: *Mines Mag.*, v. 60, no. 10, p. 20, 1970.
- 04753 **Fambrough, James W.** Abbeville Field, Vermilion Parish, Louisiana, in *Typical oil and gas fields of southwestern Louisiana*, V. 2: Lafayette, La., *Lafayette Geol. Soc.*, p. 1-1d, illus., 1970.
- 02990 **Fanfani, L.; Nunzi, A.; Zanazzi, P. F.** The crystal structure of fairfieldite: *Acta Cryst.*, v. B26, pt. 5, p. 640-645, illus., tables, 1970.
- 03168 **Fanfani, L.; Nunzi, A.; Zanazzi, P. F.** The crystal structure of roemerite: *Am. Mineralogist*, v. 55, nos. 1-2, p. 78-89, illus., tables, 1970.
- 05935 **Fang, J. H.; Robinson, P. D.** Crystal structures and mineral chemistry of double-salt hydrates — [Pt.] 2, The crystal structure of loewite: *Am. Mineralogist*, v. 55, nos. 3-4, p. 378-386, illus., tables, 1970.
- 09108 **Fang, J. H.; Robinson, Paul D.** Crystal structures and mineral chemistry of hydrated ferric sulfates — [pt.] 1, The crystal structure of coquimbite: *Am. Mineralogist*, v. 55, nos. 9-10, p. 1534-1540, illus., tables, 1970.
- Fang, J. H.** See Robinson, Paul D. 09109

- 06974 **Fang, Jen-Ho; Robinson, Paul D.** Polytypism of coquimbite and paracoquimbite [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 549, 1970.
- 02543 **Fanning, D. S.** Cave features — Information concerning the nature and genesis of soils: *Soil Sci. Soc. America Proc.*, v. 34, no. 1, p. 98-104, illus., table, 1970.
- 07629 **Fanning, D. S.; Korcak, R. F.; Coffman, C. B.** Free iron oxides — Rapid determination utilizing x-ray spectroscopy to determine iron in solution: *Soil Sci. Soc. America Proc.*, v. 34, no. 6, p. 941-946, illus., table, 1970.
- 00802 **Fanshawe, John R.** Memorial to Pierre Pruvost (1890-1967): *Geol. Soc. America Proc.* 1967, p. 243-251, portrait, 1970.
- Farnham, Paul R.** See Mooney, Harold M. 04007
- Farnham, Paul R.** See Mooney, Harold M. 05876
- Farnham, Paul R.** See Mooney, Harold M. 06582
- 04363 **Farnham, R. S.; Grubich, Donald N.** Peat resources of Minnesota — Potentiality report, Fens bog area, St. Louis County, Minnesota [Inventory Rept. 4]: St. Paul, Minn., Minnesota Office Iron Range Resources and Rehabilitation, 40 p., illus., tables, 1970.
- Farnham, R. S.** See Finney, H. R. 08250
- 01183 **Farrand, William R.** Revision of the Valders drift border of the Lake Michigan lobe [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 387, 1970.
- Farrand, William R.** See Eschman, Donald F. 08302
- 09237 **Farrell, Stewart C.** Sediment distribution and hydrodynamics, Saco River and Scarborough estuaries, Maine: Massachusetts Univ. Geology Dept. Contr. 6-Crg, 129 p., illus., tables, 1970.
- Farrell, Warren J.** See Kolb, Charles R. 10232
- 07387 **Farrell, William Elliston.** Gravity tides [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 4, p. 2069B, 1970.
- 02895 **Farvolden, R. N.; Nunan, J. P.** Hydrogeologic aspects of dewatering at Welland [with French abs.]: *Canadian Geotech. Jour.*, v. 7, no. 2, p. 194-204, illus., 1970.
- 09220 **Farvolden, Robert N.** Local variations in the water balance — geologic factors, in *Water balance in North America — Symposium, Banff, Alberta, 1969*, Proc.: Am. Water Resources Assoc. Proc. ser., no. 7, p. 116-121, 1969.
- Fatt, Irving.** See Kumar, J. 01264
- Fatt, Irving.** See Weinbrandt, R. M. 07459
- Faure, G.** See Misra, A. 01181
- Faure, G.** See Fenton, M. D. 08154
- Faure, G.** See Fenton, M. D. 08155
- 07829 **Faure, Jean.** Study of the mineralogical transformations of granite by underground nuclear explosions, in *Symposium on engineering with nuclear explosives — Am. Nuclear Soc. and U.S. Atomic Energy Comm., Las Vegas, Nev., 1970*, Proc., V. 2: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., p. 1406-1427, illus., tables, 1970.

- 09829 **Favreau, R. F.; Chung, S.** In situ dynamic strain measurements in rock, *in* Canadian Rock Mechanics Symposium, 5th, Toronto, 1968, Proc.: Ottawa, Canada Dept. Energy, Mines and Resources Mines Br., p. 15-17, illus., table, 1969
- Fawcett, J. J.** See Grieve, Richard A. F. 01770
- Fawcett, J. J.** See Grieve, R. A. F. 05945
- 10756 **Fawcett, J. J.** Petrology, *in* Background papers on the earth sciences in Canada (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 69-74, 1970.
- 06631 **Faye, G. H.; Nickel, E. H.** The effect of charge-transfer processes on the colour and pleochroism of amphiboles: Canadian Mineralogist, v. 10, pt. 4, p. 616-635, illus., table, 1970.
- Feden, Robert H.** See Ballard, J. Alan. 00105
- 04267 **Feder, G. L.** A semiquantitative method for determining the source of springflow in the Missouri Ozarks, *in* Geological Survey research 1970, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C214-C217, illus., 1970.
- Federer, B.** See Philberth, K. 01498
- 03644 **Federer, B.; vonSury, H.; Philberth, K.; deQuervain, M.** Outflow and accumulation of ice in Jarl-Joset Station, Greenland: Jour. Geophys. Research, v. 75, no. 24, p. 4567-4569, table, 1970.
- Fedirchuk, G.** See Forbis, R. G. 10647
- 06508 **Fedoseev, A. D.; Grigor'eva, L. F.; Chigareva, O. G.; Romanov, D. P.** Synthetic fibrous fluoramphiboles and their properties: Am. Mineralogist, v. 55, nos. 5-6, p. 854-863, illus., tables, 1970.
- 04121 **Feduccia, J. Alan.** A new shorebird from the Upper Pliocene: Graduate Research Center Jour., v. 38, nos. 3-4, p. 58-60, illus., 1970.
- Fehrenbacher, J. B.** See Frazee, C. J. 02549
- Fehrenbacher, J. B.** See Bushue, L. J. 03937
- Feist, Oliver J., Jr.** See Fishman, Marvin J. 04429
- 10637 **Feldhausen, Peter H.** Ordination of sediments from the Cape Hatteras continental margin: Internat. Assoc. Math. Geology Jour., v. 2, no. 2, p. 113-129, illus., tables 1970.
- 09174 **Felix, C. J.; Burbridge, P. P.** Additional knowledge of *Pteroretis*: Rev. Palaeobotany and Palynology, v. 9, nos. 3-4, p. 203-211, tables, 1969.
- Fellows, L. D.** See Thompson, Thomas L. 01350
- 05348 **Fellows, Larry D.** Geologic map of the Galloway quadrangle, Greene County, Missouri: Missouri Geol. Survey and Water Resources Geol. Quad. Map Ser., no. 5, scale 1:24,000, sections, 1970.
- Feltz, H. R.** See Wark, J. W. 06147
- Fenn, P. M.** See Luth, W. C. 09651

- 03284 **Fenner, Peter; Lloyd, Joel.** Serials important to geologists: *Geotimes*, v. 15, no. 6, p. 14-17, tables, 1970.
- 10511 **Fenske, Paul R.; Charnell, Robert L.** Ground-water infill rate of a nuclear rubble chimney [abs.]: *EOS*, v. 51, no. 11, p. 756, 1970.
- 08154 **Fenton, M. D.; Faure, G.** Rb-Sr whole-rock age determinations of the Iron Hill and McClure Mountain carbonatite-alkalic complexes, Colorado: *Mtn. Geologist*, v. 7, no. 4, p. 269-275, illus., tables, 1970.
- 08155 **Fenton, M. D.; Faure, G.** A Rb-Sr whole-rock age determination for the Rainy Creek alkalic-ultramafic complex, Montana: *Mtn. Geologist*, v. 7, no. 4, p. 277-280, illus., tables, 1970.
- 03104 **Fenton, Michael Dwight.** The evolution of the isotope composition of terrestrial strontium [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 10, p. 4660B-4661B, 1970.
- Feray, Dan E.** See Renfro, H. B. 05672
- Feray, Dan E.** See Lohse, Alan. 09490
- 07060 **Ferencic, Ante.** Porphyry copper mineralization in Panama [with German abs.]: *Mineralium Deposita*, v. 5, no. 4, p. 383-389, illus., 1970.
- 07098 **Ferguson, Carl C.; Milici, Robert C.** Geologic map of the Bald Knob quadrangle, Tennessee: Tennessee Div. Geology Geol. Map GM 332-SW, scale 1:24,000, separate text, 1970.
- 08186 **Ferguson, Carl C.; Garman, R. Keith.** Mineral resources summary of the Buchanan quadrangle, Tennessee: Nashville, Tenn., Tennessee Div. Geology, 7 p., tables, 1970.
- 08187 **Ferguson, Carl C.** Mineral resources summary of the Huntingdon Quadrangle, Tennessee: Nashville, Tenn., Tennessee Div. Geology, 26 p., illus., tables, 1970.
- 08326 **Ferguson, Carl C.** Geologic map of the Huntingdon quadrangle, Tennessee: Tennessee Div. Geology Geol. Map GM 9-SW, scale 1:24,000, separate text, 1970.
- Ferguson, Carl C.** See Garman, R. Keith. 08357
- Ferguson, George E.** See Guy, Harold P. 06390
- Ferguson, J.** See Currie, K. L. 07050
- 06150 **Ferguson, John.** The differentiation of agpaitic magmas — The Ilímaussaq Intrusion, South Greenland, in *Alkaline rocks, the Monteregian Hills — Symposium*, Montreal, 1969, *Proc.: Canadian Mineralogist*, v. 10, pt. 3, p. 335-349, illus., tables, 1970.
- 08292 **Ferguson, John.** On the schistose structure of some lujavrites: *Geol. Soc. Denmark Bull., Dansk Geol. Foren. Medd., English edition*, v. 20, pt. 1, p. 67-68, 1970.
- 08719 **Ferguson, John.** The significance of the kakortokite in the evolution of the Ilímaussaq intrusion, South Greenland: *Medd. Grönland*, v. 190, no. 1, 193 p., illus., tables, 1970; *Grönlands Geol. Undersøgelse Bull.* 89, 1970.
- 03883 **Ferguson, Laing.** Sedimentary evidence for the allochthonous origin of *Stigmaria*, Carboniferous, Nova Scotia — Discussion [of paper by N. A. Rupke, 1969]: *Geol. Soc. America Bull.*, v. 81, no. 8, p. 2531-2534, 1970.
- 05627 **Ferguson, Laing.** "Armored snowballs" and the introduction of coarse terrigenous material into sea-ice: *Jour. Sed. Petrology*, v. 40, no. 3, p. 1057-1060, illus., 1970.
- Ferm, John C.** See Horne, John C. 00716



**Ferm, John C.** See Flores, Romeo M. 03597

06709 **Ferm, John C.** Allegheny deltaic deposits, in *Deltaic sedimentation, modern and ancient*: Soc. Econ. Paleontologists and Mineralogists Spec. Pub. 15, p. 246-255, illus., 1970.

09921 **Ferm, John C.; Cavaroc, Victor V., Jr.** A field guide to Allegheny deltaic deposits in the Upper Ohio Valley — [Spring 1969 field trip] with a commentary on deltaic aspects of Carboniferous rocks in the northern Appalachian Plateau: [Pittsburgh, Pa.], Ohio Geol. Soc. and Pittsburgh Geol. Soc., 21 p., illus. [1969].

06975 **Ferrand, William R.; Eschman, Donald F.** New facts concerning the glacial Grand Valley [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 549-550, 1970.

10163 **Ferrand, William R.** Remarks on glacial and climatic events along the southern margin of the Laurentide ice sheet — chairman's summary [abs.], in *American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970*, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 43-44, 1970.

**Ferraro, John R.** See Rao, C. N. R. 10217

00895 **Ferrell, Ray E., Jr.** Carbonate-clay mineral associations on Quaternary sediments, Louisiana continental shelf [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 284, 1970.

**Ferrell, Ray E., Jr.** See Brooks, Robert A. 05650

04188 **Ferrigno, Kenneth F.** Holothurian sclerites from the Dundee Limestone in southwestern Ontario: *Compass*, v. 47, no. 2, p. 81-83, illus., table, 1970.

09374 **Ferris, Craig.** Gravity and compaction anticlines: *Canadian Soc. Explor. Geophysicists Jour.*, v. 5, no. 1, p. 72-90, illus., 1969.

10673 **Fertl, W. H.; Pirson, S. J.** Sulphur-bearing rocks characterized by well logs — a review: *Canadian Mining and Metall. Bull.*, v. 63, no. 703, p. 1297-1301, illus., table, 1970.

02209 **Fertl, Walter H.; Timko, Donald J.** Distinction of oil and gas in clean and shaly sands as derived from well logs, in *SPWLA Logging Symposium, 11th Ann., Los Angeles, Calif., 1970*, Trans.: Houston, Tex., Soc. Prof. Well Log Analysts, p. 11-120, illus., table, 1970.

02210 **Fertl, Walter H.; Timko, Donald J.** Association of salinity variations and geopressures in soft and hard rock, in *SPWLA Logging Symposium, 11th Ann., Los Angeles, Calif., 1970*, Trans.: Houston, Tex., Soc. Prof. Well Log Analysts, p. J1-J23, illus., tables, 1970.

05061 **Feth, J. H.** Saline groundwater resources of the conterminous United States, in *Saline water symposium: Water Resources Research*, v. 6, no. 5, p. 1454-1457, 1970.

**Feth, J. H.** See Arnow, Ted. 08427

00194 **Feugere, G.; Gerard, R. E.** Geochemical logging — A new exploration tool: *World Oil*, v. 170, no. 2, p. 37-40, illus., 1970.

02616 **Feugere, G.** Gasmap, a method of geochemical prospecting [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 846-847, 1970.

**Feugere, G.** See Lucon, C. 03790

**Ficklin, W. H.** See McCarthy, J. H., Jr. 05563

04670 **Ficklin, Walter H.** A rapid method for the determination of fluoride in rocks and soils, using an ion-selective electrode, in *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C186-C188, tables, 1970.

- 07244 **Fidler, Richard E.** Potential development and recharge of ground water in Mill Creek valley, Butler and Hamilton Counties, Ohio, based on analog model analysis: U.S. Geol. Survey Water-Supply Paper 1893, 37 p., illus., tables, 1970.
- 03389 **Field, Michael; Pilkey, Orrin H.** Lithification of deep sea sediments by pyrite: *Nature*, v. 226, no. 5248, p. 836-837, illus., 1970.
- Fielder, G.** See Bastin, J. A. 06269
- Fielder, Gilbert.** See Strom, Robert G. 06857
- 05939 **Fielding, P. E.** The distribution of uranium, rare earths, and color centers in a crystal of natural zircon: *Am. Mineralogist*, v. 55, nos. 3-4, p. 428-440, illus., tables, 1970.
- 05689 **Fields, P. R.; Diamond, H.; Metta, D. N.; Stevens, C. M.; Rokop, D. J.; Moreland, P. E.** Isotopic abundances of actinide elements in lunar material, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1097-1102, illus., table, 1970.
- Fies, Milton H..** See Daniel, Thomas W., Jr. 10437
- 05640 **Figueroa Vega, German Efrain.** Relaciones volumetricas para algunos acuíferos semiconfinados [Volumetric relations for some semiconfined aquifers]: *Ingeneria Hydraul. Mexico*, v. 24, no. 2, p. 205-206, illus., 1970.
- 06554 **Filby, R. H.; Haller, W. A.; Shah, K. R.** Determination of 32 elements in rocks by neutron activation analysis and high resolution gamma-ray spectroscopy: *Jour. Radioanal. Chemistry*, v. 5, no. 2, p. 277-289, illus., tables, 1970.
- Filby, R. H.** See Shah, K. R. 07850
- Filby, R. H.** See Shah, K. R. 08588
- Fillo, Paul V.** See Tooker, E. W. 02030
- 06648 **Filloux, J. H.** Bourdon-tube, deep-sea tide gauges, in *Tsunamis in the Pacific Ocean* — Internat. Symposium on Tsunamis and Tsunami Research, Honolulu, Hawaii, 1969, Proc.: Honolulu, Hawaii, East-West Center Press, p. 223-238, illus., table, 1970.
- Filloux, J. H.** See Cox, C. S. 10000
- 03306 **Filson, John.** S velocities at near distances in western central California: *Seismol. Soc. America Bull.*, v. 60, no. 3, p. 901-915, illus., tables, 1970.
- 04336 **Filson, John.** Long period  $SH_n$ : *Seismol. Soc. America Bull.*, v. 60, no. 4, p. 1297-1307, illus., 1970.
- 08707 **Finch, Warren I.; Wright, James C.** Linear features and ground-water distribution in the Ogallala Formation of the southern High Plains, in *Ogallala Aquifer Symposium*, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, p. 49-57, illus., 1970.
- 09286 **Findlay, B. F.** The water budget of the Knob Lake area, a hydrologic study in central Labrador-Ungava, in *Hydrological studies in Labrador-Ungava*: McGill Univ. Dept. Geography Sub-Arctic Research Paper 22, p. 1-95, illus., tables, 1966.
- 02240 **Finger, L. W.; Rapp, G. R., Jr.** Refinement of the crystal structure of triphylite: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 290-292, tables, 1970.
- 02241 **Finger, L. W.** Refinement of the crystal structure of an anthophyllite: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 283-288, illus., tables, 1970.

- 06976 **Finger, Larry W.; Taylor, Lawrence A.** Refinement of the crystal structure of mackinawite [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 551, 1970.
- 01909 **Fink, L. Kenneth, Jr.** Evidence for the antiquity of the Lesser Antilles Island Arc [abs.]: *EOS*, v. 51, no. 4, p. 326-327, 1970.
- 00810 **Finkelman, R. B.** Magnetic particles extracted from manganese nodules — Suggested origin from stony and iron meteorites: *Science*, v. 167, no. 3920, p. 982-984, illus., table, 1970.
- Finkelman, R. B.** See Millard, H. T., Jr. 01441
- 09038 **Finks, Robert M.; Toomey, Donald Francis.** The paleoecology of Chazyan (lower Middle Ordovician) "reefs" or "mounds" — trip F in Guidebook to field excursions, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., p. 93-120, illus., 1969.
- Finks, Robert M.** See Toomey, Donald Francis. 09039
- 07560 **Finn, Fenton H.** Charles R. Fettke, March 25, 1888-May 26, 1959, in *Geology of the Pittsburgh area: Pennsylvania Geol. Survey, 4th ser., [Bull.] G 59 (General Geology Rept.)*, p. v-vi, portrait, 1970.
- 06773 **Finn, W. D. Liam; Bransby, Peter L.; Pickering, Dennison J.** Effect of strain history of liquefaction of sand: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7670, *Jour. Soil Mechanics and Found. Div.*, no. SM 6, p. 1917-1934, illus., 1970.
- 01299 **Finnell, Tommy L.** Formations of the Bisbee Group, Empire Mountains quadrangle, Pima County, Arizona, in *Changes in stratigraphic nomenclature by the U.S. Geological Survey, 1968: U.S. Geol. Survey Bull. 1294-A*, p. A28-A35, illus., 1970.
- 01300 **Finnell, Tommy L.** Pantano Formation, in *Changes in stratigraphic nomenclature by the U.S. Geological Survey, 1968: U.S. Geol. Survey Bull. 1294-A*, p. A35-A36, 1970.
- 08250 **Finney, H. R.; Farnham, R. S.** Mineralogy of the inorganic fraction of peat from two raised bogs in northern Minnesota [with French abs.], in *International Peat Congress, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada*, p. 102-108, illus., tables, 1970.
- 06500 **Finney, J. J.; Kumbasar, Isik; Konnert, Judith A.; Clark, Joan R.** Crystal structure of the calcium silicoborate, howlite: *Am. Mineralogist*, v. 55, nos. 5-6, p. 716-728, illus., tables, 1970.
- 09786 **Finson, Bruce.** Volcano country: *Pacific Discovery*, v. 23, no. 5, p. 1-13, illus., 1970.
- 00263 **Firby, James R.** Relationship of tectonic and climatic events to the evolution of aquatic non-marine mollusca in the western Great Basin [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 91, 1970.
- Firby, James R.** See Slemmons, David B. 00363
- 09782 **Firby, Jean; Lucas, Kenneth.** A dinosaur by the tail: *Pacific Discovery*, v. 23, no. 1, p. 1-10, illus., 1970.
- 01443 **Fireman, E. L.; Goebel, R.** Argon 37 and argon 39 in recently fallen meteorites and cosmic-ray variations: *Jour. Geophys. Research*, v. 75, no. 11, p. 2115-2145, illus., tables, 1970.
- 04555 **Fireman, E. L.; DeFelice, J.; Norton, Elinor.** Ages of the Allende meteorite: *Geochim. et Cosmochim. Acta*, v. 34, no. 8, p. 873-881, tables, 1970.

**Fireman, E. L.** See Fleisher, R. L. 05334

**Fireman, E. L.** See D'Amico, J. 05684

**Fireman, E. L.** See McCorkell, R. H. 08214

**Fireman, Edward L.** See Spannagel, Gert. 02269

- 01882 **Fischbuch, N. R.** *Amphipora* and *Euryamphipora* (Stromatoporoidea) from the Devonian of western Canada: *Palaeontology*, v. 13, pt. 1, p. 64-75, illus., 1970.

- 05904 **Fischbuch, N. R.** Devonian reef-building stromatoporoids from western Canada: *Jour. Paleontology*, v. 44, no. 6, p. 1071-1084, illus., 1970.

- 08603 **Fischer, Frederick T.; Hoagland, Alan D.** Hydrologic investigations of the Middle Tennessee zinc district, in *AIME world symposium on mining and metallurgy of lead and zinc*, St. Louis, Missouri, 1970 [Proc.] — V. 1, Mining and concentrating of lead and zinc: New York, Am. Inst. Mining, Metallurgical, and Petroleum Engineers, p. 95-107, illus., tables, 1970.

**Fischer, Frederick T.** See Stagg, Alan K. 09586

- 06977 **Fischer, Joseph A.; Leeds, David J.; Murphy, William J.** Seismic-tectonic relationships of the New Madrid, Missouri, region [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 551, 1970.

- 00264 **Fischer, Joseph F.** Fluid inclusions, uraltization and grain size, Carbon River stock, Washington [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 91-92, 1970.

- 01877 **Fischer, R. P.; Ohl, Jane P.** Bibliography on the geology and resources of vanadium: *U.S. Geol. Survey Bull.* 1316, 168 p., 1970.

- 04481 **Fischer, R. P.** Similarities, differences, and some genetic problems of the Wyoming and Colorado Plateau types of uranium deposits in sandstone: *Econ. Geology*, v. 65, no. 7, p. 778-784, table, 1970.

**Fischer, Richard P.** See McKnight, Edwin T. 00206

- 00896 **Fish, Johnnie E.; Dunn, David E.; Muehlberger, William R.** Crustal structure of the central Texas Gulf Coastal Plain [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 284, 1970.

**Fisher, Alvan, Jr.** See Lyall, Anil K. 09652

- 02983 **Fisher, D. Jerome.** Twinning in pegmatitic microcline perthite [abs.]: *Arizona Acad. Sci. Jour.*, v. 6, 1970 Proc. Supp., p. 65, 1970.

- 01696 **Fisher, David E.** Uranium measurements in hypersthene chondrites and their relation to the 600-700 million year "event": *Earth and Planetary Sci. Letters*, v. 7, no. 3, p. 278-280, table, 1970.

- 02124 **Fisher, David E.** Search for  $^3\text{He}$  in deep-sea basalts: *Earth and Planetary Sci. Letters*, v. 8, no. 1, p. 77-78, table, 1970.

- 03139 **Fisher, David E.** Homogenized fission track analysis of uranium in some ultramafic rocks of known potassium content: *Geochim. et Cosmochim. Acta*, v. 34, no. 5, p. 630-634, illus., table, 1970.

- 09451 **Fisher, David E.** Homogenized fission track determination of uranium in whole rock geologic samples: *Anal. Chemistry*, v. 42, no. 3, p. 414-416, illus., table, 1970.

**Fisher, Donald W.** See Funk, Robert E. 00963

- 01761 **Fisher, George W.** Applications of ionic equilibria to metamorphic differentiation [abs.]: EOS, v. 51, no. 4, p. 445, 1970.
- 00700 **Fisher, Irving S.** Relation of trace strontium to the calcite, dolomite, and insoluble fractions of central Kentucky Ordovician limestones [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 208-209, 1970.
- 00790 **Fisher, Irving S.** Selective removal of dolomite from a limestone host by weathering [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 209, 1970.
- 05968 **Fisher, Irving S.** Selective weathering of dolomite bodies from a limestone host: Geol. Soc. America Bull., v. 81, no. 12, p. 3757-3758, illus., 1970.
- 07043 **Fisher, Irving S.** Origin of small irregular dolomite bodies in the pelletal Camp Nelson Limestone (Ordovician) of central Kentucky: Southeastern Geology, v. 12, no. 2, p. 115-120, illus., 1970.
- 01072 **Fisher, James H.** The Upper Cambrian strata of Michigan [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 388, 1970.
- 10947 **Fisher, James H.** Early Paleozoic history of the Michigan Basin, in Studies of the Precambrian of the Michigan Basin — Michigan Basin Geol. Soc. Ann. Field Excursion, 1969: [East Lansing, Mich.], Michigan Basin Geol. Soc., p. 89-93, illus., 1969.
- Fisher, Jane S.** See Kennard, William C. 02750
- 00150 **Fisher, John J.** Coastal development of Narragansett Bay as related to possible fault structures [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 17-18, 1970.
- Fisher, P. S.** See Skidmore, E. L. 07627
- Fisher, R. M.** See Nagata, T. 06352
- 01173 **Fisher, Richard V.; Waters, Aaron C.** Base surge bed forms in maar volcanoes: Am. Jour. Sci., v. 268, no. 2, p. 157-180, illus., table, 1970.
- Fisher, Richard V.** See Mattinson, James M. 01552
- Fisher, Richard V.** See Waters, Aaron C. 08538
- Fisher, Thelma.** See Laycock, Arleigh H. 09218
- Fisher, W. L.** See McGowen, J. H. 05464
- 07329 **Fisher, W. L.; Proctor, Cleo V., Jr.; Galloway W. E.; Nagle, J. S.** Depositional systems in the Jackson Group in Texas — Their relationship to oil, gas, and uranium, in Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Soc. Trans., v. 20, p. 234-261, illus., 1970.
- Fisher, W. L.** See Brown, L. F., Jr. 08003
- Fisher, W. L.** See Scott, A. J. 08490
- 08491 **Fisher, W. L.** Gulf Coast Basin Tertiary delta systems, in Delta systems in the exploration for oil and gas — A research colloquium, Austin, Texas, 1969, Syllabus [No. 1] (W. L. Fisher; L. F. Brown, Jr.; A. J. Scott; J. H. McGowen, leaders): Austin, Texas, Univ. Texas at Austin Bur. Econ. Geology, p. 30-39, illus. [1970,].
- 08493 **Fisher, W. L.; Brown, L. F., Jr.** Delta systems and oil and gas occurrence, in Delta systems in the exploration for oil and gas — A research colloquium, Austin, Texas, 1969, Syllabus [No. 1] (W. L. Fisher; L. F. Brown, Jr.; A. J. Scott; J. H. McGowen, leaders): Austin, Texas, Univ. Texas at Austin Bur. Econ. Geology, p. 54-66, illus. [1970?].

**Fisher, W. L.** See Brown, L. F., Jr. 08494

- 08570 **Fisher, W. L.; Brown, L. F., Jr.; Scott, Alan J.; McGowen, J. H.** (leaders). Delta systems in the exploration for oil and gas — A research colloquium, Austin, Texas, 1969, Syllabus [No. 1]: Austin, Texas, Univ. Texas at Austin Bur. Econ. Geology, p. 1-78, illus. [1970?].

**Fisher, William L.** See Flawn, Peter T. 01372

- 04823 **Fisher, William L.; Proctor, Cleo V., Jr.** Depositional systems in Jackson Group of Texas Gulf Coast basin [abs.]: Am. Assoc. Petroleum Geologists, v. 54, no. 9, p. 1783-1784, 1970.

**Fishman, M. J.** See Brown, Eugene. 08199

- 04304 **Fishman, Marvin J.; Pascoe, Ralph F.** The use of automated titrimetry for analyses of natural water, in Geological Survey research 1970, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C222-C225, illus., tables, 1970.

- 04429 **Fishman, Marvin J.; Feist, Oliver J., Jr.** Automated potentiometric determination of chloride in water, in Geological Survey research 1970, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C226-C228, illus., tables, 1970.

- 09461 **Fishman, Marvin J.** Determination of mercury in water: Anal. Chemistry, v. 42, no. 12, p. 1462-1463, tables, 1970.

- 03442 **Fisk, H. G.** Painted Rocks Lake area, southern Ravalli County, Montana: Montana Bur. Mines and Geology Spec. Pub. 47, 1 sheet, scale about 1 in. to 2/3 mi., text [1970,].

- 07429 **Fiskell, John G. A.** Cation exchange capacity and component variations of soils of southeastern USA: Soil Sci. Soc. America Proc., v. 34, no. 5, p. 723-727, tables, 1970.

**Fiskell, John G. A.** See Reneau, R. B., Jr. 07434

- 09775 **Fitch, John E.** Fish remains, mostly otoliths and teeth, from the Palos Verdes Sand (late Pleistocene) of California: Los Angeles County Mus. Natl. History Contr. Sci., no. 199, 41 p., illus., tables, 1970.

**Fitch, T.** See Scholz, C. H. 01830

**Fitch, Thomas J.** See Scholz, C. H. 03559

- 05208 **Fite, L. E.; Wainerdi, R. E.** Automated nuclear activation analysis in geochemistry: Minerals Sci. and Eng., v. 2 no. 3, p. 3-16, illus., tables, 1970.

- 10116 **Fitting, James E.** Environmental potential and the postglacial readaptation in eastern North America: Am. Antiquity, v. 33, no. 4, p. 441-445, 1968.

- 08181 **Fitton, J. C.; Dobrin, M. B.** An evaluation of optical processing based on experience with seismic data: Geocom Bull., v. 3, no. 10, p. 184-196, illus., 1970; reprinted from Bendix Tech. Jour., v. 2, no. 2, p. 25-38, 1969.

- 02617 **Fitzgerald, J. D.; Gagnon, P. M.** Using computerized well-data system [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 847, 1970.

- 09076 **Fitzgerald, J. D.; Gagnon, Paul M.** How computerized data file aids in the hunt for hydrocarbons: Oil and Gas Jour., v. 68, no. 51, p. 68-70, illus., 1970.

- 09166 **Fitzgerald, Ken.** (compiler). The space-age photographic atlas: New York, Crown Publishers, 246 p., illus., 1970.

- 06466 **Fix, James E.; Sherwin, John R.** A high-sensitivity strain/inertial seismograph installation: Seismol. Soc. America Bull., v. 60, no. 6, p. 1803-1822, illus., table, 1970.

**Flach, K. W.** See Nettleton, W. D. 07063

00819 **Flanagan, F. J.** Sources of geochemical standards — II: *Geochim. et Cosmochim. Acta*, v. 34, no. 1, p. 121-125, tables, 1970.

02937 **Flathe, H.** Interpretation of geoelectrical resistivity measurements for solving hydrogeological problems [with French abs.], in *Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26*, p. 580-597, illus., 1970.

01372 **Flawn, Peter T.; Fisher, William L.; Brown, L. Frank, Jr.** Environmental geology and the coast — Rationale for land-use planning: *Jour. Geol. Education*, v. 18, no. 2, p. 85-86, table, 1970.

02709 **Flawn, Peter T.** Mineral resources and conservation in Texas: *Texas Univ. Bur. Econ. Geology Geol. Circ.* 70-1, 20 p., illus., table, 1970.

02767 **Flawn, Peter T.** Environmental geology — Conservation, land-use planning, and resource management: New York, Harper and Row, 313 p., illus., tables, 1970.

02784 **Flawn, Peter T.; Turk, L. J.; Leach, Carolyn H.** Geological considerations in disposal of solid municipal wastes in Texas: *Texas Univ. Bur. Econ. Geology Geol. Circ.* 70-2, 22 p., illus., table, 1970.

06026 **Flawn, Peter T.; Muehlberger, William R.** The Precambrian of the United States of America — South-central United States, in *The geologic systems — The Precambrian*, V. 4 (Kalervo Rankama, editor): New York and London, Interscience-John Wiley and Sons, p. 73-143, illus., tables, 1970.

07997 **Flawn, Peter T.** Environmental geology — What is the responsibility of the science?, in *Environmental geology — AGI short course lecture notes*, Milwaukee, Wis., 1970: Washington, D. C., Am. Geol. Inst., [8] p., paged separately, 1970.

**Flawn, Peter T.** See Muehlberger, W. R. 09466

02371 **Fleck, R. J.** Tectonic style, magnitude, and age of deformation in the Sevier orogenic belt in southern Nevada and eastern California: *Geol. Soc. America Bull.*, v. 81, no. 6, p. 1705-1720, illus., table, 1970.

05028 **Fleck, R. J.** Age and tectonic significance of volcanic rocks, Death Valley area, California: *Geol. Soc. America Bull.*, v. 81, no. 9, p. 2807-2815, illus., tables, 1970.

00611 **Fleck, Robert J.** Age and possible origin of the Las Vegas Valley shear zone, Clark and Nye Counties, Nevada [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 333, 1970.

03499 **Fleet, M. E.** Structural aspects of the marcasite-pyrite transformation: *Canadian Mineralogist*, v. 10, pt. 2, p. 225-231, illus., table, 1970.

06978 **Fleet, M. E.** The crystal structure of pyrrhotite [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 551-552, 1970.

10609 **Fleet, M. E.** Refinement of the crystal structure of cubanite and polymorphism of  $\text{CuFe}_2\text{S}_3$  [with German and English abs.]: *Zeitschr. Kristallographie*, v. 132, no. 4-6, p. 276-287, illus., tables, 1970.

**Fleetwood, Arthur R.** See Saucier, Roger T. 00562

05555 **Fleischer, Michael.** Summary of the literature on the inorganic geochemistry of mercury, in *Mercury in the environment: U.S. Geol. Survey Prof. Paper 713*, p. 6-13, 53-59, tables, 1970.

06514 **Fleischer, Michael.** Procedure of the International Mineralogical Association Commission on New Minerals and Mineral Names: *Am. Mineralogist*, v. 55, nos. 5-6, p. 1016-1017, 1970.

**Fleischer, Michael.** See Donnay, Gabrielle. 06515

- 08349 **Fleischer, Michael.** Some possible new minerals not yet found: Mineralog. Rec., v. 1, no. 3, p. 121-123, tables, 1970.

- 10164 **Fleischer, Peter.** Effect of late Pleistocene sea-level rise on basin-sediment mineralogy, California Continental Borderland [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 46, 1970.

**Fleischer, Peter.** See Drake, David E. 10520

**Fleischer, R. L.** See Hart, H. R., Jr. 01778

**Fleischer, Robert L.** See Ahrens, Thomas J. 03363

- 05334 **Fleisher, R. L.; Lifshin, E.; Price, P. B.; Woods, R. T.; Carter, R. W.; Fireman, E. L.** Schenectady meteorite: Icarus, v. 12, no. 3, p. 402-406, illus., 1970.

**Flemal, R. C.** See Odom, I. Edgar. 09724

**Flemal, R. C.** See Odom, I. E. 09727

- 05570 **Flemal, Ronald C.** Experimentally induced variation and the environmental significance of corrensites: Illinois Acad. Sci. Trans., v. 63, no. 2, p. 178-188, illus., tables, 1970.

- 06902 **Flemal, Ronald C.** Post-glacial drainage diversions in a portion of north central Illinois: Illinois Acad. Sci. Trans., v. 63, no. 3, p. 285-294, illus., 1970.

- 09730 **Flemal, Ronald C.; Hesler, James L.; Hinkley, Kenneth C.** The De Kalb Mounds — possible remnants of pingos, in Tri-State Geol. Field Conf., 34th Ann., 1970, Guidebook (I. E. Odom and M. P. Weiss, editors): De Kalb, Ill., Northern Illinois Univ. Dept. Geology, p. 73-79, illus., 1970.

- 00438 **Fleming, George; Poodle, Thomas.** Particle size of river sediments: Am. Soc. Civil Engineers Proc., v. 96, paper 7068, Jour. Hydraulics Div., no. HY 2, p. 431-439, illus., 1970.

- 01524 **Fleming, George.** Sediment measurement techniques — [Pt.] A, Fluvial sediment — Discussion [of paper 6756 by Am. Soc. Civil Engineers (Task Comm. on Preparation of Sedimentation Manual), 1969]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Hydraulics Div., no. HY 4, p. 1075-1076, 1970.

- 01609 **Fleming, George.** Sediment measurement techniques — [Pt.] F, Laboratory procedures — Discussion [of paper 6757 by Am. Soc. Civil Engineers (Task Comm. on Preparation of Sedimentation Manual), 1969]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Hydraulics Div., no. HY 4, p. 1076-1079, tables, 1970.

- 05214 **Fleming, Henry S.; Cherkis, Norman Z.; Heirtzler, James R.** The Gibbs Fracture Zone — A double fracture zone at 52°30' N. in the Atlantic Ocean: Marine Geophys. Researches, v. 1, no. 1, p. 37-45, illus., 1970.

- 04533 **Fleming, J. M.** Developments and opportunities in Newfoundland and Labrador: Canadian Mining Jour., v. 91, no. 4, p. 57-60, illus., 1970.

- 09506 **Fleming, J. M.** Petroleum exploration in Newfoundland and Labrador: Newfoundland and Labrador Dept. Mines, Agriculture and Resources Mineral Resources Rept. 3, 118 p., illus., tables, 1970.

- 00151 **Flessa, Karl W.** Observations on the burrows of some modern bivalves [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 18, 1970.

- 02301 **Fletcher, Calvin D.** Extinct bison — Shirley Basin Mining District: Earth Sci. Bull., v. 3, no. 1, p. 5-9, illus., 1970.



- 06680 **Fletcher, Frank W.; Woodrow, Donald L.** Geology and mineral resources of the Pennsylvania portion of the Milford and Port Jervis 15-minute quadrangles: Pennsylvania Geol. Survey, 4th ser., Atlas 223, 64 p., illus., tables, geol. map, 1970.
- 04949 **Fletcher, K.** Some applications of background correction to trace metal analysis of geochemical samples by atomic-absorption spectrophotometry: *Econ. Geology*, v. 65, no. 5, p. 588-589, tables, 1970.
- Flinn, Edward A.** See Engdahl, Eric R. 00260
- Flinn, Edward A.** See Harkrider, David G. 03978
- 00192 **Flint, George M., Jr.; Pitkin, James A.** Aeroradioactivity map of the Chicago area, Illinois and Indiana: U.S. Geol. Survey Geophys. Inv. Map GP-681, scale 1:250,000, text, 1970.
- 06372 **Flint, Gordon W.** The Trona Pinnacles: *Our Public Lands*, v. 20, no. 4, p. 8-9, illus., 1970.
- 00152 **Flint, Jean-Jacques.** Topologic implications of bifurcation ratios [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 18-19, 1970.
- 01910 **Flint, Jean-Jacques.** Topologic relation between length and number of streams [abs.]: *EOS*, v. 51, no. 4, p. 278, 1970.
- 00153 **Flint, Norman K.; Hamel, J. V.** Application of geology in highway planning and design [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 19, 1970.
- Flint, R. F.** See Hindall, S. M. 03982
- 09849 **Flipse, John E.** Development in ocean exploration and mining: *Mining Cong. Jour.*, v. 56, no. 8, p. 60-64, illus., 1970.
- 03597 **Flores, Romeo M.; Ferm, John C.** A recent model for Pennsylvanian deposition in the Marathon basin, west Texas: *Jour. Sed. Petrology*, v. 40, no. 2, p. 621-628, illus., 1970.
- Flory, D.** See Oró, J. 05088
- 10039 **Flower, R. H.** Arctic Ordovician cephalopod faunas [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2480, 1970.
- 08342 **Floyd, E. O.; Long, A. T.** Well records and other basic ground-water data, Craven County, North Carolina: *North Carolina Div. Ground Water Ground-Water Circ.* 14, 104 p., illus., tables, 1970.
- 02374 **Flynn, Clinton J.** Post-batholithic geology of the La Gloria.Presa Rodríguez area, Baja California, Mexico: *Geol. Soc. America Bull.*, v. 81, no. 6, p. 1789-1806, illus., geol. map, 1970.
- 10912 **Fogel, Martin M.** Management of water resources, in *Conf. on Mining and Ecology in the Arid Environment*, 1970, Proc. (W. C. Peters, editor): Tucson, Ariz., Arizona Univ. College of Mines, p. 135-141, 1970.
- 09328 **Fogwill, W. D.** Mineral deposits and prospecting environments of Newfoundland: Newfoundland and Labrador Mineral Resources Div. Inf. Circ. 14, 45 p., illus., tables, 1970.
- 02962 **Fok, Yu-Si.** One-dimensional infiltration into layered soils: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7343, *Jour. Irrigation and Drainage Div.*, no. IR 2, p. 121-129, illus., tables, 1970.

- 00154 **Foland, K. A.; Quinn, A. W.; Gilletti, B. J.** Jurassic and Cretaceous isotopic ages of the White Mountain magma series [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 19-20, 1970.
- 01218 **Folayan, Joseph Ibikunle.** Reliability of predicted soil settlement [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 8, p. 3631B-3632B, 1970.
- 02415 **Folger, D. W.** Wind transport of land-derived mineral, biogenic, and industrial matter over the North Atlantic: *Deep-Sea Research*, v. 17, no. 2, p. 337-352, illus., tables, 1970.
- Folinsbee, A.** See VonHerzen, R. P. 01496
- 03485 **Folinsbee, R. E.** Rb/Sr, S, and O isotopic analyses indicating source and date of contact metasomatic copper deposits, Craigmont, British Columbia, Canada — A reply [to 1970 discussion by L. Christmas and others of 1969 paper]: *Econ. Geology*, v. 65, no. 1, p. 63-64, 1970.
- 03923 **Folinsbee, Robert E.; Baadsgaard, Halfdan; Cumming, George L.** Geochronology of the Cretaceous-Tertiary boundary of the western plains of North America, in *Geochronology of Phanerozoic orogenic belts — Colloquium, Switzerland, 1969, Papers: Eclogae Geol. Helvetiae*, v. 63, no. 1, p. 91, 1970.
- Folk, Robert L.** See Ward, William C. 03682
- 06980 **Folk, Robert L.** Evidence of peritidal origin for part of the Caballos novaculite (Devonian radiolarian chert), Marathon Basin, Texas [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 552-553, 1970.
- Folk, Robert L.** See Pittman, J. Stuart. 09522
- 11010 **Follett, C. R.** Ground-water resources of Bastrop County, Texas: *Texas Water Devel. Board Rept.* 109, 138 p., illus., tables, 1970.
- 00265 **Followill, Fred E.; Nuttli, Otto W.** Shear body wave travel times and velocity distribution in the lower mantle [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 92, 1970.
- 10213 **Follows, Donald S.** Capitol Reef, extended monument: *Natl. Parks and Conserv. Mag.*, v. 44, no. 274, p. 4-9, illus., 1970.
- 02749 **Folsom, Michael M.; Winters, Harold A.** Drainage orders in Michigan: *Michigan Academician*, v. 2, no. 3, p. 79-91, illus., tables, 1970.
- 03410 **Folsom, Michael M.** The glacial geomorphology of the Puget Lowland, Washington and British Columbia, comments and selected references: *Northwest Sci.*, v. 44, no. 2, p. 143-146, 1970.
- Folsom, T. R.** See Spencer, Derek W. 06407
- 09081 **Fons, Lloyd; Johns, Earl; Mougne, Marcel L.** New way to evaluate shaly formations: *Oil and Gas Jour.*, v. 68, no. 31, p. 74-77, illus., 1970.
- 10655 **Fons, Lloyd.** Some pulsed neutron logging contributions to improved formation evaluation: *Jour. Petroleum Technology*, v. 22, April, p. 424-432, illus., 1970.
- 04383 **Font, Robert G.; Williamson, Edward F.** Geologic factors affecting construction in Waco, in *Urban geology of greater Waco — Pt. 4, Engineering: Baylor Geol. Studies Bull.* 12, 34 p., illus., 1970.
- Fontan, Jacques.** See Guedelia, Daniel. 00069

- 02218 **Foord, Eugene E.; Parrott, William R.; Ritter, Dale F.** Definition of possible stratigraphic units in north central Long Island, New York, based on detailed examination of selected well cores: *Jour. Sed. Petrology*, v. 40, no. 1, p. 194-204, illus., table, 1970.
- 06979 **Foose, Richard M.** Geomorphology and environmental geology [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 552, 1970.
- Foote, H. P.** See *Cearlock, D. B.* 10510
- Foote, R. Q.** See *Weetman, Bruce G.* 01998
- Foote, R. Q.** See *Williams, Spencer L.* 02001
- 02957 **Foote, R. S.** Radioactive methods in mineral exploration [with French abs.], in *Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26*, p. 177-190, illus., 1970.
- 01911 **Foote, Richard Q.; Loux, P. C.; Hays, W. W.** Analysis of ground motions, Rulison event [abs.]: *EOS*, v. 51, no. 4, p. 345, 1970.
- Footen, Joseph J.** See *Eitel, Dean F.* 01134
- Forbes, R. B.** See *Kienle, Jurgen.* 10594
- Forbes, Robert B.** See *Gedney, Larry.* 02140
- 10040 **Forbes, Robert B.; Hamilton, Thomas; Tailleir, Irvin L.; Miller, T. P.; Patton, William W.** Tectonic implications of recently discovered "blueschist facies" metamorphic terranes in Alaska [abs.], in *Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2480, 1970.
- Forbes, Robert B.** See *Foster, Helen L.* 10041
- 10202 **Forbes, Robert B.; Engels, Joan C.** K-40/A-40 age relations of the Coast Range batholith and related rocks of the Juneau Ice Field area, Alaska: *Geol. Soc. America Bull.*, v. 81, no. 2, p. 579-584, illus., table, 1970.
- 10647 **Forbis, R. G.; Davis, L. B.; Christensen, O. A.; Fedirchuk, G.** (editors). *Chacmool 1969 — calgary Univ. Archaeol. Assoc., Ann. Paleo-Environmental Workshop, 1st, Calgary, 1969, Proc.: [Calgary, Alberta] Calgary Univ., Students' Press*, 221 p., illus. [1969].
- 01726 **Ford, D. C.; Fuller, P. G.; Drake, J. J.** Calcite precipitates at the soles of temperate glaciers: *Nature*, v. 226, no. 5244, p. 441-442, illus., table, 1970.
- Ford, D. C.** See *Drake, J. J.* 04055
- Ford, Derek C.** See *Pluhar, Agnes.* 08203
- Ford, T. D.** See *Dunham, K. C.* 10208
- 03372 **Ford, Trevor D.; Breed, William J.** Carbon Butte, an unusual landslide in the Grand Canyon: *Plateau*, v. 43, no. 1, p. 9-15, illus., 1970.
- 05662 **Ford, Trevor D.; Breed, William J.** Tadpole holes formed during desiccation of overbank pools: *Jour. Sed. Petrology*, v. 40, no. 3, p. 1044-1045, illus., 1970.
- 06700 **Foreman, Neil; Peacor, Donald R.** Refinement of the nepheline structure at several temperatures [with German abs.]: *Zeitschr. Kristallographie*, v. 132, nos. 1-2, p. 45-70, illus., tables, 1970.

- 02618 **Forgotson, James M., Jr.; Stark, Philip H.** Well-data files and computer, exploration tools for the 70s [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 847, 1970.
- 04824 **Forgotson, James M., Jr.** Well-data files and computer, exploration tools for the seventies [abs.]: Am. Assoc. Petroleum Geologists, v. 54, no. 9, p. 1784, 1970.
- 07837 **Forgotson, James M., Jr.; Stark, Philip H.** Well data files and the computer exploration tools for the 70's, in *Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Soc. Trans.*, v. 20, p. 115-122, illus., 1970.
- 04206 **Forman, John A.** Age of the Catalina Island pluton, California, in *Radiometric dating and paleontologic zonation: Geol. Soc. America Spec. Paper 124*, p. 37-45, table, 1970.
- Formel'-Kortina, F.** See Bugel'skiy, Yu. Yu. 07502
- 06783 **Forrest, J. B.; MacFarlane, I. C.** Field studies of response of peat to plate loading — Closure [to discussion of paper 6652, 1969]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Soil Mechanics and Found. Div., no. SM 6, p. 2130-2131, 1970.
- 07241 **Forsten, Ann.** The Late Miocene Trail Creek mammalian fauna: Wyoming Univ. Contr. Geology, v. 9, no. 1, p. 39-51, illus., tables, 1970.
- 08373 **Forstén, Ann.** *Mesohippus* from the Chadron of South Dakota, and a comparison with Brulean *Mesohippus bairdii* Leidy: Soc. Sci. Fennica Commentationes Biol., v. 31, 1967-70, no. 11, 22 p., tables, 1970.
- 02963 **Forstén, Ann-Marie.** Variation in and between three populations of *Mesohippus bairdii* Leidy from the Big Badlands, South Dakota: Acta Zool. Fennica 126, 16 p., illus., tables, 1970.
- Forster, W. O.** See Cory, R. L. 08676
- 03125 **Forsyth, Jane L.** A geologist looks at the natural vegetation map of Ohio: Ohio Jour. Sci., v. 70, no. 3, p. 180-191, illus., table, 1970.
- 05569 **Fortescue, J. A. C.** A research approach to the use of vegetation for the location of mineral deposits in Canada: Taxon, v. 19, no. 5, p. 695-704, illus., 1970.
- 03566 **Forward, Frank Arthur.** Science in the mineral industry, a look ahead: Canadian Mining and Metall. Bull., v. 63, no. 694, p. 181-184, 1970.
- Forward, Robert L.** See Bell, Curtis C. 07995
- 04200 **Foscolos, A. E.; Barefoot, R. R.** A rapid determination of total sulphur in rocks and minerals: Canada Geol. Survey Paper 70-11, p. 9-14, illus., tables, 1970.
- 04384 **Foscolos, A. E.; Barefoot, R. R.** A rapid determination of total organic and inorganic carbon in shales and carbonates: Canada Geol. Survey Paper 70-11, p. 1-8, illus., tables, 1970.
- 06220 **Foscolos, A. E.; Barefoot, R. R.** A buffering and standard addition technique as an aid in the comprehensive analysis of silicates by atomic absorption spectroscopy: Canada Geol. Survey Paper 70-16, 15 p., illus., tables, 1970.
- Foscolos, Anthony E.** See Barshad, Isaac. 05404
- Foster, B. P.** See Reitan, Paul H. 01820
- 01295 **Foster, Helen L.; Clark, Sandra H. B.** Geochemical and geologic reconnaissance of a part of the Fortymile area, Alaska: U.S. Geol. Survey Bull. 1312-M, p. M1-M29, illus., tables, 1970.

- 02032 **Foster, Helen L.** Reconnaissance geologic map of the Tanacross quadrangle, Alaska: U.S. Geol. Survey Misc. Geol. Inv. Map I-593, scale 1:250,000, text, 1970.
- 10041 **Foster, Helen L.; Brabb, Earl E.; Weber, Florence R.; Forbes, Robert B.** Regional geology of Yukon-Tanana Upland, Alaska [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2480-2481, 1970.
- 03655 **Foster, John D.; Palmquist, Robert C.** Possible subglacial origin for "minor moraine" topography: *Iowa Acad. Sci. Proc.* 1969, v. 76, p. 296-310, illus., tables, 1970.
- 03729 **Foster, John H.; Opdyke, Neil D.** Upper Miocene to recent magnetic stratigraphy in deep-sea sediments: *Jour. Geophys. Research*, v. 75, no. 23, p. 4465-4473, illus., 1970.
- Foster, John H.** See Opdyke, Neil D. 08446
- 00701 **Fountain, Richard C.; Zellars, Michael E.** A program for ore control in the central Florida phosphate district [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 209-210, 1970.
- Fournier, R. O.** See Truesdell, A. H. 09413
- Fournier, R. O.** See White, D. E. 09422
- 10165 **Fournier, R. O.; White, D. E.; Truesdell, A. H.** Discharge of thermal water and heat from Upper, Midway, and Lower Geyser Basins, Yellowstone Park [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.], p. 47, illus., 1970.
- Fowler, G. A.** See Griggs, G. B. 01338
- Fowler, Gerald A.** See Duncan, John R. 00437
- 04897 **Fowler, Gerald A.; Kulm, L. D.** Foraminiferal and sedimentological evidence for uplift of the deep-sea floor, Gorda Rise, northeastern Pacific: *Jour. Marine Research*, v. 28, no. 3, p. 321-329, illus., tables, 1970.
- Fowler, Lowell W.** See Burgat, Virgil A. 08414
- 00702 **Fowler, Michael L.; Atkinson, Lee C.; Gill, Dan; Keer, Frederick R.; Raring, Andrew M.** Biota and sediment in a small lagoon on Big Pine Key, Florida [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 210, 1970.
- Fowler, W. A., Jr.** See Tipsword, H. L. 10949
- 10656 **Fowler, William A., Jr.** Pressures, hydrocarbon accumulation and salinities — Chocolate Bayou field, Brazoria County, Texas: *Jour. Petroleum Technology*, v. 22, April, p. 411-423, illus., tables, 1970.
- 07138 **Fox, Fred L.** Seismic geology of the eastern United States: *Assoc. Eng. Geologists Bull.*, v. 7, nos. 1-2, p. 21-43, illus., 1970.
- 10259 **Fox, James E.** Foraminifera in the Medicine Bow Formation, south-central Wyoming: *Wyoming Univ. Contr. Geology*, v. 9, no. 2, p. 98-101, illus., 1970.
- 10524 **Fox, James H.** Geophysical investigation of the Crooked Creek, Missouri, cryptoexplosion structure [abs.]: *EOS*, v. 51, no. 11, p. 770, 1970.
- 06981 **Fox, Paul J.; Schreiber, Edward.** Granodiorites from the Cayman Trench [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 553, 1970.

- 08600 **Fox, Paul J.; Ruddiman, William F.; Ryan, William B. F.; Heezen, Bruce C.** The geology of the Caribbean crust — [Pt.] 1, Beata Ridge, in *The structure of the crust and mantle beneath inland and marginal seas* — Internat. Upper Mantle Comm. Upper Mantle Project, Sci. Rept. No. 29: Tectonophysics, v. 10, no. 5-6, p. 495-513, illus., tables, 1970.
- 09426 **Fox, Paul J.; Heezen, Bruce C.; Johnson, G. Leonard.** Jurassic sandstone from the tropical Atlantic: *Science*, v. 170, no. 3965, p. 1402-1404, illus., 1970.
- Fox, R. L.** See Hasan, S. M. 07656
- 02298 **Fox, Richard C.** A bibliography of Cretaceous and Tertiary vertebrates from western Canada: *Bull. Canadian Petroleum Geology*, v. 18, no. 2, p. 263-281, 1970.
- 04074 **Fox, Richard C.** Eutherian mammal from the early Campanian (Late Cretaceous) of Alberta, Canada: *Nature*, v. 227, no. 5258, p. 630-631, illus., 1970.
- Fox, S. W.** See Hare, P. E. 05738
- Fox, William T.** See Davis, Richard A., Jr. 06949
- 08507 **Fox, William T.** Analysis and simulation of paleoecologic communities through time, in *Computers in paleontology* — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc., Pt. B: Lawrence, Kans., Allen Press, p. 117-135, illus., table, 1970.
- Foxworthy, B. L.** See Cohen, Philip. 07488
- 02028 **Foxworthy, Bruce L.** Hydrologic conditions and artificial recharge through a well in the Salem Heights area of Salem, Oregon: U.S. Geol. Survey Water-Supply Paper 1594-F, p. F1-F56, illus., tables, geol. map, 1970.
- Frakes, Lawrence A.** See Crowell, John C. 00960
- 00587 **Francheteau, Jean; Sclater, J. G.** Comments on paper by E. Irving and W. A. Robertson, "Test for polar wandering and some possible implications" [1969]: *Jour. Geophys. Research*, v. 75, no. 5, p. 1023-1027, illus., tables, 1970.
- 01445 **Francheteau, Jean; Harrison, C. G. A.; Sclater, J. G.; Richards, M. L.** Magnetization of Pacific seamounts — A preliminary polar curve for the northeastern Pacific: *Jour. Geophys. Research*, v. 75, no. 11, p. 2035-2061, illus., tables, 1970.
- Francheteau, Jean.** See Sclater, John G. 01975
- 02197 **Francheteau, Jean; Sclater, J. G.; Menard, H. W.** Pattern of relative motion from fracture zone and spreading rate data in the north-eastern Pacific: *Nature*, v. 226, no. 5247, p. 746-748, illus., table, 1970.
- Francheteau, Jean.** See Sclater, John G. 05470
- 02553 **Francis, C. W.; Tamura, Tsuneo; Bonner, W. P.; Amburgey, J. W., Jr.** Separation of clay minerals and soil clays using isopycnic zonal centrifugation: *Soil Sci. Soc. America Proc.*, v. 34, no. 2, p. 351-353, illus., 1970.
- 10784 **Francis, D. R.** "Hard rock" core storage laboratories, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor): Canada Geol. Survey Paper 69.56, p. 313-318, 1970.
- Francisco, Martha.** See Laycock, Arleigh H. 09218
- 10214 **Franco, Alvaro; Castano Beltrán, Leopoldo.** Glosario de exploracion: Petróleo Interamericano, v. 28, no. 2, p. 3A-8A, 10A, 15A-18A, 20A, 22A, 1970.
- Franconi, A.** See Wynne-Edwards, H. R. 08121

- 05181 **Frank, D. J.; Sackett, W.; Hall, R.; Fredericks, A.** Methane, ethane, and propane concentrations in Gulf of Mexico: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 10, p. 1933-1938, illus., table, 1970.
- 04597 **Frank, F. J.** Ground-water resources of the Clatsop Plains sand-dune area, Clatsop County, Oregon: U.S. Geol. Survey Water-Supply Paper 1899-A, p. A1-A41, illus., tables, 1970.
- 08381 **Frank, J. F.; Johnson, Nyra A.** Selected ground-water data in the Eugene-Springfield area, southern Willamette Valley, Oregon: Oregon State Engineer Ground Water Rept. 14, 70 p., illus., tables, 1970.
- Franke, O. L.** See Cohen, Philip. 07488
- 04097 **Frankel, L.; Crowl, G. H.** Permo-Carboniferous stratigraphy and structure of central Prince Edward Island (11 L, and part of 21 I): Canada Geol. Survey Paper 69-17, 26 p., illus., table, 1970.
- Frankel, L.** See Crowl, G. H. 05820
- 02098 **Frankel, Larry.** A technique for investigating microorganism associations: Jour. Paleontology, v. 44, no. 3, p. 575-577, illus., 1970.
- 05663 **Frankenberg, Dirk; Giles, Robert T.** Acid treatment of organic materials and the removal of calcium carbonate: Jour. Sed. Petrology, v. 40, no. 3, p. 1046-1048, tables, 1970.
- 05262 **Franklin, A. G.** Suggested method for aerial photo interpretation for engineering reconnaissance, in Special procedures for testing soil and rock for engineering purposes (5th edition): Am. Soc. Testing and Materials Spec. Tech. Pub. 479, p. 36-42, illus., 1970.
- 06497 **Franklin, J. M.; Kustra, C. R.** Proterozoic rocks in the Thunder Bay area — Guide to the Proterozoic rocks of the northwestern Lake Superior area, Ontario, in Inst. Lake Superior Geology, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 49-68, illus., 1970.
- Franklin, R. E.** See Saxena, G. S. 07223
- 10228 **Franklin, Wesley D.** Raystown Dam — field trip 1, Pt. 1 in Assoc. Eng. Geologists, 1970 Ann. Mtg. [Washington, D. C.], [Guidebook to] field trips 1 and 5: [Sacramento, Calif.] assoc. Eng. Geologists, p. 2-5. 1970.
- Franz, Ulrich.** See Berggren, W. A. 06160
- Franzgrote, Ernest J.** See Patterson, James H. 05094
- Franzgrote, Ernest J.** See Economou, Thanasis E. 06258
- 07626 **Franzmeier, D. P.** Particle size sorting of proglacial eolian materials: Soil Sci. Soc. America Proc., v. 34, no. 6, p. 920-924, illus., tables, 1970.
- 08630 **Frarey, M. J.; Roscoe, S. M.** The Huronian Supergroup north of Lake Huron, in Basins and geosynclines of the Canadian Shield (A. J. Baer, editor) — Symposium, Ottawa, 1970, Papers: Canada Geol. Survey Paper 70-40, p. 143-156, illus., table, discussion, p. 157-158, 1970.
- Frarey, M. J.** See Roscoe, S. M. 08633
- Frarey, M. J.** See Robertson, J. A. 09257
- Fraser, J. A.** See Hoffman, P. F. 08632

- 08662 **Fraser, J. A.; Donaldson, J. A.; Fahrig, W. F.; Tremblay, L. P.** Helikian basins and geosynclines of the northwestern Canadian Shield, *in* Basins and geosynclines of the Canadian Shield (A. J. Baer, editor) — Symposium, Ottawa, 1970, Papers: Canada Geol. Survey Paper 70-40, p. 213-238, illus., table, 1970.
- 08664 **Fraser, J. A.; Donaldson, J. A.; Fahrig, W. F.; Tremblay, L. P.** Comments [on "The Canadian Shield — A status report, 1970" by F. J. Pettijohn, 1970], *in* Basins and geosynclines of the Canadian Shield (A. J. Baer, editor) — Symposium, Ottawa, 1970, Papers: Canada Geol. Survey Paper 70-40, p. 265, 1970.
- 01209 **Fraunfelter, G. H.; Utgaard, John.** Middle Pennsylvanian edrioasteroid from southern Illinois: Jour. Paleontology, v. 44, no. 2, p. 297-303, illus., 1970.
- 05862 **Fraunfelter, G. H.; Engstrom, J. C.** Development of the rugose coral *Microcyclus discus* Meek and Worthen from the Devonian of Illinois and Missouri: Jour. Paleontology, v. 44, no. 6, p. 1085-1091, illus., 1970.
- 02468 **Fraunfelter, George H.** Cephalaspids from the Middle Ordovician Platteville Limestone: Illinois Acad. Sci. Trans., v. 63, no. 1, p. 14-17, illus., 1970.
- 04423 **Fraunfelter, George H.** Silicified corals from the Lingle and St. Laurent Limestones (Middle Devonian) of southern Illinois and southeastern Missouri: Southern Illinois Studies, no. 3, 68 p., illus., table, 1970.
- 06904 **Fraunfelter, George H.** Dibunophyllid corals from the Houx limestone (Pennsylvanian) in north central Missouri: Illinois Acad. Sci. Trans., v. 63, no. 3, p. 319-323, illus., 1970.
- 02549 **Frazee, C. J.; Fehrenbacher, J. B.; Krumbein, W. C.** Loess distribution from a source: Soil Sci. Soc. America Proc., v. 34, no. 2, p. 296-301, illus., tables, 1970.
- 09299 **Frazee, C. J.; Heil, R. D.; Westin, F. C.** Remote sensing for detection of soil limitations in agricultural areas, Sec. 25 of Earth Resources Program, 3d ann., review — v. 2, Agriculture, forestry, and sensor studies: Houston, Tex., NASA Manned Spacecraft Center, Msc-03742, p. 25-1 — 25-23, illus., tables, 1970.
- 04775 **Frazell, W. D.** North Elton Field, Allen Parish, Louisiana, *in* Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 22-22d, illus., 1970.
- 05513 **Frazier, Gerald A.; Roberts, John E.** A mathematical approach to the influence of geological formations on seismic motions — UCRL-50896: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., 36 p., illus., 1970.
- 06025 **Frazier, Gerald Alvin.** Vibrational characteristics of three-dimensional solids, with applications to earth dams [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5532B, 1970.
- Frazier, J.** See Bostrom, K. 09130
- 09743 **Frazier, Ken.** California fossil marine vertebrates: Rocks and Minerals, v. 45, no. 6, p. 384-385, illus., 1970.
- Frazzetta, T. H.** See Estes, Richard. 03915
- 07667 **Frebold, Hans; Tipper, H. W.** Status of the Jurassic in the Canadian Cordillera of British Columbia, Alberta, and southern Yukon: Canadian Jour. Earth Sci., v. 7, no. 1, p. 1-21, illus., table, 1970.
- 08479 **Frebold, Hans.** Pliensbachian ammonoids from British Columbia and southern Yukon: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 1, p. 435-456, illus., table, 1970.
- Frederick, Bernard J.** See Godfrey, Richard G. 03210



- Fredericks, A.** *See* Frank, D. J. 05181
- Fredericksen, Walter F.** *See* Burgat, Virgil A. 08414
- Frederiksen, N. O.** *See* Kirkland, D. W. 08576
- 01573 **Frederiksen, Norman Oliver.** Stratigraphy and palynology of the Jackson Stage (Upper Eocene) and adjacent strata of Mississippi and western Alabama [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 9, p. 4207B, 1970.
- Fredriksson, K.** *See* Reid, Arch M. 05309
- Freeman, Dale.** *See* Walling, James M. 06722
- 11266 **Freeman, Tom.** Fossils of Arkansas — An introduction to paleontology illustrated with common fossils of Arkansas: *Arkansas Geol. Comm. Bull.* 22, 53 p., illus. [1965?].
- Freeman, Val L.** *See* Kiilsgaard, Thor H. 03207
- 00463 **Freers, Theodore F.** Geology and ground water resources, Williams County, North Dakota — Pt. 1, Geology: *North Dakota Geol. Survey Bull.* 48, pt. 1 (North Dakota Water Comm. County Ground Water Study 9), 55 p., illus., table, geol. map, 1970.
- 05812 **Freeze, R. A.; Banner, J. A.** An instrumented experimental site for the investigation of soil moisture, frost, and groundwater discharge: *Canada Dept. Energy, Mines and Resources Inland Waters Br. Tech. Bull.* 21, 29 p., illus., table, 1970.
- 10678 **Freeze, R. A.** Regional groundwater flow — Old Wives Lake drainage basin, Saskatchewan: *Canada Dept. Energy, Mines and Resources, Inland Waters Br. Sci. Ser. no. 5*, 245 p., illus., tables, 1969.
- 01715 **Freeze, R. Allan; Banner, James.** The mechanism of natural ground-water recharge and discharge — [Pt.] 2, Laboratory column experiments and field measurements: *Water Resources Research*, v. 6, no. 1, p. 138-155, illus., tables, 1970.
- 02717 **Freeze, R. Allan.** Moire pattern techniques in groundwater hydrology: *Water Resources Research*, v. 6, no. 2, p. 634-641, illus., 1970.
- 05518 **Freeze, R. Allan.** Applications of groundwater simulation to hydrologic response modelling [abs.]: *Water Well Jour.*, v. 24, no. 9, p. 54-55, 1970.
- 06982 **Freeze, R. Allan.** Hydrogeological applications of a three-dimensional, transient, saturated-unsaturated subsurface flow model [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 553-554, 1970.
- 10710 **Freeze, R. Allan.** Hydrogeology and groundwater resources of the Gravelbourg aquifer, Saskatchewan: *Canada, Dept. Energy, Mines and resources Inland Waters Br. Sci. Ser.* 6, 60 p., illus., tables, 1969.
- French, Bevan M.** *See* Bottino, Michael R. 01741
- French, Robert R.** *See* Carr, Donald D. 07529
- 06613 **French, William Stanley.** Earthquake waves following the  $P_n$  phase and their indications of focal depth and crustal structures in the Pacific Northwest States [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 2, p. 767B, 1970.
- Frenette, Marcel.** *See* Desaulniers, G. 05242
- Frentrop, A. H.** *See* Wahl, J. S. 09355
- 05318 **Frerichs, William E.** Paleobathymetry, paleotemperature, and tectonism: *Geol. Soc. America Bull.*, v. 81, no. 11, p. 3445-3452, illus., 1970.

**Frey, F. A.** See Buma, Grant. 06079

- 02827 **Frey, Fred A.** Rare earth abundances in alpine ultramafic rocks, in *Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969*, Proc.: Physics Earth and Planetary Interiors, v. 3, p. 323-330, illus., tables, 1970.
- 08408 **Frey, M. G.; Grimes, W. H.** Bay Marchand-Timbalier Bay-Caillou Island salt complex, Louisiana, in *Geology of giant petroleum fields — Symposium, AAPG, 53d Ann. Mtg., Oklahoma City, Okla., 1968*: Am. Assoc. Petroleum Geologists Mem. 14, p. 277-291, illus., table, 1970.
- 01270 **Frey, R. W.** The lebensspuren of some common marine invertebrates near Beaufort, North Carolina — [Pt.] 2, Anemone burrows: Jour. Paleontology, v. 44, no. 2, p. 308-311, illus., 1970.
- 09880 **Frey, R. W.; Howard, J. D.** Comparison of Upper Cretaceous ichnofaunas from siliceous sandstones and chalk, Western Interior Region, U.S.A., in *Trace fossils — Liverpool Geol. Soc. and Internat. Union Geol. Sci., Internat. Conf., Liverpool, England, 1970*, Proc.: Geol. Jour. Spec. Issue, no. 3, p. 141-166, illus., tables, 1970.
- 02092 **Frey, Robert W.** Environmental significance of Recent marine lebensspuren near Beaufort, North Carolina: Jour. Paleontology, v. 44, no. 3, p. 507-519, illus., tables, 1970.
- Frey, Robert W.** See Howard, James D. 02633
- Frey, Robert W.** See Reineck, Hans-Erich. 02672
- 06983 **Frey, Robert W.; Mayou, Taylor V.** Decapod burrows in Holocene barrier island beaches, Georgia [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 554, 1970.
- 07870 **Frey, Robert W.** Trace fossils of Fort Hays Limestone Member of Niobrara Chalk (Upper Cretaceous), west-central Kansas [with German abs.]: Kansas Univ. Paleont. Contr. Art. 53 (Cretaceous 2), 41 p., illus., tables, 1970.
- Freyman, Andrew J.** See Barry, George S. 10671
- 04551 **Frick, G.** Wasserschiessung in Haiti [Water resources development in Haiti]: Wasser u. Boden, v. 22, no. 8, p. 226-228, illus., 1970.
- 01883 **Fricke, P. E.; Goldstein, J. I.; Summers, A. L.** Cooling rates and thermal histories of iron and stony-iron meteorites: Geochim. et Cosmochim. Acta, v. 34, no. 4, p. 475-491, illus., tables, 1970.
- 03297 **Friedlaender, C. G. I.** Tridymite in the gangue of a Pb-Cu-Zn occurrence [with French abs.]: Schweizer. Mineralog. u. Petrog. Mitt., v. 50, no. 1, p. 183-199, illus., 1970.
- 03298 **Friedlaender, C. G. I.** Brownian movement in quartz, an attempt at quantitative evaluation [with French abs.]: Schweizer. Mineralog. u. Petrog. Mitt., v. 50, no. 1, p. 13-20, illus., 1970.
- 04446 **Friedlaender, C. G. I.** Brownian movement in liquid inclusions in quartz, some quantitative observations [with French abs.]: Canadian Mineralogist, v. 10, pt. 2, p. 272-274, table, 1970.
- 06637 **Friedlaender, C. G. I.** Entaxy of tridymite in the gangue of a Pb-Cu-Zn occurrence [with French abs.]: Canadian Mineralogist, v. 10, pt. 4, p. 704-709, illus., 1970.
- 05579 **Friedman, Don G.** Computer simulation of the earthquake hazard, in *Geologic hazards and public problems* (R. A. Olson and M. M. Wallace, editors) — [U.S.] Office Emergency Preparedness, Region 7, Conf., San Francisco, Calif., 1969, Proc.: Washington, D.C., U.S. Govt. Printing Office, p. 153-181, illus., tables [1970].

**Friedman, G. M.** *See* Sanders, John E. 00177

- 00155 **Friedman, Gerald M.; Gavish, Eliezer.** Chemical changes in interstitial waters from lagoonal, estuarine, tidal marsh, and deltaic environments [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 20-21, 1970.

**Friedman, Gerald M.** *See* McKinney, Thomas F. 01656

**Friedman, Gerald M.** *See* Braun, Moshe. 01660

**Friedman, Gerald M.** *See* Schroeder, Johannes H. 02678

**Friedman, Gerald M.** *See* Schroeder, Johannes H. 03602

- 03780 **Friedman, Gerald M.; Sanders, John E.** Coincidence of high sea level with cold climate and low sea level with warm climate — Evidence from carbonate rocks: *Geol. Soc. America Bull.*, v. 81, no. 8, p. 2457-2458, 1970.

- 04726 **Friedman, Gerald M.; Sanders, John E.** Integrated continental-shelf and marginal marine environmental research program — Sediments, organisms and waters in New York Bight and vicinity: *Maritime Sediments*, v. 6, no. 1, p. 26-29, illus., 1970.

- 05012 **Friedman, Gerald M.** The Bahamas and southern Florida — A model for carbonate deposition: *Shale Shaker*, v. 21, no. 1, p. 4-12, 14-15, illus.; discussion, p. 17-20, 1970.

- 05669 **Friedman, Gerald M.; Gavish, Eliezer.** Chemical changes in interstitial waters from sediments of lagoonal, deltaic, river, estuarine, and salt water marsh and cove environments: *Jour. Sec. Petrology*, v. 40, no. 3, p. 930-953, illus., tables, 1970.

**Friedman, Gerald M.** *See* Sanders, John E. 09555

**Friedman, Irving.** *See* Judy, Clark. 01717

- 03347 **Friedman, Irving; Smith, George I.** Deuterium content of snow cores from Sierra Nevada area: *Science*, v. 169, no. 3944, p. 467-470, illus., table, 1970.

**Friedman, Irving.** *See* Wershaw, R. L. 04086

- 05690 **Friedman, Irving; Gleason, J. D.; Hardcastle, K. G.** Water, hydrogen, deuterium, carbon and  $C^{13}$  content of selected lunar material, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1103-1109, illus., table, 1970.

- 06922 **Friedman, Irving.** Some investigations of the deposition of travertine from Hot Springs — [Pt.] 1, The isotopic chemistry of a travertine-depositing spring: *Geochim. et Cosmochim. Acta*, v. 34, no. 12, p. 1303-1315, illus., tables, 1970.

**Friedman, Irving.** *See* Pearson, F. J., Jr. 07464

**Friedman, Irving.** *See* Simpson, E. S. 08432

**Friedman, Irving.** *See* Smith, George I. 09953

- 02846 **Friedman, Jules D.** Thermal anomalies and geologic features of the Mono Lake area, California, as revealed by infrared imagery, *in* Earth resources aircraft program status review, NASA, Houston, 1968 — V. 1, Geology, geography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 11-1 — 11-76, illus., tables [1970].
- 07607 **Friedman, Jules D.** The airborne infrared scanner as a geophysical research tool: Optical Spectra, v. 4, issue 6, p. 35-44, illus., table, 1970.
- 00066 **Friedman, M.; Logan, J. M.** Influence of residual elastic strain on the orientation of experimental fractures in three quartzose sandstones: Jour. Geophys. Research, v. 75, no. 2, p. 387-405, illus., tables, 1970.
- 02401 **Friedman, M.; Perkins, R. D.; Green, S. J.** Observation of brittle-deformation features at the maximum stress of Westerly Granite and Solenhofen Limestone: Internat. Jour. Rock Mechanics and Mining Sci., v. 7, no. 3, p. 297-306, illus., table, 1970.
- Friedman, M.** See Perkins, R. D. 05594
- 07715 **Friedman, M.; Sowers, G. M.** Petrofabrics, a critical review: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 1, p. 477-497, illus., table, 1970.
- Friedman, M.** See Logan, John M. 09646
- Friedman, Melvin.** See Gallagher, John J. 00897
- 05199 **Friedman, Melvin; Logan, John M.** Microscopic feather fractures: Geol. Soc. America Bull., v. 81, no. 11, p. 3417-3420, illus., table, 1970.
- 06984 **Friedman, Melvin; Stearns, David W.** Relations between stresses derived from calcite twin lamellae and macrofractures, Teton anticline, Montana [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 555-556, 1970.
- 10042 **Friend, Peter F.** Devonian rocks of Greenland and Svalbard [abs.], *in* Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2481, 1970.
- Fries, Carl, Jr.** See Geyne, A. R. 09738
- 04066 **Frimpter, Michael H.** Ground-water basic data, Orange and Ulster Counties, New York: New York Water Resources Comm. Bull. 65, 93 p., illus., tables, 1970.
- 02896 **Frind, E. O.** Theoretical analysis of aquifer response due to dewatering at Welland [with French abs.]: Canadian Geotech. Jour., v. 7, no. 2, p. 205-216, illus., 1970.
- Fripiat, J. J.** See Fuls, P. F. 03122
- 06215 **Frisch, Thomas.** Chemical variations among the amphiboles of Shefford Mountain, a Montereian intrusion in southern Quebec, *in* Alkaline rocks, the Montereian Hills — Symposium, Montreal, 1969, Proc.: Canadian Mineralogist, v. 10, pt. 3, p. 553-570, illus., table, 1970.
- 10431 **Frischat, G. H.** Sodium diffusion in natural quartz crystals: Am. Ceramic Soc. Jour., v. 53, no. 6, p. 357, table, 1970.
- 10043 **Frischknecht, Frank C.; Stanley, W. D.** Airborne and ground electrical resistivity studies along proposed trans-Alaska pipeline system (TAPSO) route [abs.], *in* Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2481, 1970.
- 03255 **Fritsche, Albert Eugene.** Miocene geology of the central Sierra Madre Mountains, Santa Barbara County, California [abs.]: Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 5099B, 1970.

- 07159 **Fritts, Crawford E.** Geology and geochemistry of the Cosmos Hills, Ambler River and Shungnak quadrangles, Alaska: Alaska Div. Mines and Geology Geol. Rept. 39, 69 p., illus., table, geol. map, 1970.
- 10166 **Fritts, Harold C.; Hayden, Bruce P.; Blasing, Terence J.** Paleoclimatic reconstruction of past atmospheric pressure anomalies from multivariate analysis of North American tree rings [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970. Abs.: [Bozeman, Mont., Montana State Univ.?], p. 49, 1970.
- 03012 **Fritz, Madeleine A.** Redescription of type specimens of the bryozoan *Hallopora* from the Upper Ordovician of Toronto region, Ontario: Geol. Assoc. Canada Proc., v. 21, p. 15-23, illus., table, 1970.
- 05552 **Fritz, Madeleine A.** Pennsylvanian Bryozoa (Ectoprocta) from the Tellevak Limestone, northwestern Ellesmere Island, Arctic Canada [with French abs.], in Contributions to Canadian paleontology: Canada Geol. Survey Bull. 187, p. 67-77, illus., tables, 1970.
- 05224 **Fritz, P.; Smith, D. G. W.** The isotopic composition of secondary dolomites: Geochim. et Cosmochim. Acta, v. 34, no. 11, p. 1161-1173, illus., tables, 1970.
- 00414 **Fritz, T. C.; Thurston, R. N.** Extrapolation formula for finding the volume of solids at high pressures: Jour. Geophys. Research, v. 75, no. 8, p. 1557-1569, illus., 1970.
- Fritz, W. H.** See Norford, B. S. 04100
- 05550 **Fritz, W. H.; Kindle, C. H.; Lespérance, P. J.** Trilobites and stratigraphy of the Middle Cambrian Corner-of-the-Beach Formation, eastern Gaspé Peninsula, Quebec [with French abs.], in Contributions to Canadian paleontology: Canada Geol. Survey Bull. 187, p. 43-58, illus., 1970.
- 06593 **Fritz, Thomas Otto.** Man and the minerals of construction — How they interrelate in the seven counties of southwestern Wisconsin [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 719B, 1970.
- 03950 **Froelich, Albert J.** Field trip No. 1, Geologic features of southeastern Kentucky — Pt. 1, Landslide geology along south slope of Pine Mountain, Pineville to Harlan, in Guidebook for field trips — Geol. Soc. America, Southeastern Sec., 18th Ann. Mtg., Lexington, Ky., 1970: Lexington, Ky., Kentucky Geol. Survey, p. 5-11, illus., 1970.
- 09928 **Froelich, Larry L.** Ground water in the St. John area, Rolette County, North Dakota: North Dakota Water Comm., North Dakota Ground-Water Studies, no. 67, 33 p. illus., tables, 1967.
- 09930 **Froelich, Larry L.** Ground-water survey of the Tolley area, Renville County, North Dakota: North Dakota Water Comm., North Dakota Ground-Water Studies, no. 69, 30 p., illus., table, 1968.
- 06634 **Froese, E.** Calculated phase relations in the system  $\text{CaCO}_3\text{-SrCO}_3$ : Canadian Mineralogist, v. 10, pt. 4, p. 665-676, illus., table, 1970.
- 08079 **Froese, E.** Chemical petrology of some pelitic gneisses and migmatites from the Thor-Odin area, British Columbia: Canadian Jour. Earth Sci., v. 7, no. 1, p. 164-175, illus., tables, 1970.
- Frohlich, H.** See McNary, J. F. 03708
- 10374 **Frohlich, H.; McNary, J. F.** A hydrodynamically actuated deep sea hard rock corer: Marine Technology Soc. Jour., v. 3, no. 3, p. 53-60, illus., 1969.
- Fromm, J. E.** See Street, R. L. 06655

- 02747 **Fronde1, Clifford.** Early mineral collections in New England: *Mineralog. Rec.*, v. 1, no. 1, p. 6-10, illus., 1970.
- 04144 **Fronde1, Clifford.** New minerals from New England: *Mineralog. Rec.*, v. 1, no. 2, p. 46-53, illus., table, 1970.
- 06517 **Fronde1, Clifford.** Scandium-rich minerals from rhyolite in the Thomas Range, Utah: *Am. Mineralogist*, v. 55, nos. 5-6, p. 1058-1060, table, 1970.
- 09101 **Fronde1, Clifford.** Colloform hydrothermal muscovite ("Chacaltaita"): *Am. Mineralogist*, v. 55, nos. 7-8, p. 1437-1440, illus., table, 1970.
- 09051 **Fronde1, Judith W.; Wickman, Frans E.** Molybdenite polytypes in theory and occurrence — [Pt.] 2, Some naturally-occurring polytypes of molybdenite: *Am. Mineralogist*, v. 55, nos. 11-12, p. 1857-1875, illus., 1970.
- 10798 **Frost, Jack G.** Edwards Limestone of central Texas, in *Comanchean (lower Cretaceous) stratigraphy and paleontology of Texas* (Leo Hendricks, editor); *Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub.*, no. 67-8, p. 132-156, illus., 1967.
- Frost, Robert E.** See Rinker, Jack N. 08236
- Frost, Stanley.** See Peters, Walter G. 01096
- 09839 **Frye, J. C. Dr. J. C.** Frye urges environmental approach to geological discipline: *Rock Products*, v. 73, no. 6, p. 72-73, illus., 1970.
- Frye, John C.** See Willman, H. B. 05818
- 06985 **Frye, John C.; Willman, H. B.** Climatic history interpreted from Lake Michigan lobe deposits and soils [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 556, 1970.
- 08704 **Frye, John C.** The Ogallala Formation — A review, in *Ogallala Aquifer Symposium*, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, p. 5-14, illus., 1970.
- 09469 **Frye, John C.** Geological information for managing the environment, in *Limitations of the earth, a compelling focus for geology* (Texas Univ. Austin Bur. Econ. Geology) - A symposium held at the dedication of the new Geology Building, Austin Tex., 1967, Proc.: *Texas Quart.*, v. 11, no. 55-68, reprinted 1968; originally published 1967.
- 09728 **Frye, John C.; Willman, H. B.** Rock stratigraphy in the Illinois Pleistocene, in *Tri-State Geol. Field Conf., 34th Ann., 1970, Guidebook* (I. E. Odom and M. P. Weiss, editors): De Kalb, Ill., Northern Illinois Univ. Dept. Geology, p. 60-64, illus., 1970.
- 06842 **Fryer, R.; Titulaer, C.** Counts of small craters in the southern lunar highlands: *Earth and Planetary Sci. Letters*, v. 9, no. 1, p. 6-9, illus., tables, 1970.
- 06276 **Fryxell, Roald; Anderson, Daniel; Carrier, David; Greenwood, William; Heiken, Grant.** Apollo 11 drive-tube core samples, an initial physical analysis of lunar surface sediment, in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc.* — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 2121-2126, illus., tables, reprinted 1970.
- 10117 **Fryxell, Roald.** (and others). A human skeleton from sediments of mid-Pinedale age in southeastern Washington: *Am. Antiquity*, v. 33, no. 4, p. 511-515, illus., 1968.
- 05243 **Fuhrboter, Alfred.** Formation of dunes and antidunes in open channels — Discussion [of paper 7056 by Taizo Hayashi, 1970]: *Am. Soc. Civil Engineers Proc.*, v. 96, Jour. Hydraulics Div., no. HY 11, p. 2385-2388, illus., 1970.

- 01912 **Fujisawa, Hideyuki.** Elastic properties of polycrystalline olivine [abs.]: EOS, v. 51, no. 4, p. 418, 1970.
- 05309 **Funkhouser, J. G.; Schaeffer, O. A.; Bogard, D. D.; Zahringer, J.** Gas analysis of the lunar surface, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1111-1116, illus., table, 1970.
- Fukunaga, Osamu.** See Yamaoka, Shinobu. 10430
- Fullagar, P. D.** See Bottino, M. L. 06128
- 00703 **Fullagar, Paul D.; Bottino, Michael L.** Weathering's effect on Rb-Sr whole-rock ages [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 210-211, table, 1970.
- Fullagar, Paul D.** See Bottino, Michael R. 01741
- 04866 **Fullagar, Paul D.; Bottino, Michael L.** Sulfide mineralization and rubidium-strontium geochronology at Ore Knob, North Carolina, and Ducktown, Tennessee: Econ. Geology, v. 65, no. 5, p. 541-550, illus., tables, 1970.
- 06986 **Fullagar, Paul D.** Age and origin of plutonic intrusions in the Piedmont of the southeastern Appalachians [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 556-557, 1970.
- Fullagar, Paul D.** See Oclom, A. Leroy. 09699
- 03256 **Fullam, Timothy Jewell.** The measurement of bedload from sandwave migration in Bonneville Reservoir on the Columbia River [abs.]: Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 5099B, 1970.
- 00082 **Fuller, Brent D.; Ward, Stanley H.** Linear system description of the electrical parameters of rocks: IEEE Trans. Geosci. Electronics, v. GE-8, no. 1, p. 7-18, illus., 1970.
- Fuller, John.** See Hays, James D. 01429
- 01762 **Fuller, M.** Eastward continuation of elements of the fracture pattern of the east Pacific [abs.]: EOS, v. 51, no. 4, p. 430, 1970.
- Fuller, M.** See Ito, H. 06547
- Fuller, M.** See Dunn, J. 10487
- 02183 **Fuller, Michael; Lowrie, W.** Comments on paper by P. N. Shive, "The effect of internal stress on the thermoremanence of nickel" [1969]: Jour. Geophys. Research, v. 75, no. 14, p. 2781-2783, illus., 1970.
- 09758 **Fuller, Michael D.** Geophysical aspects of paleomagnetism: CRC Critical Rev. Solid State Sci., v. 1, p. 137-219, illus., tables, 1970.
- Fuller, P. G.** See Ford, D. C. 01726
- Fulrath, Richard M.** See Nicholson, Patrick S. 10421
- Fulrath, Richard M.** See Nicholson, Patrick S. 10422
- 03122 **Fuls, P. F.; Rodrique, L.; Fripiat, J. J.** Iron alkoxide obtained by reacting iron oxides with glycerol [with French, German and Russian abs.]: Clays and Clay Minerals, v. 18, no. 1, p. 53-62, illus., tables, 1970.
- 10221 **Funder, Svend.** Notes on the glacial geology of eastern Milne Land, Scoresby Sund, East Greenland, *in* Report on the 1969 geological expedition to Scoresby Sund, East Greenland: Grönlands Geol. Undersøgelse Rap. 30, p. 37-41, illus., 1970.

- 00963 **Funk, Robert E.; Fisher, Donald W.; Reilly, Edgar M., Jr.** Caribou and Paleo-Indian in New York State — A presumed association: *Am. Jour. Sci.*, v. 268, no. 2, p. 181-186, illus., 1970.
- Funkhouser, J.** See Turekian, K. K. 01700
- 05691 **Funkhouser, J. G.; Schaeffer, O. A.; Bogard, D. D.; Zahringer, J.** Gas analysis of the lunar surface, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1111-1116, illus., table, 1970.
- Funkhouser, J. G.** See Schaeffer, O. A. 06437
- 05422 **Funkhouser, John W.** Geology in the community college [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 133, 1970.
- 05423 **Funkhouser, John W.** The significance of iron sulfides in sediments [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 133, 1970.
- Funnell, Brian M.** See Saito, Tsunemasa. 09989
- 06330 **Furer, Lloyd C.** Petrology and stratigraphy of nonmarine Upper Jurassic-Lower Cretaceous rocks of western Wyoming and southeastern Idaho: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2282-2302, illus., 1970.
- 10425 **Furgerson, Robert Bernard.** A controlled-source telluric current technique and its application to structural investigations: *Mines Mag.*, v. 60, no. 6, p. 13-14, illus., 1970.
- 02505 **Furman, Marvin J.; Karner, Frank R.** Description of authigenic analcite in the Golden Valley Formation(?), southwestern North Dakota [abs.]: *North Dakota Acad. Sci. Proc.*, v. 24, pt. 1, p. 11, 1970.
- Furnish, W. M.** See Nassichuk, W. W. 01214
- Furnish, W. M.** See Spinosa, Claude. 03539
- Furumoto, A. S.** See Weaver, P. F. 03158
- Furumoto, A. S.** See Woodcock, A. H. 03162
- 04925 **Furumoto, A. S.; Campbell, J. F.; Hussong, D. M.** Seismic studies of subsurface structure in the Ewa Coastal Plain, Oahu, Hawaii: *Pacific Sci.*, v. 24, no. 4, p. 529-542, illus., tables, 1970.
- Furumoto, A. S.** See Adams, W. M. 06643
- 06644 **Furumoto, A. S.** Ionospheric recordings of Rayleigh waves for estimating source mechanisms, *in* Tsunamis in the Pacific Ocean — Internat. Symposium on Tsunamis and Tsunami Research, Honolulu, Hawaii, 1969, Proc.: Honolulu, Hawaii, East-West Center Press, p. 119-133, illus., table, 1970.
- 04777 **Fuselier, George R.** Ridge Field, Lafayette Parish, Louisiana, *in* Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 25-25c, illus., 1970.
- Fusil, G.** See Colmet-Daage, F. 05900
- Fuson, Michael L.** See Conkin, James E. 03536
- 02276 **Futrell, Darryl.** Some notes on tektites: *Gems and Minerals*, no. 394, p. 22-25, 44-46, illus., reprinted 1970; originally published 1967.
- Fyfe, William S.** See Verhoogen, John. 03811



**Fyles, J. G.** See Mathews, W. H. 07694

- 03279 **Fyles, James T.** Structure of the Shuswap metamorphic complex in the Jordan River area, northwest of Revelstoke, British Columbia, *in* Structure of the southern Canadian Cordillera: Geol. Assoc. Canada Spec. Paper 6, p. 87-98, illus., table, geol. map, 1970.

**Fyles, James T.** See Society of Economic Geologists. 04909

- 04912 **Fyles, James T.** Geologic setting of the lead-zinc deposits in the Kootenay Lake and Salmo areas of British Columbia, [Chap.] 4 *in* Lead-zinc deposits in the Kootenay Arc, northeastern Washington and adjacent British Columbia — Soc. Econ. Geologists, 1970 Northwest Field Conf. Guidebook: Washington Div. Mines and Geology Bull. 61, p. 41-53, illus., table, 1970.

- 06693 **Fyles, James T.** The Jordan River area near Revelstoke, British Columbia — A preliminary study of lead-zinc deposits in the Shuswap Metamorphic Complex: British Columbia Dept. Mines and Petroleum Resources Bull. 57, 64 p., illus., tables, geol. maps, 1970.

- 03015 **Fyson, W. K.** Structural relations in metamorphic rocks, Shuswap Lake area, British Columbia, *in* Structure of the southern Canadian Cordillera: Geol. Assoc. Canada Spec. Paper 6, p. 107-122, illus., tables, 1970.

**Gaal, Robert A.** See Inouye, George T. 06859

- 08160 **Gabelman, J. W.** Metallotectonic control of uranium distribution, *in* Uranium exploration geology — Panel on uranium exploration geology, Vienna, 1970, Proc.: Vienna, Austria, Internat. Atomic Energy Agency, p. 187-204, incl. discussion, illus., 1970.

- 08163 **Gabelman, J. W.** Speculations on the uranium ore fluid, *in* Uranium exploration geology — Panel on uranium exploration geology, Vienna, 1970, Proc.: Vienna, Austria, Internat. Atomic Energy Agency, p. 315-330, incl. discussions, tables, 1970.

- 05858 **Gable, D. J.; Sims, P. K.; Weiblen, P. W.** Thermal metamorphism of cordierite-garnet-biotite gneiss, Front Range, Colorado: Jour. Geology, v. 78, no. 6, p. 661-685, illus., tables, 1970.

**Gabrielse, H.** See Douglas, R. J. W. 07974

- 07205 **Gabrysch, R. K.; McAdoo, Gene D.; Bonnet, C. W.** Records of water-level measurements in wells in Galveston County, Texas, 1894-1969: Texas Water Devel. Board Rept. 123, 100 p., illus., table, 1970.

- 08031 **Gabrysch, R. K.; Bonnet, C. W.; Naftel, W. L.** (compilers). Records of water-level measurements in wells in Harris County, Texas, 1966-69: Texas Water Devel. Board Rept. 122, 65 p., illus., table, 1970.

- 01652 **Gaede, Verne F.** Prado-Corona oil field: California Oil Fields — Summ. Operations 1969, v. 55, no. 1, p. 23-29, illus., tables, 1970.

- 05816 **Gafarov, R. A.** Glubinnaya tektonika i tipy magnitnykh poley drevnikh platform severnykh materikov Zemli [Deep tectonics and types of magnetic fields in the old platforms of the northern continents of the Earth]: Geotektonika 1970, no. 4, p. 33-42, illus., 1970.

- 06987 **Gaffey, Michael J.; Carman, John H.** A new graphical representation for the chemical evolution of the igneous rocks [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 557, 1970.

- 02817 **Gaffney, Edward S.; Ahrens, Thomas J.** Stability of mantle minerals from lattice calculations and shock wave data, *in* Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969, Proc.: Physics Earth and Planetary Interiors, v. 3, p. 205-212, illus., tables, 1970.

- Gaffney, Edward S.** See Ahrens, Thomas J. 10584
- Gaffney, Eugene S.** See Olsson, Richard K. 00171
- 07375 **Gaffney, Eugene Spencer.** The North American baenoid turtles and the cryptodire-pleurodire dichotomy [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2155B, 1970.
- 07204 **Gage, Bard O.** Experimental dunes of the Texas coast: U.S. Army Corps Engineers Coastal Eng. Research Center Misc. Paper 1-70, 30 p., illus., table, 1970.
- 05023 **Gage, Maxwell.** The tempo of geomorphic change: Jour. Geology, v. 78, no. 5, p. 619-625, 1970.
- Gagnon, P. M.** See Fitzgerald, J. D. 02617
- Gagnon, Paul M.** See Fitzgerald, J. D. 09076
- 08571 **Gahr, William N.** Approaches to prevention of water pollution, in Governor's Conf. on Environmental Geology: Colorado Geol. Survey Spec. Pub., no. 1, p. 42-49, illus. [1970?].
- Gaines, A. F.** See Buravas, S. 04368
- 04212 **Gaines, Richard V.** The Moctezuma tellurium deposit: Mineralog. Rec., v. 1, no. 2, p. 40-43, illus., table, 1970.
- Gair, J. E.** See Cannon, W. F. 04464
- 04692 **Gair, J. E.; Simmons, G. C.** Metadiabase sills in Negaunee Iron-Formation south of Negaunee, Michigan, in Changes in stratigraphic nomenclature by the U.S. Geological Survey, 1969: U.S. Geol. Survey Bull. 1324-A, p. A24-A30, illus., 1970.
- 05647 **Gair, Jacob E.** Marquette Range field trip guidebook, in Geol. Soc. America field trip to Marquette Iron Range, Michigan, Nov. 1970: [n.p.] 27 p., paged separately, illus., 1970.
- Gait, R. I.** See Mandarino, J. A. 06639
- 06640 **Gait, R. I.; Mandarino, J. A.** Polytypes of tungstenite: Canadian Mineralogist, v. 10, pt. 4, p. 729-731, table, 1970.
- Galabova, Iliana M.** See Kerr, I. S. 05940
- 06766 **Galbraith, Frederic W.; Brennan, Daniel J.** Minerals of Arizona (4th edition): Arizona Bur. Mines Bull. 181, 116 p., 1970; originally published 1949.
- 07689 **Gale, L. A.** Geodetic observations for the detection of vertical crustal movement, in Symposium on recent crustal movements, Ottawa, Canada, 1969, Papers: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 2, p. 602-606, illus., tables, 1970.
- 10775 **Gale, L. A.; Klinkenberg, H.** Geodesy, in Background papers on the earth sciences in Canada (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 231-233, 1970.
- Gallagher, James.** See Lewis, Lloyd. 09482
- 00897 **Gallagher, John J.; Sowers, George M.; Friedman, Melvin.** Photomechanical model studies relating to fracture in granular rock aggregates [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 285, 1970.
- Gallagher, M. J.** See Dunham, K. C. 10208

- 04780 **Gallaspy, I. L.** West Lake Verret Field, St. Martin Parish, Louisiana, *in* Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 30g30d, illus., 1970.
- 02833 **Gallimore, Robert G., Jr.; Lettau, Heinz H.** Topographic influence on tornado tracks and frequencies in Wisconsin and Arkansas: Wisconsin Acad. Sci., Arts and Letters Trans. 1970, v. 58, p. 101-127, illus., tables, 1970.
- 05021 **Galloway, R. W.** Coastal and shelf geomorphology and late Cenozoic sea levels: Jour. Geology, v. 78, no. 5, p. 603-610, illus., 1970.
- 04664 **Galloway, Robert W.** The full-glacial climate in the southwestern United States: Assoc. Am. Geographers Annals, v. 60, no. 2, p. 245-256, illus., tables, 1970.
- Galloway W. E.** See Fisher, W. L. 07329
- 09741 **Gallup, Ronald W.** Eastern tourmaline: Rocks and Minerals, v. 45, no. 3, p. 155-157, illus., 1970.
- 02089 **Galton, Peter M.** The posture of hadrosaurian dinosaurs: Jour. Paleontology, v. 44, no. 3, p. 464-473, illus., tables, 1970.
- 03870 **Galton, Peter M.** Ornithischian dinosaurs and the origin of birds: Evolution, v. 24, no. 2, p. 448-462, illus., 1970.
- 02548 **Gamble, E. E.; Daniels, R. B.; Nettleton, W. D.** Geomorphic surfaces and soils in the Black Creek Valley, Johnston County, North Carolina: Soil Sci. Soc. America Proc., v. 34, no. 2, p. 276-281, illus., 1970.
- 02577 **Gamble, E. E.; Daniels, R. B.; McCracken, R. J.** A2 horizons of Coastal Plain soils, pedogenic or geologic origin: Southeastern Geology, v. 11, no. 3, p. 137-152, illus., tables, 1970.
- Gamble, E. E.** See Daniels, R. B. 03935
- Gamble, E. E.** See Daniels, R. B. 03990
- Gamble, J. C.** See Hendron, A. J., Jr. 09315
- Gamble, James C.** See Wanless, H. R. 06708
- 04361 **Gamer, Robert L.** Geology of the Klamath Mountains campout: Geol. Soc. Oregon Country News Letter, v. 36, no. 9, p. 66-72, illus., 1970.
- 05679 **Ganapathy, R.; Keays, Reid R.; Anders, Edward.** Apollo 11 lunar samples — Trace element analysis of a core and the uniformity of the regolith: Science, v. 170, no. 3957, p. 533-535, table, 1970.
- 05692 **Ganapathy, R.; Keays, Reid R.; Laul, J. C.; Anders, Edward.** Trace elements in Apollo 11 lunar rocks — Implications for meteorite influx and origin of Moon, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1117-1142, illus., tables, 1970.
- Ganapathy, R.** See Laul, J. C. 06854
- 06213 **Gandhi, S. S.** Petrology of the Monteregian intrusions of Mount Yamaska, Quebec, *in* Alkaline rocks, the Monteregian Hills — Symposium, Montreal, 1969, Proc.: Canadian Mineralogist, v. 10, pt. 3, p. 452-484, illus., tables, 1970.
- Gangadharam, Eswara V.** See Morrison, George H. 05710

- 06625 **Gangi, A. F.** Dynamic analysis of a small laser strainmeter, *in* Laser applications in the geosciences (J. Gauger and F. F. Hall, Jr., editors) — Symposium, Huntington Beach, Calif., 1969, Proc.: North Hollywood, Calif., Western Periodicals Co., p. 185-202, illus., 1970.
- 01442 **Gangi, Anthony F.** A derivation of the seismic representation theorem using seismic reciprocity: Jour. Geophys. Research, v. 75, no. 11, p. 2088-2095, illus., 1970.
- 09976 **Gangi, Anthony F.** Error analysis of a laser strainmeter, *in* Earthquake displacement fields and the rotation of the Earth (I. Mansinha, D. E. Smylie, A. E. Beck, editors) - NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 217-229, illus., 1970.
- 11024 **Gangloff, Pierre.** Structures de gélisols reliques dans la région de Montréal [structures of relict gelsols in the Montreal region (with English and Russian abs.)]: Rev. Géographie Montréal, v. 24, no. 3, p. 241-253, illus., table, 1970.
- Ganow, H. C.** See Hayes, A. W. 05429
- 06837 **Gans, Carl.** Respiration in early tetrapods — The frog is a red herring: Evolution, v. 24, no. 4, p. 723-734, illus., 1970.
- 07923 **Gans, William Thomas.** The detailed stratigraphy of the Goodsprings Dolomite, southwestern Nevada-California [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3479B-3480B, 1970.
- Gantnier, Robert F.** See Tourtelot, Harry A. 00648
- Gaponenko, G. I.** See Dementitskaya, R. M. 10030
- 08453 **Garcia Gutierrez, Carlos; Machado Martinez, Luis.** El zoneamiento en los depositos minerales de La Paz, S.L.P. [Mineral deposit zones of La Paz, San Luis Potosi]: Geologia y Metalurgia, v. 5, no. 32, p. 28-32, illus., 1970.
- Garcia, John.** See Sommer, Michael A. 00366
- 08577 **Garcia, Trinidad.** Los mineros mexicanos, 3d edition (Jose A. Garcia, editor): Mexico, D.F., Editorial Porrúa S.A., 386 p., illus., tables, 1970.
- 04808 **Garcia-Bengochea, Jose I.; Vernon, Robert O.** Deep well disposal of waste waters in saline aquifers of south Florida, *in* Saline water symposium: Water Resources Research, v. 6, no. 5, p. 1454-1470, illus., table, 1970.
- Gard, J. A.** See Kerr, I. S. 05940
- Gard, L. M., Jr.** See Carr, W. J. 04690
- 00523 **Gard, Theodore Max.** Tectonics of the Badwater uplift area, central Wyoming [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3239B-3240B, 1970.
- 02174 **Gardner, J.** Geomorphic significance of avalanches in the Lake Louise area, Alberta, Canada: Arctic and Alpine Research, v. 2, no. 2, p. 135-144, illus., tables, 1970.
- 03081 **Gardner, J.** Rockfall, a geomorphic process in high mountain terrain: Albertan Geographer, no. 6, p. 15-20, tables, 1970.
- 06907 **Gardner, James.** A note on the supply of material to debris slopes: Canadian Geographer, v. 14, no. 4, p. 369-372, illus., 1970.
- 00704 **Gardner, L. R.** A chemical model for the origin of gibbsite from kaolinite [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 211, 1970.

- 09094 **Gardner, Leonard Robert.** A chemical model for the origin of gibbsite from kaolinite: *Am. Mineralogist*, v. 55, nos. 7-8, p. 1380-1389, illus., tables, 1970.
- Gardner, Richard A.** See Weigle, James M. 01607
- Gardner, W. R.** See Hillel, D. 02858
- Gardner, W. R.** See Keeney, Dennis R. 09514
- Garland, G. D.** See Mabey, D. 02941
- 02397 **Garlick, G. D.; Dymond, J. R.** Oxygen isotope exchange between volcanic materials and ocean water: *Geol. Soc. America Bull.*, v. 81, no. 7, p. 2137-2141, illus., tables, 1970.
- Garlick, G. F.** See Brenden, B. B. 04782
- Garman, R. Keith.** See Ferguson, Carl C. 08186
- 08357 **Garman, R. Keith; Ferguson, Carl C.** Geologic map of the Buchanan quadrangle, Tennessee: Tennessee Div. Geology Geol. Map GM 19-NW, scale 1:24,000, separate text, 1970.
- Garner, L. E.** See McGowen, J. H. 03136
- Garner, L. E.** See Rodda, Peter U. 06375
- Garner, L. Edwin.** See Brown, L. F., Jr. 07039
- Garrels, Robert M.** See Mackenzie, Fred T. 02649
- Garret, Peter.** See Ginsburg, Robert N. 10328
- 04648 **Garrett, Donald E.** The chemistry and origin of potash deposits, *in* Third symposium on salt, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 211-222, illus., 1970.
- 02619 **Garrett, Peter.** Deposit feeders limit development of stromatolites [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 848, 1970.
- Garrett, Peter.** See Smith, Donald L. 02684
- 02793 **Garrett, Peter.** Phanerozoic stromatolites, noncompetitive ecologic restriction by grazing and burrowing animals: *Science*, v. 169, no. 3941, p. 171-173, illus., table, 1970.
- Garrett, R. G.** See Boyle, R. W. 01697
- Garrett, R. G.** See Nichol, Ian. 04870
- 01707 **Garrison, C. J.** Flow rates in two-dimensional, unsteady, confined groundwater flow — Discussion [of paper 6451 by B. W. Hunt, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, Jour. Hydraulics Div., no. HY 1, p. 286-288, 1970.
- 00100 **Garrison, Louis E.** Development of continental shelf south of New England: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 1, p. 109-124, illus., table, 1970.
- 00898 **Garrison, Louis E.; Berryhill, Henry L., Jr.** Possible seaward extension of the San Marcos arch [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 285-286, 1970.
- Gartner, Stefan.** See Cita, Maria B. 01348
- 03080 **Gartner, Stefan, Jr.** Sea-floor spreading, carbonate dissolution level, and the nature of horizon A: *Science*, v. 169, no. 3950, p. 1077-1079, illus., 1970.

- 07150 **Gartner, Stefan, Jr.** Coccolith age determinations Leg 5, Deep Sea Drilling Project, Chap. 19, in Initial reports of the Deep Sea Drilling Project — V. 5, Leg 5 of cruises of *Glomar Challenger*, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office, p. 495-500, 1970.
- 03257 **Garvin, Paul Lawrence.** Phase relations in the Pb-Sb-S system [abs.]: Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 5100B, 1970.
- Gasch, Jerrie W.** See Geological Society of Sacramento. 03951
- 00831 **Gaskell, T. F.** Physics of the Earth: New York, Funk and Wagnalls, 216 p., illus., 1970.
- Gasparini, E. L.** See Naldrett, A. J. 04413
- Gasparini, Paolo.** See Adams, John A. S. 07859
- Gassaway, J. D.** See Andersen, N. R. 03996
- 08548 **Gassaway, John D.** Mineral and chemical composition of sediments from the Straits of Florida: Jour. Sed. Petrology, v. 40, no. 4, p. 1136-1146, illus., tables, 1970.
- Gast, P. W.** See Kay, R. 00411
- 05693 **Gast, P. W.; Hubbard, N. J.; Wiesmann, H.** Chemical composition and petrogenesis of basalts from Tranquillity Base, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1143-1163, illus., tables, 1970.
- Gast, Paul W.** See Oversby, Virginia M. 01508
- Gast, Paul W.** See Kay, Robert. 01787
- Gast, Paul W.** See Sayyah, Taha. 02282
- 02819 **Gast, Paul W.** Dispersed elements in oceanic volcanic rocks [abs.], in Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969, Proc.: Physics Earth and Planetary Interiors, v. 3, p. 246, 1970.
- Gast, Paul W.** See Hubbard, Norman J. 06849
- Gast, R. G.** See Klobe, W. D. 07430
- 00266 **Gastil, Gordon; Krummenacher, Daniel.** Reconnaissance potassium-argon dates for Cenozoic volcanic rocks in the State of Baja California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 92-93, 1970.
- Gastil, Gordon.** See Krummenacher, Daniel. 00299
- Gastil, R. G.** See Peterson, G. L. 02995
- 10326 **Gastil, R. Gordon.** The new geologist [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 741-742, 1970.
- 05424 **Gates, D. L.** Species diversity in statistical stratigraphic analysis [abs.]: Virginia Jour. Sci., v. 21, no. 3, p. 133, 1970.
- 05581 **Gates, George O.** Earthquake hazards, in Geologic hazards and public problems (R. A. Olson and M. M. Wallace, editors) — [U.S.] Office Emergency Preparedness, Region 7, Conf., San Francisco, Calif., 1969, Proc.: Washington, D.C., U.S. Govt. Printing Office, p. 19-52, illus. [1970].

- 08370 **Gates, J. S.; Keller, O. A.** Ground water in Tooele Valley, Utah: Utah Dept. Nat. Resources Water Circ., no. 2, 15 p., illus., table, 1970.
- 10676 **Gates, Robert M.; Martin, Charles W.; Cassie, Robert M.** The bedrock geology of the Waterbury and Thomaston quadrangles, Trip D-5 in Guidebook for field trips in Connecticut — New England Intercollegiate Geol. Conf., 60th Ann. Mtg., New Haven, Conn., 1968: Connecticut Geol. and Nat. History Survey Guidebook 2, 12 p., paged separately, illus., 1968.
- 08604 **Gates, William G.** Geology and geological aids to production at the Heath Steele mine, in *AIIME world symposium on mining and metallurgy of lead and zinc*, St. Louis, Missouri, 1970 [Proc.] — V. 1, Mining and concentrating of lead and zinc: New York, Am. Inst. Mining, Metallurgical, and Petroleum Engineers, p. 108-122, illus., table, 1970.
- 07763 **Gatewood, Lloyd E.** Oklahoma City field — Anatomy of a giant, in *Geology of giant petroleum fields — Symposium, AAPG, 53d Ann. Mtg., Oklahoma City, Okla., 1968*: Am. Assoc. Petroleum Geologists Mem. 14, p. 223-254, illus., tables, 1970.
- 10119 **Gatewood, Lloyd E.** Oklahoma — Arbuckle carbonate offers great future: *Independent Petroleum Monthly*, v. 40, no. 5, p. 20-22, illus., 1969.
- 04297 **Gaucher, Edwin; Saint-Amant, Marcel.** Evaluation of E.M. anomalies at SOQUEM: *Canadian Mining and Metall. Bull.*, v. 63, no. 697, p. 567-572, illus., 1970.
- 01548 **Gaudette, Henri E.; Anderson, Franz E.** Possible sources of error in particulate matter analysis using silver filters: *Jour. Sed. Petrology*, v. 40, no. 1, p. 462-464, illus., 1970.
- Gauger, J.** See Slade, D. V. 03088
- 06622 **Gauger, J.; Hall, F. F., Jr.** (editors). Laser applications in the geosciences — Symposium, Huntington Beach, Calif., 1969, Proc.: North Hollywood, Calif., Western Periodicals Co., 283 p., illus., tables, 1970.
- Gauger, J.** See Slade, D. V. 06624
- 05097 **Gault, Donald E.** Saturation and equilibrium conditions for impact cratering on the lunar surface — Criteria and implications, in *Symposium on planetary atmospheres and surfaces*, Woods Hole, Mass., 1969: *Radio Sci.*, v. 5, no. 2, p. 273-291, illus., 1970.
- 00550 **Gauri, K. L.; Boucot, A. J.** *Cryptothyrella* (Brachiopoda) from the Brassfield Limestone (Lower Silurian) of Ohio and Kentucky: *Jour. Paleontology*, v. 44, no. 1, p. 125-132, illus., 1970.
- 10327 **Gauri, K. L.** The origin of the prismatic layer of certain articulate brachiopods [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 742-744, 1970.
- Gauri, K. Lal.** See Boucot, Arthur J. 08184
- Gautheyrou J.** See Colmet-Daage, F. 05900
- Gautheyrou, M.** See Colmet-Daage, F. 05900
- 11224 **Gautier, T. Gary.** Interpretive morphology and taxonomy of bryozoan genus *Tabulipora*: *Kansas Univ. Paleontological Contr.*, Paper 48, 21 p., illus., 1970.
- Gavin, James E.** See Blackstock, Charles G. 10376
- Gavish, Eliezer.** See Friedman, Gerald M. 00155

- 02845 **Gawarecki, Stephen J.** Infrared survey of the Pisgah Crater area, San Bernardino County, California — A geologic interpretation, *in* Earth resources aircraft program status review, NASA, Houston, 1968 — V. 1, Geology, geography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 10-1 — 10-38, illus., table [1970].
- Gawarecki, Stephen J.** See *Braddock, William A.* 04507
- Gawarecki, Stephen J.** See *Braddock, William A.* 06415
- 09294 **Gawarecki, Stephen J.** Geologic interpretation of Apollo 6 stereophotography from Baja California to west Texas, Sec. 15 of Earth Resources Program, 3d ann., review — v. 1, Geology and geography: Houston, Tex., NASA Manned Spacecraft Center, Msc-03742, p. 15-1 — 15-25, illus., 1970.
- Gawthrop, J. A.** See *Holland, H. J.* 09320
- 05013 **Gay, N. C.** The formation of step structures on slickensided shear surfaces: *Jour. Geology*, v. 78, no. 5, p. 523-532, illus., 1970.
- 06845 **Gay, P.; Bown, M. G.; Rickson, K. O.** Mineralogical studies of lunar rock 12013,10: *Earth and Planetary Sci. Letters*, v. 9, no. 2, p. 124-126, 1970.
- 02434 **Gay, S. Parker, Jr.** Some applications of geophysics to ground water exploration [abs.]: *Mining Eng.*, v. 22, no. 1, p. 44, 1970.
- Gaymard, R.** See *Poupon, A.* 02208
- Gaymard, R.** See *Poupon, A.* 05903
- Gaymard, R.** See *Poupon, A.* 10657
- 10990 **Geake, J. E.** (and others). Luminescence, electron paramagnetic resonance and optical properties of lunar material from Apollo 11, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc.—v. 3 Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp., 1), p. 2127-2147, illus., 1970.
- 10989 **Gealy, E. L.; Gerard, R. D.** *In situ* petrophysical measurements in the Caribbean, Chap. 11 *in* Initial reports of the Deep Sea Drilling Project — V. 4, Leg 4 of cruises of *Glomar Challenger*, Rio de Janeiro, Brazil, to San Cristobal, Panama, Feb.-Mar. 1969 (R. G. Bader, and others): Washington, D. C., U.S. Govt. Printing Office, p. 267-293, illus., tables, 1970.
- Gebelein, Conrad D.** See *Neumann, A. Conrad.* 01538
- 01554 **Gebelein, Conrad D.** Distribution, morphology, and accretion-rate of recent subtidal algal stromatolites, Bermuda — Reply to comment by [J. H.] Sharp [1970]: *Jour. Sed. Petrology*, v. 40, no. 1, p. 522, 1970.



- 04981 **Gebhart, Ernest J.** Public lands in Ohio: Interstate Oil Compact Comm. Comm. Bull., v. 12, no. 1, p. 26-29, 1970.
- 01226 **Geddes, Richard W.** Geochemical prospecting for mercury in the Terlingua, Texas mining district [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 8, p. 3706B-3707B, 1970.
- Geddes, Wilburt H.** See *Best, David M.* 00675
- 02140 **Gedney, Larry; Matteson, Charles; Forbes, Robert B.** Seismic refraction profiles of the ash flow in the Valley of Ten Thousand Smokes, Katmai National Monument, Alaska: Jour. Geophys. Research, v. 75, no. 14, p. 2619-2624, illus., 1970.
- 06409 **Gedney, Larry.** Tectonic stresses in southern Alaska in relationship to regional seismicity and the new global tectonics: Seismol. Soc. America Bull., v. 60, no. 6, p. 1789-1802, illus., table, 1970.
- Gedney, Larry D.** See *Bufe, Charles G.* 06078
- Gee, Dennis M.** See *Wiegel, Robert L.* 03719
- 09826 **Gees, R. A.; Medioli, F.** Continuous seismic survey of Bermuda — Pt. 2, Harrington Sound: Maritime Sediments, v. 6, no. 3, p. 118-120, illus., 1970.
- 03924 **Gees, Rudolf A.** K-Ar ages of two basalts from Bermuda, in *Geochronology of Phanerozoic orogenic belts — Colloquium, Switzerland, 1969, Papers: Eclogae Geol. Helvetiae*, v. 63, no. 1, p. 93, 1970.
- 04611 **Gees, Rudolph A.; Medioli, Franco.** A continuous seismic survey of the Bermuda Platform — Pt. 1, Castle Harbour: Maritime Sediments, v. 6, no. 1, p. 21-25, illus., table, 1970.
- Gehlen, K. v.** See *Schiller, W.-R.* 04321
- 05742 **Gehrke, Charles W.; Zumwalt, Robert W.; Aue, Walter A.; Stalling, David L.; Duffield, Alan; Kvenvolden, Keith A.; Ponnampertuma, Cyril.** Carbon compounds in lunar fines from Mare Tranquillitatis — [Pt.] 3, Organosiloxanes in hydrochloric acid hydrolysates, in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1)*, p. 1845-1856, illus., 1970.
- Geiss, J.** See *Eberhardt, P.* 05685
- Geldart, L. P.** See *Sharma, Bijon.* 07717
- Geldart, Lloyd P.** See *Gill, Denis E.* 09152
- 00267 **Geldsetzer, Helmut.** Late Cenozoic volcanic cycles in the Pacific Northwest and their tectonic implications [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 93, 1970.
- Gelpi, E.** See *Schneider, H.* 01635
- 01683 **Gelpi, E.; Schneider, H.; Mann, J.; Oró, J.** Hydrocarbons of geochemical significance in microscopic algae: *Phytochemistry*, v. 9, no. 3, p. 603-612, illus., tables, 1970.
- Gelpi, E.** See *Levy, Ram L.* 02737
- 04602 **Gelpi, E.; Han, J.; Noonan, D. W.; Oró, J.** Organic compounds in meteorites — [Pt.] 3, Distribution and identification of aliphatic hydrocarbons produced by open flow Fischer-Tropsch processes: *Geochim. et Cosmochim. Acta*, v. 34, no. 9, p. 965-979, illus., tables, 1970.

- 04603 **Gelpi, E.; Oró, J.** Organic compounds in meteorites — [Pt.] 4, Gas chromatographic-mass spectrometric studies on the isoprenoids and other isomeric alkanes in carbonaceous chondrites: *Geochim. et Cosmochim. Acta*, v. 34, no. 9, p. 981-994, illus., tables, 1970.
- 04604 **Gelpi, E.; Oró, J.** Organic compounds in meteorites — [Pt.] 5, Gas chromatographic-mass spectrometric studies on the isoprenoids and other isomeric alkanes in graphitic nodules of iron meteorites: *Geochim. et Cosmochim. Acta*, v. 34, no. 9, p. 995-1005, illus., tables, 1970.
- 01913 **Gemperle, Michael; Couch, Richard W.** Geophysical investigations of the continental margin off southeast Alaska [abs.]: *EOS*, v. 51, no. 4, p. 316, 1970.
- Gemperle, Michael.** See *Dehlinger, Peter, Couch, R. W. 10005*
- Gemperle, Michael.** See *Couch, Richard. 10565*
- 03079 **Gentry, Robert V.** Giant radioactive halos, indicators of unknown radioactivity?: *Science*, v. 169, no. 3946, p. 670-673, illus., table, 1970.
- 11231 **Geol. Soc. America.** (Rocky Mountain Section). Butte mines, description of geology and road log — Field Trip No. 1: Bozeman, Mont., *Geol. Soc. America, Rocky Mountain Sec.*, 145 p., illus., 1968.
- 02829 **Geol. Soc. America, Rocky Mtn. Sec.; Gries, J. P.** (editor). Guidebook and road logs for 23d Ann. Mtg., Rapid City, S. Dak., 1970: Rapid City, S. Dak., South Dakota School Mines and Technology, Dept. Geology and Geol. Eng., 36 p., illus., 1970.
- 03861 **Geol. Soc. America SE Sec.** Guidebook for field trips, 18th annual meeting, Lexington, Ky., 1970: Lexington, Ky., Kentucky Geol. Survey, 70 p., illus., tables, 1970.
- 02798 **Geol. Soc. America So.-Central Sec.; Berg, Robert R.** (editor). Outcrops of the Claiborne Group in the Brazos Valley, southeast Texas — Guidebook, 4th Ann. Mtg., 1970: [College Station, Tex.] Texas A and M Univ., Dept. Geology, 79 p., illus., 1970.
- Geol. Soc. Puerto Rico.** See *Association Eng. Geologists. 10226*
- 04791 **Geological Society of America; Am. Geological Institute.** Bibliography and index of geology — Cumulative bibliography 1969: Boulder, Colo., *Geol. Soc. America*, 4 vols., 3654 p., 1970.
- 09912 **Geological Society of America.** (north-Central Sec.). A field trip guidebook — 2d Ann. Mtg., 1968: Iowa City Iowa, 128 p., illus. [1968].
- 03951 **Geological Society of Sacramento; Gasch, Jerrie W.; Matthews, Robert A.** (editors). Geologic guide to the Death Valley area, California, annual field trip guidebook, 1970: Sacramento, Calif., *Geol. Soc. Sacramento*, 86 p., illus., geol. map, 1970.
- 09910 **Geological Society Sacramento; Matthews, R. A.; Burnett, J. L.** (editors). Geologic guide to the Lassen Peak, Burney Falls, and Lake Shasta area, California — *Geol. Soc. Sacramento Ann. Field Trip*, 1969: Davis, Calif., Univ. California, Geology Dept., [130] p., illus., tables, geol. maps, 1969.
- Gerard, Jesse T.** See *Morrison, George H. 05710*
- Gerard, R. D.** See *Benson, W. E. 06674*
- Gerard, R. D.** See *Gealy, E. L. 10989*
- Gerard, R. E.** See *Feugere, G. 00194*
- Gerard, R. E.** See *Lucon, C. 03790*

**Gerard, Robert D.** See *Baer, Richard G.* 06657

- 06868 **Gergel, Thomas Joseph.** The regionalization of tidal marshes along the eastern coast of the United States [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 1, p. 244B, 1970.
- 05361 **Gerhard, Lee C.; Chase, Ronald B.; Lewis, John H.** Second day's road log — Canon City, Fairplay and Breckenridge, in *Dakota and related rocks of the Front Range — Guidebook issue: Mtn. Geologist*, v. 7, no. 3, p. 228-242, illus., 1970.
- 02525 **Gerken, A. N.** Depositional environment of the upper member of the Niobrara Chalk in northeastern Nebraska [abs.]: *Nebraska Acad. Sci. Proc., 80th Ann. Mtg.*, p. 33-34, 1970.
- 08368 **Gerlach, Arch C.** Pan American Institute of Geography and History, PAIGH: Organization Am. States Specialized Organizations Pub., no. 315, 73 p., 1970.
- 05385 **Gernant, Robert E.** Paleoecology of the Choptank Formation (Miocene) of Maryland and Virginia: Maryland Geol. Survey Rept. Inv. 12, 90 p., illus., tables, 1970.
- 07504 **Gersper, P. L.; Holowaychuk, N.** Effects of stemflow water on a Miami soil under a beech tree — [Pt.] 1, Morphological and physical properties; [Pt.] 2, Chemical properties: *Soil Sci. Soc. America Proc.*, v. 34, no. 5, p. 779-794, illus., tables, 1970.
- 03716 **Gessler, Johannes.** Self-stabilizing tendencies of alluvial channels: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7263, *Jour. Waterways and Harbors Div.*, no. WW 2, p. 235-249, illus., table, 1970.

**Gettrust, J.** See *Lewis, B. R. T.* 00305

- 01227 **Gevirtz, Joel L.** Paraecology of benthonic Foraminifera and associated microorganisms of the continental shelf off Long Island, New York [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 8, p. 3707B, 1970.
- 02405 **Geyer, Alan R.; Shirk, William R.** Pennsylvania's secondary school earth science course, ten years of progress: *Jour. Geol. Education*, v. 18, no. 3, p. 118-121, illus., tables, 1970.
- 06679 **Geyer, Alan R.** Geology, mineral resources and environmental geology of the Palmyra quadrangle, Lebanon and Dauphin Counties: *Pennsylvania Geol. Survey Atlas A 157d*, 46 p., illus., tables, geol. map, 1970.
- 04373 **Geyer, Richard G.** Effect of subsurface geologic structure in electromagnetic induction prospecting: *Mines Mag.*, v. 60, no. 6, p. 7-8, illus., 1970.
- 09377 **Geyer, Robert L.** The VIEROSEIS<sup>R</sup> system of seismic mapping: *Canadian Soc. Explor. Geophysicists Jour.*, v. 6, no. 1, p. 39-57, illus., 1970.
- 09738 **Geyne, A. R.; Fries, Carl, Jr.; Segerstrom, Kenneth; Black, R. F.; Wilson, I. F.; Johnson, Paul Willard.** The Pachuca-Real del Monte mining district: *Rocks and Minerals*, v. 45, no. 1, p. 3-7, 1970.

**Gheith, Mohamed A.** See *El-Baz, Farouk.* 05951

**Ghent, E. D.** See *Jones, J. W.* 00755

- 06786 **Ghent, E. D.; Jones, J. W.; Nicholls, J.** A note on the significance of the assemblage calcite-quartz-plagioclase-paragonite-graphite: *Contr. Mineralogy and Petrology*, v. 28, no. 2, p. 112-116, illus., table, 1970.

**Ghent, E. D.** See *Macqueen, R. W.* 08145

- 05209 **Ghisler, M.** Pre-metamorphic folded chromite deposits of stratiform type in the early Precambrian of West Greenland [with German abs.]: *Mineralium Deposita*, v. 5, no. 3, p. 223-236, illus., tables, 1970.

- 05015 **Ghose, Benoy K.** Regression analysis in paleobiometrics — A reappraisal: *Jour. Geology*, v. 78, no. 5, p. 545-557, tables, 1970.
- 10642 **Ghose, Benoy K.** Statistical analysis of mixed fossil populations: *Internat. Assoc. Math. Geology Jour.*, v. 2, no. 3, p. 265-276, illus., table, 1970.
- Ghose, Subrata.** See *Saxena, Surendra K.* 01828
- Ghose, Subrata.** See *Mueller, Robert F.* 06794
- 06988 **Ghose, Subrata; Weidner, Jerry R.; Carman, John H.**  $Mg^{2+}$ - $Fe^{2+}$  order-disorder in a magnesium rich cummingtonite [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 557-558, 1970.
- Ghose, Subrata.** See *Schindler, Peter.* 09053
- Ghose, Subrata.** See *Mueller, Robert F.* 09056
- Ghose, Subrata.** See *Saxena, Surendra K.* 09087
- Ghose, Subrata.** See *Saxena, Surendra K.* 09557
- 10930 **Ghosh, A. K.; Bose, A.** Spores of vascular plants from the Cambrians of North America, in *J. Sen Memorial Volume: Calcutta, India, Bot. Soc. Bengal*, p. 173-177, table, 1969.
- 03482 **Ghosh-Dastidar, P.** Syntheses of sulfide standards for quantitative spectrochemical analyses: *Econ. Geology*, v. 65, no. 1, p. 56-59, illus., tables, 1970.
- 04487 **Ghosh-Dastidar, P.; Pajari, G. E., Jr.; Trembath, L. T.** Factors affecting the trace element partition coefficients between coexisting sulfides: *Econ. Geology*, v. 65, no. 7, p. 815-837, illus., tables, 1970.
- Giard, W. R.** See *Hart, H. R., Jr.* 01778
- 01310 **Giardini, A. A.** Emission spectrographic analyses of ruby-bearing margarite-anthophyllite-chlorite nodules and smaragdite from Habersham County, Georgia [abs.]: *Georgia Acad. Sci. Bull.*, v. 28, no. 2, p. s20-s21, 1970.
- 01763 **Giardini, A. A.; Abey, A. E.; Liptai, R. G.** The shear strength of 3 Georgia marbles and Solenhofen Limestone to 70 kilobars [abs.]: *EOS*, v. 51, no. 4, p. 424, 1970.
- Giardini, A. A.** See *Salotti, C. A.* 07522
- 06855 **Gibb, F. G. F.; Stumpfl, E. F.; Zussman, J.** Opaque minerals in an Apollo 12 rock: *Earth and Planetary Sci. Letters*, v. 9, no. 3, p. 217-224, illus., tables, 1970.
- 07675 **Gibb, R. A.; vanBoeckel, J.** Three-dimensional gravity interpretations of the Round Lake batholith, northeastern Ontario: *Canadian Jour. Earth Sci.*, v. 7, no. 1, p. 156-163, illus., table, 1970.
- 09780 **Gibb, R. A.; McConnell, R. K.** Gravity measurements in northern Ontario: *Canada Dept. Energy, Mines and Resources, Earth Physics Br. Gravity Map Ser.*, nos. 25, 28-36, 10 sheets, scale 1:500,000, with separate 10 page text, 1970.
- Gibb, R. A.** See *Tanner, J. G.* 10774
- 05291 **Gibbons, R. V.; Papezik, V. S.** Volcanic rocks and arsenopyrite veins of the Moreton's Harbour area, Notre Dame Bay, Newfoundland [with French abs.]: *Geol. Assoc. Canada Proc.*, v. 22, p. 1-9, illus., tables, 1970.
- 10525 **Gibbons, Rex V.; Kleeman, J. D.** Refractive index measurements of artificially shocked glasses, and of glasses formed by shock-loading crystalline phases [abs.]: *EOS*, v. 51, no. 11, p. 770, 1970.

**Gibbs, G. V.** See *Brown, G. E.* 06074

- 09050 **Gibbs, G. V.; Ribbe, P. H.; Anderson, C. P.** The crystal structures of the humite minerals — [Pt.] 2, Chondrodite: *Am. Mineralogist*, v. 55, nos. 7-8, p. 1182-1194, illus., tables, 1970.

**Gibbs, G. V.** See *Brown, G. E.* 09113

**Gibbs, G. V.** See *Mitchell, J. T.* 09678

- 04069 **Gibowicz, Slawomir J.** P-wave travel time residuals from the Alaskan aftershocks of 1964: *Physics Earth and Planetary Interiors*, v. 2, no. 4, p. 239-258, illus., tables, 1970.

- 10795 **Gibson, Carlton.** Glen Rose Limestone-sandstone transition in Parker County, Texas, in *Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas* (Leo Hendricks, editor): *Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub.*, no. 67-8, p. 76-100, illus., 1967.

- 07895 **Gibson, D. W.** Triassic stratigraphy, Pine Pass area, northeastern British Columbia, in *Peace River, Pine Pass, Yellowhead 1970* — *Edmonton Geol. Soc. Field Conf.*, 12th, Guidebook: Edmonton, Alberta, Edmonton Geological Society, p. 23-38, illus., 1970.

**Gibson, E. K.** See *Moore, C. B.* 05709

- 01276 **Gibson, Everett K., Jr.** Discovery of another meteorite specimen from the 1912 Holbrook, Arizona fall site: *Meteoritics*, v. 5, no. 1, p. 57-60, illus., 1970.

- 09452 **Gibson, Everett K., Jr.; Moore, Carleton B.** Inert carrier-gas fusion determination of total nitrogen in terrestrial rocks and meteorites: *Anal. Chemistry*, v. 42, no. 4, p. 461-464, illus., tables, 1970.

- 04764 **Gibson, G. G.** Grand Coulee Field, Acadia Parish, Louisiana, in *Typical oil and gas fields of southwestern Louisiana*, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 12-12c, illus., 1970.

**Gibson, Gary C.** See *Coyle, Harry M.* 03228

- 02757 **Gibson, J. Sullivan; Batten, James W.** Soils, their nature, classes, distribution, uses, and care: University, Ala., Univ. Alabama Press, 296 p., illus., tables, 1970.

- 00268 **Gibson, R. E.; Moody, M. L.; Ayre, R. S.** Free vibration of an unsymmetrical multi-storied building modeled as a shear-flexible cantilever beam [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 93-94, 1970.

- 00269 **Gibson, R. E.; Moody, M. L.; Ayre, R. S.** A response spectrum solution for earthquake analysis of unsymmetrical multi-storied buildings [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 94, 1970.

- 07580 **Gibson, Richard Ernest.** A response spectrum solution for earthquake analysis of unsymmetrical multi-storied buildings [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 3, p. 1323B-1324B, 1970.

- 02518 **Gibson, Shirley.** (compiler). Cardiff Township, Haliburton County (data series): Ontario Dept. Mines Prelim. Geol. Map P. 603, scale 1 in. to 1/2 mi., text, 1970.

- 03874 **Gibson, Shirley.** (compiler). Faraday Township, Hastings County (data series): Ontario Dept. Mines and Northern Affairs Prelim. Map P. 608, scale 1 in. to 1/2 mi., text, 1970.

- 03178 **Gibson, Shirley J.; Ehlmann, Arthur J.** Annealing characteristics of metamict gadolinite from Rode Ranch, Texas: *Am. Mineralogist*, v. 55, nos. 1-2, p. 288-291, illus., table, 1970.

- 03753 **Gibson, T. G.** Late Mesozoic-Cenozoic tectonic aspects of the Atlantic coastal margin: *Geol. Soc. America Bull.*, v. 81, no. 6, p. 1813-1822, illus., table, 1970.
- 05375 **Gieger, Ronald M.** Quitman Mountains intrusion, in *Geology of the southern Quitman Mountains area, Trans-Pecos Texas — S.E.P.M. Permian Basin Sec.*, 1970 Bienial Field Trip, Symposium and Guidebook: *Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub.* 70-12, p. 100-103, illus., 1970.
- Gierman, G.** See *Revelle, R.* 08382
- 05238 **Giese, G. L.; Hobba, W. A., Jr.** Water resources of the Champlain-Upper Hudson basins in New York State: Albany, N.Y., New York State Office Plan. Coordination, 153 p., illus., tables, 1970.
- Gieskes, J. M. T. M.** See *Mangelsdorf, P. C., Jr.* 01419
- Gieskes, J. M. T. M.** See *Edmond, John M.* 06917
- 06989 **Gieskes, Joris M.; Edmond, John M.** Thermodynamical approaches to geochemical problems in sea water [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 558, 1970.
- 00191 **Gigl, Paul D.; Dachtile, Frank.** P-T studies in the alumina-water system [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 43-44, revised 1970; originally published 1969.
- 06756 **Giguere, J. F.** St. Ignace Island and vicinity (east and west parts), Lake Superior, District of Thunder Bay: Ontario Dept. Mines and Northern Affairs Prelim. Geol. Maps P. 615-616, scale 1 in. to 1/2 mi., text, 1970.
- Gil-Av, E.** See *Oró, J.* 05088
- Gilbert, C. M.** See *Christensen, M. N.* 00244
- Gilbert, C. M.** See *Christensen, M. N.* 03677
- 01720 **Gilbert, C. R.** Water-loss studies of Lake Corpus Christi, Nueces River basin, Texas, 1949-65: *Texas Water Devel. Board Rept.* 104, 11 p., illus., table, 1970.
- Gilbert, F.** See *Backus, G.* 01730
- 06537 **Gilbert, G. K.** Land sculpture in the Henry Mountains, [Chap.] 4 in *Rivers and river terraces* (G. H. Dury, editor): London, Macmillan and Co. Ltd., p. 95-116, illus., condensed 1970, originally published 1887.
- Gilbert, J.** See *Levy, Ram L.* 02737
- Gilbert, J.** See *Oró, J.* 05088
- Gilbert, M. C.** See *Ernst, W. G.* 05079
- 06990 **Gilbert, Ray C.; Hoagland, Alan D.** Paleokarst phenomena and the post-Knox unconformity of middle Tennessee [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 558, 1970; *Econ. Geology*, v. 65, no. 6, p. 737, 1970.

- 00270 **Gilbert, Wyatt G.** Structural relations along the Sur fault [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 94-95, 1970.
- 00614 **Gilbert, Wyatt G.; Dickinson, William R.** Stratigraphic variations in sandstone petrology, Great Valley sequence, central California coast: *Geol. Soc. America Bull.*, v. 81, no. 3, p. 949-954, illus., tables, 1970.
- Gilchrist, H. G.** See *Brawner, C. O.* 05509
- 10044 **Gilchrist, Joseph T.** Inuvik test loop — An Arctic prototype investigation [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2481-2482, 1790.
- Giles, Harry N.** See *Lyall, Anil K.* 09652
- 02567 **Giles, Leland H.** Soils of the Rio Grande Valley border in southern New Mexico: *Soil Sci. Soc. America Proc.*, v. 34, no. 3, p. 465-472, illus., table, 1970.
- 10167 **Giles, Richard S.** The determination of mountain glacial stades by soil characteristics in the Madison Mountains, Montana [abs.], in *American Quaternary Assoc. Mtg. 1st Yellowstone Park, Wyo., and Bozeman, Mont.*, 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 52, 1970.
- Giles, Robert T.** See *Frankenberg, Dirk.* 05663
- Giletti, B. J.** See *Foland, K. A.* 00154
- Giletti, Bruno J.** See *Hofmann, Albrecht.* 04011
- Giletti, Bruno J.** See *Zartman, Robert E.* 05194
- Gilheany, J. J.** See *Schuyler, P. B.* 09865
- 03095 **Gill, Ajit Singh.** A study of cohesion in terms of effective stresses for some Ontario clays [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 10, p. 4607B, 1970.
- Gill, Allan.** See *Hunkins, Kenneth.* 05623
- Gill, Angela C.** See *McHerry, J. Roger.* 03523
- Gill, Angela C.** See *Ritchie, Jerry C.* 10384
- Gill, Clark C.** See *Bonine, Michael E.* 07191
- Gill, D. E.** See *Sharma, Bijon.* 07717
- Gill, Dan.** See *Fowler, Michael L.* 00702
- 02074 **Gill, Dan.** Application of a statistical zonation method to reservoir evaluation and digitized-log analysis: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 719-729, illus., 1970.
- 02620 **Gill, Dan; Briggs, Louis I.** Silurian reef in Michigan basin, stratigraphic-, facies-, and reservoir-properties analysis [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 848-849, 1970.
- 09152 **Gill, Denis E.; Coates, Donald F.; Geldart, Lloyd P.** Un modèle mathématique d'un souterrain cylindrique circulaire droit révetu et percé dans un milieu viscoélastique linéaire [with English and German summ.], in *Internat. Soc. Rock Mechanics Cong.*, 2d, Belgrade, Yugoslavia, 1970, Proc., V. 2: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 625-632, illus., 1970.

- 04104 **Gill, H. L.** Soil-pile interaction under lateral loading, Paper 17 in *In situ investigations in soils and rocks* — British Geotechnical Soc., Conf., London, 1969, Proc.: London, British Geotechnical Soc., p. 221-227, illus., table, 1970.
- 05638 **Gill, J. E.** Further notes on the deformation of sulfides: *Econ. Geology*, v. 65, no. 5, p. 579-582, illus., 1970.
- 01430 **Gill, J. R.; Merewether, E. A.; Cobban, W. A.** Stratigraphy and nomenclature of some Upper Cretaceous and lower Tertiary rocks in south-central Wyoming: U.S. Geol. Survey Prof. Paper 667, 50 p., illus., table, 1970.
- 07986 **Gillard, Douglas R.; White, Wilbert I.** Plato Viking Pool — Reservoir engineering and geological study: *Jour. Canadian Petroleum Technology*, v. 9, no. 4, p. 227-236, illus., 1970.
- 01165 **Gillerman, Elliot.** Roselle lineament of southeast Missouri: *Geol. Soc. America Bull.*, v. 81, no. 3, p. 975-982, illus., 1970.
- 08680 **Gillerman, Elliot.** Mineral deposits and structural pattern of the Big Burro Mountains, New Mexico, in *Guidebook of the Tyrone-Big Hatchet Mountains-Florida Mountains region* — New Mexico Geol. Soc. Field Conf., 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, p. 115-121, illus., 1970.
- 00617 **Gilles, Albert P.; Mathisrud, Gordon C.** Computerized ore estimating at Homestake [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 333-334, 1970.
- 07988 **Gillespie, J. B.; Green, D. W.; Slagle, S. E.** Artificial ground-water recharge, Wet Walnut Creek: Kansas Water Resources Board Prog. Rept. 1, 22 p., illus., tables, illus., tables, 1970.
- 09170 **Gillespie, J. B.; Lindskov, K. L.; Slagle, S. E.** Artificial ground-water recharge, Wet Walnut Creek: Kansas Water Resources Board Prog. Rept. 1, 22 p., illus., tables, 1969.
- 05382 **Gillespie, J. M.** Mammoth hair — Stability of  $\alpha$ -keratin structure and constituent proteins: *Science*, v. 170, no. 3962, p. 1100-1102, illus., table, 1970.
- 09269 **Gillespie, William H.; Clendening, John A.** A flora from proglacial Lake Monongahela: *Castanea*, v. 33, no. 4, p. 267-300, illus., 1968.
- Gillham, C. J.** See *King, H. W.* 04135
- 09191 **Gilliland, J. A.** Groundwater instrumentation and observation techniques, in *Instrumentation and observation techniques, V. 1 — Hydrology Symposium, 7th, Victoria, B. C., 1969 Proc.*: [Ottawa] Canada Dept. Energy, Mines and Resources Inland Waters Br., p. 37-57, illus. [1970?].
- 10493 **Gilliland, John A.** Principles of groundwater data acquisition [abs.]: *EOS*, v. 51, no. 11, p. 748, 1970.
- Gillon, Allon.** See *Ben-Menahem, Ari.* 03069
- 02307 **Gillott, J. E.** Fabric of Leda clay investigated by optical, electron-optical, and X-ray diffraction methods: *Eng. Geology*, v. 4, no. 2, p. 133-153, illus., tables, 1970.
- Gillott, J. E.** See *Penner, E.* 03945
- 00102 **Gilluly, James; Reed, John C., Jr.; Cady, Wallace M.** Sedimentary volumes and their significance: *Geol. Soc. America Bull.*, v. 81, no. 2, p. 353-375, illus., 1970.
- 05039 **Gilluly, James.** Crustal deformation in the western United States, [Chap.] 4 in *The megatectonics of continents and oceans* (Helgi Johnson and Bennett L. Smith, editors): New Brunswick, N. J., Rutgers Univ. Press, p. 47-73, illus., 1970.



- 11244 **Gilluly, James.** The role of geological concepts in man's intellectual development, *in* Limitations of the earth, a compelling focus for geology (Texas Univ. Austin Bur. Econ. Geology) — A symposium held at the dedication of the new Geology Building, Austin, Tex., 1967, *Proc.: Texas Quart.*, v. 11, no. 2, p. 11-23, 1968.
- Gillum, D. E.** See *Ehmann, W. D.* 04781
- Gilmore, James C.** See *Antoine, John W.* 02540
- 08528 **Gilmour, Ernest H.; Stradling, Dale.** (editors). Columbia River Basalt Symposium, 2nd, Cheney, Wash., 1969, *Proc.: Cheney, Eastern Washington State College Press*, 333 p., illus., tables, 1970.
- 10328 **Ginsburg, Robert N.; Bricker, Owen P.; Wanless, Harold R.; Garret, Peter.** Exposure index and sedimentary structures of a Bahama tidal flat [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 744-745, illus., 1970.
- 07812 **Girard, G.** Essai pour un modèle hydropluviométrique conceptuel et son utilisation au Québec [A conceptual hydropluviometric model and its use in Quebec]: [France] *Office Recherche Sci. et Tech. Outre-Mer Cahiers, Sér. Hydrologie*, v. 7, no. 2, p. 85-116, illus., 1970.
- 01125 **Giraud, A.** Application of pyrolysis and gas chromatography to geochemical characterization of kerogen in sedimentary rock: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 3, p. 439-455, illus., tables, 1970.
- Girdley, W. Arch.** See *Baars, D. L.* 02584
- 06779 **Giroud, Jean Pierre; Gupta, Sachinder N.** Guide for depth of foundation exploration — Discussion [of paper 7120 by Ronald E. Smith, 1970]: *Am. Soc. Civil Engineers Proc.*, v. 96, *Jour. Soil Mechanics and Found. Div.*, no. SM 6, p. 2140-2144, illus., 1970.
- 06781 **Giroud, Jean Pierre.** Settlement problem oriented computer language — Discussion [of paper 7178 by Robert L. Schiffman, Robert V. Whitman, and Jane C. Jordan, 1970]: *Am. Soc. Civil Engineers Proc.*, v. 96, *Jour. Soil Mechanics and Found. Div.*, no. SM 6, p. 2160-2162, illus., table, 1970.
- 00271 **Gisler, Patrick; Lange, Nixon; Barnett, George.** Genesis of mordenite in the Aravaipa member, Galiuro Volcanics, Pinal County, Arizona [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 95, 1970.
- 03435 **Gittins, J.; Hayatsu, A.; York, D.** A strontium isotope study of metamorphosed limestones: *Lithos*, v. 3, no. 1, p. 51-58, tables, 1970.
- 09181 **Giusti, Ennio V.** Water resources of the Juana Dáz area, Puerto Rico — A preliminary appraisal, 1966: *Puerto Rico Water Resources Authority Water-Resources Bull.* 8, 43 p., illus., tables, 1968.
- 04091 **Given, P. H.; Spackman, W.; Cohen, A.; Imbalzano, J.; Casida, L. E.; Hiscott, T.** Botanical, chemical and microbiological studies of peat accumulation processes in the Everglades of Florida [abs.], *in* *Advances in organic geochemistry — Internat. Cong.*, 3d, *Proc. (G. D. Hobson and G. C. Speers, editors): London and New York, Pergamon Press (Internat. Ser. Mons. Earth Sci., V. 32)*, p. 313-314, 1970.
- Given, P. H.** See *Vastola, F. J.*
- 09759 **Given, Peter H.** Peat — Precursor of coal: *Earth and Mineral Sci.*, v. 39, no. 5, p. 38-39, illus., 1970.
- 07376 **Givens, Charles Ray.** Eocene molluscan biostratigraphy of the Pine Mountain area, Ventura County, California [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 4, p. 2156B, 1970.
- Gizienski, Stanley F.** See *Noorany, Iraj.* 04222

- 00156 **Glaeser, J. Douglas.** Correlation of Catskill sedimentary environments and its economic significance [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 21, 1970.
- Glancy, Patrick A.** See VanDenburgh, A. S. 07514
- 09934 **Glancy, Patrick A.; VanDenburgh, A. S.** Water-resources appraisal of the lower Virgin River Valley area, Nevada, Arizona, and Utah: Nevada Div. Water Resources, Water Resources-Reconn. Ser. Rept. 51, 87 p., illus., tables, 1969.
- 02213 **Glanville, C. R.** Log interpretation of thinly-bedded, oil-productive sands with unusually low resistivities, in *SPWLA Logging Symposium*, 11th Ann., Los Angeles, Calif., 1970, Trans.: Houston, Tex., Soc. Prof. Well Log Analysts, p. M1-M27, illus., tables, 1970.
- 04653 **Glanville, C. R.** Log interpretations of gas sands from multiple-porosity and resistivity logging programs: *Log Analyst*, v. 11, no. 4, p. 3-11, illus., table, 1970.
- 07583 **Glaser, John Donald.** Nonmarine Cretaceous sedimentation in the middle Atlantic Coastal Plain [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 3, p. 1349B-1350B, 1970.
- 00705 **Glass, F. R.** The relationship of the Christiansburg-Radford, Virginia, window complex to the underlying anticlinorium [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 211-212, 1970.
- 05425 **Glass, F. R., Jr.; Lowry, W. D.** Tectonic erratics near Christiansburg, Virginia [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 133, 1970.
- 07558 **Glass, Gary B.** Limonite concretions in Clearfield County: *Pennsylvania Geology*, v. 1, no. 8, p. 8-9, illus., 1970.
- 05426 **Glassen, Robert C.** The geomorphology of Fire Island, New York [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 134, 1970.
- 04710 **Glawe, L. N.** *Chlamys menthifontis*, a new pectinid from the Oligocene of Mississippi: *Jour. Paleontology*, v. 44, no. 5, p. 858-866, illus., table, 1970.
- Gleason, J. D.** See Friedman, Irving. 05690
- 06304 **Gleeson, C. F.** Heavy mineral studies in the Klondike area, Yukon Territory [with French abs.]: *Canada Geol. Survey Bull.* 173, 63 p., illus., tables, 1970.
- Glenister, Brian F.** See Spinosa, Claude. 03539
- 09920 **Glenister, Brian F.; Rexroad, Carl B.** Field trip No. 6, Conodont successions, in *Geol. Soc. America, North-Central Sec., Ann. Mtg.*, 2d, May 1968, guidebook: Iowa City, Iowa, Univ. Iowa, p. 6-1 to 6-17, illus. [1968].
- Glenn, E. E.** See Zemanek, Joe. 01249
- 03189 **Globensky, Yvon.** The nature of conodonts [with French abs.]: *Naturaliste Canadien*, v. 97, no. 2, p. 213-228, 1970.
- 08416 **Globensky, Yvon.** Arenaceous foraminifera from the Windsor Group (Middle and Upper Mississippian) of the Atlantic Provinces of Canada: *Canadian Jour. Earth Sci.*, v. 7, no. 3, p. 768-785, illus., tables, 1970.
- 10942 **Glover, Albert D.** Geology and mineral resources of the southern half of the Clearfield 15-minute quadrangle, Pennsylvania: *Pennsylvania Geol. Survey Atlas A84 cd*, 139 p., illus., tables, 1970.
- 02621 **Glover, E. D.** Technique of observation of organized organic remains in carbonates [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 849, 1970.

- 05542 **Gluskoter, Harold J.; Hopkins, M. E.** Distribution of sulfur in Illinois coals, in Depositional environments in parts of the Carbondale Formation, western and northern Illinois — Francis Creek Shale and associated strata and Mazon Creek biota — Geol. Soc. America, Coal Geology Div., Ann. Field Trip, Milwaukee, Wis., 1970: Illinois Geol. Survey Guidebook Ser. 8, p. 89-95, illus., 1970.
- 08624 **Gluskoter, Harold J.; Pierard, Louis H.; Pfefferkorn, Hermann W.** Apatite petrifactions in Pennsylvanian shales of Illinois: Jour. Sed. Petrology, v. 40, no. 4, p. 1363-1366, illus., table, 1970.
- 08252 **Glynn, T. E.; Kirwan, R. W.; Wilson, N. E.** Measurements of the dynamic response of peat subjected to repeated loading [with French abs.], in International Peat Congress, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 128-131, illus., 1970.
- Gocłowski, John C.** See Butera, Anthony W. 06704
- 01764 **Godchaux, M. M.; Orville, P. M.** Microcline- and orthoclase-bearing pegmatites, southeastern Connecticut [abs.]: EOS, v. 51, no. 4, p. 446, 1970.
- 01229 **Godchaux, Martha Miller.** Petrology of the Greyback igneous complex and contact aureole, Klamath Mountains, southwestern Oregon [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 8, p. 3707B, 1970.
- Goddard, E. N.** See Shoemaker, E. M. 06294
- 06991 **Goddard, John G.** The  $^{230}\text{U}/^{234}\text{U}$  dating of saline deposits from Searles Lake, California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 558, 1970.
- Godden, C. A.** See Pelletier, B. R. 04380
- Godfrey, Andrew E.** See Cleaves, Emery T. 04877
- 10168 **Godfrey, Andrew E.** Processes of fan and pediment development in the northern Henry Mountains piedmont, Utah [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 53, 1970.
- 05988 **Godfrey, J. D.** Geology of the Marguerite River district, Alberta: Edmonton, Alberta, Research Council Alberta, scale 1:63,360, 1970.
- 03210 **Godfrey, Richard G.; Frederick, Bernard J.** Stream dispersion at selected sites: U.S. Geol. Survey Prof. Paper 433-K, p. K1-K38, illus., tables, 1970.
- Godwin, C. I.** See Phillips, M. P. 09862
- 01073 **Goebel, Edwin D.; Chronic, John.** New ages based on conodonts for some pre-Pennsylvanian rocks in southern Front Range, Colorado [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 388-389, 1970.
- 04269 **Goebel, Lorna M.** Analysis of rhenium in molybdenites: New Mexico Bur. Mines and Mineral Resources Circ. 108, 17 p., illus., tables, 1970.
- Goebel, R.** See Fireman, E. L. 01443
- 01914 **Goetze, Christopher.** Measurements of attenuation of polycrystalline salts at high temperatures [abs.]: EOS, v. 51, no. 4, p. 417, 1970.
- 04544 **Göke, Gerhard.** Eine kambrische Trilobitenfauna im Millard Co., Utah, USA [Some Cambrian trilobite fauna from Millard County, Utah, U.S.A.]: Aufschluss, v. 21, no. 7-8, p. 273-275, illus., 1970.
- 06572 **Gold, L. W.** Process of failure in ice [with French abs.]: Canadian Geotech. Jour., v. 7, no. 4, p. 405-413, illus., 1970.

- 05111 **Gold, T.; Pearce, F.; Jones, R.** Lunar surface closeup stereoscopic photography, *in* Apollo 12 preliminary science report: U.S. Natl. Aeronautics and Space Adm. Spec. Pub. SP-235, p. 183-188, illus., 1970.
- 05113 **Gold, T.** Lunar theory and processes — Chemical observations by Surveyor V, *in* Surveyor final reports: Icarus, v. 12, no. 2, p. 224-225, 1970.
- 06278 **Gold, T.; Campbell, M. J.; O'Leary, B. T.** Optical and high-frequency electrical properties of the lunar sample, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 2149-2154, illus., 1970.
- Goldberg, Edward D.** See Klein, David H. 03954
- 05175 **Goldberg, Edward D.** The chemical invasion of the oceans by man, *in* Global effects of environmental pollution — Am. Assoc. Adv. Sci. Symposium, Dallas, Tex., 1968 (S. F. Singer, editor): New York, Springer-Verlag, and Dordrecht-Holland, D. Reidel Publishing Co., p. 179-185, table, 1970.
- Goldberg, Edward D.** See Bernat, Michel. 05590
- Golden, Howard.** See Weltman, Gershon. 09866
- Golden, Julia.** See Nitecki, Matthew H. 05819
- 06898 **Golden, Julia; Nitecki, Matthew H.** Catalogue of type and referred specimens of fossil Echinozoa (Echinoidea and Cyclocystoidea) in Field Museum of Natural History: Fieldiana — Geology, v. 20, no. 2, p. 43-51, 1970.
- 06899 **Golden, Julia; Nitecki, Matthew H.** Catalogue of type and referred specimens of Echinozoa (Edrioasteroidea) in Field Museum of Natural History: Fieldiana — Geology, v. 20, no. 3, p. 53-64, 1970.
- 06900 **Golden, Julia; Nitecki, Matthew H.** Catalogue of type and referred specimens of fossil Stelleroidea in Field Museum of Natural History: Fieldiana — Geology, v. 20, no. 4, p. 65-75, 1970.
- Goldhaber, M. B.** See Presley, B. J. 07152
- 05965 **Goldich, S. S.; Hedge, C. E.; Stern, T. W.** Age of the Morton and Montevideo gneisses and related rocks, southwestern Minnesota: Geol. Soc. America Bull., v. 81, no. 12, p. 3671-3695, illus., tables, 1970.
- Goldich, S. S.** See Hanson, G. N. 06479
- Goldich, S. S.** See Peterman, Z. E. 06489
- 09389 **Goldman, Harold.** Geology of San Francisco Bay — Summary of the report, "Geology of San Francisco Bay" (1967), *in* San Francisco Bay Conserv. and Devel. Comm., San Francisco Bay Plan Supplement: Sacramento, Calif., Documents and Publications Branch, p. 133-145, illus., 1969.
- Goldsmith, Louis A.** See Sheffer, Herman W. 10714
- Goldsmith, W.** See Ricketts, T. E. 02403
- 01915 **Goldstein, Alan S.; Henyey, Thomas L.** Studies of secular variation from late Cenozoic sediments, Lake Tahoe, California-Nevada [abs.]: EOS, v. 51, no. 4, p. 270, 1970.
- Goldstein, J. I.** See Fricker, P. E. 01883
- 10204 **Goldstein, Robert F.** Correlation of Silurian strata between Georgia, Alabama, and Florida based on chitinozoan biostratigraphy [abs.]: Am. Assoc. Petroleum Geolo-

- gists, v. 54, no. 9, p. 1784, 1970; Gulf Coast Assoc. Geol. Soc. Trans., v. 20, p. 228, 1970.
- 02175 **Goldthwait, Richard P.** Mountain glaciers of the Presidential Range in New Hampshire: Arctic and Alpine Research, v. 2, no. 2, p. 85-102, illus., tables, 1970.
- 03867 **Goldthwait, Richard P.** Suggestions for the collection of glaciology data: Ice, no. 33, p. 14-19, 1970.
- Goldthwait, Richard P.** See Dreimanis, Aleksis. 06960
- 05694 **Goles, Gordon G.; Randle, Keith; Osawa, Masumi; Schmitt, Roman A.; Wakita, Hiroshi; Ehmann, William D.; Morgan, John W.** Elemental abundances by instrumental activation analyses in chips from 27 lunar rocks, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1165-1176, tables, 1970.
- 05709 **Gales, Gordon G.** (and others) Interpretations and speculations on elemental abundances in lunar samples, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — v. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochem. et Cosmochim. Acta Supp. 1), p. 1177-1194, illus., tables, 1970.
- Goles, Gordon G. See Osawa, Masumi. 08532
- Goll, R.** See Olson, R. K. 07158
- Goll, Robert.** See Hays, James D. 01429
- Goll, Robert M.** See McManus, Dean A. 07143
- 07578 **Golparvar, Hassan.** Soil-ice properties of frost-susceptible soils, made hydrophobic [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 3, p. 1260B-1261B, 1970.
- 03872 **Golubic, Stjepko; Brent, Gayle; LeCampion, Thérèse.** Scanning electron microscopy of endolithic algae and fungi using a multipurpose casting-embedding technique: Lethaia, v. 3 no. 2, p. 203-209, illus., 1970.
- 03758 **Gomberg, David N.; Bonatti, Enrico.** High-magnesian calcite — Leaching of magnesium in the deep sea: Science, v. 168, no. 3938, p. 1451-1453, illus., table, 1970.
- Gomez, Manuel.** See Clarke, Roy S., Jr. 10268
- 10853 **Gonzalez Reyna, Jenaro.** La mineralogénesis terciaria de México [Tertiary mineralogénesis of Mexico (with Spanish and English abs.)], in Trabajos técnicos presentados en la segunda reunión de geólogos de América Central: Inst. Centroamericano Inv. y Tecnología Indus. Pubs. Geol., no. 2, p. 8-17, illus., 1969.
- 02022 **Good, Charles W.; Taylor, Thomas N.** On the structure of *Cordaites felicis* Benson from the Lower Pennsylvanian of North America: Palaeontology, v. 13, pt. 1, p. 29-39, illus., 1970.
- 04171 **Good, Charles W.** The apical organization of *Calamites* [abs.]: Am. Jour. Botany, v. 57, no. 6, pt. 2, p. 756-757, 1970.
- 04172 **Good, Charles W.** Ontogenetic studies of the cone *Calamostachys binneyana* [abs.]: Am. Jour. Botany, v. 57, no. 6, pt. 2, p. 757, 1970.
- Good, John M.** See Love, J. D. 02083
- 01765 **Goodacre, A. K.** Structure and composition of the deep crust and upper mantle in Canada [abs.]: EOS, v. 51, no. 4, p. 422, 1970.
- 10963 **Goode, Harry D.** Landslides as geologic hazards in Utah, in Governor's conference on geologic hazards in Utah, December 14, 1967: Utah Geol. and Mineralog. Survey Spec. Studies 32, p. 21, illus., 1970.

- Goodell, H. G.** See Kunzler, R. H. 04737
- Goodell, H. G.** See McGookey, Donald P. 05364
- Goodell, H. G.** See Huang, Ter-Chien. 05793
- Goodkind, John M.** See Prothero, William A., Jr. 10478
- Goodman, A.** See Alsop, L. E. 06041
- 07634 **Goodman, George J.** Arthur Curtis Shead (1891-1968): Oklahoma Acad. Sci. Proc. 1968, v. 49, p. 226, 1970.
- 07173 **Goodman, James M.; Harrow, David R.** Micro-landscape models in geomorphic instruction: Oklahoma Acad. Sci. Proc. 1970, v. 50, p. 159-161, illus., 1970.
- Goodman, R. E.** See Mahtab, M. A. 09160
- 09317 **Goodman, R. E.** The deformability of joints, in Determination of the *in situ* modulus of deformation of rock (Symposium, ASTM, Winter Mtg., Denver, Colo., 1969): Am. Soc. Testing and Materials Spec. Tech. Pub. 477, p. 174-196, illus., tables, 1970.
- 00053 **Goodman, Richard E.; Taylor, Robert L.; Brekke, Tor L.** A model for the mechanics of jointed rock — Closure [to discussion of paper 5937, 1968]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Soil Mechanics and Found. Div., no. SM 1, p. 298, 1970.
- Goodman, Richard E.** See Cruz, Rodolfo V. de la. 07450
- Goodman, Richard E.** See Drozd, Karel. 09147
- Goodman, Richard E.** See Heuze, Francois E. 09153
- 00272 **Goodspeed, G. E.** Fluidization of the viborgite rapakivi in the Salmon River Mountains, Idaho [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 95-96, 1970.
- Goodwin, A. M.** See Land, A. H. 07972
- 08627 **Goodwin, A. M.; Ridler, R. H.** The Abitibi orogenic belt, in Basins and geosynclines of the Canadian Shield (A. J. Baer, editor) — Symposium, Ottawa, 1970, Papers: Canada Geol. Survey Paper 70-40, p. 1-24, illus., discussion, p. 24-30, 1970.
- 10757 **Goodwin, A. M.; Irvine, T. N.** Volcanology, in Background papers on the earth sciences in Canada (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 75-78, 1970.
- 05427 **Goodwin, B. K.** Geological endeavors of Virginia's colleges and universities [abs.]: Virginia Jour. Sci., v. 21, no. 3, p. 134, 1970.
- Goodwin, B. K.** See Johnson, Gerald H. 11246
- 07838 **Goodwin, Bruce K.** Geology of the Hylas and Midlothian quadrangles, Virginia: Virginia Div. Mineral Resources Rept. Inv. 23, 51 p., illus., tables, geol. maps, 1970.
- 08316 **Goodwin, Bruce K.; Johnson, Gerald H.** Geology of the upland gravels near Midlothian, Virginia, Pt. 2 of Atlantic Coastal Plain Geol. Assoc. Guidebook, 11th Ann. Field Conf., 1970: [Norfolk, Va.] Old Dominion Univ., 35 p., illus., 1970.
- 04047 **Goody, Peter C.** Comments on enchodontid paper by [C. L.] McNulty [Jr.] and [G.] Kienzl [1970]: Texas Jour. Sci., v. 21, no. 4, p. 455-457, 1970.
- 08752 **Goody, Peter C.** The Cretaceous teleostean fish *Cimolichthys* from the Niobrara Formation of Kansas and the Pierre Shale of Wyoming: Am. Mus. Novitates, no. 2434, 29 p., illus., 1970.

- 03696 **Gopalan, K.; Wetherill, G. W.** Rubidium-strontium studies on enstatite chondrites — Whole meteorite and mineral isochrons: *Jour. Geophys. Research*, v. 75, no. 17, p. 3457-3467, illus., tables, 1970.
- 05110 **Gopalan, K.; Kaushal, S.; Lee-Hu, C.; Wetherill, G. W.** Rb-Sr and U, Th-Pb ages of lunar materials, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1195-1205, illus., tables, 1970.
- 04802 **Gordon, Bryan C.** *Bison antiquus* from the Northwest Territories: *Arctic*, v. 23, no. 2, p. 132-133, illus., table, 1970.
- Gordon, D. T.** See Morton, J. T. 10662
- 03309 **Gordon, David W.; Bennett, Theron J.; Herrmann, Robert B.; Rogers, Albert M.** The south-central Illinois earthquake of November 9, 1968 — Macroseismic studies: *Seismol. Soc. America Bull.*, v. 60, no. 3, p. 953-971, illus., tables, 1970.
- 01644 **Gordon, Donald C., Jr.** Microscopic study of organic particles in the North Atlantic Ocean: *Deep-Sea Research*, v. 17, no. 1, p. 175-185, illus., tables, 1970.
- 11003 **Gordon, Donald C., Jr.** Some studies on the distribution and composition of particulate organic carbon in the North Atlantic Ocean: *Deep-Sea Research*, v. 17, no. 2, p. 233-243, illus., tables, 1970; erratum, *ibid.*, no. 6, 1025, 1970
- Gordon, J. D.** See Davis, M. E. 10219
- Gordon, L. I.** See Williams, P. M. 01685
- Gordon, M. J.** See Smith, S. V. 09579
- 05447 **Gordon, Mackenzie, Jr.; Duncan, Helen M.** Biostratigraphy and correlation of the Oquirrh Group and related rocks in the Oquirrh Mountains, Utah, in *Upper Paleozoic rocks in the Oquirrh Mountains and Bingham mining district*: U.S. Geol. Survey Prof. Paper 629-A, p. A38-A57, illus., tables, 1970.
- 09770 **Gordon, Mackenzie, Jr.** California Carboniferous cephalopods: U.S. Geol. Survey Prof. Paper 483-A, p. A1-A27, illus., 1964.
- Gordon, Richard F.** See Bean, Alan L. 05105
- 00060 **Gordon, Robert B.** Mechanical properties of iron meteorites and the structure of their parent planets: *Jour. Geophys. Research*, v. 75, no. 2, p. 439-447, illus., 1970.
- 00966 **Gordon, T. M.; Greenwood, H. J.** The reaction — dolomite + quartz + water = talc + calcite + carbon dioxide: *Am. Jour. Sci.*, v. 268, no. 3, p. 225-242, illus., tables, 1970.
- 00618 **Gordon, W. A.** Contrasts in Jurassic biogeographic patterns [abs]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 334, 1970.
- 02370 **Gordon, W. A.** Biogeography of Jurassic Foraminifera: *Geol. Soc. America Bull.*, v. 81, no. 6, p. 1689-1703, illus., tables, 1970.

- Gordus, A. A.** *See* Griffin, James B. 10138
- 02700 **Goreau, Thomas F.** Foreereef slope ecology and depositional processes in Jamaica [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 849, 1970.
- 10712 **Goreau, Thomas F.** Post Pleistocene urban renewal in coral reefs: *Micronesica*, v. 5, no. 2, p. 323-326, 1969.
- Gorham, Eville.** *See* Sanger, Jon E. 02444
- Gornitz, Vivian.** *See* Bender, Michael. 01893
- 11000 **Gornitz, Vivien; Kerr, Paul F.** Uranium mineralization and alteration, Orphan Mine, Grand Canyon, Arizona: *Econ. Geology*, v. 65, no. 7, p. 751-768, illus., tables, 1970.
- 03530 **Gorsline, D. S.** Submarine canyons, an introduction: *Marine Geology*, v. 8, nos. 3-4, p. 183-186, 1970.
- 10169 **Gorsline, Donn S.; Barnes, Peter W.** Evidence for Holocene climatic changes from Tanner and Santa Cruz basins, California Continental Borderland [abs.], *in* American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 54, 1970.
- 04547 **Gose, Wulf Achim.** Palaeomagnetic studies of Miocene ignimbrites from Nevada: *Royal Astron. Soc. Geophys. Jour.*, v. 20, no. 3, p. 241-252, illus., table, 1970.
- Goth, Joseph H.** *See* Lytle, William S. 08495
- 01637 **Gotla, Peter.** The magnetometer in oceanology: *Oceanology Internat.*, v. 5, no. 2, p. 36-39, illus., table, 1970.
- Gott, Garland.** *See* Kleinkopf, M. Dean. 03472
- 07403 **Gott, Garland B.** Zoning of major and minor metals in the Coeur d'Alene district, Idaho [abs.]: *Mining Eng.*, v. 22, no. 9, p. 50, 1970.
- Gottfried, David.** *See* Tilling, Robert I. 01411
- Gottfried, David.** *See* Anderson, A. T. 06044
- 05392 **Goudarzi, Gus H.** Geologic map of the Glen Dean quadrangle, Breckinridge and Hancock Counties, Kentucky: *U.S. Geol. Survey Geol. Quad. Map GQ-836*, scale 1:24,000, text, 1970.
- Gough, D. I.** *See* Porath, H. 01680
- Gough, D. I.** *See* Reitzel, J. S. 01856
- Gough, D. I.** *See* Camfield, P. A. 02065
- Gough, D. I.** *See* Porath, Hartmut. 02067
- 04445 **Gough, D. L.; Porath, H.** Long lived thermal structure under the southern Rocky Mountains: *Nature*, v. 226, no. 5248, p. 837-839, illus., 1970.
- 06706 **Gould, H. R.** The Mississippi delta complex, *in* Deltaic sedimentation, modern and ancient: *Soc. Econ. Paleontologists and Mineralogists Spec. Pub.* 15, p. 3-30, illus., table, 1970.
- 04749 **Gould, Joseph C.; Langford, N. Gerald; Mott, Charles J.** Study guide for audio-tutorial earth science: Minneapolis, Minn., Burgess Publishing Co., sections paged separately, illus., tables, 1970.



- 10997 **Gould, Stephen J.** *Gryphaea* did not alter its coiling during the Lower Lias (Mirabile dictu) [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, 559, 1970.
- 00959 **Gould, Stephen Jay.** History versus prophecy — Discussion with J. W. Harrington [of two papers by Harrington, 1967, 1969]: *Am. Jour. Sci.*, v. 268, no. 2, p. 187-189, 1970.
- 01203 **Gould, Stephen Jay.** Coincidence of climatic and faunal fluctuations in Pleistocene Bermuda: *Science*, v. 168, no. 3931, p. 572-573, illus., 1970.
- 03369 **Gould, Stephen Jay.** Evolutionary paleontology and the science of form: *Earth-Sci. Rev.*, v. 6, no. 2, p. 77-119, illus., table, 1970.
- 08519 **Gould, Stephen Jay.** Land snail communities and Pleistocene climates in Bermuda — A multivariate analysis of microgastropod diversity, in *Evolution of communities — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc., Pt. E: Lawrence, Kans., Allen Press*, p. 486-521, illus., tables, 1970.
- 07784 **Goulden, P. D.; Afghan, B. K.** An automated method for determining mercury in water: *Canada Dept. Energy, Mines and Resources Inland Waters Br. Tech. Bull.* 27, 21 p., illus., tables, 1970.
- 09034 **Goulland, Lee H.** Petrologic studies of the Precambrian and Cambrian of Brandon Gap, Vermont [abs.], in *Guidebook to field excursions, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., p. 149, 1969.*
- 05238 **Gourlay, Michael R.; Vollmers, Hans; Giese, Egon.** Initial instability of fine bed sand — Discussion [of paper 7139 by Anthony J. Grass, 1970]: *Am. Soc. Civil Engineers Proc.*, v. 96, *Jour. Hydraulics Div.*, no. HY 12, p. 2645-2654, illus., table, 1970.
- 03665 **Govindaraju, K.** Use of complexing agents as solvents for atomic absorption determination of calcium and magnesium in silicates: *Appl. Spectroscopy*, v. 24, no. 1, p. 81-85, illus., tables, 1970.
- 03648 **Graber, F. M.; Lukens, H. R.; MacKenzie, J. K.** Neutron activation analysis determination of all 14 stable rare-earth elements with group separation and Ge(Li) spectrometry: *Jour. Radioanal. Chemistry*, v. 4, no. 2, p. 229-239, illus., tables, 1970.
- 10170 **Grabert, Garland F.** Prehistoric man and maritime environments in northwestern Washington State [abs.], in *American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 55, 1970.*
- 03449 **Grachev, A. F.; Demenitskaya, R. M.; Karasik, A. M.** Dissimetriya — General'naya cherta tektonicheskogo razvitiya Arktiki (Dissymmetry — A general feature of tectonic development of the Arctic): *Akad. Nauk SSSR Doklady*, v. 192, no. 4, p. 860-861, illus., 1970.
- 07215 **Grachev, A. F.; Dolukhanov, P. M.** Poslelednikovoye podnyatiye zemnoy kory v Kanade i v Fennoskandii po dannym radiouglerodnykh datirovok [Postglacial crustal uplift in Canada and Fennoscandia from radiocarbon dating (with English and German abs.)], in *Baltica, V. 4: Vilnius, U.S.S.R., "Mintis," p. 297-312, illus., tables, 1970.*
- 11260 **Gradziński, Ryszard; Radomski, Andrzej.** Factors controlling karst development and cave types, in *Internat. Cong. Speleology, 4th Yugoslavia, 1965, Proc., V. 3: Ljubljana, Yugoslavia, Speleolog. Soc. Yugoslavia, p. 457-461, 1968.*

**Graf, H.** See Eberhardt, P. 05685

- 04313 **Graf, Joseph L., Jr.; Skinner, Brian J.** Strength and deformation of pyrite and pyrrhotite: *Econ. Geology*, v. 65, no. 2, p. 206-215, illus., 1970.
- 06134 **Graf, William L.** The geomorphology of the glacial valley cross section: *Arctic and Alpine Research*, v. 2, no. 4, p. 303-312, illus., tables, 1970.
- 10171 **Graf, William L.** Pinedale IV Stade glaciation in the southeastern Beartooth Mountains, Montana and Wyoming [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont. Montana State Univ.?], p. 56, 1970.
- Graham, A. L.** See Mason, Brian. 06135
- Graham, A. R.** See Mitchell, G. P. 05949
- 06614 **Graham, Earl Kendall, Jr.** The elastic coefficients of forsterite as a function of pressure and temperature [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 2, p. 767B, table, 1970.
- Graham, J. A.** See Stearns, David W. 09588
- 10995 **Gramly, Richard M.** Use of a magnetic balance to detect pits and postmolds: *Am. Antiquity*, v. 35, no. 2, p. 217-220, illus., 1970.
- Granath, J. W.** See Langenheim, R. L., Jr. 00303
- Grande López, Fernando.** See Grande López, Raul. 07794
- Grande López, Fernando.** See Grande López, Raul. 10272
- 07794 **Grande Lopez, Raul; Grande Lopez, Fernando.** Suelos fosiles del Municipio de Mexquitic de Carmona, Estado de San Luis Potosi [Fossil soils of the municipality of Mexquitic de Carmona, State of San Luis Potosi]: *Geologia y Metalurgia*, v. 5, no. 31, p. 51-100, illus., tables, 1970.
- 10272 **Grande Lopez, Raul; Grande Lopez, Fernando.** Suelos fosiles del Municipio de Mexquite de Carmona, Estado de San Luis Potosi [Fossil soils of the Municipio de Mexquite de Carmona, San Luis Potosi State]: *San Luis Potosi Univ. Autonoma Potosina Inst. Geologia y Metalurgia Foll. Tec.* 23, 54 p., illus., tables, 1970.
- Grangaard, O. H., Jr.** See Selig, E. T. 05330
- Granger, H. C.** See Jacobs, M. L. 01483
- 09769 **Granger, Harry C.; Raup, Robert B.** Geology of uranium deposits in the Dripping Spring Quartzite, Gila County, Arizona: *U.S. Geol. Survey Prof. Paper* 595, 108 p., illus., tables, 1969.
- 00273 **Grannell, Roswitha B.** Geological and gravimetric studies of Franciscan serpentinite bodies in the southern Santa Lucia Range, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 96, 1970.
- 07367 **Grannell, Roswitha Barenberg.** Geological and geophysical studies of three Franciscan serpentinite bodies in the southern Santa Lucia Range, California [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 4, p. 2069B-2070B, 1970.
- 07685 **Grant, A. C.** Recent crustal movements on the Labrador Shelf, in *Symposium on recent crustal movements*, Ottawa, Canada, 1969, *Papers: Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 2, p. 571-575, illus., 1970.

- 08164 **Grant, A. C.; Manchester, K. S.** Geophysical investigations in the Ungava Bay-Hudson Strait region of northern Canada: *Canadian Jour. Earth Sci.*, v. 7, no. 4, p. 1062-1076, illus., 1970.
- 07133 **Grant, C. L.** Sampling and preparation errors in trace analysis, *in* *Developments in applied spectroscopy*, V. 8 — Mid-America Spectroscopy Symposium, 20th Ann., Chicago, Ill., 1969, Selected papers: New York and London, Plenum Press, p. 216-225, tables, 1970.
- 02451 **Grant, Douglas R.** Surficial deposits, geomorphic features, and late Quaternary history of the terminus of the Northern Peninsula of Newfoundland and adjacent Quebec-Labrador: *Maritime Sediments*, v. 5, no. 3, p. 123-125, illus., 1969 [1970].
- 02452 **Grant, Douglas R.** Late Pleistocene re-advance of piedmont glaciers in western Newfoundland: *Maritime Sediments*, v. 5, no. 3, p. 126-128, illus., 1969 [1970].
- 07693 **Grant, Douglas R.** Recent coastal submergence of the Maritime Provinces, Canada, *in* *Symposium on recent crustal movements*, Ottawa, Canada, 1969, *Papers: Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 2, p. 676-689, illus., 1970.
- 07924 **Grant, Douglas Roderick.** Recent coastal submergence of the Maritime Provinces, Canada [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 6, p. 3527B, 1970.
- Grant, F. S.** *See* Spector, A. 01251
- Grant, F. S.** *See* West, G. F. 02958
- Grant, J. A.** *See* Austin, G. S. 08291
- Grant, James.** *See* Parham, Walter. 03490
- 01766 **Grant, James A.; Weiblen, P. W.** Retrograde zoning in garnet near the second sillimanite isograd [abs.]: *EOS*, v. 51, no. 4, p. 444-445, 1970.
- Grant, R. W.** *See* Housley, R. M. 06286
- Grant, Richard E.** *See* Stehli, Francis G. 00547
- Grant, Richard E.** *See* Cooper, G. Arthur. 02100
- 07076 **Grantz, Arthur; Wolf, S. C.; Breslau, Lloyd; Johnson, T. C.; Hanna, W. F.** Reconnaissance geology of the Chukchi Sea as determined by acoustic and magnetic profiling, *in* *Geological seminar on the North Slope of Alaska*, Palo Alto, Calif., 1970, *Proc.: Los Angeles, Calif., Am. Assoc. Petroleum Geologists Pacific Sec.*, p. F1-F28, illus., 1970.
- 10045 **Grantz, Arthur; Hanna, W. F.; Holmes, M. L.; Creager, Joe S.** Reconnaissance geology of Chukchi Sea as determined by acoustic and magnetic profiling [abs.], *in* *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, *Abs. Papers: Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2483, 1970.
- Grantz, Arthur.** *See* Clark, M. M. 10824
- 01517 **Grass, Anthony J.** Initial instability of fine bed sand: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7139, *Jour. Hydraulics Div.*, no. HY 3, p. 619-632, illus., tables, 1970.
- Grasty, R. L.** *See* Darnley, A. G. 04528
- Graves, R. W., Jr.** *See* Akin, R. H., Jr. 06138
- 07258 **Gray, Donald H.** Effects of forest clear-cutting on the stability of natural slopes: *Assoc. Eng. Geologists Bull.*, v. 7, nos. 1-2, p. 45-66, illus., tables, 1970.

- 06993 **Gray, Jane; Boucot, A. J.** Silurian trilete spore occurrences [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 560-561, 1970.
- Gray, Jerry J.** See Kingston, Gary A. 03208
- Gray, N. H.** See Marchand, M. 01796
- 07710 **Gray, N. H.** Crystal growth and nucleation in two large diabase dikes: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 366-375, illus., tables, 1970.
- 03629 **Gray, Richard E.; Meyers, James F.** Mine subsidence and support methods in Pittsburgh area: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7407, *Jour. Soil Mechanics and Found. Div.*, no. SM 4, p. 1267-1287, illus., table, 1970.
- 07567 **Gray, Richard E.** Landslides, in *Geology of the Pittsburgh area: Pennsylvania Geol. Survey, 4th ser.*, [Bull.] G 59 (General Geology Rept.), p. 103-105, illus., 1970.
- Gray, Richard E.** See Heyman, Louis. 07568
- Grayson, Michael A.** See Levy, Ram L. 02737
- 09911 **Great Lakes Basin Comm.** Natl. Council Marine Resources (and Eng. Devel.) Great Lakes institutions — A survey of institutions concerned with the water and related resources in the Great Lakes basin: Washington, D. C., U.S. Govt. Printing Office, 58 p., 1969.
- Greaves, C.** See Burns, Roger G. 06082
- 00274 **Greeley, Ronald; Hyde, Jack H.** Lava tubes of Mount St. Helens, Washington [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 96-97, 1970.
- 01212 **Greeley, Ronald.** Life-orientation relationships of some Eocene bryozoan-coral associations: *Jour. Paleontology*, v. 44, no. 2, p. 343-345, illus., 1970.
- 05808 **Greeley, Ronald.** Note on a specimen collecting sieve: *Jour. Paleontology*, v. 44, no. 6, p. 1132-1133, illus., 1970.
- Green, A. J.** See Warren, H. V. 09863
- Green, D. H.** See Marchand, M. 01796
- 02487 **Green, D. H.** Peridotite-gabbro complexes as keys to petrology of mid-oceanic ridges — Discussion [of paper by T. P. Thayer, 1969]: *Geol. Soc. America Bull.*, v. 81, no. 7, p. 2161-2166, 1970.
- Green, D. W.** See Gillespie, J. B. 07988
- 01767 **Green, David H.** Petrogenetic grid for mantle-derived magmas [abs.]: *EOS*, v. 51, no. 4, p. 448, 1970.
- 03073 **Green, Don W.; Dabiri, Hassan; Weinaug, Charles F.; Prill, Robert.** Numerical modeling of unsaturated groundwater flow and comparison of the model to a field experiment: *Water Resources Research*, v. 6, no. 3, p. 862-874, illus., tables, 1970.
- 07172 **Green, Donald E.** The idea of an inexhaustible supply of ground water on the Texas High Plains — The obstacle of a myth to water conservation: *Oklahoma Acad. Sci. Proc.* 1970, v. 50, p. 151-154, 1970.
- 01768 **Green, E. Jewett.** Predictive thermodynamic models for mineral systems [abs.]: *EOS*, v. 51, no. 4, p. 438, 1970.
- 04615 **Green, E. Jewett.** On the perils of thermodynamic modelling: *Geochim. et Cosmochim. Acta*, v. 34, no. 9, p. 1029-1033, table, 1970.

- 09121 **Green, E. Jewett.** Predictive thermodynamic models for mineral systems — [Pt.] 1, Quasi-chemical analysis of the halite-sylvite subsolidus: *Am. Mineralogist*, v. 55, nos. 9-10, p. 1692-1713, illus., tables, 1970.
- 10245 **Green, G. W.; Holliday, D. W.** The Cretaceous rocks of Blue Mountain Peak, Jamaica: *Geol. Soc. Jamaica Jour.*, v. 11, p. 19-23, illus., 1970.
- 03008 **Green, H. W., 2d; Radcliffe, S. V.; Heuer, A. H.** High voltage (800 kv) transmission electron microscopy study of a type III carbonaceous chondrite [abs.]: *EOS*, v. 51, no. 4, p. 341, 1970.
- 06759 **Green, H. W., 2d; Griggs, D. T.; Christie, J. M.** Syntectonic and annealing recrystallization of fine-grained quartz aggregates [with German abs.], in *Experimental and natural rock deformation — Internat. Symposium, Darmstadt, Germany, 1969*, Proc. (P. Paulitsch, editor): Berlin and Heidelberg, Germany, Springer-Verlag, p. 272-335, illus., tables, 1970.
- Green, J.** See Metherell, A. F. 06629
- Green, J.** See McCue, G. A. 09790
- Green, J. C.** See Morey, G. B. 04971
- Green, J. H.** See Holt, C. L. R., Jr. 05617
- 07570 **Green, Jimmie Logan.** Phosphate fractions and their relation to the weathering and genesis of some soils of the Texas High Plains [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 3, p. 1007B-1008B, 1970.
- 03581 **Green, John; Weiblen, Paul.** A teacher's guide for geologic field investigations in northeastern Minnesota: [St. Paul, Minn.] Minnesota Dept. Education, 21 p., illus. [n.d.].
- 03882 **Green, John C.** Snowflake texture not diagnostic of devitrified ash-flow tuffs — Discussion [of "Development of snowflake texture in a welded tuff. . ." and "Recognition and time distribution of . . . welded tuff" by J. E. Anderson, Jr., 1969 and 1970]: *Geol. Soc. America Bull.*, v. 81, no. 8, p. 2527-2528, illus., 1970.
- 06478 **Green, John C.** Ultramafic bodies in the Vermilion district near Ely, Minnesota [abs.], in *Inst. Lake Superior Geology, 16th Ann., Thunder Bay, Ontario, 1970*, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 17, 1970.
- 07605 **Green, John C.** Lower Precambrian rocks of the Gabbro Lake quadrangle, northeastern Minnesota: *Minnesota Geol. Survey Spec. Pub. Ser. SP-13*, 96 p., illus., tables, geol. map, 1970.
- 03928 **Green, Morton.** Functions of a university museum: *Jour. Geol. Education*, v. 18, no. 4, p. 161-162, 1970.
- 10874 **Green, Morton.** Recovering microvertebrates with acetic acid: *South Dakota Geol. Survey Circ. 40*, 11 p., illus., 1970.
- Green, R.** See LeBreton, E. Gordon. 10887
- Green, R. E.** See Corey, J. C. 10987
- Green, S. J.** See Friedman, M. 02401
- Green, S. J.** See Perkins, R. D. 05594
- Green, Sidney J.** See Gregson, Victor G., Jr. 01769

- 09463 **Green, Thomas E.; Law, Stephen L.; Campbell, William J.** Use of selective ion exchange paper in X-ray spectrography and neutron activation — application to the determination of gold: *Anal. Chemistry*, v. 42, no. 14, p. 1749-1753, illus., tables, 1970.
- 02824 **Green, Trevor H.** High pressure experimental studies on the mineralogical constitution of the lower crust, *in* Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969, *Proc.: Physics Earth and Planetary Interiors*, v. 3, p. 441-450, illus., tables, 1970.
- 00091 **Green, W. V.; Zukas, E. G.** Stored energy in creep deformed graphite: *Nature*, v. 225, no. 5233, p. 628-629, illus., 1970.
- Green, William Joel.** *See* Schmidt, Norbert O. 05506
- Greenblatt, M.** *See* Banks, E. 04367
- 01544 **Greene, H. Gary.** Microrelief of an arctic beach: *Jour. Sed. Petrology*, v. 40, no. 1, p. 419-427, illus., 1970.
- 01879 **Greene, H. Gary.** A portable refraction seismograph survey of gold placer areas near Nome, Alaska: *U.S. Geol. Survey Bull.* 1312-B, p. B1-B29, illus., 1970.
- Greene, H. Gary.** *See* Scholl, David W. 05962
- Greene, John F.** *See* Smith, Charles I. 01104
- 00276 **Greene, Robert C.** A crystal-rich ash-flow tuff in southeast Oregon [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 97-98, 1970.
- Greene, Robert C.** *See* Irwin, William P. 02334
- 03052 **Greenfield, Leonard J.; Hamilton, Robert D.; Weiner, Catherine.** Nondestructive determination of protein, total amino acids, and ammonia in marine sediments [with Spanish abs.]: *Bull. Marine Sci.*, v. 20, no. 2, p. 289-304, illus., tables, 1970.
- 05941 **Greenland, L. Paul.** An equation for trace element distribution during magmatic crystallization: *Am. Mineralogist*, v. 55, nos. 3-4, p. 455-465, illus., 1970.
- 05910 **Greenlee, David W.** Paleozoic history of the Diablo Platform south of Van Horn, Texas [abs.], *in* The geologic framework of the Chihuahua tectonic belt — Symposium in honor of Ronald K. De Ford, Midland, Tex., 1970: Midland, Tex., West Texas Geol. Soc., p. 28-29, 1970.
- 07648 **Greenman, L.** The grey breccia, host to the ore at Strathcona mine, Sudbury [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 561, 1970; *Econ. Geology*, v. 65, no. 6, p. 737, 1970.
- 06279 **Greenman, Norman N.; Gross, H. Gerald.** Luminescence studies of Apollo 11 lunar samples, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, *Proc.* — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 2155-2161, illus., tables, 1970.
- 06127 **Greenwood, E.** Oil and gas possibilities in the Chihuahua area [summ.], *in* The geologic framework of the Chihuahua tectonic belt — Symposium in honor of Ronald K. De Ford, Midland, Tex., 1970: Midland, Tex., West Texas Geol. Soc., p. 62-68, illus., 1970.
- 08649 **Greenwood, Eugene; Kottowski, Frank E.; Armstrong, Augustus K.** Upper Paleozoic and Cretaceous stratigraphy of the Hidalgo County area, New Mexico, *in* Guidebook of the Tyrone-Big Hatchet Mountains-Florida Mountains region — New Mexico Geol. Soc. Field Conf., 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, p. 33-43, illus., 1970.

- 10842 **Greenwood, Eugene.** Oil and gas possibilities in the Pedregosa Basin [summ.], in *Guidebook of the Tyrone-Big Hatchet Mountains-Florida Mountains region — New Mexico Geol. Soc. Field Conf.*, 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, p. 105, 1970.
- Greenwood, H. J.** See Gordon, T. M. 00966
- Greenwood, J. C.** See Greenwood, W. R. 05018
- 06280 **Greenwood, N. N.; Howe, A. T.** Mössbauer studies of Apollo 11 lunar samples, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 2163-2169, illus., tables, 1970.
- Greenwood, W. R.** See Reid, R. R. 00568
- 05018 **Greenwood, W. R.; Greenwood, J. C.** Experimental error in zircon crystal shape measurements: *Jour. Geology*, v. 78, no. 5, p. 576-580, tables, 1970.
- Greenwood, William.** See Fryxell, Roald. 06276
- Greenwood, William R.** See Hedberg, Marion R. 02201
- Greer, Jackie D.** See McGregor, Keith C. 09253
- Greer, Jackie D.** See McGregor, Keith C. 09360
- Greer, R. T.** See Nash, D. B. 06291
- Greer, Randall E.** See Bischoff, James L. 00981
- 04924 **Greer, Raymond T.** Thermoluminescence-chemical composition correlations for meteoritic enstatite: *Materials Research Bull.*, v. 5, no. 10, p. 765-770, illus., 1970.
- 10604 **Greer, Raymond T.** Ultrastructure of opalized wood [abs.]: *EOS*, v. 51, no. 11, p. 831, 1970.
- 05561 **Greeson, Phillip E.** Biological factors in the chemistry of mercury, in *Mercury in the environment*: U.S. Geol. Survey Prof. Paper 713, p. 32-34, 66, illus., table, 1970.
- 04264 **Gregg, Dean O.** Rock movement triggered by a water-level change in the Brunswick area, Georgia, in *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C198-C201, illus., 1970.
- Greggs, Robert G.** See Bartlett, Grant A. 07704
- Greggs, Robert G.** See Bartlett, Grant A. 07705
- 05009 **Gregor, B.** Denudation of the continents: *Nature*, v. 228, no. 5268, p. 273-275, illus., table, 1970.
- 01311 **Gregor, Bryan.** The human factor in denudation [abs.]: *Georgia Acad. Sci. Bull.*, v. 28, no. 2, p. s21, 1970.
- 10769 **Gregory, A. F.; Morley, L. W.** Remote sensing and the solid-earth sciences, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor): *Canada Geol. Survey Paper* 69-56, p. 170-179, 1970.
- 03868 **Gregory, Gardiner E.** Mineral locations in Pennsylvania: *Gems and Minerals*, no. 397, p. 24-27, 49, illus., 1970.
- 09818 **Gregory, Irene.** An ancient acacia wood from Oregon: *Ore Bin*, v. 32, no. 11, p. 205-210, illus., 1970.

- 01769 **Gregson, Victor G., Jr.; Isbell, William M.; Green, Sidney J.** Yield of Westerly Granite under shock loading [abs.]: EOS, v. 51, no. 4, p. 423, 1970.
- 06995 **Greiner, Gary O. G.** On the construction of calcite walls in foraminifera [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 561-562, 1970.
- 07272 **Greiner, Gary Oliver George.** Environmental factors causing distributions of recent Foraminifera [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2763B, 1970.
- 10447 **Greiner, H. R.** Geology of the Charlo area 21-0/16, Restigouche County, New Brunswick: New Brunswick Dept. Nat. Resources Mineral Resources Br. Map Ser. 70-2, 18 p., illus., table, geol. maps, 1970.
- Greender, G. C.** See Hayes, A. W. 05429
- 00039 **Gresens, Randall L.** Serpentinities, blueschists, and tectonic continental margins: Geol. Soc. America Bull., v. 81, no. 1, p. 307-310, 1970.
- Gresens, Randall L.** See Stensrud, Howard L. 00647
- Gresens, Randall L.** See Campbell, K. Vincent. 01186
- 09378 **Gretener, P. E.** Is there an explanation for the gravity anomalies associated with reefs? [Discussion of papers by S. H. Yungul (1961), E. F. Haye (1967), and W. W. Soukoreff (1968), with comments and replies]: Canadian Soc. Explor. Geophysicists Jour., v. 6, no. 1, p. 58-67, illus., 1970.
- 00157 **Grew, Edward S.** Stratigraphy of the Worcester area, central Massachusetts [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 21-22, 1970.
- 00954 **Grew, Edward S.; Mamay, Sergius H.; Barghoorn, Elso S.** Age of plant fossils from the Worcester coal mine, Worcester, Massachusetts: Am. Jour. Sci., v. 268, no. 2, p. 113-126, illus., table, 1970.
- Grey, D. C.** See Kaliser, B. N. 05497
- 04054 **Gribbon, P. W. F.** Frontal recession of Sermikavsaq, West Greenland [with German and French abs.]: Jour. Glaciology, v. 9, no. 56, p. 279-282, illus., 1970.
- 08409 **Grice, R. H.** Quaternary geology of the Grand Rapids area, Manitoba: Canadian Jour. Earth Sci., v. 7, no. 3, p. 853-857, illus., table, 1970.
- 09867 **Grice, R. H.** Optimum handling of exploration data [with French resume], in Internat. Assoc. Eng. Geology Internat. Congress, 1st, Paris, 1970, V. 2: Paris, Comité Français de Géologie de l'Ingénieur, p. 796-800, 1970.
- 03515 **Griecus, Anthony.** Rare twinned quartz crystals in a geode: Earth Sci., v. 23, no. 5, p. 222-224, illus., 1970.
- Gries, J. C.** See Haenggi, W. T. 05372
- Gries, J. P.** See Geol. Soc. America, Rocky Mtn. Sec. 02829
- 05915 **Gries, John C.; Haenggi, Walter T.** Structural evolution of the eastern Chihuahua tectonic belt [summ.], in The geologic framework of the Chihuahua tectonic belt — Symposium in honor of Ronald K. De Ford, Midland, Tex., 1970: Midland, Tex., West Texas Geol. Soc., p. 46-48, illus., 1970.
- 02622 **Gries, Robbie Rice.** Biostratigraphy of Carboniferous rocks, San Saba County, central Texas [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 849, 1970.
- 02526 **Griesemer, Allan D.; Rowell, Bruce F.** Semiquantitative biofacies analysis of shale samples [abs.]: Nebraska Acad. Sci. Proc., 80th Ann. Mtg., p. 34, 1970.



- 05945 **Grieve, R. A. F.; Fawcett, J. J.** The synthesis of chloritoid at low pressures: *Am. Mineralogist*, v. 55, nos. 3-4, p. 517-521, illus., tables, 1970.
- 01770 **Grieve, Richard A. F.; Fawcett, J. J.** Stability of chloritoid below 10 kb  $\text{H}_2\text{O}$  [abs.]: *EOS*, v. 51, no. 4, p. 437, 1970.
- Griffin, James B.** See Crane, H. R. 01370
- 10138 **Griffin, James B.; Gordus, A. A.; Wright, G. A.** Identification of the sources of Hopewellian obsidian in the Middle West: *Am. Antiquity*, v. 34, no. 1, p. 1-14, illus., tables, 1969.
- Griffin, John J.** See Bernat, Michel. 05590
- Griffin, John J.** See Sheppard, Richard A. 09063
- 06996 **Griffin, John R.** Prelithification slump structures in Middle Silurian rocks of central Maine [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 562, 1970.
- Griffin, Margaret S.** See Weld, Betsy A. 02036
- 06435 **Griffin, Villard S., Jr.** Relevancy of the Dewey-Bird hypothesis of cordilleran-type mountain belts and the Wegmann stockwork concept: *Jour. Geophys. Research*, v. 75, no. 35, p. 7504-7507, illus., 1970.
- 06715 **Griffin, Villard S., Jr.** A probable pre-Triassic mafic intrusive in the Anderson 15-minute quadrangle, South Carolina: *South Carolina Div. Geology Geol. Notes*, v. 14, no. 4, p. 97-104, illus., 1970.
- 07042 **Griffin, Villard S., Jr.** Position of the Kings Mountain belt in Abbeville County, South Carolina: *Southeastern Geology*, v. 12, no. 2, p. 105-113, illus., 1970.
- Griffin, W. L.** See Murthy, V. Rama. 08267
- 03368 **Griffiths, J. C.** Current trends in geomathematics: *Earth-Sci. Rev.*, v. 6, no. 2, p. 121-140, illus., tables, 1970.
- 05237 **Grigg, Neil S.** Motion of single particles in alluvial channels: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7770, *Jour. Hydraulics Div.*, no. HY 12, p. 2501-2518, illus., tables, 1970.
- 00513 **Grigg, Neil Sadler.** Motion of single particles in sand channels [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 7, p. 3192B, 1970.
- Griggs, Allan B.** See King, Elizabeth R. 04595
- Griggs, Allan E.** See Peck, Dallas L. 08534
- Griggs, D. T.** See Green, H. W., 2d. 06759
- Griggs, G. B.** See Duncan, John R. 01121
- 01338 **Griggs, G. B.; Kulm, L. D.; Duncan, J. R.; Fowler, G. A.** Holocene faunal stratigraphy and paleoclimatic implications of deep-sea sediments in Cascadia Basin: *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 7, no. 1, p. 5-12, illus., table, 1970.
- 01499 **Griggs, G. B.; Kulm, L. D.** Sedimentation in Cascadia Deep-Sea Channel: *Geol. Soc. America Bull.*, v. 81, no. 5, p. 1361-1384, illus., tables, 1970.
- 03402 **Griggs, G. B.; Kulm, L. D.** Physiography of Cascadia deep-sea channel: *Northwest Sci.*, v. 44, no. 2, p. 82-94, illus., tables, 1970.
- 00277 **Griggs, Gary B.** Possible Holocene climatic fluctuations [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 98, 1970.

- 10868 **Griggs, Peter H.** Palynological interpretation of the type section, Chuckanut Formation, northwestern Washington, *in* Symposium on palynology of the Late Cretaceous and early Tertiary, San Francisco, Calif., 1966: Geol. Soc. America Spec. Paper 127, p. 169-212, illus., tables, 1970.
- Grigor'eva, L. F.** See Fedoseev, A. D. 06508
- Grijalva, V. E.** See Brown, H. D. 02207
- Grikurov, G. E.** See Egiazarov, B. Kh. 10036
- 02329 **Grill, E. V.** A mathematical model for the marine dissolved silicate cycle: Deep-Sea Research, v. 17, no. 2, p. 245-266, illus., tables, 1970.
- 10248 **Grill, E. V.; Murray, J. W.; Macdonald, R. D.** Manganese nodules from Jervis Inlet, a British Columbia fjord: Syesis, v. 1, pts. 1-2, p. 57-63, illus., table, 1968.
- 00577 **Grim, Muriel S.; Drake, Charles L.; Heirtzler, James R.** Sub-bottom study of Long Island Sound: Geol. Soc. America Bull., v. 81, no. 3, p. 649-665, illus., 1970.
- 03706 **Grim, Muriel S.; McManus, Dean A.** A shallow seismic-profiling survey of the northern Bering Sea: Marine Geology, v. 8, no. 5, p. 293-320, illus., 1970.
- 10920 **Grim, Muriel S.; McManus, Dean A.** A shallow seismic-profiling survey of the northern Bering Sea, *in* Research on the continental shelf off Washington and western Alaska from August 1968 through June 1969 — Univ. Washington Dept. Oceanography Spec. Rept. 41: Seattle, Wash., Univ. Washington, p. 2-39, illus., 1969.
- 10923 **Grim, Muriel S.; Bennett, Lee C., Jr.** Shallow seismic profiling of the continental shelf off Grays Harbor, Washington, *in* Research on the continental shelf off Washington and western Alaska from August 1968 through June 1969 — Univ. Washington Dept. Oceanography Spec. Rept. 41: Seattle, Wash., Univ. Washington, p. 72-92, illus., 1969.
- Grim, Paul J.** See Epp, David. 04272
- 05213 **Grim, Paul J.** Connection of the Panama fracture zone with the Galapagos rift zone, eastern tropical Pacific: Marine Geophys. Researches, v. 1, no. 1, p. 85-90, illus., 1970.
- 09188 **Grim, Paul J.** SEAMAP deep-sea channel: U.S. ESSA Tech. Rept. Erl 93-Pol 2, 27 p., illus., 1969.
- Grim, Paul J.** See Peter, George. 10006
- Grimes, D. J.** See Harrison, J. E. 04514
- 05183 **Grimes, Mollie J.** Russell Winters Grimes (1900-1969): Am. Assoc. Petroleum Geologists Bull., v. 54, no. 10, p. 1951, portrait, 1970.
- Grimes, W. H.** See Frey, M. G. 08408
- 08703 **Grinenko, V. A.; Thode, H. G.** Sulfur isotope effects in volcanic gas mixtures: Canadian Jour. Earth Sci., v. 7, no. 6, p. 1402-1409, illus., tables, 1970.
- 00706 **Grinnell, Robert S., Jr.** Structure and development of oyster reefs off the Suwannee River delta, Florida [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 212, 1970.
- 09048 **Grisafe, D. A.; Hummel, F. A.** Crystal chemistry and color in apatites containing cobalt, nickel, and rare-earth ions: Am. Mineralogist, v. 55, nos. 7-8, p. 1131-1145, illus., tables, 1970.

- 01364 **Grissinger, E. H.; McDowell, L. L.** Sediment in relation to water quality: Water Resources Bull., v. 6, no. 1, p. 7-14, 1970.
- 00707 **Griswold, T. B.** The theoretical prediction of the effect of water pressure on eutectic systems and its application to systems of geologic interest [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 212-213, 1970.
- Griswold, Thomas B.** See Brown, William R. 00679
- Groat, C. G.** See McGowen, J. H. 05464
- 00484 **Groat, Charles G.** Effects of ground water on geomorphology, Lower Mojave Valley, California [abs.]: Texas Jour. Sci., v. 21, no. 3, p. 336, 1970.
- 06524 **Groat, Charles G.** Geology and hydrology of Troy Playa, San Bernardino County, California, Chap. 5 in Geology and hydrology of selected playas in western United States (Ward S. Motts, editor) — Univ. Massachusetts, Geology Dept., Contract AF19(628)-2486, Final Sci. Rept., Pt. 2: Bedford, Mass., U.S. Air Force Office Aerospace Research, p. 166-213, illus., 1970.
- 06997 **Groat, Charles G.** Excavation of Presidio Bolson, trans-Pecos, Texas [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 562-563, 1970.
- 07655 **Groben, Mike.** Natrolite and analcime from Eckman Creek quarry, Waldport, Oregon: Mineralog. Rec., v. 1, no. 4, p. 153-173, 176, illus., 1970.
- Groen, Pier.** See Brongersma-Sanders, Margaretha. 05636
- Grogler, N.** See Eberhardt, P. 05685
- Groh, E. A.** See Peterson, N. V. 09816
- 07550 **Grolrier, Maurice J.** Geologic map of Apollo landing site 2 (Apollo 11) — Part of Sabine D region, southwestern Mare Tranquillitatis: U.S. Geol. Survey Misc. Geol. Inv. Map I-619 [ORB II-6 (25)], scale 1:25,000, separate text, 1970.
- Grommé, C. Sherman.** See Doell, Richard R. 06275
- Gronberg, Eric C.** See Murphy, Michael A. 00041
- 09442 **Grönlands Geol. Undersögelse.** C-14 dates on post-glacial marine shells, in Report on the 1969 geological expedition to Scoresby Sund, East Greenland: Grönlands Geol. Undersögelse Rap. 30.43, 1970.
- 06998 **Groshong, Richard H., Jr.** Twinned calcite as a natural strain gage [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 563, 1970.
- 02118 **Gross, D. L.; Lineback, J. A.; White, W. A.; Ayer, N. J.; Collinson, Charles; Leland, H. V.** Studies of Lake Michigan bottom sediments — No. 1, Preliminary stratigraphy of unconsolidated sediments from the southwestern part of Lake Michigan: Illinois Geol. Survey Environmental Geology Note 30, 20 p., illus., 1970.
- Gross, D. L.** See Lineback, J. A. 03917
- Gross, D. L.** See Odom, I. E. 09727
- Gross, D. L.** See Kempton, J. P. 09729
- Gross, David L.** See Collinson, Charles. 01064
- 03611 **Gross, David L.; Moran, Stephen R.** A technique for the rapid determination of the light minerals of detrital sands: Jour. Sed. Petrology, v. 40, no. 2, p. 759-761, 1970.

- 03669 **Gross, David L.** (compiler). *Geology for planning in De Kalb County, Illinois*: Illinois Geol. Survey Environmental Geology Note 33, 26 p., illus., 1970.
- 06999 **Gross, David L.; Lineback, Jerry A.** Age and stratigraphy of Pleistocene sediments in southern Lake Michigan [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 563-564, 1970.
- Gross, David L.** See Kempton, John P. 10732
- 06597 **Gross, David Lee.** Glacial geology of Kane County, Illinois [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 2, p. 757B, 1970.
- 09131 **Gross, Eugene B.; Parwel, A.** Rutile mineralization at the White Mountain andalusite deposits, California: *Arkiv Mineralogi och Geologi*, v. 4, no. 6, art. 29, p. 493-497, illus., table, 1969.
- 04534 **Gross, G. A.** Geological concepts leading to mineral discovery: *Canadian Mining Jour.*, v. 91, no. 4, p. 51-53, 1970.
- 04695 **Gross, G. A.** Nature and occurrence of iron ore deposits, in *Survey of world iron ore resources, occurrence and appraisal*: New York, United Nations Dept. Econ. and Social Affairs, p. 13-31, illus., tables, 1970.
- 04697 **Gross, G. A.** Iron ore deposits of Canada and the West Indies, in *Survey of world iron ore resources, occurrence and appraisal*: New York, United Nations Dept. Econ. and Social Affairs, p. 237-269, illus., 1970.
- Gross, G. A.** See Land, A. H. 07972
- Gross, H. Gerald.** See Greenman, Norman N. 06279
- 10526 **Gross, H. Gerald; Hyatt, Howard A.** Optical laser induced luminescence in natural materials, a tool for active remote sensing [abs.]: *EOS*, v. 51, no. 11, p. 770-771, 1970.
- 03421 **Gross, M. Grant.** New York metropolitan region, a major sediment source: *Water Resources Research*, v. 6, no. 3, p. 927-931, illus., table, 1970.
- 09987 **Grossling, B. F.** Seamount magnetism, in *The sea — v. 4, New concepts of sea floor evolution*, Pt. 1, General observations (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 129-156, illus., tables, 1970.
- 04320 **Grossling, Bernardo F.** Future mineral supply: *Econ. Geology*, v. 65, no. 3, p. 348-349, 1970.
- 08753 **Grossling, Bernardo F.; Johnston, John E.** On bridging the gap between raw remote-sensing data and resource and environmental information, in *Photo-optical instrumentation for the 70's — Soc. Photo-Optical Instrumentation Engineers, Ann. Tech. Symposium, 15th, Anaheim, Calif., 1970, Proc.*: Redondo Beach, Calif., Soc. Photo-Optical Instrumentation Engineers, p. 179-188, 1970.
- 01487 **Grossman, I. G.** Waterborne styrene in a crystalline bedrock aquifer in the Gales Ferry area, Ledyard, southeastern Connecticut, in *Geological Survey research 1970*, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B203-B209, illus., table, 1970.
- 03744 **Grossman, I. G.; Wilson, William E.** Hydrogeologic data for the lower Housatonic River basin, Connecticut: *Connecticut Water Resources Bull.* 20, 52 p., illus., tables, 1970.
- 06281 **Grossman, J. J.; Ryan, J. A.; Mukherjee, N. R.; Wegner, M. W.** Microchemical, microphysical and adhesive properties of lunar material, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 2171-2181, illus., 1970.

- Grossman, J. J.** See Wegner, M. W. 10599
- Grossman, Robert B.** See Lynn, Warren C. 04019
- 10122 **Grove, David B.** A method to describe the flow of radioactive ions in ground water: Sandia Corp., Albuquerque, N. Mex., Rept. Sc-Cr-70-6139, 38 p., illus., table, 1970.
- 02877 **Grove, E. L.; Perkins, Alfred J.** (editors). Developments in applied spectroscopy, V. 7B — Mid-America Spectroscopy Symposium, 19th Ann., Chicago, Ill., 1968, Selected papers: New York and London, Plenum Press, 291 p., illus., tables, 1970.
- 06795 **Grover, John E.; Orville, Philip M.** Partitioning of cations between coexisting single- and multi-site phases — A reply with incidental corrections [to discussion of 1969 paper by R. F. Mueller, G. Subrata, and S. K. Saxena, 1970]: *Geochim. et Cosmochim. Acta*, v. 34, no. 12, p. 1361-1364, table, 1970.
- Groves, H. Leon, Jr.** See Raup, Omer B. 04643
- 06118 **Grow, John A.; Atwater, Tanya.** Mid-Tertiary tectonic transition in the Aleutian Arc: *Geol. Soc. America Bull.*, v. 81, no. 12, p. 3715-3721, illus., 1970.
- Growitz, D. J.** See Signor, D. C. 00077
- 07653 **Grubbs, Donald Keeble.** Weathering of diabase [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 1, p. 249B, 1970.
- Grubich, Donald N.** See Farnham, R. S. 04363
- Gruse, R. J.** See Mancini, A. J. 10403
- 04105 **Gryc, George.** Geologic framework of the North Slope petroleum province [abs.], in *Alaska Sci. Conf.*, 20th, College, 1969, *Proc.: Sci. Alaska 1969*, p. 46-47, 1970.
- 07103 **Gryc, George.** History of petroleum exploration in northern Alaska, in *Geological seminar on the North Slope of Alaska*, Palo Alto, Calif., 1970, *Proc.: Los Angeles, Calif., Am. Assoc. Petroleum Geologists Pacific Sec.*, p. C1-C8, illus.; discussion, p. C9-C10, 1970.
- 08229 **Gryc, George.** Geologic research in the Alaskan Arctic environment, in *The use of remote sensing . . . of natural resources of Alaska*: Juneau, Alaska, Dept. of Econ. Devel., p. 48-50, illus. [1970].
- Gualtieri, J. L.** See Weir, G. W. 00774
- Gude, Arthur J., 3d.** See Sheppard, Richard A. 06308
- Gude, Arthur J., 3d.** See Sheppard, Richard A. 09063
- Gudjurgis, P. J.** See Cumming, G. L. 05339
- 00069 **Guedelia, Daniel; Laurent, Jean-Louis; Fontan, Jacques; Blanc, Daniel; Druilhet, Aime.** A study of radon 220 emanation from soils: *Jour. Geophys. Research*, v. 75, no. 2, p. 357-369, illus., tables, 1970.
- Guensburg, Thomas E.** See Clark, John. 10207
- Guerrera, A. A.** See Perlmutter, N. M. 01255
- 10706 **Guerrero, E. T.** Practical reservoir engineering: Tulsa, Okla., Petroleum Pub. Co. 266 p., illus., tables, 1968.
- Guerrero-Garcia, Jose.** See Cordoba, Diego A. 05913
- Guest, J. E.** See Murray, J. B. 02202

- 07534 **Guha, Shyamal K.; Stauder, William.** The effect of focal depth on the spectra of P waves — [Pt.] 2, Observational studies: *Seismol. Soc. America Bull.*, v. 60, no. 5, p. 1457-1477, illus., tables, 1970.
- 07289 **Guha, Shyamal Kanti.** The effect of focal depth on the spectrum of P waves [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 5, p. 2772B, 1970.
- Guidoboni, R. J.** See Evans, C. A., Jr. 03666
- 04348 **Guidotti, Charles V.** The mineralogy and petrology of the transition from the lower to upper sillimanite zone in the Oquossoc area, Maine: *Jour. Petrology*, v. 11, no. 2, p. 277-336, illus., tables, 1970.
- Guilbert, John M.** See Lowell, J. David. 04280
- 08403 **Guilcher, A.** Quaternary events on the continental shelves of the world [with French and German abs.], in *The geology of the East Atlantic continental margin — ICSU/SCOR Working Party 31 Symposium*, Cambridge, England, 1970, [Pt.] 1, General and Economic Papers: [Great Britain] *Inst. Geol. Sci. Rept.*, no. 70-13, p. 31-46, illus., 1970.
- Guilday, John E.** See Parmalee, Paul W. 09446
- 10172 **Guilday, John E.** Wisconsinan range changes of birds and mammals in eastern North America [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 57, 1970.
- 10718 **Guillet, G. R.** A geological guide to Highway 60, Algonquin Provincial Park: Ontario Dept. Mines Misc. Paper 29, 44 p., illus., 1969.
- 01917 **Guja, N. H.; Vincenz, S. A.** Paleomagnetic investigations of Jamaica [abs.]: *EOS*, v. 51, no. 4, p. 270, 1970.
- 01462 **Gulbrandsen, R. A.** Relation of carbon dioxide content of apatite of the Phosphoria Formation to regional facies, in *Geological Survey research 1970*, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B9-B13, illus., tables, 1970.
- 04254 **Gulbrandsen, R. A.; Cremer, Marcelyn.** Coprecipitation of carbonate and phosphate from sea water, in *Geological Survey research 1970*, Chap. C: U.S. Geol. Survey Prof. Paper 700-C, p. C125-C126, illus., table, 1970.
- 09749 **Gulf Coast Assoc. Geol. Societies; DuBar, Jules R.; DuBar, Susan S.** (compilers and editors). Late Cenozoic stratigraphy of southwestern Florida — [Guidebook], Field Trip no. 4 [19th] Ann Mtg. Gulf Coast Assoc. Geol. Socs., with SEPM, Gulf Coast Sec., Miami Beach, Fla., 1969: [New Orleans, La.], Gulf Coast Assoc. Geol. Socs., 141 p., illus., table, 1969.
- 07993 **Gumert, William R.; Cobb, Glen E.** Helicopter gravity measuring system, in *Advances in dynamic gravimetry* (Wilbur T. Kattner, editor) — Symposium, Fort Worth, Texas, 1970, Proc.: Pittsburgh, Pa., Instrument Society of America, p. 79-85, 1970.
- 01918 **Gumper, Frank J.; Scholz, C. H.** Microearthquake seismicity, Death Valley, California to Fairview Peak, Nevada [abs.]: *EOS*, v. 51, no. 4, p. 351-352, 1970.
- Gumper, Frank J.** See Sbar, Marc L. 01973
- Gumper, Frank J.** See Sbar, Marc L. 04431
- 01412 **Gunn, Bernard M.; Watkins, Norman D.** Geochemistry of the Steens Mountain basalts, Oregon: *Geol. Soc. America Bull.*, v. 81, no. 5, p. 1497-1515, illus., tables, 1970.
- Gunther, F. J.** See Swain, P. M. 10859

**Gunther, K. H.** See Toussaint, C. J. 10413

04355 **Gunther, P.; Hills, L. V.** Heterospory in *Ariadnaesporites* [with French abs.]: Pollen et Spores, v. 12, no. 1, p. 123-130, illus., table, 1970.

00158 **Gupta, Alok K.** The system forsterite-diopside-akermanite-leucite and its significance in the petrogenesis of potassium-rich mafic and ultramafic volcanic rocks [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 22, 1970.

06870 **Gupta, Alok Krishna.** The system forsterite-diopside-akermanite-leucite and its significance in the petrogenesis of potassium-rich mafic and ultramafic volcanic rocks [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 1, p. 249B-250B, 1970.

06442 **Gupta, M. C.; MacFarlane, R. D.** The natural alpha radioactivity of samarium: Jour. Inorganic and Nuclear Chemistry, v. 32, no. 11, p. 3425-3432, illus., table, 1970.

**Gupta, Sachinder N.** See Giroud, Jean Pierre. 06779

08694 **Gupta, Sujoy.** Miospores from the Desmoinesian-Missourian boundary formations of Texas and the age of the Salesville Formation, in Perkins, B. F., editor, Geoscience and Man — V. 1, Proceedings of Am. Assoc. Stratig. Palynologists, Ann. Mtg., 1st, 1968: Baton Rouge, La., Louisiana State Univ., School of Geoscience, p. 67-82, illus., tables, 1970.

10928 **Gupta, Sujoy; Boozer, Otha Wayne.** Spores and pollen from the Rock Lake Shale at Garnett locality of Kansas, in J. Sen Memorial Volume: Calcutta, India, Bot. Soc. Bengal, p. 69-91, illus., tables, 1969.

06465 **Gurbuz, B. M.** A study of the Earth's crust and upper mantle using traveltimes and spectrum characteristics of body waves: Seismol. Soc. America Bull., v. 60, no. 6, p. 1921-1935, illus., tables, 1970.

08223 **Gurke, John L.** Shipboard data acquisition—Why use a computer?, Chap. 7 in UnderSea Technology Handbook Directory 1970: Arlington, Va., Compass Publications, p. A63-A68, illus., 1970.

**Gurley, G. Edward.** See McGregor, Keith C. 09253

**Gurley, G. Edward.** See McGregor, Keith C. 09360

08740 **Gussow, William Caruthers.** Heat, the factor in salt rheology, in Geology and technology of Gulf Coast salt — Symposium, Baton Rouge, La., 1967, Proc.: Baton Rouge, La., Louisiana State Univ. School of Geoscience, p. 125-148, illus., with discussion, 1970.

**Gutentag, Edwin D.** See Meyer, Walter R. 03768

**Guthrie, R. Dale.** See Hoskin, Charles M. 02991

**Gutiérrez-Estrada, Mario.** See Reimnitz, Erk. 03533

**Gutschick, R. C.** See Rodriguez, J. 09882

02623 **Gutschick, Raymond C.; Sandberg, Charles A.** Latest Devonian conchostracans along Cordilleran miogeosyncline, Alberta, Montana, Utah, and Nevada [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 849-850, 1970.

07000 **Gutschick, Raymond C.** The stratigraphy and structure of the Kentland impact anomaly, Indiana [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 564, 1970.

09099 **Gutshall, Paul L.; Bryant, Paul J.; Cole, George M.** Cleavage surface energy of phlogopite mica: Am. Mineralogist, v. 55, nos. 7-8, p. 1432-1434, illus., table, 1970.

- 07620 **Giiven, Necip.** Compositional and structural relationships between phengites and illites: *Clays and Clay Minerals*, v. 18, no. 4, p. 233-235, tables, 1970.
- Giiven, Necip.** See Morimoto, Nobuo. 09085
- 01527 **Guy, Harold P.** Sediment measurement techniques — [Pt.] A, Fluvial sediment — Discussion [of paper 6756, by Am. Soc. Civil Engineers (Task Comm. on Preparation of Sedimentation Manual), 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, Jour. Hydraulics Div., no. HY 5, p. 1212-1215, illus., 1970.
- 06390 **Guy, Harold P.; Ferguson, George E.** Stream sediment, an environmental problem: *Jour. Soil and Water Conserv.*, v. 25, no. 6, p. 217-221, illus., tables, 1970.
- 07048 **Guy, Harold P.** Sediment problems in urban areas: *U.S. Geol. Survey Circ.* 601-E, p. E1-E8, illus., table, 1970.
- 07468 **Guymon, G. L.; Scott, V. H.; Herrmann, L. R.** A general numerical solution to the two-dimensional diffusion-convection equation by the finite element method: *Water Resources Research*, v. 6, no. 6, p. 1611-1617, illus., 1970.
- 01711 **Guymon, Gary L.** A finite element solution of the one-dimensional diffusion-convection equation: *Water Resources Research*, v. 6, no. 1, p. 204-210, table, 1970.
- 01357 **Guyton, William F., and Associates.** Ground-water conditions in Angelina and Nacogdoches Counties, Texas: *Texas Water Devel. Board Rept.* 110, 125 p., illus., tables, 1970.
- 07337 **Guzel, Nuri.** A pedogenic study of Malcolm, Morrill and Sharpsburg soils in southwestern Saunders County, Nebraska [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 4, p. 1648B, 1970.
- 07295 **Gwynn, John Wallace.** Instrumental analysis of tars and their correlations in oil-impregnated sandstone beds, Uintah and Grand Counties, Utah [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 5, p. 2857B, 1970.
- 04285 **Haach, U.; Condie, K.; Kuo, Chin-Shin.** In situ Uranbestimmungen an Dünnschliffen und Gesamt-Uranganalysen von ultramafischen Gesteinen mit Hilfe der Spaltspurenmethode [In situ uranium determination on thin sections and whole rock uranium analyses of ultramafic rocks with assistance of the fission-track method] [abs.]: *Fortschr. Mineralogie*, v. 48, no. 1, p. 8, 1970.
- 01771 **Haas, Herbert; Holdaway, M. J.** Stability relations of corundum and diaspore in the medium pressure and temperature range [abs.]: *EOS*, v. 51, no. 4, p. 437, 1970.
- Haas, J. Eugene.** See Kates, Robert W. 04961
- Haas, J. Eugene.** See Norton, Frank R. B. 04963
- Haas, J. Eugene.** See Norton, Frank R. B. 04964
- 01871 **Haas, John L., Jr.** The effect of salinity on the maximum thermal gradient of a hydrothermal system at hydrostatic pressure and near boiling [abs.]: *EOS*, v. 51, no. 4, p. 453, 1970.
- 07232 **Haas, John L., Jr.** An equation for the density of vapor-saturated NaCl-H<sub>2</sub>O solutions from 75° to 325°C: *Am. Jour. Sci.*, v. 269, no. 5, p. 489-493, illus., table, 1970.
- 02097 **Haas, Otto.** Recent literature on Mesozoic ammonites, Pt. 11: *Jour. Paleontology*, v. 44, no. 3, p. 544-557, 1970.
- 10909 **Habashi, Fathi.** Uranium in phosphate rock: *Montana Bur. Mines and Geology Spec. Pub.* 52, 33 p., illus., tables, 1970.



- 04608 **Habib, Daniel.** Middle Cretaceous palynomorph assemblages from clays near the Horizon Beta deep-sea outcrop: *Micropaleontology*, v. 16, no. 3, p. 345-379, illus., tables, 1970.
- 08521 **Habib, Daniel; Thurber, David; Ross, David; Donahue, Jack.** Holocene palynology of the Middle America Trench near Tehuantepec, Mexico *in* Geological Investigations of the North Pacific (James D. Hays, editor): *Geol. Soc. America Mem.* 126, p. 233-261, illus., tables, 1970.
- 09199 **Habib, Daniel.** Morphological affinity of selected palynomorphs from the Horizon Beta outcrop [abs.], *in* Perkins, B. F. (editor), *Geoscience and Man* — v. 1, *Am. Assoc. Stratig. Palynologists Ann. Mtg.*, 1st, 1968, *Proc.*: Baton Rouge, La., Louisiana State Univ. School of Geoscience, p. 134, 1970.
- 01460 **Hach-Ali, P. Fenoll; Ottemann, J.** Linneit und Bravot von Fredericktown, Missouri (eine Mikrosonde-Untersuchung): *Aufschluss*, v. 21, no. 1, p. 29-33, illus., tables, 1970.
- 05428 **Hackett, James E.** A general methodology for analysis of physical factors in environmental planning [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 134, 1970.
- Hacquebard, P. A.** *See* Rose, E. R. 08008
- 08133 **Hacquebard, P. A.; Donaldson, J. R.** Coal metamorphism and hydrocarbon potential in the Upper Paleozoic of the Atlantic Provinces, Canada: *Canadian Jour. Earth Sci.*, v. 7, no. 4, p. 1139-1163, illus., tables, 1970.
- 10752 **Hacquebard, P. A.; Cameron, A. R.** Coal geology, *in* Background papers on the earth sciences in Canada (C. H. Smith, editor): *Canada Geol. Survey Paper* 69-56, p. 36-42, 1970.
- 07001 **Hacquebard, Peter A.; Donaldson, J. Roger.** Coal rank studies in the Rocky Mountain foothills belt of Canada [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 564-565, 1970.
- Hade, George.** *See* Molnar, Peter. 01288
- 10505 **Hadjithodorou, C.** Groundwater pollution by deep-well injection [abs.]: *EOS*, v. 51, no. 11, p. 755, 1970.
- 07256 **Hadley, C. J.** Subsurface studies of reef debris will help reveal the presence and quality of pinnacle reefs in southwestern Ontario, *Tech. Paper 8 in Ontario Petroleum Inst.*, 9th Ann. Conf., Ottawa, 1970: Chatham, Ontario, Ontario Petroleum Inst., 15 p., paged separately, illus., 1970.
- 02624 **Hadley, Donald G.** Paleocurrents and origin of Huronian Lorrain Formation, Ontario and Quebec [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 850, 1970.
- 00126 **Hadley, James W.** [Discussion of a chart showing relation between earthquake magnitudes and energy, 1969]: *California Div. Mines and Geology Mineral Inf. Service*, v. 23, no. 1, p. 16-17, illus., 1970.
- 00708 **Hadley, Jarvis B.** Origin of some layered gneisses of the western Carolina Piedmont [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 213-214, 1970.
- 04691 **Hadley, Jarvis B.; Nelson, Arthur E.** Caesars Head Quartz Monzonite in the western Carolina Piedmont, *in* Changes in stratigraphic nomenclature by the U.S. Geological Survey, 1969: *U.S. Geol. Survey Bull.* 1324-A, p. A23-A24, 1970.
- Hadley, R. S.** *See* Burrell, D. C. 10522
- Hady, M. A.** *See* Matalucci, R. V. 10715

- 07783 **Haefeli, C. J.** Regional groundwater flow between Lake Simcoe and Lake Ontario: Canada Dept. Energy, Mines and Resources Island Waters Br. Tech. Bull. 23, 42 p., illus., tables, 1970.
- 03983 **Haefeli, Charles.** Beispiel zur theoretischen Analyse von regionalen Grundwasserströmungen [An example of theoretical analysis of regional ground-water flow]: Ver. Schweizer. Petroleum-Geologen u. -Ingenieure Bull., v. 36, no. 90, p. 41-49, illus., 1970.
- 05372 **Haenggi, W. T.; Gries, J. C.** Structural evolution of northeastern Chihuahua Tectonic Belt, in *Geology of the southern Quitman Mountains area, Trans-Pecos Texas* — S.E.P.M. Permian Basin Sec., 1970 Biennial Field Trip, Symposium and Guidebook: Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub. 70-12, p. 55-69, illus., 1970.
- Haenggi, Walter T.** See Gries, John C. 05915
- Haenggi, Walter T.** See DeFord, Ronald K. 05919
- 04410 **Hafer, George.** Fossil falls: Desert, v. 33, no. 6, p. 26-27, 33, illus., 1970.
- Haffty, Joseph** See Pinckney, Darrell M. 04281
- 01772 **Hafner, S. S.; Weber, H. P.; Kullerud, Gunnar.** Vacancy distribution in kenotetrahedral magnetite [abs.]: EOS, v. 51, no. 4, p. 447, 1970.
- Hafner, S. S.** See Bush, W. R. 03905
- 07135 **Hafner, S. S.** Order-disorder studies in silicates by means of gamma-ray resonant absorption of  $^{57}\text{Fe}$ , in *Developments in applied spectroscopy*, V. 8 — Mid-America Spectroscopy Symposium, 20th Ann., Chicago, Ill., 1969, Selected papers: New York and London, Plenum Press, p. 292-299, illus., tables, 1970.
- Hafner, Stefan S.** See Virgo, David. 03175
- 04426 **Hafner, Stefan S.; Virgo, David.** Temperature-dependent cation distributions in lunar and terrestrial pyroxenes, in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc.* — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 2183-2198, illus., tables, 1970.
- 06521 **Hagar, David J.** Geology and hydrology of Coyote Playa, Chap. 3, Pt. 1 in *Geology and hydrology of selected playas in western United States* (Ward S. Motts, editor) — Univ. Massachusetts, Geology Dept., Contract AF19(628)-2486, Final Sci. Rept., Pt. 2: Bedford, Mass., U.S. Air Force Office Aerospace Research, p. 66-107, illus., tables, 1970.
- 07652 **Hagerty, Royal Moncrief.** Clay mineralogy of the southwestern Gulf of Mexico and adjacent river outlets [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 1, p. 274B, 1970.
- Haggerty, S. E.** See Lindsley, D. H. 01795
- 02242 **Haggerty, S. E.; Lindsley, D. H.** Stability of the pseudobrookite ( $\text{Fe}_2\text{TiO}_5$ )-ferropseudobrookite ( $\text{FeTi}_2\text{O}_5$ ) series: Carnegie Inst. Washington Year Book 68, 1968-69, p. 247-249, illus., 1970.
- 02243 **Haggerty, S. E.** Magnetic minerals in pelagic sediments: Carnegie Inst. Washington Year Book 68, 1968-69, p. 332-336, 1970.

- 02244 **Haggerty, S. E.** A new iron-phosphate mineral: Carnegie Inst. Washington Year Book 68, 1968-69, p. 330-332, table, 1970.
- 03006 **Haggerty, S. E.; Irving, E.** On the origin of the natural remanence (NMR) of the Mid-Atlantic Ridge at 45°N [abs.]: EOS, v. 51, no. 4, p. 273, 1970.  
**Haggerty, S. E.** See Irving, E. 05285
- 03007 **Haggerty, Stephen E.** Mid-Atlantic Ridge near 45°N, magnetic mineralogy [abs.]: EOS, v. 51, no. 4, p. 273, 1970.
- 08018 **Haggerty, Stephen E.; Meyer, Henry O. A.** Apollo 12 — Opaque oxides: Earth and Planetary Sci. Letters, v. 9, no. 5, p. 379-387, illus., tables, 1970.
- 08581 **Haggett, Peter; Chorley, Richard J.** Network analysis is geography: New York, St. Martin's Press, 348 p., illus., tables, 1970.
- 01709 **Hagist, Warren M.; Huff, Lewis L.** Dispersion of silt particles in open channel flow — Discussion [of paper 6579 by W. W. Sayre, 1969]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Hydraulics Div., no. HY 1, p. 299-302, illus., 1970.  
**Hagmaier, J. Ladd.** See Clayton, Lee. 00600
- 00754 **Hagmaier, J. Ladd.** Relation of uranium occurrences to groundwater flow systems in the Powder River Basin, Wyoming [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 334-335, 1970.
- 04033 **Hagmaier, J. Ladd.** Surface morphology of the Little Missouri Badlands, North Dakota: Compass, v. 47, no. 3, p. 141-146, illus., table, 1970.  
**Hagner, Arthur F.** See Pride, Douglas E. 09525
- 01665 **Hahn, Hermann H.; Stumm, Werner.** The role of coagulation in natural waters: Am. Jour. Sci., v. 268, no. 4, p. 354-368, illus., tables, 1970.
- 01773 **Hail, W. Roger; Randall, Walter; Rex, Robert W.** Possible sea-floor spreading in the Imperial Valley of California — [Pt.] 2, Configuration of the basement [abs.]: EOS, v. 51, no. 4, p. 421-422, 1970.  
**Hailu, Tsegaye.** See Lau, L. Stephen. 10620
- 07505 **Haimson, B.; Fairhurst, C.** In-situ stress determination at great depth by means of hydraulic fracturing, Chap. 28 in Rock mechanics, theory and practice — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 559-584, illus., tables, 1970.  
**Haines, E. L.** See Hart, H. R., Jr. 01778
- 07880 **Haines, G. V.; Hannaford, W.; Serson, P. H.** Magnetic anomaly maps of the Nordic countries and the Greenland and Norwegian Seas: Dominion Observatory Ottawa Pubs., v. 39, no. 5, illus., tables, 1970.  
**Hait, M. H.** See Shoemaker, E. M. 06294
- 07830 **Hakala, W. W.** Subsidence caused by an underground nuclear explosion, in Symposium on engineering with nuclear explosives — Am. Nuclear Soc. and U.S. Atomic Energy Comm., Las Vegas, Nev., 1970, Proc., V. 2: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., p. 1428-1455, illus., table, 1970.
- 01774 **Halbig, J. B.** The crystalline solubility of thallium in synthetic sphalerite and galena — An interpretation of some natural occurrences of the element [abs.]: EOS, v. 51, no. 4, p. 453, 1970.

- 00524 **Halbig, Joseph Benjamin.** Trace element studies in synthetic sulfide systems — The solubility of thallium in sphalerite and the partition of selenium between sphalerite and galena [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3240B, 1970.
- 07313 **Halbouty, Michel T.** The exploration geologist in the seventies, *in* Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Soc. Trans., v. 20, p. 1-4, 1970.
- 07752 **Halbouty, Michel T.** (editor). Geology of giant petroleum fields — Symposium, AAPG, 53d Ann. Mtg., Oklahoma City, Okla., 1968: Am. Assoc. Petroleum Geologists Mem. 14, 575 p., illus., tables, 1970.
- 07753 **Halbouty, Michel T.** Introduction, *in* Geology of giant petroleum fields — Symposium, AAPG, 53d Ann. Mtg., Oklahoma City, Okla., 1968: Am. Assoc. Petroleum Geologists Mem. 14, p. 1-7, illus., 1970.
- 07757 **Halbouty, Michel T.** Giant oil and gas fields in United States, *in* Geology of giant petroleum fields — Symposium, AAPG, 53d Ann. Mtg., Oklahoma City, Okla., 1968: Am. Assoc. Petroleum Geologists Mem. 14, p. 91-127, illus., tables, 1970.
- 07768 **Halbouty, Michel T.; Meyerhoff, A. A.; King, Robert E.; Dott, Robert H., Sr.; Klemme, H. Douglas; Shabad, Theodore.** World's giant oil and gas fields, geologic factors affecting their formation, and basin classification — 2 Pts., *in* Geology of giant petroleum fields — Symposium, AAPG, 53d Ann. Mtg., Oklahoma City, Okla., 1968: Am. Assoc. Petroleum Geologists Mem. 14, p. 502-555, illus., tables, 1970.
- 03995 **Hale, Dan.** Archaeological and paleontological finds in the New Fern system (Jackson Co., Ala.): Natl. Speleol. Soc. NSS News, v. 28, no. 8, p. 105-106, 1970.
- 09242 **Hale, Dan.** Sotano de las Golondrinas: Explorers Jour., v. 47, no. 1, p. 34-40, illus., 1969.
- 05364 **Hales, A. L.; Helsley, C. E.; Nation, J. B. P** Travel times for an oceanic path: Jour. Geophys. Research, v. 75, no. 35, p. 7362-7381, illus., tables, 1970.
- 00709 **Hale, Robin C.** Factors favoring Precambrian Ocoee sediments as a source of gold for auriferous quartz veins in the Coker Creek district, Monroe County, Tennessee [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 214, 1970.
- 01920 **Hales, A. L.; Helsley, C. E.; Nation, J. B.** Travel times for an oceanic path [abs.]: EOS, v. 51, no. 4, p. 359, 1970.
- 03513 **Hales, A. L.; Roberts, J. L.** The travel times of S and SKS: Seismol. Soc. America Bull., v. 60, no. 2, p. 461-489, illus., tables, 1970.
- 04681 **Hales, A. L.; Roberts, J. L.** Shear velocities in the lower mantle and the radius of the core: Seismol. Soc. America Bull., v. 60, no. 5, p. 1427-1436, illus., table, 1970.
- 05321 **Hales, A. L.; Helsley, C. E.; Nation, J. B. P** travel times for an oceanic path: Jour. Geophys. Research, v. 75, no. 35, p. 7362-7381, illus., tables, 1970.
- 05796 **Hales, A. L.; Helsley, C. E.; Nation, J. B.** Crustal study on Gulf coast of Texas: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 11, p. 2040-2057, illus., tables, 1970.
- Hales, Anton L.** See Cleary, John. 03360
- Haley, James F.** See Comm. on Subsoils of Boston. 07865
- 07874 **Hall, Bradford A.** Stratigraphy of the southern end of the Munsungun anticlinorium, Maine: Maine Geol. Survey Bull. 22, 63 p., illus., table, geol. map, 1970.
- Hall, C. A.** See Turner, D. L. 00383
- Hall, Clarence.** See Surdam, Ronald C. 00376

- 10782 **Hall, D. H.** History of earth science, *in* Background papers on the earth sciences in Canada (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 292-303, 1970.
- 09379 **Hall, David Joseph.** Compositional variations in biotites and garnets from kyanite and sillimanite zone mica schists, Orange area, Massachusetts and New Hampshire: Massachusetts Univ. Geology Dept. Contr. 4, 110 p. illus., tables, 1970.
- Hall, F. F., Jr.** See Gauger, J. 06622
- 01574 **Hall, Frank Washington.** Bedrock geology, north half of Missoula 30' quadrangle, Montana [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 9, p. 4208B, 1970.
- 05362 **Hall, Gary; Bullock, Jim.** Third day's road log — Breckenridge to Granby, *in* Dakota and related rocks of the Front Range — Guidebook issue: Mtn. Geologist, v. 7, no. 3, p. 244-250, illus., 1970.
- Hall, H. T.** See Rama Murthy, V. 04070
- 10603 **Hall, H. T.** Thermal and photochemical studies on the polymorphism of realgar (As<sub>2</sub>S<sub>4</sub>) [abs.]: EOS, v. 51, no. 11, p. 831, 1970.
- Hall, Henry T.** See Yund, Richard A. 04349
- Hall, J. L.** See Boyne, H. S. 06627
- Hall, J. R., Jr.** See Richart, F. E. 03799
- 04161 **Hall, J. W.; Stidd, B. M.** Development of pollen in the genus *Vesicaspora* [abs.]: Am. Jour. Botany, v. 57, no. 6, pt. 2, p. 758, 1970.
- Hall, J. W.** See Stidd, B. M. 04175
- 10046 **Hall, John K.** Geophysical evidence for ancient sea-floor spreading from Alpha Cordillera and Mendeleyev Ridge [abs.], *in* Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2483-2484, 1970.
- Hall, John W.** See Stidd, Benton M. 04196
- 09195 **Hall, John W.** Megaspores as indicators of habitat [abs.], *in* Perkins, B. F. (editor), Geoscience and Man — v. 1, Am. Assoc. Stratig. Palynologists Ann. Mtg., 1st, 1968, Proc.: Baton Rouge, La., Louisiana State Univ. School of Geoscience, p. 133, 1970.
- Hall, M. R.** See Dietrich, R. V. 03749
- Hall, R.** See Frank, D. J. 05181
- 03653 **Hall, Stephen A.** Nomenclature of some Pennsylvanian Upper Cherokee (Desmoinesian Series) coals of Iowa: Iowa Acad. Sci. Proc. 1969, v. 76, p. 275-281, 1970.
- 08397 **Hall, Warren A.; Dracup, John A.** Water resources systems engineering: New York and San Francisco, McGraw-Hill Book Company, 372 p., illus., tables, 1970.
- 07057 **Haller, John.** Tectonic map of East Greenland (1:500,000) — An account of tectonism, plutonism, and volcanism in East Greenland: Medd. Grönland, v. 171, no. 5, 286 p., illus., tables, 1970.
- Haller, W. A.** See Filby, R. H. 06554
- Haller, W. A.** See Shah, K. R. 07850
- Haller, W. A.** See Shah, K. R. 08588

**Hallford, C. R.** *See* Crisp, R. W. 10239

- 04004 **Halliday, W. R.; Anderson, C. H.** Glacier caves, a new field of speleology: *Studies Speleology* 1969, v. 2, pt. 2, p. 53-59, illus., 1970.

- 09244 **Halliday, William R.; Anderson, Charles H., Jr.** Glacier caves: *Explorers Jour.*, v. 48, no. 2, p. 131-135, illus., 1970.

- 09785 **Halliday, William R.; Anderson, Charles H., Jr.** The hollow glacier: *Pacific Discovery*, v. 23, no. 4, p. 24-30, illus., 1970.

**Hallinger, Donald E.** *See* Haun, John D. 04649

- 09224 **Hallof, Philip G.** The use of induced polarization measurements to locate massive sulphide mineralization in environments in which EM methods fail [with French abs.], in *Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26*, p. 302-309, illus., 1970.

- 10401 **Halloran, James E.** [compiler]. Groundwater, in *Water resources survey — Dawson County, Montana: Helena, Mont., Montana Water Resources Board*, p. 24-30, illus., tables, 1970.

**Halls, C.** *See* Stumpf, E. F. 06768

- 04647 **Halls, Chris; Stumpf, E. F.** Geology and ore deposition, Western Kerr Lake Arch, Cobalt, Ontario, in *Mining and petroleum geology — Commonwealth Mining and Metall. Cong., 9th, United Kingdom, 1969, Proc., V. 2: London, Inst. Mining and Metallurgy*, p. 241-284, illus., tables, 1970.

**Halpern, Berthold.** *See* Hodgson, Gordon W. 05591

**Halpern, Berthold.** *See* Hodgson, Gordon W. 05741

- 07002 **Halsey, S. D.; Perkins, R. D.** Microborings in relict sediments, a possible key to Carolina shelf history [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 565, 1970.

- 09858 **Haman, Peter J.** Structural analysis of the Christina Lake area: *Western Miner.*, v. 43, no. 4, p. 54-61, illus., 1970.

**Hamano, Y.** *See* Mizutani, H. 02138

- 07003 **Hambleton, William W.** Toward a concept for a national geoscience information program, a report of the Committee on Geoscience Information of the American Geological Institute [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 565, 1970.

- 06923 **Hamblin, W. K.; Best, M. G.** (editors). The western Grand Canyon district: *Utah Geol. Soc. Guidebook to Geology of Utah*, no. 23, 154 p., illus., tables, 1970.

- 06924 **Hamblin, W. K.** Structure of the western Grand Canyon region, in *The western Grand Canyon district: Utah Geol. Soc. Guidebook to Geology of Utah*, no. 23, p. 3-20, illus., 1970.

- 06925 **Hamblin, W. K.** Late Cenozoic basalt flows of the western Grand Canyon, in *The western Grand Canyon district: Utah Geol. Soc. Guidebook to Geology of Utah*, no. 23, p. 21-37, illus., 1970.

**Hamblin, W. K.** *See* Best, M. G. 06927

- 06928 **Hamblin, W. K.** A summary of the stratigraphy of the western Grand Canyon region, in *The western Grand Canyon district: Utah Geol. Soc. Guidebook to Geology of Utah*, no. 23, p. 81-91, illus., 1970.

- 07073 **Hamblin, W. K.; Best, M. G.** Road log, *in* The western Grand Canyon district: Utah Geol. Soc. Guidebook to Geology of Utah, no. 23, p. 93-154, illus., 1970.
- 07107 **Hamblin, W. K.** Lava dams in the Toroweap and Prospect areas of the Grand Canyon, *in* The western Grand Canyon district: Utah Geol. Soc. Guidebook to Geology of Utah, no. 23, p. 39-55, illus., 1970.
- 07004 **Hamburger, Richard.** Geologic factors in rapid excavation with nuclear explosions [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 566, 1970.
- 09848 **Hamburger, Richard.** State of mineral extraction projects using nuclear explosives: Mining Cong. Jour., v. 56, no. 7, p. 48-52, illus., 1970.
- Hamel, J. V.** See Flint, Norman K. 00153
- 00619 **Hamel, James V.** The Pima mine slide, Pima County, Arizona [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 335, 1970.
- 04228 **Hamel, James V.** Coefficient of friction of natural rock surfaces — Discussion [of paper 7121 by B. W. Paulding, Jr., 1970]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Soil Mechanics and Found. Div., no. SM5, p. 1833-1835, table, 1970.
- 07265 **Hamel, James Victor.** Stability of slopes in soft, altered rocks [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2664B, 1970.
- 03235 **Hamelin, Louis Edmond.** Contribution au vocabulaire géographique des pays froids — Périglaciaire et glaces flottantes [Contribution to the geographic vocabulary of the cold regions — Periglacial and floating ice (with English and Russian abs.)]: Rev. Géographie Montréal, v. 24, no. 3, p. 305-309, 1970.
- Hamil, M.** See Slaughter, M. 00616
- 03725 **Hamilton, E. L.; Buckner, H. P.; Keir, D. L.; Whitney, J. A.** Velocities of compressional and shear waves in marine sediments determined in situ from a research submersible: Jour. Geophys. Research, v. 75, no. 20, p. 4039-4049, illus., tables, 1970.
- 10644 **Hamilton, E. L.** Sound velocity, elasticity, and related properties of marine sediments, North Pacific — [Pt.] 1, Sediment properties, environmental control, and empirical relationships: U.S. Naval Undersea Research and Devel. Center [Rept.], NUC TP 143, 56 p., illus., tables, 1969.
- 10645 **Hamilton, E. L.** Sound velocity, elasticity, and related properties of marine sediments, North Pacific — [Pt.] 2, Elasticity and elastic constants: U. S. Naval Undersea Research and Devel. Center [Rept.], NUC TP 144, 64 p., illus., tables, 1969.
- 10646 **Hamilton, E. L.; Buckner, H. P.; Keir, D. L.; Whitney, J. A.** In situ determinations of the velocities of compressional and shear waves in marine sediments from a research submersible: U.S. Naval Undersea Research and Devel. Center [Rept.], NUC TP 163, 26 p., illus., tables, 1969.
- 03558 **Hamilton, Edwin L.** Sound velocity and related properties of marine sediments, North Pacific: Jour. Geophys. Research, v. 75, no. 23, p. 4423-4446, illus., tables, 1970.
- 07515 **Hamilton, Edwin L.** Reflection coefficients and bottom losses at normal incidence computed from Pacific sediment properties: Geophysics, v. 35, no. 6, p. 995-1004, illus., tables, 1970.
- 06383 **Hamilton, J. B.; Barnette, D. E.** Gypsum in New Brunswick: New Brunswick Dept. Nat. Resources Mineral Resources Br. Rept. Inv. 10, 62 p., illus., tables, geol. map, 1970.
- Hamilton, M.** See Nishita, H. 07230

**Hamilton, Michael M.** *See* Benham, Steven R. 00672

- 05596 **Hamilton, N.; Rees, A. I.** Magnetic fabric of sediments from the shelf at La Jolla (California): *Marine Geology*, v. 9, no. 2, p. M6-M11, illus., tables, 1970.

**Hamilton, Paul B.** *See* Murphy, Mary E. 05745

- 01628 **Hamilton, R. M.; Healy, J. H.** Aftershocks of the JORUM underground nuclear explosion [abs.]: *EOS*, v. 51, no. 3, p. 203, 1970.

**Hamilton, R. M.** *See* Healy, J. H. 03974

**Hamilton, Robert D.** *See* Greenfield, Leonard J. 03052

- 03583 **Hamilton, Robert M.** Time-term analysis of explosion data from the vicinity of the Borrego Mountain, California, earthquake of 9 April 1968: *Seismol. Soc. America Bull.*, v. 60, no. 2, p. 367-381, illus., tables, 1970.

- 07005 **Hamilton, Robert M.; Healy, John H.** Aftershocks of underground nuclear explosions [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 566, 1970.

**Hamilton, Thomas.** *See* Forbes, Robert B. 10040

- 04305 **Hamilton, Thomas M.** Channel-scarp formation in western North Dakota, in *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C229-C232, illus., 1970.

- 10047 **Hamilton, Warren.** Continental drift in Arctic [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2484, 1970.

- 04887 **Hamilton, Wayne L.** Atmospheric dust records in permanent snowfields, implications to marine sedimentation — Discussion [of paper by H. L. Windom, 1969]: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 3175-3176, illus., 1970.

- 05387 **Hamilton-Smith, T.** Stratigraphy and structure of Ordovician and Silurian rocks of the Siegas area, New Brunswick: *New Brunswick Dept. Nat. Resources Mineral Resources Br. Rept. Inv.* 12, 55 p., illus., tables, geol. map, 1970.

**Hammerquist, Donald W.** *See* Hoskins, Earl R. 07028

- 02012 **Hammond, Douglas E.; Takahashi, Taro; Bassett, William A.** Isothermal compression of CsI up to 226 kilobars at 23°C [abs.]: *EOS*, v. 51, no. 4, p. 419, 1970.

- 03438 **Hammond, Stephen R.** Paleomagnetic investigations of deep borings on the Ewa Plain, Oahu, Hawaii: *Hawaii Inst. Geophysics [Rept.] HIG-70-10*, 60 p., illus., 1970.

**Hamza, V. M.** *See* Verma, R. K. 07309

**Han, J.** *See* Gelpi, E. 04602

**Han, J.** *See* Burlingame, A. L. 05736

- 03538 **Hanai, Tetsuro.** Studies on the ostracod subfamily Schizocytherinae Mandelstam: *Jour. Paleontology*, v. 44, no. 4, p. 693-729, illus., tables, 1970.

**Hanan, Robert V.** *See* Stewart, Joseph W. 07900

- 10917 **Hancock, W. P.** The Willey Pool, Elgin County, Ontario, in *Ontario Petroleum Inst. Conf.*, 7th, Windsor, 1968 [Proc.]: Chatham (Ontario), Ontario Petroleum Inst., Tech. Paper No. 5, 14 p., illus., table, 1968.

- 08485 **Hand, John W.** Planning for disposal of oil shale, chemical and mine wastes, in *Governor's Conf. on Environmental Geology*: Colorado Geol. Survey Spec. Pub., no. 1, p. 33-37 [1970?].



- 07353 **Handfield, Robert Charles.** Archaeocyatha from the Mackenzie and Cassiar Mountains, western Canada [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 4, p. 2063B, 1970.
- 07006 **Handin, John W.; Logan, John M.** Experimental folding of rocks under confining pressure [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 567, 1970.
- 07007 **Haner, Barbara E.** Segmented submarine fan model, a relationship between recent and ancient sedimentary fan facies [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 567, 1970.
- 07617 **Hang, Pham Thi; Brindley, G. W.** Methylene blue absorption by clay minerals — Determination of surface areas and cation exchange capacities (Clay-Organic Studies XVIII) [with French, German, and Russian abs.]: *Clays and Clay Minerals*, v. 18, no. 4, p. 203-212, illus., tables, 1970.
- 01921 **Hanks, T. C.; Brune, J. N.** Seismicity of the San Geronio Pass [abs.]: *EOS*, v. 51, no. 4, p. 352, 1970.
- 09501 **Hann, Roy W., Jr.** Mathematical modeling of Gulf Coast estuaries: *Water Resources Bull.*, v. 6, no. 3, p. 323-338, illus., tables, 1970.
- 00462 **Hanna, G. Dallas.** Fossil diatoms from the Pribilof Islands, Bering Sea, Alaska: *California Acad. Sci. Proc.*, v. 37, no. 5, p. 167-233, illus., 1970.
- Hanna, W. F.** See Oliver, H. W. 00328
- 01559 **Hanna, W. F.** Aeromagnetic and gravity features of the western Franciscan and Salinian basement terranes between Cape San Martin and San Luis Obispo, California, in *Geological Survey research 1970*, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B66-B77, illus., 1970.
- Hanna, W. F.** See Grantz, Arthur. 07076
- Hanna, W. F.** See Grantz, Arthur. 10045
- Hannaford, W.** See Haines, G. V. 07880
- 02544 **Hannah, Peter R.; Zahner, Robert.** Nonpedogenetic texture bands in outwash sands of Michigan — Their origin, and influence on tree growth: *Soil Sci. Soc. America Proc.*, v. 34, no. 1, p. 134-136, illus., tables, 1970.
- 05697 **Hanneman, R. E.** Thermal and gas evolution behavior of Apollo 11 samples, in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis*: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp. 1*), p. 1207-1211, illus., table, 1970.
- 07008 **Hanor, Jeffrey S.; Marshall, Neil F.** Quantitative analysis of worm burrowing and sediment mixing in some recent southern California borderland sediments [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 568, 1970.
- Hanor, Jeffrey S.** See Reid, Arch M. 09093
- 08253 **Hanrahan, E. T.; Quinn, W. J.** A fundamental analysis of the strains in stressed specimens of peat [with French abs.], in *International Peat Congress, 3d, Quebec, Canada, 1968, Proc.*: Ottawa, Canada, National Research Council of Canada, p. 132-135, illus., 1970.
- 00445 **Hansen, Dan E.; Kume, Jack.** Geology and ground water resources of Grand Forks County — Pt. 1, Geology: *North Dakota Geol. Survey Bull. 53*, pt. 1 (North Dakota Water Comm. County Ground Water Study 13), 76 p., illus., tables, geol. maps, 1970.

- 02950 **Hansen, Don A.** Iron ore exploration in North and South America [with French abs.], in *Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26*, p. 371-380, illus., tables, 1970.
- 08468 **Hansen, Edward E.** Sediment movement in a pool and riffle stream [with French abs.], in *Symposium on the results of research on representative and experimental basins: Internat. Assoc. Sci. Hydrology-Unesco Pub. 96*, p. 541-561, illus., tables, 1970.
- 08198 **Hansen, Hans Jörgen.** Danian foraminifera from Nûgssuaq, West Greenland — With special reference to species occurring in Denmark [with Danish summ.]: *Medd. Grönland*, v. 193, No. 2, 132 p., illus., 1970; *reprinted as Grönlands Geol. Undersøgelse Bull. 93*, 1970.
- 00159 **Hansen, Harry J.** Transmissibility trends in the Coastal Plain aquifers of Maryland [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 23, 1970.
- 08405 **Hansen, Kaj.** Geological and geographical investigations in Kong [!] Frederik IX's Land — Morphology, sediments, periglacial processes and salt lakes: *Medd. Grönland*, v. 188, no. 4, 77 p., illus., tables, 1970.
- 03406 **Hansen, R. O.; Begg, E. L.** Age of Quaternary sediments and soils in the Sacramento area, California, by uranium and actinium series dating of vertebrate fossils: *Earth and Planetary Sci. Letters*, v. 8, no. 6, p. 411-419, illus., tables, 1970.
- 05478 **Hansen, Richard O.** Radioactivity of a California terrace soil: *Soil Sci.*, v. 110, no. 1, p. 31-36, 1970.
- 04931 **Hansen, Robert E.** Geology and ground-water resources of Linn County, Iowa: *Iowa Geol. Survey Water-Supply Bull. 10*, 66 p., illus., tables, geol. map, 1970.
- 00970 **Hansen, Robert J.** (editor). *Seismic design for nuclear power plants: Cambridge, Mass., M.I.T. Press*, 489 p., illus., tables, 1970.
- Hansen, W. M.** See Wegner, M. W. 10599
- Hanshaw, B. B.** See Pearson, F. J., Jr. 08478
- Hanshaw, Bruce B.** See Back, William. 04129
- Hanshaw, Bruce B.** See Back, William. 05323
- Hanshaw, Penelope M.** See D'Agostino, John P. 04250
- 06479 **Hanson, G. N.; Goldich, S. S.** Early Precambrian geology of the Saganaga-Northern Light Lakes area, Minnesota-Ontario [abs.], in *Inst. Lake Superior Geology, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ.*, p. 18, 1970.
- 06480 **Hanson, G. N.; Malhotra, R.** K-Ar ages of mafic dikes in northeastern Minnesota [abs.], in *Inst. Lake Superior Geology, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ.*, p. 19, 1970.
- 01775 **Hanson, Gilbert N.** Rate of loss of radiogenic argon from biotite in whole rock laboratory heating [abs.]: *EOS*, v. 51, no. 4, p. 433, 1970.
- 10496 **Hanson, Hal C.** The accuracy of ground water contour maps [abs.]: *EOS*, v. 51, no. 11, p. 748, 1970.
- 09007 **Hanson, William E.** Nomenclature and terms, [chap.] 1 in *Bituminous materials — asphalts, tars, and pitches*, A. J. Hoiberg, editor — v. 1: New York, Intersci. Publishers, p. 1-24, tables, 1964.

- 07402 **Hansuld, John A.** Geochemical surface halos — Tri-state district [abs.]: *Mining Eng.*, v. 22, no. 9, p. 50, 1970.
- 02762 **Hapgood, Charles H.** The path of the pole (revised edition of *Earth's shifting crust*): Philadelphia, Pa., and New York, Chilton Book Co., 413 p., illus., tables, 1970; originally published 1958.
- 05098 **Hapke, Bruce.** Inferences from the optical properties of the Moon concerning the nature and evolution of the lunar surface, in *Symposium on planetary atmospheres and surfaces*, Woods Hole, Mass., 1969: *Radio Sci.*, v. 5, no. 2, p. 293-299, illus., 1970.
- 10386 **Happ, Stafford C.** Valley sedimentation in north central Mississippi, in *Mississippi Water Resources Conf.*, 3d, 1968, Jackson, Proc.: State College, Miss., Water Resources Research Inst., p. 38-45, illus., table [1968].
- Harada, K.** See Hare, P. E. 05738
- 01693 **Harada, Kaoru.** Origin and development of optical activity of organic compounds on the primordial Earth: *Naturwissenschaften*, v. 57, no. 3, p. 114-119, illus., tables, 1970.
- Harakal, J. E.** See White, William H. 08135
- 01590 **Harbaugh, John W.** Computer simulation of marine sedimentation [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 3, p. 555, 1970.
- 04790 **Harbaugh, John W.; Bonham-Carter, Graeme.** Computer simulation in geology: New York and London, Wiley-Interscience, 575 p., illus., tables, 1970.
- Harbour, Robert L.** See Bachman, George O. 01612
- 04261 **Harbour, Robert L.** The Hondo Sandstone Member of the San Andres Limestone of south-central New Mexico, in *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C175-C182, illus., table, 1970.
- Hardcastle, K. G.** See Friedman, Irving. 05690
- Hardee, Jack.** See McCoy, H. J. 03913
- Harder, Hermann.** See Lehmann, Gerhard. 03328
- 09954 **Hardie, Lawrence A.; Eugster, Hans P.** The evolution of closed-basin brines, in *Symposium on the mineralogy and geochemistry of non-marine evaporites — Fiftieth Anniversary Symposia* (Benjamin A. Morgan, editor): *Mineralog. Soc. America Spec. Paper* 3, p. 273-290, illus., table, 1970.
- Harding, S. R. L.** See Link, T. A. 05185
- Harding, S. R. L.** See Link, T. A. 05288
- 07009 **Harding, Samuel T.; Hardy, H. Reginald, Jr.** Acoustic emission during transient and secondary creep and during creep recovery [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 569, 1970.
- 04937 **Hardt, William F.; Hilton, George S.** Water resources and geology of Gloucester County, New Jersey: New Jersey Div. Water Policy and Supply Spec. Rept. 30, 130 p., illus., tables, geol. map, 1970.
- 04935 **Hardwick, W. R.** Fracturing hard rock with nuclear explosives and extraction of ore by a modified block-caving method: U.S. Bureau Mines Rept. Inv. 7391, 18 p., illus., tables, 1970.

- 07451 **Hardy, H. R., Jr.; Kim, R. Y.; Stefanko, R.; Wang, Y. J.** Creep and microseismic activity in geologic materials, Chap. 21 in *Rock mechanics, theory and practice* — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 377-413, illus., tables, 1970.
- 01922 **Hardy, H. Reginald, Jr.; Kimble, E. J.; Kim, R. Y.** Development of facilities for monitoring microseismic activity in geologic materials [abs.]: *EOS*, v. 51, no. 4, p. 350-351, 1970.
- 03994 **Hardy, H. Reginald, Jr.; Kim, Y. S.** A clamp-on strain transducer for use on geologic materials: *Soc. Petroleum Engineers Jour.*, v. 10, no. 1, p. 41-50, illus., table, 1970.
- Hardy, H. Reginald, Jr.** See *Harding, Samuel T.* 07009
- 09154 **Hardy, H. Reginald, Jr.** Model studies associated with the mechanical stability of underground natural gas storage reservoirs [with French and German summ.], in *Internat. Soc. Rock Mechanics Cong.*, 2d, Belgrade, Yugoslavia, 1970, Proc., V. 2: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 689-696, illus., table, 1970.
- 09156 **Hardy, H. Reginald, Jr.; Jayaraman, Natesa I.** An investigation of methods for the determination of the tensile strength of rock [with French and German summ.], in *Internat. Soc. Rock Mechanics Cong.*, 2d, Belgrade, Yugoslavia, 1970, Proc., V. 3: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 85-92, illus., tables, 1970.
- 03030 **Hardy, Léon.** Sur les conditions hydrologiques (salinité et température) du golfe de Laflamme, région Alma-Arvida [Hydrologic conditions (salinity and temperature) of the gulf of Laflamme, Alma-Arvida region (with English and Russian abs.)]: *Rev. Géographie Montréal*, v. 24, no. 3 p. 333-339, illus., table, 1970.
- 08242 **Hardy, R. M.** Design, construction and performance of dykes founded on peat [with French abs.], in *International Peat Congress*, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 39-44, illus., 1970.
- 05849 **Hardy, Ronald G.** Inventory of industrial, metallic, and solid-fuel minerals in Kansas: *Kansas Geol. Survey Bull.* 199, pt. 5, 30 p., illus., tables, 1970.
- 00278 **Hardyman, Richard F.** Subsolidus reequilibration and secondary alteration of a primary sulfide assemblage in the basal Duluth Gabbro Complex, Minnesota [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 98-99, 1970.
- 10687 **Hare, Ben D.** Petrology of the Thurman Sandstone (Desmoinesian), Hughes and Coal counties, California: *Compass*, v. 48, no. 1, p. 45-55, illus., tables, 1970.
- Hare, P. E.** See *Abelson, P. H.* 02225
- 05738 **Hare, P. E.; Harada, K.; Fox, S. W.** Analyses for amino acids in lunar fines, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1799-1803, illus., 1970.
- 07010 **Hare, P. E.; Abelson, P. H.** Dynamics of nitrogenous organic matter in marine sediments [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 569, 1970.
- Hare, P. E.** See *Wehmiller, John.* 10298
- 10173 **Hare, P. Edgar; Taylor, R. E.** Amino acid ages — comparison with radiometric determinations and potential applications to archaeological materials [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.], p. 58, 1970.

- 08597 **Hargis, David R.; Peterson, Frank L.** Artificial recharge practices in Hawaii: Hawaii Univ. Water Resources Research Center Tech. Rept. 43, 36 p., illus., tables, 1970.
- 01776 **Hargraves, R. B.** Progressive experimental oxidation of titaniferous magnetite and attendant change in magnetic properties [abs.]: EOS, v. 51, no. 4, p. 436, 1970.
- 08457 **Hargraves, R. B.; Buddington, A. F.** Analogy between anorthosite series on the Earth and Moon: Icarus, v. 13, no. 3, p. 371-382, tables, 1970.
- 06132 **Harrington, C. R.** A postglacial muskox (*Ovibos moschatus*) from Grandview, Manitoba, and comments on the zoogeography of *Ovibos* [with French abs.]: Canada Natl. Mus. Nat. Sci. Pubs. Palaeontology, no. 2, 13 p., illus., table, 1970.
- 08147 **Harrington, C. R.** A Pleistocene muskox (*Ovibos moschatus*) from gravels of Illinoian age near Nome, Alaska: Canadian Jour. Earth Sci., v. 7, no. 5, p. 1326-1331, illus., table, 1970.
- Harrington, C. R.** See Crossman, E. J. 08194
- 03978 **Harkrider, David G.; Flinn, Edward A.** Effect of crustal structure on Rayleigh waves generated by atmospheric explosions: Rev. Geophysics and Space Physics, v. 8, no. 3, p. 501-516, illus., 1970.
- Harkrider, David G.** See Ben-Menahem, Ari. 04339
- 06461 **Harkrider, David G.** Surface waves in multilayered elastic media — Pt. 2, Higher mode spectra and spectral ratios from point sources in plane layered earth models: Seismol. Soc. America Bull., v. 60, no. 6, p. 1937-1987, illus., tables, 1970.
- 10048 **Harland, W. B.** Tectonic evolution of Barents Shelf and related plates [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2484-2485, 1970.
- Harlow, David.** See Decker, Robert W. 01905
- Harmer, Richard S., 3d.** See Cescas, Michel P. 03934
- 03450 **Harmon, Russell S.** The chemical evolution of cave waters, Inner Space Cavern, Texas: Caves and Karst, v. 12, no. 1, p. 1-8, illus., tables, 1970.
- Harmon, Russell S.** See Reid, Arch M. 06841
- Harms, J. C.** See Walker, Roger G. 02695
- 07736 **Harnett, Richard A.** How to operate an oilfield — An outline for the inexperienced: Earth Sci. Bull., v. 3, no. 4, p. 13-18, illus., 1970.
- 03918 **Harper, Christopher T.** Graphical solutions to the problem of radiogenic argon-40 loss from metamorphic minerals, in Geochronology of Phanerozoic orogenic belts — Colloquium, Switzerland, 1969, Papers: Eclogae Geol. Helvetiae, v. 63, no. 1, p. 119-140, illus., table, 1970.
- Harper, J. C.** See Crimes, T. P. 09878
- 02625 **Harper, J. D.** Trends of faunal morphologic variation and their environmental significance, key to paleoecologic analysis [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 850, 1970.
- 06871 **Harper, John David.** Stratigraphy, sedimentology, and paleoecology of the Rondout Formation (Late Silurian), eastern New York State [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 1, p. 250B, 1970.

- 04414 **Harrill, J. R.** Determining transmissivity from water-level recovery of a step-draw-down test, in *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C212-C213, 1970.
- 10395 **Harrington, C. R.** Ice age mammal research in the Yukon Territory and Alaska, in *Early man and environments in northwest North America* (R. A. Smith and J. W. Smith, editors) — Calgary Univ. Archaeol. Assoc. Ann. Paleoenvironmental Workshop, 2d, Proc.: Calgary, Alberta, Univ. Calgary Students' Press, p. 35-51, illus., tables, 1970.
- 00850 **Harrington, J. W.** Reply [to a discussion by S. J. Gould, 1970 of papers by Harrington, 1967, 1969]: *Am. Jour. Sci.*, v. 268, no. 2, p. 189-191, 1970.
- 04523 **Harrington, John W.** Ontology of geologic reasoning with a rationale for evaluating historical contributions: *Am. Jour. Sci.*, v. 269, no. 3, p. 295-303, 1970.
- 03528 **Harrington, Lyn.** The Columbia Icefield: *Canadian Geog. Jour.*, v. 80, no. 6, p. 202-205, illus., 1970.
- 09736 **Harris, Arthur H.** The Dry Cave mammalian fauna and late pluvial conditions in southeastern New Mexico: *Texas Jour. Sci.*, v. 22, no. 1, p. 3-27, illus., tables, 1970.
- 10131 **Harris, Arthur H.** Past climate of the Navajo Reservoir District: *Am. Antiquity*, v. 35, no. 3, p. 374-377, table, 1970.
- Harris, D. C.** See Petruk, W. 03494
- 03497 **Harris, D. C.; Cabri, L. J.; Kaiman, S.** Athabascaite, a new copper selenide mineral from Martin Lake, Saskatchewan: *Canadian Mineralogist*, v. 10, pt. 2, p. 207-215, illus., tables, 1970.
- Harris, D. C.** See Cabri, L. J. 03500
- Harris, D. C.** See Manning, P. G. 03503
- 06724 **Harris, D. C.** New data on tyrrrellite: *Canadian Mineralogist*, v. 10, pt. 4, p. 731-736, illus., tables, 1970.
- 06753 **Harris, D. C.; Cabri, L. J.; Murray, E. J.** An occurrence of a sulphur-bearing berzelianite: *Canadian Mineralogist*, v. 10, pt. 4, p. 737-740, illus., tables, 1970.
- Harris, D. C.** See Schwarz, E. J. 08205
- 02626 **Harris, D. G.; Young, A.; Hay-Roe, H.** Formation pressure patterns in Cretaceous Viking Formation, Alberta [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 850-851, 1970.
- 04343 **Harris, E. E.** Reconnaissance bathymetry of Pyramid Lake, Washoe County, Nevada: *U.S. Geol. Survey Hydrol. Inv. Atlas HA-379*, scale 1:62,500, text, 1970.
- 04409 **Harris, J. W.; Milledge, H. J.; Barron, T. H. K.; Munn, R. W.** Thermal expansion of garnets included in diamond: *Jour. Geophys. Research*, v. 75, no. 29, p. 5775-5792, illus., tables, 1970.
- 07317 **Harris, John F.** The search for the subtle clue, carbonate exploration in the Seventies, in *Exploration concepts for the Seventies*: Gulf Coast Assoc. Geol. Socs. Trans., v. 20, p. 89, 1970.
- 04508 **Harris, L. D.; Mixon, R. B.** Geologic map of the Howard Quarter quadrangle, northeastern Tennessee: *U.S. Geol. Survey Geol. Quad. Map GQ-842*, scale 1:24,000, section, text, 1970.

**Harris, Lawrence A.** See Kopp, Otto C. 09840

- 00710 **Harris, Leonard D.** The Cross Mountain wrench fault — A major structural element of the southeastern United States (?) [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 214, 1970.
- Harris, R. F.** See *Sommers, L. E.* 04061
- 02787 **Harris, Sherod A.** Bends of the South Canadian River of Oklahoma as related to regional geomorphology: *Shale Shaker*, v. 20, no. 5, p. 80-95, illus., 1970.
- Harris, Stanley E., Jr.** See *Parker, Mary C.* 09915
- 08204 **Harris, Stuart A.** The Waterloo kame-moraine, Ontario, and its relationship to the Wisconsin advances of the Erie and Simcoe ice lobes [with German and French summaries]: *Zeitschr. Geomorphologie*, v. 14, no. 4, p. 487-509, illus., table, 1970.
- 05219 **Harrison, A. E.** Fluctuations of Coleman Glacier, Mt. Baker, Washington, U.S.A. [with French and German abs.]: *Jour. Glaciology*, v. 9, no. 57, p. 393-396, illus., table, 1970.
- 05220 **Harrison, A. E.** Renewed activity of Muldrow Glacier, Alaska, after the 1956 surge [with French and German abs.]: *Jour. Glaciology*, v. 9, no. 57, p. 397-400, illus., 1970.
- Harrison, C. G. A.** See *Sclater, J. G.* 00070
- Harrison, C. G. A.** See *Ball, M. M.* 00947
- Harrison, C. G. A.** See *Francheteau, Jean.* 01445
- 04491 **Harrison, C. G. A.** Magnetization of Atlantic seamounts: *Bull. Marine Sci.*, v. 20, no. 3, p. 560-574, illus., tables, 1970.
- Harrison, C. G. A.** See *Akker, F. B. van den.* 07801
- Harrison, Christopher G. A.** See *Emiliani, Cesare.* 00813
- 09285 **Harrison, D. A.** Glacial landforms of southwest Labrador, in *Ten years (1954-1964) of field research in Labrador-Ungava*: McGill Univ. Dept. Geography Sub-Arctic Research Paper 20, p. 172-178, illus., 1966.
- 11014 **Harrison, David L.** The world of American caves: Chicago, Ill., Reilly and Lee Books (a division of Henry Regnery Co.), 152 p., illus., 1970.
- Harrison, Frank W., Jr.** See *Lafayette Geological Society.* 04752
- 04771 **Harrison, Frank W., Jr.** Maurice Field, Lafayette and Vermilion Parishes, Louisiana, in *Typical oil and gas fields of southwestern Louisiana*, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 19-19c, illus., 1970.
- 02791 **Harrison, J. C.; Longley, W. W.** Denver earthquakes: *Science*, v. 169, no. 3941, p. 211, 1970.
- 04514 **Harrison, J. E.; Grimes, D. J.** Mineralogy and geochemistry of some Belt rocks, Montana and Idaho: *U.S. Geol. Survey Bull.* 1312-O, p. 01-049, illus., tables, 1970.
- Harrison, Jack E.** See *King, Elizabeth R.* 04595
- Harrison, John.** See *Keulegan, Garbis H.* 03739
- 01140 **Harrison, Samuel S.; Clayton, Lee.** Effects of ground-water seepage on fluvial processes: *Geol. Soc. America Bull.*, v. 81, no. 4, p. 1217-1225, illus., 1970.
- 05197 **Harrison, Samuel S.** Note on the importance of frost weathering in the disintegration and erosion of till in east-central Wisconsin: *Geol. Soc. America Bull.*, v. 81, no. 11, p. 3407-3409, illus., 1970.

**Harrison, W.** See Lynch, M. P. 01546

- 01777 **Harrison, W. D.; Kamb, Barclay.** Direct measurement of sliding velocity at the base of a glacier [abs.]: EOS, v. 51, no. 4, p. 431, 1970.

- 06564 **Harriss, Robert C.; Troup, Arthur G.** Chemistry and origin of freshwater ferromanganese concretions: Limnology and Oceanography, v. 15, no. 5, p. 702-712, illus., tables, 1970.

**Harriss, Robert C.** See Williams, Harold H. 08115

**Harrow, David R.** See Goodman, James M. 07173

- 11001 **Harry, W. T.** The Igaliko Nepheline Syenite Complex — general description: Medd. Grönland, v. 181, no. 3, 116 p., illus., table, geol. maps, 1970; reprinted as Grönlands Geol. Undersögelse Bull. 85, 1970.

- 08300 **Harshbarger, John W.** Water resources in the Tucson basin, Section 5 in Mining and ecology in the arid environment — Conf., Tucson, Ariz., 1970, Proc. (W. C. Peters, editor): Tucson, Arizona, University of Arizona, College of Mines, Sec. 5-1 to 5-2 [1970].

- 08336 **Harshbarger, John W.** Source, movement and development of water in arid regions, in Mining and ecology in the arid environment — Conf., Tucson, Ariz., 1970, Proc. (W. C. Peters, editor): Tucson, Arizona, University of Arizona, College of Mines, p. 122-134, illus. [1970].

- 04483 **Harshman, E. N.; Bell, Kenneth G.** Uraninite-bearing contact metamorphic deposits, Heaths Peak, Carbon County, Wyoming: Econ. Geology, v. 65, no. 7, p. 849-855, illus., 1970.

- 08161 **Harshman, E. N.** Uranium ore rolls in the United States, in Uranium exploration geology — Panel on uranium exploration geology, Vienna, 1970, Proc.: Vienna, Austria, Internat. Atomic Energy Agency, p. 219-232, incl. discussion, illus., 1970.

**Hart, David N.** See Norris, Roger A. 01438

- 00279 **Hart, Gary C.** Linear oscillator response to segmented nonstationary ground motions [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 99, 1970.

**Hart, Gary C.** See Saragoni, Rudolfo. 00355

**Hart, George F.** See Darrell, James H., 2d. 03822

- 01778 **Hart, H. R., Jr.; Haines, E. L.; Fleischer, R. L.; Giard, W. R.** Fission track ages and uranium contents of glasses [abs.]: EOS, v. 51, no. 4, p. 450, 1970.

- 05340 **Hart, Roger.** Chemical exchange between sea water and deep ocean basalts: Earth and Planetary Sci. Letters, v. 9, no. 3, p. 269-279, illus., tables, 1970.

- 01923 **Hart, Roger A.** Chemical exchange between sea water and deep ocean basalts [abs.]: EOS, v. 51, no. 4, p. 326, 1970.

**Hart, S. E.** See Krogh, T. E. 02248

- 00475 **Hart, S. R.; Nalwalk, A. J. K.** Rb, Cs and Sr relationships in submarine basalts from the Puerto Rico trench: Geochim. et Cosmochim. Acta, v. 34, no. 2, p. 145-155, illus., tables, 1970.

- 01613 **Hart, S. R.** Sea floor basalts: Carnegie Inst. Washington Year Book 68, 1968-69, p. 403-408, illus., 1970.

**Hart, S. R.** See Krogh, T. E. 01614

**Hart, S. R.** See Brooks, C. 01615



**Hart, S. R.** See Brooks, C. 01616

**Hart, S. R.** See Brooks, C. 01617

**Hart, S. R.** See Brooks, C. 01618

01619 **Hart, S. R.; Brooks, C.** Rb-Sr mantle evolution models: Carnegie Inst. Washington Year Book 68, 1968-69, p. 426-429, illus., table, 1970.

01620 **Hart, S. R.; Davis, G. L.; Brooks, C.; Krogh, T. E.** The K, Rb, Cs, and Sr geochemistry of Archaean metavolcanics: Carnegie Inst. Washington Year Book 68, 1968-69, p. 429-433, illus., tables, 1970.

08270 **Hart, S. R.; Brooks, C.; Krogh, T. E.; Davis, G. L.; Nava, D.** Ancient and modern volcanic rocks — A trace element model: Earth and Planetary Sci. Letters, v. 10, no. 1, p. 17-28, illus., tables, 1970.

**Hart, W.** See Bogard, D. D. 02270

07877 **Hartman, Charles W.; Carlson, Robert F.** Bibliography of arctic water resources: Alaska Univ. Inst. Water Resources Rept. 1WR-11, 344 p., 1970.

04364 **Hartronft, B. C.; Smith, M. D.; Hayes, C. J.; McCasland, W.** Engineering classification of geological materials and related soils: [Oklahoma City, Okla.] Oklahoma Highway Dept., 272 p., illus., tables, 1970.

09924 **Hartshorne, N. H.; Stuart, A.** Crystals and the polarising microscope, 4th edition: New York, American Elsevier Publishing Company, 614 p., illus., 1970.

06393 **Hartung, Jack B.; Short, Nicholas M.; Adams, John A. S.** Potassium-argon analysis of rocks shocked by nuclear explosions: Modern Geology, v. 1, no. 4, p. 279-281, table, 1970.

**Hartviksen, R. C.** See Boyum, B. H. 10670

09238 **Hartwell, Allan D.** Hydrography and Holocene sedimentation of the Merrimack River estuary, Massachusetts: Massachusetts Univ. Geology Dept. Contr. 5-Crg, 166 p., illus., 1970

05118 **Harvalik, Z. V.** A biophysical magnetometer-gradiometer: Virginia Jour. Sci., v. 21, no. 2, p. 59-60, 1970.

07410 **Harvey, Edward J.; Skelton, John.** An evaluation of anomalous streamflow patterns by seepage runs and radar imagery in the Missouri Ozarks [abs.]: Mining Eng., v. 22, no. 9, p. 54, 1970.

09388 **Harvey, H. Thomas.** Marshes and mud flats of San Francisco Bay — summary from the report, "Some ecological aspects of San Francisco Bay" (1966), in San Francisco Bay Conserv. and Devel. Comm., San Francisco Bay Plan Supplement: Sacramento, Calif., Documents and Publications Branch, p. 59-66, illus., 1969.

05853 **Harvey, Richard D.** Petrographic and mineralogical characteristics of carbonate rocks related to sorption of sulfur oxides in flue gases: Illinois Geol. Survey Environmental Geology Note 38, 31 p., illus., tables, 1970.

**Harward, M. E.** See Norgren, J. A. 01196

**Harward, M. E.** See Carstea, D. D. 02569

**Harward, M. E.** See Chichester, F. W. 04278

**Harward, M. E.** See Carstea, D. D. 07618

- 09765 **Harwood, T. A.; Brown, R. J. E.** A report on permafrost to the Solid-Earth Science Study [group] of the Science Council of Canada, Pt. 3 of Report on the geotechnical sciences: Natl. Research Council Canada Assoc. Comm. Geotech. Research Tech. Memo. 95, p. lii1-lii17, apps., 1969.
- 10765 **Harwood, T. A.; Brown, R. J. E.** Permafrost, in Background papers on the earth sciences in Canada (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 124-133, 1970.
- Hasadsri, T.** See Buravas, S. 04368
- 09169 **Hasan, Asghar; Kasabach, Haig F.; Malone, John E.** Water resources of the Syreville area, Middlesex County, n. J.: New Jersey Div. Water Policy and Supply Water-Resources Circ., no. 20, 32 p., illus., 1969.
- 07656 **Hasan, S. M.; Fox, R. L.; Boyd, C. C.** Solubility and availability of sorbed sulfate in Hawaiian soils: Soil Sci. Soc. America Proc., v. 34, no. 6, p. 897-901, illus., tables, 1970.
- Hasan, Zia-Ul.** See Wynne-Edwards, H. R. 01668
- 03304 **Hasegawa, H. S.** Short-period P-coda characteristics in the eastern Canadian shield: Seismol. Soc. America Bull., v. 60, no. 3, p. 839-858, illus., tables, 1970.
- 07011 **Hasegawa, H. S.** Analysis of teleseismic signals from underground explosions originating in four geologic environments [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 570, 1970.
- 02367 **Hashad, A. H.; Damon, Paul; Whelan, J. A.** Precambrian geochronology of the central Wasatch Mountains, in Radioactive and isotopic age determinations of Utah rocks: Utah Geol. and Mineralog. Survey Bull. 81 (Utah Univ. Bull., v. 61, no. 18; Utah Eng. Expt. Sta. Bull. 135), p. 15-17, tables, 1970.
- 10127 **Hashiba, Tomonori; Whitman, Robert V.** Soil-structure interaction during earthquakes: Soils and Foundations, v. 8, no. 2, p. 1-12, illus., 1968.
- 02112 **Haskell, E. E., Jr.; Dunham, Don.** Geophysical exploration at small earthfill damsites: Jour. Soil and Water Conserv., v. 25, no. 2, p. 66-67, illus., 1970.
- Haskin, L. A.** See Cullers, R. L. 01754
- Haskin, L. A.** See Allen, R. O. 07907
- Haskin, L. A.** See Denechaud, E. B. 08697
- Haskin, Larry A.** See Cullers, Robert L. 03349
- 05698 **Haskin, Larry A.; Allen, Ralph O.; Helmke, Philip A.; Paster, Theodore P.; Anderson, Michael R.; Korotev, Randy L.; Zweifel, Kathleen A.** Rare earths and other trace elements in Apollo 11 lunar samples, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1213-1231, illus., tables, 1970.
- 04559 **Hass, John L., Jr.** Fugacity of H<sub>2</sub>O from 0° to 350°C at the liquid-vapor equilibrium and at 1 atmosphere: Geochim. et Cosmochim. Acta, v. 34, no. 8, p. 929-932, table, 1970.
- 07844 **Hassan, Farkhonda.** Anisotropic color centers related to iron in amethyst quartz [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2763B, 1970.
- Hasslacher, Robert N.** See Sweeney, John W. 01881

- 04338 **Hastie, L. M.; Savage, J. C.** A dislocation model for the 1964 Alaska earthquake: *Seismol. Soc. America Bull.*, v. 60, no. 4, p. 1389-1392, illus., tables, 1970.
- Hastings, Carl R.** *See* Kirsch, Jeffrey W. 10580
- 04029 **Hatch, N. L., Jr.; Stanley, R. S.; Clark, S. F., Jr.** The Russell Mountain Formation, a new stratigraphic unit in western Massachusetts: *U.S. Geol. Survey Bull.* 1324-B, p. B1-B10, illus., 1970.
- 00160 **Hatch, Norman L.; Stanley, Rolfe S.** Stratigraphic continuity and facies changes in formations of early Paleozoic age in western Massachusetts and tentative correlations with Connecticut [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 23-24, 1970.
- 06695 **Hatch, Norman L., Jr.; Norton, S. A.; Clark, R. G., Jr.** Geologic map of the Chester quadrangle, Hampden and Hampshire Counties, Massachusetts: *U.S. Geol. Survey Geol. Quad. Map GQ-858*, scale 1:24,000, section, text, 1970.
- Hatcher, J. T.** *See* McNeal, B. L. 07229
- Hatcher, J. T.** *See* Rhoades, J. D. 07628
- 00570 **Hatcher, Robert D., Jr.** Stratigraphy of the Brevard Zone and Poor Mountain area, northwestern South Carolina: *Geol. Soc. America Bull.*, v. 81, no. 3, p. 933-939, illus., 1970.
- 00711 **Hatcher, Robert D., Jr.** Stratigraphic controls and thrusting along the Brevard zone [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 214-215, 1970.
- 03066 **Hatcher, Robert D., Jr.** Structure of the Dumplin Valley fault zone in east Tennessee: *Tennessee Div. Geology Rept. Inv.* 29, p. 85-96, illus., reprinted 1970; originally published 1969.
- 04357 **Hatcher, Robert D., Jr.** Geology of the Long Creek soapstone body, Oconee County, South Carolina: *South Carolina Div. Geology Geol. Notes*, v. 14, no. 2, p. 49-55, illus., tables, 1970.
- Hatcher, Robert D., Jr.** *See* Acker, Louis L. 04358
- 10329 **Hatcher, Robert D., Jr.** A working model for the developmental history of the southern Appalachian Blue Ridge and Piedmont [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 745-747, 1970.
- 00117 **Hatfield, Craig B.** Teaching versus research — The perennial criticism: *Jour. Geol. Education*, v. 18, no. 1 p. 44-45, 1970.
- 00567 **Hatfield, Craig B.; Camp, Mark J.** Mass extinctions correlated with periodic galactic events: *Geol. Soc. America Bull.*, v. 81, no. 3, p. 911-914, 1970.
- 05576 **Hathaway, John C.; McFarlin, Peter F.; Ross, David A.** Mineralogy and origin of sediments from drill holes on the continental margin off Florida: *U.S. Geol. Survey Prof. Paper* 581-E, p. E1-E26, illus., tables, 1970.
- 06856 **Hatheway, Allen W.** Basalt melts in a simulated lunar environment: *Arizona Univ. Lunar and Planetary Lab. Commun.*, v. 8, pt. 4, no. 151, p. 289-296, illus., 1970.
- 07069 **Hatheway, Allen W.; Herring, Alike K.** Bandera lava tubes of New Mexico, and lunar implications: *Arizona Univ. Lunar and Planetary Lab. Commun.*, v. 8, pt. 4, no. 152, p. 299-327, illus., 1970.
- Hathout, S. A.** *See* Bunting, B. T. 07959

- 03754 **Hatten, C. W.; Meyerhoff, A. A.** The Caribbean area, a case of destruction and regeneration of a continent — Discussion [of paper by V. Skvor, 1969]: *Geol. Soc. America Bull.*, v. 81, no. 6, p. 1855-1962, illus., 1970.
- 09969 **Haubrich, Richard A.** An examination of the data relating pole motion to earthquakes, in *Earthquake displacement fields and the rotation of the Earth* (L. Mansinha, D. E. Smylie, A. E. Beck, editors) - NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 149-158, illus., tables, 1970.
- 04765 **Hauck, Raymond J.** Holmwood-South Manchester, in *Typical oil and gas fields of southwestern Louisiana*, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 13-13d, illus., 1970.
- Haug, P.** See Simoneit, B. R. 00943
- Haugen, Richard K.** See McGaw, Richard W. 10075
- 07012 **Haugh, Bruce N.; Lane, N. Gary.** Water vascular system of Mississippian camerate crinoids [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 570-571, 1970.
- 04531 **Haugh, I.** Manitoba exploration 1970 — Retrospect and prospects: *Canadian Mining Jour.*, v. 91, no. 4, p. 69-72, illus., 1970.
- 11222 **Haugh, I.** Geology of the Split Lake area: Manitoba Dept. Mines and Nat. Resources Mines Br. Pub. 65-2, 87 p., illus., tables, geol. map, 1969.
- Haun, J. D.** See McGookay, Donald P. 05364
- 02627 **Haun, John D.; Barlow, James A., Jr.** Lower Tertiary deltas and petroleum, Rocky Mountain region [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 851, 1970.
- 04649 **Haun, John D.; Barlow, James A., Jr.; Hallinger, Donald E.** Natural gas resources, Rocky Mountain region: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 9, p. 1706-1718, illus., tables, 1970.
- 04847 **Haun, John D.; Kent, Harry C.** Geologic history of Rocky Mountain region, in *Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region* — Natl. Assoc. Geology Teachers, Southwest Sec., Field Conf. Earth Sci., Cedar City, Utah, 1970: Socorro, N. Mex., New Mexico Inst. Mining and Technology, p. 1-20, illus., reprinted 1970; originally published 1965.
- Haun, John D.** See Barlow, James A., Jr. 07759
- 08728 **Haupt, W.; Walther, C.** The determination of the stresses in a potash-salt pillar (with French summ.), in *Canadian Symposium on Mining Surveying and Rock Deformation Measurements*, 1st, Fredericton (New Brunswick), 1969, *Proc.: Fredericton, Univ. of New Brunswick*, p. 342-348, illus., 1970.
- Haury, E. W.** See Bucha, V. 00952
- Hauser, Victor L.** See Lehman, Oliver R. 05058
- Haushild, W. L.** See Nelson, Jack L. 01716
- Häusser, O.** See Ollerhead, R. W. 06559
- Havard, Christina Jean.** See Norris, D. K. 03477
- Havens, R. G.** See Myers, A. T. 07259

- 05355 **Haverfield, J. Joseph.** Lower Cretaceous sediments of North Park basin, *in* Dakota and related rocks of the Front Range — Guidebook issue: Mtn. Geologist, v. 7, no. 3, p. 139-149, illus., 1970.
- 02456 **Hawaii Div. Water and Land Devel.** An inventory of basic water resources data, Island of Hawaii: Hawaii Div. Water and Land Devel. Rept. R34, 188 p., illus., tables, 1970.
- 08567 **Hawaii Div. Water and Land Devel.** Hydrologic data networks — Island of Molokai, rainfall stations, stream-gage stations, ground water: Honolulu, Hawaii Div. Water and Land Devel. Circ. C59, 29 p., illus., tables, 1970.
- 10281 **Hawaii Div. Water and Land Devel.** Water supply investigations for Laupahoehoe water system, Island of Hawaii: Hawaii Div. Water and Land Devel. Report R29, 39 p., illus., tables, 1966.
- Hawkes, Herbert E.** *See* Bloom, Harold. 02435
- 05251 **Hawkins, James W.** Petrology and possible tectonic significance of late Cenozoic volcanic rocks, southern California and Baja California: Geol. Soc. America Bull., v. 81, no. 11, p. 3323-3338, illus., tables, 1970.
- 00280 **Hawkins, James W., Jr.; Allison, Edwin C.** Volcanic petrology and paleontology of Northeast Bank, southern California borderland [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 99-100, 1970.
- Hawkins, James W., Jr.** *See* Whetten, John T. 08455
- Hawkins, R. H.** *See* Corey, J. C. 10987
- Hawks, Paul H.** *See* Ritchie, Jerry C. 10384
- 04270 **Hawks, William L.** Test data for New Mexico clay materials — Pt. 1, Central New Mexico (Bernalillo, Los Alamos, Sandoval, and Santa Fe Counties): New Mexico Bur. Mines and Mineral Resources Circ. 110, 37 p., illus., tables, 1970.
- 09020 **Hawley, David.** Sedimentary characteristics and tectonic deformation of Middle and Upper Ordovician shales of northwestern Vermont north of Malletts Bay — Trip A *in* Guidebook to field excursions, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., p. 6-20, illus., 1969.
- Hawley, J. E.** *See* Culberson, Charles. 03293
- Hawley, John W.** *See* El Paso Geological Society. 09756
- 06670 **Hay, W. W.** Calcareous nannofossils from cores recovered on Leg 4, Chap. 23 *in* Initial reports of the Deep Sea Drilling Project — V. 4, Leg 4 of cruises of *Glomar Challenger*, Rio de Janeiro, Brazil, to San Cristobal, Panama, Feb.-Mar. 1969 (R. G. Bader, and others): Washington, D. C., U.S. Govt. Printing Office, p. 455-501, illus., tables, 1970.
- Hay, W. W.** *See* Benson, W. E. 06674
- Hay, William W.** *See* Bader, Richard G. 06657
- 07463 **Hay, William W.; Wise, Sherwood W., Jr.; Stieglitz, Ronald D.** Scanning electron microscope study of fine grain size biogenic carbonate particles, *in* Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Soc. Trans., v. 20, p. 287-302, illus., 1970.
- 00114 **Hayashi, Taizo.** Formation of dunes and antidunes in open channels: Am. Soc. Civil Engineers Proc., v. 96, paper 7056, Jour. Hydraulics Div., no. HY 2, p. 357-366, illus., 1970.

- 02123 **Hayatsu, A.; Carmichael, C. M.** K-Ar isochron method and initial argon ratios: Earth and Planetary Sci. Letters, v. 8, no. 1, p. 71-76, illus., tables, 1970.
- Hayatsu, A.** See Gittins, J. 03435
- Hayden, Bruce P.** See Fritts, Harold C. 10166
- 05429 **Hayes, A. W.; Ganow, H. C.; Grender, G. C.** Petrography and interpretations of selected Middle Ordovician limestones of southwestern Virginia [abs.]: Virginia Jour. Sci., v. 21, no. 3, p. 134, 1970.
- Hayes, C. J.** See Hartronft, B. C. 04364
- Hayes, D. W.** See Corey, J. C. 06819
- 08451 **Hayes, Dennis E.; Pitman, Walter C., 3d.** Magnetic lineations in the North Pacific in Geological Investigations of the North Pacific (James D. Hays, editor): Geol. Soc. America Mem. 126, p. 291-314, illus., 1970.
- 10003 **Hayes, Dennis E.; Ewing, Maurice.** Pacific boundary structure, in The sea — v. 4, New concepts of sea floor evolution, Pt. 2, Regional observations (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 29-72, 1970.
- Hayes, J. M.** See Abell, P. I. 05734
- 07666 **Hayes, John B.** Polytypism of chlorite in sedimentary rocks [with French, German, and Russian abs.]: Clays and Clay Minerals, v. 18, no. 5, p. 285-306, illus., tables, 1970.
- 00161 **Hayes, Miles O.; Boothroyd, Jon C.** Storms as modifying agents in the coastal environment [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 24, 1970.
- 02628 **Hayes, Miles O.; Boothroyd, Jon C.; Hine, Albert C., 3d.** Diagnostic primary structures of estuarine sand bodies [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 851, 1970.
- 00134 **Hayes, Philip T.** Mesozoic stratigraphy of the Mule and Huachuca Mountains, Arizona: U.S. Geol. Survey Prof. Paper 658-A, p. A1-A28, illus., 1970.
- 04031 **Hayes, Philip T.** Cretaceous paleogeography of southeastern Arizona and adjacent areas: U.S. Geol. Survey Prof. Paper 658-B, p. B1-B42, illus., 1970.
- Hayley, D. W.** See Brooker, E. W. 05979
- Haynes, C. Vance.** See Meighan, Clement W. 00980
- Haynes, C. Vance.** See Irwin-Williams, Cynthia. 05343
- 08046 **Haynes, C. Vance.** Geochronology of man-mammoth sites and their bearing on the origin of the Llano Complex, in Pleistocene and recent environments of the central Great Plains: Kansas Univ. Dept. Geology Spec. Pub. 3, p. 77-92, illus., table, 1970.
- 07093 **Hayre, Harbhajan S.** Geophysical dielectric constant determination: IEEE Trans. Geosci. Electronics, v. GE-8, no. 4, p. 289-295, illus., tables, 1970.
- Hay-Roe, H.** See Harris, D. G. 02626
- Hays, J. D.** See Opdyke, N. D. 09703
- Hays, J. F.** See Mao, Nai-Hsien. 03730
- 01429 **Hays, James D.; Cook, Harry; Cook, Frances; Fuller, John; Jenkins, Graham; Goll, Robert; Milo, Dean; Orr, William.** Deep Sea Drilling Project — Leg 9: Geotimes, v. 15, no. 4, p. 10-13, illus., 1970.

- 07013 **Hays, James D.** Extinctions and reversals of the earth's magnetic field [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 572-573, 1970.
- 08449 **Hays, James D.** Stratigraphy and evolutionary trends of Radiolaria in North Pacific deep-sea sediments *in* Geological Investigations of the North Pacific (James D. Hays, editor): Geol. Soc. America Mem. 126, p. 185-218, illus., tables, 1970.
- 08450 **Hays, James D.; Ninkovich, Dragoslav.** North Pacific deep-sea ash chronology and age of present Aleutian underthrusting *in* Geological Investigations of the North Pacific (James D. Hays, editor): Geol. Soc. America Mem. 126, p. 263-290, illus., tables, 1970.
- 08526 **Hays, James D. (editor).** Geologic investigations of the North Pacific: Geol. Soc. America Mem. 126, 323 p., illus., tables, 1970.
- Hays, James Fred.** See Beger, Richard M. 06056
- Hays, W. W.** See Murphy, J. R. 00321
- Hays, W. W.** See Foote, Richard Q. 01911
- Hays, W. W.** See Weetman, Bruce G. 01998
- Hays, W. W.** See Williams, Spencer L. 02001
- 00281 **Hays, Walter W.** The effect of Yucca fault on seismic wave propagation [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 100, 1970.
- Hays, Walter W.** See Lynch, Robert D. 10541
- 07014 **Hayward, O. T.** Relevant geology in an urban world [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 573, 1970.
- 10791 **Hayward, O. T.; Brown, L. F., Jr.** Comanchean (Cretaceous) rocks of central Texas, *in* Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas (Leo Hendricks, editor): Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub., no. 67-8, p. 30-48, illus., 1967.
- 02080 **Hazel, Joseph E.** The Atlantic continental shelf and slope of the United States — Ostracode zoogeography in the southern Nova Scotian and northern Virginian faunal provinces: U.S. Geol. Survey Prof. Paper 529-E, p. E1-E21, illus., tables, 1970.
- 05250 **Hazel, Joseph E.** Binary coefficients and clustering in biostratigraphy: Geol. Soc. America Bull., v. 81, no. 11, p. 3237-3252, illus., 1970.
- Hazelhoff-Roelfzema, B. H.** See Summerhayes, C. P. 04902
- Hea, J. P.** See Swartz, Frank M. 09903
- 06598 **Head, James William, 3d.** An integrated model of carbonate depositional basin evolution — Late Cayugan (Upper Silurian) and Helderbergian (Lower Devonian) of the central Appalachians [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 758B-759B, 1970.
- 07015 **Heald, Emerson F.; Weiss, Clair W.** Kinetics and mechanism of the anatase/rutile transformation, as catalyzed by ferric oxide and reducing conditions [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 573-574, 1970.
- 02527 **Heald, Sally Lynne.** Slope orientation and modification of the Holmes Lake watershed, Lancaster County, Nebraska: Nebraska Acad. Sci. Proc., 80th Ann. Mtg., p. 34, 1970.
- 02215 **Healey, D. L.** Calculated in situ bulk densities from subsurface gravity observations and density logs, Nevada Test Site and Hot Creek Valley, Nye County, Nevada, *in*

- Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B52-B62, illus., table, 1970.
- 00081 **Healy, Henry G.** Water levels in artesian and nonartesian aquifers of Florida, 1965-66: Florida Bur. Geology Inf. Circ. 61, 55 p., illus., tables, 1970.
- Healy, J. H.** See Hamilton, R. M. 01628
- 02792 **Healy, J. H.; Marshall, P. Anthony.** Nuclear explosions and distant earthquakes, a search for correlations: Science, v. 169, no. 3941, p. 176-177, illus., tables, 1970.
- 03974 **Healy, J. H.; Hamilton, R. M.; Raleigh, C. B.** Earthquakes induced by fluid injection and explosion, in Earthquake mechanics (T. Rikitake, editor), a symposium, Madrid, Spain, 1969: Tectonophysics, v. 9, nos. 2-3, p. 205-214, illus., 1970.
- Healy, J. H.** See Raleigh, C. B. 09532
- Healy, John H.** See King, Chi-Yu. 01939
- Healy, John H.** See Raleigh, C. Barry. 01969
- Healy, John H.** See Hamilton, Robert M. 07005
- Heard, H. C.** See Stephens, D. R. 04127
- Heard, H. C.** See Borg, I. Y. 06121
- 01779 **Heard, Hugh C.** The flow law for polycrystalline halite [abs.]: EOS, v. 51, no. 4, p. 424, 1970.
- Heard, Hugh C.** See Carter, Neville L. 04741
- 07833 **Heard, Hugh C.** The influence of environment on the inelastic behavior of rocks, in Symposium on engineering with nuclear explosives — Am. Nuclear Soc. and U.S. Atomic Energy Comm., Las Vegas, Nev., 1970, Proc., V. 1: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., p. 127-141, illus., 1970.
- 02342 **Heard, Nancy.** Jack Frost (1900-1970): Am. Assoc. Petroleum Geologists Bull., v. 54, no. 7, p. 1308, portrait, 1970.
- 07218 **Heerst, Joseph R.; Carlson, Richard C.; Rambo, John T.** K-division experimental work — Pt. 1, Geophysical research for underground explosion technology — Univ. California Livermore, Lawrence Radiation Lab. UCRL-50855: Springfield, Va., Natl. Tech. Inf. Center, 172 p., illus., tables, 1970.
- 10271 **Heath, Edward W.** Geology of the Moose River and Roach River synclinoria, northwestern Maine: Maine Geol. Survey Bull. 21, 117 p., illus., tables, geol. maps, 1969.
- 04886 **Heath, G. Ross; Culberson, Charles.** Calcite — Degree of saturation, rate of dissolution, and the compensation depth in the deep ocean: Geol. Soc. America Bull., v. 81, no. 10, p. 3157-3160, illus., 1970.
- Heath, G. Ross.** See Pak, Hasong. 06727
- Heath, Stanley A.** See Kesler, Stephen E. 00901
- Heath, Stanley A.** See Kesler, Stephen E. 01938
- Heath, Stanley A.** See Kesler, Stephen E. 03782
- 04673 **Hecht, Alan D.; Savin, Samuel M.** Oxygen-18 studies of Recent planktonic Foraminifera — Comparisons of phenotypes and of test parts: Science, v. 170, no. 3953, p. 69-71, table, 1970.



- 07016 **Hecht, Alan D.; Savin, Samuel M.** Planktonic foraminifera, environmental stress model as a paleoclimatic indicator [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 574, 1970.
- 10174 **Hecht, Alan D.; Savin, Samuel M.** Morphological variation in planktonic foraminifera — paleoclimatic indicators [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.], p. 59-60, illus., 1970.
- Heck, David B.** See Schleicher, John A. 07250
- 05282 **Heck, W. J.** Suggested method of test for triaxial compressive strength of undrained rock core specimens with induced pore pressure measurements, in *Special procedures for testing soil and rock for engineering purposes* (5th edition): *Am. Soc. Testing and Materials Spec. Tech. Pub.* 479, p. 604-612, illus., 1970.
- 02629 **Heckel, Philip H.** Organic carbonate buildups in epeiric seas, some theoretical aspects [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 851-852, 1970.
- 09917 **Heckel, Philip H.** Limestone facies in the Kansas City and Lansing Groups (Missourian, Upper Pennsylvanian) in southwestern Iowa, Appendix 2 of Field trip No. 4, Middle River traverse of Iowa Pennsylvanian stratigraphy, in *Geol. Soc. America, North-Central Sec., Ann. Mtg.*, 2d, May 1968, guidebook: Iowa City, Iowa, Univ. Iowa, p. 4-27 to 4-41, illus. [1968].
- 00198 **Hedberg, Hollis D.** Continental margins from viewpoint of the petroleum geologist: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 1, p. 3-43, illus., 1970.
- 04545 **Hedberg, Hollis D.** Stratigraphic boundaries — A reply: *Eclogae Geol. Helvetiae*, v. 63, no. 2, p. 673-684, illus., 1970.
- 08590 **Hedberg, Hollis D.** (editor). Preliminary report on lithostratigraphic units — *Internat. Subcomm. Stratig. Classification, Rept. 3*: Ottawa, Ontario, *Internat. Geol. Cong.*, 30 p., 1970.
- 08591 **Hedberg, Hollis D.** (editor). Preliminary report on stratotypes — *Internat. Subcomm. Stratig. Classification, Rept. 4*: Ottawa, Ontario, *Internat. Geol. Cong.*, 39 p., illus., 1970.
- 02201 **Hedberg, Marion R.; Greenwood, William R.** Computer analysis of zircon morphology data (a contribution to geometrics): *Idaho Bur. Mines and Geology Inf. Circ.* 21, 15 p., illus., 1970.
- 01469 **Hedge, C. E.** Whole-rock Rb-Sr age of the Pikes Peak batholith, Colorado, in *Geological Survey research 1970*, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B86-B89, illus., tables, 1970.
- Hedge, C. E.** See Goldich, S. S. 05965
- Hedge, C. E.** See Doe, B. R. 06955
- Hedge, Carl E.** See Peterman, Zell E. 00956
- 03364 **Hedge, Carl E.; Hildreth, R. A.; Henderson, W. T.** Strontium isotopes in some Cenozoic lavas from Oregon and Washington: *Earth and Planetary Sci. Letters*, v. 8, no. 6, p. 434-438, illus., table, 1970.
- 03773 **Hedge, Carl E.; Peterman, Zell E.** The strontium isotopic composition of basalts from the Gordo and Juan de Fuca Rises, northeastern Pacific Ocean: *Contr. Mineralogy and Petrology*, v. 27, no. 2, p. 114-120, illus., table, 1970.
- Hedge, Carl E.** See O'Neil, James R. 03792
- Hedge, Carl E.** See Noble, Donald C. 08274

**Hedge, Carl E.** See Sainsbury, C. L. 10093

- 10817 **Hedges, James.** A vertical shaft beneath cherty limestone caprock at Dutton's Cave. Iowa, in Internat. Cong. Speleology, 4th, Yugoslavia, 1965, Proc., V. 3: Ljubljana, Yugoslavia, Speleolog. Soc. Yugoslavia, p. 477-481, 1968.
- 04003 **Hedges, Lynn S.; Koch, Neil C.** Geology and water resources of Campbell County, South Dakota — Pt. 3, Basic data: South Dakota Geol. Survey Bull. 20, 172 p., illus., tables, 1970.
- 10872 **Hedges, Lynn S.** Sand and gravel deposits in Campbell County, South Dakota: South Dakota Geol. Survey Circ. 38, 8 p., illus., 1969.
- 09833 **Hedley, D. G. F.; Zahary, G.; Soderlund, H. W.; Coates, D. F.** Underground measurements in a steeply dipping orebody, in Canadian Rock Mechanics Symposium, 5th, Toronto, 1968, Proc.: Ottawa, Canada Dept. Energy, Mines and Resources Mines Br., p. 105-125, illus., tables, 1969.
- 07056 **Hedlund, Richard W.; Engelhardt, Donald W.** *Rugaepollis fragilis* sp. nov. from the Tertiary of Kachemak Bay, Alaska [with French abs.]: Pollen et Spores, v. 12, no. 2, p. 173-176, illus., 1970; erratum, *ibid.*, no. 3, p. [482], 1970 [1971].
- 03793 **Hedman, E. R.** Mean annual runoff as related to channel geometry of selected streams in California: U.S. Geol. Survey Water-Supply Paper 1999-E, p. E1-E17, illus., tables, 1970.
- 03549 **Heede, Burchard H.** Morphology of gullies in the Colorado Rocky Mountains [with French abs.]: Internat. Assoc. Sci. Hydrology Bull., v. 15, no. 2, p. 79-89, illus., tables, 1970.
- 06365 **Heerden, J. van.** The taxonomic value of spiral accessory apertures in some Tertiary taxa [with Spanish abs.]: Rev. Española Micropaleontología, v. 2, no. 2, p. 165-172, illus., 1970.
- 07017 **Heezen, Bruce C.** Modern abyssal ichnology [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 574, 1970.
- Heezen, Bruce C.** See Fox, Paul J. 08600
- Heezen, Bruce C.** See Fox, Paul J. 09426
- 10342 **Heidari, Manoutchehr; Chow, Ven Te; Meredith, Dale D.** A discrete differential dynamic programming approach to water resources systems analysis [abs.]: EOS, v. 51, no. 11, p. 751, 1970.
- 02464 **Heigold, Paul C.** A gravity survey of extreme southeastern Illinois: Illinois Geol. Survey Circ. 450, 12 p., illus., 1970.
- 00539 **Heigold, Paul Clay.** Theoretical analysis of regional groundwater flow in the Havana region, Illinois [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3261B-3262B, 1970.
- Heiken, Grant.** See Fryxell, Roald. 06276
- Heil, R. D.** See Frazee, C. J. 09299
- 09881 **Heinberg, C.** Some Jurassic trace fossils from Jameson Land (east Greenland), in Trace fossils — Liverpool Geol. Soc. and Internat. Union Geol. Sci., Internat. Conf., Liverpool, England, 1970, Proc.: Geol. Jour. Spec. Issue, no. 3, p. 227-234, illus., table, 1970.
- 01368 **Heindl, L. A.** Proposal for a U.S. National Water Atlas: Water Resources Bull., v. 6, no. 1, p. 1-6, 1970.

- 07018 **Heindl, L. A.** An approach to the rational classification of hydrological maps [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 574-575, 1970.
- 07201 **Heindl, L. A.** The water we live by — How to manage it wisely: New York, N.Y., Coward-McCann, 127 p., illus., 1970.
- 10262 **Heiner, Lawrence E.** Fortran IV program for processing geochemical sediment data: Alaska Univ. Mineral Industry Research Lab. Rept. 23, 27 p., 1970.
- 01074 **Heinrich, E. W.** The Goldie carbonatite, Fremont County, Colorado — A unique cryolite occurrence [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 389, 1970.
- 06116 **Heinrich, E. William; Moore, D. G., Jr.** Metasomatic potash feldspar rocks associated with igneous alkalic complexes, in *Alkaline rocks, the Monteregian Hills* — Symposium, Montreal, 1969, Proc.: Canadian Mineralogist, v. 10, pt. 3, p. 571-584, illus., table, 1970.
- Heinrich, E. William.** See Salotti, C. A. 07522
- 04898 **Heinrichs, Donald F.** More bathymetric evidence for block faulting on the Gorda Rise: Jour. Marine Research, v. 28, no. 3, p. 330-335, illus., 1970.
- 10559 **Heinrichs, Donald F.; Lu, Richard S.** Magnetic and gravity measurements south of Baja California [abs.]: EOS, v. 51, no. 11, p. 761-762, 1970.
- Heins, R. W.** See DeGeoffroy, J. 03988
- 04504 **Heirtzler, J. R.** The paleomagnetic field as inferred from marine magnetic studies, in Symposium on multidisciplinary studies of unusual regions of the upper mantle, Madrid, Spain, 1969, Proc.: Jour. Geomagnetism and Geoelectricity, v. 22, nos. 1-2, p. 197-211, illus., 1970.
- 09986 **Heirtzler, J. R.** Magnetic anomalies measured at sea, in *The sea* — v. 4, New concepts of sea floor evolution, Pt. 1, General observations (Arthur E. Maxwell, editor); New York and London, Wiley-Interscience, p. 85-128, illus., 1970.
- Heirtzler, James R.** See Grim, Muriel S. 00577
- Heirtzler, James R.** See Fleming, Henry S. 05214
- Heisel, J. E.** See Watkins, F. A., Jr. 04636
- 09456 **Heistand, Robert N.** Automated Kjeldahl determination of nitrogen in petroleum: Anal. Chemistry, v. 42, no. 8, p. 903-906, illus., tables, 1970.
- 09440 **Heitner, Kenneth L.; Housner, George W.** Numerical model for tsunami run-up: Am. Soc. Civil Engineers Proc., Jour. Waterways, Harbors and Coastal Eng. Div., v. 96, paper 7491, no. WW3, p. 701-719, illus., tables, 1970.
- Helander, D. P.** See Konen, C. E. 01263
- Helander, D. P.** See Karaoguz, Dogu. 03519
- 08314 **Helenelund, K. V.** Compression, tension and beam tests on fibrous peat [with French abs.], in International Peat Congress, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 136-142, illus., tables, 1970.
- 08335 **Helper, Jacques R.** How to know the rocks and minerals: Dubuque, Iowa, Wm. C. Brown Company Publishers, 228 p., illus., 1970.
- 00620 **Helgeson, R. N.; Mowatt, T. C.** Mineralogic relationships in the Scenic Member of the Brule Formation (Oligocene), South Dakota [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 335-336, 1970.

**Helgesen, John O.** See Karner, Frank R. 03876

- 04366 **Helgeson, Gaylord A.; Ross, Donald S.** Remote sensor imaging for oceanography: *Oceanology Internat.*, v. 5, no. 9, p. 20-25, illus., 1970.
- 02163 **Helgeson, Harold C.** Description and interpretation of phase relations in geochemical processes involving aqueous solutions: *Am. Jour. Sci.*, v. 268, no. 5, p. 415-438, illus., 1970.
- 04318 **Helgeson, Harold C.** Reaction rates in hydrothermal flow systems: *Econ. Geology*, v. 65, no. 3, p. 299-303, 1970.
- 06818 **Helgeson, Harold C.; Mackenzie, Fred T.** Silicate-sea water equilibria in the ocean system: *Deep-Sea Research*, v. 17, no. 5, p. 877-892, illus., tables, 1970.
- 09948 **Helgeson, Harold C.** A chemical and thermodynamic model of ore deposition in hydrothermal systems, in *Symposium on sulfides—Fiftieth Anniversary Symposia* (Benjamin A. Morgan, editor): *Mineralog. Soc. America Spec. Paper* 3, p. 155-186, illus., tables, 1970.

**Heller, Robert L.** See American Geological Institute. 10378

**Heller, S. J.** See Wershaw, R. L. 04086

- 00282 **Helley, Edward J.; Ritter, John R.** Fluvial sediment load calculations and their significance to erosion rates with special application to north coastal California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 100-101, 1970.
- 03507 **Helmberger, Donald V.; Morris, Gerald B.** A travel time and amplitude interpretation of a marine refraction profile — Transformed shear waves: *Seismol. Soc. America Bull.*, v. 60, no. 2, p. 593-600, illus., 1970.

**Helmke, P. A.** See Denechaud, E. B. 08697

**Helmke, Philip A.** See Haskin, Larry A. 05698

- 07809 **Helmstaedt, H.** Geology of map area O-6, Head of Middle River and Wildcat Brook (northern New Brunswick): *New Brunswick Dept. Nat. Resources Mineral Resources Br. Map Ser.* 70-1, 18 p., illus., table, geol. map, 1970.

**Helmstaedt, H.** See Brown, R. L. 08055

**Helsley, C. E.** See Hales, A. L. 01920

**Helsley, C. E.** See Hales, A. L. 05321

**Helsley, C. E.** See Hales, A. L. 05796

- 06283 **Helsley, Charles E.** Magnetic properties of lunar 10022, 10069, 10084 and 10085 samples, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, *Proc.* — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 2213-2219, illus., 1970.
- 01120 **Helwig, James.** Slump folds and early structures, northeastern Newfoundland Appalachians: *Jour. Geology*, v. 78, no. 2, p. 172-187, illus., 1970.
- Helz, Armin W.** See Annell, Charles S. 05682
- 01780 **Helz, G. R.; Barnes, H. L.** Hydrothermal solubility of magnetite [abs.]: *EOS*, v. 51, no. 4, p. 436, 1970.
- 03142 **Hem, John D.** Study and interpretation of the chemical characteristics of natural water (2d edition): *U.S. Geol. Survey Water-Supply Paper* 1473, 363 p., illus., tables, 1970; originally published 1959.

- 05558 **Hem, John D.** Chemical behavior of mercury in aqueous media, in *Mercury in the environment: U.S. Geol. Survey Prof. Paper 713*, p. 19-24, 61-62, illus., tables, 1970.
- Hemming, Robert.** See Stormer, John C., Jr. 09590
- 07756 **Hemphill, C. R.; Smith, R. I.; Szabo, F.** Geology of Beaverhill Lake reefs, Swan Hills area, Alberta, in *Geology of giant petroleum fields — Symposium, AAPG, 53d Ann. Mtg., Oklahoma City, Okla., 1968: Am. Assoc. Petroleum Geologists Mem. 14*, p. 50-90, illus., tables, 1970.
- 02852 **Hemphill, William R.** Application of ultraviolet reflectance and stimulated luminescence to the remote detection of natural materials, in *Earth resources aircraft program status review, NASA, Houston, 1968 — V. 1, Geology, geography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 19-1 — 19-2, illus. [1970].*
- 07770 **Hemphill, William R.** Geologic applications program — Summary of recent progress and plans, in *Earth Resources Aircraft Program, status review, V. 1: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 1-1—1-4, [1970].*
- 10049 **Hemstock, R. A.** Engineering geology and petroleum exploration in Arctic [abs.], in *Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2485, 1970.*
- 10050 **Henaio-Londoño, Diego.** Mesozoic transgressions in Sverdrup basin [abs.], in *Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2485, 1970.*
- 03258 **Henderson, Barry Keith.** A mathematical model of some Pennsylvanian stratigraphy [abs.]: *Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 5100B, 1970.*
- 06223 **Henderson, Bonnie C.** Student enrollment in earth science, 1969-70: *Geotimes*, v. 15, no. 10, p. 16-19, illus., tables, 1970.
- 09627 **Henderson, E. P.** Surficial geology of Brockville and Mallorytown map areas, Ontario—map 6-1970: *Canada Geol. Survey Paper 70-18*, scale 1:50,000, 1970.
- 04279 **Henderson, G. V.; Bradley, W. F.** Rectorite and the rectorite-like layer structures [with French, German, and Russian abs.]: *Clays and Clay Minerals*, v. 18, no. 2, p. 115-119, illus., 1970.
- 07663 **Henderson, G. V.** The origin of pyrophyllite-rectorite in shales of north central Utah [with French, German, and Russian abs.]: *Clays and Clay Minerals*, v. 18, no. 5, p. 239-246, illus., tables, 1970.
- 09481 **Henderson, Garry C.; Strange, William E.; Iverson, Robert M.** Dynamic gravimetry in marine exploration, in *Offshore Technology Conference, 2d Ann., Houston, Tex., 1970, Preprints—v. 2: Dallas, Tex., Offshore Technology Conf., p. 11-626—11-635, illus., tables, 1970.*
- Henderson, J. B.** See McGlynn, J. C. 08628
- 07194 **Henderson, J. F.** (compiler). Current research in the geological sciences in Canada 1969-70: *Canada Geol. Survey Paper 70-5*, 250 p., 1970.
- 07853 **Henderson, J. H.; Syers, J. K.; Jackson, M. L.** Quartz dissolution as influenced by pH and the presence of a disturbed surface layer: *Israel Jour. Chemistry*, v. 8, no. 3, p. 357-372, illus., tables, 1970.
- 04746 **Henderson, John B.** Stratigraphy of the Archean Yellowknife Supergroup, Yellowknife Bay-Prosperous Lake area, District of Mackenzie (85 J/8, J/9): *Canada Geol. Survey Paper 70-26*, 12 p., illus., geol. map, 1970.
- Henderson, W.** See Burlingame, A. L. 05736

**Henderson, W. T.** *See* Hedge, Carl E. 03364

- 04145 **Henderson, William A., Jr.** Building a one-circle optical goniometer: *Mineralog. Rec.*, v. 1, no. 2, p. 56-57, illus., 1970.
- 04146 **Henderson, William A., Jr.** Bavenite from Connecticut: *Mineralog. Rec.*, v. 1, no. 2, p. 70-71, illus., 1970.
- 08344 **Henderson, William A., Jr.** Rutile from Watertown, Connecticut: *Mineralog. Rec.*, v. 1, no. 3, p. 88-90, illus., table, 1970.

**Hendricks, Ernest L.** *See* Cywin, Allen. 08389

- 10788 **Hendricks, Leo.** (editor). Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas: *Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub.*, no. 67-8, 410 p., illus., tables, 1967.
- 10789 **Hendricks, Leo; Wilson, W. Feather.** Introduction, *in* Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas (Leo Hendricks, editor): *Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub.*, no. 67-8, p. 1-6, illus., 1967.
- 10792 **Hendricks, Leo.** Comanchean stratigraphy of the Cretaceous of north Texas, *in* Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas (Leo Hendricks, editor): *Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub.*, no. 67-8, p. 51-63, illus., table, 1967.

**Hendrickson, G. E.** *See* Doonan, C. J. 07106

- 09315 **Hendron, A. J., Jr.; Mesri, G.; Gamble, J. C.; Way, G.** Compressibility characteristics of shales measured by laboratory and *in situ* tests, *in* Determination of the *in situ* modulus of deformation of rock (Symposium, ASTM, Winter Mtg., Denver, Colo., 1969): *Am. Soc. Testing and Materials Spec. Tech. Pub.* 477, p. 137-153, illus., table, 1970.

**Hendron, A. J., Jr.** *See* Heuer, R. E. 10838

**Henika, William S.** *See* Conley, James F. 03762

- 05836 **Henisch, Heinz K.** Crystal growth in gels: University Park, Pa., and London, England, Pennsylvania State Univ. Press, 111 p., illus., 1970.
- 02422 **Henkel, D. J.** The role of waves in causing submarine landslides [with French abs.]: *Géotechnique*, v. 20, no. 1, p. 75-80, illus., 1970.

**Henkel, Donald.** *See* Sendlein, Lyle V. A. 01103

**Hennessey, W. J.** *See* Wright-Broughton, C. 08677

**Henniger, B. R.** *See* Martin, W. D. 01356

**Henniger, B. R.** *See* Overbey, W. K., Jr. 01549

- 05586 **Henoch, W. E. S.** (coordinator). Peyto Glacier, Banff National Park, Alberta — Provisional edition, IWB 1008: Ottawa, Canada Dept. Energy, Mines and Resources, Inland Waters Br., scale 1:10,000, text, 1970.

**Henrichs, Donald F.** *See* Thiruvathukal, John V. 00558

- 06348 **Henriksen, N.; Jepsen, H. F.** K/Ar age determinations on dolerites from southern Peary Land, *in* Report of activities, 1969: *Grönlands Geol. Undersögelse Rap.* 28, p. 55-58, 1970.
- 06253 **Henriksen, Niels.** Field mapping in the Scoresby Sund area, East Greenland, *in* Report of activities, 1969: *Grönlands Geol. Undersögelse Rap.* 28, p. 39-41, 1970.

- 09445 **Henriksen, Niels; Higgins, A. K.** Preliminary results of mapping in the crystalline complex of Renland, the southern Stauning Alper and south-west Liverpool Land, Scoresby Sund, East Greenland, *in* Report on the 1969 geological expedition to Scoresby Sund, East Greenland: Grönlands Geol. Undersøgelse Rap. 30, p. 5-17, illus., geol. map, 1970.
- 10051 **Henriksen, Niels.** Caledonian geology of Scoresby Sund region, Central East Greenland [abs.], *in* Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2485, 1970.
- 03673 **Henrikson, Paul; Nash, Raymond A., Jr.** A statistical analysis of errors in gravimetrically computed vertical deflections: Jour. Geophys. Research, v. 75, no. 20, p. 4017-4028, illus., table, 1970.
- 04920 **Henry, Elvin F.** Soils of the Dismal Swamp of Virginia: Virginia Jour. Sci., v. 21, no. 2, p. 41-46, illus., 1970.
- 06669 **Henry, K. W.; Opdyke, N. D.** Preliminary report on paleomagnetism of Deep Sea Drilling Project Leg 4 specimens, Chap. 22 *in* Initial reports of the Deep Sea Drilling Project — V. 4, Leg 4 of cruises of *Glomar Challenger*, Rio de Janeiro, Brazil, to San Cristobal, Panama, Feb.-Mar. 1969 (R. G. Bader, and others): Washington, D. C., U.S. Govt. Printing Office, p. 439-454, illus., tables, 1970.
- Henry, Vernon J.** *See* Levy, John S. 00735
- Henry, Vernon J., Jr.** *See* Logan, Thomas F., Jr. 00736
- 04763 **Hensarling, Larry.** Glenmora Field, Rapides Parish, Louisiana, *in* Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 11-11c, illus., 1970.
- Hensel, D. R.** *See* Volk, G. M. 07226
- Henson, E. B.** *See* Hunt, Allen S. 09021
- Henye, T. L.** *See* Lee, T. C. 10573
- Henye, Thomas L.** *See* Goldstein, Alan S. 01915
- Herbert, L. R.** *See* Sumsion, C. T. 03063
- 01156 **Herbert, Robin.** Modelling partially penetrating rivers on aquifer models: Ground Water, v. 8, no. 2, p. 29-36, illus., table, 1970.
- 07526 **Herbert, T. A.; Wingard, N. E.** Evaluation of three gravel sampling methods, *in* Forum on Geology of Industrial Minerals, 6th, Ann Arbor, Mich., 1970, Proc.: Michigan Geol. Survey Miscellany 1, p. 95-102, illus., tables, 1970.
- Herbosch, Alain.** *See* Jedwab, Jacques. 06518
- Herbst, Emmett L.** *See* Eargle, D. Hoye. 08738
- 02482 **Herdendorf, Charles E.** Sand and gravel resources of the Maumee River estuary, Toledo to Perrysburg, Ohio: Ohio Div. Geol. Survey Rept. Inv. 76, 19 p., illus., tables, 1970.
- 05879 **Herdendorf, Charles E.** Lake Erie physical limnology cruise, midsummer 1967: Ohio Div. Geol. Survey Rept. Inv. 79, 77 p., illus., tables, 1970.
- 07527 **Herdendorf, Charles E.; Braidech, Lawrence L.** A study of the sand and gravel deposits of the Maumee River estuary, Ohio, *in* Forum on Geology of Industrial Minerals, 6th, Ann Arbor, Mich., 1970, Proc.: Michigan Geol. Survey Miscellany 1, p. 103-116, illus., tables, 1970.
- Herman, Gerald F.** *See* Herzog, Gregory F. 05699

- 01924 **Herman, Yvonne.** Late Cenozoic Arctic oceanography [abs.]: EOS, v. 51, no. 4, p. 333, 1970.
- 03348 **Herman, Yvonne.** Arctic paleo-oceanography in late Cenozoic time: Science, v. 169, no. 3944, p. 474-477, illus., table, 1970.
- 10052 **Herman, Yvonne.** Late Cenozoic biostratigraphic and paleoecologic studies of Arctic Ocean deep-sea cores [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2485-2486, 1970.
- 00028 **Hermes, O. Don.** Petrochemistry of coexistent mafic silicates from the Mecklenburg gabbro-metagabbro Complex, North Carolina: Geol. Soc. America Bull., v. 81, no. 1, p. 137-163, illus., tables, 1970.
- Heron, S. Duncan.** See Jorgeson, Eric. 00978
- Herpers, U.** See Herr, W. 05759
- 08390 **Herr, Lester A.** The control of erosion and sediment in highway construction, in *National Conference on Sediment Control*, Washington, D.C., 1969, Proc. Washington, D.C., U.S. Dept. Housing and Urban Development Environmental Planning Division, p. 41-47, 1970.
- 05775 **Herr, W.; Herpers, U.; Hess, B.; Skerra, B.; Woelfle, R.** Determination of manganese-53 by neutron activation and other miscellaneous studies on lunar dust, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1233-1238, illus., tables, 1970.
- 11262 **Herran Martinez, Santiago.** Estudio geologico de las Sierras de Sta. Rita, La Centella y El Barroso, Municipios de Concepcion del Oro y Mazapil, Edo. de Zacatecas [Geologic study of the Santa Rita, La Centella and El Barroso Mountains, Municipios of Concepcion del Oro and Mazapil, State of Zacatecas]: Geologia y Metalurgia, v. 4, no. 27, p. 5-35, illus., geol. map, 1969.
- 10255 **Herreid, Gordon.** Geology of the Spirit Mountain nickel-copper prospect and surrounding area: Alaska Div. Mines and Geology Geol. Rept. 40, 19 p., illus., table, geol. map, 1970.
- 01713 **Herrera, Ismael.** Theory of multiple leaky aquifers: Water Resources Research, v. 6, no. 1, p. 185-193, illus., 1970.
- 00712 **Herrick, Stephen M.** New data regarding the Okefenokee Swamp in southeastern Georgia [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 215, 1970.
- Herriman, R. C.** See Parsons, R. B. 02955
- Herring, Alika K.** See Hatheway, Allen W. 07069
- 10667 **Herring, James C.; Payne, Roy D.** Texas water—the question of quality: Jour. Petroleum Technology, v. 22, December, p. 1525-1527, 1970.



**Herrmann, L. R.** See Guymon, G. L. 07468

**Herrmann, Robert B.** See Gordon, David W. 03309

04930 **Hershey, H. G.; Wahl, K. D.; Steinhilber, W. L.** Geology and ground-water resources of Cerro Gordo County, Iowa: Iowa Geol. Survey Water-Supply Bull. 9, 75 p., illus., tables, 1970.

09016 **Hershey, H. Garland.** Management of Iowa's water resources, *in* Water resources of Iowa—A symposium, Paul J. Horick, editor: Cedar Falls, Iowa, Iowa Acad. Sci., Geology Sec., p. 122-140, illus., table, 1970.

**Hershey, L. A.** See Kelly, T. E. 04921

03065 **Hershey, Robert E.; Wilson, John M.** Anomalous zinc in water wells, northeastern Henry County, Tennessee: Tennessee Div. Geology Rept. Inv. 27, 11 p., illus., tables, 1970.

**Hertlein, Leo G.** See Zullo, Victor A. 03797

07611 **Hertlein, Leo G.** A new species of fossil *Kelletia* (Mollusca: Gastropoda) from the Lomita Marl, late Cenozoic of San Pedro, California: Los Angeles County Mus. Contr. Sci., no. 190, 8 p., illus., 1970.

**Hertweck, Gunther.** See Reineck, Hans-Erich. 02672

00214 **Herz, Norman; Valentine, L. D.; Iberall, E. R.** Rutile and ilmenite placer deposits, Roseland district, Nelson and Amherst Counties, Virginia: U.S. Geol. Survey Bull. 1312-F, p. F1-F19, illus., tables, 1970.

04245 **Herz, Norman; Valentine, L. B.** Rutile in the Harford County, Maryland, serpentine belt, *in* Geological Survey research 1970, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C43-C48, illus., tables, 1970.

06284 **Herzenberg, C. L.; Riley, D. L.** Analysis of first returned lunar samples by Mössbauer spectrometry, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 2221-2241, illus., tables, 1970.

07134 **Herzenberg, C. L.; Riley, D. L.** Current applications of Mössbauer spectrometry in geochemistry, *in* Developments in applied spectroscopy, V. 8 — Mid-America Spectroscopy Symposium, 20th Ann., Chicago, Ill., 1969, Selected papers: New York and London, Plenum Press, p. 277-291, illus., tables, 1970.

05699 **Herzog, Gregory F.; Herman, Gerald F.** Na<sup>22</sup>, Al<sup>26</sup>, Th and U in Apollo 11 lunar samples, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1239-1245, tables, 1970.

**Hesler, James L.** See Flemal, Ronald C. 09730

**Hess, B.** See Herr, W. 05759

**Hess, H. H.** See Vine, F. J. 09721

**Hess, John W.** See Brucker, Roger W. 06075

03589 **Hester, B. W.** Geology and evaluation of placer gold deposits in the Klondike area, Yukon Territory: Inst. Mining and Metallurgy Trans., Sec. B., v. 79, Bull. 762, p. B60-B67, illus., tables, 1970.

Hester, N. C. See Bradbury, J. C. 06321

- 00713 Hester, Norman C. Weathering effects on the mineralogy of Upper Cretaceous sands in Alabama and Georgia [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 215-216, 1970.
- 05854 Hester, Norman C.; Labotka, Theodore C. An investigation of sands on the uplands adjacent to the Sangamon River floodplain — Possibilities as a "blend sand" resource: Illinois Geol. Survey Indus. Minerals Note 42, 10 p., illus., tables, 1970.
- 06767 Hester, Norman C. Sand and gravel resources of Sangamon County, Illinois: Illinois Geol. Survey Circ. 452, 20 p., illus., tables, 1970.
- 07019 Hester, Norman C.; Pryor, Wayne A. A detailed study of lithified specimens of *Ophiomorpha* [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 576, 1970.
- Hetland, D. L. See Austin, S. R. 02200
- Heuer, A. H. See Green, H. W., 2d. 03008
- 10838 Heuer, R. E.; Hendron, A. J., Jr. Geomechanical model study of the behavior of underground openings in rock subjected to static loads — Rept. 1, Development of modeling techniques: U.S. Army Corps Engineers Waterways Expt. Sta. Contract Rept. N-69-1, 209 p., illus., tables, 1969.
- Heuze, Francois E. See Drozd, Karel. 09147
- 09153 Heuzé, François E.; Goodman, Richard E. The design of "room and pillar" structures in competent jointed rock — Example, the Crestmore mine, California [with French and German summ.], in Internat. Soc. Rock Mechanics Cong., 2d, Belgrade, Yugoslavia, 1970, Proc., V. 2: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 679-687, illus., tables, 1970.
- Hewett, D. F. See Dibblee, T. W., Jr. 04806
- 07020 Hewins, R. H. Microprobe studies of the base of the Sudbury nickel Irruptive, Ontario, Canada [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 576-577, 1970; Econ. Geology, v. 65, no. 6, p. 637-638, 1970.
- 03455 Hewitt, D. F.; Vos, M. A. Urbanization and rehabilitation of pits and quarries [abs.]: Canadian Mining and Metall. Bull., v. 63, no. 695, p. 283, 1970.
- 09367 Hewitt, D. F.; Cowan, W. R. Sand and gravel in southern Ontario, 1967-68: Ontario Dept. Mines Indus. Mineral Rept. 29, 105 p., illus., 1969 [Supplement to Rept. 11, 1963].
- 07021 Hewitt, David A. The metamorphism of micaceous limestones [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 577, 1970.
- 07925 Hewitt, David Allyn. An experimental and field investigation of the progressive metamorphism of micaceous limestones [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3480B-3481B, 1970.
- 09183 Hewitt, Phillip C.; Conil, Raphaël. Foraminifères du Méramécien et du Chestérien des États-Unis (Tennessee): Soc. Belge Géologie. Paléontologie et Hydrologie Bull., v. 78, pt. 3-4, p. 175-185, illus., tables, 1969.
- 10960 Hewitt, William P. Construction hazards in Utah, in Governor's conference on geologic hazards in Utah, December 14, 1967: Utah Geol. and Mineralog. Survey Spec. Studies 32, p. 19-20, illus., 1970.
- 08606 Hewitt, William Paxton. San Carlos lead deposit, northeast Chihuahua, Mexico, in AIME world symposium on mining and metallurgy of lead and zinc, St. Louis, Mis-

souri, 1970 [Proc.] — V. 1, Mining and concentrating of lead and zinc: New York, Am. Inst. Mining, Metallurgical, and Petroleum Engineers, p. 130-138, illus., 1970.

**Hey, Max H.** *See* Leavens, Peter B. 08346

- 01731 **Heye, Dietrich.** A system for detection of ionium, thorium and protactinium to date deep-sea cores: *Geochim. et Cosmochim. Acta*, v. 34, no. 3, p. 389-397, illus., tables, 1970.

- 07202 **Heyl, A. V.; Broughton, W. A.; West, W. S.** Guidebook to the Upper Mississippi Valley base-metal district (prepared for the Geol. Soc. America Ann. Mtg., Milwaukee, Wis., 1970): Wisconsin Geol. and Nat. History Survey Inf. Circ. 16, 49 p., illus., table, 1970.

- 08732 **Heyl, A. V.** Some aspects of genesis of stratiform zinc-lead-barite-fluorite deposits in the Mississippi Valley, United States, *in* Problems of hydrothermal ore deposition; the origin, evolution and control of ore-forming fluids — Symposium, St. Andrews, Scotland, 1967: Stuttgart, Germany, E. Schweizerbart'sche Verlagsbuchhandlung (Internat. Union Geol. Sci., Ser. A, no. 2), p. 95-99, illus., 1970.

- 07470 **Heyl, Allen V.; Jolly, Janice L.** Mineralogy, trace elements and sequence of deposition in the central Tennessee district [abs.]: *Mining Eng.*, v. 22, no. 9, p. 50, 1970.

- 00205 **Heyman, Louis.** Evidence for Chazy volcanism from the Lower Middle Ordovician Blackford Formation of Russell County, Virginia [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 24-25, 1970.

**Heyman, Louis.** *See* Kelley, Dana R. 06534

**Heyman, Louis.** *See* Cate, Addison S. 07561

- 07565 **Heyman, Louis.** History of Pittsburgh's rivers, [Chap.] 7 *in* Geology of the Pittsburgh area: Pennsylvania Geol. Survey, 4th ser., [Bull.] G 59 (General Geology Rept.), p. 84-92, illus., 1970.

- 07568 **Heyman, Louis; Gray, Richard E.; Wagner, W. R.; Edgerton, Curtis D.** Economic geology, [Chap.] 9 *in* Geology of the Pittsburgh area: Pennsylvania Geol. Survey, 4th ser., [Bull.] G 59 (General Geology Rept.), p. 105-127, illus., 1970.

**Heyman, Louis.** *See* Kelley, Dana R. 09382

**Heymann, D.** *See* Taylor, G. J. 03640

**Heymann, Dieter.** *See* Anders, Edward. 00969

**Heymann, Dieter.** *See* Mazor, Emanuel. 03159

- 05700 **Heymann, Dieter; Yaniv, Akiva.** Inert gases in the fines from the Sea of Tranquillity, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1247-1259, illus., tables, 1970.

- 05701 **Heymann, Dieter; Yaniv, Akiva.** Ar-40 anomaly in lunar samples from Apollo 11, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1261-1267, illus., 1970.

**Hiatt, John L.** *See* Odom, I. Edgar. 07521

- 07641 **Hibbard, Claude W.** A new microtine rodent from the upper Pliocene of Kansas: Michigan Univ. Mus. Paleontology Contr., v. 23, no. 7, p. 99-103, illus., 1970.

- 07873 **Hibbard, Claude W.** The Pliocene rodent *Microscoptes disjunctus* (Wilson) from Idaho and Wyoming: Michigan Univ. Mus. Paleontology Contr., v. 23, no. 6, p. 95-98, illus., 1970.
- 08053 **Hibbard, Claude W.** Pleistocene mammalian local faunas from the Great Plains and central lowland provinces of the United States, in Pleistocene and recent environments of the central Great Plains: Kansas Univ. Dept. Geology Spec. Pub. 3, p. 395-433, illus., tables, 1970.
- 00283 **Hibbard, M. J.** Magmatic origin of Lower Cretaceous granitic gneisses and migmatites, Okanogan Range, Washington [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 101, 1970.
- Hickcox, Alice E.** See Clark, H. C. 00881
- 10492 **Hickey, John J.** Important considerations in the process of designing a ground-water data collection program [abs.]: EOS, v. 51, no. 11, p. 747-748, 1970.
- 02388 **Hickling, Nelson L.; Phair, George; Moore, Roosevelt; Rose, Harry J., Jr.** Boulder Creek Batholith, Colorado — Pt. 1, Allanite and its bearing upon age patterns: Geol. Soc. America Bull., v. 81, no. 7, p. 1973-1993, illus., tables, 1970.
- 10269 **Hickman, Carole Jean Stentz.** The Oligocene marine molluscan fauna of the Eugene Formation in Oregon: Oregon Univ. Museum Nat. History Bull. 16, 112 p., illus., tables, 1969.
- 08393 **Hidalgo, Robert V.; Renton, John J.** The use of pelletized samples for X-ray diffraction analysis of clay minerals in shale: West Virginia Geol. and Econ. Survey Circ. 12, 9 p., illus., 1970.
- 01440 **Hide, Raymond.** Comment on a paper by M. Nafi Toksöz, Jafar Arkani-Hamed, and Curtis A. Knight, "Geophysical data and long-wave heterogeneities on the Earth's mantle" [1969]: Jour. Geophys. Research, v. 75, no. 11, p. 2141, 1970.
- 09614 **Hiebert, Clyde; Lanning, F. C.** Vertical variations in the chemical composition of the Burr Limestone bed in Riley County Kansas: Kansas Acad. Sci. Trans., 1970, v. 73, no. 1, p. 25-30, tables, 1970.
- Higer, Aaron L.** See Kolipinski, Milton C. 02906
- 07792 **Higgins, A. K.** The stratigraphy and structure of the Ketilidian rocks of Midternaes, South-West Greenland: Grönlands Geol. Undersögelse Bull., no. 87, 96 p., illus., tables, geol. maps, 1970.
- Higgins, A. K.** See Henriksen, Niels. 09445
- 06571 **Higgins, Anthony K.** On some ice-dammed lakes in the Frederikshaab district, South-West Greenland [with Danish abs.]: Dansk Geol. Foren Medd., v. 19, no. 4, p. 378-397, illus., table, 1970.
- 05244 **Higgins, David T.** Nonsteady flow to surface reservoir — Discussion [of paper 7137 by William Wen-Gong Yeh, 1970]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Hydraulics Div., no. HY 12, p. 2642-2644, illus., table, 1970.
- 03809 **Higgins, Gary H.** Summary of nuclear explosion data for underground engineering applications — UCRL-50853: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., 7 p., tables, 1970.
- Higgins, Jon L.** See Boyer, Robert E. 08281
- 00714 **Higgins, Michael W.; Smith, Charles W.; Zietz, Isidore.** New aeroradioactivity map of the Georgia Nuclear Laboratory area [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 216, 1970.

- 04463 **Higgins, Michael W.; Waters, Aaron C.** A re-evaluation of basalt-obsidian relations at East Lake fissure, Newberry caldera, Oregon: *Geol. Soc. America Bull.*, v. 81, no. 9, p. 2835-2842, illus., table, 1970.
- 05828 **Higgins, Michael W.; Crowley, William.** Metavolcanic rocks and epizonal plutons in the Cecil County Piedmont, Maryland — Field trip introduction, first day, and road log, *in* New interpretations of eastern Piedmont geology of Maryland, or granite and gabbro or graywacke and greenstone?—35th Ann. Field Conf. Pennsylvania Geologists, 1970, Guidebook: Harrisburg, Pa., Pennsylvania Topog. and Geol. Survey, also Baltimore, Md., Maryland Geol. Survey, p. 5-36, illus., table, 1970.
- Higgs, Robert H.** See Einwich, Anna M. 01908
- High, Lee R., Jr.** See Picard, M. Dane. 02703
- High, Lee R., Jr.** See Picard, M. Dane. 03604
- High, Lee R., Jr.** See Picard, M. Dane. 04401
- Hiimae, Karen.** See Crompton, A. W. 01261
- Hilde, Thomas W. C.** See Larson, Peggy A. 01943
- Hildreth, R. A.** See Hedge, Carl E. 03364
- Hill, D. M.** See Cloud, W. K. 00858
- 00284 **Hill, David P.** Crustal structure of the Columbia Plateau from the Edzoe events [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 101-102, 1970.
- 06615 **Hill, Donald Gardner.** A laboratory investigation of conductivity and dielectric constant tensors of rocks [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 2, p. 767B-768B, 1970.
- Hill, Dorothy.** See Jell, J. S. 04707
- 01163 **Hill, F. L.** Northwest San Joaquin gas field: *California Oil Fields — Summ. Operations* 1969, v. 55, no. 1, p. 39-43, illus., tables, 1970.
- 07166 **Hill, F. L.** Rice Creek gas field: *California Oil Fields — Summ. Operations* 1970, v. 56, no. 1, p. 39-43, illus., tables, 1970.
- 05814 **Hill, Mary R.** "Mount Lassen is in eruption and there is no mistake about that": *California Div. Mines and Geology Mineral Inf. Service*, v. 23, no. 11, p. 211-224, illus., 1970.
- 06570 **Hill, Mary R.** Barrier beach: *California Div. Mines and Geology Mineral Inf. Service*, v. 23, no. 12, p. 231-233, illus., 1970.
- 09907 **Hill, Mary R.** "Mount Lassen is in eruption and there is no mistake about that," *in* *Geologic guide to the Lassen Peak, Burney Falls, and Lake Shasta area, California—geol. Soc. Sacramento Ann. Field Trip, 1969: Davis, Calif., Univ. California, Geology Dept.*, p. 59-78, illus., 1969.
- 00809 **Hill, Robin E. T.; Boettcher, A. L.** Water in the Earth's mantle — Melting curves of basalt-water and basalt-water-carbon dioxide: *Science*, v. 167, no. 3920, p. 980-982, illus., 1970.
- 01781 **Hill, Robin E. T.; Boettcher, A. L.** Melting relationships in basalt-H<sub>2</sub>O and basalt-H<sub>2</sub>O-CO<sub>2</sub> to 30 kilobars [abs.]: *EOS*, v. 51, no. 4, p. 438, 1970.
- 07409 **Hill, Ronald D.; Wilmoth, Roger C.** Limestone treatment of acid mine drainage [abs.]: *Mining Eng.*, v. 22, no. 9, p. 53, 1970.

- 02858 **Hillel, D.; Gardner, W. R.** Measurement of unsaturated conductivity and diffusivity by infiltration through an impeding layer: *Soil Sci.*, v. 109, no. 3, p. 149-153, illus., 1970.
- 02528 **Hillerud, John M.** A subfossil assemblage from Milburn, Custer County, Nebraska [abs.]: *Nebraska Acad. Sci. Proc.*, 80th Ann. Mtg., p. 34-35, 1970.
- Hillis, S. F.** See Skermer, N. A. 02893
- Hillman, Norman S.** See Saito, Tsunemasa. 07787
- 10428 **Hills, I. R.; Smith, G. W.; Whitehead, E. V.** Hydrocarbons from fossil fuels and their relationship with living organisms: *Inst. Petroleum Jour.*, v. 56, no. 549, p. 127-137, illus., table, 1970.
- 05176 **Hills, John M.** Late Paleozoic structural directions in southern Permian basin, west Texas and southeastern New Mexico: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 10, p. 1809-1827, illus., 1970.
- 02160 **Hills, L. V.; Wallace, Sandra.** Reworked Devonian megaspores from the Triassic Bjorne Formation, Melville Island, Arctic Canada: *Bull. Canadian Petroleum Geology*, v. 18, no. 1, p. 113-114, 1970.
- Hills, L. V.** See Shepherd, W. W. 02295
- Hills, L. V.** See Gunther, P. 04355
- 10649 **Hills, L. V.** Problems in palynology, in Chacmool 1969 (R. G. Forbis, L. B. Davis, O. A. Christensen, G. Fedirchuk, editors) — Calgary Univ. Archaeol. Assoc., Ann. Paleo-Environmental Workshop, 1st, Calgary, 1969, Proc.: [Calgary, Alberta] Calgary Univ., Students' Press, p. 67-108 [1969].
- 10053 **Hills, Len V.** Stratigraphy of Beaufort Formation along western margin of Canadian Arctic Islands [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2486, 1970.
- 01201 **Hilpman, Paul L.** Devonian rocks in Kansas and their epeirogenic significance [abs.]: *Kansas Geol. Survey Bull.* 199, pt. 1, p. 75, 1970.
- 07022 **Hilpman, Paul L.** Geology teachers and environmental education [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 577-578, 1970.
- 08482 **Hilpman, Paul L.** Urban growth and environmental geology, in *Governor's Conf. on Environmental Geology: Colorado Geol. Survey Spec. Pub.*, no. 1, p. 16-19, tables [1970?].
- 00525 **Hilpman, Paul Lorenz.** Devonian rocks in Kansas and their epeirogenic significance [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 7, p. 3241B, 1970.
- 07354 **Hiltabrand, Robert Ray.** Experimental diagenesis of argillaceous sediment [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 4, p. 2063B, 1970.
- 10424 **Hilterman, Fred J.** Three-dimensional seismic modeling: *Mines Mag.*, v. 60, p. 11-12, illus., 1970.
- Hilton, George S.** See Hardt, William F. 04937
- Hilton, George S.** See Rosenau, Jack C. 10940
- Hilts, D. E.** See Miller, R. P. 07441

- 00285 **Himmelberg, Glen R.; Loney, R. A.** Origin and emplacement of the alpine type peridotites of the California Coast Ranges [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 102, 1970.
- 03982 **Hindall, S. M.; Flint, R. F.** Sediment yields of Wisconsin streams: U.S. Geol. Survey Hydrol. Inv. Atlas HA-376, scale about 1 in. to 7 mi., text, 1970.
- 02038 **Hinds, Jim S.; Cunningham, Richard R.** Elemental sulfur in Eddy County, New Mexico: U.S. Geol. Survey Circ. 628, 13 p., illus., 1970.
- 04136 **Hinds, Robert W.** Ordovician Bryozoa from the Pogonip Group of Millard County, western Utah: *Brigham Young Univ. Geology Studies*, v. 17, pt. 1, p. 19-40, illus., tables, 1970.
- Hine, Albert C., 3d.** *See* Hayes, Miles O. 02628
- 07501 **Hine, George T.** Relation of fracture traces, joints, and ground-water occurrence in the area of the Bryantsville quadrangle, central Kentucky: *Kentucky Geol. Survey*, ser. 10, Thesis Ser. 3, 27 p., illus., 1970.
- 02529 **Hingorani, G. G.** The role of computers in geophysics and its relationship to exploration [abs.]: *Nebraska Acad. Sci. Proc.*, 80th Ann. Mtg., p. 35, 1970.
- Hinkle, Kenneth R.** *See* Ramsey, Elmer W. 05486
- Hinkley, Kenneth C.** *See* Flemal, Ronald C. 09730
- 09732 **Hinkley, Kenneth C.** Soils in northeastern Illinois, *in* Tri-State Geol. Field Conf., 34th Ann., 1970, Guidebook (I. E. Odom and M. P. Weiss, editors): De Kalb, Ill., Northern Illinois Univ. Dept. Geology, p. 88-94, illus., 1970.
- 09913 **Hinman, Eugene E.** Field trip No. 1, Niagaran bioherms in the vicinity of Iowa City (Iowa and Cedar Counties), *in* *Geol. Soc. America, North-Central Sec., Ann. Mtg.*, 2d, May 1968, guidebook: Iowa City, Iowa, Univ. Iowa, p. 1-1 to 1-9, illus. [1968].
- Hinsch, Gertrude W.** *See* Mueller, George. 06301
- 05702 **Hintenberger, H.; Weber, H. W.; Voshage, H.; Wanke, H.; Begemann, F.; Wlotzka, F.** Concentrations and isotopic abundances of the rare gases, hydrogen and nitrogen in Apollo 11 lunar matter, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1269-1282, illus., tables, 1970.
- 10999 **Hinton, Richard J.** The hand-book to Arizona — Its resources, history, towns, mines, ruins and scenery (amply illustrated, accompanied with a new map of the territory): Glorieta, N.Mex., Rio Grande Press, [593] p., illus., reprinted 1970; originally published 1878.

**Hinze, W. J.** *See* Meshref, W. M. 07185

**Hinze, William J.** *See* Onesti, Lawrence J. 05320

- 10946 **Hinze, William J.; Merritt, Donald W.** Basement rocks of the Southern Peninsula of Michigan, *in* Studies of the Precambrian of the Michigan Basin—Michigan Basin Geol. Soc. Ann. Field Excursion, 1969: [East Lansing, Mich.], Michigan Basin Geol. Soc., p. 28-59, illus., tables, 1969.

- 09356 **Hirasaki, G. J.; O'Dell, P. M.** Representation of reservoir geometry for numerical simulation: Soc. Petroleum Engineers Jour., v. 10, no. 4, 393-404, illus., 1970.

- 06718 **Hirasawa, Tomowo.** Focal mechanism determination from S wave observations of different quality: Jour. Physics Earth, v. 18, nos. 3-4, p. 285-294, illus., tables, 1970.

- 09459 **Hirsch, E.; Altgelt, K. H.** Integrated structural analysis—A method for the determination of average structural parameters of petroleum heavy ends: Anal. Chemistry, v. 42, no. 12, p. 1330-1339, illus., tables, 1970.

**Hirschfeld, R. C.** *See* Einstein, H. H. 07439

**Hirschfeld, Ronald C.** *See* Einstein, Herbert H. 09141

**Hiscott, T.** *See* Given, P. H. 04091

- 04804 **Hiss, W. L.** Acquisition and machine processing of saline water data from southeastern New Mexico and western Texas, *in* Saline water symposium: Water Resources Research, v. 6, no. 5, p. 1471-1477, illus., 1970.

**Hiss, W. L.** *See* Peterson, J. B. 09713

**Hitchen, A.** *See* Beals, C. S. 08459

- 02630 **Hitchon, Brian; Billings, Gale K.; Klovan, J. E.** Factors controlling chemical composition of formation waters, Alberta [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 852, 1970.

- 04565 **Hite, Robert J.** Shelf carbonate sedimentation controlled by salinity in the Paradox Basin, southeast Utah, *in* Third symposium on salt, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 48-66, illus., table, 1970.

**Hite, Robert J.** *See* Dyni, John R. 04569

**Hite, Robert J.** *See* Raup, Omer B. 04643

- 03683 **Hjelmfelt, Allen T.; Lenau, Charles W.** Nonequilibrium transport of suspended sediment: Am. Soc. Civil Engineers Proc., v. 96, paper 7430, Jour. Hydraulics Div., no. HY 7, p. 1567-1586, illus., 1970.

**Hladik, William B.** *See* Bauleke, Maynard P. 01199

- 09250 **Hnatiuk, John.** Lateral water encroachment in the Pincher Creek Field: Jour. Canadian Petroleum Technology, v. 9, no. 2, p. 85-91, illus., tables, 1970.

**Ho, C.** *See* Prior, D. B. 00814

**Hoagland, Alan D.** *See* Gilbert, Ray C. 06990

**Hoagland, Alan D.** *See* Fischer, Frederick T. 08603

**Hoagland, G. W.** *See* Borchardt, G. A. 07851

- 10054 **Hoare, J. M.** Bering Sea basalts—Their sequence and origin [abs.], *in* Internat. Artic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2486, 1970.



**Hobba, W. A., Jr.** See Giese, G. L. 05489

- 09824 **Hobbs, Carl H.**, 3d. Shoreline orientation and storm surge: Maritime Sediments, v. 6, no. 3, p. 113-115, illus., 1970.
- 03259 **Hobday, David Kenneth**. Upper Carboniferous shorelines systems in northern Alabama [abs.]: Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 5100B, 1970.
- 04185 **Hobson, G. D.; Speers, G. C.** (editors). Advances in organic geochemistry — Internat. Cong., 3d, London, 1966, Proc.: London and New York, Pergamon Press (Internat. Ser. Mons. Earth Sci., V. 32), 576 p., illus., tables, 1970.
- 01457 **Hobson, George D.; Hunter, J. A. M.; Scott, J. S.** A shallow seismic survey, elastic constants studies and surficial geology of part of Defence Research Establishment Suffield (DRES), Suffield, Alberta: Canada Geol. Survey Paper 69-13, 24 p., illus., geol. map, 1970.
- 02919 **Hobson, George D.** Seismic methods in mining and groundwater exploration [with French abs.], in Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 148-176, illus., table, 1970.
- 03152 **Hobson, George D.** Hammer refraction seismic survey to assist biogeochemical program, Huckleberry Mountain, British Columbia, App. D in Biogeochemical prospecting for copper in west-central British Columbia: Canada Geol. Survey Paper 69-49, p. 29-39, illus., table, 1970.
- 06310 **Hobson, George D.** A hammer refraction seismic survey, Catamaran Brook area, McKendrick Lake, New Brunswick, 21 J/16 east half, App. A, in Geology of McKendrick Lake map-area, New Brunswick: Canada Geol. Survey Paper 69-12, p. 11-16, illus., 1970.
- 10690 **Hobson, George D.** Bedrock features of the Mer Bleue area by seismic methods: Canadian Field-Naturalist, v. 84, no. 1, p. 35-38, illus., 1970.
- 05666 **Hockey, Burn.** An improved co-ordinate system for particle shape representation: Jour. Sed. Petrology, v. 40, no. 3, p. 1054-1056, illus., 1970.
- 09082 **Hodder, D. T.** Multispectral photography in earth resources research: Optical Spectra, v. 4, no. 7, p. 71-75, illus., 1970.
- 01782 **Hodge, Dennis S.; Jurdy, Donna M.** Numerical analysis of temperature distribution around intrusives [abs.]: EOS, v. 51, no. 4, p. 446, 1970.
- 03713 **Hodge, Dennis S.; Smith, Bruce D.; Smithson, Scott B.** Quantitative geophysical study of petrogenesis of syenites related to Laramie anorthosite, Wyoming, U.S.A.: Lithos, v. 3, no. 3, p. 237-250, illus., table, 1970.
- Hodge, Dennis S.** See Smith, Bruce D. 07240
- 00195 **Hodge, Paul W.; Wright, Frances W.** Meteoritic spherules in the soil surrounding terrestrial impact craters: Nature, v. 225, no. 5234, p. 717-718, illus., table, 1970.
- 00526 **Hodgson, Christopher John.** Montereian dike rocks [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3241B, 1970.
- 07584 **Hodgson, Edward Askew.** Petrogenesis of the Lower Devonian Oriskany Sandstone and its correlates in New York, with a note on their acritarchs [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 3, p. 1350B, 1970.
- 05591 **Hodgson, Gordon W.; Holmes, Margot A.; Halpern, Berthold.** Biogeochemistry of molecular complexes of amino acids with chlorins and porphyrins: Geochim. et Cosmochim. Acta, v. 34, no. 10, p. 1107-1119, illus., tables, 1970.

- 05741 **Hodgson, Gordon W.; Bunnenberg, Edward; Halpern, Berthold; Peterson, Etta; Kvenvolden, Keith A.; Ponnamperna, Cyril.** Carbon compounds in lunar fines from Mare Tranquillitatis — [Pt.] 2, Search for porphyrins, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1829-1844, illus., tables, 1970.
- Hodgson, Gordon W.** See Peake, Eric. 09710
- 07421 **Hodgson, J. F.** Chemistry of trace elements in soils with reference to trace element concentration in plants, *in* Trace substances in environmental health III — Conf. on Trace Substances in Environmental Health, 3d Ann., Columbia, Mo., 1969, Proc.: Columbia, Mo., Univ. Missouri, p. 45-58, illus., tables, 1970.
- 06586 **Hoekstra, Karl Egmond.** Crystal chemical considerations of the spinel structural group [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 569B, 1970.
- 02245 **Hoering, T. C.** Optically active steranes in a Miocene petroleum: Carnegie Inst. Washington Year Book 68, 1968-69, p. 303-307, illus., 1970.
- 03425 **Hoerle, Shirley E.** Mollusca of the "Glades" unit of southern Florida — Pt. 2, List of molluscan species from the Belle Glade rock pit, Palm Beach County, Florida: Tulane Studies Geology and Paleontology, v. 8, no. 2, 56-68, 1970.
- 05467 **Hofer, H.** Applications of seismic interval velocity: Oilweek, v. 21, no. 33, p. 42-43, illus., 1970.
- 09373 **Hofer, Helmut; Carter, Melvan D.; McBeath, Robert G.** Stratigraphic trap exploration: Canadian Soc. Explor. Geophysicists Jour., v. 5, no. 1, p. 53-71, illus., 1969.
- 02396 **Hoffer, Jerry M.** Petrology and mineralogy of the Campus Andesite pluton, El Paso, Texas: Geol. Soc. America Bull., v. 81, no. 7, p. 2129-2135, illus., table, 1970.
- 08531 **Hoffer, Jerry M.** Plagioclase mineralogy of the Rock Creek flow, Columbia River basalt, *in* Columbia River Basalt Symposium, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 51-53, 1970.
- Hoffer, Roger M.** See Smedes, Harry W. 07772
- 03564 **Hoffman, B. W.; Wainerdi, R. E.** KRIS, a computer program for the least-squares resolution of gamma-ray spectra by half-life and gamma-ray energy: Jour. Radioanal. Chemistry, v. 4, no. 2, p. 375-382, illus., tables, 1970.
- Hoffman, Barry L. P.** See Hoskin, Charles M. 02991
- Hoffman, Buren W.** See Kuykendall, W. E., Jr. 06664
- Hoffman, Buren W.** See Kuykendall, W. E., Jr. 07148
- 09810 **Hoffman, Charles S.** Priceite in Curry County: Ore Bin, v. 32, no. 2, p. 34-35, 1970.
- 04283 **Hoffman, David J.** Relation of magnetite content to geology at Queco: Econ. Geology, v. 65, no. 4, p. 511-512, 1970.
- 04869 **Hoffman, David J.** Deformational effects on iron occurrence and ore potential at Queco: Econ. Geology, v. 65, no. 5, p. 583-587, illus., table, 1970.
- 03260 **Hoffman, James Irvine.** The nature of calcium-organic complexes in natural solutions and its implications on mineral equilibria [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 11, p. 5101B, 1970.

- 08632 **Hoffman, P. F.; Fraser, J. A.; McGlynn, J. C.** The Coronation geosyncline of Aphebian age, District of Mackenzie, *in* Basins and geosynclines of the Canadian Shield (A. J. Baer, editor) — Symposium, Ottawa, 1970, Papers: Canada Geol. Survey Paper 70-40, p. 201-212, illus., 1970.
- 04772 **Hoffmann, Edward A., Jr.** Mud Lake and Second Bayou Fields, Cameron Parish, Louisiana, *in* Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 20-20f, illus., 1970.
- 08052 **Hoffmann, Robert S.; Jones, J. Knox, Jr.** Influence of late-glacial and post-glacial events on the distribution of recent mammals on the northern Great Plains, *in* Pleistocene and recent environments of the central Great Plains: Kansas Univ. Dept. Geology Spec. Pub. 3, p. 355-394, illus., tables, 1970.
- Hofman, George.** *See* Minch, John A. 04885
- 04011 **Hofmann, Albrecht; Giletti, Bruno J.** Diffusion of geochronologically important nuclides in minerals under hydrothermal conditions, *in* Geochronology of Phanerozoic orogenic belts — Colloquium, Switzerland, 1969, Papers: Eclogae Geol. Helvetiae, v. 63, no. 1, p. 141-150, illus., table, 1970.
- 06872 **Hofmann, Albrecht Werner.** Hydrothermal experiments on equilibrium partitioning and diffusion kinetics of Rb, Sr, and Na in biotite — Alkali chloride solution systems [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 1, p. 250B-251B, 1970.
- 00286 **Hofmann, R. B.; Anderson, D. L.; Tocher, Don; Ryall, Alan; Morrill, B. J.** Cooperative seismic data exchange in California and Nevada [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 102-103, 1970.
- 06623 **Hofmann, R. B.** Geodimeter and laser ranging measurements across the San Andreas fault system, *in* Laser applications in the geosciences (J. Gauger and F. F. Hall, Jr., editors) — Symposium, Huntington Beach, Calif., 1969, Proc.: North Hollywood, Calif., Western Periodicals Co., p. 131-150, illus., 1970.
- 09977 **Hofmann, Renner B.** Earthquake predictions from fault movement and strain precursors in California, *in* Earthquake displacement fields and the rotation of the Earth (L. Mansinha, D. E. Smylie, A. E. Beck, editors)-NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 234-245, illus., 1970.
- 11005 **Hofmann, Renner B.** Fault strain and slip from recent State of California Geodimeter measurements [abs.]: EOS, v. 51, no. 11, p. 740, 1970.
- Hofstra, W. E.** *See* Jenkins, C. T. 00859
- Hofstra, W. E.** *See* Jenkins, C. T. 08713
- 07192 **Hogan, Edward Patrick; Opheim, Lee A.; Zieske, Scott H.** Atlas of South Dakota: Dubuque, Iowa, Kendall/Hunt Publishing Co., 137 p., illus., 1970.
- 04941 **Hogarth, D. D.** Geology of the southern part of Gatineau Park, National Capital region: Canada Geol. Survey Paper 70-20, 8 p., geol. map, 1970.
- 06638 **Hogarth, D. D.; Brown, F. F.; Pritchard, A. M.** Biabsorption, Mössbauer spectra, and chemical investigation of five phlogopite samples from Quebec: Canadian Mineralogist, v. 10, pt. 4, p. 710-722, illus., tables, 1970.
- 07023 **Hogarth, David D.** Petrology of lapis lazuli, Soper River, Baffin Island [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 578-579, 1970.
- 03491 **Hogberg, Rudolph; Matsch, Charles L.** A teacher's guide for geologic field investigations in central Minnesota: [St. Paul, Minn.] Minnesota Dept. Education, 17 p., illus., table [n.d.].

- 09845 **Hogberg, Rudolph K.** Urbanization, environmental quality and the industrial minerals industry: Mining Cong. Jour., v. 56, no. 2, p. 108-114, illus., tables, 1970
- 06305 **Hoggan, Roger D.** Paleontology and paleoecology of the Curtis Formation in the Uinta Mountains area, Daggett County, Utah: Brigham Young Univ. Geology Studies, v. 17, pt. 2, p. 31-65, illus., 1970.
- Hohenberg, C. M.** See Podosek, F. A. 03366
- 05703 **Hohenberg, C. M.; Davis, P. K.; Kaiser, W. A.; Lewis, R. S.; Reynolds, J. H.** Trapped and cosmogenic rare gases from stepwise heating of Apollo 11 samples, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1283-1309, illus., tables, 1970.
- 04785 **Hohmann, Gerald W.; Kintzinger, Paul R.; VanVoorhis, Gerald D.; Ward, Stanley H.** Evaluation of the measurement of induced electrical polarization with an inductive system: Geophysics, v. 35, no. 5, p. 901-915, illus., 1970.
- 09001 **Holberg, Arnold J.** (editor). Bituminous materials—Asphalts, tars, and pitches—v. 1: New York, Intersci. Publishers, 432 p., illus., tables, 1964; V. 2, Asphalts, pt. 1, 698 p., illus., tables, 1965.
- 10343 **Holbert, D. R.; Thomas, G. B.; Sweeney, M.; VonTiehl, R. D.; Ehrling, T. W.** A computerized file for directional well courses: Jour. Petroleum Technology, v. 22, March, p. 267-276, illus., tables, 1970.
- 07024 **Holbrook, Sally Jean; Bambach, Richard K.** Budding, growth, and environmental response in *Favosites helderbergiae* hall (tabulata) [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 579, 1970.
- 10210 **Holcomb, C. Wayne.** Future petroleum provinces of Gulf Coast, Upper Cretaceous [abs.]: Am. Assoc. Petroleum Geologists, v. 54, no. 9, p. 1785, 1970; Gulf Coast Assoc. Geol. Soc. Trans., v. 20, p. 125-126, 1970.
- Holcombe, Troy L.** See Johnson, G. Leonard. 01934
- 10481 **Holdahl, Sanford R.** Studies of precise leveling at California fault sites [abs.]: EOS, v. 51, no. 11, p. 742, 1970
- Holdaway, M. J.** See Haas, Herbert. 01771
- Holden, J.** See Wilde, P. 01335
- Holden, John C.** See Dietz, Robert S. 02490
- Holden, John C.** See Dietz, Robert S. 03963
- Holden, W. R.** See Overpeck, A. C. 10664
- Holdridge, D. A.** See Davis, C. E. 07869
- Holdridge, D. A.** See Davis, C. E. 09339
- Holdridge, D. A.** See Davis, C. E. 09340
- Holdridge, D. A.** See Davis, C. E. 09341
- 10354 **Holdridge, D. A.; Taylor, W. A.** The mineralogy of some Jamaica clays: Information—Jamaica Sci. Research Council Bull., v. 9, nos. 1-4, p. 25-29, 1969.
- 10355 **Holdridge, D. A.; Taylor, W. A.** Preliminary survey of some Westmoreland and St. Elizabeth clays: Information—Jamaica Sci. Research Council Bull., v. 9, nos. 1-4, p. 30-38, illus., 1969.

- Holdridge, D. A.** See Davis, C. E. 10356
- 06813 **Hole, F. D.** Drumlin morphology and soil relationships in Jefferson County, Wisconsin, Pt. F in Pleistocene geology of southern Wisconsin — Geol. Soc. America, Ann. Mtg., Milwaukee, Wis., 1970, Field Trip Guide: Wisconsin Univ. Geol. and Nat. History Survey Inf. Circ. 15, p. F1-F9, illus., table, 1970.
- Hole, Francis D.** See Black, Robert F. 06810
- Hole, Francis D.** See Milfred, Clarence J. 08264
- 06836 **Hole, Thornton J. F.; Redmond, Charles E.** Florence valley, an abandoned stream valley, Florence Township, Erie County, Ohio: Ohio Jour. Sci., v. 70, no. 6, p. 341-346, illus., 1970.
- Holland, H. D.** See Poty, B. P. 09523
- 09320 **Holland, H. J.; Gawthrop, J. A.** Crystallographic indexing with a computer program modified for use with the IBM 360 O/S: Jour. Appl. Crystallography, v. 2, pt. 1, p. 81-82, table, 1969.
- Holland, Warren E.** See Robinson, Leon H. 07457
- 00287 **Hollenbaugh, Kenneth M.** Geology of a portion of the north flank of the San Bernardino Mountains, California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 103, 1970.
- Holliday, B. W.** See Swift, D. J. P. 10337
- Holliday, Barry W.** See Swift, Donald J. P. 04724
- 03606 **Holliday, D. W.** The petrology of secondary gypsum rocks, a review: Jour. Sed. Petrology, v. 40, no. 2, p. 734-744, illus., 1970.
- Holliday, D. W.** See Green, G. W. 10245
- 10247 **Holliday, D. W.** (leader). Field excursion to the Brooks and Bito gypsum quarries, eastern St. Andrew: Geol. Soc. Jamaica Jour., v. 11, p. 36-42, illus., 1970
- Hollingshead, Robert D.** See Culbertson, William J. 10904
- Hollister, C. D.** See Phillips, J. D. 01967
- Hollister, Charles D.** See Zimmerman, Herman B. 02008
- Hollister, Charles D.** See Young, Robert A. 10318
- Hollister, Charles D.** See Tucholke, Brian E. 10339
- 07355 **Hollister, Charles Davis.** Sediment distribution and deep circulation in the western North Atlantic [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2063B-2064B, 1970.
- Hollister, J. C.** See Mabey, D. 02941
- 06577 **Hollister, Lincoln S.** Origin, mechanism, and consequences of compositional sector-zoning in staurolite: Am. Mineralogist, v. 55, nos. 5-6, p. 742-766, illus., tables, 1970.
- 02346 **Hollister, Victor F.** Edward H. Wisser (1895-1970): Am. Assoc. Petroleum Geologists Bull., v. 54, no. 7, p. 1311-1312, portrait, 1970.
- 07025 **Holloway, John R.** Fluid compositions in basalt-H<sub>2</sub>O—CO<sub>2</sub> system [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 579-580, 1970.

- 07926 **Holloway, John Requa.** Phase relations and compositions in the basalt-CO<sub>2</sub>-H<sub>2</sub>O system at high temperatures and pressures [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 6, p. 3590B, 1970.
- 02908 **Hollyday, Este F.** Use of infrared imagery to locate surficial aquifers, Delmarva Peninsula, Maryland and Delaware, *in* Earth resources aircraft program status review, NASA, Houston, 1968 — V. 3, Hydrology, oceanography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 25-1 — 25-14, illus. [1970].
- 07750 **Hollyday, Este F.** Use of infrared radiometry in measuring ground-water inflow to streams, Delmarva Peninsula, Maryland and Delaware, *in* Earth Resources Aircraft Program, status review, 2d Ann., Houston, Tex., 1969 — V. 3, Hydrology and oceanography: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 44-1 — 44-14, illus. [1970?].
- 00497 **Holman, J. Alan.** A small Pleistocene herpetofauna from Tamaulipas: *Florida Acad. Sci. Quart. Jour.*, v. 32, no. 2, p. 153-158, 1969 [1970].
- 08146 **Holman, J. Alan.** Herpetofauna of the Wood Mountain Formation (Upper Miocene) of Saskatchewan: *Canadian Jour. Earth Sci.*, v. 7, no. 5, p. 1317-1325, illus., 1970.
- 08351 **Holman, J. Alan.** Possible habits of juvenile prototetrapods: *Michigan Academician*, v. 3, no. 2, p. 101-103, 1970.
- 00899 **Holmes, Charles W.** Trace elements in the Gulf of Mexico [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 286, 1970.
- Holmes, John.** *See* Bell, John. 04758
- Holmes, M. L.** *See* Grantz, Arthur. 10045
- Holmes, M. L.** *See* Kummer, John T. 10070
- Holmes, Margot A.** *See* Hodgson, Gordon W. 05591
- Holmes, Mark L.** *See* Scholl, David W. 00359
- 01925 **Holmes, Mark L.; vonHuene, Roland; McManus, Dean A.** Underthrusting of the Aleutian Arc by the Pacific Ocean floor near Amchitka Island [abs.]: *EOS*, v. 51, no. 4, p. 330, 1970.
- Holmes, Mark L.** *See* Creager, Joe S. 10025
- 00715 **Holmes, Robert F.** Thematic mapping with 1:50,000 scale side-looking radar (SLR) [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 216-217, 1970.
- Holmes, Robert F.** *See* Eitel, Dean F. 01134
- 08756 **Holmgren, Dennis A.** K/Ar dates and paleomagnetism of the type Yakima Basalt, central Washington, *in* Columbia River Basalt Symposium, 2nd, Cheney, Wash., 1969, *Proc.*: Cheney, Eastern Washington State College Press, p. 189-199, illus., table, 1970.
- 06599 **Holmgren, Dennis Arthur.** Columbia River basalt patterns from central Washington to northern Oregon [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 2, p. 759B, 1970.
- Holowaychuk, N.** *See* Gersper, P. L. 07504
- Holroyd, M. T.** *See* Bhattacharyya, B. K. 04288
- 06303 **Holroyd, M. T.; Bhattacharyya, B. K.** Automatic contouring of geophysical data using bicubic spline interpolation: *Canada Geol. Survey Paper* 70-55, 40 p., illus., tables, 1970.

- 07026 **Holser, William T.; Anderson, Roger Y.** Bromide distribution in Castile halites, Delaware basin, Texas [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 580, 1970.
- 09955 **Holser, William T.** Bromide geochemistry of some non-marine salt deposits in the southern Great Basin, *in* *Symposium on the mineralogy and geochemistry of non-marine evaporites—Fiftieth Anniversary Symposia* (Benjamin A. Morgan, editor): *Mineralog. Soc. America Spec. Paper* 3, p. 307-319, illus., tables, 1970.
- 05617 **Holt, C. L. R., Jr.; Cotter, R. D.; Green, J. H.; Olcott, P. G.** Hydrogeology of the Rock-Fox River basin of southeastern Wisconsin — *Geol. Soc. America, Ann. Mtg., Milwaukee, Wis., 1970, Field Trip Guidebook: Wisconsin Geol. and Nat. History Survey Inf. Circ.* 17, 47 p., illus., table, 1970.
- 05109 **Holt, H. E.; Rennilson, J. J.** Preliminary geologic investigation of the Apollo 12 landing site — Pt. B, Photometric and polarimetric properties of the lunar regolith, *in* *Apollo 12 preliminary science report: U.S. Natl. Aeronautics and Space Adm. Spec. Pub. SP-235*, p. 157-161, illus., 1970.
- 05092 **Holt, Henry E.** Photometry and polarimetry of the lunar regolith as measured by Surveyor, *in* *Symposium on planetary atmospheres and surfaces*, Woods Hole, Mass., 1969: *Radio Sci.*, v. 5, no. 2, p. 157-170, illus., 1970.
- 03261 **Holt, Jack Haston.** A study of the physico-chemical, mineralogical and engineering properties of fine-grained soil in relation to their expansive characteristics [abs.]: *Dissert. Abs. Internat., Sec. B., Sci. and Eng.*, v. 30, no. 11, p. 5034B, 1970.
- 01375 **Holtedahl, Olaf.** On the morphology of the West Greenland shelf with general remarks on the "marginal channel" problem: *Marine Geology*, v. 8, no. 2, p. 155-172, illus., 1970.
- 08082 **Holter, M. R.** September 1969 annual report of NASA supported remote sensing activities at the University of Michigan Willow Run Laboratories, *in* *Earth Resources Aircraft Program, status review*, 2d Ann., Houston, Tex., 1969 — V. 2, Agriculture, Forestry, and sensor studies: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 27-1—27-36, illus., tables, [1970,].
- 05268 **Holtz, W. G.** Suggested method of test for one-dimensional expansion and uplift pressure of clay soils, *in* *Special procedures for testing soil and rock for engineering purposes* (5th edition): *Am. Soc. Testing and Materials Spec. Tech. Pub.* 479, p. 198-205, illus., 1970.
- 05312 **Holtz, W. G.** Suggested method of test for permeability of undisturbed soil or rock specimens, *in* *Special procedures for testing soil and rock for engineering purposes* (5th edition): *Am. Soc. Testing and Materials Spec. Tech. Pub.* 479, p. 150-156, illus., tables, 1970.
- 05317 **Holtz, W. G.; Noell, O. A.** Suggested method of test for internal friction and cohesion values of soils and soil mixtures by triaxial loading, *in* *Special procedures for testing soil and rock for engineering purposes* (5th edition): *Am. Soc. Testing and Materials Spec. Tech. Pub.* 479, p. 220-233, illus., tables, 1970.
- Holz, Robert K.** *See* Bonine, Michael E. 07191
- 08656 **Homme, Frank C.; Rosenzweig, Abraham.** Contact metamorphism in the Tres Hermanas Mountains, Luna County, New Mexico, *in* *Guidebook of the Tyrone-Big Hatchet Mountains-Florida Mountains region* — *New Mexico Geol. Soc. Field Conf.*, 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, p. 141-145, illus., 1970.
- Homuth, E. F.** *See* Boucher, Gary W. 01626
- 09122 **Honda, S.; Muffler, L. J. P.** Hydrothermal alteration in core from research drill hole Y-1, Upper Geyser Basin, Yellowstone National Park, Wyoming: *Am. Mineralogist*, v. 55, nos. 9-10, p. 1714-1737, illus., tables, 1970.

- 01157 **Honduras Instituto Geografico Nac.** Mapa geologico de Honduras — Nueva Armenia (Hoja 2757 II G): Tegucigalpa, Honduras, Ministerio de Comunicaciones y Obras Publicas, scale 1:50,000 [n.d.].
- 01158 **Honduras Instituto Geografico Nac.** Mapa geologico de Honduras — Tegucigalpa (Hoja 2758 II G): Tegucigalpa, Honduras, Ministerio de Comunicaciones y Obras Publicas, scale 1:50,000, text [n.d.].
- 01159 **Honduras Instituto Geografico Nac.** Mapa geologico de Honduras — San Buenaventura (Hoja 2757 I G): Tegucigalpa, Honduras, Ministerio de Comunicaciones y Obras Publicas, scale 1:50,000 [n.d.].
- 03801 **Honduras Instituto Geografico Nac.** Mapa geologico de Honduras — San Juan de Flores (Hoja 2758 I G): Tegucigalpa, Honduras, Ministerio de Comunicaciones y Obras Publicas, scale 1:50,000, 1970.
- 06371 **Honjo, Susumu; Tabuchi, Hiroyoshi.** Distribution of some minor elements in carbonate rocks — [Pt.] 1, A list of analytical values of Mg, Sr, Fe, Mn, Zn, Cu, Cr, Ni, and V: *Pacific Geology*, v. 2, p. 41-79, illus., tables, 1970.
- 05430 **Honkala, A. U.** The professional geologist [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 134, 1970.
- Hood, Donald W.** See Kelley, John J. 10689
- 09629 **Hood, J. W.; Price, Don.** Hydrologic reconnaissance of Grouse Creek valley, Box Elder County, Utah: *Utah Dept. Nat. Resources Tech. Pub.* 29, 54 p., illus., tables, geol. map, 1970.
- 02172 **Hood, Peter.** Geophysical activity surges in the western world: *Mining Eng.*, v. 22, no. 3, p. 63-64, illus., table, 1970.
- 02951 **Hood, Peter.** Magnetic surveying instrumentation — A review of recent advances [with French abs.], in *Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept.* 26, p. 3-31, illus., tables, 1970.
- 03514 **Hood, Peter.** Sea-floor spreading and continental drift: *Canadian Geog. Jour.*, v. 80, no. 1, p. 32-36, illus., 1970.
- 01523 **Hooke, Roger LeB.** Sediment measurement techniques — [Pt.] A, Fluvial sediment — Discussion [of paper 6756 by Am. Soc. Civil Engineers (Task Comm. on Preparation of Sedimentation Manual), 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, Jour. Hydraulics Div., no. HY 4, p. 1073-1074, illus., 1970.
- 05215 **Hooke, Roger LeB.** Morphology of the ice-sheet margin near Thule, Greenland [with French and German abs.]: *Jour. Glaciology*, v. 9, no. 57, p. 303-324, illus., tables, 1970.
- 07027 **Hooke, Roger LeB.** Geomorphic evidence for late-Wisconsin tectonic deformation, Death Valley, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 580-581, 1970.
- 06173 **Hooker, Marjorie.** "Catoctin schist" analysis — Its true identity, in *Geological Survey research 1970*, Chap. D: *U.S. Geol. Survey Prof. Paper* 700-D, p. D106-D107, 1970.
- 03409 **Hooper, P. R.; Rosenberg, P. E.** The petrology of Granite Point, southeastern Washington: *Northwest Sci.*, v. 44, no. 2, p. 131-142, illus., table, 1970.

**Hoover, D. B.** See VanPoolen, H. K. 10659

**Hoover, John I.** See Wilkniss, Peter E. 02000



- 07474 **Hoover, Karl V.** (editor). Forum on geology of industrial minerals, 5th, Harrisburg, Pa., 1969, Proc.: Pennsylvania Geol. Survey, 4th ser., Bull. M64 (Mineral Resources Rept.), 278 p., illus., tables, 1970.
- Hope, R. C.** See Delevoryas, T. 04155
- 05809 **Hope, R. C.; Patterson, O. F., 3d.** *Pekinopteris auriculata*, a new plant from the North Carolina Triassic: Jour. Paleontology, v. 44, no. 6, p. 1137-1139, illus., 1970.
- Hopkins, David M.** See Scholl, David W. 03531
- 10055 **Hopkins, David M.; Scholl, David W.** Tectonic development of Beringia, Late Mesozoic to Holocene [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2487-2488, 1970.
- 10175 **Hopkins, David M.** Paleoclimatic speculations suggested by new data of the location of the spruce refugium in Alaska during the last glaciation [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 67, 1970.
- 05453 **Hopkins, H. T.; Mull, D. S.** Ground water, in Influences of strip mining on the hydrologic environment of parts of Beaver Creek basin, Kentucky, 1955-66: U.S. Geol. Survey Prof. Paper 427-C, p. C9-C14, illus., 1970.
- 01861 **Hopkins, Herbert T.** Occurrence of fresh water in the Lee Formation in parts of Elliott, Johnson, Lawrence, Magoffin, and Morgan Counties, Eastern Coal Field region, Kentucky: U.S. Geol. Survey Water-Supply Paper 1867, 44 p., illus., tables, geol. map, 1970.
- 02631 **Hopkins, John P.; Mountjoy, Eric W.** Reef-margin and basin sedimentation, Miette reef complex, Jasper National Park, Alberta [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 852, 1970.
- Hopkins, M. E.** See Smith, W. H. 05533
- Hopkins, M. E.** See Damberger, H. H. 05534
- Hopkins, M. E.** See Damberger, H. H. 05535
- Hopkins, M. E.** See Gluskoter, Harold J. 05542
- 05542 **Hopkins, M. E.; Nance, Roger B.** Sulfur content of the Colchester (No. 2) Coal Member at the Banner Mine, Peoria and Fulton Counties, Illinois, in Depositional environments in parts of the Carbondale Formation, western and northern Illinois — Francis Creek Shale and associated strata and Mazon Creek biota — Geol. Soc. America, Coal Geology Div., Ann. Field Trip, Milwaukee, Wis., 1970: Illinois Geol. Survey Guidebook Ser. 8, p. 96-98, illus., table, 1970.
- Hopkins, W. S., Jr.** See Waldman, M. 08195
- Hopkins, W. S., Jr.** See Rouse, Glenn E. 10869
- Hopkins, William S., Jr.** See King, Lewis H. 07674
- 05431 **Hopper, Margaret; Bollinger, G. A.** Seismic studies of the Virginia earthquakes of 20 November and 11 December, 1969 [abs.]: Virginia Jour. Sci., v. 21, no. 3, p. 134, 1970.

**Hopper, Margaret G.** See Bollinger, G. A. 02305

- 04018 **Hopper, Margaret G.; Bollinger, G. A.** A note on the central Virginia earthquake of December 11, 1969: *Earthquake Notes*, v. 41, no. 2, p. 31-36, illus., table, 1970.
- 03823 **Hoppin, Richard A.** Structural development of Five Springs Creek area, Bighorn Mountains, Wyoming: *Geol. Soc. America Bull.*, v. 81, no. 8, p. 2403-2415, illus., geol. map, 1970.
- 00288 **Hopson, C. A.; Cater, F. W.; Crowder, D. F.** Emplacement of plutons, Cascade Mountains, Washington [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 104, 1970.
- Hopson, C. A.** See Tilton, G. R. 10280
- Hopson, James A.** See Barghusen, Herbert R. 01202
- 10429 **Hopson, James A.** The classification of nontherian mammals: *Jour. Mammalogy*, v. 51, no. 1, p. 1-9, 1970.
- 00015 **Horai, Ki-iti; Chessman, Mary; Simmons, Gene.** Heat flow measurements on the Reykjanes Ridge: *Nature*, v. 225, no. 5229, p. 264-265, illus., table, 1970.
- 00584 **Horai, Ki-iti; Simmons, Gene.** An empirical relationship between thermal conductivity and Debye temperature for silicates: *Jour. Geophys. Research*, v. 75, no. 5, p. 978-982, illus., tables, 1970.
- 01447 **Horai, Ki-iti; Nur, Amos.** Relationship among terrestrial heat flow, thermal conductivity, and geothermal gradient: *Jour. Geophys. Research*, v. 75, no. 11, p. 1985-1991, illus., table, 1970.
- 06285 **Horai, Ki-iti; Simmons, Gene; Kanamori, Hiroo; Wones, David.** Thermal diffusivity, conductivity and thermal inertia of Apollo 11 lunar material, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 2243-2249, illus., tables, 1970.
- 11211 **Horenstein, Sidney.** Fossil collecting in New York City: *New York Paleont. Soc. Notes*, no. 7, p. 5-6, 1970.
- 11212 **Horenstein, Sidney; Singer, Harry.** Granton Quarry, Bergen County, New Jersey: *New York Paleont. Soc. Notes*, no. 5, p. 3-5, 1970.
- 11213 **Horenstein, Sidney.** Trilobite Mountain, New York: *New York Paleont. Soc. Notes*, no. 3, p. 4-8, 1970.
- 11214 **Horenstein, Sidney.** Lower Devonian rocks at Highland Mills, New York: *New York Paleont. Soc. Notes*, no. 2, p. 1-4, 1970.
- 11216 **Horenstein, Sidney.** Selected references on the geology of the New York City area: *New York Paleont. Soc. Notes*, no. 2, p. 10, 1970.
- 10840 **Hori, Daniel H.; Burbank, Nathan C., Jr.; Young, Reginald H. F.; Lau, L. Stephen; Klemmer, Howard W.** Migration of poliovirus type 2 in percolating water through selected Oahu soils: *Hawaii Univ. Water Resources Research Center Tech. Rept.* 36, 40 p., illus., tables, 1970.
- 09013 **Horick, Paul J. (editor).** Water resources of Iowa—A symposium: *Cedar Falls, Iowa, Iowa Acad. Sci., Geology Sec.*, 175 p., illus., tables, 1970.

**Horick, Paul J.** See Steinhilber, Walter L. 09014

**Horn, B. M.** See Horn, D. R. 08445

- 08445 **Horn, D. R.; Horn, B. M.; Delach, M. N.** Sedimentary provinces of the North Pacific in Geological Investigations of the North Pacific (James D. Hays, editor): Geol. Soc. America Mem. 126, p. 1-21, illus., map, 1970.
- 10638 **Horn, M. K.** An improved method for computer simulation of geochemical neutron activation experiments: Internat. Assoc. Math. Geology Jour., v. 2, no. 2, p. 131-139, illus., table, 1970.
- 09779 **Hornal, R. W.; Sobczak, L. W.; Burke, W. E. F.; Stephens, L. E.** Preliminary results of gravity surveys over the Mackenzie basin and Beaufort Sea: Canada Dept. Energy, Mines and Resources, Earth Physics Br. Gravity Map Ser., nos. 117-119, 3 sheets, scale 1:1,000,000, with separate 12 page text (1970), 1969.
- Hornal, Robert W.** See Spector, Allan. 00967
- 02716 **Hornberger, George M.; Ebert, Janet; Remson, Irwin.** Numerical solution of the Boussinesq equation for aquifer-stream interaction: Water Resources Research, v. 6, no. 2, p. 601-608, illus., 1970.
- 07370 **Hornberger, George Milton.** Numerical studies of composite soil-moisture ground-water systems [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2099B, 1970.
- 07214 **Hornbogen, Erhard; Kreye, Heinrich.** The microstructure of two iron meteorites [with German abs.]: Zeitschr. Metallkunde, v. 61, no. 12, p. 914-923, illus., 1970.
- 03022 **Hornbrook, E. H. W.; Allan, R. J.** Geochemical exploration feasibility study within the zone of continuous permafrost, Coppermine River region, Northwest Territories: Canada Geol. Survey Paper 70-36, 35 p., illus., tables, 1970.
- 03151 **Hornbrook, E. H. W.** Biogeochemical prospecting for copper in west-central British Columbia (with a contribution by G. D. Hobson): Canada Geol. Survey Paper 69-49, 39 p., illus., tables, 1970.
- Hornbrook, E. H. W.** See Allan, R. J. 04660
- 06449 **Hornbrook, E. H. W.** Biogeochemical investigations in the Perch Lake area, Chalk River, Ontario: Canada Geol. Survey Paper 70-43, 23 p., illus., tables, 1970.
- 02408 **Horne, Gregory S.** Complex volcanic-sedimentary patterns in the Magog Belt of northeastern Newfoundland: Geol. Soc. America Bull., v. 81, no. 6, p. 1767-1788, illus., table, geol. map, 1970.
- 05803 **Horne, Gregory S.; Johnson, J. Harlan.** Ordovician algae from boulders in Silurian deposits of New World Island, Newfoundland: Jour. Paleontology, v. 44, no. 6, p. 1055-1059, illus., table, 1970.
- 00716 **Horne, John C.; Ferm, John C.** Facies relationships of the Mississippian-Pennsylvanian contact in northeastern Kentucky [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 217, 1970.
- Horne, John C.** See Wanless, H. R. 06708
- Horodyski, R. J.** See Coombs, D. S. 00848
- 01075 **Horowitz, Alan Stanley.** Biotic diversity in the Chesterian (Upper Mississippian) rocks of the Illinois basin [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 389-390, 1970.
- 03642 **Horowitz, Alan Stanley.** Nomenclatorial diversity within *Fistulipora* McCoy and allied genera: Jour. Paleontology, v. 44, no. 4, p. 776-778, illus., tables, 1970.
- 01290 **Horsfield, W. T.; Maton, P. I.** Transform faulting along the De Geer line: Nature, v. 226, no. 5242, p. 256-257, illus., 1970.

- Horska, S. J.** *See* Webber, G. R. 05367
- Horton, J. H.** *See* Corey, J. C. 02216
- 06684 **Horton, R. E.** Erosional development of streams — Quantitative physiographic factors, [Chap.] 5 in *Rivers and river terraces* (G. H. Dury, editor): London, Macmillan and Co. Ltd., p. 117-165, illus., tables, condensed 1970; originally published 1945.
- Horvath, C. G.** *See* Lipsky, S. R. 05744
- 02632 **Horvitz, Leo.** Geochemical prospecting for petroleum [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 852-853, 1970.
- 00657 **Hörz, Friedrich.** Static and dynamic origin of kink bands in micas: *Jour. Geophys. Research*, v. 75, no. 5, p. 965-977, illus., tables, 1970.
- Hörz, Friedrich.** *See* Wolfe, Stephen H. 09091
- 02126 **Hoshkiw, M. E.** Reliability of saturation-pressure method for dating time of oil accumulation: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 699-708, illus., table, 1970.
- Hoskin, C. M.** *See* Naidu, A. S. 01957
- 02991 **Hoskin, Charles M.; Guthrie, R. Dale; Hoffman, Barry L. P.** Pleistocene, Holocene and recent bird gastroliths from interior Alaska [with French and Russian abs.]: *Arctic*, v. 23, no. 1, p. 14-23, illus., 1970.
- 00162 **Hoskins, Donald M.** Alternative interpretation of the Catskill-Pocono contact in the anthracite area of Pennsylvania [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 25, 1970.
- Hoskins, E. L.** *See* Raleigh, C. B. 01627
- 07028 **Hoskins, Earl R.; Hammerquist, Donald W.; Rahn, Perry H.** The use of aerial photography of delineate areas of highway distress in western South Dakota [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 581, 1970.
- Hoskins, Earl R.** *See* Russell, James E. 07444
- 10581 **Hoskins, Earl R.; Daniells, Paul A.** Measurements of residual strain in rocks [abs.]: *EOS*, v. 51, no. 11, p. 826-827, 1970.
- 00448 **Hosman, R. L.; Broussard, W. L.; Calandro, J. J.** Water resources of northwestern St. Landry Parish and vicinity, Louisiana: Louisiana Geol. Survey and Dept. Public Works Water Resources Pamph. 23, 29 p., illus., tables, 1970.
- Hosman, R. L.** *See* Cushing, E. M. 04550
- Hosman, R. L.** *See* Calandro, A. J. 08185
- 06686 **Hospers, J.; VanAndel, S. I.** A review of selected palaeomagnetic data from Europe and North America and their bearing on the origin of the North Atlantic Ocean, Chap. 30 in *Palaeogeophysics* (S. K. Runcorn, editor): London and New York, Academic Press, p. 263-275, illus., tables, 1970.
- 04248 **Hosterman, John W.; Wood, Gordon H., Jr.; Bergin, M. J.** Mineralogy of underclays in the Pennsylvania Anthracite region, in *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C89-C97, illus., table, 1970.
- Hostetler, P. B.** *See* Christ, C. L. 02194
- 01783 **Hostetler, Paul B.; Siebert, Robert M.; Christ, Charles L.** Thermodynamic solubility of sepiolite [abs.]: *EOS*, v. 51, no. 4, p. 453, 1970.

**Hostetler, Paul B.** See Siebert, Robert M. 09568

- 02752 **Hotchkiss, Frederick H. C.** North American Ordovician Ophiuroidea — The genus *Taeniaster* Billings, 1858 (Protasteridae): Biol. Soc. Washington Proc., v. 83, no. 5, p. 59-75, 1970.
- 04700 **Hotton, Nicholas, 3d.** *Mauchchunkia bassa*, gen. et sp. nov., an anthracosaur (Amphibia, Labrinthodontia) from the Upper Mississippian: Kirtlandia, no. 12, 38 p., illus., tables, 1970.
- 03502 **Hounslow, A. W.; Chao, G. Y.** Monoclinic chlorapatite from Ontario: Canadian Mineralogist, v. 10, pt. 2, p. 252-259, illus., tables, 1970.
- 07356 **Hounslow, Arthur William.** Crystal structures of two naturally occurring chlorapatites [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2064B, 1970.
- 02302 **House, Eldon.** Wyoming stratigraphic correlation chart: Earth Sci. Bull., v. 3, no. 1, p. 14, 1970.
- 05266 **Housel, W. S.** Suggested method of test for permeability and capillarity of soils and soil mixtures, in Special procedures for testing soil and rock for engineering purposes (5th edition): Am. Soc. Testing and Materials Spec. Tech. Pub. 479, p. 172-179, illus., tables, 1970.
- 05269 **Housel, W. S.** Suggested method of test for ultimate shearing resistance of cohesive clay soils, in Special procedures for testing soil and rock for engineering purposes (5th edition): Am. Soc. Testing and Materials Spec. Tech. Pub. 479, p. 244-247, illus., 1970.
- 05270 **Housel, W. S.** Suggested method of test for ultimate shearing resistance of granular soils and stabilized mixtures, in Special procedures for testing soil and rock for engineering purposes (5th edition): Am. Soc. Testing and Materials Spec. Tech. Pub. 479, p. 248-256, illus., table, 1970.
- Houser, B. L.** See Empson, F. M. 04639
- Houser, F. N.** See Sargent, K. A. 00356
- 06286 **Housley, R. M.; Blander, M.; Abdel-Gawad, M.; Grant, R. W.; Muir, A. H., Jr.** Mössbauer spectroscopy of Apollo 11 samples, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 2251-2268, illus., tables, 1970.
- 03031 **Housner, G. W.; West, P. J.; Johnson, C. G.** Analysis of ground motions at San Onofre Nuclear Generating Station April 9, 1968: Seismol. Soc. America Bull., v. 60, no. 3, p. 987-1000, illus., 1970.
- 03043 **Housner, G. W.** Strong ground motion, Chap. 4 in Earthquake engineering (R. L. Wiegell, editor): Englewood Cliffs, N.J., Prentice-Hall, p. 75-91, illus., tables, 1970.
- 03044 **Housner, G. W.** Design spectrum, Chap. 5 in Earthquake engineering (R. L. Wiegell, editor): Englewood Cliffs, N.J., Prentice-Hall, p. 93-106, illus., table, 1970.
- Housner, G. W.** See Tsai, N. C. 04686
- Housner, George W.** See Heitner, Kenneth L. 09440
- 04257 **Houston, Robert S.; Murphy, John F.** Thorium- and titanium-bearing organic material in the Dakota Sandstone near Durango, Colorado, in Geological Survey research 1970, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C138-C144, illus., tables, 1970.

- 03968 **Houtz, R.; Ewing, J.; Buhl, P.** Seismic data from sonobuoy stations in the northern and equatorial Pacific: Jour. Geophys. Research, v. 75, no. 26, p. 5093-5111, illus., tables, 1970.
- 07029 **Hovis, Guy L.; Waldbaum, David R.; Thompson, James B., Jr.** Calorimetric studies of Al-Si ordering and Na-K mixing in monoclinic alkali feldspars [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 582, 1970.
- 07465 **Howard, Alan D.; Keetch, Mary E.; Vincent, C. Linwood.** Topological and geometrical properties of braided streams: Water Resources Research, v. 6, no. 6, p. 1674-1688, illus., tables, 1970.
- 00106 **Howard, Arthur D.; Mercado, Jose.** Low sun-angle vertical photography versus thermal infrared scanning imagery: Geol. Soc. America Bull., v. 81, no. 2, p. 521-523, illus., 1970.
- 07219 **Howard, Barry C.** A computer code for the analysis of digitized seismic signals — Univ. California Livermore, Lawrence Radiation Lab. UCRL-50939: Springfield, Va., Natl. Tech. Inf. Center, 45 p., illus., tables, 1970.
- 09774 **Howard, Hildegard.** A review of the extinct avian genus, *Mancalla*: Los Angeles County Mus. Natl. History Contr. Sci., no. 203, 12 p., illus., tables, 1970.
- Howard, J. D.** See Frey, R. W. 09880
- 01228 **Howard, James Campbell.** Simulation of salt dome forms [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 8, p. 3707B-3708B, 1970.
- 02633 **Howard, James D.; Frey, Robert W.** Examination of Georgia coastal sediments with N.E.L. spade corer [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 853, 1970.
- Howard, James D.** See Reineck, Hans-Erich. 02672
- 02386 **Howard, James F.; Kissling, Don L.; Lineback, Jerry A.** Sedimentary facies and distribution of biota in Coupon Bight, lower Florida Keys: Geol. Soc. America Bull., v. 81, no. 7, p. 1929-1945, illus., 1970.
- 05999 **Howard, James Hatten, 3d.** Geochemical behavior of selenium in earth-surface environments [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5554B-5555B, 1970.
- 04120 **Howard, L. N.; Malkus, W. V. R.; Whitehead, J. A.** Self-convection of floating heat sources — A model for continental drift: Geophys. Fluid Dynamics, v. 1, nos. 1-2, p. 123-142, illus., 1970.
- Howard, Robert B.** See Orme, Antony R. 00330
- Howe, A. T.** See Greenwood, N. N. 06280
- 07585 **Howe, Dennis Milton.** Post-Casper-Ingleside unconformity and related sediments of southeastern Wyoming and northcentral Colorado [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 3, p. 1350B-1351B, 1970.
- 00717 **Howe, Herbert J.** American Upper and Middle Ordovician brachiopods [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 217-218, 1970.
- 02634 **Howe, Herbert J.** Occurrence and significance of ribbing variations in Late Ordovician brachiopods [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 853, 1970.
- 04718 **Howe, John A.** The range of variation in *Equus (Plesippus) simplicidens* Cope from the Broadwater quarries of Nebraska: Jour. Paleontology, v. 44, no. 5, p. 958-968, illus., tables, 1970.

- 07030 **Howe, Robert C.** "Geohumanities" and teaching introductory geology [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 582-583, 1970.
- 08474 **Howe, Robert H. L.** The development of a new technique for the evaluation of a watershed [with French abs.], in *Symposium on the results of research on representative and experimental basins: Internat. Assoc. Sci. Hydrology-Unesco Pub.* 96, p. 677-680, 1970.
- 02195 **Howell, B. F., Jr.** Coriolis force and the new global tectonics: *Jour. Geophys. Research*, v. 75, no. 14, p. 2769-2772, illus., tables, 1970.
- 03307 **Howell, B. F., Jr.; Lundquist, G. M.; Yiu, S. K.** Integrated and frequency-band magnitude, two alternative measures of the size of an earthquake: *Seismol. Soc. America Bull.*, v. 60, no. 3, p. 917-937, illus., tables, 1970.
- 04360 **Howell, Paul W.** The mystery of Death Valley's Race Track playa: *Geol. Soc. Oregon Country News Letter*, v. 36, no. 8, p. 58, 1970.
- Hower, John.** See Reynolds, Robert C., Jr. 03119
- Hower, John.** See Perry, Ed. 06914
- Hower, John.** See Perry, Ed. 09712
- 05869 **Howie, R. D.** Oil and gas exploration — Atlantic coast of Canada: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 11, p. 1989-2006, illus., 1970.
- 10056 **Howitt, Frank; Clegg, Michael W.** Permafrost in Prudhoe Bay field — Geology and physical characteristics [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2487, 1970.
- 03765 **Hoyaux, B.; Ladanyi, B.** Gravitational stress field around a tunnel in soft ground [with French abs.]: *Canadian Geotech. Jour.*, v. 7, no. 1, p. 54-61, illus., 1970.
- 03961 **Hoyaux, B.; Ladanyi, B.** Gravitational stress field around a tunnel in soft ground — Reply [to discussion of 1970 paper by B. Schmidt]: *Canadian Geotech. Jour.*, v. 7, no. 3, p. 348, 1970.
- 07448 **Hoyaux, B.; Ladanyi, B.** Rock failure around a circular opening in a gravity field with tectonic forces, Chap. 17 in *Rock mechanics, theory and practice* — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, *Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers*, p. 281-292, illus., 1970.
- 06287 **Hoyt, H. P., Jr.; Kardos, J. L.; Miyajima, M.; Seitz, M. G.; Sun, S. S.; Walker, R. M.; Wittels, M. C.** Thermoluminescence, X-ray and stored energy measurements of Apollo 11 samples, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, *Proc.* — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 2269-2287, illus., 1970.
- 00718 **Hoyt, John H.** Littoral surge channels, Cabretta Island, Georgia [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 218, 1970.
- 05971 **Hoyt, John H.** Development and migration of barrier islands, northern Gulf of Mexico — Discussion [of paper by E. G. Otvos, Jr., 1970]: *Geol. Soc. America Bull.*, v. 81, no. 12, p. 3779-3782, 1970.
- 00719 **Hrabar, S. V.; Potter, Paul Edwin.** Cross-bedding in the Tanglewood Limestone Member of the Lexington Limestone (Ordovician), central Kentucky [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 218-219, 1970.
- Hrabar, S. V.** See Cressman, E. R. 05394
- Hradilek, P. J.** See Duke, C. M. 04667

- 06431 **Hriskevich, Michael E.** Middle Devonian reef production, Rainbow area, Alberta, Canada: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2260-2281, illus., 1970.
- Hron, F.** See Kanasewich, E. R. 10533
- 03508 **Hron, Marie.** Radiation of seismic surface waves from extending circular sources: Seismol. Soc. America Bull., v. 60, no. 2, p. 517-537, illus., 1970.
- 09371 **Hryhor, W.** Spread design for maximum multiple attenuation: Canadian Soc. Explor. Geophysicists Jour., v. 5, no. 1, p. 7-23, illus., tables, 1969.
- 05296 **Hsu, K. Jinghwa.** The meaning of the word flysch, a short historical search [with French abs.], in Flysch sedimentology in North America: Geol. Assoc. Canada Spec. Paper 7, p. 1-11, 1970.
- 10709 **Hsu, K. Jinghwa.** Preliminary report and geologic guide to Franciscan melanges of the Morro Bay-San Simeon area, California: California Division of Mines and Geology Pub., no. 35, 46 p., illus., tables, 1969.
- 06481 **Hsu, Mao-Yang; Clifford, Paul M.** Deformation of the Seine conglomerate in the Rainy River area, Ontario [abs.], in Inst. Lake Superior Geology, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 20-21, 1970.
- 06456 **Hu, Chung-Hung.** The ontogenies of *Ponumia obscura* (Lochman), n.g., and of *Housia canadensis* (Walcott) (Trilobita) from the Upper Cambrian of the Big Horn Mountains, Wyoming [with Japanese abs.]: Palaeont. Soc. Japan Trans. and Proc., new ser., no. 78, p. 253-264, illus., 1970.
- Hu, Tse-Chuang.** See Best, David M. 00675
- Huang, Chung-Hsi.** See Knop, Osvald. 09047
- 05871 **Huang, Ju-Chang; Liao, Cheng-Sun.** Adsorption of pesticides by clay minerals: Am. Soc. Civil Engineers Proc., v. 96, paper 7603, Jour. Sanitary Eng. Div., no. SA5, p. 1057-1078, illus., tables, 1970.
- 05286 **Huang, P. M.; Kozak, L. M.** Adsorption of hydroxy-aluminium polymers by muscovite and biotite: Nature, v. 228, no. 5276, p. 1084-1085, table, 1970.
- 05793 **Huang, Ter-Chien; Goodell, H. G.** Sediments and sedimentary processes of eastern Mississippi cone, Gulf of Mexico: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 11, p. 2070-2100, illus., tables, 1970.
- 07274 **Huang, Ter-Chien.** The sediments and sedimentary processes of the eastern Mississippi Cone, Gulf of Mexico [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2764B-2765B, 1970.
- 09065 **Huang, W. H.; Keller, W. D.** Dissolution of rock-forming silicate minerals in organic acids—Simulated first-stage weathering of fresh mineral surfaces: Am. Mineralogist, v. 55, nos. 11-12, p. 2076-2094, illus., tables, 1970.
- 07275 **Huang, Wen Hsing.** Experimental studies of kinetics and mechanisms of simulated organo-chemical weathering of silicate minerals [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2765B, 1970.
- 10624 **Hubaux, A.** Archival files of geological data: Internat. Assoc. Math. Geology Jour., v. 1, no. 1, p. 41-52, 1969.
- Hubbard, E. F.** See McMaster, W. M. 04425
- Hubbard, N. J.** See Kay, R. 00411
- Hubbard, N. J.** See Gast, P. W. 05693



- 06849 **Hubbard, Norman J.; Gast, Paul W.; Wiesmann, Henry.** Rare earth, alkaline and alkali metal and Sr-87:Sr-86 data for subsamples of lunar sample 12013: Earth and Planetary Sci. Letters, v. 9, no. 2, p. 181-184, illus., table, 1970.
- 05487 **Hubbell, S. W.; Hunter, J. H.** Development of a theoretical attack on slope stability problems [abs.]: Virginia Jour. Sci., v. 21, no. 3, p. 129, 1970.
- 10176 **Hubbs, Carl L.; Miller, Robert Rush.** Paleohydrography and remnant fishes of the north-central Great Basin [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 68, 1970.
- Huber, A. Leon.** See Jeppson, Roland W. 09902
- 01926 **Huber, Richie; Adams, William Mansfield.** Application of geophysical techniques to ground-water research on the Kona Coast, Hawaii, [abs.]: EOS, v. 51, no. 4, p. 285, 1970.
- Huber, Richie D.** See Adams, William M. 08595
- 05488 **Huber, W. G.** The nature of the classical contact of the St. Marys and Yorktown Formations on the south bank of the James River in Virginia [abs.]: Virginia Jour. Sci., v. 21, no. 3, p. 135, 1970.
- 00720 **Huber, William G.** Karst topography near Claremont, Virginia [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 219, 1970.
- Hubert, Arthur E.** See Shacklette, Hansford T. 01876
- Hubert, Arthur E.** See Curtin, Gary C. 04255
- 05302 **Hubert, C.; Lajoie, J.; Léonard, M. A.** Deep sea sediments in the lower Paleozoic Québec Supergroup [with French abs.], in Flysch sedimentology in North America: Geol. Assoc. Canada Spec. Paper 7, p. 103-125, illus., tables, 1970.
- 10446 **Hubred, Gale Lee.** Relationship of morphology and transition metal content of manganese nodules to an abyssal hill: Hawaii Inst. Geophysics [rept.] hig-70-18, 38 p., illus., tables, 1970.
- 04287 **Huckenholz, H. G.; Yoder, H. S., Jr.** Synthese und Stabilität von Andradit [Synthesis and stability of andradite] [abs.]: Fortschr. Mineralogie, v. 48, no. 1, p. 8-9, 1970.
- 05867 **Huddle, John W.** Revised descriptions of some late Devonian polygnathid conodonts: Jour. Paleontology, v. 44, no. 6, p. 1029-1040, illus., tables, 1970.
- 03262 **Huddleston, James Herbert.** Local soil-landscape relationships in eastern Pottawattamie County, Iowa [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 11, p. 4872B, 1970.
- 07483 **Hudec, Peter P.** Long range planning for aggregate materials in Metropolitan New York, in Forum on geology of industrial minerals, 5th, Harrisburg, Pa., 1969, Proc.: Pennsylvania Geol. Survey, 4th ser., Bull. M64 (Mineral Resources Rept.), p. 165-177, illus., tables, 1970.
- 06136 **Hudson, Adonnis S.** Depositional environment of the Red Fork and equivalent sandstones east of the Nemaha Ridge, Kansas and Oklahoma: Shale Shaker, v. 21, no. 4, p. 80-95, illus., 1970.
- Hudson, D. E.** See Trifunac, M. D. 00380
- Hudson, D. E.** See Trifunac, M. D. 03032
- 03445 **Hudson, Donald E.** Ground motion measurements, Chap. 6 in Earthquake engineering (R. L. Wiegel, editor): Englewood Cliffs, N.J., Prentice-Hall, p. 107-125, illus., table, 1970.

**Hudson, J. A.** See Brown, E. T. 04351

**Hudson, J. D.** See Busch, F. E. 03701

**Hudson, Travis.** See Sainsbury, C. L. 03334

- 05613 **Hueber, Francis M.** *Rebuchia*, a new name for *Bucheria* Dorf: *Taxon*, v. 19, no. 5, p. 822, 1970.

**Huebner, George L., Jr.** See Merrell, William J., Jr. 03216

- 06511 **Huebner, J. Stephen; Sato, Motoaki.** The oxygen fugacity-temperature relationships of manganese oxide and nickel oxide buffers: *Am. Mineralogist*, v. 55, nos. 5-6, p. 934-952, illus., tables, 1970.

- 09058 **Huebner, J. Stephen; Papike, J. J.** Synthesis and crystal chemistry of sodium-potassium richterite,  $(\text{Na}, \text{K})\text{NaCaMg}_5\text{Si}_8\text{O}_{22}(\text{OH}, \text{F})_2$ —A model for amphiboles: *Am. Mineralogist*, v. 55, nos. 11-12, p. 1973-1992, illus., tables, 1970.

**Huey, James M.** See Kohman, Truman P. 06436

**Huff, D. M.** See Deal, D. E. 02504

**Huff, Lewis L.** See Hagist, Warren M. 01709

- 00498 **Huff, Lyman C.** A geochemical study of alluvium-covered copper deposits in Pima County, Arizona, with a section on Analytical methods, by A. P. Marranzino and H. M. Nakagawa: *U. S. Geol. Survey Bull.* 1312-C, p. C1-C31, illus., tables, 1970.

- 05346 **Huff, William J.** The Jackson Eocene Ostracoda of Mississippi: *Mississippi Geol. Econ. and Topog. Survey Bull.* 114, 289 p., illus., tables, 1970.

- 01482 **Huffman, Claude, Jr.; Riley, Leonard B.** The fluorimetric method — Its use and precision for determination of uranium in the ash of plants, in *Geological Survey research 1970*, Chap. B: *U.S. Geol. Survey Prof. Paper* 700-B, p. B181-B183, illus., tables, 1970.

**Huffman, M. E.** See Cloud, W. K. 00858

- 00289 **Huffman, O. Frank.** Miocene and post Miocene offset on the San Andreas fault in central California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 104-105, 1970.

- 00721 **Huffman, Samuel F.; Anderson, Garry G.; Orosco, Cesar A.; Eslinger, Eric V.** A carbonate sand bar near Bahia Honda Key, Florida [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 219-220, 1970.

- 03537 **Huffman, Samuel F.** The ectoproct (bryozoan) *Rhombopora lepidodendroides* Meek, Late Pennsylvanian (Virgilian), Nebraska: *Jour. Paleontology*, v. 44, no. 4, p. 673-679, illus., tables, 1970.

**Huggett, Thomas.** See Watkins, Joel S. 10575

**Huggins, F. G.** See King, H. W. 04135

**Huggins, Frank E.** See Burns, Roger G. 06083

- 00197 **Hughes, Charles J.** The Heart Mountain detachment fault — A volcanic phenomenon: *Jour. Geology*, v. 78, no. 1, p. 107-115, 1970.

- 00204 **Hughes, Charles J.** Role of cohesive strength in the mechanics of overthrust faulting and landsliding — Discussion [of paper by K. J. Hsu, 1969]: *Geol. Soc. America Bull.*, v. 81, no. 2, p. 607-608, 1970.

- 04396 **Hughes, Charles J.** The Late Precambrian Avalonian orogeny in Avalon, southeast Newfoundland: *Am. Jour. Sci.*, v. 269, no. 2, p. 183-190, 1970.
- 05025 **Hughes, Charles J.** The Heart Mountain detachment fault, a volcanic phenomenon, — A reply [to discussion by W. G. Pierce and W. H. Nelson, 1970]: *Jour. Geology*, v. 78, no. 5, p. 629-630, 1970.
- 00005 **Hughes, Dan A.** Las Tiendas Field, Webb County, Texas: *South Texas Geol. Soc. Bull.*, v. 10, no. 4, p. 3-10, illus., 1970.
- 10975 **Hughes, Gordon J.** Stratigraphy and structure in the Henderson-Willow Creek igneous belt, Granite County, Montana [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 336, 1970.
- 07896 **Hughes, J. E.** Structural geology, Pine River area of the Rocky Mountain Foothills, in *Peace River, Pine Pass, Yellowhead 1970* — Edmonton Geol. Soc. Field Conf., 12th, Guidebook: Edmonton, Alberta, Edmonton Geological Society, p. 39-45, illus., 1970.
- 07683 **Hughes, O. L.** Incidental observations on Quaternary crustal movements, central Yukon Territory — [Discussion of "Volcanism and its relationship to recent crustal movements in the Canadian Cordillera," by J. G. Souther, 1970], in *Symposium on recent crustal movements*, Ottawa, Canada, 1969, *Papers: Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 2, p. 569, 1970.
- 10393 **Hughes, O. L.** Quaternary geology, Yukon Territory and western District of Mackenzie, in *Early man and environments in northwest North America* (R. A. Smith and J. W. Smith, editors) — Calgary Univ. Archaeol. Assoc. Ann. Paleo-environmental Workshop, 2d, Proc.: Calgary, Alberta, Univ. Calgary Students' Press, p. 9-11, 1970.
- 09125 **Hughes, Randall; Bohor, Bruce.** Random clay powders prepared by spray-drying: *Am. Mineralogist*, v. 55, nos. 9-10, p. 1780-1786, illus., 1970.
- 05541 **Hughes, Randall E.** Clay minerals associated with the Colchester (No. 2) Coal of the Illinois Basin, in *Depositional environments in parts of the Carbondale Formation, western and northern Illinois* — Francis Creek Shale and associated strata and Mazon Creek biota — *Geol. Soc. America, Coal Geology Div., Ann. Field Trip, Milwaukee, Wis.*, 1970: *Illinois Geol. Survey Guidebook Ser. 8*, p. 84-88, illus., 1970.
- Hughes, Thomas C.** See Carpenter, Robert H. 01308
- 01312 **Hughes, Thomas C.; Carpenter, Robert H.** Magnetite-bearing quartzite in southwestern Jackson County, Georgia [abs.]: *Georgia Acad. Sci. Bull.*, v. 28, no. 2, p. s21, 1970.
- Hughes, Thomas C.** See Carpenter, Robert H. 05255
- Hulbert, L. C.** See Alizai, Hamid Ullah. 07225
- 02446 **Hummel, F. A.; Auh, Keunho; Johnson, G. H.** Synthesis of the chromium analogue of ( $\alpha$ ) spodumene and its solubility relationships with ureyite and  $\beta$ -spodumene: *Materials Research Bull.*, v. 5, no. 5, p. 301-306, illus., table, 1970.
- Hummel, F. A.** See Kreidler, Eric R. 03174
- Hummel, F. A.** See Grisafe, D. A. 09048
- 05279 **Humphres, H. W.** Suggested method of test for density of soil in place using the Washington densometer, in *Special procedures for testing soil and rock for engineering purposes* (5th edition): *Am. Soc. Testing and Materials Spec. Tech. Pub.* 479, p. 385-391, illus., 1970.

- 00722 **Humphrey, Ronald; Radcliffe, Dennis.** The petrology of the Siloam Granite, Greene County, Georgia [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 220, 1970.
- Hunkins, K. L.** See *Demenitskaya, R. M.* 10007
- 05623 **Hunkins, Kenneth; Mathieu, Guy; Teeter, Steven; Gill, Allan.** The floor of the Arctic Ocean in photographs [with French and Russian abs.]: *Arctic*, v. 23, no. 3, p. 175-189, illus., table, 1970.
- 08075 **Hunn, J. D.; Cherry, R. N.** Remote sensing of offshore springs and spring discharge along the Gulf Coast of central Florida, in *Earth Resources Aircraft Program, status review*, 2d Ann., Houston, Tex., 1969 — V. 3, Hydrology and oceanography: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 39-1 — 39-7, illus., [1970?].
- 08341 **Hunsucker, John K.; Shoffner, Joseph E., Jr.** Ground-water levels in North Carolina in 1963-64: North Carolina Div. Ground Water Ground-Water Circ. 13, 56 p., illus., tables, 1970.
- 09021 **Hunt, Allen S.; Henson, E. B.** Recent sedimentation and water properties, Lake Champlain — trip B in *Guidebook to field excursions*, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., p. 21-35, illus., 1969.
- 01518 **Hunt, Bruce W.** Exact flow rates from Dupuit's approximation: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7140, *Jour. Hydraulics Div.*, no. HY 3, p. 633-642, illus., 1970.
- 01520 **Hunt, Bruce W.** Unsteady seepage toward sink beneath free surface: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7202, *Jour. Hydraulics Div.*, no. HY 4, p. 859-869, illus., 1970.
- 03619 **Hunt, Bruce W.** Flow rates in two-dimensional, unsteady, confined groundwater flow — Closure [to discussion of paper 6451, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, *Jour. Hydraulics Div.*, no. HY 7, p. 1611-1612, 1970.
- 03621 **Hunt, Bruce W.** Nonsteady flow to surface reservoir — Discussion [of paper 7137 by W. W.-G. Yeh, 1970]: *Am. Soc. Civil Engineers Proc.*, v. 96, *Jour. Hydraulics Div.*, no. HY 7, p. 1663-1665, illus., 1970.
- 07820 **Hunt, G. H.** Geology of the Iskwasum Lake area (west half), The Pas mining district, Manitoba: Manitoba Dept. Mines and Nat. Resources Mines Br. Pub. 65-3, 40 p., illus., tables, geol. map, 1970.
- 00723 **Hunt, Graham.** Igneous rocks of Elliott County, Kentucky [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 220, 1970.
- 00788 **Hunt, Graham; Blackburn, W. H.** A study of the effects of regional metamorphism on the equilibration of calciferous amphibole from the Irishman Creek sill, British Columbia [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 221, 1970.
- Hunt, Graham R.** See *Logan, Lloyd M.* 06260
- 06394 **Hunt, Graham R.; Salisbury, John W.** Visible and near-infrared spectra of minerals and rocks — [Pt. 1] Silicate minerals: *Modern Geology*, v. 1, no. 4, p. 283-300, illus., 1970.
- 04087 **Hunt, John M.** The significance of carbon isotope variations in marine sediments, in *Advances in organic geochemistry — Internat. Cong.*, 3d, Proc. (G. D. Hobson and G. C. Speers, editors): London and New York, Pergamon Press (Internat. Ser. Mons. Earth Sci., V. 32), p. 27-35, illus., table, 1970.
- Hunten, D. M.** See *Walker, J. C. G.* 03223

- 08033 **Hunter, Garry T.** Postglacial uplift at Fort Albany, James Bay: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 547-548, 1970.
- 09796 **Hunter, Gary T.; Bird, S. J. Glenn.** Critical terrain analysis: *Photogramm. Eng.*, v. 36, no. 9, p. 939-952, illus., table, 1970.
- Hunter, J. A. M.** See Hobson, George D. 01457
- Hunter, J. H.** See Hubbell, S. W. 05487
- Hunter, Ralph E.** See Dickinson, Kendell A. 00888
- 05252 **Hunter, Ralph E.; Dickinson, Kendell A.** Map showing landforms and sedimentary deposits of the Padre Island portion of the South Bird Island 7.5-minute quadrangle, Texas: *U.S. Geol. Survey Misc. Geol. Inv. Map I-659*, scale 1:24,000, sections, text, 1970.
- 09817 **Hunter, Ralph E.; Clifton, H. Edward; Phillips, R. Lawrence.** Geology of the stacks and reefs off the southern Oregon coast: *Ore Bin*, v. 32, no. 10, p. 185-201, illus., tables, 1970.
- 03769 **Huntoon, Peter.** The deep structure of the Laramide monoclines exposed in the eastern Grand Canyon [abs.]: *Arizona Acad. Sci. Jour.*, v. 6, 1970 *Proc. Supp.*, p. 65, 1970.
- 07293 **Huntoon, Peter Wesley.** The hydro-mechanics of the ground water system in the southern portion of the Kaibab Plateau, Arizona [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 5, p. 2802B, 1970.
- Huntress, Wesley T., Jr.** See Manatt, Stanley L. 06290
- 05704 **Hurley, P. M.; Pinson, W. H., Jr.** Whole-rock Rb-Sr isotopic age relationships in Apollo 11 lunar samples, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, *Proc.* — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1311-1315, illus., table, 1970.
- Hurley, P. M.** See Bottino, M. L. 06128
- Hurley, Patrick M.** See Fairbairn, Harold W. 03922
- Hurley, Patrick M.** See Zartman, Robert E. 05194
- 09998 **Hurley, Patrick M.; Rand, John R.** Continental radiometric ages, in *The sea — v. 4*, New concepts of sea floor evolution, Pt. 1, General observations (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 575-596, illus., table, 1970.
- Hurley, R. J.** See Malloy, R. J. 02387
- Hurley, Robert J.** See Andrews, James E. 01137
- 03308 **Husebye, Eystein; Madariaga, Raúl.** The origin of precursors to core waves: *Seismol. Soc. America Bull.*, v. 60, no. 3, p. 939-952, illus., table, 1970.
- Husebye, Eystein S.** See Toksoz, M. Nafi. 01991
- 02712 **Hussain, M. S.** A study of minerals in some Hawaiian soil colloids: *Pakistan Jour. Sci. and Indus. Research*, v. 12, no. 3, p. 222-226, illus., 1970.
- 02713 **Hussain, M. S.** Extractable aluminium content in some Hawaiian soils: *Pakistan Jour. Sci. and Indus. Research*, v. 12, no. 3, p. 217-221, illus., table, 1970.
- 05124 **Hussain, M. S.; Swindale, L. D.** A morphological and mineralogical study of the gray hydromorphic soils of the Hawaiian Islands: *Pacific Sci.*, v. 24, no. 4, p. 543-553, illus., tables, 1970.

**Hussong, D. M.** See Furumoto, A. S. 04925

- 06024 **Hustad, Paul Andrew.** Behavior of soils under impact loading [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5487B-5488B, 1970.

**Hutchinson, R. W.** See Suffel, G. G. 03461

- 06382 **Hutchinson, R. W.** Mineral potential in greenstone belts of northwestern Ontario [abs.], in Inst. Lake Superior Geology, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 22-23, 1970.

- 08385 **Hutchison, Harold C.** Map of southwestern Indiana showing locations of active coal mines: Indiana Geol. Survey Misc. Map 7, scale about 1 in to 6 mi, revised 1970; originally published 1962.

- 07744 **Hutchison, W. W.** Metamorphic framework and plutonic styles in the Prince Rupert region of the central Coast Mountains, British Columbia: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 1, p. 376-405, illus., tables, 1970.

- 03689 **Hutt, R. B.** The development and use of the Ontario Well Data System: Jour. Canadian Petroleum Technology, v. 9, no. 1, p. 52-59, illus., 1970.

**Hutton, M. A.** See Bott, M. H. P. 03938

**Huttrer, Gerald W.** See Hyde, Jack H. 01129

**Huxel, C. J., Jr.** See Yamanaga, George. 07609

- 05624 **Hwang, Li-San; Divoky, David.** Tsunami generation: Jour. Geophys. Research, v. 75, no. 33, p. 6802-6817, illus., 1970.

- 06721 **Hwang, Li-san; Lin, Albert C.** Experimental investigations of wave run-up under the influence of local geometry, in Tsunamis in the Pacific Ocean — Internat. Symposium on Tsunamis and Tsunami Research, Honolulu, Hawaii, 1969, Proc.: Honolulu, Hawaii, East-West Center Press, p. 407-425, illus., tables, 1970.

**Hyatt, Howard A.** See Gross, H. Gerald. 10526

**Hyde, Jack H.** See Greeley, Ronald. 00274

- 01129 **Hyde, Jack H.; Huttrer, Gerald W.** Geology of central Grant Range, Nevada: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 3, p. 503-521, illus., table, geol. map, 1970.

**Hyde, Jack R.** See Clarke, Roy S., Jr. 10268

- 10464 **Hyde, Luther W.** Acid drainage in Cane Creek basin, near Oakman, Walker County, Alabama: Alabama Geol. Survey Circ. 64, 19 p., illus., table, 1970.

- 10890 **Hyde, Luther W.** Effects of water and soil on drainage structures in Alabama, Phase 1: Alabama Geol. Survey Bull. 92-A, 289 p., illus., tables, 1970.

- 08364 **Hydrologic Data Branch.** Ground water in Ontario, southeastern area, 1960 to 1964: Ontario Water Resources Comm. Ground Water Bull. 2-8, 307 p., illus., tables, 1970.

- 01927 **Hyndman, R. D.** Geomagnetic variations and electrical conductivity structure under Atlantic Canada [abs.]: EOS, v. 51, no. 4, p. 268, 1970.

**Hyndman, R. D.** See Beaumont, C. 03408

**Hyndman, R. D.** See Cochrane, N. A. 08139

**Hyndman, Roy D.** See Rankin, Douglas S. 01818

- 07276 **Hyne, Norman John, Jr.** Sedimentology and Pleistocene history of Lake Tahoe, California-Nevada [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2765B, 1970.
- Iagmin, Paula J.** See Desborough, George A. 06897
- 08429 **IASH-Unesco.** Symposium on world water balance, V. 1: Internat. Assoc. Sci. Hydrology-Unesco Pub. 92, 241 p., illus., tables [1970].
- 08475 **IASH-Unesco.** Symposium on the results of research on representative and experimental basins: Internat. Assoc. Sci. Hydrology-Unesco Pub. 96, 737 p., illus., tables, 1970.
- 08572 **IASH-Unesco.** Symposium on the hydrology of deltas, V. 1: Internat. Assoc. Sci. Hydrology-Unesco Pub. 90, p. 1-238, illus., tables, 1970; V. 2, Pub. 91, p. 239-491, illus., tables, 1970.
- Ibanez, J.** See Oró, J. 05088
- Iberall, E. R.** See Herz, Norman. 00214
- 01076 **Ibrahim, Abdelwahid.** The application of the gravity method to mapping bedrock topography in Kalamazoo County, Michigan [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 390, 1970.
- Ichisugi, Norio.** See Uchida, Kinsuke. 02474
- 08222 **Ichie, Takashi.** Marine geological and geophysical research and exploration, Chap. 5 in Undersea Technology Handbook Directory 1970: Arlington, Va., Compass Publications, p. A41-A56, illus., 1970.
- Ida, Y.** See Mizutani, H. 02138
- 01928 **Ida, Yoshiaki.** A new estimation of melting point in the Earth's interior [abs.]: EOS, v. 51, no. 4, p. 418, 1970.
- 03678 **Ida, Yoshiaki.** Thermodynamic problems related to growth of magma: Jour. Geophys. Research, v. 75, no. 20, p. 4051-4062, illus., table, 1970.
- 05493 **Idaho Department of Highways.** (and others). Proceedings of the 8th annual engineering geology and soils engineering symposium, Pocatello, Idaho, 1970: Boise, Idaho, Idaho Dept. Highways, 313 p., illus., tables, 1970.
- Idriss, I. M.** See Kovacs, W. D. 00298
- 02413 **Idriss, I. M.; Seed, H. Bolton.** Seismic response of soil deposits: Am. Soc. Civil Engineers Proc., v. 96, paper 7175, Jour. Soil Mechanics and Found. Div., no. SM2, p. 631-638, illus., 1970.
- Idriss, I. M.** See Seed, H. Bolton. 03355
- Idriss, I. M.** See Seed, H. Bolton. 03635
- Idriss, I. M.** See Seed, H. Bolton. 05507
- 08623 **Igarashi, Y.; Ridlon, J. B.; Campbell, J. R.; Allman, R. L.** Note on a mode of piston core disturbance: Jour. Sed. Petrology, v. 40, no. 4, p. 1351-1355, illus., table, 1970.
- 04543 **Iglehart, Charles F.** Descriptive classification of subsurface correlative tops: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 9, p. 1697-1705, illus., table, 1970.
- Ihochi, Haruhiko.** See Kohman, Truman P. 06436

- 02961 **Iida, Chuzo; Yamasaki, Kazuo.** Atomic absorption spectrometric analysis of silicates by the absorption tube technique: *Anal. Letters*, v. 3, no. 5, p. 251-257, tables, 1970.
- Ikola, R. J.** See Austin, G. S. 08291
- 00661 **Ikola, Rodney J.** Simple Bouguer gravity map of Minnesota — Two Harbors sheet: Minnesota Geol. Survey Misc. Map M-9, scale 1:250,000, 1970.
- 08686 **Illiman, W. I.; McLachlan, J.; Edelstein, T.** Marine algae of the Champlain Sea episode near Ottawa: *Canadian Jour. Earth Sci.*, v. 7, no. 6, p. 1583-1585, illus., 1970.
- 06324 **Illinois State Geological Survey.** Geological science field trip — Winchester area, Scott, Morgan and Greene Counties, Winchester and Griggsville quadrangles: Illinois Geol. Survey Guide Leaflet 1970B, 28 p., illus., tables, 1970.
- 06325 **Illinois State Geological Survey.** Geological science field trip — Freeport area, Stephenson County, Freeport, Lena and Pecatonica quadrangles: Illinois Geol. Survey Guide Leaflet 1970C, 22 p., illus., tables, 1970.
- 06326 **Illinois State Geological Survey.** Geological science field trip — Mt. Carroll area, Carroll County, Savanna and Mt. Carroll quadrangles: Illinois Geol. Survey Guide Leaflet 1969D and 1970D, 26 p., illus., table, 1970.
- 06327 **Illinois State Geological Survey.** Geological science field trip — Hamilton-Warsaw area, Hancock County, Keokuk 15-minute quadrangle: Illinois Geol. Survey Guide Leaflet 1970E and 1971B, 22 p., illus., tables, 1970.
- 06454 **Illinois State Geological Survey.** Geological science field trip — Millstadt-Dupo area, St. Clair and Monroe Counties, French Village, Cahokia, Columbia and Millstadt 7.5-minute quadrangles: Illinois Geol. Survey Guide Leaflet 1970[A?], 33 p., illus., tables, 1970.
- Imbalzano, J.** See Given, P. H. 04091
- 07031 **Imbrie, John; Broecker, Wallace S.** Wisconsin climates recorded in Atlantic deep-sea cores [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 584, 1970.
- 10177 **Imbrie, John.** A paleoecological method for quantitative Pleistocene climatology — application to deep-sea cores [abs.], in American quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 70-72, illus., 1970.
- 01431 **Imlay, Ralph W.; Jones, David L.** Ammonites from the *Buchia* zones in northwestern California and southwestern Oregon: U.S. Geol. Survey Prof. Paper 647-B, p. B1-B59, illus., tables, 1970.
- 10057 **Imlay, Ralph W.** Jurassic paleogeography of Alaska [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2487, 1970.
- 10653 **Imreh, L.** Geology of the southwest part of Baby township, Temisamingue county — Preliminary report [also French edition]: Quebec Dept. Nat. Resources Prelim. Rept. 592, 21 p., illus., table, geol. map, 1970.
- 11245 **Imrie, A. S.; Jory, L. T.** Behavior of the underground powerhouse arch at the W. A. C. Bennett Dam during excavation, in Canadian Rock Mechanics Symposium, 5th, Toronto, 1968, Proc.: Ottawa, Canada Dept. Energy, Mines and Resources Mines Br., p. 19-39, illus., tables, discussion, 1969.
- Imrie, Alan S.** See Jory, Lisle T. 07894



- 08560 **Inderbitzen, A. L.** Empirical relationships between mass physical properties for recent marine sediments off southern California: *Marine Geology*, v. 9, no. 5, p. 311-329, illus., tables, 1970.
- 05875 **Inderbitzen, Anton L.** Marine geotechnique—What is it?: *Oceanology Internat.*, v. 5, no. 12, p. 19-21, illus., 1970.
- 09478 **Inderbitzen, Anton L.; Carsola, Alfred J.; Everhart, Donald L.** The submarine phosphate deposits off Southern California, in *Offshore Technology Conference*, 2d Ann., Houston, Tex., 1970, Preprints—v. 2: Dallas, Tex., Offshore Technology Conf., p. II-287—II-304, illus., tables, 1970.
- 07357 **Inderbitzen, Anton Louis.** Relationships between sedimentation rate and shear strength in recent marine sediments off southern California [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 4, p. 2064B-2065B, 1970.
- 08324 **Indiana Geological Survey.** Map of Indiana showing bedrock geology: *Indiana Geol. Survey Misc. Map* 16, scale about 1 in. to 30 mi., section, 1970.
- Ingamells, C. O.** See Engels, J. C. 04526
- 06219 **Ingamells, C. O.** Lithium metaborate flux in silicate analysis [with French and German abs.]: *Anal. Chim. Acta*, v. 52, no. 2, p. 323-334, 1970.
- Ingamells, C. O.** See Czamanske, Gerald K. 09070
- Ingham, J. Keith.** See Ross, Reuben James, Jr. 00209
- Ingle, James C., Jr.** See Bandy, Orville L. 04388
- 09464 **Ingram, Blanche L.** Determination of fluoride in silicate rocks without separation of aluminum using a specific ion electrode: *Anal. Chemistry*, v. 42, no. 14, p. 1825-1827, tables, 1970.
- 10704 **Ingram, Helen M.** Patterns of politics in water resource development—A case study of New Mexico's role in the Colorado River Basin Bill: [Albuquerque, New Mexico], Univ. of New Mexico, 95 p., illus., 1969.
- Ingvalson, R. D.** See Rhoades, J. D. 07628
- Inman, Douglas L.** See Komar, Paul D. 04599
- 02923 **Innes, M. J. S.** A new gravity anomaly map of Canada — An aid to mineral exploration [with French abs.], in *Mining and groundwater geophysics*, 1967: *Canada Geol. Survey Econ. Geology Rept.* 26, p. 238-248, illus., 1970.
- 06859 **Inouye, George T.; Bernstein, Hyman; Gaal, Robert A.** Electromagnetic depth sounder: *IEEE Trans. Geosci. Electronics*, v. GE-8, no. 4, p. 336-343, illus., 1970.
- 09508 **Institute on Lake Superior Geology; Stonehouse, Harold B.** (leader). Guide for field trip to the Grenville of southeastern [Bancroft-Madoc area] Ontario, [13th Ann. Mtg.] April 1967: [Lansing, Mich.] Michigan State Univ. Dept. Geology, 74 p., illus., table, 1967.
- 11232 **Internat. Assoc. Hydraulic Research.** Thirteenth Congress, August 31-Sept. 5, 1969, *Proc.: Sci. Council Japan*, v. 5, no. 13, [1241] p., illus., tables, 1969.
- 08156 **International Atomic Energy Agency.** Uranium exploration geology — Panel on uranium exploration geology, Vienna, 1970, *Proc.: Vienna, Austria, Internat. Atomic Energy Agency*, 384 p., illus., tables, 1970.
- 08476 **International Atomic Energy Agency.** Isotope hydrology, 1970 — Proceedings of symposium on use of isotopes in hydrology, 1970: Vienna, Austria, *Internat. Atomic Energy Agency STI-Pub.* 255, 918 p., illus., tables, 1970.

**Inwood, Robin.** See Berry, Cameron G. 10915

- 11277 **Ion, Daniel C.** Arctic oil and the World — One perspective [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2487, 1970.
- 01604 **Iorwerth, H. ab.** Magnetic grain fabric of sedimentary rocks [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 3, p. 561-562, 1970.
- 00471 **Iranpanah, Assad.** Trace-element analyses of the Ada shales and sandstones, Seminole and Pontotoc Counties, Oklahoma: *Oklahoma Geology Notes*, v. 30, no. 1, p. 5-10, illus., table, 1970.
- 02493 **Irish, E. J. W.** GSC leads way to new plays — History of Geological Survey of Canada in western Canada and Arctic islands: *Oilweek*, v. 21, no. 17, p. 35-38, illus., 1970.
- 03148 **Irish, E. J. W.** Halfway River map-area, British Columbia (94B): *Canada Geol. Survey Paper* 69-11, 154 p., illus., tables, geol. map, 1970.
- 03751 **Irish, E. J. W.** The Edmonton Group of south-central Alberta: *Bull. Canadian Petroleum Geology*, v. 18, no. 2, p. 125-155, illus., 1970.
- 08128 **Irvine, T. N.** Heat transfer during solidification of layered intrusions — [Pt.] 1, Sheets and sills: *Canadian Jour. Earth Sci.*, v. 7, no. 4, p. 1031-1061, illus., tables, 1970.
- Irvine, T. N.** See Goodwin, A. M. 10757
- 00656 **Irving, E.; Robertson, W. A.** Reply [to comments by J. Francheteau and J. G. Sclater (1970) on "Test for polar wandering and some possible implications" (1969)]: *Jour. Geophys. Research*, v. 75, no. 5, p. 1027, 1970.
- Irving, E.** See Haggerty, S. E. 03006
- Irving, E.** See Brooke, J. 03009
- 05285 **Irving, E.; Park, J. K.; Haggerty, S. E.; Aumento, F.; Loncarevic, B.** Magnetism and opaque mineralogy of basalts from the Mid-Atlantic Ridge at 45°N: *Nature*, v. 228, no. 5275, p. 974-976, illus., table, 1970.
- 07702 **Irving, E.; Robertson, W. A.; Aumento, F.** The Mid-Atlantic Ridge near 45° N. — [Pt.] 6, Remanent intensity, susceptibility, and iron content of dredged samples: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 226-238, illus., tables, 1970.
- 08114 **Irving, E.** The Mid-Atlantic Ridge at 45°N — [Pt.] 14, Oxidation and magnetic properties of basalt; review and discussion: *Canadian Jour. Earth Sci.*, v. 7, no. 6, p. 1528-1538, illus., table, 1970.
- Irving, E.** See Park, J. K. 08167
- Irving, E.** See Brooke, J. 08168
- Irving, E.** See Fahrig, W. F. 10038
- 08706 **Irwin, James H.; Morton, Robert B.** Hydrogeologic information on the Glorieta Sandstone and the Ogallala Formation in the Oklahoma Panhandle and adjoining areas as related to underground waste disposal [abs.], in *Ogallala Aquifer Symposium*, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, *Internat. Center for Arid and Semi-Arid Land Studies*, p. 30, 1970.
- 08262 **Irwin, R. W.** Soil water characteristics of some Ontario peats [with French abs.], in *International Peat Congress*, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 219-223, illus., tables, 1970.

**Irwin, Thomas D.** *See* Sturgul, John R. 02987

- 09430 **Irwin, W. P.** Geology of the Klamath Mountains: California Div. Mines and Geology Mineral Inf. Service, v. 23, no. 7, p. 135-137, illus., 1970.
- 02334 **Irwin, William P.; Greene, Robert C.; Thurber, Horace K.** Mineral resources of the Agua Tibia Primitive Area, California: U.S. Geol. Survey Bull. 1319-A, p. A1-A19, illus., table, geol. map, 1970.
- 05343 **Irwin-Williams, Cynthia; Haynes, C. Vance.** Climatic change and early population dynamics in the southwestern United States: Quaternary Research, v. 1, no. 1, p. 59-71, illus., 1970.
- 10140 **Irwin-Williams, Cynthia.** Comments on the associations of archaeological materials and extinct fauna in the Valsequillo region, Puebla, Mexico: *Am. Antiquity*, v. 34, no. 1, p. 82-83, 1969.
- 00428 **Isaacs, K. N.** New magnetometer defines sedimentary structures: *World Oil*, v. 170, no. 4, p. 79-81, illus., 1970.
- Isaacs, William H.** *See* Rogers, Lewis W. 10666
- Isaacson, M.** *See* Crewe, A. V. 10410
- Isacks, Bryan.** *See* Sykes, Lynn R. 09993
- Isasi, J. A.** *See* Beaman, D. R. 09462
- Isbell, William M.** *See* Gregson, Victor G., Jr. 01769
- 09505 **Isenberg, Henry D.** The origin of microbial life on earth and its implications for extraterrestrial forms, in *Exobiology—Am. Astronaut. Soc.-Am. Assoc. Adv. Sci. Symposium, 1967, Proc.: Washington, D.C., Am. Astronaut. Soc. (Sci. and Tech. Serv., V. 19)*, p. 63-95, illus., tables, 1969.
- Isenberger, K. J.** *See* Welp, T. L. 09916
- 06780 **Ishihara, Kenji.** Development of failure around excavated slopes — Discussion [of paper 7162 by Peter Dunlop and James M. Duncan, 1970]: *Am. Soc. Civil Engineers Proc.*, v. 96, Jour. Soil Mechanics and Found. Div., no. SM 6, p. 2152-2153, 1970.
- 03351 **Ishii, Hiroshi; Ellis, Robert M.** Multiple reflection of plane SH waves by a dipping layer: *Seismol. Soc. America Bull.*, v. 60, no. 1, p. 15-28, illus., 1970.
- 04400 **Ishii, Hiroshi; Ellis, Robert M.** Multiple reflection of plane P and SV waves by a dipping layer: *Royal Astron. Soc. Geophys. Jour.*, v. 20, no. 1, p. 11-30, illus., 1970.
- 06886 **Ishii, Hiroshi.** Reflected wave propagation in a wedge [abs]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 1, p. 258B-259B, 1970.
- Ishikawa, Y.** *See* Nagata, T. 06352
- 02865 **Ismail, F. T.** Biotite weathering and clay formation in arid and humid regions, California: *Soil Sci.*, v. 109, no. 4, p. 257-261, tables, 1970.
- 05410 **Ismail, F. T.** Oxidation-reduction mechanism of octahedral iron in mica type structures: *Soil Sci.*, v. 110, no. 3, p. 167-171, illus., 1970.
- 00404 **Isphording, Wayne C.** Late Tertiary paleoclimate of eastern United States: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 2, p. 334-343, illus., tables, 1970.
- 00724 **Isphording, Wayne C.** Origin of the post-Oligocene sediments of the Florida platform [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 221, 1970.

- 05024 **Isphording, Wayne C.** FORTRAN IV program for calculations of measures of central tendency and dispersion on IBM 360 computer: *Jour. Geology*, v. 78, no. 5, p. 626-628, table, 1970.
- 05659 **Isphording, Wayne C.** Petrology, stratigraphy, and re-definition of the Kirkwood Formation (Miocene) of New Jersey: *Jour. Sed. Petrology*, v. 40, no. 3, p. 986-997, illus., tables, 1970.
- 07032 **Isphording, Wayne C.; Lamb, George M.** Age of the Citronelle Formation, an end to a controversy [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 584-585, 1970.
- 07033 **Isphording, Wayne C.** Epeirogeny and clay mineral facies in the Gulf Coast geosyncline [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 585, 1970.
- Isselhardt, C.** See Wilde, P. 01335
- 04051 **Itagaki, K.** X-ray topographic study of vibrating dislocations in ice under an AC electric field, in *Advances in X-ray analysis*, V. 13 — Applications of X-ray analysis, 18th Ann. Conf., 1969, Proc.: New York, Plenum Press, p. 526-538, illus., table, 1970.
- 06547 **Ito, H.; Fuller, M.** A paleomagnetic study of the reversal process of the geomagnetic field, Chap. 15 in *Palaeogeophysics* (S. K. Runcorn, editor): London and New York, Academic Press, p. 133-137, illus., 1970.
- Ito, H.** See Dunn, J. 10487
- Ito, Jun.** See Mao, Nai-Hsien. 03730
- 06580 **Ito, Jun; Arem, Joel E.** Idocrase — Synthesis, phase relations and crystal chemistry: *Am. Mineralogist*, v. 55, nos. 5-6, p. 880-912, illus., tables, 1970.
- Ito, Jun.** See Merker, Ludwig. 09100
- 07034 **Ito, Keisuke; Kennedy, George C.** The basalt-eclogite transition and the structure of the upper mantle [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 586, 1970.
- 09940 **Ito, Keisuke; Kennedy, George C.** The fine structure of the basalt-eclogite transition, in *Symposium on the mineralogy and petrology of the upper mantle—Fiftieth Anniversary Symposia* (Benjamin A. Morgan, editor): *Mineralog. Soc. America Spec. Paper* 3, p. 51-62, illus., table, 1970.
- 01422 **Iturralde-Vinent, Manuel A.** Neogene stratigraphy in western Cuba — New data: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 4, p. 658-661, illus., 1970.
- Ivanov, S. S.** See Demenitskaya, R. M. 10030
- Ivanova, E. F.** See Saks, V. N. 10094
- 08438 **Ivems, J. Loreena.** Annotated list of publications, 1895-1970, Illinois State Water Survey: Urbana, Ill., Illinois State Water Survey, 84 p., illus., 1970.
- 02884 **Iverson, N. L.** Riverbank stability study at the University of Alberta, Edmonton — Discussion [of paper by S. Thomson, 1970]: *Canadian Geotech. Jour.*, v. 7, no. 2, p. 169-170, 1970.
- Iverson, Robert M.** See Henderson, Garry C. 09481
- 08480 **Ivey, John B.** Definition of environmental geology and purpose of the conference, in *Governor's Conf. on Environmental Geology*: Colorado Geol. Survey Spec. Pub., No. 1, p. 3-7 [1970?].

- Iwasaki, Takeshi.** *See* Logan, John M. 09646
- Iyengar, Leela.** *See* Rao, K. V. Krishna. 10423
- 00290 **Iyer, H. M.** Crust and upper mantle structure beneath LASA, Montana, based on traveltime, dT/d $\Delta$  and amplitude anomalies [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 105, 1970.
- 01929 **Iyer, H. M.; Landers, T. E.** Spectral variation of teleseismic P-waves across the Large Aperture Seismic Array (LASA), Montana [abs.]: *EOS*, v. 51, no. 4, p. 358, 1970.
- 05847 **Iyer, H. M.** Seismology, in *Global geophysics*: New York, American Elsevier Publishing Company, p. 69-144, illus., tables, 1970.
- 00622 **Izett, G. A.; Wilcox, Ray E.; Powers, H. A.; Desborough, G. A.** Pleistocene ash beds in California, Utah, Colorado, and Nebraska related to the Bishop Tuff of California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 336-337, table, 1970.
- 04259 **Izett, G. A.; Denson, N. M.; Obradovich, J. D.** K-Ar age of the lower part of the Browns Park Formation, northwestern Colorado, in *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C150-C152, illus., tables, 1970.
- 05344 **Izett, G. A.; Wilcox, Ray E.; Powers, H. A.; Desborough, G. A.** The Bishop ash bed, a Pleistocene marker bed in the western United States: *Quaternary Research*, v. 1, no. 1, p. 121-132, illus., tables, 1970.
- Izett, Glen A.** *See* Wilcox, Ray E. 09423
- Jachens, A. C.** *See* Kuo, J. T. 05611
- Jachens, R. C.** *See* Kuo, J. T. 01674
- Jack, R. N.** *See* Turner, D. L. 00382
- 05921 **Jackman, E. R.; Scharff, John.** Steens Mountain in Oregon's high desert country: Caldwell, Idaho, Caxton Printers, 203 p., illus., 1970.
- Jackman, H. W.** *See* Ehrlinger, H. P., 3d. 07246
- Jackson, D. E.** *See* Morgan, G. R. 02159
- 01784 **Jackson, Dallas B.; Swanson, Donald A.** 1968-70 Kilauea deformation — East rift [abs.]: *EOS*, v. 51, no. 4, p. 441, 1970.
- Jackson, Dallas B.** *See* Swanson, Donald A. 01840
- 02102 **Jackson, David D.; Anderson, Don L.** Physical mechanisms of seismic-wave attenuation: *Rev. Geophysics and Space Physics*, v. 8, no. 1, p. 1-63, illus., tables, 1970.
- Jackson, David D.** *See* Knopoff, Leon. 10550
- 10555 **Jackson, David D.** Backus-Gilbert inversion of Love wave attenuation data [abs.]: *EOS*, v. 51, no. 11, p. 781, 1970.
- 05642 **Jackson, Dennis Edward; Bulman, Oliver Meredith Boone.** On the generic name *Trigonograptus* Nicholson, 1869: *Geol. Soc. London Proc.* 1970, no. 1663, p. 107-109, illus., 1970.
- 04286 **Jackson, E. D.** The origin of ultramafic rocks by cumulus processes [abs.]: *Fortschr. Mineralogie*, v. 48, no. 1, p. 9-10, 1970.
- Jackson, Everett D.** *See* O'Neil, James R. 03792

- 04350 **Jackson, Everett D.; Wright, Thomas L.** Xenoliths in the Honolulu Volcanic Series, Hawaii: Jour. Petrology, v. 11, no. 2, p. 405-430, illus., tables, 1970.
- Jackson, Everett D.** See James, Odette B. 05680
- Jackson, Everett D.** See Beeson, Melvin H. 09942
- Jackson, G. D.** See Dimroth, E. 08629
- Jackson, G. D.** See Bridgwater, D. 10017
- Jackson, G. D.** See Fahrig, W. F. 10038
- 09788 **Jackson, George F.** The Trona pinnacles: Pacific Discovery, v. 23, no. 6, p. 14-15, illus., 1970.
- 07035 **Jackson, Jeremy B. C.** The ecology and paleoecology of near shore tropical Lucinacea (Bivalvia) [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 586-587, 1970.
- 10723 **Jackson, Jeremy B. C.** Recent cryptic brachiopod-sclerosponge communities and their paleontological significance [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 587, 1970.
- Jackson, Kenneth A.** See Chalmers, Bruce. 10195
- Jackson, Kern C.** See Miller, Donald K. 00913
- 04021 **Jackson, Kern C.** Textbook of lithology: New York and London, McGraw-Hill Book Co., 552 p., illus., tables, 1970.
- Jackson, M. L.** See Mokma, D. L. 02545
- Jackson, M. L.** See Dolcater, D. L. 04674
- Jackson, M. L.** See Henderson, J. H. 07853
- Jackson, M. L.** See Sridhar, K. 09585
- Jackson, M. L.** See May, H. M. 09663
- 10724 **Jackson, Philip L.** Applications of digital modeling for travel times and ray paths [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 587, 1970.
- Jackson, R. H.** See Bunting, B. T. 07957
- Jackson, T. J.** See Meinschein, W. G. 05762
- 07233 **Jackson, Togwell A.; Keller, W. D.** A comparative study of the role of lichens and "inorganic" processes in the chemical weathering of recent Hawaiian lava flows: Am. Jour. Sci., v. 269, no. 5, p. 446-466, illus., tables, 1970.
- 03105 **Jacob, Arthur Frank.** Delta facies of the Green River Formation (Eocene), Carbon and Duchesne Counties, Utah [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 10, p. 4661B-4662B, 1970.
- 08260 **Jacob, H.; Koch, J.** Application of coalpetrologic methods in peat research [with French abs.], in International Peat Congress, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 201-205, illus., 1970.
- 01930 **Jacob, Klaus H.** P-residuals and global tectonic structures investigated by three-dimensional seismic ray tracing with emphasis on Longshot data [abs.]: EOS, v. 51, no. 4, p. 359, 1970.

- 04618 **Jacob, Klaus H.** Three-dimensional seismic ray tracing in a laterally heterogeneous spherical earth: *Jour. Geophys. Research*, v. 75, no. 32, p. 6675-6689, illus., table, 1970.
- 01077 **Jacobs, Alan M.** Surficial deposits of St. Clair County, Illinois [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 390-391, 1970.
- 02506 **Jacobs, J. A.** Geophysical numerology: *Nature*, v. 227, no. 5254, p. 161-162, 1970.
- 02826 **Jacobs, J. A.** The evolution of the Earth's core and its magnetic field, *in* Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969, *Proc.: Physics Earth and Planetary Interiors*, v. 3, p. 513-518, illus., table, 1970.
- 06862 **Jacobs, J. A.** The origin of the Earth's core, *in* Geophysical studies on the evolution of the Earth's deep interior — A symposium, Madrid, 1969, *Proc.: Physics Earth and Planetary Interiors*, v. 2, no. 5 (spec. issue), p. 303-310, 1970.
- 07968 **Jacobs, J. A.** The Earth's core: *Comments Earth Sci. — Geophysics*, v. 1, no. 2, p. 36-42, 1970.
- 07431 **Jacobs, L. W.; Syers, J. K.; Keeney, D. R.** Arsenic sorption by soils: *Soil Sci. Soc. America Proc.*, v. 34, no. 5, p. 750-754, illus., tables, 1970.
- 01483 **Jacobs, M. L.; Warren, C. G.; Granger, H. C.** Chemical extraction of an organic material from a uranium ore, *in* Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B184-B186, table, 1970.
- 05651 **Jacobs, Marian B.** Clay mineral investigations of Cretaceous and Quaternary deep sea sediments of the North American Basin: *Jour. Sed. Petrology*, v. 40, no. 3, p. 864-868, illus., tables, 1970.
- 02486 **Jacobson, Roger L.; Langmuir, Donald.** The chemical history of some spring waters in carbonate rocks: *Ground Water*, v. 8, no. 3, p. 5-9, illus., tables, 1970.
- 03586 **Jacobson, Russell.** The Gilmore City crinoid fauna: *Earth Sci.*, v. 23, no. 5, p. 228-233, illus., 1970.
- 04478 **Jacoby, Charles H.** Faults in salt mines — Their impact on operations, *in* Third symposium on salt, V. 2 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 447-452, illus., 1970.
- 05641 **Jacoby, Charles H.** Storage of hydrocarbons in cavities in bedded salt deposits formed by hydraulic fracturing, *in* Third symposium on salt, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 463-469, illus., 1970.
- 03471 **Jacoby, W. R.** Gravity diagrams for thickness determination of exposed rock bodies: *Geophysics*, v. 35, no. 3, p. 471-475, illus., 1970.
- 01634 **Jacoby, Wolfgang R.** Active diapirism under mid-oceanic ridges [abs.]: *EOS*, v. 51, no. 3, p. 204, 1970.
- 01931 **Jacoby, Wolfgang R.** A refraction profile across the southern Canadian Cordillera [abs.]: *EOS*, v. 51, no. 4, p. 356, 1970.
- 04274 **Jacoby, Wolfgang R.** Instability in the upper mantle and global plate movements: *Jour. Geophys. Research*, v. 75, no. 29, p. 5671-5680, illus., 1970.
- 04776 **Jacques, T. E.** Rayne Field, Acadia Parish, Louisiana, *in* Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 24-24d, illus., 1970.

- 09966 **Jady, R. J.** Solar activity and the rotation of the Earth, *in* Earthquake displacement fields and the rotation of the Earth (L. Mansinha, D. E. Smylie, A. E. Beck, editors)—NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 115-121, illus., table, 1970.
- 03332 **Jaeger, Charles.** Engineering and rock mechanics, Pt. 1: Water Power, v. 22, nos. 5-6, p. 203-209, illus., tables, 1970.
- Jaeger, Herman.** See Churkin, Michael, Jr. 11015
- 07437 **Jaeger, J. C.** Behavior of closely jointed rock, Chap. 4 *in* Rock mechanics, theory and practice — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 57-68, illus., table, 1970.
- 06839 **Jaffe, Leonard D.** Lunar surface — Changes in 31 months and micrometeoroid flux: Science, v. 170, no. 3962, p. 1092-1094, illus., 1970.
- 09511 **Jaffe, Louis S.** The global balance of carbon monoxide, *in* Global effects of environmental pollution—Symposium, Am. Assoc. Adv. Sci., Dallas, Texas, 1968: New York, Springer-Verlag, and Dordrecht-Holland, D. Reidel Pub. Co., p. 34-49, illus., table, 1970.
- 03096 **Jagannath, Banad Nandiswar.** Certain mechanical properties of gyratory compacted kaolin clay [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 10, p. 4609B, 1970.
- 08298 **Jahn, Alfred.** Soil movements under the influence of freezing [with French abs.] *in* Ecology of the subarctic regions, V. 1 of Ecology and conservation — A symposium, Helsinki, 1966, Proc.: Paris, UNESCO, p. 119-123, 1970.
- 01332 **Jahns, Richard H.** Geologic hazards — Problems for joint solution: Jour. Geol. Education, v. 18, no. 2, p. 81-84, 1970.
- 05531 **Jahns, Richard H.** Seventeen years of response by the City of Los Angeles to geologic hazards, *in* Geologic hazards and public problems (R. A. Olson and M. M. Wallace, editors)—[U.S.] Office Emergency Preparedness, Region 7, Conf., San Francisco, Calif., 1969, Proc.: Washington, D.C., U.S. Govt. Printing Office, p. 283-296, table [1970].
- 09470 **Jahns, Richard H.** Geologic jeopardy, *in* Limitations of the earth, a compelling focus for geology, Texas Univ. Austin Bur. Econ. Geology.—A symposium held at the dedication of the new Geology Building, Austin, Tex., 1967, Proc.: Texas Quart., v. 11, no. 2, p. 69-83, illus., 1968.
- 11229 **Jahns, Richard H.** Guide to the geology of the Diablo Canyon Nuclear Power Plant Site, San Luis Obispo County, California — Field Trip No. 4, 1970 Ann. Mtg.: Hayward, Calif., Geol. Soc. America, Cordilleran Sec., [44] p., illus., geol. map, 1970.
- 01932 **Jain, A. V.; Lipschutz, M. E.** The shock history and origin of chemical group IVA meteorites [abs.]: EOS, v. 51, no. 4, p. 341, 1970.



- 04556 **Jain, A. V.; Lipschutz, M. E.** On preferred disorder and the shock history of chemical group IVA meteorites: *Geochim. et Cosmochim. Acta*, v. 34, no. 8, p. 883-892, illus., table, 1970.
- 01623 **James, D. E.** Model seismology: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 462-471, illus., table, 1970.
- 03613 **James, Gerard W.** Comment on a paper "Carbonate facies and paleogeography of the Blackjack Creek Formation (Pennsylvanian), Missouri" [by W. J. Neal, 1969]: *Jour. Sed. Petrology*, v. 40, no. 2, p. 765-767, 1970.
- 07927 **James, Gerard W.** Stratigraphic geochemistry of a Pennsylvanian black shale (Ex-cello) in the mid-continent and Illinois basin [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 6, p. 3481B, 1970.
- 02780 **James, H. L.; Pettijohn, F. J.; Clark, L. D.** Geology and magnetic data between Iron River and Crystal Falls, Michigan: *Michigan Geol. Survey Rept. Inv.* 7, 17 p., illus., table, geol. maps, 1970.
- 05505 **James, Harold L.** Engineering geology with the New Mexico State Highway Commission [abs.], in *Engineering geology and soils engineering symposium*, 8th Ann., Pocatello, Idaho, 1970, *Proc.: Boise, Idaho, Idaho Dept. Highways*, p. 217, 1970.
- James, James E.** See Breslau, Lloyd R. 09484
- 05680 **James, Odette B.; Jackson, Everett D.** Petrology of the Apollo 11 ilmenite basalts: *Jour. Geophys. Research*, v. 75, no. 29, p. 5793-5824, illus., tables, 1970.
- James, Odette B.** See Chao, E. C. T. 07547
- 06133 **James, P. A.** The soils of the Rankin Inlet area, Keewatin, N.W.T., Canada: *Arctic and Alpine Research*, v. 2, no. 4, p. 293-302, illus., 1970.
- 01420 **James, W. R.** Regression models for faulted structural surfaces: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 4, p. 638-646, illus., 1970.
- James, William R.** See Jones, Thomas A. 10626
- 02816 **Jamieson, John C.** The phase behavior of simple compounds, in *Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969, Proc.: Physics Earth and Planetary Interiors*, v. 3, p. 201-203, 1970.
- 09625 **Jamison, David W.** Earth Resources Observation Satellite-image utility at state level: [Olympia, Wash.] *Washington Dept. Nat. Resources*, 138 p., illus., tables, 1970.
- 06000 **Jamkhindikar, Suresh M.** Petrography and clay mineralogy of the Lawrence Shale Formation (Pennsylvanian) in Kansas [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5555B, 1970.
- Janal, Martin J.** See Saito, Tsunemasa. 07787
- 00291 **Janda, Richard J.** Multiple approaches to computing denudation rates for the Wai-anae and Koolau Volcanoes, Island of Oahu, Hawaii [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 105-106, 1970.
- 10178 **Janda, Richard J.** Pleistocene tectonism and sedimentation near Cape Blanco, Oregon [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, *Abs.: [Bozeman, Mont., Montana State Univ. ?]*, p. 74, 1970.
- 04892 **Janke, N. C.** Intrusive sandstone dykes in the Siamo Slate near Negaunee, Michigan — Discussion [of paper by C. McA. Powell, 1969]: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 3179-3180, 1970.

- 06232 **Janke, N. C.** An empirical expression for the probability of particle passage through ideal screens — Discussion [of "Particle shape and influence of size from sieving," 1968]: *Sedimentology*, v. 14, nos. 3-4, p. 321-323, 1970.
- 03603 **Jansa, Lubomir F.; Carozzi, Albert V.** Exotic pebbles in La Salle Limestone (Upper Pennsylvanian), La Salle, Illinois: *Jour. Sed. Petrology*, v. 40, no. 2, p. 688-694, illus., 1970.
- 10926 **Jansonius, Jan; Pocock, A. J.** Tula, a new descriptive term for sexinal inflations, in *J. Sen Memorial Volume: Calcutta, India, Bot. Soc. Bengal*, p. 45, 1969.
- 01078 **Janssens, A.** Preliminary report on the Sauk sequence in Ohio [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 391, 1970.
- 02764 **Janssens, A.** Guidebook to the Middle Devonian rocks of north-central Ohio — Ohio Geol. Soc., Ann. Field Trip, 1970: [n.p.] Ohio Geol. Soc., 30 p., illus., 1970.
- 04585 **Janssens, A.** Middle Devonian formations in the subsurface of northwestern Ohio: Ohio Div. Geol. Survey Rept. Inv. 78, 22 p., illus., tables, 1970.
- 08372 **Janssens, A.** Guidebook to the Middle Devonian rocks of north-central Ohio — Ohio Geological Society field trip, May 15, 1970: [Columbus, O.] Ohio Geol. Soc., 30 p., illus., tables, 1970.
- 01193 **Jarman, Clara.** Effect of Tertiary intrusions on Cretaceous mudstones near Mitchell, Oregon [abs.]: *Northwest Sci.*, v. 44, no. 1, p. 63, 1970.
- 04582 **Jaron, Michael G.** Investigation of solution collapse breccia in mature salt cavities, in *Third symposium on salt*, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 422-428, illus., 1970.
- Jarosewich, E.** See Clarke, R. S., Jr. 02265
- Jarosewich, Eugene.** See White, John S., Jr. 07635
- Jarosewich, Eugene.** See Clarke, Roy S., Jr. 10268
- 03944 **Jarrett, P. M.; Eden, W. J.** Groundwater flow in eastern Ottawa [with French abs.]: *Canadian Geotech. Jour.*, v. 7, no. 3, p. 326-333, illus., tables, 1970.
- 06741 **Jarrett, Peter M.** The mechanics of landslides in Leda clay — Discussion [of paper by W. J. Eden and R. J. Mitchell, 1970]: *Canadian Geotech. Jour.*, v. 7, no. 4, p. 504-505, illus., 1970.
- 07795 **Jauregui Ostos, Ernesto.** La erosión hidraulica y eólica en México y sus efectos en las estructuras hidráulicas y en los núcleos de población [Hydraulic and eolian erosion in Mexico and its effect on hydraulic structures and on population centers]: *Mexico Univ. Nac. Autónoma Inst. Geografía Bol.*, v. 3, p. 39-60, illus., tables, 1970.
- Javoy, Marc.** See Montigny, Raymond. 01636
- Jaworowski, R. J.** See Lublin, P. 04128
- 07749 **Jayaraman, A.; Cohen, Lewis H.** Phase diagrams in high-pressure research, in *Phase diagrams, materials science and technology* — V. 1, Theory, principles, and techniques of phase diagrams: New York and London, Academic Press, p. 245-293, illus., tables, 1970.
- Jayaraman, Natesa I.** See Hardy, H. Reginald, Jr. 09156
- 06518 **Jedwab, Jacques; Defleur-Schenus, Muriel; Herbosch, Alain.** Mounting and polishing small quantities of minerals: *Am. Mineralogist*, v. 55, nos. 5-6, p. 1065-1066, 1970.

**Jeffery, H. G.** See Emmett, L. F. 01530

- 05225 **Jeffery, Peter M.; Anders, Edward.** Primordial noble gases in separated meteoritic minerals, [Pt.] 1: *Geochim. et Cosmochim. Acta*, v. 34, no. 11, p. 1175-1198, illus., tables, 1970.

**Jeffords, Russell M.** See Raymond C. 09323

- 09324 **Jeffords, Russell M.; Miller, Theo H.** Ontogenetic development in Late Pennsylvanian crinoid columnals and pluricolumnals: *Kansas Univ. Paleont. Contr.* [47], *Echinodermata*, art. 10, 14 p., illus., 1968.

**Jeffords, Russell M.** See Moore, Raymond C. 09325

**Jeffords, Russell M.** See Moore, Raymond C. 11251

**Jeffords, Russell M.** See Moore, Raymond C. 11272

- 02635 **Jeffrey, D. A.; Zarrella, W. M.** Geochemical prospecting at sea [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 853-854, 1970.

- 02636 **Jeffries, F.** Applications of digitized logs in exploration [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 854, 1970.

**Jeffries, J. D.** See Morawski, F. P. 04801

- 03149 **Jeletzky, J. A.** Some salient features of early Mesozoic history of Insular Tectonic Belt, western British Columbia: *Canada Geol. Survey Paper* 69-14, 26 p., illus., 1970.

**Jeletzky, J. A.** See Muller, J. E. 04440

**Jeletzky, J. A.** See King, Lewis H. 07674

- 10059 **Jeletzky, J. A.** Cretaceous paleogeography of Arctic Canada [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2488, 1970.

- 04707 **Jell, J. S.; Hill, Dorothy.** A redescription of the holotype of the Devonian rugose coral *Utaratuia laevigata* Crickmay: *Jour. Paleontology*, v. 44, no. 5, p. 833-835, illus., 1970.

- 00859 **Jenkins, C. T.; Hofstra, W. E.** Availability of water for artificial recharge, Plains Ground Water Management District, Colorado: *Colorado Water Conserv. Board Ground-Water Ser. Circ.* 13, 16 p., illus., tables, 1970.

- 08713 **Jenkins, C. T.; Hofstra, W. E.** Problems of artificially recharging the Ogallala Formation in Colorado, in *Ogallala Aquifer Symposium*, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, *Internat. Center for Arid and Semi-Arid Land Studies*, p. 154-164, illus., 1970.

- 07091 **Jenkins, Charles R.; Carroll, Henry C.** Mine acid drainage and associated flow fluctuations: *West Virginia Acad. Sci. Proc.* 1969, v. 41 (*West Virginia Univ. Bull.*, ser. 70, no. 11-3), p. 286-293, illus., table, 1970.

**Jenkins, Edward D.** See McClain, Thomas J. 08709

- 03663 **Jenkins, Farish A., Jr.** Cynodont postcranial anatomy and the "prototherian" level of mammalian organization: *Evolution*, v. 24, no. 1, p. 230-252, illus., 1970.

**Jenkins, Graham.** See Hays, James D. 01429

- 06186 **Jenkins, Lillie B.; Moore, Roosevelt.** Determination of lead in rocks and minerals after extraction with diethylammonium diethyldithiocarbamate, in *Geological Survey research* 1970, Chap. D: *U.S. Geol. Survey Prof. Paper* 700-D, p. D222-D224, table, 1970.

- 10698 **Jenkins, Olaf P.** Geology of placer deposits: California Div. Mines and geology, Spec. Pub. No. 34, 27 p., illus., tables [1969?]; originally published 1964.
- 09164 **Jenkins, R. H.; DeVries, B.** Worked examples in X-ray spectrometry: New York, Springer Verlag, 129 p., illus., tables [1970?].
- Jenkins, Ralph E.** See Bush, Darrell C. 10658
- Jenkins, W. A., Jr.** See Wermund, E. G. 06710
- 04702 **Jenkins, W. A. M.** Chitinozoa from the Ordovician Sylvan Shale of the Arbuckle Mountains, Oklahoma: *Palaeontology*, v. 13, pt. 2, p. 261-288, illus., tables, 1970.
- 08415 **Jenkins, W. A. M.** Chitinozoa, in Perkins, B. F., editor, *Geoscience and Man — V. 1*, Proceedings of Am. Assoc. Stratig. Palynologists, Ann. Mtg., 1st, 1968: Baton Rouge, La., Louisiana State Univ., School of Geoscience, p. 1-21, illus., 1970.
- 09182 **Jenkins, W. A. M.** Chitinozoa from the Ordovician Viola and Fernvale Limestones of the Arbuckle Mountains, Oklahoma: *Spec. Papers Palaeontology*, no. 5, 44 p., illus., tables, 1969.
- 06483 **Jenks, William F.** Root severance and tectonic transport of orebodies in metavolcanic host rocks [abs.], in *Inst. Lake Superior Geology*, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 25, 1970.
- Jenne, E. A.** See Anderson, B. J. 02954
- 05564 **Jenne, E. A.** Atmospheric and fluvial transport of mercury, in *Mercury in the environment*: U.S. Geol. Survey Prof. Paper 713, p. 40-45, 1970.
- Jennings, C. W.** See Cloud, W. K. 00858
- 04166 **Jennings, J. R.** A lycopod from the Salem Limestone (Mississippian) of Illinois [abs.]: *Am. Jour. Botany*, v. 57, no. 6, pt. 2, p. 756, 1970.
- 06432 **Jennings, James R.** Preliminary report on fossil plants from the Chester Series (Upper Mississippian) of Illinois: *Illinois Acad. Sci. Trans.*, v. 63, no. 2, p. 167-177, illus., 1970.
- Jensen, H. B.** See Brown, Dennis. 09133
- 04210 **Jensen, James A.** Fossil eggs in the Lower Cretaceous of Utah: *Brigham Young Univ. Geology Studies*, v. 17, pt. 1, p. 51-65, illus., 1970.
- 09180 **Jensen, James A.** Fossil eggs from Utah and a concept of surviving feathered reptiles: *Utah Acad. Sci., Arts and Letters Proc.*, v. 46, pt. 1, pt. 125-133, 1969.
- Jensen, Lyle H.** See Stout, George H. 04499
- Jensen, T. E.** See McGinnis, L. D. 01084
- Jensky, Wallace.** See Snyder, Henry. 00365
- 09902 **Jeppson, Roland W.; Ashcroft, Gaylen L.; Huber, A. Leon; Skogerboe, Gaylord V.; Bagley, Jay M.** Hydrologic atlas of Utah: [Logan Utah] Utah State Univ. and Utah Div. Water Resources (OWRR Project B-001-Utah; PRWG35-1), 306 p., illus., tables, 1968.
- Jepsen, H. F.** See Henriksen, N. 06348
- Jerabek, L. A.** See VanVoast, W. A. 01531
- 00827 **Jeran, P. W.; Mashey, J. R.** A computer program for the stereographic analysis of coal fractures and cleats: *U.S. Bur. Mines Inf. Circ.* 8454, 34 p., illus., tables, 1970.

**Jerome, Dominique Y.** *See* Goles, Gordon G. 05695

07983 **Jesionek-Szymańska, Wanda.** On a new pygasterid (Echinoidea) from the Jurassic (Middle Lias) of Nevada, U.S.A. [with Polish and Russian abs.]: *Acta Palaeont. Polonica*, v. 15, no. 4, p. 411-419, illus., table, 1970.

00093 **Jessop, A. M.** How to beat permafrost problems: *Oilweek*, v. 20, no. 47, p. 22, 24-25, illus., 1970.

07307 **Jessop, A. M.** The effect of environment on divided bar measurements, *in* Geothermal problems — Symposium, Madrid, Spain, 1969, *Proc.: Tectonophysics*, v. 10, nos. 1-3 (spec. issue), p. 39-49, illus., tables, 1970.

10777 **Jessop, A. M.** Heat flow, *in* Background papers on the earth sciences in Canada (C. H. Smith, editor): *Canada Geol. Survey Paper* 69-56, p. 241-251, apps., 1970.

08337 **Jimenez Salas, Jose A.; Rodriguez Ortiz, Jose M.** (editors). Proceedings of the International symposium on Rock mechanics [2d], Madrid, 1968: Madrid, Spain, Soc. Espanola de Mecanica de Rocas, 422 p., illus., tables, 1970.

**Jindal, Vinod K.** *See* Martinez, Joseph D. 05030

01610 **Jobson, Harvey E.; Sayre, William W.** Vertical transfer in open channel flow: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7148, *Jour. Hydraulics Div.*, no. HY 3, p. 703-724, illus., table, 1970.

03854 **Johansen, Nils I.; Melhorn, Wilton N.** Proposed origins for the Hadley Lake depression, Tippecanoe County, Indiana: *Indiana Acad. Sci. Proc.* 1969, v. 79, p. 270-280, illus., 1970.

07438 **John, Klaus W.** Civil engineering approach to evaluate strength and deformability of regularly jointed rock, Chap. 5 *in* Rock mechanics, theory and practice — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, *Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers*, p. 69-80, illus., 1970.

**Johns, Earl.** *See* Fons, Lloyd. 09081

09860 **Johns, R. W. C.** The Athabasca sandstone and uranium deposits: *Western Miner*, v. 43, no. 10, p. 42-52, illus., 1970; addenda, v. 43, no. 12, p. 32-34, illus., 1970.

07541 **Johns, Willis M.** Geology and mineral deposits of Lincoln and Flathead Counties, Montana: *Montana Bur. Mines and Geology Bull.* 79, 182 p., illus., tables, geol. maps, 1970.

**Johnsen, S. J.** *See* Dansgaard, W. 08209

**Johnsen, S. J.** *See* Dansgaard, W. 08743

**Johnsen, S. J.** *See* Langway, C. C., Jr. 09635

09078 **Johnson, A. C.** How to hunt oil and gas using inorganic surface-geochemical method: *Oil and Gas Jour.*, v. 68, no. 49, p. 110-112, illus., 1970.

03005 **Johnson, A. H.** Jurassic Navajo Sandstone, a fold test for stability of remanent magnetization [abs.]: *EOS*, v. 51, no. 4, p. 271, 1970.

**Johnson, A. I.** *See* Teasdale, W. E. 04307

05059 **Johnson, A. I.** Saline water symposium — Introduction: *Water Resources Research*, v. 6, no. 5, p. 1441, 1970.

05267 **Johnson, A. I.** Suggested method of test for infiltration rate in field using double-ring infiltrometers, *in* Special procedures for testing soil and rock for engineering

- purposes (5th edition): Am. Soc. Testing and Materials Spec. Tech. Pub. 479, p. 187-191, illus., table, 1970.
- 05311 **Johnson, A. I.** Suggested method for geologic reconnaissance of construction sites, *in* Special procedures for testing soil and rock for engineering purposes (5th edition): Am. Soc. Testing and Materials Spec. Tech. Pub. 479, p. 43-55, illus., 1970.
- 09875 **Johnson, Alan A.** (editor). Water pollution in the Greater New York area: New York, London and Paris, Gordon and Breach, Sci. Pub., 211 p., illus., tables, 1970.
- Johnson, Alfred M. F.** *See* Wilson, John M. 10846
- 08367 **Johnson, Arvid M.** Physical processes in geology: San Francisco, California, Freeman, Cooper and Company, 577 p., illus., tables, 1970.
- 09617 **Johnson, Arvid M.; Rahn, Perry H.** Mobilization of debris flows [with German and French abs.], *in* New contributions to slope evolution: Zeitschr. Geomorphologie, supp. 9, p. 168-186, illus., 1970.
- Johnson, C. G.** *See* Housner, G. W. 03031
- Johnson, D.** *See* Crewe, A. V. 10410
- 07174 **Johnson, Donald Lee.** Beachrock (water-table rock) in southern California [abs.]: Assoc. Pacific Coast Geographers Yearbook, v. 32, p. 179, 1970.
- 05173 **Johnson, Francis S.** The oxygen and carbon dioxide balance in the Earth's atmosphere, *in* Global effects of environmental pollution — Am. Assoc. Adv. Sci. Symposium, Dallas, Tex., 1968 (S. F. Singer, editor): New York, Springer-Verlag, and Dordrecht-Holland, D. Reidel Publishing Co., p. 4-11, tables, 1970.
- Johnson, G. H.** *See* Hummel, F. A. 02446
- Johnson, G. H.** *See* Maloney, J. F. 05433
- Johnson, G. H.** *See* Simpson, M. G. 05441
- Johnson, G. L.** *See* Schneider, E. D. 05795
- Johnson, G. L.** *See* Schneider, E. D. 08356
- Johnson, G. Leonard.** *See* Watson, Jerry A. 00083
- 01934 **Johnson, G. Leonard; Vogt, Peter R.; Holcombe, Troy L.** Hypothesis on the origin of North Atlantic basement topography [abs.]: EOS, v. 51, no. 4, p. 274, 1970.
- Johnson, G. Leonard.** *See* Watson, Jerry A. 07707
- Johnson, G. Leonard.** *See* Fox, Paul J. 09426
- 10060 **Johnson, G. Leonard; Vogt, Peter R.** Marine geology of Atlantic north of Arctic Circle [abs.], *in* Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2488-2489, 1970.
- Johnson, G. R.** *See* Anderson, L. A. 04251
- 04052 **Johnson, Gerald G., Jr.; Chan, Frank L.** An approach to the solid solution problem using a computerized identification technique, *in* Advances in X-ray analysis, V. 13 — Applications of X-ray analysis, 18th Ann. Conf., 1969, Proc.: New York, Plenum Press, p. 539-549, 1970.
- Johnson, Gerald H.** *See* Goodwin, Bruce K. 08316

- 11246 **Johnson, Gerald H.; Goodwin, B. K.** Guidebook to the geology of the lower York-James Peninsula and south bank of the James River — Atlantic Coastal Plain Geol. Assoc., 10th Ann. Field Conf., and First Ann. Virginia Geol. Field Conf.: Williamsburg, Va., College of William and Mary (Dept. Geology Guidebook no. 1), 33 p., illus. [1969].
- 03212 **Johnson, Gerald W.** Plowshare at the crossroads: Bull. Atomic Scientists, v. 26, no. 6, p. 83-91, illus., 1970.
- Johnson, Gordon R.** See Anderson, Lennart A. 06174
- Johnson, Gordon R.** See Anderson, Lennart A. 06175
- 05036 **Johnson, Helgi; Smith, Bennett L.** (editors). The megatectonics of continents and oceans: New Brunswick, N. J., Rutgers Univ. Press, 282 p., illus., 1970.
- Johnson, Henry S., Jr.** See Jorgeson, Eric. 00978
- Johnson, J. Donald.** See Dobbins, David A. 03956
- 01205 **Johnson, J. G.** Early Middle Devonian brachiopods from central Nevada: Jour. Paleontology, v. 44, no. 2, p. 252-264, illus., tables, 1970.
- 01206 **Johnson, J. G.; Boucot, A. J.** Brachiopods and age of the Tor Limestone of central Nevada: Jour. Paleontology, v. 44, no. 2, p. 265-269, illus., 1970.
- 02395 **Johnson, J. G.** Taghanic onlap and the end of North American Devonian provinciality: Geol. Soc. America Bull., v. 81, no. 7, p. 2077-2105, illus., tables, 1970.
- Johnson, J. G.** See Boucot, A. J. 04713
- 05567 **Johnson, J. G.** Great Basin Lower Devonian Brachiopoda: Geol. Soc. America Mem. 121, 419 p., illus., tables, 1970.
- 05811 **Johnson, J. G.; Reso, Anthony; Stephens, Michael.** *Crurithyris subfissa*, new name for *Crurithyris fissa* Johnson, Reso, and Stephens, 1969: Jour. Paleontology, v. 44, no. 6, p. 1146, 1970.
- Johnson, J. Harlan.** See Horne, Gregory S. 05803
- Johnson, J. M.** See Robertson, J. A. 06419
- 01172 **Johnson, John T.; Thrailkill, John.** Non-parametric analysis of variables influencing limestone groundwater occurrence [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 221-222, 1970.
- 02494 **Johnson, Kenneth S.; Nicholson, Alex.** Bibliography and index of Oklahoma geology, 1969: Oklahoma Geology Notes, v. 30, no. 2, p. 19-39, 1970.
- 02496 **Johnson, Kenneth S.** Salt produced by solar evaporation on Big Salt Plain, Woods County, Oklahoma: Oklahoma Geology Notes, v. 30, no. 3, p. 47-54, illus., tables, 1970.
- 07556 **Johnson, Kenneth S.** William E. Ham, 1916-1970: Oklahoma Geology Notes, v. 30, no. 5, p. 95-97, portrait, 1970.
- 10685 **Johnson, Kenneth S.** Geology and mineral resources of Oklahoma: Compass, v. 48, no. 1, p. 5-18, illus., table, 1970.
- 07664 **Johnson, Leon J.** Clay minerals in Pennsylvania soils — Relation to lithology of the parent rocks and other factors, [Pt.] 1 [with French, German, and Russian abs.]: Clays and Clay Minerals, v. 18, no. 5, p. 247-260, illus., tables, 1970.

- 10725 **Johnson, Noye M.; Reynolds, Robert C., Jr.; Campbell, William J.** Rate of chemical weathering in a temperate glacial environment [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 588-589, 1970.
- Johnson, Nyra A.** See Frank, J. F. 08381
- Johnson, P. H.** See Martin, J. R. 02266
- Johnson, P. H.** See Taylor, S. R. 05725
- Johnson, Paul Willard.** See Geyne, A. R. 09738
- 09475 **Johnson, Peter A.** The design of ocean mineral prospecting ships, in *Offshore Technology Conference*, 2d Ann., Houston, Tex., 1970, Preprints—v. 2: Dallas, Tex., Offshore Technology Conf., p. II-95—II-106, illus., 1970.
- 08716 **Johnson, Philip.** Application of surface pressure to assist water recharge into the Ogallala Formation, in *Ogallala Aquifer Symposium*, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, p. 193-204, illus., 1970.
- 05923 **Johnson, Philip L.** Remote sensing as an ecological tool [with French abs.], in *Ecology of the subarctic regions (Écologie des régions subarctiques)*—Helsinki, Symposium, Proc.: Paris, UNESCO, p. 169-187, illus., tables, discussion, 1970.
- Johnson, R. B.** See Shuey, R. T. 01977
- 10061 **Johnson, R. D.** Geology, petroleum potential, and exploration of Hudson Bay basin, Canada [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2489, 1970.
- Johnson, R. G.** See Damberger, H. H. 05534
- Johnson, R. G.** See Damberger, H. H. 05535
- 06649 **Johnson, R. H.** Estimating earthquake rupture length from *T* waves, in *Tsunamis in the Pacific Ocean*—Internat. Symposium on Tsunamis and Tsunami Research, Honolulu, Hawaii, 1969, Proc.: Honolulu, Hawaii, East-West Center Press, p. 253-259, illus., 1970.
- Johnson, Ralph G.** See Smith, W. H. 05533
- 05538 **Johnson, Ralph G.; Richardson, Eugene S., Jr.** Fauna of the Francis Creek Shale in the Wilmington area: Illinois Geol. Survey Guidebook sec. 8, p. 53-60, illus., tables, 1970.
- 05739 **Johnson, Richard D.; Davis, Catherine C.** Total organic carbon in the Apollo 11 lunar samples, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc.—V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1805-1812, illus., table, 1970.
- 07928 **Johnson, Richard Gustave.** Economic geology of a portion of the basal Duluth Complex, northeastern Minnesota [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 6, p. 3481B, 1970.
- 05494 **Johnson, Robert B.** Refraction seismic and electrical resistivity studies of engineering geologic problems at mountain tunnel sites, in *Engineering geology and soils engineering symposium*, 8th Ann., Pocatello, Idaho, 1970, Proc.: Boise, Idaho, Idaho Dept. Highways, p. 1-20, illus., 1970.
- Johnson, Robert B.** See Rockaway, John D., Jr. 09500
- 10370 **Johnson, Robert C.** Strippable coal in the northern Cumberland Plateau area of Tennessee [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 589, 1970.



- Johnson, Robert W.** *See* Dennison, John M. 00693
- Johnson, Robert W., Jr.** *See* Stearns, Richard G. 08607
- Johnson, Ross B.** *See* Kleinkopf, M. Dean. 01468
- 04072 **Johnson, S. J.; Dansgaard, W.; Clausen, H. B.; Langway, C. C.** Climatic oscillations 1200-2000 A.D.: *Nature*, v. 227, no. 5257, p. 482-483, illus., 1970.
- 02781 **Johnson, Stanley S.; Sweet, Palmer C.** Gravity survey of Northampton and Accomack Counties, Virginia: *Virginia Minerals*, v. 16, no. 3, p. 21-26, illus., 1970.
- Johnson, Stephen.** *See* Couch, Richard. 10565
- Johnson, Stephen H.** *See* Mooney, Harold M. 04007
- 04334 **Johnson, Stephen H.; Couch, Richard W.** Crustal structure in the North Cascade Mountains of Washington and British Columbia from seismic refraction measurements: *Seismol. Soc. America Bull.*, v. 60, no. 4, p. 1259-1269, illus., table, 1970.
- Johnson, Stephen H.** *See* Mooney, Harold M. 05876
- Johnson, Stephen H.** *See* Mooney, Harold M. 06582
- Johnson, T. C.** *See* Grantz, Arthur. 07076
- 04290 **Johnson, Thys B.; Mickle, David G.** Optimum design of an open pit, an application in uranium [abs.]: *Canadian Mining and Metall. Bull.*, v. 63, no. 696, p. 443, 1970.
- Johnson, Tracy.** *See* Oliver, Jack. 07687
- Johnson, W. S.** *See* Kruse, G. H. 07442
- Johnson, Walter E.** *See* Selander, Robert K. 03871
- Johnston, A. G.** *See* Land, A. H. 07972
- Johnston, G. H.** *See* Brown, W. G. 06739
- Johnston, G. H.** *See* Brown, R. J. E. 10021
- 04970 **Johnston, Herbert E.** Ground-water resources of the Loysville and Mifflintown quadrangles in south-central Pennsylvania: *Pennsylvania Geol. Survey Bull. W-27* (Water-Resources Rept.), 96 p., illus., tables, 1970.
- Johnston, John E.** *See* Grossling, Bernardo F. 08753
- 00791 **Johnston, Paul M.; Libbey, F. W.** Memorial to Raymond Clarence Treasher (1898-1967): *Geol. Soc. America Proc.* 1967, p. 277-279, 1970.
- 06146 **Johnston, Paul M.; Pollock, Samuel J.; Weist, William G., Jr.** (compilers). Ground-water resources of the Potomac River basin, App. G in Potomac River basin report, V. 4: U.S. Cong., 91st, 2d sess., House Doc. 91-343, 114 p., paged separately, illus., tables, 1970.
- 10785 **Johnston, R.** On salinity and its estimation, in *Oceanography and marine biology — an annual review*, V. 7 (Harold Barnes, editor): New York, Hafner Publishing Co., p. 31-48, tables, 1969.
- Johnston, R. C.** *See* Brede, E. C. 06737
- Johnstone, C. W.** *See* Wahl, J. S. 09355
- Joiner, Thomas J.** *See* Wilson, Gary V. 05068

- Joiner, Thomas J.** See McWilliams, Richebourg G., Jr. 06690
- Joiner, Thomas J.** See LaMoreaux, Philip E. 06734
- Joiner, Thomas J.** See McWilliams, R. G. 07167
- Joiner, Thomas J.** See Warman, James C. 09221
- Jolly, Janice L.** See Heyl, Allen V. 07470
- 01785 **Jolly, Wayne T.** Evolution of Cretaceous calc-alkaline magmas of southern Puerto Rico [abs.]: EOS, v. 51, no. 4, p. 441-442, 1970.
- 03820 **Jolly, Wayne T.** Zeolite and prehnite-pumpellyite facies in south central Puerto Rico: Contr. Mineralogy and Petrology, v. 27, no. 3, p. 204-224, illus., tables, 1970.
- 10726 **Jolly, Wayne T.; Smith, Raymond E.** Zeolite and prehnite-pumpellyite facies in the Keweenaw flood basalts of northern Michigan—[Pt.] 1, Metamorphic differentiation [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 589-590, 1970.
- 04202 **Jonasson, I. R.** Mercury in the natural environment, a review of recent work: Canada Geol. Survey Paper 70-57, 39 p., 1970.
- 05371 **Jones, Bill R.; Reaser, Donald F.** Geologic map of southern Quitman Mountains, Hudspeth County, Texas: Texas Univ. Austin Bur. Econ. Geology Geol. Quad. Map 39, scale 1:48,000, sections, separate text, 1970; *reprinted in* Geology of the southern Quitman Mountains area, Trans-Pecos Texas: Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub. 70-12, p. [31-54], illus., 1970.
- 09471 **Jones, Charles F.** Energy resources, *in* Limitations of the earth, a compelling focus for geology (Texas Univ. Austin Bur. Econ. Geology)—A symposium held at the dedication of the new Geology Building, Austin, Tex., 1967, Proc.: Texas Quart., v. 11, no. 2, p. 84-89, 1968.
- Jones, D. J.** See Lewis, D. W. 01663
- 10062 **Jones, D. L.; Mackevett, E. M., Jr.; Plafker, George.** Speculations on late Mesozoic tectonic history of part of southern Alaska [abs.], *in* Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2489, 1970.
- Jones, D. L.** See Richter, D. H. 10092
- Jones, David L.** See Bailey, Edgar H. 00225
- Jones, David L.** See Imlay, Ralph W. 01431
- Jones, David L.** See Bailey, Edgar H. 04418
- 00846 **Jones, E. J. W.; Ewing, M.; Ewing J. I.; Eittreim, S. L.** Influences of Norwegian Sea overflow water on sedimentation in the northern North Atlantic and Labrador Sea: Jour. Geophys. Research, v. 75, no. 9, p. 1655-1680, illus., 1970.
- Jones, E. J. W.** See Sclater, J. G. 07308
- Jones, F. P.** See Berg, R. B. 04699
- 07814 **Jones, F. W.; Parker, M. L. G. S. C.** tree-ring scanning densitometer and data acquisition system: Tree-Ring Bull., v. 30, nos. 1-4, p. 23-31, illus., 1970.
- 09980 **Jones, Harold E.** Geodetic survey measurements to determine motion in the Earth's crust, *in* Earthquake displacement fields and the rotation of the Earth (I. Mansinha, D. E. Smylie, A. E. Beck, editors)—NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 269-275, illus., 1970.

- 01575 **Jones, Hershel Leonard.** Petrography, mineralogy, and geochemistry of the chamositic iron ores of north-central Louisiana [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 9, p. 4208B-4209B, 1970.
- Jones, J. A. A.** See Adams, W. P. 09279
- 09280 **Jones, J. A. A.** A reconnaissance note on some raised beaches in northern Labrador, in *Field research in Labrador-Ungava* [1965-66]: McGill Univ. Dept. Geography Sub-Arctic Research Paper 23, p. 63-67, illus., table, 1967.
- Jones, J. Knox, Jr.** See Dort, Wakefield, Jr. 08040
- Jones, J. Knox, Jr.** See Hoffmann, Robert S. 08052
- Jones, J. M.** See Runcorn, S. K. 06292
- 00755 **Jones, J. W.; Ghent, E. D.** Low grade metamorphic rocks of the Horsethief Creek Formation, Esplanade Range, Selkirk Mountains, British Columbia [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 337, 1970.
- Jones, J. W.** See Ghent, E. D. 06786
- Jones, John F.** See Trescott, Peter C. 01608
- Jones, M. B.** See Cheney, E. S. 00144
- 03598 **Jones, Michael L.; Dennison, John M.** Oriented fossils as paleocurrent indicators in Paleozoic lutes of southern Appalachians: Jour. Sed. Petrology, v. 40, no. 2, p. 642-649, illus., 1970.
- Jones, Michael L.** See Duncan, William M. 07090
- 08711 **Jones, Ordie; Schneider, Arland D.** Comparison of methods for determining the specific yield of the Ogallala, in *Ogallala Aquifer Symposium*, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, p. 118-130, illus., table, 1970.
- Jones, Ordie, R.** See Aronovici, V. S. 08715
- Jones, Ordie R.** See Schneider, Arland D. 08717
- 08663 **Jones, Paul H.** Hydrology of Quaternary delta deposits of the Mississippi River, in *Symposium on the Hydrology of Deltas*, V. 1: Internat. Assoc. Sci. Hydrology-UNESCO Pub. 90, p. 49-63, illus., 1970.
- Jones, R.** See Gold, T. 05111
- Jones, Richard K.** See Lafayette Geological Society. 04752
- Jones, Robert L.** See Davis, C. E. 02838
- 01304 **Jones, Robert S.** Gold content of water, plants, and animals: U.S. Geol. Survey Circ. 625, 15 p., tables, 1970.
- 08757 **Jones, Robert W.** Comparison of Columbia River Basalts and Snake Plains basalts, in *Columbia River Basalt Symposium*, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 209-221, illus., 1970.
- Jones, Thomas A.** See Krumbein, W. C. 03600
- 06140 **Jones, Thomas A.** Paleostructure and lithologic variation coefficients, their use in exploration for new oil and gas pools — Discussion [of paper by S. T. Ovnatanov and G. P. Tamrazyan, 1969]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 9, p. 1749-1750, 1970.

- 08550 **Jones, Thomas A.** Comparison of the descriptors of sediment grain-size distributions: Jour. Sed. Petrology, v. 40, no. 4, p. 1204-1215, illus., tables, 1970.
- 10626 **Jones, Thomas A.; James, William R.** Analysis of bimodal orientation data: Internat. Assoc. Math. Geology Jour., v. 1, no. 2, p. 129-135, illus., 1969.
- 03106 **Jones, Thomas Allen.** A comparison of the estimators of sediment grain-size distributions [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 10, p. 4662B, 1970.
- 05500 **Jones, Walter V.; Larsen, Ronald.** Investigation and correction of a highway landslide (special emphasis on horizontal drains), in Engineering geology and soils engineering symposium, 8th Ann., Pocatello, Idaho, 1970, Proc.: Boise, Idaho, Idaho Dept. Highways, p. 123-144, illus., 1970.
- 05462 **Jones, William R.; Moore, Samuel L.; Pratt, Walden P.** Geologic map of the Fort Bayard quadrangle, Grant County, New Mexico: U.S. Geol. Survey Geol. Quad. Map GQ-865, scale 1:24,000, sections, separate text, 1970.
- 02111 **Jongejan, A.; Wilkins, A. L.** A re-examination of the system  $\text{CaO-TiO}_2$  at liquidus temperatures: Jour. Less-Common Metals, v. 20, no. 4, p. 273-279, illus., table, 1970.
- 03296 **Jongejan, A.; Wilkins, A. L.** Phase equilibrium studies in the system  $\text{CaO-Nb}_2\text{O}_5\text{-TiO}_2$ : Jour. Less-Common Metals, v. 21, no. 3, p. 225-253, illus., tables, 1970.
- 02778 **Jopling, A.** (committee chairman). Recommendations on the future development of geomorphology in Canada: Canadian Geographer, v. 14, no. 2, p. 167-173, 1970.
- Jordaan, Jan M., Jr.** See Williams, John A. 06652
- Jordan, Jane C.** See Schiffman, Robert L. 02353
- Jordan, Jane C.** See Schiffman, Robert L. 04226
- Jordan, Louise.** See Tarr, Russell S. 10852
- Jordan, Paul R.** See Deutsch, Morris. 10810
- Jordan, T.** See Anderson, Don L. 02811
- Jordan, Thomas.** See Sammis, Charles. 10589
- Jordan, Tom.** See Sammis, Charles. 03561
- 07852 **Jørgensen, P.; Low, P. F.** Conductance studies of Na-bentonite-water systems: Israel Jour. Chemistry, v. 8, no. 3, p. 325-333, illus., table, 1970.
- 07929 **Jorgenson, David Bruce.** Petrology and origin of the Illinois River Gabbro, a part of the Josephine Peridotite-Gabbro Complex, Klamath Mountains, southwestern Oregon [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3482B, 1970.
- 00978 **Jorgeson, Eric; Heron, S. Duncan; Johnson, Henry S., Jr.** The Duplin Formation in the northwest coastal plain of South Carolina [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 222, 1970.
- Jory, L. T.** See Imrie, A. S. 11245
- 07894 **Jory, Lisle T.; Imrie, Alan S.** Geology and general features W.A.C. Bennett Dam, in Peace River, Pine Pass, Yellowhead 1970 — Edmonton Geol. Soc. Field Conf., 12th, Guidebook: Edmonton, Alberta, Edmonton Geological Society, p. 15-22, illus., 1970.
- Josey, William L.** See Kesler, Stephen E. 05192

- Jouret, C.** See Dran, J. C. 08019
- 03440 **Journaux, André.** La plaine du gel éternel en Alaska [The permafrost plain of Alaska (with English, German and Russian abs.)]: *Sci. Prog. Découverte*, no. 3422, p. 37-43, illus., 1970.
- Jovanovic, S.** See Reed, G. W., Jr. 05718
- Jovel, J. Roberto.** See Wozab, David. 03548
- 03721 **Judd, James B.; Smith, William C.; Pilkey, Orrin H.** The environmental significance of iron-stained quartz grains on the southeastern United States Atlantic shelf: *Marine Geology*, v. 8, no. 5, p. 355-362, illus., 1970.
- 05891 **Judd, John H.** Lake stratification caused by runoff from street deicing: *Water Research*, v. 4, no. 8, p. 521-532, illus., tables, 1970.
- 08339 **Judd, William R.** Rock mechanics observations [with French and German abs.], in *International Symposium on Rock Mechanics* [2d], Madrid, 1968, Proc.: Madrid, Spain, Soc. Española de Mecánica de Rocas, p. 255-262, illus., 1970.
- 08318 **Judge, C. W.** Heavy minerals in beach and stream sediments as indicators of shore processes between Monterey and Los Angeles, California: U.S. Army Corps Engineers Coastal Eng. Research Center Tech. Memo., no. 33, 44 p., illus., tables, 1970.
- 01717 **Judy, Clark; Meiman, James R.; Friedman, Irving.** Deuterium variations in an annual snowpack: *Water Resources Research*, v. 6, no. 1, p. 125-129, illus., tables, 1970.
- 01935 **Julian, Bruce R.** Regional variations in upper mantle structure of North America [abs.]: *EOS*, v. 51, no. 4, p. 359, 1970.
- 07358 **Julian, Bruce Rene.** Regional variations in upper mantle structure beneath North America [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 4, p. 2065B, 1970.
- 03890 **Jung, Peter.** *Torreites sanchezi* (Douvillé) from Jamaica: *Palaeontographica Americana*, v. 7, no. 42, 12 p., illus., 1970.
- 06239 **Jung, Peter.** Fossil *Plauratomaria* from Jamaica: *Caribbean Jour. Sci.*, v. 10, nos. 1-2, p. 83-86, illus., 1970.
- Jung, Peter.** See Cambray, F. W. 10244
- Jungels, Pierre.** See Smith, Stewart W. 04068
- Jurdy, Donna M.** See Hodge, Dennis S. 01782
- 01417 **Juskevics, John A.** On computerized collections: *Geol. Soc. America Bull.*, v. 81, no. 5, p. 1597-1600, tables, 1970.
- 00726 **Justus, Philip S.; Thayer, Paul A.; Weigand, Peter.** Comparative geochemistry and petrology of diabase dikes in the North Carolina Triassic basins [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 223, 1970.
- 10361 **Jutsum, P. J.** Seismogram data processing program for an IBM 1620 computer: *West Indies Univ. Seismic Research Unit Spec. Pub.* 5, 19 p., illus., tables, 1967.
- 10362 **Jutsum, P. J.** A program for the determination of the focal parameters of regional earthquakes using an IBM 1620 computer: *West Indies Univ. Seismic Research Unit Spec. Pub.* 6, illus., tables, 1967.
- Jutsum, P. J.** See Tomblin, J. F. 10363

- 10368 **Jutsum, P. J.; Tomblin, J. F.** Earthquake magnitude and residual programme for an IBM 1620 computer: West Indies Univ. Seismic Research Unit Spec. Pub. 19, 21 p., illus., tables, 1969.
- Kachadoorian, Reuben.** See Sainsbury, C. L. 01464
- Kachadoorian, Reuben.** See Sainsbury, C. L. 03334
- 03263 **Kadigamathaiyah, Sinnathamby.** Role of aluminum and iron hydroxy compounds in the adsorption of organic matter by a montmorillonite clay [abs.]: Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 4873B, 1970.
- 01145 **Kaesler, Roger L.** The cophenetic correlation coefficient in paleoecology: Geol. Soc. America Bull., v. 81, no. 4, p. 1261-1265, illus., 1970.
- 08505 **Kaesler, Roger L.** Numerical taxonomy in paleontology — Classification, ordination and reconstruction of phylogenies, in *Computers in paleontology — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc., Pt. B: Lawrence, Kans., Allen Press, p. 84-100, illus., 1970.*
- 01585 **Kafescioglu, Ismail Ali.** Quantitative distribution of foraminifera on the continental shelf and uppermost continental slope off Massachusetts, eastern United States [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 9, p. 4282B, 1970.
- 00623 **Kahil, Alain A.; Rutherford, Robert H.** A preliminary study of the White River terraces in central South Dakota [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 337-338, 1970.
- 03509 **Kaila, K. L.** Decay rate of P-wave amplitudes from nuclear explosions and the magnitude relations in the epicentral distance range 1° to 98°: Seismol. Soc. America Bull., v. 60, no. 2, p. 447-460, illus., 1970.
- Kaiman, S.** See Harris, D. C. 03497
- Kaiser, W. A.** See Hohenberg, C. M. 05703
- 10727 **Kajiwar, Yoshimichi; Krouse, H. R.** Sulfur isotope geothermometry, pyrite-pyrrhotite-chalcopyrite-galena-sphalerite systems [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 590, 1970.
- Kalashnikova, I. V.** See Magnitsky, V. A. 00660
- 06619 **Kalb, George William.** Desorption isotherms of montmorillonite-organic complexes [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 826B, 1970.
- Kalin, D. C.** See Proctor, R. J. 00426
- 05497 **Kaliser, B. N.; Grey, D. C.** Sulfur isotope determinations as a geohydrologic tool, in *Engineering geology and soils engineering symposium, 8th Ann., Pocatello, Idaho, 1970, Proc.: Boise, Idaho, Idaho Dept. Highways, p. 55-63, illus., tables, 1970.*
- 02438 **Kaliser, Bruce N.** Environmental geology of the Bear Lake area, Utah, with application to planning in the intermountain West [abs.]: Mining Eng., v. 22, no. 1, p. 44-45, 1970.
- Kallberg, Razel Wittels.** See Brace, William F. 00870
- Kallberg, Razel Wittels.** See Brace, William F. 01409

- 04871 **Kalliokoski, J.** Company geologists, students, and economic geology: *Econ. Geology*, v. 65, no. 5, p. 592-593, 1970.
- 10531 **Kalra, Ashok K.; Rodgers, Peter W.** Wave-front reconstruction technique [abs.]: *EOS*, v. 51, no. 11, p. 775, 1970.
- 02478 **Kalsbeek, Feiko.** The petrography and origin of gneisses, amphibolites and migmatites in the Qasigialik area, south-west Greenland: *Medd. Grönland*, v. 189, no. 1, 70 p., illus., tables, 1970; *reprinted as Grönlands Geol. Undersögelse Bull.* 83, 1970.
- 08355 **Kalsbeek, Feiko; Leake, Bernard E.** The chemistry and origin of some basement amphibolites between Ivigtut and Frederikshaab, south-west Greenland: *Grönlands Geol. Undersögelse Bull.*, no. 90, 36 p., illus., tables, 1970; *Medd. Grönland*, v. 190, no. 4, 1970.
- Kam, D.** See Smith, S. V. 09579
- Kam, William.** See Signor, D. C. 00077
- Kamb, Barclay.** See Harrison, W. D. 01777
- 01786 **Kamb, Barclay.** Results of a quantitative theory of glacier sliding applied to field measurements [abs.]: *EOS*, v. 51, no. 4, p. 431, 1970.
- 06363 **Kamb, Barclay.** Sliding motion of glaciers — Theory and observation: *Rev. Geophysics and Space Physics*, v. 8, no. 4, p. 673-728, illus., tables, 1970.
- 06503 **Kamb, Barclay.** Interference colors in flash figures: *Am. Mineralogist*, v. 55, nos. 5-6, p. 767-775, illus., 1970.
- 03451 **Kamp, J. W.** The cavernicolous Grylloblattodea of the western United States [with French abs.]: *Annales Spéléologie*, v. 25, pt. 1, p. 223-230, illus., 1970.
- 09110 **Kanamaru, F.; Vand, V.** The crystal structure of a clay-organic complex of 6-amino hexanoic acid and vermiculite: *Am. Mineralogist*, v. 55, nos. 9-10, p. 1550-1561, illus., tables, 1970.
- 02128 **Kanamori, H.; Press, Frank.** How thick is the lithosphere?: *Nature*, v. 226, no. 5243, p. 330-331, illus., 1970.
- Kanamori, H.** See Takeuchi, H. 08285
- 01936 **Kanamori, Hiroo.** The Alaska earthquake of 1964, radiation of long-period surface waves and source mechanism [abs.]: *EOS*, v. 51, no. 4, p. 355, 1970.
- Kanamori, Hiroo.** See Wu, Francis T. 02004
- 04006 **Kanamori, Hiroo.** The Alaska earthquake of 1964 — Radiation of long-period surface waves and source mechanism: *Jour. Geophys. Research*, v. 75, no. 26, p. 5029-5040, illus., table, 1970.
- Kanamori, Hiroo.** See Horai, Ki-iti. 06285
- 06288 **Kanamori, Hiroo; Amos, Nur; Chung, D. H.; Simmons, Gene.** Elastic wave velocities of lunar samples at high pressures and their geophysical implications, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 2289-2293, illus., tables, 1970.
- 01937 **Kanasewich, E. R.; Clowes, R. M.** The nature of seismic reflecting horizons near the base of the crust [abs.]: *EOS*, v. 51, no. 4, p. 356, 1970.
- 04275 **Kanasewich, E. R.; Agarwal, R. G.** Analysis of combined gravity and magnetic fields in wave number domain: *Jour. Geophys. Research*, v. 75, no. 29, p. 5702-5712, illus., 1970.

**Kanasewich, E. R.** See Clowes, R. M. 04734

- 10533 **Kanasewich, E. R.; Hron, F.** Synthetic seismograms for crustal studies using generalized ray theory [abs.]: EOS, v. 51, no. 11, p. 775-776, 1970.

**Kanasewich, Ernest R.** See Montalbetti, James F. 05842

- 00727 **Kane, Henry E.** Late Cenozoic geomorphology of a portion of the lower Kentucky River basin [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 223-224, 1970.

**Kanes, William H.** See Donaldson, Alan C. 02607

- 06707 **Kanes, William H.** Facies and development of the Colorado River delta in Texas, in Deltaic sedimentation, modern and ancient: Soc. Econ. Paleontologists and Mineralogists Spec. Pub. 15, p. 78-106, illus., tables, 1970.

**Kanes, William H.** See Donaldson, Alan C. 06748

- 10711 **Kansas Geological Survey.** Feasibility of underground storage of natural gas in the Kansas River basin: Kansas Geol. Survey Geol. Policies Comm. Rept. 15C, 84 p., illus., tables, 1968.

- 07213 **Kantrowitz, I. H.** Ground-water resources in the Eastern Oswego River basin, New York — Oswego River Basin Plan. Rept. ORB-2: Albany, N.Y., New York State Water Resources Comm., 129 p., illus., tables, 1970.

- 10063 **Kanygin, A. V.; Oradovskaya, M. M.; Sobolevskaya, R. F.** Stratigraphic scheme of Ordovician of northeastern USSR and its correlation [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2489-2490, 1970.

**Kaplan, I.** See Chang, S. 05743

**Kaplan, I. R.** See Kolodny, Yehoshua. 00816

**Kaplan, I. R.** See Smith, J. W. 00945

- 01346 **Kaplan, I. R.; Presley, B. J.** Interstitial water chemistry, Deep Sea Drilling Project, Leg 2, [Chap.] 16 in Initial reports of the Deep Sea Drilling Project — V. 2, Leg 2 of cruises of *Glomar Challenger*, Hoboken, N. J., to Dakar, Senegal, Oct.-Nov. 1968: Washington, D. C., U.S. Govt. Printing Office, p. 373, table, 1970.

**Kaplan, I. R.** See Belsky, T. 01864

**Kaplan, I. R.** See Smith, J. W. 03638

**Kaplan, I. R.** See Kolodny, Yehoshua. 05658

- 05705 **Kaplan, I. R.; Smith, J. W.; Ruth, E.** Carbon and sulfur concentration and isotopic composition in Apollo 11 lunar samples, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1317-1329, illus., tables, 1970.

**Kaplan, I. R.** See Brown, Frederick S. 06073

**Kaplan, I. R.** See Presley, B. J. 06667

**Kaplan, R. I.** See Presley, B. J. 07152

- 08350 **Kapp, Ronald O.** A 24,000-year-old Jefferson mammoth from Midland County, Michigan: Michigan Academician, v. 3, no. 2, p. 95-99, illus., 1970.



- 08691 **Kapp, Ronald O.** Pollen analysis of pre-Wisconsin sediments from the Great Plains, in *Pleistocene and recent environments of the central Great Plains*: Kansas Univ. Dept. Geology Spec. Pub. 3, p. 143-155, illus., 1970.
- 09499 **Karadi, Gabor M.; Krizek, Raymond J.; Rechea, Manual.** Critical evaluation of certain methods of unsteady ground water hydraulics: *Water Resources Bull.*, v. 6, no. 3, p. 424-438, illus., 1970.
- 03519 **Karaoguz, Dogu; Helander, D. P.; Kemp, M. K.** An experimental study of Redox Logging: *Log Analyst*, v. 11, no. 3, p. 8-16, illus., tables, 1970.
- Karasik, A. M.** See Grachev, A. F. 03449
- Karbs, Harlan H.** See Abdel-Hady, M. 07248
- Kardos, J. L.** See Hoyt, H. P., Jr. 06287
- 02330 **Karig, D. E.; Peterson, M. N. A.; Shor, G. G.** Sediment-capped guyots in the Mid-Pacific Mountains: *Deep-Sea Research*, v. 17, no. 2, p. 373-378, illus., table, 1970.
- 00551 **Karklins, Olgerts L.** Restudy of type species of the Ordovician bryozoan genus *Stictoporellina*: *Jour. Paleontology*, v. 44, no. 1, p. 133-139, illus., tables, 1970.
- 00728 **Karklins, Olgerts L.** Preliminary Bryozoan zonation of the Lexington Limestone (Ordovician) of Kentucky [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 224, 1970.
- Karklins, Olgerts L.** See Cressman, Earle R. 03857
- Karner, Frank R.** See Furman, Marvin J. 02505
- 02736 **Karner, Frank R.; Connors, Roland A.** Composition, distribution, and orientation of xenoliths in the Tunk Lake Granite, Maine [abs.]: *North Dakota Acad. Sci. Proc.*, v. 24, pt. 1, p. 16, 1970.
- 03876 **Karner, Frank R.; Helgesen, John O.** Petrologic significance of zircon variation in the Tunk Lake Granite, southeastern Maine: *Jour. Geology*, v. 78, no. 4, p. 480-498, illus., tables, 1970.
- 10728 **Karner, Frank R.** Evidence for convection as a cause of zoning in granitic plutons [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 590-591, 1970.
- 00953 **Karp, Edwin.** Denver earthquakes [discussion of note by R. B. Simon, 1970]: *Science*, v. 167, no. 3924, p. 1518-1519, 1970.
- 03107 **Karp, Edwin.** Aspects of strain history in experimental rock deformation [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 10, p. 4662B-4663B, 1970.
- 02407 **Karp, Stanley E.** Geologic technician, a new curriculum: *Jour. Geol. Education*, v. 18, no. 3, p. 132-134, 1970.
- 02554 **Karrow, P. F.** Pleistocene geology of the Thornhill area: *Ontario Dept. Mines Indus. Mineral Rept.* 32, 51 p., illus., tables, geol. map, 1970.
- 07722 **Karrow, P. F.; Terasmae, J.** Pollen-bearing sediments of the St. Davids buried valley fill at the Whirlpool, Niagara River gorge, Ontario: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 539-542, illus., tables, 1970.
- 09859 **Karup, Möller, S.** Geology of the Compulsion River Fold Belt: *Western Miner*, v. 43, no. 2, p. 35-51, illus., table, 1970.
- 03495 **Karup-Möller, S.** Gustavite, a new sulphosalt mineral from Greenland: *Canadian Mineralogist*, v. 10, pt. 2, p. 173-190, illus., tables, 1970.

- 05122 **Karup-Möller, S.; Brummer, J. J.** The George Lake zinc deposit, Wollaston Lake area, northeastern Saskatchewan: *Econ. Geology*, v. 65, no. 7, p. 862-874, illus., tables, 1970.
- 00292 **Karvinen, William O.** The structure of Lardeau group rocks at Albert Canyon, British Columbia [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 106, 1970.
- Kasabach, Haig F.** See Hasan, Asghar. 09169
- 09215 **Kashef, A. I.** Salt water encroachment in the eastern North Carolina coastal region, in *Symposium on hydrology of the coastal waters of North Carolina*, Raleigh, N. C., 1967, Proc.: North Carolina Univ. Water Resources Research Inst. Rept., no. 5, p. 24-38, illus., 1967[2].
- 06935 **Kashef, Abdel-Aziz I.** Model studies of salt water intrusion: *Water Resources Bull.*, v. 6, no. 6, p. 946-967, illus., tables, 1970.
- 09217 **Kashef, Abdel-Aziz I.** Diffusion and dispersion in porous media — salt water mounds in coastal aquifers: North Carolina Univ. Water Resources Research Inst. Rept., no. 11, 258 p., illus., tables, 1968.
- Kashuba, A. Thomas.** See Morrison, George H. 05710
- 07930 **Kashuba, Andrew Thomas, Jr.** Analysis of terrestrial, meteoritic and lunar basaltic samples by spark source mass spectroscopy [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 6, p. 3225B, 1970.
- Kaspar, I.** See Kuraz, V. 07222
- 04164 **Kasper, Andrew E., Jr.; Andrews, Henry N., Jr.** A new genus of Devonian plants from northern Maine [abs.]: *Am. Jour. Botany*, v. 57, no. 6, pt. 2, p. 755, 1970.
- 09069 **Kastner, Miriam.** An inclusion hourglass pattern in synthetic gypsum: *Am. Mineralogist*, v. 55, nos. 11-12, p. 2128-2130, illus., 1970.
- 10729 **Kastner, Miriam.** Feldspars as provenance and physicochemical indicators [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 591, 1970.
- 04961 **Kates, Robert W.; Haas, J. Eugene.** General introduction, conclusions, and recommendations, in *The great Alaska earthquake of 1964 — Human ecology*: Washington, D. C., Natl. Acad. Sci., p. 1-4, 1970.
- 07992 **Kattner, Wilbur T. (editor).** Advances in dynamic gravimetry — Symposium, Fort Worth, Texas, 1970, Proc.: Pittsburgh, Pa., Instrument Society of America, 172 p., illus., tables, 1970.
- 05064 **Katz, Donald L.; Tek, M. Rasin.** Storage of natural gas in saline aquifers, in *Saline water symposium*: Water Resources Research, v. 6, no. 5, p. 1515-1521, illus., tables, 1970.
- Katz, J. Lawrence.** See Borst, Roger L. 09092
- 03501 **Katz, M. B.** Notes on the mineralogy and coexisting pyroxenes from the granulites of Mont Tremblant Park, Quebec: *Canadian Mineralogist*, v. 10, pt. 2, p. 247-251, table, 1970.
- 03709 **Katz, Michael B.** Banded gneisses — Thickness distribution of layers and their lithologic transitions: *Lithos*, v. 3, no. 1, p. 1-12, illus., tables, 1970.

- 05292 **Katz, Michael B.** A critical appraisal of the term 'green rock' from studies in Mont Tremblant Park area, Quebec [with French abs.]: *Geol. Assoc. Canada Proc.*, v. 22, p. 19-26, illus., table, 1970.
- 05954 **Katz, Samuel.** Memorial of Joseph Leon Rosenholtz: *Am. Mineralogist*, v. 55, nos. 3-4, p. 595-596, portrait, 1970.
- 02637 **Kauffman, Marvin E.; Campbell, Lyle.** Kinzers Formation, Appalachian analogue of Burgess Shale? [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 854, 1970.
- Kauffunger, Richard A.** *See* Larach, Simon. 04148
- Kaufman, Aaron.** *See* Broecker, Wallace S. 06404
- Kaufman, Aaron.** *See* Broecker, Wallace. 06405
- 10064 **Kaufman, Gordon M.; Bradley, Paul G.** Two stochastic models useful in petroleum exploration [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12p. 2490, 1970.
- 10730 **Kaufmann, Robert F.** The role of hydrogeology in the regulation of solid waste disposal and site selection [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 591-592, 1970.
- 03418 **Kaula, William M.** Earth's gravity field, relation to global tectonics: *Science*, v. 169, no. 3949, p. 982-985, illus., table, 1970.
- 07994 **Kaula, William M.** Application of space and astronomic techniques to solid earth and ocean physics, in *Advances in dynamic gravimetry* (Wilbur T. Kattner, editor) — Symposium, Fort Worth, Texas, 1970, Proc.: Pittsburgh, Pa., Instrument Society of America, p. 130-135, 1970.
- Kaushal, S.** *See* Gopalan, K. 05696
- 00088 **Kaushal, Sushil K.; Wetherill, George W.** Rubidium 87-strontium 87 age of carbonaceous chondrites: *Jour. Geophys. Research*, v. 75, no. 2, p. 463-468, tables, 1970.
- Kawano, Minoru.** *See* Minato, Susumu. 04406
- 01561 **Kay, Beverley David McClure.** The heat of compression of Na-montmorillonite systems [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 9, p. 3942B, 1970.
- 00801 **Kay, Marshall.** Memorial to Buford Maxwell Miller (1905-1967): *Geol. Soc. America Proc.* 1967, p. 241-242, portrait, 1970.
- 06445 **Kay, Marshall.** Flysch and bouldery mudstone in northeast Newfoundland [with French abs.], in *Flysch sedimentology in North America*: *Geol. Assoc. Canada Spec. Paper* 7, p. 155-164, illus., 1970.
- 06549 **Kay, Marshall.** Continental margins and continental drift, Chap. 36 in *Palaeogeophysics* (S. K. Runcorn, editor): London and New York, Academic Press, p. 333-340, illus., 1970.
- 00411 **Kay, R.; Hubbard, N. J.; Gast, P. W.** Chemical characteristics and origin of oceanic ridge volcanic rocks: *Jour. Geophys. Research*, v. 75, no. 8, p. 1585-1613, illus., tables, 1970.
- 01787 **Kay, Robert; Gast, Paul W.** Rare earths and europium anomalies in undersaturated basaltic rocks [abs.]: *EOS*, v. 51, no. 4, p. 450, 1970.

**Kay, Robert.** See Sykes, Lynn R. 09432

**Kaye, J. H.** See Rancitelli, L. A. 02272

- 04457 **Kays, M. Allan.** Mesozoic metamorphism, May Creek Schist belt, Klamath Mountains, Oregon: Geol. Soc. America Bull., v. 81, no. 9, p. 2743-2758, illus., tables, geol. map, 1970.

- 09814 **Kays, M. Allan.** Western Cascades Volcanic Series, South Umpqua Falls region, Oregon: Ore. Bin., v. 32, no. 5, p. 81-94, illus., 1970.

- 05886 **Kazmann, Raphael G.** The present and future ground-water supply of the Baton Rouge area: Louisiana Water Resources Research Inst. Bull. 5, p. 1-44, illus., tables, 1970.

**Kazmann, Raphael G.** See Wintz, William A., Jr. 07109

- 09427 **Kazmann, Raphael G.** The present and future ground water supply of the Baton Rouge area: Louisiana Water Resources Research Inst. Tech. Rept. 2, 36 p., illus., tables, 1967.

**Keady, D. M.** See Davis, Darrell E. 07335

- 09608 **Keady, Donald M.** Application of moments to mapping the vertical variability of the aquifer systems in Mississippi: State College, Miss., Mississippi State Univ. Water Resources Research Inst., 31 p., illus., table, 1968.

- 09609 **Keady, Donald M.** A study of the hydrochemical facies of the Wilcox aquifers in Mississippi: State College, Miss., Mississippi State Univ. Water Resources Research Inst., 42 p., illus., tables, 1970.

- 05495 **Kealy, Dan; Williams, Roy E.** Mathematical models of ground-water flow as an aid for predicting slope stability in tailings-pond embankments, in Engineering geology and soils engineering symposium, 8th Ann., Pocatello, Idaho, 1970, Proc.: Boise, Idaho, Idaho Dept. Highways, p. 21-36, illus., 1970.

- 10731 **Kealy, Dan; Williams, Roy E.** Finite-element models of water flow through tailings-pond embankments [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 592, 1970.

**Kearney, P. C.** See Woolson, E. A. 02866

- 03705 **Keary, R.** Coastal climate and shelf-bottom sediments — A comment [on a paper by M. O. Hayes, 1967]: Marine Geology, v. 8, no. 5, p. 363-365, 1970.

**Keays, R. R.** See Laul, J. C. 06854

- 04417 **Keays, Reid R.; Crockett, James H.** A study of precious metals in the Sudbury Nickel Irruptive ores: Econ. Geology, v. 65, no. 4, p. 438-450, illus., tables, 1970.

**Keays, Reid R.** See Ganapathy, R. 05679

**Keays, Reid R.** See Ganapathy, R. 05692

- 07047 **Kebeasy, Rashad M.** P-wave travel time anomaly in the north and the east of circum Pacific region [with Japanese abs.]: Tokyo Univ. Earthquake Research Inst. Bull., v. 48, pt. 3, 381-397, illus., tables, 1970.

- 03082 **Keeble, A. B.** The mode of origin and depositional history of kames southwest of Edmonton: Albertan Geographer, no. 6, p. 33-44, illus., tables, 1970.

- 02560 **Keech, C. F.** Groundwater levels in Nebraska, 1969: Nebraska Water Survey Paper 26, 83 p., illus., tables, 1970.
- Keefer, W. R.** See Witkind, I. J. 01466
- 02079 **Keefer, William R.** Structural geology of the Wind River basin, Wyoming: U.S. Geol. Survey Prof. Paper 495-D, p. D1-D35, illus., tables, geol. map, 1970.
- 00527 **Keeler, Charles Martyn.** The relationship between the mechanical and other properties of a mountain snow cover, Alta, Utah, 1967 [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3241B, 1970.
- 00798 **Keen, A. Myra.** Memorial to Joseph John Graham (1909-1967): Geol. Soc. America Proc. 1967, p. 211-213, portrait, 1970.
- 09726 **Keen, Gerald F.** The underground storage of natural gas, in Tri-State Geol. Field Conf., 34th Ann., 1970, Guidebook (I. E. Odom and M. P. Weiss, editors): De Kalb, Ill., Northern Illinois Univ. Dept. Geology, p. 32-33, 1970.
- Keen, M. J.** See Beaumont, C. 03408
- 08054 **Keen, M. J.; Manchester, K. S.** The Mid-Atlantic Ridge near 45°N -- [Pt.] 10, Sediment distribution and thickness from seismic reflection profiling: Canadian Jour. Earth Sci., v. 7, no. 3, p. 735-747, illus., tables, 1970.
- 08117 **Keen, M. J.** A possible diapir in the Laurentian Channel: Canadian Jour. Earth Sci., v. 7, no. 6, p. 1561-1564, illus., 1970.
- 08152 **Keen, M. J.** Fracture zones on the Mid-Atlantic Ridge between 43°N and 44°N: Canadian Jour. Earth Sci., v. 7, no. 5, p. 1352-1355, illus., 1970.
- 09717 **Keen, M. J.; Loncarevic, B. D.; Ewing, G. N.** Continental margin of eastern Canada — georges Bank to Kane Basin, in The sea — v. 4, New concepts of sea floor evolution, Pt. 2, Regional observations (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 251-291, illus., tables, 1970.
- Keen, M. J.** See Manchester, K. S. 10074
- 08243 **Keene, P.; Zawodniak, C. D.** Embankment construction on peat utilizing hydraulic fill [with French abs.], in International Peat Congress, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 45-50, illus., 1970.
- Keeney, D. R.** See Konrad, J. G. 06930
- Keeney, D. R.** See Jacobs, L. W. 07431
- 03330 **Keeney, Dennis R.; Konrad, John G.; Chesters, Gordon.** Nitrogen distribution in some Wisconsin lake sediments: Water Pollution Control Federation Jour., v. 42, no. 3, pt. 1, p. 411-417, tables, 1970.
- Keeney, Dennis R.** See Konrad, John G. 06373
- 09514 **Keeney, Dennis R.; Gardner, W. R.** The dynamics of nitrogen transformations in the soil, in Global effects of environmental pollution—Symposium, Am. Assoc. Adv. Sci., Dallas, Texas, 1968: New York, Springer-Verlag, and Dordrecht-Holland, D. Reidel Pub. Co., p. 96-103, illus., table, 1970.
- Keer, Frederick R.** See Fowler, Michael L. 00702
- Keetch, Mary E.** See Howard, Alan D. 07465
- 00900 **Kehle, Ralph O.; Reid, William M.** Interpreting stress-strain data — Constant strain rate tests [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 286-287, 1970.

- 03752 **Kehle, Ralph O.** Analysis of gravity sliding and orogenic translation: *Geol. Soc. America Bull.*, v. 81, no. 6, p. 1641-1663, illus., table, 1970.
- 08000 **Kehle, Ralph O.** Earth movements — An increasing problem in the cities, in *Environmental geology — AGI short course lecture notes*, Milwaukee, Wis., 1970: Washington, D. C., Am. Geol. Inst., 78 p., paged separately, illus., 1970.
- Kehlenbeck, M. M.** See Wynne-Edwards, H. R. 08121
- Kehrer, Harold H.** See Toksoz, M. Nafi. 10289
- 06484 **Keighin, C. W.** Age and petrology of the Fort Ridgely Granite, southwestern Minnesota [abs.], in *Inst. Lake Superior Geology, 16th Ann.*, Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 26, 1970.
- Keil, Klaus.** See Blander, Milton. 04119
- Keil, Klaus.** See Bunch, T. E. 04438
- Keil, Klaus.** See Blander, Milton. 05677
- Keir, D. L.** See Hamilton, E. L. 03725
- Keir, D. L.** See Hamilton, E. L. 10646
- Keith, J.** See Bogard, D. D. 02270
- 02638 **Keith, J. W.** Tectonic control of Devonian reef sedimentation, Alberta [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 854, 1970.
- 01788 **Keith, M. L.** Ocean floor convergence, a contrary view of global tectonics [abs.]: *EOS*, v. 51, no. 4, p. 430, 1970.
- Keith, M. L.** See Rose, Arthur W. 04310
- Keith, Stanton B.** See Peirce, H. Wesley. 07209
- Kelleher, John.** See Savino, John. 01633
- 04408 **Kelleher, John A.** Space-time seismicity of the Alaska-Aleutian seismic zone: *Jour. Geophys. Research*, v. 75, no. 29, p. 5745-5756, illus., 1970.
- 08554 **Keller, E. A.** Bed-load movement experiments, Dry Creek, California: *Jour. Sed. Petrology*, v. 40, no. 4, p. 1339-1344, illus., tables, 1970.
- 00293 **Keller, Edward A.** Pool-riffle spacing in Dry Creek, near Winters, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 106-107, 1970.
- Keller, F. J.** See Wark, J. W. 06147
- Keller, George H.** See Richards, Adrian F. 00176
- Keller, George H.** See Bennett, Richard H. 05661
- 06764 **Keller, George H.; Bennett, Richard H.** Variations in the mass physical properties of selected submarine sediments: *Marine Geology*, v. 9, no. 3, p. 215-223, illus., tables, 1970.
- 02946 **Keller, George V.** Application of resistivity methods in mineral and groundwater exploration programs [with French abs.], in *Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26*, p. 51-66, illus., tables, 1970.
- Keller, H. H.** See Couch, E. J. 09251

**Keller, O. A.** See Gates, J. S. 08370

- 05668 **Keller, W. D.** Environmental aspects of clay minerals, in Symposium on environmental aspects of clay minerals: Jour. Sed. Petrology, v. 40, no. 3, p. 788-813, illus., tables, 1970.

**Keller, W. D.** See Jackson, Togwell A. 07233

- 07418 **Keller, W. D.** Geologic materials as sources of biologic nutrient elements, in Trace substances in environmental health III — Conf. on Trace Substances in Environmental Health, 3d Ann., Columbia, Mo., 1969, Proc.: Columbia, Mo., Univ. Missouri, p. 3-7, 1970.

**Keller, W. D.** See Huang, W. H. 09065

**Kelley, D. G.** See Poole, W. H. 07973

- 10919 **Kelley, D. R.; McGlade, W. G.** Medina and Oriskany production along the shore of Lake Erie, Pierce Field, Erie County, Pennsylvania, in Ontario Petroleum Inst. Conf., 7th, Windsor, 1968 [Proc.]: Chatham (Ontario), Ontario Petroleum Inst., Tech. Paper No. 10, 41 p., illus., table, 1968.

- 06534 **Kelley, Dana R.; Lytle, William S.; Wagner, Walter R.; Heyman, Louis.** Oil and gas developments in Pennsylvania in 1969 with ten year review and forecast: Pennsylvania Geol. Survey Prog. Rept. 181, 65 p., illus., tables, 1970.

- 09382 **Kelley, Dana R.; Lytle, William S.; Wagner, Walter R.; Heyman, Louis.** The petroleum industry and the future petroleum province in Pennsylvania, 1970: Pennsylvania Geol. Survey, 4th ser., Bull. M65 (Mineral Resources Rept.), 39 p., illus., 1970.

**Kelley, James C.** See Sonderegger, John L. 06735

- 08553 **Kelley, James C.; McManus, Dean A.** Hierarchical analysis of variance of shelf sediment texture: Jour. Sed. Petrology, v. 40, no. 4, p. 1335-1339, illus., tables, 1970.

- 10689 **Kelley, John J.; Hood, Donald W.** Carbon dioxide in the surface waters of the southeastern Being Sea [abs.]: EOS, v. 51, no. 11, p. 769, 1970.

- 07427 **Kelley, K. V., Jr.** Kelley's guide to fossil sharks: Ruskin, Fla., M and M Printing, 30 p., illus., 1970.

- 05852 **Kelling, Gilbert; Stanley, Daniel J.** Morphology and structure of Wilmington and Baltimore submarine canyons, eastern United States: Jour. Geology, v. 78, no. 6, p. 637-660, illus., tables, 1970.

**Kelling, Gilbert.** See Stanley, Daniel J. 06129

- 04799 **Kellogg, Karl; Larson, E. E.; Watson, D. E.** Thermochemical remanent magnetization and thermal remanent magnetization — Comparison in a basalt: Science, v. 170, no. 3958, p. 628-630, illus., 1970.

- 02978 **Kelly, Allan O.** Wind-rain ripple marks, a rare geomorphic phenomenon [abs.]: Arizona Acad. Sci. Jour., v. 6, 1970 Proc. Supp., p. 57, 1970.

**Kelly, J. A.** See Craig, D. B. 04529

- 02148 **Kelly, T. E.; Paulson, Q. F.** Geology and ground water resources of Grand Forks County — Pt. 3, Ground water resources: North Dakota Geol. Survey Bull. 53, pt. 3 (North Dakota Water Comm. County Ground Water Study 13), 58 p., illus., tables, 1970.

- 04921 **Kelly, T. E.; Myers, B. N.; Hershey, L. A.** (and others). Saline ground-water resources of the Rio Grande drainage basin, pilot study — U.S. Office Saline Water

Research and Devel. Prog. Rept. 560: Washington, D.C., U.S. Govt. Printing Office, 71 p., illus., table, 1970.

**Kelly, William C.** *See* Coveney, Raymond M. 08406

**Kemp, Anthony L. W.** *See* Thomas, Richard L. 10273

**Kemp, M. K.** *See* Karaoguz, Dogu. 03519

- 01526 **Kemp, Patrick H.; Plinston, David T.** Beaches produced by waves of low phase difference — Closure [to discussion of paper 6100, 1968]: *Am. Soc. Civil Engineers Proc.*, v. 96, Jour. Hydraulics Div., no. HY 5, p. 1197, 1970.

- 07059 **Kempe, D. R. C.; Deer, W. A.; Wager, L. R.** Geological investigations in East Greenland — Pt. 8, The petrology of the Kangerdlugssuaq alkaline intrusion, East Greenland: *Medd. Grönland*, v. 190, no. 2, 49 p., illus., tables, geol. map, 1970.

- 08404 **Kempe, D. R. C.; Deer, W. A.** Geological investigations in East Greenland — Pt. 9, The mineralogy of the Kangerdlugssuaq alkaline intrusion, East Greenland: *Medd. Grönland*, v. 190, no. 3, 95 p., illus., tables, 1970.

**Kempton, J. P.** *See* Odom, I. E. 09727

- 09729 **Kempton, J. P.; Gross, D. L.** Stratigraphy of the Pleistocene deposits in northeastern Illinois, *in* Tri-State Geol. Field Conf., 34th Ann., 1970, Guidebook (I. E. Odom and M. P. Weiss, editors): De Kalb, Ill., Northern Illinois Univ. Dept. Geology, p. 65-72, illus., 1970.

- 10732 **Kempton, John P.; Gross, David L.** Rate of advance of the Woodfordian glacial margin in Illinois [abs.]: *Geol. Soc. American Abs. with programs*, v. 2, no. 7, p. 592-593, 1970.

- 09851 **Kendrick, Robert.** Induction caving of the Urad mine: *Mining Cong. Jour.*, v. 56, no. 10, p. 39-44, illus., 1970.

- 02750 **Kennard, William C.; Fisher, Jane S.** A bibliography of publications relating to water resources in Connecticut, 1900-1970: *Connecticut Univ. Inst. Water Resources Rept.* 10, 125 p., 1970.

**Kennedy, E. Joyce.** *See* Ruch, R. R. 04488

- 00586 **Kennedy, G. C.; Vaidya, S. N.** The effect of pressure on the melting temperature of solids: *Jour. Geophys. Research*, v. 75, no. 5, p. 1019-1022, illus., 1970.

**Kennedy, G. C.** *See* Williams, D. W. 07235

**Kennedy, George C.** *See* Ito, Keisuke. 07034

**Kennedy, George C.** *See* Ito, Keisuke. 09940

- 09079 **Kennedy, John L.** Drilling porosity log proves accurate: *Oil and Gas Jour.*, v. 68, no. 34, p. 53-55, illus., 1970.

**Kennedy, M. J.** *See* Coates, H. J. 00146

**Kennedy, M. J.** *See* Williams, Harold. 01505

**Kennedy, V. C.** *See* Malcolm, Ronald L. 03331

- 01285 **Kennedy, Vance C.; Kouba, Dorothy L.** Fluorescent sand as a tracer of fluvial sediment: *U.S. Geol. Survey Prof. Paper* 562-E, p. E1-E13, illus., tables, 1970.



- 02291 **Kennett, James P.** Comparison of *Globigerina pachyderma* (Ehrenberg) in Arctic and Antarctic areas: Cushman Found. Foram. Research Contr., v. 21, pt. 2, p. 47-49, illus., table, 1970.
- 10825 **Kennett, James P.; Watkins, N. D.** Plio-Pleistocene volcanism and geomagnetic reversals [abs.]: Internat. Symposium on Recent Crustal Movements and Associated Seismicity, Wellington, N.Z., 1970, Proc.: Wellington, N.Z., Royal Soc. of New Zealand, p. 18-19, 1970.
- 10432 **Kenney, G. I.** Glaciers of Arctic Canada: Canadian Audubon, v. 32, no. 3, p. 96-97, illus., 1970.
- Kent, Bion H.** See Berryhill, Henry L., Jr. 07216
- 10733 **Kent, Dennis; Opdyke, Neil D.; Ewing, Maurice.** The pattern of climate change in the North Pacific using ice rafted detritus as a climatic indicator [abs.]: Geol. Soc. America Abs. with programs, v. 2, no. 7, p. 594, 1970.
- 07171 **Kent, Douglas C.** New FORTRAN-IV programs for electronic data processing of geophysical and water quality data in hydrogeological investigations: Oklahoma Acad. Sci. Proc. 1970, v. 50, p. 140-144, illus., 1970.
- 06600 **Kent, Douglas Charles.** A preliminary hydrogeologic investigation of the upper Skunk River basin [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 759B-760B, 1970.
- 02639 **Kent, Harry C.** Computer-based information bank for Cretaceous foraminifers from western interior region, United States and Canada [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 854-855, 1970.
- Kent, Harry C.** See Haun, John D. 04847
- 02701 **Kent, P. E.** Worldwide development in exploration field [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 855, 1970.
- 01512 **Kentner, Edward; Zeitlin, Harry.** A rapid method for the determination of cobalt in seawater: Anal. Chim. Acta, v. 49, no. 3, p. 587-590, table, 1970.
- 05981 **Kentucky Geological Survey.** Bibliography of coal in Kentucky: Kentucky Geol. Survey, Ser. 10, Spec. Pub. 19, 73 p., 1970.
- 05283 **Kenty, J. D.** Suggested method of test for direct shear strength of rock core specimens, in Special procedures for testing soil and rock for engineering purposes (5th edition): Am. Soc. Testing and Materials Spec. Tech. Pub. 479, p. 613-617, illus., 1970.
- Kepferle, Roy C.** See Peterson, Warren L. 00747
- 02640 **Kepferle, Roy C.; Peterson, Warren L.** Borden delta (Lower Mississippian) in north-central Kentucky [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 855, 1970.
- Kepferle, Roy C.** See Peterson, Warren L. 06167
- 11025 **Kepper, John Charles.** Stratigraphy and petrology of a Middle and Upper Cambrian interval in the Great Basin [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 11, p. 5102B, 1970.
- 00439 **Keppie, J. Duncan.** The Martic thrust and the ages of the Wissahickon Schist and Octararo Phyllite — New structural data [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 25-26, 1970.
- Kern, John M.** See Conkin, James E. 04515

- 05456 **Keroher, Grace C.** Lexicon of geologic names of the United States for 1961-1967: U.S. Geol. Survey Bull. 1350, 848 p., table, 1970.
- 05940 **Kerr, I. S.; Gard, J. A.; Barrer, R. M.; Galabova, Iliana M.** Crystallographic aspects of the co-crystallization of zeolite L, offretite and erionite: *Am. Mineralogist*, v. 55, nos. 3-4, p. 441-454, illus., tables, 1970.
- 07886 **Kerr, J. W.** Geology of outstanding Arctic aerial photographs — [Pt.] 1, Cape Storm area, southern Ellesmere Island: *Bull. Canadian Petroleum Geology*, v. 18, no. 4, p. 463-468, illus., 1970.
- 02641 **Kerr, J. William.** Importance of continental drift to petroleum exploration [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 855, 1970.
- 07684 **Kerr, J. William.** Today's topography and tectonics in northeastern Canada [abs.], in *Symposium on recent crustal movements*, Ottawa, Canada, 1969, *Papers: Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 2, p. 570, 1970.
- 10065 **Kerr, J. William.** North Canada rift system [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, *Abs. Papers: Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2490, 1970.
- 05794 **Kerr, Paul F.; Drew, Isabella M.; Richardson, Darlene S.** Mud volcano clay, Trinidad, West Indies: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 11, p. 2104-2110, illus., tables, 1970.
- Kerr, Paul F.** See Gornitz, Vivien. 11000
- 05648 **Kerrick, D. M.** Contact metamorphism in some areas of the Sierra Nevada, California: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 2913-2937, illus., table, 1970.
- 10734 **Kerrick, D. M.** Jadeitic pyroxene in Franciscan metagraywackes near San Jose, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 594-595, 1970.
- 04991 **Kerridge, J. F.** Meteoritic pyrrhotite: *Meteoritics*, v. 5, no. 3, p. 149-152, illus., 1970.
- Kerridge, J. F.** See Reid, Arch M. 05309
- 00901 **Kesler, Stephen E.; Heath, Stanley A.** Structural evidence for Precambrian rocks in the Xolapa complex, Guerrero, Mexico [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 287, 1970.
- 01938 **Kesler, Stephen E.; Heath, Stanley A.** Structural trends in the southernmost North American Precambrian, Oaxaca, Mexico [abs.]: *EOS*, v. 51, no. 4, p. 421, 1970.
- 03782 **Kesler, Stephen E.; Heath, Stanley A.** Structural trends in the southernmost North American Precambrian, Oaxaca, Mexico: *Geol. Soc. America Bull.*, v. 81, no. 8, p. 2471-2476, illus., 1970.
- 05192 **Kesler, Stephen E.; Josey, William L.; Collins, Earl M.** Basement rocks of western nuclear Central America—The western Chuacús Group, Guatemala: *Geol. Soc. America Bull.*, v. 81, no. 11, p. 3307-3321, illus., tables, geol. map, 1970.

Guatemala: Geol. Soc. America Bull., v. 81, no. 11, p. 3307-3321, illus., tables, geol. map, 1970.

- 10735 **Kesler, Stephen E.; Bateson, J. Howard.** Structural equivalence of the Maya and Macal groups, British Honduras, key to the late-Paleozoic stratigraphy of nuclear Central America [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 595-596, 1970.
- 04415 **Kesler, Thomas L.** Hydrothermal kaolinization in Michoacan, Mexico [with French, German, and Russian abs.]: Clays and Clay Minerals, v. 18, no. 2, p. 121-124, illus., table, 1970.
- Kesling, Robert V.** See Ehlers, George M. 08306
- 08502 **Kesling, Robert V.** Micropaleontology — Mostly a little about much concerning many of the little, *in* Teaching paleontology — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc., Pt. A: Lawrence, Kans., Allen Press, p. 27-39, illus., 1970.
- 08674 **Kesling, Robert V.** *Drepanaster wrighti*, a new species of brittle-star from the Middle Devonian Arkona Shale of Ontario: Michigan Univ. Mus. Paleontology Contr., v. 23, no. 4, p. 73-79, illus., 1970.
- 10805 **Kessinger, Walter Paul, Jr.** Cretaceous (Kiamichi and Duck Creek) Foraminifera from Lynn, Terry, Hockley, and Lamb Counties, Texas, *in* Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas (Leo Hendricks, editor): Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub., no. 67-8, p. 300-308, illus., table, 1967.
- 00624 **Kessler, L. G., 2d.** Bar development and aggradational sequences in the braided portions of the Canadian River, Hutchinson, Roberts, and Hemphill Counties, Texas [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 338, 1970.
- 07330 **Kessler, L. G., 2d; Cooper, Fred G.** Channel sequences and braided stream development in the South Canadian River, Hutchinson, Roberts, and Hemphill Counties, Texas, *in* Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Socs. Trans., v. 20, p. 263-273, illus., table, 1970.
- 04919 **Kesten, S. Norman.** The Van Stone mine, Stevens County, Washington, [Chap.] 11 *in* Lead-zinc deposits in the Kootenay Arc, northeastern Washington and adjacent British Columbia — Soc. Econ. Geologists, 1970 Northwest Field Conf. Guidebook: Washington Div. Mines and Geology Bull. 61, p. 121-123, 1970.
- 05589 **Kester, Dana R.; Pytkowicz, Ricardo M.** Effect of temperature and pressure on sulfate ion association in sea water: Geochim. et Cosmochim. Acta, v. 34, no. 10, p. 1039-1051, illus., tables, 1970.
- Ketner, K. B.** See Tillman, C. G. 10279
- 01473 **Ketner, Keith B.** Geology and mineral potential of the Adobe Range, Elko Hills, and adjacent areas, Elko County, Nevada, *in* Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B105-B108, illus., 1970.
- Ketner, Keith B.** See Smith, George I. 06162

- 06163 **Ketner, Keith B.** Limestone turbidite of Kinderhook age and its tectonic significance, Elko County, Nevada, *in* Geological Survey research 1970, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D18-D22, illus., 1970.
- Kettenbrink, E. C.** *See* Manger, Walter L. 09659
- 00729 **Kettren, Leroy P., Jr.** Igneous intrusions in Highland County, Virginia [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 224-225, 1970.
- 03739 **Keulegan, Garbis H.; Harrison, John.** Tsunami refraction diagrams by digital computer: Am. Soc. Civil Engineers Proc., v. 96, paper 7261, Jour. Waterways and Harbors Div., no. WW 2, p. 219-233, illus., tables, 1970.
- Kevi, L.** *See* Wiebenga, William A. 03986
- Key, G.** *See* Smith, S. V. 09579
- 08770 **Keys, W. S.; Brown, R. F.** The use of well logging in recharge studies of the Ogallala Formation, *in* Ogallala Aquifer Symposium, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, p. 31-48, illus., 1970.
- 03004 **Keys, W. Scott.** Borehole geophysics as applied to groundwater [with French abs.], *in* Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 598-612, illus.; discussion, p. 612-614, 1970.
- 08594 **Khan, Ehsanullah.** Biostratigraphy and palaeontology of a Sangamon deposit at Fort Qu'Appelle, Saskatchewan [with French abs.]: Canada Natl. Mus. Nat. Sci. Pubs. Palaeontology, no. 5, 82 p., illus., tables, 1970.
- 02129 **Khan, Mohammad Asadullah; Woollard, George P.** Geophysical implications of the interrelationship of the geogravity and geomagnetic fields: Nature, v. 226, no. 5243, p. 340-342, illus., tables, 1970.
- 09044 **Khan, Mohammad Asadullah.** Internal structure of the Earth from the geogravity field and other geophysical data: Hawaii Inst. Geophysics [Rept.] HIG-70-14. 52 p., illus., tables, 1970.
- Khan, Mohammad Asadullah.** *See* Woollard, George P. 10198
- 00504 **Khangerot, Agam Singh.** Relative intensity of soil weathering of Wisconsin and Illinoian-age terraces near Newark, Ohio [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 2991B, 1970.
- 06460 **Khanna, Sat Dev.** Experimental investigation of form of bed-roughness: Am. Soc. Civil Engineers Proc., v. 96, paper 7623, Jour. Hydraulics Div., no. HY 10, p. 2029-2040, illus., 1970.
- Kharin, G. S.** *See* Barash, M. S. 00830
- Kharin, G. S.** *See* Yemel'yanov, Ye. M. 07211
- Kharkar, D. P.** *See* Turekian, K. K. 01700
- Kharkar, D. P.** *See* Turekian, Karl K. 05727
- 07931 **Khattab, Khattab Mansour M.** Analysis of uranium and thorium and their daughter nuclides in uranium-thorium ores by high-resolution gamma-ray spectroscopy [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3590B, 1970.
- 11276 **Khattak, Jehangir Khan.** Weathering product of basalt at Tucson, Arizona, U.S.A.: Peshawar Univ. Geol. Bull., v. 5, no. 1, p. 135-138, 1970.
- 07290 **Khattri, Kailash Nath.** Kinematic parameters of earthquakes [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2772B, 1970.

- 09383 **Khera, Raj P.; Krizek, Raymond J.** Effect of principal consolidation stress difference on undrained shear strength: Soils and Foundations. v. 8, no. 1, p. 1-17, illus., tables, 1968.
- 01292 **Kheradpir, Ahmad.** Foraminiferal trends in the Quaternary of Tanner Basin, California: Micropaleontology, v. 16, no. 1, p. 102-116, illus., 1970.
- 08348 **Khin, BaSaw.** Corretite from Saginaw Hill, Arizona: Mineralog. Rec., v. 1, no. 3, p. 117-118, illus., 1970.
- 00163 **Khoury, S. G.; Abdel-Khalek, M. Lotfi.** Effect of a Precambrian orogeny on some layered rocks in the Piedmont of central Virginia [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 26, 1970.
- Kiefer, Fred W.** See Seed, H. Bolton. 03635
- 04731 **Kienle, Jürgen.** Gravity traverses in the Valley of Ten Thousand Smokes, Katmai National Monument, Alaska: Jour. Geophys. Research, v. 75, no. 32, p. 6641-6649, illus., table, 1970.
- 10594 **Kienle, Jürgen; Bingham, Douglas; Forbes, R. B.** Seismic and geologic evidence of pre-1912 tuff deposits in the Valley of 10,000 Smokes, Katmai National Monument, Alaska [abs.]: EOS, v. 51, no. 11, p. 829, 1970.
- Kienzen, Geraldine.** See McNulty, C. L., Jr. 04131
- 00579 **Kier, Porter M.** Lantern support structures in the clypeasteroid echinoids: Jour. Paleontology, v. 44, no. 1, p. 98-109, illus., 1970.
- Kierans, T. W.** See Benson, R. P. 09155
- 04370 **Kiesl, W.; Weinke, H. H.** Über Mangandaubréelith in den Troilitknollen des Odesa-Eisenmeteorits [On the manganese daubréelite in the troilite inclusions of the Odesa-iron meteorite (with English abs.)]: Mikrochim. Acta 1970, pt. 2, p. 392-402, illus., tables, 1970.
- Kiff, Irving T.** See Worthington, Joseph E. 04958
- Kiilsgaard, Thor H.** See Becraft, George E. 01878
- 03207 **Kiilsgaard, Thor H.; Freeman, Val L.; Coffman, Joseph S.** Mineral resources of the Sawtooth Primitive Area, Idaho: U.S. Geol. Survey Bull. 1319-D, p. D1-D174, illus., tables, geol. map, 1970.
- 09854 **Kiilsgaard, Thor H.; Pearson, Robert C.** Effect of wilderness policy on exploration activity—As observed from the government viewpoint: Mining Cong. Jour., v. 56, no. 12, p. 39-44, illus., 1970.
- 09767 **Kilfoyle, Clinton F.** Catalog of type specimens of fossils in the New York State Museum. Supplement 6: New York State Mus. and Sci. Service Bull. 413, 305 p., 1969.
- 09208 **Kilgour, R. J.** Mining experience with permafrost, in Canadian Conf. on Permafrost, 3d, 1969, Proc. (R. J. E. Brown, editor): Natl. Research Council Canada, Associate Comm. Geotech. Research Tech. Memo. 96, p. 65-70, 1969.
- 07799 **Kilinc, I. A.; Lyon, R. J. P.** Airborne infrared spectral study of igneous rocks, in Earth Resources Aircraft Program, status review, 2d Ann., Houston, Tex., 1969 — V. 2, Agriculture, Forestry, and sensor studies: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 26-1—26-21, illus., [1970,].
- 06601 **Kilinc, Ishak Attila.** Experimental metamorphism and anatexis of shales and graywackes [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 760B, 1970.

- 08129 **Killeen, P. G.; Carmichael, C. M.** Gamma-ray spectrometer calibration for field analysis of thorium, uranium and potassium: Canadian Jour. Earth Sci., v. 7, no. 4, p. 1093-1098, illus., 1970.
- 00164 **Kim, Ann G.** Geochemistry of methane formation in coal—[Pt.] 1, Microbial generation [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 26-27, 1970.
- 06594 **Kim, Jong Sol.** Load-deformation-time behavior in clays [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 730B, 1970.
- Kim, R. Y.** See Hardy, H. Reginald, Jr. 01922
- Kim, R. Y.** See Hardy, H. R., Jr. 07451
- 03184 **Kim, Stephen M.** Illinois State Geological Survey radiocarbon dates II: Radiocarbon, v. 12, no. 2, p. 503-508, 1970.
- Kim, Y. D.** See Soderman, L. G. 02897
- Kim, Y. S.** See Hardy, H. Reginald, Jr. 03994
- Kim, Young C.** See Merriam, Richard. 02308
- 04216 **Kim, Young S.; Zeitlin, Harry.** Thorium hydroxide as a collector of molybdenum from sea water: Anal. Chim. Acta, v. 51, no. 3, p. 516-519, illus., tables, 1970.
- 00514 **Kim, Yung Sam.** An experimental investigation of initial failure criteria for brittle materials [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3208B-3209B, 1970.
- Kimble, E. J.** See Hardy, H. Reginald, Jr. 01922
- 05065 **Kimble, Oscar K.** Fluid model studies of the storage of freshwater in saline aquifers, in Saline water symposium: Water Resources Research, v. 6, no. 5, p. 1522-1527, illus., 1970.
- Kimble, Oscar K.** See Kumar, Anil. 08026
- Kimmel, G. E.** See Cohen, Philip. 06191
- 02125 **Kimmel, Grant E.; Schiner, George R.** The Shenango Formation (Mississippian) in northwestern Pennsylvania: U.S. Geol. Survey Bull. 1294-C, p. C1-C13, illus., 1970.
- Kimoto, S.** See Oshima, T. 09795
- 07261 **Kimura, Hubert Satoshi.** Alkaline dissolution of kaolin, montmorillonite, Windy soil and saprolite clay minerals [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2413B, 1970.
- 07058 **Kimyai, Abbas.** Plant microfossils from the Raritan Formation (Cretaceous) in Long Island [with French abs.]: Pollen et Spores, v. 12, no. 2, p. 181-204, illus., table, 1970.
- Kindle, C. H.** See Fritz, W. H. 05550
- 04201 **Kindle, E. D.** Preliminary report on the copper deposits, Coppermine River area, District of Mackenzie: Canada Geol. Survey Paper 70-49, 13 p., table, 1970.
- King, Billy Joe.** See Tully, Philip C. 02839
- King, C. A. M.** See McCullagh, M. J. 03201

- 01939 **King, Chi-Yu; O'Neill, Mary E.; Healy, John H.** Source parameters of the Salmon and Sterling nuclear explosions [abs.]: EOS, v. 51, no. 4, p. 345, 1970.
- 02304 **King, Chi-Yu.** Acoustic efficiency of tensile fracture in glass: Earthquake Notes, v. 41, no. 1, p. 31-36, illus., table, 1970.
- 03510 **King, Chi-Yu.** Particle motion along a kinematic fault model: Seismol. Soc. America Bull., v. 60, no. 2, p. 491-501, illus., 1970.
- 10736 **King, Chi-Yu; Nason, Robert D.; Tocher, Don.** Particle motion during fault-creep events [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 596, 1970.
- 06440 **King, Darrell L.** The role of carbon in eutrophication [with French, German, Portuguese, and Spanish abs.]: Water Pollution Control Federation Jour., v. 42, no. 12, p. 2035-2051, illus., tables, 1970.
- 05675 **King, Elbert A., Jr.; Martin, R.; Nance, Weldon B.** Tektite glass *not* in Apollo 12 samples — [Discussion of "Tektite glass in Apollo 12 sample," by J. A. O'Keefe, 1970]: Science, v. 170, no. 3954, p. 199-200, illus., table, 1970.
- King, Elizabeth R.** See Brosgé, William P. 00467
- 04595 **King, Elizabeth R.; Harrison, Jack E.; Griggs, Allan B.** Geologic implications of aeromagnetic data in the Pend Oreille area, Idaho and Montana: U.S. Geol. Survey Prof. Paper 646-D, p. D1-D17, illus., table, geol. map, 1970.
- 04135 **King, H. W.; Gillham, C. J.; Huggins, F. G.** A versatile Bragg-Brentano/Seeman-Bohlin powder diffractometer, in Advances in X-ray analysis, V. 13 — Applications of X-ray analysis, 18th Ann. Conf., 1969, Proc.: New York, Plenum Press, p. 550-597, illus., tables, 1970.
- 02975 **King, James E.** Wisconsin-age boreal assemblages from the Ozarks of western Missouri [abs.]: Arizona Acad. Sci. Jour., v. 6, 1970 Proc. Supp., p. 23, 1970.
- King, James E.** See Mehringer, Peter J., Jr. 08048
- King, James E.** See Wood, W. Raymond. 09228
- King, Kenneth W.** See Engdahl, Eric R. 01631
- King, L. H.** See Rashid, M. A. 00477
- King, L. H.** See Phipps, C. V. G. 02448
- 04727 **King, Lewis H.; MacLean, Brian.** A diapiric structure near Sable Island, Scotian Shelf: Maritime Sediments, v. 6, no. 1, p. 1-4, illus., 1970.
- 04884 **King, Lewis H.; MacLean, Brian.** Pockmarks on the Scotian Shelf: Geol. Soc. America Bull., v. 81, no. 10, p. 3141-3148, illus., table, 1970.
- 04939 **King, Lewis H.** Surficial geology of the Halifax-Sable Island map area: Canada Dept. Energy, Mines and Resources, Marine Sci. Br. Paper 1, 16 p., illus., geol. map, 1970.
- 05868 **King, Lewis H.; MacLean, Brian.** Continuous seismic-reflection study of Orpheus gravity anomaly: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 11, p. 2007-2031, illus., 1970.
- 07674 **King, Lewis H.; MacLean, B.; Bartlett, Grant A.; Jeletzky, J. A.; Hopkins, William S., Jr.** Cretaceous strata on the Scotian Shelf: Canadian Jour. Earth Sci., v. 7, no. 1, p. 145-155, illus., tables, 1970.
- 07679 **King, Lewis H.; MacLean, Brian.** Observations on Cretaceous outcrop from a submersible — Scotian Shelf: Canadian Jour. Earth Sci., v. 7, no. 1, p. 188-190, illus., 1970.

- 08126 **King, Lewis H.; MacLean, Brian.** Origin of the outer part of the Laurentian Channel: *Canadian Jour. Earth Sci.*, v. 7, no. 6, p. 1470-1484, illus., 1970.
- 04470 **King, M. S.; Acar, K. Z.** Creep properties of Saskatchewan potash as a function of changes in temperature and stress, in *Third symposium on salt*, V. 2 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 226-235, illus., table, 1970.
- 07507 **King, M. S.** Static and dynamic elastic moduli of rocks under pressure, Chap. 19 in *Rock mechanics, theory and practice* — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 329-351, illus., table, 1970.
- 09834 **King, M. S.** Ultrasonic compressional and shear-wave velocities of confined rock samples, in *Canadian Rock Mechanics Symposium*, 5th, Toronto, 1968, Proc.: Ottawa, Canada Dept. Energy, Mines and Resources Mines Br., p. 127-156, illus., table, discussion, 1969.
- 02378 **King, Philip B.** Fossiliferous boulders in the Woods Hollow Shale, Marathon region, Texas — Discussion [of "Stratigraphy and sedimentology of the Woods Hollow Formation. . ." by E. F. McBride, 1969]: *Geol. Soc. America Bull.*, v. 81, no. 6, p. 1843-1845, 1970.
- 05040 **King, Philip B.** Tectonics and geophysics of eastern North America, [Chap.] 5 in *The megatectonics of continents and oceans* (Helgi Johnson and Bennett L. Smith, editors): New Brunswick, N. J., Rutgers Univ. Press, p. 74-112, illus., 1970.
- 06027 **King, Philip B.** The Precambrian of the United States of America — Southeastern United States, in *The geologic systems — The Precambrian*, V. 4 (Kalervo Rankama, editor): New York and London, Interscience-John Wiley and Sons, p. 1-71, illus., tables, 1970.
- King, Richard.** See Creighton, Reginald. 09184
- King, Robert E.** See Halbouty, Michel T. 07768
- 03434 **King, Rubert U.** (compiler). Molybdenum in the United States, exclusive of Alaska and Hawaii: U.S. Geol. Survey Mineral Inv. Resource Map MR-55, scale 1:3,168,000, separate text, 1970.
- 08444 **Kingsbury, Robert C.** An atlas of Indiana: Indiana Univ. Dept. Geography Occasional Pub. 5, 94 p., illus., 1970.
- 02023 **Kingston, Gary A.; Miller, Robert A.; Carrillo, Fred V.** Availability of U.S. chromium resources: U.S. Bur. Mines Inf. Circ. 8465, 23 p., illus., tables, 1970.
- 03208 **Kingston, Gary A.; Carrillo, Fred V.; Gray, Jerry J.; McIlroy, Paul.** Availability of U.S. primary nickel resources: U.S. Bur. Mines Inf. Circ. 8469, 57 p., illus., tables, 1970.
- Kinney, Edward E.** See Zeller, Robert A., Jr. 08647
- 10737 **Kinney, Patrick J.; Williams, Peter M.; Arhelger, Martin.** Carbon-14 dating of dissolved and particulate organic carbon in the ocean [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 596, 1970.
- Kinoshita, H.** See Nagata, T. 06352
- 02642 **Kinsman, David J. J.** Geochemistry, mineralogy, and occurrence of calcium sulfate minerals [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 855-856, 1970.
- 10738 **Kinsman, David J. J.** Trace cations in aragonite [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 596-597, 1970.



- Kintzinger, Paul R.** See Hohmann, Gerald W. 04785
- Kirby, John R.** See Zietz, Isidore. 05125
- Kirby, S. H.** See Raleigh, C. B. 01627
- Kirby, Stephen H.** See Raleigh, C. Barry. 09943
- 03222 **Kirichenko, L. V.** Radon exhalation from vast areas according to vertical distribution of its short-lived decay products: Jour. Geophys. Research, v. 75, no. 18, p. 3639-3649, illus., tables, 1970.
- Kirk, Jon N.** See Dellwig, Louis F. 09798
- 08378 **Kirk, Ruth.** The oldest man in America: New York, Harcourt Brace Jovanovich, Inc., 96 p., illus., 1970.
- 06531 **Kirkby, Edward A.** Geologic map index of Michigan, 1843-1962: Michigan Geol. Survey Circ. 8, 56 p., illus., 1970.
- 09017 **Kirkham, Don.** The importance of water resources research, in Water resources of Iowa — A symposium, Paul J. Horick, editor: Cedar Falls, Iowa, Iowa Acad. Sci., Geology Sec., p. 158-175, 1970.
- Kirkland, D. W.** See Davis, J. B. 04309
- 08576 **Kirkland, D. W.; Frederiksen, N. O.** *Cordaitina* pollen from Pennsylvanian strata of Oklahoma and Texas: Rev. Palaeobotany and Palynology, v. 10, no. 3, p. 221-231, illus., tables, 1970.
- 05189 **Kirkland, Douglas W.; Anderson, Roger Y.** Microfolding in the Castile and Todilto evaporites, Texas and New Mexico: Geol. Soc. America Bull., v. 81, no. 11, p. 3259-3281, illus., 1970.
- Kirklin, Richard H.** See Shopland, Robert C. 03354
- Kirkwood, Samuel.** See Swain, Frederick W. 00435
- 10580 **Kirsch, Jeffrey W.; Hastings, Carl R.** Hydrodynamic equation of state for homogeneous mixtures of rock and water [abs.]: EOS, v. 51, no. 11, p. 826, 1970.
- 00295 **Kirsch, Stephen A.** The structure of Mineral Ridge, Esmeralda County, Nevada [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 107-108, 1970.
- 10066 **Kirschner, C. E.; Lyon, C. A.** Stratigraphic and tectonic development of Cook Inlet petroleum province [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2490, 1970.
- 05706 **Kirsten, T.; Müller, O.; Steinbrunn, F.; Zähringer, J.** Study of distribution and variations of rare gases in lunar material by a microprobe technique, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Suppl. 1), p. 1331-1343, illus., tables, 1970.
- Kirwan, R. W.** See Glynn, T. E. 08252
- Kiselev, Yu. G.** See Dementitskaya, R. M. 10030
- Kisiel, Chester C.** See Moench, Allen F. 03985
- 07571 **Kissel, David Edwin.** A study of some reactions of acidity in selected Kentucky soils [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 3, p. 1009B, 1970.

- 00730 **Kissling, Don L.** Recent and Silurian circumrotary corals [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 225, 1970.
- Kissling, Don L.** See Howard, James F. 02386
- 01940 **Kisslinger, Carl; Cherry, J. T., Jr.** Excitation of earthquakes by underground explosions [abs.]: *EOS*, v. 51, no. 4, p. 353, 1970.
- Kisslinger, Carl.** See Rogers, Al. 09544
- Kistler, R. W.** See Evernden, J. F. 00207
- 10739 **Kistler, Ronald W.** Fold orientations and intrusion loci in the central Sierra Nevada, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 597, 1970.
- 07665 **Kittrick, J. A.** Precipitation of kaolinite at 25°C and 1 atm [with French, German, and Russian abs.]: *Clays and Clay Minerals*, v. 18, no. 5, p. 261-267, illus., 1970.
- 01941 **Klappenberger, Fred A.** Distribution of short period P-phase amplitudes at LASA [abs.]: *EOS*, v. 51, no. 4, p. 358, 1970.
- 08749 **Klapper, Gilbert; Berry, W. B. N.; Boucot, A. J.** Conodont correlations, in *Correlation of the North American Silurian rocks*: *Geol. Soc. America Spec. Paper* 102, p. 35-38, 1970.
- 07862 **Klassen, R. W.; Wyder, J. E.; Bannatyne, B. B.** Bedrock topography and geology of southern Manitoba: *Manitoba Dept. Mines and Nat. Resources Map* 25-1970, scale 1:500,000, sections, descriptive notes, 1970; also in *Canada Geol. Survey Paper* 70-51, 1970.
- 10938 **Klassen, R. W.; Wyder, J. E.** Bedrock topography, buried valleys and nature of the drift, Virden map-area, Manitoba: *Canada Geol. Survey Paper* 70-56, 11 p., illus., geol. map, 1970.
- 04563 **Klaus, Wilhelm.** Utilization of spores in evaporite studies, in *Third symposium on salt*, V. 1 (J. L. Rau and L. F. Dellwig, editors): *Cleveland, Ohio, Northern Ohio Geol. Soc.*, p. 30-33, 1970.
- 09096 **Kleck, Wallace D.** Cavity minerals at Summit Rock, Oregon: *Am. Mineralogist*, v. 55, nos. 7-8, p. 1396-1404, illus., table, 1970.
- Kleeman, J. D.** See Gibbons, Rex V. 10525
- 10596 **Kleeman, J. D.** Uranium distribution in some eclogite and peridotite inclusions [abs.]: *EOS*, v. 51, no. 11, p. 830, 1970.
- 03954 **Klein, David H.; Goldberg, Edward D.** Mercury in the marine environment: *Environmental Sci. and Technology*, v. 4, no. 9, p. 765-768, illus., 1970.
- Klein, Edward.** See LeGeros, Racquel Z. 02803
- 02878 **Klein, Edward; LeGeros, John P.; Trautz, Otto R.; LeGeros, Racquel Z.** Polarized infrared reflectance of single crystals of apatites, in *Developments in applied spectroscopy*, V. 7B — *Mid-America Spectroscopy Symposium*, 19th Ann., Chicago, Ill., 1968, Selected papers: New York and London, Plenum Press, p. 13-22, illus., table, 1970.
- 11002 **Klein, G. deVries; Middleton, G. V.** Intertidal sandbars in the Minas Basin, Bay of Fundy [abs.]: *Geol. Soc. London Proc.* 1970, no. 1663, p. 143-144, discussion, 1970.
- 08546 **Klein, George deVries.** Depositional and dispersal dynamics of intertidal sand bars: *Jour. Sed. Petrology*, v. 40, no. 4, p. 1095-1127, illus., tables, 1970.

- 10740 **Klein, George deVries.** Paleotidal sedimentation [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 598, 1970.
- 10498 **Kleinecke, David.** The use of linear programming for estimating geohydrological parameters of groundwater [abs.]: EOS, v. 51, no. 11, p. 749, 1970.
- Kleinhampl, F. J.** See Rogers, C. L. 04246
- Kleinhampl, Frank J.** See Albers, John P. 04240
- Kleinkopf, M. D.** See Witkind, I. J. 01466
- 00756 **Kleinkopf, M. Dean.** Magnetic and gravity studies in the Black Hills, South Dakota [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 338-339, 1970.
- 01468 **Kleinkopf, M. Dean; Peterson, Donald L.; Johnson, Ross B.** Reconnaissance geophysical studies of the Trinidad quadrangle, south-central Colorado, in Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B78-B85, illus., 1970.
- 03472 **Kleinkopf, M. Dean; Peterson, Donald L.; Gott, Garland.** Geophysical studies of the Cripple Creek mining district, Colorado: Geophysics, v. 35, no. 3, p. 490-500, illus., 1970.
- 02731 **Kleiss, Harold J.** Hillslope sedimentation and soil formation in northeastern Iowa: Soil Sci. Soc. America Proc., v. 34, no. 2, p. 287-290, illus., 1970.
- 04698 **Klemic, Harry.** Iron ore deposits of the United States of America, Puerto Rico, Mexico and Central America, in Survey of world iron ore resources, occurrence and appraisal: New York, United Nations Dept. Econ. and Social Affairs, p. 411-477, illus., tables, 1970.
- Klemme, H. Douglas.** See Halbouty, Michel T. 07768
- Klemmer, Howard W.** See Hori, Daniel H. 10840
- 11017 **Klesse, Elmar.** Geology of the El Ocotito-Ixcuinatoyac region and of La Dicha stratiform sulphide deposit, State of Guerrero [with Spanish and German abs.]: Soc. Geol. Mexicana Bol. 1968, v. 31, no. 2, p. 107-140, illus., tables, geol. map, 1970.
- 03319 **Kliwer, Gene.** Challenger Leg 10 finds gas in Gulf of Mexico: World Oil, v. 171, no. 2, p. 43-45, illus., 1970.
- 05994 **Klimowski, Richard Joseph.** Development and application of a high-resolution mass spectrometer-computer system [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5461B, 1970.
- 02430 **Kline, Charles H.** Industrial minerals in the world economy [abs.]: Mining Eng., v. 22, no. 1, p. 42, 1970.
- Kline, D.** See Chaterlain, A. 04402
- Kline, D.** See Weeks, R. A. 06300
- Kline, Judith K.** See Urban, James B. 00576
- Kling, S. A.** See Bukry, D. 02723
- Kling, Stanley A.** See Logan, John M. 09646
- Klingeman, Peter C.** See Roberts, Michael C. 03620
- Klinkenberg, H.** See Gale, L. A. 10775

- 07430 **Klobe, W. D.; Gast, R. G.** Conditions affecting cesium fixation and sodium entrapment in hydrobiotite and vermiculite: *Soil Sci. Soc. America Proc.*, v. 34, no. 5, p. 746-750, illus., tables, 1970.
- 07486 **Klosterman, Gregory E.** Mineral aggregates, exploration, mining and reclamation, *in* Forum on geology of industrial minerals, 5th, Harrisburg, Pa., 1969, *Proc.: Pennsylvania Geol. Survey, 4th ser., Bull. M64 (Mineral Resources Rept.)*, p. 233-241, illus., 1970.
- 05046 **Klotz, John W.** Assumptions in science and paleontology, [Chap.] 2 *in* Rock strata and the Bible record (P. A. Zimmerman, editor): St. Louis, Mo., and London, England, Concordia Publishing House, p. 24-39, 1970.
- 07212 **Klotz, John W.** Genes, Genesis and evolution (2d revised edition): Saint Louis, Mo., Concordia Publishing House, 544 p., illus., tables, 1970.
- Klovan, J. E.** See Solohub, J. T. 01535
- Klovan, J. E.** See Embry, A. F., 3d. 02613
- Klovan, J. E.** See Hitchon, Brian. 02630
- Klovan, J. E.** See Dolphin, Dale R. 05289
- Klovan, J. E.** See Bayliss, P. 08413
- 10067 **Klovan, J. Edward; Embry, Ashton F.** Upper Devonian stratigraphy and structure, western Canadian Arctic Islands [abs.], *in* Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2491, 1970.
- 00625 **Klusman, Ronald W.; Towell, David G.** Some observed systematics of calcium zonation in plagioclase of rocks from the Tobacco Root batholith, southwestern Montana [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 339, 1970.
- 05791 **Klusman, Ronald W.** A comprehensive computer program for plotting of electron microprobe elemental profiles: *Jour. Geology*, v. 78, no. 6, p. 751, 1970.
- 03023 **Klusman, Ronald William.** Electron microprobe analysis of feldspars [abs.]: *Disser. Abs. Internat., Sec. B., Sci. and Eng.*, v. 30, no. 11, p. 5102B-5103B, 1970.
- Klute, A.** See Raats, P. A. C. 09603
- 10345 **Klute, A.; Peters, D. B.** Hydraulic and pressure head measurement with strain gauge pressure transducers, *in* Water in the unsaturated zone, V. 1: Internat. Assoc. Sci. Hydrology Pub. 82, p. 156-165, illus., 1968.
- Klute, A.** See Whisler, F. D. 10348
- 05565 **Knapp, Carol E.** Mercury in the environment: *Environmental Sci. and Technology*, v. 4, no. 11, p. 890-892, illus., tables, 1970.
- Knarr, Bruce Alan.** See McJunkin, Frederick Eugene. 10441
- Knauer, George A.** See Wallick, Edward I. 03423
- 10068 **Knebel, Harley J.; Creager, Joe S.** Holocene sedimentary framework of east-central Bering Shelf — preliminary results [abs.], *in* Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2491, 1970.
- Knecht, Joseph.** See Orchard, R. J. 06782

- 07518 **Kneller, W. A.** (editor). Sixth forum on geology of industrial minerals, Ann Arbor, Mich., 1970, Proc.: Michigan Geol. Survey Miscellany 1, 155 p., illus., tables, 1970.
- 01449 **Knight, Charles A.; LaChapelle, E.** Further observations on stress-generated ice in the Blue Glacier, Washington, U.S.A. [with French and German abs.]: Jour. Glaciology, v. 9, no. 55, p. 87-101, illus., 1970.
- Knight, Curtis A.** See Shapiro, Irwin I. 09982
- 10939 **Knight, F. P.** Mining in Arizona, its past, its present, its future: Phoenix, Ariz., Arizona Dept. Mineral Resources, 52 p., illus., tables, revised 1970.
- 06873 **Knight, Louis Harold, Jr.** Structure and mineralization of the Oro Blanco mining district, Santa Cruz County, Arizona [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 1, p. 251B, 1970.
- 10981 **Knisel, Walter G., Jr.; Baird, Ralph W.** Depth-integrating and dip samplers: Am. Soc. Civil Engineers Proc., v. 96, paper 7084, Jour. Hydraulics Div., no. Hy 2, p. 497-507, illus., table, 1970.
- Knoke, R.** See Usdowski, E. 01845
- 09047 **Knop, Osvald; Huang, Chung-Hsi; Woodhams, F. W. D.** Chalcogenides of the transition elements — [Pt.] 7, A Mössbauer study of pentlandite: Am. Mineralogist, v. 55, nos. 7-8, p. 1115-1130, illus., table, 1970.
- 03679 **Knopoff, L.; Mal, A. K.; Alsop, L. E.; Phinney, R. A.** A property of long-period Love waves: Jour. Geophys. Research, v. 75, no. 20, p. 4084-4086, illus., 1970.
- 03964 **Knopoff, L.; Randall, M. J.** The compensated linear-vector dipole — A possible mechanism for deep earthquakes: Jour. Geophys. Research, v. 75, no. 26, p. 4957-4963, 1970.
- Knopoff, L.** See Randall, M. J. 03965
- 06745 **Knopoff, L.** Models of continental drift, in Geophysical studies on the evolution of the Earth's deep interior — A symposium, Madrid, 1969, Proc.: Physics Earth and Planetary Interiors, v. 2, no. 5 (spec. issue), p. 386-392, illus., 1970.
- 07310 **Knopoff, L.; Schlue, J. W.; Schwab, F. A.** Phase velocities of Rayleigh waves across the East Pacific Rise, in Geothermal problems — Symposium, Madrid, Spain, 1969, Proc.: Tectonophysics, v. 10, nos. 1-3 (spec. issue), p. 321-334, illus., tables, 1970.
- 05041 **Knopoff, Leon.** Developments in seismology and georheology, [Chap.] 6 in The megatectonics of continents and oceans (Helgi Johnson and Bennett L. Smith, editors): New Brunswick, N. J., Rutgers Univ. Press, p. 113-146, illus., 1970.
- 10550 **Knopoff, Leon; Jackson, David D.; Mitchel, Robert.** A stochastic model of earthquake fault zones [abs.]: EOS, v. 51, no. 11, p. 780, 1970.
- Knott, S. T.** See Emery, K. O. 00099
- Knowles, C. E.** See Reid, R. O. 06654
- Knowles, Doyle B.** See LaMoreaux, Philip E. 11248
- Knox, E. G.** See Carstea, D. D. 02569
- Knox, E. G.** See Carstea, D. D. 07618
- 07932 **Knox, James Clarence.** Stream channel adjustment to physiographic factors in small drainage basins, Iowa and southwestern Wisconsin [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3473B, 1970.

- 02475 **Knox, Reed, Jr.** The yield strength of meteoritic iron: *Meteoritics*, v. 5, no. 2, p. 63-74, tables, 1970.
- 10741 **Knudson, Charles F.** Worldwide strong-motion instruments [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 598, 1970.
- 04342 **Knutilla, R. L.** Water resources of the Black River basin, southeastern Michigan: *U.S. Geol. Survey Hydrol. Inv. Atlas HA-338*, 3 sheets, scale 1:125,000, text, 1970.
- 08289 **Knutilla, R. L.** Water resources of the River Rouge basin, southeastern Michigan: *U.S. Geol. Survey Hydrol. Inv. Atlas HA-356*, 2 sheets, maps, diagrams, separate text, 1970.
- 05102 **Ko, H. Y.; Christensen, E. M.** Lunar soil erosion — Surveyor attitude control jets, *in* Analysis of Surveyor data: California Inst. Technology Jet Propulsion Lab. Tech. Rept. 32-1443, p. 141-163, illus., 1970.
- 07299 **Ko, Kyung Chul.** The failure criteria and deformational moduli of granular rock [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 5, p. 2734B, 1970.
- 06719 **Koch, Donald L.** Stratigraphy of the Upper Devonian Shell Rock Formation of north-central Iowa: *Iowa Geol. Survey Rept. Inv. 10*, 123 p., illus., 1970.
- Koch, Donald L.** See Parker, Mary C. 09915
- 03808 **Koch, George S., Jr.; Link, Richard F.** Statistical analysis of geological data: New York and London, John Wiley and Sons, 375 p., illus., tables, 1970.
- Koch, George S., Jr.** See Link, Richard F. 08610
- Koch, J.** See Jacob, H. 08260
- 06729 **Koch, Karl-Rudolf.** Gravity anomalies for ocean areas from satellite altimetry, *in* Marine geodesy, a practical view — Symposium on Marine Geodesy, 2d, 1969: Washington, D. C., Marine Technology Soc., p. 301-307, 1970.
- Koch, Neil C.** See Hedges, Lynn S. 04003
- 05841 **Koch, Neil C.** Geology and water resources of Campbell County, South Dakota — Pt. 2, Water resources: *South Dakota Geol. Survey Bull. 20*, pt. 2, 38 p., illus., tables, 1970.
- Kodama, H.** See Ross, G. J. 06790
- 10251 **Kochler, J. G.; Needham, R. A.** Manual for chemical analysis of minerals containing gold, silver, mercury, lead, or platinum: Redlands, Calif., Privately published, 39 p., illus., tables, 1968.
- Koehn, Henry H.** See Youngblood, Irma. 04795
- 09906 **Koenig, James B.** Geothermal steam potential of the Mount Lassen area, *in* Geologic guide to the Lassen Peak, Burney Falls, and Lake Shasta area, California — *Geol. Soc. Sacramento Ann. Field Trip*, 1969: Davis, Calif., Univ. California, Geology Dept., p. 43-51, illus., table, 1969.
- 02310 **Koerner, R. M.** Some observations on superimposition of ice on the Devon Island Ice Cap, N.W.T., Canada: *Geog. Annaler*, v. 52A, no. 1, p. 57-67, illus., tables, 1970.
- 05216 **Koerner, R. M.** The mass balance of the Devon Island ice cap, Northwest Territories, Canada, 1961-66 [with French and German abs.]: *Jour. Glaciology*, v. 9, no. 57, p. 325-336, illus., tables, 1970.
- 03624 **Koerner, Robert M.** Effect of particle characteristics on soil strength: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7393, *Jour. Soil Mechanics and Found. Div.*, no. SM 4, p. 1221-1234, illus., tables, 1970.

- 03630 **Koerner, Robert M.** Behavior of single mineral soils in triaxial shear: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7432, *Jour. Soil Mechanics and Found. Div.*, no. SM 4, p. 1373-1390, illus., tables, 1970.
- 05503 **Koerner, Robert M.** Energy and surface characteristics of quartz soils, *in* Engineering geology and soils engineering symposium, 8th Ann., Pocatello, Idaho, 1970, *Proc.*: Boise, Idaho, Idaho Dept. Highways, p. 187-195, illus., table, 1970.
- 04078 **Koesemadinata, R. P.** Stratigraphy and petroleum occurrence, Green River Formation, Red Wash field, Utah, Pt. A: *Colorado School Mines Quart.*, v. 65, no. 1, 77 p., illus., tables, geol. map, 1970.
- 01215 **Kohland, William Francis.** Soils of Erie and Jefferson Counties, Pennsylvania — A geographic study and comparison of the distribution and utilization of soils in a glaciated and a non-glaciated area [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 8, p. 3453B, 1970.
- Kohler, J. A.** See Simpson, M. G. 05441
- 06436 **Kohman, Truman P.; Black, Lance P.; Ihochi, Haruhiko; Huey, James M.** Lead and thallium isotopes in Mare Tranquillitatis surface material, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, *Proc.* — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1345-1350, illus., table, 1970.
- 05857 **Kohnen, Heinz.** Über die Absorption elastischer longitudinaler Wellen im Eis [The absorption of elastic longitudinal waves by ice (with English abs.)]: *Polarforschung* 1969, v. 39, pt. 6, no. 1, p. 269-275, illus., 1970.
- 05060 **Kohout, F. A.** Reorientation of our saline water resources thinking, *in* Saline water symposium: *Water Resources Research*, v. 6, no. 5, p. 1442-1448, illus., 1970.
- 09224 **Kohout, Francis A.; Sachs, Milton S.** Modifying the water balance by desalination, *in* Water balance in North America—Symposium, Banff, Alberta, 1969, *Proc.*: Am. Water Resources Assoc. *Proc. Ser.*, no. 7, p. 214-222, illus., 1969.
- Koide, Minoru.** See Bernat, Michel. 05590
- Kojan, Eugene.** See Twiss, Robert. 06920
- 02989 **Kokalis, Peter G.** Terraces of the middle Salt River valley, Arizona — [Pt.] 2, Size, shape, and lithologic characteristics of the alluvial sediments [abs.]: *Arizona Acad. Sci. Jour.*, v. 6, 1970 *Proc. Supp.*, p. 64, 1970.
- 10232 **Kolb, Charles R.; Farrell, Warren J.; Curro, Joseph R., Jr.** Hard rock silo prototype test site selection investigations: U.S. Army Corps Engineers Waterways Expt. Sta. Misc. Paper S-70-12, 248 p., illus., tables, 1970.
- Kolehmainen, Victoria.** See Craddock, Campbell. 04382
- 08655 **Kolessar, Joseph.** Geology and copper deposits of the Tyrone district, *in* Guidebook of the Tyrone-Big Hatchet Mountains-Florida Mountains region — New Mexico Geol. Soc. Field Conf., 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, p. 127-132, illus., 1970.
- 02906 **Kolipinski, Milton C.; Higer, Aaron L.** Remote-sensing applications to hydrobiology in south Florida, *in* Earth resources aircraft program status review, NASA, Houston, 1968 — V. 3, Hydrology, oceanography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 23-1—23-44, illus., table [1970].
- 00816 **Kolodny, Yehoshua; Kaplan, I. R.** Uranium isotopes in sea-floor phosphorites: *Geochim. et Cosmochim. Acta*, v. 34, no. 1, p. 3-24, illus., tables, 1970.
- 03265 **Kolodny, Yehoshua.** Studies in geochemistry of uranium and phosphorites [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 11, p. 5103B, 1970.

- 05658 **Kolodny, Yehoshua; Kaplan, I. R.** Carbon and oxygen isotopes in apatite  $\text{CO}_2$  and co-existing calcite from sedimentary phosphorite: Jour. Sed. Petrology, v. 40, no. 3, p. 954-959, illus., table, 1970.
- Kolopus, J. L.** See Chaterlain, A. 04402
- Kolopus, J. L.** See Weeks, R. A. 06300
- 10136 **Koloseike, Alan.** Costs of shell analysis: Am. Antiquity, v. 35, no. 4, p. 475-480, tables, 1970.
- Kolpack, Ronald L.** See Mattson, James S. 09134
- Kolpack, Ronald L.** See Drake, David E. 10520
- 11268 **Kolpack, Ronald L.** (and others). Santa Barbara Channel, California marine environment [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 747-748, 1970.
- 07112 **Komar, C. A.; Kovach, S. J.** Directional ultrasonic pulses orient failure planes in sedimentary rocks [abs.]: West Virginia Acad. Sci. Proc. 1969, v. 41 (West Virginia Univ. Bull., ser. 70, no. 11-3), p. 303, 1970.
- 01414 **Komar, Paul D.** The competence of turbidity current flow: Geol. Soc. America Bull., v. 81, no. 5, p. 1555-1562, illus., 1970.
- 04599 **Komar, Paul D.; Inman, Douglas L.** Longshore sand transport on beaches: Jour. Geophys. Research, v. 75, no. 30, p. 5914-5927, illus., tables, 1970.
- 03116 **Komar, Paul Douglas.** The longshore transport of sand on beaches [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 10, p. 4729B, 1970.
- 02457 **Komornik, A.; Zeitlen, J. G.** Laboratory determination of lateral and vertical stresses in compacted swelling clay: Jour. Materials, v. 5, no. 1, p. 108-128, illus., table, 1970.
- 04225 **Komornik, Amos; David, David.** Prediction of swelling pressure of clays — Closure [to discussion of paper 6358, 1969]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Soil Mechanics and Found. Div., no. SM5, p. 1792, 1970.
- 08277 **Konda, Tadashi.** Pyroxenes from the Beaver Bay gabbro complex of Minnesota: Contr. Mineralogy and Petrology, v. 29, no. 4, p. 338-344, illus., tables, 1970.
- 01263 **Konen, C. E.; Helander, D. P.** A computer analysis of shaly sands using multiple porosity logging devices: Log Analyst, v. 11, no. 1, p. 3-12, illus., 1970.
- Konnert, Judith A.** See Finney, J. J. 06500
- 09055 **Konnert, Judith A.; Clark, Joan R.; Christ, C. L.** Crystal structure of strontogingerite ( $\text{Sr}, \text{Ca}_{12}\text{B}_{14}\text{O}_{20}(\text{OH})_6 \cdot 5\text{H}_2\text{O}$ ): Am. Mineralogist, v. 55, nos. 11-12, p. 1911-1931, illus., tables, 1970.
- 10608 **Konnert, Judith A.; Clark, Joan R.; Christ, C. L.** Crystal structure of fabianite,  $\text{CaB}_3\text{O}_5(\text{OH})$ , and comparison with the structure of its synthetic dimorph [with German and English abs.]: Zeitschr. Kristallographie, v. 132, no. 4-6, p. 241-254, illus., tables, 1970.
- Kono, M.** See Nagata, T. 06352
- 06930 **Konrad, J. G.; Chesters, G.; Keeney, D. R.** Determination of organic- and carbonate-carbon in freshwater lake sediments by a microcombustion procedure [with French, German, and Russian abs.]: Jour. Thermal Analysis, v. 2, no. 2, p. 199-208, illus., tables, 1970.
- Konrad, John G.** See Keeney, Dennis R. 03330



- 06373 **Konrad, John G.; Keeney, Dennis R.; Chesters, Gordon; Chen, Kuan-Lin.** Nitrogen and carbon distribution in sediment cores of selected Wisconsin lakes [with French, German, Portuguese, and Spanish abs.]: *Water Pollution Control Federation Jour.*, v. 42, no. 12, p. 2094-2101, tables, 1970.
- Koons, C. B.** See Spencer, Derek W. 02686
- 06796 **Koons, Charles B.** JOIDES cores — Organic geochemical analyses of four Gulf of Mexico and western Atlantic sediment samples: *Geochim. et Cosmochim. Acta*, v. 34, no. 12, p. 1353-1356, tables, 1970.
- 06620 **Koopman, Donald Edward.** The adsorption of crystal violet lactone by kaolinite [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 2, p. 826B-827B, 1970.
- 00296 **Kopf, Rudolph W.** Distinction between folded and abraded thrust faults [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 108, 1970.
- 07083 **Kopf, Rudolph W.** Geologic names in use north of the Brooks Range, Alaska, in Geological seminar on the North Slope of Alaska, Palo Alto, Calif., 1970, *Proc.*: Los Angeles, Calif., Am. Assoc. Petroleum Geologists Pacific Sec., p. Q1-Q5, table, 1970.
- Kopp, Otto C.** See Potosky, Robert A. 04040
- 04044 **Kopp, Otto C.** Ferrisilicates, counterparts of the common aluminosilicates, and the dual role of  $Fe^{+3}$ : *Compass*, v. 47, no. 2, p. 119-124, table, 1970.
- 09840 **Kopp, Otto C.; Harris, Lawrence A.** Hydrothermal system  $SiO_2$ -RbOH- $H_2O$ -Fe under dynamic conditions: *Tennessee Acad. Sci. Jour.*, v. 45, no. 4, p. 110-113, tables, 1970.
- 09784 **Koranda, John J.** Pingos: *Pacific Discovery*, v. 23, no. 3, p. 18-24, illus., 1970.
- Korcak, R. F.** See Fanning, D. S. 07629
- Korchunov, S. S.** See Solopov, S. G. 08256
- 10465 **Korf, M. G.** Ob inzhenernykh kharakteristikakh zemletryasenyi [on the engineering characteristics of earthquakes], in *Seismicheskoye dvizheniye grunta*: Akad. Nauk Sssr Inst. Fiziki Zemli, Voprosy Inzh. Seismologii, no. 12, p. 84-91, illus., tables, 1970.
- 01638 **Kornfeld, J. A.** Drilling will center in three areas: *World Oil*, v. 170, no. 6, p. 64-66, illus., 1970.
- 10980 **Kornfeld, J. A.** Gas, oil discoveries boost Canadian hopes: *World Oil*, v. 170, no. 4, p. 95-96, illus., 1970.
- 02315 **Kornfeld, Joseph.** Smackover exploration increases in Mississippi: *World Oil*, v. 171, no. 1, p. 122-123, illus., 1970.
- 03789 **Kornfeld, Joseph A.** Deep oil being sought in southeastern U.S.: *World Oil*, v. 171, no. 4, p. 80-82, illus., 1970.
- 04150 **Kornfeld, Joseph A.** Economics and geology of the natural gas of North America [abs.]: *Houston Geol. Soc. Bull.*, v. 13, no. 1, p. 4, 1970.
- 05168 **Kornfeld, Joseph A.** Cretaceous gas trend is developing in Saskatchewan: *World Oil*, v. 171, no. 6, p. 109-110, illus., 1970.
- 05169 **Kornfeld, Joseph A.** Ultra-deep gas search continues at record pace: *World Oil*, v. 171, no. 7, p. 54, 1970.

- 07742 **Kornfeld, Joseph A.** Uinta basin oil discoveries increase Utah drilling: *World Oil*, v. 171, no. 5, p. 113-117, illus., 1970.
- 10897 **Kornik, L. J.** Aeromagnetic survey of the Athabasca Formation—A quantitative interpretation: *Canadian Mining Jour.*, v. 91, no. 8, p. 50-53, illus., 1970.
- Koropatnick, A.** See Macpherson, J. G. 06747
- Korotev, Randy L.** See Haskin, Larry A. 05698
- 08246 **Korpijaakko, E. O.; Radforth, N. W.** Development of certain patterned ground in muskeg as interpreted from aerial photographs [with French abs.], in *International Peat Congress*, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 69-73, illus., 1970.
- 00297 **Korringa, Marjorie K.; Noble, Donald C.** Ash-flow eruption from a linear vent area without caldera collapse [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 108-109, 1970.
- Korringa, Marjorie K.** See Noble, Donald C. 06164
- 10742 **Korringa, Marjorie K.; Noble, Donald C.** Feldspar-liquid partition coefficients for Sr and Ba based on a Rayleigh fractionation model [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 598-599, 1970.
- 04025 **Korver, John A.** T-WAVE, a computer code for analyzing the nonsteady gravity decay of a groundwater anomaly — UCRL-50830: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., 58 p., illus., 1970.
- 01942 **Kosalos, James G.; Lewis, Brian T. R.; Dorman, LeRoy M.; Meyer, Robert P.** An ocean refraction experiment range 85-1,500 kms [abs.]: *EOS*, v. 51, no. 4, p. 356, 1970.
- 00977 **Kosanke, Robert M.** Palynological studies of the coals of the Princess Reserve district of northeastern Kentucky [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 225-226, 1970.
- 10864 **Kosanke, Robert M.; Cross, Aureal T.** (editors). Symposium on palynology of the Late Cretaceous and early Tertiary. San Francisco, Calif., 1966: *Geol. Soc. America Spec. Paper* 127, 396 p., illus., tables, 1970.
- 06565 **Koshinsky, Gordon D.** The morphometry of shield lakes in Saskatchewan: *Limnology and Oceanography*, v. 15, no. 5, p. 695-701, illus., tables, 1970.
- 08063 **Koster, F.; Baadsgaard, H.** On the geology and geochronology of northwestern Saskatchewan — [Pt.] 1, Tazin Lake region: *Canadian Jour. Earth Sci.*, v. 7, no. 3, p. 919-930, illus., tables, 1970.
- 09230 **Koster, F.** The geology of the Zin Bay area, Saskatchewan: Saskatchewan Dept. Mineral Resources Rept. 121, 40 p., illus., geol. map, 1968.
- 10899 **Koster, F.** The geology of the Burchinall Lake area, Saskatchewan: Saskatchewan Dept. Mineral Resources Rept. 131, 24 p., illus., tables, geol. map, 1970.
- 04512 **Koteff, Carl.** Surficial geologic map of the Milford quadrangle, Hillsborough County, New Hampshire: U.S. Geol. Survey Geol. Quad. Map GQ-881, scale 1:62,500, text, 1970.
- Koteff, Carl.** See Oldale, Robert N. 05402
- 10179 **Koteff, Carl; Pessl, Fred Jr.; Rubin, Meyer.** Stratigraphic evidence for multiple glaciations in northern New England [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ. ?], p. 78, 1970.

- 04810 **Kotick, Ottmar F.** Edward W. Beltz (1891-1970): Am. Assoc. Petroleum Geologists Bull., v. 54, no. 9, p. 1753-1754, portrait, 1970.
- Koto, Kichiro.** See Morimoto, Nobuo. 03170
- 04326 **Kottowski, Frank E.; Stewart, Wendell J.** The Wolcampian Joyita uplift in central New Mexico: New Mexico Bur. Mines and Mineral Resources Mem. 23, p. 1-31, illus., 1970.
- 05907 **Kottowski, Frank E.** Paleozoic geologic history of southwest New Mexico and northwest Chihuahua [summ.], in The geologic framework of the Chihuahua tectonic belt — Symposium in honor of Ronald K. De Ford, Midland, Tex., 1970: Midland, Tex., West Texas Geol. Soc., p. 16-18, 1970.
- Kottowski, Frank E.** See Greenwood, Eugene. 08649
- Kouba, Dorothy L.** See Kennedy, Vance C. 01285
- Koucky, Frank L.** See Starmer, Robert J. 00646
- Kovach, Robert L.** See Wesson, Robert L. 01999
- Kovach, Robert L.** See Talwani, Pradeep. 10571
- Kovach, S. J.** See Komar, C. A. 07112
- 00298 **Kovacs, W. D.; Seed, H. Bolton; Idriss, I. M.** The response of clay banks to harmonic excitation [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 109, 1970.
- Kozak, Eugene J.** See Ralston, Dale R. 10256
- Kozak, L. M.** See Huang, P. M. 05286
- 02745 **Kozak, Samuel J.** Geology of the Elliott Knob, Deerfield, Craigsville, and Augusta Springs quadrangles, Virginia: Virginia Div. Mineral Resources Rept. Inv. 21, 23 p., illus., tables, geol. maps, 1970.
- 02643 **Kraft, John C.** Morphology and vertical sedimentary sequences in Holocene transgressive sand barriers [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 856, 1970.
- Krahenbuhl, U.** See Eberhardt, P. 05685
- Kramer, David J.** See Odom, I. Edgar. 07521
- Kramer, Fritz L.** See Patton, Clyde P. 04126
- 02644 **Kramer, J. R.** Geochemistry and deposition of lower Salina Group, southwestern Ontario and Michigan [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 856, 1970.
- 08584 **Krantz, Grover S.** Human activities and megafaunal extinctions: Am. Scientist, v. 58, no. 2, p. 164-170, illus., 1970.
- 10743 **Kranz, Peter M.** Bivalve escape behavior as an indication of sedimentary rates and environments [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 599, 1970.
- Krashennnikov, V.** See Bukry, D. 02723
- Krause, D. C.** See Watkins, N. D. 10834
- Krauss, Roland K.** See Smith, R. M. 02728

- 04725 **Kravitz, Joseph H.; Sorensen, Fredrick H.** Sedimentological reconnaissance survey of Kane Basin: Maritime Sediments, v. 6, no. 1, p. 17-20, illus., 1970.
- 05621 **Kravitz, Joseph H.** Repeatability of three instruments used to determine the undrained shear strength of extremely weak, saturated, cohesive sediments: *Jour. Sed. Petrology*, v. 40, no. 3, p. 1026-1037, illus., tables, 1970.
- 03174 **Kreidler, Eric R.; Hummel, F. A.** The crystal chemistry of apatite — Structure fields of fluor- and chlorapatite: *Am. Mineralogist*, v. 55, nos. 1-2, p. 170-184, illus., tables, 1970.
- 10929 **Kremp, Gerhard O. W.; Methvin, Jewel G.** Computer techniques in palynology-paleobotany can stimulate fruitful research on a world scale, in *J. Sen Memorial Volume: Calcutta, India, Bot. Soc. Bengal*, p. 161-171, illus., tables, 1969.
- 11267 **Kremp, Gerhard O. W.; Nagy, Lois Anne; Nagy, Bartholemew.** Studies of microstructure in the Orgueil carbonaceous meteorite and in early Precambrian sedimentary rocks from South Africa [abs.], in *Perkins, B. F. (editor), Geoscience and Man — V. 1, Am. Assoc. Stratig. Palynologists Ann. Mtg., 1st, 1968, Proc.: Baton Rouge, La., Louisiana State Univ. School of Geoscience*, p. 135, 1970.
- 08140 **Kretz, Ralph.** Variation in the composition of muscovite and albite in a pegmatite dike near Yellowstone: *Canadian Jour. Earth Sci.*, v. 7, no. 5, p. 1219-1235, illus., tables, 1970.
- Kreye, Heinrich.** See Hornbogen, Erhard. 07214
- 04601 **Krimmel, Robert M.** Gravimetric ice thickness determination. South Cascade Glacier, Washington: *Northwest Sci.* v. 44, no. 3, p. 147-153, illus., 1970.
- 02759 **Krinitzsky, E. L.** Radiography in the earth sciences and soil mechanics: New York and London, Plenum Press, 163 p., illus., tables, 1970.
- 06222 **Krinitzsky, E. L.; Rader, Miles.** Attrition among geologists: *Geotimes*, v. 15, no. 10, p. 24-26, 1970.
- 07203 **Krinitzsky, E. L.** The effects of geological features on soil strength: U.S. Army Corps Engineers Waterways Expt. Sta. Misc. Paper S-70-25, 103 p., illus., tables, 1970.
- Krinsley, David.** See Cloud, Preston. 05737
- 08625 **Krinsley, David; Cavallero, Lillian.** Scanning electron microscopic examination of periglacial eolian sands from Long Island, New York: *Jour. Sed. Petrology*, v. 40, no. 4, p. 1345-1350, illus., 1970.
- 08027 **Krishna Murti, G. S. R.; Satyanarayana, K. V. S.** Discussion on the significance of magnesium and iron in montmorillonite formation from basic igneous rocks: *Soil Sci.*, v. 110, no. 4, p. 287-298, 1970.
- 05239 **Krishnamurthy, M.; Sarma, K. V. N.; Blech, Tom.** Erodibility of channels with cohesive boundary — Discussion [of paper 7156 by Emmanuel Partheniades and Robert E. Paaswell, 1970]: *Am. Soc. Civil Engineers Proc.*, v. 96, *Jour. Hydraulics Div.*, no. HY 12, p. 2658-2661, 1970.
- Krivoy, H. L.** See Richter, D. H. 06692
- 00902 **Krivoy, Harold L.** Comparison between seaborne and airborne magnetic reconnaissance of the Gulf of Mexico and Caribbean [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 287-288, 1970.
- 00903 **Krivoy, Harold L.** A magnetic lineament in the Bay of Campeche [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 288, 1970.
- Kriz, George J.** See Rochester, Eugene W., Jr. 05785

- Krizek, Raymond J.** See Khera, Raj P. 09383
- Krizek, Raymond J.** See Karadi, Gabor M. 09499
- 01614 **Krogh, T. E.; Brooks, C.; Hart, S. R.; Davis, G. L.** The Grenville front in the Chibougamau-Surprise Lake area: Carnegie Inst. Washington Year Book 68, 1968-69, p. 408-410, illus., 1970.
- Krogh, T. E.** See Brooks, C. 01616
- Krogh, T. E.** See Brooks, C. 01617
- Krogh, T. E.** See Brooks, C. 01618
- Krogh, T. E.** See Hart, S. R. 01620
- 01789 **Krogh, T. E.; Davis, G. L.** Two periods of metamorphism and deformation, 1700 and 1000 m.y. ago, in the Grenville province, Ontario [abs.]: EOS, v. 51, no. 4, p. 434, 1970.
- 02246 **Krogh, T. E.; Davis, G. L.** Metamorphism 1700  $\pm$  100 m.y. and 900  $\pm$  100 m.y. ago in the northwest part of the Grenville province in Ontario: Carnegie Inst. Washington Year Book 68, 1968-69, p. 308-309, illus., 1970.
- 02247 **Krogh, T. E.; Davis, G. L.** Isotopic ages along the Grenville front in Ontario: Carnegie Inst. Washington Year Book 68, 1968-69, p. 309-313, illus., 1970.
- 02248 **Krogh, T. E.; Brooks, C.; Hart, S. E.; Davis, G. L.** The Grenville front in the Chibougamau-Surprise Lake area, Ontario: Carnegie Inst. Washington Year Book 68, 1968-69, p. 313-314, illus., 1970.
- Krogh, T. E.** See Hart, S. R. 08270
- Krohn, Douglas H.** See Rhodes, Rodney C. 10592
- 06760 **Kroopnick, P.; Deuser, W. G.; Craig, H.** Carbon 13 measurements on dissolved inorganic carbon at the North Pacific (1969) Geosecs station: Jour. Geophys. Research, v. 75, no. 36, p. 7668-7671, illus., table, 1970.
- 02020 **Krouse, H. R.; Modzeleski, V. E.** C<sup>13</sup>/C<sup>12</sup> abundances in components of carbonaceous chondrites and terrestrial samples: Geochim. et Cosmochim. Acta, v. 34, no. 4, p. 459-474, illus., tables, 1970.
- Krouse, H. R.** See Robinson, Brian W. 09541
- Krouse, H. R.** See Kajiwarra, Yoshimichi. 10727
- Krouse, H. Roy.** See Bailey, N. J. L. 02585
- 10250 **Kruckeberg, Arthur R.** Plant life on serpentinite and other ferromagnesian rocks in northwestern North America: Syesis, v. 2, pts. 1-2, p. 15-114, illus., tables, 1969.
- 07531 **Krueger, Allen R.** Alpha's sand and gravel deposit and processing plant at Martins Creek, Pennsylvania, in Forum on geology of industrial minerals, 5th, Harrisburg, Pa., 1969, Proc.: Pennsylvania Geol. Survey, 4th ser., Bull. M64 (Mineral Resources Rept.), p. 91-103, illus., tables, 1970.
- Krueger, Harold W.** See Zartman, Robert E. 05194
- 08477 **Kruger, P.; Channell, J. K.** Use of rare-earth elements as tracers in estuaries in Isotope hydrology, 1970 — A symposium, Vienna, Austria, 1970, Proc.: Vienna, Austria, Internat. Atomic Energy Agency STI-Pub. 255, p. 869-883, illus., tables, 1970.
- Kruger, Paul.** See Linstedt, K. Daniel. 09132

**Krumbein, W. C.** See Frazee, C. J. 02549

- 03600 **Krumbein, W. C.; Jones, Thomas A.** The influence of areal trends on correlations between sedimentary properties: *Jour. Sed. Petrology*, v. 40, no. 2, p. 656-665, illus., tables, 1970.

- 08617 **Krumbein, W. C.** Geological models in transition, *in* *Geostatistics — A colloquium* (D. F. Merriam, editor), Lawrence, Kan., 1970, Proc.: New York, Plenum Press, p. 143-161, illus., 1970.

- 10625 **Krumbein, W. C.; Dacey, Michael F.** Markov chains and embedded Markov chains in geology: *Internat. Assoc. Math. Geology Jour.*, v. 1, no. 1, p. 79-96, illus., tables, 1969.

**Krumbein, W. C.** See Dacey, Michael F. 10640

- 06311 **Krumbein, William C.** Mathematical geologists: *Geotimes*, v. 17, no. 8, p. 16, 1970.

**Krummenacher, Daniel.** See Gastil, Gordon. 00266

- 00299 **Krummenacher, Daniel; Gastil, Gordon.** Reconnaissance potassium argon dates for basement rocks in the State of Baja California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 109, 1970.

- 02187 **Krummenacher, Daniel.** Isotopic composition of argon in modern surface volcanic rocks: *Earth and Planetary Sci. Letters*, v. 8, no. 2, p. 109-117, illus., tables, 1970.

**Krupicka, J.** See Burwash, R. A. 08143

- 07442 **Kruse, G. H.; Zerneke, K. L.; Scott, J. B.; Johnson, W. S.; Nelson, J. S.** Approach to classifying rock for tunnel liner design, Chap. 10 *in* *Rock mechanics, theory and practice — 11th Symposium on Rock Mechanics*, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 169-192, illus., tables, 1970.

- 09311 **Kruse, G. H.** Deformability of rock structures, California State Water Project, *in* *Determination of the *in situ* modulus of deformation of rock* (Symposium, ASTM, Winter Mtg., Denver, Colo., 1969): *Am. Soc. Testing and Materials Spec. Tech. Pub.* 477, p. 59-88, illus., 1970.

- 04101 **Krusiewski, S. Victoria.** Selected bibliography on radioactive occurrences in the United States — RME-4110: Washington, D.C., U.S. Atomic Energy Comm., 136 p., 1970.

- 00904 **Krutak, Paul R.** Ostracode-substrate relationships, Laguna Mandinga, Veracruz, Mexico [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 288-289, 1970.

- 05358 **Krutak, Paul R.** Origin and depositional environment of the Codell Sandstone Member of the Carlile Shale (Upper Cretaceous), southeastern Colorado, *in* *Dakota and related rocks of the Front Range — Guidebook issue: Mtn. Geologist*, v. 7, no. 3, p. 185-204, illus., table, 1970.

**Ku, L. F.** See Dohler, G. C. 07690

**Ku, Teh-Lung.** See Bischoff, James L. 01898

**Ku, Teh-Lung.** See Bender, M. L. 02136

**Ku, Teh-Lung.** See Broecker, Wallace. 06405

**Kuba, Edward M.** See Wiegel, Robert L. 03719

**Kube, W. R.** See Elder, J. L. 04671

- 10837 **Kubiena, Walter L.** Micromorphological features of soil geography: New Brunswick, N. J., Rutgers University Press, 254 p., illus., tables, 1970.
- 04537 **Kudelasek, Vladimir; Policky, Josef; Zamarsky, Vitezslav.** A contribution to the geochemistry and petrology of the ultrabasics of Cuba: Carolina Univ. Acta, Geologica 1969, no. 2, p. 119-131, illus., tables, 1970.
- Kudo, A. M.** See Laughlin, A. W. 01792
- 00856 **Kudo, Albert M.; Weill, Daniel F.** An igneous plagioclase thermometer: Contr. Mineralogy and Petrology, v. 25, no. 1, p. 52-65, illus., tables, 1970.
- 00485 **Kuehn, Jack; Walper, Jack.** The Marble Canyon igneous complex, Culberson County, Texas [abs.]: Texas Jour. Sci., v. 21, no. 3, p. 336-337, 1970.
- 01131 **Kugler, Hans G.** Vincent Charles Illing (1890-1969): Am. Assoc. Petroleum Geologists Bull., v. 54, no. 3, p. 542-544, portrait, 1970.
- 09792 **Kuhl, Arthur D.** Color and Ir photos for soils: Photogramm. Eng., v. 36, no. 5, p. 475-482, illus., tables, 1970.
- 07991 **Kuhlmann, Dietrich H. H.** Die Korallenriffe Kubas — Pt. 1, Genese und Evolution [The coral reefs of Cuba — Pt. 1, Genesis and evolution (with German, English, and Spanish abs.)]: Internat. Rev. Gesamten Hydrobiologie, v. 55, no. 5, p. 729-756, illus., 1970.
- Kuhn, John K.** See Schleicher, John A. 05335
- 10069 **Kulakov, Y. H.; Puminov, A. P.; Dibner, V. D.** Neotectonics of Arctic [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2492, 1970.
- Kulikov, N. N.** See Lapina, N. N. 10071
- Kullerud, G.** See Puchelt, H. 00821
- Kullerud, G.** See Bell, P. M. 02228
- Kullerud, G.** See Bell, P. M. 02229
- 02249 **Kullerud, G.** Sulfide- and arsenide-type binary systems: Carnegie Inst. Washington Year Book 68, 1968-69, p. 256-259, table, 1970.
- Kullerud, G.** See Taylor, L. A. 02258
- Kullerud, G.** See Williams, K. L. 02260
- Kullerud, Gunnar.** See Hafner, S. S. 01772
- Kullerud, Gunnar.** See Taylor, Lawrence A. 01842
- 09950 **Kullerud, Gunnar.** Sulfide phase relations, in Symposium on sulfides—Fiftieth Anniversary Symposia (Benjamin A. Morgan, editor): Mineralog. Soc. America Spec. Paper 3, p. 199-210, illus., tables, 1970.
- 05982 **Kullmann, Jürgen; Scheuch, Jörn.** Wachstums-Anderungen in der Ontogenese paläozoischer Ammonoiten [Proportional growth changes during the ontogenies of Paleozoic ammonoids (with English abs.)]: Lethaia, v. 3, no. 4, p. 397-412, illus., 1970.
- 09841 **Kullmann, Jürgen; Wiedmann, Jost.** Significance of sutures in phylogeny of Ammonoidea: Kansas Univ. Paleont. Contr. Paper 47, 32 p., illus., tables, 1970.
- Kulm, L. D.** See Duncan, John R. 00437

- Kulm, L. D.** See Duncan, John R. 01121
- Kulm, L. D.** See Griggs, G. B. 01338
- Kulm, L. D.** See Griggs, G. B. 01499
- Kulm, L. D.** See Duncan, John R. 01895
- Kulm, L. D.** See Moore, T. C., Jr. 02458
- Kulm, L. D.** See Griggs, G. B. 03402
- Kulm, L. D.** See Fowler, Gerald A. 04897
- Kulm, L. D.** See Duncan, John R. 05653
- 08026 **Kumar, Anil; Kimbler, Oscar K.** Effect of dispersion, gravitational segregation, and formation stratification on the recovery of freshwater stored in saline aquifers: *Water Resources Research*, v. 6, no. 6, p. 1689-1700, illus., tables, 1970.
- 01264 **Kumar, J.; Fatt, Irving.** Nuclear magnetic resonance study of porosity, permeability and surface area of unconsolidated porous materials: *Log Analyst*, v. 11, no. 1, p. 13-16, illus., table, 1970.
- 00165 **Kumar, Naresh; Sanders, John E.** Geologic implications of migration of Fire Island Inlet [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 27, 1970.
- Kumar, Naresh.** See Sanders, John E. 00177
- Kumar, Naresh.** See Sanders, John E. 09555
- 06112 **Kumarapeli, P. S.** Monteregean alkalic magmatism and the St. Lawrence rift system in space and time, in *Alkaline rocks, the Monteregean Hills — Symposium, Montreal, 1969*, *Proc.: Canadian Mineralogist*, v. 10, pt. 3, p. 421-431, illus., 1970.
- 02180 **Kumazawa, Mineo.** Reply [to comments by D. Weidner and R. Madariaga on "The elastic constant of polycrystalline rocks and nonelastic behavior inherent to them" (1969)]: *Jour. Geophys. Research*, v. 75, no. 14, p. 2790-2792, 1970.
- Kumbasar, Isik.** See Finney, J. J. 06500
- Kume, Jack.** See Hansen, Dan E. 00445
- 00626 **Kume, Jack.** Choteau Creek and its relationship to Choteau aquifer in Charles Mix and Douglas Counties, southeast South Dakota [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 339-340, 1970.
- Kume, Jack.** See Bluemle, John P. 02480
- 08401 **Kummel, Bernhard.** History of the Earth — An introduction to historical geology, 2d edition: San Francisco, Calif., W. H. Freeman and Company, 707 p., illus., tables, 1970.
- 10070 **Kummer, John T.; Holmes, M. L.; Creager, Joe S.** Continental shelf structure and sediments of Gulf of Anadyr [abs.], in *Internat. Arctic Geology Symposium, 2d, San Francisco, 1971*, abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2492-2493, 1970.
- 04566 **Kunasz, Ihor A.** Significance of laminations in the Upper Silurian evaporite deposit of the Michigan Basin, in *Third symposium on salt, V. 1* (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 67-77, illus., 1970.
- 11247 **Kunkel, Fred.** Test-well and soil data, Fort Mohave Indian Reservation area, California: Menlo Park, Calif., U.S. Geol. Survey Water Resources Div. (Basic-Data Compilation), 77 p., illus., tables, 1969.



**Kunkle, George R.** See Rowland, Mark R. 02489

- 03767 **Kuno, Hisashi; Aoki, Ken-Ichiro.** Chemistry of ultramafic nodules and their bearing on the origin of basaltic magmas, *in* Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969, Proc.: Physics Earth and Planetary Interiors, v. 3, p. 273-301, illus., tables, 1970.

**Kunze, G. W.** See Carson, C. D. 02571

**Kunze, G. W.** See Naghshineh-Pour, B. 05407

- 04737 **Kunzler, R. H.; Goodell, H. G.** The aragonite-calcite transformation — A problem in the kinetics of a solid-solid reaction: *Am. Jour. Sci.*, v. 269, no. 4, p. 360-391, illus., tables, 1970.

- 06001 **Kunzler, Robert Henry.** The aragonite-calcite transformation [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5555B-5556B, 1970.

**Kuo, Chin-Shin.** See Haach, U. 04285

- 01674 **Kuo, J. T.; Jachens, R. C.; Ewing, M.; White, G.** Transcontinental tidal gravity profile across the United States: *Science*, v. 168, no. 3934, p. 968-971, illus., table, 1970.

- 05611 **Kuo, J. T.; Jachens, A. C.; Ewing, Maurice; White, G.** Tidal anomalies and regional geologic structure [Reply to discussion by D. A. Rigassi of "Transcontinental tidal gravity profile across the United States," 1970]: *Science*, v. 170, no. 3961, p. 1003, 1970.

- 03522 **Kuo, John T.; Ottaviani, Mario; Singh, Shri K.** Reply by authors to Dr. Thyssen-Bornemisza's discussion [of "Variations of vertical gravity gradient in New York City and Alpine, New Jersey" (1969)]: *Geophysics*, v. 35, no. 3, p. 522, 1970.

- 01790 **Kupfer, Donald H.** Transform-fault nomenclature and the San Andreas fault [abs.]: *EOS*, v. 51, no. 4, p. 427, 1970.

- 04576 **Kupfer, Donald H.** Conflicting strain patterns in the salt of Gulf Coast salt domes and their genetic implications, *in* Third symposium on salt, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 271-282, illus., 1970.

**Kupfer, Donald H.** See Louisiana State University. 08734

- 08736 **Kupfer, Donald H.** Mechanism of intrusion of Gulf Coast salt, *in* Geology and technology of Gulf Coast salt — Symposium, Baton Rouge, La., 1967, Proc.: Baton Rouge, La., Louisiana State Univ. School of Geoscience, p. 25-66, illus., tables, 1970.

- 08174 **Kupsch, W. O.** John Campbell Sproule, 1905-1970: *Royal Soc. Canada Minutes Proc.* 1970, ser. 4, v. 8, p. 137-141, portrait, 1970.

- 07222 **Kuraz, V.; Kutilek, M.; Kaspar, I.** Resonance-capacitance soil moisture meter: *Soil Sci.*, v. 110, no. 4, p. 278-279, illus., 1970.

**Kuroda, P. K.** See Manuel, Oliver K. 01953

- 03906 **Kuroda, P. K.; Manuel, O. K.** Mass fractionation and isotope anomalies in neon and xenon: *Nature*, v. 227, no. 5263, p. 1113-1116, illus., 1970.

**Kuroda, P. K.** See Manuel, O. K. 04273

**Kushiro, I.** See Erlank, A. J. 01621

**Kushiro, I.** See Erlank, A. J. 02239

- 02250 **Kushiro, I.; Schairer, J. F.** Diopside solid solutions in the system diopside-anorthite-albite at 1 atm and at high pressures: Carnegie Inst. Washington Year Book 68, 1968-69, p. 222-226, illus., table, 1970.
- 02251 **Kushiro, I.; Yoder, H. S., Jr.** Stability field of iron-free pigeonite in the system  $\text{Mg-SiO}_3\text{-CaMgSi}_2\text{O}_6$ : Carnegie Inst. Washington Year Book 68, 1968-69, p. 226-229, illus., 1970.
- 02252 **Kushiro, I.** Stability of amphibole and phlogopite in the upper mantle: Carnegie Inst. Washington Year Book 68, 1968-69, p. 245-247, illus., 1970.
- 02366 **Kushiro, I.** Systems bearing on melting of the upper mantle under hydrous conditions: Carnegie Inst. Washington Year Book 68, 1968-69, p. 240-245, illus., 1970.
- Kustra, C. R.** See Franklin, J. M. 06497
- Kutilek, M.** See Kuraz, V. 07222
- 06664 **Kuykendall, W. E., Jr.; Hoffman, Buren W.; Wainerdi, R. E.** 14-MeV neutron activation analysis of selected Leg 4 core samples, Chap. 16 in Initial reports of the Deep Sea Drilling Project — V. 4, Leg 4 of cruises of *Glomar Challenger*, Rio de Janeiro, Brazil, to San Cristobal, Panama, Feb.-Mar. 1969 (R. G. Bader, and others): Washington, D. C., U.S. Govt. Printing Office, p. 371-374, table, 1970.
- 07148 **Kuykendall, W. E., Jr.; Hoffman, Buren W.; Wainerdi, R. E.** 14-MeV neutron activation analysis of selected Leg 5 core samples, Chap. 17 in Initial reports of the Deep Sea Drilling Project — V. 5, Leg 5 of cruises of *Glomar Challenger*, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office, p. 485-486, table, 1970.
- 05740 **Kvenvolden, K. A.** (and others). Carbon compounds in lunar fines from Mare Tranquillitatis — [Pt.] 1, Search for molecules of biological significance, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Suppl. 1), p. 1813-1828, illus., tables, 1970.
- Kvenvolden, K. A.** See Chang, S. 05743
- 00300 **Kvenvolden, Keith A.; Peterson, Etta; Brown, Frederick S.** Amino acid enantiomers in Recent and ancient sediments [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 110, 1970.
- 03164 **Kvenvolden, Keith A.; Peterson, Etta; Brown, Frederick S.** Racemization of amino acids in sediments from Saanich Inlet, British Columbia: Science, v. 169, no. 3950, p. 1079-1082, illus., table, 1970.
- 04092 **Kvenvolden, Keith A.** Evidence for transformations of normal fatty acids in sediments, in Advances in organic geochemistry — Internat. Cong., 3d, Proc. (G. D. Hobson and G. C. Speers, editors): London and New York, Pergamon Press (Internat. Ser. Mons. Earth Sci., V. 32), p. 335-366, illus., tables, 1970.
- Kvenvolden, Keith A.** See Hodgson, Gordon W. 05741
- Kvenvolden, Keith A.** See Gehrke, Charles W. 05742
- 03830 **Kwak, Teunis A. P.** An attempt to correlate non-predicted variations of distribution coefficients with mineral grain internal inhomogeneity using a field example studied near Sudbury, Ontario: Contr. Mineralogy and Petrology, v. 26, no. 3, p. 199-224, illus., tables, 1970.
- 03266 **Kwon, Hyuck Jae.** Source of barrier island sediments, northern Gulf Coast [abs.]: Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 5103B-5104B, 1970.
- Labotka, T. C.** See Langenheim, R. L., Jr. 00303

**Labotka, Theodore C.** See Hester, Norman C. 05854

- 04997 **Labounsky, Alex.** New geophysical exploration tool under development: Eng. and Mining Jour., v. 171, no. 5, p. 80-82, illus., 1970.

**Lachance, G. R.** See Wanless, R. K. 04096

**LaChapelle, E.** See Knight, Charles A. 01449

**LaChapelle, E.** See Sommerfeld, R. A. 02459

- 09630 **Lachel, Dennis J.** The engineering geologist's role in determining the feasibility of a tunneling machine for hard rock [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 600, 1070.

- 00010 **Lachenbruch, Arthur H.** Some estimates of the thermal effects of a heated pipeline in permafrost: U.S. Geol. Survey Circ. 632, 23 p., illus., tables, 1970.

- 03690 **Lachenbruch, Arthur H.** Crustal temperature and heat production — Implications of the linear heat-flow relation: Jour. Geophys. Research, v. 75, no. 17, p. 3291-3300, illus., 1970.

- 07077 **Lachenbruch, Arthur H.** Thermal considerations in permafrost, in Geological seminar on the North Slope of Alaska, Palo Alto, Calif., 1970, Proc.: Los Angeles, Calif., Am. Assoc. Petroleum Geologists Pacific Sec., p. J1-J2, discussion, p. J2-J5, illus., 1970.

- 00826 **Ladanyi, B.** Discussion of W. F. Brace and R. J. Martin's paper, 'A test of the law of effective stress for crystalline rocks of low porosity' [1968]: Internat. Jour. Rock Mechanics and Mining Sci., v. 7, no. 1, p. 123-124, 1970.

**Ladanyi, B.** See Hoyaux, B. 03765

- 03958 **Ladanyi, B.** The pore pressure-strain relationship of normally consolidated undisturbed clays — Pt. 1, Theoretical consideration — Discussion [of paper by K. Y. Lo, 1969]: Canadian Geotech. Jour., v. 7, no. 3, p. 341-342, illus., 1970.

**Ladanyi, B.** See Hoyaux, B. 03961

- 07070 **Ladanyi, B.** The mechanics of landslides in Leda clay — Discussion [of paper by W. J. Eden and R. J. Mitchell, 1970]: Canadian Geotech. Jour., v. 7, no. 4, p. 506-507, illus., 1970.

**Ladanyi, B.** See Hoyaux, B. 07448

- 07508 **Ladanyi, B.; Archambault, G.** Simulation of shear behavior of a jointed rock mass, Chap. 7 in Rock mechanics, theory and practice — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 105-125, illus., 1970.

- 04752 **Lafayette Geological Society; Spencer, Samuel A.; Harrison, Frank W., Jr.; Jones, Richard K.; Searles, Leonard C.** (chairman and editors). Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., sections pagged separately, illus., 1970.

- 10692 **Lafayette Geological Society.** Tertiary of Central Louisiana — Field Trip Guidebook, 1968: Lafayette, Louisiana, Louisiana Geol. Soc., 52 p., illus., 1968.

- 07227 **LaFleur, K. S.** Color of heated South Carolina Ultisols: Soil Sci., v. 110, no. 6, p. 379-382, illus., tables, 1970.

- 04560 **Lafon, G. Michel.** Calcium complexing with carbonate ion in aqueous solutions at 25°C and 1 atmosphere: Geochim. et Cosmochim. Acta, v. 34, no. 8, p. 935-940, illus., tables, 1970.

- 03108 **Lafon, Guy Michel.** Some quantitative aspects of the chemical evolution of the oceans [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 10, p. 4663B, 1970.  
**LaFountain, L.** See Larson, E. E. 03362
- 01143 **LaFountain, Lester J.** Plotted and point-counted stereograms by computer X-Y plotter or microfilm devices: *Geol. Soc. America Bull.*, v. 81, no. 4, p. 1267-1271, 1970.
- 10562 **LaFrenz, Robert L.** Project Pre-Gondola — Explosive cratering in clay shale: *Mil. Engineer*, v. 62, no. 407, p. 149-153, illus., table, 1970.  
**Lagache, Martine.** See Martin, Robert-F. 08375
- 07788 **Laguette G., C.** La explotacion de los mares [Exploitation of the seas (with Spanish abs.)]: *Inst. Mexicano Petroleo Rev.*, v. 2, no. 4, p. 20-29, 1970.  
**Lahiri, A.** See Rao, S. V. L. N. 03087
- 00301 **Lahoud, J. A.; Orphal, D. L.** Seismic motions generated by the Milrow detonation, Aleutian Islands [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 110, 1970.  
**Lahr, John.** See Page, Robert. 01810  
**Lahr, John C.** See Sbar, Marc L. 01973  
**Lahr, John C.** See Sbar, Marc L. 04431
- 01545 **Laird, M. G.** Vertical sheet structures — A new indicator of sedimentary fabric: *Jour. Sed. Petrology*, v. 40, no. 1, p. 428-434, illus., 1970.
- 05295 **Lajoie, J. (editor).** Flysch sedimentology in North America: *Geol. Assoc. Canada Spec. Paper 7*, 272 p., illus., tables, 1970.  
**Lajoie, J.** See Hubert, C. 05302
- 08700 **Lajoie, J. J.; Caner, B.** Geomagnetic induction anomaly near Kootenay Lake — A strike-like feature in the lower crust?: *Canadian Jour. Earth Sci.*, v. 7, no. 6, p. 1568-1579, illus., 1970.  
**Lajoie, J. J.** See Caner, B. 10483  
**Lajoie, K. R.** See Christensen, M. N. 00244
- 09145 **Lajtai, Emery Zoltan.** Unconfined shear strength of discontinuous rocks [with French and German summ.], in *Internat. Soc. Rock Mechanics Cong.*, 2d, Belgrade, Yugoslavia, 1970, *Proc.*, V. 2: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 267-272, illus., 1970.
- 01791 **Lakatos, Stephen; Miller, Donald S.** Effect of water pressure on stability of fission tracks in muscovite [abs.]: *EOS*, v. 51, no. 4, p. 450, 1970.  
**Lakin, Hubert W.** See Shacklette, Hansford T. 01876  
**Lakin, Hubert W.** See Curtin, Gary C. 04255
- 09239 **Lal, D.; Suess, Hans E.** The radioactivity of the atmosphere and hydrosphere, in *Annual review of nuclear science*, V. 18: Palo Alto, Calif., Annual Reviews, Inc., p. 407-434, illus., tables, 1968.  
**Lalou, C.** See Duplessy, J. C. 01280  
**Lam, Jürgen.** See Pedersen, K. Raunsgaard. 02477

**Lamar, D. L.** *See* Merifield, P. M. 06542

10988 **Lamar, D. L.; McGann-Lamar, J. V.; Merifield, P. M.** Age and origin of Earth-Moon system, Chap. 6 in *Palaeogeophysics* (S. K. Runcorn, editor): London and New York, Academic Press, p. 41-52, illus., table, 1970.

08458 **Lamar, Donald L.** Geology of the Elysian Park-Repetto Hills area, Los Angeles County, California: California Div. Mines and Geology Spec. Rept. 101, 45 p., illus., tables, geol. map, 1970.

**Lamb, George M.** *See* Isphording, Wayne C. 07032

**Lamb, James L.** *See* Robinson, E. 04065

00302 **Lamb, Thomas N.** Fossiliferous Triassic (?) meta-sedimentary rocks near Sun City, Riverside County, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 110-111, 1970.

03211 **Lambert, A.** The response of the Earth to loading by the ocean tides around Nova Scotia: *Royal Astron. Soc. Geophys. Jour.*, v. 19, no. 5, p. 449-477, illus., tables, 1970.

**Lambert, D. G.** *See* vonSeggern, David. 05222

02872 **Lambert, I. B.; Wyllie, P. J.** Melting in the deep crust and upper mantle and the nature of the low velocity layer, in *Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969*, *Proc.: Physics Earth and Planetary Interiors*, v. 3, p. 316-322, illus., table, 1970.

03412 **Lambert, Ian B.; Wyllie, Peter J.** Low-velocity zone of the Earth's mantle — Incipient melting caused by water: *Science*, v. 169, no. 3947, p. 764-766, illus., 1970.

07298 **Lammers, George Eber.** The late Cenozoic Benson and Curtis Ranch faunas from the San Pedro Valley, Cochise County, Arizona [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 5, p. 2862B, 1970.

00544 **Lammons, James Monroe.** The palynology and paleoecology of the Pierre Shale (Campanian-Maestrichtian) of northwestern Kansas and environs [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 7, p. 3309B, 1970.

09631 **Lamontagne, Robert A.; Swinnerton, John W.; Linnenbom, Victor J.** Apparent nonequilibrium of carbon monoxide at the air-sea interface [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 600, 1970.

06226 **LaMoreaux, Philip E.; Simpson, Thomas A.** Birmingham's Red Mountain cut: *Geotimes*, v. 17, no. 8, p. 10-11, illus., 1970.

06734 **LaMoreaux, Philip E.; Raymond, Dorothy; Joiner, Thomas J.** Hydrology of limestone terranes — Annotated bibliography of carbonate rocks: *Alabama Geol. Survey Bull.* 94, pt. A, 242 p., illus., tables, 1970.

**LaMoreaux, Philip E.** *See* Warman, James C. 09221

11248 **LaMoreaux, Philip E.; Knowles, Doyle B.; Powell, William J.** Ground-water network planning and design [abs.]: *EOS*, v. 51, no. 11, p. 749, 1970.

05609 **Lancet, Michael S.; Anders, Edward.** Carbon isotope fractionation in the Fischer-Tropsch synthesis and in meteorites: *Science*, v. 170, no. 3961, p. 980-982, illus., tables, 1970.

07972 **Land, A. H.; Goodwin, A. M.; Mulligan, R.; Whitmore, D. R. E.; Gross, G. A.; Boyle, R. W.; Johnston, A. G.; Chamberlain, J. A.; Rose, E. R.** Economic minerals of the Canadian Shield, Chap. 5 in *Geology and economic minerals of Canada: Canada Geol. Survey Econ. Geology Rept.* 1 (5th edition), p. 151-226, illus., tables, 1970.

**Land, Lynton S.** See Behrens, E. William. 06057

- 06234 **Land, Lynton S.** Phreatic versus vadose meteoric diagenesis of limestones — Evidence from a fossil water table: *Sedimentology*, v. 14, nos. 3-4, p. 175-185, illus., tables, 1970.

- 06235 **Land, Lynton S.; Epstein, S.** Late Pleistocene diagenesis and dolomitization, North Jamaica: *Sedimentology*, v. 14, nos. 3-4, p. 187-200, illus., tables, 1970.

- 08557 **Land, Lynton S.** Carbonate mud — Production by epibiont growth on *Thalassia testudinum*: *Jour. Sed. Petrology*, v. 40, no. 4, p. 1361-1363, table, 1970.

**Land, P. E.** See Anderson, David N. 01162

- 07164 **Land, P. E.** Rancho Capay gas field: California Oil Fields — Summ. Operations 1970, v. 56, no. 1. p. 33-37, illus., tables, 1970.

- 05536 **Lander, J. F.** National Earthquake Information Center, in *Geologic hazards and public problems* (R. A. Olson and M. M. Wallace, editors) — [U.S.] Office Emergency Preparedness, Region 7, Conf., San Francisco, Calif., 1969, Proc.: Washington, D.C., U.S. Govt. Printing Office, p. 197-198 [1970].

**Landers, T. E.** See Iyer, H. M. 01929

- 10532 **Landers, Tom; Claerbout, Jon.** Numerical calculation of elastic waves in inhomogeneous media [abs.]: *EOS*, v. 51, no. 11, p. 775, 1970.

- 04978 **Landes, Kenneth K.** Petroleum geology of the United States: New York and London, Wiley-Interscience, 571 p., illus., 1970.

- 09302 **Landgrebe, D. A.** The development of machine technology processing for earth resource survey, Sec. 40 of Earth Resources Program, 3d ann., review — v. 2, Agriculture, forestry, and sensor studies: Houston, Tex., NASA Manned Spacecraft Center, Msc-03742, p. 40-1 — 40-31, illus., 1970.

**Landisman, M.** See Dziewonski, A. 00780

- 03980 **Landisman, M.; Usami, T.; Sato, Y.; Massé, R.** Contributions of theoretical seismograms to the study of modes, rays, and the Earth: *Rev. Geophysics and Space Physics*, v. 8, no. 3, p. 533-589, illus., 1970.

**Landisman, M.** See Mitchell, B. J. 04454

- 04762 **Landry, Paul R.** Gillis-English Bayou Field, Calcasieu Parish, Louisiana, in *Typical oil and gas fields of southwestern Louisiana*, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 10-10c, illus., 1970.

**Lane, H. Richard.** See Straka, Joseph J., 2d. 04372

- 00528 **Lane, Harold Richard.** Morrowan (Lower Pennsylvanian) conodonts from northwestern Arkansas and northeastern Oklahoma [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 7, p. 3242B, 1970.

- 07456 **Lane, K. S.** Engineering problems due to fluid pressure in rock, Chap. 26 in *Rock mechanics, theory and practice* — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 501-540, illus., 1970.

**Lane, N. Gary.** See Webster, G. D. 01208

- 03909 **Lane, N. Gary.** On the crinoid order Declinida Knapp, 1969 [discussion of "Declinida, a new order of late Paleozoic inadunate crinoids" by W. D. Knapp, 1969]: *Systematic Zoology*, v. 19, no. 3, p. 308-310, 1970.

- 04209 **Lane, N. Gary.** Lower and Middle Ordovician crinoids from west-central Utah: *Brigham Young Univ. Geology Studies*, v. 17, pt. 1, p. 3-17, illus., 1970.

**Lane, N. Gary.** See Haugh, Bruce N. 07012

- 10538 **Lane, Stephen S.** An analysis of seismic signals generated by the Scroll event [abs.]: *EOS*, v. 51, no. 11, p. 777, 1970.

- 01151 **Laney, R. L.** Quality of water, in *Objectives, methods, and environment* — Gila River Phreatophyte Project, Graham County, Arizona: U.S. Geol. Survey Prof. Paper 655-A, p. A21-A22, 1970.

- 04593 **Lang, A. H.** Historical sidelights of Brenda mine and region, Pt. 1: *Canadian Mining Jour.*, v. 91, no. 3, p. 41-43, illus., 1970.

- 10851 **Lang, A. H.** Prospecting in Canada [with French abs.]: *Canada Geol. Survey Econ. Geology Rept. no. 7*, 4th edition, 308 p., illus., tables, 1970; originally published 1930.

**Lang, Solomon M.** See Rosenau, Jack C. 10940

- 06540 **Langbein, Walter B.; Leopold, Luna B.** River meanders and the theory of minimum variance, [Chap.] 8 in *Rivers and river terraces* (G. H. Dury, editor): London, Macmillan and Co. Ltd., p. 238-263, illus., tables, condensed 1970; originally published 1966.

**Lange, A. L.** See Westphal, W. H. 05635

- 05212 **Lange, Arthur L.** The detection of prehistoric earthquakes from fractured cave structures: *Caves and Karst*, v. 12, no. 2, p. 9-14, illus., 1970.

- 09808 **Lange, Erwin F.** The Klamath Falls iron meteorite: *Ore Bin*, v. 32, no. 2, p. 21-24, illus., 1970.

**Lange, Nixon.** See Gisler, Patrick. 00271

- 00303 **Langenheim, R. L., Jr.; Brackin, W. P.; Granath, J. W.; Labotka, T. C.** Geology of the Bristol mine area and the Silverhorn mining district, Lincoln County, Nevada [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 111, 1970.

**Langenheim, R. L., Jr.** See Pierce, R. W. 05187

- 03718 **Langfelder, Leonard J.; Stafford, Donald B.; Amein, Michael.** Coastal erosion in North Carolina: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7306, *Jour. Waterways and Harbors Div.*, no. WW 2, p. 531-545, illus., tables, 1970.

**Langford, N. Gerald.** See Gould, Joseph C. 04749

- 09632 **Langhus, Bruce G.; Medioli, Franco; Watkins, Curtis.** Foraminiferal tests as sedimentary particles [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 601, 1970.

- 09633 **Langille, Gerald B.** Subtidal-intertidal ichnofossils of the Middle Silurian Thorold Sandstone [abs.]: Geol. Soc. American Abs. with Programs, v. 2, no. 7, p. 601, 1970.
- Langmuir, Donald.** See Jacobson, Roger L. 02486
- 09634 **Langmuir, Donald.** The effect of particle size on the reaction, hematite + water = goethite [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 601-602, 1970.
- Langseth, Marcus G., Jr.** See Epp, David. 04272
- 09992 **Langseth, Marcus G., Jr.; VonHerzen, Richard P.** Heat flow through the floor of the world oceans, in *The sea* — v. 4, New concepts of sea floor evolution, Pt. 1, General observations (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 299-352, illus., tables, 1970.
- 08666 **Langston, Wann., Jr.** A fossil ray, possibly *Myledaphus* (Elasmobranchii: Batoidea) from the Late Cretaceous Oldman Formation of western Canada [with French abs.]: Canada Natl. Mus. Nat. Sci. Pubs. Palaeontology, no. 6, 15 p., illus., 1970.
- Langway, C. C.** See Johnson, S. J. 04072
- Langway, C. C., Jr.** See Dansgaard, W. 08209
- Langway, C. C., Jr.** See McCorkell, R. H. 08214
- Langway, C. C., Jr.** See Dansgaard, W. 08743
- 09635 **Langway, C. C., Jr.; Dansgaard, W.; Johnsen, S. J.; Clausen, H.** Climatic fluctuations during the Late Pleistocene [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 602, 1970.
- 08208 **Langway, Chester C., Jr.** Features and measurements of deep polar ice cores obtained by various drilling methods [abs.], in *Internat. Symposium on Antarctic Glaciological Exploration (ISAGE)*, Hanover, N.H., 1968 [Proc.]: Internat. Assoc. Sci. Hyrology (and Sci. Comm. Antarctic Research) Pub. 86, p. 77, 1970.
- 08722 **Langway, Chester C., Jr.** Stratigraphic analysis of a deep ice core from Greenland: Geol. Soc. America Spec. Paper 125, 186 p., illus., tables, 1970.
- Lanning, F. C.** See Hiebert, Clyde. 09614
- 09616 **Lanning, F. C.; Meyer, H. A.** Determination of sodium, lead and barium in Cottonwood and Burr Limestone beds in Riley County Kansas, by flame photometry: Kansas Acad. Sci. Trans., 1970, v. 73, no. 1, p. 40-44, tables, 1970.
- 09636 **Lanphere, Marvin A.; Coleman, Robert G.** Age and geologic implications of high-grade blueschists and associated amphibolites from Oregon and California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 602-603, 1970.
- Lanphere, Marvin A.** See Reed, Bruce L. 10091
- Lao, Chester.** See Peterson, Frank L. 01154
- 10621 **Lao, Chester; Peterson, Frank L.; Cox, Doak C.** Application of electric well logging and other well logging methods in Hawaii: Hawaii Univ. Water Resources Research Center Tech. Rept. 21, 108 p., illus., tables, 1969.
- 11264 **Lao, Chester; Adams, William M.** Potential water development of the Kahua area, Kohala, Hawaii: Hawaii Univ. Water Resources Research Center Tech. Rept. 19, 16 p., illus., 1968.
- 06831 **Lapham, D. M.** Calciostrontianite (?): Pennsylvania Geology, v. 1, no. 9, p. 11, 1970.



**Lapham, Davis M.** *See* Bolles, William H. 07559

- 09507 **Lapham, Davis M.; Saylor, Timothy E.** Chemical analyses of three Triassic (?) diabase dikes in Pennsylvania: Pennsylvania Geol. Survey Inf. Circ. 68, 16p., illus., tables, 1970.

- 10071 **Lapina, N. N.; Kulikov, N. N.; Semenov, G. P.; Belov, N. A.** Organic material in modern sediments of Arctic Ocean [abs.]: *in* Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2493, 1970.

- 01079 **Laporte, Léo F.** Paleontology — Fossils and environment [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 391-392, 1970.

**LaPorte, Léo F.** *See* Walker, Kenneth R. 04716

**LaPray, Reed.** *See* Arnow, Ted. 06188

- 04148 **Larach, Simon; Shrader, Ross E.; Kauffunger, Richard A.** Cathode-ray-excited emission spectroscopic analysis of trace rare earths — Pt. 4, Determination of thulium in zinc sulfide [with French and German abs.]: Anal. Chim. Acta, v. 51, no. 3, p. 393-398, illus., tables, 1970.

**Lardear, L. F.** *See* Prewitt, C. T. 09319

**Larew, H. Gordon.** *See* Atakol, Kenan. 02360

- 01862 **Larimer, J. W.; Anders, Edward.** Chemical fractionations in meteorites — Pt. 3, Major element fractionations in chondrites: Geochim. et Cosmochim. Acta, v. 34, no. 3, p. 367-387, illus., tables, 1970.

**Larimer, J. W.** *See* Moore, C. B. 05709

- 06353 **Laroche, A.; Schwarz, E. J.** Magnetic properties of lunar sample 10048-22, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 2305-2308, illus., reprinted 1970.

- 02898 **LaRoche, P.; Chagnon, J. Y.; Lefebvre, G.** Regional geology and landslides in the marine clay deposits of eastern Canada [with French abs.]: Canadian Geotech. Jour., v. 7, no. 2, p. 145-156, illus., 1970.

**LaRoche, P.** *See* Tavenas, F. 03756

**LaRoche, P.** *See* Tamuly, A. L. 07443

- 09766 **LaRoche, P.** A report on soil mechanics to the Solid-Earth Science Study [group] of the Science Council of Canada, Pt. 4 of Report on the geotechnical sciences: Natl. Research Council Canada Assoc. Comm. Geotech. Research Tech. Memo. 95, p. IV1-IV11, 1969.

- 10767 **LaRoche, Pierre.** Soil Mechanics, *in* Background papers on the earth sciences in Canada (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 151-155, 1970.

- 02481 **LaRocque, Auréle.** Pleistocene Mollusca of Ohio, Pt. 4 (of 4 pts.): Ohio Div. Geol. Survey Bull. 62, pt. 4, p. 555-800, illus., 1970.

**Larocque, G. S.** *See* Dussault, R. 02890

**Larsen, J. C.** *See* Cox, C. S. 10000

- 06251 **Larsen, Leo.** The International Hydrological Decade Programme in Narssaq river valley, south Greenland, *in* Report of activities, 1969: Grönlands Geol. Undersøgelse Rap. 28, p. 35-36, 1970.

- Larsen, Leonard H.** *See* Rowan, Lawrence C. 01176
- Larsen, Ronald.** *See* Jones, Walter V. 05500
- Larson, A. L.** *See* Norvitch, R. F. 03750
- Larson, Donald A.** *See* Leffingwell, Harry A. 02297
- 07294 **Larson, Douglas William.** On reconciling lake classification with the evolution of four oligotrophic lakes in Oregon [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 5, p. 2805B, 1970.
- 03362 **Larson, E. E.; LaFountain, L.** Timing of the breakup of the continents around the Atlantic as determined by paleomagnetism: *Earth and Planetary Sci. Letters*, v. 8, no. 5, p. 341-351, illus., table, 1970.
- Larson, E. E.** *See* Kellogg, Karl. 04799
- Larson, E. E.** *See* Strangway, D. W. 06297
- Larson, E. R.** *See* Olson, G. H. 00329
- 10486 **Larson, Edwin E.; Mutschler, Felix E.** Anomalous early Paleozoic paleomagnetic pole as determined from dated Cambro-Ordovician intrusives in Colorado [abs.]: *EOS*, v. 51, no. 11, p. 744-745, 1970.
- 06896 **Larson, L. T.** Cobalt- and nickel-bearing manganese oxides from the Fort Payne Formation, Tennessee: *Econ. Geology*, v. 65, no. 8, p. 952-962, illus., tables, 1970.
- 09637 **Larson, L. T.** Textural study of polycrystalline pyrrhotite by reflectance measurements and X-ray pole figures [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 603, 1970.
- 01943 **Larson, Peggy A.; Mudie, John D.; Hilde, Thomas W. C.; Larson, Roger L.** Sea-floor spreading in the Gulf of California? [abs.]: *EOS*, v. 51, no. 4, p. 330, 1970.
- 07860 **Larson, Peggy Pickering.** *Deserts of America: Englewood Cliffs, N.J., Prentice-Hall, Inc., 340 p., illus., 1970.*
- Larson, R. J.** *See* Bradshaw, L. E. 01056
- Larson, R. L.** *See* Chase, C. G. 10201
- Larson, R. R.** *See* Rose, Harry J., Jr. 05719
- Larson, Richard R.** *See* Desborough, George A. 04904
- 01699 **Larson, Roger L.; Chase, Clement G.** Relative velocities of the Pacific, North America, and Cocos plates in the Middle America region: *Earth and Planetary Sci. Letters*, v. 7, no. 5, p. 425-428, illus., 1970.
- Larson, Roger L.** *See* Larson, Peggy A. 01943
- 01944 **Larson, Roger L.; Spiess, Fred N.** The American-Pacific plate boundary at the East Pacific Rise [abs.]: *EOS*, v. 51, no. 4, p. 329, 1970.
- 07597 **Larson, Roger Lee.** Near-bottom studies of the East Pacific Rise crest and tectonics of the mouth of the Gulf of California [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 3, p. 1431B-1432B, 1970.
- 07718 **LaSalle, Pierre.** Notes on the St-Narcisse morainic system north of Quebec City [with French abs.]: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 516-521, illus., 1970.
- Lasca, Norman P.** *See* Nelson, Katherine G. 06225

**Lasca, Norman P.** See Black, Robert F. 06810

06812 **Lasca, Norman P.** The drumlin field of southeastern Wisconsin, Pt. E in Pleistocene geology of southern Wisconsin — Geol. Soc. America, Ann. Mtg., Milwaukee, Wis., 1970, Field Trip Guide: Wisconsin Univ. Geol. and Nat. History Survey Inf. Circ. 15, p. E1-E13, illus., 1970.

06909 **Lasca, Norman P.** The Pleistocene geology of southeastern Wisconsin, an introduction, Pt. B in Pleistocene geology of southern Wisconsin — Geol. Soc. America, Ann. Mtg., Milwaukee, Wis., 1970, Field Trip Guide: Wisconsin Univ. Geol. and Nat. History Survey Inf. Circ. 15, p. B1-B7, illus., table, 1970.

06910 **Lasca, Norman P.** Pleistocene geology from Milwaukee to the Kettle Interlobate Moraine, Pt. C in Pleistocene geology of southern Wisconsin — Geol. Soc. America, Ann. Mtg., Milwaukee, Wis., 1970, Field Trip Guide: Wisconsin Univ. Geol. and Nat. History Survey Inf. Circ. 15, p. C1-C14, illus., 1970.

**Lasky, Samuel G.** See Blondel, Fernand. 04696

**Lastrico, R.** See Duke, C. M. 04667

00796 **Laswell, Troy J.** Memorial to Paul Heaney Dunn (1895-1967): Geol. Soc. America Proc. 1967, p. 203-205, portrait, 1970.

05758 **Latham, G. V.; Ewing, Maurice; Press, Frank; Sutton, G. H.; Dorman, J.; Nakamura, Y.; Derr, J.; Duennbier, F.** Passivnyy seysmicheskiy eksperiment [The passive seismic experiment]: Akad. Nauk SSSR Izv. Ser. Geol., no. 8, p. 51-55, illus., 1970.

**Latham, Gary V.** See Warren, Nicholas W. 04444

05106 **Latham, Gary V.** (and others). Passive seismic experiment, in Apollo 12 preliminary science report: U.S. Natl. Aeronautics and Space Adm. Spec. Pub. SP-235, p. 39-53, illus., 1970.

06257 **Latham, Gary V.** (and others). Seismic data from man-made impacts on the Moon: Science, v. 170, no. 3958, p. 620-626, illus., tables, 1970.

06289 **Latham, Gary V.** (and others). Apollo 11 passive seismic experiment, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 2309-2320, illus., 1970.

07764 **Latham, Jack W.** Petroleum geology of Healdton field, Carter County, Oklahoma, in Geology of giant petroleum fields — Symposium, AAPG, 53d Ann. Mtg., Oklahoma City, Okla., 1968: Am. Assoc. Petroleum Geologists Mem. 14, p. 255-276, illus., tables, 1970.

**Lathan, Carl P.** See Dodd, Philip H. 02929

02850 **Latham, Ernest H.** Progress in application of remote-sensing techniques to marine geology and hydrology, in Earth resources aircraft program status review, NASA, Houston, 1968 — V. 1, Geology, geography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 17B1-17B2 [1970].

10072 **Latham, Ernest H.** Tectonic framework of northern and central Alaska [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2493, 1970.

04117 **Latour, B. A.; Christmas, L. P.** Preliminary estimate of measured coal resources including reassessment of indicated and inferred resources in western Canada: Canada Geol. Survey Paper 70-58, 14 p., illus., tables, 1970.

**Latour, B. A.** See Little, H. W. 07975

**Lattery, J. E.** See Cress, J. P. 05460

- 01182 **Lattman, Laurence H.** Geological instruction in remote sensing [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 392, 1970.
- 09638 **Lattman, Laurence H.** Gully-widening and pedimentation in case-hardened carbonate gravels [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 604, 1970.
- 10620 **Lau, L. Stephen; Hailu, Tsegaye.** Tritium measurements in natural Hawaiian waters — Instrumentation: Hawaii Univ. Water Resources Research Center Tech. Rept. 22, 36 p., illus., tables, 1969.
- Lau, L. Stephen.** See Hori, Daniel H. 10840
- 02766 **Lauber, Patricia.** This restless Earth: New York, Random House, 129 p., illus., 1970.
- 01792 **Laughlin, A. W.; Brookins, D. G.; Kudo, A. M.; Causey, J. D.** Sr isotopic and chemical analyses of ilmenite inclusions and basalt, Bandera Crater, New Mexico [abs.]: EOS, v. 51, no. 4, p. 449, 1970.
- 01793 **Laughlin, A. William; Causey, J. D.** Phlogopite-kaersutite bearing ultramafic inclusions from a new locality, Bandera Crater, Valencia County, New Mexico [abs.]: EOS, v. 51, no. 4, p. 449, 1970.
- 11274 **Laughlin, A. William.** A geochronological-geochemical study of the Rutherford and Morefield pegmatites, Amelia, Virginia, App. A-1 of Correlation and chronology of ore deposits and volcanic rocks, Damon, Paul E.: U.S. Atomic Energy Comm. Research Div., p. A11-A135, illus., tables, 1968.
- 05944 **Laughon, R. B.** New data on guildite: Am. Mineralogist, v. 55, nos. 3-4, p. 502-511, illus., tables, 1970.
- Laughon, Robert B.** See Anthony, John W. 06574
- 07277 **Laughon, Robert Bush.** The crystal structure of a new hydrous calcium copper silicate mineral [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2766B, 1970.
- Laughton, A. S.** See Berggren, W. A. 06160
- 00955 **Laul, J. C.; Case, D. R.; Schmidt-Bleck, F.; Lipschutz, M. E.** Bismuth contents of chondrites: Geochim. et Cosmochim. Acta, v. 34, no. 1, p. 89-103, illus., tables, 1970.
- 01945 **Laul, J. C.; Pelly, I.; Lipschutz, M. E.** Thallium and other trace elements in primitive chondrites [abs.]: EOS, v. 51, no. 4, p. 341, 1970.
- 03651 **Laul, J. C.; Case, D. R.; Wechter, M.; Schmidt-Bleck, F.; Lipschutz, M. E.** An activation analysis technique for determining groups of trace elements in rocks and chondrites: Jour. Radioanal. Chemistry, v. 4, no. 2, p. 241-264, illus., tables, 1970.
- 04557 **Laul, J. C.; Pelly, I.; Lipschutz, M. E.** Thallium contents of chondrites: Geochim. et Cosmochim. Acta, v. 34, no. 8, p. 909-920, illus., tables, 1970.
- Laul, J. C.** See Ganapathy, R. 05692
- 06854 **Laul, J. C.; Keays, R. R.; Ganapathy, R.; Anders, E.** Abundance of 14 trace elements in lunar rock 12013,10: Earth and Planetary Sci. Letters, v. 9, no. 2, p. 211-215, illus., table, 1970.
- Laurent, Jean-Louis.** See Guedelia, Daniel. 00069
- 04610 **Laurin, A. F.; Dugas, J.** Current mining exploration and development in Quebec: Canadian Mining Jour., v. 91, no. 4, p. 66-69, illus., 1970.

**Laurin, A. F.** See Wynne-Edwards, H. R. 08121

**Laurin, A.-F.** See Chown, E. H. 08469

00844 **Laursen, Dan.** Profiler af udenlandske videnskabsmaend i Grönland — [Pt.] 4, William Herbert Hobbs [1864-1923]: Grönland 1970, no. 3, p. 83-84, portrait, 1970.

08729 **Lautsch, H.** Principles of the theoretical prediction of ground movements — Comparison with practical results and the task of the mining surveyor in the application of these predictions (with French summ.), in Canadian Symposium on Mining Surveying and Rock Deformation Measurements, 1st, Fredericton (New Brunswick), 1969, Proc.: Fredericton, Univ. of New Brunswick, p. 293-324, illus., 1970.

03020 **Laverdière, Camille.** Description d'une coupe (Anse de Roberval, Québec) pour servir à l'étude des dépôts du golfe de Laflamme [Description of a section (Roberval Cove, Quebec) made to study the gulf of Laflamme deposits (with English and Russian abs.)]: Rev. Géographie Montréal, v. 24, no. 3, p. 330-333, illus., table, 1970.

03128 **Laverdière, Camille; Bernard, Claude.** Bibliographie annotée sur les broutures glaciaires — An annotated bibliography on glacial chattermarks [text in French and English]: Rev. Géographie Montréal, v. 24, no. 1, p. 79-89, 1970.

03239 **Laverdière, Camille; Lengellé, Jean-G.** Trains de broutures glaciaires au Témiscamingue, Québec [Glacial chattermark trains at Temiskaming, Quebec (with English and Russian abs.)]: Rev. Géographie Montréal, v. 24, no. 3, p. 327-329, illus., 1970.

**Lavery, Norman G.** See Barnes, Hubert L. 07404

**Lavin, Peter M.** See Rankin, William E. 04057

07432 **Lavkulich, L. M.; Wiens, J. H.** Comparison of organic matter destruction by hydrogen peroxide and sodium hypochlorite and its effect on selected mineral constituents: Soil Sci. Soc. America Proc. v. 34, no. 5, p. 755-758, illus., tables, 1970.

**Law, A. D.** See Burns, Roger G. 06082

09350 **Law, L.; Brebner, A.** On water waves generated by landslides — Australasian Conference on Hydraulics and Fluid Mechanisms, 3d, Sydney, Australia, 1968, Proc.: Sydney, Australia, Inst. Eng., p. 155-159, illus., 1970.

**Law, Stephen L.** See Green, Thomas E. 09463

**Lawless, J.** See Chang, S. 05743

04407 **Lawlor, Florine.** Exploring Nevada's Gypsum Cavern: Desert, v. 33, no. 1, p. 28-29, 38, illus., 1970.

03186 **Lawn, Barbara.** University of Pennsylvania radiocarbon dates XIII: Radiocarbon, v. 12, no. 2, p. 577-589, 1970.

00731 **Lawrence, David R.** A communication system for paleoecology [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 226, 1970.

10332 **Lawrence, David R.** Reciprocation — a unifying theme for paleoecology [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 748-749, 1970.

03109 **Lawrence, Edmond Francis.** Geological and geophysical investigations of the mineral deposits of the Calico area, Mineral County, Nevada [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 10, p. 4663B, 1970.

**Lawrence, H. W.** See Baltosser, R. W. 00843

- 09639 **Lawrence, James R.; Taylor, Hugh P., Jr.** Estimation of  $\alpha$ -hy-gibbsite- $H_2O$  and  $\alpha$ -ox-gibbsite- $H_2O$  from  $\delta D$  and  $\delta O_{18}$  contents of gibbsites and Al-Si-Fe hydroxides in Holocene weathering zones [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 604-605, 1970.
- 09662 **Lawrence, James R.; Taylor, Hugh P., Jr.** Utilization of  $\delta D$  and  $\delta O_{18}$  of ancient kaolinites to determine  $\delta D$  and  $\delta O_{18}$  of ancient meteoric waters [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 605, 1970.
- 07933 **Lawrence, James Robert.** O-18/O-16 and D/H ratios of soils, weathering zones and clay deposits [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3482B-3483B, 1970.
- 03786 **Lawrence, Robert D.** Stress analysis based on albite twinning of plagioclase feldspars: Geol. Soc. America Bull., v. 81, no. 8, p. 2507-2512, illus., 1970.
- 10896 **Lawson, Andrew C.** (and others). California earthquake of April 18, 1906 — Atlas of maps and seismograms accompanying the report of the State Earthquake Investigation Committee [reprinted]: Carnegie Inst. Washington Pub. 87, 25 maps, 15 seismograms, 1970; originally published, 1908.
- 02184 **Lawson, B. L.; Cook, C. F.** A theoretical and laboratory evaluation of carbon logging — Pt. 2, Theoretical evaluation of oxygen interference, in SPWLA Logging Symposium, 11th Ann., Los Angeles, Calif., 1970, Trans.: Houston, Tex., Soc. Prof. Well Log Analysts, p. B1-B12, illus., tables, 1970.
- Lawson, D. C.** See Berg, R. B. 04699
- 08473 **Lawson, D. W.** A rational approach to groundwater investigations in representative basins [with French abs.], in Symposium on the results of research on representative and experimental basins: Internat. Assoc. Sci. Hydrology-Unesco Pub. 96, p. 652-667, illus., table, 1970.
- Lawson, D. W.** See Elrick, D. E. 09193
- 03215 **Lay, E. P.** Descent to the deep: Oceans, v. 3, no. 2, p. 58-59, illus., 1970.
- 09218 **Laycock, Arleigh H.; Francisco, Martha; Fisher, Thelma.** (editors). Water balance in North America — Symposium, Banff, Alberta, 1969, Proc.: Am. Water Resources Assoc. Proc. Ser., no. 7, 335 p., illus., tables, 1969.
- 07733 **Laycock, George.** The diligent destroyers: New York, Doubleday and Company, 225 p., illus., 1970.
- 02161 **Layer, D. B.; Sproule, J. C.** Robert William Landes, 1910-1969: Bull. Canadian Petroleum Geology, v. 18, no. 1, p. 120-121, portrait, 1970.
- Lazurkin, V. M.** See Tkatchenko, B. V. 10108
- Leach, Carolyn H.** See Flawn, Peter T. 02784
- Leach, J. W.** See Parry, W. T. 03401
- Leaird, James D.** See Burkett, David H. 06081
- Leake, Bernard E.** See Kalsbeek, Feiko. 08355
- 09640 **Leamon, A. R.** Trends in the Tennessee coal industry [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 605-606, 1970.
- Learned, R. E.** See Pierce, A. P. 05556
- Learned, R. E.** See McCarthy, J. H., Jr. 05563

- 08346 **Leavens, Peter B.; White, John S., Jr.; Hey, Max H.** Eakerite — A new tin silicate: *Mineralog. Rec.*, v. 1, no. 3, p. 92-96, illus., tables, 1970.
- LeBlanc, Rufus J.** *See* Bernard, Hugh A. 05898
- 00905 **LeBlanc, Rufus J., Sr.** Coastal interdeltaic sedimentation in the northwest gulf region [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 289, 1970.
- LeBlanc, Rufus J., Sr.** *See* Bernard, Hugh A. 05896
- 10887 **LeBreton, E. Gordon; Green, R.** Hydrogeological map, Red Deer area, Alberta, NTS 83A [also accompanies RCA Rept. 71-1, 1970]: Edmonton, Alberta, Research Council Alberta, scale 1:250,000, 1970.
- LeCampion, Thérèse.** *See* Golubic, Stjepko. 03872
- LeCount, Peter F.** *See* Comm. on Subsoils of Boston. 07865
- 06022 **Lee, Chun Chi.** The decomposition of organic matter in some shallow water, calcareous sediments of Little Black Water Sound, Florida Bay [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5582B, 1970.
- 06183 **Lee, Donald E.; VanLoenen, Richard E.** Biotites from hybrid granitoid rocks of the southern Snake Range, Nevada, in *Geological Survey research 1970*, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D196-D206, illus., tables, 1970.
- 06209 **Lee, Donald E.; Marvin, Richard F.; Stern, T. W.; Peterman, Zell E.** Modification of potassium-argon ages by Tertiary thrusting in the Snake Range, White Pine County, Nevada, in *Geological Survey research 1970*, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D92-D102, illus., tables, 1970.
- Lee, Gerhard B.** *See* Parker, Dale E. 02384
- Lee, Gerhard B.** *See* Parker, Dale E. 09800
- Lee, John J.** *See* McEnery, Marie. 04058
- Lee, K. L.** *See* Seed, H. Bolton. 05507
- Lee, Keenan.** *See* Lyon, R. J. P. 04482
- 06020 **Lee, Keenan.** Infrared exploration for shoreline springs, a contribution to the hydrogeology of Mono Basin, California [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5577B, 1970.
- 02355 **Lee, Kenneth L.; Seed, H. Bolton.** Undrained strength of anisotropically consolidated sand: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7136, *Jour. Soil Mechanics and Found. Div.*, no. SM2, p. 411-428, illus., 1970.
- 03226 **Lee, Kenneth L.** Comparison of plane strain and triaxial tests on sand: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7276, *Jour. Soil Mechanics and Found. Div.*, no. SM 3, p. 901-923, illus., tables, 1970.
- 03633 **Lee, Kenneth L.; Shen, C. K.** Horizontal movements related to subsidence — Closure [to discussion of paper 6336, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7385, *Jour. Soil Mechanics and Found. Div.*, no. SM 4, p. 1464-1466, illus., 1970.
- Lee, Kenneth L.** *See* Singh, Awtar. 05502
- 06777 **Lee, Kenneth L.; Morrison, Ross A.** Strength of anisotropically consolidated compacted clay: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7703, *Jour. Soil Mechanics and Found. Div.*, no. SM 6, p. 2025-2043, illus., tables, 1970.

- 10573 **Lee, T. C.; Henyey, T. L.** Heat flow in Lake Tahoe, California-Nevada [abs.]: EOS, v. 51, no. 11, p. 824, 1970.
- 00304 **Lee, W. H. K.; Roller, J. C.; Eaton, J. P.** Microearthquake mapping of the San Andreas fault system in central California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 111-112, 1970.
- Lee, W. H. K.** See Stewart, S. W. 00372
- Lee, W. H. K.** See Eaton, J. P. 03975
- 06743 **Lee, W. H. K.** On the global variations of terrestrial heat-flow, in Geophysical studies on the evolution of the Earth's deep interior — A symposium, Madrid, 1969, Proc.: Physics Earth and Planetary Interiors, v. 2, no. 5 (spec. issue), p. 332-341, illus., tables, 1970.
- 10547 **Lee, W. H. K.; Eaton, M. S.** A detailed study of the Danville, California, earthquakes of May to July, 1970 [abs.]: EOS, v. 51, no. 11, p. 779, 1970.
- Lee, W. H. K.** See Stewart, S. W. 10832
- 09641 **Leeds, D. J.; Matthiesen, R. B.; Smith, C. B.** Simulation of earthquake effects on nuclear reactors using underground explosions [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 606, 1970.
- Leeds, David J.** See Fischer, Joseph A. 06977
- Lee-Hu, C.** See Gopalan, K. 05696
- 01794 **Leeman, W. P.; Manton, W. I.** Sr-87/Sr-86 ratios of Snake River Plain basalts [abs.]: EOS, v. 51, no. 4, p. 444, 1970.
- 00854 **Leeman, William P.; Rogers, John J. W.** Late Cenozoic alkali-olivine basalts of the Basin-Range Province, USA: Contr. Mineralogy and Petrology, v. 25, no. 1, p. 1-24, illus., tables, 1970.
- 04554 **Leeman, William P.** The isotopic composition of strontium in late-Cenozoic basalts from the Basin-Range province, western United States: Geochim. et Cosmochim. Acta, v. 34, no. 8, p. 857-872, illus., tables, 1970.
- Lefebvre, G.** See LaRochelle, P. 02898
- 08529 **Lefebvre, Richard H.** Columbia River basalt of the Grand Coulee area, in Columbia River Basalt Symposium, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 1-38, illus., tables, 1970.
- 05234 **LeFeuvre, Albert R.; Altinbilek, Hilmi D.; Carstens, Marion R.** Sediment-pickup function: Am. Soc. Civil Engineers Proc., v. 96, paper 7636, Jour. Hydraulics Div., no. HY 10, p. 2051-2063, illus., tables, 1970.
- 02297 **Leffingwell, Harry A.; Larson, Donald A.; Valencia, Mark J.** A study of the fossil pollen *Wodehouseia spinata* — [Pt.] 1, Ultrastructure and comparisons to selected modern taxa; [Pt.] 2, Optical microscopic recognition of foot layers in differentially stained fossil pollen and their significance: Bull. Canadian Petroleum Geology, v. 18, no. 2, p. 238-262, illus., 1970.
- 10865 **Leffingwell, Harry A.** Palynology of the Lance (late Cretaceous) and Fort Union (paleocene) formations of the type Lance area, Wyoming, in Symposium on palynology of the Lake Cretaceous and early Tertiary, San Francisco, Calif., 1966: Geol. Soc. America Spec. Paper 127, p. 1-64, illus., 1970.
- 09304 **Legault, Richard R.** Summary of Michigan multispectral investigations program, Sec. 37 of Earth Resources Program, 3d ann., review — v. 2, Agriculture, forestry,



and sensor studies: Houston, Tex., NASA manned Spacecraft Center, Msc-03742, p. 37-1S37-31, illus., table, 1970.

**LeGeros, John P.** *See* LeGeros, Racquel Z. 02803

**LeGeros, John P.** *See* Klein, Edward. 02878

- 02803 **LeGeros, Racquel Z.; LeGeros, John P.; Trautz, Otto R.; Klein, Edward.** Spectral properties of carbonate in carbonate-containing apatites, *in* Developments in applied spectroscopy, V. 7B — Mid-America Spectroscopy Symposium, 19th Ann., Chicago, Ill., 1968, Selected papers: New York and London, Plenum Press, p. 3-12, illus., tables, 1970.

**LeGeros, Racquel Z.** *See* Klein, Edward. 02878

- 08035 **Legget, Robert F.** The Ink Pots, a group of karst springs in the Rocky Mountains near Banff, Alberta — Discussion [of paper by R. O. van Everdingen, 1969]: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 1, p. 551, 1970.

- 09467 **Legget, Robert F.** Consequences of man's alteration of natural systems, *in* Limitations of the earth, a compelling focus for geology (Texas Univ. Austin Bur. Econ. Geology)-A symposium held at the dedication of the new Geology Building, Austin, Tex., 1967, Proc.: Texas Quart., v. 11, no. 2, p. 24-35, 1968.

**Leggett, D.** *See* Murrmann, R. P. 03337

- 01148 **LeGrand, Harry E.** Comparative hydrogeology — An example of its use: Geol. Soc. America Bull., v. 81, no. 4, p. 1243-1248, illus., table, 1970.

- 09642 **LeGrand, Harry E.** Development and distribution of permeability in carbonate aquifers [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 606, 1970.

- 05058 **Lehman, Oliver R.; Hauser, Victor L.** Playa water quality changes with time and effects on clarification: Water Resources Research, v. 6, no. 5, p. 1420-1423, tables, 1970.

- 03328 **Lehmann, Gerhard; Harder, Hermann.** Optical spectra of di- and trivalent iron in corundum: Am. Mineralogist, v. 55, nos. 1-2, p. 98-105, illus., tables, 1970.

- 05525 **Leighton, F. Beach.** Landslides, *in* Geologic hazards and public problems (R. A. Olson and M. M. Wallace, editors) — [U.S.] Office Emergency Preparedness, Region 7, Conf., San Francisco, Calif., 1969, Proc.: Washington, D.C., U.S. Govt. Printing Office, p. 97-132, illus. [1970].

**Leighton, Fred.** *See* Blake, Wilson. 07453

**Leipziger, F. D.** *See* Evans, C. A., Jr. 03666

- 04002 **Leisman, Gilbert A.** A petrified *Sporangiostrobus* and its spores from the Middle Pennsylvanian of Kansas: Palaeontographica, Abt. B., v. 129, nos. 4-6, illus., 1970.

- 04389 **Leisman, Gilbert A.; Peters, John S.** A new pteridosperm male fructification from the Middle Pennsylvanian of Illinois: Am. Jour. Botany, v. 57, no. 7, p. 867-873, illus., 1970.

- 09198 **Leisman, Gilbert A.** Densospore variability as exhibited in the cone genus *Sporangiostrobus* [abs.], *in* Perkins, B. F. (editor), Geoscience and Man — v. 1, Am. Assoc. Stratig. Palynologists Ann. mtg., 1st, 1968, Proc.: Baton Rouge, La., Louisiana State Univ. School of Geoscience, p. 134, 1970.

- 00732 **Leith, C. J.** Environmental aspects of beach processes, sediment, and erosion in the coastal region of North Carolina [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 226-227, 1970.

- 09216 **Leith, C. J.; Welby, C. W.** An application of the high resolution boomer seismic technique in ground water problems in the Pamlico Sound area, *in* Symposium on hydrology of the coastal waters of North Carolina, Raleigh, N.C., 1967, Proc.: North Carolina Univ. Water Resources Research Inst. Rept. no. 5, p. 39-48, illus., 1967 [?].
- Leland, George R.** See Ericksen, George E. 03818
- Leland, H. V.** See Gross, D. L. 02118
- Leland, Harry V.** See Shimp, Neil F. 02204
- Leland, Harry V.** See Shimp, Neil F. 09566
- Leland, Harry V.** See Shimp, Neil F. 11256
- 00104 **LeMasurier, Wesley E.** Structural study of a Laramide fold involving shallow-seated basement rock, Front Range, Colorado: Geol. Soc. America Bull., v. 81, no. 2, p. 421-434, illus., 1970.
- Lemish, J.** See Simon, D. E. 04451
- 00079 **Lemmon, Richard M.** Chemical evolution: Chem. Rev., v. 70, no. 1, p. 95-109, illus., tables, 1970.
- 00906 **LeMone, David V.** Middle Canadian (Lower Ordovician) cyclic digitate algae of the Jose Formation, southern Franklin Mountains, El Paso County, Texas [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 289-290, 1970.
- Lenau, Charles W.** See Hjelmfelt, Allen T. 03683
- 03237 **Lengellé, Jean-G.** Les bourrelets de congère de Luskville, Québec [Protalus moraines near Luskville, Quebec (with English and Russian abs.)]: Rev. Géographie Montréal, v. 24, no. 3, p. 321-326, illus., 1970.
- Lengellé, Jean-G.** See Laverdière, Camille. 03239.
- 02645 **Lennon, R. B.** Width-thickness relations for fluvial and shoreline sand bodies [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 857, 1970.
- 02935 **Lennox, D. H.; Carlson, V.** Integration of geophysical methods for groundwater exploration in the prairie provinces, Canada [with French abs.], *in* Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 517-533, illus., tables; discussion, p. 533-535, 1970.
- 06931 **Lennox, D. H.; Vandenberg, A.** Geohydrologic boundary envelopes: Jour. Hydrology, v. 12, no. 1, p. 48-52, illus., 1970.
- 01230 **Lent, Robert Louis.** Geology of the southern half of the Langlois quadrangle, Oregon [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 8, p. 3708B-3709B, 1970.
- 02153 **Lenz, A. C.** Late Silurian brachiopods of Prongs Creek, northern Yukon: Jour. Paleontology, v. 44, no. 3, p. 480-500, illus., 1970.
- 05899 **Leon Vallejo, G.; Segalen, P.** Observations sur des sols rouges dérivés de roches volcaniques basiques dans le Bajío (Mexique Central) [Observations on some red soils derived from basic volcanic rocks in the Bajío (Central Mexico) (with English and Spanish abs.)]: [France] Office Recherche Sci. et Tech. Outre-Mer Cahiers, Sér. Pédologie, v. 8, no. 1, p. 49-60, illus., tables, 1970.
- Leonard, M. A.** See Hubert, C. 05302
- 07615 **Leonard, R. A.; Weed, S. B.** Mica weathering rates as related to mica type and composition [with French, German, and Russian abs.]: Clays and Clay Minerals, v. 18, no. 4, p. 187-195, illus., tables, 1970.

- 07616 **Leonard, R. A.; Weed, S. B.** Effects of potassium removal on the *b*-dimension of phlogopite [with French, German, and Russian abs.]: *Clays and Clay Minerals*, v. 18, no. 4, p. 197-202, illus., tables, 1970.
- 02550 **Leonard, Ralph A.** Infrared analysis of partially deuterated water adsorbed on clay: *Soil Sci. Soc. America Proc.*, v. 34, no. 2, p. 339-343, illus., 1970.
- 00470 **Leonard, Robert B.; Morgan, Charles O.** Application of computer techniques to seepage-salinity surveys in Kansas: *Kansas Geol. Survey Spec. Distrib. Pub.* 47, 44 p., tables, 1970.
- Leonardsen, Erik S.** See Sørensen, Henning. 08293
- 07573 **Leonhardy, Frank Clinton.** Artifact assemblages and archaeological units at Granite Point Locality 1 (45WT41), southeastern Washington [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 3, p. 1030B, 1970.
- Leopold, Estella B.** See Tschudy, Bernadine D. 10867
- 05055 **Leopold, Luna B.** An improved method for size distribution of stream bed gravel: *Water Resources Research*, v. 6, no. 5, p. 1357-1366, illus., tables, 1970.
- Leopold, Luna B.** See Wolman, M. Gordon. 06538
- 06539 **Leopold, Luna B.; Wolman, M. Gordon** River channel patterns, [Chap.] 7 in *Rivers and river terraces* (G. H. Dury, editor): London, Macmillan and Co. Ltd., p. 197-237, illus., tables. condensed 1970; originally published 1957.
- Leopold, Luna B.** See Langbein, Walter B. 06540
- 09895 **Leopold, Luna B.** Review of studies of hillslopes, U.S.A. [with German and French abs.], in *New contributions to slope evolution: Zeitschr. Geomorphologie*, supp. 9, p. 57-66, 1970.
- 01946 **LePichon, Xavier; Pautot, Guy; Martinais, Jacques; Sichler, Bertrand; Sibuet, Jean-Claude; Olivet, Jean-Louis; Bonnin, Jean.** Transform faults survey in North Atlantic [abs.]: *EOS*, v. 51, no. 4, p. 329, 1970.
- 02108 **LePichon, Xavier.** Correction to paper by Xavier LePichon, 'Sea-floor spreading and continental drift' [1968]: *Jour. Geophys. Research*, v. 75, no. 14, p. 2793, tables, 1970.
- LePichon, Xavier.** See Pautot, Guy. 03395
- LePichon, Xavier.** See Olivet, Jean-Louis. 05254
- Lepley, L.** See Adams, William. 09807
- Lepley, Larry K.** See Adams, William M. 10615
- 11265 **Lepley, Larry K.; Adams, William M.** Reflectivity of electromagnetic waves at an air-water interface for pure and sea water: *Hawaii Univ. Water Resources Research Center Tech. Rept.* 25, 15 p., illus., 1968.
- 03625 **Leps, Thomas M.** Review of shearing strength of rockfill: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7394, *Jour. Soil Mechanics and Found. Div.*, no. SM 4, p. 1159-1170, illus., tables, 1970.
- 08273 **Lerman, Abraham; Weiler, Roland R.** Diffusion and accumulation of chloride and sodium in Lake Ontario sediment: *Earth and Planetary Sci. Letters*, v. 10, no. 1, p. 150-156, illus., tables, 1970.
- Lerman, J. C.** See Oeschger, H. 03181

- 08418 **LeRoux, J.; Rich, C. I.; Ribbe, P. H.** Ion selectivity by weathered micas as determined by electron microprobe analysis [with French, German, and Russian abs.]: *Clays and Clay Minerals*, v. 18, no. 6, p. 333-338, illus., table, 1970.
- Lespérance, P. J.** See Fritz, W. H. 05550
- 05178 **Lespérance, Pierre J.; Bourque, Pierre-André.** Silurian and basal Devonian stratigraphy of northeastern Gaspé Peninsula, Quebec: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 10, p. 1868-1886, illus., 1970.
- 00627 **Lessard, Robert H.** Micropaleontology and paleoecology of the Tununk Member of the Mancos Shale [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 340, 1970.
- 07278 **Lessard, Robert Henry.** Micropaleontology and paleoecology of the Tununk Member of the Mancos Shale [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 5, p. 2766B-2767B, 1970.
- Letourneau, Nelson J.** See Sutton, George H. 02779
- Lettau, Heinz H.** See Gallimore, Robert G., Jr. 02833
- 04448 **Leung, Irene Sheung-Ying.** An optical and X-ray analysis of deformation structures in diopside [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 10, p. 4664B, 1970.
- 00733 **Leung, Samuel S.** A vertical chemical profile of the Greenland ice sheet at Camp Century [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 227, 1970.
- 00734 **Leung, Samuel S.** Trace ferride content in magnetites of cores and host rocks of different geologic occurrences [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 227-228, 1970.
- 03880 **Leve, G. W.** Report on geophysical and television exploration in City of Jacksonville water wells: *Florida Bur. Geology Inf. Circ.* 64, 15 p., illus., table, 1970.
- 01275 **Levi-Donati, G. R.** Micro-chondrules: *Meteoritics*, v. 5, no. 1, p. 33-42, illus., 1970.
- Levine, J.** See Boyne, H. S. 06627
- 06628 **Levine, J.** Analysis of data from a laser strainmeter using fast Fourier transforms, *in* *Laser applications in the geosciences* (J. Gauger and F. F. Hall, Jr., editors) — Symposium, Huntington Beach, Calif., 1969, *Proc.: North Hollywood, Calif., Western Periodicals Co.*, p. 227-245, illus., 1970.
- Levine, Stephen R.** See Wood, M. D. 10312
- Levinson, A. A.** See Bayliss, P. 02157
- 05681 **Levinson, A. A.** (editor). *Proceedings of the Apollo 11 Lunar Science Conference, Houston, Tex., 1970 — V. 2, Chemical and isotope analysis*: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 991-1936, illus., tables, 1970.
- 06265 **Levinson, A. A.** (editor). *Proceedings of the Apollo 11 lunar science conference, Houston, Tex., 1970 — V. 3, Physical properties*: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1937-2492, illus., tables, 1970.
- Levinson, A. A.** See Bayliss, P. 08413
- 00961 **Levinton, Jeffrey S.; Bambach, Richard K.** Some ecological aspects of bivalve mortality patterns: *Am. Jour. Sci.*, v. 268, no. 2, p. 97-112, illus., 1970.

- 04371 **Levinton, Jeffrey S.** The paleoecological significance of opportunistic species: Lethaia, v. 3, no. 1, p. 69-78, illus., tables, 1970.
- 02998 **Levitt, S. R.; Condrate, R. A., Sr.** The polarized infrared spectra of hydroxyl ion in fluorapatite: Appl. Spectroscopy, v. 24, no. 2, p. 288-289, illus., 1970.
- 05946 **Levitt, S. R.; Condrate, R. A., Sr.** The preparation of fine mineral powders for infrared spectroscopy: Am. Mineralogist, v. 55, nos. 3-4, p. 522-524, illus., 1970.
- 09111 **Levitt, S. R.; Condrate, R. A., Sr.** The vibrational spectra of lead apatites: Am. Mineralogist, v. 55, nos. 9-10, p. 1562-1575, illus., tables, 1970.
- 00450 **Levy, Enrique.** La metalogenesis en America Central [with English abs.], in Mapa metalogenetico de America Central, 1:2,000,000; Estudios metalogeneticos de America Central: Inst. Centroamericano Inv. y Tecnologia Indus. Pubs. Geol., no. 3, p. 17-57, illus., table, 1970.
- Levy, Enrique.** See Dengo, Gabriel. 00466
- 06338 **Levy, Harold H.** Earth-resources technology satellite — NASA Data-Processing Facility: IEEE Trans. Geosci. Electronics, v. GE-8, no. 4, p. 348-352, illus., table, 1970.
- 00735 **Levy, John S.; Henry, Vernon J.** Seasonal variations in suspended sediment in a salt marsh estuary [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 228, 1970.
- 01168 **Levy, John S.; Logan, Thomas F.; Woolsey, James R.** Potential applications of infrared aerial photography to sedimentary processes [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 228-229, 1970.
- 03312 **Levy, Michael A.; Pollack, Henry N.; Pomeroy, Paul W.** Motion picture of the seismicity of the Earth, 1961-1967: Seismol. Soc. America Bull., v. 60, no. 3, p. 1015-1016, 1970.
- 02737 **Levy, Ram L.; Wolf, Clarence J.; Grayson, Michael A.; Gilbert, J.; Gelpi, E.; Updegrove, W. S.; Zlatkis, A.; Oró, J.** Organic analysis of the Pueblito de Allende meteorite: Nature, v. 227, no. 5254, p. 148-150, illus., table, 1970.
- 05329 **Levy, Ram L.; Wolf, Clarence J.; Oró, J.** A gas chromatographic method for characterization of the organic content present in an inorganic matrix: Jour. Chromatographic Sci., v. 8 [no. 9], p. 524-526, illus., 1970.
- 04108 **Lewellen, Robert; Brown, Jerry.** Man induced erosion on permafrost [abs.], in Alaska Sci. Conf., 20th, College, 1969, Proc.: Sci. Alaska 1969, p. 333-334, 1970.
- Lewin, S. Z.** See Baer, N. S. 05942
- Lewis, Anthony J.** See MacDonald, Harold C. 00907
- 03085 **Lewis, Anthony J.; Macdonald, Harold C.** Significance of estuarine meanders identified from radar imagery of eastern Panama and northwestern Colombia: Modern Geology, v. 1, no. 3, p. 187-196, illus., tables, 1970.
- 05874 **Lewis, Anthony J.; MacDonald, Harold C.** Interpretive and mosaicking problems of SLAR imagery: Remote Sensing Environment, v. 1, no. 4, p. 231-236, illus., table, 1970.
- 00305 **Lewis, B. R. T.; Meyer, R. P.; Gettrust, J.** Upper mantle structure along the axis of the Rocky Mountains [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 112, 1970.
- Lewis, Brian T. R.** See Kosalos, James G. 01942
- Lewis, Brian T. R.** See Dorman, LeRoy M. 03733

- 03736 **Lewis, Brian T. R.; Dorman, LeRoy M.** Experimental isostasy — [Pt.] 2, An isostatic model for the U.S.A. derived from gravity and topographic data: *Jour. Geophys. Research*, v. 75, no. 17, p. 3367-3386, illus., 1970.
- Lewis, Brian T. R.** See Dorman, LeRoy M. 06958
- 07593 **Lewis, Brian Thomas Robert.** An isostatic model for the U.S.A. derived from gravity and topographic data [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 3, p. 1355B, 1970.
- Lewis, C. F.** See Moore, C. B. 05709
- 07692 **Lewis, C. F. M.** Recent uplift of Manitoulin Island, Ontario, in *Symposium on recent crustal movements, Ottawa, Canada, 1969, Papers: Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 2, p. 665-675, illus., table, 1970.
- Lewis, Christopher F. M.** See Thomas, Richard L. 10273
- 08280 **Lewis, Clyde L.; Ott, Welland L.** Analytical chemistry of nickel: Elmsford, N. Y., and Oxford, England, Pergamon Press, 233 p., illus., tables, 1970.
- Lewis, D.** See Northwood, D. O. 03498
- Lewis, D. E., Jr.** See Dixon, J. B. 07433
- 01663 **Lewis, D. W.; Lingen, G. J. van der; Jones, D. J.** The construction of a transparent grain-size comparator: *Jour. Sed. Petrology*, v. 40, no. 1, p. 472-474, illus., 1970.
- 01477 **Lewis, G. Edward.** New discoveries of Pleistocene bison and peccaries in Colorado, in *Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B*, p. B137-B140, illus., 1970.
- 05885 **Lewis, James E.** Water-resources manpower — Supply and demand patterns to 1980: *Louisiana Water Resources Research Inst. Bull.* 4, 48 p., illus., tables, 1970.
- 06579 **Lewis, John F.** Chemical composition and physical properties of magnetite from the ejected plutonic blocks of the Soufrière Volcano, St. Vincent, West Indies: *Am. Mineralogist*, v. 55, nos. 5-6, p. 793-807, illus., tables, 1970.
- Lewis, John H.** See Gerhard, Lee C. 05361
- 06002 **Lewis, John Richard.** Structure and stratigraphy of the Rossie complex, northwest Adirondacks, New York [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 12, pt. 1, p. 5556B, 1970.
- 09482 **Lewis, Lloyd; Nacci, Vito; Gallagher, James.** In situ investigation of ocean sediments, in *Offshore Technology Conference, 2d Ann., Houston, Tex., 1970, Preprints — v. 2: Dallas, Tex., Offshore Technology Conf.*, p. II-637 — II-644, illus., tables, 1970.
- 00628 **Lewis, Paul H.** Microenvironmental relationships of the Petrified Forest Member of the Chinle Formation (Triassic) in and adjacent to the Petrified Forest National Park, Arizona [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 340-341, 1970.
- Lewis, Phyllis G.** See Bishop, Margaret S. 09922
- Lewis, R. S.** See Hohenberg, C. M. 05703
- 02033 **Lewis, Richard Q., Sr.; Luft, Stanley J.** Geologic map of the Parnell quadrangle, Wayne County, Kentucky: *U.S. Geol. Survey Geol. Quad. Map GQ-861*, scale 1:24,000, section, text, 1970.
- Lewontin, Richard C.** See Selander, Robert K. 03871

**Liang, S. S.** *See* Asunmaa, S. K. 06268

**Liao, Cheng-Sun.** *See* Huang, Ju-Chang. 05871

- 06617 **Liao, Kao Hsiung.** Statistical models of porous media and other hydrological systems [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 2, p. 790B, 1970.

**Libbey, F. W.** *See* Johnston, Paul M. 00791

- 08011 **Libby, W. F.** Radiocarbon dating, *in* A symposium on the impact of the natural sciences on archeology: *Royal Soc. London Philos. Trans.*, ser. A, v. 269, no. 1193, p. 1-10, illus., 1970.

- 08746 **Libby, W. F.** Ruminations on radiocarbon dating, *in* Radiocarbon variations and absolute chronology — Nobel Symposium, 12th, Uppsala, 1969, *Proc.*: New York, John Wiley and Sons, and Stockholm, Almqvist and Wiksell, p. 629-640, illus., tables, 1970.

**Libby, Willard F.** *See* Berger, Rainer. 11239

**Licari, G. R.** *See* Cloud, Preston. 05737

- 08065 **Lichti-Federovich, Sigrid.** The pollen stratigraphy of a dated section of Late Pleistocene lake sediment from central Alberta: *Canadian Jour. Earth Sci.*, v. 7, no. 3, p. 938-945, illus., tables, 1970.

**Lieber, Maxim.** *See* Perlmutter, N. M. 03317

**Liebermann, Robert C.** *See* Molnar, Peter. 01288

**Liebermann, Robert C.** *See* Savino, John. 01633

- 01947 **Liebermann, Robert C.; Banerjee, Subir K.** Magnetoelastic interactions in hematite [abs.]: *EOS*, v. 51, no. 4, p. 418, 1970.

**Liebermann, Robert C.** *See* Anderson, Orson L. 02814

- 03025 **Liebermann, Robert C.; Pomeroy, Paul W.** Source dimensions of small earthquakes as determined from the size of the aftershock zone: *Seismol. Soc. America Bull.*, v. 60, no. 3, p. 879-890, illus., tables, 1970.

- 03674 **Liebermann, Robert C.** Velocity-density systematics for the olivine and spinel phases of  $Mg_2SiO_4$ - $Fe_2SiO_4$ : *Jour. Geophys. Research*, v. 75, no. 20, p. 4029-4034, illus., tables, 1970.

- 03267 **Liebermann, Robert Cooper.** Effect of iron content upon the elastic properties of oxides and some applications to geophysics [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 11, p. 5104B, 1970.

- 06602 **Lifshin, Arthur.** Element migration across granitic dikes [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 2, p. 760B, 1970.

**Lifshin, E.** *See* Fleisher, R. L. 05334

**Ligon, D. T.** *See* Rose, Harry J., Jr. 05719

- 06349 **Likussar, W.; Sparks, G. E.; Boltz, D. F.** The ultraviolet spectrophotometric determination of rhenium by the pyrrolidinedithiocarbamate method [with French and German abs.]: *Anal. Chim. Acta*, v. 52, no. 2, p. 349-355, illus., table, 1970.

- 04184 **Lilienberg, D. A.** Osobennosti geomorfologii Kuby [Features of the geomorphology of Cuba]: *Moskov. Obshch. Ispytateley Prirody Byull., Otdel Geol.*, v. 45, no. 1, p. 155-156, 1970.

- 00613 **Lillegraven, Jason A.** Stratigraphy, structure, and vertebrate fossils of the Oligocene Brule Formation, Slim Buttes, northwestern South Dakota: *Geol. Soc. America Bull.*, v. 81, no. 3, p. 831-850, illus., table, 1970.
- Lilley, E. M.** *See* Stephens, D. R. 02402
- Lilley, E. M.** *See* Stephens, D. R. 06296
- Lilley, E. M.** *See* Stephens, D. R. 07832
- 08144 **Lilley, F. E. M.; Carmichael, C. M.** Electromagnetic damping of elastic waves, a simple theory: *Canadian Jour. Earth Sci.*, v. 7, no. 5, p. 1304-1307, illus., tables, 1970.
- 07489 **Limerinos, J. T.** Determination of the Manning coefficient from measured bed roughness in natural channels: U.S. Geol. Survey Water-Supply Paper 1898-B, p. B1-B47, illus., tables, 1970.
- Lin, Albert C.** *See* Hwang, Li-san. 06721
- 10253 **Lin, Chang L.** Hydrogeology of the Musquodoboit River Valley, Nova Scotia: Nova Scotia Dept. Mines Groundwater Sec. Rept. 70-3, 60 p., illus., tables, geol. map, 1970.
- 09643 **Lin, Tsen-Hsiung; Yund, R. A.** Potassium diffusion in K-feldspar [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 607, 1970.
- 04439 **Lincoln, J. B.; Miller, R. J.; Tettendorst, R.** Random powder mounts from montmorillonite aerogels: *Clay Minerals*, v. 8, no. 3, p. 347-348, illus., 1970.
- 06190 **Lind, Carol J.** Specific conductance as a means of estimating ionic strength, in *Geological Survey research 1970*, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D272-D280, illus., tables, 1970.
- 10456 **Lindholm, Gerald F.** An appraisal of ground water for irrigation in the Wadena area, central Minnesota: U.S. Geol. Survey Water-Supply Paper 1983, 56 p., illus., tables, hydrogeol. maps, 1970.
- 10434 **Lindroth, Carl H.** Survival of animals and plants on ice-free refugia during the Pleistocene glaciations: *Endeavour*, v. 29, no. 108, p. 129-134, illus., 1970.
- Lindsay, Everett H.** *See* Lundin, Robert F. 02982
- Lindsay, Everett H.** *See* Mehringer, Peter J., Jr. 08048
- Lindsay, J. R.** *See* Rose, Harry J., Jr. 05719
- 01550 **Lindsay, John F.; Summerson, C. H.; Barrett, P. J.** A long-axis clast fabric comparison of the Squantum "Tillite", Massachusetts, and the Gowganda Formation, Ontario: *Jour. Sed. Petrology*, v. 40, no. 1, p. 475-479, illus., 1970.
- 05020 **Lindsay, John F.** Clast fabric strength of tillite: *Jour. Geology*, v. 78, no. 5, p. 597-603, tables, 1970.
- Lindsay, W. L.** *See* Norvell, W. A. 02552
- 00629 **Lindsey, David A.** Facies and paleocurrents in conglomerates of the Harebell Formation and Pinyon Conglomerate, northwestern Wyoming [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 341, table, 1970.
- Lindskov, K. L.** *See* Gillespie, J. B. 09170
- 01795 **Lindsley, D. H.; Haggerty, S. E.; Smith, Douglas.** Occurrence of aenigmatite in differentiated basalt [abs.]: *EOS*, v. 51, no. 4, p. 435, 1970.



Lindsley, D. H. *See* Haggerty, S. E. 02242

Lindsley, Donald H. *See* Smith, Douglas. 09576

Lindstrom, David J. *See* Goles, Gordon G. 05695

- 01080 **Lindstrom, Maurits.** On the affinities of the conodonts — A review of existing knowledge [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 392-393, 1970.

- 06769 **Lindström, Maurits.** A suprageneric taxonomy of the conodonts: *Lethaia*, v. 3, no. 4, p. 427-445, illus., 1970.

- 07574 **Lindstrom, Richard Mark.** Radionuclides in meteorites and in the lunar surface [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 3, p. 1143B-1144B, 1970.

Lindvall, Robert M. *See* Scott, Glenn R. 01556

Lineback, J. A. *See* Gross, D. L. 02118

- 03917 **Lineback, J. A.; Ayer, N. J.; Gross, D. L.** Studies of Lake Michigan bottom sediments — No. 3, Stratigraphy of unconsolidated sediments in the southern part of Lake Michigan: *Illinois Geol. Survey Environmental Geology Note* 35, 35 p., illus., 1970.

Lineback, Jerry A. *See* Collinson, Charles. 01064

- 01081 **Lineback, Jerry A.** Calcarene and shallow-water carbonate facies of the Salem and St. Louis Limestones (Mississippian) in Illinois [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 393, 1970.

Lineback, Jerry A. *See* Howard, James F. 02386

Lineback, Jerry A. *See* Willman, H. B. 05584

- 06934 **Lineback, Jerry A.** Stratigraphy of the New Albany Shale in Indiana: *Indiana Geol. Survey Bull.* 44, 73 p., illus., 1970.

Lineback, Jerry A. *See* Gross, David L. 06999

- 00832 **Linehan, Daniel.** Geological and seismological factors influencing the assessment of a seismic threat to nuclear reactors, in *Seismic design for nuclear power plants* (Robert J. Hansen, editor): Cambridge, Mass., M.I.T. Press, p. 69-90, illus., 1970.

Linehan, Daniel. *See* Comm. on Subsoils of Boston. 07865

Lines, Gregory C. *See* Bentley, Robert D. 01903

- 01598 **Ling, Hsin-Yi.** Occurrences of silicoflagellates from central north Pacific cores [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 3, p. 558, 1970.

- 03650 **Ling, Hsin-Yi; Stadum, Carol J.** An evaluation of the Nomarski System for the study of siliceous microskeletons: *Jour. Paleontology*, v. 44, no. 4, p. 781-784, illus., 1970.

- 04391 **Ling, Hsin-Yi.** Silicoflagellates from central North Pacific core sediments: *Bulls. Am. Paleontology*, v. 58, no. 259, p. 85-129, illus., 1970.

Lingen, G. J. van der. *See* Lewis, D. W. 01663

- 08763 **Lingenfelter, R. E.; Ramaty, R.** Astrophysical and geophysical variations in C-14 production, in *Radiocarbon variations and absolute chronology — Nobel Symposium, 12th, Uppsala, 1969, Proc.*: New York, John Wiley and Sons, and Stockholm, Almqvist and Wiksell, p. 513-535, discussion, p. 535-537, illus., tables, 1970.

- 00529 **Link, Arthur Jürgen.** Inclusions of the Half Dome Quartz Monzonite, Yosemite National Park, California [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3242B, 1970.
- Link, Richard F.** See Koch, George S., Jr. 03808
- 08610 **Link, Richard F.; Koch, George S., Jr.** Experimental designs and trend-surface analysis, *in* Geostatistics — A colloquium (D. F. Merriam, editor), Lawrence, Kan., 1970, Proc.: New York, Plenum Press, p. 23-29, illus., tables, 1970.
- 05185 **Link, T. A.; Webb, J. B.; Harding, S. R. L.; Shaw, E. W.** John Campbell Sproule (1905-1970): Am. Assoc. Petroleum Geologists Bull., v. 54, no. 10, p. 1953-1954, portrait, 1970.
- 05288 **Link, T. A.; Webb, J. B.; Harding, S. R. L.; Shaw, E. W.** John Campbell Sproule, 1905-1970: Bull. Canadian Petroleum Geology, v. 18, no. 3, p. 450-452, portrait, 1970.
- 08207 **Linkletter, George O.** The use of cationic ratios in determining annual stratigraphic layers in polar ice [abs.]: *in* Internat. Symposium on Antarctic Glaciological Exploration (ISAGE), Hanover, N.H., 1968 [Proc.]: Internat. Assoc. Sci. Hydrology (and Sci. Comm. Antarctic Research) Pub. 86, p. 16-18, illus., 1970.
- Linn, Kurt O.** See Evans, Robert. 04578
- Linnenbom, Victor J.** See Lamontagne, Robert A. 09631
- 08499 **Linsley, Robert M.** Undergraduate paleontology in a liberal arts college — Or, "How many thousand genera do they really need to know?" *in* Teaching paleontology — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc., Pt. A: Lawrence, Kans., Allen Press, p. 3-12, 1970.
- 09132 **Linstedt, K. Daniel; Kruger, Paul.** Determination of vanadium in natural waters by neutron activation analysis: Anal. Chemistry, v. 42, no. 1, p. 113-115, tables, 1970.
- 02646 **Lintz, Joseph, Jr.** Remote sensing for petroleum [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 857, 1970.
- 05583 **Liou, J. G.** Synthesis and stability relations of wairakite,  $\text{CaAl}_2\text{Si}_4\text{O}_{12} \cdot 2\text{H}_2\text{O}$ : Contr. Mineralogy and Petrology, v. 27, no. 4, p. 259-282, illus., tables, 1970.
- 07586 **Liou, Juhn-Guang.** Stability relations of zeolites and related minerals in the system  $\text{CaO-Al}_2\text{O}_3\text{-SiO}_2\text{-H}_2\text{O}$  [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 3, p. 1351B, 1970.
- 00306 **Lipman, Peter W.; Prostka, Harold J.; Christensen, Robert L.** Cenozoic volcanism and tectonism in the western United States and adjacent parts of the spreading ocean floor — Pt. 1, Early and middle Tertiary [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 112-113, 1970.
- Lipman, Peter W.** See Christiansen, Robert L. 00432
- 03777 **Lipman, Peter W.; Steven, Thomas A.; Mehnert, Harald H.** Volcanic history of the San Juan Mountains, Colorado, as indicated by potassium-argon dating: Geol. Soc. America Bull., v. 81, no. 8, p. 2329-2351, illus., tables, 1970.
- 04242 **Lipman, Peter W.; Steven, Thomas A.** Reconnaissance geology and economic significance of the Platoro caldera, southeastern San Juan Mountains, Colorado, *in* Geological Survey research 1970, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C19-C29, illus., 1970.
- 04984 **Lipman, Peter W.** Relations between Cenozoic andesitic and rhyolitic volcanism, western interior United States: Geol. Soc. London Proc. 1969, no. 1662, p. 36-39, discussion, 1970.

**Lipps, Jere H.** See Valentine, James W. 03346

03664 **Lipps, Jere H.** Plankton evolution: Evolution, v. 24, no. 1, p. 1-22, illus., 1970.

04927 **Lipps, Jere H.; Valentine, James W.** The role of Foraminifera in the trophic structure of marine communities: Lethaia, v. 3, no. 3, p. 279-286, illus., 1970.

09644 **Lipps, Jere H.** Evolution in the pelagic realm [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 607-608, 1970.

**Lipps, Lewis.** See Ray, Clayton E. 01318

**Lipschutz, M. E.** See Laul, J. C. 00955

**Lipschutz, M. E.** See Jain, A. V. 01932

**Lipschutz, M. E.** See Laul, J. C. 01945

**Lipschutz, M. E.** See Laul, J. C. 03651

**Lipschutz, M. E.** See Pelly, I. Z. 04524

**Lipschutz, M. E.** See Jain, A. V. 04556

**Lipschutz, M. E.** See Laul, J. C. 04557

08021 **Lippskiy, Yu. N.** Nekotoryye rezul'taty neposredstvennogo izucheniya poverkhnosti Luny [Some results of direct study of the surface of the Moon]: Akad. Nauk SSSR Vestnik, no. 10, p. 43-56, illus., tables, 1970.

05744 **Lipsky, S. R.; Cushley, R. J.; Horvath, C. G.; McMurray, W. J.** Analysis of lunar material for organic compounds, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1871-1873, reprinted 1970.

**Liptai, R. G.** See Giardini, A. A. 01763

09249 **Lishman, J. R.** Core permeability anisotropy: Jour. Canadian Petroleum Technology, v. 9, no. 2, p. 79-84, illus., table, 1970.

07503 **Lisitsyna, N. A. K.** geokhimii kor vyvetrivaniya osnovnykh porod tropicheskoy zony Tikhogo Okeana [Geochemistry of weathering profiles developed on basic rocks in tropical zone of the Pacific Ocean]: Kora Vyvetrivaniya 1970, no. 11, p. 214-233, illus., tables, 1970.

01948 **Lister, C. R. B.** A heat-flow profile across the Juan de Fuca Ridge near 47°N [abs.]: EOS, v. 51, no. 4, p. 317, 1970.

02192 **Lister, C. R. B.** Heat flow west of the Juan de Fuca ridge: Jour. Geophys. Research, v. 75, no. 14, p. 2648-2654, illus., table, 1970.

**Liston, Thomas C.** See Viksne, Andris. 09789

07975 **Little, H. W.; Belyea, H. R.; Stott, D. F.; Latour, B. A.; Douglas, R. J. W.** Economic minerals of western Canada, Chap. 9 in Geology and economic minerals of Canada: Canada Geol. Survey Econ. Geology Rept. 1 (5th edition), p. 489-546, illus., tables, 1970.

08158 **Little, H. W.** Distribution of types of uranium deposits and favourable environments for uranium exploration, in Uranium exploration geology — Panel on uranium exploration geology, Vienna, 1970, Proc.: Vienna, Austria, Internat. Atomic Energy Agency, p. 35-48, incl. discussion, illus., table, 1970.

- 03268 **Little, Robert Lewis.** Lithostratigraphy and structural geology of a portion of the Dunham Ridge thrust block, Greene and Washington Counties, Tennessee [abs.]: Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 5104B-5105B, 1970.
- Litvin, V. M.** See Yemel'yanov, Ye. M. 07211
- 01949 **Liu, L. G.; Takahashi, T.; Bassett, W. A.** Isothermal compression of iron rich garnet at 25°C and the bulk modulus of the pyrope-almandite solid solutions [abs.]: EOS, v. 51, no. 4, p. 419, 1970.
- Liu, Lin-gun.** See Takahashi, Taro. 04277
- 03305 **Liu, S. C.** Evolution power spectral density of strong-motion earthquakes: Seismol. Soc. America Bull., v. 60, no. 3, p. 891-900, illus., 1970.
- 05278 **Liu, Thomas K.** A review of engineering soil classification systems, in Special procedures for testing soil and rock for engineering purposes (5th edition): Am. Soc. Testing and Materials Spec. Tech. Pub. 479, p. 361-382, illus., tables, 1970.
- 09357 **Liu, Thomas K.** A review of engineering soil classification systems: Natl. Research Council Canada Highway Research Board Highway Research Record, no. 156, p. 1-22, illus., tables, 1967.
- Livingston, H. D.** See Thompson, G. 03365
- 00054 **Livneh, Moshe.** Prediction of swelling pressure of clays — Discussion [of paper 6358, by A. Komornik and D. David, 1969]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Soil Mechanics and Found. Div., no. SM 1, p. 323-324, table, 1970.
- 03295 **Lloyd, David P.** Down-the-hole TV, the greatest show in earth: Ground Water Age, v. 4, no. 10, p. 28-35, illus., 1970.
- Lloyd, Joel.** See Fenner, Peter. 03284
- 05752 **Lloyd, Joel J.** John Wilkins, seventeenth century lunar explorer: Geol. Soc. America Bull., v. 81, no. 9, p. 2777-2779, 1970.
- 09645 **Lloyd, Joel J.** Geo-Ref, a bibliographic reference tool [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 608, 1970.
- 03120 **Lloyd, Mary K.; Conley, Robert F.** Adsorption studies on kaolinites [with French, German and Russian abs.]: Clays and Clay Minerals, v. 18, no. 1, p. 37-46, illus., tables, 1970.
- 09503 **Lloyd, Orville B., Jr.; Dean, Roberta B.** Ground-water supply of Cape Hatteras National Seashore Recreational Area, North Carolina — Pt. 6, Pea Island Campground: North Carolina Div. Ground Water Rept. Inv. 7, 29 p., illus., tables, 1968.
- 10943 **Lloyd, Orville B., Jr.; Wilder, Hugh B.** Ground-water supply of Cape Hatteras National Seashore Recreational Area, North Carolina — Pt. 4, Fort Raleigh National Historical Site: North Carolina Div. Ground Water Rept. Inv. 5, 19 p., illus., tables, 1968.

- 02647 **Lloyd, R. Michael.** Application of stable oxygen and carbon isotope techniques to studies of diagenesis [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 857, 1970.
- 02421 **Lo, K. Y.** The operational strength of fissured clays [with French abs.]: *Géotechnique*, v. 20, no. 1, p. 57-74, illus., tables, 1970.
- Lo, K. Y.** See Milligan, V. 02899
- 03628 **Lobdell, Herbert L.** Settlement of buildings constructed in Hackensack Meadows: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7398, *Jour. Soil Mechanics and Found. Div.*, no. SM 4, p. 1235-1248, illus., 1970.
- 05186 **Lochman-Balk, Christina.** Upper Cambrian faunal patterns on the craton: *Geol. Soc. America Bull.*, v. 81, no. 11, p. 3197-3224, illus., 1970.
- Lockwood, John P.** See Moore, James G. 00317
- Lockwood, John P.** See Bateman, Paul C. 04014
- 10686 **Lockwood, Richard P.** Petrology of syenites, Wausau, Wisconsin: *Compass*, v. 48, no. 1, p. 32-44, illus., tables, 1970.
- 07279 **Lodewick, Richard Ballard.** The petrology and stratigraphy of the Earp Formation, Pima and Cochise Counties, Arizona [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 5, p. 2767B, 1970.
- Loeblich, Alfred R., 3d.** See Loeblich, Alfred R., Jr. 02096
- 02096 **Loeblich, Alfred R., Jr.; Loeblich, Alfred R., 3d.** Index to the genera, subgenera, and sections of the Pyrrhophyta, [Pt.] 4: *Jour. Paleontology*, v. 44, no. 3, p. 536-543, 1970.
- 02144 **Loeblich, Alfred R., Jr.; Tappan, Helen.** Annotated index and bibliography of the calcareous nannoplankton, [Pt.] 4: *Jour. Paleontology*, v. 44, no. 3, p. 558-574, 1970.
- 07045 **Loeblich, Alfred R., Jr.; Tappan, Helen.** *Thysanoprobolus*, a new acritarch genus from the Early Devonian (Late Gedinian) Haragan Formation of Oklahoma, U.S.A.: *Biol. Soc. Washington Proc.*, v. 83, no. 24, p. 261-266, illus., 1970.
- Loeblich, Alfred R., Jr.** See Tappan, Helen. 10870
- 09926 **Loewe, F.** The scientific exploration of Greenland from the Norsemen to the present: *Ohio State Univ. Inst. Polar Studies Rept.*, no. 35, 19 p., illus., 1970.
- 00110 **Lofgren, Gary.** Experimental devitrification rate of rhyolite glass: *Geol. Soc. America Bull.*, v. 81, no. 2, p. 553-559, illus., table, 1970.
- 10952 **Lofton, Coleman L.** Possible future petroleum provinces of United States western gulf basin, Eocene and Paleocene [abs.]: *Am. Assoc. Petroleum Geologists*, v. 54, no. 9, p. 1786-1787, 1970; *Gulf Coast Assoc. Geol. Soc. Trans.*, v. 20, p. 111-113, 1970.
- 02091 **Logan, Alan.** The new bivalve genus *Arctomyalina* from the Pennsylvanian of the Canadian Arctic Archipelago: *Jour. Paleontology*, v. 44, no. 3, p. 501-506, illus., table, 1970.
- 04711 **Logan, Alan.** A new species of *Cyrtostrostra* (Bivalvia) from the Permian of the Canadian Arctic: *Jour. Paleontology*, v. 44, no. 5, p. 867-871, illus., table, 1970.
- Logan, J. M.** See Friedman, M. 00066
- Logan, John M.** See Friedman, Melvin. 05199
- Logan, John M.** See Handin, John W. 07006

**Logan, John M.** See Swolfs, Hans. 09594

- 09646 **Logan, John M.; Iwasaki, Takeshi; Friedman, M.; Kling, Stanley A.** Experimental investigation of sliding friction in multilithologic specimens [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 608-609, 1970.
- 06260 **Logan, Lloyd M.; Hunt, Graham R.** Emission spectra of particulate silicates under simulated lunar conditions: *Jour. Geophys. Research*, v. 75, no. 32, p. 6539-6548, illus., table, 1970.
- Logan, Thomas F.** See Levy, John S. 01168
- 00736 **Logan, Thomas F., Jr.; Henry, Vernon J., Jr.** Pleistocene drainage in McIntosh County, Georgia [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 229, 1970.
- 09647 **Lohnes, Robert A.; Demirel, Turgut.** Influence of parent rock and climate on geotechnical properties of residual tropical soils [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 609, 1970.
- 04857 **Lohrengel, C. Frederick.** (compiler). Second day road log from Salt Lake City to Cedar City, Utah, via U.S. Highway 89, Long Valley Junction and Utah State Road 14, in *Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region* — Natl. Assoc. Geology Teachers, Southwest Sec., Field Conf. Earth Sci., Cedar City, Utah, 1970: Socorro, N. Mex., New Mexico Inst. Mining and Technology, p. 107-123, 1970.
- 04861 **Lohrengel, C. Frederick.** (compiler). Sixth day road log from Cedar City to Salt Lake City, via Minersville, Milford, Delta, and Nephi, in *Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region* — Natl. Assoc. Geology Teachers, Southwest Sec., Field Conf. Earth Sci., Cedar City, Utah, 1970: Socorro, N. Mex., New Mexico Inst. Mining and Technology, p. 145-149, 1970.
- 03231 **Lohrengel, C. Frederick, 2d.** Palynology of the Kaiparowits Formation, Garfield County, Utah: Brigham Young Univ. Geology Studies, v. 16, pt. 3, p. 61-180, illus., tables, 1969 [1970].
- 09490 **Lohse, Alan; Sharp, James M.; Oppenheimer, Carl H.; Feray, Dan E.** Gulf of Mexico Environmental Program, in *Offshore Technology Conference, 2d Ann.*, Houston, Tex., 1970, Preprints — v. 1: Dallas, Tex., Offshore Technology Conf., p. I-41 — I-48, illus., 1970.
- 10806 **Lokke, Donald H.** Status and bibliographic review of Comanchean Series (Lower Cretaceous) paleontology in Texas, in *Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas* (Leo Hendricks, editor): *Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub.*, no. 67-8, p. 309-375, 1967.
- 10807 **Lokke, Donald H.** Bibliography of graduate theses on the Comanchean Series (Lower Cretaceous) of Texas, in *Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas* (Leo Hendricks, editor): *Soc. Econ. Paleontologist and Mineralogists Permian Basin Sec. Pub.*, no. 67-8, p. 377-385, 1967.
- Lomenick, T. F.** See Bradshaw, R. L. 08739
- 10826 **Lomnitz, C.** Ocean-continent interaction patterns in northwestern Mexico and in southern Chile [abs.] - Internat. Symposium on Recent Crustal Movements and Associated Seismicity, Wellington, N.Z., 1970, Proc.: Wellington, N.Z., Royal Soc. of New Zealand, p. 22, 1970.
- 10888 **Lomnitz, Cinna; Mooser, Federico; Allen, Clarence R.; Brune, James N.; Thatcher, Wayne.** Sismicidad y tectonica de la region norte del Golfo de California, Mexico — resultados preliminares [Seismicity and tectonics of the northern Gulf of California region, Mexico — Preliminary results (with Spanish and English abs.): *Geofisica Internac.*, v. 10, no. 2, p. 37-48, illus., tables, 1970.

**Loncarevic, B.** See Irving, E. 05285

**Loncarevic, B. D.** See Keen, M. J. 09717

- 00042 **Londe, Pierre; Bigier, Gaston; Vormeringer, Raymond.** Stability of rock slopes, a three-dimensional study — Errata [to paper 6363, 1969]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Soil Mechanics and Found. Div., no. SM 1, p. 329-330, 1970.

- 03631 **Londe, Pierre; Vigier, Gaston; Vormeringer, Raymond.** Stability of rock slopes — Graphical methods: Am. Soc. Civil Engineers Proc., v. 96, paper 7435, Jour. Soil Mechanics and Found. Div., no. SM 4, p. 1411-1434, illus., table, 1970.

- 04392 **Londe, Pierre; Vigier, Gaston; Vormeringer, Raymond.** Stability of rock slopes, a three dimensional study — Closure [to discussion of paper 6363, 1969]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Soil Mechanics and Found. Div., no. SM5, p. 1792-1793, 1970.

**Loney, R. A.** See Himmelberg, Glen R. 00285

- 01147 **Loney, Robert A.** Faulting in the Burro Mountain area, California Coast Ranges, and its relation to the Nacimiento fault: Geol. Soc. America Bull., v. 81, no. 4, p. 1249-1254, illus., 1970.

**Long, A. T.** See Floyd, E. O. 08342

**Long, G. H.** See Magnusson, D. H. 03474

**Long, Leon E.** See DeLong, Stephen E. 00887

- 01313 **Long, Sumner.** Identification of paleodispersal centers for deltaic sediments [abs.]: Georgia Acad. Sci. Bull., v. 28, no. 2, p. s21-s22, 1970.

- 10966 **Longacre, Susan Ann.** Trilobites of the Upper Cambrian Ptychaspis Biome, Wilberns Formation, central Texas: Paleont. Soc. Mem. 4 (Jour. Paleontology, v. 44, no. 1, supp.), 70 p., illus., table, 1970; *reprinted as* Texas Univ. Austin Bur. Econ. Geology Rept. Inv. 66, 1970.

**Longley, W. W.** See Harrison, J. C. 02791

- 09648 **Lonsdale, P. F.; Normark, W. R.; Newman, W. A.; Allison, E. C.** Submarine erosion on the crest of Horizon Guyot [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 610, 1970.

- 03443 **Loomis, Stuart R.** Studies of morphology and stream action on ablating ice — Pt. 1, Morphology and structure of an ice-cored medial moraine, Kaskawulsh Glacier, Yukon: Arctic Inst. North America Research Paper 57, p. 1-65, illus., tables, 1970.

- 03902 **Loomis, Stuart R.** Morphology and ablation processes on glacier ice: Assoc. Am. Geographers Proc., v. 2, p. 88-92, illus., 1970.

- 07726 **Loomis, Stuart R.** Morphology and ablation processes on glacier ice, in Icefield Ranges Research Project, scientific results, V. 2 (V. C. Bushnell and R. H. Ragle, editors): New York, Am. Geog. Soc., and Montreal, Quebec, Arctic Inst. No. America, p. 27-31, illus., revised 1970; originally published 1970.

- 08379 **Looney, Mary.** Washita Bat Caves: Oklahoma Underground, v. 3, no. 2, p. 42-46, illus., 1970.

- 10860 **Lopez Ramos, Ernesto.** Geologia del sureste de Mexico y norte de Guatemala [geology of southeastern Mexico and northern Guatemala (with Spanish and English abs.)2, in Trabajos tecnicos presentados en la segunda reunion de geologos de America Central: Inst. Centroamericano Inv. y Tecnologia Indus. Pubs. Geol., no. 2, p. 57-67, illus., 1969.

**LoPinto, Victor J.** See Bigham, Robert E. 00051

- 00086 **LoPinto, Victor J.** Field studies of response of peat to plate loading — Discussion [of paper 6652 by J. B. Forrest and I. C. MacFarlane, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, Jour. Soil Mechanics and Found. Div., no. SM 1, p. 361-362, 1970.
- 10407 **Loranger, D. M.** Devonian microfauna from northeastern Alberta — Pt. 2, Ostracoda, order Podocopida: Calgary, Alberta, privately printed, 53 p., illus., 1963.
- 10408 **Loranger, D. M.** Devonian microfauna from northeastern Alberta — Pt. 1, Ostracoda, orders Leperditicopida and Palaeocopida: Calgary, Alberta, privately printed, 55 p., illus., 1963.
- 06561 **Lord, Harry C., 3d.** Retention coefficients and thermal release profiles of ion-injected argon from silicates and iron: *Canadian Jour. Physics*, v. 48, no. 1, p. 1472-1479, illus., tables, 1970.
- 06360 **Lord, James.** Real-time simulated earthquake motion of high rise structures: *New Zealand Soc. Earthquake Eng. Bull.*, v. 3, no. 3, p. 95-106, illus., 1970.
- 09874 **Loren, J. D.; Robinson, J. D.** Relations between pore size fluid and matrix properties, and NML measurements: *Soc. Petroleum Engineers Jour.*, v. 10, no. 3, p. 268-278, illus., tables, 1970.
- Lorentzen, G. R.** See Vogt, Peter R. 01993
- Lorenz, Douglas M.** See Bretsky, Peter W. 03779
- 02375 **Lorenz, Volker.** Some aspects of the eruption mechanism of the Big Hole maar, central Oregon: *Geol. Soc. America Bull.*, v. 81, no. 6, p. 1823-1829, illus., table, 1970.
- 03707 **Loring, D. H.; Nota, D. J. G.; Chesterman, W. D.; Wong, H. K.** Sedimentary environments on the Magdalen shelf, southern Gulf of St. Lawrence: *Marine Geology*, v. 8, no. 5, p. 337-354, illus., 1970.
- Lormeyer, David H.** See Meyer, Walter R. 03768
- 01247 **Lorshbough, A. L.** Clarksburg gas field: California Oil Fields — *Summ. Operations* 1969, v. 55, no. 1, p. 31-37, illus., tables, 1970.
- 02724 **Losche, C. K.; McCracken, R. J.; Davey, C. B.** Soils of steeply sloping landscapes in the southern Appalachian Mountains: *Soil Sci. Soc. America Proc.*, v. 34, no. 3, p. 473-478, tables, 1970.
- 03763 **Losche, C. K.; McCracken, R. J.; Davey, C. B.** Soils of steeply sloping landscapes in the southern Appalachian Mountains: *Soil Sci. Soc. America Proc.*, v. 34, no. 3, p. 473-478, tables, 1970.
- 04809 **Lotz, Charles W.** (compiler). Probable original minable extent of the bituminous coal seams in West Virginia: Morgantown, W. Va., West Virginia Geol. and Econ. Survey, 1 sheet, various scales, sections, text, 1970.
- 10435 **Loudon, T. Victor.** Computing techniques in geology: *Endeavour*, v. 29, no. 108, p. 125-128, illus., 1970.
- 10628 **Loudon, T. Victor.** A small geological data library: *Internat. Assoc. Math. Geology Jour.*, v. 1, no. 2, p. 155-170, illus., 1969.
- Louis, H.** See Stephens, D. R. 02402
- 08734 **Louisiana State University; Kupfer, Donald H.** (editor). Geology and technology of Gulf Coast salt — Symposium, Baton Rouge, La., 1967, *Proc.*: Baton Rouge, La., Louisiana State Univ. School of Geoscience, 192 p., illus., tables, discussion, 1970.



- 10610 **Louisnathan, S. J.; Smith, J. V.** Crystal structure of tilleyite — refinement and coordination [with German and English abs.]: *Zeitschr. Kristallographie*, v. 132, no. 4-6, p. 288-306, illus., tables, 1970.
- 04923 **Louisnathan, S. John.** The crystal structure of synthetic soda melilite,  $\text{CaNaAlSi}_2\text{O}_7$ , [with German abs.]: *Zeitschr. Kristallographie*, v. 131, nos. 4-5, p. 314-321, tables, 1970.
- Louke, Gladys P.** See Dibblee, T. W., Jr. 08028
- Loux, P. C.** See Foote, Richard Q. 01911
- 07911 **Loux, P. C.** Seismic motions from project Rulison, in *Symposium on engineering with nuclear explosives* — Am. Nuclear Soc. and U.S. Atomic Energy Comm., Las Vegas, Nev., 1970, Proc., V. 2: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., p. 1069-1082, illus., 1970.
- Lovberg, R. H.** See Berger, Jon. 04548
- 02854 **Love, D. S.** Infrared studies, in *Earth resources aircraft program status review*, NASA, Houston, 1968 — V. 1, Geology, geography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 51-1 — 51-17, illus., table [1970].
- 01284 **Love, J. D.** Cenozoic geology of the Granite Mountains area, central Wyoming: U.S. Geol. Survey Prof. Paper 495-C, p. C1-C154, illus., tables, geol. maps, 1970.
- 02083 **Love, J. D.; Good, John M.** Hydrocarbons in thermal areas, northwestern Wyoming: U.S. Geol. Survey Prof. Paper 644—B, p. B1-B23, illus., table, 1970.
- Love, J. D.** See McKenna, Malcolm C. 06208
- 09255 **Lovell, H. L.; Caine, T. W.** Lake Timiskaming Rift Valley: Ontario Dept. Mines Misc. Paper 39, 16 p., illus., 1970.
- Loveridge, W. D.** See Wanless, R. K. 05731
- Loveridge, William D.** See Wanless, Robert K. 03926
- 06434 **Lovering, J. F.; Butterfield, D.** Neutron activation analysis of rhenium and osmium in Apollo 11 lunar material, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1351-1355, tables, 1970.
- 01461 **Lovering, T. G.; Cooper, J. R.; Drewes, Harald; Cone, G. C.** Copper in biotite from igneous rocks in southern Arizona as an ore indicator, in *Geological Survey research 1970*, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B1-B8, illus., tables, 1970.
- 05957 **Lovering, T. S.** Memorial of Bronson F. Stringham — July 28, 1907-May 30, 1968: *Am. Mineralogist*, v. 55, nos. 3-4, p. 607-614, portrait, 1970.
- 09473 **Lovering, T. S.** Non-fuel mineral resources in the next century, in *Limitations of the earth, a compelling focus for geology* (Texas Univ. Austin Bur. Econ. Geology)—A symposium held at the dedication of the new Geology Building, Austin, Tex., 1967, Proc.: *Texas Quart.*, v. 11, no. 2, p. 127-147, illus., 1968.
- Lövseth, Knut.** See Nydal, Reider. 01326
- Low, Doris.** See Todd, Ruth. 03904
- Low, P. F.** See Jörgensen, P. 07852
- Low, Philip.** See Davidtz, John C. 08392

- 01725 **Low, Philip F.; Ravina, Israela; White, Joe L.** Changes in b dimension of Na-montmorillonite with interlayer swelling: *Nature*, v. 226, no. 5244, p. 445-446, illus., 1970.
- 03123 **Low, Philip F.; White, Joe L.** Hydrogen bonding and polywater in clay-water systems: *Clays and Clay Minerals*, v. 18, no. 1, p. 63-66, illus., 1970.
- 03179 **Lowdon, J. A.** Carbon-isotope fractionation during dry combustion of oxalic acid: *Radiocarbon*, v. 12, no. 2, p. 347-349, table, 1970.
- 03183 **Lowdon, J. A.; Wilmeth, R.; Blake, W., Jr.** Geological Survey of Canada radiocarbon dates X: *Radiocarbon*, v. 12, no. 2, p. 472-485, tables, 1970.
- 08081 **Lowe, D. S.** Multispectral data collection and instrumentation studies, in *Earth Resources Aircraft Program, status review, 2d Ann., Houston, Tex., 1969 — V. 2, Agriculture, Forestry, and sensor studies: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 25-1—25-13, illus., tables, [1970?].*
- 03373 **Lowell, Brent H.; Morgan, Charles O.; McNellis, Jesse M.** Brief descriptions of and examples of output from computer programs developed for use with water data in Kansas: *Kansas Geol. Survey Spec. Distrib. Pub.* 48, 54 p., illus., tables, 1970.
- Lowell, Brent H.** See McNellis, Jesse M. 10847
- 02572 **Lowell, J. D.** Copper resources in 1970: *Soc. Mining Engineers AIME Trans.*, v. 247, no. 2, p. 97-103, 1970.
- 04280 **Lowell, J. David; Guilbert, John M.** Lateral and vertical alteration-mineralization zoning in porphyry ore deposits: *Econ. Geology*, v. 65, no. 4, p. 373-408, illus., tables, 1970.
- 07390 **Lowell, J. David.** Copper resources in 1970: *Mining Eng.*, v. 22, no. 4, p. 67-73, illus., 1970.
- 06141 **Lowell, James D.** Antithetic faults in upthrusting: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 10, p. 1946-1950, 1970.
- 05432 **Lowenhaupt, D. E.; Mozingo, G. L.; Mitchell, R. S.** Mineralogy of a perrierite-bearing pegmatite near Chamblissburg, Bedford County, Virginia [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 135, 1970.
- Lowrie, W.** See Fuller, Michael. 02183
- 00166 **Lowright, R. H.; Williams, E. G.** Light and heavy mineral settling velocity distributions in sands along southern Lake Erie [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 27-28, 1970.
- Lowry, H. Michael.** See Einwich, Anna M. 01908
- 00737 **Lowry, W. D.** Proterozoic origin of North American geosynclines [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 230, 1970.
- 05182 **Lowry, W. D.; Cooper, B. N.** Penecontemporaneous downdip slump structures in Middle Ordovician limestone, Harrisonburg, Virginia: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 10, p. 1938-1945, 1970.
- Lowry, W. D.** See Glass, F. R., Jr. 05425
- 01194 **Lowther, J. Stewart.** Silica sandstones in the Swauk formation near Wenatchee, Washington [abs.]: *Northwest Sci.*, v. 44, no. 1, p. 65, 1970.
- Lu, Richard S.** See Heinrichs, Donald F. 10559

- 06861 **Lubimova, E. A.** (organizer). Geophysical studies on the evolution of the Earth's deep interior — A symposium, Madrid, 1969, *Proc.: Physics Earth and Planetary Interiors*, v. 2, no. 5 (spec. issue), p. 303-398, illus., tables, 1970.
- 04128 **Lublin, P.; Cukor, P.; Jaworowski, R. J.** Mass absorption coefficient measurements using thin films, in *Advances in X-ray analysis*, V. 13 — Applications of X-ray analysis, 18th Ann. Conf., 1969, *Proc.*: New York, Plenum Press, p. 632-638, tables, 1970.
- Lucas, Kenneth.** See Firby, Jean. 09782
- 01231 **Luce, Robert William.** Dissolution of magnesium silicates [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 8, p. 3709B, 1970.
- 10893 **Lucey, Carol S.** The geology of Sussex County in brief: Trenton, N.J., New Jersey Bur. Geology and Topography [17 p.], illus., table, 1969.
- 05908 **Lucia, F. Jerry.** Lower Paleozoic history of the western Diablo Platform of West Texas and south central New Mexico [summ.], in *The geologic framework of the Chihuahuan tectonic belt — Symposium in honor of Ronald K. De Ford*, Midland, Tex., 1970: Midland, Tex., West Texas Geol. Soc., p. 20-22, 1970.
- 09649 **Lucke, William N.** Several new approaches to rock excavation [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 610-611, 1970.
- 10497 **Luckey, Richard R.** Statistical estimates of ground-water withdrawals [abs.]: *EOS*, v. 51, no. 11, p. 748-749, 1970.
- Luckey, Richard R.** See Taylor, O. James. 10509
- Luco, J. E.** See Duke, C. M. 04667
- 03790 **Lucon, C.; Feugere, G.; Gerard, R. E.** Geochemical exploration method accurate in field test: *World Oil*, v. 171, no. 4, p. 74-75, illus., 1970.
- 05369 **Ludvigsen, Rolf.** Age and fauna of the Michelle Formation, northern Yukon Territory: *Bull. Canadian Petroleum Geology*, v. 18, no. 3, p. 407-429, illus., tables, 1970.
- 05463 **Ludwick, John C.** Sand waves and tidal channels in the entrance to Chesapeake Bay: *Virginia Jour. Sci.*, v. 21, no. 4, p. 178-184, illus., 1970.
- 06231 **Ludwick, John C.** An empirical expression for the probability of particle passage through ideal screens — A reply [to N. C. Janke's 1970 discussion of "Particle shape and influence of size from sieving," 1968]: *Sedimentology*, v. 14, nos. 3-4, p. 323, 1970.
- 09650 **Ludwig, Kenneth R.; Silver, Leon T.** Lead isotope heterogeneity in igneous potassium feldspars [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 611, 1970.
- 09985 **Ludwig, William J.; Nafe, John E.; Drake, Charles L.** Seismic refraction, in *The sea — v. 4, New concepts of sea floor evolution*, Pt. 1, General observation (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 53-84, illus., 1970.
- 00119 **Lueck, Gail G.** Inquiry — Directed or open-ended?: *Jour. Geol. Education*, v. 18, no. 1 p. 40-42, 1970.
- Luehrmann, William H.** See Pawley, Julian K. 09476
- Luft, Stanley J.** See Lewis, Richard Q., Sr. 02033
- 05482 **Luft, Stanley J.** Geologic map of the De Mossville quadrangle, north-central Kentucky: U.S. Geol. Survey Geol. Quad. Map GQ-862, scale 1:24,000, text, 1970.
- Lugmair, G. W.** See Marti, K. 05707

- Luistro, Antonio O.** See Bischoff, James L. 00981
- Lukens, H. R.** See Graber, F. M. 03648
- 00031 **Lum, Daniel; Stearns, Harold T.** Pleistocene stratigraphy and eustatic history based on cores at Waimanalo, Oahu, Hawaii: *Geol. Soc. America Bull.*, v. 81, no. 1, p. 1-16, illus., 1970.
- 01950 **Lum, Daniel.** Geohydrology of sewage effluent disposal in coastal limestone aquifers in Hawaii [abs.]: *EOS*, v. 51, no. 4, p. 284, 1970.
- 03940 **Lumb, Peter.** Safety factors and the probability distribution of soil strength [with French abs.]: *Canadian Geotech. Jour.*, v. 7, no. 3, p. 225-242, illus., tables, 1970.
- 02648 **Lumsden, D. M.** Markov chain analysis of carbonate rocks — Applications, limitations, and implications as exemplified by Pennsylvanian carbonates in southern Nevada [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 857-858, 1970.
- 07388 **Lumsden, Jesse Beadles, 3d.** Quadrupole splitting of Al-27 nuclear magnetic resonance in topaz [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 4, p. 2222B, 1970.
- Lumsden, W. W.** See Moores, E. M. 00018
- 05112 **Lunar Sample Prelim. Exam. Team.** Preliminary examination of lunar samples, in Apollo 12 preliminary science report: U.S. Natl. Aeronautics and Space Adm. Spec. Pub. SP-235, p. 189-216, illus., 1970.
- 01195 **Lund, Ernest H.** Origin of nonporphyritic selvages in porphyry intrusions [abs.]: *Northwest Sci.*, v. 44, no. 1, p. 65, 1970.
- 02099 **Lund, Richard.** A new technique for chemical preparation of fossils: *Jour. Paleontology*, v. 44, no. 3, p. 578, 1970.
- 07564 **Lund, Richard.** Fossil vertebrates from the Pittsburgh area, in *Geology of the Pittsburgh area: Pennsylvania Geol. Survey, 4th ser., [Bull.] G 59 (General Geology Rept.)*, p. 80-83, illus., 1970.
- 02150 **Lundberg, John G.; Case, Gerard R.** A new catfish from the Eocene Green River Formation, Wyoming: *Jour. Paleontology*, v. 44, no. 3, p. 451-457, illus., tables, 1970.
- Lundberg, John G.** See Cavender, Ted M. 04630
- 00581 **Lundelius, Ernest L.; Stevens, Margaret S.** *Equus francisci* Hay, a small stilt-legged horse, middle Pleistocene of Texas: *Jour. Paleontology*, v. 44, no. 1, p. 148-153, illus., table, 1970.
- 05325 **Lundgren, Raymond; Sturges, F. C.; Cluff, L. S.** General guide for use of borehole cameras, in *Special procedures for testing soil and rock for engineering purposes (5th edition)*: *Am. Soc. Testing and Materials Spec. Tech. Pub.* 479, p. 56-61, 1970.
- 02982 **Lundin, Robert F.; Lindsay, Everett H.** An oreodont (Mammalia: Artiodactyla) from central Arizona [abs.]: *Arizona Acad. Sci. Jour.*, v. 6, 1970 *Proc. Supp.*, p. 63, 1970.
- 06566 **Lundin, Robert F.; Newton, George D.** Ostracoda and the Silurian stratigraphy of northwestern Alabama: *Alabama Geol. Survey Bull.* 95, 64 p., illus., table, 1970.
- Lundquist, G. M.** See Howell, B. F., Jr. 03307
- 00738 **Lurie, Patricia L.** A study of the surface textures of sand grains from the Atlantic continental margin by use of the transmission electron microscope [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 230-231, 1970.

- 00855 **Luth, W. C.; Querol-Suñé, F.** An alkali feldspar series: *Contr. Mineralogy and Petrology*, v. 25, no. 1, p. 25-40, illus., tables, 1970.
- Luth, W. C.** See Martin, R. F. 01797
- Luth, W. C.** See Whitney, James A. 01852
- 09651 **Luth, W. C.; Fenn, P. M.; Martin, R. F.** Thermodynamic excess functions, relative activities, and solvus relations for synthetic alkali feldspars [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 611-612, 1970.
- Luther, Edward T.** See Avery, Gleason G. 07543
- 07546 **Luther, Edward T.; Avery, Gleason G.** Geologic map (and five coal maps) of the Norma quadrangle, Tennessee: Tennessee Div. Geology Geol. Map GM 128-SW, 6 sheets, scale 1:24,000, separate text, 1970.
- Luthin, James N.** See Ortiz, Jaime. 04385
- 02574 **Lutton, R. J.** Rock slope chart from empirical slope data: *Soc. Mining Engineers AIME Trans.*, v. 247, no. 2, p. 160-162, illus., 1970.
- 10716 **Lutton, R. J.** Fractures and failure mechanics in loess and applications to rock mechanics: U.S. Army Corps Engineers, Waterways Expt. Sta. Research Rept. S-69-1, 53 p., illus., tables, 1969.
- 10648 **Lutwick, L. E.** Grassland environment as reflected in soil profiles, *in* Chacmool 1969 (R. G. Forbis, L. B. Davis, O. A. Christensen, G. Fedirchuk, editors)-Calgary Univ. Archaeol. Assoc., Ann. Paleo-Environmental Workshop, 1st, Calgary, 1969, Proc.: [Calgary, Alberta] Calgary Univ., Students' Press, p. 47-66 [1969].
- 10719 **Lutz, J. Fulton.** The movement and storage of water in North Carolina soils and the role of the soil in determining water quality: North Carolina Univ. Water Resources Research Inst. Rept. 24, 43 p., illus., tables, 1969.
- Lutzen, Edwin E.** See Rockaway, John D., Jr. 07904
- 10576 **Luyendyk, B. P.; Uchupi, Elazar; Milliman, J. D.** Structure of the southeastern Bahamas [abs.]: *EOS*, v. 51, no. 11, p. 825, 1970.
- Luyendyk, Bruce P.** See Phillips, J. D. 01967
- 03825 **Luyendyk, Bruce P.** Origin and history of abyssal hills in the northeast Pacific Ocean: *Geol. Soc. America Bull.*, v. 81, no. 8, p. 2237-2260, illus., 1970.
- 04736 **Luyendyk, Bruce P.** Reply [to discussion by George Peter of "Origin of short-wavelength magnetic lineations observed near the ocean bottom" (1969)]: *Jour. Geophys. Research*, v. 75, no. 32, p. 6721-6722, 1970.
- Luyendyk, Bruce P.** See Bada, Jeffrey L. 04992
- Luyendyk, Bruce P.** See Phillips, J. D. 04993
- 05198 **Luyendyk, Bruce P.** Dips of downgoing lithospheric plates beneath island arcs: *Geol. Soc. America Bull.*, v. 81, no. 11, p. 3411-3416, illus., 1970.
- 00543 **Luyendyk, Bruce Peter.** Geological and geophysical observations in an abyssal hill area using a deeply towed instrument package [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 7, p. 3309B, 1970.
- Luza, Kenneth V.** See Rice, Lee R. 00639
- Lyall, Anil K.** See Swift, Donald J. P. 03745

- 09652 **Lyall, Anil K.; Stanley, Daniel J.; Giles, Harry N.; Fisher, Alvan, Jr.** Suspended sediment transport and resuspension at the shelf-break and on the slope, Wilmington Canyon area, eastern U.S.A. [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 612, 1970.
- 09836 **Lyall, K. D.; Tervo, R. O.** Fracture characteristics of rock particles tested under impact, in *Canadian Rock Mechanics Symposium*, 5th, Toronto, 1968, *Proc.*: Ottawa, Canada Dept. Energy, Mines and Resources Mines Br., p. 171-183, illus., tables, 1969.
- 02862 **Lyles, Leon; Dickerson, J. D.; Disrud, L. A.** Modified rotary sieve for improved accuracy: *Soil Sci.*, v. 109, no. 3, p. 207-210, illus., tables, 1970.
- Lyman, W. J.** See *Stoenner, R. W.* 05722
- 01546 **Lynch, M. P.; Harrison, W.** Sedimentation caused by a tube-building amphipod: *Jour. Sed. Petrology*, v. 40, no. 1, p. 434-436, illus., 1970.
- Lynch, R. D.** See *Davis, L. L.* 00251
- 10541 **Lynch, Robert D.; Murphy, John R.; Hays, Walter W.** Models for generating synthetic seismograms [abs.]: *EOS*, v. 51, no. 11, p. 778, 1970.
- 04019 **Lynn, Warren C.; Grossman, Robert B.** Observations of certain soil fabrics with the scanning electron microscope: *Soil Sci. Soc. America Proc.*, v. 34, no. 4, p. 645-648, illus., 1970.
- 01286 **Lynts, George W.** Conceptual model of the Bahamian Platform for the last 135 million years: *Nature*, v. 225, no. 5239, p. 1226-1228, illus., 1970.
- Lyon, C. A.** See *Kirschner, C. E.* 10066
- 06551 **Lyon, John.** The search for fossil man — Cinq personnages à la recherche du temps perdu [Five persons in search of lost epochs]: *Isis*, v. 61, pt. 1, no. 206, p. 68-84, 1970.
- 04482 **Lyon, R. J. P.; Lee, Keenan.** Remote sensing in exploration for mineral deposits: *Econ. Geology*, v. 65, no. 7, p. 785-800, illus., tables, 1970.
- 06762 **Lyon, R. J. P.** The multiband approach to geological mapping from orbiting satellites — Is it redundant or vital?: *Remote Sensing Environment*, v. 1, no. 4, p. 237-224, illus., tables, 1970.
- Lyon, R. J. P.** See *Kilinc, I. A.* 07799
- 09803 **Lyon, R. J. P.; Mercado, Jose; Campbell, Robert, Jr.** Pseudo radar: *Photogramm. Eng.*, v. 36, no. 12, p. 1257-1261, illus., tables, 1970.
- 03171 **Lyon, Stephen R.; Ehlers, Ernest G.** The system  $MgO-GeO_2-H_2O$ : *Am. Mineralogist*, v. 55, nos. 1-2, p. 118-125, illus., tables, 1970.
- 03176 **Lyons, J. B.; Morse, S. A.** Mg/Fe partitioning in garnet and biotite from some granitic, pelitic, and calcic rocks: *Am. Mineralogist*, v. 55, nos. 1-2, p. 231-245, illus., tables, 1970.
- 04800 **Lyons, Paul L.** Continental and oceanic geophysics, [Chap.] 7 in *The megatectonics of continents and oceans* (Helgi Johnson and Bennett L. Smith, editors): New Brunswick, N. J., Rutgers Univ. Press, p. 147-166, illus., 1970.
- 03353 **Lysmer, John.** Lumped mass method for Rayleigh waves: *Seismol. Soc. America Bull.*, v. 60, no. 1, p. 89-104, illus., tables, 1970.
- Lysmer, John.** See *Drake, Lawrence.* 10529

- 03557 **Lysne, P. C.** A comparison of calculated and measured low-stress Hugoniot and release adiabats of dry and water-saturated tuff: *Jour. Geophys. Research*, v. 75, no. 23, p. 4375-4386, illus., tables, 1970.

**Lytle, William S.** See Kelley, Dana R. 06534

- 08495 **Lytle, William S.; Goth, Joseph H.** Oil and gas geology of the Kinzua quadrangle, Warren and McKean Counties, Pennsylvania: *Pennsylvania Geol. Survey, 4th Ser., Bull. M 62*, 99 p., illus., 1970.

**Lytle, William S.** See Kelley, Dana R. 09382

- 02941 **Mabey, D.; Garland, G. D.; Hollister, J. C.; Dash, B. P.; Brown, J. M.; Parasnis, D. S.** Human resources and geophysical exploration, *in* Mining and groundwater geophysics, 1967: *Canada Geol. Survey Econ. Geology Rept. 26*, p. 709-719, 1970.

- 01161 **Mabey, Don R.; Oriol, Steven S.** Gravity and magnetic anomalies in the Soda Springs region, southeastern Idaho: *U.S. Geol. Survey Prof. Paper 646-E*, p. E1-E15, illus., geol. map, 1970.

- 02944 **Mabey, Don R.** The role of geophysics in the development of the world's ground-water resources [with French abs.], *in* Mining and groundwater geophysics, 1967: *Canada Geol. Survey Econ. Geology Rept. 26*, p. 267-271, illus., 1970.

- 04034 **MacCarthy, Ronald F.** The Campbell strandline of Glacial Lake Agassiz in Walsh County, North Dakota: *Compass*, v. 47, no. 3, p. 147-153, illus., table, 1970.

- 08038 **MacChesney, J. B.; Rosenberg, P. E.** The methods of phase equilibria determination and their associated problems, *in* Phase diagrams, materials science and technology — V. 1, Theory, principles, and techniques of phase diagrams: New York and London, Academic Press, p. 113-165, illus., 1970.

**MacDiarmid, Roy A.** See Park, Charles F., Jr. 08398

- 02901 **MacDonald, A. B.; Sauer, E. Karl.** The engineering significance of Pleistocene stratigraphy in the Saskatoon area, Saskatchewan, Canada [with French abs.]: *Canadian Geotech. Jour.*, v. 7, no. 2, p. 116-126, illus., table, 1970.

- 06358 **MacDonald, A. B.; Sauer, E. K.** Engineering properties of tills, *in* Physical environment of Saskatoon, Canada: *Natl. Research Council Canada Pub. 11378*, p. 53-55, illus., 1970.

- 04913 **Macdonald, A. S.** Structural environment of the Salmo type lead-zinc deposits, [Chap.] 5 *in* Lead-zinc deposits in the Kootenay Arc, northeastern Washington and adjacent British Columbia — *Soc. Econ. Geologists, 1970 Northwest Field Conf. Guidebook*: Washington Div. Mines and Geology Bull. 61, p. 55-64, illus., 1970.

- 00125 **MacDonald, Angus A.** The northern Mojave Desert's little Sahara: *California Div. Mines and Geology Mineral Inf. Service*, v. 23, no. 1, p. 3-6, illus., 1970.

- 09366 **MacDonald, G.** Geology of the Kingston area — A compilation: *Carleton Univ. Dept. Geology Geol. Paper 70-2*, 3 p., geol. map, 1970.

- 05856 **Macdonald, Gordon A.; Abbott, Agatin T.** Volcanoes in the sea — The geology of Hawaii: Honolulu, Univ. Hawaii Press, 441 p., illus., tables, 1970.

**MacDonald, H. C.** See Wing, R. S. 00941

- 07778 **MacDonald, H. C.** Effective radar look-directions for geologic interpretation, *in* Earth Resources Aircraft Program, status review, V. 1: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 9-1—9-22, illus., table, [1970?].

- 00907 **MacDonald, Harold C.; Lewis, Anthony J.** Mapping and landform analysis of coastal regions with radar [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 290, 1970.
- Macdonald, Harold C.** See Lewis, Anthony J. 03085
- MacDonald, Harold C.** See Lewis, Anthony J. 05874
- MacDonald, Harold C.** See Dellwig, Louis F. 09798
- 05310 **Macdonald, J. R.** Review of the Miocene Wounded Knee faunas of southwestern South Dakota: *Los Angeles County Mus. Nat. History Bull.* — Sci., no. 8, 82 p., illus., tables, geol. maps, 1970.
- 09301 **MacDonald, R. B.** The application of automatic recognition techniques in the Apollo IX so-65 experiment, Sec. 39 of Earth Resources Program, 3d ann., review — v. 2, Agriculture, forestry, and sensor studies: Houston, Tex., NASA Manned Spacecraft Center, Msc-03742, p. 39-1 — 39-17, illus., tables, 1970.
- Macdonald, R. D.** See Grill, E. V. 10248
- 08218 **Macdonald, Raymond; Edge, R. A.** Trace element distribution in alkaline dykes from the Tugtutôq region, South Greenland: *Geol. Soc. Denmark Bull., Dansk Geol. Foren. Medd.*, English edition, v. 20, pt. 1, p. 38-58, illus., tables, 1970.
- 08219 **Macdonald, Raymond; Parker, A.** Zirconium in alkaline dykes from the Tugtutôq region, South Greenland: *Geol. Soc. Denmark Bull., Dansk Geol. Foren. Medd.*, English edition, v. 20, pt. 1, p. 59-63, illus., table, 1970.
- 08220 **Macdonald, Raymond.** Mid-Gardar feldspathoidal dykes in the Tugtutôq region, South Greenland: *Geol. Soc. Denmark Bull., Dansk Geol. Foren. Medd.*, English edition, v. 20, pt. 1, p. 64-66, tables, 1970.
- MacDougall, A. R.** See Calder, Peter N. 03457
- 05277 **MacFarlane, I. C.** Guide to a field description of muskeg, in *Special procedures for testing soil and rock for engineering purposes* (5th edition): *Am. Soc. Testing and Materials Spec. Tech. Pub.* 479, p. 346-360, illus., tables, 1970.
- MacFarlane, I. C.** See Forrest, J. B. 06783
- 08248 **MacFarlane, I. C.; Radforth, N. W.** Structure as a basis of peat classification [with French abs.], in *International Peat Congress*, 3d, Quebec, Canada, 1968, *Proc.*: Ottawa, Canada, National Research Council of Canada, p. 91-97, illus., tables, 1970.
- 08254 **MacFarlane, I. C.** Strength and deformation tests on frozen peat [with French abs.], in *International Peat Congress*, 3d, Quebec, Canada, 1968, *Proc.*: Ottawa, Canada, National Research Council of Canada, p. 143-149, illus., tables, 1970.
- MacFarlane, R. D.** See Gupta, M. C. 06442



- 02823 **MacGregor, Ian D.** The effect of  $\text{CaO}$ ,  $\text{Cr}_2\text{O}_3$ ,  $\text{Fe}_2\text{O}_3$ , and  $\text{Al}_2\text{O}_3$  on the stability of spinel and garnet peridotites, in *Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969, Proc.: Physics Earth and Planetary Interiors*, v. 3, p. 372-377, illus., tables, 1970.
- 09938 **MacGregor, Ian D.** An hypothesis for the origin of kimberlite, in *Symposium on the mineralogy and petrology of the upper mantle — Fiftieth Anniversary Symposia (Benjamin A. Morgan, editor): Mineralog. Soc. America Spec. Paper 3*, p. 51-62, illus., 1970.
- Machado Martinez, Luis.** See Garcia Gutierrez, Carlos. 08453
- 10983 **Machairas, G.** La dalmatianite et son mode de formation dans la région de Noranda (Québec) [Dalmatianite and its method of formation in the Noranda region (Quebec)], in *Problems of hydrothermal ore deposition; the origin, evolution and control of ore-forming fluids — Symposium, St. Andrews, Scotland, 1967: Stuttgart, Germany, E. Schweizerbart'sche Verlagsbuchhandlung (Internat. Union Geol. Sci., Ser. A, no. 2)*, p. 363-368, illus., table, 1970.
- 06361 **MacIntyre, Ferren.** Why the sea is salt: *Sci. American*, v. 223, no. 5, p. 104-115, illus., 1970.
- 05032 **Macintyre, I. G.; Milliman, J. D.** Physiographic features on the outer shelf and upper slope, Atlantic continental margin, southeastern United States: *Geol. Soc. America Bull.*, v. 81, no. 9, p. 2577-2597, illus., tables, 1970.
- 03735 **Macintyre, Ian G.** Sediments off the west coast of Barbados, diversity of origins: *Marine Geology*, v. 9, no. 1, p. 5-23, illus., tables, 1970.
- 09008 **Mack, Charles.** Physical chemistry, [chap.] 2 in *Bituminous materials — Asphalts, tars, and pitches*, A. J. Hoiberg, editor — v. 1: New York, Intersci. Publishers, p. 25-121, illus., tables, 1964.
- Mack, Douglas E.** See Shelton, John W. 02350
- Mack, Lawrence R.** See Thompson, Erik G. 00415
- 02517 **Mackasey, W. O.** Summers Township, District of Thunder Bay: Ontario Dept. Mines Prelim. Geol. Map P. 602, scale 1 in. to 1/4 mi., text, 1970.
- 02732 **Mackasey, W. O.** Eva Township, District of Thunder Bay: Ontario Dept. Mines Prelim. Geol. Map P. 601, scale 1 in. to 1/4 mi., text, 1970.
- 06498 **Mackasey, W. O.** The Beardmore-Geraldton belt — Guide to Sturgeon River metavolcanic-metasedimentary formations, in *Inst. Lake Superior Geology, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ.*, p. 69-84, illus., 1970.
- 08426 **MacKay, D. K.** Electrical resistivity measurements in frozen ground, Mackenzie Delta area, Northwest Territories [with French abs.], in *Symposium on the Hydrology of Deltas, V. 2: Internat. Assoc. Sci. Hydrology-Unesco Pub. 91*, p. 363-375, illus., tables, 1970.
- 06860 **Mackay, J. Ross.** Disturbances to the tundra and forest tundra environment of the western Arctic [with French abs.]: *Canadian Geotech. Jour.*, v. 7, no. 4, p. 420-432, illus., 1970.
- 00055 **MacKay, Margaret R.** Lepidoptera in Cretaceous amber: *Science*, v. 167, no. 3917, p. 379-380, illus., 1970.
- 10126 **Mackenzie, Angus G.** A source of bentonite for Arctic oil well drilling: *Western Miner.*, v. 43, no. 7, p. 32.33, illus., 1970.

**Mackenzie, F. T.** See Bricker, O. P. 07512

- 02649 **Mackenzie, Fred T.; Garrels, Robert M.** Diagenesis of shaly rocks [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 858, 1970.
- Mackenzie, Fred T.** *See* Vacher, H. Leonard. 02693
- Mackenzie, Fred T.** *See* Helgeson, Harold C. 06818
- MacKenzie, J. K.** *See* Graber, F. M. 03648
- 07460 **Mackenzie, R. C.** (editor). Differential thermal analysis — V. 1, Fundamental aspects: London and New York, Academic Press, 775 p., illus., tables, 1970.
- MacKenzie, W. S.** *See* Taylor, G. C. 07207
- 07888 **MacKenzie, W. S.** Allochthonous reef-debris limestone turbidites Powell Creek, Northwest Territories: *Bull. Canadian Petroleum Geology*, v. 18, no. 4, p. 474-492, illus., table, 1970.
- 07280 **MacKenzie, Wallace Bruce.** Hydrothermal alteration associated with the Urad and Henderson molybdenite deposits, Clear Creek County, Colorado [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 5, p. 2767B, 1970.
- MacKenzie, Warren S.** *See* Toomey, Donald Francis. 08066
- MacKevett, E. M., Jr.** *See* Smith, James G. 00213
- MacKevett, E. M., Jr.** *See* Plafker, George. 01463
- 05403 **MacKevett, E. M., Jr.** Geologic map of the McCarthy C-5 quadrangle, Alaska: *U.S. Geol. Survey Geol. Quad. Map GQ-899*, scale 1:63,360, sections, 1970.
- 05577 **MacKevett, E. M., Jr.; Plafker, George.** Geochemical and geophysical reconnaissance of parts of the Yakutat and Mount Saint Elias quadrangles, Alaska: *U.S. Geol. Survey Bull.* 1312-L, p. L1-L12, illus., table, geol. map, 1970.
- 06416 **MacKevett, E. M., Jr.** Geologic map of the McCarthy C-4 quadrangle, Alaska: *U.S. Geol. Survey Geol. Quad. Map GQ-844*, scale 1:63,360, separate text, sections, 1970.
- 07490 **MacKevett, E. M., Jr.** Geology of the McCarthy B-4 quadrangle, Alaska: *U.S. Geol. Survey Bull.* 1333, 31 p., illus., table, 1970.
- MacKevett, E. M., Jr.** *See* Jones, D. L. 10062
- 06143 **Mackin, J. H.** Origin of pediments in the western United States, *in* Problems of relief planation (Marton Pecs, editor) — *Internat. Symposium, Budapest, 1968, Proc.*: Budapest, Hungary, Akademiai Kiado (Studies in Geography in Hungary 8), p. 85-105, illus., 1970.
- Mackin, J. Hoover.** *See* Schmidt, Dwight L. 03379
- Maclay, R. W.** *See* Winter, T. C. 05490
- Maclay, R. W.** *See* Bidwell, L. E. 07049
- MacLean, B.** *See* King, Lewis H. 07674
- MacLean, Brian.** *See* King, Lewis H. 04727
- MacLean, Brian.** *See* King, Lewis H. 04884
- MacLean, Brian.** *See* King, Lewis H. 05868
- MacLean, Brian.** *See* King, Lewis H. 07679

**MacLean, Brian.** See King, Lewis H. 08126

- 02088 **MacLean, William P., 3d.** The braincase of *Labidosaurikos* (a Permian captorhinomorph reptile): Jour. Paleontology, v. 44, no. 3, p. 458-463, illus., 1970.

**MacLeod, N. S.** See Snively, P. D., Jr. 08642

- 02948 **MacLeod, Norman S.; Snively, Parke D., Jr.** Radar and infrared imagery, Oregon and Washington coasts, in Earth resources aircraft program status review, NASA, Houston, 1968 — V. 1, Geology, geography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 17A1-17A8, illus. [1970].

**MacMillan, J. R.** See Speed, R. C. 00367

- 09394 **MacNeil, F. Stearns.** New Pliocene *Chalmys* (*swiftopecten*) and *Beringius* from the Alaska Peninsula: Nautilus, v. 84, no. 2, p. 69-74, illus., 1970.

- 02087 **Macomber, R. W.** Articulate brachiopods from the upper Bighorn Formation (Late Ordovician) of Wyoming: Jour. Paleontology, v. 44, no. 3, p. 416-450, illus., tables, 1970.

- 06747 **Macpherson, J. G.; Watson, G. H.; Koropatnick, A.** Dikes on permafrost foundations in northern Manitoba [with French abs.]: Canadian Geotech. Jour., v. 7, no. 4, p. 356-364, illus., 1970.

**Macqueen, R. W.** See Petryk, A. A. 03014

- 08145 **Macqueen, R. W.; Ghent, E. D.** Electron microprobe study of magnesium distribution in some Mississippian echinoderm limestones from western Canada: Canadian Jour. Earth Sci., v. 7, no. 5, p. 1308-1316, illus., table, 1970.

- 02155 **Macqueen, Roger W.; Sandberg, Charles A.** Stratigraphy, age and interregional correlation of the Exshaw Formation, Alberta Rocky Mountains: Bull. Canadian Petroleum Geology, v. 18, no. 1, p. 32-66, illus., tables, 1970.

**Madariaga, Raul.** See Weidner, Donald. 03013

**Madariaga, Raul.** See Husebye, Eystein. 03308

- 10501 **Maddaus, William O.; Aaronson, Michael.** A regional groundwater resource management model [abs.]: EOS, v. 51, no. 11, p. 750, 1970.

- 04502 **Madden, T.** Geoelectric upper mantle anomalies in the United States, in Symposium on multidisciplinary studies of unusual regions of the upper mantle, Madrid, Spain, 1969, Proc.: Jour. Geomagnetism and Geoelectricity, v. 22, nos. 1-2, p. 91-95, illus., 1970.

- 05236 **Maddock, Thomas, Jr.** Indeterminate hydraulics of alluvial channels: Am. Soc. Civil Engineers Proc., v. 96, paper 7696, Jour. Hydraulics Div., no. HY 11, p. 2309-2323, illus., 1970.

- 01314 **Madeley, Hulon M.** A tentative interpretive stratigraphy of the pre-Womble Shale section of the Ouachita Mountains [abs.]: Georgia Acad. Sci. Bull., v. 28, no. 2, p. s22, 1970.

- 01323 **Madeley, Hulon M.** Make geology relevant! [abs.]: Georgia Acad. Sci. Bull., v. 28, no. 2, p. s47, 1970.

- 05458 **Madison, R. J.** Effects of a causeway on the chemistry of the brine in Great Salt Lake, Utah: Utah Geol. and Mineralog. Survey Water-Resources Bull. 14, 52 p., illus., tables, 1970.

- 04976 **Madsen, Beth M.** Core logs of three test holes in Cenozoic lake deposits near Hector, California: U.S. Geol. Survey Bull. 1296, 43 p., illus., 1970.
- 06182 **Madsen, Beth M.; Murata, K. J.** Occurrence of laumontite in Tertiary sandstones of the central Coast Ranges, California, *in* Geological Survey research 1970, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D188-D195, illus., tables, 1970.
- Magill, Arthur W.** *See* Twiss, Robert. 06920
- 00660 **Magnitsky, V. A.; Kalashnikova, I. V.** Problem of phase transitions in the upper mantle and its connection with the Earth's crustal structure: Jour. Geophys. Research, v. 75, no. 5, p. 877-885, illus., 1970.
- 03474 **Magnusson, D. H.; Long, G. H.** Atlantic continental margin, its history, its future, *in* Geological provinces of Canada, exploration and outlook: Canadian Mining and Metall. Bull., v. 63, no. 693, p. 25-30, illus., 1970.
- 02650 **Magnusson, Don H.** Sable Island deep test of Scotian shelf [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 858, 1970.
- 01951 **Magorian, Thomas R.** Characteristic overland flow length [abs.]: EOS, v. 51, no. 4, p. 278, 1970.
- 07469 **Magorian, Thomas R.** Vegetation and watershed shape: Water Resources Research, v. 6, no. 6, p. 1759-1764, illus., 1970.
- Mahan, S.** *See* Rogers, J. J. W. 01167
- 02114 **Maher, J. C.; Trollman, W. M.** (compilers). Geological literature on the north slope of Alaska: Tulsa, Okla., Am. Assoc. Petroleum Geologists, 133 p., illus., 1970.
- Maher, Louis J., Jr.** *See* Black, Robert F. 06810
- 06811 **Maher, Louis J., Jr.** Two Creeks forest, Valdres glaciation, and pollen grains, Pt. D *in* Pleistocene geology of southern Wisconsin — Geol. Soc. America, Ann. Mtg., Milwaukee, Wis., 1970, Field Trip Guide: Wisconsin Univ. Geol. and Nat. History Survey Inf. Circ. 15, p. D1-D8, illus., 1970.
- 10180 **Maher, Louis J., Jr.** A pollen paradox — Blocking the drainage of a bog to create a pond may reduce the number of conifer pollen grains in its sediments [abs.], *in* American Quaternary Assoc. mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs: [Bozeman, Mont., Montana State Univ.?], p. 85, 1970.
- 03971 **Maher, Stuart W.** Possible basement control of geologic phenomena in Tennessee [abs.]: Tennessee Acad. Sci. Jour., v. 45, no. 2, p. 53, 1970.
- 03981 **Maher, Stuart W.; Fagan, James M.** Trace element content of some ore deposits in the Southeastern States: Tennessee Div. Geology Inf. Circ. 16, map with text and table, 1970.
- 06376 **Maher, Stuart W.** Barite resources of Tennessee: Tennessee Div. Geology Rept. Inv. 28, 40 p., illus., tables, 1970.
- 09160 **Mahtab, M. A.; Goodman, R. E.** Three-dimensional finite element analysis of jointed rock slopes [with French and German summ.], *in* Internat. Soc. Rock Mechanics Cong., 2d, Belgrade, Yugoslavia, 1970, Proc., V. 3: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 353-360, illus., tables, 1970.
- 09799 **Mairs, Robert L.** Oceanographic interpretation of Apollo photographs: Photogramm. Eng., v. 36, no. 10, p. 1045-1058, illus., tables, 1970.
- Majeske, E. C.** *See* Anderson, Raymond J. 07520
- Majima, H.** *See* Oka, Y. 05006

- Major, C. F., Jr.** *See* Bernard, Hugh A. 05896
- Major, C. F., Jr.** *See* Bernard, Hugh A. 05897
- 00307 **Major, M. W.; Butler, David; Blackford, M. E.** Residual strains associated with Millrow [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 113, 1970.
- Major, M. W.** *See* Blackford, M. E. 01630
- Major, M. W.** *See* Romig, P. R. 09546
- 00508 **Majtenyi, Steven Istvan.** An application of stereo aerial photographs to the estimation of discharge properties of drainage basins [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 7, p. 3163B, 1970.
- 00044 **Majumdar, Dalim K.** Property interrelationships in sensitive clays — Discussion [of paper 6666 by W. N. Houston and J. K. Mitchell, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, *Jour. Soil Mechanics and Found. Div.*, no. SM 1, p. 368, 1970.
- Mal, A. K.** *See* Knopoff, L. 03679
- 01495 **Malahoff, Alexander.** Some possible mechanisms for gravity and thrust faults under oceanic trenches: *Jour. Geophys. Research*, v. 75, no. 11, p. 1992-2001, illus., 1970.
- 01952 **Malahoff, Alexander; Burns, R.** Gravity anomalies across the fracture zones of the northeastern Pacific Ocean [abs.]: *EOS*, v. 51, no. 4, p. 318, 1970.
- 09271 **Malahoff, Alexander; Woollard, G. P.** Magnetic surveys over the Hawaiian Ridge: Hawaii Inst. Geophysics [Rept.] HIG-65-11, 64 p., illus., tables, geol. maps, revised 1969; originally published 1965.
- 10004 **Malahoff, Alexander; Woollard, G. P.** Geophysical studies of the Hawaiian Ridge and Murray Fracture Zone, *in* The sea — v. 4, New concepts of sea floor evolution, Pt. 2, Regional observations (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 73-131, illus., table, 1970.
- Malan, Roger C.** *See* Sterling, David A. 04591
- 05926 **Malaurie, J.** Complexité des notions de faciés morphologique arctique et subarctique (nord-ouest et centre-ouest du Groenland) [Complexities of the concepts of arctic and subarctic morphologic facies (northwest and west-central Greenland) (with English abs.)], *in* Ecology of the subarctic regions (Écologie des régions subarctiques) — Helsinki, Symposium, Proc.: Paris, UNESCO, p. 125-128, 1970.
- 00331 **Malcolm, Ronald L.; Kennedy, V. C.** Variation of cation exchange capacity and rate with particle size in stream sediment: *Water Pollution Control Federation Jour.*, v. 42, no. 5, pt. 2, p. R153-R160, illus., table, 1970.
- 06335 **Malek-Aslani, Morad.** Lower Wolfcampian reef in Kemnitz field, Lea County, New Mexico: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2317-2335, illus., 1970.
- 00308 **Maley, Richard P.** Recent developments in the Coast and Geodetic Survey's program in strong-motion seismology [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 114, 1970.
- 00309 **Maley, Richard P.** Strong-motion seismograph records of the Borrego Mountain earthquake from multi-story buildings in the Los Angeles area [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 114, 1970.
- 09658 **Maley, Richard P.** Results from the strong-motion seismograph records of the Borrego Mountain, California, earthquake of 9 April 1968 [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 615, 1970.

- 03098 **Malhotra, Anil Kumar.** Stochastic analysis of offshore tower structures [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 10, p. 4610B, 1970.
- Malhotra, R.** See Hanson, G. N. 06480
- Malina, J., Jr.** See Adams, W. M. 10534
- Malkus, W. V. R.** See Howard, L. N. 04120
- 07281 **Mallio, William Joseph.** Geochemistry of pyrrhotite from metamorphosed pelitic rocks in western Maine [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2768B, 1970.
- 09288 **Mallon, Harry J.** Experimental applications of multispectral data to natural resource inventory and survey, Sec. 7 of Earth Resources Program, 3d ann., review — v. 1, Geology and geography: Houston, Tex., NASA Manned Spacecraft Center, Msc-03742, p. 7-1 — 7-33, illus., 1970.
- Mallory, V. Standish.** See Wheeler, Harry E. 08535
- Mallory, V. Standish.** See Wheeler, Harry E. 08536
- 02387 **Malloy, R. J.; Hurley, R. J.** Geomorphology and geologic structure, Straits of Florida: Geol. Soc. America Bull., v. 81, no. 7, p. 1947-1972, illus., table, 1970.
- Malone, John E.** See Hasan, Asghar. 09169
- 08658 **Malone, Ph. G.; Towe, K. M.** Microbial carbonate and phosphate precipitates from sea water cultures: Marine Geology, v. 9, no. 5, p. 301-309, illus., 1970.
- Malone, Philip G.** See Towe, K. M. 02131
- 01576 **Malone, Philip Garcin.** Paleotemperature determinations from pelecypod skeletal carbonates from the Upper Pleistocene of the Atlantic Coast [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 9, p. 4209B, 1970.
- 10536 **Malone, Stephen D.** Tidal and secular strain observations at Round Mountain, Nevada [abs.]: EOS, v. 51, no. 11, p. 777, 1970.
- 05433 **Maloney, J. F.; Turner, C. E.; Johnson, G. H.** The urbanization of the Green Cove drainage basin, Williamsburg, Virginia [abs.]: Virginia Jour. Sci., v. 21, no. 3, p. 135, 1970.
- Maloney, W. E.** See Andersen, N. R. 03996
- Mamay, Sergius H.** See Grew, Edward S. 00954
- 01474 **Mamay, Sergius H.; Breed, William J.** Early Permian plants from the Cutler Formation in Monument Valley, Utah, in Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B109-B117, illus., 1970.
- Mamet, B. L.** See Skipp, Betty. 01475
- Mamet, B. L.** See Toomey, Donald Francis. 02292
- Mamet, B. L.** See Petryk, A. A. 03014
- 07891 **Mamet, B. L.; Mason, D.** Lisburne Group, lithostratigraphy and foraminiferal zonation British Mountains, northern Yukon Territory: Bull. Canadian Petroleum Geology, v. 18, no. 4, p. 556-565, illus., 1970.

- 10073 **Mamet, B. L.** Foraminiferal biostratigraphy and Carboniferous microfacies, northern Alaska and Yukon [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2494, 1970.
- Mamet, Bernard L.** See Armstrong, Augustus K. 02072
- 06733 **Mamet, Bernard L.** Carbonate microfacies of the Windsor Group (Carboniferous), Nova Scotia and New Brunswick [with French abs.]: Canada Geol. Survey Paper 70-21, 121 p., illus., 1970.
- Mamet, Bernard L.** See Armstrong, Augustus K. 07081
- 08134 **Mamet, Bernard L.** Sur les *Umbellaceae* [On the *Umbellaceae* (with English abs.)]: Canadian Jour. Earth Sci., v. 7, no. 4, p. 1164-1171, illus., 1970.
- Mammerickx, J.** See Chase, T. E. 08323
- 05203 **Mammerickx, Jacqueline.** Morphology of the Aleutian abyssal plain: Geol. Soc. America Bull., v. 81, no. 11, p. 3457-3464, illus., 1970.
- 09510 **Manabe, Syjkuro.** The dependence of atmospheric temperature on the concentration of carbon dioxide, in *Global effects of environmental pollution — Symposium*, Am. Assoc. Adv. Sci., Dallas, Texas, 1968: New York, Springer-Verlag, and Dordrecht-Holland, D. Reidel Pub. Co., p. 25-29, illus., table, 1970.
- 06290 **Manatt, Stanley L.; Elleman, Daniel D.; Vaughan, Robert W.; Chan, Sunney I.; Tsay, Fun-Dow; Huntress, Wesley T., Jr.** Magnetic resonance studies of lunar samples, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 2321-2323, illus., 1970.
- Manbeian, T.** See Waldron, L. J. 07228
- Manchester, K. S.** See Keen, M. J. 08054
- Manchester, K. S.** See Grant, A. C. 08164
- 10074 **Manchester, K. S.; Keen, M. J.; Clarke, D. B.; Ross, D. I.** Geologic structure of Baffin Bay and Davis Strait determined by various geophysical techniques [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2494-2495, 1970.
- 10403 **Mancini, A. J.; Gruse, R. J.** [compilers]. Groundwater, in *Water resources survey — prairie County, Mont.*: Helena, Mont., Montana Water Resources Board, p. 22-34, illus., tables, 1970.
- 11201 **Mancini, A. J.** (compiler). Groundwater, in *Water resources survey, Glacier County, Montana: Helena, Mont.*, Montana Water Resources Board, p. 38-45, illus., table, 1969.
- 11202 **Mancini, A. J.** (compiler). Groundwater, in *Water resources survey, Valley County, Montana: Helena, Mont.*, Montana Water Resources Board, p. 30-39, illus., 1968.
- 11203 **Mancini, A. J.** (compiler). Groundwater, in *Water resources survey, Phillips County, Montana: Helena, Mont.*, Montana Water Resources Board, p. 29-38, illus., 1968.
- 11204 **Mancini, A. J.** (compiler). Groundwater, in *Water resources survey, Mineral County, Montana: Helena, Mont.*, Montana Water Resources Board, p. 31-35, illus., table, 1969.
- 11205 **Mancini, A. J.** (compiler). Groundwater, in *Water resources survey, Sanders County, Montana: Helena, Mont.*, Montana Water Resources Board, p. 20-25, illus., table, 1969.

- 05937 **Manconi, John W.; McDougall, David J.** Thermal activation energy of shocked and strained quartz: *Am. Mineralogist*, v. 55, nos. 3-4, p. 398-402, illus., tables, 1970.
- 06485 **Mancuso, J. D.; Dolence, J. D.** Structure of the Duluth gabbro complex in the Babbitt area, Minnesota [abs.], in *Inst. Lake Superior Geology, 16th Ann.*, Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 27, 1970.
- Mancuso, J. J.** See Den Besten, I. E. 08268
- 06639 **Mandarino, J. A.; Gait, R. I.** Molybdenite polytypes in the Royal Ontario Museum: *Canadian Mineralogist*, v. 10, pt. 4, p. 723-729, table, 1970.
- Mandarino, J. A.** See Gait, R. I. 06640
- 01662 **Mandelbaum, Hugo.** Definition and properties of a variability index of deltaic sediments: *Jour. Sed. Petrology*, v. 40, no. 1, p. 436-445, illus., tables, 1970.
- 01419 **Mangelsdorf, P. C., Jr.; Manheim, F. T.; Gieskes, J. M. T. M.** Role of gravity, temperature gradients, and ion-exchange media in formation of fossil brines: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 4, p. 617-626, illus., tables, 1970.
- 09659 **Manger, Walter L.; Kettenbrink, E. C.** Deformation patterns in pisoliths from the Plattsburg Limestone (Missourian), southeastern Kansas [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 615-616, 1970.
- 03757 **Manghnani, Murli H.** Analcite-jadeite phase boundary, in *Phase transformations and the Earth's interior* — Symposium, Canberra, Australia, 1969, *Proc.: Physics Earth and Planetary Interiors*, v. 3, p. 456-461, illus., tables, 1970.
- 07910 **Manghnani, Murli H.** Elastic parameters and infrared characteristics of glasses under high pressures and temperatures — U.S. Office Naval Research Contract N00014-67-A-0387-0005, NR 032-515, Final Rept.: Hawaii Inst. Geophysics [Rept.] HIG-70-30, 38 p., illus., tables, 1970.
- Mangum, John H.** See Reed, John C., Jr. 04258
- Mangus, Marlyn.** See Schaeffer, Bobb. 00580
- Manheim, F. T.** See Mangelsdorf, P. C., Jr. 01419
- Manheim, F. T.** See Chan, K. M. 01658
- 02651 **Manheim, F. T.** Critique of membrane-filtration concepts as applied to origin of subsurface brines [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 858, 1970.
- 02652 **Manheim, F. T.; Chan, K. M.; Sayles, F. L.** Chemical composition of oceanic water during Tertiary time; evidence from pore-water studies on JOIDES drill cores [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 858-859, 1970.
- 04375 **Manheim, F. T.; Sayles, F. L.** Brines and interstitial brackish water in drill cores from the deep Gulf of Mexico: *Science*, v. 170, no. 3953, p. 57-61, illus., table, 1970.
- Manheim, F. T.** See Sayles, F. L. 06666
- 06820 **Manheim, F. T.** The diffusion of ions in unconsolidated sediments: *Earth and Planetary Sci. Letters*, v. 9, no. 4, p. 307-309, illus., table, 1970.
- 07151 **Manheim, F. T.; Chan, K. M.; Sayles, F. L.** Interstitial water studies on small core samples, Deep Sea Drilling Project, Leg 5, Chap. 20 in *Initial reports of the Deep Sea Drilling Project* — V. 5, Leg 5 of cruises of *Glomar Challenger*, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office, p. 501-511, tables, 1970.



- 00056 **Manheim, Frank T.; Meade, Robert H.; Bond, Gerard C.** Suspended matter in surface waters of the Atlantic continental margin from Cape Cod to the Florida Keys: *Science*, v. 167, no. 3917, p. 371-376, illus., tables, 1970.

**Manheim, Frank T.** *See* Sayles, Fred L. 01972

**Maniatis, Jessie.** *See* Alberstadt, Leonard P. 00666

- 03973 **Maniatis, Jessie Klyce.** Carbonate petrography of Middle and Upper Ordovician rocks in the Central Basin of Tennessee [abs.]: *Tennessee Acad. Sci. Jour.*, v. 45, no. 2, p. 53-54, 1970.

**Mankin, Charles J.** *See* Wu, Dah Cheng. 00971

- 05667 **Mankin, Charles J.** Introduction to the symposium papers on environmental aspects of clay minerals: *Jour. Sed. Petrology*, v. 40, no. 3, p. 788, 1970.

- 06237 **Mankin, Charles J.** Alex. Nicholson, Jr., 1921-1970: *Oklahoma Geology Notes*, v. 30, no. 6, p. 151-152, portrait, 1970.

**Manley, F. H.** *See* Martin, B. F. 01315

- 01322 **Manley, F. H.** Chlorite polytypism in the migmatitic Piedmont belt of northwestern South Carolina [abs.]: *Georgia Acad. Sci. Bull.*, v. 28, no. 2, p. s25, 1970.

- 00035 **Mann, C. John.** Randomness in nature: *Geol. Soc. America Bull.*, v. 81, no. 1, p. 95-103, 1970.

- 04894 **Mann, C. John.** On randomness and determinism — Reply [to discussion by G. G. Simpson, 1970, of 'Randomness in nature,' 1970]: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 3187-3189, 1970.

- 04896 **Mann, C. John.** Randomness in nature — Reply [to discussion of 1970 paper by I. J. Smalley, 1970]: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 3195-3196, 1970.

- 05790 **Mann, C. John.** Isochronous, synchronous, and coetaneous: *Jour. Geology*, v. 78, no. 6, p. 749-750, 1970.

- 09864 **Mann, C. John; Semple, Robert M.** Computer reduction and plotting of marine sediment data: *Marine Technology Soc. Jour.*, v. 4, no. 1, p. 53-57, illus., 1970.

**Mann, J.** *See* Gelpi, E. 01683

**Mann, J. A.** *See* Cherry, R. N. 03383

- 03912 **Mann, J. A.; Cherry, R. N.** Large springs of Florida's "Sun Coast," Citrus and Hernando Counties: *Florida Bur. Geology Leaflet* 9, [22] p., illus., table, 1970.

- 03503 **Manning, P. G.; Harris, D. C.** Optical-absorption and electron-microprobe studies of some high-Ti andradites: *Canadian Mineralogist*, v. 10, pt. 2, p. 260-271, illus., tables, 1970.

- 06635 **Manning, P. G.** Racah parameters and their relationship to lengths and covalencies of  $Mn^{2+}$ - and  $Fe^{3+}$ -oxygen bonds in silicates: *Canadian Mineralogist*, v. 10, pt. 4, p. 677-688, illus., tables, 1970.

**Mansfield, Charles F.** *See* Cowan, Darrel S. 04452

- 09956 **Mansinha, L.; Smylie, D. E.; Beck, A. E.** (editors). Earthquake displacement fields and the rotation of the Earth — NATO Advanced Study Inst. Conf., London, Ontario 1969: New York, Springer-Verlag New York, 308 p., illus., tables, 1970.

- 09967 **Mansinha, L.; Smylie, D. E.** Seismic excitation of the Chandler wobble, in Earthquake displacement fields and the rotation of the Earth (L. Mansinha, D. E.

Smylie, A. E. Beck, editors)-NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 122-135, illus., tables, 1970.

**Manson, A. J.** See Runcorn, S. K. 06292

- 07129 **Mantek, William.** Review of current activity in the Niagaran reef belt in northern Michigan, Tech. Paper 9 in Ontario Petroleum Inst., 9th Ann. Conf., Ottawa, 1970: Chatham, Ontario, Ontario Petroleum Inst., 12 p., paged separately, illus., 1970.

- 04666 **Mantel, Erwin; Bolter, Ernst; Al Shaieb, Zuhair.** Distribution of gold, silver, copper, lead and zinc in the productive Marysville stock, Montana [with German abs.]: Mineralium Deposita, v. 5, no. 2, p. 184-190, illus., 1970.

**Manton, W. I.** See Leeman, W. P. 01794

- 07302 **Mantuani, Mark Anthony.** Sediment-water relations in lakes of the lower Grand Coulee, Washington [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2483B, 1970.

**Manuel, O. K.** See Wright, Robert J. 02003

**Manuel, O. K.** See Alexander, E. C., Jr. 02066

**Manuel, O. K.** See Bennett, G. A. 03140

**Manuel, O. K.** See Kuroda, P. K. 03906

- 04273 **Manuel, O. K.; Wright, R. J.; Miller, D. K.; Kuroda, P. K.** Heavy noble gases in Leoville — The case for mass fractionated xenon in carbonaceous chondrites: Jour. Geophys. Research, v. 75, no. 29, p. 5693-5701, illus., tables, 1970.

- 01953 **Manuel, Oliver K.; Kuroda, P. K.** Mass fractionation and isotope anomalies in neon and xenon [abs.]: EOS, v. 51, no. 4, p. 339, 1970.

**Mao, H. K.** See Bell, P. M. 02226

- 02253 **Mao, H. K.; Schairer, J. F.** Quenching experiments in the system jadeite ( $\text{NaAlSi}_2\text{O}_6$ )-forsterite ( $\text{Mg}_2\text{SiO}_4$ ) and jadeite ( $\text{NaAlSi}_2\text{O}_6$ )-anorthite ( $\text{CaAl}_2\text{Si}_2\text{O}_8$ ): Carnegie Inst. Washington Year Book 68, 1968-69, p. 221-222, 1970.

- 02254 **Mao, H. K.; Takahashi, T.; Bassett, W. A.** Study of lead up to 180 kb: Carnegie Inst. Washington Year Book 68, 1968-69, p. 251-253, table, 1970.

- 02255 **Mao, H. K.; Bassett, W. A.; Takahashi, T.** High-pressure phase transformation in magnetite: Carnegie Inst. Washington Year Book 68, 1968-69, p. 249-251, tables, 1970.

- 02812 **Mao, H. K.; Takahashi, Taro; Bassett, William A.** Isothermal compression of the spinel phase of  $\text{Ni}_2\text{SiO}_4$  up to 300 kilobars at room temperature, in Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969, Proc.: Physics Earth and Planetary Interiors, v. 3, p. 51-53, illus., table, 1970.

- 03730 **Mao, Nai-Hsien; Ito, Jun; Hays, J. F.; Drake, John; Birch, Francis.** Composition and elastic constants of hortonolite dunite: Jour. Geophys. Research, v. 75, no. 20, p. 4071-4076, tables, 1970.

- 06397 **Mao, Nai-Hsien.** Empirical equation of state for high compression: Jour. Geophys. Research, v. 75, no. 35, p. 7508-7512, tables, 1970.

**Mapper, D.** See Smales, A. A. 05763

- 03097 **Marachi, Nezameddin.** Strength and deformation characteristics of rockfill materials [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 10, p. 4610B, 1970.

**Maragos, J. E.** *See* Smith, S. V. 09579

**Marano, David.** *See* Wilson, Stanley D. 00052

03785 **Marchand, Denis E.** Soil contamination in the White Mountains, eastern California: *Geol. Soc. America Bull.*, v. 81, no. 8, p. 2497-2505, illus., tables, 1970.

01796 **Marchand, M.; Gray, N. H.; Green, D. H.** Ultramafic nodules from the Ile Bizard kimberlite [abs.]: *EOS*, v. 51, no. 4, p. 448, 1970.

**Marchant, L. C.** *See* White, E. J. 05983

05084 **Marcus, Allan H.** Comparison of equilibrium size distributions for lunar craters: *Jour. Geophys. Research*, v. 75, no. 26, p. 4977-4984, illus., 1970.

08615 **Marechal, A.; Serra, J.** Random kriging, in *Geostatistics — A colloquium* (D. F. Merriam, editor), Lawrence, Kan., 1970, *Proc.*: New York, Plenum Press, p. 91-112, illus., 1970.

03580 **Margherita, Lucio.** Display techniques as an aid to aeromagnetic interpretation: *Canadian Petroleum*, v. 11, no. 6, p. 12-13, 16-18, illus., 1970.

**Margolis, Stanley V.** *See* Cloud, Preston. 05737

10215 **Margulis, Lynn.** (editor). *Origins of life — First Conference*, Princeton, N.J., 1967, *Proc.*: New York, Gordon and Breach, Sci. Publishers, (for Interdisciplinary Communication Associates), 376 p., illus., tables, 1970.

**Mariacher, Burt C.** *See* Rausch, Donald O. 08601

**Marine, I. W.** *See* Webster, D. S. 01359

06172 **Marinenko, John; May, Irving.** Gas chromatographic determination of carbonate carbon in rocks and minerals, in *Geological Survey research 1970*, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D103-D105, illus., table, 1970.

05608 **Mariner, Robert H.; Surdam, Ronald C.** Alkalinity and formation of zeolites in saline alkaline lakes: *Science*, v. 170, no. 3961, p. 977-980, illus., table, 1970.

09660 **Mariner, Robert H.; Surdam, Ronald C.** Zeolitization of siliceous tuffs in saline alkaline lakes [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 616-617, 1970.

09266 **Marjaniemi, Darwin.** Tertiary volcanism in the northern Chiricahua Mountains, Cochise County, Arizona, App. A-VIII of *Correlation and chronology of ore deposits and volcanic rocks*, Damon, Paul E.: n.p., U.S. Atomic Energy Comm. Research Div., p. 209-214, illus., tables, 1968.

00310 **Marjaniemi, Darwin K.** Denuded caldera in the Basin and Range of Arizona [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 116, 1970.

06003 **Marjaniemi, Darwin Keith.** Geologic history of an ash-flow sequence and its source area in the Basin and Range Province of southeastern Arizona [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5557B, 1970.

**Mark, D. M.** *See* Roberts, M. C. 08136

**Mark, Harry B., Jr.** *See* Mattson, James S. 07130

**Mark, Harry B., Jr.** *See* Mattson, James S. 09134

**Mark, Norman.** *See* Sutton, George H. 02779

03637 **Markl, R. G.; Bryan, G. M.; Ewing, J. I.** Structure of the Blake-Bahama outer ridge: *Jour. Geophys. Research*, v. 75, no. 24, p. 4539-4555, illus., 1970.

**Markov, F. G.** See Tkatchenko, B. V. 10108

- 09962 **Markowitz, William.** Sudden changes in rotational acceleration of the Earth and secular motion of the pole, in Earthquake displacement fields and the rotation of the Earth (L. Mansinha, D. E. Smylie, A. E. Beck, editors) - NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 69-81, illus., tables, 1970.
- 10601 **Marland, Gregg.** Precursors to calcite and aragonite precipitation [abs.]: EOS, v. 51, no. 11, p. 831, 1970.
- 01365 **Marlow, M. S.; Scholl, D. W.; Buffington, E. C.; Boyce, R. E.; Alpha, Tau Rho; Smith, P. J.; Shippek, C. J.** Buldir Depression, a late Tertiary graben on the Aleutian Ridge, Alaska: Marine Geology, v. 8, no. 1, p. 85-108, illus., table, 1970.
- Marlow, Michael S.** See Scholl, David W. 00359
- Marlow, Michael S.** See Scholl, David W. 01592
- Marlow, Michael S.** See Scholl, David W. 04540
- Marlow, Michael S.** See Scholl, David W. 05962
- 01664 **Marlowe, James I.** Weddellite in bottom sediment from the St. Lawrence and Saguenay Rivers: Jour. Sed. Petrology, v. 40, no. 1, p. 499-506, illus., tables, 1970.
- Márquez Calderón, Rafael.** See del Castillo G., Luis. 11269
- 00419 **Marranzino, A. P.; Nakagawa, H. M.** Analytical methods, in A geochemical study of alluvium-covered copper deposits in Pima County, Arizona: U. S. Geol. Survey Bull. 1312-C, p. C11-C13, 1970.
- 03034 **Marsell, Ray E.** Cloudburst floods, in Governor's conference on geologic hazards in Utah, December 14, 1967: Utah Geol. and Mineralog. Survey Spec. Studies 32, p. 11-17, illus., tables, 1970.
- 10489 **Marshall, Monte; Cox, Allan.** Changes in the magnetic properties of pillow basalt due to submarine weathering [abs.]: EOS, v. 51, no. 11, p. 745, 1970.
- Marshall, Neil F.** See Hanor, Jeffrey S. 07008
- Marshall, P. Anthony.** See Healy, J. H. 02792
- Marshall, R.** See Coker, A. E. 08410
- 04980 **Marshall, Thomas R., Jr.** Oil and gas regulatory practice, Prudhoe Bay Field, Alaska: Interstate Oil Compact Comm. Comm. Bull., v. 12, no. 1, p. 43-46, 1970.
- 06603 **Marszalek, Donald Stanley.** Aspects of chamber formation by *Archias angulatus*, a foraminifer [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 761B, 1970.
- 05707 **Marti, K.; Lugmair, G. W.; Urey, H. C.** Solar wind gases, cosmic-ray spallation products and the irradiation history of Apollo 11 samples, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1357-1367, illus., tables, 1970.
- 07876 **Martignole, J.; Schrijver, K.** The level of anorthosites and its tectonic pattern: Tectonophysics, v. 10, no. 4, p. 403-409, illus., 1970.
- 05963 **Martin, A. J.** Structure and tectonic history of the western Brooks Range, De Long Mountains and Lisburne Hills, northern Alaska: Geol. Soc. America Bull., v. 81, no. 12, p. 3605-3621, illus., tables, geol. map, 1970.

- 01315 **Martin, B. F.; Manley, F. H.** Clay mineralogy of some Ordovician bentonites from the Chickamauga Supergroup, northwest Georgia [abs.]: Georgia Acad. Sci. Bull., v. 28, no. 2, p. s22-s23, 1970.
- 02460 **Martin, B. F.** A study of rhodolite garnet: Jour. Gemmology, v. 12, no. 2, p. 29-36, illus., 1970.
- 03987 **Martin, C. S.** Effect of a porous sand bed on incipient sediment motion: Water Resources Research, v. 6, no. 4, p. 1162-1174, illus., tables, 1970.
- 06218 **Martin, Charles W.** The bedrock geology of the Torrington quadrangle (with map): Connecticut Geol. and Nat. History Survey Quad. Rept. 25, 53 p., illus., tables, geol. map, 1970.
- Martin, Charles W.** See Gates, Robert M. 10676
- Martin, D. F.** See McLester, M. E. 00787
- Martin, D. F.** See Allen, R. J. 04421
- 03802 **Martin, Dean F.** Marine chemistry (in two volumes) — V. 2, Theory and applications: New York, Marcel Dekker, 451 p., illus., tables, 1970.
- 02266 **Martin, J. R.; Johnson, P. H.; Nance, W. B.; Allen, J. H.** Analytical chemical and X-ray diffraction analysis of the Lost City meteorite [abs.]: EOS, v. 51, no. 7, p. 581, 1970.
- 07408 **Martin, James A.; Rueff, Ardel W.** Paleocollapse — Determinant of a quarry failure [abs.]: Mining Eng., v. 22, no. 9, p. 53, 1970.
- 10804 **Martin, Ken G.** Stratigraphy of the Buda Limestone, south-central Texas, in Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas (Leo Hendricks, editor): Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub., no. 67-8, p. 286-299, illus., 1967.
- Martin, L.** See West, G. F. 02958
- 02530 **Martin, Larry D.** Two microtine phylogenetic lineages [abs.]: Nebraska Acad. Sci. Proc., 80th Ann. Mtg., p. 35, 1970.
- Martin, Larry D.** See Schultz, C. Bertrand. 07638
- Martin, Larry D.** See Schultz, C. Bertrand. 08051
- Martin, Larry D.** See Schultz, C. Bertrand. 09405
- Martin, Marilyn R.** See Goles, Gordon G. 05695
- 10181 **Martin, Paul S.** Vegetation of the Southwest between 14,000 and 9,000 years ago [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ. ?], p. 87-88, 1970.
- Martin, R.** See King, Elbert A., Jr. 05675
- Martin, R.** See Taylor, S. R. 05725
- 01797 **Martin, R. F.; Luth, W. C.** Peralkaline alkali feldspar solvii [abs.]: EOS, v. 51, no. 4, p. 439, 1970.
- Martin, R. F.** See Piwinskii, A. J. 07661
- Martin, R. F.** See Luth, W. C. 09651

- 00908 **Martin, Ray G., Jr.** Structure of the continental margin, northeasternmost Gulf of Mexico [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 290-291, 1970.
- Martin, Richard H.** See Donaldson, Alan C. 06748
- 10473 **Martin, Robert A.** Aquatic rodents of the Florida Pleistocene: *Plaster Jacket*, no. 8, 7 p., illus., 1968.
- 07845 **Martin, Robert Allen.** Fossil mammals of the Coleman IIA local fauna, Sumter County, Florida [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 3, p. 1433B, 1970.
- 01669 **Martin, Robert F.** Petrogenetic and tectonic implications of two contrasting Devonian batholithic associations in New Brunswick, Canada: *Am. Jour. Sci.*, v. 268, no. 4, p. 309-321, illus., tables, 1970.
- 08375 **Martin, Robert-F.; Lagache, Martine.** L'effet du remplacement du potassium par le rubidium sur les paramètres de la maille de la sanidine et la leucite (The effect of replacement of potassium by rubidium on the lattice parameters of sanidine and leucite): *Soc. Francaise Minéralogie et Crystallographie Bull.* 93, nos. 5-6, p. 581-582, tables, 1970.
- Martin, T. G.** See Murrmann, R. P. 08191
- 01356 **Martin, W. D.; Henniger, B. R.** Reply [to discussion by J. B. Roen of "Sandstone distribution [in] lower member of the Waynesburg Formation, Green and Washington Counties, southwest Pennsylvania," 1970]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 3, p. 535, 1970.
- Martinais, Jacques.** See LePichon, Xavier. 01946
- Martinais, Jacques.** See Olivet, Jean-Louis. 05254
- Martinez Baca, Alfonso.** See del Castillo G., Luis. 11269
- 10863 **Martinez H., Maximiliano.** Estudio sobre la erosion y sus causas en el Lago de Ilopango, El Salvador [a study on erosion and its causes at Lake Ilopango, El Salvador (with Spanish and English abs.)], in *Trabajos tecnicos presentados en la segunda reunion de geologos de America Central: Inst. Centroamericano Inv. y Tecnologia Indus. Pubs. Geol.*, no. 2, p. 81-88, illus., 1969.
- Martinez, Joseph D.** See Weidie, A. E. 01418
- 04581 **Martinez, Joseph D.** The relationship between optical orientation and shape anisotropy in detrital gypsum grains, in *Third symposium on salt*, V. 1 (J. L. Rau and L. F. Dellwig, editors): *Cleveland, Ohio, Northern Ohio Geol. Soc.*, p. 331-338, illus., 1970.
- 04907 **Martinez, Joseph D.** The tectonic behavior of evaporites [abs.]: *Corpus Christi Geol. Soc. Bull.*, v. 11, no. 2, p. 4-5, 1970.
- 05030 **Martinez, Joseph D.; Thoms, Robert L.; Jindal, Vinod K.** Model studies of effects of closure of solution caverns in salt domes, in *Third symposium on salt*, V. 2 (J. L. Rau and L. F. Dellwig, editors): *Cleveland, Ohio, Northern Ohio Geol. Soc.*, p. 308-320, illus., 1970.
- 08735 **Martinez, Joseph D.** Technology of Gulf Coast salt, in *Geology and technology of Gulf Coast salt — Symposium*, Baton Rouge, La., 1967, *Proc.: Baton Rouge, La., Louisiana State Univ. School of Geoscience*, p. 149-159, illus., tables, 1970.
- Martini, E.** See Worsley, T. 01354

- 02868 **Martini, J. A.** Allocation of cation exchange capacity of soil fractions in seven surface soils from Panama and the application of a cation exchange factor as a weathering index: *Soil Sci.*, v. 109, no. 5, p. 324-331, illus., tables, 1970.
- Martinsson, Anders.** *See* Berdan, Jean M. 08760
- Marvin, R. F.** *See* Barker, Fred. 00132
- 05196 **Marvin, R. F.; Mehnert, H. H.; Noble, D. C.** Use of Ar<sup>36</sup> to evaluate the incorporation of air by ash flows: *Geol. Soc. America Bull.*, v. 81, no. 11, p. 3385-3391, tables, 1970.
- Marvin, Ray G.** *See* Rocky Mountain Assoc. Geologists. 05350
- Marvin, Richard F.** *See* Reed, John C., Jr. 04258
- 05646 **Marvin, Richard F.; Byers, F. M., Jr.; Mehnert, Harold H.; Orkild, Paul P.; Stern, T. W.** Radiometric ages and stratigraphic sequence of volcanic and plutonic rocks, southern Nye and western Lincoln Counties, Nevada: *Geol. Soc. America Bull.*, v. 81, no. 9, p. 2657-2676, illus., tables, 1970.
- Marvin, Richard F.** *See* Lee, Donald E. 06209
- 00958 **Marvin, Ursula B.; Wood, J. A.; Dickey, J. S., Jr.** Ca-Al rich phases in the Allende meteorite: *Earth and Planetary Sci. Letters*, v. 7, no. 4, p. 346-350, illus., tables, 1970.
- 11249 **Maryland State Plan. Dept.** (Patuxent River Watershed Advisory Comm.). The Patuxent River — Maryland's asset, Maryland's responsibility: *Maryland State Plan. Dept. Pub.* 149, 50 p., illus., 1968.
- Mashey, J. R.** *See* Jeran, P. W. 00827
- Masland, Frank A., Jr.** *See* Socolow, Arthur A. 07487
- Mason, Brian.** *See* Smith, J. V. 01676
- 06135 **Mason, Brian; Graham, A. L.** Minor and trace elements in meteoritic minerals: *Smithsonian Contr. Earth Sci.*, no. 3, 17 p., illus., tables, 1970.
- 06858 **Mason, Brian; Melson, William G.** The lunar rocks: New York, Wiley-Interscience, 179 p., illus., 1970.
- Mason, Brian.** *See* Clarke, Roy S., Jr. 10268
- 10521 **Mason, Curtis C.; Norris, Dean R.; Browne, Ivan D.** Evaluation of factors affecting resolution of shallow water bottom features [abs.]: *EOS*, v. 51, no. 11, p. 767, 1970.
- Mason, D.** *See* Mamet, B. L. 07891
- Mason, Shirley L.** *See* Mather, Kirtley F. 02758
- Masonheimer, Roy.** *See* Somerton, Wilbur H. 09135
- Massé, R.** *See* Landisman, M. 03980
- Massingill, J. V.** *See* Walker, J. R. 04942
- Masson, S.** *See* Card, K. D. 06421
- Masson, S.** *See* Card, K. D. 06422
- Mast, R. F.** *See* Swann, D. H. 03059

- 04598 **Mast, R. F.** Size, development, and properties of Illinois oil fields: Illinois Geol. Survey Illinois Petroleum 93, 42 p., illus., tables, 1970.
- Masters, J. A.** See McKenny, J. W. 00009
- 04926 **Mastrogiuseppe, Joy D.; Cridland, Arthur A.; Bogyo, Thomas P.** Multivariate comparison of fossil and Recent *Ginkgo* wood: Lethaia, v. 3, no. 3, p. 271-277, illus., tables, 1970.
- 08020 **Masuda, Akimasa; Nakamura, Noboru.** Evolution of lunar materials in light of the abundance variation of oxyphile trace elements: Contr. Mineralogy and Petrology, v. 29, no. 1, p. 11-27, illus., tables, 1970.
- 06732 **Matalucci, R. V.; Abdel-Hady, M.; Shelton, J. W.** Influence of microstructure of loess on triaxial shear strength: Eng. Geology, v. 4, no. 4, p. 341-351, illus., table, 1970.
- 10715 **Matalucci, R. V.; Hady, M. A.** Applications of infrared aerial surveys to civil and environmental engineering purposes: Oklahoma State Univ. School Civil Eng. Tech. Pub. 11, 71 p., illus., 1967.
- 00909 **Matalucci, Rudolph V.; Shelton, John W.; Abdel-Hady, Mohamed.** Relationship of fabric to shear failure in Vicksburg loess [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 291, 1970.
- 02306 **Matalucci, Rudolph V.; Abdel-Hady, Mohamed; Shelton, John W.** Influence of grain orientation on direct shear strength of a loessial soil: Eng. Geology, v. 4, no. 2, p. 121-132, illus., tables, 1970.
- 04829 **Mateker, Emil J., Jr.** Yesterday, today, and tomorrow in seismic exploration [abs.]: Am. Assoc. Petroleum Geologists, v. 54, no. 9, p. 1787, 1970.
- 07320 **Mateker, Emil J., Jr.** Yesterday, today, and tomorrow in seismic exploration, in Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Soc. Trans., v. 20, p. 129-132, 1970.
- Matelski, R. P.** See Petersen, G. W. 07428
- 02758 **Mather, Kirtley F.; Mason, Shirley L.** A source book in geology, 1400-1900: Cambridge, Mass., Harvard Univ. Press, 702 p., illus., reprinted 1970; originally published 1939.
- 10937 **Mather, Kirtley F.** The emergence of values in geologic life development, in Human values and natural science — Conf. on Value Inquiry, 3d, State Univ. New York, Geneseo, N. Y., 1969, Proc.: New York, London and Paris, Gordon and Breach Sci. Publishers (current topics of contemporary thought, V. 4), p. 3-14, 1970.
- 07934 **Mather, Terry James.** Stratigraphy and paleontology of the Permian Kaibab Formation, Mogollon Rim, Arizona [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3483B, 1970.
- 08614 **Matheron, G.** Random functions and their application in geology, in Geostatistics — A colloquium (D. F. Merriam, editor), Lawrence, Kan., 1970, Proc.: New York, Plenum Press, p. 79-87, 1970.
- 03943 **Matheson, David S.** A tunnel roof failure in till [with French abs.]: Canadian Geotech. Jour., v. 7, no. 3, p. 313-317, illus., 1970.
- 07935 **Mathews, Geoffrey William.** The petrology and geochemical variability of the Audubon-Albion stock, Boulder County, Colorado [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3483B-3484B, 1970.
- 07694 **Mathews, W. H.; Fyles, J. G.; Nasmith, H. W.** Postglacial crustal movements in southwestern British Columbia and adjacent Washington state, in Symposium on



recent crustal movements, Ottawa, Canada, 1969, Papers: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 2, p. 690-702, illus., 1970.

- 10249 **Mathews, W. H.** Geomorphology of Lightning Creek Valley, Manning Park, southwestern British Columbia: Syesis, v. 1, pts. 1-2, p. 65-79, illus., 1968.

- 02147 **Mathewson, Christopher C.** Submarine canyons and the shelf along the north coast of Molokai Island, Hawaiian Ridge: Pacific Sci., v. 24, no. 2, p. 235-244, illus., 1970.

**Mathieu, Arthur.** See Duquette, Gilles. 06367

**Mathieu, Arthur.** See Duquette, Gilles. 06757

**Mathieu, Guy.** See Hunkins, Kenneth. 05623

- 09661 **Mathieu, Guy G.; Broecker, Wallace S.** Radon — 222 as a groundwater tracer [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 617, 1970.

**Mathisrud, Gordon C.** See Gilles, Albert P. 00617

- 06588 **Mathur, Jagdish Narain.** Analysis of the response of earth dams to earthquakes [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 669B, 1970.

**Mathur, Surendra P.** See Adams, William M. 08595

**Matlock, William G.** See Sorey, Michael L. 03617

**Maton, P. I.** See Horsfield, W. T. 01290

**Matsch, Charles L.** See Hogberg, Rudolph. 03491

**Matsch, Charles L.** See Wright, H. E., Jr. 10313

- 02472 **Matson, Robert E.** Preliminary report, strippable coal resources, McCone County, Montana: Montana Bur. Mines and Geology Bull. 78, 13 p., illus., tables, 1970.

**Matsuda, Tokihiko.** See Allen, Clarence R. 10563

- 02714 **Matsumoto, Mayme; Nichols, Rachel.** (compilers). Bibliography of vertebrate paleontology and related subjects, 1968-1969: Soc. Vertebrate Paleontology Bibliography, no. 24, 46 p., 1970.

**Matsuo, Sadao.** See Smith, George I. 09953

**Matten, L. C.** See Bartholomew, R. L. 04609

**Matteson, Charles.** See Gedney, Larry. 02140

- 09282 **Matthews, Barry.** Late Quaternary events in Northern Ungava, Quebec — the glaciation of the Deception Bay, Lac Watts and Sugluk areas, in Field research in Labrador-Ungava [1965-66]: McGill Univ. Dept. Geography Sub-Arctic Research Paper 23, p. 42-62, illus., 1967.

- 06131 **Matthews, John V., Jr.** Quaternary environmental history of interior Alaska — Pollen samples from organic colluvium and peats: Arctic and Alpine Research, v. 2, no. 4, p. 241-251, illus., table, 1970.

- 09842 **Matthews, John V., Jr.** Two new species of *Micropeplus* from the Pliocene of western Alaska with remarks on the evolution of Micropeplinae (Coleoptera: Staphylinidae): Canadian Jour. Zoology, v. 48, no. 4, p. 779-788, illus., 1970.

- 09441 **Matthews, R. A.; Schwarz, Charles.** Lake Tahoe Basin — A preliminary bibliography, 1969: California Div. Mines and Geology Spec. Pub. 36, 110 p., 1970.

- Matthews, R. A.** See Geological Society Sacramento. 09910
- 01082 **Matthews, R. David.** The origin of Silurian potash in the Michigan basin [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 393-394, 1970.
- 07603 **Matthews, R. David.** The distribution of Silurian potash in the Michigan Basin, *in* Forum on Geology of Industrial Minerals, 6th, Ann Arbor, Mich., 1970, Proc.: Michigan Geol. Survey Miscellany 1, p. 20-33, illus., table, 1970.
- 02653 **Matthews, R. K.** Process approach to diagenesis of reefs and reef-associated limestone [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 859, 1970.
- Matthews, R. K.** See Mesolella, Kenneth J. 05246
- Matthews, Robert A.** See Geological Society of Sacramento. 03951
- Matthiesen, R. B.** See Leeds, D. J. 09641
- 04253 **Mattick, Robert E.** Thickness of unconsolidated to semiconsolidated sediments in Jordan Valley, Utah, *in* Geological Survey research 1970, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C119-C124, illus., 1970.
- 00311 **Mattinson, James M.** Uranium-lead geochronology of the Northern Cascade Mountains, Washington [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 116, 1970.
- 01552 **Mattinson, James M.; Fisher, Richard V.** Impossibility of Bernoulli pressure forces on particles suspended in boundary layers — Reply [to J. B. Southard's (1970) criticism of original work in 1968]: Jour. Sed. Petrology, v. 40, no. 1, p. 520-521, illus., 1970.
- 10212 **Mattox, Richard B.; Miller, William D.** (editors). The Ogallala aquifer, a symposium, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, 242 p., illus., tables, 1970.
- 07130 **Mattson, James S.; Mark, Harry B., Jr.; Weber, Walter J., Jr.** Investigation of optically dense systems by internal reflection spectroscopy — Experimental considerations, *in* Developments in applied spectroscopy, V. 8 — Mid-America Spectroscopy Symposium, 20th Ann., Chicago, Ill., 1969, Selected papers: New York and London, Plenum Press, p. 91-104, illus., 1970.
- 09134 **Mattson, James S.; Mark, Harry B., Jr.; Kolpack, Ronald L.; Schutt, Clarence E.** A rapid, nondestructive technique for infrared identification of crude oils by internal spectrometry — Qualitative differentiation of crude oils originating from natural seepages and Platform "A" in the Santa Barbara Channel: Anal. Chemistry, v. 42, no. 2, p. 234-238, illus., tables, 1970.
- Mattson, L. A.** See Wright, H. E., Jr. 07732
- Mattson, Peter H.** See Anibal, Espejo C. 00138
- Matumoto, T.** See Molnar, P. 09680
- 07893 **Matwe, L.; Bos, C.** A discussion of the stratigraphy and structure in the Sukunka area of British Columbia, *in* Peace River, Pine Pass, Yellowhead 1970 — Edmonton Geol. Soc. Field Conf., 12th, Guidebook: Edmonton, Alberta, Edmonton Geological Society, p. 1-14, illus., tables, 1970.
- Matz, David B.** See Motts, Ward S. 06526
- 01798 **Mauger, Richard L.; Diffenbach, Robert.** A sulfur isotope study of Ducktown, Tennessee [abs.]: EOS, v. 51, no. 4, p. 454, 1970.

- 07386 **Maurer, Robert Eugene.** Geology of the Cedar Mountains, Tooele County, Utah [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2066B, 1970.
- Maurette, M.** See Dran, J. C. 08019
- 04300 **Maurice, O. D.** Limestones and dolomites of Quebec: Canadian Mining and Metall. Bull., v. 63, no. 698, p. 711-718, illus., 1970.
- 09247 **Mausel, Paul W.** General subgroup soil regions of Illinois: Illinois Geog. Soc. Bull., v. 11, no. 2, p. 70-81, illus., tables, 1969.
- 10218 **Maxson, Rodney R.** Movable oil plot completion aid: Petroleum Engineer, v. 42, no. 2, p. 50, 52, 54, 57, illus., 1970.
- 09983 **Maxwell, Arthur E.** (editor). The sea — Ideas and observations on progress in the study of the seas, V. 4, New concepts of sea floor evolution. Pts. 1-3: New York and London, Wiley-Interscience, pt. 1, 791 p.; pts. 2-3, 664 p., illus., 1970.
- 05708 **Maxwell, J. A.; Peck, L. C.; Wiik, H. B.** Chemical composition of Apollo 11 lunar samples 10017, 10020, 10072 and 10084, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1369-1374, illus., tables, 1970.
- Maxwell, J. R.** See Douglas, A. G. 04193
- Maxwell, J. R.** See Abell, P. I. 05734
- 10578 **Maxwell, John C.; Raney, Jay.** Interfingering contact of Franciscan and Great Valley rocks [abs.]: EOS, v. 51, no. 11, p. 825, 1970.
- Maxwell, Ross A.** See Brown, L. F., Jr. 07039
- 07108 **Maxwell, Ross A.** Introduction, physiography and geology, in Geologic and historic guide to the state parks of Texas: Texas Univ. Austin Bur. Econ. Geology Guidebook 10, p. 1-27, illus., tables, 1970.
- 07206 **Maxwell, Ross A.; Dietrich, John W.** Correlation of Tertiary rock units, West Texas: Texas Univ. Austin Bur. Econ. Geology Rept. Inv. 70, 34 p., illus., 1970.
- 09663 **May, H. M.; Jackson, M. L.; Syers, J. K.** Proton donor-acceptor properties of octahedral layer edges of phyllosilicate and sesquioxide minerals [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 617-618, 1970.
- May, Irving.** See Marinenko, John. 06172
- May, James P.** See Osmond, J. K. 00089
- 09664 **May, R. W.** Cu, Zn, Cr, Ni geochemistry of glacial tills in southern Ontario, Canada [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 618, 1970.
- Mayeda, Toshiko.** See Onuma, Naoki. 01963
- Mayeda, Toshiko.** See Schwarcz, H. P. 04650
- Mayeda, Toshiko K.** See Onuma, Naoki. 05714
- 01083 **Mayer, Victor J.** The undergraduate preparation of earth science teachers at the Ohio State University [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 394, 1970.
- 02406 **Mayer, Victor J.** A field course for undergraduate earth science education majors: Jour. Geol. Education, v. 18, no. 3, p. 129-131, 1970.

- 07700 **Mayhew, Michael A.; Drake, Charles L.; Nafe, John E.** Marine geophysical measurements on the continental margins of the Labrador Sea: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 199-214, illus., table, 1970; erratum, *ibid.*, no. 5, p. 1356, 1970.
- 00785 **Maynard, G. Lafayette.** Crustal layer of seismic velocity 6.9 to 7.6 kilometers per second under the deep oceans: *Science*, v. 168, no. 3927, p. 120-121, illus., table, 1970.
- Maynard, J. Barry.** See Bada, Jeffrey L. 04992
- 08266 **Maynes, A. D.** A new procedure for the determination of metallic iron in chondritic meteorites: *Chem. Geology*, v. 6, no. 4, p. 255-263, tables, 1970.
- Mayou, Taylor V.** See Frey, Robert W. 06983
- 03805 **Mayr, Ernst.** Populations, species, and evolution (an abridgment of *Animal species and evolution*): Cambridge, Mass., Belknap Press of Harvard Univ. Press, 453 p., illus., tables, 1970; originally published 1963.
- 07760 **Mayuga, M. N.** Geology and development of California's giant — Wilmington oil field, in *Geology of giant petroleum fields — Symposium, AAPG, 53d Ann. Mtg., Oklahoma City, Okla., 1968: Am. Assoc. Petroleum Geologists Mem. 14*, p. 158-184, illus., table, 1970.
- Mazor, Emanuel.** See Anders, Edward. 00969
- 03159 **Mazor, Emanuel; Heymann, Dieter; Anders, Edward.** Noble gases in carbonaceous chondrites: *Geochim. et Cosmochim. Acta*, v. 34, no. 7, p. 781-824, illus., tables, 1970.
- McAdoo, Gene D.** See Gabrysch, R. K. 07205
- 02149 **McAlester, A. Lee.** Animal extinctions, oxygen consumption, and atmospheric history: *Jour. Paleontology*, v. 44, no. 3, p. 405-409, illus., 1970.
- McAlester, A. Lee.** See Sutton, Robert G. 04950
- 10349 **McAlinden, John M.** Oceanographic mapping — The key to Davy Jones' locker, in *Acsm-Asp Tech. Conf., Denver, Colo., 1970. Papers: Washington, D.C., Am. Cong. Surveying and Mapping, and Falls Church, Va., Am. Soc. Photogrammetry*, p. 256-275, illus., 1970.
- McAllister, James F.** See Erd, Richard C. 05934
- 08689 **McAllister, James F.** Geology of the Furnace Creek borate area, Death Valley, Inyo County, California: *California Div. Mines and Geology Map Sheet 14*, 9 p., table, text, 1970.
- McAndrews, John H.** See Norris, Geoffrey. 04703
- 05377 **McAnulty, W. N., Sr.** Comments on some of the mineral resources of Trans-Pecos Texas, in *Geology of the southern Quitman Mountains area, Trans-Pecos Texas — S.E.P.M. Permian Basin Sec., 1970 Biennial Field Trip, Symposium and Guidebook: Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub. 70-12*, p. 107-114, illus., table, 1970.
- 05920 **McAnulty, W. N., Sr.** The mineral potential of the Chihuahua tectonic belt [summ.], in *The geologic framework of the Chihuahua tectonic belt — Symposium in honor of Ronald K. De Ford, Midland, Tex., 1970: Midland, Tex., West Texas Geol. Soc.*, p. 70-75, 1970.

- 07958 **McArthur, David S.; Onesti, Lawrence J.** Contorted structures in Pleistocene sediments near Lansing, Michigan: *Geol. Annaler, Ser. A, Phys. Geog.*, v. 52A, no. 3-4, p. 186-193, illus., 1970.
- 07619 **McAtee, James L., Jr.** Simultaneous X-ray diffraction-DTA [with French, German, and Russian abs.]: *Clays and Clay Minerals*, v. 18, no. 4, p. 223-232, illus., 1970.
- 07236 **McAuslan, E. R.** Boys (Geologists) be careful of probable Tertiary landslide in western Washakie Basin, Wyoming: *Wyoming Univ. Contr. Geology*, v. 9, no. 1, p. 1-6, illus., 1970.
- McBeath, Robert G.** *See* Hofer, Helmut. 09373
- McBirney, A. R.** *See* Pushkar, Paul. 09260
- 04983 **McBirney, Alexander R.** Andesites of North and Central America: *Geol. Soc. London Proc.* 1969, no. 1662, p. 30-36, illus., discussion, 1970.
- McBirney, Alexander R.** *See* Murase, Tsutomu. 05674
- 06919 **McBirney, Alexander R.** Some current aspects of volcanology: *Earth-Sci. Rev.*, v. 6, no. 5, p. 337-352, 1970.
- 10333 **McBirney, Alexander R.** Cenozoic igneous events of the circum-Pacific [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 749-751, 1970.
- McBride, E. F.** *See* Weidie, A. E. 09890
- McBride, E. F.** *See* Weidie, A. E. 09891
- 02309 **McBride, Earle F.; Thomson, Alan.** The Caballos Novaculite, Marathon region, Texas: *Geol. Soc. America Spec. Paper* 122, 129 p., illus., table, 1970.
- 04542 **McBride, Earle F.** Stratigraphy and origin of Maravillas Formation (Upper Ordovician), West Texas: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 9, p. 1719-1745, illus., tables, 1970.
- 05300 **McBride, Earle F.** Flysch sedimentation in the Marathon region, Texas [with French abs.], in *Flysch sedimentology in North America: Geol. Assoc. Canada Spec. Paper* 7, p. 67-83, illus., 1970.
- McBride, Earle F.** *See* Wolleben, James A. 09892
- McBride, Earle F.** *See* Wolleben, James A. 09893
- 10261 **McCabe, H. R.; Bannatyne, B. B.** Lake St. Martin crypto-explosion crater and geology of the surrounding area: *Manitoba Dept. Mines and Nat. Resources Mines Br. Geol. Paper* 3/70, 79 p., illus., tables, 1970.
- 05784 **McCabe, Robert A.** Beach behavior, north shore, Long Island Sound: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7679, *Jour. Waterways, Harbors and Coastal Eng. Div.*, no. WW4, p. 781-794, illus., tables, 1970.
- McCallister, Robert H.** *See* Yund, Richard A. 04081
- McCallum, I. S.** *See* Drake, M. J. 06844
- 00167 **McCammon, R. B.** An information theoretic approach to stratigraphic systems analysis [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 28, 1970.
- 01282 **McCammon, Richard B.** Minimum entropy criterion for analytic rotation: *Kansas Geol. Survey Computer Contr.* 43, 24 p., illus., tables, 1970.
- 02381 **McCammon, Richard B.; Wenninger, Guenther.** The dendrograph: *Kansas Geol. Survey Computer Contr.* 48, 28 p., illus., tables, 1970.

- 02654 **McCammon, Richard B.** Pattern recognition as guide for establishing minimum sampling requirements in regional stratigraphic studies [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 859-860, 1970.
- 08612 **McCammon, Richard B.** Component estimation under uncertainty, *in* *Geostatistics — A colloquium* (D. F. Merriam, editor), Lawrence, Kan., 1970, *Proc.*: New York, Plenum Press, p. 45-61, illus., 1970.
- McCann, S. B.** *See* Owens, E. H. 02164
- 09773 **McCann, S. B.; Owens, E. H.** Plan and profile characteristics of beaches in the Canadian Arctic Archipelago: *Shore and Beach*, v. 38, no. 4, p. 26-39, illus., 1970.
- 09825 **McCann, S. B.; Bryant, E. A.** Beach processes and shoreline changes, Kouchibouguac Bay, New Brunswick: *Maritime Sediments*, v. 6, no. 3, p. 116-117, illus.,
- 05563 **McCarthy, J. H., Jr.; Meuschke, J. L.; Ficklin, W. H.; Learned, R. E.** Mercury in the atmosphere, *in* *Mercury in the environment: U.S. Geol. Survey Prof. Paper 713*, p. 37-39, 67, illus., table, 1970.
- 07323 **McCarthy, James A.** The Miocene trend of Calhoun and Matagorda Counties, Texas, *in* *Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Soc. Trans.*, v. 20, p. 163-175, illus., 1970.
- McCartney, W. D.** *See* Sangster, A. L. 03454
- 06457 **McCary, Charles E. L.** Mineral resources summary of the Boonshill quadrangle, Tennessee: Nashville, Tenn., Tennessee Div. Geology, 4 p., 1970.
- McCary, Charles E. L.** *See* Barnes, Robert H. 07099
- McCasland, W.** *See* Hartronft, B. C. 04364
- 07371 **McCauley, Ronald Arthur.** Crystal chemistry and luminescence of pyrochlores [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 4, p. 2151B-2152B, 1970.
- 08709 **McClain, Thomas J.; Jenkins, Edward D.** Digital simulation of the Ogallala aquifer in Sherman County, northwestern Kansas, *in* *Ogallala Aquifer Symposium*, Lubbock, Texas, 1970 [*Proc.*]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, p. 72-88, illus., tables, 1970.
- McClain, W. C.** *See* Empson, F. M. 04639
- 10745 **McClain, W. C.; Bradshaw, R. L.** Deformation and stress transference in a salt mine resulting from the application of heat [with French and German summ.], *in* *Internat. Soc. Rock Mechanics Cong.*, 2d, Belgrade, Yugoslavia, 1970, *Proc.*, V. 1: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 559-565, illus., table, 1970.
- 06687 **McClellan, William Alan.** Siluro-Devonian microfaunal biostratigraphy in Nevada [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 2, p. 832B, 1970.
- 07960 **McCloy, James M.** Hydrometeorological relationships and their effects on the levees of a small arctic delta: *Geog. Annaler, Ser. A, Phys. Geog.*, v. 52A, no. 3-4, p. 223-241, illus., table, 1970.
- 01180 **McCloy, James Murl.** Morphologic characteristics of the Blow River delta, Yukon Territory, Canada [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 7, p. 3234B-3235B, 1970.
- 04437 **McClure, Duane; Sackett, John.** (compilers). Index to graduate theses on California geology, 1968: California Div. Mines and Geology Mineral Inf. Service, v. 23, no. 5, p. 91-94, illus., 1970.

**McClurg, James E.** *See* Smith, Charles I. 01104

- 01232 **McComas, Murray Ratcliffe.** Pleistocene geology and hydrogeology of the middle Illinois Valley [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 8, p. 3709B, 1970.

- 02037 **McConaghy, James A.** Reconnaissance of water resources in the Haines-Port Chilkoot area, Alaska: U.S. Geol. Survey Circ. 626, 16 p., illus., tables, 1970.

- 03591 **McConnell, Duncan.** Arsenic in phosphorite and apatite — Discussion [of paper by S. H. Stow, 1969]: Econ. Geology, v. 65, no. 1, p. 64-65, 1970.

- 09118 **McConnell, Duncan.** Crystal chemistry of bone mineral— Hydrated carbonate apatites: Am. Mineralogist, v. 55, nos. 9-10, p. 1659-1669, tables, 1970.

**McConnell, R. K.** *See* Aronson, J. R. 03695

**McConnell, R. K.** *See* Gibb, R. A. 09780

**McConnell, R. K., Jr.** *See* Cabaniss, G. H. 10479

- 10697 **McConnen, R. J.; Menon, G. M.** A linear programming model for analyzing the integrated use of ground and surface water for irrigation — A case study of the Gallatin Valley, Montana: Montana Agric. Experiment Sta. Bull. 616, 60 p., illus., tables, 1968.

**McCord, Thomas B.** *See* Adams, John B. 06266

- 08214 **McCorkell, R. H.; Pinson, W. H.; Fireman, E. L.; Langway, C. C., Jr.** A search for cosmic dust in a large collection of particulate and dissolved material from polar ice, in Internat. Symposium on Antarctic Glaciological Exploration (ISAGE), Hanover, N.H., 1968 [Proc.]: Internat. Assoc. Sci. Hydrology (and Sci. Comm. Antarctic Research) Pub. 86, p. 25-30, tables, 1970.

- 03913 **McCoy, H. J.; Hardee, Jack.** Ground-water resources of the lower Hillsboro Canal area, southeastern Florida: Florida Bur. Geology Rept. Inv. 55, 44 p., illus., tables, 1970.

- 02910 **McCoy, Roger M.** Application of radar imagery to drainage analysis, in Earth resources aircraft program status review, NASA, Houston, 1968 — V. 3, Hydrology, oceanography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 27-1 — 27-18, illus. [1970].

**McCracken, R. J.** *See* Gamble, E. E. 02577

**McCracken, R. J.** *See* Losche, C. K. 02724

**McCracken, R. J.** *See* Losche, C. K. 03763

**McCreath, D. R.** *See* Benson, R. P. 09312

**McCreery, R. A.** *See* Tan, K. H. 03953

- 02262 **McCrosky, R. E.; Shao, C. -Y.** Lost City meteorite — Recovery and preliminary analysis of the trajectory data [abs.]: EOS, v. 51, no. 7, p. 580, 1970.

**McCubbin, Donald G.** *See* McGookey, Donald P. 05364

- 09790 **McCue, G. A.; Green, J.** Roughness of simulated planetary terrain: Photogramm. Eng., v. 36, no. 3, p. 273-279, illus., table, 1970.

- 03201 **McCullagh, M. J.; King, C. A. M.** SPITSYM, a FORTRAN IV computer program for spit simulation: Kansas Geol. Survey Computer Contr. 50, 20 p., illus., 1970.

**McCulloch, David S.** *See* Carlson, Paul R. 00241

- 02316 **McCulloch, David S.; Bonilla, Manuel G.** Effects of the earthquake of March 27, 1964, on the Alaska Railroad: U.S. Geol. Survey Prof. Paper 545-D, p. D1-D161, illus., tables, 1970.
- McCulloch, David S.** See Carlson, Paul R. 03078
- 05520 **McDermott, James H.** The home groundwater supply picture as we see it [abs.]: Water Well Jour., v. 24, no. 9, p. 80-81, 1970.
- McDermott, V. J.** See Brookins, D. G. 09615
- 06004 **McDole, Robert Elroy.** Loess deposits adjacent to the Snake River flood plain in the vicinity of Pocatello, Idaho [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5557B, 1970.
- McDonald, F. R.** See Brown, Dennis. 09133
- McDonald, Harris R.** See Phillips, H. Boyd. 04229
- McDougall, D. J.** See Douglas, G. 02121
- McDougall, D. J.** See Douglas, G. 03086
- 02476 **McDougall, David J.** Natural thermoluminescence of calcareous rocks from the Charlevoix (Malbaie) structure: Meteoritics, v. 5, no. 2, p. 75-83, illus., table, 1970.
- 03131 **McDougall, David J.** La thermoluminescence des roches métamorphiques (note préliminaire) [Thermoluminescence of metamorphic rocks (preliminary note)]: Soc. Géol. France Bull, 1969, 7th ser., v. 11, no. 3, p. 323-329, illus., 1970.
- 04484 **McDougall, David J.** Relative concentrations of lattice defects as an index of the temperature of formation of fluorite: Econ. Geology, v. 65, no. 7, p. 856-861, illus., table, 1970.
- McDougall, David J.** See Manconi, John W. 05937
- 01593 **McDougall, Donald S.; Osborne, Robert H.** Statistical analysis of calcsiltites from Bird Springs Group, Mountain Springs, Nevada [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 3, p. 556, 1970.
- 04443 **McDougall, Harry.** Volcanoes of Hawaii: Canadian Geog. Jour., v. 80, no. 6, p. 208-217, illus., 1970.
- 02770 **McDougall, Robert B.** Mineral resources at six reservoir sites in the Blue River basin, Johnson County, Kans., and Cass County, Mo., in Blue River, vicinity of Kansas City, Missouri and Kansas: U.S. Cong., 91st, 2d sess., House Doc. 91-332, p. 108-120, tables, 1970.
- McDowell, Fred W.** See Signer, Peter. 04012
- McDowell, L. L.** See Grissinger, E. H. 01364
- 10385 **McDowell, L. L.; Ryan, M. E.** Interference studies in the determination of sodium, potassium, calcium, and magnesium in natural waters by atomic absorption spectrophotometry, in Mississippi Water Resources Conf., 5th, 1970, Jackson, Proc.: State College, Miss. Water Resources Research Inst., p. 163-180, illus., tables, 1970.
- McDowell, Robert C.** See Mytton, James W. 05399
- 00312 **McEldowney, Roland C.** An occurrence of Paleozoic fossils in Baja California, Mexico [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 117, 1970.
- 04058 **McEnery, Marie; Lee, John J.** Tracer studies on calcium and strontium mineralization and mineral cycling in two species of foraminifera, *Rosalina leei* and *Spirolocu-*



*lina hyalina*: Limnology and Oceanography, v. 15, no. 2, p. 173-182, illus., tables, 1970.

**McEvilly, T. V.** See Zanetti, John. 00394

**McEvilly, T. V.** See Cloud, W. K. 00858

**McEvilly, T. V.** See Carder, D. S. 06410

**McEvilly, T. V.** See Zanetti, John. 10544

10828 **McEvilly, T. V.** Seismology and central California tectonics [abs.] - Internat. Symposium on Recent Crustal Movements and Associated Seismicity, Wellington, N.Z., 1970, Proc.: Wellington, N.Z., Royal Soc. of New Zealand, p. 23, 1970.

05245 **McFall, Robert L.** Digital model of alluvial aquifer — Discussion [of paper 7264 by Peter C. Trescott, George F. Pinder, and John F. Jones, 1970]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Hydraulics Div., no. HY 11, p. 2398, 1970.

**McFarlin, Peter F.** See Hathaway, John C. 05576

**McGann-Lamar, J. V.** See Lamar, D. L. 10988

09468 **McGauhey, P. H.** Earth's tolerance for wastes, in Limitations of the earth, a compelling focus for geology (Texas Univ. Austin Bur. Econ. Geology) - A symposium held at the dedication of the new Geology Building, Austin, Tex., 1967, Proc.: Texas Quart., v. 11, no. 2, p. 36-42, 1968.

10075 **McGaw, Richard W.; Anderson, Duwayne M.; Brown, Jerry; Haugen, Richard K.; Tice, Allen R.** Bentonitic debris flows near Umiat, Alaska [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2495, 1970.

09563 **McGee, Brian A.** The Canadian index to geoscience data, a new national service for mineral exploration [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 613, 1970.

00064 **McGetchin, T. R.; Silver, L. T.; Chodos, A. A.** Titanoclinohumite — A possible mineralogical site for water in the upper mantle: Jour. Geophys. Research, v. 75, no. 2, p. 255-259, table, 1970.

01799 **McGetchin, T. R.; Silver, L. T.; Chodos, A. A.** Mineral inclusions in pyropes from Colorado Plateau kimberlite pipes [abs.]: EOS, v. 51, no. 4, p. 448, 1970.

02825 **McGetchin, Thomas R.; Silver, Leon T.** A crustal-upper mantle model for the Colorado Plateau based on observations of crystalline rock fragments in a kimberlite dike [abs.], in Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969, Proc.: Physics Earth and Planetary Interiors, v. 3, p. 471, 1970.

09123 **McGetchin, Thomas R.; Silver, Leon T.** Compositional relations in minerals from kimberlite and related rocks in the Moses Rock dike, San Juan County, Utah: Am. Mineralogist, v. 55, nos. 9-10, p. 1738-1771, illus., tables, 1970.

10801 **McGill, Daniel W.** Washita Formations, north Texas, correlated to Georgetown Limestone, central Texas, in Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas (Leo Hendricks, editor); Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub., no. 67-8, p. 218-239, illus., 1967.

00403 **McGill, George E.** Belt Supergroup correlation, Helena to Glacier National Park, Montana: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 2, p. 349-352, illus., 1970.

- 04944 **McGill, George E.; Raney, Jay Alan.** Experimental study of faulting in an anisotropic, inhomogeneous dolomitic limestone: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 2949-2958, illus., 1970.
- 00071 **McGinnis, L. D.** Tectonics and the gravity field in the continental interior: *Jour. Geophys. Research*, v. 75, no. 2, p. 317-331, illus., 1970.
- 01084 **McGinnis, L. D.; Sawayan, A. R.; Jensen, T. E.** Geophysical studies of the ancient Mississippi River bedrock valley [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 394-395, 1970.
- 09731 **McGinnis, L. D.** The bedrock surface in northeastern Illinois — A review, *in* Tri-State Geol. Field Conf., 34th Ann., 1970, Guidebook (I. E. Odom and M. P. Weiss, editors): De Kalb, Ill., Northern Illinois Univ. Dept. Geology, p. 80-87, illus., 1970.
- McGinnis, Michael R.** See Strimple, Harrell L. 03727
- 03428 **McGinty, Thomas L.** Mollusca of the "Glades" unit of southern Florida — Pt. 1, Introduction and observations: *Tulane Studies Geology and Paleontology*, v. 8, no. 2, p. 53-56, 1970.
- McGlade, W. G.** See Kelley, D. R. 10919
- 06829 **McGlade, William G.** Environmental study of the Harrisburg area: *Pennsylvania Geology*, v. 1, no. 9, p. 2-5, illus., 1970.
- McGlynn, J. C.** See Stockwell, C. H. 07971
- 08628 **McGlynn, J. C.; Henderson, J. B.** Archean volcanism and sedimentation in the Slave Structural Province, *in* Basins and geosynclines of the Canadian Shield (A. J. Baer, editor) — Symposium, Ottawa, 1970, Papers: Canada Geol. Survey Paper 70-40, p. 31-44, illus., table, 1970.
- McGlynn, J. C.** See Hoffman, P. F. 08632
- 05364 **McGookey, Donald P.; Haun, J. D.; Hale, Lyle A.; Goodell, H. G.; McCubbin, Donald G.; Weimer, Robert J.; Wulf, George R.** Correlation chart of Cretaceous formations, *in* Dakota and related rocks of the Front Range — Guidebook issue: *Mtn. Geologist*, v. 7, no. 3, p. inside back cover, 1970.
- 08705 **McGovern, Harold E.** Geology and ground water in the Ogallala Formation and undifferentiated Pleistocene deposits, southwestern Kansas, *in* Ogallala Aquifer Symposium, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, p. 15-29, illus., 1970.
- 03136 **McGowen, J. H.; Garner, L. E.** Physiographic features and stratification types of coarse-grained point bars, modern and ancient examples: *Sedimentology*, v. 14, nos. 1-2, p. 77-111, illus., table, 1970.
- 05464 **McGowen, J. H.; Groat, C. G.; Brown, L. F., Jr.; Fisher, W. L.; Scott, A. J.** Effects of Hurricane Celia — A focus on environmental geologic problems of the Texas coastal zone: *Texas Univ. Austin Bur. Econ. Geology Geol. Circ.* 70-3, 35 p., illus., 1970.
- 07606 **McGowen, J. H.** Gum Hollow fan delta, Nueces Bay, Texas: *Texas Univ. Austin Bur. Econ. Geology Rept. Inv.* 69, 91 p., illus., tables, 1970.
- McGowen, J. H.** See Fisher, W. L. 08570
- 10200 **McGowen, J. H.** Gum Hollow Delta, Nueces Bay, Texas, depositional model for fan deltas [abs.]: *Am. Assoc. Petroleum Geologists*, v. 54, no. 9, p. 1787, 1970; *Gulf Coast Assoc. Geol. Socs. Trans.*, v. 20, p. 262, 1970.

- 00530 **McGowen, Joseph Hobbs.** Gum Hollow fan delta, Nueces Bay, Texas — Mode of development and sediment characteristics [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 7, p. 3242B-3243B, 1970.
- 07743 **McGrain, Preston; Schwalb, Howard R.; Smith, Gilbert E.** Economic geology of Hancock County, Kentucky: *Kentucky Geol. Survey County Rept., ser. X*, 24 p., illus., tables, min. resources map, 1970.
- 10843 **McGrain, Preston.** Economic geology of Marshall County, Kentucky: *Kentucky Geol. Survey County Rept.* 5, 33 p., illus., tables, geol. map, 1970.
- 10970 **McGrath, P. H.** Magnetic investigations of the Charlotte and Pokiok intrusions, southern New Brunswick: *Geol. Assoc. Canada Proc.*, v. 21, p. 25-32, illus., 1970.
- 07758 **McGregor, Alexander A.; Biggs, Charles A.** Bell Creek field, Montana — A rich stratigraphic trap, in *Geology of giant petroleum fields — Symposium, AAPG*, 53d Ann. Mtg., Oklahoma City, Okla., 1968: *Am. Assoc. Petroleum Geologists Mem.* 14, p. 128-146, illus., 1970.
- McGregor, D. C.** See Norford, B. S. 04100
- 05294 **McGregor, D. C.; Sanford, B. V.; Norris, A. W.** Palynology and correlation of Devonian formations in the Moose River Basin, northern Ontario [with French abs.]: *Geol. Assoc. Canada Proc.*, v. 22, p. 45-54, illus., 1970.
- McGregor, E. E.** See Cattermole, J. M. 00599
- 09253 **McGregor, Keith C.; Greer, Jackie D.; Gurley, G. Edward; Bolton, Gerald C.** Erodibility factors for Loring and Lexington soils: *Jour. Soil and Water Conserv.*, v. 24, no. 6, p. 231-232, illus., table, 1969.
- 09360 **McGregor, Keith C.; Greer, Jackie D.; Gurley, G. Edward; Bolton, Gerald C.** Runoff and sediment production from North Mississippi loessial soils: *Mississippi State Univ. Agr. Exp. Sta. Bull.* 777, 30 p., illus., tables, 1969.
- McGregor, Ronald L.** See Bare, Janét E. 03195
- 00805 **McGrew, Paul O.** Memorial to Horace Davis Thomas (1905-1967): *Geol. Soc. America Proc.* 1967, p. 269-271, portrait, 1970.
- 10258 **McGrew, Paul O.; Sullivan, Raymond.** The stratigraphy and paleontology of Bridger A: *Wyoming Univ. Contr. Geology*, v. 9, no. 2, p. 66-85, illus., tables, 1970.
- 00803 **McGuinness, C. L.** Memorial to Albert Nelson Sayre (1901-1967): *Geol. Soc. America Proc.* 1967, p. 253-257, portrait, 1970.
- 07537 **McGuire, Odel S.** Geology of the Eagle Rock, Strom, Oriskany, and Salisbury quadrangles, Virginia: *Virginia Div. Mineral Resources Rept. Inv.* 24, 39 p., illus., tables, geol. maps, 1970.
- McGuire, Robert C.** See Tettenhorst, Rodney. 06502
- 03523 **McHenry, J. Roger; Gill, Angela C.** Measurement of soil moisture with a portable gamma ray scintillation spectrometer: *Water Resources Research*, v. 6, no. 3, p. 989-992, illus., tables, 1970.
- McHenry, J. Roger.** See Bruscato, Frank N. 04056
- McHenry, J. Roger.** See Ritchie, Jerry C. 10384
- McIlroy, Paul.** See Kingston, Gary A. 03208
- 00446 **McIlwaine, W. H.** Operation Maple Mountain — Whitson Township, District of Timiskaming: *Ontario Dept. Mines Prelim. Geol. Map P.* 580, scale 1 in. to 1/4 mi., text, 1970.

- 00451 **McIlwaine, W. H.** Operation Maple Mountain — Speight Township, District of Timiskaming: Ontario Dept. Mines Prelim. Geol. Map P. 573, scale 1 in. to 1/4 mi., text, 1970.
- 00465 **McIlwaine, W. H.** Operation Maple Mountain — Auld Township, District of Timiskaming: Ontario Dept. Mines Prelim. Geol. Map P. 579, scale 1 in. to 1/4 mi., text, 1970.
- 02508 **McIlwaine, W. H.; Meyn, H. D.; Card, K. D.** Operation Maple Mountain — Smoothwater Lake area, Districts of Sudbury and Timiskaming: Ontario Dept. Mines Prelim. Geol. Map P. 584, scale 1 in. to 1 mi., text, 1970.
- 02509 **McIlwaine, W. H.; Meyn, H. D.; Card, K. D.** Operation Maple Mountain — Lady Evelyn Lake sheet, Districts of Nipissing, Sudbury and Timiskaming: Ontario Dept. Mines Prelim. Geol. Map P. 585, scale 1 in. to 1 mi., text, 1970.
- McIlwaine, W. H.** See Wolfe, W. J. 02516
- McIlwaine, W. H.** See Wolfe, W. J. 02734
- 04497 **McIntosh, Willard L.; Morgan, Ida M.** (compilers). Geologic map index of New Mexico, 1955-1968: Washington, D.C., U.S. Geol. Survey, scale 1:1,000,000, 1970.
- 06528 **McIntosh, Willard L.; Morgan, Ida M.** (compilers). Geologic map index of Ohio: Washington, D.C., U.S. Geol. Survey, scale 1:1,000,000, 1970.
- 01691 **McIntyre, Andrew.** *Gephyrocapsa protohuxleyi* sp.n., a possible phyletic link and index fossil for the Pleistocene: Deep-Sea Research, v. 17, no. 1, p. 187-190, illus., 1970.
- 06697 **McIntyre, Andrew; Bé, Allan W. H.; Roche, Michael B.** Modern Pacific Coccolithophorida — A paleontological thermometer: New York Acad. Sci. Trans., ser. 2, v. 32, no. 6, p. 720-731, illus., 1970.
- McIntyre, Andrew.** See Ruddiman, William F. 09551
- 00130 **McIntyre, David H.; Aaron, John M.; Tobisch, Othmar T.** Cretaceous and lower Tertiary stratigraphy in northwestern Puerto Rico: U.S. Geol. Survey Bull. 1294-D, p. D1-D16, illus., 1970.
- McIntyre, James R.** See Peterson, Norman V. 02773
- 10441 **McJunkin, Frederick Eugene; Coe, Mary Jordan; Knarr, Bruce Alan.** Water resources of North Carolina — An inventory of information and data: North Carolina Univ. Water Resources Research Inst. Rept., no. 22, 384p., illus., 1968.
- 01800 **McKague, H. Lawrence.** Statistical evaluation of petrographic data from the State Line Serpentinite [abs.]: EOS, v. 51, no. 4, p. 450, 1970.
- McKay, E. J.** See Myers, Donald A. 05401
- 04513 **McKay, Edward J.; Sargent, K. A.** Geologic map of the Lathrop Wells quadrangle, Nye County, Nevada: U.S. Geol. Survey Geol. Quad. Map GQ-883, scale 1:24,000, 1970.
- McKay, Edward J.** See Sargent, K. A. 05400
- McKay, G. A.** See Drake, M. J. 06844
- 05248 **McKay, Gordon A.; Rogers, John J. W.** Ignimbrites of the Seven Springs Formation, Barrilla Mountains, western Texas: Geol. Soc. America Bull., v. 81, no. 11, p. 3351-3357, illus., tables, 1970.
- McKay, Sheila M.** See Goles, Gordon G. 05695

- 02392 **McKee, Bates; Stradling, Dale.** The sag flowout, a newly described volcanic structure: *Geol. Soc. America Bull.*, v. 81, no. 7, p. 2035-2043, illus., table, 1970.
- 08530 **McKee, Bates; McKee, Pamela.** Refractive index data for fused glass from basalt of the Columbia Plateau, in *Columbia River Basalt Symposium*, 2nd, Cheney, Wash., 1969, *Proc.*: Cheney, Eastern Washington State College Press, p. 39-49, illus., 1970.
- 02198 **McKee, E. H.; Noble, D. C.; Silberman, M. L.** Middle Miocene hiatus in volcanic activity in the Great Basin area of the western United States: *Earth and Planetary Sci. Letters*, v. 8, no. 2, p. 93-96, illus., 1970.
- 09654 **McKee, E. H.; Silberman, M. L.** Periods of plutonism in north-central Nevada [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 613-614, 1970.
- 09655 **McKee, Edith M.** Detailed mapping of the bottom terrain and associated geology of the Lake Superior basin [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 614, 1970.
- 09656 **McKee, Edith M.** Paleogeomorphic history of the Great Lakes region with detailed discussion of the topography and geology of the Lake Michigan basin [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 614, 1970.
- 00313 **McKee, Edwin H.; Naeser, C. W.** K-Ar and fission-track dates of Tertiary ash-flow sheets — Comparison and evaluation of the methods [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 118, 1970.
- 00314 **McKee, Edwin H.; Silberman, Miles L.** Tertiary igneous activity in north-central Nevada [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 118-119, 1970.
- 03832 **McKee, Edwin H.; Silberman, Miles L.** Geochronology of Tertiary igneous rocks in central Nevada: *Geol. Soc. America Bull.*, v. 81, no. 8, p. 2317-2327, illus., tables, 1970.
- McKee, Edwin H.** See Naeser, C. W. 05195
- 05815 **McKee, Edwin H.** Fish Creek Mountains Tuff and volcanic center, Lander County, Nevada: *U.S. Geol. Survey Prof. Paper* 681, 17 p., illus., tables, 1970.
- McKee, Edwin H.** See Noble, Donald C. 06164
- McKee, Pamela.** See McKee, Bates. 08530
- 09812 **McKee, Thomas M.** Preliminary report on fossil fruits and seeds from the Mammal quarry of the Clarno Formation, Oregon: *Ore Bin*, v. 32, no. 7, p. 117-132, illus., 1970.
- 06208 **McKenna, Malcolm C.; Love, J. D.** Local stratigraphic and tectonic significance of *Leptoceratops*, a Cretaceous dinosaur in the Pinyon Conglomerate, northwestern Wyoming, in *Geological Survey research 1970*, Chap. D: *U.S. Geol. Survey Prof. Paper* 700-D, p. D55-D61, illus., 1970.
- McKenney, Dean B.** See Slater, Philip N. 08083
- 00009 **McKenny, J. W.; Masters, J. A.** Limestone likely source of oil in igneous sill: *World Oil*, v. 170, no. 1, p. 57-60, illus., 1970.
- 10433 **McKenzie, D. P.** Plate tectonics and continental drift: *Endeavour*, v. 29, no. 106, p. 39-44, illus., 1970.
- 01341 **McKenzie, G. D.** Rate of collapse of snow-bank kames in Adams Inlet, southeastern Alaska: *Ohio Jour. Sci.*, v. 70, no. 2, p. 107-111, illus., table, 1970.
- 03000 **McKenzie, Garry D.** Some properties and age of volcanic ash in Glacier Bay National Monument: *Arctic*, v. 23, no. 1, p. 46-49, illus., table, 1970.

- 08464 **McKenzie, Garry D.** Glacial geology of Adams Inlet, southeastern Alaska: Ohio State Univ. Inst. Polar Studies Rept. no. 25, 121 p., illus., tables, 1970.
- 01629 **McKeown, F. A.; Dickey, D. D.; Bucknam, R. C.** Preliminary analysis of geologic and geodetic data from the JORUM and MILROW nuclear events [abs.]: EOS, v. 51, no. 3, p. 203, 1970.
- McKeown, F. A.** See Yacoub, Nazieh K. 03698
- McKeown, F. A.** See Bucknam, R. C. 06077
- 09657 **McKeown, F. A.; Orkild, Paul P.; Bucknam, R. C.** Earthquake phenomena generated by nuclear explosions [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 614-615, 1970.
- 10459 **McKern, Sharon S.; McKern, Thomas W.** Tracking fossil man, an adventure in evolution: New York, London, Praeger Publishers, 174 p., illus., 1970.
- McKillop, Alexander.** See Taylor, Edward C. 09348
- 04048 **McKinney, Charles N.; Rosenberg, Arthur S.** Simultaneous X-ray emission analysis of P, Si, Ca, Fe, Al, and Mg in phosphate rock using a small computer to correct for matrix variations, *in* Advances in X-ray analysis, V. 13 — Applications of X-ray analysis, 18th Ann. Conf., 1969, Proc.: New York, Plenum Press, p. 125-135, illus., tables, 1970.
- 00739 **McKinney, Frank K.** Trepostomata (Phylum Ectoprocta) from the lower part of the Chickamauga Group (Middle Ordovician) of northeastern Alabama [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 231-232, 1970.
- 01656 **McKinney, Thomas F.; Friedman, Gerald M.** Continental shelf sediments of Long Island, New York: Jour. Sed. Petrology, v. 40, no. 1, p. 213-248, illus., tables, 1970.
- 00206 **McKnight, Edwin T.; Fischer, Richard P.** Geology and ore deposits of the Picher field, Oklahoma and Kansas: U.S. Geol. Survey Prof. Paper 588, 162 p., illus., tables, geol. map, 1970.
- McKown, D. M.** See Ehmann, W. D. 02019
- 07575 **McKown, David Melvin.** Application of gamma-gamma coincidence counting techniques to the non-destructive activation analysis of meteoritic materials [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 3, p. 1144B, 1970.
- 00509 **McKyes, Shirley Edward.** Yielding of a remoulded clay under stress states [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3165B, 1970.
- McLachlan, J.** See Illiman, W. I. 08686
- 04619 **McLaren, D. J.** Presidential address — Time, life, and boundaries: Jour. Paleontology, v. 44, no. 5, p. 801-815, illus., 1970.
- 04043 **McLaughlin, R. E.; Avignone, Joseph M.** Spore succession in a single coal, a critique on sampling: Compass, v. 47, no. 2, p. 99-109, illus., tables, 1970.
- McLaughlin, R. J. W.** See Bond, A. M. 09458
- 01801 **McLaughlin, W. A.; Studer, H. P.** Isotopic ages for various particle size fractions of illitic sediments [abs.]: EOS, v. 51, no. 4, p. 433, 1970.
- McLaughlin, W. A.** See Yeats, Robert S. 04208
- 10918 **McLean, D. D.** Subsurface disposal of liquid wastes in Ontario, *in* Ontario Petroleum Inst. Conf., 7th, Windsor, 1968 [Proc.]: Chatham (Ontario), Ontario Petroleum Inst., Tech. Paper No. 7, 15 p., illus., tables, 1968.

- 05839 **McLean, J. S.** Objectives of a current study of saline ground water in the Tularosa Basin, New Mexico, in *New Mexico Water Resources Research Inst., 15th Ann. Water Conf., 1970, Proc.: Las Cruces, N.Mex., New Mexico State Univ., p. 95-100, illus., 1970.*
- 07467 **McLean, J. S.** Saline ground-water resources of the Tularosa Basin, New Mexico: U.S. Office Saline Water Research and Devel. Prog. Rept. 561, 128 p., illus., tables, 1970.
- 06123 **McLean, W. John.** Confirmation of the mineral species wherryite: *Am. Mineralogist*, v. 55, nos. 3-4, p. 505-508, tables, 1970.
- McLean, W. John.** See Williams, Sidney A. 06575
- 09046 **McLean, W. John; Anthony, John W.** The crystal structure of hemihedrite: *Am. Mineralogist*, v. 55, nos. 7-8, p. 1103-1114, illus., tables, 1970.
- 10839 **McLearn, F. H.** Middle Triassic (anisian) ammonoids from northeastern British Columbia and Ellesmere Island [with French abs.]: *Canada Geol. Survey Bull.* 170, 90 p., illus., 1969.
- 04940 **McLeod, C. R.** Some Canadian occurrences of maghemite: *Canada Geol. Survey Paper* 70-7, 13 p., illus., table, 1970.
- 04412 **McLeroy, Donald F.** Genesis of Precambrian banded iron deposits, Rio Arriba County, New Mexico: *Econ. Geology*, v. 65, no. 2, p. 195-205, illus., 1970.
- 06895 **McLeroy, Donald F.** Genesis of Precambrian banded iron deposits, Rio Arriba County, New Mexico — A reply [to discussion by E. L. Beutner of 1970 paper]: *Econ. Geology*, v. 65, no. 8, p. 1008-1009, 1970.
- 00787 **McLester, M. E.; Martin, D. F.; Taft, W. H.** Effects of alkaline-earth metal ions on the transformation of aragonite to calcite in aqueous solution: *Jour. Inorganic and Nuclear Chemistry*, v. 32, no. 2, p. 391-399, illus., tables, 1970.
- 08579 **McMahon, Clifford C.** Particle size analysis by the method of Musgrave and Harner: *Am. Ceramic. Soc. Bull.*, v. 49, no. 9, p. 794-796, illus., 1970.
- McManus, D. A.** See Dehlinger, Peter, Couch, R. W. 10005
- McManus, Dean.** See Creager, Joe S. 10025
- McManus, Dean A.** See Holmes, Mark L. 01925
- McManus, Dean A.** See Grim, Muriel S. 03706
- 05386 **McManus, Dean A.** Criteria of climatic change in the inorganic components of marine sediments: *Quaternary Research*, v. 1, no. 1, p. 72-102, illus., tables, 1970.
- 05652 **McManus, Dean A.; Smyth, C. Stephen.** Turbid bottom water on the continental shelf of the northern Bering Sea: *Jour. Sed. Petrology*, v. 40, no. 3, p. 869-873, illus., 1970.
- 07143 **McManus, Dean A.; Burns, Robert E.; Weser, Oscar; Vallier, Tracy; vonderBorch, Christopher V.; Olsson, Richard K.; Goll, Robert M.; Milow, E. Dean.** Initial reports of the Deep Sea Drilling Project — V. 5, covering Leg 5 of the cruises of the Drilling Vessel *Glomar Challenger*, San Diego, California to Honolulu, Hawaii, April-June, 1969: Washington, D. C., U.S. Govt. Printing Office, 827 p., illus., tables, 1970.
- 07144 **McManus, Dean A. (and others).** Sites 32-43, Chaps. 1-13 in Initial reports of the Deep Sea Drilling Project — V. 5, Leg 5 of cruises of *Glomar Challenger*, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office, p. 15-418, illus., tables, 1970.

- 07156 **McManus, Dean A.** Comparison of three methods of measuring or estimating sonic velocity in sediments, Chap. 27 in Initial reports of the Deep Sea Drilling Project — V. 5, Leg 5 of cruises of *Glomar Challenger*, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office, p. 545-549, illus., tables, 1970.
- 07249 **McManus, Dean A.; Weser, Oscar; vonderBorch, C. C.; Vallier, Tracy; Burns, Robert E.** Regional aspects of Deep Sea Drilling in the northeast Pacific, Chap. 31 in Initial reports of the Deep Sea Drilling Project — V. 5, Leg 5 of cruises of *Glomar Challenger*, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office, p. 621-636, illus., tables, 1970.
- McManus, Dean A.** See Kelley, James C. 08553
- McManus, Dean A.** See Grim, Muriel S. 10920
- 10922 **McManus, Dean A.; Smyth, C. Stephen.** Distribution and transport of suspended material through straits of the northern Bering Sea, in Research on the continental shelf off Washington and western Alaska from August 1968 through June 1969 — Univ. Washington Dept. Oceanography Spec. Rept. 41: Seattle, Wash., Univ. Washington, p. 62-71, illus., table, 1969.
- 04425 **McMaster, W. M.; Hubbard, E. F.** Water resources of the Great Smoky Mountains National Park, Tennessee and North Carolina: U.S. Geol. Survey Hydrol. Inv. Atlas HA-420, 2 sheets, scale 1:125,000, text, 1970.
- 02655 **McMillan, Neil J.** Marine geology of eastern continental margin of Canada [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 860, 1970.
- 03280 **McMillan, W. J.** West flank, Frenchman's Cap gneiss dome, Shuswap terrane, British Columbia, in Structure of the southern Canadian Cordillera: Geol. Assoc. Canada Spec. Paper 6, p. 99-106, illus., tables, geol. map, 1970.
- 05276 **McMinn, Jack.** Identifying soils by a triangle based on Unified Soil Classification System, in Special procedures for testing soil and rock for engineering purposes (5th edition): Am. Soc. Testing and Materials Spec. Tech. Pub. 479, p. 341-345, illus., table, 1970.
- 01289 **McMorris, Daniel W.** ESR detection of fossil alpha damage in quartz: Nature, v. 226, no. 5241, p. 146-148, illus., 1970.
- McMurray, W. J.** See Lipsky, S. R. 05744
- McMurry, H. V.** See Callahan, William H. 02927
- McMurtrey, R. G.** See Reed, T. E. 02473
- 10350 **McNair, Arthur J.** A cartographer inventories environment — the CLARI Project, in ACSM-ASP Tech. Conf., Denver, Colo., 1970, Papers: Washington, D. C., Am. Cong. Surveying and Mapping, and Falls Church, Va., Am. Soc. Photogrammetry, p. 276-295, illus., table, 1970.
- McNally, N. K.** See Bennett, G. 02513
- McNally, N. K.** See Bennett, G. 02733
- 03708 **McNary, J. F.; Frohlich, H.** An in situ sediment vane shear testing device: Marine Geology, v. 8, no. 5, p. 367-370, illus., 1970.
- 07229 **McNeal, B. L.; Oster, J. D.; Hatcher, J. T.** Calculation of electrical conductivity from solution composition data as an aid to in-situ estimation of soil salinity: Soil Sci., v. 110, no. 6, p. 405-414, illus., tables, 1970.



**McNeely, L.** *See* Tank, R. W. 07878

**McNeill, J. D.** *See* Barringer, A. R. 00557

**McNellis, Jesse M.** *See* Lowell, Brent H. 03373

- 10847 **McNellis, Jesse M.; Morgan, Charles O.; Lowell, Brent H.** Digital computer applications that facilitate collection and interpretation of ground-water data [with French abs.], *in* The use of analog and digital computers in hydrology, V. 2 — IASH Symposium, Tucson, Ariz., 1968: Internat. Assoc. Sci. Hydrology Pub. 81, p. 625-634, illus., 1968.

- 02980 **McNerney, John J.; Buseck, Peter R.** Mercury vapor used for geochemical exploration [abs.]: Arizona Acad. Sci. Jour., v. 6, 1970 Proc. Supp., p. 62-63, 1970.

**McNary, J. F.** *See* Frohlich, H. 10374

- 00486 **McNulty, C. L., Jr.** A new cylindracanthid rostrum from the Eagle Ford Shale (Turonian), Dallas County, Texas [abs.]: Texas Jour. Sci., v. 21, no. 3, p. 337, 1970.

- 04131 **McNulty, C. L., Jr.; Kienzien, Geraldine.** An enchodontid mandible from the Eagle Ford Shale (Turonian), Dallas County, Texas: Texas Jour. Sci., v. 21, no. 4, p. 447-453, illus., 1970.

**McNulty, C. L., Jr.** *See* Powell, J. Dan. 06030

- 02881 **McPherson, H. J.** Landforms and glacial history of the upper North Saskatchewan Valley, Alberta, Canada [with French abs., p. 89]: Canadian Geographer, v. 14, no. 1, p. 10-26, illus., 1970.

**McQueen, I. S.** *See* Branson, F. A. 03910

- 10197 **McQueen, I. S.; Miller, R. F.** Calibration and evaluation of a wide range method for measuring moisture stress in field soil samples, *in* Water in the unsaturated zone, V. 1: Internat. Assoc. Sci. Hydrology Pub. 82, p. 147-155, illus., tables, 1968.

**McReynolds, J.** *See* Oró, J. 05088

- 04428 **McSween, Harry Y., Jr.** Petrology of Charlotte and Kings Mountain belt rocks in northern Greenwood County, South Carolina: South Carolina Div. Geology Geol. Notes, v. 14, no. 3, p. 57-84, illus., tables, geol. map, 1970.

- 03273 **McTaggart, K. C.; Wheeler, J. O.** An appreciation — James Aubrey Coates, 1931-1968, *in* Structure of the southern Canadian Cordillera: Geol. Assoc. Canada Spec. Paper 6, preceding page 1, portrait, 1970.

- 03282 **McTaggart, K. C.** Tectonic history of the northern Cascade Mountains, *in* Structure of the southern Canadian Cordillera: Geol. Assoc. Canada Spec. Paper 6, p. 137-148, illus., table, 1970.

- 07167 **McWilliams, R. G.; Joiner, Thomas J.** Gravity survey of Clarke County, Alabama: Alabama Geol. Survey Circ. 54, 73 p., illus., tables, 1970.

- 06689 **McWilliams, Richebourg G., Jr.** Gravity survey of Marengo County, Alabama: Alabama Geol. Survey Circ. 59, 58 p., illus., tables, 1970.

- 06690 **McWilliams, Richebourg G., Jr.; Joiner, Thomas J.** Gravity survey of Baldwin County, Alabama: Alabama Geol. Survey Circ. 60, 84 p., illus., tables, 1970.

- 07169 **McWilliams, Richebourg G., Jr.** Gravity survey of Wilcox County, Alabama: Alabama Geol. Survey Circ. 62, 63 p., illus., tables, 1970.

- 00400 **McWilliams, Robert G.** Evidence for thrust faulting in northern Olympic Peninsula, Washington: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 2, p. 344-349, illus., 1970.

- 10882 **Mead, Walter J.** The workability of competition in federal oil shale leasing, *in* Public land policy (Phillip O. Foss, editor) - Western Resources Conference, Ft. Collins, Colo., 1968, Proc.: Boulder, Colo., Colorado Assoc. Univ. Press, p. 205-218, table, 1970.
- 10827 **Meade, Buford K.** Horizontal movement along the San Andreas fault [abs.] - Internat. Symposium on Recent Crustal Movements and Associated Seismicity, Wellington, N.Z., 1970, Proc.: Wellington, N.Z., Royal Soc. of New Zealand, p. 22, 1970.
- 07485 **Meade, Lance.** Industrial minerals and the community, an alienation gap, *in* Forum on geology of industrial minerals, 5th, Harrisburg, Pa., 1969, Proc.: Pennsylvania Geol. Survey, 4th ser., Bull. M64 (Mineral Resources Rept.), p. 225-231, illus., 1970.
- Meade, Robert H.** See Manheim, Frank T. 00056
- 10841 **Mears, Brainerd, Jr.** The nature of geology — Contemporary readings: New York, Van Nostrand Reinhold Company, 248 p., illus., 1970.
- Medaris, L. G., Jr.** See Cullers, R. L. 01754
- 01802 **Medaris, L. G., Jr.** Mantle-derived peridotites in southwestern Oregon [abs.]: EOS, v. 51, no. 4, p. 448, 1970.
- 03416 **Medaris, L. G., Jr.; Dott, R. H., Jr.** Mantle-derived peridotites in southwestern Oregon, relation to plate tectonics: Science, v. 169, no. 3949, p. 971-974, illus., table, 1970.
- Medaris, L. Gordon, Jr.** See Cullers, Robert L. 03349
- 08522 **Medina R., Flavio.** El drenaje subterraneo en la region de Aristo-San Lorenzo, Mpio. de Villa Hidalgo, S.L.P. [Subterranean drainage in the Aristo-San Lorenzo area, Municipio of Villa Hidalgo, San Luis Potosi]: Geologia y Metalurgia, v. 5, no. 32, p. 5-27, illus., tables, 1970.
- Medioli, F.** See Gees, R. A. 09826
- Medioli, Franco.** See Gees, Rudolph A. 04611
- Medioli, Franco.** See Langhus, Bruce G. 09632
- 04083 **Medlin, J. H.; Suhr, N. H.; Bodkin, J. B.** Determination of rubidium in silicate materials by atomic absorption spectrophotometry: Chem. Geology, v. 6, no. 2, p. 143-148, illus., tables, 1970.
- 02738 **Meeves, Henry C.; Darnell, Richard P.** Silver potential and economic aspects of the Leadville district, Lake County, Colo.: U.S. Bur. Mines Inf. Circ. 8464, 105 p., illus., tables, 1970.
- 07161 **Mefferd, M. G.** Murphy area of Las Cienegas oil field: California Oil Fields — Summ. Operations 1970, v. 56, no. 1, p. 5-13, illus., tables, 1970.
- Mehnert, H. H.** See Marvin, R. F. 05196
- Mehnert, Harald H.** See Lipman, Peter W. 03777
- Mehnert, Harold H.** See Marvin, Richard F. 05646
- 08048 **Mehringer, Peter J., Jr.; King, James E.; Lindsay, Everett H.** A record of Wisconsin-age vegetation and fauna from the Ozarks of western Missouri, *in* Pleistocene and recent environments of the central Great Plains: Kansas Univ. Dept. Geology Spec. Pub. 3, p. 173-183, illus., table, 1970.
- Mehrotra, P. N.** See Stearn, C. W. 07980

- 01688 **Meidav, Tsvi; Rex, R. W.** Geothermal exploration in Imperial Valley [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 3, p. 560, 1970.
- 01803 **Meidav, Tsvi.** Possible sea-floor spreading in the Imperial Valley — [Pt.] 1, Structural setting [abs.]: *EOS*, v. 51, no. 4, p. 421, 1970.
- Meidav, Tsvi.** See Snow, D. T. 02433
- Meidav, Tsvi.** See Elders, Wilfred A. 06967
- 08076 **Meier, M.; Edgerton, A. T.** Snow and ice sensing with passive microwave and ground truth instrumentation — Recent results, South Cascade Glacier, in *Earth Resources Aircraft Program, status review, 2d Ann.*, Houston, Tex., 1969 — V. 3, Hydrology and oceanography: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 43-1—43-15, illus., table, [1970].
- 02903 **Meier, M. F.** Evaluation of South Cascade Glacier Test Site results, in *Earth resources aircraft program status review, NASA, Houston, 1968* — V. 3, Hydrology, oceanography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 20-1—20-17, illus., tables [1970].
- 09330 **Meier, Mark F.; Edgerton, A. T.** Emission characteristics of snow and ice in the microwave range, Sec. 51 of *Earth Resources Program, 3d ann.*, review — v. 3, Hydrology and oceanography: Houston, Tex., NASA Manned Spacecraft Center, MSC-03742, p. 51-1—51-14, illus., 1970.
- 00980 **Meighan, Clement W.; Haynes, C. Vance.** The Borax Lake site revisited: *Science*, v. 167, no. 3922, p. 1213-1220, illus., tables, 1970.
- 04341 **Meighan, Clement W.** Obsidian hydration rates: *Science*, v. 170, no. 3953, p. 99-100, illus., table, 1970.
- 10674 **Meikle, B. K.** Camflo Mines Limited — *Geology and Mining: Canadian Mining and Metall. Bull.*, v. 63, no. 704, p. 1406-1410, illus., 1970.
- Meiman, James R.** See Judy, Clark. 01717
- 05762 **Meinschein, W. G.; Jackson, T. J.; Mitchell, J. M.; Cordes, Eugene; Shiner, V. J., Jr.** Search for alkanes of 15-30 carbon atom length in lunar fines, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1875-1877, 1970.
- Meisenheimer, J. K.** See Aughenbaugh, N. B. 05501
- Meisler, Harold.** See Becher, Albert E. 02221
- 08365 **Meisler, Harold; Becher, Albert E.** Hydrogeology of the carbonate rocks of the Lancaster 15-minute quadrangle, southeastern Pennsylvania: *Pennsylvania Geol. Survey Bull.* W26, 149 p., illus., tables, geol. map, 1970.
- Meledina, S. V.** See Saks, V. N. 10094
- Meleskie, K. R.** See Parker, M. L. 07815
- Melhorn, Wilton N.** See Johansen, Nils I. 03854
- Melhorn, Wilton N.** See Coffman, Daniel M. 06100
- Mello, James F.** See Owens, James P. 05860
- 08503 **Mello, James F.** Paleontologic data storage and retrieval, in *Computers in paleontology* — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc., Pt. B: Lawrence, Kans., Allen Press, p. 57-71, illus., 1970.

- 08394 **Mellor, Malcolm.** Phase composition of pore water in cold rocks: U.S. Army Corps Engineers Cold Regions Research and Eng. Lab. Research Rept. 292, 61 p., illus., tables, 1970.
- 07802 **Mel'nik, V. I.** Geologicheskkiye issledovaniya v Meksikanskom zalive i Karibskom more [Geological investigations in the Gulf of Mexico and the Caribbean Sea (with English and Spanish abs.)], in *Okeanologicheskkiye issledovaniya, Sbornik statey*, no. 20 — Rezul'taty issledovaniy po mezhdunarodnym geofizicheskim proyektam: Moscow, Izdatel'stvo "Nauka," p. 22-41, illus., tables, 1970.
- 01859 **Melson, W. G.; Thompson, G.** Layered basic complex in oceanic crust, Romanche Fracture, equatorial Atlantic Ocean: *Science*, v. 168, no. 3933, p. 817-820, illus., tables, 1970.
- Melson, William G.** See Switzer, George. 00563
- Melson, William G.** See Simon, Ivan. 01868
- Melson, William G.** See Thompson, Geoffrey. 02025
- Melson, William G.** See Mason, Brian. 06858
- 01085 **Melton, William; Scott, Harold W.** Progress report on the study of the conodont-bearing animal [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 395, 1970.
- 05901 **Melvin, Robert L.** Hydrogeologic data for the upper Housatonic River basin, Connecticut: *Connecticut Water Resources Bull.* 22, 33 p., illus., tables, 1970.
- Menard, H. W.** See Atwater, Tanya. 01702
- Menard, H. W.** See Francheteau, Jean. 02197
- Menard, H. W.** See Chase, T. E. 08323
- 09994 **Menard, H. W.; Chase, T. E.** Fracture zones, in *The sea* — v. 4, New concepts of sea floor evolution, Pt. 1. General observations (Arthur E. Maxwell, editor); New York and London, Wiley-Interscience, p. 421-443, illus., table, 1970.
- Menard, H. W.** See Shor, G. G., Jr. 10002
- Menard, H. W.** See Chase, C. G. 10201
- 10705 **Menard, H. W.** Physiography of the northeastern Pacific: Maplewood, N.J., C. S. Hammond and Co., map, no scale given (also available in *Marine geology of the Pacific*, H. W. Menard), 1964.
- Mendive A., Lázaro.** See DelCastillo G., Luis. 08452
- 06356 **Meneley, W. A.** Groundwater resources, in *Physical environment of Saskatoon, Canada*: Natl. Research Council Canada Pub. 11378, p. 39-50, illus., 1970.
- Meneley, W. A.** See Christiansen, Earl A. 06357
- Menon, G. M.** See McConnen, R. J. 10697
- 05069 **Menzel, David W.** The role of *in situ* decomposition of organic matter on the concentration of non-conservative properties in the sea: *Deep-Sea Research*, v. 17, no. 4, p. 751-764, illus., tables, 1970.
- 09665 **Menzel, David W.** Primary producers of and the vertical flux of organic matter in the oceans [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 619, 1970.
- 00911 **Menzer, Fred J.; Slaughter, Bob H.** Evidence bearing on the age of Texas topography [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 292, 1970.

- 00199 **Menzer, Fred J., Jr.** Geochronologic study of granitic rocks from the Okanogan Range, north-central Washington: *Geol. Soc. America Bull.*, v. 81, no. 2, p. 573-578, illus., tables, 1970.
- 03403 **Menzer, Fred J., Jr.; Swanberg, Chandler A.; Taylor, H. C.** The Darling Lake mafic and ultramafic pluton, Washington — Petrology, gravity and structure: *Northwest Sci.*, v. 44, no. 2, p. 95-101, illus., table, 1970.
- Mercado, Jose.** See Howard, Arthur D. 00106
- Mercado, Jose.** See Lyon, R. J. P. 09803
- 05604 **Mercer, J. H.** A former ice sheet in the Arctic Ocean?: *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 8, no. 1, p. 19-27, illus., 1970.
- 09278 **Mercer, John H.** Contrasts in the late Pleistocene glacial chronology of temperate North and South America [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 91, 1970.
- Meredith, Dale D.** See Heidari, Manoutchehr. 10342
- Merek, Edward L.** See Oyama, Vance I. 05748
- Merewether, E. A.** See Gill, J. R. 01430
- 06542 **Merifield, P. M.; Lamar, D. L.** Paleotides and the geologic record, Chap. 5 in *Palaeogeophysics* (S. K. Runcorn, editor): London and New York, Academic Press, p. 31-40, illus., 1970.
- Merifield, P. M.** See Lamar, D. L. 10988
- 01954 **Merkel, Richard H.** The mapping of ground water by placing a current source in a drill hole [abs.]: *EOS*, v. 51, no. 4, p. 285, 1970.
- 09100 **Merker, Ludwig; Engle, Günter; Wondratschek, Hans; Ito, Jun.** Lead ions and empty halid sites in apatites: *Am. Mineralogist*, v. 55, nos. 7-8, p. 1435-1437, 1970.
- 05073 **Merlino, S.** Crystal structure of aenigmatite: *Chem. Commun.* 1970, no. 20, p. 1288-1289, illus., table, 1970.
- 03466 **Mero, John L.** The past, present and future of ocean mining [abs.]: *Canadian Mining and Metall. Bull.*, v. 63, no. 695, p. 299, 1970.
- 03216 **Merrell, William J., Jr.; Huebner, George L., Jr.** New aerial photo techniques are available for offshore industry: *Offshore*, v. 30, no. 3, p. 90-93, illus., 1970.
- Merriam, D. F.** See Sackin, M. J. 10622
- 08608 **Merriam, Daniel F.** (editor). *Geostatistics — A colloquium*, Lawrence, Kan., 1970, Proc.: New York, Plenum Press, 177 p., illus., tables, 1970.
- 10641 **Merriam, Daniel F.** Comparison of British and American Carboniferous cyclic rock sequences: *Internat. Assoc. Math. Geology Jour.*, v. 2, no. 2, p. 241-264, illus., tables, 1970.
- 02308 **Merriam, Richard; Rieke, Herman H., 3d; Kim, Young C.** Tensile strength related to mineralogy and texture of some granitic rocks: *Eng. Geology*, v. 4, no. 2, p. 155-160, illus., tables, 1970.
- 05587 **Merrifield, John D.** Mountains, valleys, and subterrestrial forces: Philadelphia, Pa., Dorrance and Co., 62 p., 1970.

- 01086 **Merrill, Glen K.** Environmental and other non-biostratigraphic controls of Pennsylvanian conodont faunas [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 395-396, 1970.
- 09666 **Merrill, Glen K.** Pennsylvanian non-platform conodont genera — [Pt.] 1, *Spathognathodus* [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 619-620, 1970.
- 05643 **Merrill, R. B.; Robertson, J. K.; Wyllie, P. J.** Melting reactions in the system  $\text{NaAl-Si}_3\text{O}_8\text{-KAlSi}_3\text{O}_8\text{-SiO}_2\text{-H}_2\text{O}$  to 20 kilobars compared with results for other feldspar-quartz- $\text{H}_2\text{O}$  and rock- $\text{H}_2\text{O}$  systems: Jour. Geology, v. 78, no. 5, p. 558-569, illus., tables, 1970.
- 09667 **Merrill, R. B.; Robertson, J. K.** Melting reactions in the granite system  $\text{Ab-Or-Qz-H}_2\text{O}$  to 20 kilobars compared with results for other feldspar-quartz- $\text{H}_2\text{O}$  and rock- $\text{H}_2\text{O}$  systems [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 620, 1970.
- 09668 **Merrill, R. B.** Stability of titanoclinohumite and the role of water in the upper mantle [abs.]: Geol. Soc. America Abs. with programs, v. 2, no. 7, p. 620, 1970.
- 09669 **Merrill, Robert D.** Terrace development and flood discharge on the ancestral Greybull River, Big Horn Basin, Wyoming [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 621, 1970.
- 07394 **Merrill, Robert H.; Statcham, Raymond M.** Loose rock can be detected by infrared devices: Mining Eng., v. 22, no. 11, p. 59-62, illus., 1970.
- 03692 **Merrill, Ronald T.** Low-temperature treatments of magnetite and magnetite-bearing rocks: Jour. Geophys. Research, v. 75, no. 17, p. 3343-3349, illus., 1970.
- Merritt, A. H.** See Coon, R. F. 09316
- Merritt, Donald W.** See Hinze, William J. 10946
- Merritt, Gary L.** See Emrich, Grover H. 00149
- 01632 **Merritt, M. L.; Perret, W. R.** Ground shock and water pressures from MILROW [abs.]: EOS, v. 51, no. 3, p. 204, 1970.
- 07989 **Merritt, Melvin L.** Physical and biological effects, Milrow event — U.S. Atomic Energy Comm. NVO-79: Springfield, Va., Natl. Tech. Inf. Service, 113 p., illus., tables, 1970.
- 04041 **Merschat, Carl E.** Mineralogy of selected ceramic clays from West Tennessee: Compass, v. 47, no. 2, p. 70-80, illus., tables, 1970.
- Merschat, Walter R.** See Yeats, Robert S. 00392
- Merz, Evelyn L.** See Stern, Daniel H. 11255
- Mesezhnikov, M. S.** See Saks, V. N. 10094
- 07185 **Meshref, W. M.; Hinze, W. J.** Geologic interpretation of aeromagnetic data in western Upper Peninsula of Michigan: Michigan Geol. Survey Rept. Inv. 12, 25 p., illus., tables, geol. maps, 1970.
- 05246 **Mesolella, Kenneth J.; Sealy, H. A.; Matthews, R. K.** Facies geometries within Pleistocene reefs of Barbados, West Indies: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 10, p. 1899-1917, illus., table, 1970.
- 04353 **Mesri, G.; Olson, R. E.** Shear strength of montmorillonite [with French abs.]: Géotechnique, v. 20, no. 3, p. 261-270, illus., tables, 1970.
- Mesri, G.** See Hendron, A. J., Jr. 09315

- 06589 **Mesri, Gholamreza.** Engineering properties of montmorillonite [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 2, p. 670B, 1970.
- Mesri, Gholamreza.** See Olson, Roy E. 06775
- 03585 **Messina-Allen, S.; VanLandingham, Sam L.** Physicochemical conditions of deposition of Bacillariophyta in Davis Lake, Klamath and Deschutes Counties, Oregon, U.S.A. [with Spanish and German summ.]: *Hydrobiologia*, v. 35, no. 1, p. 31-44, illus., tables, 1970.
- 02497 **Meszoely, Charles A. M.** North American fossil anguid lizards: *Harvard Univ. Mus. Comp. Zoology Bull.*, v. 139, no. 2, p. 87-150, illus., tables, 1970.
- 09735 **Metcalf, Artie L.** Late Pleistocene (Woodfordian) gastropods from Dry Cave, Eddy County, New Mexico: *Texas Jour. Sci.*, v. 22, no. 1, p. 41-46, 1970.
- 06629 **Metherell, A. F.; Green, J.** Acoustical holography imaging of geological structures, in *Laser applications in the geoscience* (J. Gauger and F. F. Hall, Jr., editors) — Symposium, Huntington Beach, Calif., 1969, *Proc.: North Hollywood, Calif., Western Periodicals Co.*, p. 267-279, illus., 1970.
- Methvin, Jewel G.** See Kremp, Gerhard O. W. 10929
- Metta, D. N.** See Fields, P. R. 05689
- Metz, M. C.** See Rosenberg, P. E. 09549
- Meuschke, J. L.** See McCarthy, J. H., Jr. 05563
- 06803 **Mexico Con. Rec. Nat. no Renovables.** Mapa fotogeológico de la Sierra de Querétaro: Mexico, D.F., México Consejo de Recursos Naturales no Renovables, scale 1:100,000, 1970.
- 10764 **Meyboom, P.** Hydrogeology, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor); *Canada Geol. Survey Paper* 69-56, p. 119-123, 1970.
- 00315 **Meyer, C. E.; Naeser, C. W.** Oligocene trachytes of northwestern Humboldt County, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 119, 1970.
- 09670 **Meyer, Charles.** Trends in geological research applied to ore-finding [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 621-622, 1970.
- 10499 **Meyer, Charles F.** Using experimental models to guide data gathering [abs.]: *EOS*, v. 51, no. 11, p. 749, 1970.
- Meyer, Charles, Jr.** See Reid, Arch M. 06841
- 06874 **Meyer, Charles, Jr.** Sputter-condensation of silicates [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 1, p. 251B-252B, 1970.
- Meyer, H. A.** See Lanning, F. C. 09616
- 06212 **Meyer, Henry O. A.** Géochimie des inclusions minérales dans les diamants naturels [Geochemistry of mineral inclusions in natural diamonds]: *Assoc. Française Gemmologie Bull.* 22, p. 8-10, table, 1970.
- Meyer, Henry O. A.** See Haggerty, Stephen E. 08018
- Meyer, Henry O. A.** See Novak, Gary A. 09068
- Meyer, R. P.** See Lewis, B. R. T. 00305
- 02339 **Meyer, Richard F.** Geologic provinces code map for computer use: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 7, p. 1301-1305, 1970.

**Meyer, Robert P.** *See* Anzoleaga, Rodolfo. 01907

**Meyer, Robert P.** *See* Kosalos, James G. 01942

**Meyer, Robert P.** *See* Ocola, Leonidas C. 01961

- 09671 **Meyer, Robert P.; Unger, William L.; Meyer, Thomas R.** High resolution sub-bottom seismic profiling, Lake Michigan [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 622, 1970.

**Meyer, Robert P.** *See* Ocola, Leonidas C. 09698

**Meyer, Thomas R.** *See* Meyer, Robert P. 09671

**Meyer, W. J.** *See* Pettry, D. E. 05437

- 04323 **Meyer, W. T.; Evans, D. S.** Determination of trace mercury in soil and rock media — Discussion [of paper by R. Z. Pyrih and R. E. Bisque, 1969]: *Econ. Geology*, v. 65, no. 3, p. 357-358, 1970.

- 03768 **Meyer, Walter R.; Gutentag, Edwin D.; Lormeyer, David H.** Geohydrology of Finney County, southwestern Kansas: U.S. Geol. Survey Water-Supply Paper 1891, 117 p., illus., tables, geol. map, 1970.

- 02344 **Meyer, Willis G.** Carleton D. Speed, Jr. (1903-1970): *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 7, p. 1310-1311, portrait, 1970.

- 06738 **Meyerhof, G. G.** Safety factors in soil mechanics [with French abs.]: *Canadian Geotech. Jour.*, v. 7, no. 4, p. 349-355, illus., 1970.

- 06740 **Meyerhof, G. G.; Sebastyan, G. Y.** Settlement studies on air terminal building and apron, Vancouver International Airport, British Columbia [with French abs.]: *Canadian Geotech. Jour.*, v. 7, no. 4, p. 433-456, illus., tables, 1970.

- 00094 **Meyerhoff, A. A.** Continental drift — Implications of paleomagnetic studies, meteorology, physical oceanography, and climatology: *Jour. Geology*, v. 78, no. 1, p. 1-51, illus., 1970.

**Meyerhoff, A. A.** *See* Hatten, C. W. 03754

- 03879 **Meyerhoff, A. A.** Continental drift — [Pt.] 2, High-latitude evaporite deposits and geologic history of Arctic and North Atlantic Oceans: *Jour. Geology*, v. 78, no. 4, p. 406-444, illus., tables, 1970.

- 04786 **Meyerhoff, A. A.** Continental drift — Implications of paleomagnetic studies, meteorology, physical oceanography, and climatology (a reply [to discussion by R. A. Facer, 1970]): *Jour. Geology*, v. 78, no. 5, p. 633-634, 1970.

**Meyerhoff, A. A.** *See* Paine, William R. 04834

**Meyerhoff, A. A.** *See* Paine, William R. 07314

**Meyerhoff, A. A.** *See* Halbouty, Michel T. 07768

- 10076 **Meyerhoff, A. A.** High-latitude evaporite deposits and geologic history of Arctic and North Atlantic Oceans [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2495, 1970.

- 00808 **Meyerhoff, Howard A.** Memorial to Stephen Sargent Visser (1887-1967): *Geol. Soc. America Proc.* 1967, p. 283-286, portrait, 1970.

- 01087 **Meyerhoff, Howard A.** Basement relief beneath the Upper Cambrian of the mid-continent [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 396, 1970.



- 05798 **Meyerhoff, Howard A.** Continental margins — Discussion [of papers by K. O. Emery, et al.; H. D. Hedberg; P. A. Rona, 1970]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 11, p. 2214, 1970.
- 06936 **Meyers, J. Thomas.** Chert resources of the lower Illinois Valley: *Illinois State Mus. Rept. Inv.* 18 (Illinois Valley Archaeol. Program Research Papers, v. 2), 42 p., illus., tables, 1970.
- Meyers, James F.** See Gray, Richard E. 03629
- Meyn, H. D.** See McIlwaine, W. H. 02508
- Meyn, H. D.** See McIlwaine, W. H. 02509
- 06423 **Meyn, H. D.** Sweeny Township, District of Sudbury: Ontario Dept. Mines and Northern Affairs Prelim. Geol. Map P. 617, scale 1 in. to 1/4 mi., text, 1970.
- 06424 **Meyn, H. D.** Beaumont Township, District of Sudbury: Ontario Dept. Mines and Northern Affairs Prelim. Geol. Map P. 618, scale 1 in. to 1/4 mi., text, 1970.
- 06425 **Meyn, H. D.** Beresford Township, District of Sudbury: Ontario Dept. Mines and Northern Affairs Prelim. Geol. Map P. 619, scale 1 in. to 1/4 mi., text, 1970.
- 04262 **Meyrowitz, Robert.** A microprocedure for the determination of carbon dioxide in minerals, in *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C183-C185, illus., 1970.
- 06307 **Meyrowitz, Robert.** A pyrocatechol violet spectrophotometric procedure for the direct microdetermination of aluminum in silicate minerals, in *Geological Survey research 1970*, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D225-D229, illus., tables, 1970.
- 09457 **Meyrowitz, Robert.** New semimicroprocedure for determination of ferrous iron in refractory silicate minerals using a sodium metafluoborate decomposition: *Anal. Chemistry*, v. 42, no. 9, p. 1110-1113, illus., tables, 1970.
- 07673 **Miall, A. D.** Continental marine transition in the Devonian of Prince of Wales Island, Northwest Territories: *Canadian Jour. Earth Sci.*, v. 7, no. 1, p. 125-144, illus., tables, 1970.
- 03593 **Miall, Andrew D.** Devonian alluvial fans, Prince of Wales Island, Arctic Canada: *Jour. Sed. Petrology*, v. 40, no. 2, p. 556-571, illus., tables, 1970.
- 08073 **Miall, Andrew D.** A new Lower Devonian rock unit in the Canadian Arctic Islands — Discussion [of paper by A. R. Ormiston, 1969]: *Canadian Jour. Earth Sci.*, v. 7, no. 3, p. 1027-1029, illus., 1970.
- 02656 **Michaelis, E. R.** Sedimentologic models for Cardium of south-central Alberta [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 860, 1970.
- 01577 **Michalek, Daniel D.** Fanlike features and related periglacial phenomena of the southern Blue Ridge [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 9, p. 4209B, 1970.
- 05434 **Michell, Wilson D.** American Institute of Mining, Metallurgical, and Petroleum Engineers [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 135, 1970.
- 10139 **Michels, Joseph W.** Testing stratigraphy and artifact reuse through obsidian hydration dating: *Am. Antiquity*, v. 34, no. 1, p. 15-22, illus., 1969.
- 04435 **Michelson, R. W.; Polta, H. J.; Peterson, Orin.** Evaluating the economic availability of Mesabi Range iron ores with computerized models: *U.S. Bur. Mines Inf. Circ.* 8480, 99 p., illus., tables, 1970.

- 08688 **Michigan Basin Geol. Society.** Guidebook for field trips in connection with Geol. Soc. America North-Central Sec. meeting, May 1970: [East Lansing, Mich.], Michigan Basin Geol. Soc., 177 p., illus., tables, 1970.
- 10945 **Michigan Basin Geological Society; Stonehouse, Harold B.** (editor). Studies of the Precambrian of the Michigan Basin — Annual field excursion, 1969: [East Lansing, Mich.], Michigan Basin Geol. Soc., 95 p., illus., tables, 1969.
- 05275 **Michigan Dept. State Highways.** Suggested procedure for pedological classification of soils, *in* Special procedures for testing soil and rock for engineering purposes (5th edition): Am. Soc. Testing and Materials Spec. Tech. Pub. 479, p. 333-340, illus., table, 1970.
- 05366 **Michon, D.** Attenuating multiple reflections, a new method (the "Souston" process): *Oilweek*, v. 21, no. 33, p. 44-45, illus., 1970.
- 09672 **Mickey, Wendell V.** Earthquakes and dams [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 622, 1970.
- 09673 **Mickey, Wendell V.; Brockman, Stanley R.** Microearthquake characteristics before and after a large scale detonation [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 622-623, 1970.
- Mickle, David G.** *See* Johnson, Thys B. 04290
- Mickle, Jack L.** *See* Russell, Eugene R. 03229
- Middel, Ursula.** *See* Bender, Michael. 01893
- 10750 **Middleton, G. V.** Sedimentology, *in* Background papers on the earth sciences in Canada (C. H. Smith, editor): *Canada Geol. Survey Paper* 69-56, p. 10-14, 1970.
- 10753 **Middleton, G. V.** (chairman). Palaeontology, *in* Background papers on the earth sciences in Canada (C. H. Smith, editor): *Canada Geol. Survey Paper* 69-56, p. 43-48, 1970.
- Middleton, G. V.** *See* Klein, G. deVries. 11002
- 02657 **Middleton, Gerard V.; Neal, William J.** Bed thickness in experimental turbidites [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 860, 1970.
- 05307 **Middleton, Gerard V.** Experimental studies related to problems of flysch sedimentation [with French abs.], *in* Flysch sedimentology in North America: *Geol. Assoc. Canada Spec. Paper* 7, p. 253-272, illus., 1970.
- Middleton, Gerard V.** *See* Parkash, Barham. 06341
- 02515 **Middleton, R.** (compiler). Robb Township, District of Cochrane: Ontario Dept. Mines Prelim. Geol. Map P. 598 (Geophys. Ser.), scale 1 in. to 1/4 mi., text, 1970.
- 03460 **Middleton, R. S.; Pyke, D. R.** Distribution and characteristics of the sulphide ores of the Timmins area [abs.]: *Canadian Mining and Metall. Bull.*, v. 63, no. 695, p. 289, 1970.
- Mielke, James E.** *See* Stuckenrath, Robert, Jr. 01327
- Miers, John H.** *See* Campbell, K. Vincent. 01186
- Miesch, A. T.** *See* Shacklette, Hansford T. 00002
- 10629 **Miesch, A. T.** Critical review of some multivariate procedures in the analysis of geochemical data: *Internat. Assoc. Math. Geology Jour.*, v. 1, no. 2, p. 171-184, illus., tables, 1969.

- 08574 **Mifflin, M. D.** Mudlumps and suggested genesis in Pyramid Lake, Nevada [with French abs.], in Symposium on the Hydrology of Deltas, V. 1: Internat. Assoc. Sci. Hydrology-Unesco Pub. 90, p. 75-88, illus., 1970.
- Migdisov, A. A.** See Ronov, A. B. 11016
- 10077 **Migliaccio, Ralph R.; Rooney, James W.** Engineering geologic and subsurface soil investigations for Trans-Alaska Pipeline System [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2496, 1970.
- 09674 **Mihálik, Peter; Czamanske, Gerald K.** Manganiferous ilmenites, products of oxidation during differentiation [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 623, 1970.
- Mikolaj, Paul G.** See Allen, Alan A. 05607
- Mikulich, M. J.** See Shuey, R. T. 08206
- Mikulich, Matthew J.** See Smith, Robert B. 01982
- 00840 **Milcoveanu, D.** Some formulas useful in the interpretation of gravitational and magnetic profiles: Geophysics, v. 35, no. 1, p. 66-79, illus., 1970.
- Miles, Robert D.** See Barr, David J. 09802
- 08264 **Milfred, Clarence J.; Hole, Francis D.** Soils of Jefferson County, Wisconsin: Wisconsin Univ. Geol. and Nat. History Survey Soil Survey Div. Bull. 86, Ser. 61; 172 p., illus., tables, 1970.
- Milfred, Clarence J.** See Parker, Dale E. 09800
- 00968 **Milici, Robert C.** The Allegheny structural front in Tennessee and its regional tectonic implications: Am. Jour. Sci., v. 268, no. 2, p. 127-141, illus., 1970.
- 03335 **Milici, Robert C.** Middle Ordovician stratigraphy in central Sequatchie Valley, Tennessee: Tennessee Div. Geology Rept. Inv. 30, p. 111-127, illus., tables, reprinted 1970; originally published 1969.
- Milici, Robert C.** See Ferguson, Carl C. 07098
- 09675 **Milici, Robert C.** The Ozone décollement, a bedding thrust in the Cumberland Plateau of Tennessee [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 623-624, 1970.
- 01441 **Millard, H. T., Jr.; Finkelman, R. B.** Chemical and mineralogical compositions of cosmic and terrestrial spherules from a marine sediment: Jour. Geophys. Research, v. 75, no. 11, p. 2125-2134, illus., tables, 1970.
- 04668 **Millay, M. A.; Eggert, D. A.** A *Psaronius* with whorled leaves from the Pennsylvanian of Iowa [abs.]: Am. Jour. Botany, v. 57, no. 6, pt. 2, p. 757, 1970.
- 01672 **Millay, Michael A.; Eggert, Donald A.** *Idanothekion* gen. n., a synangiate pollen organ with saccate pollen from the Middle Pennsylvanian of Illinois: Am. Jour. Botany, v. 57, no. 1, p. 50-61, illus., 1970.
- 05568 **Millay, Michael A.; Taylor, Thomas N.** Studies of living and fossil saccate pollen grains: Micropaleontology, v. 16, no. 4, p. 463-470, illus., 1970.
- Milledge, H. J.** See Harris, J. W. 04409
- 01088 **Miller, Barry B.; Wittine, Arthur H.** Depositional environment of late Pleistocene deposits at Garfield Heights (Cleveland), Ohio [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 396-397, 1970.

- 01361 **Miller, Barry B.** The Sandahl molluscan fauna (Illinoian) from McPherson County, Kansas: *Ohio Jour. Sci.*, v. 70, no. 1, p. 39-50, illus., tables, 1970.
- 04157 **Miller, C. N.** Structurally-preserved cones and vegetative organs of *Pinus* from the Eocene of British Columbia [abs.]: *Am. Jour. Botany*, v. 57, no. 6, pt. 2, p. 759, 1970.
- 04393 **Miller, Charles N., Jr.** *Picea diettertiana*, a new species of petrified cones from the Oligocene of western Montana: *Am. Jour. Botany*, v. 57, no. 5, p. 579-585, illus., table, 1970.
- 09783 **Miller, Clinton T.** The eruption of Arenal: *Pacific Discovery*, v. 23, no. 1, p. 25-31, illus., 1970.
- Miller, D. E.** See Dunster, D. E. 10878
- Miller, D. K.** See Wright, Robert J. 02003
- Miller, D. K.** See Manuel, O. K. 04273
- 02078 **Miller, D. N., Jr.** Thomas W. Todd (1927-1969): *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 808-809, portrait, 1970.
- 02658 **Miller, Daniel N., Jr.** Integrated exploration economics in Wyoming, viewpoint of geologist [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 860-861, 1970.
- 04045 **Miller, Don R.** Preparation of carbonate samples for geochemical trace element analysis: *Compass*, v. 47, no. 2, p. 125-127, table, 1970.
- 00913 **Miller, Donald K.; Jackson, Kern C.** Fission tracks in micas and the rate of erosion [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 292-293, 1970.
- 01955 **Miller, Donald K.; Reynolds, M. A.; Sakamoto, Koh.** The isotopic composition of xenon and krypton in ordinary chondrites [abs.]: *EOS*, v. 51, no. 4, p. 340, 1970.
- Miller, Donald S.** See Lakatos, Stephen. 01791
- Miller, Donald S.** See Schroeder, Johannes H. 02678
- Miller, Donald S.** See Schroeder, Johannes H. 03602
- 05504 **Miller, Eugene A.; Boitano, Joseph D.** Sand densification to reduce liquefaction potential, in *Engineering geology and soils engineering symposium*, 8th Ann., Pocatello, Idaho, 1970, *Proc.: Boise, Idaho, Idaho Dept. Highways*, p. 197-215, illus., tables, 1970.
- 07497 **Miller, Fred K.** Geologic map of the Quartzsite quadrangle, Yuma County, Arizona: *U.S. Geol. Survey Geol. Quad. Map GQ-841*, scale 1:62,500, sections, separate text, 1970.
- Miller, G.** See Sokolowski, T. 06645
- 03864 **Miller, G. A.** Ground water in Death Valley, California, in *Geologic guide to the Death Valley area, California* — *Geol. Soc. Sacramento, Ann. Field Trip Guidebook* 1970: Sacramento, Calif., *Geol. Soc. Sacramento*, p. 33-39, illus., 1970.
- Miller, Gary B.** See Morrison, George H. 05710
- Miller, Gaylord.** See Vitousek, Martin. 06752
- 03998 **Miller, George J.** The Rancho La Brea Project, 1969-70: *Los Angeles County Mus. Nat. History Quart.*, v. 9, no. 1, p. 26-30, illus., 1970.

- 02107 **Miller, Howard S.** Dollars for research — Science and its patrons in nineteenth-century America: Seattle, Wash., and London, England, Univ. Washington Press, 258 p., 1970.
- 06536 **Miller, Hugh.** Methods and results of river terracing, [Chap.] 1 in *Rivers and river terraces* (G. H. Dury, editor): London, Macmillan and Co. Ltd., p. 19-35, illus., condensed 1970; originally published 1883.
- Miller, James A.** See Swift, Donald J. P. 03745
- Miller, James F.** See Barnes, Christopher R. 01049
- 01089 **Miller, James F.** The Cambro-Ordovician boundary of the U.S. — A diachronous horizon [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 397, 1970.
- 09676 **Miller, James F.** Conodont zonation of the uppermost Cambrian and lowest Ordovician [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 624, 1970.
- Miller, Lee D.** See White, Donald E. 03002
- 05253 **Miller, Marshall S.** Mechanical well-logging methods: *Virginia Minerals*, v. 16, no. 4, p. 29-38, illus., 1970.
- 09246 **Miller, Maynard.** Wind, sky and ice: *Explorers Jour.*, v. 48, no. 3, p. 192-196, illus., 1970.
- 05838 **Miller, Maynard M.** 1946-1962 survey of the regional pattern of Alaskan glacier variations, in *National Geographic Society research reports 1961-1962*: Washington, D.C., Natl. Geog. Soc., p. 167-189, illus., tables, 1970.
- 04852 **Miller, Paul T.** (compiler). First day road log from Tempe to Grand Canyon, Arizona via Interstate 17, Sedona, Flagstaff, Sunset Crater, and Desert View, in *Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region* — Natl. Assoc. Geology Teachers, Southwest Sec., Field Conf. Earth Sci., Cedar City, Utah, 1970: Socorro, N. Mex., New Mexico Inst. Mining and Technology, p. 53-61, 1970.
- Miller, Paul T.** See Smith, Clay T. 04856
- 04862 **Miller, Paul T.** (compiler). Seventh day road log from Holbrook to Tempe, Arizona, via Painted Desert, Petrified Forest, Meteor Crater, Winslow, Payson, and Scottsdale, in *Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region* — Natl. Assoc. Geology Teachers, Southwest Sec., Field Conf. Earth Sci., Cedar City, Utah, 1970: Socorro, N. Mex., New Mexico Inst. Mining and Technology, p. 150-155, 1970.
- Miller, R. F.** See Branson, F. A. 03910
- Miller, R. F.** See McQueen, I. S. 10197
- Miller, R. J.** See Lincoln, J. B. 04439
- 05476 **Miller, R. L.** Recent geologic work in Lee and Wise Counties [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 135, 1970.
- 07441 **Miller, R. P.; Hiltz, D. E.** Experimental open-pit mine slope stability study, Chap. 9 in *Rock mechanics, theory and practice* — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 147-167, illus., table, 1970.
- Miller, Robert A.** See Kingston, Gary A. 02023

- 04042 **Miller, Robert C.** Analysis of sandstones in the Dowlstown Member of the Chattanooga Shale, Macon County, Tennessee and vicinity: *Compass*, v. 47, no. 2, p. 84-89, illus., tables, 1970.
- Miller, Robert Rush.** See Hubbs, Carl L. 10176
- 01090 **Miller, Roy M.** Blue glass from Craters of the Moon National Monument, Idaho [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 397, 1970.
- Miller, S. P.** See Sclater, J. G. 07308
- Miller, T. P.** See Forbes, Robert B. 10040
- Miller, Theo H.** See Jeffords, Russell M. 09324
- Miller, Theo H.** See Moore, Raymond C. 09325
- Miller, Theo H.** See Moore, Raymond C. 11272
- Miller, Thomas P.** See Patton, William W., Jr. 00129
- Miller, Thomas P.** See Patton, William W., Jr. 03413
- 10078 **Miller, Thomas P.** Preliminary correlation of Mesozoic plutonic rocks in Bering Sea region [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2496, 1970.
- Miller, William D.** See Mattox, Richard B. 10212
- 00168 **Miller, William H.** Tectonic and structural history of the Staten Island serpentinite [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 28-29, 1970.
- Millett, Frank B., Jr.** See Williams, Sidney A. 03505
- 09677 **Millhollen, G. L.** Melting of Blue Mountain nepheline syenite with  $H_2O$  and  $H_2O + CO_2$  — the condition  $P_{c_{water}} < (total)$  [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 624-625, 1970.
- 04606 **Milligan, G. C.** Precambrian of Cape Breton Island as a prospecting area: *Canadian Mining Jour.*, v. 91, no. 4, p. 61-63, illus., 1970.
- 10900 **Milligan, G. C.** Geology of the George River series, Cape Breton — stratigraphy, structure, and economic geology: *Nova Scotia Dept. Mines Mem.* 7, 111 p., illus., tables, geol. maps, 1970.
- 05995 **Milligan, James Homer.** Optimizing conjunctive use of groundwater and surface water [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 12, pt. 1, p. 5489B, 1970.
- 02899 **Milligan, V.; Lo, K. Y.** Observations on some basal failures in sheeted excavations [with French abs.]: *Canadian Geotech. Jour.*, v. 7, no. 2, p. 136-144, illus., table, 1970.
- Milliman, J. D.** See Macintyre, I. G. 05032
- Milliman, J. D.** See Luyendyk, B. P. 10576
- 05837 **Millot, Georges.** Geology of clays — Weathering, sedimentology, geochemistry (translated from French by W. R. Farrand and Hélène Paquet): New York and Berlin, Springer-Verlag, 429 p., illus., tables, 1970.
- Mills, D. H.** See Palonen, P. 02514

- 07766 **Mills, Herbert G.** Geology of Tom O'Connor field, Refugio County, Texas, *in* Geology of giant petroleum fields — Symposium, AAPG, 53d Ann. Mtg., Oklahoma City, Okla., 1968: Am. Assoc. Petroleum Geologists Mem. 14, p. 292-300, illus., 1970.
- 04759 **Mills, Lee.** Cecelia Field, St. Martin Parish, Louisiana, *in* Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 7-7d, illus., 1970.
- 05265 **Mills, W. H., Jr.** Suggested method for grain size analysis of soil by elutriation, *in* Special procedures for testing soil and rock for engineering purposes (5th edition): Am. Soc. Testing and Materials Spec. Tech. Pub. 479, p. 88-90, tables, 1970.
- 05349 **Milne, V. G.** Manitouwadge area, Mapledoram Township, District of Thunder Bay: Ontario Dept. Mines and Northern Affairs Prelim. Geol. Map P. 611, scale 1 in. to 800 feet, text, 1970.
- 07688 **Milne, W. G.; Smith, W. E. T.; Rogers, G. C.** Canadian seismicity and microearthquake research in Canada, *in* Symposium on recent crustal movements, Ottawa, Canada, 1969, Papers: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 2, p. 591-601, illus., 1970.
- 08118 **Milne, W. G.** The Snipe Lake, Alberta earthquake of March 8, 1970: Canadian Jour. Earth Sci., v. 7, no. 6, p. 1564-1567, illus., tables, 1970.
- Milne, W. G.** See Rogers, G. C. 10677
- Milo, Dean.** See Hays, James D. 01429
- 04411 **Milovic, D. N.; Touzot, G.; Tournier, J. P.** Stresses and displacements in an elastic layer due to inclined and eccentric load over a rigid strip [with French abs.]: Géotechnique, v. 20, no. 3, p. 231-252, illus., tables, 1970.
- 09161 **Milovic, Dusan M.; Tournier, Jean-Pierre.** Contraintes et déplacements dans un milieu anisotrope [with French and German summ.], *in* Internat. Soc. Rock Mechanics Cong., 2d, Belgrade, Yugoslavia, 1970, Proc., V. 3: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 471-478, illus., tables, 1970.
- Milow, E. Dean.** See McManus, Dean A. 07143
- Minard, James P.** See Owens, James P. 05860
- Minard, James P.** See Sirkin, Leslie A. 06170
- 07936 **Minard, Lane Hall.** Chemical relations between coexisting minerals in a progressively metamorphosed pelite [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3480B, 1970.
- 04406 **Minato, Susumu; Kawano, Minoru.** On the constitution of terrestrial gamma radiation: Jour. Geophys. Research, v. 75, no. 29, p. 5825-5830, illus., tables, 1970.
- 04885 **Minch, John A.; Schulte, Kenneth C.; Hofman, George.** A middle Miocene age for the Rosarito Beach Formation in northwestern Baja California, Mexico: Geol. Soc. America Bull., v. 81, no. 10, p. 3149-3153, illus., table, 1970.
- 00416 **Minear, John W.; Toksöz, M. Nafi.** Thermal regime of a downgoing slab and new global tectonics: Jour. Geophys. Research, v. 75, no. 8, p. 1397-1419, illus., 1970.
- 07311 **Minear, John W.; Toksöz, M. Nafi.** Thermal regime of a downgoing slab, *in* Geothermal problems — Symposium, Madrid, Spain, 1969, Proc.: Tectonophysics, v. 10, nos. 1-3 (spec. issue), p. 367-390, illus., tables, 1970.
- 03741 **Mining Engineering.** Industrial minerals of 1969, their status, challenge, and future [abs.]: Mining Eng., v. 22, no. 1, p. 46-70, illus., tables, 1970.

- 01727 **Mining in Canada.** Performance of the mineral industry in 1969, with a look to the future: Mining in Canada, February 1970, p. 37-81, illus., tables, 1970.
- 03110 **Minke, Joseph Garrett.** Petrology of dolomites in the Everton Formation, Marion County, Arkansas [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 10, p. 4664B, 1970.
- Minkin, Jean A.** See Chao, E. C. T. 07547
- Minkin, Jean A.** See Chao, Edward C. T. 09097
- Minnick, L. John.** See Socolow, Arthur A. 07487
- 10634 **Minster, Jean B.; Archambeau, Charles B.** Systematic inversion of continental heat flow and temperature data [abs.]: EOS, v. 51, no. 11, p. 824, 1970.
- 03609 **Minter, W. E. Lawrence.** Origin of mud polygons that are concave downward: Jour. Sed. Petrology, v. 40, no. 2, p. 755-756, illus., 1970.
- 04712 **Mintz, Leigh W.** The Edrioblastoidea — Re-evaluation based on a new specimen of *Astrocystites* from the Middle Ordovician of Ontario: Jour. Paleontology, v. 44, no. 5, p. 872-880, illus., 1970.
- 09358 **Mintzer, Olin W.; Struble, Richard A.** Combined techniques for terrain investigation: Natl. Research Council Canada Highway Research Board Highway Research Record, no. 156, p. 33-61, illus., tables, 1967.
- 03784 **Misch, Peter.** Paracrystalline microboudinage in a metamorphic reaction sequence: Geol. Soc. America Bull., v. 81, no. 8, p. 2483-2485, illus., 1970.
- 07639 **Mishra, D. C.** Crustal model based on aeromagnetic profiles, gravity studies and wave velocities in rocks and crust: Pure and Appl. Geophysics, v. 81, p. 5-16, illus., tables, 1970.
- Misk, A.** See Poupon, A. 10657
- 01181 **Misra, A.; Faure, G.** Restudy of the age of the Gunflint Formation of Ontario, Canada [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 398, 1970.
- 09309 **Misterek, D. L.** Analysis of data from radial jacking tests, in Determination of the *in situ* modulus of deformation of rock (Symposium, ASTM, Winter Mtg., Denver, Colo., 1969): Am. Soc. Testing and Materials Spec. Tech. Pub. 477, p. 27-38, illus., 1970.
- 10811 **Mitacek, Eugene.** Mineral identification key — A card system and guide: New York, McGraw-Hill Book Company, 39 p., illus., tables, punched cards, 1969.
- Mitchel, Robert.** See Knopoff, Leon. 10550
- 04454 **Mitchell, B. J.; Landisman, M.** Interpretation of a crustal section across Oklahoma: Geol. Soc. America Bull., v. 81, no. 9, p. 2647-2656, illus., tables, 1970.
- 05949 **Mitchell, G. P.; Graham, A. R.** Memorial of Horace John Fraser — November 27, 1905-February 2, 1969: Am. Mineralogist, v. 55, nos. 3-4, p. 554-651, portrait, 1970.
- Mitchell, J. K.** See Scott, R. F. 05110
- Mitchell, J. K.** See Costes, N. C. 06272
- Mitchell, J. M.** See Meinschein, W. G. 05762
- 09516 **Mitchell, J. Murray, Jr.** A preliminary evaluation of atmospheric pollution as a cause of the global temperature fluctuation of the past century, in Global effects of environmental pollution — Symposium, Am. Assoc. Adv. Sci., Dallas, Texas, 1968: New York, Springer-Verlag, and Dordrecht-Holland, D. Reidel Pub. Co., p. 139-155, illus., tables, 1970.



- 09678 **Mitchell, J. T.; Bloss, F. D.; Gibbs, G. V.** The variation of tetrahedral bond lengths and angles in clinoamphibole [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 626, 1970.

**Mitchell, James.** See Dilcher, David L. 02876

- 10693 **Mitchell, James Kenneth.** A selected bibliography of coastal erosion, protection and related human activity in North America and the British Isles — Toronto Univ., Dept. Geography Working Paper 4: Toronto, Ontario, Toronto Univ., 67 p., 1968.

- 05786 **Mitchell, R. H.** Kimberlite and related rocks — A critical reappraisal: Jour. Geology, v. 78, no. 6, p. 686-704, illus., table, 1970.

- 02894 **Mitchell, R. J.; Crawford, C. B.** Anisotropic consolidation of Leda Clay — Discussion [of paper by L. K. Walker and G. P. Raymond, 1969]: Canadian Geotech. Jour., v. 7, no. 1, p. 92, 1970.

**Mitchell, R. J.** See Eden, W. J. 03941

- 03942 **Mitchell, R. J.** On the yielding and mechanical strength of Leda clays [with French abs.]: Canadian Geotech. Jour., v. 7, no. 3, p. 297-312, illus., tables, 1970.

**Mitchell, R. S.** See Lowenhaupt, D. E. 05432

- 02727 **Mitchell, Richard S.; Zulkiewicz, Rudolph J.** Virginia metamict minerals — Pyrochlore-microlite series: Southeastern Geology, v. 11, no. 3, p. 173-185, tables, 1970.

**Mitchell, Richard S.** See Ehlmann, Arthur J. 03166

- 07051 **Mitchell, Richard S.** Virginia metamict minerals — X-ray diffraction study of samarskite: Southeastern Geology, v. 12, no. 2, p. 121-133, tables, 1970.

- 09739 **Mitchell, Richard S.** Barite and lepidocrocite in spherulitic dahllite from Big Horn Basin, Wyoming: Rocks and Minerals, v. 45, no. 2, p. 90-92, illus., 1970.

- 02837 **Mitchell, Steven W.** Stratigraphy of the Hay River Formation, Upper Devonian, Northwest Territories, Canada: Michigan Academician, v. 2, no. 3, p. 103-132, illus., tables, 1970.

**Mitropols'kiy, O. Yu.** See Bilyavs'kiy, G. O. 02555

**Mixon, R. B.** See Harris, L. D. 04508

**Miyajima, M.** See Hoyt, H. P., Jr. 06287

- 01642 **Miyashiro, Akiho; Shido, Fumiko; Ewing, Maurice.** Petrologic models for the Mid-Atlantic Ridge: Deep-Sea Research, v. 17, no. 1, p. 109-123, illus., table, 1970.

- 03714 **Miyashiro, Akiho; Shido, Fumiko.** Progressive metamorphism in zeolite assemblages: Lithos, v. 3, no. 3, p. 251-260, illus., table, 1970.

- 02138 **Mizutani, H.; Hamano, Y.; Ida, Y.; Akimoto, S.** Compressional-wave velocities of fayalite,  $\text{Fe}_2\text{SiO}_4$  spinel, and coesite: Jour. Geophys. Research, v. 75, no. 14, p. 2741-2747, illus., tables, 1970.

**Moberly, R., Jr.** See Campbell, J. F. 04489

- 03135 **Moberly, Ralph, Jr.** Microprobe study of diagenesis in calcareous algae: Sedimentology, v. 14, nos. 1-2, p. 113-123, illus., 1970.

- 09679 **Modreski, Peter J.; Boettcher, A. L.** The stability of phlogopite in the Earth's mantle [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 626-627, 1970.

- 10420 **Modry, S.; Borovec, Z.** Pore structure of homoionic kaolinite sediments: *Am. Ceramic Soc. Jour.*, v. 53, no. 5, p. 292, illus., table, 1970.
- Modzeleski, V. E.** See Krouse, H. R. 02020
- Modzeleski, Vincent E.** See Scott, Ward M. 01353
- Modzeleski, Vincent E.** See Murphy, Mary E. 05745
- 03985 **Moench, Allen F.; Kisiel, Chester C.** Application of the convolution relation to estimating recharge from an ephemeral stream: *Water Resources Research*, v. 6, no. 4, p. 1087-1094, illus., table, 1970.
- 01504 **Moench, Robert H.** Premetamorphic down-to-basin faulting, folding, and tectonic dewatering, Rangeley area, western Maine: *Geol. Soc. America Bull.*, v. 81, no. 5, p. 1463-1496, illus., table, 1970.
- Mogilevskii, I. I.** See Solopov, S. G. 08256
- 03623 **Mogridge, Geoffrey R.** Testing sediment movement due to wave action: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7433, *Jour. Hydraulics Div.*, no. HY 7, p. 1587-1604, illus., tables, 1970.
- Mohamed, S. M. M.** See Andersland, Orlando B. 03027
- 09120 **Moiola, Richard J.** Authigenic zeolites and K-feldspar in the Esmeralda Formation, Nevada: *Am. Mineralogist*, v. 55, nos. 9-10, p. 1681-1691, illus., 1970.
- 02372 **Moiseyev, A. N.** Late serpentinite movements in the California Coast Ranges, new evidence and its implications: *Geol. Soc. America Bull.*, v. 81, no. 6, p. 1721-1731, illus., 1970.
- 00316 **Moiseyev, Alexis N.** Geotectonic evolution of northern California — An alternate hypothesis [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 119-120, 1970.
- 02545 **Mokma, D. L.; Syers, J. K.; Jackson, M. L.** Cation exchange capacity and weathering of muscovite macroflakes: *Soil Sci. Soc. America Proc.*, v. 34, no. 1, p. 146-151, illus., table, 1970.
- 00786 **Molenaar, Dee; Noble, John B.** Geology and related ground-water occurrence, southeastern Mason County, Washington: *Washington Dept. Water Resources Water-Supply Bull.* 29, 145 p., illus., tables, geol. map, 1970.
- 02900 **Mollard, J. D.** Photo-interpretation studies in the location of prairie groundwater supplies [with French abs.]: *Canadian Geotech. Jour.*, v. 7, no. 2, p. 127-135, table, 1970.
- Moller, J.** See Dansgaard, W. 08209
- 09680 **Molnar, P.; Matumoto, T.; Savino, J.** P-wave spectra from earthquakes and underground nuclear explosions [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 627, 1970.
- 01288 **Molnar, Peter; Savino, John; Sykes, Lynn R.; Liebermann, Robert C.; Hade, George; Pomeroy, Paul W.** Reply to Thirlaway [comment on Molnar et al, "Earthquakes and explosions" (1969)]: *Nature*, v. 225, no. 5239, p. 1238, 1970.
- 00740 **Molnia, Bruce F.; Pilkey, Orrin H.** Origin and distribution of carbonate fines on the North and South Carolina continental margin [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 232, 1970.

- 11250 **Monahan, E. J.** Engineering geology — An educational survey of the United States [with French abs.], in *Internat. Assoc. Eng. Geology Internat. Congress*, 1st, Paris, 1970, V. 2: Paris, Comité Français de Géologie de l'Ingénieur, p. 1359-1370, 1970.
- 08631 **Money, P. L.; Baer, A. J.; Scott, B. P.; Wallis, R. H.** The Wollaston Lake Belt, Saskatchewan, Manitoba, Northwest Territories, in *Basins and geosynclines of the Canadian Shield* (A. J. Baer, editor) — Symposium, Ottawa, 1970, Papers: Canada Geol. Survey Paper 70-40, p. 170-197, illus., tables, discussion, p. 197-200, 1970.
- 04203 **Monger, J. W. H.** Hope map-area, west half (92HW1/2), British Columbia: Canada Geol. Survey Paper 69-47, 75 p., illus., tables, geol. map, 1970.
- 05890 **Monkhouse, F. J.** A dictionary of geography (2d edition): Chicago, Ill., Aldine Publishing Co., 378 p., illus., 1970.
- 08580 **Monkhouse, F. J.** Principles of physical geography [7th edition, revised]: New York, American Elsevier Publishing Company, 570 p., illus., table, 1970; originally published by University of London Press, 1954.
- Monnin, M.** See Burnett, D. S. 06846
- Monroe, Eugene A.** See Barnes, Christopher R. 01050
- 01513 **Monroe, Watson H.** (compiler). A glossary of karst terminology: U.S. Geol. Survey Water-Supply Paper 1899-K, p. K1-K26, 1970.
- 07300 **Monsees, James Eugene.** Design of support systems for tunnels in rock [abs.]: *Desert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 5, p. 2666B, 1970.
- 05842 **Montalbetti, James F.; Kanasewich, Ernest R.** Enhancement of teleseismic body phases with a polarization filter: *Royal Astron. Soc. Geophys. Jour.*, v. 21, no. 2, p. 119-129, illus., 1970.
- 10651 **Montana Water Resources Bd.** Water resources survey, Liberty and Toole Counties, Montana — Pt. 1, History of land and water use on irrigated areas; Pt. 2, Maps showing irrigated areas in colors designating the sources of supply: Helena, Mont., Montana Water Resources Board, pt. 1, 102 p., illus., tables; pt. 2, 55 maps, 1969.
- 10402 **Montana Water Resources Board.** Water resources survey — Dawson County, Montana: Helena, Mont., Montana Resources Board, 43 p., illus., tables, 1970.
- 10404 **Montana Water Resources Board.** Water resources survey — Prairie County, Montana: Helena, Mont., Montana Water Resources Board, 47 p., illus., tables, 1970.
- 11206 **Montana Water Resources Board.** Water resources survey, Phillips County, Montana: Helena, Mont., Montana Water Resources Board, 83 p., illus., tables, 1968.
- 11207 **Montana Water Resources Board.** Water resources survey, Valley County, Montana: Helena, Mont., Montana Water Resources Board, 71 p., illus., 1968.
- 11208 **Montana Water Resources Board.** Water resources survey, Glacier County, Montana: Helena, Mont., Montana Water Resources Board, 63 p., illus., tables, 1969.
- 11209 **Montana Water Resources Board.** Water resources survey, Sanders County, Montana: Helena, Mont., Montana Water Resources Board, 62 p., illus., tables, 1969.
- 11210 **Montana Water Resources Board.** Water resources survey, Mineral County, Montana: Helena, Mont., Montana Water Resources Board, 55 p., illus., 1969.
- 04141 **Montgomery, Arthur.** Swarthmore-Leidy collection [Pt. 1]: *Mineralog. Rec.*, v. 1, no. 2, p. 36, 38, 44, 1970.
- 08345 **Montgomery, Arthur.** Swarthmore-Leidy collection, Pt. 2: *Mineralog. Rec.*, v. 1, no. 3, p. 84, 86, 91, 126, 1970.

- 09746 **Montgomery, Arthur.** The phosphate minerals of Fairfield, Utah, Pt. 1: Rocks and Minerals, v. 45, no. 11, p. 667-674, illus., 1970; Pt. 2, *ibid.*, v. 45, no. 12, p. 739-745, illus., 1970.
- 01636 **Montigny, Raymond; Javoy, Marc; Allégre, Claude J.** Le problème des andésites — Étude du volcanisme quaternaire du Costa Rica (Amérique centrale) à l'aide des traceurs couples Sr-87/Sr-86 et O-18/O-16 [abs.]: Soc. Géol. France Compte Rendu 1969, pt. 8, p. 287, 1970.
- 06328 **Moody, J. D.** Petroleum demands of future decades: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2239-2245, illus., table, 1970.
- 07754 **Moody, J. D.; Mooney, J. W.; Spivak, J.** Giant oil fields of North America, in Geology of giant petroleum fields — Symposium, AAPG, 53d Ann. Mtg., Oklahoma City, Okla., 1968: Am. Assoc. Petroleum Geologists Mem. 14, p. 8-18, illus., 1970.
- Moody, M. L.** See Gibson, R. E. 00268
- Moody, M. L.** See Gibson, R. E. 00269
- 04901 **Mookherjee, Asoke; Dutta, N. K.** Evidence of incipient melting of sulfides along a dike contact, Geco mine, Manitouwadge, Ontario: Econ. Geology, v. 65, no. 6, p. 706-713, illus., 1970.
- 05123 **Mookherjee, Asoke.** "Metamorphic" and "metamorphosed" sulfide deposits: Econ. Geology, v. 65, no. 7, p. 886-889, table, 1970.
- 05129 **Mookherjee, Asoke.** Dykes, sulphide deposits, and regional metamorphism — Criteria for determining their time relationship [with German abs.]: Mineralium Deposita, v. 5, no. 2, p. 120-144, illus., 1970.
- 04007 **Mooney, Harold M.; Craddock, Campbell; Farnham, Paul R.; Johnson, Stephen H.; Volz, Gary.** Refraction seismic investigations of the northern midcontinent gravity high: Jour. Geophys. Research, v. 75, no. 26, p. 5056-5086, illus., 1970.
- Mooney, Harold M.** See Craddock, Campbell. 04382
- 05876 **Mooney, Harold M.; Farnham, Paul R.; Johnson, Stephen H.; Volz, Gary; Craddock, Campbell.** Seismic studies over the Midcontinent Gravity High in Minnesota and northwestern Wisconsin: Minnesota Geol. Survey Rept. Inv. 11, 191 p., illus., 1970.
- 06582 **Mooney, Harold M.; Craddock, Campbell; Farnham, Paul R.; Johnson, Stephen H.; Volz, Gary.** Refraction seismic investigations of the northern Midcontinent Gravity High [abs.], in Inst. Lake Superior Geology, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 28-29, 1970.
- Mooney, Harold M.** See Craddock, Campbell. 06938
- Mooney, J. W.** See Moody, J. D. 07754
- 00169 **Moore, Bruce R.** Age dating and sedimentation rates in Recent Ohio River sediments, Kentucky, implied by the distribution of Pennsylvanian age coal particles [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 29, 1970.
- 00741 **Moore, Bruce R.; Blackburn, William H.; Navarro, Enrique.** Trend surface analysis applied to the interpretation of the source area of a turbidite sequence in the Mississippian age Borden Formation, eastern Kentucky [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 232-233, 1970.
- 01547 **Moore, Bruce R.** Scour and fill processes in a deep river hole, Ohio River, Louisville, Kentucky: Jour. Sed. Petrology, v. 40, no. 1, p. 449-462, illus., 1970.

- 05305 **Moore, Bruce R.; Clarke, Murray K.** The significance of a turbidite sequence in the Borden Formation (Mississippian) of eastern Kentucky and southern Ohio [with French abs.], in *Flysch sedimentology in North America: Geol. Assoc. Canada Spec. Paper 7*, p. 211-218, illus., 1970.
- 08549 **Moore, Bruce R.; Dennen, William H.** A geochemical trend in silicon-aluminum-iron ratios and the classification of clastic sediments: *Jour. Sed. Petrology*, v. 40, no. 4, p. 1147-1152, illus., 1970.
- 05272 **Moore, C. A.** Suggested method for applications of X-ray diffraction of clay structural analysis to the understanding of the engineering behavior of soils, in *Special procedures for testing soil and rock for engineering purposes (5th edition): Am. Soc. Testing and Materials Spec. Tech. Pub. 479*, p. 291-300, illus., 1970.
- 05273 **Moore, C. A.** Suggested techniques for measuring the fabric of engineering soils, in *Special procedures for testing soil and rock for engineering purposes (5th edition): Am. Soc. Testing and Materials Spec. Tech. Pub. 479*, p. 301-310, illus., 1970.
- 05709 **Moore, C. B.; Gibson, E. K.; Larimer, J. W.; Lewis, C. F.; Nichiporuk, W.** Total carbon and nitrogen abundances in Apollo 11 lunar samples and selected achondrites and basalts, in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1)*, p. 1375-1382, tables, 1970.
- 02721 **Moore, Carl A.** Energy fuels field course and workshop: *Shale Shaker*, v. 20, no. 9, p. 177, 1970.
- Moore, Carleton B.** See Nichiporuk, Walter. 05341
- Moore, Carleton B.** See Gibson, Everett K., Jr. 09452
- Moore, Clyde H., Jr.** See Facundus, Michael R. 00894
- 02659 **Moore, Clyde H., Jr.** Recent intertidal cements, their mineralogy, texture, and significance, Grand Cayman, British West Indies [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 861, 1970.
- Moore, D. E.** See Dixon, J. B. 07433
- Moore, D. G., Jr.** See Heinrich, E. William. 06116
- 07587 **Moore, Dwight Garrison, Jr.** Geology, mineralogy, and origin of feldspar rocks associated with alkalic carbonatitic complexes, northern Wet Mountains, Colorado [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 3, p. 1351B-1352B, 1970.
- Moore, E. P.** See Prewitt, C. T. 09319
- 00461 **Moore, George T.** Role of salt wedge in bar-finger sand and delta development: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 2, p. 326-333, illus., tables, 1970.
- 04461 **Moore, George W.** Sea-floor spreading at the junction between Gorda Rise and Mendocino Ridge: *Geol. Soc. America Bull.*, v. 81, no. 9, p. 2817-2823, illus., 1970.
- 09487 **Moore, J. Robert.** Manganese-rich pellets in Green Bay, an exploitable mineral resource of the Great Lakes, in *Offshore Technology Conference, 2d Ann., Houston, Tex., 1970, Preprints — v. 1: Dallas, Tex., Offshore Technology Conf.*, p. I-11 — I-24, illus., 1970.
- 00317 **Moore, James G.; Lockwood, John P.** Geometry and genesis of Willow Lake-type banded rocks in the central Sierra Nevada, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 120-121, 1970.

- 01178 **Moore, James G.** Pillow lava in a historic lava flow from Hualalai Volcano, Hawaii: *Jour. Geology*, v. 78, no. 2, p. 239-243, illus., 1970.
- 06788 **Moore, James G.** Water content of basalt erupted on the ocean floor: *Contr. Mineralogy and Petrology*, v. 28, no. 4, p. 272-279, illus., table, 1970.
- 08561 **Moore, James G.** Submarine basalt from the Revillagigedo Islands region, Mexico: *Marine Geology*, v. 9, no. 5, p. 331-345, illus., tables, 1970.
- Moore, K. P.** See Schell, E. M. 04519
- Moore, Neil A.** See Pawley, Julian K. 09476
- Moore, Nelson K.** See Alberstadt, Leonard P. 00666
- 02870 **Moore, P. B.; Smith, J. V.** Crystal structure of  $\beta\text{-Mg}_2\text{SiO}_4$  — Crystal-chemical and geophysical implications, in *Phase transformations and the Earth's interior — Symposium*, Canberra, Australia, 1969, *Proc.: Physics Earth and Planetary Interiors*, v. 3, p. 166-177, illus., tables, 1970.
- 01277 **Moore, Paul B.** A crystal-chemical basis for short transition series orthophosphate and orthoarsenate parageneses: *Neues Jahrb. Mineralogie Monatsh.* 1970, no. 1, p. 39-44, illus., table, 1970.
- 03173 **Moore, Paul B.** Crystal chemistry of the basic iron phosphates: *Am. Mineralogist*, v. 55, nos. 1-2, p. 135-169, illus., tables, 1970.
- 03397 **Moore, Paul B.** Structural heirarchies among minerals containing octahedrally coordinating oxygen — [Pt.] 1, Stereoisomerism among corner-sharing octahedral and tetrahedral chains: *Neues Jahrb. Mineralogie Monatsh.* 1970, no. 4, p. 163-173, illus., 1970.
- 09049 **Moore, Paul B.** Edge-sharing silicate tetrahedra in the crystal structure of leucophoenicite: *Am. Mineralogist*, v. 55, nos. 7-8, p. 1146-1166, illus., tables, 1970.
- 09061 **Moore, Paul B.** Crystal chemistry of the basic manganese arsenates — [Pt.] 4, Mixed arsenic valences in the crystal structure of synadelphite: *Am. Mineralogist*, v. 55, nos. 11-12, p. 2023-2037, illus., tables, 1970.
- 09105 **Moore, Paul B.** Manganostibite — A novel cubic close-packed structure type: *Am. Mineralogist*, v. 55, nos. 9-10, p. 1489-1499, illus., tables, 1970.
- 10910 **Moore, R. D.** (compiler). *Geologic roadguide, Tucson-San Manuel-Hayden-Kearney* (mammoth and Mineral Creek mining districts, San Pedro River valley), secs. 3 and 4 of App. A, in *Conf. on Mining and Ecology in the Arid Environment*, 1970, *Proc.* (W. C. Peters, editor): Tucson, Ariz., Arizona Univ. College of Mines, 10 p., illus., 1970.
- 10911 **Moore, R. D.** (compiler). *Geologic roadguide, Tucson-Pima mining district, Santa Cruz Valley*, secs. 1 and 2 of App. A, in *Conf. on Mining and Ecology in the Arid Environment*, 1970, *Proc.* (W. C. Peters, editor): Tucson, Ariz., Arizona Univ. College of Mines, 4 p., illus., 1970.
- 02853 **Moore, R. K.** Radar progress in the NASA Earth Resources Aircraft Program, in *Earth resources aircraft program status review*, NASA, Houston, 1968 — V. 1, *Geology, geography, and sensor studies*: Houston, Tex., Manned Spacecraft Center, p. 50-1 — 50-51, illus. [1970].
- 01408 **Moore, Raymond C.** Stability of the Earth's crust: *Geol. Soc. America Bull.*, v. 81, no. 5, p. 1285-1323, illus., 1970.
- 09325 **Moore, Raymond C.; Jeffords, Russell M.; Miller, Theo H.** Supplement to *Echinodermata*, Arts. 8-10 [collecting localities, references and index]: *Kansas Univ. Paleont. Contr.* [supp. to 45-47], 17 p., 1968.

- 10968 **Moore, Raymond C.** Omission — Treatise on invertebrate paleontology, Pt. N [Mollusca 6, Bivalvia, V. 2, 1969]: Jour. Paleontology, v. 44, no. 402, 1970.
- 11251 **Moore, Raymond C.; Jeffords, Russell M.** Classification and nomenclature of fossil crinoids based on studies of dissociated parts of their columns: Kansas Univ. Paleont. Contr. [46], Echinodermata, art. 9, 86 p., illus., tables, 1968.
- 11272 **Moore, Raymond C.; Jeffords, Russell M.; Miller, Theo H.** Morphological features of crinoid columns: Kansas Univ. Paleont. Contr. [45], Echinodermata, art. 8, 30 p., illus., table, 1968.
- 06604 **Moore, Raymond Kenworthy.** Spectroscopic properties of the natural silicate garnets [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 761B, 1970.
- 07800 **Moore, Richard K.** Radar and data processing, in Earth Resources Aircraft Program, status review, 2d Ann., Houston, Tex., 1969 — V. 2, Agriculture, Forestry, and sensor studies: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 32-1—32-28, illus., [1970?].
- 09303 **Moore, Richard K.** Remote sensing at the University of Kansas in radar systems, Sec. 41 of Earth Resources Program, 3d ann., review — v. 2, Agriculture, forestry, and sensor studies: Houston, Tex., NASA Manned Spacecraft Center, Msc-03742, p. 41-1—41-39, illus., tables, 1970.
- Moore, Robert D.** See Block, Barry. 02130
- Moore, Roosevelt.** See Hickling, Nelson L. 02388
- Moore, Roosevelt.** See Jenkins, Lillie B. 06186
- 05397 **Moore, Samuel L.** Geologic map of the Summersville quadrangle, Green County, Kentucky: U.S. Geol. Survey Geol. Quad. Map GQ-870, scale 1:24,000, text, 1970.
- Moore, Samuel L.** See Jones, William R. 05462
- 02458 **Moore, T. C., Jr.; Kulm, L. D.** A high-resolution sub-bottom profiling system for use in ocean basins: Jour. Marine Research, v. 28, no. 2, p. 271-280, illus., 1970.
- 05077 **Moore, Thomas H.** Water geochemistry, Hog Creek basin, central Texas: Baylor Geol. Studies Bull. 18, 44 p., illus., 1970.
- 00914 **Moore, W. Richard.** Reduction of quartz grain size by diagenesis [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 293, 1970.
- Moore, W. Richard.** See Davies, David K. 01541
- Moore, William J.** See Fabbi, Brent P. 03326
- 04247 **Moore, William J.** Phlogopite and actinolite in latitic dike rocks, Bingham mining district, Utah, in Geological Survey research 1970, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C61-C69, illus., tables, 1970.
- 00018 **Moores, E. M.; Scott, R. B.; Lumsden, W. W.** Tertiary tectonics of the White Pine-Grant Range region, east-central Nevada, and some regional implications — Reply [to discussion by H. Drewes, 1969, of 1968 paper]: Geol. Soc. America Bull., v. 81, no. 1, p. 323-329, illus., 1970.
- 00318 **Moores, E. M.; Wise, W. S.** Pre-batholith structure and stratigraphy of the Lake Almanor and Greenville quadrangles, northern Sierra Nevada — Progress report [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 121, 1970.
- Moores, E. M.** See Valentine, J. W. 06450
- 06385 **Moores, Eldridge.** Ultramafics and orogeny, with models of the US Cordillera and the Tethys: Nature, v. 228, no. 5274, p. 837-842, illus., 1970.

- 09681 **Moores, Eldridge M.** Patterns of continental fragmentation and reassembly, some implications [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 629, 1970.
- 05121 **Moorhouse, W. W.** A comparative atlas of textures of Archean and younger volcanic rocks: *Geol. Assoc. Canada Spec. Paper 8*, 1 p., 20 plates, 1970.
- Moorman, Mary.** See Cloud, Preston. 05737
- Mooser, Federico.** See Lomnitz, Cinna. 10888
- 09682 **Moran, S. R.; Clayton, Lee.** Stratigraphy of the deposits of the southern part of glacial Lake Agassiz [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 629-630, 1970.
- 01091 **Moran, Stephen R.; Deal, Dwight E.** Glacial Lake Souris — A study in the complexity of a glacial-lacustrine environment [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 398, 1970.
- 02502 **Moran, Stephen R.; Clayton, Lee; Cvancara, A. M.** New sedimentological and paleontological evidence for history of Lake Agassiz, Snake Curve Section, Rd Lake County, Minnesota [abs.]: *North Dakota Acad. Sci. Proc.*, v. 24, pt. 1, p. 22, illus., 1970.
- Moran, Stephen R.** See Gross, David L. 03611
- 06875 **Moran, Stephen Royse.** Geology of the Hudson Bay area, Saskatchewan [abs.]: *Desert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 1, p. 252B, 1970.
- 04801 **Morawski, F. P.; Jeffries, J. D.; Schelske, J. E.** The Griffith story, development and operation of the Griffith mine — Pt. 1, Introduction; Pt. 2, Mining, in *Mining Symposium*, 31st Ann., and *AIIME, Minnesota Sec.*, 43d Ann. Mtg., Duluth, 1970: Minneapolis, Minn., Univ. Minnesota, p. 1-3, illus., 1970.
- Moreland, P. E.** See Fields, P. R. 05689
- 02660 **Morelock, Jack; Bryant, W. R.** Consolidation of marine carbonate mud [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 861, 1970.
- Morency, M.** See Douglas, G. 03086
- 01200 **Morency, Maurice; Emond, Pierre L.; vonBitter, Peter H.** Dating conodonts using electron spin resonance — A possible technique, in *Short papers in research in 1969: Kansas Geol. Survey Bull.* 199, pt. 1, p. 17-19, illus., 1970.
- 10600 **Morency, Maurice.** Determination of strain effects in crystalline rocks using thermoluminescence [abs.]: *EOS*, v. 51, no. 11, p. 830-831, 1970.
- Morey, G. B.** See Sims, Paul. 03582
- 04971 **Morey, G. B.; Green, J. C.; Ojakangas, R. W.; Sims, P. K.** Stratigraphy of the Lower Precambrian rocks in the Vermilion district, northeastern Minnesota: *Minnesota Geol. Survey Rept. Inv.* 14, 33 p., illus., geol. maps, 1970.
- 05345 **Morey, G. B.; Ojakangas, Richard W.** Sedimentology of the Middle Precambrian Thomson Formation, east-central Minnesota: *Minnesota Geol. Survey Rept. Inv.* 13, 32 p., illus., tables, 1970.
- Morey, G. B.** See Sims, P. K. 08587
- 09936 **Morgan, Benjamin A.** (editor). Symposium on the mineralogy and petrology of the upper mantle — Fiftieth Anniversary Symposia: *Mineralog. Soc. America Spec. Paper 3*, p. 1-121, illus., tables, 1970.
- 09944 **Morgan, Benjamin A.** (editor). Symposium on sulfides — Fiftieth Anniversary Symposia: *Mineralog. Soc. America Spec. Paper 3*, p. 123-212, illus., tables, 1970.



- 09952 **Morgan, Benjamin A.** (editor). Symposium on the mineralogy and geochemistry of non-marine evaporites — Fiftieth Anniversary Symposia: Mineralog. Soc. America Spec. Paper 3, p. 213-319, illus., tables, 1970.
- Morgan, Charles O.** See Leonard, Robert B. 00470
- Morgan, Charles O.** See Lowell, Brent H. 03373
- Morgan, Charles O.** See McNellis, Jesse M. 10847
- 02159 **Morgan, G. R.; Jackson, D. E.** A probable 'Waulsortian' carbonate mound in the Mississippian of northern Alberta: Bull. Canadian Petroleum Geology, v. 18, no. 1, p. 104-112, illus., table, 1970.
- Morgan, Ida M.** See McIntosh, Willard L. 04497
- Morgan, Ida M.** See McIntosh, Willard L. 06528
- 02193 **Morgan, J. W.** Uranium and thorium in tektites, an additional comment: Earth and Planetary Sci. Letters, v. 8, no. 2, p. 141-142, illus., 1970.
- Morgan, J. W.** See Ehmann, W. D. 04781
- Morgan, J. W.** See Ehmann, W. D. 05686
- 06847 **Morgan, J. W.; Ehmann, W. D.** Lunar rock 12013 — O, Si, Al, and Fe abundances: Earth and Planetary Sci. Letters, v. 9, no. 2, p. 164-168, illus., table, 1970.
- Morgan, James J.** See Stumm, Werner. 08400
- 02488 **Morgan, James P.** Deltas, a resumé: Jour. Geol. Education, v. 18, no. 3, p. 107-117, illus., tables, 1970.
- 06705 **Morgan, James P.; Shaver, Robert H.** (editors). Deltaic sedimentation, modern and ancient: Soc. Econ. Paleontologists and Mineralogists Spec. Pub. 15, 312 p., illus., tables, 1970.
- 06749 **Morgan, James P.** Depositional processes and products in the deltaic environment, in Deltaic sedimentation, modern and ancient: Soc. Econ. Paleontologists and Mineralogists Spec. Pub. 15, p. 31-47, illus., tables, 1970.
- Morgan, John W.** See Goles, Gordon G. 05694
- 04832 **Morgan, Joseph K.** Central Mississippi uplift [abs.]: Am. Assoc. Petroleum Geologists, v. 54, no. 9, p. 1787-1788, 1970.
- 07318 **Morgan, Joseph K.** The Central Mississippi Uplift, in Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Soc. Trans., v. 20, p. 91-109, illus., 1970.
- 10567 **Morgan, W. Jason.** Plate motions and deep mantle convection [abs.]: EOS, v. 51, no. 11, p. 822, 1970.
- 09683 **Morgenstein, Maury E.** A study of the growth morphologies of two types of deep-sea manganese mega-nodules [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 630, 1970.
- 07282 **Morgenstern, Lillian Nimitz.** The evolution of some rocks west and south of Boston, Massachusetts [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2768B, 1970.
- 02882 **Morgenstern, N. R.** Black shale heaving at Ottawa, Canada — Discussion [of paper by R. M. Quigley and R. W. Vogan, 1970]: Canadian Geotech. Jour., v. 7, no. 2, p. 114-115, 1970.

- 10182 **Moriarty, James Robert.** Paleoclimatic interpretations from prehistoric sites on the Southern California coast [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 94, 1970.
- 01860 **Morimoto, Nobuo; Nakazawa, Hiromoto; Nishiguchi, Katsuhisa; Tokonami, Masayasu.** Pyrrhotites — Stoichiometric compounds with composition  $\text{Fe}_n\text{-S}_n$  ( $n \geq 8$ ): Science, v. 168, no. 3934, p. 964-966, illus., table, 1970.
- 03170 **Morimoto, Nobuo; Koto, Kichiro.** Phase relations of the Cu-S system at low temperatures — Stability of anilite: Am. Mineralogist, v. 55, nos. 1-2, p. 106-117, illus., table, 1970.
- 09085 **Morimoto, Nobuo; Güven, Necip.** Refinement of the crystal structure of pigeonite: Am. Mineralogist, v. 55, nos. 7-8, p. 1195-1209, illus., tables, 1970.
- 09361 **Morin, Marcel.** Labrieville area, Saguenay County: Quebec Dept. Nat. Resources Geol. Rept. 141, 45 p., illus., tables, geol. map, 1969; also French edition.
- 02795 **Morin, Robert; Theyer, Fritz; Vincent, Edith.** Pleistocene climates in the Atlantic and Pacific Oceans, a reevaluated comparison based on deep-sea sediments: Science, v. 169, no. 3943, p. 365-366, illus., 1970.
- 01599 **Morin, Ronald W.** Late Quaternary biostratigraphy of cores from beneath California Current [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 3, p. 559, 1970.
- 10183 **Morin, Ronald W.** Paleotemperature increase about 11,000 years ago beneath the California Current — Paleontological evidence [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 95, 1970.
- Morisawa, Marie.** See Coates, Donald R. 09187
- 09684 **Morisawa, Marie E.** A relevant geology [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 630-631, 1970.
- 08241 **Morita, H.** Polyphenols in the extractives of an organic soil [with French abs.], in International Peat Congress, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 28-31, illus., 1970.
- 08440 **Moritz, Helmut.** Least-squares estimation in physical geodesy: Ohio State Univ. Dept. Geod. Sci. Rept., no. 130 (U.S. Air Force Cambridge Research Lab., AFCRL-70-0202), 52 p., illus., 1970.
- 02913 **Morley, L. W. (editor).** Mining and groundwater geophysics, 1967 — Canadian Centennial Conf., Niagara Falls, Ontario, 1967, Proc.: Canada Geol. Survey Econ. Geology Rept. 26, 722 p., illus., tables, 1970.
- 02942 **Morley, L. W.** Regional geophysical mapping [with French abs.], in Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 249-258, illus., 1970.
- 08233 **Morley, L. W.** Reconnaissance aerogeophysical mapping in mineral areas, in The use of remote sensing . . . of natural resources of Alaska: Juneau, Alaska, Dept. of Econ. Devel., p. 82-90, illus. [1970].
- 10768 **Morley, L. W.** Exploration geophysics, in Background papers on the earth sciences in Canada (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 158-169, tables, 1970.

**Morley, L. W.** See Gregory, A. F. 10769

- 09685 **Mörner, Nils-Axel; Dreimanis, Aleksis.** The Erie interstadial — type section, lake level, ice recession and correlations [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 631, 1970.
- 10330 **Mörner, Nils-Axel.** Late Wisconsin ice marginal changes in Erie lobe area and comparison with late Weichselian sequence of southern Scandinavia [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 751-752, 1970.
- Morrill, B. J.** See Hofmann, R. B. 00286
- Morris, E. C.** See Shoemaker, E. M. 05091
- Morris, Gerald B.** See Helmberger, Donald V. 03507
- 07071 **Morris, Gerald B.** Picking first energy on marine seismic refraction records: *Deep-Sea Research*, v. 17, no. 5, p. 913-915, illus., 1970.
- 01582 **Morris, Gerald Brooks.** Velocity anisotropy and crustal structure of the Hawaiian arch [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 9, p. 4212B, 1970.
- Morris, H. T.** See Tooker, E. W. 02030
- Morris, Hugh C.** See Bishop, Donald. 06064
- 07545 **Morris, William J.** Hadrosaurian dinosaur bills — Morphology and function: *Los Angeles County Mus. Contr. Sci.*, no. 193, 14 p., illus., 1970.
- 09270 **Morrison, Alastair.** Pollen diagrams from interior Labrador: *Canadian Jour. Botany*, v. 48, no. 11, p. 1957-1975, illus., tables, 1970.
- 07836 **Morrison, Bert C.** An electrical potential method used at a single hole to indicate direction to better mineralization [abs.]: *Mining Eng.*, v. 22, no. 9, p. 52, 1970.
- Morrison, D. A.** See Reid, R. R. 00568
- 05710 **Morrison, George H., (and others).** Elemental abundances of lunar soil and rocks, in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2*: New York, and Oxford, England, Pergamon Press, p. 1383-1392, illus., tables, 1970.
- Morrison, H. F.** See Coggon, J. H. 03470
- 06262 **Morrison, J. A.; Norton, P. R.** The heat capacity and thermal conductivity of Apollo 11 lunar rocks 10017 and 10046 at liquid helium temperatures: *Jour. Geophys. Research*, v. 75, no. 32, p. 6553-6557, table, 1970.
- Morrison, J. L.** See Wilson, L. R. 03377
- Morrison, M. F.** See Northrop, John. 01959
- Morrison, Michael F.** See Northrop, John. 03726
- 09295 **Morrison, R. B.** Geologic terrain mapping from earth-satellite and ultrahigh aerial photographs, *Sec. 16 of Earth Resources Program, 3d ann., review — v. 1, Geology and geography*: Houston, Tex., NASA Manned Spacecraft Center, Msc-03742, p. 16-1 — 16-5, illus., 1970.
- 10184 **Morrison, Roger B.** Conflicting pluvial-lake evidence on climatic changes between 14 and 9 millennia ago, with particular reference to Lakes Lahontan, Bonneville, and Searles [abs.], in *American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.*: [Bozeman, Mont., Montana State Univ.?], p. 97-98, 1970.
- Morrison, Ross A.** See Lee, Kenneth L. 06777

- 09375 **Morse, David J.** Some remarks concerning the Bott-Smith inequalities for depth determinations of gravitating bodies: *Canadian Soc. Explor. Geophysicists Jour.*, v. 5, no. 1, p. 91-112, illus., 1969.
- 09032 **Morse, Dexter A.** Petrological and structural study of the Bethel granite, Vermont [abs.], in *Guidebook to field excursions*, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., p. 147, 1969.
- Morse, S. A.** See Lyons, J. B. 03176
- 04346 **Morse, S. A.** Alkali feldspars with water at 5 kb pressure: *Jour. Petrology*, v. 11, no. 2, p. 221-251, illus., tables, 1970.
- 00319 **Morton, D. M.** 1969 mudflows at Wrightwood, San Bernardino County, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 121-122, 1970.
- 00320 **Morton, D. M.; Baird, A. K.; Watson, K. D.** Carbonatite lenses within phlogopite-carbonate dikes, Mountain Pass, San Bernardino County, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 122, 1970.
- 10662 **Morton, J. T.; Gordon, D. T.** Influence of pore geometry on water-oil relative permeability: *Jour. Petroleum Technology*, v. 22, October, p. 1199-1208, illus., table, 1970.
- Morton, R. W.** See Chramiec, M. A. 09493
- Morton, Robert B.** See Irwin, James H. 08706
- 01092 **Mosher, L. Cameron.** Evolutionary, ecologic, and geographic observations on conodonts during their decline and extinction [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 398-399, 1970.
- 03540 **Mosher, L. Cameron.** New conodont species as Triassic guide fossils: *Jour. Paleontology*, v. 44, no. 4, p. 737-742, illus., 1970.
- 10185 **Moss, John H.** The geologic history of the Mummy Cave early man site, Absaroka Mountains, Wyoming [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 99, 1970.
- 07588 **Mossler, John Hamilton.** Facies and diagenesis of Swope Limestone (Upper Pennsylvanian) southeast Kansas [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 3, p. 1352B, 1970.
- 07044 **Mosteller, Moice A.** Subsurface stratigraphy of the Comanchean Series in east central Texas: *Baylor Geol. Studies Bull.* 19, 33 p., illus., 1970.
- 08420 **Mothersill, John S.** Relationship of grain-size modes to nearshore sedimentary environments, Lake Superior, Ontario: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 522-527, illus., 1970.
- 09686 **Mothersill, John S.** Limnogeological studies from St. Mary's River to Michipicoten Harbour, Lake Superior, Ontario [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 631-632, 1970.
- Mott, Charles J.** See Gould, Joseph C. 04749
- 03710 **Mottana, A.; Edgar, A. D.** The significance of amphibole compositions in the genesis of eclogites: *Lithos*, v. 3, no. 1, p. 37-49, illus., tables, 1970.
- 06519 **Motts, Ward S.** Introduction to playa studies, Chap. 1 in *Geology and hydrology of selected playas in western United States* (Ward S. Motts, editor) — Univ. Mas-

sachusetts, Geology Dept., Contract AF19(628)-2486, Final Sci. Rept., Pt. 2: Bedford, Mass., U.S. Air Force Office Aerospace Research, p. 1-22, illus., table, 1970.

- 06520 **Motts, Ward S.; Carpenter, David.** Geology and hydrology of Rogers Playa and Rosamond Playa, California, Chap. 2 in *Geology and hydrology of selected playas in western United States* (Ward S. Motts, editor) — Univ. Massachusetts, Geology Dept., Contract AF19(628)-2486, Final Sci. Rept., Pt. 2: Bedford, Mass., U.S. Air Force Office Aerospace Research, p. 23-65, illus., 1970.

- 06522 **Motts, Ward S.** Results of test-drilling and winter mapping programs on Coyote Playa, California, Chap. 3, Pt. 2 in *Geology and hydrology of selected playas in western United States* (Ward S. Motts, editor) — Univ. Massachusetts, Geology Dept., Contract AF19(628)-2486, Final Sci. Rept., Pt. 2: Bedford, Mass., U.S. Air Force Office Aerospace Research, p. 108-136, illus., 1970.

**Motts, Ward S.** See Walker, Robert F. 06523

- 06525 **Motts, Ward S.** Geology of Troy Playa surface, winter of 1967-68, in *Geology and hydrology of selected playas in western United States* (Ward S. Motts, editor) — Univ. Massachusetts, Geology Dept., Contract AF19(628)-2486, Final Sci. Rept., Pt. 2: Bedford, Mass., U.S. Air Force Office Aerospace Research, p. 200-202, illus., 1970.

- 06526 **Motts, Ward S.; Matz, David B.** Reconnaissance geology of Clayton Playa, Nevada, Chap. 6 in *Geology and hydrology of selected playas in western United States* (Ward S. Motts, editor) — Univ. Massachusetts, Geology Dept., Contract AF19(628)-2486, Final Sci. Rept., Pt. 2: Bedford, Mass., U.S. Air Force Office Aerospace Research, p. 214-236, illus., 1970.

- 06527 **Motts, Ward S.** Some hydrologic and geologic processes influencing playa development in the western part of the Basin and Range Province, United States, Chap. 7 in *Geology and hydrology of selected playas in western United States* (Ward S. Motts, editor) — Univ. Massachusetts, Geology Dept., Contract AF19(628)-2486, Final Sci. Rept., Pt. 2: Bedford, Mass., U.S. Air Force Office Aerospace Research, p. 237-286, illus., tables, 1970.

- 06578 **Motts, Ward S.** (editor). *Geology and hydrology of selected playas in western United States* — Univ. Massachusetts, Geology Dept., Contract AF19(628)-2486, Final Sci. Rept., Pt. 2: Bedford, Mass., U.S. Air Force Office Aerospace Research (AFCRL-69-0214), 286 p., illus., tables, 1970.

- 09240 **Motz, H. T.** Neutron capture gamma-ray spectroscopy in *Annual review of nuclear science*, V. 20: Palo Alto, Calif., Annual Reviews, Inc., p. 1-38, illus., table, 1970.

**Mouge, Marcel L.** See Fons, Lloyd. 09081

- 02169 **Moulder, E. A.** Water pollution control creates demand for groundwater hydrologists: *Mining Eng.*, v. 22, no. 2, p. 90-91, illus., 1970.

- 05066 **Moulder, E. A.** Freshwater bubbles — A possibility for using saline aquifers to store water, in *Saline water symposium: Water Resources Research*, v. 6, no. 5, p. 1528-1531, illus., table, 1970.

- 10881 **Moulton, Lyle K.** Prediction of the depth of frost penetration — A review of literature [West Virginia Univ. Eng. Expt. Sta. Rept. 5]: Springfield, Va., Fed. Sci. and Tech. Inf. Clearinghouse (pb 183 233), 115 p., illus., tables, 1969.

- 02558 **Moultrie, William.** Systems, computer simulation, and drainage basins: *Illinois Geog. Soc. Bull.*, v. 12, no. 2, p. 29-35, illus., 1970.

**Mountjoy, E. W.** See Price, R. A. 03275

**Mountjoy, Eric W.** See Hopkins, John P. 02631

- 02661 **Mountjoy, Eric W.** Architecture of western part of Alberta basin and Upper Devonian reef trends [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 861-862, 1970.
- 02662 **Mountjoy, Eric W.** Comparison of some Alberta Upper Devonian reef complexes with modern Caribbean reefs [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 862, 1970.
- 08006 **Mountjoy, Eric W.** Geology of the Main Ranges between Tete Jaune Cache and Jasper, in Peace River, Pine Pass, Yellowhead 1970 — Edmonton Geol. Soc. Field Conf., 12th, Guidebook: Edmonton, Alberta, Edmonton Geological Society, p. 94-107, illus., tables, 1970.
- Mountjoy, Eric W.** See Toomey, Donald Francis. 08066
- 10079 **Mountjoy, Eric W.** Mesozoic stratigraphy, sedimentology, and paleogeography of northern Yukon, Canada [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2497, 1970.
- 01557 **Mountjoy, Wayne.** Determination of cobalt in geologic materials by solvent extraction and atomic absorption spectrometry, in *Geological Survey research 1970*, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B174-B176, tables, 1970.
- 10439 **Mourant, Walter A.; Shomaker, John W.** Reconnaissance of water resources of De Baca County, New Mexico: New Mexico Bur. Mines and Mineral Resources Groundwater Rept. 10, 87 p., illus., tables, 1970.
- 01210 **Moussa, Mounir T.** Nematode fossil trails from the Green River Formation (Eocene) in the Uinta Basin, Utah: *Jour. Paleontology*, v. 44, no. 2, p. 304-307, illus., 1970.
- 05179 **Moussa, Mounir T.; Seiglie, George A.** Revision of mid-Tertiary stratigraphy of southwestern Puerto Rico: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 10, p. 1887-1898, illus., 1970.
- 08317 **Moussa, Mounir T.; Smith, Alan Lewis.** (compilers). Status of geological research in the Caribbean, No. 16: Mayaguez, Puerto Rico, Puerto Rico Univ. Inst. Caribbean Sci., 87 p., 1970.
- Mowatt, T. C.** See Crabb, D. E. 00601
- Mowatt, T. C.** See Helgerson, R. N. 00620
- Mowatt, T. C.** See Stach, R. L. 00645
- 01486 **Mower, R. W.** Ground-water inflow toward Jordan Valley from Utah Valley through valley fill near the Jordan Narrows, Utah, in *Geological Survey research 1970*, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B199-B202, illus., 1970.
- Mower, R. W.** See Sumsion, C. T. 03063
- Mower, R. W.** See Arnow, Ted. 08427
- 06792 **Moxham, R. M.** Thermal features at volcanoes in the Cascade Range, as observed by aerial infrared surveys: *Bull. Volcanol.*, v. 34, no. 1, p. 77-106, illus., table, 1970.
- Mozingo, G. L.** See Lowenhaupt, D. E. 05432
- 06396 **Mozola, Andrew J.** Geology for environmental planning in Monroe County, Michigan: Michigan Geol. Survey Rept. Inv. 13, 34 p., illus., tables, geol. map, 1970.
- 09106 **Mrose, Mary E.; Fahey, Joseph J.; Ericksen, George E.** Mineralogical studies of the nitrate deposits of Chile — [Pt.] 3, Humberstonite,  $K_3Na_7Mg_2(SO_4)_6(NO_3)_2 \cdot 6H_2O$ , a

new saline mineral: *Am. Mineralogist*, v. 55, nos. 9-10, p. 1518-1533, illus., tables, 1970.

**Mrose, Mary E.** *See* Ericksen, George E. 09107

**Muan, A.** *See* Navrotsky, A. 06388

**Mudd, R. D.** *See* Cearlock, D. B. 10510

00103 **Mudge, Melville R.** Origin of the disturbed belt in northwestern Montana: *Geol. Soc. America Bull.*, v. 81, no. 2, p. 377-392, illus, tables, geol. map, 1970.

05974 **Mudge, Melville R.** Origin of the disturbed belt in northwestern Montana — Reply [to discussion by R. Scholten of 1970 paper]: *Geol. Soc. America Bull.*, v. 81, no. 12, p. 3793, 1970.

**Mudie, J. D.** *See* Sclater, J. G. 00070

01413 **Mudie, J. D.; Normark, W. R.; Cray, E. J., Jr.** Direct mapping of the sea floor using side-scanning sonar and transponder navigation: *Geol. Soc. America Bull.*, v. 81, no. 5, p. 1547-1553, illus., 1970.

**Mudie, John D.** *See* Larson, Peggy A. 01943

**Mudie, John D.** *See* Akker, F. B. van den. 07801

**Mudie, John D.** *See* Spiess, F. N. 09990

05906 **Muehlberger, W. R.; Wiley, M. A.** The Texas lineament [summ.], in *The geologic framework of the Chihuahua tectonic belt — Symposium in honor of Ronald K. De Ford*, Midland, Tex., 1970: Midland, Tex., West Texas Geol. Soc., p. 8-15, illus., 1970.

09466 **Muehlberger, W. R.; Flawn, Peter T.** Introduction, in *Limitations of the earth, a compelling focus for geology* (Texas Univ. Austin Bur. Econ. Geology) - A symposium held at the dedication of the new Geology Building, Austin, Tex., 1967, *Proc.: Texas Quart.*, v. 11. no. 2, p. 8-10, 1968.

00807 **Muehlberger, William R.** Memorial to Edwin Leslie Trice, Jr. (1929-1967): *Geol. Soc. America Proc.* 1967, p. 281, portrait, 1970.

**Muehlberger, William R.** *See* Fish, Johnnie E. 00896

**Muehlberger, William R.** *See* Flawn, Peter T. 06026

01804 **Muehlenbachs, Karlis; Clayton, Robert N.** O-18/O-16 studies of fresh and weathered submarine basalts [abs.]: *EOS*, v. 51, no. 4, p. 444, 1970.

04654 **Mueller, G.** Indications of high-temperature processes in organic geochemistry, in *Advances in organic geochemistry — Internat. Cong.*, 3d, *Proc.* (G. D. Hobson and G. C. Speers, editors): London and New York, Pergamon Press (*Internat. Ser. Mons. Earth Sci.*, V. 32), p. 443-467, illus., tables, 1970.

04107 **Mueller, George.** Geological aspects of the problem of origin of life [abs.], in *Alaska Sci. Conf.*, 20th, College, 1969, *Proc.: Sci. Alaska* 1969, p. 309, 1970.

06301 **Mueller, George; Hinsch, Gertrude W.** Glassy particles in lunar fines: *Nature*, v. 228, no. 5268, p. 254-258, illus., tables, 1970.

02857 **Mueller, O. P.** Soil temperature regimes in a forested area of the northern Rockies: *Soil Sci.*, v. 109, no. 1, p. 40-47, illus., 1970.

- 06825 **Mueller, Paul A.**  $\text{TiO}_2$  and K-Ar age — A covariation in the mafic rocks of the southern Beartooth Mountains of Montana and Wyoming: *Earth and Planetary Sci. Letters*, v. 9, no. 5, p. 427-430, illus., 1970.
- 09687 **Mueller, Paul A.** Secular variations in the mafic rocks of the southern Beartooth Mountains, Montana and Wyoming [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 632, 1970.
- Mueller, R. A.** See Murphy, J. R. 00321
- 07825 **Mueller, R. A.** Prediction of seismic motion from contained and excavation nuclear detonations, in *Symposium on engineering with nuclear explosives* — Am. Nuclear Soc. and U.S. Atomic Energy Comm., Las Vegas, Nev., 1970, Proc., V. 2: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., p. 1051-1068, illus., 1970.
- 03398 **Mueller, Robert F.** Energetics of HCl and HF in volcanic emanations: *Geochim. et Cosmochim. Acta*, v. 34, no. 7, p. 737-744, illus., tables, 1970.
- 06794 **Mueller, Robert F.; Ghose, Subrata; Saxena, Surendra K.** Partitioning of cations between coexisting single- and multi-site phases — A discussion [of paper by J. E. Grover and P. M. Orville, 1969]: *Geochim. et Cosmochim. Acta*, v. 34, no. 12, p. 1356-1360, 1970.
- 09056 **Mueller, Robert F.; Ghose, Subrata.** Thermodynamic behavior of  $\text{Ga}^{3+}$   $\text{Al}^{3+}$  and  $\text{Fe}^{3+}$  distributions in garnets: *Am. Mineralogist*, v. 55, nos. 11-12, p. 1932-1944, illus., table, 1970.
- 09086 **Mueller, Robert F.** Two-step mechanism for order-disorder kinetics in silicates: *Am. Mineralogist*, v. 55, nos. 7-8, p. 1210-1218, illus., 1970.
- Muffler, L. J. P.** See White, Donald E. 01850
- Muffler, L. J. P.** See Honda, S. 09122
- 09277 **Muffler, L. J. P.; White, D. E.; Truesdell, A. H.** Violent late Pleistocene hydrothermal explosions in Yellowstone National Park [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 100, 1970.
- Muffler, L. J. P.** See Truesdell, A. H. 09413
- Muffler, L. J. P.** See White, D. E. 09422
- Muir, A. H., Jr.** See Housley, R. M. 06286
- 10382 **Muir, T. C.** Sampling and analysis of coarse riverbed sediments, in *Mississippi Water Resources Conf.*, 4th, 1969, Jackson, Proc.: State College, Miss. Water Resources Research Inst., p. 73-83, illus., tables, 1969.
- Mukae, Michitoshi.** See California Dept. Water Resources. 09173
- Mukherjee, N. R.** See Grossman, J. J. 06281
- 10696 **Mukherjee, Pratip Kumar.** Petrology of some mafic dyke-rocks of southern British Columbia, Canada: *Geol., Mining and Metall. Soc. India Quart. Jour.*, v. 41, no. 3, p. 139-146, table, 1969.
- 10744 **Mukherji, Anil K.** Analytical chemistry of zirconium and hafnium: Oxford, England, and New York, Pergamon Press, 281 p., illus., tables, 1970.
- 08124 **Mukherji, K. K.; Winder, C. G.** Regional microfabric analysis and insoluble residues of Black River Group (Middle Ordovician) in southern Ontario: *Canadian Jour. Earth Sci.*, v. 7, no. 6, p. 1437-1448, illus., tables, 1970.



- 06486 **Mulder, David C.** Ore controls and open pit geological procedures at Steep Rock Iron Mines Limited [abs.], in *Inst. Lake Superior Geology*, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 30, 1970.
- Mull, D. S.** See Hopkins, H. T. 05453
- Mullen, Ruth E.** See Clark, David L. 10024
- 10080 **Mullen, Ruth E.; Darby, Dennis A.; Clark, David L.** Sedimentary processes in Arctic Ocean [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2497, 1970.
- 07538 **Muller, German.** Petrology of the cliff limestone (Holocene), North Bimini, Bahamas: *Neues Jahrb. Mineralogie Monatsh.* 1970, no. 11, p. 507-523, illus., 1970.
- 09337 **Muller, J.** Palynological evidence on early differentiation of angiosperms, in *Major evolutionary events and the geological record of plants — Symposium, Internat. Bot. Cong.*, 11th, Seattle, Wash., 1969: Cambridge Philos. Soc. Biol. Rev., v. 45, no. 3, p. 417-450, illus., tables, 1970.
- 04440 **Muller, J. E.; Jeletzky, J. A.** Geology of the Upper Cretaceous Nanaimo Group, Vancouver Island and Gulf Islands, British Columbia: Canada Geol. Survey Paper 69-25, 77 p., illus., tables, geol. map, 1970.
- Muller, O.** See Kirsten, T. 05706
- Muller, O.** See Allen, R. O. 07907
- Muller, P. M.** See Burke, J. D. 01287
- Mulligan, R.** See Land, A. H. 07972
- Mullineaux, Donal R.** See Crandell, Dwight R. 00248
- 04640 **Mullineaux, Donal R.** Geology of the Renton, Auburn, and Black Diamond quadrangles, King County, Washington: U.S. Geol. Survey Prof. Paper 672, 92 p., illus., tables, 1970.
- 06126 **Mumme, W. G.** The crystal structure of  $\text{SnTa}_2\text{O}_7$ , thoreaulite, an example of tin in five-fold coordination: *Am. Mineralogist*, v. 55, nos. 3-4, p. 367-377, illus., tables, 1970.
- 08582 **Mundorff, J. C.** Major thermal springs of Utah: *Utah Geol. and Mineralog. Survey Water-Resources Bull.* 13, 60 p., illus., tables, 1970.
- Mundorff, M. J.** See Crosthwaite, E. G. 07532
- 09245 **Munk, Walter.** Tides of the deep sea: *Explorers Jour.*, v. 48, no. 3, p. 177-183, illus., 1970.
- Munk, Walter.** See Wimbush, Mark. 10001
- Munn, R. W.** See Harris, J. W. 04409
- Münnich, Karl-Otto.** See Roether, Wolfgang. 06402
- Munoz, Elaine F.** See Silverman, Melvin P. 04442
- Munroe, Robert J.** See Sass, J. H. 03647
- Munsell, David A.** See Browman, David L. 10194

- 06458 **Munson, R. C.** Relationship of effect of waterflooding of the Rangely Oil Field on seismicity, *in* Engineering seismology — The works of man: Geol. Soc. America Eng. Geology Case Histories, no. 8, p. 39-49, illus., table, 1970.
- 05674 **Murase, Tsutomu; McBirney, Alexander R.** Thermal conductivity of lunar and terrestrial igneous rocks in their melting range: *Science*, v. 170, no. 3954, p. 165-167, illus., 1970.
- 01695 **Murata, K. J.** Tholeiitic basalt magmatism of Kilauea and Mauna Loa volcanoes of Hawaii: *Naturwissenschaften*, v. 57, no. 3, p. 108-113, illus., tables, 1970.
- Murata, K. J.** See Madsen, Beth M. 06182
- Murata, K. J.** See Richter, D. H. 06692
- 08701 **Murata, K. J.** A test for chemical equilibrium between olivine phenocrysts and their basaltic host melts, *in* West Commemoration Volume: Faridabad, Indian, University of Saugor, p. 331-336, illus., table, 1970.
- Murdock, J. N.** See Eaton, J. P. 04420
- Murphy, Andrew.** See Savino, John. 01633
- 01956 **Murphy, Andrew J.; Sykes, Lynn R.; Donnelly, Thomas W.** Preliminary survey of the microseismicity of the northeastern Caribbean [abs.]: *EOS*, v. 51, no. 4, p. 352, 1970.
- 03829 **Murphy, Andrew J.; Sykes, Lynn R.; Donnelly, Thomas W.** Preliminary survey of the microseismicity of the northeastern Caribbean: *Geol. Soc. America Bull.*, v. 81, no. 8, p. 2459-2463, illus., table, 1970.
- Murphy, D. K.** See Benson, R. P. 09312
- 00321 **Murphy, J. R.; Mueller, R. A.; Hays, W. W.** Characteristics of the seismic motions generated by the nuclear excavation detonations, Cabriole, Schooner, and Buggy I [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 122-123, 1970.
- 11013 **Murphy, James L.** Coiled nautiloid cephalopods from the Brush Creek Limestone (conemaugh) of eastern Ohio and western Pennsylvania: *Jour. Paleontology*, v. 44, no. 2, p. 195-205, illus., 1970.
- 05754 **Murphy, James P.; Siry, Joseph W.** Lunar mascon evidence from Apollo orbits: *Planetary and Space Sci.*, v. 18, no. 8, p. 1137-1141, illus., 1970.
- Murphy, John F.** See Houston, Robert S. 04257
- 10528 **Murphy, John R.** The effects of variations in layer thickness on the amplitude characteristics of Rayleigh and Love waves [abs.]: *EOS*, v. 51, no. 11, p. 775, 1970.
- Murphy, John R.** See Lynch, Robert D. 10541
- 06650 **Murphy, L. M.; Eppley, R. A.** Developments and plans for the Pacific Tsunami Warning System, *in* Tsunamis in the Pacific Ocean — Internat. Symposium on Tsunamis and Tsunami Research, Honolulu, Hawaii, 1969, Proc.: Honolulu, Hawaii, East-West Center Press, p. 261-270, illus., 1970.
- 05745 **Murphy, Mary E.; Modzeleski, Vincent E.; Nagy, Bartholomew; Scott, Ward M.; Young, Maria; Drew, Charles M.; Hamilton, Paul B.; Urey, Harold C.** Analysis of Apollo 11 lunar samples by chromatography and mass spectrometry — Pyrolysis products, hydrocarbons, sulfur, amino acids, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1879-1890, illus., tables, 1970.

- 00041 **Murphy, Michael A.; Gronberg, Eric C.** Stratigraphy and correlation of the lower Nevada Group (Devonian) north and west of Eureka, Nevada: *Geol. Soc. America Bull.*, v. 81, no. 1, p. 127-135, illus., 1970.
- 05746 **Murphy, R. C.; Preti, George; Nafissi-V, M. Om.; Biemann, K.** Search for organic material in lunar fines by mass spectrometry, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1891-1900, illus., table, 1970.
- Murphy, T. J.** *See* Barnes, I. L. 10606
- 10607 **Murphy, T. J.; Barnes, I. L.; Sappenfield, K. M.; Shields, W. R.** The separation of microgram amounts of lead from a silicate matrix by electrodeposition [abs.]; *eos*, v. 51, no. 11, p. 832, 1970.
- Murphy, William J.** *See* Fischer, Joseph A. 06977
- Murray, B.** *See* Rex, R. W. 06730
- Murray, B.** *See* Rex, R. W. 07147
- 09396 **Murray, Bertram G., Jr.** A redescription of two Pliocene cormorants: *Condor*, v. 72, no. 3, p. 293-298, tables, 1970.
- 05337 **Murray, C. G.** Magma genesis and heat flow — Differences between mid-ocean ridges and African rift valleys: *Earth and Planetary Sci. Letters*, v. 9, no. 1, p. 34-38, 1970.
- Murray, E. J.** *See* Harris, D. C. 06753
- 02202 **Murray, J. B.; Guest, J. E.** Circularities of craters and related structures on Earth and Moon: *Modern Geology*, v. 1, no. 2, p. 149-159, illus., table, 1970.
- Murray, J. W.** *See* Grill, E. V. 10248
- Murray, James W.** *See* Birkhead, Paul K. 06758
- 07937 **Murray, Marc Michael.** Petrology, structure, and origin of the San Isabel batholith, Wet Mountains, Colorado [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 6, p. 3484B, 1970.
- 02663 **Murray, R. C.** Dolomitization, dolomite distribution, reservoir rocks [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 862, 1970.
- 02718 **Murrell, S. A. F.; Digby, P. J.** The theory of brittle fracture initiation under triaxial stress conditions: *Royal Astron. Soc. Geophys. Jour.*, v. 19, no. 4, p. 309-334, illus., table, 1970.
- 03318 **Murrell, S. A. F.; Digby, P. J.** The theory of brittle fracture under triaxial stress conditions, [Pt.] 2: *Royal Astron. Soc. Geophys. Jour.*, v. 19, no. 5, p. 499-512, illus., 1970.
- Murri, William J.** *See* Petersen, Carl F. 01446
- Murri, William J.** *See* Smith, Carl W. 01981
- 03337 **Murrmann, R. P.; Reynolds, R. C.; Leggett, D.** Determination of cation exchange capacity of earth materials using a radiotracer technique: U.S. Army Corps Engineers Cold Regions Research and Eng. Lab. Research Report 283, 12 p., illus., tables, 1970.
- 08191 **Murrmann, R. P.; Winters, R. W.; Martin, T. G.** Gamma-ray spectra of resonance neutron irradiated earth materials: U.S. Army Corps Engineers Cold Regions Research and Eng. Lab. Research Rept. 289, 27 p., illus., tables, 1970.

**Murthy, M. K.** See Smith, Donald E. 04404

- 05711 **Murthy, V. Rama; Evensen, N. M.; Coscio, M. R., Jr.** Distribution of K, Rb, Sr and Ba and Rb-Sr isotopic relations in Apollo 11 lunar samples, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1393-1406, illus., tables, 1970.

- 08267 **Murthy, V. Rama; Griffin, W. L.** K/Rb fractionation by plagioclase feldspars: Chem. Geology, v. 6, no. 4, p. 265-271, illus., table, 1970.

- 06646 **Murty, T. S.; Boilard, Lise.** The tsunami in Alberni Inlet caused by the Alaska earthquake of March 1964, *in* Tsunamis in the Pacific Ocean — Internat. Symposium on Tsunamis and Tsunami Research, Honolulu, Hawaii, 1969, Proc.: Honolulu, Hawaii, East-West Center Press, p. 165-187, illus., tables, 1970.

**Musich, Lillian.** See Berggren, W. A. 06160

- 06153 **Muskatt, Herman Solomon.** Petrology and origin of the Clinton Group of east-central New York and its relationship to the Shawangunk Formation of southeastern New York [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5558B, 1970.

**Musser, J. J.** See Collier, C. R. 05449

- 05454 **Musser, J. J.; Pickering, R. J.** Geochemistry of water, *in* Influences of strip mining on the hydrologic environment of parts of Beaver Creek basin, Kentucky, 1955-66: U.S. Geol. Survey Prof. Paper 427-C, p. C14-C30, illus., tables, 1970.

- 05756 **Mutch, Thomas A.** Geology of the Moon — A stratigraphic view: Princeton, New Jersey, Princeton University Press, 324 p., illus., 1970.

- 00915 **Mutis-Duplat, Emilio.** Precambrian geology of a portion of the Purdy Hill quadrangle, Mason County, Texas [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 293-294, 1970.

- 03194 **Mutschler, Felix E.** Geologic map of the Snowmass Mountain quadrangle, Pitkin and Gunnison Counties, Colorado: U.S. Geol. Survey Geol. Quad. Map GQ-853, scale 1:24,000, sections, 1970.

**Mutschler, Felix E.** See Larson, Edwin E. 10486

**Muxart, R.** See Corbel, J. 08201

- 07259 **Myers, A. T.; Havens, R. G.; Niles, W. W.** Glass reference standards for trace element analysis of geologic material, *in* Developments in applied spectroscopy, V. 8 — Mid-America Spectroscopy Symposium, 20th Ann., Chicago, Ill., 1969, Selected papers: New York and London, Plenum Press, p. 132-137, tables, 1970.

**Myers, B. N.** See Kelly, T. E. 04921

- 06374 **Myers, D. A.** Availability of ground water in western Cowlitz County, Washington: Washington Dept. Ecology Water-Supply Bull. 35, 63 p., illus., tables, geol. map, 1970.

- 05401 **Myers, Donald A.; McKay, E. J.** Geologic map of the Mount Washington quadrangle, Bernalillo and Valencia Counties, New Mexico: U.S. Geol. Survey Geol. Quad. Map GQ-886, scale 1:24,000, 1970.

**Myers, Harold E.** See Association of Missouri Geologists. 09231

**Myers, J.** See Welp, T. L. 09916

- 09329 **Myers, Victor I.** Remote sensing for defining aquifers in glacial drift, Sec. 48 of Earth Resources Program, 3d ann., review — v. 3, Hydrology and oceanography: Houston, Tex., NASA Manned Spacecraft Center, Msc-03742, p. 48-1—49-20, illus., table, 1970.
- 04730 **Myerson, Robert J.** Long-term evidence for the association of earthquakes with the excitation of the Chandler wobble: Jour. Geophys. Research, v. 75, no. 32, p. 6612-6617, illus., 1970.
- 09970 **Myerson, Robert J.** Evidence for association of earthquakes with the Chandler wobble, using long term polar data of the IIs-Ipms, in Earthquake displacement fields and the rotation of the Earth (L. Mansinha, D. E. Smylie, A. E. Beck, editors)-NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 159-168, illus., table, 1970.
- 01246 **Myrick, R. M.** Ground water, in Objectives, methods, and environment — Gila River Phreatophyte Project, Graham County, Arizona: U.S. Geol. Survey Prof. Paper 655-A, p. A16-A17, illus., 1970.
- 05399 **Mytton, James W.; McDowell, Robert C.** Geologic map of the Hillsboro quadrangle, Fleming and Bath Counties, Kentucky: U.S. Geol. Survey Geol. Quad. Map GQ-876, scale 1:24,000, text, 1970.
- 07589 **Nabighian, Misac Noubar.** The wedge problem in geophysics [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 3, p. 1353B, 1970.
- Nacci, Vito.** See Lewis, Lloyd. 09482
- 04587 **Nace, Raymond L.** Hydrological and related data programs in the United States of America, in CENTO seminar on evaluation of water resources with scarce data, Tehran, Iran, 1969: Beirut, Lebanon, Middle East Devel. Div., Ministry Overseas Devel., p. 87-101, table, 1970.
- 08430 **Nace, Raymond L.** World hydrology, status and prospects [with French, Spanish, and Russian abs.], in Internat. Assoc. Sci. Hydrology-Unesco Pub. 92, p. 1-10, illus., table [1970?].
- Nadeau, Joseph.** See Baars, D. L. 02584
- 00757 **Nadeau, Joseph E.** Stratigraphy of the Leadville Limestone of central Colorado [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 341-342, 1970.
- Nadkarni, R. A.** See Ehmann, W. D. 04781
- Naeser, C. W.** See McKee, Edwin H. 00313
- Naeser, C. W.** See Meyer, C. E. 00315
- 00410 **Naeser, C. W.; Engels, J. C.; Dodge, F. C. W.** Fission track annealing and age determination of epidote minerals: Jour. Geophys. Research, v. 75, no. 8, p. 1579-1584, illus., tables, 1970.
- 05195 **Naeser, C. W.; McKee, Edwin H.** Fission-track and K-Ar ages of Tertiary ash-flow tuffs, north-central Nevada: Geol. Soc. America Bull., v. 81, no. 11, p. 3375-3383, illus., tables, 1970.
- Naeser, Charles W.** See Offield, Terry W. 09700
- Nafe, John E.** See Mayhew, Michael A. 07700
- Nafe, John E.** See Ludwig, William J. 09985
- Nafissi-V, M. Om.** See Murphy, R. C. 05746

**Naftel, W. L.** See Gabrysch, R. K. 08031

- 04362 **Nafziger, Ralph H.** Geology along the Rogue River from Merlin to Whiskey Creek: Geol. Soc. Oregon Country News Letter, v. 36, no. 9, p. 63-65, 1970.
- 09062 **Nafziger, Ralph H.** The join diopside-iron oxide-silica and its relation to the join diopside-forsterite-iron oxide-silica: *Am. Mineralogist*, v. 55, nos. 11-12, p. 2402-2052, illus., 1970.
- 09688 **Nafziger, Ralph H.** The join diopside-iron oxide-silica and its relation to the diopside-forsterite-iron oxide-silica join [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 632-633, 1970.
- 06352 **Nagata, T.; Ishikawa, Y.; Kinoshita, H.; Kono, M.; Syono, Y.; Fisher, R. M.** Magnetic properties and natural remanent magnetization of lunar materials, in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc.* — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 2325-2340, illus., tables, 1970.
- Nagata, Takeshi.** See Shima, Makoto. 05115
- 06742 **Nagata, Takeshi.** Palaeomagnetic data in connection with the evolution of the Earth's core, in *Geophysical studies on the evolution of the Earth's deep interior — A symposium, Madrid, 1969, Proc.: Physics Earth and Planetary Interiors*, v. 2, no. 5 (spec. issue), p. 311-317, illus., 1970.
- 05407 **Naghshineh-Pour, B.; Kunze, G. W.; Carson, C. D.** The effect of electrolyte composition on hydraulic conductivity of certain Texas soils: *Soil Sci.*, v. 110, no. 2, p. 124-127, illus., 1970.
- 09689 **Nagle, Frederick.** Serpentinites and metamorphic rocks at the Caribbean boundaries [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 633, 1970.
- Nagle, J. S.** See Fisher, W. L. 07329
- Nagy, Bartholomew.** See Kremp, Gerhard O. W. 11267
- Nagy, Bartholomew.** See Scott, Ward M. 01353
- Nagy, Bartholomew.** See Murphy, Mary E. 05745
- Nagy, Lois Anne.** See Kremp, Gerhard O. W. 11267
- 01957 **Naidu, A. S.; Burrell, D. C.; Hoskin, C. M.** Sediments of the south Beaufort Sea [abs.]: *EOS*, v. 51, no. 4, p. 332, 1970.
- 10081 **Naidu, A. S.; Burrell, D. C.; Dygas, Joe.** Texture, organic carbon, and clay mineralogy of western Beaufort Sea sediments [abs.], in *Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2497-2498, 1970.
- 01250 **Naidu, Prabhakar S.** Statistical structure of aeromagnetic field: *Geophysics*, v. 35, no. 2, p. 279-292, illus., 1970.
- 05571 **Naidu, Prabhakar S.** A statistical study of the interpolation of randomly spaced geophysical data: *Geoexploration*, v. 8, no. 2, p. 61-70, illus., table, 1970.
- Naidu, S. V. Nagender.** See Rao, K. V. Krishna. 10423
- 05029 **Nair, K.; Deere, D. U.** Creep behavior of salt in triaxial extension tests, in *Third symposium on salt, V. 2 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc.*, p. 208-215, illus., 1970.

- 09151 **Nair, Keshavan; Boresi, Arthur P.** Stress analysis for time-dependent problems in rock mechanics [with French and German summ.], *in* Internat. Soc. Rock Mechanics Cong., 2d, Belgrade, Yugoslavia, 1970, Proc., V. 2: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 531-536, illus., 1970.
- Nakagawa, H. M.** *See* Marranzino, A. P. 00419
- Nakamura, Noboru.** *See* Masuda, Akimasa. 08020
- Nakamura, Y.** *See* Latham, G. V. 05758
- Nakazawa, Hiromoto.** *See* Morimoto, Nobuo. 01860
- 04413 **Naldrett, A. J.; Bray, J. G.; Gasparini, E. L.; Podolsky, T.; Rucklidge, J. C.** Cryptic variation and the petrology of the Sudbury nickel irruptive: *Econ. Geology*, v. 65, no. 2, p. 122-155, illus., tables, 1970.
- 08660 **Naldrett, A. J.** Ultramafic and related mafic rocks of the Abitibi orogen [comments on "The Abitibi orogenic belt" by A. M. Goodwin and R. H. Ridler, 1970], *in* Basins and geosynclines of the Canadian Shield (A. J. Baer, editor) — Symposium, Ottawa, 1970, Papers: Canada Geol. Survey Paper 70-40, p. 24-30, illus., 1970.
- 09690 **Naldrett, A. J.** Syn-volcanic ultramafic bodies, a new class [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 633-634, 1970.
- Nal'nyayeva, T. I.** *See* Saks, V. N. 10094
- Nalwalk, A. J.** *See* Hart, S. R. 00475
- 07938 **Namy, Dominique.** An investigation of certain aspects of stress-strain relationships for clay soils [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 6, p. 3380B, 1970.
- Nance, J. W.** *See* Boos, C. M. 05360
- Nance, J. W.** *See* Boos, C. M. 05363
- Nance, R. B.** *See* Damberger, H. H. 05534
- Nance, R. B.** *See* Damberger, H. H. 05535
- Nance, Roger B.** *See* Smith, W. H. 05533
- 05540 **Nance, Roger B.** Limestones and phosphatic rocks from the Summum and Liverpool Cyclothems in western Illinois, *in* Depositional environments in parts of the Carbondale Formation, western and northern Illinois — Francis Creek Shale and associated strata and Mazon Creek biota — *Geol. Soc. America, Coal Geology Div., Ann. Field Trip*, Milwaukee, Wis., 1970: Illinois Geol. Survey Guidebook Ser. 8, p. 75-83, illus., 1970.
- Nance, Roger B.** *See* Hopkins, M. E. 05543
- Nance, W.** *See* Taylor, S. R. 05725
- Nance, W. B.** *See* Martin, J. R. 02266
- Nance, Weldon B.** *See* King, Elbert A., Jr. 05675
- Nandi, A.** *See* Wynne-Edwards, H. R. 08121
- 07796 **Napier, John.** The roots of mankind: Washington, D.C., Smithsonian Institution Press, 240 p., illus., tables, 1970.

- 08461 **Naplin, Charles E.** Ground-water survey of the Buxton area, Traill County, North Dakota: North Dakota Water Comm. North Dakota Ground-Water Studies, no. 71 (SEC Project No. 741), 93 p., illus., tables, 1970.
- 09931 **Naplin, Charles E.** Ground-water survey of the Willow City area, Bottineau County, North Dakota: North Dakota Water Comm., North Dakota Ground-Water Studies, no. 70 (SWC Project No. 1463), 46 p., illus., tables, 1968.
- 09932 **Naplin, Charles E.** Ground-water survey of the Makoti area, Ward County, North Dakota: North Dakota Water Comm., North Dakota Ground-Water Studies, no. 72, 44 p., illus., tables, 1968.
- 09933 **Naplin, Charles E.** Ground-water survey of the Columbus area, Burke County, North Dakota: North Dakota Water Comm., North Dakota Ground-Water Studies, no. 73, (SWC Project No. 745), 59 p., illus., tables, 1969.
- 09618 **Naprstek, Vladimir.** Recent sediments of Cayo Chico de Moa, Cuba [with Czechoslovakian abs.]: Carolina Univ. Acta — Geologica, no. 2, p. 113-115, illus., tables, 1970.
- 09619 **Naprstek, Vladimir.** Black sand from the Bibijagua beach, Isla de Pinos, Cuba [with Czechoslovakian abs.]: Carolina Univ. Acta — Geologica, no. 2, p. 137-141, illus., 1970.
- 03203 **Narayana Iyengar, R.; Sundara Raja Iyengar, K. T.** Probabilistic response analyses to earthquakes: Am. Soc. Civil Engineers Proc., v. 96, paper 7321, Jour. Eng. Mechanics Div., no. EM 3, p. 207-225, illus., table, 1970.
- 06553 **Nargolwalla, S. S.; Niewodniczanski, J.; Sudduth, J. E.** Experimental sensitivities for 3 MeV neutron activation analysis: Jour. Radioanal. Chemistry, v. 5, no. 2, p. 403-423, illus., tables, 1970.
- 06291 **Nash, D. B.; Greer, R. T.** Luminescence properties of Apollo 11 lunar samples and implications for solar-excited lunar luminescence, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 2341-2350, illus., table, 1970.
- Nash, Raymond A., Jr.** See Henrikson, Paul. 03673
- 03161 **Nash, W. P.; Wilkinson, J. F. G.** Shonkin Sag laccolith, Montana — [Pt.] 1, Mafic minerals and estimates of temperature, pressure, oxygen fugacity, and silica activity: Contr. Mineralogy and Petrology, v. 25, no. 4, p. 241-269, illus., tables, 1970.
- 09691 **Nash, W. P.** Mineralogy and petrology of the Iron Hill carbonatite complex, Powderhorn, Colorado [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 634, 1970.
- Nasmith, H. W.** See Mathews, W. H. 07694
- 10392 **Nasmith, Hugh.** Pleistocene geology of the Queen Charlotte Islands and southern British Columbia, in *Early man and environments in northwest North America* (R. A. Smith and J. W. Smith, editors) — Calgary Univ. Archaeol. Assoc. Ann. Paleoenvironmental Workshop, 2d, Proc.: Calgary, Alberta, Univ. Calgary Students' Press, p. 5-8, illus., 1970.
- Nason, R. D.** See Cloud, W. K. 00858
- Nason, Robert D.** See Rogers, Thomas H. 10876
- 00322 **Nason, Robert D.** Active slippage on the Buena Vista thrust fault, Taft, California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 123, 1970.
- 00323 **Nason, Robert D.** Fault creep slippage in the street grids of Hollister and Hayward, California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 123-124, 1970.



- 01805 **Nason, Robert D.** Geodetic measurements and fault slip in central California [abs.]: EOS, v. 51, no. 4, p. 427, 1970.
- 09978 **Nason, Robert D.; Tocher, Don.** Measurement of movement on the San Andreas fault, in Earthquake displacement fields and the rotation of the Earth (L. Mansinha, D. E. Smylie, A. E. Beck, editors) - NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 246-254, illus., 1970.
- 10549 **Nason, Robert D.** Fault creep events near Hollister, California [abs.]: EOS, v. 51, no. 11, p. 779-780, 1970.
- Nason, Robert D.** See King, Chi-Yu. 10736
- 10829 **Nason, Robert D.** Fault creep slippage investigations in central California [abs.] - internat. Symposium on Recent Crustal Movements and Associated Seismicity, Wellington, N.Z., 1970, Proc.: Wellington, N.Z., Royal Soc. of New Zealand, p. 27, 1970.
- 11230 **Nason, Robert D.; Rogers, Thomas H.** Hayward-Hollister field trip — Hayward, Calaveras and San Andreas faults — 1970 Field Trip 5: Hayward, Calif., Geol. Soc. America, Cordilleran Sec., [26] p., illus., 1970.
- 00578 **Nassichuk, W. W.** Permian ammonoids from Devon and Melville Islands, Canadian Arctic Archipelago: Jour. Paleontology, v. 44, no. 1, p. 77-97, illus., tables, 1970.
- 01214 **Nassichuk, W. W.; Furnish, W. M.** *Christioceras*, an arctic Pennsylvanian ammonoid, discovered in west Texas: Jour. Paleontology, v. 44, no. 2, p. 399-401, illus., 1970.
- 05807 **Nassichuk, W. W.; Spinosa, Claude.** *Helicoprion* sp., a Permian elasmobranch from Ellesmere Island, Canadian Arctic: Jour. Paleontology, v. 44, no. 6, p. 1130-1132, illus., 1970.
- Nassichuk, Walter W.** See Ross, Charles A. 03643
- 01234 **Nathan, Harold Decantillon.** The geology of a portion of the Duluth complex, Cook County [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 8, p. 3710B-3711B, 1970.
- Nation, J. B.** See Hales, A. L. 01920
- Nation, J. B.** See Hales, A. L. 05321
- 05321 **Naugler, Frederic P.** Aleutian deep-sea channel on the Aleutian abyssal plain: Nature, v. 228, no. 5276, p. 1081-1082, illus., 1970.
- Nation, J. B.** See Hales, A. L. 05796
- 10894 **National Petroleum Council.** Future petroleum provinces of the United States — A summary: [Washington, D.C.] Natl. Petroleum Council, 138 p., illus., tables, 1970.
- 03196 **National Research Council.** (Committee on Polar Research). Polar research, a survey: Natl. Acad. Sci. [Pub. 1753], 204 p., illus., 1970.
- 04960 **National Research Council.** (Comm. Alaska Earthquake, Div. Earth Sci.). The great Alaska earthquake of 1964 — Human ecology: Washington, D. C., Natl. Acad. Sci., 510 p., illus., tables, 1970.
- 09190 **National Research Council of Canada.** Instrumentation and observation techniques, V. I-2 — Hydrology Symposium, 7th, Victoria, B. C., 1969, Proc.: [Ottawa] Canada Dept. Energy, Mines and Resources Inland Waters Br., 343 and 123 p., illus., tables [1970,2].

- 04953 **Natl. Assoc. Geology Teachers; Smith, Clay T.** (editor). Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region, 1970 — NAGT, Southwest Sec., Field Conf. Earth Sci., Cedar City, Utah, 1970: Socorro, N. Mex., New Mexico Inst. Mining and Technology, 183 p., illus., table, 1970.
- 09763 **Natl. Research Council Canada; Eng. Inst. Canada Geotech. Eng. Div.** Report on the geotechnical sciences to the Solid-Earth Science Study Group of the Science Council of Canada Assoc. Comm. Geotech. Research Tech. Memo. 95, p. 11-169, apps., 1969.
- 04883 **Naugler, Frederic P.; Rea, David K.** Abyssal hills and sea-floor spreading in the central North Pacific: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 3123-3127, illus., 1970.
- 05287 **Naugler, Frederic P.** Aleutian deep-sea channel on the Aleutian abyssal plain: *Nature*, v. 228, no. 5276, p. 1081-1082, illus., 1970.
- 09771 **Naugler, Frederic P.** Bathymetry of a region (PORL - 421 - 2) north of the Hawaiian Ridge: U.S. ESSA Tech. Rept. Erl 82 - Pol 1, 13 p., illus., 1968.
- Nauman, J. W.** See Cory, R. L. 08676
- Nava, D.** See Hart, S. R. 08270
- 02264 **Nava, David F.** Atomic absorption and classical chemical analyses of the Lost City meteorite [abs.]: *EOS*, v. 51, no. 7, p. 580, 1970.
- Navarro, Enrique.** See Moore, Bruce R. 00741
- 06388 **Navrotsky, A.; Muan, A.** Phase equilibria and thermodynamic properties of solid solutions in the systems  $\text{ZnO-CoO-TiO}_2$  and  $\text{ZnO-NiO-TiO}_2$  at  $1050^\circ\text{C}$ : *Jour. Inorganic and Nuclear Chemistry*, v. 32, no. 11, p. 3471-3484, illus., tables, 1970.
- 10508 **Nawrocki, Michael A.** Comparison of methods for evaluating aquifer characteristics [abs.]: *EOS*, v. 51, no. 11, p. 755, 1970.
- Naylor, R. S.** See Coombs, D. S. 00848
- 06453 **Naylor, R. S.; Steiger, R. H.; Wasserburg, G. J.** U-Th-Pb and Rb-Sr systematics in  $2700 \times 106$ -year old plutons from the southern Wind River Range, Wyoming: *Geochim. et Cosmochim. Acta*, v. 34, no. 11, p. 1133-1159, illus., tables, 1970.
- 03925 **Naylor, Richard.** Radiometric dating of pennine-type nappes in the northern Apalachians, in *Geochronology of Phanerozoic orogenic belts — Colloquium, Switzerland, 1969*, Papers: *Eclogae Geol. Helvetiae*, v. 63, no. 1, p. 230, 1970.
- 09692 **Naylor, Richard S.** Continent collision and the Acadian orogeny [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 634-635, 1970.
- Neal, William J.** See Middleton, Gerard V. 02657
- 03615 **Neal, William J.** Carbonate facies and paleogeography of the Blackjack Creek Formation (Pennsylvanian), Missouri — Reply to comment by G. W. James [1970] on 1969 paper: *Jour. Sed. Petrology*, v. 40, no. 2, p. 767-768, 1970.
- Neale, E. R. W.** See Williams, Harold. 01505
- 02274 **Nease, Felton R.; Wolf, Frederick A.** Nonpetrified fossils in Pleistocene sediment from a marl quarry site in eastern North Carolina: *Elisha Mitchell Sci. Soc. Jour.*, v. 86, no. 1, p. 41-43, 1970.
- Nease, Felton R.** See Wolf, Frederick A. 02275

- 07939 **Neasham, John West.** Sedimentology of the Willwood Formation (lower Eocene) - An alluvial molasse facies in northwestern Wyoming, U.S.A. [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3484B, 1970.
- Neathery, Thornton L.** See Bentley, Robert D. 00673
- 00742 **Neathery, Thornton L.; Bentley, Robert D.** Southern terminus of the Brevard fault zone [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 233, 1970.
- Neathery, Thornton L.** See Bentley, Robert D. 01903
- Neathery, Thornton L.** See Bentley, Robert D. 06059
- 07400 **Neathery, Thornton L.** Geology and mining of low grade talc deposits, Tallapoosa County, Alabama [abs.]: Mining Eng., v. 22, no. 9, p. 45, 1970.
- Neathery, Thornton L.** See Wampler, J. Marion. 07734
- Neathery, Thornton L.** See Alabama Geological Society. 07735
- 00456 **Neave, K. G.; Savage, J. C.** Icequakes on the Athabasca glacier: Jour. Geophys. Research, v. 75, no. 8, p. 1351-1362, illus., 1970.
- 09072 **Nebraska Soil Water Conserv. Comm.** Comprehensive report on land and water resources of the Big River basin: Nebraska Soil and Water Conserv. Comm. State Water Plan Pub. 201, 103 p., illus., tables, 1968; Pub. 201A, Appendix, 143 p., illus., tables, 1968.
- Nedveckaite, T. N.** See Styra, B. I. 03221
- 09693 **Needham, H. D.; Connolly, J. R.** Sedimentary sequences of modern abyssal plains [abs.]: Geol. Soc. America Abs. with programs, v. 2, no. 7, p. 635, 1970.
- Needham, R. A.** See Koehler, J. G. 10251
- Neeley, V. I.** See Brenden, B. B. 04782
- 00743 **Neff, James R.; Blankenship, Terry L.; Bonnett, Richard B.; Scrudato, Ronald J.** Teays River and lake deposits [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 233-234, 1970.
- 00324 **Neff, Thomas R.** The Buffalo Mountain pluton dike swarm [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 124, 1970.
- 01267 **Neff, Thomas Rodney.** Petrology and structure of the Buffalo Mountain pluton, Humboldt County, Nevada [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 8, p. 3711B, 1970.
- 00325 **Nehru, C. E.** Morphology and growth trend changes in zircons during metamorphism — A case study from Upper Dripping Spring Formation, Gila County, Arizona [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 124-125, 1970.
- 02373 **Nehru, C. E.; Prinz, Martin.** Petrologic study of the Sierra Ancha sill complex, Arizona: Geol. Soc. America Bull., v. 81, no. 6, p. 1733-1765, illus., tables, 1970.
- Nehru, C. E.** See Bhattacharji, S. 07680
- 01601 **Neidell, N. S.** Semblance and other coherency measures for multichannel data [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 3, p. 560, 1970.
- 01708 **Neill, Charles R.** Formation of flood plain lands — Discussion [of paper 6574 by W. C. Carey, 1969]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Hydraulics Div., no. HY 1, p. 297-298, illus., 1970.

Nelen, J. *See* Clarke, R. S., Jr. 02265

Nelen, Joseph. *See* Clarke, Roy S., Jr. 10268

Nelligan, W. B. *See* Wahl, J. S. 09355

Nelson, Arthur E. *See* Hadley, Jarvis B. 04691

- 03532 Nelson, C. Hans; Carlson, P. R.; Byrne, J. V.; Alpha, Tau Rho. Development of the Astoria Canyon-Fan physiography and comparison with similar systems: *Marine Geology*, v. 8, nos. 3-4, p. 259-291, illus., tables, 1970.

- 04176 Nelson, C. Hans. Potential development of heavy metal resources in the northern Bering Sea in Alaska Sci. Conf., 20th, College, 1969, Proc.: *Sci. Alaska* 1969, p. 366-376, 1970.

- 10082 Nelson, C. Hans. Late Cenozoic history of deposition of northern Bering shelf [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2498, 1970.

- 09300 Nelson, Gerald D. Recognition of crops and soils by spot density measurements of imagery, Sec. 26 of Earth Resources Program, 3d ann., review — v. 2, Agriculture, forestry, and sensor studies: Houston, Tex., NASA Manned Spacecraft Center, Msc-03742, p. 26-1 — 26-34, illus., tables, 1970.

- 07662 Nelson, Henry F.; Bray, Ellis E. Stratigraphy and history of the Holocene sediments in the Sabine-High Island area, Gulf of Mexico, in *Deltaic sedimentation, modern and ancient*: Soc. Econ. Paleontologists and Mineralogists Spec. Pub. 15, p. 48-77, illus., tables, 1970.

- 10216 Nelson, J. G.; Chambers, M. J. (editors). *Water — Selected readings*: Toronto, London, Methuen, 444 p., illus., tables, 1969.

Nelson, J. S. *See* Kruse, G. H. 07442

- 01716 Nelson, Jack L.; Haushild, W. L. Accumulation of radionuclides in bed sediments of the Columbia River between Hanford reactors and McNary Dam: *Water Resources Research*, v. 6, no. 1, p. 130-137, illus., tables, 1970.

- 10083 Nelson, Joseph L. Application of acoustics to determination of permafrost distribution, in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2498, 1970.

- 06225 Nelson, Katherine G.; Lasca, Norman P. Milwaukee, its geologic setting: *Geotimes*, v. 17, no. 8, p. 12-18, illus., 1970.

Nelson, L. A. *See* Daniels, R. B. 03990

- 04306 Nelson, Leonard M. A method of estimating annual suspended-sediment discharge, in *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C233-C236, illus., 1970.

Nelson, Lloyd S. *See* Blander, Milton. 04119

Nelson, Lloyd S. *See* Blander, Milton. 05677

Nelson, R. A. *See* Einstein, H. H. 07439

- 02551 Nelson, R. E. Semimicro determination of sulfate in water extracts of soils: *Soil Sci. Soc. America Proc.*, v. 34, no. 2, p. 343-345, table, 1970.

Nelson, R. E. *See* Nettleton, W. D. 07063

- 06117 **Nelson, Robert S.; Semken, Holmes A.** Paleocological and stratigraphic significance of the muskrat in Pleistocene deposits: *Geol. Soc. America Bull.*, v. 81, no. 12, p. 3733-3737, illus., 1970.
- 07940 **Nelson, Robert Stanley, Jr.** The glaciation of the headwaters area of Clear Creek, Bighorn Mountains, Wyoming [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 6, p. 3484B-3485B, 1970.
- 10751 **Nelson, S. J.; Andrichuk, J. M.** (and others). Petroleum geology, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor); *Canada Geol. Survey Paper* 69-56, p. 15-35, 1970.
- 01806 **Nelson, T. H.; Roeder, D. H.** Post-Paleozoic evolution of the northern Pacific Ocean [abs.]: *EOS*, v. 51, no. 4, p. 421, 1970.
- Nelson, T. H.** See Roeder, D. H. 02069
- Nelson, Thomas H.** See White, David A. 05201
- Nelson, Willis H.** See Pierce, William G. 00097
- 08613 **Nemec, Vaclav.** The law of regular structural pattern — Its applications with special regard to mathematical geology, in *Geostatistics — A colloquium* (D. F. Merriam, editor), Lawrence, Kan., 1970, *Proc.*: New York, Plenum Press, p. 63-78, illus., tables, 1970.
- Ness, A. O.** See Parsons, R. B. 02568
- 02664 **Nestell, M. K.; Danner, W. R.** Cache Creek fusulinids from southern British Columbia [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 862, 1970.
- Nettleton, W. D.** See Gamble, E. E. 02548
- 07063 **Nettleton, W. D.; Flach, K. W.; Nelson, R. E.** Pedogenic weathering of tonalite in southern California: *Geoderma*, v. 4, no. 4, p. 387-402, illus., tables, 1970.
- 08543 **Neuman, Karl R.** Palynology of interflow sediments from the Standard Oil Company of California Rattlesnake Hills No. 1 well, Benton County, Washington, in *Columbia River Basalt Symposium, 2nd*, Cheney, Wash., 1969, *Proc.*: Cheney, Eastern Washington State College Press, p. 201-207, illus., 1970.
- 03076 **Neuman, Shlomo P.; Witherspoon, Paul A.** Finite element method of analyzing steady seepage with a free surface: *Water Resources Research*, v. 6, no. 3, p. 889-897, illus., 1970.
- 05056 **Neuman, Shlomo P.; Witherspoon, Paul A.** Variational principles for confined and unconfined flow of ground water: *Water Resources Research*, v. 6, no. 5, p. 1376-1382, illus., 1970.
- 01538 **Neumann, A. Conrad; Gebelein, Conrad D.; Scoffin, Terence P.** The composition, structure, and erodability of subtidal mats, Abaco, Bahamas: *Jour. Sed. Petrology*, v. 40, no. 1, p. 274-297, illus., tables, 1970.
- 04943 **Neumann, A. Conrad; Ball, Mahlon M.** Submersible observations in the Straits of Florida — Geology and bottom currents: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 2861-2873, illus., table, 1970.
- 05961 **Neuschel, Sherman K.** Correlation of aeromagnetism and aeroradioactivity with lithology in the Spotsylvania area, Virginia: *Geol. Soc. America Bull.*, v. 81, no. 12, p. 3575-3582, illus., 1970.
- Nevens, Thomas D.** See Culbertson, William J. 10904

- 08646 **New Mexico Geol. Soc.; Woodward, Lee A.** (editor). Guidebook of the Tyrone-Big Hatchet Mountains, Florida Mountains region — New Mexico Geol. Soc. Field Conf., 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, 162 p., illus., tables, 1970.
- 09019 **New York State Geol. Assoc.; Barnett, Stockton G.** (editor). Guidebook to field excursions at the 41st annual Meeting, May 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., 150 p., illus., tables, 1969.
- 11233 **New York State Geol. Assoc.** (Heaslip, William Graham, editor). Field trip guidebook, 42nd annual meeting, May 1970, Cortland, N.Y.: Brockport, N.Y., New York State Geol. Assoc., 145 p., illus., 1970.
- 07471 **Newall, Geoffrey; Rast, Nicholas.** (editors). Mechanism of igneous intrusion — Liverpool Geol. Soc. Symposium, Liverpool, England, 1969, Proc.: Geol. Jour., Spec. Issue no. 2, 380 p., illus., tables, 1970.
- 01188 **Newcomb, R. C.; Repenning, C. A.** Occurrence of mammoth fossils in the Touchet Beds, south-central Washington: Northwest Sci., v. 44, no. 1, p. 16-18, illus., 1970.
- 06378 **Newcomb, R. C.** Tectonic structure of the main part of the basalt of the Columbia River Group, Washington, Oregon, and Idaho: U.S. Geol. Survey Misc. Geol. Inv. Map 587, scale 1:500,000, text, 1970.
- 08540 **Newcomb, R. C.** The Columbia River group — Its tectonic structure in Washington, Oregon, and Idaho, in Columbia River Basalt Symposium, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 173-175, 1970.
- 00401 **Newcombe, R. B.** Jed B. Maebius (1907-1969): Am. Assoc. Petroleum Geologists Bull., v. 54, no. 2, p. 362-363, portrait, 1970.
- 10462 **Newcome, Roy, Jr.; Thomson, F. H.** Water for industrial development in Amite, Franklin, Lincoln, Pike, and Wilkinson Counties, Mississippi: Jackson, Miss., Mississippi Research and Development Center (in cooperation with U.S. Geol. Survey), 61 p., illus., tables, 1970.
- 07866 **Newell, Norman D.; Boyd, Donald W.** Oyster-like Permian Bivalvia: Am. Mus. Nat. History Bull., v. 143, art. 4, p. 217-282, illus., tables, 1970.
- 06827 **Newell, Wayne L.** Factors influencing the grain of the topography along the Willoughby Arch in northeastern Vermont: Geog. Annaler, v. 52A, no. 2, p. 103-112, illus., 1970.
- Newlon, Howard H., Jr.** See Ozol, Michael A. 09705
- Newman, W. A.** See Lonsdale, P. F. 09648
- 03048 **Newmark, Nathan M.** Current trends in the seismic analysis and design of high-rise structures, Chap. 16 in Earthquake engineering (R. L. Wiegel, editor): Englewood Cliffs, N.J., Prentice-Hall, p. 403-424, illus., table, 1970.
- 02809 **Newnham, Ivan.** Dr. A. D. Wadsley, 1918-1969, in Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969, Proc.: Physics Earth and Planetary Interiors, v. 3, p. VI-VIII, portrait, 1970.
- 05625 **Newton, Geoffrey B.; Dutcher, Russell R.** An inexpensive student sample splitter: Jour. Sed. Petrology, v. 40, no. 3, p. 1051-1052, illus., table, 1970.
- Newton, George D.** See Lundin, Robert F. 06566
- Newton, R. C.** See Smith, J. V. 05753
- Ney, C. S.** See Brown, A. Sutherland. 03464

**Ng-Yelum, Joyce.** *See* Cunningham, R. L. 11261

**Niazi, Mansour.** *See* Bolt, Bruce A. 01679

- 04501 **Niblett, E. R.; Whitham, K.** Multi-disciplinary studies of geomagnetic variation anomalies in the Canadian Arctic, *in* Symposium on multidisciplinary studies of unusual regions of the upper mantle, Madrid, Spain, 1969, Proc.: Jour. Geomagnetism and Geoelectricity, v. 22, nos. 1-2, p. 99-111, illus., 1970.

- 05578 **Niccum, Marvin R.** The construction and subsurface geology of the PBF waste seepage wells, *in* Engineering geology and soils engineering symposium, 8th Ann., Pocatello, Idaho, 1970, Proc.: Boise, Idaho, Idaho Dept. Highways, p. 65-84, illus., 1970.

- 04990 **Nichiporuk, Walter; Bingham, Elizabeth.** Vanadium and copper in chondrites: Meteoritics, v. 5, no. 3, p. 115-130, illus., tables, 1970.

- 05341 **Nichiporuk, Walter; Moore, Carleton B.** Lithium in chondritic meteorites: Earth and Planetary Sci. Letters, v. 9, no. 3, p. 280-286, illus., tables, 1970.

- 04870 **Nichol, Ian; Garrett, R. G.; Webb, J. S.** The role of some statistical and mathematical methods in the interpretation of regional geochemical data — A reply [to 1969 discussion by A. J. Parsley and J. D. H. Doveton of 1969 paper]: Econ. Geology, v. 65, no. 5, p. 593-594, 1970.

**Nicholls, J.** *See* Carmichael, I. S. E. 03177

**Nicholls, J.** *See* Ghent, E. D. 06786

- 07359 **Nicholls, James Watson.** Studies of the volcanic petrology of the Navajo-Hopi area, Arizona [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2066B, 1970.

**Nichols, Bruce M.** *See* Campbell, K. Vincent. 01186

- 00916 **Nichols, Chester E.** Reconnaissance heavy metals survey in the Stoutland, Missouri quadrangle [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 294, 1970.

- 05671 **Nichols, Clayton R.** Diabase argillation at King Mountain, Kiowa County, Oklahoma, *in* Symposium on environmental aspects of clay minerals: Jour. Sed. Petrology, v. 40, no. 3, p. 848-845, illus., tables, 1970.

- gillation at King Mountain, Kiowa County, Oklahoma, *in* Symposium on environmental aspects of clay minerals: Jour. Sed. Petrology, v. 40, no. 3, p. 848-854, illus., tables, 1970.
- 08417 **Nichols, Douglas James.** Palynology in relation to depositional environments of lignite in the Wilcox Group (early Tertiary) in Texas [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3491B, 1970.
- 00824 **Nichols, Harvey.** Late Quaternary pollen diagrams from the Canadian Arctic barren grounds at Pelly Lake, northern Keewatin, N. W. T.: Arctic and Alpine Research, v. 2, no. 1, p. 43-61, illus., 1970.
- 03933 **Nichols, J. D.; Stone, J. F.** Evaluation of soil moisture measurements in Oklahoma as soil characteristics for classification: Soil Sci. Soc. America Proc., v. 34, no. 4, p. 638-641, illus., table, 1970.
- Nichols, Maynard M.** See Ellison, Robert L. 00782
- 07055 **Nichols, R. A. H.** Petrology and economic geology of the Upper Devonian Birdbear Formation in southeastern Saskatchewan: Saskatchewan Dept. Mineral Resources Rept. 125, 94 p., illus., tables, 1970.
- Nichols, Rachel.** See Matsumoto, Mayme. 02714
- Nicholson, Alex.** See Johnson, Kenneth S. 02494
- 07254 **Nicholson, Max.** The environmental revolution — A guide for the new masters of the world: New York, McGraw-Hill Book Co., 366 p., illus., tables, 1970.
- 10421 **Nicholson, Patrick S.; Fulrath, Richard M.** Differential thermal calorimetric estimation of kaolinite-metakaolinite endothermic enthalpy: Am. Ceramic Soc. Jour., v. 53, no. 5, p. 278, tables, 1970.
- 10422 **Nicholson, Patrick S.; Fulrath, Richard M.** Differential thermal calorimetric determination of the thermodynamic properties of kaolinite: Am. Ceramic Soc. Jour., v. 53, no. 5, p. 237-240, illus., table, 1970.
- 02026 **Nickel, E. H.** The application of ligand-field concepts to an understanding of the structural stabilities and solid-solution limits of sulphides and related minerals, *in* Geochemical application of crystal-field theory: Chem. Geology, v. 5, no. 4, p. 233-241, illus., tables, 1970.
- Nickel, E. H.** See Faye, G. H. 06631
- 08371 **Nicks, Oran W.** (editor). This island Earth: U.S. Natl. Aeronautics and Space Adm. Spec. Pub., SP-250, 182 p., illus., 1970.
- Nicol, Alan B.** See Parry, W. T. 07413
- 09395 **Nicol, David.** Pelecypods, successful invaders of the infauna: Nautilus, v. 84, no. 2, p. 75-77, 1970.
- Nicoll, Robert S.** See Pollock, Charles A. 03541
- 03704 **Niedoroda, A. W.; Tanner, W. F.** Preliminary study of transverse bars: Marine Geology, v. 9, no. 1, p. 41-62, illus., 1970.
- 09820 **Nieland, Jim.** "spatter cone pits," Sand Mountain Lava Field, Oregon Cascades: ore Bin, v. 32, no. 12, p. 231-236, illus., 1970.
- 02145 **Nielsen, Bjarne Leth.** Paa spor af sjældne metaller i Sydgrønland — [Pt.] 8, Man har atter boret paa Kvanefjeldet, kan uranmalmen brydes, [On trace and rare metals in South Greenland — [Pt.] 8, Prospecting activities on Kvanefjeld, uranium metals (with English abs.)]: Grönland 1970, no. 5, p. 129-136, illus., 1970.



- 06250 **Nielsen, Bjarne Leth.** Preliminary report on the core drillings in the radioactive rocks of Kvanefjeld in the Ilimaussaq intrusion, *in* Report of activities, 1969: Grönlands Geol. Undersögelse Rap. 28, p. 33-35, 1970.
- Nielsen, H.** *See* Schiller, W.-R. 04321
- 08682 **Nielsen, Richard L.** Mineralization and alteration in calcareous rocks near the Santa Rita stock, New Mexico, *in* Guidebook of the Tyrone-Big Hatchet Mountains-Florida Mountains region — New Mexico Geol. Soc. Field Conf., 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, p. 133-139, illus., tables, 1970.
- 04132 **Nielson, Dennis N.** Washboard moraines in northeastern North Dakota: *Compass*, v. 47, no. 3, p. 154-162, illus., 1970.
- Niem, Alan R.** *See* Picha, Frantisek. 09519
- 07579 **Nieswand, George Heinz.** The conjunctive use of surface and ground waters in the Mullica River basin, New Jersey — A change constrained linear programming approach [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 3, p. 1262B, 1970.
- Niewodniczanski, J.** *See* Nargolwalla, S. S. 06553
- 07220 **Nightingale, H. I.; Bianchi, W. C.** Rapid measurement of hydraulic conductivity changes in slowly permeable soils: *Soil Sci.*, v. 110, no. 4, p. 221-228, illus., tables, 1970.
- 00429 **Nightingale, Harry I.** Statistical evaluation of salinity and nitrate content and trends beneath urban and agricultural areas, Fresno, California: *Ground Water*, v. 8, no. 1, p. 22-28, illus., tables, 1970.
- 00531 **Nigrini, Andrew.** Prediction of ionic fluxes in rock alteration processes at elevated temperatures [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 7, p. 3243B, 1970.
- 04231 **Nigrini, Andrew.** Diffusion in rock alteration systems — [Pt.] I, Prediction of limiting equivalent ionic conductances at elevated temperatures: *Am. Jour. Sci.*, v. 269, no. 1, p. 65-91, illus., tables, 1970.
- Nigrini, Catherine.** *See* Cita, Maria B. 01348
- 08448 **Nigrini, Catherine.** Radiolarian assemblages in the North Pacific and their application to a study of Quaternary sediments in core V20-130 *in* Geological Investigations of the North Pacific (James D. Hays, editor): *Geol. Soc. America Mem.* 126, p. 139-183, illus., tables, 1970.
- Niihara, Toshihiro.** *See* Takeno, Setsuo. 09116
- Niles, W. W.** *See* Myers, A. T. 07259
- 09694 **Nilsen, Tor H.** Paleocurrent analysis of the flysch-like Butano Sandstone (eocene), Santa Cruz Mountains, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 636, 1970.
- 08157 **Nininger, R. D.** Uranium reserves, future demand and the extent of the exploration problem, *in* Uranium exploration geology — Panel on uranium exploration geology, Vienna, 1970, *Proc.: Vienna, Austria, Internat. Atomic Energy Agency*, p. 3-19, incl. discussion, illus., 1970.
- Ninkovich, Dragoslav.** *See* Hays, James D. 08450
- Nishi, Charles K.** *See* Prokopovich, Nikola P. 10976
- Nishiguchi, Katsuhisa.** *See* Morimoto, Nobuo. 01860

- 03404 **Nishimura, Susuma.** Disequilibrium of the U-238 series in recent volcanic rocks: *Earth and Planetary Sci. Letters*, v. 8, no. 4, p. 293-300, illus., tables, 1970.
- Nishioka, R.** *See* Adams, W. M. 10534
- 07230 **Nishita, H.; Hamilton, M.** Spurious thermoluminescence of soils: *Soil Sci.*, v. 110, no. 6, p. 371-378, illus., table, 1970.
- Niskin, S.** *See* Östlund, H. Gote. 06467
- Nissenbaum, A.** *See* Brown, Frederick S. 06073
- 05819 **Nitecki, Matthew H.; Golden, Julia.** Catalogue of type specimens of trilobites in Field Museum of Natural History: *Fieldiana—Geology*, v. 22, 117 p., 1970.
- 06227 **Nitecki, Matthew H.** North American cyclocrinitid algae: *Fieldiana — Geology*, v. 21, 182 p., illus., tables, 1970.
- Nitecki, Matthew H.** *See* Golden, Julia. 06898
- Nitecki, Matthew H.** *See* Golden, Julia. 06899
- Nitecki, Matthew H.** *See* Golden, Julia. 06900
- 06901 **Nitecki, Matthew H.** Redescription of *Ischadites elrodi* (S. A. Miller, 1892), a Lower Devonian receptaculitid: *Fieldiana — Geology*, v. 20, no. 5, p. 77-83, illus., 1970.
- Nitsan, U.** *See* Shankland, T. J. 10632
- Noble, D. C.** *See* McKee, E. H. 02198
- Noble, D. C.** *See* Marvin, R. F. 05196
- Noble, Donald C.** *See* Korrington, Marjorie K. 00297
- 00431 **Noble, Donald C.** Significance of phenocryst resorption for the intratelluric crystallization and eruptive history of silicic pyroclastic rocks [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 125, 1970.
- 05033 **Noble, Donald C.** Loss of sodium from crystallized comendite welded tuffs of the Miocene Grouse Canyon Member of the Belled Range Tuff, Nevada: *Geol. Soc. America Bull.*, v. 81, no. 9, p. 2677-2687, illus., tables, 1970.
- 06164 **Noble, Donald C.; McKee, Edwin H.; Smith, James G.; Korrington, Marjorie K.** Stratigraphy and geochronology of Miocene volcanic rocks in northwestern Nevada, in *Geological Survey research 1970*, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D23-D32, illus., tables, 1970.
- 08274 **Noble, Donald C.; Hedge, Carl E.** Distribution of rubidium between sodic sanidine and natural silicic liquid: *Contr. Mineralogy and Petrology*, v. 29, no. 3, p. 234-241, illus., table, 1970.
- Noble, Donald C.** *See* Korrington, Marjorie K. 10742
- 00630 **Noble, J. A.** Structural control of gold mineralization of Tertiary age in the northern Black Hills, South Dakota [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 342, 1970.
- 07889 **Noble, J. P. A.** Biofacies analysis, Cairn Formation of Miette Reef complex (Upper Devonian) Jasper National Park, Alberta: *Bull. Canadian Petroleum Geology*, v. 18, no. 4, p. 493-543, illus., 1970.
- 02368 **Noble, James A.** Metal provinces of the western United States: *Geol. Soc. America Bull.*, v. 81, no. 6, p. 1607-1624, tables, 1970.

- Noble, John B.** *See* Molenaar, Dee. 00786
- 05859 **Noda, Edward.** Water waves generated by landslides: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7699, *Jour. Waterways, Harbors and Coastal Eng. Div.*, no. WW4, p. 835-855, illus., tables, 1970.
- Noda, Edward K.** *See* Wiegel, Robert L. 03719
- Noel, J. A.** *See* Bradshaw, L. E. 01056
- Noell, O. A.** *See* Holtz, W. G. 05317
- 03856 **Noger, M. C.; Ponsetto, Louis R.** Field trip No. 1, Geologic features of southeastern Kentucky — Pt. 2, Geology of middle and upper Paleozoic rocks along Pine Mountain front, Harlan to Pineville; Paleozoic rocks along Interstate 75, London to Lexington, in *Guidebook for field trips — Geol. Soc. America, Southeastern Sec.*, 18th Ann. Mtg., Lexington, Ky., 1970: Lexington, Ky., Kentucky Geol. Survey, p. 11-15, illus., geol. maps, 1970.
- 00326 **Nokleberg, Warren J.** Multiple folding in the Strawberry mine roof pendant, central Sierra Nevada, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 125-126, 1970.
- Nokleberg, Warren J.** *See* Page, Norman J. 00631
- 00793 **Nolan, Thomas B.** Memorial to Charles Findlay Davidson (1911-1967): *Geol. Soc. America Proc.* 1967, p. 185-191, portrait, 1970.
- 01115 **Noland, Anne Vinson.** Revisions of selected Silurian arenaceous foraminifera from north-central Kentucky and southeastern Indiana [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 7, p. 3310B, 1970.
- 00917 **Noltimier, H. C.** A re-examination of a magnetic survey on the Spavinaw Granite [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 294-295, 1970.
- 01958 **Noltimier, H. C.** Fourier analysis of several adjacent North Atlantic ridge magnetic profiles [abs.]: *EOS*, v. 51, no. 4, p. 274, 1970.
- 10577 **Noltimier, H. C.** A proposed structural evolution of the Caribbean and Central America since the Jurassic [abs.]: *EOS*, v. 51, no. 11, p. 825, 1970.
- Nooner, D. W.** *See* Oró, J. 04089
- Nooner, D. W.** *See* Oró, J. 04194
- Nooner, D. W.** *See* Gelpi, E. 04602
- 04222 **Noorany, Iraj; Gizienski, Stanley F.** Engineering properties of submarine soils, state-of-the-art review: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7536, *Jour. Soil Mechanics and Found. Div.*, no. SM5, p. 1735-1762, illus., tables, 1970.
- Nordemann, Daniel.** *See* Tobailem, Jacques. 05322
- 05457 **Nordemann, Daniel; Tobailem, Jacques.** Contribution à l'étude de l'origine des palasites [Contribution to the study of the origin of pallasites]: *Acad. Sci. Comptes Rendus*, ser. D, v. 271, no. 9, p. 753-755, table, 1970.
- 02358 **Nordlund, Reymond L.; Deere, Don U.** Collapse of Fargo grain elevator: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7172, *Jour. Soil Mechanics and Found. Div.*, no. SM2, p. 585-607, illus., tables, 1970.
- 00203 **Nordstrom, Charles E.** Lusardi Formation — A post-batholithic Cretaceous conglomerate north of San Diego, California: *Geol. Soc. America Bull.*, v. 81, no. 2, p. 601-605, illus., 1970.

**Nordstrom, Charles E.** See Peterson, Gary L. 00458

- 07828 **Nordyke, Milo D.** On the use of nuclear explosives for stimulation of geothermal heat [abs.], in Symposium on engineering with nuclear explosives — Am. Nuclear Soc. and U.S. Atomic Energy Comm., Las Vegas, Nev., 1970, Proc., V. 2: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., p. 1384-1385, illus., 1970.
- 01132 **Norford, B. S.** Ordovician and Silurian biostratigraphy of the Sogepet-Aquitaine Kaskattama Province No. 1 well, northern Manitoba: Canada Geol. Survey Paper 69-8, 36 p., illus., tables, 1970.
- 04100 **Norford, B. S.; Braun, W. K.; Chamney, T. P.; Fritz, W. H.; McGregor, D. C.; Norris, A. W.; Pedder, A. E. H.; Uyeno, T. T.** Biostratigraphic determinations of fossils from the subsurface of the Yukon Territory and the Districts of Mackenzie and Franklin: Canada Geol. Survey Paper 70-15, 19 p., illus., 1970.
- 10084 **Norford, B. S.** Silurian stratigraphic sections at Cape Tyson, Offley Island, and Cape Schuchert, northwest Greenland [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2499, 1970.
- 01196 **Norgren, J. A.; Borchardt, G. A.; Harward, M. E.** Mt. St. Helens Y ash in northeastern Oregon and south-central Washington [abs.]: Northwest Sci., v. 44, no. 1, p. 66, 1970.
- 04979 **Norling, Donald L.** Ohio — 110 years of oil and gas: Interstate Oil Compact Comm. Comm. Bull., v. 12, no. 1, p. 47-63, illus., tables, 1970.
- 00918 **Norman, Carl E.** Geometric relationship of microfractures in brittle rock to rock structure and in situ rock stresses [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 295, 1970.
- 10085 **Norman, Charles A.** Economics of Prudhoe Bay field — comparison with Bell Creek field [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2499, 1970.
- 00919 **Norman, William S.** Clay mineralogy of Pleistocene and Holocene sediments on Louisiana continental shelf [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 295-296, 1970.
- Normark, W. R.** See Mudie, J. D. 01413
- 06816 **Normark, W. R.** Channel piracy on Monterey Deep-Sea Fan: Deep-Sea Research, v. 17, no. 5, p. 837-846, illus., table, 1970.
- Normark, W. R.** See Lonsdale, P. F. 09648
- 05872 **Normark, William R.** Growth patterns of deep-sea fans: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 11, p. 2170-2195, illus., tables, 1970.
- 03269 **Normark, William Raymond.** Growth patterns of deep sea fans [abs.]: Dissert. Abs. Internat., Sec. B., Sci. and Eng., v. 30, no. 11, p. 5169B, 1970.
- Norquay, I. P.** See Costello, J. T. 02933
- Norris, A. W.** See Norford, B. S. 04100
- Norris, A. W.** See McGregor, D. C. 05294
- Norris, A. W.** See Stockwell, C. H. 07971
- 10914 **Norris, A. W.; Sanford, B. V.** Operation Winisk — an air-supported geological reconnaissance survey of the Hudson Bay lowlands, in Ontario Petroleum Inst. Conf., 7th, Windsor, 1968 [Proc.]: Chatham (Ontario), Ontario Petroleum Inst., Tech. Paper No. 1, 33 p., illus., 1968.

- 00920 **Norris, D. K.** Inclined flexural-slip folds in the eastern Canada Cordillera [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 296, 1970.
- 03477 **Norris, D. K.; Cook, Donald G.; Havard, Christina Jean; Ollerenshaw, Neil C.; Taylor, Gordon C.** Eastern and northern Cordillera, in *Geological provinces of Canada, exploration and outlook: Canadian Mining and Metall. Bull.*, v. 63, no. 693, p. 45-49, 1970.
- Norris, Dean R.** See Mason, Curtis C. 10521
- 04703 **Norris, Geoffrey; McAndrews, John H.** Dinoflagellate cysts from postglacial lake muds, Minnesota (U.S.A.): *Rev. Palaeobotany and Palynology*, v. 10, no. 2, p. 131-156, illus., table, 1970.
- 01438 **Norris, Roger A.; Hart, David N.** Confirmation of sofar-hydrophone detection of submarine eruptions: *Jour. Geophys. Research*, v. 75, no. 11, p. 2144-2147, illus., 1970.
- 06189 **Norris, Stanley E.** The effect of stream discharge on streambed leakage to a glacial outwash aquifer, in *Geological Survey research 1970, Chap. D: U.S. Geol. Survey Prof. Paper 700-D*, p. D262-D265, illus., table, 1970.
- 09233 **North American Rockwell.** (Space Division). A study for natural resources management information system and remote sensing applications prepared for Bureau of Indian Affairs, U.S. Department of Interior, Washington, D. C.: Downey, Calif., North Am. Rockwell Space Div., [163] p., illus., tables, 1970.
- Northern California Geological Society.** See U.S. Geological Survey. 07074
- 01959 **Northrop, John; Morrison, M. F.** Hydroacoustic signals from the 1968-1969 underwater and underground explosions in the Aleutian Arc [abs.]: *EOS*, v. 51, no. 4, p. 353, 1970.
- 03359 **Northrop, John.** Accuracy of earthquake epicenters on the Gorda Ridge: *Seismol. Soc. America Bull.*, v. 60, no. 1, p. 265-267, table, 1970.
- 03726 **Northrop, John; Morrison, Michael F.; Duenebier, Frederick K.** Seismic slip rate versus sea-floor spreading rate on the Eastern Pacific rise and Pacific Antarctic ridge: *Jour. Geophys. Research*, v. 75, no. 17, p. 3285-3290, illus., table, 1970.
- 03498 **Northwood, D. O.; Lewis, D.** Strain induced calcite-aragonite transformation in calcium carbonate: *Canadian Mineralogist*, v. 10, pt. 2, p. 216-224, illus., tables, 1970.
- 03143 **Norton, David L.** Uranium geology of the Gulf Coastal area: *Corpus Christi Geol. Soc. Bull.*, v. 10, no. 5, p. 19-26, 1970.
- Norton, Elinor.** See Fireman, E. L. 04555
- 04963 **Norton, Frank R. B.; Haas, J. Eugene.** The cities and towns, in *The great Alaska earthquake of 1964 — Human ecology: Washington, D. C., Natl. Acad. Sci.*, p. 248-356, illus., 1970.
- 04964 **Norton, Frank R. B.; Haas, J. Eugene.** The native villages, in *The great Alaska earthquake of 1964 — Human ecology: Washington, D. C., Natl. Acad. Sci.*, p. 357-399, illus., 1970.
- 04811 **Norton, George H.** Gilbert Parvin Moore (1898-1970): *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 9, p. 1754-1755, portrait, 1970.
- 06512 **Norton, James J.** Composition of a pegmatite, Keystone, South Dakota: *Am. Mineralogist*, v. 55, nos. 5-6, p. 981-1002, illus., tables, 1970.
- Norton, L. J.** See Zemanek, Joe. 01249

- 11252 **Norton, N.** An analysis of Middle and Upper Devonian palynomorph assemblages from Iowa, Ohio, Pennsylvania, and New York [abs.], in Perkins, B. F. (editor), *Geoscience and Man — V. 1*, Am. Assoc. Stratig. Palynologists Ann. Mtg., 1st, 1968, Proc.: Baton Rouge, La., Louisiana State Univ. School of Geoscience, p. 133, 1970.
- 01093 **Norton, Norman J.; Allen, David.** Analyses of palynomorph assemblages from mid-continent and eastern Devonian formations [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 399-400, 1970.
- Norton, P. R.** See Morrison, J. A. 06262
- Norton, S. A.** See Hatch, Norman L., Jr. 06695
- 02552 **Norvell, W. A.; Lindsay, W. L.** Lack of evidence for  $ZnSiO_3$  in soils: *Soil Sci. Soc. America Proc.*, v. 34, no. 2, p. 360-361, 1970.
- 03750 **Norvitch, R. F.; Larson, A. L.** A reconnaissance of the water resources in the Portneuf River basin, Idaho: *Idaho Dept. Reclamation Water Inf. Bull.* 16, 58 p., illus., tables, 1970.
- Nota, D. J. G.** See Loring, D. H. 03707
- 05184 **Notestein, Frank B.** Willis Charles Hatfield (1898-1970): *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 10, p. 1951-1953, portrait, 1970.
- 09837 **Notley, K. R.** Closure studies improve ground control at Falconbridge Mine, in *Canadian Rock Mechanics Symposium*, 5th, Toronto, 1968, Proc.: Ottawa, Canada Dept. Energy, Mines and Resources Mines Br., p. 185-195, illus., tables, 1969.
- 09745 **Novak, Bill.** Devonian fossils along the Delaware River: *Rocks and Minerals*, v. 45, no. 10, p. 631-632, illus., 1970.
- Novak, G. A.** See Brown, G. E. 06074
- 09068 **Novak, Gary A.; Meyer, Henry O. A.** Refinement of the crystal structure of a chrome pyrope garnet — an inclusion in natural diamond: *Am. Mineralogist*, v. 55, nos. 11-12, p. 2124-2127, tables, 1970.
- 03202 **Novak, M.** Finite dynamic model for infinite media — Discussion [of paper 6719 by John Lysmer and Roger Kuhlemeyer, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, Jour. Eng. Mechanics Div., no. EM 2, p. 186-188, illus., 1970.
- 10680 **NovaScotiaDept.Mines, Cartog.Div.** (compiler). Metallic mineral occurrences recorded in the Province of Nova Scotia (to accompany mineral map of Nova Scotia): Halifax, Nova Scotia Dept. Mines, 349 p., 1966.
- Novitzki, R. P.** See VanVoast, W. A. 01531
- 09305 **Novoselova, A. V.; Batsanova, L. R.** (J. Schmorak, translator). Analytical chemistry of beryllium: Ann Arbor [Mich.] and London, Ann Arbor-Humphrey Sci. Publishers, 225 p., illus., tables, 1969.
- 03660 **Novotny, Oldrich.** Partial derivatives of dispersion curves of Love waves in a layered medium [with German summ.]: *Ceskoslovensk. Akad. Ved Studia Geophys. et Geod.*, v. 14, no. 1, p. 36-50, illus., tables, 1970.
- 01558 **Nowlan, Gary A.** A field method for the determination of cold-extractable nickel in stream sediments and soils, in *Geological Survey research 1970*, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B177-B180, 1970.
- 02178 **Nowlan, J. P.** Memorial to Walter Andrew Bell [1889-1969]: *Geol. Assoc. Canada Proc.*, v. 21, p. 45-46, portrait, 1970.
- Nowroozi, Ali.** See Seeber, Leonard. 04687

**Nowroozi, Ali A.** *See* Seeber, Leonardo. 01976

09695 **Nriagu, J. O.; Anderson, G. M.** Solubility of PbS in concentrated NaCl solutions at elevated temperatures [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 637, 1970.

08173 **Nuffield, E. W.** Walter Wilson Moorhouse, 1913-1969: *Royal Soc. Canada Minutes Proc.* 1970, ser. 4, v. 8, p. 125-128, portrait, 1970.

**Nunan, J. P.** *See* Farvolden, R. N. 02895

**Nunan, W. E.** *See* Webb, H. W. 03333

01807 **Nunes, Paul D.** U-Pb age determinations of the Stillwater igneous complex and associated rocks [abs.]: *EOS*, v. 51, no. 4, p. 449, 1970.

**Nunzi, A.** *See* Fanfani, L. 02990

**Nunzi, A.** *See* Fanfani, L. 03168

02404 **Nur, A.; Simmons, G.** The origin of small cracks in igneous rocks: *Internat. Jour. Rock Mechanics and Mining Sci.*, v. 7, no. 3, p. 307-314, illus., tables, 1970.

**Nur, Amos.** *See* Aki, Keiiti. 00219

**Nur, Amos.** *See* Horai, Ki-iti. 01447

01960 **Nur, Amos.** Velocity anisotropy in rock with cracks and the effect of stress [abs.]: *EOS*, v. 51, no. 4, p. 417-418, 1970.

**Nur, Amos.** *See* Aki, Keiiti. 04337

**Nutalaya, Prinya.** *See* Braddock, William A. 04507

**Nutalaya, Prinya.** *See* Braddock, William A. 06415

**Nuttli, Otto W.** *See* Followill, Fred E. 00265

**Nuttli, Otto W.** *See* Syed, Atiq A. 01986

**Nuttli, Otto W.** *See* Stauder, William. 03310

**Nyborg, W. L.** *See* Saksena, T. K. 09103

01326 **Nydal, Reider; Lovseth, Knut; Syrstad, Oddveig.** Trondheim natural radiocarbon measurements V: *Radiocarbon*, v. 12, no. 1, p. 205-237, 1970.

00921 **Nygreen, Paul W.** An unusual palynological assemblage from the Ordovician of Oklahoma [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 296-297, 1970.

**Nyquist, L. E.** *See* Pepin, R. O. 05715

**Nyquist, L. E.** *See* Begemann, F. 06821

07602 **Nyquist, Laurence Elwood.** The cosmic ray record in the metallic phase of chondrites [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 3, p. 1445B-1446B, 1970.

00744 **Nystrom, Paul G., Jr.** Slate belt stratigraphy near Pageland, South Carolina [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 234-235, 1970.

02127 **Oakes, Edward L.** Geology and ground-water resources of the Grand Rapids area, north-central Minnesota: *U.S. Geol. Survey Hydrol. Inv. Atlas HA-322*, 2 sheets, scale 1:48,000, sections, text, 1970.

- 00215 **Oakeshott, Gordon B.** Geology of the California Coast Ranges: California Div. Mines and Geology Mineral Inf. Service, v. 23, no. 1, p. 7-10, illus., 1970.
- 02806 **Oakeshott, Gordon B.** Geology of the Yosemite Valley: Sci. and Children (Washington, D.C., Natl. Sci. Teachers Assoc.), v. 7, no. 6, p. 18-21, illus., 1970.
- 04748 **Oakeshott, Gordon B.** (compiler). A guide to information on the geology of California: California Div. Mines and Geology Mineral Inf. Service, v. 23, no. 10, p. 195-199, illus., 1970.
- 05573 **Oakeshott, Gordon B.** Geologic hazard reduction programs at the state level — The example of California, in *Geologic hazards and public problems* (R. A. Olson and M. M. Wallace, editors) — [U. S.] Office Emergency Preparedness, Region 7, Conf., San Francisco, Calif., 1969, Proc.: Washington, D.C., U.S. Govt. Printing Office, p. 233-247, illus. [1970].
- 07368 **Obenson, Gabriel Francis També.** Direct evaluation of the Earth's gravity anomaly field from orbital analysis of artificial Earth satellites [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2070B, 1970.
- Obradovich, J. D.** See Izett, G. A. 04259
- 06552 **O'Brien, Charles F.** *Eozoon Canadense*, "the dawn animal of Canada": Isis, v. 61, pt. 2, no. 207, p. 206-223, 1970.
- 03599 **O'Brien, Neal R.; Burrell, D. C.** Mineralogy and distribution of clay size sediment in Glacier Bay, Alaska: Jour. Sed. Petrology, v. 40, no. 2, p. 650-655, illus., 1970.
- 07962 **O'Brien, Neal R.** Clay flake orientation in flocculated illite — An electron microscope study: Maritime Sediments, v. 6, no. 2, p. 79-80, illus., 1970.
- 08454 **O'Brien, Neal R.** The fabric of shale — An electron-microscope study: Sedimentology, v. 15, nos. 3-4, p. 229-246, illus., table, 1970.
- 09696 **O'Brien, Neal R.** Fabric of flocculated clay sediment [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 637, 1970.
- 02726 **Ocean Industry.** New tools for testing and analyzing ocean bottom: Ocean Industry, v. 5, no. 5, p. 39-40, illus., 1970.
- 06384 **Ocean Industry.** Nuclear probe for underwater detection of minerals: Ocean Industry, v. 5, no. 10, p. 39-40, illus., 1970.
- 11253 **Ochoterena F., H.; Silva-Barcenas, Angel.** *Cuvieronius arellanoi* sp. n., Mastodonte del Pleistoceno del Estado de Oaxaca [with English and German abs.]: Mexico Univ. Nac. Autonoma Inst. Geologia Paleontologia Mexicana, no. 33, 22 p., illus., 1970.
- Ocola, Leonidas C.** See Anzoleaga, Rodolfo. 01907
- 01961 **Ocola, Leonidas C.; Meyer, Robert P.** Evidence relevant to the origin of the mid-continent region and its mineral deposits [abs.]: EOS, v. 51, no. 4, p. 357, 1970.



- 09697 **Ocola, Leonidas C.** Computation of source to detector ranges from the travel time of multiple reflected sound waves [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 637-638, 1970.
- 09698 **Ocola, Leonidas C.; Meyer, Robert P.** Regional upper crustal structure of mid-continent of U.S.A. [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 638, 1970.
- 05948 **O'Connell, Daniel T.** Memorial of Bertram Theodore Butler — March 22, 1874-October 5, 1958: *Am. Mineralogist*, v. 55, nos. 3-4, p. 551-554, portrait, 1970.
- 01808 **O'Connell, Richard J.; Wasserburg, G. J.** Effect of a phase boundary on subsidence and uplift from sedimentation or erosion [abs.]: *EOS*, v. 51, no. 4, p. 431, 1970.
- 01962 **O'Connell, Richard J.** Equation of state of spinel to 10 kbar and 800°C [abs.]: *EOS*, v. 51, no. 4, p. 419, 1970.
- 00582 **O'Connell, Richard John.** Pt. 1, Dynamic response of phase boundaries in the earth to surface loading; Pt. 2, Pleistocene glaciation and the viscosity of the lower mantle [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 7, p. 3243B, 1970.
- O'Connor, Howard G.** See Burgat, Virgil A. 08414
- O'Connor, J. J.** See Armington, A. F. 00444
- O'Connor, J. T.** See Orkild, Paul P. 08013
- 09887 **O'Connor, James P.** Seismograph and resistivity use in shallow ground water search, in *The finding, care and operation of wells* — *Am. Water Works Assoc. Ann. Conf.*, San Diego, Calif., 1969, Joint Discussion: *Am. Water Works Assoc. Jour.*, v. 62, no. 7, p. 433-434, illus., 1970.
- Odegard, Mark E.** See Sutton, George H. 02779
- 02289 **Odekirk, J. R.** Desert Mountain granite, in *Radioactive and isotopic age determinations of Utah rocks*: *Utah Geol. and Mineralog. Survey Bull.* 81 (*Utah Univ. Bull.*, v. 61, no. 18; *Utah Eng. Expt. Sta. Bull.* 135), p. 33, 1970.
- O'Dell, P. M.** See Hirasaki, G. J. 09356
- 09699 **Odom, A. Leroy; Fullagar, Paul D.** Isotopic evidence for Late Devonian movement along the Brevard Zone [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 638-639, 1970.
- 09727 **Odom, I. E.; Flemal, R. C.; Kempton, J. P.; Gross, D. L.** Road log for field trip no. 2, Stratigraphy of Pleistocene deposits in northeastern Illinois, in *Tri-State Geol. Field Conf.*, 34th Ann., 1970, Guidebook (I. E. Odom and M. P. Weiss, editors): *De Kalb, Ill., Northern Illinois Univ. Dept. Geology*, p. 35-59, illus., geol. maps, 1970.
- 01094 **Odom, I. Edgar.** Mineralogy of the Franconia and adjacent formations in western Wisconsin and eastern Minnesota — A progress report [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 400, 1970.
- Odom, I. Edgar.** See Peters, Walter G. 01096
- 07521 **Odom, I. Edgar; Hiatt, John L.; Kramer, David J.** Potash feldspar in the Franconia Formation, Wisconsin and Minnesota, in *Forum on Geology of Industrial Minerals*, 6th, Ann Arbor, Mich., 1970, *Proc.: Michigan Geol. Survey Miscellany* 1, p. 37-47, illus., table, 1970.
- 09723 **Odom, I. Edgar; Weiss, Malcolm P.** (editors). Thirty-fourth Annual Tri-State Geological Field Conference, October 2-4, 1970, Guidebook: *De Kalb, Ill., Northern Illinois Univ. Dept. Geology*, 94 p., illus., geol. maps, 1970.

- 09724 **Odom, I. Edgar; Weiss, Malcolm P.; Flemal, R. C.** Road log for field trip no. 1, Cambro-Ordovician stratigraphy and structure of north-central Illinois, *in* Tri-State Geol. Field Conf., 34th Ann., 1970, Guidebook (I. E. Odom and M. P. Weiss, editors): De Kalb, Ill., Northern Illinois Univ. Dept. Geology, p. 10-26, illus., 1970.
- 00170 **O'Donnell, Edward.** The petrology of the Brassfield Formation (Lower Silurian) in the Cincinnati arch area [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 29-30, 1970.
- O'Donnell, T. A.** See Bond, A. M. 09458
- Odynsky, William.** See Reeder, S. W. 09179
- Oesch, Ronald D.** See Parmalee, Paul W. 09446
- 03181 **Oeschger, H.; Riesen, T.; Lerman, J. C.** Bern radiocarbon dates VII: Radiocarbon, v. 12, no. 2, p. 358-384, 1970.
- Offield, T. W.** See Pohn, H. A. 05086
- 05087 **Offield, T. W.; Pohn, H. A.** Lunar crater morphology and relative-age determination of lunar geologic units — Pt. 2, Applications, *in* Geological Survey research 1970, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C163-C169, illus., table, 1970.
- Offield, T. W.** See Rowan, L. C. 05960
- Offield, T. W.** See Eggleton, R. E. 07552
- Offield, T. W.** See Rowan, L. C. 07774
- 09290 **Offield, T. W.; Rowan, L. C.; Watson, R. D.** Linear geologic structure and mafic rock discrimination as determined from infrared data, Sec. 11 of Earth Resources Program, 3d ann., review — v. 1, Geology and geography: Houston, Tex., NASA Manned Spacecraft Center, MSC-03742, p. 11-1 — 11-12, illus., 1970.
- 09700 **Offield, Terry W.; Pohn, Howard A.; Naeser, Charles W.** The character and origin of the Decaturville, Missouri, cyptoexplosion structure [abs.]: Geol. Soc. America Abs. with programs, v. 2, no. 7, p. 639, 1970.
- 09486 **Offshore Technology Conference.** Offshore Technology Conference, 2d Ann., Houston, Tex., 1970, Preprints — v. 1: Dallas, Tex., Offshore Technology Conf., 764 p., illus., tables, 1970; V. 2, 853 p., illus., tables, 1970.
- 01435 **Ogata, Akio.** Theory of dispersion in a granular medium: U.S. Geol. Survey Prof. Paper 411-I, p. 11-134, illus., 1970.
- 04779 **Ogden, Park.** Ville Platte Field, Evangeline Parish, Louisiana, *in* Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 29-29c, illus., 1970.
- Ogner, G.** See Schnitzer, M. 07854
- 04558 **Ogner, Gunnar; Schnitzer, Morris.** The occurrence of alkanes in fulvic acid, a soil humic fraction: Geochim. et Cosmochim. Acta, v. 34, no. 8, p. 921-928, illus., table, 1970.
- 06835 **Ogren, D. E.** Ostracoda from the Paleocene Clayton Formation in central Georgia: Georgia Acad. Sci. Bull., v. 28, no. 4, p. 149-152, illus., 1970.
- O'Hara, M. J.** See Biggar, G. M. 10417
- O'Hara, M. J.** See Biggar, G. M. 10418
- Ohl, Jane P.** See Fischer, R. P. 01877

- 04910 **Ohle, Ernest L.** Mississippi Valley type ore deposits, a general review, [Chap.] 2 in Lead-zinc deposits in the Kootenay Arc, northeastern Washington and adjacent British Columbia — Soc. Econ. Geologists, 1970 Northwest Field Conf. Guidebook: Washington Div. Mines and Geology Bull. 61, p. 5-15, illus., 1970.
- 04416 **Ohmoto, Hiroshi; Rye, Robert O.** The Bluebell mine, British Columbia — [Pt.] 1, Mineralogy, paragenesis, fluid inclusions, and the isotopes of hydrogen, oxygen, and carbon: *Econ. Geology*, v. 65, no. 4, p. 417-437, illus., table, 1970.
- 09701 **Ohmoto, Hiroshi.** Influence of pH and oxygen fugacity of hydrothermal fluids on the isotopic composition of sulfur species [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 640, 1970.
- 09971 **O'Hara, N. P. J.; Thomas, D. V.** An investigation of PZT observations for evidence of the existence of polar disturbances due to large earthquakes, in *Earthquake displacement fields and the rotation of the Earth* (L. Mansinha, D. E. Smylie, A. E. Beck, editors) - NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 169-175, illus., table, 1970.
- 00327 **Ohta, Yutaka; Asada, Tetsutaro.** Strong-motion observation system with a wide amplitude range — Pt. 1, Construction of headquarters station [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 126, 1970.
- 06487 **Oja, R.** Keweenawan copper deposits in the Archean of northwestern Ontario [abs.], in *Inst. Lake Superior Geology*, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 31, 1970.
- 03325 **Ojakangas, Dennis R.** FORTRAN IV program for simulating geologic development of sedimentary basins: *Kansas Geol. Survey Computer Contr.* 49, 52 p., illus., tables, 1970.
- Ojakangas, R. W.** See Morey, G. B. 04971
- Ojakangas, R. W.** See Sims, P. K. 08587
- Ojakangas, Richard W.** See Morey, G. B. 05345
- 06488 **Ojakangas, Richard W.** Geology of a greenstone belt in Minnesota — Rainy Lake to Lake of the Woods [abs.], in *Inst. Lake Superior Geology*, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 32-33, 1970.
- Ojeda Rivera, Jesús.** See Salas, Guillermo P. 09804
- 05006 **Oka, Y.; Majima, H.** A theory of size reduction involving fracture mechanics [with French abs.]: *Canadian Metall. Quart.*, v. 9, no. 2, p. 429-439, illus., 1970.
- 05593 **Oka, Y.; Bain, I.** A means of determining the complete state of stress in a single borehole: *Internat. Jour. Rock Mechanics and Mining Sci.*, v. 7, no. 5, p. 503-515, illus., 1970.
- Okada, Akihiko.** See Shima, Makoto. 05115
- Okada, Atsumasa.** See Allen, Clarence R. 10563
- 05664 **Okada, Hakuyu; Arita, Masafumi.** An instrument for measuring pre-tectonic current-directions: *Jour. Sed. Petrology*, v. 40, no. 3, p. 1048-1051, illus., 1970.
- 03866 **Okaya, Y.** Anomalous dispersion in diffraction studies, an introduction, in *Crystallographic computing* — Internat. Summer School, Ottawa, 1969, Proc.: Copenhagen, Denmark, Munksgaard, p. 127-131, tables, 1970.
- 05082 **O'Keefe, John A.** Apollo 11 — Implications for the early history of the solar system: *EOS*, v. 51, no. 9, p. 633-636, 1970.

- 05676 **O'Keefe, John A.** Tektite glass *not* in Apollo 12 samples — [Reply to discussion by E. A. King, Jr., and others of "Tektite glass in Apollo 12 sample," 1970]: Science, v. 170, no. 3954, p. 200, 1970.
- 06263 **O'Keefe, John A.** The origin of the Moon: Jour. Geophys. Research, v. 75, no. 32, p. 6565-6574, illus., 1970.
- 05712 **O'Kelley, G. Davis, (and others)** Primordial radionuclide abundances, solar proton and cosmic-ray effects and ages of Apollo 11 lunar samples by non-destructive gamma ray spectrometry, *in* Apollo 11 Sci. Conf., Houston, Tex., 1970, Proc.—V. 2: New York and Oxford, England, Pergamon Press, p. 1407-1423, illus., tables, 1970.
- 07186 **Oklahoma Water Resources Board.** Appraisal of the water and related land resources of Oklahoma — Region 7: Oklahoma Water Resources Board Pub. 29, 141 p., illus., tables, 1970.
- 09209 **Oklahoma Water Resources Board.** Appraisal of the water and related land resources of Oklahoma — Region 1: Oklahoma Water Resources Board Pub. 17, [168] p., illus., tables, 1967.
- 09210 **Oklahoma Water Resources Board.** Appraisal of the water and related land resources of Oklahoma — Region 2: Oklahoma Water Resources Board Pub. 19, 131 p., illus., tables, 1968.
- 09211 **Oklahoma Water Resources Board.** Appraisal of the water and related land resources of Oklahoma — Region 3: Oklahoma Water Resources Board Pub. 23, 131 p., illus., tables, 1968.
- 09212 **Oklahoma Water Resources Board.** Appraisal of the water and related land resources of Oklahoma — Region 4: Oklahoma Water Resources Board Pub. 24, 128 p., illus., tables, 1969.
- 09213 **Oklahoma Water Resources Board.** Appraisal of the water and related land resources of Oklahoma — Regions 5 and 6: Oklahoma Water Resources Board Pub. 27, 159 p., illus., tables, 1969.
- Okrusch, M.** See Evans, B. W. 03554
- 03715 **Okrusch, Martin; Evans, Bernard W.** Minor element relationships in coexisting andalusite and sillimanite: Lithos, v. 3, no. 3, p. 261-268, illus., tables, 1970.
- 06876 **Okulitch, Andrew Vladimír.** Geology of Mount Kobau [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 1, p. 252B-253B, 1970.
- 05883 **Okuma, Angelo.** Geology of the carbonate rocks of Path Valley, Franklin County, Pennsylvania: Pennsylvania Geol. Survey Prog. Rept. 179, 1 sheet, scale 1:62,500, sections, text, 1970.
- Olcott, P. G.** See Holt, C. L. R., Jr. 05617
- 02665 **Oldaker, Richard B.** Evaluation of petroleum prospects under conditions of uncertainty [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 862-863, 1970.
- 01481 **Oldale, R. N.; Uchupi, Elazar.** The glaciated shelf off northeastern United States, *in* Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B167-B173, illus., 1970.
- 05402 **Oldale, Robert N.; Koteff, Carl.** Geologic map of the Chatham quadrangle, Barnstable County, Cape Cod, Massachusetts: U.S. Geol. Survey Geol. Quad. Map GQ-911, scale 1:24,000, section, text, 1970.
- Oldenburg, D. W.** See Porath, H. 01680
- 10186 **Oldfield, F.; Schoenwetter, J.** Pollen analysis of late Pleistocene deposits in West Texas and eastern New Mexico [abs.], *in* American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 102, 1970.

**O'Leary, B. T.** *See* Gold, T. 06278

06259 **O'Leary, Brian; Briggs, Frank.** Optical properties of Apollo 11 Moon samples: Jour. Geophys. Research, v. 75, no. 32, p. 6532-6538, illus., table, 1970.

07818 **Olenin, V. B.; Sokolov, B. A.** Novyye perspektivy neftegazonosnosti akvatorii zemnogo shara [New perspectives on oil and gas in water areas of the Earth]: Akad. Nauk SSSR Doklady, v. 193, no. 6, p. 1364-1367, 1970.

10585 **Olinger, Bart; Duba, Al.** Compressions of the cell parameters of olivine to 100 kilobars [abs.]: EOS, v. 51, no. 11, p. 827, 1970.

**Oliphant, J. D.** *See* Cheney, E. S. 00144

**Oliphant, Jerrelyn.** *See* Campbell, K. Vincent. 01186

**Oliphant, Van N.** *See* Peden, Guy T., Jr. 09607

00328 **Oliver, H. W.; Hanna, W. F.** Structural significance of gravity and magnetic meganomalies in central California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 126-127, 1970.

03010 **Oliver, H. W.** Geophysical studies, in Mineral resources of the Emigrant Basin primitive area, California: U.S. Geol. Survey Bull. 1261-G, p. G44-G49, tables, 1970.

03976 **Oliver, Jack.** Recent earthquake prediction research in the U.S.A., in Earthquake mechanics (T. Rikitake, editor), a symposium, Madrid, Spain, 1969: Tectonophysics, v. 9, nos. 2-3, p. 283-290, 1970.

06744 **Oliver, Jack.** Structure and evolution of the mobile seismic belts, in Geophysical studies on the evolution of the Earth's deep interior — A symposium, Madrid, 1969, Proc.: Physics Earth and Planetary Interiors, v. 2, no. 5 (spec. issue), p. 350-362, illus., 1970.

07687 **Oliver, Jack; Johnson, Tracy; Dorman, James.** Postglacial faulting and seismicity in New York and Quebec, in Symposium on recent crustal movements, Ottawa, Canada, 1969, Papers: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 2, p. 579-590, illus., tables, 1970.

**Oliver, Jack.** *See* Sykes, Lynn R. 09993

04149 **Oliver, R. T.; Clayton, A. G.** Direct determination of fluoride in miscellaneous fluoride materials with the Orion fluoride electrode [with French and German abs.]: Anal. Chim. Acta, v. 51, no. 3, p. 409-415, illus., tables, 1970.

02666 **Oliver, William B.** Geologist's role in evaluation economics [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 863, 1970.

10959 **Oliver, William B.** Depositional systems in Woodbine Formation (upper Cretaceous), northeast Texas [abs.]: Am. Assoc. Petroleum Geologists, v. 54, no. 9, p. 1788, 1970; Gulf Coast Assoc. Geol. Soc. Trans., v. 20, p. 262, 1970.

**Olivet, Jean-Louis.** *See* LePichon, Xavier. 01946

05254 **Olivet, Jean-Louis; Sichler, Bertrand; Thonon, Pierre; LePichon, Xavier; Martinais, Jacques; Pautot, Guy.** Le faille transformante Gibbs entre le rift et la marge du Labrador [The Gibbs transform fault between the rift and the Labrador margin]: Acad. Sci. Comptes Rendus, ser. D, v. 271, no. 12, p. 949-952, illus., 1970.

**Olivet, Jean-Louis.** *See* Auzende, Jean-Marie. 06446

00828 **Ollerenshaw, N. C.** Geology, Marble Mountain, west of fifth meridian, Alberta: Canada Geol. Survey Prelim. Ser. Map 7-1969, scale 1:50,000, sections, text, 1970.

**Ollerenshaw, Neil C.** *See* Norris, D. K. 03477

- 06559 **Ollerhead, R. W.; Alexander, T. K.; Hausser, O.** Lifetimes in S-32: Canadian Jour. Physics, v. 48, no. 1, p. 47-55, illus., tables, 1970.
- 02888 **Olpinski, K.** Hydrogeologic aspects of dewatering at Welland — Discussion [of paper by R. N. Farvolden and J. F. Nunan, 1970]; Theoretical analysis of aquifer response to dewatering at Welland — Discussion [of paper by E. O. Frind, 1970]: Canadian Geotech. Jour., v. 7, no. 2, p. 217-218, 1970.
- 06412 **Olsen, C. W.** Soil strain near a nuclear detonation: Seismol. Soc. America Bull., v. 60, no. 6, p. 1999-2014, illus., tables, 1970.
- Olsen, E.** See Bunch, T. E. 04438
- Olsen, E. J.** See Smith, J. V. 05753
- 06576 **Olsen, Edward; Bunch, T. E.** Compositions of natural osuimilites: Am. Mineralogist, v. 55, nos. 5-6, p. 875-879, illus., tables, 1970.
- 09702 **Olsen, Edward; Bunch, T. E.** Empirical derivation of activity coefficients for the magnesium-rich portion of the olivine solid solution [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 641-642, 1970.
- Olsen, Saki.** See Crowley, William. 05829
- 01262 **Olson, Everett C.** *Trematops stonei* sp. nov. (Temnospondyli: Amphibia) from the Washington Formation, Dunkard Group, Ohio: Kirtlandia, no. 8, 12 p., illus., 1970.
- 03407 **Olson, Everett C.** New and little known genera and species of vertebrates from the Lower Permian of Oklahoma: Fieldiana — Geology, v. 18, no. 3, p. 359-434, illus., tables, 1970.
- 08508 **Olson, Everett C.** Current and projected impacts of computers upon concepts and research in paleontology, in Computers in paleontology — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc., Pt. B: Lawrence, Kans., Allen Press, p. 135-153, 1970.
- 00329 **Olson, G. H.; Larson, E. R.** Differentiation of Lake Lahontan sediments in western Nevada by grain size distribution [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 127, 1970.
- 07475 **Olson, Norman K.** Silica sand for glass production in a portion of the Atlantic Coastal Plain, in Forum on geology of industrial minerals, 5th, Harrisburg, Pa., 1969, Proc.: Pennsylvania Geol. Survey, 4th ser., Bull. M64 (Mineral Resources Rept.), p. 3-22, illus., tables, 1970.
- Olson, R. E.** See Mesri, G. 04353
- Olson, R. J.** See Oró, J. 04089
- 07158 **Olson, R. K.; Goll, R.** Biostratigraphy, Chap. 29 in Initial reports of the Deep Sea Drilling Project — V. 5, Leg 5 of cruises of *Glomar Challenger*, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office, p. 557-567, illus., 1970.
- 03800 **Olson, Ralph E.** A geography of water: Dubuque, Iowa, Wm. C. Brown Co. Publishers, 132 p., illus., 1970.
- 02426 **Olson, Richard H.** Some factors to consider in evaluating talc deposits [abs.]: Mining Eng., v. 22, no. 1, p. 41, 1970.

- 05582 **Olson, Robert A.; Wallace, Mildred M.** (editors). Geologic hazards and public problems — [U.S.] Office of Emergency Preparedness, Region 7, Conf., San Francisco, Calif., 1969, Proc.: Washington, D.C., U.S. Govt. Printing Office, 335 p., illus., tables [1970].
- 00331 **Olson, Robert C.** A major thrust fault in the northwestern Inyo Mountains, Inyo County, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 128, 1970.
- 06775 **Olson, Roy E.; Mesri, Gholamreza.** Mechanisms controlling compressibility of clays: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7649, *Jour. Soil Mechanics and Found. Div.*, no. SM 6, p. 1863-1878, illus., tables, 1970.
- 03213 **Olson, Walter S.** Tidal amplitudes in geological history: *New York Acad. Sci. Trans.*, ser. 2, v. 32, no. 2, p. 220-233, illus., tables, 1970.
- 04020 **Olsson, Axel A.** The cancellariid radula and its interpretation: *Palaeontographica Americana*, v. 7, no. 43, p. 19-26, illus., 1970.
- 09754 **Olsson, Axel A.** A review of late Cenozoic stratigraphy of southern Florida, in *Late Cenozoic stratigraphy of southwestern Florida* — [Guidebook], Field Trip no. 4 [19th] Ann. Mtg. Gulf Coast Assoc. Geol. Socs., with SEPM, Gulf Coast Sec., Miami Beach, Fla., 1969: [New Orleans, La.], Gulf Coast Assoc. Geol. Socs., p. 122-139, illus., 1969.
- 08754 **Olsson, Ingrid U.** (editor). Radiocarbon variations and absolute chronology — Nobel Symposium, 12th, Uppsala, 1969 Proc.: New York, John Wiley and Sons, and Stockholm, Almqvist and Wiksell, 652 p., illus., tables, 1970.
- Olsson, R. K.** See Cordey, W. G. 02016
- 00171 **Olsson, Richard K.; Gaffney, Eugene S.** The Cretaceous-Tertiary datum in New Jersey [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 30, 1970.
- 03534 **Olsson, Richard K.** Paleocene planktonic foraminiferal biostratigraphy and paleozoogeography of New Jersey: *Jour. Paleontology*, v. 44, no. 4, p. 589-597, illus., 1970.
- 03535 **Olsson, Richard K.** Planktonic Foraminifera from base of Tertiary, Millers Ferry, Alabama: *Jour. Paleontology*, v. 44, no. 4, p. 598-604, illus., 1970.
- 04797 **Olsson, Richard K.** Biostratigraphy, magnetic stratigraphy, and sea floor spreading, [Chap.] 11 in *The megatectonics of continents and oceans* (Helgi Johnson and Bennett L. Smith, editors): New Brunswick, N. J., Rutgers Univ. Press, p. 241-252, illus., 1970.
- Olsson, Richard K.** See McManus, Dean A. 07143
- 09201 **Oltz, Donald.** Palynology, paleoecology, and a computer [abs.], in Perkins, B. F. (editor), *Geoscience and Man* — v. 1, *Am. Assoc. Stratig. Palynologists Ann. Mtg.*, 1st, 1968, Proc.: Baton Rouge, La., Louisiana State Univ. School of Geoscience, p. 135, 1970.
- 09054 **Omori, Keiichi.** Infrared study of sulfohalite: *Am. Mineralogist*, v. 55, nos. 11-12, p. 1897-1910, illus., tables, 1970.
- Onasick, E. P.** See Beales, F. W. 05328
- 01351 **Ondrick, C. W.; Srivastava, G. S.** CORFAN-FORTTRAN IV computer program for correlation, factor analysis (R- and Q-mode) and varimax rotation: *Kansas Geol. Survey Computer Contr.* 42, 92 p., illus., tables, 1970.
- 03792 **O'Neil, James R.; Hedge, Carl E.; Jackson, Everett D.** Isotopic investigations of xenoliths and host basalts from the Honolulu Volcanic Series: *Earth and Planetary Sci. Letters*, v. 8, no. 3, p. 253-257, illus., tables, 1970.

- 05713 **O'Neil, James R.; Adami, Lanford H.** Oxygen isotope analyses of selected Apollo 11 materials, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1425-1427, table, 1970.
- 00950 **O'Neill, A. L.** Memorial to Elmer Chester Marliave (1910-1967): Geol. Soc. America Proc. 1967, p. 237-239, portrait, 1970.
- 08578 **O'Neill, James F.; Vallely, James L.** Gold values from the Devils Backbone area, Tallapoosa County, Alabama: Alabama Geol. Survey Circ. 67, 18 p., illus., table, 1970.
- O'Neill, M. E.** See Eaton, J. P. 04420
- O'Neill, Mary E.** See King, Chi-Yu. 01939
- O'Neill, N. J.** See Taylor, P. T. 01988
- 05320 **Onesti, Lawrence J.; Hinze, William J.** Magnetic observations over eskers in Michigan: Geol. Soc. America Bull., v. 81, no. 11, p. 3453-3455, illus., 1970.
- Onesti, Lawrence J.** See McArthur, David S. 07958
- 04256 **Ong, H. Ling; Swanson, Vernon E.; Bisque, Ramon E.** Natural organic acids as agents of chemical weathering, *in* Geological Survey research 1970, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C130-C137, illus., table, 1970.
- Ong, Patricia T.** See Tackett, Stanford L. 02960
- 02880 **Ongley, E. D.** Drainage basin axial and shape parameters from moment measures [with French abs., p. 89]: Canadian Geographer, v. 14, no. 1, p. 38-44, illus., table, 1970.
- 08202 **Ongley, E. D.** Determination of rectilinear profile segments by automatic data processing [with German and French summaries]: Zeitschr. Geomorphologie, v. 14, no. 4, p. 383-391, illus., tables, 1970.
- 03812 **Ontario Water Resources Commission.** Bedrock well yields, Lake Ontario drainage basin, Ontario-New York: Toronto, Ontario Water Resources Comm., scale 1:500,000, 1970.
- 10451 **Ontario Water Resources Commission.** Ground water in Ontario southwestern area 1964 to 1967: Ontario Water Resources Comm. Water Resources Bull. 2-10, Ground Water ser., 538 p., 1970.
- Onuki, H.** See Ernst, W. G. 05079
- 01963 **Onuma, Naoki; Clayton, Robert N.; Mayeda, Toshiko.** Oxygen isotope fractionation between coexisting minerals in chondritic meteorites [abs.]: EOS, v. 51, no. 4, p. 340, 1970.
- 05714 **Onuma, Naoki; Clayton, Robert N.; Mayeda, Toshiko K.** Apollo 11 rocks — Oxygen isotope fractionation between minerals, and an estimate of the temperature of formation, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1429-1434, illus., tables, 1970.
- 00172 **Oostdam, B. L.; Swift, Robert N.** Variations in tidal currents, salinity and turbidity across the Delaware Bay mouth [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 30-31, 1970.
- 02931 **Oostdam, B. L.** Exploration for marine placer deposits of diamonds [with French abs.], *in* Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 447-461, illus., tables, 1970.



**Oostdam, B. L.** See Sheridan, R. E. 05792

- 01657 **Opdyke, N. D.** Preliminary report on paleomagnetism of Deep Sea Drilling Project Leg 2 specimens, [Chap.] 17 in Initial reports of the Deep Sea Drilling Project — V. 2, Leg 2 of cruises of *Glomar Challenger*, Hoboken, N. J., to Dakar, Senegal, Oct.-Nov. 1968: Washington, D. C., U.S. Govt. Printing Office, p. 375-385, illus., tables, 1970.

**Opdyke, N. D.** See Henry, K. W. 06669

- 09703 **Opdyke, N. D.; Burckle, L. H.; Hays, J. D.; Saito, T.** Extension of the magnetic stratigraphy to the Middle Miocene in deep-sea sediments [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 642, 1970.

- 09988 **Opdyke, N. D.** Paleomagnetism, in *The sea* — v. 4, New concepts of sea floor evolution, Pt. 1. General observations (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 157-182, illus., tables, 1970.

**Opdyke, Neil D.** See Foster, John H. 03729

- 08446 **Opdyke, Neil D.; Foster, John H.** Paleomagnetism of cores from the North Pacific in Geological Investigations of the North Pacific (James D. Hays, editor): Geol. Soc. America Mem. 126, p. 83-119, illus., tables, 1970.

**Opdyke, Neil D.** See Kent, Dennis. 10733

**Opheim, Lee A.** See Hogan, Edward Patrick. 07192

**Oppenheimer, Carl H.** See Lohse, Alan. 09490

**Oradovskaya, M. M.** See Kanygin, A. V. 10063

- 06782 **Orchard, R. J.; Knecht, Joseph; Voytko, George A.** State of predictive art in subsidence engineering — Discussion [of paper 7187 by Barry Voight and William Pariseau, 1970]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Soil Mechanics and Found. Div., no. SM 6, p. 2162-2163, 1970.

**O'Reilly, W.** See Day, R. 00067

**O'Reilly, W.** See Runcorn, S. K. 06292

**Oriel, Steven S.** See Mabey, Don R. 01161

- 02318 **Oriel, Steven S.; Tracey, Joshua I., Jr.** Uppermost Cretaceous and Tertiary stratigraphy of Fossil basin, southwestern Wyoming: U.S. Geol. Survey Prof. Paper 635, 53 p., illus., tables, 1970.

**Oriel, Steven S.** See Peterson, Donald L. 04252

**Orkild, Paul P.** See Marvin, Richard F. 05646

- 08013 **Orkild, Paul P.; O'Connor, J. T.** Geologic map of the Topopah Spring quadrangle, Nye County, Nevada: U.S. Geol. Survey Geol. Quad. Map GQ-849, scale 1:24,000, sections, text, 1970.

**Orkild, Paul P.** See McKeown, F. A. 09657

- 08412 **Orlenok, V. V.** Rezul'taty seysmicheskikh issledovaniy v odnom iz rayonov Labradorskogo okeanicheskogo basseyna [Results of seismic investigations in one of the areas of the Labrador ocean basin] in Seysmicheskiye issledovaniya stroyeniya dna morey i okeanov: Akad. Nauk SSSR Inst. Okeanologii Trudy, v. 87, p. 76-85, illus., 1970.

- 08471 **Orlob, Gerald T.; Shubinski, Robert P.** Water quality modeling of estuaries [with French abs.], in *Symposium on the hydrology of deltas*, V. 2: Internat. Assoc. Sci. Hydrology-Unesco Pub. 91, p. 342-353, illus., 1970.
- Orlopp, Donald R.** See Wanless, H. R. 06708
- 00330 **Orme, Antony R.; Howard, Robert B.; Weide, David L.** Stream channel geometry and coarse sediment morphometry as measures of debris production and erosion in small drainage basins — A test case [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 128, 1970.
- Oró, J.** See Schneider, H. 01635
- Oró, J.** See Gelpi, E. 01683
- Oró, J.** See Levy, Ram L. 02737
- 04089 **Oró, J.; Nooner, D. W.; Olson, R. J.** Hydrocarbons in meteorites, in *Advances in organic geochemistry — Internat. Cong., 3d, Proc.* (G. D. Hobson and G. C. Speers, editors): London and New York, Pergamon Press (Internat. Ser. Mons. Earth Sci., V. 32), p. 507-521, illus., 1970.
- 04194 **Oró, J.; Nooner, D. W.** Aliphatic hydrocarbons from the Pre-Cambrian of North America and South Africa, in *Advances in organic geochemistry — Internat. Cong., 3d, Proc.* (G. D. Hobson and G. C. Speers, editors): London and New York, Pergamon Press (Internat. Ser. Mons. Earth Sci., V. 32), p. 493-506, illus., 1970.
- Oró, J.** See Gelpi, E. 04602
- Oró, J.** See Gelpi, E. 04603
- Oró, J.** See Gelpi, E. 04604
- 05088 **Oró, J.; Gilbert, J.; Updegrave, W. S.; McReynolds, J.; Ibanez, J.; Gil-Av, E.; Flory, D.; Zlatkis, A.** Gas chromatographic and mass spectrometric methods applied to the analysis of lunar samples from the Sea of Tranquillity: *Jour. Chromatographic Sci.*, v. 8, no. 6, p. 297-308, illus., tables, 1970.
- Oró, J.** See Levy, Ram L. 05329
- 05747 **Oró, J. (and others).** Organogenic elements and compounds in type C and D lunar samples from Apollo 11, in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc.* — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1901-1920, illus., tables, 1970.
- Orosco, Cesar A.** See Huffman, Samuel F. 00721
- Orphal, D. L.** See Lahoud, J. A. 00301
- 09704 **Orr, Patricia; Ehrlich, Robert.** In vitro dedolomitization at low temperature and pressure with implications on the mineral equilibria of dolomite [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 642-643, 1970.
- 09813 **Orr, W. N.; Weinstein, B. B.** Oregon Tertiary phytoplankton: *Ore Bin*, v. 32, no. 7, p. 133-139, illus., 1970.

**Orr, William.** *See* Hays, James D. 01429

01187 **Orr, William N.; Zaitzeff, James B.** Miocene Silicoflagellates from southeast Oregon: *Northwest Sci.*, v. 44, no. 1, p. 12-15, illus., 1970.

01705 **Orsborn, John F.** Drainage density in drift-covered basins: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7033, *Jour. Hydraulics Div.*, no. HY 1, p. 183-192, illus., tables, 1970.

07084 **Orth, Donald J.** North Slope geographic name sources for geologic nomenclature, *in* Geological seminar on the North Slope of Alaska, Palo Alto, Calif., 1970, *Proc.*: Los Angeles, Calif., *Am. Assoc. Petroleum Geologists Pacific Sec.*, p. R1-R10, 1970.

04385 **Ortiz, Jaime; Luthin, James N.** Movement of salts in ponded anisotropic soils: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7530, *Jour. Irrigation and Drainage Div.*, no. IR3, p. 257-264, illus., 1970.

08431 **Orvig, Svenn.** The hydrological cycle of Greenland and Antarctica [with French, Spanish, and Russian abs.], *in* Symposium on World Water Balance, V. 1: *Internat. Assoc. Sci. Hydrology-Unesco Pub.* 92, p. 41-49 [1970,].

**Orville, P. M.** *See* Godchaux, M. M. 01764

02217 **Orville, Philip M.** Synthesis of scapolite solid solution and its stability field at 750°C and 4 kb [abs.]: *EOS*, v. 51, no. 4, p. 434-435, 1970.

**Orville, Philip M.** *See* Grover, John E. 06795

**Osawa, Masumi.** *See* Goles, Gordon G. 05694

**Osawa, Masumi.** *See* Goles, Gordon G. 05695

08532 **Osawa, Masumi; Goles, Gordon G.** Trace element abundances in Columbia River Basalts, *in* Columbia River Basalt Symposium, 2nd, Cheney, Wash., 1969, *Proc.*: Cheney, Eastern Washington State College Press, p. 55-71, illus., tables, 1970.

**Osborne, Robert H.** *See* McDougall, Donald S. 01593

02021 **Osborne, Robert H.** The American Upper Ordovician standard — [Pt.] 12, Time-trend analysis of Cincinnati calcarenites, Hamilton County, Ohio: *Jour. Geology*, v. 78, no. 3, p. 363-370, illus., table, 1970.

03817 **Osborne, Robert H.** Bedrock geology of the Madeira quadrangle, Hamilton and Clermont Counties, Ohio: *Ohio Div. Geol. Survey Rept. Inv.* 77, scale 1:24,000, text, 1970.

10267 **Osgood, Richard G., Jr.** Trace fossils of the Cincinnati area: *Palaeontographica Americana*, v. 6, no. 41, p. 281-444, illus., 1970.

09795 **Oshima, T.; Kimoto, S.; Suganuma, T.** Stereomicrography with a scanning electron microscope: *Photogramm. Eng.*, v. 36, no. 8, p. 874-879, illus., 1970.

00089 **Osmond, J. K.; May, James P.; Tanner, W. F.** Age of the Cape Kennedy barrier-and-lagoon complex: *Jour. Geophys. Research*, v. 75, no. 2, p. 469-479, illus., tables, 1970.

03520 **Osoba, J. S.; VonGonten, W. D.** Measurement of SP in nonconducting mud: *Log Analyst*, v. 11, no. 3, p. 3-7, illus., 1970.

**Ostenso, N. A.** *See* Vogt, P. R. 03962

**Ostenso, N. A.** *See* Wold, R. J. 05010

**Ostenso, Ned A.** *See* Wold, Richard J. 10113

**Oster, J. D.** See McNeal, B. L. 07229

- 06414 **Osterwald, Frank W.** Comments on rock bursts, outbursts, and earthquake prediction: Seismol. Soc. America Bull., v. 60, no. 6, p. 2083-2085, 1970.

**Östlund, H. Göte.** See Roether, Wolfgang. 06402

- 06467 **Östlund, H. Göte; Niskin, S.** Radiocarbon profile in the North Pacific 1969 Geosecs intercalibration station: Jour. Geophys. Research, v. 75, no. 36, p. 7667, table, 1970.

- 06828 **Östrem, G.; Arnold, K.** Ice-cored moraines in southern British Columbia and Alberta, Canada: Geog. Annaler, v. 52A, no. 2, p. 120-128, illus., 1970.

**Ostrom, D.** See Duke, C. M. 04667

- 04793 **Ostrom, John H.** Archaeopteryx — Notice of a "new" specimen: Science, v. 170, no. 3957, p. 537-538, illus., 1970.

- 07243 **Ostrom, John H.** Stratigraphy and paleontology of the Cloverly Formation (Lower Cretaceous) of the Bighorn Basin area, Wyoming and Montana [with German and Russian abs.]: Yale Univ. Peabody Mus. Nat. History Bull. 35, 234 p., illus., tables, 1970.

- 08514 **Ostrom, John H.** Terrestrial vertebrates as indicators of Mesozoic climates, in Paleoclimatology — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc., Pt. D: Lawrence, Kans., Allen Press, p. 347-376, illus., 1970.

- 07422 **Ostrom, Meredith E.; Davis, Richard A., Jr.; Cline, Lewis M.** (Field Trip Committee). Field trip guidebook for Cambrian-Ordovician geology of western Wisconsin — Geol. Soc. America, Ann. Mtg., Milwaukee, Wis., 1970: Wisconsin Geol. and Nat. History Survey Inf. Circ. 11, 131 p., illus., table, 1970.

- 07423 **Ostrom, Meredith E.** Sedimentation cycles in the Lower Paleozoic rocks of western Wisconsin, in Field trip guidebook for Cambrian-Ordovician geology of western Wisconsin — Geol. Soc. America, Ann. Mtg., Milwaukee, Wis., 1970: Wisconsin Geol. and Nat. History Survey Inf. Circ. 11, p. 10-34, illus., table, 1970.

- 01433 **O'Sullivan, Robert B.** The upper part of the Upper Triassic Chinle Formation and related rocks, southeastern Utah and adjacent areas: U.S. Geol. Survey Prof. Paper 644-E, p. E1-E22, illus., 1970.

- 08725 **Osvald, Hugo.** Vegetation and stratigraphy of peatlands in North America: Nova Acta Regiae Soc. Sci. Upsaliensis (Acta Univ. Upsaliensis), Ser. 5-C, v. 1, 96 p., illus., tables, 1970.

**Ott, Arthur N.** See Toth, Stephen J. 05566

**Ott, Jorg A.** See Riedl, Rupert J. 07816

**Ott, Welland L.** See Lewis, Clyde L. 08280

**Ottaviani, Mario.** See Kuo, John T. 03522

- 04234 **Ottaway, J. M.; Coker, D. T.; Davies, J. A.** A sensitive indirect method for the determination of titanium by atomic absorption spectrophotometry using an air-acetylene flame: Anal. Letters, v. 3, no. 7, p. 385-392, illus., 1970.

**Ottemann, J.** See Hach-Ali, P. Fenoll. 01460

- 03238 **Ottmann, Liane.** Quelques aspects graphiques de la carte géomorphologique détaillée [Several graphic aspects of the detailed geomorphologic map (with English and Russian abs.)]: Rev. Géographie Montréal, v. 24, no. 3, p. 346-351, illus., 1970.

- 00024 **Otvos, Ervin G., Jr.** Development and migration of barrier islands, northern Gulf of Mexico: Geol. Soc. America Bull., v. 81, no. 1, p. 241-246, illus., 1970.

- 01543 **Otvos, Ervin G., Jr.** High pressure shales and their depositional facies, southern Louisiana Cenozoic: *Jour. Sed. Petrology*, v. 40, no. 1, p. 412-417, illus., table, 1970.
- 05972 **Otvos, Ervin G., Jr.** Development and migration of barrier islands, northern Gulf of Mexico — Reply [to discussion by J. H. Hoyt of 1970 paper]: *Geol. Soc. America Bull.*, v. 81, no. 12, p. 3783-3788, illus., 1970.
- 09787 **Ouellette, Cecil; Ouellette, Elaine.** The John Day fossil beds: *Pacific Discovery*, v. 23, no. 6, p. 1-6, illus., 1970.
- Ouimet, J. M.** See Dussault, R. 02890
- Ouryvaev, V.** See Toebes, C. 07731
- 01170 **Outerbridge, W. F.** Sedimentary environments of the Magoffin Beds of Morse in eastern Kentucky [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 235, 1970.
- 04510 **Outerbridge, William F.** Geologic map of the Sherbourne quadrangle, northeastern Kentucky: *U.S. Geol. Survey Geol. Quad. Map GQ-854*, scale 1:24,000, text, 1970.
- 04260 **Ovenshine, A. T.; Webster, G. D.** Age and stratigraphy of the Heceta Limestone in northern Sea Otter Sound, southeastern Alaska, in *Geological Survey research 1970*, Chap. C.: *U.S. Geol. Survey Prof. Paper 700-C*, p. C170-C174, illus., table, 1970.
- 00574 **Ovenshine, A. Thomas.** Observations of iceberg rafting in Glacier Bay, Alaska, and the identification of ancient ice-rafted deposits: *Geol. Soc. America Bull.*, v. 81, no. 3, p. 891-894, illus., 1970.
- 01549 **Overbey, W. K., Jr.; Henniger, B. R.** Disaggregation of sandstones by ultrasonic energy: *Jour. Sed. Petrology*, v. 40, no. 1, p. 465-472, illus., table, 1970.
- Overbey, W. K., Jr.** See Rough, R. L. 02739
- Overbey, William K., Jr.** See Wing, Richard S. 05202
- Overman, R. F.** See Corey, J. C. 10987
- 10664 **Overpeck, A. C.; Holden, W. R.** Well imaging and fault detection in anisotropic reservoirs: *Jour. Petroleum Technology*, v. 22, October, p. 1317-1325, illus., 1970.
- 00817 **Oversby, Virginia M.** The isotopic composition of lead in iron meteorites: *Geochim. et Cosmochim. Acta*, v. 34, no. 1, p. 65-75, illus., tables, 1970.
- 01508 **Oversby, Virginia M.; Gast, Paul W.** Isotopic composition of lead from oceanic islands: *Jour. Geophys. Research*, v. 75, no. 11, p. 2097-2114, illus., tables, 1970.
- 06180 **Overstreet, William C.; White, Amos M.; Warr, Jesse J., Jr.** Uranium-rich monazites in the United States, in *Geological Survey research 1970*, Chap. D: *U.S. Geol. Survey Prof. Paper 700-D*, p. D169-D175, illus., tables, 1970.
- 06184 **Overstreet, William C.; Warr, Jesse J., Jr.; White, Amos M.** Influence of grain size on percentages of ThO<sub>2</sub> and U<sub>3</sub>O<sub>8</sub> in detrital monazite from North Carolina and South Carolina, in *Geological Survey research 1970*, Chap. D: *U.S. Geol. Survey Prof. Paper 700-D*, p. D207-D216, illus., tables, 1970.
- 07745 **Overton, A.** Seismic refraction surveys, western Queen Elizabeth Islands and polar continental margin: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 346-365, illus., tables, 1970.
- 00922 **Overton, Harold L.** Salinity anomalies in marine sands [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 297, 1970.
- 01265 **Overton, Harold L.** Rock stress and casing collapse: *Log Analyst*, v. 11, no. 1, p. 17-22, illus., 1970.

- 02185 **Overton, Harold L.** Resistivity logging from shale slurries, in SPWLA Logging Symposium, 11th Ann., Los Angeles, Calif., 1970, Trans.: Houston, Tex., Soc. Prof. Well Log Analysts, p. C1-C20, illus., tables, 1970.
- Overton, Harold L.** See Zanier, Aldo M. 02211
- 02667 **Overton, Harold L.** Salinity variations and anomalies in marine sandstone [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 863, 1970.
- 09080 **Overton, Harold L.** Predicting rock stress and casing collapse: Oil and Gas Jour., v. 68, no. 5, p. 98-104, illus., 1970.
- 09483 **Overton, Harold L.** Rock salinity variations as earth stress indicators, in Offshore Technology Conference, 2d Ann., Houston, Tex., 1970, Preprints — v. 2: Dallas, Tex., Offshore Technology Conf., p. li-671 — ii-679, illus., 1970.
- 10224 **Overton, Harold L.** Sp curve reflects stressed zones: Petroleum Engineer, v. 42, no. 10, p. 76, 81, 83, 85, illus., 1970.
- 06139 **Ovnatanov, S. T.; Tamrazyan, G. P.** Reply [to discussion by T. A. Jones of "Paleostructure and lithologic variation coefficients, their use in exploration for new oil and gas pools," 1969]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 9, p. 1750-1752, 1970.
- 10892 **Owen, Edgar W.** Exercise in leadership — Ronald K. DeFord, in The geologic framework of the Chihuahua tectonic belt — Symposium in honor of Ronald K. DeFord, Midland, Texas, 1970: Midland, Texas, West Texas Geol. Soc. and University of Texas at Austin, p. 1-3, portrait, 1970.
- 10932 **Owen, Ellis Frederic.** A revision of the brachiopod subfamily Kingeninae Elliott: British Mus. (Nat. History) Bull., Geology, v. 19, no. 2, p. 27-83, illus., tables, 1970.
- Owen, J. B.** See Branson, F. A. 03071
- 02164 **Owens, E. H.; McCann, S. B.** The role of ice in the Arctic beach environment with special reference to Cape Ricketts, southwest Devon Island, Northwest Territories, Canada: Am. Jour. Sci., v. 268, no. 5, p. 397-414, illus., tables, 1970.
- Owens, E. H.** See McCann, S. B. 09773
- 03219 **Owens, Gordon L.** The subsurface Silurian-Devonian "Big Lime" of Ohio: Ohio Div. Geol. Survey Rept. Inv. 75, 17 p., tables, 1970.
- Owens, James P.** See Stefansson, Karl. 01478
- 05860 **Owens, James P.; Minard, James P.; Sohl, Norman F.; Mello, James F.** Stratigraphy of the outcropping post-Magothy Upper Cretaceous formations in southern New Jersey and northern Delmarva Peninsula, Delaware and Maryland: U.S. Geol. Survey Prof. Paper 674, 60 p., illus., tables, 1970.
- Owens, James P.** See Sirkin, Leslie A. 06170
- 08486 **Owens, Willard C.** Ground water and our environment, in Governor's Conf. on Environmental Geology: Colorado Geol. Survey Spec. Pub., no. 1, p. 38-41 [1970,].
- 02369 **Oxburgh, E. R.; Turcotte, D. L.** Thermal structure of island arcs: Geol. Soc. America Bull., v. 81, no. 6, p. 1665-1688, illus., 1970.
- Oxburgh, E. R.** See Schubert, Gerald. 03420
- Oxburgh, E. R.** See Turcotte, D. L. 06261
- 05748 **Oyama, Vance I.; Merek, Edward L.; Silverman, Melvin P.** A search for viable organisms in a lunar sample, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc.

— V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1921-1927, illus., tables, 1970.

- 03361 **Ozard, J. M.; Russell, R. D.** Discrimination in solid source lead isotope abundance measurement: Earth and Planetary Sci. Letters, v. 8, no. 5, p. 331-336, illus., tables, 1970.

- 09705 **Ozol, Michael A.; Newlon, Howard H., Jr.** Bridge deck deterioration promoted by reaction of a dolomitic limestone coarse aggregate with cement alkalies [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 643, 1970.

**Paaswell, Robert E.** See Partheniades, Emmanuel. 01519

- 02531 **Pabian, Roger K.** Gemstone occurrences in Nebraska [abs.]: Nebraska Acad. Sci. Proc., 80th Ann. Mtg., p. 35-36, 1970.

- 02532 **Pabian, Roger K.** A theoretical ontogeny of the Pennsylvanian trilobite *Ditomopyge scitula* (Meek and Worthen) [abs.]: Nebraska Acad. Sci. Proc., 80th Ann. Mtg., p. 36, 1970.

- 02533 **Pabian, Roger K.; Strimple, Harrell, L.** Paleocology of Pennsylvanian crinoids from southeastern Nebraska and southwestern Iowa [abs.]: Nebraska Acad. Sci. Proc., 80th Ann. Mtg., p. 36, 1970.

- 07542 **Pabian, Roger K.** Record in rock — A handbook of the invertebrate fossils of Nebraska: Nebraska Univ. Conserv. and Survey Div. Educ. Circ. 1, 99 p., illus., 1970.

**Pablo Galan, Liberto de.** See Schlaepfer, Carmen J. 02676

- 06877 **Padgham, William Albert.** The geological structure of the Lac La Ronge region, Saskatchewan [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 1, p. 253B, 1970.

- 00923 **Padovani, E. Reeves.** Devonian acritarchs from the Cedar Valley Formation [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 297, 1970.

**Padovani, E. Reeves.** See Urban, J. B. 04356

- 03090 **Paeth, Robert Carl.** Genetic and stability relationships of four western Cascade soils [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 10, p. 4461B, 1970.

- 00332 **Page, Ben M.** Time of completion of underthrusting, Franciscan vs. Great Valley rocks, Santa Lucia Range, California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 129, 1970.

- 00575 **Page, Benjamin M.** Sur-Nacimiento fault zone of California — Continental margin tectonics: Geol. Soc. America Bull., v. 81, no. 3, p. 667-689, illus., table, geol. map, 1970.

- 04462 **Page, Benjamin M.** Time of completion of underthrusting of Franciscan beneath Great Valley rocks west of Salinian block, California: Geol. Soc. America Bull., v. 81, no. 9, p. 2825-2833, illus., 1970.

- 09706 **Page, Benjamin M.** Oceanic crust remnant on land near San Luis Obispo, California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 643-644, 1970.

**Page, Benjamin M.** See Dickinson, William R. 11228

- 07773 **Page, Lincoln R.** Geologic analysis of the X-band radar mosaics of Massachusetts, in Earth Resources Aircraft Program, status review, V. 1: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 4-1—4-19, illus., [1970?].

- 00631 **Page, Norman J.; Nokleberg, Warren J.** A suite of granitic intrusive rocks below the base of the Stillwater complex, Mount Wood quadrangle, Montana [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 342, 1970.
- 01810 **Page, Robert; Lahr, John.** Geodetic triangulation for fault movement on the Denali and Fairweather faults in Alaska [abs.]: *EOS*, v. 51, no. 4, p. 427, 1970.
- Page, Robert.** See Scholz, C. H. 01831
- 01964 **Page, Robert.** Dating episodes of faulting from tree-rings [abs.]: *EOS*, v. 51, no. 4, p. 363, 1970.
- 04881 **Page, Robert.** Dating episodes of faulting from tree rings — Effects of the 1958 rupture of the Fairweather fault on tree growth: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 3085-3094, illus., tables, 1970.
- 04156 **Page, Virginia M.** "The problem of identifying the wood of Cretaceous . . . dicotyledons" forty-six years later [abs.]: *Am. Jour. Botany*, v. 57, no. 6, pt. 2, p. 758-759, 1970.
- 06798 **Page, Virginia M.** Angiosperm wood from the Upper Cretaceous of central California, [Pt.] 3: *Am. Jour. Botany*, v. 57, no. 9, p. 1139-1144, illus., 1970.
- 07262 **Pailoor, Govind.** Variations in cation exchange capacities of some representative Michigan soils with analytical procedures and their relationships to acidity, clay mineralogy and organic matter [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 5, p. 2413B-2414B, 1970.
- 01367 **Paine, Robert T.** The sediment occupied by Recent lingulid brachiopods and some paleoecological implications: *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 7, no. 1, p. 21-31, illus., tables, 1970.
- 04760 **Paine, William.** East Basile Field, Evangeline Parish, Louisiana, *in* Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 8-8c, illus., 1970.
- 04773 **Paine, William.** Neale Field, Beauregard Parish, Louisiana, *in* Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 21-21c, illus., 1970.
- 04756 **Paine, William R.** Bear-Ragley Fields, Beauregard Parish, Louisiana, *in* Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 4-4c, illus., 1970.
- 04834 **Paine, William R.; Meyerhoff, A. A.** Gulf of Mexico basin — Interactions among tectonics, sedimentation, and hydrocarbon accumulation [abs.]: *Am. Assoc. Petroleum Geologists*, v. 54, no. 9, p. 1788-1789, 1970.
- 07314 **Paine, William R.; Meyerhoff, A. A.** Gulf of Mexico basin — Interactions among tectonics, sedimentation, and hydrocarbon accumulation, *in* Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Soc. Trans., v. 20, p. 5-44, illus., table, 1970.
- 11008 **Paintal, Amreek Singh.** The probabilistic characteristics of bed load transport in alluvial channels [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 8, p. 3659B, 1970.
- 05074 **Paist, Donald A.; Pings, W. B.** Vanadium — 1970: Colorado School Mines Mineral Industries Bull., v. 13, no. 4, 24 p., illus., tables, 1970.
- Pajari, G. E., Jr.** See Ghosh-Dastidar, P. 04487
- 06727 **Pak, Hasong; Beardsley, George F., Jr.; Heath, G. Ross; Curl, Herbert.** Light-scattering vectors of some marine particles: *Limnology and Oceanography*, v. 15, no. 5, p. 683-687, illus., 1970.



**Pakalns, G. V.** See Swain, F. M. 04095

- 03676 **Pakiser, L. C.** Structure of Mono Basin, California: Jour. Geophys. Research, v. 75, no. 20, p. 4077-4080, illus., 1970.

**Pakiser, L. C.** See Eaton, J. P. 03975

- 05532 **Pakiser, Louis C., Jr.** Earthquake prediction and modification research in progress, in Geologic hazards and public problems (R. A. Olson and M. M. Wallace, editors) - [U.S.] Office Emergency Preparedness, Region 7, Conf., San Francisco, Calif., 1969, Proc.: Washington, D.C., U.S. Govt. Printing Office, p. 297-303 [1970].

- 02668 **Pallister, A. E.** Operation Arcticquest, application of multidiscipline, multiparticipant exploration concept [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 863, 1970.

- 10086 **Pallister, A. E.; Bourne, S. A.** Geology of offshore areas of Canadian Arctic Islands based on geophysical work [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2500, 1970.

- 06021 **Palmer, Arthur Nicholas.** A hydrologic study of the Indiana karst — An evaluation of the effects of geologic setting upon ground-water flow and water supply in a karst region, with special reference to northwestern Lawrence County, Indiana [abs.]: Desert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5578B, 1970.

- 01811 **Palmer, D. F.** Metamorphic conditions in the northwest Adirondacks [abs.]: EOS, v. 51, no. 4, p. 446, 1970.

- 06306 **Palmer, Dennis E.** Geology of Stansbury Island, Tooele County, Utah: Brigham Young Univ. Geology Studies, v. 17, pt. 2, p. 3-30, illus., geol. map, 1970.

- 03481 **Palmer, Donald F.** Geology and ore deposits near Benson Mines, New York: Econ. Geology, v. 65, no. 1, p. 31-39, illus., tables, 1970.

- 08123 **Palmer, H. C.** Paleomagnetism and correlation of some Middle Keweenawan rocks, Lake Superior: Canadian Jour. Earth Sci., v. 7, no. 6, p. 1410-1436, illus., tables, 1970.

- 06005 **Palmer, Harold Dean.** Wave-induced scour around natural and artificial objects [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5558B, 1970.

- 00746 **Palmer, James E.** Fault scarp exposures in the Saint Charles and Nortonville quadrangles, western Kentucky [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 235, 1970.

- 02454 **Palmer, Katherine V. W.** Paleozoic nonmarine bivalve from a deep well in Georgia: Georgia Acad. Sci. Bull., v. 28, no. 1, p. 45-54, illus., 1970.

**Palmquist, Robert C.** See Foster, John D. 03655

- 02514 **Palonen, P.; Mills, D. H.** Whitefish Lake Indian Reserve No. 6, Louise-Eden area, District of Sudbury: Ontario Dept. Mines Prelim. Geol. Map P. 597, scale 1 in. to 1/4 mi., text, 1970.

**Palonen, P.** See Card, K. D. 06420

**Palonen, P.** See Card, K. D. 06421

**Palonen, P.** See Card, K. D. 06422

- 00092 **Pamenter, Bev.** No surprises in Sable well report: Oilweek, v. 20, no. 47, p. 7-8, 10, illus., table, 1970.

- 04584 **Pamenter, Bev.** Gaspé region beckons oil hunters: *Oilweek*, v. 21, no. 33, p. 18, 20, illus., 1970.
- 02300 **Pampe, William R.** Stratigraphy of the Devonian rocks of western Colorado: *Earth Sci. Bull.*, v. 3, no. 1, p. 19-43, illus., table, 1970.
- 02804 **Pampe, William R.** Nature's hot water heaters: *Sci. and Children* (Washington, D.C., Natl. Sci. Teachers Assoc.), v. 7, no. 6, p. 32-33, illus., 1970.
- Pampeyan, E. H.** See Tschanz, C. M. 03396
- 01812 **Pan, Cheh.** The dynamical evolution of a layered earth [abs.]: *EOS*, v. 51, no. 4, p. 430, 1970.
- 02710 **Pan, Cheh.** The gravitational factor from mid-continental body tides and its statistical analysis: *Tectonophysics*, v. 9, no. 1, p. 15-46, illus., tables, 1970.
- 07781 **Pan, Poh-Hsi; DeBremaecker, J. C.** Direct location of oil and gas by the seismic reflection method: *Geophys. Prosp.* [Netherlands], v. 18, supp., p. 712-727, illus., 1970.
- Panda, P. K.** See Verma, R. K. 07309
- 01562 **Pandey, Sheo Ji.** Prediction and comparison of properties of Hawaiian and Indian red earths using automatic data processing techniques [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 9, p. 3944B-3945B, 1970.
- 01965 **Pandit, B. I.; Savage, J. C.** An experimental test of Lomnitz's theory of internal friction [abs.]: *EOS*, v. 51, no. 4, p. 417, 1970.
- Panek, Louis A.** See Wang, Fun-Den. 02439
- 04472 **Panek, Louis A.** Methods and equipment for measuring subsidence, in *Third symposium on salt*, V. 2 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 321-338, illus., 1970.
- 09139 **Panek, Louis A.** Effect of rock fracturing on the modulus, as determined by borehole dilation tests [with French and German summ.], in *Internat. Soc. Rock Mechanics Cong.*, 2d, Belgrade, Yugoslavia, 1970, proc., V. 1: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 383-387, illus., 1970.
- Pannella, Giorgio.** See Rhoads, Donald C. 03885
- 10818 **Panos, Vladimir; Stelcl, Otakar.** Problems of the conical karst in Cuba, in *Internat. Cong. Speleology*, 4th, Yugoslavia, 1965, Proc., V. 3: Ljubljana, Yugoslavia, *Speleolog. Soc. Yugoslavia*, p. 533-555, illus., 1968.
- Panteleyev, A.** See Brown, A. Sutherland. 03464
- Papezik, V. S.** See Gibbons, R. V. 05291
- 08127 **Papezik, V. S.** Petrochemistry of volcanic rocks of the Harbour Main Group, Avalon Peninsula, Newfoundland: *Canadian Jour. Earth Sci.*, v. 7, no. 6, p. 1485-1498, illus., tables, 1970.
- Papike, J. J.** See Bence, A. E. 01738
- Papike, J. J.** See Prewitt, C. T. 03367
- 09057 **Papike, J. J.; Ross, Malcolm.** Gedrites — crystal structures and intracrystalline cation distributions: *Am. Mineralogist*, v. 55, nos. 11-12, p. 1945-1972, illus., tables, 1970.
- Papike, J. J.** See Huebner, J. Stephen. 09058

- 09737 **Papke, Keith G.** Montmorillonite, bentonite, and fuller's earth deposits in Nevada: Nevada Bur. Mines. Bull. 76, 47 p., illus., tables, geol. maps. 1970.
- Parasnis, D. S.** See Mabey, D. 02941
- 03490 **Parham, Walter; Phinney, William; Grant, James.** A teacher's guide for geologic field investigations in the Minnesota River valley: [St. Paul, Minn.] Minnesota Dept. Education, 24 p., illus. [n.d.].
- 07539 **Parham, Walter E.** Clay mineralogy and geology of Minnesota's kaolin clays: Minnesota Geol. Survey Spec. Pub. Ser. SP-10, 142 p., illus., tables, 1970.
- 09146 **Pariseau, W. G.; Voight, Barry; Dahl, H. D.** Finite element analyses of elastic-plastic problems in the mechanics of geologic media — an overview [with French and German summ.], in Internat. Soc. Rock Mechanics Cong., 2d, Belgrade, Yugoslavia, 1970, Proc., V. 2: Belgrade, Jaroslav Černi Inst. Devel. Water Resources, p. 311-323, illus., 1970.
- Pariseau, William.** See Voight, Barry. 02361
- 11018 **Parizek, Richard R.; Siddiqui, Shamsul H.** Determining the sustained yields of wells in carbonate and fractured aquifers: Ground Water, v. 8, no. 5, p. 12-20, illus., tables, 1970; errata, *ibid.*, v. 9, no. 1, p. 51, 1971.
- 07411 **Parizek, Richard R.** Prevention of coal mine drainage problems by well dewatering [abs.]: Mining Eng., v. 22, no. 9, p. 54, 1970.
- 08398 **Park, Charles F., Jr.; MacDiarmid, Roy A.** Ore deposits, 2d edition: San Francisco, Calif., W. H. Freeman and Company, 522 p., illus., tables, 1970.
- 02283 **Park, G. M.** Granite Mountain, in Radioactive and isotopic age determinations of Utah rocks: Utah Geol. and Mineralog. Survey Bull. 81 (Utah Univ. Bull., v. 61, no. 18; Utah Eng. Expt. Sta. Bull. 135), p. 21, 1970.
- 02284 **Park, G. M.** Volcanics, Thomas Range, in Radioactive and isotopic age determinations of Utah rocks: Utah Geol. and Mineralog. Survey Bull. 81 (Utah Univ. Bull., v. 61, no. 18; Utah Eng. Expt. Sta. Bull. 135), p. 23, 1970.
- Park, J.** See Brooke, J. 03009
- Park, J. K.** See Irving, E. 05285
- 08166 **Park, J. K.** Acid leaching of red beds and the relative stability of the red and black magnetic components: Canadian Jour. Earth Sci., v. 7, no. 4, p. 1087-1092, illus., tables, 1970.
- 08167 **Park, J. K.; Irving, E.** The Mid-Atlantic Ridge near 45°N — [Pt.] 12, Coercivity, secondary magnetization, polarity, and thermal stability of dredge samples: Canadian Jour. Earth Sci., v. 7, no. 6, p. 1499-1514, illus., tables, 1970.
- Park, J. K.** See Brooke, J. 08168
- 05992 **Park, Robert Gene.** The electrophoretic separation of mixtures of pure clays and the electrophoretic separation and characterization of a soil allophane [abs.]: Desert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5326B, 1970.
- 03594 **Parkash, Barham.** Downcurrent changes in sedimentary structures in Ordovician turbidite greywackes: Jour. Sed. Petrology, v. 40, no. 2, p. 572-590, illus., tables, 1970.
- 06341 **Parkash, Barham; Middleton, Gerard V.** Downcurrent textural changes in Ordovician turbidite graywackes: Sedimentology, v. 14, nos. 3-4, p. 259-293, illus., tables, 1970.
- Parker, A.** See Macdonald, Raymond. 08219

- 01966 **Parker, Andrew.** The influence of geochemistry on the geotechnical properties of marine clays [abs.]: EOS, v. 51, no. 4, p. 328, 1970.
- 02384 **Parker, Dale E.; Lee, Gerhard B.; Yanggen, Douglas A.** Using soil maps to delineate floodplains in a glaciated low-relief landscape: Jour. Soil and Water Conserv., v. 25, no. 3, p. 96-99, illus., tables, 1970.
- 09800 **Parker, Dale E.; Lee, Gerhard B.; Milfred, Clarence J.** Flood plain delineation with pan and color: Photogramm. Eng., v. 36, no. 10, p. 1059-1063, illus., table, 1970.  
**Parker, Frances L.** See Berger, Wolfgang H. 03343
- 02573 **Parker, Jack.** Temperature and humidity affect strength of rock structures at White Pine: Soc. Mining Engineers AIME Trans., v. 247, no. 2, p. 142-144, illus., 1970.
- 01095 **Parker, Lee R.** A titanotherium from the Eocene Green River Formation of Utah [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 400, 1970.  
**Parker, M. L.** See Jones, F. W. 07814
- 07815 **Parker, M. L.; Meleskie, K. R.** Preparation of X-ray negatives of tree-ring specimens for dendrochronological analysis: Tree-Ring Bull., v. 30, nos. 1-4, p. 11-22, illus., 1970.
- 09915 **Parker, Mary C.; Dorheim, Fred H.; Koch, Donald L.; Harris, Stanley E., Jr.** Field trip No. 3, Mississippian (Osage and Kinderhook) stratigraphy and Mississippian-Devonian boundary problems in southeastern Iowa, in Geol. Soc. America, North-Central Sec., Ann. Mtg., 2d, May 1968, guidebook: Iowa City, Iowa, Univ. Iowa, P. 3-1 to 3-28, illus. [1968].  
**Parker, P. L.** See Attaway, David. 03411
- 09707 **Parker, P. L.** Isotopic chemistry of organic matter in the oceans [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 644-645, 1970.  
**Parker, Patrick L.** See Sever, Julia R. 09563
- 04768 **Parker, Phillip D.** Lake Arthur Field, Jefferson Davis Parish, Louisiana, in Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 16-16c, illus., 1970.
- 04015 **Parker, Raymond L.; Sharp, William N.** Mafic-ultramafic igneous rocks and associated carbonatites of the Gem Park Complex, Custer and Fremont Counties, Colorado: U.S. Geol. Survey Prof. Paper 649, 24 p., illus., tables, geol. map, 1970.
- 00569 **Parker, Ronald B.; Toots, Heinrich.** Minor elements in fossil bone: Geol. Soc. America Bull., v. 81, no. 3, p. 925-932, illus., tables, 1970.
- 02799 **Parker, Travis J.** Regional structure of the southeast Texas coastal plain, in Outcrops of the Claiborne Group in the Brazos Valley, southeast Texas — Geol. Soc. America South-Central Sec., 4th Ann. Mtg., 1970, Guidebook: [College Station, Tex.] Texas A and M Univ., Dept. Geology, p. 4-11, illus., 1970.  
**Parkin, C. W.** See Dyal, P. 05107
- Parkinson, W. W.** See Watson, Clyde D. 09011
- 00107 **Parks, James M.** Computerized trigonometric method for rotation of structurally tilted sedimentary directional features: Geol. Soc. America Bull., v. 81, no. 2, p. 537-540, illus., 1970.
- 00441 **Parks, James M.** Computerized trigonometric solution for finding original dip azimuth and inclination of cross-beds in plunging folded strata [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 31, 1970.

- 03200 **Parks, James M.** FORTRAN IV program for Q-mode cluster analysis on distance function with printed dendrogram: Kansas Geol. Survey Computer Contr. 46, 32 p., illus., tables, 1970.
- 09446 **Parmalee, Paul W.; Oesch, Ronald D.; Guilday, John E.** Pleistocene and recent vertebrate faunas from Crankshaft Cave, Missouri: Illinois State Mus. Rept. Inv. 14, 37 p., illus., tables, 1969.
- 09425 **Parmenter, Bev.** GSC uncovers Beaufort secrets: Oilweek, v. 22, no. 39, p. 8, 10-11, illus., 1970.
- Parrott, B. S.** See Bernard, Hugh A. 05896
- Parrott, B. S.** See Bernard, Hugh A. 05897
- Parrott, William R.** See Foord, Eugene E. 02218
- 07369 **Parry, John Robert.** Integral equation formulations of scattering from two-dimensional inhomogeneities in a conductive earth [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2070B, 1970.
- Parry, W. T.** See Bates, T. R. 00427
- 03401 **Parry, W. T.; Reeves, C. C., Jr.; Leach, J. W.** Oxygen and carbon isotopic composition of West Texas lake carbonates: Geochim. et Cosmochim. Acta, v. 34, no. 7, p. 825-830, illus., table, 1970.
- 07413 **Parry, W. T.; Nicol, Alan B.** A tiltmeter to measure minute rotational movement: Mining Eng., v. 22, no. 9, p. 71-73, illus., 1970.
- 05078 **Parsley, Ronald L.** Revision of the North American Pleurocystitidae (Rhombifera-Cystoidea): Bulls. Am. Paleontology, v. 58, no. 260, p. 135-213, illus., 1970.
- 01116 **Parsley, Ronald Lee.** Studies in Middle Ordovician primitive Echinodermata [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3310B-3311B, 1970.
- 01216 **Parsons, Barbara Mae.** A palynological investigation of glacial Lake Monongahela sediments [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 8, p. 3515B, 1970.
- Parsons, D. A.** See Willis, J. C. 10381
- 08023 **Parsons, Myles L.** Groundwater thermal regime in a glacial complex: Water Resources Research, v. 6, no. 6, p. 1701-1720, illus., 1970.
- 08060 **Parsons, Myles L.** Groundwater movement in a glacial complex, Cochrane district, Ontario: Canadian Jour. Earth Sci., v. 7, no. 3, p. 869-883, illus., table, 1970.
- 02568 **Parsons, R. B.; Balster, C. A.; Ness, A. O.** Soil development and geomorphic surfaces, Willamette Valley, Oregon: Soil Sci. Soc. America Proc., v. 34, no. 3, p. 485-491, illus., tables, 1970.
- 02955 **Parsons, R. B.; Herriman, R. C.** Haploxerolls and argixerolls developed in recent alluvium, southern Willamette Valley, Oregon: Soil Sci., v. 109, no. 5, p. 299-309, illus., tables, 1970.
- 01866 **Parsons, Willard H.** Current status of Central American volcanoes [abs.]: EOS, v. 51, no. 4, p. 440, 1970.
- 02364 **Parsons, Willard H.** Cerro Negro Volcano: Explorer, v. 12, no. 2, p. 16-19, illus., 1970.
- 10933 **Parthé, Erwin.** Crystal chemistry of tetrahedral structures: New York, and London, Gordon and Breach Sci. Publishers, 176 p., illus., tables, 1964.

- 01519 **Partheniades, Emmanuel; Paaswell, Robert E.** Erodibility of channels with cohesive boundary: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7156, *Jour. Hydraulics Div.*, no. HY 3, p. 755-771, illus., 1970.
- Parwel, A.** See Gross, Eugene B. 09131
- Pascoe, Ralph F.** See Fishman, Marvin J. 04304
- Paslay, Paul R.** See Weidler, Jay B., Jr. 03329
- Pasley, Susan M.** See Thompson, Geoffrey. 00853
- Pasley, Susan M.** See Thompson, Geoffrey. 04084
- 09090 **Passaglia, Elio.** The crystal chemistry of chabazites: *Am. Mineralogist*, v. 55, nos. 7-8, p. 1278-1301, illus., tables, 1970.
- 09708 **Passero, Richard N.** The impact of N.S.F. institutes on secondary earth science, a study of 21 selected summer, in-service and academic year institutes [abs.]: *Geol. Soc. America Abs. with programs*, v. 2, no. 7, p. 645, 1970.
- Paster, Theodore P.** See Haskin, Larry A. 05698
- 06398 **Pastine, D. John.** On the accuracy of the Wachtman-Anderson relation: *Jour. Geophys. Research*, v. 75, no. 35, p. 7421-7425, 1970.
- 04917 **Pastoor, D. W.** Geology of the Invincible tungsten ore zone of Canadian Exploration Limited, Salmo, British Columbia, [Chap.] 9 in *Lead-zinc deposits in the Kootenay Arc, northeastern Washington and adjacent British Columbia* — *Soc. Econ. Geologists, 1970 Northwest Field Conf. Guidebook: Washington Div. Mines and Geology Bull.* 61, p. 99-106, illus., 1970.
- Patchen, Douglas G.** See Cardwell, Dudley H. 07199
- 05930 **Paterson, M. S.; Turner, F. J.** Experimental deformation of constrained crystals of calcite in extension [with German abs.], in *Experimental and natural rock deformation* — *Internat. Symposium, Darmstadt, Germany, 1969, Proc.* (P. Paulitsch, editor): Berlin and Heidelberg, Germany, Springer-Verlag, p. 109-141, illus., tables, 1970.
- 02945 **Paterson, Norman R.** Exploration for massive sulphides in the Canadian Shield [with French abs.], in *Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept.* 26, p. 275-287, illus., tables; discussion, p. 287-289, 1970.
- 10898 **Paterson, Norman R.** Airborne VLF-EM test: *Canadian Mining Jour.*, v. 91, no. 11, p. 47-50, illus., 1970.
- 01448 **Paterson, W. S. B.** Excess pressure observed in a water-filled cavity in Athabasca Glacier, Canada [with French and German abs.]: *Jour. Glaciology*, v. 9, no. 55, p. 103-107, illus., table, 1970.
- 01450 **Paterson, W. S. B.** The sliding velocity of Athabasca Glacier, Canada [with French and German abs.]: *Jour. Glaciology*, v. 9, no. 55, p. 55-63, illus., tables, 1970.
- 04024 **Paterson, W. S. B.** Glaciation of the north-western part of the Canadian Arctic Archipelago [correction to 1969 paper]: *Jour. Glaciology*, v. 9, no. 56, p. 286, 1970.
- Patricuin, David.** See Smith, Donald L. 02684
- 08159 **Patterson, J. A.** Character of the United States uranium resources, in *Uranium exploration geology* — Panel on uranium exploration geology, Vienna, 1970, *Proc.*: Vienna, Austria, *Internat. Atomic Energy Agency*, p. 117-127, illus., tables, 1970.

- 05094 **Patterson, James H.; Turkevich, Anthony L.; Franzgrote, Ernest J.** Chemical analysis of the lunar surface in the Surveyor program — Summary, in Symposium on planetary atmospheres and surfaces, Woods Hole, Mass., 1969: Radio Sci., v. 5, no. 2, p. 181-183, 1970.
- Patterson, James H.** See Economou, Thanasis E. 06258
- Patterson, O. F., 3d.** See Hope, R. C. 05809
- Patterson, W. C.** See Payton, C. E. 05665
- 04126 **Patton, Clyde P.; Alexander, Charles S.; Kramer, Fritz L.** Physical geography: Belmont, Calif., Wadsworth Publishing Co., 408 p., illus., tables, 1970.
- Patton, John B.** See Becker, Leroy E. 01052
- 09709 **Patton, Thomas C.** Quartz deficient potassic hydrothermal alteration, central Cascades, Washington [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 645-646, 1970.
- 08363 **Patton, Thomas H.; Webb, S. David.** Fossil vertebrate deposits in Florida: Plaster Jacket, no. 14, [8] p., illus., 1970.
- Patton, William W.** See Forbes, Robert B. 10040
- 00129 **Patton, William W., Jr.; Miller, Thomas P.** Preliminary geologic investigations in the Kanuti River region, Alaska: U.S. Geol. Survey Bull. 1312-J, p. J1-J10, illus., 1970.
- 03413 **Patton, William W., Jr.; Miller, Thomas P.** A possible bedrock source for obsidian found in archeological sites in northwestern Alaska: Science, v. 169, no. 3947, p. 760-761, illus., table, 1970.
- 10087 **Patton, William W., Jr.** Mesozoic tectonics and correlations in Yukon-Koyukuk province, west-central Alaska [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2500, 1970.
- 00924 **Patty, Tom S.** Industrial mineral utilization by the Texas Highway Department [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 297, 1970.
- 01587 **Pauken, Robert John, Jr.** A population study of the Pleistocene molluscan faunas in loess of the Missouri River basin in Missouri [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 9, p. 4285B, 1970.
- 03575 **Paul, C. R. C.** The aboral nervous system of *Marsupiocrinus* Morris: Fieldiana — Geology, v. 16, no. 18, p. 461-469, illus., 1970.
- Paul, Richard R.** See Archbold, N. L. 03217
- 02414 **Paulding, Bartlett W., Jr.** Coefficient of friction of natural rock surfaces: Am. Soc. Civil Engineers Proc., v. 96, paper 7121, Jour. Soil Mechanics and Found. Div., no. SM2, p. 385-394, illus., tables, 1970.
- 09945 **Pauling, Linus.** Crystallography and chemical bonding of sulfide minerals, in Symposium on sulfides — Fiftieth Anniversary Symposia (Benjamin A. Morgan, editor): Mineralog. Soc. America Spec. Paper 3, p. 125-131, table, 1970.
- 00632 **Paull, Richard A.** Evidence against the existence of the Antler orogenic belt in central Idaho [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 343, 1970.
- 04577 **Paulson, Oscar L., Jr.** Wrench faulting as a trigger mechanism for interior salt ridges of Mississippi, in Third symposium on salt, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 283-285, illus., 1970.

- Paulson, Q. F.** See Kelly, T. E. 02148
- 02907 **Paulson, Richard W.** Estuarine studies, *in* Earth resources aircraft program status review, NASA, Houston, 1968 — V. 3, Hydrology, oceanography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 24-1 — 24-10, illus. [1970].
- Pautot, Guy.** See LePichon, Xavier. 01946
- 03395 **Pautot, Guy; Auzende, Jean-Marie; LePichon, Xavier.** Continuous deep sea salt layer along North Atlantic margins related to early phase of rifting: *Nature*, v. 227, no. 5256, p. 351-354, illus., 1970.
- Pautot, Guy.** See Olivet, Jean-Louis. 05254
- Pavelka, B. R.** See Crippen, J. R. 03056
- Pavlick, Raphael J.** See Dilcher, David L. 02876
- 09476 **Pawley, Julian K.; Moore, Neil A.; Ellert, Ruben; Luehrmann, William H.** The North Pacific crossing, *in* Offshore Technology Conference, 2d Ann., Houston, Tex., 1970, Preprints — v. 2: Dallas, Tex., Offshore Technology Conf., p. II-171 — II-173, 1970.
- 00583 **Pawlowicz, Edmund Frank.** An isostatic study of northern and central Greenland based on gravity values and airborne radar ice-thickness measurements [abs.]: *Disser. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 7, p. 3247B, 1970.
- Pawson, D. L.** See Donnay, G. 02236
- 11221 **Paylore, Patricia.** (compiler). Desert research II — Selected references, 1966-1970: U.S. Army Natick Lab. Tech. Rept. ES-60, 169 p., 1970.
- Payne, C. Marshall.** See Proctor, R. J. 00426
- 04783 **Payne, J. N.** Geohydrologic significance of lithofacies of the Cockfield Formation of Louisiana and Mississippi and of the Yegua Formation of Texas: U.S. Geol. Survey Prof. Paper 569-B, p. B1-B14, illus., table, 1970.
- Payne, Roy D.** See Herring, James C. 10667
- 02075 **Paynter, Donald D.** Main Pass Block 35 field, Louisiana, paleostructural analysis: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 783-788, illus., 1970.
- 05665 **Payton, C. E.; Patterson, W. C.; Brown, G. L.** Automatic sample changer for Norelco vertical X-ray diffractometer: *Jour. Sed. Petrology*, v. 40, no. 3, p. 1052-1054, illus., 1970.
- Peacor, Donald R.** See Foreman, Neil. 06700
- 01589 **Peak, Wilfred W.** California geologic registration — Where do you fit? [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 3, p. 554-555, 1970.
- 09710 **Peake, Eric.; Baker, Bruce L.; Hodgson, Gordon W.** The contribution of amino acids and chlorins to the Beaufort Sea by the Mackenzie River system [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 646, 1970.
- Pearce, F.** See Gold, T. 05111
- Pearce, G. W.** See Strangway, D. W. 06297
- 01454 **Pearce, T. H.** Chemical variations in the Palisade sill: *Jour. Petrology*, v. 11, no. 1, p. 15-32, illus., tables, 1970.
- 07670 **Pearce, T. H.** The analcite-bearing volcanic rocks of the Crowsnest Formation, Alberta: *Canadian Jour. Earth Sci.*, v. 7, no. 1, p. 46-66, illus., tables, 1970.



- 01813 **Pearce, Thomas H.** The Crowsnest Volcanics and the genesis of analcite-bearing volcanics [abs.]: EOS, v. 51, no. 4, p. 442, 1970.
- 09711 **Pearce, Thomas H.** The analysis of chemical variation in basic rock suites [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 646-548, 1970.
- 08712 **Pearl, Richard Howard.** Method for estimating average coefficient of permeability using hydrogeologic field data, in Ogallala Aquifer Symposium, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, p. 131-144, illus., tables, 1970.
- 10260 **Pearson, Eugene F.** Conodonts from the lower Goose Egg Formation (permian) of southeastern Wyoming: Wyoming Univ. Contr. Geology, v. 9, no. 2, p. 102-104, illus., 1970.
- 07464 **Pearson, F. J., Jr.; Friedman, Irving.** Sources of dissolved carbonate in an aquifer free of carbonate minerals: Water Resources Research, v. 6, no. 6, p. 1775-1781, illus., tables, 1970.
- 08478 **Pearson, F. J., Jr.; Hanshaw, B. B.** Sources of dissolved carbonate species in groundwater and their effects on carbon-14 dating in Isotope hydrology, 1970 — A symposium, Vienna, Austria, 1970, Proc.: Vienna, Austria, Internat. Atomic Energy Agency STI-Pub. 255, p. 271-286, illus., table, 1970.
- Pearson, Robert C.** See Kiilsgaard, Thor H. 09854
- 06166 **Pease, Maurice H., Jr.** Pleistocene stratigraphy observed in a pipeline trench in east-central Connecticut and its bearing on the two-till problem, in Geological Survey research 1970, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D36-D48, illus., 1970.
- 08534 **Peck, Dallas L.; Wolfe, Jack A.; Griggs, Allan E.** Remarks on the paper "Oregon Cascades in relation to Cenozoic stratigraphy" by H. E. Wheeler and V. S. Mallory [1970], in Columbia River Basalt Symposium, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 125-130, 1970.
- 08645 **Peck, Dallas L.** Solidification of ponded basalt flows, as shown by studies of recent Kilauean lava lakes, Hawaii [abs.], in Columbia River Basalt Symposium, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 328, 1970.
- Peck, L. C.** See Maxwell, J. A. 05708
- 09850 **Pecora, W. T.** Resources and environment — Quest for balance: Mining Cong. Jour., v. 56, no. 8, p. 65-70, illus., 1970.
- 09853 **Pecora, W. T.** The need for new mineral sources to maintain the economic and social health of the free world: Mining Cong. Jour., v. 56, no. 11, p. 77-81, illus., 1970.
- 08227 **Pecora, William T.** The need for mapping and inventorying natural resources, in The use of remote sensing . . . of natural resources of Alaska: Juneau, Alaska, Dept. of Econ. Devel., p. 30-32 [1970].
- 08723 **Pecora, William T.** The influence of modern life on the work of the Geological Survey: Annales Inst. Geol. Publici Hungarici, v. 54, no. 1, p. 99-103, 1970.
- 09041 **Pecora, William T.** Resources and environment — Quest for balance: Mines Mag., v. 60, no. 7, p. 8-11, illus., 1970.
- 09474 **Pecora, William T.** Searching out resource limits, in Limitations of the earth, a compelling focus for geology (Texas Univ. Austin Bur. Econ. Geology)-A symposium held at the dedication of the new Geology Building, Austin, Tex., 1967, Proc.: Texas Quart, v. 11, no. 2, p. 148-154, 1968.

**Pedder, A. E. H.** See Norford, B. S. 04100

- 09607 **Peden, Guy T., Jr.; Oliphant, Van N.** The availability of water for industrial uses in selected small communities in Mississippi: State College, Miss., Mississippi State Univ. Water Resources Research Inst., 101 p., illus., tables, 1967.
- 05368 **Pedersen, Edward P.; Royse, Chester F.** Late Cenozoic geology of the Payson basin, Gila County, Arizona: Arizona Acad. Sci. Jour., v. 6, no. 2, p. 168-178, illus., tables, 1970.
- 02477 **Pedersen, K. Raunsgaard; Lam, Jörgen.** Precambrian organic compounds from the Ketilidian of South-West Greenland, Pt. 3: Medd. Grönland, v. 185, no. 7, 42 p., illus., tables, 1970; *reprinted as* Grönlands Geol. Undersögelse Bull. 82, 1970.
- 06243 **Pedersen, K. Raunsgaard.** Late Precambrian microfossils from Peary Land, *in* Report of activities, 1969: Grönlands Geol. Undersögelse Rap. 28, p. 16-17, 1970.
- Pedro, G.** See Brindley, G. W. 07847
- 04469 **Pegler, A. V.** The aeolotropy of thermal conductivity in rock, *in* Third symposium on salt, V. 2 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 216-225, illus., tables, 1970.
- 08730 **Pegler, A. V.** Instrumentation strain measurement stress calculation for excavation in rock (with French summ.), *in* Canadian Symposium on Mining Surveying and Rock Deformation Measurements, 1st, Fredericton (New Brunswick), 1969, Proc.: Fredericton, Univ. of New Brunswick, p. 246-267, illus., table, 1970.
- 01594 **Peikert, Ernest W.** Interactive computer graphics and the fault problem [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 3, p. 556-557, 1970.
- 07209 **Peirce, H. Wesley; Keith, Stanton B.; Wilt, Jan Carol.** Coal, oil, natural gas, helium, and uranium in Arizona: Arizona Bur. Mines Bull. 182, 289 p., illus., tables, geol. map, 1970.
- 04380 **Pelletier, B. R.; Godden, C. A.** A submersible electric coring drill for geological exploration of the shelf: Mining in Canada, August 1970, p. 34-40, illus., 1970.
- Pelletier, B. R.** See Brooke, J. 04549
- 09822 **Pelletier, B. R.** Sedimentological sampling and results from the diver lock-out facility of the submersible Shelf Diver, Bay of Fundy, Nova Scotia: Maritime Sediments, v. 6, no. 3, p. 102-109, illus., 1970.
- Pelletier, Bernard R.** See Swift, Donald J. P. 03745
- 03316 **Pelletier, Jean.** Le relief du massif des Adirondacks — Pt. 1, Étude préliminaire [The relief of the Adirondack massif — Pt. 1, Preliminary study (with English and German abs.): Rev. Géographic Montréal, v. 24, no. 1, p. 65-78, illus., 1970.
- Pelly, I.** See Laul, J. C. 01945
- Pelly, I.** See Laul, J. C. 04557
- 04524 **Pelly, I. Z.; Lipschutz, M. E.; Balsiger, H.** Vanadium isotopic composition and contents in chondrites: Geochim. et Cosmochim. Acta, v. 34, no. 9, p. 1033-1036, table, 1970.
- Pelton, P. J.** See Burchfiel, B. C. 00026
- 04634 **Pemberton, R.** Geophysical prospecting in the Wollaston basin area: Canadian Mining Jour., v. 91, no. 5, p. 49-51, illus., 1970.
- 02930 **Pemberton, R. H.** Airborne radiometric surveying for mineral deposits [with French abs.], *in* Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 416-424, illus., tables, 1970.

- 04467 **Pendery, Eugene.** Distribution of salt and potash deposits — Present and potential effect on potash economics and exploration, *in* Third symposium on salt, V. 2 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 85-95, illus., tables, 1970.
- Penley, H. M.** See Webb, H. W. 03333
- 02889 **Penner, E.** Frost heaving forces in Leda clay [with French abs.]: Canadian Geotech. Jour., v. 7, no. 1, p. 8-16, illus., 1970.
- 03945 **Penner, E.; Gillott, J. E.; Eden, W. J.** Investigation of heave in Billings shale by mineralogical and biogeochemical methods [with French abs.]: Canadian Geotech. Jour., v. 7, no. 3, p. 333-338, illus., 1970.
- 08067 **Penner, E.** Thermal conductivity of frozen soils: Canadian Jour. Earth Sci., v. 7, no. 3, p. 982-987, illus., table, 1970.
- 10129 **Penner, E.** Particle size as a basis for predicting frost action in soils: Soils and Foundations, v. 8, no. 4, p. 21-29, illus., 1968.
- 05826 **Pennsylvania Geologists.** New interpretations of eastern Piedmont geology of Maryland, *or* granite and gabbro or graywacke or greenstone? — 35th Ann. Field Conf., 1970, Guidebook: Harrisburg, Pa., Pennsylvania Topog. and Geol. Survey, also Baltimore, Md., Maryland Geol. Survey, 60 p., illus., 1970.
- 10088 **Penttilä, Bill.** Sadlerochit Reservoir at Prudhoe Bay, Alaska [abs.], *in* Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2500-2501, 1970.
- 03447 **Penzien, Joseph.** Soil-pile foundation interaction, Chap. 14 *in* Earthquake engineering (R. L. Wiegel, editor): Englewood Cliffs, N.J., Prentice-Hall, p. 349-381, illus., 1970.
- 05715 **Pepin, R. O.; Nyquist, L. E.; Phinney, Douglas; Black, David C.** Rare gases in Apollo 11 lunar material, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1435-1454, illus., tables, 1970.
- 02844 **Peplies, Robert W.** Land use and regional analysis, *in* Earth resources aircraft program status review, NASA, Houston, 1968 — V. 1, Geology, geography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 5-1 — 5-16, illus., tables [1970].
- 05539 **Peppers, R. A.; Pfefferkorn, H. W.** A comparison of the floras of the Colchester (No. 2) Coal and Francis Creek Shale, *in* Depositional environments in parts of the Carbondale Formation, western and northern Illinois — Francis Creek Shale and associated strata and Mazon Creek biota — Geol. Soc. America, Coal Geology Div., Ann. Field Trip, Milwaukee, Wis., 1970: Illinois Geol. Survey Guidebook Ser. 8, p. 61-74, illus., tables, 1970.
- 02466 **Peppers, Russel A.** Correlation and palynology of coals in the Carbondale and Spoon Formations (Pennsylvanian) of the northeastern part of the Illinois basin: Illinois Geol. Survey Bull. 93, 173 p., illus., table, 1970.
- 06254 **Perch-Nielsen, K.** Field mapping in Palaeozoic and Mesozoic sediments of Jameson Land, Scoresby Land and Werner Bjerger, *in* Report of activities, 1969: Grönlands Geol. Undersøgelse Rap. 28, p. 42-43, 1970.
- Perch-Nielsen, K.** See Bromley, R. G. 09444
- Perch-Nielsen, Katharina.** See Berggren, W. A. 06160
- 09265 **Percious, J. K.** Geology and geochronology of the Del Bac Hills, Pima County, Arizona, App. A-VII of Correlation and chronology of ore deposits and volcanic

- rocks, Damon, Paul E.: n.p., U.S. Atomic Energy Comm. Research Div., p. 199-207, illus., tables, 1968.
- Peres, J.** See Revelle, R. 08382
- 04022 **Perhac, Ralph M.** Geology and mineral deposits of the Gallinas Mountains, Lincoln and Torrance Counties, New Mexico: New Mexico Bur. Mines and Mineral Resources Bull. 95, 51 p., illus., tables, geol. map, 1970.
- Perkins, Alfred J.** See Grove, E. L. 02877
- Perkins, Bob F.** See Erdoğan, Solmaz Z. 02614
- 02669 **Perkins, Bob F.** Genetic implications of rudist reef architecture [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 863-864, 1970.
- 08307 **Perkins, Bob F.** (editor). Geoscience and Man — V. 1, Proceedings of Am. Assoc. Stratig. Palynologists, Ann. Mtg., 1st, 1968: Baton Rouge, La., Louisiana State Univ., School of Geoscience, 141 p., illus., tables, 1970.
- 00333 **Perkins, Michael E.** Upper Cretaceous marine conglomerates in the central Coast Ranges, California — Source area and transport mechanism [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 129-130, 1970.
- 04928 **Perkins, Philip L.** Equitability and trophic levels in an Eocene fish population: Lethaia, v. 3, no. 3, p. 301-310, illus., table, 1970.
- Perkins, R. D.** See Friedman, M. 02401
- 05594 **Perkins, R. D.; Green, S. J.; Friedman, M.** Uniaxial stress behavior of porphyritic tonalite at strain rates to  $10^3$ /second: Internat. Jour. Rock Mechanics and Mining Sci., v. 7, no. 5, p. 527-535, illus., table, 1970.
- Perkins, R. D.** See Halsey, S. D. 07002
- Perkins, R. W.** See Rancitelli, L. A. 02272
- 05716 **Perkins, R. W.; Rancitelli, L. A.; Cooper, J. A.; Kaye, J. H.; Wogman, N. A.** Cosmogenic and primordial radionuclide measurements in Apollo 11 lunar samples by nondestructive analysis, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1455-1469, illus., tables, 1970.
- 07942 **Perkins, William Enfield.** Deep crustal reflections on land and at sea [abs.]: Disser. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3492B, 1970.
- 05572 **Perlman, David.** Hazards and the public — Sell, scare, or communicate?, in Geologic hazards and public problems (R. A. Olson and M. M. Wallace, editors) — [U.S.] Office Emergency preparedness, Region 7, Conf., San Francisco, Calif., 1969, Proc.: Washington, D.C., U.S. Govt. Printing Office, p. 221-228 [1970].
- 01255 **Perlmutter, N. M.; Guerrero, A. A.** Detergents and associated contaminants in ground water at three public-supply well fields in southwestern Suffolk County, Long Island, New York: U.S. Geol. Survey Water-Supply Paper 2001-B, p. B1-B22, illus., tables, 1970.
- 03317 **Perlmutter, N. M.; Lieber, Maxim.** Dispersal of plating wastes and sewage contaminants in ground water and surface water, South Farmingdale-Massapequa area, Nassau County, New York: U.S. Geol. Survey Water-Supply Paper 1879-G, p. G1-G67, illus., tables, 1970.
- 03493 **Perrault, Guy.** La minéralogie de nos jours à l'an 2000 [The mineralogy of our days to the year 2000]: Canadian Mineralogist, v. 10, pt. 2, p. 151-162, 1970.

- 06105 **Perrault, Guy.** (editor). Alkaline rocks, the Montereian Hills — Symposium, Joint Ann. Mtg., Mineralog. Assoc. Canada, Geol. Assoc. Canada, Mineralog. Soc. America, Montreal, 1969, Proc.: Canadian Mineralogist, v. 10, pt. 3, p. 295-598, illus., tables, 1970.
- Perret, W. R.** See Merritt, M. L. 01632
- 10457 **Perret, William.** Gasbuggy seismic source and surface motion: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf. (U.S. Atomic Energy Comm., PNE-1002 (TID-4500) 2, 74 p., illus., tables, 1970.
- 08022 **Perry, Douglas.** Early diagenesis of sediments and their interstitial fluids from the continental slope, northern Gulf of Mexico, *in* Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Soc. Trans., v. 20, p. 219-227, illus., tables, 1970.
- 11019 **Perry, Douglas.** Early diagenesis of sediments and their interstitial fluids from continental slope, northern Gulf of Mexico [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 9, p. 1789, 1970.
- 06914 **Perry, Ed; Hower, John.** Burial diagenesis in Gulf Coast pelitic sediments [with French, German, and Russian abs.]: Clays and Clay Minerals, v. 18, no. 3, p. 165-177, illus., tables, 1970.
- 09712 **Perry, Ed.; Hower, John.** Diagenesis and dehydration of Gulf coast pelitic sediments [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 648-649, 1970.
- 07943 **Perry, Edward Adams, Jr.** Burial diagenesis in Gulf Coast pelitic sediments [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 2385B, 1970.
- Perry, R. M.** See West, L. J. 07454
- 10089 **Perry, Richard B.** Emergence model for formation of Aleutian arc [abs.], *in* Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2501, 1970.
- Perry, T. G.** See Anstey, Robert L. 01213
- Perry, T. G.** See Corneliussen, Eric F. 05870
- 02965 **Persiani, C.; Cosgrove, J. F.** The determination of thorium in rare earths by gamma-ray spectrometry: Appl. Spectroscopy, v. 24, no. 2, p. 250-252, illus., tables, 1970.
- 05850 **Persinger, Ival D.; Yahner, Joseph E.** Relation of percolation rates to soil texture on several Indiana soils: Jour. Soil and Water Conserv., v. 25, no. 5, p. 189-191, illus., tables, 1970.
- Persoage, N. P.** See Clark, R. H. 08078
- 03807 **Persons, Benjamin S.** Laterite genesis, location, use: New York and London, Plenum Press, 103 p., illus., tables, 1970.
- 00473 **Persse, Franklin H.** Bismuth in the United States: U. S. Bur. Mines Inf. Circ. 8439, 26 p., illus., tables, 1970.
- Peselnick, L.** See Byerlee, J. D. 01692
- Peske, G. Richard.** See Tappen, N. C. 10133

- 10134 **Peske, G. Richard; Tappen, N. C.** Microscopic examination of human femurs buried at Washington Island, Wisconsin: *Am. Antiquity*, v. 35, no. 4, p. 463-465, illus., 1970.
- 00334 **Pessagno, Emile A., Jr.** The biostratigraphic potential of radiolaria in the upper Cretaceous portion of the Great Valley sequence, California Coast Ranges [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 130, 1970.
- 04198 **Pessagno, Emile A., Jr.** The Rotaformidae, a new family of Upper Cretaceous Nasselliina (Radiolaria) from the Great Valley Sequence, California Coast Ranges: *Bulls. Am. Paleontology*, v. 58, no. 257, p. 7-32, illus., 1970.
- Pessagno, Emile A., Jr.** See Powell, J. Dan. 06030
- 06417 **Pessl, Fred, Jr.** Surficial geologic map of the Woodbury quadrangle, Litchfield and New Haven Counties, Connecticut: U.S. Geol. Survey Geol. Quad. Map GQ-896, scale 1:24,000, sections, text, 1970.
- Pessl, Fred Jr.** See Koteff, Carl. 10179
- 00564 **Pestana, Harold R.; Bonta, Bruce D.** Congressional geology: *Geol. Soc. America Bull.*, v. 81, no. 3, p. 899-903, 1970.
- 00335 **Pestrong, Raymond.** Processes of sedimentation in San Francisco Bay [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 130-131, 1970.
- 05000 **Pestrong, Raymond.** Environmental trends in geologic education: *Jour. Geol. Education*, v. 18, no. 5, p. 198-201, 1970.
- 04735 **Peter, George.** Discussion of paper by B. P. Luyendyk, "Origin of short-wavelength magnetic lineations observed near the ocean bottom" [1969]: *Jour. Geophys. Research*, v. 75, no. 32, p. 6717-6720, illus., table, 1970.
- 10006 **Peter, George; Erickson, Barrett H.; Grim, Paul J.** Magnetic structure of the Aleutian Trench and Northeast Pacific Basin, in *The sea — v. 4, New concepts of sea floor evolution, Pt. 2, Regional observations* (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 191-222, illus., tables, 1970.
- Peterman, Z. E.** See Barker, Fred. 00132
- 06489 **Peterman, Z. E.; Goldich, S. S.** Early Precambrian geology of the Rainy Lake district [abs.], in *Inst. Lake Superior Geology, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ.*, p. 34, 1970.
- Peterman, Z. E.** See Turek, A. 08071
- Peterman, Z. E.** See Rosholt, J. N. 08423
- 00038 **Peterman, Zell E.; Carmichael, I. S. E.; Smith, A. L.** Sr<sup>87</sup>/Sr<sup>86</sup> ratios of Quaternary lavas of the Cascade Range, northern California: *Geol. Soc. America Bull.*, v. 81, no. 1, p. 311-317, illus., tables, 1970.
- 00956 **Peterman, Zell E.; Hedge, Carl E.; Tourtelot, Harry A.** Isotopic composition of strontium in sea water throughout Phanerozoic time: *Geochim. et Cosmochim. Acta*, v. 34, no. 1, p. 105-120, illus., tables, 1970.
- 01698 **Peterman, Zell E.; Carmichael, I. S. E.; Smith, A. L.** Strontium isotopes in Quaternary basalts of southeastern California: *Earth and Planetary Sci. Letters*, v. 7, no. 5, p. 381-384, table, 1970.
- Peterman, Zell E.** See Hedge, Carl E. 03773

- 03826 **Peterman, Zell E.; Doe, Bruce R.; Prostka, Harold J.** Lead and strontium isotopes in rocks of the Absaroka volcanic field, Wyoming: *Contr. Mineralogy and Petrology*, v. 27, no. 2, p. 121-130, illus., tables, 1970.
- Peterman, Zell E.** See Lee, Donald E. 06209
- Peters, D. B.** See Klute, A. 10345
- Peters, David C.** See Crosson, Robert S. 06944
- 10495 **Peters, Helen J.** Criteria for water level data networks for hydrology and modeling purposes [abs.]: *EOS*, v. 51, no. 11, p. 748, 1970.
- Peters, John S.** See Leisman, Gilbert A. 04389
- 05435 **Peters, Robert R.** Procedure for developing a sub-surface water supply [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 136, 1970.
- 08299 **Peters, W. C.** (editor). Mining and ecology in the arid environment — Conf., Tucson, Arizona, 1970, *Proc. Tucson, Arizona, University of Arizona, College of Mines*, 229 p., illus. [1970].
- 01096 **Peters, Walter G.; Wallace, Robert J.; Odom, I. Edgar; Frost, Stanley.** Application of radiography to the study of microfossils in black shales and other sediments [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 400-401, 1970.
- 09852 **Peters, William C.** Some geological comparisons — Recent porphyry copper discoveries: *Mining Cong. Jour.*, v. 56, no. 10, p. 28-32, illus., table, 1970.
- 01446 **Petersen, Carl F.; Murri, William J.; Cowperthwaite, Michael.** Hugoniot and release-adiabat measurements for selected geologic materials: *Jour. Geophys. Research*, v. 75, no. 11, p. 2063-2072, illus., tables, 1970.
- Petersen, Carl F.** See Smith, Carl W. 01981
- 11011 **Petersen, Carl Frank.** Shock wave studies of selected rocks [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 8, p. 3716B, 1970.
- Petersen, F. L.** See Cherry, J. T. 07908
- Petersen, G. W.** See Chiang, S. L. 06389
- 07428 **Petersen, G. W.; Ranney, R. W.; Cunningham, R. L.; Matelski, R. P.** Fragipans in Pennsylvania soils — A statistical study of laboratory data: *Soil Sci. Soc. America Proc.*, v. 34, no. 5, p. 719-722, illus., table, 1970.
- Petersen, J. C.** See Barbour, F. A. 09455
- 10836 **Petersen, Morris S.; Rigby, J. Keith.** Interpreting earth history — A manual in historical geology: Dubuque, Iowa, Wm. C. Brown Company, 185 p., illus., tables, 1970.
- Petersen, Ole V.** See Sørensen, Henning. 08293
- 03711 **Petersilie, I. A.; Sørensen, H.** Hydrocarbon gases and bituminous substances in rocks from the Ilímaussaq alkaline intrusion, South Greenland (Contribution to the mineralogy of Ilímaussaq No. 18): *Lithos*, v. 3, no. 1, p. 59-76, illus., tables, 1970; reprinted as *Grönlands Geol. Undersögelse Misc. Paper 76*, 1970.
- 04975 **Peterson, D. L.** A gravity and aeromagnetic survey of Heber and Rhodes valleys, Utah, in *Water resources of the Heber-Kamas-Park City area, north-central Utah*: Utah Dept. Nat. Resources Tech. Pub. 27, p. 54-60, illus., 1970.
- Peterson, David H.** See Carlson, Paul R. 00241

- Peterson, David H.** See Conomos, T. John. 00247
- Peterson, Donald L.** See Eaton, Gordon P. 00609
- Peterson, Donald L.** See Kleinkopf, M. Dean. 01468
- Peterson, Donald L.** See Kleinkopf, M. Dean. 03472
- 04252 **Peterson, Donald L.; Oriol, Steven S.** Gravity anomalies in Cache Valley, Cache and Box Elder Counties, Utah, and Bannock and Franklin Counties, Idaho, in Geological Survey research 1970, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C114-C118, illus., 1970.
- 08525 **Peterson, Donald N.** Glaciological investigations on the Casement Glacier, southeast Alaska: Ohio State Univ. Inst. Polar Studies Rept., no 36, 161 p., illus., tables, 1970.
- 01330 **Peterson, Donald W.** Ash-flow deposits, their character, origin and significance: Jour. Geol. Education, v. 18, no. 2, p. 66-76, 1970.
- Peterson, Etta.** See Kvenvolden, Keith A. 00300
- Peterson, Etta.** See Kvenvolden, Keith A. 03164
- Peterson, Etta.** See Hodgson, Gordon W. 05741
- 01154 **Peterson, Frank L.; Lao, Chester.** Electric well logging of Hawaiian basaltic aquifers: Ground Water, v. 8, no. 2, p. 11-18, illus., 1970.
- Peterson, Frank L.** See Hargis, David R. 08597
- Peterson, Frank L.** See Lao, Chester. 10621
- 06006 **Peterson, Fred.** Cretaceous sedimentation and tectonism in the southeastern Kaiparowits region, Utah [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5559B, 1970.
- 02995 **Peterson, G. L.; Gastil, R. G.; Allison, E. C.** Geology of the Peninsular Ranges: California Div. Mines and Geology Mineral Inf. Service, v. 23, no. 6, p. 124-127, illus., 1970.
- 00336 **Peterson, Gary L.** Pleistocene deformation of the Lina Vista terrace near San Diego, California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 131, 1970.
- 00458 **Peterson, Gary L.; Nordstrom, Charles E.** Sub-La Jolla unconformity in vicinity of San Diego, California: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 2, p. 265-274, illus., 1970.
- 09713 **Peterson, J. B.; Hiss, W. L.** A computer-based data file for the earth sciences in New Mexico [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 651, 1970.
- Peterson, M. N. A.** See Karig, D. E. 02330
- 01260 **Peterson, Melvin N. A.** (and others). Initial reports of the Deep Sea Drilling Project — V. 2, covering Leg 2 of cruises of the Drilling Vessel "*Glomar Challenger*", Hoboken, N. J. to Dakar, Senegal, Oct.-Nov. 1968: Washington, D. C., U.S. Govt. Printing Office, 501 p., illus., tables, 1970.
- Peterson, N. V.** See Bowen, R. G. 07188
- 09816 **Peterson, N. V.; Groh, E. A.** Geologic tour of Cove Palisades State Park near Madras, Oregon: Ore Bin, v. 32, no. 8, p. 141-168, illus., 1970.



- 02773 **Peterson, Norman V.; McIntyre, James R.** The reconnaissance geology and mineral resources of eastern Klamath County and western Lake County, Oregon: Oregon Dept. Geology and Mineral Industries Bull. 66, 70 p., illus., tables, geol. map, 1970.
- Peterson, Orin.** See Michelson, R. W. 04435
- 08180 **Peterson, R. A.** Remote sensing in layered rocks: *Geocom Bull.*, v. 3, no. 9, p. 162-169, illus., 1970; reprinted from *Bendix Tech. Jour.*, v. 3, no. 2, p. 1-8, 1970.
- 06716 **Peterson, Robert W.; Cazeau, Charles J.** Lynches River sediments, South Carolina: South Carolina Div. Geology Geol. Notes, v. 14, no. 4, p. 85-96, illus., tables, 1970.
- Peterson, Sam H.** See Dvoracek, Marvin J. 08769
- 03144 **Peterson, W. A.** Uranium on horseback, or South Texas revisited: *Corpus Christi Geol. Soc. Bull.*, v. 10, no. 5, p. 5-10, 11A-17, illus., 1970.
- 00747 **Peterson, Warren L.; Kepferle, Roy C.** Deltaic deposits of the Borden Formation (Mississippian) in central Kentucky [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 236, 1970.
- 01301 **Peterson, Warren L.** Bardstown Member of the Drakes Formation in central Kentucky, in *Changes in stratigraphic nomenclature by the U.S. Geological Survey, 1968*: U.S. Geol. Survey Bull. 1294-A, p. A36-A41, illus., 1970.
- Peterson, Warren L.** See Kepferle, Roy C. 02640
- 06167 **Peterson, Warren L.; Kepferle, Roy C.** Deltaic deposits of the Borden Formation in central Kentucky, in *Geological Survey research 1970*, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D49-D54, illus., 1970.
- 03430 **Petit, Richard E.** Notes on Cancellariidae (Mollusca: Gastropoda), [Pt.] 2: *Tulane Studies Geology and Paleontology*, v. 8, no. 2, p. 83-88, illus., 1970.
- 03907 **Petocz, Ronald G.** Biostratigraphy and Lower Permian Fusulinidae of the Upper Delta River area, east-central Alaska Range: *Geol. Soc. America Spec. Paper* 130, 94 p., illus., tables, 1970.
- 02783 **Petracca, A. N.** Tertiary microfauna, Mackenzie Delta area [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 864, 1970.
- 08679 **Petroleum Resources Section.** Oil and gas exploration, drilling and production summary, 1969: Ontario Dept. Mines and Northern Affairs Paper 70-3, 175 p., illus., tables, 1970.
- 01814 **Petrović, Radomir; Skinner, Brian J.** Deformation of alkali feldspars as a consequence of alkali diffusion [abs.]: *EOS*, v. 51, no. 4, p. 439, 1970.
- 03494 **Petruk, W.; Cabri, L. J.; Harris, D. C.; Stewart, J. M.; Clark, L. A.** Allargentum, redefined: *Canadian Mineralogist*, v. 10, pt. 2, p. 163-172, illus., tables, 1970.
- 03014 **Petryk, A. A.; Mamet, B. L.; Macqueen, R. W.** Preliminary foraminiferal zonation, Rundle Group and uppermost Banff Formation (Lower Carboniferous), southwestern Alberta: *Bull. Canadian Petroleum Geology*, v. 18, no. 1, p. 84-103, illus., 1970.
- Pettijohn, F. J.** See Walker, Roger G. 02696
- Pettijohn, F. J.** See James, H. L. 02780

- 04325 **Pettijohn, F. J.** Geology and magnetic data for northern Crystal Falls area, Michigan: Michigan Geol. Survey Rept. Inv. 8, 23 p., illus., tables, geol. maps, 1970.
- 08634 **Pettijohn, F. J.** Response [to comments by S. M. Roscoe and M. J. Fraey on "The Canadian Shield — A status report, 1970], in *Basins and geosynclines of the Canadian Shield* (A. J. Baer, editor) — Symposium, Ottawa, 1970, Papers: Canada Geol. Survey Paper 70-40, p. 262-265, 1970.
- 08661 **Pettijohn, F. J.** The Canadian Shield — A status report, 1970, in *Basins and geosynclines of the Canadian Shield* (A. J. Baer, editor) — Symposium, Ottawa, 1970, Papers: Canada Geol. Survey Paper 70-40, p. 239-255, tables, 1970.
- 08080 **Pettinger, Lawrence R.** Multiple resource inventory on space and high-altitude photography, in *Earth Resources Aircraft Program, status review, 2d Ann.*, Houston, Tex., 1969 — V. 2, Agriculture, Forestry, and sensor studies: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 21-1—21-19, illus., [1970?].
- 09336 **Pettitt, John.** Heterospory and the origin of the seed habit, in *Major evolutionary events and the geological record of plants* — Symposium, Internat. Bot. Cong., 11th, Seattle, Wash., 1969: Cambridge Philos. Soc. Biol. Rev., v. 45, no. 3, p. 401-415, lus., [1970?].
- 05436 **Pettry, D. E.; Elder, J. H.** Plinthite, a new genetic horizon for coastal plain soils in Virginia [abs.]: Virginia Jour. Sci., v. 21, no. 3, p. 136, 1970.
- 05437 **Pettry, D. E.; Meyer, W. J.** The soil survey and interpretation program in Virginia [abs.]: Virginia Jour. Sci., v. 21, no. 3, p. 136, 1970.
- Péwé, T. L.** See Updike, R. G. 03371
- Péwé, T. L.** See Updike, R. G. 04850
- Péwé, Troy L.** See Weber, Florence R. 01509
- 02994 **Péwé, Troy L.** Terraces of the middle Salt River Valley — [Pt.] 1, Progress report [abs.]: Arizona Acad. Sci. Jour., v. 6, 1970 Proc. Supp., p. 64, 1970.
- 05011 **Péwé, Troy L.; Updike, Randall G.** Guidebook to the geology of the San Francisco Peaks, Arizona, with special reference to the glacial deposits: Plateau, v. 43, no. 2, p. 45-102, illus., tables, 1970.
- 07096 **Péwé, Troy L.** Altiplanation terraces of early Quaternary age near Fairbanks, Alaska, in *Problemy Czwariorzedu: Acta Geog. Lodziensia* 24, p. 357-363, illus., 1970.
- 08331 **Péwé, Troy L.** Permafrost and vegetation on flood-plains of subarctic rivers (Alaska) — A summary [with French abs.] in *Ecology of the subarctic regions, V. 1 of Ecology and conservation* — A symposium, Helsinki, 1966, Proc.: Paris, UNESCO, p. 141-142, 1970.
- 10090 **Péwé, Troy L.** Permafrost and environmental-engineering problems in Arctic [abs.], in *Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2501, 1970.
- Peyrot, Alain H.** See Saul, William E. 09556
- 10660 **Peyton, Harold R.** Arctic-engineering: Jour. Petroleum Technology, v. 22, September, p. 1076-1082, illus., tables, 1970.
- 09714 **Pezzetta, J. M.** The St. Clair River delta, sedimentary characteristics and depositional environments [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 651-652, 1970.
- Pfefferkorn, H. W.** See Peppers, R. A. 05539

**Pfefferkorn, Hermann W.** See Gluskoter, Harold J. 08624

- 09715 **Pfefferkorn, Hermann W.** Use of plant megafossils in correlation of the Pennsylvanian of the Illinois Basin with the Upper Carboniferous of Europe [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 652, 1970.

- 09453 **Pfluger, C. E.** X-ray diffraction, in *Analytical reviews, 1970 — Fundamentals: Anal. Chemistry*, v. 42, no. 5, p. 317R-324R, 1970.

**Phair, George.** See Hickling, Nelson L. 02388

**Phares, Roderick S.** See Visher, Glenn S. 02694

- 01498 **Philberth, K.; Federer, B.** A note on the surface profile of the Greenland ice sheet [with French and German abs.]: *Jour. Glaciology*, v. 9, no. 55, p. 150-153, table, 1970.

**Philberth, K.** See Federer, B. 03644

**Philbin, Philip W.** See Senftle, Frank E. 02932

- 05967 **Philbrick, Shailer S.** Horizontal configuration and the rate of erosion of Niagara Falls: *Geol. Soc. America Bull.*, v. 81, no. 12, p. 3723-3731, illus., 1970.

- 00752 **Philcox, M. E.** Coral bioherms in the Hopkinton Formation (Silurian), Iowa: *Geol. Soc. America Bull.*, v. 81, no. 3, p. 969-973, illus., 1970.

- 02702 **Philcox, Michael E.** Reefs and wave action [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 864, 1970.

- 10971 **Philcox, Michael E.** Geometry and evolution of the Palisades Reef Complex, Silurian of Iowa: *Jour. Sed. Petrology*, v. 40, no. 1, p. 171-183, illus., tables, 1970.

- 09417 **Philip, Wagner W.** Laurentide ice margin and associated water bodies in the Champlain Valley of northwestern Vermont [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?] p. 141, 1970.

- 00748 **Phillee, John C.; Dever, Garland R., Jr.** St. Louis-St. Genevieve relationships in northeastern Kentucky [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 236-237, 1970.

- 03860 **Phillee, John C.** Field trip No. 4, Paleozoic section on east flank of Cincinnati Arch along Interstate 64, Lexington to Olive Hill, Kentucky — Pt. 2, Valley of Licking River eastward to Olive Hill interchange, in *Guidebook for field trips — Geol. Soc. America, Southeastern Sec.*, 18th Ann. Mtg., Lexington, Ky., 1970: Lexington, Ky., Kentucky Geol. Survey, p. 56-70, illus., 1970.

- 03127 **Phillips, Brian A. M.** Effective levels of marine planation on raised and present rock platforms [with French and German abs.]: *Rev. Géographie Montréal*, v. 24, no. 3, p. 227-240, illus., 1970.

- 04229 **Phillips, H. Boyd; McDonald, Harris R.** Analog of ground water in east-central New Mexico — Closure [to discussion of paper 6435, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, *Jour. Irrigation and Drainage Div.*, no. IR3, p. 345-346, 1970.

**Phillips, J. D.** See Emery, K. O. 00099

- 01967 **Phillips, J. D.; Luyendyk, Bruce P.; Hollister, C. D.** Geophysical study on the Mid-Atlantic Ridge and the Atlantis Fracture Zone [abs.]: *EOS*, v. 51, no. 4, p. 330-331, 1970.

**Phillips, J. D.** See Uchupi, Elazar. 04745

- 04993 **Phillips, J. D.; Luyendyk, Bruce P.** Central North Atlantic plate motions over the last 40 million years: *Science*, v. 170, no. 3959, p. 727-729, illus., table, 1970.
- 05799 **Phillips, J. D.** Reply [to discussion by H. A. Meyerhoff of "Continental Rise off North America" by K. O. Emery, E. Uchupi, J. D. Phillips, and others, 1970]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 11, p. 2215, 1970.
- Phillips, Joseph D.** See Bunce, Elizabeth T. 09720
- 09862 **Phillips, M. P.; Godwin, C. I.** Geology and rotary drilling at the Casino silver mines property: *Western Miner*, v. 43, no. 11, p. 43-49, illus., tables, 1970.
- Phillips, M. W.** See Ribbe, P. H. 09537
- 07231 **Phillips, R. E.; Ellis, J. H.** A rapid method of measurement of diffusion coefficients in aqueous solutions: *Soil Sci.*, v. 110, no. 6, p. 421-425, illus., table, 1970.
- Phillips, R. E.** See Ellis, J. H. 07624
- Phillips, R. Lawrence.** See Hunter, Ralph E. 09817
- 04195 **Phillips, Tom L.; Rosso, Samuel W.** Spores of *Botryopteris globosa* and *Botryopteris americana* from the Pennsylvanian: *Am. Jour. Botany*, v. 57, no. 5, p. 543-551, illus., tables, 1970.
- 01815 **Philpotts, A. R.** Immiscibility between critically undersaturated basic and oversaturated felsic magmas [abs.]: *EOS*, v. 51, no. 4, p. 438, 1970.
- 06110 **Philpotts, A. R.** Mechanism of emplacement of the Montereian intrusions, in Alkaline rocks, the Montereian Hills — Symposium, Montreal, 1969, *Proc.: Canadian Mineralogist*, v. 10, pt. 3, p. 395-410, illus., table, 1970.
- 07681 **Philpotts, A. R.** Igneous structures and mechanism of emplacement of Mount Johnson, a Montereian intrusion, Quebec — Reply [to 1970 discussion by S. Bhattacharji and C. E. Nehru of 1968 paper]: *Canadian Jour. Earth Sci.*, v. 7, no. 1, p. 195-197, illus., 1970.
- Philpotts, A. R.** See Philpotts, John A. 09716
- Philpotts, J. A.** See Schnetzler, C. C. 06850
- 01867 **Philpotts, John A.** Redox estimation from a calculation of  $\text{Eu}^{2+}$  and  $\text{Eu}^{3+}$  concentration in natural phases [abs.]: *EOS*, v. 51, no. 4, p. 451, 1970.
- 05390 **Philpotts, John A.** Redox estimation from a calculation of  $\text{Eu}^{2+}$  and  $\text{Eu}^{3+}$  concentrations in natural phases: *Earth and Planetary Sci. Letters*, v. 9, no. 3, p. 257-268, illus., table, 1970.
- 05717 **Philpotts, John A.; Schnetzler, C. C.** Apollo 11 lunar samples — K, Rb, Sr, Ba and rare-earth concentrations in some rocks and separated phases, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, *Proc.* — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1471-1486, illus., tables, 1970.
- 06108 **Philpotts, John A.; Schnetzler, C. C.** Speculations on the genesis of alkaline and sub-alkaline basalts following exodus of the continental crust, in *Alkaline rocks, the Montereian Hills* — Symposium, Montreal, 1969, *Proc.: Canadian Mineralogist*, v. 10, pt. 3, p. 375-379, illus., table, 1970.
- 09716 **Philpotts, John A.; Schnetzler, Charles C.; Philpotts, A. R.** Montereian mixed rocks, some trace element data [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 652-653, 1970.
- Phinney, Douglas.** See Pepin, R. O. 05715

- Phinney, R. A.** See Knopoff, L. 03679
- Phinney, R. A.** See Chapman, C. H. 05843
- 03979 **Phinney, Robert A.** Reflection of acoustic waves from a continuously varying interfacial region: *Rev. Geophysics and Space Physics*, v. 8, no. 3, p. 517-532, illus., 1970.
- Phinney, William.** See Parham, Walter. 03490
- 03487 **Phinney, William C.** (editor). A teacher's guide for geologic field investigations in Minnesota: [St. Paul, Minn.] Minnesota Dept. Education, sections paged separately [n.d.].
- 03821 **Phinney, William C.** Chemical relations between Keweenaw lavas and the Duluth complex, Minnesota: *Geol. Soc. America Bull.*, v. 81, no. 8, p. 2487-2495, illus., tables, 1970.
- 02448 **Phipps, C. V. G.; King, L. H.** Chemical, mineralogical and textural variations in sediments from the Scotian Shelf: *Maritime Sediments*, v. 5, no. 3, p. 101-112, illus., tables, 1969 [1970].
- 07842 **Phipps, Richard L.** The potential use of tree rings in hydrologic investigations in eastern North America with some botanical considerations: *Water Resources Research*, v. 6, no. 6, p. 1634-1640, illus., 1970.
- 04678 **Phleger, Fred B.** Foraminiferal populations and marine marsh processes: *Limnology and Oceanography*, v. 15, no. 4, p. 522-534, illus., tables, 1970.
- 10958 **Phleger, Fred B.** Foraminifera as indicators of some nearshore processes [abs.]; *am. Assoc. Petroleum Geologists*, v. 54, no. 9, p. 1789, 1970; *Gulf Coast Assoc. Geol. Soc. Trans.*, v. 20, p. 218, 1970.
- Phukan, K. Y. Lo.** See Tamuly, A. L. 07443
- 02703 **Picard, M. Dane; Aadland, Rolf; High, Lee R., Jr.** Shelf-edge carbonate-redbed transitions, Red Peak and Thaynes Formations (Triassic), western Wyoming and adjacent Idaho [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 864-865, 1970.
- 03604 **Picard, M. Dane; High, Lee R., Jr.** Interference ripple marks formed by ephemeral streams: *Jour. Sed. Petrology*, v. 40, no. 2, p. 708-711, illus., table, 1970.
- 04401 **Picard, M. Dane; High, Lee R., Jr.** Sedimentology of oil-impregnated, lacustrine and fluvial sandstone, P. R. Spring area, southeast Uinta Basin, Utah: *Utah Geol. and Mineralog. Survey Spec. Studies* 33, 32 p., illus., tables, 1970.
- 09612 **Picard, M. Dane.** Relative abundance of bedding types and sedimentary structures formed by straight to slightly meandering ephemeral streams [abs.]: *Utah Acad. Sci., Arts, and Letters Proc.*, v. 47, pt. 1, p. 274-275, 1970.
- 09519 **Picha, Frantisek; Niem, Alan R.** Distribution and extension of some flysch deposits, Ouachita Mountains, Arkansas and Oklahoma [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 653, 1970.
- 08605 **Pickard, Greenleaf W.** Geology of the Prieta mine, Parral, Chihuahua, in *AIME world symposium on mining and metallurgy of lead and zinc*, St. Louis, Missouri, 1970 [Proc.] — V. 1, Mining and concentrating of lead and zinc: New York, *Am. Inst. Mining, Metallurgical, and Petroleum Engineers*, p. 123-129, illus., 1970.
- 09947 **Pickart, Stanley J.** Physical properties of sulfide materials, in *Symposium on sulfides — Fiftieth Anniversary Symposia* (Benjamin A. Morgan, editor): *Mineralog. Soc. America Spec. Paper* 3, p. 145-153, illus., 1970.
- 04352 **Pickering, D. J.** Anisotropic elastic parameters for soil [with French abs.]: *Géotechnique*, v. 20, no. 3, p. 271-276, illus., 1970.

**Pickering, Dennison J.** See Finn, W. D. Liam. 06773

- 01567 **Pickering, Dennison John.** A simple shear machine for soil [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 9, p. 4125B, 1970.

- 01434 **Pickering, R. J.** Composition of water in Clinch River, Tennessee River, and Whiteoak Creek as related to disposal of low-level radioactive liquid wastes: U.S. Geol. Survey Prof. Paper 433-J, p. J1-J15, illus., tables, 1970.

**Pickering, R. J.** See Collier, C. R. 05449

- 05454 **Pierce, A. P.; Botbol, J. M.; Learned, R. E.** Mercury content of rocks, soils, and stream sediments, in *Mercury in the environment*: U.S. Geol. Survey Prof. Paper 713, p. 14-16, 60, illus., table, 1970.

- 00839 **Pickett, G. R.** Applications for borehole geophysics in geophysical exploration: *Geophysics*, v. 35, no. 1, p. 81-92, illus., tables, 1970.

- 00842 **Pickett, G. R.; Artus, D. S.** Prediction from logs of recoverable hydrocarbon volume, Ordovician carbonates — Williston basin: *Geophysics*, v. 35, no. 1, p. 113-123, illus., table, 1970.

**Pickett, T. E.** See Sundstrom, R. W. 10263

**Pickett, T. E.** See Sundstrom, R. W. 10264

**Pickett, T. E.** See Sundstrom, R. W. 10265

- 00173 **Pickett, Thomas E.** New geologic mapping in Delaware [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 31-32, 1970.

- 10722 **Pico, Rafael; Buitrago de Santiago, Zayda; Berrios, Hector H.** Nueva geografía de Puerto Rico [New geography of Puerto Rico]: [San Juan, Puerto Rico], Editorial Universitaria, 460 p., illus., tables, 1969.

**Piel, K. M.** See Rouse, Glenn E. 10869

- 06889 **Piel, Kenneth Martin.** Palynology of Middle and Late Tertiary sediments from the central interior of British Columbia, Canada [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 1, p. 309B, 1970.

**Pierard, Louis H.** See Gluskoter, Harold J. 08624

- 05556 **Pierce, A. P.; Botbol, J. M.; Learned, R. E.** Mercury content of rocks, soils, and stream sediments, in *Mercury in the environment*: U.S. Geol. Survey Prof. Paper 713, p. 14-16, 60, illus., table, 1970.

**Pierce, Charles.** See Alba, Roy S. 04774

- 00749 **Pierce, J. W.; So, C. L.; Roth, H. Daniel; Colquhoun, D. J.** Wave refraction and coastal erosion, southern Virginia and northern North Carolina [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 237, 1970.

- 01124 **Pierce, J. W.** Tidal inlets and washover fans: *Jour. Geology*, v. 78, no. 2, p. 230-234, illus., 1970.

**Pierce, J. W.** See Yochelson, E. L. 01501

- 03748 **Pierce, J. W.; Colquhoun, D. J.** Configuration of the Holocene primary barrier chain, Outer Banks, North Carolina: *Southeastern Geology*, v. 11, no. 4, p. 231-236, illus., 1970.

- 05622 **Pierce, J. W.** Clay mineralogy of cores from the continental margin of North Carolina: *Southeastern Geology*, v. 12, no. 1, p. 33-51, illus., tables, 1970.

- 05966 **Pierce, J. W.; Colquhoun, D. J.** Holocene evolution of a portion of the North Carolina coast: *Geol. Soc. America Bull.*, v. 81, no. 12, p. 3697-3714, illus., 1970.
- Pierce, Jack W.** *See* Byrnes, John B. 02595
- 04693 **Pierce, Kenneth L.; Christiansen, Robert L.; Richmond, Gerald M.** The Osprey Formation (Pleistocene) and its Tower Creek Gravel Member, Yellowstone National Park, in *Changes in stratigraphic nomenclature by the U.S. Geological Survey, 1969: U.S. Geol. Survey Bull.* 1324-A, p. A30-A34, illus., 1970.
- Pierce, Kenneth L.** *See* Smedes, Harry W. 07772
- 10187 **Pierce, Kenneth L.** Glaciation of northern Yellowstone Park [abs.], in *American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Boseman, Mont., Montana State Univ.?], p. 105-106, 1970.*
- 05187 **Pierce, R. W.; Langenheim, R. L., Jr.** Surface patterns on selected Mississippian conodonts: *Geol. Soc. America Bull.*, v. 81, no. 11, p. 3225-3236, illus., 1970.
- 01600 **Pierce, Richard L.** Preliminary revaluation of late Miocene biostratigraphy of California [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 3, p. 559, 1970.
- 04805 **Pierce, Robert L.** Reducing land subsidence in the Wilmington oil field by use of saline waters, in *Saline water symposium: Water Resources Research*, v. 6, no. 5, p. 1505-1514, illus., 1970.
- 06605 **Pierce, Robert William.** Ultrastructure and biostratigraphy of the conodonts of the Monte Cristo Group, Arrow Canyon Range, Clark County, Nevada [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 2, p. 761B-762B, 1970.
- 00097 **Pierce, William G.; Nelson, Willis H.** The Heart Mountain detachment fault — A volcanic phenomenon?—A discussion [of paper by C. J. Hughes, 1970]: *Jour. Geology*, v. 78, no. 1, p. 116-123, illus., 1970.
- 04506 **Pierce, William G.** Geologic map of the Devils Tooth quadrangle, Park County, Wyoming: *U.S. Geol. Survey Geol. Quad. Map GQ-817*, scale 1:62,500, sections, 1970.
- 00025 **Pierce, William H.** A thermal speedometer for overthrust faults: *Geol. Soc. America Bull.*, v. 81, no. 1, p. 227-231, 1970.
- 04761 **Pierson, J. R., Jr.** Fordoche Field, Pointe Coupee Parish, Louisiana, in *Typical oil and gas fields of southwestern Louisiana*, V. 2: Lafayette, La., *Lafayette Geol. Soc.*, p. 9-9g, illus., 1970.
- 02782 **Pilbeam, David.** The evolution of Man: New York, Funk and Wagnalls, 216 p., illus., 1970.
- Pilkey, Orrin H.** *See* Molnia, Bruce F. 00740
- Pilkey, Orrin H.** *See* Field, Michael. 03389
- Pilkey, Orrin H.** *See* Judd, James B. 03721
- 04243 **Pilkey, Orrin H.; Bornhold, Brian D.** Gold distribution on the Carolina continental margin, a preliminary report, in *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C30-C34, illus., tables, 1970.
- Pillinger, C. T.** *See* Abell, P. I. 05734
- Pilson, M. E. Q.** *See* Betzer, Peter R. 04743
- 06660 **Pimm, A. C.** Leg 4 grain size results, Chap. 12 in *Initial reports of the Deep Sea Drilling Project — V. 4, Leg 4 of cruises of Glomar Challenger, Rio de Janeiro, Brazil,*

to San Cristobal, Panama, Feb.-Mar. 1969 (R. G. Bader, and others): Washington, D. C., U.S. Govt. Printing Office, p. 295-305, illus., table, 1970.

- 06661 **Pimm, A. C.** Carbon carbonate results, Leg 4, Chap. 13 in Initial reports of the Deep Sea Drilling Project — V. 4, Leg 4 of cruises of *Glomar Challenger*, Rio de Janeiro, Brazil, to San Cristobal, Panama, Feb.-Mar. 1969 (R. G. Bader, and others): Washington, D. C., U.S. Govt. Printing Office, p. 307-314, table, 1970.

- 04538 **Pimm, Anthony Charles.** Deep sea drilling: Sci. Jour., v. 6, no. 7, p. 61-67, illus., 1970.

- 04281 **Pinckney, Darrell M.; Haffty, Joseph** Content of zinc and copper in some fluid inclusions from the Cave-in-Rock district, southern Illinois: Econ. Geology, v. 65, no. 4, p. 451-458, illus., table, 1970.

**Pinder, G. F.** See Bredehoeft, J. D. 03075

**Pinder, George F.** See Trescott, Peter C. 01608

**Pinder, George F.** See Trescott, Peter C. 02418

- 03074 **Pinder, George F.; Cooper, Hilton H., Jr.** A numerical technique for calculating the transient position of the saltwater front: Water Resources Research, v. 6, no. 3, p. 875-882, illus., 1970.

**Pinder, George F.** See Sauer, Stanley P. 10491

- 09520 **Pinet, Paul R.** Tectonic implications of a magnetic survey between the Cayman Trough and coastal Honduras [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 653-654, 1970.

- 03686 **Pingitore, Nicholas E., Jr.** Diagenesis and porosity modification in *Acropora palmata*, Pleistocene of Barbados, West Indies: Jour. Sed. Petrology, v. 40, no. 2, p. 712-721, illus., table, 1970.

**Pings, W. B.** See Paist, Donald A. 05074

**Pinson, W. H.** See McCorkell, R. H. 08214

**Pinson, W. H., Jr.** See Hurley, P. M. 05704

**Pinson, W. H. Jr.** See Bottino, M. L. 06128

- 02557 **Piotrowski, J. M.; Edgar, A. D.** Melting relations of undersaturated alkaline rocks from South Greenland, compared to those of Africa and Canada: Medd. Grönland, v. 181, no. 9, 62 p., illus., tables, 1970.

- 08352 **Piotrowski, J. M.; Edgar, A. D.** Melting relations of undersaturated alkaline rocks from south Greenland, compared to those of Africa and Canada: Medd. Grönland, v. 181, no. 9, 62 p., illus., tables, 1970.

- 03652 **Piper, D. J. W.** Transport and deposition of Holocene sediment on La Jolla deep sea fan, California: Marine Geology, v. 8, nos. 3-4, p. 221-227, illus., tables, 1970.

- 09901 **Pippin, Therese.** Characteristics of valley sections in a moderate relief controlled by fluvial erosion (Puerto Rico) compared with such influenced by both fluvial and glacial erosion (Alpine Flysch Zone and Bohemian Forest) [With German and French abs.], in New contributions to slope evolution: Zeitschr. Geomorphologie, supp. 9, p. 119-126, illus., 1970.

- 07762 **Pippin, Lloyd.** Panhandle-Hugoton field, Texas-Oklahoma-Kansas — The first fifty years, in Geology of giant petroleum fields — Symposium, AAPG, 53d Ann. Mtg., Oklahoma City, Okla., 1968: Am. Assoc. Petroleum Geologists Mem. 14, p. 204-222, illus., 1970.



**Pirie, R. Gordon.** *See* Swift, Donald J. P. 03292

- 03480 **Pirkle, E. C.; Yoho, W. H.** The heavy mineral ore body of Trail Ridge, Florida: *Econ. Geology*, v. 65, no. 1, p. 17-30, illus., tables, 1970.

**Pirone, A. J.** *See* Vastola, F. J. 04093

- 09254 **Pirson, S. J.** Environmental logging and mapping in the search for minerals: *Log Analyst*, v. 11, no. 2, p. 23-44, illus., 1970.

**Pirson, S. J.** *See* Fertl, W. H. 10673

- 09624 **Pirson, Sylvain J.** *Geologic well log analysis: Houston, Tex., Gulf Pub. Co., 370 p., illus., tables, 1970.*

- 03091 **Pissarides, Andreas Savva.** The interaction of phosphate with hydroxy-aluminum interlayers of montmorillonite [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 10, p. 4462B, 1970.

**Pitkin, James A.** *See* Flint, George M., Jr. 00192

- 03815 **Pitkin, James A.** Natural gamma radioactivity map of the Fort Worth-Dallas area, Texas: *U.S. Geol. Survey Geophys. Inv. Map GP-696*, scale 1:250,000, text, 1970.

**Pitman, Walter C., 3d.** *See* Hayes, Dennis E. 08451

- 10334 **Pitman, Walter C., 3d.** Sea floor spreading in the North Atlantic and its implications regarding the closing of the Tethys [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 752-754, 1970.

- 05601 **Pitrat, Charles W.** Phytoplankton and the late Paleozoic wave of extinction — Discussion [of "Primary production, isotopes, extinctions, and the atmosphere," by H. Tappan, 1968]: *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 8, no. 1, p. 49-55, table, 1970.

**Pitt, Andrew M.** *See* Stauder, William. 03311

- 03595 **Pittman, Edward D.** Plagioclase feldspar as an indicator of provenance in sedimentary rocks: *Jour. Sed. Petrology*, v. 40, no. 2, p. 591-598, illus., table, 1970.

- 08621 **Pittman, Edward D.; Duschatko, Robert W.** Use of pore casts and scanning electron microscope to study pore geometry: *Jour. Sed. Petrology*, v. 40, no. 4, p. 1153-1157, illus., 1970.

- 09521 **Pittman, Edward D.** Nature and formation of quartz overgrowths in sandstones as revealed by the scanning electron microscope [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 654, 1970.

- 09522 **Pittman, J. Stuart; Folk, Robert L.** Length-slow chalcedony, a new testament for vanished evaporite minerals [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 654-655, 1970.

- 00095 **Piwiński, A. J.; Wyllie, P. J.** Experimental studies of igneous rock series — Felsic body suite from the Needle Point pluton, Wallowa batholith, Oregon: *Jour. Geology*, v. 78, no. 1, p. 52-76, illus., tables, 1970.

- 00337 **Piwiński, A. J.** Experimental investigation bearing on the petrogenesis of the Coast Range and Sierra Nevada plutonic belts [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 131-132, 1970.

- 07661 **Piwiński, A. J.; Martin, R. F.** An experimental study of equilibrium with granitic rocks at 10 kb: *Contr. Mineralogy and Petrology*, v. 29, no. 1, p. 1-10, illus., tables, 1970.

- 01463 **Plafker, George; MacKevett, E. M., Jr.** Mafic and ultramafic rocks from a layered pluton at Mount Fairweather, Alaska, *in* Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B21-B26, illus., tables, 1970.
- Plafker, George.** *See* MacKevett, E. M., Jr. 05577
- Plafker, George.** *See* Jones, D. L. 10062
- Plant, A. G.** *See* Dence, M. R. 01902
- Platonov, A. N.** *See* Povarennykh, A. S. 08295
- Platt, R. G.** *See* Sood, M. K. 06109
- Playford, Phillip E.** *See* Wray, John L. 07890
- Plinston, David T.** *See* Kemp, Patrick H. 01526
- 08203 **Pluhar, Agnes; Ford, Derek C.** Dolomite karren of the Niagara Escarpment, Ontario, Canada [with German and French summaries]: *Zeitschr. Geomorphologie*, v. 14, no. 4, p. 392-410, illus., tables, 1970.
- 01514 **Pluhowski, E. J.** Hydrology of the upper Malad River basin, southeastern Idaho: U.S. Geol. Survey Water-Supply Paper 1888, 89 p., illus., tables, 1970.
- 02904 **Pluhowski, E. J.** Effects of urban development on the hydrology of Long Island, New York, *in* Earth resources aircraft program status review, NASA, Houston, 1968 — V. 3, Hydrology, oceanography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 21-1—21-9, illus. [1970].
- 09268 **Plummer, William T.** (editor). *Speleo digest 1966*: Vienna, Va., The Speleo Digest [410] p., illus., 1969.
- Pocock, A. J.** *See* Jansonius, Jan. 10926
- 07062 **Pocock, Stanley A. J.** Palynology of the Jurassic sediments of western Canada — Pt. 1, Terrestrial species: *Palaeontographica*, ser. B. v. 130, nos. 1-2, p. 12-72, 1970; *ibid.*, nos. 3-6, p. 73-136, illus., 1970.
- Podolsky, George.** *See* Donohoo, H. V. 09847
- Podolsky, T.** *See* Naldrett, A. J. 04413
- 01729 **Podosek, F. A.** Dating of meteorites by the high-temperature release of iodine-correlated  $Xe^{129}$ : *Geochim. et Cosmochim. Acta*, v. 34, no. 3, p. 341-365, illus., tables, 1970.
- 03366 **Podosek, F. A.; Hohenberg, C. M.** I-Xe dating, evidence for cold assembly of an unequilibrated chondrite: *Earth and Planetary Sci. Letters*, v. 8, no. 6, p. 443-447, illus., table, 1970.
- 06616 **Podosek, Frank Anthony.** Early solar system abundances of iodine-129 and plutonium-244 from analysis of xenon in neutron-irradiated meteorites [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 2, p. 768B, 1970.
- Podwysocki, Melvin H.** *See* Dutcher, Russell R. 06964
- Pohl, E. R.** *See* White, William B. 00012
- 04430 **Pohl, E. R.** Upper Mississippian deposits of south-central Kentucky, a project report: *Kentucky Acad. Sci. Trans.*, v. 31, nos. 1-2, p. 1-15, illus., 1970.

- 05086 **Pohn, H. A.; Offield, T. W.** Lunar crater morphology and relative-age determination of lunar geologic units — Pt. 1, Classification, *in* Geological Survey research 1970, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C153-C162, illus., tables, 1970.
- Pohn, H. A.** *See* Offield, T. W. 05087
- Pohn, Howard A.** *See* Offield, Terry W. 09700
- 03019 **Poirier, Jean.** Fente de gel fossile aux Îles-de-la-Madeleine, Québec [A fossil ice wedge at Îles-de-la-Madeleine, Quebec (with English and Russian abs.)]: *Rev. Géographie Montréal*, v. 24, no. 3, p. 319-320, illus., 1970.
- 00750 **Pojeta, John, Jr.** Silicified pelecypods from the Lexington Limestone (Ordovician) of Kentucky [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 238, 1970.
- 05532 **Poland, Joseph F.** Land subsidence in western United States, *in* Geologic hazards and public problems (R. A. Olson and M. M. Wallace, editors) - [U.S.] Office Emergency Preparedness, Region 7, Conf., San Francisco, Calif., 1969, *Proc.*: Washington, D.C., U.S. Govt. Printing Office, p. 77-96, illus., tables, [1970].
- 02912 **Polecyn, F. C.** Surface effects and submerged features, *in* Earth resources aircraft program status review, NASA, Houston, 1968 — V. 3, Hydrology, oceanography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 46B1-46B18, illus. [1970].
- Polický, Josef.** *See* Kudělásek, Vladimír. 04537
- 07175 **Polizzi, Nicholas T.** The effect of sanitary landfill on urban space — Preliminary findings [abs.]: *Assoc. Pacific Coast Geographers Yearbook*, v. 32, p. 185-186, 1970.
- Pollack, Henry N.** *See* Levy, Michael A. 03312
- 03541 **Pollock, Charles A.; Rexroad, Carl B.; Nicoll, Robert S.** Lower Silurian conodonts from northern Michigan and Ontario: *Jour. Paleontology*, v. 44, no. 4, p. 743-764, illus., table, 1970.
- Pollock, Samuel J.** *See* Johnston, Paul M. 06146
- Polta, H. J.** *See* Michelson, R. W. 04435
- 05395 **Pomeroy, J. S.** Geologic map of the Midway quadrangle, central Kentucky: U.S. Geol. Survey Geol. Quad. Map GQ-856, scale 1:24,000, section, text, 1970.
- Pomeroy, Paul W.** *See* Molnar, Peter. 01288
- Pomeroy, Paul W.** *See* Liebermann, Robert C. 03025
- Pomeroy, Paul W.** *See* Levy, Michael A. 03312

- 07176 **Pond, Richard B.** The perception of earthquake hazard at Tehachapi, California [abs.]: Assoc. Pacific Coast Geographers Yearbook, v. 32, p. 187, 1970.
- Ponnamperuma, C.** See Chang, S. 05743
- Ponnamperuma, Cyril.** See Hodgson, Gordon W. 05741
- Ponnamperuma, Cyril.** See Gehrke, Charles W. 05742
- Ponsetto, Louis R.** See Noger, M. C. 03856
- Poodle, Thomas.** See Fleming, George. 00438
- 00515 **Poole, Donald Hudson.** Slope failure forms — Their identification, characteristics, and distribution as depicted by selected remote sensor returns [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3235B-3236B, 1970.
- Poole, Forrest G.** See Sandberg, Charles A. 00353
- Poole, Forrest G.** See Stewart, John H. 11022
- 03569 **Poole, W. H.** Solid-earth science in the Appalachian region of Canada, in Geological provinces of Canada, exploration and outlook: Canadian Mining and Metall. Bull., v. 63, no. 694, p. 204-213, 1970.
- 07973 **Poole, W. H.; Sanford, B. V.; Williams, H.; Kelley, D. G.** Geology of southeastern Canada, Chap. 6 in Geology and economic minerals of Canada: Canada Geol. Survey Econ. Geology Rept. 1 (5th edition), p. 227-304, illus., tables, 1970.
- Poolet, Michelle A.** See Rutherford, William A. 09031
- 01316 **Poort, Jon M.** Distribution of seismic background noise compared to the major tectonic provinces of the United States [abs.]: Georgia Acad. Sci. Bull., v. 28, no. 2, p. s23, 1970.
- 06878 **Poort, Jon Michael.** Stratigraphic patterns in the Sauk sequence of the western craton [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 1, p. 253B-254B, 1970.
- 01171 **Popenoe, Peter; Brinkworth, G. L.; Worl, R. G.; Behrendt, J. C.** Geophysical lineations in north-central Colorado and their possible relationship to Tertiary plutonic activity [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 343, 1970.
- 01680 **Porath, H.; Oldenburg, D. W.; Gough, D. I.** Separation of magnetic variation fields and conductive structures in the western United States: Royal Astron. Soc. Geophys. Jour., v. 19, no. 3, p. 237-260, illus., table, 1970.
- Porath, H.** See Reitzel, J. S. 01856
- Porath, H.** See Camfield, P. A. 02065
- Porath, H.** See Gough, D. L. 04445
- 05336 **Porath, H.** Determination of strike of conductive structures from geomagnetic variation anomalies: Earth and Planetary Sci. Letters, v. 9, no. 1, p. 29-33, illus., 1970.
- Porath, Hartmut.** See Dziewonski, Adam. 01885
- 02067 **Porath, Hartmut; Gough, D. I.** Geomagnetic deep sounding and upper mantle structure in the southwestern United States [abs.]: EOS, v. 51, no. 4, p. 268, 1970.

- 05235 **Poreh, Michael; Sagiv, Abraham; Seginer, Ido.** Sediment sampling efficiency of slots: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7637, Jour. Hydraulics Div., no. HY 10, p. 2065-2078, illus., 1970.
- 02190 **Porter, Christopher R.; Carothers, James E.** Formation factor-porosity relation derived from well log data, in *SPWLA Logging Symposium*, 11th Ann., Los Angeles, Calif., 1970, Trans.: Houston, Tex., Soc. Prof. Well Log Analysts, p. A1-A18, illus., tables, 1970.
- 01968 **Porter, Lawrence D.** An application of generalized inverse theory to local magnitude determination [abs.]: *EOS*, v. 51, no. 4, p. 357, 1970.
- 07909 **Porter, Lawrence D.** Magnitude determination for large underground nuclear explosions, in *Symposium on engineering with nuclear explosives* — Am. Nuclear Soc. and U.S. Atomic Energy Comm., Las Vegas, Nev., 1970, Proc., V. 2: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., p. 1118-1135, illus., tables, 1970.
- 10539 **Porter, Lawrence D.** Distance-amplitude relationships for large underground nuclear explosions [abs.]: *EOS*, v. 51, no. 11, p. 778, 1970.
- Porter, S. C.** See Denton, G. H. 03157
- 10188 **Porter, Stephen C.** Glacier recession in the southern and central Puget Lowland, Washington, between 14,000 and 13,000 years B.P. [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 107, illus., 1970.
- 07253 **Portmann, Jean-Pierre.** Présence de moraine de fond à Poste-de-la-Baleine (Nouveau-Québec) [Presence of till at Poste-de-la-Baleine (Great Whale), New Quebec]: *Cahiers Géographie Québec*, v. 14, no. 32, p. 243-251, illus., 1970.
- Post, B.** See Banks, E. 04367
- 01816 **Post, Robert L., Jr.** The flow laws of Mt. Burnett dunite at 750°C-1150°C [abs.]: *EOS*, v. 51, no. 4, p. 424, 1970.
- 04040 **Potosky, Robert A.; Kopp, Otto C.** Application of cathodoluminescence to petrographic studies: *Compass*, v. 47, no. 2, p. 63-69, illus., 1970.
- 00925 **Potter, Delbert E.** Palynology and environmental analysis of Upper Pennsylvanian strata, Keystone Reservoir area, Oklahoma [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 297-298, 1970.
- 01235 **Potter, Noel, Jr.** Rock glaciers and mass-wastage in the Galena Creek area, northern Absaroka Mountains, Wyoming [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 8, p. 3711B-3712B, 1970.
- 05710 **Powell, J. Dan.** Early Upper Cretaceous faunal zones southwest of the Diablo-Coahuila Platform, in *Geology of the southern Quitman Mountains area, Trans-Pecos Texas* — S.E.P.M. Permian Basin Sec., 1970 Biennial Field Trip, Symposium and Guidebook: Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub. 70-12, p. 96-99, illus., 1970.
- Potter, Paul Edwin.** See Hrabar, S. V. 00719
- 09523 **Poty, B. P.; Holland, H. D.** Stability relations in the system  $MgO-SiO_2-H_2O-HCl$  at 500°C and 1 kb [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 655, 1970.
- 08766 **Pouba, Zdenek; Stemprok, Miroslav.** (editors). Problems of hydrothermal ore deposition; the origin, evolution and control of ore-forming fluids — *Symposium*, St. Andrews, Scotland, 1967: Stuttgart, Germany, E. Schweizerbart'sche Verlag-sbuchhandlung (Internat. Union Geol. Sci., Ser. A, no. 2), 396 p., illus., tables, 1970.

- 06114 **Pouliot, Gaston.** Study of carbonatitic calcites from Oka, Que. [with French abs.], in *Alkaline rocks, the Monteregian Hills* — Symposium, Montreal, 1969, Proc.: Canadian Mineralogist, v. 10, pt. 3, p. 511-540, illus., tables, 1970.
- Poulos, Harry G.** See Viggiani, Carlo. 00048
- 02856 **Poulouvassilis, A.** Hysteresis of pore water in granular porous bodies: Soil Sci., v. 109, no. 1, p. 5-12, illus., table, 1970.
- 02859 **Poulouvassilis, A.** The effect of the entrapped air on the hysteresis curves of a porous body and on its hydraulic conductivity: Soil Sci., v. 109, no. 3, p. 154-162, illus., 1970.
- 02208 **Poupon, A.; Gaymard, R.** The evaluation of clay content from logs, in *SPWLA Logging Symposium, 11th Ann.*, Los Angeles, Calif., 1970, Trans.: Houston, Tex., Soc. Prof. Well Log Analysts, p. G1-G20, illus., 1970.
- 05903 **Poupon, A.; Gaymard, R.** The evaluation of clay content from logs: Log Analyst, v. 11, no. 6, p. 18-25, illus., 1970.
- 10657 **Poupon, A.; Clavier, C.; Dumanoir, J.; Gaymard, R.; Misk, A.** Log analysis of sand-shale sequences — A systematic approach: Jour. Petroleum Technology, v. 22, July, p. 867-881, illus., 1970.
- 08562 **Pourret, G.; Bergeron, R.** Les schistes cristallins Grenvilliens de la région du Lac McGillivray [The Grenville crystalline schists of the Lac McGillivray region (with English abs.)]: Canadian Jour. Earth Sci., v. 7, no. 4, p. 1109-1116, illus., tables, 1970.
- 08295 **Povarennykh, A. S.; Platonov, A. N.; Belichenko, V. P.** On the colour of ussingite from the Ilímaussaq (South Greenland) and Lovozero (Kola Peninsula) alkaline intrusions (Contribution to the mineralogy of Ilímaussaq No. 19): Geol. Soc. Denmark Bull., Dansk Geol. Foren. Medd., English edition, v. 20, pt. 1, p. 20-26, illus., table, 1970.
- 04891 **Powell, C. McA.** Intrusive sandstone dykes in the Siamo Slate near Negaunee, Michigan — Reply [to discussion of 1969 paper by N. C. Janke, 1970]: Geol. Soc. America Bull., v. 81, no. 10, p. 3181-3183, 1970.
- 06490 **Powell, C. McA.** Structural and metamorphic history of the Marquette Synclinorium [abs.], in *Inst. Lake Superior Geology, 16th Ann.*, Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 35, 1970.
- 05466 **Powell, J. Dan.** Early Upper Cretaceous faunal zones southwest of the Diablo-Coahuila Platform, in *Geology of the southern Quitman Mountains area, Trans-Pecos Texas* — S.E.P.M. Permian Basin Sec., 1970 Biennial Field Trip, Symposium and Guidebook: Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub. 70-12, p. 96-99, illus., 1970.
- 06030 **Powell, J. Dan; Pessagno, Emile A., Jr.; McNulty, C. L., Jr.; Rothwell, W. T., Jr.; Schell, W. W.; Williams, T. E.** (editors). Field trip guidebook for the 1st Interamerican Micropaleontological Colloquium, 1970: Dallas, Tex., Univ. Texas Dallas, [127] p., illus., 1970.
- 06152 **Powell, J. Dan.** Summary of Upper Cretaceous stratigraphy — The Gulf of Mexico Province, in *Interamerican Micropaleont. Colloquium, 1st*, 1970, Field Trip Guidebook: Dallas, Tex., Univ. Texas Dallas, p. 9-36, A25-A91, illus., 1970.
- 03771 **Powell, J. L.; Bell, Keith.** Strontium isotopic studies of alkalic rocks, localities from Australia, Spain, and the western United States: Contr. Mineralogy and Petrology, v. 27, no. 1, p. 1-10, illus., tables, 1970.

- 05639 **Powell, L. C.; Woodbury, H. O.** Possible future petroleum provinces of United States western gulf basin, Pleistocene [abs.]: *Am. Assoc. Petroleum Geologists*, v. 54, no. 9, p. 1789, 1970.
- 07315 **Powell, L. C.; Woodbury, H. O.** Possible future petroleum provinces of the United States western Gulf basin — Pleistocene [abs.], *in* *Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Socs. Trans.*, v. 20, p. 63-65, illus., 1970.
- 02805 **Powell, Richard L.** Limestone caverns: *Sci. and Children* (Washington, D.C., Natl. Sci. Teachers Assoc.), v. 7, no. 6, p. 36-38, 41, illus., 1970.
- 03949 **Powell, Richard L.** Base level, lithologic and climatic controls of karst groundwater zones in south-central Indiana: *Indiana Acad. Sci. Proc.* 1969, v. 79, p. 281-291, illus., table, 1970.
- 08773 **Powell, Richard L.** Geology of the Falls of the Ohio River: *Indiana Geol. Survey Circ.* 10, 45 p., illus., 1970.
- 09033 **Powell, Robert E.; Coney, Peter J.** Structural and gravity profiles of the Champlain Valley, Champlain Thrust, and Green Mountain front, west-central Vermont [abs.], *in* *Guidebook to field excursions*, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., p. 148, 1969.
- 01427 **Powell, W. J.; Copeland, C. W.; Drahovzal, J. A.** Space-acquired data for Alabama: *Geotimes*, v. 15, no. 4, p. 14-15, illus., 1970.
- 01611 **Powell, W. J.; Copeland, C. W.; Drahovzal, J. A.** Delineation of linear features and application to reservoir engineering using Apollo 9 multispectral photography: *Alabama Geol. Survey Inf. Ser.* 41, 37 p., illus., tables, 1970.
- Powell, William J.** *See* LaMoreaux, Philip E. 11248
- 10553 **Power, Frederick W.** Application of Dorman's model to determine the attenuation of  $P_g$  waves [abs.]: *EOS*, v. 51, no. 11, p. 781, 1970.
- Powers, H. A.** *See* Izett, G. A. 00622
- Powers, H. A.** *See* Izett, G. A. 05344
- Powers, Howard A.** *See* Wilcox, Ray E. 09423
- 01123 **Powers, William E.** Subdivisions of the Pleistocene ice age in New Zealand, and possible correlation with the glacial sequence in the United States: *Jour. Geology*, v. 78, no. 2, p. 221-229, illus., tables, 1970.
- Prada, K. E.** *See* Uchupi, Elazar. 04745
- 04365 **Prakash, Uttam; Boureau, Édouard.** Sur une monocotylédone herbacée fossile à structure conservée des basaltes de Columbia, dans le Miocène de Vantage, central Washington, U.S.A. [On a fossil herbaceous monocotyledon from structures preserved in Columbia basalts in the Miocene at Vantage, central Washington, U.S.A.], *in* *Soc. Savantes Cong. Natl.*, 92d, Strasbourg et Colmar, 1967, *Comptes Rendus, Sec. Sci.*, V. 3: Paris, Bibliothèque Natl., p. 93-107, illus., 1970.
- Prasertwitayakij, A.** *See* Buravas, S. 04368
- 10977 **Prather, Preston; Radcliffe, Dennis.** Petrology of the norites of Monroe County, Georgia [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 238, 1970.
- 07036 **Pratt, Alan R.; Callaghan, Eugene.** Land and mineral resources of Sanpete County, Utah: *Utah Geol. and Mineralog. Survey Bull.* 85, 69 p., illus., tables, geol. map, 1970.

- 03240 **Pratt, C. J.** Sulfur: Sci. American, v. 222, no. 5, p. 62-72, illus., 1970.  
**Pratt, Richard M.** See Schlee, John. 04030
- 04882 **Pratt, Richard M.** Granitic rocks from the Blake Plateau: Geol. Soc. America Bull., v. 81, no. 10, p. 3117-3121, illus., 1970.  
**Pratt, Walden P.** See Jones, William R. 05462
- 05462 **Preiss, K.** Relation between energy and error due to nuclear statistics for density measurement by gamma ray transmission: Soil Sci., v. 110, no. 3, p. 151-156, illus., 1970.
- 04060 **Pravdic, V.** Surface charge characterization of sea sediments: Limnology and Oceanography, v. 15, no. 2, p. 230-233, illus., tables, 1970.  
**Pray, Lloyd C.** See Choquette, Philip W. 00405
- 05408 **Preiss, K.** Relation between energy and error due to nuclear statistics for density measurement by gamma ray transmission: Soil Sci., v. 110, no. 3, p. 151-156, illus., 1970.  
**Prentice, F. Jean.** See Burns, Roger G. 06082
- Presley, B. J.** See Kaplan, I. R. 01346
- 06667 **Presley, B. J.; Kaplan, I. R.** Interstitial water chemistry — Deep Sea Drilling Project, Leg 4, Chap. 20 in Initial reports of the Deep Sea Drilling Project — V. 4, Leg 4 of cruises of *Glomar Challenger*, Rio de Janeiro, Brazil, to San Cristobal, Panama, Feb.-Mar. 1969 (R. G. Bader, and others): Washington, D. C., U.S. Govt. Printing Office, p. 415-430, illus., tables, 1970.
- 07152 **Presley, B. J.; Goldhaber, M. B.; Kaplan, R. I.** Interstitial water chemistry, Deep Sea Drilling Project, Leg 5, Chap. 21 in Initial reports of the Deep Sea Drilling Project — V. 5, Leg 5 of cruises of *Glomar Challenger*, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office, p. 513-522, tables, 1970.
- 07644 **Presley, Bobby Joe.** Chemistry of interstitial water from marine sediments [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 762B, 1970.  
**Press, F.** See Bullen, K. E. 02869
- Press, Frank.** See Kanamori, H. 02128
- 02810 **Press, Frank.** Earth models consistent with geophysical data, in Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969, Proc.: Physics Earth and Planetary Interiors, v. 3, p. 3-22, illus., tables, 1970.
- 04728 **Press, Frank.** Regionalized earth models: Jour. Geophys. Research, v. 75, no. 32, p. 6575-6581, illus., 1970.  
**Press, Frank.** See Latham, G. V. 05758
- 07978 **Prest, V. K.** Quaternary geology of Canada, Chap. 12 in Geology and economic minerals of Canada: Canada Geol. Survey Econ. Geology Rept. 1 (5th edition), p. 675-764, illus., tables, 1970.
- 01117 **Preston, D. A.** FORTRAN IV program for sample normality tests: Kansas Geol. Survey Computer Contr. 41, 28 p., illus., tables, 1970.  
**Preston, H.** See Donnay, G. 02235
- Preston, H.** See Donnay, Gabrielle. 02708



- 01884 **Preston, Richard D.** Occurrence and quality of ground water in Throckmorton County, Texas: Texas Water Devel. Board Rept. 113, 51 p., illus., tables, 1970.
- Preti, George.** See Murphy, R. C. 05746
- 00559 **Preto, V. A. G.** Amphibolites from the Grand Forks quadrangle of British Columbia, Canada: Geol. Soc. America Bull., v. 81, no. 3, p. 763-782, illus., tables, 1970.
- 09758 **Preto, V. A.** Structure and petrology of the Grand Forks group, British Columbia: Canada Geol. Survey Paper 69-22, 80 p., illus., tables, geol. maps, 1970.
- 03367 **Prewitt, C. T.; Papike, J. J.; Ross, Malcolm.** Cumingtonite, a reversible, nonquenchable transition from  $P2_1/m$  to  $C2/m$  symmetry: Earth and Planetary Sci. Letters, v. 8, no. 6, p. 448-450, illus., 1970.
- 09319 **Prewitt, C. T.; Moore, E. P.; Lardear, L. F.** High-speed X-ray diffraction photography: Jour. Appl. Crystallography, v. 3, pt. 5, p. 409-410, 1970.
- 09524 **Prewitt, C. T.; Wu, C. H.** Symmetry and structure of orthopyroxenes [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 655-656, 1970.
- 05824 **Price, Don; Bolke, E. L.** Hydrologic reconnaissance of the Sink Valley area, Tooele and Box Elder Counties, Utah: Utah Dept. Nat. Resources Tech. Pub. 26, 28 p., illus., tables, 1970.
- Price, Don.** See Hood, J. W. 09629
- 03901 **Price, Larry W.** Up-heaved blocks, a curious feature of instability in the tundra: Assoc. Am. Geographers Proc., v. 2, p. 106-110, illus., 1970.
- 07177 **Price, Larry W.** Relationship between vegetation and permafrost on different slopes in a subarctic alpine tundra environment [abs.]: Assoc. Pacific Coast Geographers Yearbook, v. 32, p. 187, 1970.
- 07268 **Price, Larry Wayne.** Morphology and ecology of solifluction lobe development, Ruby Range, Yukon Territory [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2758B-2759B, 1970.
- 07509 **Price, Neville J.** Laws of rock behavior in the Earth's crust, Chap. 1 in Rock mechanics, theory and practice — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 3-23, illus., 1970.
- Price, P. B.** See Fleisher, R. L. 05334
- Price, P. Buford.** See Ahrens, Thomas J. 03363
- 03275 **Price, R. A.; Mountjoy, E. W.** Geologic structure of the Canadian Rocky Mountains between Bow and Athabasca Rivers — A progress report, in Structure of the southern Canadian Cordillera: Geol. Assoc. Canada Spec. Paper 6, p. 7-25, illus., geol. map, 1970.
- 06879 **Price, Vaneaton, Jr.** Distribution of trace elements in plutonic rocks of the southeastern Piedmont [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 1, p. 254B, 1970.
- 05521 **Prickett, Thomas A.** Some trends in groundwater simulation techniques [abs.]: Water Well Jour., v. 24, no. 9, p. 83-84, 1970.
- 09525 **Pride, Douglas E.; Hagner, Arthur F.** Geochemistry and origin of the Precambrian iron formation deposit near Atlantic City, Fremont County, Wyoming [abs.]: Geol. Soc. America Abs. with programs, v. 2, no. 7, p. 656-657, 1970.
- 06607 **Pride, Douglas Elbridge.** Geochemistry of the Precambrian iron formation near Atlantic City, Fremont County, Wyoming [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 762B-763B, 1970.

- 04433 **Pride, R. W.** Estimated water use in Florida, 1965: Florida Bur. Geology Map Ser., no. 36, scale about 1 in. to 30 mi., text, 1970.
- Prider, R. T.** *See* Clarke, E. de C. 09186
- 09438 **Priest, Amel.** Crinoid Stems: Earth Sci., v. 23, no. 6, p. 286-290, illus., 1970.
- Priest, Melville S.** *See* Shindala, Adnan. 02101
- Priest, Melville S.** *See* Shindala, Adnan. 09733
- Prill, Robert.** *See* Green, Don W. 03073
- 00571 **Prinz, Martin.** Idaho rift system, Snake River plain, Idaho: Geol. Soc. America Bull., v. 81, no. 3, p. 941-947, illus., 1970.
- Prinz, Martin.** *See* Nehru, C. E. 02373
- 00814 **Prior, D. B.; Ho, C.** Bentonite landslides [discussion of paper by D. M. Anderson; R. C. Reynolds; J. Brown, 1969]: Science, v. 167, no. 3920, p. 1014-1015, table, 1970.
- Prior, Jean C.** *See* Ruhe, Robert V. 00615
- Pritchard, A. M.** *See* Hogarth, D. D. 06638
- Proctor, Cleo V., Jr.** *See* Fisher, William L. 04823
- Proctor, Cleo V., Jr.** *See* Fisher, W. L. 07329
- Proctor, J. F.** *See* Webster, D. S. 01359
- 00426 **Proctor, R. J.; Payne, C. Marshall; Kalin, D. C.** Crossing the Sierra Madre fault zone in the Glendora tunnel, San Gabriel Mountains, California: Eng. Geology, v. 4, no. 1, p. 5-63, illus., geol. maps, 1970.
- 04453 **Prodehl, Claus.** Seismic refraction study of crustal structure in the western United States: Geol. Soc. America Bull., v. 81, no. 9, p. 2629-2645, illus., table, 1970.
- 05892 **Prodehl, Claus.** Crustal structure of the western United States from seismic-refraction measurements in comparison with central European results [with German summ.]: Zeitschr. Geophysik, v. 36, no. 4, p. 477-500, illus., table, 1970.
- 00338 **Prokopovich, Nikola P.** Hydrocompaction near San Luis Canal, west-central San Joaquin Valley, California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 132, 1970.
- 10976 **Prokopovich, Nikola P.; Nishi, Charles K.** Lithology and chemistry of San Joaquin Valley alluvium near South Dos Palos, California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 344, 1970.
- Prokoptsev, N. G.** *See* Vakrushev, V. A. 09768
- Prolss, G. W.** *See* Weaver, P. F. 03158
- Prostka, Harold J.** *See* Lipman, Peter W. 00306
- Prostka, Harold J.** *See* Peterman, Zell E. 03826
- 10478 **Prothero, William A., Jr.; Goodkind, John M.** Earth tide measurements with the superconducting gravimeter [abs.]: EOS, v. 51, no. 11, p. 738, 1970.

- 01097 **Prouty, C. E.** Cambrian sedimentary framework — Appalachian Valley to the northern midwest [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 401-402, 1970.
- 01098 **Prouty, C. E.** Some Lower Paleozoic sedimentary environments and related paleostructural development — Michigan basin area [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 402, 1970.
- 09526 **Prouty, C. E.** Michigan basin — Paleozoic evolutionary development [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 657-658, 1970.
- 08297 **Pruitt, W. O., Jr.** Some ecological aspects of snow [with French abs.] in *Ecology of the subarctic regions, V. 1 of Ecology and conservation — A symposium*, Helsinki, 1966, *Proc.*: Paris, UNESCO, p. 83-99, illus., tables, 1970.
- 03930 **Prusok, Rudi.** Ice as stream table bedrock: *Jour. Geol. Education*, v. 18, no. 4, p. 170, 1970.
- 07193 **Pryor, Robert.** Formation of a deep-water submarine canyon head in the Tongue of the Ocean [with Spanish summ.]: *Bull. Marine Sci.*, v. 20, no. 4, p. 813-329, illus., table, 1970.
- Pryor, Wayne A.** See Hester, Norman C. 07019
- 09527 **Pryor, Wayne A.** Ophiomorpha in Cretaceous bar and runnel deposits, central Alabama [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 658, 1970.
- 02511 **Pryslak, A. P.** Dent Township, District of Kneora (Patricia Portion): Ontario Dept. Mines Prelim. Geol. Map P. 592, scale 1 in. to 1/4 mi., text, 1970.
- 02512 **Pryslak, A. P.** Mitchell Township, District of Kenora (Patricia Portion): Ontario Dept. Mines Prelim. Geol. Map P. 593, scale 1 in. to 1/4 mi., text, 1970.
- 05834 **Psuty, Norbert P.** (compiler). A bibliography of Latin American coastal geomorphology: *Pan American Inst. Geography and History Spec. Pub.* 1, 12 p., 1970.
- 00821 **Puchelt, H.; Kullerud, G.** Sulfur isotope fractionation in the Pb-S system: *Earth and Planetary Sci. Letters*, v. 7, no. 4, p. 301-306, illus., table, 1970.
- Puchelt, Harold R.** See Schock, Hans H. 04637
- 09528 **Puffer, John H.** Iron rich zone of Kingman, Arizona, pegmatites [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 658-659, 1970.
- 06007 **Puffer, John Harold.** Magnetite and ilmenite in the granitic rocks of the Pegmatite Points area, Colorado [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 12, pt. 1, p. 5559B-5560B, 1970.
- 03869 **Pugh, Wally.** Fossil cache on the Eel: *Gems and Minerals*, no. 397, p. 28, 44-46, illus., 1970.
- 00800 **Pugh, William J.** Memorial to Owen Thomas Jones (1878-1967): *Geol. Soc. America Proc.* 1967, p. 219-235, portrait, 1970.
- 09529 **Pugliese, Joseph M.** The effects of geology on explosive blasting in limestone and dolomite quarries [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 659, 1970.
- Puminov, A. P.** See Egiazarov, B. Kh. 10036
- Puminov, A. P.** See Kulakov, Y. H. 10069

- 02704 **Purdy, Edward G.** Reef configurations — Some causes and effects [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 865-866, 1970.
- 09752 **Puri, Harbans S.; Vanstrum, V. V.** Geologic history of the Miocene and younger sediments in south Florida, *in* Late Cenozoic stratigraphy of southwestern Florida — [Guidebook], Field Trip no. 4 [19th] Ann. Mtg. Gulf Coast Assoc. Geol. Socs., with Sepm, Gulf Coast Sec., Miami Beach, Fla., 1969: 3new Orleans, La.], Gulf Coast Assoc. Geol. Socs., p. 70-87, illus., 1969.
- 01817 **Pushkar, Paul.** Sr-87/Sr-86 ratios of volcanic rocks on and near the Colorado Plateau [abs.]: *EOS*, v. 51, no. 4, p. 444, 1970.
- 09260 **Pushkar, Paul; McBirney, A. R.** The isotopic composition of strontium in Central American ignimbrites, App. A-II of Correlation and chronology of ore deposits and volcanic rocks, Damon, Paul E.: n.p., U.S. Atomic Energy Comm. Research Div., p. Aii1-Aii24, illus., tables, 1968.
- 06499 **Puskas, F.** Guide to the Port Coldwell alkali complex, *in* Inst. Lake Superior Geology, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 85-99, illus., 1970.
- 09306 **Pyantnitskii, I. V.** (N. Kaner, translator). Analytical chemistry of cobalt: Ann Arbor [Mich.] and London, Ann Arbor-Humphrey Sci. Publishers, 253 p., Illus., tables, 1969.
- 04527 **Pye, E. G.** Current activities and trends in exploration in Ontario: *Canadian Mining Jour.*, v. 91, no. 4, p. 112-118, illus., 1970.
- 09256 **Pye, E. G.** Current activities and trends in exploration in Ontario: Ontario Dept. Mines Misc. Paper 37, 31 p., illus., 1970.
- 10452 **Pye, E. G.** (editor). Summary of field work, 1970 by the Geological Branch: Ontario Dept. Mines Misc. Paper 43, 96 p., illus., 1970.
- Pyke, D. R.** See Middleton, R. S. 03460
- Pyle, T. E.** See Antoine, J. W. 08599
- Pyle, Thomas E.** See Antoine, John W. 00861
- 02442 **Pyle, Thomas E.; Tieh, Thomas T.** Strontium, vanadium, and zinc in the shells of pteropods: *Limnology and Oceanography*, v. 15, no. 1, p. 153-154, table, 1970.
- 04324 **Pyrh, Roman Z.; Bisque, Ramon E.** Determination of trace mercury in soil and rock media — A reply [to 1970 discussion by W. T. Meyer and D. S. Evans of 1969 paper]: *Econ. Geology*, v. 65, no. 3, p. 358-359, tables, 1970.
- Pytkowicz, R. M.** See Culberson, Charles. 03293
- 03400 **Pytkowicz, R. M.** On the carbonate compensation depth in the Pacific Ocean: *Geochim. et Cosmochim. Acta*, v. 34, no. 7, p. 836-839, illus., tables, 1970.
- Pytkowicz, Ricardo M.** See Kester, Dana R. 05589
- Pytlak, Shirley.** See Campbell, K. Vincent. 01186
- Qamar, A.** See Bolt, Bruce A. 04115
- Qamar, Anthony.** See Carder, D. S. 06410
- Qamar, Anthony.** See Bolt, Bruce A. 10557
- Quade, Jack.** See Blinn, John C., 3d. 02851

- Quade, Jack.** *See* Chapman, Peter. 07793
- Quaide, William L.** *See* Wrigley, Robert C. 05733
- Qualls, B. R.** *See* Tryggvason, E. 02720
- 03517 **Quebec Dept. Natural Resources.** Field work in 1968, summary of results [also French edition]: Quebec, Quebec Dept. Nat. Resources (S-115), 48 p., illus., 1970.
- Querol-Sune, F.** *See* Luth, W. C. 00855
- 02902 **Quigley, R. M.; Vogan, R. W.** Black shale heaving at Ottawa, Canada [with French abs.]: Canadian Geotech. Jour., v. 7, no. 2, p. 106-112, illus., 1970.
- Quinlivan, W. D.** *See* Carr, W. J. 04690
- Quinn, A. W.** *See* Foland, K. A. 00154
- 00926 **Quinn, James H.** Occurrence of *Sus* in North America [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 298, 1970.
- Quinn, W. J.** *See* Hanrahan, E. T. 08253
- 10189 **Quinn, William H.** Simulation of equatorial circulation during a glacial stage and its ramifications [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 108, 1970.
- 09606 **Quirke, Terence T., Jr.; Cranstone, Donald A.; Bell, C. Keith; Coats, Colin J. A.** (compilers). Geology of the Moak-Setting Lakes area, Manitoba — Guidebook, Field Trip No. 1 of Geol. Assoc. Canada — Mineralog. Assoc. Canada Joint Ann. Mtg., 23d, Winnipeg, 1970: [Winnipeg (?), Manitoba Dept. Mines and Nat. Resources Geol. Div.], 55 p., illus., geol. map, 1970.
- 03656 **Qutub, Musa.** Hydrogeology of the northeast quarter of Marion County, Iowa: Iowa Acad. Sci. Proc. 1969, v. 76, p. 311-319, illus., table, 1970.
- 09530 **Qutub, Musa.** An open approach to teaching earth science to large classes [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 659-660, 1970.
- 03929 **Qutub, Musa Yacub.** The status of earth science in Illinois: Jour. Geol. Education, v. 18, no. 4, p. 163-165, tables, 1970.
- Raats, P. A. C.** *See* Scotter, D. R. 02860
- 09603 **Raats, P. A. C.; Klute, A.** Development of equations describing transport of mass, momentum and energy in soils, in Water in the unsaturated zone, V. 2: Internat. Assoc. Sci. Hydrology Pub. 83, p. 535-546, 1968.
- Rabagay, T. V.** *See* Ehmann, W. D. 04781
- 06387 **Rabchevsky, George.** Remote sensing of the Earth's surface — Pt. 2, Remote sensing and sensors: Jour. Remote Sensing, v. 1, no. 4, p. 5, 15-17, tables, 1970.
- 03439 **Rabchevsky, George A.** Remote sensing of the earth's surface — Pt. 1, Fundamentals of remote sensing: Jour. Remote Sensing, v. 1, no. 3, p. 15-17, illus., 1970.
- 07987 **Rabchevsky, George A.** (compiler). Remote sensing of the Earth's surface: Jour. Remote Sensing, v. 1, no. 5, p. 14-17, 1970.
- Rabson, Gustave.** *See* VanDiver, Bradford B. 05019

**Race, Ronald W.** *See* Campbell, K. Vincent. 01186

- 10830 **Radbruch, D. H.** Progress in planning and regulation of construction in active fault zones, California [abs.] - Internat. Symposium on Recent Crustal Movements and Associated Seismicity, Wellington, N.Z., 1970, Proc.: Wellington, N.Z., Royal Soc. of New Zealand, p. 28-29, 1970.

**Radcliffe, Dennis.** *See* Humphrey, Ronald. 00722

- 01317 **Radcliffe, Dennis.** Some applications of combined scanning electron microscopy and electron probe microanalysis [abs.]: Georgia Acad. Sci. Bull., v. 28, no. 2, p. s23, 1970.

**Radcliffe, Dennis.** *See* Prather, Preston. 10977

**Radcliffe, S. V.** *See* Green, H. W., 2d. 03008

**Rader, Miles.** *See* Krinitzsky, E. L. 06222

**Radforth, N. W.** *See* Korpjaakko, E. O. 08246

**Radforth, N. W.** *See* MacFarlane, I. C. 08248

- 08313 **Radforth, N. W.** New developments in peatland studies, *in* International Peat Congress, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 1-3, 1970.

- 09764 **Radforth, N. W.** A report on muskeg to the Solid-Earth Science Study [group] of the Science Council of Canada, Pt. 2 of Report on the geotechnical sciences: Natl. Research Council Canada Assoc. Comm. Geotech. Research Tech. Memo. 95, p. III-1121, 1969.

- 11009 **Radforth, N. W.** Muskeg, *in* Background papers on the earth sciences in Canada (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 134-140, 1970.

**Radforth, Norman W.** *See* Brideaux, Wayne W. 07669

- 10128 **Radhakrishnan, N.; Reese, Lymon C.** A review of applications of the finite element method of analysis to problems in soil and rock mechanics: Soils and Foundations, v. 10, no. 3, p. 95-112, 1970.

- 10974 **Radhakrishnan, Narayanaswamy.** Solution of some plane strain problems in soil mechanics using the method of finite elements [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3166B-3167B, 1970.

**Radomski, Andrzej.** *See* Gradziński, Ryszard. 11260

- 04308 **Radtke, Arthur S.; Scheiner, Bernard J.** Studies of hydrothermal gold deposition — [Pt.] 1, Carlin gold deposit, Nevada, the role of carbonaceous materials in gold deposition: Econ. Geology, v. 65, no. 2, p. 87-102, illus., tables, 1970.

- 09531 **Radtke, Arthur S.** Influence of organic carbon on gold deposition at the Carlin and Cortez deposits, Nevada [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 660, 1970.

- 00339 **Ragan, Donal H.; Sheridan, Michael F.** The Archean rocks of the Grand Canyon, Arizona [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 132-133, 1970.

**Ragland, P. C.** *See* Dietrich, R. V. 03749

- 00758 **Ragland, Paul C.** Subsolidus unmixing and inversion of potassium feldspars from a granitic batholith [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 239, 1970.

- 03703 **Ragland, Paul C.** Composition and structural state of the potassic phase in perthites as related to petrogenesis of a granitic pluton: *Lithos*, v. 3, no. 2, p. 167-189, illus., tables, 1970.
- Ragland, Paul C.** See Dobbins, David A. 03956
- Ragland, Paul C.** See Weigand, Peter W. 08275
- Ragle, Richard H.** See Bushnell, Vivian C. 07725
- 08641 **Rahm, D. A.** Post-Miocene erosion of basalt in southeastern Washington [abs.], in *Columbia River Basalt Symposium*, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 328, 1970.
- Rahm, David A.** See Easterbrook, Don J. 05977
- 02299 **Rahmani, R. A.** Carbonate concretions in the Upper Cretaceous Cedar District Formation, British Columbia: *Bull. Canadian Petroleum Geology*, v. 18, no. 2, p. 282-288, illus., 1970.
- 00174 **Rahn, Perry H.** The weathering of tombstones, and its relationship to the topography of New England [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 32, 1970.
- Rahn, Perry H.** See Hoskins, Earl R. 07028
- Rahn, Perry H.** See Johnson, Arvid M. 09617
- Rainville, George D.** See Bombolakis, Emanuel G. 00868
- 02670 **Rainwater, E. H.** Geologic occurrence of oil and gas in Miocene of Gulf Coast of United States [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 866, 1970.
- 04837 **Rainwater, E. H.** Regional stratigraphy and petroleum potential of Gulf Coast Lower Cretaceous [abs.]: *Am. Assoc. Petroleum Geologists*, v. 54, no. 9, p. 1790, 1970.
- 07316 **Rainwater, E. H.** Stratigraphy and petroleum potential of Peninsular Florida and southern Georgia, in *Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Socs. Trans.*, v. 20, p. 49-59, illus., 1970.
- 07322 **Rainwater, E. H.** Regional stratigraphy and petroleum potential of the Gulf Coast Lower Cretaceous, in *Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Socs. Trans.*, v. 20, p. 145-157, illus., 1970.
- Raitt, R. W.** See Shor, G. G., Jr. 10002
- 01627 **Raleigh, C. B.; Hoskins, E. L.; Kirby, S. H.** Deep-hole determinations of strain and in-situ stress related to the JORUM event [abs.]: *EOS*, v. 51, no. 3, p. 203, 1970.
- Raleigh, C. B.** See Healy, J. H. 03974
- 09532 **Raleigh, C. B.; Bredehoeft, J.; Healy, J. H.; Bohn, Joyce.** Earthquakes and water-flooding in the Rangely oil field [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 660-661, 1970.
- 01969 **Raleigh, C. Barry; Bohn, Joyce; Healy, John H.** Earthquakes and fluid pressure in the Rangely oil field, Colorado [abs.]: *EOS*, v. 51, no. 4, p. 351, 1970.
- 09943 **Raleigh, C. Barry; Kirby, Stephen H.** Creep in the upper mantle, in *Symposium on the mineralogy and petrology of the upper mantle — Fiftieth Anniversary Symposia* (Benjamin A. Morgan, editor): *Mineralog. Soc. America Spec. Paper* 3, p. 113-121, illus., 1970.

- 04013 **Ralston, Dale R.; Chapman, Sherl L.** Ground-water resource of southern Ada and western Elmore Counties, Idaho: Idaho Dept. Reclamation Water Inf. Bull. 15, 52 p., illus., tables, 1970.
- 10256 **Ralston, Dale R.; Kozak, Eugene J.** Ground-water development in Idaho — 1969: Idaho Dept. Water Admin. Water Inf. Bull. 17, 52 p., illus., tables, 1970.
- Ralston, Dale R.** See Chapman, Sherl L. 10450
- 04070 **Rama Murthy, V.; Hall, H. T.** The chemical composition of the Earth's core — Possibility of sulphur in the core: Physics Earth and Planetary Interiors, v. 2, no. 4, p. 276-282, illus., tables, 1970.
- 05889 **Ramachandran, G. N.; Srinivasan, R.** Fourier methods in crystallography: New York and London, Wiley-Interscience, 259 p., illus., tables, 1970.
- 02362 **Ramanatha Iyer, T. S.** Causes of clay sensitivity — Discussion [of paper 6568 by James K. Mitchell and William N. Houston, 1969]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Soil Mechanics and Found. Div., no. SM2, p. 774-776, 1970.
- Ramanatha Iyer, T. S.** See Andersland, Orlando B. 03027
- 00510 **Ramanjaneya, Gundarahalli Sankarasetty.** Consolidation characteristics of a varved clay [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3167B-3168B, 1970.
- 10907 **Ramanujam, C. G. K.** A petrified bark of Cupressaceae from the Upper Cretaceous of Alberta: Canadian Jour. Botany, v. 48, no. 5, p. 855-858, illus., 1970.
- Ramaty, R.** See Lingenfelter, R. E. 08763
- 04575 **Ramberg, Hans.** Experimental and theoretical study of salt-dome evolution, in Third symposium on salt, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 261-270, illus., tables, 1970.
- Rambo, John T.** See Hearst, Joseph R. 07218
- Ramden, Hans-Ake.** See Reymont, Richard A. 02382
- 05757 **Ramdohr, Paul; ElGoresy, Ahmed.** Zur Mineralogie des Mondes [The mineralogy of the Moon]: Aufschluss, v. 21, nos. 7-8, p. 219-224, illus., 1970.
- Ramey, H. J., Jr.** See Eickmeier, J. R. 09252
- 10190 **Rampton, V. N.** Late Quaternary vegetation changes in the western Yukon Territory, Canada - Their relationship to the regional Late Wisconsin glacial history [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 109, 1970.
- 08141 **Rampton, Vern.** Neoglacial fluctuations of the Natzazhat and Klutlan Glaciers, Yukon Territory, Canada: Canadian Jour. Earth Sci., v. 7, no. 5, p. 1236-1263, illus., table, 1970.
- 01236 **Rampton, Vernon Neil.** Pleistocene geology of the Snag-Klutlan area, southwestern Yukon, Canada [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 8, p. 3712B, 1970.
- Ramsay, J. N.** See Douglas, A. G. 04193
- 00927 **Ramsay, John G.** Geometric stability of chevron and kink folds [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 298-299, 1970.
- 00635 **Ramsden, John.** A new method of producing orientation diagrams for till fabrics [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 344, 1970.



- 04614 **Ramsell, J.** IBM computers in exploration and development: Canadian Mining Jour., v. 91, no. 4, p. 101-103, 1970.
- 05438 **Ramsey, E. W.** A ground-water program for Virginia [abs.]: Virginia Jour. Sci., v. 21, no. 3, p. 136, 1970.
- 05486 **Ramsey, Elmer W.; Hinkle, Kenneth R.; Benander, Laurence E.** Waters of the Dismal Swamp: Virginia Jour. Sci., v. 21, no. 3, p. 81-83, illus., 1970.
- 05516 **Rampott, L. D.; Braun, R. L.; Wadleigh, W. F.** Mineral composition, CO<sub>2</sub> content, and grain density of drill hole samples from Yucca Flat, Nevada Test Site — UCRL-50915: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., 15 p., illus., tables, 1970.
- Rampott, Lawrence D.** See Braun, Robert L. 07200
- Ramstedt, Eugene C.** See California Dept. Water Resources. 09173
- 07291 **Ranalli, Giorgio.** Rheological properties of rocks as inferred from the study of earthquake aftershock sequences [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2773B, 1970.
- 02272 **Rancitelli, L. A.; Perkins, R. W.; Kaye, J. H.; Cooper, J. A.; Wogman, N. A.** Cosmogenic and primordial radionuclide concentrations in the Lost City meteorite [abs.]: EOS, v. 51, no. 7, p. 581-582, 1970.
- Rancitelli, L. A.** See Perkins, R. W. 05716
- Rand, John R.** See Hurley, Patrick M. 09998
- 01521 **Rand, Walter.** Sill-controlled flow transitions and extent of erosion: Am. Soc. Civil Engineers Proc., v. 96, paper 7212, Jour. Hydraulics Div., no. HY 4, p. 927-939, illus., table, 1970.
- 05391 **Randall, Allan D.** Surficial geologic map of the Tariffville quadrangle, Connecticut-Massachusetts: U.S. Geol. Survey Geol. Quad. Map GQ-798, scale 1:24,000, 1970.
- 00409 **Randall, M. J.** Toroidal free oscillations by the method of factorization: Jour. Geophys. Research, v. 75, no. 8, p. 1571-1572, 1970.
- Randall, M. J.** See Knopoff, L. 03964
- 03965 **Randall, M. J.; Knopoff, L.** The mechanism at the focus of deep earthquakes: Jour. Geophys. Research, v. 75, no. 26, p. 4965-4976, illus., tables, 1970.
- Randall, Walter.** See Hail, W. Roger. 01773
- Randall, Walter.** See Rex, Robert W. 02363
- 05630 **Randazzo, Anthony F.; Swe, Win; Wheeler, Walter H.** A study of tectonic influence on Triassic sedimentation — The Wadesboro Basin, central Piedmont: Jour. Sed. Petrology, v. 40, no. 3, p. 998-1006, illus., 1970.
- Randle, Keith.** See Goles, Gordon G. 05694
- 08386 **Randolph, Jennings.** Sediment, number one water pollutant — Keynote address in National Conference on Sediment Control, Washington, D.C., 1969, Proc. Washing-

ton, D.C., U.S. Dept. Housing and Urban Development Environmental Planning Division, p. 1-7, 1970.

- 07493 **Ranere, Anthony J.** Prehistoric environments and cultural continuity in the western Great Basin: *Tebiwa*, v. 13, no. 2, p. 52-[73], 1970.

**Raney, Jay.** See *Maxwell, John C.* 10578

**Raney, Jay Alan.** See *McGill, George E.* 04944

- 07417 **Rango, Albert.** Possible effects of precipitation modification on stream channel geometry and sediment yield: *Water Resources Research*, v. 6, no. 6, p. 1765-1770, illus., tables, 1970.

- 03288 **Rankin, D.; Reddy, I. K.** Polarization of the magneto-telluric fields over an anisotropic earth: *Pure and Appl. Geophysics*, v. 78, p. 58-65, illus., 1970.

- 10773 **Rankin, David.** Magnetotellurics, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor): *Canada Geol. Survey Paper* 69-56, p. 213-217, 1970.

- 01818 **Rankin, Douglas S.; Hyndman, Roy D.** Shallow water heat-flow measurements in Bras d'Or Lake, Nova Scotia [abs.]: *EOS*, v. 51, no. 4, p. 426, 1970.

**Rankin, Douglas W.** See *Espenshade, Gilbert H.* 00696

**Rankin, John G.** See *Sackett, William M.* 03563

- 04057 **Rankin, William E.; Lavin, Peter M.** Analysis of a reconnaissance gravity survey for drift-filled valleys in the Mercer quadrangle, Pennsylvania: *Jour. Hydrology*, v. 10, no. 4, p. 418-435, illus., 1970.

**Ranney, R. W.** See *Petersen, G. W.* 07428

- 10217 **Rao, C. N. R.; Ferraro, John R.** (editors). *Spectroscopy in inorganic chemistry*, V. 1: New York, Academic Press, 410 p., illus., tables, 1970.

- 05014 **Rao, J. S.; Sengupta, Surpriya.** An optimum hierarchical sampling procedure for cross-bedding data: *Jour. Geology*, v. 78, no. 5, p. 533-544, tables, 1970.

- 10423 **Rao, K. V. Krishna; Naidu, S. V. Nagender; Iyengar, Leela.** Thermal expansion of rutile and anatase: *Am. Ceramic Soc. Jour.*, v. 53, no. 3, p. 124-126, illus., tables, 1970.

**Rao, Kunduri V.** See *Deutsch, Ernst R.* 01888

- 01242 **Rao, Manam Venkata Panduranga.** Effects of effluent and influent seepage on the hydrodynamic forces acting on an idealized noncohesive sediment particle [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 8, p. 3659B, 1970.

- 03087 **Rao, S. V. L. N.; Lahiri, A.** Concordance between trend maps: *Modern Geology*, v. 1, no. 3, p. 219-236, illus., tables, 1970.

- 01528 **Rao, Udayagiri Mohan.** Sediment measurement techniques — [Pt.] F, Laboratory procedures — Discussion [of paper 6757 by Am. Soc. Civil Engineers (Task Comm. on Preparation of Sedimentation Manual), 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, *Jour. Hydraulics Div.*, no. HY 5, p. 1215-1220, tables, 1970.

- 08296 **Rapp, A.** Some geomorphological processes in cold climates [with French abs.] in *Ecology of the subarctic regions*, V. 1 of *Ecology and conservation* — A symposium, Helsinki, 1966, *Proc.: Paris, UNESCO*, p. 105-114, illus., 1970.

**Rapp, G. R., Jr.** See *Finger, L. W.* 02240

- 08456 **Rapson-McGugan, J. E.** The diagenesis and depositional environment of the Permian Ranger Canyon and Mowitch Formations, Ishbel Group, from the southern Canadian Rocky Mountains: *Sedimentology*, v. 15, nos. 3-4, p. 363-417, illus., tables, 1970.
- Raring, Andrew M.** See *Fowler, Michael L.* 00702
- 00477 **Rashid, M. A.; King, L. H.** Major oxygen-containing functional groups present in humic and fulvic acid fractions isolated from contrasting marine environments: *Geochim. et Cosmochim. Acta*, v. 34, no. 2, p. 193-201, tables, 1970.
- 09346 **Rasmussen, John O.** Patterns of nuclear rotational excitation: *Accounts Chem. Research*, v. 3, no. 5, p. 5, 166-176, illus., 1970.
- Rasmussen, Lowell A.** See *Campbell, William J.* 08213
- 05588 **Raspe, Rudolf Erich.** An introduction to the natural history of the terrestrial sphere, principally concerning new islands born from the sea and Hooke's hypothesis of the Earth on the origin of mountains and petrified bodies to be further established from accurate descriptions and observations (translated and edited by Audrey Notvik Iversen and Albert V. Carozzi), including a facsimile of the 1763 edition: New York, Hafner Publishing Co., [498] p., illus., 1970.
- Rast, Nicholas.** See *Newall, Geoffrey.* 07471
- 00175 **Ratcliffe, Nicholas M.; Shuart, Susan G.** The Rosetown complex and its bearing on the antiquity of the Ramapo fault system [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 32-33, 1970.
- 08325 **Ratcliffe, Nicholas M.** Ancient strike-slip fault tectonics in the Hudson Highlands and Manhattan Prong: *New York Acad. Sci. Trans.*, ser. 2, v. 32, no. 8, p. 1009-1021, illus., 1970.
- 07221 **Ratliff, L. F.; Allen, B. L.** The mineralogy and genesis of two soils from Trans-Pecos, Texas: *Soil Sci.*, v. 110, no. 4, p. 268-277, illus., tables, 1970.
- 00636 **Ratté, James C.; Zartman, Robert E.** Bear Mountain gneiss dome, Black Hills, South Dakota — Age and structure [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 345, 1970.
- 00928 **Ratzlaff, John R.; Dort, Wakefield, Jr.** Late Quaternary channel pattern and lateral behavior, middle part of Kansas River, Kansas [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 299, 1970.
- 01099 **Rau, Jon L.** Environmental hydrology of the Akron metropolitan area, Ohio [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 402-403, 1970.
- 04466 **Rau, Jon L.; Dellwig, Louis F.** (editors). Third symposium on salt — V. 2, Evaporated salt, solar salt, economic aspects, salt applications, rock physics-mechanics, subsidence, geophysics, hydraulic fracturing, mining: Cleveland, Ohio, Northern Ohio Geol. Soc., 486 p., illus., tables, 1970.
- 04562 **Rau, Jon L.; Dellwig, Louis F.** (editors). Third symposium on salt — V. 1, Stratigraphy-sedimentation, geochemistry, tectonics, solution mining, underground storage-disposal: Cleveland, Ohio, Northern Ohio Geol. Soc., 474 p., illus., tables, 1970.
- 08374 **Rau, Weldon W.** Foraminifera, stratigraphy, and paleoecology of the Quinalt Formation, Point Grenville-Raft River coastal area, Washington: *Washington Div. Mines and Geology Bull.* 62, 41 p., illus., 1970.
- 01970 **Rauch, Henry W.; White, William B.** Solution kinetics of Middle Ordovician carbonate rocks from central Pennsylvania [abs.]: *EOS*, v. 51, no. 4, p. 285, 1970.

- 04064 **Rauch, Henry W.; White, William B.** Lithologic controls on the development of solution porosity in carbonate aquifers: *Water Resources Research*, v. 6, no. 4, p. 1175-1192, illus., tables, 1970.
- 08504 **Raup, David M.** Modeling and simulation of morphology by computer, in *Computers in paleontology — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc.*, Pt. B: Lawrence, Kans., Allen Press, p. 71-83, illus., 1970.
- Raup, Omer B.** See *Dyni, John R.* 04569
- 04643 **Raup, Omer B.; Hite, Robert J.; Groves, H. Leon, Jr.** Bromine distribution and paleosalinities from well cuttings, Paradox Basin, Utah and Colorado, in *Third symposium on salt*, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 40-47, illus., 1970.
- 06329 **Raup, Omer B.** Brine mixing — An additional mechanism for formation of basin evaporites: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2246-2259, illus., tables, 1970.
- Raup, Robert B.** See *Granger, Harry C.* 09769
- 08601 **Rausch, Donald O.; Mariacher, Burt C.** (editors). AIME world symposium on mining and metallurgy of lead and zinc, St. Louis, Missouri, 1970 [Proc.] — V. 1, Mining and concentrating of lead and zinc: New York, Am. Inst. Mining, Metallurgical, and Petroleum Engineers, 1017 p., illus., tables, 1970.
- Ravich, M. G.** See *Egiazarov, B. Kh.* 10036
- Ravich, M. G.** See *Tkatchenko, B. V.* 10108
- Ravina, Israela.** See *Low, Philip F.* 01725
- Ray, B. W.** See *Bushue, L. J.* 03937
- 00036 **Ray, Clayton E.; Denny, Charles S.; Rubin, Meyer.** A peccary, *Platygonus compressus* LeConte, from drift of Wisconsinan age in northern Pennsylvania: *Am. Jour. Sci.*, v. 268, no. 1, p. 78-94, illus., tables, 1970.
- 01318 **Ray, Clayton E.; Lipps, Lewis.** Southerly distribution of porcupine in eastern United States during late Quaternary time [abs.]: *Georgia Acad. Sci. Bull.*, v. 28, no. 2, p. s24, 1970.
- Ray, Lily.** See *Albee, Arden L.* 09460
- Raymer, L. L.** See *Brown, H. D.* 02207
- 03521 **Raymer, L. L.; Salisch, H. A.** The contribution of flushed zone measurements to formation evaluation: *Log Analyst*, v. 11, no. 3, p. 17-25, illus., tables, 1970.
- 00532 **Raymond, Charles Forest.** Flow in a transverse section of Athabasca Glacier, Alberta, Canada [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 7, p. 3244B, 1970.
- Raymond, Dorothy.** See *LaMoreaux, Philip E.* 06734
- 08244 **Raymond, G. P.** Construction method and performance of an embankment on a deep muskeg [with French abs.], in *International Peat Congress*, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 51-56, illus., table, 1970.
- Raymond, Lon.** See *Boos, C. M.* 05360

- 00340 **Raymond, Loren A.** Del Puerto keratophyres and Lotta Creek tuffs — Great Valley not Franciscan rocks [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 133, 1970.
- 00341 **Raymond, Loren A.** Relationships between blueschist facies metamorphism, folding, and faulting in Franciscan rocks, Seegers Ranch area, northeastern Diablo Range, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 133-134, 1970.
- 02485 **Raymond, Loren A.** Cretaceous sedimentation and regional thrusting, northeastern Diablo Range, California: *Geol. Soc. America Bull.*, v. 81, no. 7, p. 2123-2128, illus., 1970.
- Raymond, William H.** See *Desborough, George A.* 06176
- Raymond, William H.** See *Desborough, George A.* 06897
- 08772 **Rayner, F. A.** Dynamic model of the Ogallala aquifer, in *Ogallala Aquifer Symposium*, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, p. 111-117, illus., 1970.
- 02943 **Rayner, J. M.** The role of geophysics in the development of mineral resources [with French abs.], in *Mining and groundwater geophysics*, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 259-266, illus., 1970.
- Rea, B. D.** See *Verille, G. J.* 02152
- 00457 **Rea, David K.** Changes in structure and trend of fracture zones north of the Hawaiian ridge and relation to sea-floor spreading: *Jour. Geophys. Research*, v. 75, no. 8, p. 1421-1430, illus., 1970.
- Rea, David K.** See *Naugler, Frederic P.* 04883
- 10449 **Rea, David K.** Bathymetry and magnetics of a region [POL-421-3] 29° to 35°N, 155° to 165°W; U.S. ESSA Tech. Rept. ERL 146-Pol 4, 21 p., illus., table, 1969.
- 04788 **Rea, W. J.** Andesites of the Lesser Antilles: *Geol. Soc. London Proc.* 1969, no. 1662, p. 39-46, discussion, 1970.
- 06491 **Read, W. F.** Is the Limestone Mountain structure an astrobleme? [abs.], in *Inst. Lake Superior Geology*, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 36, 1970.
- Readman, P. W.** See *Runcorn, S. K.* 06292
- Reasenbergs, Paul.** See *Aki, Keiiti.* 00219
- Reasenbergs, Paul.** See *Aki, Keiiti.* 04337
- Reaser, Donald F.** See *Jones, Bill R.* 05371
- 05373 **Reaser, Donald F.** Preliminary study of the Buda Limestone in foothills of the southern Quitman Mountains, Trans-Pecos Texas, in *Geology of the southern Quitman Mountains area, Trans-Pecos Texas — S.E.P.M. Permian Basin Sec.*, 1970 Biennial Field Trip, Symposium and Guidebook: Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub. 70-12, p. 76-81, illus., 1970.
- Rebagay, T. V.** See *Ehmann, W. D.* 03550
- 04268 **Rebagay, T. V.; Ehmann, W. D.** Simultaneous determination of zirconium and hafnium in standard rocks by neutron activation analysis: *Jour. Radioanal. Chemistry*, v. 5, no. 1, p. 51-60, illus., tables, 1970.
- Rechea, Manual.** See *Karadi, Gabor M.* 09499

- 04475 **Rechtien, Richard D.** A high frequency wave generator for application to cavity delineation, in *Third symposium on salt*, V. 2 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 357-366, illus., table, 1970.
- Rector, Roger J.** See *Clifford, Paul M.* 00882
- 08714 **Reddell, Donald L.** A mathematical model for determining areal distribution of natural recharge in the northern High Plains of Colorado, in *Ogallala Aquifer Symposium*, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, p. 165-181, illus., tables, 1970.
- 07594 **Reddell, Donald Lee.** Dispersion in groundwater flow systems [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 3, p. 1381B, 1970.
- 07631 **Reddell, Donald Lee; Sunada, Daniel K.** Numerical simulation of dispersion in groundwater aquifers: Colorado State Univ. Hydrology Paper 41, 79 p., illus., 1970.
- Reddy, I. K.** See *Rankin, D.* 03288
- Redmond, Charles E.** See *Hole, Thornton J. F.* 06836
- Reed, Bruce L.** See *Anderson, Lennart A.* 06175
- 10091 **Reed, Bruce L.; Lanphere, Marvin A.** Plutonic belts of central and southern Alaska Range and Alaska Peninsula [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2502, 1970.
- 05054 **Reed, Edward B.** Disturbed sediments in a small alpine lake in Colorado: Arctic, v. 23, no. 2, p. 136-138, illus., 1970.
- 05734 **Reed, G. W., Jr.; Jovanovic, S.** Halogens, mercury, lithium and osmium in Apollo 11 samples, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1487-1492, illus., tables, 1970.
- Reed, J. E.** See *Bedinger, M. S.* 05473
- Reed, J. E.** See *Stallman, R. W.* 09604
- 03241 **Reed, John C.** Oil developments in Alaska: Polar Rec., v. 15, no. 94, p. 7-17, illus., 1970.
- 09243 **Reed, John C.** Minerals potential of Alaska: Explorers Jour., v. 48, no. 1, p. 56-62, illus., 1970.
- Reed, John C., Jr.** See *Gilluly, James.* 00102
- 04258 **Reed, John C., Jr.; Marvin, Richard F.; Mangum, John H.** K-Ar ages of lamprophyre dikes near Great Falls, Maryland-Virginia, in *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C145-C149, illus., tables, 1970.
- Reed, John C., Jr.** See *Bryant, Bruce.* 08176
- 02671 **Reed, Philip E. C.** Discontinuity surfaces in Beaverhill Lake Group (Devonian) limestones, Alberta [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 866, 1970.

- 02473 **Reed, T. E.; McMurtrey, R. G.** Water levels and artesian pressures in observation wells in Montana, 1966-69: Montana Bur. Mines and Geology Bull. 76, 36 p., illus., tables, 1970.
- Reed, W.** See *Burlingame, A. L.* 05736
- 00073 **Reed, Walter E.** Transport of water away from a buried heat source with special reference to hydrologic phenomena observed at Aardvark nuclear detonation: Jour. Geophys. Research, v. 75, no. 2, p. 415-430, illus., tables, 1970.
- 09179 **Reeder, S. W.; Odynsky, William.** Reconnaissance soil survey of the Hotchkiss and Keg River area: Research Council Alberta Rept., no. 89 (also Alberta Univ. Bull., no. SS-9; Alberta Soil Survey Rept., no. 26), 90 p., illus., tables, 1969.
- Rees, A. I.** See *Hamilton, N.* 05596
- 05597 **Rees, A. I.** Magnetic properties of some canyon sediments: Marine Geology, v. 9, no. 2, p. M12-M16, illus., 1970.
- 00822 **Rees, C. E.** The sulphur isotope balance of the ocean — An improved model: Earth and Planetary Sci. Letters, v. 7, no. 4, p. 366-370, 1970.
- 08396 **Rees, John D.** Paricutin revisited — A review of man's attempts to adapt to ecological changes resulting from volcanic catastrophe [with French and German summaries]: Geoforum 4, p. 7-25, illus., tables, 1970.
- Reese, Lymon C.** See *Desai, Chandrakant S.* 09149
- Reese, Lymon C.** See *Radhakrishnan, N.* 10128
- 03276 **Reesor, J. E.** Some aspects of structural evolution and regional setting in part of the Shuswap metamorphic complex, in Structure of the southern Canadian Cordillera: Geol. Assoc. Canada Spec. Paper 6, p. 73-86, illus., table, 1970.
- Reeve, F. A. E.** See *Smith, Derrell A.* 02347
- 10191 **Reeves, Brian.** On the coalescence of the Laurentide and Cordilleran ice sheets in the western interior of North America with particular reference to the southern Alberta area [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ. ?], p. 110, 1970.
- 10699 **Reeves, Brian O. K.** The southern Alberta paleo-cultural — paleo-environmental sequence, in Chacmool 1969 (R. G. Forbis, L. B. Davis, O. A. Christensen, G. Fedirchuk, editors) - Calgary Univ. Archaeol. Assoc., Ann. Paleo-Environmental Workshop, 1st, Calgary, 1969, Proc.: [Calgary, Alberta] Calgary Univ., Students' Press, p. 6-46, illus. [1969].
- Reeves, C. C., Jr.** See *Bates, T. R.* 00427
- 02018 **Reeves, C. C., Jr.** Origin, classification, and geologic history of caliche on the southern High Plains, Texas and eastern New Mexico: Jour. Geology, v. 78, no. 3, p. 352-362, illus., 1970.
- Reeves, C. C., Jr.** See *Parry, W. T.* 03401
- 08708 **Reeves, C. C., Jr.** Drainage pattern analysis, southern High Plains, West Texas and eastern New Mexico, in Ogallala Aquifer Symposium, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, p. 58-71, illus., tables, 1970.
- 02977 **Reeves, R. W.** Arroyos outside the southwest [abs.]: Arizona Acad. Sci. Jour., v. 6, 1970 Proc. Supp., p. 56-57, 1970.

- 07340 **Reeves, Richard Wayne.** Modern channel entrenchment in the Coastal Ranges of central and southern California [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 4, p. 2053B-2054B, 1970.
- 03285 **Reeves, Robert G.** Working geologists compare training and needs: *Geotimes*, v. 15, no. 4 [15], p. 16, 1970.
- 04588 **Reeves, Robert G.; Delo, David M.** (editors). Requirements in the field of geology — Council on Education in Geological Sciences Programs Pub. 5: Washington, D. C., Am. Geol. Inst., 38 p., illus., tables, 1970.
- 09533 **Regis, A. J.** Occurrences of ferrierite in altered pyroclastics in central Nevada [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 661, 1970.
- 09534 **Regis, A. J.** The role of the industrial geologist in geological education in public schools [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 662, 1970.
- 08589 **Reich, A. R.** Automation of liquid scintillation data processing: *Jour. Radioanal. Chemistry*, v. 6, no. 2, p. 437-445, tables, 1970.
- Reichmuth, Donald R.** See *Sanderson, Robert L., Jr.* 05499
- 05309 **Reid, Arch M.; Bass, Manuel N.; Fujita, H.; Kerridge, J. F.; Fredriksson, K.** Olivine and pyroxene in the Orgueil meteorite: *Geochim. et Cosmochim. Acta*, v. 34, no. 11, p. 1253-1255, illus., 1970.
- 06841 **Reid, Arch M.; Meyer, Charles, Jr.; Harmon, Russell S.; Brett, Robin.** Metal grains in Apollo 12 igneous rocks: *Earth and Planetary Sci. Letters*, v. 9, no. 1, p. 1-5, illus., 1970.
- 09093 **Reid, Arch M.; Hanor, Jeffrey S.** Pyrope in kimberlite: *Am. Mineralogist*, v. 55, nos. 7-8, p. 1375-1379, illus., 1970.
- Reid, Fred.** See *Boos, C. M.* 05360
- 04807 **Reid, I. A.; Shastal, J.** Glacier surveys in British Columbia, 1968 — V. 1, English system; V. 2, Metric system: Canada Dept. Energy, Mines and Resources Inland Waters Br. Rept. Ser. 10, V. 1, 26 p., illus.; V. 2, illus., 1970.
- Reid, I. A.** See *Campbell, P. I.* 10283
- 01819 **Reid, John B., Jr.** The role of lherzolite and spinel-pyroxenite in the formation of basaltic magmas [abs.]: *EOS*, v. 51, no. 4, p. 447-448, 1970.
- 00637 **Reid, John R.** Surging as an explanation of the neoglacal limit, Martin River Glacier, Alaska [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 345, 1970.
- 06125 **Reid, John R.** Late Wisconsin and Neoglacal history of the Martin River Glacier, Alaska: *Geol. Soc. America Bull.*, v. 81, no. 12, p. 3593-3603, illus., 1970.
- 07195 **Reid, John R., Jr.** Geomorphology and glacial geology of the Martin River Glacier, Alaska [with French and Russian abs.]: *Arctic*, v. 23, no. 4, p. 254-267, illus., 1970.
- 10411 **Reid, L. R.; Smith, J. P.** A method of electron microprobe signal enhancement by pulse rate analysis: *Rev. Sci. Instruments*, v. 41, no. 1, p. 26-28, illus., 1970.
- Reid R. O.** See *Vastano, A. C.* 05026
- 06654 **Reid, R. O.; Knowles, C. E.** An inverse tsunami problem, in *Tsunamis in the Pacific Ocean* — Internat. Symposium on Tsunamis and Tsunami Research, Honolulu, Hawaii, 1969, Proc.: Honolulu, Hawaii, East-West Center Press, p. 399-406, tables, 1970.



- 00568 **Reid, R. R.; Greenwood, W. R.; Morrison, D. A.** Precambrian metamorphism of the Belt Supergroup in Idaho: *Geol. Soc. America Bull.*, v. 81, no. 3, p. 915-917, illus., table, 1970.
- Reid, W. E.** See *Wilson, L. R.* 03377
- Reid, William M.** See *Kehle, Ralph O.* 00900
- 02498 **Reig, Osvaldo A.** The Proterosuchia and the early evolution of the Archosaurs, an essay about the origin of a major taxon: *Harvard Univ. Mus. Comp. Zoology Bull.*, v. 139, no. 5, p. 229-292, illus., table, 1970.
- Reilly, Edgar M., Jr.** See *Funk, Robert E.* 00963
- 06824 **Reimer, G. M.; Storzer, D.; Wagner, G. A.** Geometry factor in fission track counting: *Earth and Planetary Sci. Letters*, v. 9, no. 5, p. 401-404, illus., table, 1970.
- Reimer, M.** See *Wagner, G. A.* 01846
- 00342 **Reimnitz, Erk.** Surf-beat and related strong, pulsating bottom currents in the Rio Balsas submarine canyon, Mexico [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 134, 1970.
- 03533 **Reimnitz, Erk; Gutiérrez-Estrada, Mario.** Rapid changes in the head of the Rio Balsas submarine canyon system, Mexico: *Marine Geology*, v. 8, nos. 3-4, p. 245-258, illus., 1970.
- 04244 **Reimnitz, Erk; vonHuene, Roland; Wright, F. F.** Detrital gold and sediments in Nuka Bay, Alaska, in *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C35-C42, illus., table, 1970.
- 02672 **Reineck, Hans-Erich; Howard, James D.; Frey, Robert W.; Dorjes, Jurgen; Hertweck, Gunther.** Characteristics of shoreface sediments [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 866, 1970.
- Reisenauer, A. E.** See *Cearlock, D. B.* 10510
- 10512 **Reisenauer, A. E.; Cearlock, D. B.; Bryan, C. A.** Mathematical model for approximating transient three-dimensional groundwater systems [abs.]: *EOS*, v. 51, no. 11, p. 756, 1970.
- 07078 **Reiser, Hillard N.** Northeastern Brooks Range — A surface expression of the Prudhoe Bay section, in *Geological seminar on the North Slope of Alaska*, Palo Alto, Calif., 1970, *Proc.*: Los Angeles, Calif., Am. Assoc. Petroleum Geologists Pacific Sec., p. K1-K14, illus., discussion, 1970.
- 01820 **Reitan, Paul H.; Szekely, Julian; Foster, B. P.** Material emplacement models for dikes extending to the mantle [abs.]: *EOS*, v. 51, no. 4, p. 447, 1970.
- 03350 **Reiter, Leon.** An investigation into the time term method in refraction seismology: *Seismol. Soc. America Bull.*, v. 60, no. 1, p. 1-13, illus., tables, 1970.
- 10635 **Reiter, Leon.** Attenuation of Rayleigh waves in the 15 to 50 second period range [abs.]: *EOS*, v. 51, no. 11, p. 781, 1970.
- 06887 **Reiter, Marshall Allan.** Terrestrial heat flow and thermal conductivity in southwestern Virginia [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 1, p. 259B, 1970.
- 06880 **Reith, Howard Cartnick.** A study of earth science teachers and practices in North Dakota for the academic year 1968-1969 [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 1, p. 254B, 1970.

- 01856 **Reitzel, J. S.; Gough, D. I.; Porath, H.; Anderson, C. W., 3d.** Geomagnetic deep sounding and upper mantle structure in the western United States: Royal Astron. Soc. Geophys. Jour., v. 19, no. 3, p. 213-235, illus., 1970.
- 00638 **Remson, Irwin.** Hydrogeologic models in urban planning [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 346, 1970.
- Remson, Irwin.** See *Hornberger, George M.* 02716
- 09535 **Renaud, Jane W.** Scientific separatism [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 662-663, 1970.
- 04116 **Renault, Jacques; Bonem, Rena Mae; Riese, Ronald.** Computerization of the New Mexico Bureau of Mines Mineralogical Museum: New Mexico Bur. Mines and Mineral Resources Circ. 111, 49 p., illus., 1970.
- 10448 **Renault, Jacques.** Major-element variations in the Potrillo, Carrizozo, and McCartys basalt fields, New Mexico: New Mexico Bur. Mines and Mineral Resources Circ. 113, 22 p., illus., tables, 1970.
- 04008 **Render, F. W.** Geohydrology of the metropolitan Winnipeg area as related to groundwater supply and construction [with French abs.]: Canadian Geotech. Jour., v. 7, no. 3, p. 243-274, illus., 1970.
- 04292 **Rendu, Jean-Michel.** Some applications of geostatistics to decision making in exploration [abs.]: Canadian Mining and Metall. Bull., v. 63, no. 696, p. 445, 1970.
- 04998 **Rendu, Jean-Michel M.** Geostatistical approach to ore reserve calculation: Eng. and Mining Jour., v. 171, no. 6, p. 114-118, illus., table, 1970.
- 10482 **René, R. M.** Magnetotelluric fields for H-polarization over structures bounded by vertical discontinuities and an infinitely resistive or conductive substrata [abs.]: EOS, v. 51, no. 11, p. 743, 1970.
- 07434 **Reneau, R. B., Jr.; Fiskell, John G. A.** Selective dissolution effects on cation-exchange capacity and specific surface of some tropical soil clays: Soil Sci. Soc. America Proc., v. 34, no. 5, p. 809-812, illus., tables, 1970.
- 05672 **Renfro, H. B.; Feray, Dan E.** (compilers). Geological highway map of the Mid-Atlantic region: Am. Assoc. Petroleum Geologists U.S. Geol. Highway Map Ser., no. 4, scale about 1 in. to 28 mi., sections, text [1970?].
- Renfro, W. C.** See *Cory, R. L.* 08676
- 10796 **Renner, Richard E.** Glen Rose Limestone deposition in Parker County, Texas, in Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas (Leo Hendricks, editor): Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub., no. 67-8, p. 102-116, illus., tables, 1967.
- Rennilson, J. J.** See *Holt, H. E.* 05109
- 07086 **Rennix, Mark T.** Observations of some unusual Dugway geodes: West Virginia Acad. Sci. Proc. 1969, v. 41 (West Virginia Univ. Bull., ser. 70, no. 11-3), p. 184-188, illus., discussion, 1970.
- Renton, John J.** See *Hidalgo, Robert V.* 08393
- 06702 **Rentzeperis, P. J.** The crystal structure of alleghanyite,  $Mn_5[(OH)_2(SiO_4)]$  [with German abs.]: Zeitschr. Kristallographie, v. 132, nos. 1-2, p. 1-18, illus., tables, 1970.
- Repenning, C. A.** See *Newcomb, R. C.* 01188
- Reshkin, Mark.** See *Schneider, Allan F.* 01102

**Reso, Anthony.** See *Johnson, J. G.* 05811

**Reveal, James L.** See *Tidwell, William D.* 01677

- 08382 **Revelle, R.; Seibold, E.; Uyeda, S.; Udintsev, G.; Gierman, G.; Peres, J.** Problemy morskoy geologii v svyazi s ispol'zovaniyem mineral'nykh resursov Zemli [Problems of marine geology in connection with utilization of the mineral resources of the Earth (with English summ.)]: *Okeanologiya*, v. 10, no. 6, p. 931-946, 1970.

- 03919 **Rex, David C.; Dodson, Martin H.** Improved resolution and precision of argon analysis using an MS 10 mass spectrometer, in *Geochronology of Phanerozoic orogenic belts — Colloquium, Switzerland, 1969, Papers: Eclogae Geol. Helvetiae*, v. 63, no. 1, p. 275-280, illus., table, 1970.

**Rex, David C.** See *Beckinsale, Robert D.* 08690

- 01343 **Rex, R. W.** X-ray mineralogy studies, Leg 2, [Chap.] 11 in Initial reports of the Deep Sea Drilling Project — V. 2, Leg 2 of cruises of *Glomar Challenger*, Hoboken, N. J., to Dakar, Senegal, Oct.-Nov. 1968: Washington, D. C., U.S. Govt. Printing Office, p. 329-346, illus., tables, 1970.

**Rex, R. W.** See *Meidav, Tsvi.* 01688

- 06730 **Rex, R. W.; Murray, B.** X-ray mineralogy studies, Leg 4, Chap. 15 in Initial reports of the Deep Sea Drilling Project — V. 4, Leg 4 of cruises of *Glomar Challenger*, Rio de Janeiro, Brazil, to San Cristobal, Panama, Feb.-Mar. 1969 (R. G. Bader, and others): Washington, D. C., U.S. Govt. Printing Office, p. 325-369, illus., tables, 1970.

- 07147 **Rex, R. W.; Murray, B.** X-ray mineralogy studies, Chap. 16 in Initial reports of the Deep Sea Drilling Project — V. 5, Leg 5 of cruises of *Glomar Challenger*, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office, p. 441-483, illus., table, 1970.

**Rex, R. W.** See *vonderBorch, C. C.* 07155

**Rex, Robert W.** See *Hail, W. Roger.* 01773

- 02363 **Rex, Robert W.; Randall, Walter.** Possible sea-floor spreading in the Imperial Valley of California — [Pt.] 5, Present centers [abs.]: *EOS*, v. 51, no. 7, p. 589, 1970.

**Rex, Robert W.** See *Elders, Wilfred A.* 06967

**Rexroad, Carl B.** See *Barnes, Christopher R.* 01049

**Rexroad, Carl B.** See *Pollock, Charles A.* 03541

- 08761 **Rexroad, Carl B.** An outline of Silurian conodont zones in the Illinois Basin and the Cincinnati Arch area, in *Correlation of the North American Silurian rocks: Geol. Soc. America Spec. Paper 102*, p. 91-94, 1970.

**Rexroad, Carl B.** See *Glenister, Brian F.* 09920

- 04232 **Rey, P.; Wakita, H.; Schmitt, R. A.** Radiochemical neutron activation analysis of indium, cadmium, yttrium and the 14 rare earth elements in rocks [with French and German abs.]: *Anal. Chim. Acta*, v. 51, no. 2, p. 163-178, illus., tables, 1970.

**Rey, P.** See *Wakita, H.* 05729

- 08442 **Reybold, William U., 3d.** Soil survey of Talbot County, Maryland: Washington, D. C., U. S. Government Printing Office, 84 p., illus., tables, 1970.

- 02382 **Reyment, Richard A.; Ramdén, Hans-Åke.** FORTRAN IV program for canonical variates analysis for CDC 3600 computer: *Kansas Geol. Survey Computer Contr.* 47, 40 p., table, 1970.

- 10630 **Reyment, Richard Arthur.** Covariance structure and morphometric analysis — A contribution to paleogenetics: *Internat. Assoc. Math. Geology Jour.*, v. 1, no. 2, p. 185-197, illus., tables, 1969.
- Reynolds, J. H.** See *Hohenberg, C. M.* 05703
- Reynolds, M.** See *Bogard, D. D.* 02270
- Reynolds, M. A.** See *Miller, Donald K.* 01955
- 07576 **Reynolds, Michael Anthony.** A study of the age of the elements [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 3, p. 1144B, 1970.
- 00343 **Reynolds, Mitchell W.** Low-angle faults of lag and gravity origin, northeastern Death Valley, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 134-135, 1970.
- 09536 **Reynolds, Peter H.; Dasch, E. Julius.** Lead isotopes in marine manganese nodules [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 663, 1970.
- Reynolds, R. C.** See *Murmann, R. P.* 03337
- 03119 **Reynolds, Robert C., Jr.; Hower, John.** The nature of interlayering in mixed-layer illite-montmorillonites [with French, German and Russian abs.]: *Clays and Clay Minerals*, v. 18, no. 1, p. 25-36, illus., tables, 1970.
- Reynolds, Robert C., Jr.** See *Johnson, Noye M.* 10725
- 05681 **Reynolds, William R.** Mineralogy and stratigraphy of lower Tertiary clays and claystones of Alabama, in *Symposium on environmental aspects of clay minerals: Jour. Sed. Petrology*, v. 40, no. 3, p. 829-838, illus., 1970.
- 00929 **Rezak, R.; Edwards, G. S.** Carbonate sediments of the Gulf of Mexico [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 299-300, 1970.
- 07333 **Rezak, Richard.** Experiments in calcium carbonate cementation, in *Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Soc. Trans.*, v. 20, p. 285-286, 1970.
- Rhindress, Richard C.** See *Emrich, Grover H.* 00149
- 05749 **Rho, Joon H.; Bauman, A. J.; Yen, Teh Fu; Bonner, James.** Fluorometric examination of the returned lunar fines from Apollo 11, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1929-1932, illus., 1970.
- 07628 **Rhoades, J. D.; Ingvalson, R. D.; Hatcher, J. T.** Adsorption of boron by ferromagnesian minerals and magnesium hydroxide: *Soil Sci. Soc. America Proc.*, v. 34, no. 6, p. 938-941, illus., tables, 1970.
- 03885 **Rhoads, Donald C.; Pannella, Giorgio.** The use of molluscan shell growth patterns in ecology and paleoecology: *Lethaia*, v. 3, no. 2, p. 143-161, illus., tables, 1970.

- 08032 **Rhodehamel, Edward C.** A hydrologic analysis of the New Jersey Pine Barrens region: New Jersey Div. Water Policy and Supply Water Resources Circ. 22, 35 p., illus., tables, 1970.
- 01100 **Rhodes, F. H. T.** Conodont research — Problems, programs, and priorities [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 403, 1970.
- 01101 **Rhodes, Frank H. T.; Williams, John A.; Austin, Ronald L.** Micromorphologic studies of conodonts [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 403-404, 1970.
- Rhodes, Rodney C.** See *Elston, Wolfgang E.* 08651
- 10592 **Rhodes, Rodney C.; Smith, Eugene I.; Krohn, Douglas H.** The Squirrel Springs volcano, tectonic depression, southwestern New Mexico — Evidence for a buried caudron and possible analog of some lunar ghost craters [abs.]: EOS, v. 51, no. 11, p. 828-829, 1970.
- 07360 **Rhodes, Rodney Charles.** Volcanic rocks associated with the western part of the Mogollon Plateau volcano-tectonic complex, southwestern New Mexico [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2066B-2067B, 1970.
- Ribbe, P. H.** See *Brown, G. E.* 06074
- Ribbe, P. H.** See *LeRoux, J.* 08418
- Ribbe, P. H.** See *Gibbs, G. V.* 09050
- 09537 **Ribbe, P. H.; Stewart, D. B.; Phillips, M. W.** Structural explanations for variations in the lattice parameters of sodic plagioclase [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 663, 1970.
- 00007 **Rice, Alan.** A note on nonlinear effects in mantle convection: Jour. Geophys. Research, v. 75, no. 2, p. 491-494, table, 1970.
- 00759 **Rice, Charles L.** Facies in the Kendrick Shale of eastern Kentucky [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 239, 1970.
- 00639 **Rice, Lee R.; Luza, Kenneth V.** Factors controlling stream pollution related to bog iron ore mining in the north-central Black Hills, South Dakota [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 346, 1970.
- 08467 **Rice, Raymond M.** Factor analyses for the interpretation of basin physiography [with French abs.], in Symposium on the results of research on representative and experimental basins: Internat. Assoc. Sci. Hydrology-Unesco Pub. 96, p. 253-268, illus., tables, 1970.
- Rich, C. I.** See *LeRoux, J.* 08418
- 00344 **Rich, Ernest I.** Structural interpretation of late Mesozoic rocks in the Pope-Chiles Valley area, California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 135, 1970.
- 05804 **Rich, Mark.** The genus *Tuberitina* (Foraminiferida) in Lower and Middle Pennsylvanian rocks from the eastern Great Basin: Jour. Paleontology, v. 44, no. 6, p. 1060-1066, illus., 1970.
- 03126 **Richard, Pierre.** L'analyse pollinique au Québec — Mise au point et tendances actuelles [Palynology in Quebec — Observations on its development and present trends (with English and German abs.)]: Rev. Géographie Montréal, v. 24, no. 2, p. 189-197, illus., 1970.
- 00176 **Richards, Adrian F.; Keller, George H.** Geotechnical properties of sediments in the Wilkinson basin, Gulf of Maine [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 33, 1970.

- 02992 **Richards, Horace G.** Changes in shoreline during the past million years: *Am. Philos. Soc. Proc.*, v. 114, no. 3, p. 198-204, illus., 1970.
- 08190 **Richards, Horace G.; Fairbridge, Rhodes W.** Annotated bibliography of Quaternary shorelines, 1965-1969 — Prepared for 8th Internat. Cong. INQUA, 1969; supp. to that prepared for 7th Internat. Cong. INQUA, 1965: *Acad. Nat. Sci. Philadelphia Spec. Pub.* 10, 240 p., 1970.
- Richards, M. L.** See *Francheteau, Jean*. 01445
- 10530 **Richards, Paul G.** A theory for pressure radiation from ocean-bottom earthquakes [abs.]: *EOS*, v. 51, no. 11, p. 775, 1970.
- 07283 **Richards, Paul Granston.** A contribution to the theory of high frequency elastic waves, with applications to the shadow boundary of the Earth's core [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 5, p. 2769B, 1970.
- Richards, Rowland, Jr.** See *Chowdhury, R. N.* 00047
- 08138 **Richards, T.; White, William H.** K-Ar ages of plutonic rocks between Hope, British Columbia, and the 49th parallel: *Canadian Jour. Earth Sci.*, v. 7, no. 5, p. 1203-1207, illus., tables, 1970.
- Richards, Thomas.** See *Sainsbury, C. L.* 03334
- Richardson, A.** See *Watkins, N. D.* 01997
- Richardson, Darlene S.** See *Kerr, Paul F.* 05794
- Richardson, E. S., Jr.** See *Damberger, H. H.* 05534
- Richardson, E. S., Jr.** See *Damberger, H. H.* 05535
- Richardson, J.** See *Allen, J. M.* 03465
- Richardson, J. W.** See *Webber, P. J.* 07708
- 03799 **Richart, F. E.; Hall, J. R., Jr.; Woods, R. D.** Vibrations of soils and foundations: *Englewood Cliffs, N.J.*, Prentice-Hall, 414 p., illus., tables, 1970.
- Richart, F. E., Jr.** See *Drnevich, Vincent P.* 02356
- 00201 **Richer, Kenneth A.** Comments on "A microwave radiometric study of buried karst topography" [by J. M. Kennedy, 1968]: *Geol. Soc. America Bull.*, v. 81, no. 2, p. 585-587, illus., table, 1970.
- 09029 **Richert, Robert E.** Some aspects of the glacial geology and geomorphology of the Hilton, New York, quadrangle [abs.], in *Guidebook to field excursions*, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., p. 144, 1969.
- Richmond, Gerald M.** See *Pierce, Kenneth L.* 04693
- 05342 **Richmond, Gerald M.** Comparison of the Quaternary stratigraphy of the Alps and Rocky Mountains: *Quaternary Research*, v. 1, no. 1, p. 3-28, illus., 1970.
- 09400 **Richmond, Gerald M.** Glacial history of the Yellowstone Lake Basin [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 112-113, 1970.
- 00016 **Richter, C. F.** Seismicity of the Earth: *Nature*, v. 225, no. 5228, p. 170, 1970.

- 00345 **Richter, C. F.** Seismicity of the Inglewood fault and adjacent areas [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 136, 1970.
- 03511 **Richter, C. F.** Magnitude of the Inglewood, California, earthquake of June 21, 1920: *Seismol. Soc. America Bull.*, v. 60, no. 2, p. 647-649, table, 1970.
- 10831 **Richter, C. F.** Sporadic and continuous seismicity of faults and regions [abs.] - Internat. Symposium on Recent Crustal Movements and Associated Seismicity, Wellington, N.Z., 1970, *Proc.: Wellington, N.Z., Royal Soc. of New Zealand*, p. 29-30, 1970.
- Richter, Charles F.** See *Anderson, Don L.* 00811
- 06692 **Richter, D. H.; Eaton, J. P.; Murata, K. J.; Ault, W. U.; Krivoy, H. L.** Chronological narrative of the 1959-60 eruption of Kilauea Volcano, Hawaii: *U.S. Geol. Survey Prof. Paper* 537-E, p. E1-E73, illus., table, 1970.
- 10092 **Richter, D. H.; Jones, D. L.** Structure and stratigraphy of eastern Alaska Range, Alaska [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, *Abs. Papers: Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2502, 1970.
- 03055 **Richter, Dieter.** Bau und Entstehung der Front Range bei Denver in Colorado, U.S.A. als Beispiel eines Uplift in den südlichen Rocky Mountains [Structure and origin of the Front Range near Denver, Colorado, U.S.A. as an example of an uplift in the southern Rocky Mountains]: *Aufschluss*, v. 21, no. 6, p. 201-210, illus., 1970.
- 01437 **Richter, Donald H.** Geology and lode-gold deposits of the Nuka Bay area, Kenai Peninsula, Alaska: *U.S. Geol. Survey Prof. Paper* 625-B, p. B1-B16, illus., tables, geol. maps, 1970.
- 04249 **Richter, Donald H.** A corundum occurrence in the eastern Alaska Range, Alaska, in *Geological Survey research 1970*, Chap. C.: *U.S. Geol. Survey Prof. Paper* 700-C, p. C98-C102, illus., tables, 1970.
- 08741 **Richter-Bernburg, Gerhard.** Post-depositional structures in salt, in *Geology and technology of Gulf Coast salt* — Symposium, Baton Rouge, La., 1967, *Proc.: Baton Rouge, La., Louisiana State Univ. School of Geoscience*, p. 161-166, table, 1970.
- 04564 **Rickard, Lawrence V.** Gamma-ray logs and the origin of salt, in *Third symposium on salt*, V. 1 (J. L. Rau and L. F. Dellwig, editors): *Cleveland, Ohio, Northern Ohio Geol. Soc.*, p. 34-39, illus., 1970.
- Rickards, R. B.** See *Bulman, O. M. B.* 08179
- 02403 **Ricketts, T. E.; Goldsmith, W.** Dynamic properties of rocks and composite structural materials: *Internat. Jour. Rock Mechanics and Mining Sci.*, v. 7, no. 3, p. 315-335, illus., tables, 1970.
- 10461 **Rickher, James G.** (and others). Water records of Puerto Rico, 1964-67 — v. 1, North and northeast slopes: Ft. Buchanan, P. R., *U.S. Geol. Survey*, 269 p., illus., tables, 1970.
- 02722 **Rickman, Ron W.** Soil structure evaluation with audiofrequency vibrations: *Soil. Sci. Soc. America Proc.*, v. 34, no. 1, p. 19-24, illus., table, 1970.
- Rickson, K. O.** See *Gay, P.* 06845
- 07079 **Rickwood, Frank K.** The Prudhoe Bay field, in *Geological seminar on the North Slope of Alaska*, Palo Alto, Calif., 1970, *Proc.: Los Angeles, Calif., Am. Assoc. Petroleum Geologists Pacific Sec.*, p. L1-L11, illus., 1970.
- 02177 **Ridler, R. H.** Relationship of mineralization to volcanic stratigraphy in the Kirland-Larder Lakes area, Ontario: *Geol. Assoc. Canada Proc.*, v. 21, p. 33-42, illus., 1970.

**Ridler, R. H.** See *Suffel, G. G.* 03461

- 06492 **Ridler, R. H.** Archaean volcanic stratigraphy of the Kirkland-Larder Lakes area of northeastern Ontario [abs.], in *Inst. Lake Superior Geology, 16th Ann.*, Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 37-39, illus., 1970.

**Ridler, R. H.** See *Goodwin, A. M.* 08627

- 00346 **Ridley, Albert P.** Paleozoic submarine rockslide deposits, Inyo Mountains, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 136, 1970.

**Ridley, W. I.** See *Baker, I.* 08272

**Ridley, William I.** See *Baker, Ian.* 06052

**Ridlon, J. B.** See *Igarashi, Y.* 08623

- 07374 **Ridlon, James Barr.** Bathymetry and structure of San Clemente Island, California, and tectonic implications for the southern California continental borderland [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 4, p. 2154B, 1970.

- 00930 **Riecker, Robert E.; Rooney, Thomas P.** Amphibole deformation [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 300, 1970.

**Riecker, Robert E.** See *Rooney, Thomas P.* 02794

**Riedel, W. R.** See *Sanfilippo, Annika.* 04612

- 06671 **Riedel, W. R.; Sanfilippo, Annika.** Radiolaria, Leg 4, Deep Sea Drilling Project, Chap. 24 in *Initial reports of the Deep Sea Drilling Project — V. 4, Leg 4 of cruises of Glomar Challenger, Rio de Janeiro, Brazil, to San Cristobal, Panama, Feb.-Mar. 1969* (R. G. Bader, and others): Washington, D. C., U.S. Govt. Printing Office, p. 503-575, illus., tables, 1970.

**Riedel, William R.** See *Bader, Richard G.* 06657

**Rieder, R.** See *Begemann, F.* 05683

**Rieder, R.** See *Wanke, H.* 05730

- 07816 **Riedl, Rupert J.; Ott, Jörg A.** A suction-corer to yield potentials in coastal sediment layers [with German abs.]: *Senckenbergiana Maritima*, v. 2, p. 67-83, illus., 1970.

- 01821 **Riehle, James R.** Theoretical compaction profiles in ash-flow tuffs [abs.]: *EOS*, v. 51, no. 4, p. 442, 1970.

**Rieke, Herman H., 3d.** See *Merriam, Richard.* 02308

- 09884 **Riemer, D. N.; Toth, S. J.** Adsorption of copper by clay minerals, humic acid and bottom muds: *Am. Water Works Assoc. Jour.*, v. 62, no. 3, p. 195-197, tables, 1970.

**Riese, Ronald.** See *Renault, Jacques.* 04116

**Riesen, T.** See *Oeschger, H.* 03181

- 05610 **Rigassi, Danilo A.** Tidal anomalies and regional geologic structure [Discussion of "Transcontinental tidal gravity profile across the United States," by J. T. Kuo, and others, 1970]: *Science*, v. 170, no. 3961, p. 1002-1003, illus., 1970.

- 00546 **Rigby, J. Keith.** Two new Upper Devonian hexactinellid sponges from Alberta: *Jour. Paleontology*, v. 44, no. 1, p. 7-16, illus., table, 1970.



- 04706 **Rigby, J. Keith; Chamberlain, C. Kent; Black, B. Allen.** Mississippian and Pennsylvanian sponges from the Ouachita Mountains of Oklahoma: *Jour. Paleontology*, v. 44, no. 5, p. 816-832, illus., table, 1970.
- 05810 **Rigby, J. Keith.** *Brachiospongia tuberculata* James from the Ordovician of central Ontario: *Jour. Paleontology*, v. 44, no. 6, p. 1139-1142, illus., 1970.
- 05861 **Rigby, J. Keith.** *Ellesmerespongia feildeni*, a new Permian sponge from the Canadian Arctic: *Jour. Paleontology*, v. 44, no. 6, p. 1143-1145, illus., 1970.
- Rigby, J. Keith.** See *Petersen, Morris S.* 10836
- 10913 **Rigg, John B.** A quality environment in the southwest, in *Conf. on Mining and Ecology in the Arid Environment*, 1970, Proc. (W. C. Peters, editor): Tucson, Ariz., Arizona Univ. College of Mines, p. 211-215, 1970.
- 06334 **Riker, E. P.** Norman Lee Johnson (1926-1970): *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2448, portrait, 1970.
- 05352 **Riker, Edward P.** Norman Lee Johnson (1926-1970), in *Dakota and related rocks of the Front Range — Guidebook issue: Mtn. Geologist*, v. 7, no. 3, p. [101], 1970.
- Riley, D. L.** See *Herzenberg, C. L.* 06284
- Riley, D. L.** See *Herzenberg, C. L.* 07134
- 01507 **Riley, Francis S.** Land-surface tilting near Wheeler Ridge, southern San Joaquin Valley, California: *U.S. Geol. Survey Prof. Paper* 497-G, p. G1-G29, illus., 1970.
- 03551 **Riley, G. H.** Isotopic discrepancies in zoned pegmatites, Black Hills, South Dakota: *Geochim. et Cosmochim. Acta*, v. 34, no. 6, p. 713-725, illus., tables, 1970.
- 03552 **Riley, G. H.** Excess Sr-87 in pegmatitic phosphates: *Geochim. et Cosmochim. Acta*, v. 34, no. 6, p. 727-731, illus., table, 1970.
- Riley, Leonard B.** See *Huffman, Claude, Jr.* 01482
- Riley, R. A.** See *Bennett, G.* 09275
- 03387 **Rimsaite, J.** Structural formulae of oxidized and hydroxyl-deficient micas and decomposition of the hydroxyl group: *Contr. Mineralogy and Petrology*, v. 25, no. 3, p. 225-240, illus., tables, 1970.
- Rincón Orta, César.** See *Cserna, Zoltan de.* 04180
- 07306 **Rinehart, John.** Heat flow from natural geysers, in *Geothermal problems — Symposium*, Madrid, Spain, 1969, Proc.: *Tectonophysics*, v. 10, nos. 1-3 (spec. issue), p. 11-17, illus., 1970.
- 00347 **Rinehart, John S.** Relationships between earth strain and geothermal activity [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 136-137, 1970.
- 01822 **Rinehart, John S.** Effect of earth tides on geyser performance [abs.]: *EOS*, v. 51, no. 4, p. 432, 1970.
- 04627 **Rinehart, John S.** Geysering action in a drilled well, Crump, Lake County, Oregon: *Jour. Geophys. Research*, v. 75, no. 32, p. 6714-6716, illus., 1970.
- 07826 **Rinehart, John S.** Origins of displacements caused by underground nuclear explosions, in *Symposium on engineering with nuclear explosives — Am. Nuclear Soc. and U.S. Atomic Energy Comm., Las Vegas, Nev., 1970, Proc.*, V. 2: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., p. 1095-1102, illus., 1970.

- 10455 **Rinehart, John S.** Influence of solid earth tides on Old Faithful Geyser [abs.]; Colorado-Wyoming Acad. Sci. Jour., v. 7, no. 1, p. 31, 1970.
- 10605 **Rinehart, John S.** Effect of barometric pressure on performance of a geyser, "Old Faithful," Calistoga, California [abs.]: EOS, v. 51, no. 11, p. 831-832, 1970.
- Rinehart, W. A.** See *Algermissen, S. T.* 00221
- 04951 **Ringe, Don.** Sub-loess basalt topography in the Palouse Hills, southeastern Washington: Geol. Soc. America Bull., v. 81, no. 10, p. 3049-3059, illus., 1970.
- 06256 **Ringwood, A. E.** Petrogenesis of Apollo 11 basalts and implications for lunar origin: Jour. Geophys. Research, v. 75, no. 32, p. 6453-6479, illus., tables, 1970.
- 08236 **Rinker, Jack N.; Frost, Robert E.** Application of remote sensing to Arctic environmental studies, in The use of remote sensing . . . of natural resources of Alaska: Juneau, Alaska, Dept. of Econ. Devel., p. 105-116, illus., [1970].
- 05062 **Rinne, W. W.** Need for saline groundwater data to advance desalting technology, in Saline water symposium: Water Resources Research, v. 6, no. 5, p. 1482-1486, tables, 1970.
- 10384 **Ritchie, Jerry C.; McHenry, J. Roger; Gill, Angela C.; Hawks, Paul H.** The use of fallout cesium-137 as a tracer of sediment movement and deposition, in Mississippi Water Resources Conf., 5th, 1970, Jackson, Proc.: State College, Miss. Water Resources Research Inst., p. 149-162, illus., tables, 1970.
- Ritchie, W. D.** See *Barss, D. L.* 07755
- 07868 **Ritchot, Gilles.** La cartographie géomorphologique en noir et blanc [Geomorphologic cartography in black and white]: Cahiers Géographie Québec, v. 14, no. 33, p. 359-376, illus., 1970.
- Ritter, Dale F.** See *Born, Stephen M.* 01245
- Ritter, Dale F.** See *Foord, Eugene E.* 02218
- 01510 **Ritter, J. R.** A summary of preliminary studies of sedimentation and hydrology in Bolinas Lagoon, Marin County, California: U.S. Geol. Survey Circ. 627, 22 p., illus., tables, 1970.
- Ritter, John R.** See *Helley, Edward J.* 00282
- 05027 **Riva, John.** Thrusted Paleozoic rocks in the northern and central HD Range, northeastern Nevada: Geol. Soc. America Bull., v. 81, no. 9, p. 2689-2715, geol. map, 1970.
- 10375 **Riva, Joseph P., Jr.** The Smithsonian Science Information Exchange: Marine Technology Soc. Jour., v. 4, no. 2, p. 56-61, illus., 1970.
- Riva-Palacio, E.** See *Bonet, F.* 07789
- 10222 **Rive, Maurice.** Geology of the Rowanton-Maganasipi East area: Quebec Dept. Nat. Resources Prelim. Rept. 586, 12 p., tables, geol. map, 1970.
- Rizer, William D.** See *Bombolakis, Emanuel G.* 00868
- 09538 **Roach, Carl H.** Total systems approach to rapid excavation and its geological requirements [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 664, 1970.
- Robbins, Lamont G.** See *Winkley, Brien R.* 10383
- Robbins, Robert C.** See *Robinson, Elmer.* 09512

**Roberson, Charles E.** See *Schoen, Robert*. 03167

07140 **Roberts, George D.** Soil formation and engineering applications: Assoc. Eng. Geologists Bull., v. 7, nos. 1-2, p. 87-105, illus., 1970.

07884 **Roberts, George D.** History and applicability of geologic engineering: Eng. Geologist, v. 5, no. 1, p. 1-3, 1970.

01578 **Roberts, Harry Heil.** Recent carbonate sedimentation, North Sound, Grand Cayman Island, British West Indies [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 9, p. 4210B, 1970.

**Roberts, J. L.** See *Hales, A. L.* 03513

**Roberts, J. L.** See *Hales, A. L.* 04681

05513 **Roberts, Michael Foster.** Late glacial and postglacial environments in southeastern Wyoming: Palaeogeography, Palaeoclimatology, Palaeoecology, v. 8, no. 1, p. 5-17, illus., 1970.

04017 **Roberts, John L.** Using professional equipment in the beginning geology course: Jour. Geol. Education, v. 18, no. 4, p. 169-170, 1970.

04085 **Roberts, John M.** The wandering sands: Américas, v. 22, no. 8, p. 9-14, illus., 1970.

08136 **Roberts, M. C.; Mark, D. M.** The use of trend surfaces in till fabric analysis: Canadian Jour. Earth Sci., v. 7, no. 4, p. 1179-1184, illus., 1970.

03620 **Roberts, Michael C.; Klingeman, Peter C.** Drainage density in drift-covered basins — Discussion [of paper 7033 by John F. Orsborn, 1970]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Hydraulics Div., no. HY 7, p. 1656-1657, 1970.

05603 **Roberts, Michael Foster.** Late glacial and postglacial environments in southeastern Wyoming: Palaeogeography, Palaeoclimatology, Palaeoecology, v. 8, no. 1, p. 5-17, illus., 1970.

03193 **Roberts, Miriam** (compiler). Bibliography of the geology and mineral resources of Oregon — 4th supplement, January 1, 1956 to December 31, 1960: Oregon Dept. Geology and Mineral Industries Bull. 67, 88 p., 1970.

**Roberts, Ralph J.** See *Tooker, E. W.* 05446

**Robertson, D. E.** See *Spencer, Derek W.* 06407

08162 **Robertson, D. S.** Uranium — Its geological occurrence as a guide to exploration, in Uranium exploration geology — Panel on uranium exploration geology, Vienna, 1970, Proc.: Vienna, Austria, Internat. Atomic Energy Agency, p. 267-284, incl. discussion, illus., tables, 1970.

04669 **Robertson, David S.; Douglas, Richard F.** Sedimentary uranium deposits: Canadian Mining and Metall. Bull., v. 63, no. 697, p. 557-566, illus., tables, 1970.

04397 **Robertson, George M.** The oral region of ostracoderms and placoderms, possible phylogenetic significance: Am. Jour. Sci., v. 269, no. 1, p. 39-64, 1970; erratum, ibid., no. 3, p. 320, 1970.

06418 **Robertson, J. A.** Township 1A, District of Algoma: Ontario Dept. Mines and Northern Affairs Prelim. Geol. Map P. 610, scale 1 in. to 1/4 mi., text, 1970.

06419 **Robertson, J. A.; Johnson, J. M.** Township 1B, District of Algoma: Ontario Dept. Mines and Northern Affairs Prelim. Geol. Map P. 609, scale 1 in. to 1/4 mi., text, 1970.

- 09257 **Robertson, J. A.; Card, K. D.; Frarey, M. J.** The Federal-Provincial Committee on Huronian stratigraphy — Progress report: Ontario Dept. Mines Misc. Paper 31, 26 p., illus., tables, 1969.
- 09539 **Robertson, J. K.** Experimental studies on rocks from the Deboullie Stock, northern Maine, including melting relations in the water-deficient environment [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 664, 1970.
- Robertson, J. K.** See *Merrill, R. B.* 09667
- 04676 **Robertson, James A.** Geology of the Spragge area, District of Algoma: Ontario Dept. Mines Geol. Rept. 76, 109 p., illus., tables, geol. maps, 1970.
- 10476 **Robertson, Jesse S.** Fossil *Bison* from Florida: Plaster Jacket, no. 12, [10] p., illus., table, 1969.
- 06192 **Robertson, John B.** Vertical molecular diffusion of xenon-133 gas after injection underground, in Geological Survey research 1970, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D287-D300, illus., tables, 1970.
- Robertson, W. A.** See *Irving, E.* 00656
- Robertson, W. A.** See *Irving, E.* 07702
- Robie, R. A.** See *Waldbaum, D. R.* 05788
- 09540 **Robie, Ronald B.** Implementing ground water policy by legislation [abs.]: Geol. Soc.: America Abs. with Programs, v. 2, no. 7, p. 664-665, 1970.
- 08212 **Robin, G. de Q.** Stability of ice sheets as deduced from deep temperature gradients, in Internat. Symposium on Antarctic Glaciological Exploration (ISAGE), Hanover, N.H., 1968 [Proc.]: Internat. Assoc. Sci. Hydrology (and Sci. Comm. Antarctic Research) Pub. 86, p. 141-151, illus., tables, 1970.
- 08419 **Robinson, A. R.** Technology for sediment control in urban areas, in National Conference on Sediment Control, Washington, D.C., 1969, Proc: Washington, D.C., U.S. Dept. Housing and Urban Development Environmental Planning Division, p. 48-54, 1970.
- 09541 **Robinson, Brian W.; Krouse, H. R.** Stable isotopes of the Echo Bay deposit, N.W.T., Canada [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 665, 1970.
- 08488 **Robinson, Charles S.** Environmental aspects of Colorado streets and highway engineering, in Governor's Conf. on Environmental Geology: Colorado Geol. Survey Spec. Pub., no. 1, p. 55-66, illus. [1970,].
- 04065 **Robinson, E.; Lamb, James L.** Preliminary palaeomagnetic data from the Plio-Pleistocene of Jamaica: Nature, v. 227, no. 5264, p. 1236-1237, illus., 1970.
- 02393 **Robinson, Edwin S.** Relations between geological structure and aeromagnetic anomalies in central Nevada: Geol. Soc. America Bull., v. 81, no. 7, p. 2045-2060, illus., table, 1970.
- 04460 **Robinson, Edwin S.** Mechanical disintegration of the Navajo Sandstone in Zion Canyon, Utah: Geol. Soc. America Bull., v. 81, no. 9, p. 2799-2806, illus., 1970.
- 09512 **Robinson, Elmer; Robbins, Robert C.** Gaseous atmospheric pollutants from urban and natural sources, in Global effects of environmental pollution — Symposium, Am. Assoc. Adv. Sci., Dallas, Texas, 1968: New York, Springer-Verlag, and Dordrecht-Holland, D. Reidel Pub. Co., p. 50-64, illus., tables, 1970.

- 04839 **Robinson, Gray S.** Change of bathymetric distribution of genus *Cyclammina* [abs.]: Am. Assoc. Petroleum Geologists, v. 54, no. 9, p. 1790, 1970.
- 08024 **Robinson, Gray S.** Change of the bathymetric distribution of the genus *Cyclammina*, in *Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Socs. Trans.*, v. 20, p. 201-209, illus., 1970.
- Robinson, J. D.** See *Senturia, Stephen D.* 09872
- Robinson, J. D.** See *Loren, J. D.* 09874
- Robinson, K. G.** See *Brown, G. E.* 06074
- 07457 **Robinson, Leon H.; Holland, Warren E.** Some interpretation of pore fluid effects in rock failure, Chap. 29 in *Rock mechanics, theory and practice* — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 585-597, illus., table, 1970.
- Robinson, P. D.** See *Fang, J. H.* 05935
- Robinson, Paul D.** See *Fang, Jen-Ho.* 06974
- Robinson, Paul D.** See *Fang, J. H.* 09108
- 09109 **Robinson, Paul D.; Fang, J. H.** The crystal structure of epididymite: Am. Mineralogist, v. 55, nos. 9-10, p. 1541-1549, illus., tables, 1970.
- 00348 **Robinson, Paul T.** Petrology of the Silver Peak volcanic center, western Nevada [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 137, 1970.
- Robinson, Paul T.** See *Elders, Wilfred A.* 01758
- 01823 **Robinson, Paul T.; Elders, Wilfred A.** Possible sea-floor spreading in the Imperial Valley of California — [Pt.] 3, Xenoliths in rhyolite volcanoes as samples of the basement [abs.]: EOS, v. 51, no. 4, p. 422, 1970.
- Robinson, Paul T.** See *Elders, Wilfred A.* 06967
- 11254 **Robinson, Peter.** The Tertiary deposits of the Rocky Mountains — A summary and discussion of unsolved problems: Wyoming Univ. Contr. Geology, v. 9, no. 2, p. 86-96, 1970.
- 08724 **Robinson, S. C.** The role of the Geological Survey of Canada in storage and retrieval of geological data: Annales Inst. Geol. Publici Hungarici, v. 54, no. 1, p. 131-139, 1970.
- 10643 **Robinson, S. C.** A review of data processing in the earth sciences in Canada: Internat. Assoc. Math. Geology Jour., v. 2, no. 4, p. 377-397, illus., 1970.
- 10454 **Robnett, Q. L.; Thompson, M. R.** Recommendations for stabilization of Illinois soils: Illinois Univ. Eng. Expt. Sta. Bull. 502, 225 p., illus., tables, 1970.
- Robson, G. R.** See *Andrew, E. M.* 05835
- 10357 **Robson, G. R.; Barr, K. G.** Report of the investigation into the Dominica tremors of 1959 and 1960: West Indies Univ. Seismic Research Unit Spec. Pub. 9, 7 p., illus., table, 1967.
- 10358 **Robson, G. R.** Reports and correspondence on the St. Kitts-Nevis earthquakes of 1961 to 1963: West Indies Univ. Seismic Research Unit Spec. Pub. 10, 75 p., 1967.
- 10369 **Robson, G. R.** Proposals for the establishment of an Institute for Volcanology in Central America: West Indies Univ. Seismic Research Unit Spec. Pub. 2, [48] p., tables, 1966.

- 09310 **Rocha, M.** New techniques in deformability testing of *in situ* rock masses, in *Determination of the in situ modulus of deformation of rock* (Symposium, ASTM, Winter Mtg., Denver, Colo., 1969): Am. Soc. Testing and Materials Spec. Tech. Pub. 477, p. 39-57, illus., tables, 1970.
- Rocha-Campos, Antonio.** See *Wanless, H. R.* 06708
- 06908 **Roche, J. E.; Carozzi, A. V.** Petrography of back-reef carbonates — Traverse Group (Givétian) of the northern part of the Southern Peninsula of Michigan [with French abs.]: Centre Recherches Pau Bull., v. 4, no. 1, p. 137-189, illus., table, 1970.
- 06608 **Roche, James Edward.** Petrography of back-reef carbonates — Traverse Group (Givétian) of the northern part of the Southern Peninsula of Michigan [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 763B, 1970.
- Roche, Michael B.** See *McIntyre, Andrew.* 06697
- 05785 **Rochester, Eugene W., Jr.; Kriz, George J.** Potable water availability on long oceanic islands: Am. Soc. Civil Engineers Proc., v. 96, paper 7627, Jour. Sanitary Eng. Div., no. SA5, p. 1235-1248, illus., 1970.
- 07381 **Rochester, Eugene Wallace, Jr.** Potable water availability on long ocean islands [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 1909B, 1970.
- 06863 **Rochester, M. G.** Coremantle interactions — Geophysical and astronomical consequences [abs.], in *Geophysical studies on the evolution of the Earth's deep interior — A symposium, Madrid, 1969*, Proc.: Physics Earth and Planetary Interiors, v. 2, no. 5 (spec. issue), p. 381, 1970.
- 09957 **Rochester, M. G.** Polar wobble and drift — A brief history, in *Earthquake displacement fields and the rotation of the Earth* (L. Mansinha, D. E. Smylie, A. E. Beck, editors) - NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 17-38, illus., tables, 1970.
- 09968 **Rochester, M. G.** Core-mantle interactions — Geophysical and astronomical consequences, in *Earthquake displacement fields and the rotation of the Earth* (L. Mansinha, D. E. Smylie, A. E. Beck, editors) - NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 136-148, table, 1970.
- 07401 **Rockaway, John D.** Engineering geology of St. Louis County, Missouri [abs.]: Mining Eng., v. 22, no. 9, p. 49, 1970.
- 02419 **Rockaway, John D., Jr.** Trend-surface analysis of ground-water fluctuations: Ground Water, v. 8, no. 3, p. 29-36, illus., 1970.
- 07904 **Rockaway, John D., Jr.; Lutzen, Edwin E.** Engineering geology of the Creve Coeur quadrangle, St. Louis County, Missouri: Missouri Geol. Survey and Water Resources Eng. Geology Ser., no. 2, 19 p., illus., 1970.
- 09500 **Rockaway, John D., Jr.; Johnson, Robert B.** Statistical analysis of ground water use and replenishment: Water Resources Bull., v. 6, no. 3, p. 408-423, illus., 1970.
- 05350 **Rocky Mountain Assoc. Geologists; Marvin, Ray G.** (editor). Dakota and related rocks of the Front Range — Guidebook issue: Mtn. Geologist, v. 7, no. 3, p. 101-252, illus., tables, 1970.
- 06375 **Rodda, Peter U.; Garner, L. E.; Dawe, G. L.** Geologic map of the Austin West quadrangle, Travis County, Texas: Texas Univ. Austin Bur. Econ. Geology Geol. Quad. Map 38, scale 1:24,000, separate text by P. U. Rodda, 1969 [1970].
- 07182 **Roddick, J. A.** Douglas Channel-Hecate Strait map-area, British Columbia: Canada Geol. Survey Paper 70-41, 56 p., illus., table, geol. map, 1970.

- 07824 **Rodean, Howard C.** Explosion-produced ground motion — Technical summary with respect to seismic hazards, in Symposium on engineering with nuclear explosives — Am. Nuclear Soc. and U.S. Atomic Energy Comm., Las Vegas, Nev., 1970, Proc., V. 2: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., p. 1024-1050, illus., 1970.
- 07867 **Rodgers, John.** The tectonics of the Appalachians: New York, Wiley — Interscience, 271 p., illus., maps, 1970.
- Rodgers, Peter W.** See *Kalra, Ashok K.* 10531
- 10797 **Rodgers, Robert W.** Stratigraphy of Glen Rose Limestone, central Texas, in Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas (Leo Hendricks, editor): Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub., no. 67-8, p. 118-130, illus., 1967.
- Rodine, James.** See *Colburn, Ivan P.* 01605
- 03601 **Rodolfo, Kelvin S.** Annual suspended sediment supplied to the California continental borderland by the southern California watershed: Jour. Sed. Petrology, v. 40, no. 2, p. 666-671, illus., 1970.
- 09882 **Rodriguez, J.; Gutschick, R. C.** Late Devonian-early Mississippian ichnofossils from western Montana and northern Utah, in Trace fossils — Liverpool, Geol. Soc. and Internat. Union Geol. Sci., Internat. Conf., Liverpool, England, 1970, Proc.: Geol. Jour. Spec. Issue, no. 3, p. 407-438, illus., 1970.
- Rodriguez Ortiz, Jose M.** See *Jimenez Salas, Jose A.* 08337
- Rodriguez-Torres, Rafael.** See *Cordoba, Diego A.* 05913
- Rodrique, L.** See *Fuls, P. F.* 03122
- 02483 **Roed, M. A.** Surficial geology, Edson (NTS 83F): Research Council Alberta Map 33, scale 1:250,000, 1970.
- 09856 **Roed, Murray A.** An occurrence of chalcopryrite: Western Miner, v. 43, no. 4, p. 24-34, illus., 1970.
- 03299 **Roedder, Edwin.** Application of an improved crushing microscope stage to studies of the gases in fluid inclusions: Schweizer. Mineralog. u. Petrog. Mitt., v. 50, no. 1, p. 41-58, illus., 1970.
- 09542 **Roedder, Edwin; Weiblen, Paul W.** Lunar petrology of silicate melt inclusion, Apollo 11 and 12, and terrestrial equivalents [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 666, 1970.
- Roeder, D. H.** See *Nelson, T. H.* 01806
- 02069 **Roeder, D. H.; Nelson, T. H.** Fossil subduction zones in the North America Cordillera [abs.]: EOS, v. 51, no. 4, p. 421, 1970.
- Roeder, Dietrich H.** See *White, David A.* 05201
- 08276 **Roeder, P. L.; Emslie, R. F.** Olivine-liquid equilibrium: Contr. Mineralogy and Petrology, v. 29, no. 4, p. 275-289, illus., tables, 1970.
- 06181 **Roehler, Henry W.** Nonopaque heavy minerals from sandstone of Eocene age in the Washakie Basin, Wyoming, in Geological Survey research 1970, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D181-D187, illus., table, 1970.
- 01130 **Roen, John B.** Sandstone distribution in lower member of Waynesburg Formation, Greene and Washington Counties, southwest Pennsylvania — Discussion [of paper

- by W. D. Martin and B. R. Henniger, 1969]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 3, p. 532-534, illus., 1970.
- 05393 **Roen, John B.** Geologic map of the Waynesburg quadrangle, southwestern Pennsylvania: U.S. Geol. Survey Geol. Quad. Map GQ-838, scale 1:24,000, section, text, 1970.
- 04813 **Roen, Ulrik.** Aksel Nörvang (1914-1968): Am. Assoc. Petroleum Geologists Bull., v. 54, no. 9, p. 1757-1758, portrait, 1970.
- 09543 **Roepke, Harlan H.** Evidence of reproduction by budding in *Archaeolithophyllum missouriense*, a Pennsylvanian red alga [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 666, 1970.
- 00835 **Roesset, J. M.** Fundamentals of soil amplification, in Seismic design for nuclear power plants (Robert J. Hansen, editor): Cambridge, Mass., M.I.T. Press, p. 183-244, illus., 1970.
- 05072 **Roessingh, Hank.** Data storage and retrieval, or how to manage overgrown files: Canadian Petroleum, v. 11, no. 9, p. 22-25, illus., 1970.
- 06402 **Roether, Wolfgang; Münnich, Karl-Otto; Östlund, H. Göte.** Tritium profile at the North Pacific (1969) Geosecs intercalibration station: Jour. Geophys. Research, v. 75, no. 36, p. 7672-7675, illus., table, 1970.
- 09544 **Rogers, Al; Kisslinger, Carl.** The effect of a dipping layer on P wave transmission [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 667, 1970.
- Rogers, Albert M.** See *Gordon, David W.* 03309
- 04246 **Rogers, C. L.; Kleinhampl, F. J.; Ziony, J. I.; Danilchik, Walter.** Phosphate occurrences in Nye County and adjacent areas, Nevada, in Geological Survey research 1970, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C49-C60, illus., tables, 1970.
- Rogers, G. C.** See *Milne, W. G.* 07688
- 10677 **Rogers, G. C.; Milne, W. G.; Bone, M. N.** The strong motion seismograph network in western Canada, 1970: Canada Dept. Energy, Mines and Resources Earth Physics Br. Pub., v. 41, no. 2, p. 15-29, illus., tables, 1970.
- 01167 **Rogers, J. J. W.; Condie, K. C.; Mahan, S.** Significance of thorium, uranium, and potassium in some early Precambrian graywackes from Wyoming and Minnesota: Chem. Geology, v. 5, no. 3, p. 207-213, tables, 1970.
- Rogers, John J. W.** See *Leeman, William P.* 00854
- Rogers, John J. W.** See *McKay, Gordon A.* 05248
- 10666 **Rogers, Lewis W.; Strong, James F.; Isaacs, William H.** Reserves and economics of the deep Delaware-Val Verde basin gas play: Jour. Petroleum Technology, v. 22, December, p. 1515-1519, illus., tables, 1970.
- Rogers, Mark.** See *Estavillo, William.* 00262
- Rogers, Thomas H.** See *Nason, Robert D.* 11230
- 10876 **Rogers, Thomas H.; Nason, Robert D.** Modern fault displacement on the Calaveras fault in and near the City of Hollister, central California [abs.] - Internat. Symposium on Recent Crustal Movements and Associated Seismicity, Wellington, N.Z., 1970, Proc.: Wellington, N.Z., Royal Soc. of New Zealand, p. 31, 1970.
- Rogers, W. S.** See *Spencer, R. S.* 00087



- 05439 **Rogers, W. S.; Spencer, R. S.** Ground-water quality and structural control in southeastern Virginia [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 136, 1970.
- 09281 **Rogerson, R. J.** A study of the post-glacial emergence of the south shore of Hudson Strait, between Cape Weggs and Deception Bay, in *Field research in Labrador-Ungava* [1965-66]: McGill Univ. Dept. Geography Sub-Arctic Research Paper 23, p. 26-41, illus., 1967.
- 07266 **Rohani-Najafabadi, Behzad.** A nonlinear elastic-viscoplastic constitutive relationship for earth materials [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 5, p. 2669B, 1970.
- Rokop, D. J.** See *Fields, P. R.* 05689
- 04316 **Roland, G. W.** Phase relations below 575°C in the system Ag-As-S: *Econ. Geology*, v. 65, no. 3, p. 241-252, illus., tables, 1970.
- 02673 **Rold, John W.** A new look at old provinces [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 866-867, 1970.
- 08483 **Rold, John W.** The Colorado Geological Survey's role in environmental geology, in *Governor's Conf. on Environmental Geology: Colorado Geol. Survey Spec. Pub.*, no. 1, p. 20-23, illus. [1970?].
- 04656 **Roldán-Quintana, Jaime.** Estudio geológico de reconocimiento de la región de Peñón Blanco, Estado de Durango [Reconnaissance geologic study of the Peñón Blanco region, State of Durango]: *Soc. Geol. Mexicana Bol.* 1968, v. 31, no. 2, p. 79-105, illus., table, 1970.
- Roller, J. C.** See *Lee, W. H. K.* 00304
- 09234 **Rollo, J. R.** Salt-water encroachment in aquifers of the Baton Rouge area, Louisiana: *Louisiana Geol. Survey and Dept. Public Works Water Resources Bull.* 13, 45 p., illus., table, 1969.
- Romanov, D. P.** See *Fedoseev, A. D.* 06508
- Romanov, V. I.** See *Bilyavs'kiy, G. O.* 02555
- Romanovich, B. S.** See *Egiazarov, B. Kh.* 10036
- Romanovich, B. S.** See *Tkatchenko, B. V.* 10108
- 01564 **Romans, Robert Charles.** Palynology of some Upper Cretaceous coals of Black Mesa, Arizona [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 9, p. 4008B-4009B, 1970.
- 07066 **Romberger, S. B.; Barnes, H. L.** Ore solution chemistry — [Pt.] 3, Solubility of CuS in sulfide solutions: *Econ. Geology*, v. 65, no. 8, p. 901-919, illus., tables, 1970.
- 02470 **Romer, Alfred Sherwood.** A new anthracosaurian labyrinthodont, *Proterogyrinus scheelei*, from the lower Carboniferous: *Kirtlandia*, no. 10, 16 p., illus., 1970.
- 04498 **Romer, Alfred Sherwood.** The vertebrate body (4th edition): Philadelphia, Pa., and London, England, W. B. Saunders Co., 601 p., illus., tables, 1970; originally published 1949.
- 08565 **Romer, Alfred Sherwood.** Teaching vertebrate paleontology, in *Teaching paleontology — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc., Pt. A: Lawrence, Kans., Allen Press*, p. 39-46, 1970.
- 09545 **Romey, William D.** Preparing geology and earth science teachers to help students learn about the environment [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 667, 1970.

- 00349 **Romig, P. R.; VanWormer, J. D.; Tocher, Don; Wideman, C. J.** Residual strains associated with Jorum [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 137, 1970.
- 09546 **Romig, P. R.; Major, M. W.** NE Denver, deformation without earthquakes [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 667-668, 1970.
- 01624 **Romig, Philip R.; Wideman, C. J.; VanWormer, J. D.; Tocher, Don.** Strain steps from the nuclear explosion JORUM [abs.]: *EOS*, v. 51, no. 3, p. 202, 1970.
- Romney, Carl F.** See *Engdahl, Eric R.* 00260
- 00101 **Rona, Peter A.** Comparison of continental margins of eastern North America at Cape Hatteras and northwestern Africa at Cap Blanc: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 1, p. 129-157, illus., tables, 1970.
- 01119 **Rona, Peter A.** Submarine canyon origin on upper continental slope off Cape Hatteras: *Jour. Geology*, v. 78, no. 2, p. 141-152, illus., tables, 1970.
- 05800 **Rona, Peter A.** Reply [to discussion by H. A. Meyerhoff of "Comparison of continental margins of eastern North America at Cape Hatteras and northwestern Africa at Cap Blanc," 1970]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 11, p. 2216-2218, illus., 1970.
- Rona, Peter A.** See *Brier, Chester.* 08559
- 08278 **Rondot, Jehan.** La structure de Charlevoix comparee à d'autres impacts météoritiques [The Charlevoix structure compared with other meteoritic impacts (with English abs.)]: *Canadian Jour. Earth Sci.*, v. 7, no. 5, p. 1194-1202, illus., table, 1970.
- Rones, M.** See *Swartz, Frank M.* 09903
- Roney, James R.** See *Rose, Vincent C.* 08558
- 11016 **Ronov, A. B.; Migdisov, A. A.** Evolyutsiya khimicheskogo sostava porod shchitov i osadochnogo pokrova Russkoy i Severoamerikanskoy platform [Evolution of the chemical composition of the rocks of the shields and sedimentary cover of the Russian and North American platforms (with English summ.)]: *Geokhimiya* 1970, no. 4, p. 403-438, illus., tables, 1970; English translation, *Geochemistry Internat.*, v. 7, no. 4, p. 294-325, illus., tables, 1970.
- Rooney, James G.** See *Rosenau, Jack C.* 10940
- Rooney, James W.** See *Migliaccio, Ralph R.* 10077
- 03787 **Rooney, Lawrence F.; Ault, Curtis H.** Patterns of Devonian sand on the North American craton and their interpretation — Discussion [of paper by C. H. Summerston, and D. H. Swann, 1970]: *Geol. Soc. America Bull.*, v. 81, no. 8, p. 2519-2520, 1970.
- 06322 **Rooney, Lawrence F.** High-calcium limestone and high-magnesium dolomite resources of Indiana: *Indiana Geol. Survey Bull.* 42-B, 20 p., illus., tables, 1970.
- 07484 **Rooney, Lawrence F.; Ault, Curtis H.** Potential limestone and dolomite resources of northern Indiana, in *Forum on geology of industrial minerals*, 5th, Harrisburg, Pa., 1969, *Proc.: Pennsylvania Geol. Survey*, 4th ser., *Bull. M64 (Mineral Resources Rept.)*, p. 179-224, illus., tables, 1970.
- 07630 **Rooney, Lawrence F.** Dimension limestone resources of Indiana: *Indiana Geol. Survey Bull.* 42-C, 29 p., illus., table, 1970.
- Rooney, Thomas P.** See *Riecker, Robert E.* 00930

- 02794 **Rooney, Thomas P.; Riecker, Robert E.; Ross, Malcolm.** Deformation twins in hornblende: *Science*, v. 169, no. 3941, p. 173-175, illus., table, 1970.
- 07053 **Root, J. D.** Index to current geologic maps of Alberta: Research Council Alberta Rept. 70-2, 20 p., illus., 1970.
- 07557 **Root, Samuel.** Disconformity exposed: *Pennsylvania Geology*, v. 1, no. 8, p. 3, 9, illus., 1970.
- 00612 **Root, Samuel I.** Structure of the northern terminus of the Blue Ridge in Pennsylvania: *Geol. Soc. America Bull.* v. 81, no. 3, p. 815-830, illus., table, 1970.
- Roots, E. F.** See *Sobczak, L. W.* 02179
- Roots, E. F.** See *Sobczak, L. W.* 10099
- 00760 **Roper, Paul J.; Dunn, David E.** Structural evolution of northwestern South Carolina [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 239-240, 1970.
- 06433 **Roper, Paul J.; Dunn, David E.** Geology of the Tamassee, Satolah and Cashiers quadrangles, Oconee County, South Carolina: *South Carolina Div. Geology Map Ser.* MS-16, scale 1:24,000, sections, separate text (55 p., illus., tables), 1970.
- 09547 **Roper, Paul J.** The paleoecology of hermatypic stromatoporoids in a bioherm in southwestern Ontario [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 668, 1970.
- 07284 **Roper, Paul James.** Geology of the Tamassee, Satolah, and Cashiers quadrangles, Oconee County, South Carolina [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 5, p. 2770B, 1970.
- 03658 **Rosauer, Elmer A.** Closed-circuit television in electron microscopy: *Iowa Acad. Sci. Proc.* 1969, v. 76, p. 350-355, illus., 1970.
- Roscoe, S. M.** See *Frarey, M. J.* 08630
- 08633 **Roscoe, S. M.; Frarey, M. J.** Comments [on "The Canadian Shield — A status report, 1970" by F. J. Pettijohn, 1970], in *Basins and geosynclines of the Canadian Shield* (A. J. Baer, editor) — Symposium, Ottawa, 1970, *Papers: Canada Geol. Survey Paper* 70-40, p. 255-262, 1970.
- 04310 **Rose, Arthur W.; Dahlberg, Eric C.; Keith, M. L.** A multiple regression technique for adjusting background values in stream sediment geochemistry: *Econ. Geology*, v. 65, no. 2, p. 156-165, illus., tables, 1970.
- 05130 **Rose, Arthur W.** Origin of trace element distribution patterns in sulfides of the Central and Bingham districts, western U.S.A. [with German abs.]: *Mineralium Deposita*, v. 5, no. 2, p. 157-163, illus., table, 1970.
- 07067 **Rose, Arthur W.** Zonal relations of wallrock alteration and sulfide distribution at porphyry copper deposits: *Econ. Geology*, v. 65, no. 8, p. 920-936, illus., tables, 1970.
- 08319 **Rose, Arthur W.** Atlas of Pennsylvania's mineral resources — Pt. 3, Metal mines and occurrences in Pennsylvania: *Pennsylvania Geol. Survey 4th ser., Bull.* M50, pt. 3, 14 p., illus., tables, 1970.
- Rose, Arthur W.** See *Smith, Robert C.*, 2d. 09578
- 02855 **Rose, E. R.** The ferride element content of titaniferous magnetite in Canada: *Canada Geol. Survey Paper* 69-54, 9 p., illus., table, 1970.
- Rose, E. R.** See *Land, A. H.* 07972

- 08008 **Rose, E. R.; Sanford, B. V.; Hacquebard, P. A.** Economic minerals of southeastern Canada, Chap. 7 in *Geology and economic minerals of Canada*: Canada Geol. Survey Econ. Geology Rept. 1 (5th edition), p. 305-364, illus., tables, 1970.
- Rose, Harry J., Jr.** See *Hickling, Nelson L.* 02388
- 05735 **Rose, Harry J.,** (and others) Semimicro X-ray fluorescence analysis of lunar samples, in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc.* — V.2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press, p. 1177-1194, illus., Tables, 1970.
- 04459 **Rose, Peter R.** Stratigraphic interpretation of submarine versus subaerial discontinuity surfaces — An example from the Cretaceous of Texas: *Geol. Soc. America Bull.*, v. 81, no. 9, p. 2787-2797, illus., 1970.
- 06008 **Rose, Peter Robert.** Edwards Formation, surface and subsurface, central Texas [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 12, pt. 1, p. 5560B, 1970.
- 08558 **Rose, Vincent C.; Roney, James R.** Discussion of "Preliminary evaluation of a core scintillation counter for bulk density measurement in marine sediment cores" [by C. Brier, R. Bennin, and P. A. Rona, 1969]: *Jour. Sed. Petrology*, v. 40, no. 4, p. 1369, 1970.
- 06916 **Rose, W. I., Jr.; Stoiber, R. E.; Bonis, S. B.** Volcanic activity at Santiaguito volcano, Guatemala, June 1968-August 1969: *Bull. Volcanol.*, v. 34, no. 1, p. 295-307, illus., tables, 1970.
- Rose, William I., Jr.** See *Stoiber, Richard E.* 01837
- Rose, William I., Jr.** See *Stoiber, Richard E.* 04873
- 07944 **Rose, William Ingersoll, Jr.** The geology of the Santiaguito volcanic dome, Guatemala [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 6, p. 3485B, 1970.
- 04858 **Roseman, Mike.** Sixth day road log from Cedar City, Utah to Holbrook, Arizona, via Long Valley Junction, Kanab, Jacob Lake, Marble Canyon, Moenkopi, Keams Canyon and Bidahochi, in *Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region* — Natl. Assoc. Geology Teachers, Southwest Sec., Field Conf. Earth Sci., Cedar City, Utah, 1970: Socorro, N. Mex., New Mexico Inst. Mining and Technology, p. 123-131, 1970.
- 10940 **Rosenau, Jack C.; Lang, Solomon M.; Hilton, George S.; Rooney, James G.** Geology and ground-water resources of Salem County, New Jersey: New Jersey Div. Water Policy and Supply Spec. Rept. 33, 142 p., illus., tables, geol. maps, 1969.
- Rosenberg, Arthur S.** See *McKinney, Charles N.* 04048
- 10199 **Rosenberg, Gary D.** Botanical criteria for differentiating eustatic and relative fluctuations in sea level: *Geol. Soc. America Bull.*, v. 81, no. 2, p. 525-528, illus., 1970.
- Rosenberg, P. E.** See *Hooper, P. R.* 03409
- Rosenberg, P. E.** See *MacChesney, J. B.* 08038
- 09548 **Rosenberg, P. E.** Fluorine substitution in muscovite and pyrophyllite [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 668-669, 1970.
- 09549 **Rosenberg, P. E.; Metz, M. C.; Brookins, D. G.; Zartman, R. E.** Genesis of a pegmatitic, quartz-carbonate deposit, western Montana [abs]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 669, 1970.
- 07440 **Rosenblad, J. Lyndon.** Development of equipment for testing models of jointed-rock masses, Chap. 8 in *Rock mechanics, theory and practice* — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 127-146, illus., 1970.

- 09142 **Rosenblad, J. Lyndon.** Failure modes of models of jointed rock masses [with French and German summ.], in *Internat. Soc. Rock Mechanics Cong.*, 2d, Belgrade, Yugoslavia, 1970, Proc., V. 2: Belgrade, Jaroslav Černi inst. Devel. Water Resources, p. 75-81, illus., tables, 1970.
- Rosendahl, B. R.** See *Campbell, J. F.* 04489
- 04236 **Rosenfeld, John L.** Rotated garnets in metamorphic rocks: *Geol. Soc. America Spec. Paper* 129, 105 p., illus., 1970.
- Rosenfeld, John L.** See *Adams, Herbert G.* 06038
- 06683 **Rosenkrantz, Alfred.** Marine Upper Cretaceous and lowermost Tertiary deposits in West Greenland — Investigations before and since 1938 [with Danish abs.]: *Dansk Geol. Foren. Medd.*, v. 19, no. 4, p. 406-453, illus., 1970.
- Rosenman, Martin.** See *Ben-Menahem, Ari.* 04339
- 09027 **Rosenshein, Arthur N.** Stratigraphy of the Connelly Formation and associated Deerparkian (I. Devonian) strata in southeastern New York [abs.], in *Guidebook to field excursions*, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., p. 142, 1969.
- Rosenzweig, Abraham.** See *Homme, Frank C.* 08656
- Rosholt, J. N.** See *Szabo, B. J.* 01470
- 08423 **Rosholt, J. N.; Peterman, Z. E.; Bartel, A. J.** U-Th-Pb and Rb-Sr ages in granite reference sample from southwestern Saskatchewan: *Canadian Jour. Earth Sci.*, v. 7, no. 1, p. 184-187, illus., tables, 1970.
- 05761 **Rosholt, John N.; Tatsumoto, Mitsunobu.** Isotopic composition of uranium and thorium in Apollo 11 samples, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1499-1502, tables, 1970.
- Ross, C. S.** See *Smith, R. L.* 01204
- 00350 **Ross, Charles A.** Late Paleozoic carbonate shelf ecology [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 138, 1970.
- 03643 **Ross, Charles A.; Nassichuk, Walter W.** *Yabeina* and *Waagenoceras* from the Atlin Horst area, northwestern British Columbia: *Jour. Paleontology*, v. 44, no. 4, p. 779-781, illus., 1970.
- 04205 **Ross, Charles A.** Concepts in late Paleozoic correlations, in *Radiometric dating and paleontologic zonation*: *Geol. Soc. America Spec. Paper* 124, p. 7-36, illus., table, 1970.
- 06028 **Ross, Clyde P.** The Precambrian of the United States of America — Northwestern United States, the Belt Series, in *The geologic systems — The Precambrian*, V. 4 (Kalervo Rankama, editor): New York and London, Interscience-John Wiley and Sons, p. 145-251, illus., tables, 1970.
- Ross, D. C.** See *Dodge, F. C. W.* 06211
- Ross, D. I.** See *Manchester, K. S.* 10074
- 10770 **Ross, D. I.** Marine geophysics, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor): *Canada Geol. Survey Paper* 69-56, p. 180-186, 1970.
- Ross, David.** See *Habib, Daniel.* 08521

- 02081 **Ross, David A.** Atlantic continental shelf and slope of the United States — Heavy minerals of the continental margin from southern Nova Scotia to northern New Jersey: U.S. Geol. Survey Prof. Paper 529-G, p. G1-G40, illus., tables, 1970.
- Ross, David A.** See *Hathaway, John C.* 05576
- 05576 **Ross, David A.** Source and dispersion of surface sediments in the Gulf of Maine-Georges Bank area: Jour. Sed. Petrology, v. 40, no. 3, p. 906-920, illus., tables, 1970.
- 05656 **Ross, David A.** Source and dispersion of surface sediments in the Gulf of Maine-Georges Bank area: Jour. Sed. Petrology, v. 40, no. 3, p. 906-920, illus., tables, 1970.
- 08189 **Ross, David A.** Introduction to oceanography: New York, Appleton-Century-Crofts, Educ. Div., Meredith Corp., 384 p., illus., tables, 1970.
- 00351 **Ross, Donald C.** Plutonic rocks of the California Coast Ranges [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 138, 1970.
- 02154 **Ross, Donald C.** Pegmatitic trachyandesite plugs and associated volcanic rocks in the Saline Range-Inyo Mountains region, California: U.S. Geol. Survey Prof. Paper 614-D, p. D1-D29, illus., tables, geol. maps, 1970.
- 06119 **Ross, Donald C.** Quartz gabbro and anorthositic gabbro, markers of offset along the San Andreas Fault in the California Coast Ranges: Geol. Soc. America Bull., v. 81, no. 12, p. 3647-3661, illus., tables, 1970.
- Ross, Donald S.** See *Helgeson, Gaylord A.* 04366
- 06790 **Ross, G. J.; Kodama, H.** Differential release of potassium from interstratified mica clay minerals as related to probable differences in their mica layer components [with French, German, and Russian abs.]: Clays and Clay Minerals, v. 18, no. 3, p. 151-156, illus., tables, 1970.
- 03278 **Ross, John V.** Structural evolution of the Kootenay Arc, southeastern British Columbia, in Structure of the southern Canadian Cordillera: Geol. Assoc. Canada Spec. Paper 6, p. 53-65, illus., geol. map, 1970.
- 01271 **Ross, June Phillips.** Distribution, paleoecology and correlation of Champlainian Ectoprocta (Bryozoa), New York State, Pt. 3: Jour. Paleontology, v. 44, no. 2, p. 346-382, illus., tables, 1970.
- 03545 **Ross, June R. P.** Discussion of "On the validity of the name *Hallopora* for a genus of trepostome bryozoan," by R. J. Singh [1970]: Jour. Paleontology, v. 44, no. 4, p. 785, 1970.
- Ross, Malcolm.** See *Rooney, Thomas P.* 02794
- Ross, Malcolm.** See *Prewitt, C. T.* 03367
- Ross, Malcolm.** See *Papike, J. J.* 09057
- 00209 **Ross, Reuben James, Jr.; Ingham, J. Keith.** Distribution of the Toquima-Table Head (Middle Ordovician Whiterock) Faunal Realm in the Northern Hemisphere: Geol. Soc. America Bull., v. 81, no. 2, p. 393-408, illus., tables, 1970.
- 05485 **Ross, Reuben James, Jr.** Ordovician brachiopods, trilobites, and stratigraphy in east and central Nevada: U.S. Geol. Survey Prof. Paper 639, 103 p., illus., 1970.
- Rossmann, Ronald.** See *Bowser, Carl J.* 06070
- Rossmann, Ronald.** See *Callender, Edward.* 06085
- Rosso, Samuel W.** See *Phillips, Tom L.* 04195

- 09006 **Rostler, F. S.** Fractional composition, analytical and functional significance [Chap.] 6 in *Bituminous materials—Asphalts, tars and pitches*, A. J. Hoiberg, Editor — v. 2, Asphalts, pt. 1: New York, Intersci. Publishers, p. 151-222, illus., tables, 1965.
- 09391 **Roth, Barry.** (and others, compilers). Taxa proposed in honor of Leo George Hertlein from 1926 to 1969: *Nautilus*, v. 84, no. 2, p. 42, 1970.
- 09393 **Roth, Barry.** Names proposed by Leo George Hertlein from 1925 to 1970: *Nautilus*, v. 84, no. 2, p. 52-69, 1970.
- 00502 **Roth, Charles Barron.** Ferrous-ferric ratio and cec changes with removal of ferruginous colloidal coatings from weathered micaceous vermiculites and soils [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 7, p. 2985B, 1970.
- Roth, Edward.** See *Dalquest, Walter W.* 05381
- Roth, H. Daniel.** See *Pierce, J. W.* 00749
- 07785 **Roth, Peter Hans.** Oligocene calcareous nannoplankton biostratigraphy (with German summ.): *Eclogae Geol. Helvetiae*, v. 63, no. 3, p. 799-881, illus., 1970.
- Rothenberg, Ann M.** See *Morrison, George H.* 05710
- 08654 **Rothrock, Howard E.** Fluorspar, in *Guidebook of the Tyrone-Big Hatchet Mountains-Florida Mountains region — New Mexico Geol. Soc. Field Conf.*, 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, p. 123-125, illus., 1970.
- 05127 **Rothstein, Arnold J.** Deep ocean nodule mining: *Underwater Sci. and Technology Jour.*, v. 2, no. 3, p. 133-137, illus., tables, 1970.
- 04170 **Rothwell, G. W.; Taylor, T. N.** Structurally preserved calamite fructifications [abs.]: *Am. Jour. Botany*, v. 57, no. 6, pt. 2, p. 756, 1970.
- 04665 **Rothwell, G. W.; Eggert, D. A.** A *Conostoma* with a tentacular integument from the Pennsylvanian of Illinois [abs.]: *Am. Jour. Botany*, v. 57, no. 6, pt. 2, p. 758, 1970.
- 07902 **Rothwell, G. W.; Eggert, D. A.** A *Conostoma* with a tentacular sarcotesta from the Upper Pennsylvanian of Illinois: *Bot. Gaz.*, v. 131, no. 4, p. 359-366, illus., 1970.
- Rothwell, W. T., Jr.** See *Powell, J. Dan.* 06030
- 00931 **Rothwell, W. Thomas, Jr.** Late Neogene geologic events in common between the Caribbean and the Gulf of Mexico [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 300-301, 1970.
- Rothwell, W. Thomas, Jr.** See *Bader, Richard G.* 06657
- 02739 **Rough, R. L.; Overbey, W. K., Jr.** Lithologic descriptions of Appalachian area oil-producing formations: *U.S. Bur. Mines Inf. Circ.* 8473, 133 p., illus., tables, 1970.
- Rouse, Glenn E.** See *Srivastava, Satish K.* 04328
- 10869 **Rouse, Glenn E.; Hopkins, W. S., Jr.; Piel, K. M.** Palynology of some Late Cretaceous and early Tertiary deposits in British Columbia and adjacent Alberta, in *Symposium on palynology of the Late Cretaceous and early Tertiary*, San Francisco, Calif., 1966: *Geol. Soc. America Spec. Paper* 127, p. 213-246, illus., tables, 1970.
- Rouse, John T.** See *Clark, Robey H.* 02599
- 07821 **Rousell, D. H.** Geology of the Iskwasum Lake area (east half), The Pas mining district, Manitoba: *Manitoba Dept. Mines and Nat. Resources Mines Br. Pub.* 66-3, 26 p., illus., tables, geol. map, 1970.

- 07572 **Routson, Ronald Chester.** Illite solubility [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 3, p. 1010B-1011B, 1970.
- 06507 **Rouxhet, Paul G.** Kinetics of dehydroxylation and of OH-OD exchange in macrocrystalline micas: *Am. Mineralogist*, v. 55, nos. 5-6, p. 841-853, illus., 1970.
- 05960 **Rowan, L. C.; Offield, T. W.; Watson, Kenneth; Cannon, P. J.; Watson, R. D.** Thermal infrared investigations, Arbuckle Mountains, Oklahoma: *Geol. Soc. America Bull.*, v. 81, no. 12, p. 3549-3561, illus., 1970.
- 06236 **Rowan, L. C.; Cannon, P. J.** Remote-sensing investigations near Mill Creek, Oklahoma: *Oklahoma Geology Notes*, v. 30, no. 6, p. 127-134, illus., 1970.
- 07774 **Rowan, L. C.; Offield, T. W.; Watson, Kenneth; Watson, R. D.; Cannon, P. J.** Thermal infrared investigations, Mill Creek area, Oklahoma, in *Earth Resources Aircraft Program, status review, V. 1: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center*, p. 5-1—5-25, illus., [1970,].
- Rowan, L. C.** See *Offield, T. W.* 09290
- 09291 **Rowan, L. C.; Watson, Kenneth.** Multispectral analysis of limestone, dolomite, and granite, Mill Creek, Oklahoma, Sec. 12 of *Earth Resources Program*, 3d ann., review — v. 1, *Geology and geography: Houston, Tex., NASA Manned Spacecraft Center*, MSC-03742, p. 12-1—12-14, illus., 1970.
- 01176 **Rowan, Lawrence C.; Larsen, Leonard H.** Precambrian history of the Beartooth Mountains-Hellroaring Lakes area, Montana [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 347, 1970.
- 00442 **Rowe, M. W.** <sup>81</sup>Kr radiation ages of stone meteorites: *Nature*, v. 225, no. 5230, p. 368, 1970.
- 04525 **Rowe, M. W.** Evidence for decay of extinct Pu<sup>244</sup> and I<sup>129</sup> in the Kapoeta meteorite: *Geochim. et Cosmochim. Acta*, v. 34, no. 9, p. 1019-1028, illus., tables, 1970.
- 02277 **Rowe, Royle C.** Hunting Utah trilobites: *Gems and Minerals*, no. 394, p. 28-29, 50-51, illus., 1970.
- Rowekamp, Edward T.** See *Bradley, William C.* 00597
- 08569 **Rowell, A. J.** The contribution of numerical taxonomy to the genus concept, in *The genus, a basic concept in paleontology — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc., Pt. C: Lawrence, Kans., Allen Press*, p. 264-293, illus., 1970.
- 10631 **Rowell, A. J.** Numerical methods and phylogeny of the Calceocrinidae: *Internat. Assoc. Math. Geology Jour.*, v. 1, no. 2, p. 229-234, illus., 1969.
- Rowell, Bruce F.** See *Griesemer, Allan D.* 02526
- 02489 **Rowland, Mark R.; Kunkle, George R.** Cones of influence developed in the Silurian-Devonian aquifer, Maumee River basin, Ohio: *Ground Water*, v. 8, no. 3, p. 37-43, illus., tables, 1970.
- Rowland, T. L.** See *Tarr, Russell S.* 10852
- 07945 **Rowland, Tommy Lee.** Lithostratigraphy and carbonate petrology of the Morrow Formation (Pennsylvanian), Braggs-Cookson area, northeastern Oklahoma [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 6, p. 3486B, 1970.
- 00641 **Rowley, Peter D.** Geologic evolution of the southern Sevier Plateau, Utah [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 347-348, 1970.
- 03834 **Roy, D. M.; Faile, S. P.** Experimental introduction of excess Ar<sup>40</sup> into a granitic melt [discussion of paper by W. S. Fyfe, M. A. Lanphere, and G. B. Dalrymple, 1969]: *Contr. Mineralogy and Petrology*, v. 27, no. 3, p. 258, 1970.



- 09550 **Roy, David C.** Variations in a thin-bedded turbidite sequence from the Silurian of northeastern Maine [abs]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 669-670, 1970.
- Roy, K. J.** See *Smith, S. V.* 09579
- 08524 **Roy, Kenneth J.** Change in bathymetric configuration, Kaneohe Bay, Oahu, 1882-1969: Hawaii Inst. Geophysics [Rept.] HIG-70-15 (SEAGRANT 70-6), 26 p., illus., tables, 1970.
- Roy, Robert F.** See *Williams, David L.* 01854
- Roy, Rustum.** See *Berkes, John S.* 02997
- 09830 **Royea, M. J.** Rock stress measurement at the Sullivan Mine, in *Canadian Rock Mechanics Symposium*, 5th, Toronto, 1968, Proc.: Ottawa, Canada Dept. Energy, Mines and Resources Mines Br., p. 59-74, illus., 1969.
- 04954 **Royse, Chester F.; Wadell, James S.** Geology of the Verde Valley, Yavapai County, Arizona, in *Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region* — Natl. Assoc. Geology Teachers, Southwest Sec., Field Conf. Earth Sci., Cedar City, Utah, 1970: Socorro, N. Mex., New Mexico Inst. Mining and Technology, p. 35-39, illus., 1970.
- Royse, Chester F.** See *Pedersen, Edward P.* 05368
- 02981 **Royse, Chester F., Jr.; Sheridan, Michael F.** Alunite, a new occurrence near Wickenburg, Arizona [abs.]: *Arizona Acad. Sci. Jour.*, v. 6, 1970 Proc. Supp., p. 63, 1970.
- 03286 **Royse, Chester F., Jr.** A sedimentologic analysis of the Tongue River-Sentinel Butte interval (Paleocene) of the Williston Basin, western North Dakota: *Sed. Geology*, v. 4, no. 1, p. 19-80, illus., tables, 1970.
- Royse, Chester F., Jr.** See *Sheridan, Michael F.* 09060
- 01424 **Rozendal, R. A.; Erskine, W. S.** Deep test in the Ouachita structural belt of central Texas [abs.]: *Houston Geol. Soc. Bull.*, v. 12, no. 6, p. 18, 1970.
- 07737 **Rubin, Bruce.** Uranium roll front zonation in the southern Powder River basin, Wyoming: *Earth Sci. Bull.*, v. 3, no. 4, p. 5-12, illus., 1970.
- 10347 **Rubin, J.** Numerical analysis of ponded rainfall infiltration, in *Water in the unsaturated zone*, V. 1: Internat. Assoc. Sci. Hydrology Pub. 82, p. 440-451, illus., 1968.
- Rubin, Meyer.** See *Ray, Clayton E.* 00036
- Rubin, Meyer.** See *Sullivan, Beverly Marsters.* 01371
- Rubin, Meyer.** See *Back, William.* 05323
- Rubin, Meyer.** See *Sirkin, Leslie A.* 06170
- 09401 **Rubin, Meyer.** Radiocarbon versus calendar time scale in the period 10,000 to 12,000 years ago [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ?] 2, p. 114, 1970.
- Rubin, Meyer.** See *Kotteff, Carl.* 10179
- 04488 **Ruch, R. R.; Kennedy, E. Joyce; Shimp, Neil F.** Studies of Lake Michigan bottom sediments — No. 4, Distribution of arsenic in unconsolidated sediments from southern Lake Michigan: *Illinois Geol. Survey Environmental Geology Note* 37, 16 p., illus., tables, 1970.

**Ruch, R. R.** See *Bradbury, J. C.* 06321

**Rucklidge, J. C.** See *Naldrett, A. J.* 04413

- 10759 **Rucklidge, J. C.** Crystallography, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 84-89, 1970.

- 01643 **Ruddiman, W. F.; Tolderlund, D. S.; Bé, A. W. H.** Foraminiferal evidence of a modern warming of the North Atlantic Ocean: *Deep-Sea Research*, v. 17, no. 1, p. 141-155, illus., tables, 1970.

- 02070 **Ruddiman, William F.** Southward penetrations of the North Atlantic polar front in the late Pleistocene [abs.]: *EOS*, v. 51, no. 4, p. 332, 1970.

**Ruddiman, William F.** See *Fox, Paul J.* 08600

- 09551 **Ruddiman, William F.; McIntyre, Andrew.** Late Pleistocene migration of the North Atlantic polar front [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 670, 1970.

**Rudrum, M.** See *Blumer, M.* 08564

- 06751 **Rudwick, Martin J. S.** The strategy of Lyell's *Principles of geology*: *Isis*, v. 61, pt. 1, no. 206, p. 5-33, illus., 1970.

**Ruef, Michael H.** See *Bader, Richard G.* 06657

**Rueff, Ardel W.** See *Martin, James A.* 07408

- 07985 **Rueff, Serge.** Wellhead geology — Its development and prospects: *Canadian Petroleum*, v. 11, no. 11, p. 42-44, 46, 1970.

- 04583 **Rueffel, Philip G.** Natural sodium sulfate in North America, in *Third symposium on salt*, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 429-451, illus., 1970.

- 00932 **Ruffin, James H.** Paleoeecology (via palynology) of the upper Shaunavon, southwestern Saskatchewan [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 301, 1970.

**Ruffman, A.** See *Berggren, W. A.* 06160

- 07709 **Ruffman, Alan; Woodside, John.** The Odd-twins magnetic anomaly and its possible relationship to the Humber Arm Klippe of western Newfoundland, Canada [with French abs.]: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 326-337, illus., 1970.

- 00615 **Ruhe, Robert V.; Prior, Jean C.** Pleistocene Lake Calvin, eastern Iowa: *Geol. Soc. America Bull.*, v. 81, no. 3, p. 919-923, illus., tables, 1970.

- 08044 **Ruhe, Robert V.** Soils, paleosols, and environment, in *Pleistocene and recent environments of the central Great Plains*: Kansas Univ. Dept. Geology Spec. Pub. 3, p. 37-52, illus., tables, 1970.

- 09919 **Ruhe, Robert V.** Field trip No. 5, Problems of Pleistocene Lake Calvin, in *Geol. Soc. America, North-Central Sec., Ann. Mtg., 2d, May 1968, guidebook*: Iowa City, Iowa, Univ. Iowa, p. 5-1 to 5-10, illus. [1968].

- 10453 **Ruitenbergh, A. A.** Mineralized structures in the Johnson Croft, Annidale, Jordan Mountain, and Black River areas: New Brunswick Dept. Nat. Resources Mineral Resources Br. Rept. Inv. 13, 28 p., illus., tables, 1970.

- 03102 **Ruiz, Patricio.** Probabilistic study of the behavior of structures during earthquakes [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 10, p. 4645B-4646B, 1970.

- 02151 **Ruley, E. E.** "Big Injun" oil and gas production in north-central West Virginia: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 758-782, illus., table, 1970.
- 07779 **Rummel, F.; Fairhurst, C.** Determination of the post-failure behavior of brittle rock using a servo-controlled testing machine (with German and French summ.): Rock Mechanics. v. 2, no. 4, p. 189-204, illus., 1970.
- 02199 **Rumney, George R.** The geosystem — Dynamic integration of land, sea and air: Dubuque, Iowa, Wm. C. Brown Publishers, 135 p., illus., tables, 1970.
- 09402 **Rumney, George R.** The geosystem — Dynamic integration of land, sea and air in the Quaternary [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?] p. 115, 1970.
- Runcorn, S. K.** See *Bullen, K. E.* 02869
- 06292 **Runcorn, S. K.; Collinson, D. W.; O'Reilly, W.; Battey, M. H.; Stephenson, A.; Jones, J. M.; Manson, A. J.; Readman, P. W.** Magnetic properties of Apollo 11 lunar samples, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 2369-2387, illus., 1970.
- 06541 **Runcorn, S. K.** (editor). Palaeogeophysics: London and New York, Academic Press, 518 p., illus., tables, 1970.
- 09973 **Runcorn, S. K.** A possible cause of the correlation between earthquakes and polar motions, in Earthquake displacement fields and the rotation of the Earth (I. Mansinha, D. E. Smylie, A. E. Beck, editors)-NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 181-187, 1970.
- Runge, E. C. A.** See *Ballagh, T. M.* 02570
- 08620 **Runnells, Donald D.** Errors in X-ray analysis of carbonates due to solid-solution variation in composition of component minerals: Jour. Sed. Petrology, v. 40, no. 4, p. 1158-1166, illus., table, 1970.
- Rupert, G. B.** See *Clark, George B.* 04010
- 03394 **Rupke, N. A.** Continental drift before 1900: Nature, v. 227, no. 5256, p. 349-350, 1970.
- 03881 **Rupke, N. A.** Sedimentary evidence for the allochthonous origin of *Stigmara*, Carboniferous, Nova Scotia — Reply [to discussion of 1969 paper by L. Ferguson, 1970]: Geol. Soc. America Bull., v. 81, no. 8, p. 2535-2537, 1970.
- 05051 **Rusch, Wilbert H., Sr.** Human fossils, [Chap.] 9 in Rock strata and the Bible record (P. A. Zimmerman, editor): St. Louis, Mo., and London, England, Concordia Publishing House, p. 133-177, 1970.
- Rush, Clayton.** See *Sanford, Allan.* 00354
- Rushforth, Samuel R.** See *Tidwell, William D.* 01677
- Rushforth, Samuel R.** See *Tidwell, William D.* 03452
- 03016 **Rushforth, Samuel Roberts.** Notes on the fern family Matoniaceae from the western United States: Brigham Young Univ. Geology Studies, v. 16, pt. 3, p. 3-34, illus., tables, 1969 [1970].
- 03572 **Rushton, K. R.; Bannister, R. G.** Aquifer simulation on slow time resistance-capacitance networks: Ground Water, v. 8, no. 4, p. 15-24, illus., table, 1970.
- 02831 **Russell, Dale A.** The vertebrate fauna of the Selma Formation of Alabama — Pt. 7, The mosasaurs: Fieldiana — Geology Mem., v. 3, no. 7, p. [363]-380, illus., 1970.

- 06210 **Russell, Dale A.** Tyrannosaurs from the Late Cretaceous of western Canada [with French abs.]: Canada Natl. Mus. Nat. Sci. Pubs. Palaeontology, no. 1, 34 p., illus., tables, 1970.
- 07677 **Russell, Dale A.** A skeletal reconstruction of *Leptoceratops gracilis* from the upper Edmonton Formation (Cretaceous) of Alberta: Canadian Jour. Earth Sci., v. 7, no. 1, p. 181-184, illus., 1970.
- Russell, E. E.** See *Davis, Darrell E.* 07335
- 08361 **Russell, Ernest E.; Wilson, Charles W., Jr.** Geologic map of the Big Sandy quadrangle, Tennessee: Tennessee Div. Geology Geol. Map GM 20-NE, scale 1:24,000, separate text by A. T. Staller, 1970.
- 03229 **Russell, Eugene R.; Mickle, Jack L.** Liquid limit values by soil moisture tension: Am. Soc. Civil Engineers Proc., v. 96, paper 7298, Jour. Soil Mechanics and Found. Div., no. SM 3, p. 967-989, illus., tables, 1970.
- 07444 **Russell, James E.; Hoskins, Earl R.** Correlation of electrical resistivity of dry rock with cumulative damage, Chap. 12 in Rock mechanics, theory and practice — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 213-218, illus., 1970.
- 02534 **Russell, John L.** Permian-Cretaceous unconformity in Marion County, Kansas [abs.]: Nebraska Acad. Sci. Proc., 80th Ann. Mtg., p. 37, 1970.
- 04641 **Russell, Kenneth L.** Geochemistry and halmyrolysis of clay minerals, Rio Ameca, Mexico: Geochim. et Cosmochim. Acta, v. 34, no. 8, p. 893-907, illus., tables, 1970.
- 06609 **Russell, Kenneth Lloyd.** Geochemistry and halmyrolysis of clay minerals, Rio Ameca, Mexico [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 763B, 1970.
- 08130 **Russell, Loris S.** Correlation of the Upper Cretaceous Montana Group between southern Alberta and Montana: Canadian Jour. Earth Sci., v. 7, no. 4, p. 1099-1108, illus., 1970.
- Russell, R. D.** See *Ozard, J. M.* 03361
- 11004 **Russell, R. Dana.** SEPM history, 1926-1946: Jour. Palaeontology, v. 44, no. 2, p. 173-194, illus., 1970.
- 02972 **Russell, Richard H.** Biogeography of late Cenozoic Mollusca from the San Pedro Valley, southeastern Arizona [abs.]: Arizona Acad. Sci. Jour., v. 6, 1970 Proc. Supp., p. 22-23, 1970.
- 08061 **Rust, Brian R.; Coakley, John P.** Physico-chemical characteristics and postglacial desalination of Stanwell-Fletcher Lake, Arctic Canada: Canadian Jour. Earth Sci., v. 7, no. 3, p. 900-911, illus., tables, 1970.
- Rutford, Robert H.** See *Kahil, Alain A.* 00623
- Ruth, E.** See *Kaplan, I. R.* 05705
- 01824 **Rutherford, Malcolm J.** Phase relations in the system  $\text{Al}_2\text{O}_3\text{-SiO}_2\text{-Fe-O-H}$  at "fluid = 2kb [abs.]: EOS, v. 51, no. 4, p. 437, 1970.
- 09031 **Rutherford, William A.; Poolet, Michelle A.; Boland, Geoffrey.** A study of the ectoproct genus *Prasopora* at Trenton Falls, New York [abs.], in Guidebook to field excursions, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., p. 146, 1969.

- 01825 **Rutstein, Martin S.; White, William B.** Optical and infrared spectra of high calcium pyroxenes [abs.]: EOS, v. 51, no. 4, p. 436, 1970.
- 06881 **Rutstein, Martin Stuart.** The partitioning of iron between natural and synthetic wollastonite, clinopyroxene and garnet [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 1, p. 255B, 1970.
- Ruttan, G. D.** See *Campbell, F. H. A. 11258*
- Ryall, Alan.** See *Hofmann, R. B. 00286*
- 00944 **Ryall, Alan; Boucher, Gary.** Earthquakes and nuclear detonations: Science, v. 167, no. 3920, p. 1013, illus., 1970.
- Ryall, Alan.** See *Boucher, Gary W. 01626*
- Ryall, Alan.** See *Douglas, Bruce M. 04685*
- 00352 **Ryan, Barry D.** Rubidium strontium geochronology of the Hellroaring Creek stock, southeast British Columbia [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 139, 1970.
- Ryan, J. A.** See *Grossman, J. J. 06281*
- Ryan, M. E.** See *McDowell, L. L. 10385*
- Ryan, William B. F.** See *Fox, Paul J. 08600*
- 04536 **Ryder, Robert B.; Cervione, Michael A., Jr.; Thomas, Chester E., Jr.; Thomas, Mendall P.** Water resources inventory of Connecticut — Pt. 4, Southwestern coastal river basins: Connecticut Water Resources Bull. 17, 54 p., illus., tables, 1970.
- 02409 **Ryder, Robert T.; Ames, H. Tate.** Palynology and age of Beaverhead Formation and their paleotectonic implications in Lima region, Montana-Idaho: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 7, p. 1155-1171, 1970.
- Rye, Robert O.** See *Ohmoto, Hiroshi. 04416*
- Rye, Robert O.** See *Schoen, Robert. 05471*
- Rye, Robert O.** See *Schoen, Robert. 09404*
- Rylander, Don L.** See *Bullard, Fred M. 00875*
- Rynn, John M. W.** See *Sbar, Marc L. 01973*
- Rynn, John M. W.** See *Sbar, Marc L. 04431*
- 09552 **Sabatier, Henri; Velde, Bruce.** Trioctahedral micas in the system  $K_2O-FeO-Fe_2O_3-SiO_2 + O$  [abs.]: Geol. Soc. America abs. with Programs, v. 2, no. 7, p. 671, 1970.
- 03049 **Sabina, Ann P.** Rocks and minerals for the collector/Hull-Maniwaki, Quebec; Ottawa-Peterborough, Ontario; Canada Geol. Survey Paper 69-50, 177 p., illus., 1970.
- 06171 **Sable, Edward G.** Source areas of lower Mississippi red beds in eastern midcontinent, in Geological Survey research 1970, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D88-D91, illus., table, 1970.
- 03955 **Sachdev, Sham L.; West Phillip W.** Concentration of trace metals by solvent extraction and their determination by atomic absorption spectrophotometry: Environmental Sci. and Technology, v. 4, no. 9, p. 749-751, tables, 1970.

- 07946 **Sachs, Jules B.** Calcareous nannofossils of the Aftonian shale, Louisiana continental shelf [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 6, p. 3486B, 1970.
- Sachs, Milton S.** See *Kohout, Francis A.* 09224
- Sachs, Peter L.** See *Spencer, Derek W.* 05599
- Sackett, John.** See *McClure, Duane.* 04437
- Sackett, W.** See *Frank, D. J.* 05181
- 03563 **Sackett, William M.; Rankin, John G.** Paleotemperatures for the Gulf of Mexico: *Jour. Geophys. Research*, v. 75, no. 24, p. 4557-4560, illus., 1970.
- 09403 **Sackett, William M.** Paleotemperatures in the Gulf of Mexico [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 116-117, illus., 1970.
- 10622 **Sackin, M. J.; Merriam, D. F.** Automassociation, a new geological tool: *Internat. Assoc. Math. Geology Jour.*, v. 1, no. 1, p. 7-16, illus., tables, 1969.
- 01622 **Sacks, I. S.; Evertson, D. W.** A sensitive borehole strain-rate meter: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 448-452, illus., 1970.
- Sacks, I. Selwyn.** See *Dorman, LeRoy M.* 06957
- Sáenz R., Rodrigo.** See *Simon, Ivan.* 01868
- Sagiv, Abraham.** See *Poreh, Michael.* 05235
- 02312 **Sahl, H. L.** Mobeetie field economics justifies search for similar areas: *Oil and Gas Jour.*, v. 68, no. 9, p. 100-102, 104-106, illus., table, 1970.
- 03068 **Sahl, Howard Leroy.** Mobeetie Field, Wheeler County, Texas: *Shale Shaker*, v. 20, no. 6, p. 108-115, illus., 1970.
- 04088 **Sahores, J. J.; Witherspoon, P. A.** Diffusion of light paraffin hydrocarbons in water from 2° C to 80° C, in *Advances in organic geochemistry — Internat. Cong.*, 3d, Proc. (G. D. Hobson and G. C. Speers, editors): London and New York, Pergamon Press (*Internat. Ser. Mons. Earth Sci.*, V. 32), p. 219-230, illus., tables, 1970.
- 02674 **Sahu, Basanta K.** Correlation of mean sizes obtained from size measurement by thin-section and loose-grain methods [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 867, 1970.
- 01464 **Sainsbury, C. L.; Coleman, R. G.; Kachadoorian, Reuben.** Blueschist and related greenschist facies rocks of the Seward Peninsula, Alaska, in *Geological Survey research* 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B33-B42, illus., table, 1970.
- 03334 **Sainsbury, C. L.; Hudson, Travis; Kachadoorian, Reuben; Richards, Thomas.** Geology, mineral deposits, and geochemical and radiometric anomalies, Serpentine Hot Springs area, Seward Peninsula, Alaska: *U.S. Geol. Survey Bull.* 1312-H, p. H1-H19, illus., tables, geol. map, 1970.
- Sainsbury, C. L.** See *Desborough, George A.* 06893
- 10093 **Sainsbury, C. L.; Hedge, Carl E.; Bunker, Carl M.** Structure, stratigraphy, and isotopic composition of rocks of Seward Peninsula, Alaska [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2502-2503, 1970.

- 03737 **Saint Amant, M.; Strangway, David W.** Dielectric properties of dry, geologic materials: Geophysics, v. 35, no. 4, p. 624-645, illus., table, 1970.
- 03592 **Saint John, Brian E.** Ultra-trace element analysis of carbonate rocks by APDC-MIBK extraction and atomic absorption spectrophotometry: Jour. Sed. Petrology, v. 40, no. 2, p. 537-541, tables, 1970.
- Saint-Amant, Marcel.** See *Gaucher, Edwin*. 04297
- 09622 **Saint-Julien, Pierre.** Geology of Disraeli area (eastern half), Frontenac, Wolfe and Megantic Counties — Preliminary Report: Quebec Dept. Nat. Resources Prelim. Rept. 587, 20 p., tables, geol. map, 1970.
- Saito, Shinroku.** See *Yamaoka, Shinobu*. 10430
- Saito, T.** See *Opdyke, N. D.* 09703
- 07787 **Saito, Tsunemasa; Hillman, Norman S.; Janal, Martin J.** The Brooks F. Ellis and Angelina R. Messina Catalogue of Foraminifera, Supplement for 1970, No. 1: New York, Am. Mus. Nat. History Spec. Pub., [782] p., illus., 1970.
- 09989 **Saito, Tsunemasa; Funnell, Brian M.** Pre-Quaternary sediments and microfossils in the oceans, in *The sea — v. 4, New concepts of sea floor evolution, Pt. 1, General observations* (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 183-204, illus., 1970.
- Saitta-Bertoni, Sandro.** See *Visher, Glenn S.* 02694
- 06187 **Sakamoto, Kenji.** Some techniques for photographing fossils, in *Geological Survey research 1970*, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D230-D232, illus., 1970.
- Sakamoto, Koh.** See *Miller, Donald K.* 01955
- Sakata, S.** See *Takeuchi, H.* 00658
- 10094 **Saks, V. N.; Bassov, V. A.; Dagis, A. A.; Dagis, A. S.; Zakharov, V. A.; Ivanova, E. F.; Meledina, S. V.; Na'l'nyayeva, T. I.; Mesezhnikov, M. S.; Shulgina, N. I.** Jurassic and Neocomian paleozoogeography of Arctic [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2503, 1970.
- 09103 **Saksena, T. K.; Nyborg, W. L.** Sonoluminescence from stable cavitation: Jour. Chem. Physics, v. 53, no. 5, p. 1722-1734, illus., tables, 1970.
- Sakurai, Shunsuke.** See *Adachi, Toshihisa*. 07449
- 04109 **Salas, Guillermo A.** Areal geology and petrology of the igneous rocks of the Santa Ana region, northwest Sonora [with Spanish abs.]: Soc. Geol. Mexicana Bol. 1968, v. 31, no. 1, p. 11-63, illus., tables, geol. map, 1970.
- 09804 **Salas, Guillermo P.; Ojeda Rivera, Jesus.** Geologia, reservas y petrografia de los Carbones mexicanos para la siderurgia [Geology, reserves and petrography of the Mexican coals for the iron industry] Mexico Consejo Recursos Nat. no Renovables Bol. 70, 22 p., illus., tables, 1969.
- Saldukas, R. B.** See *Dutro, J. T., Jr.* 10034
- 04331 **Saleem, Z. A.** A computer method for pumping-test analysis: Ground Water, v. 8, no. 5, p. 21-24, illus., table, 1970.
- 05095 **Salisbury, John W.** Composition of the Moon from balloon-borne mid-infrared observations, in *Symposium on planetary atmospheres and surfaces*, Woods Hole, Mass., 1969: Radio Sci., v. 5, no. 2, p. 241-246, illus., 1970.

**Salisbury, John W.** See *Hunt, Graham R.* 06394

**Salisch, H. A.** See *Raymer, L. L.* 03521

- 07522 **Salotti, C. A.; Heinrich, E. William; Giardini, A. A.** Limestone as raw material for hydrocarbon fuels, in *Forum on Geology of Industrial Minerals*, 6th, Ann Arbor, Mich., 1970, Proc.: Michigan Geol. Survey Miscellany 1, p. 48-55, illus., tables, 1970.

- 01826 **Salotti, Charles A.** The relative measurement of monatomic zinc vapor from franklinite, willemite, and zincite [abs.]: EOS, v. 51, no. 4, p. 437, 1970.

**Salvas, R. J.** See *DeLory, F. A.* 04009

**Sammis, Charles.** See *Anderson, Don L.* 02871

- 03561 **Sammis, Charles; Anderson, Don; Jordan, Tom.** Application of isotropic finite strain theory to ultrasonic and seismological data: Jour. Geophys. Research, v. 75, no. 23, p. 4478-4480, table, 1970.

**Sammis, Charles.** See *Archambeau, Charles.* 03977

**Sammis, Charles.** See *Archambeau, Charles B.* 06046

- 10589 **Sammis, Charles; Jordan, Thomas; Anderson, Don L.** Inhomogeneity of the lower mantle [abs]: EOS, v. 51, no. 11, p. 828, 1970.

- 01681 **Sammis, Charles G.** The pressure dependence of the elastic constants of cubic crystals in the NaCl and spinel structures from a lattice model: Royal Astron. Soc. Geophys. Jour., v. 19, no. 3, p. 285-297, illus., tables, 1970.

- 01971 **Sammis, Charles G.** Elastic constants of lower mantle minerals from a lattice model [abs.]: EOS, v. 51, no. 4, p. 419, 1970.

- 09553 **Samples, Robert E.** Environmental studies, inside out education [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 671-672, 1970.

- 04908 **Sams, Richard H.** The Kingsville dome, Kleberg County, Texas: Corpus Christi Geol. Soc. Bull., v. 11, no. 1, p. 6-9, 12-17, illus., table, 1970.

- 09206 **Samson, L.; Tordon, F.** Experience with engineering site investigations in northern Quebec and northern Baffin Island, in *Canadian Conf. on Permafrost*, 3d, 1969, Proc. (R. J. E. Brown, editor): Natl. Research Council Canada, Associate Comm. Geotech. Research Tech. Memo. 96, p. 21-38, illus., 1969.

- 09384 **San Francisco Bay C. D. Comm.** San Francisco Bay Plan Supplement: Sacramento, Calif., Documents and Publications Branch, 572 p., illus., tables, 1969.

- 09387 **San Francisco Bay C. D. Comm.** (staff). Pollution — summary of report, "water pollution and San Francisco Bay" (1967), in *San Francisco Bay Conserv. and Devel. Comm.*, San Francisco Bay Plan Supplement: Sacramento, Calif., Documents and Publications Branch, p. 25-42, illus., 1969.

- 07791 **Sanchez Z., J.; Villamar V., M.** Procedimiento de laboratorio para la separacion y cuantificacion de las arcillas [Laboratory procedures for separation and quantification of clays]: Inst. Mexicano Petroleo Rev., v. 2, no. 4, p. 76-81, tables, 1970.

- 00353 **Sandberg, Charles A.; Poole, Forrest G.** Conodont biostratigraphy and age of West Range Limestone and Pilot Shale at Bactrian Mountain, Pahranaagat Range, Nevada [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 139, 1970.

**Sandberg, Charles A.** See *Macqueen, Roger W.* 02155

**Sandberg, Charles A.** See *Gutschick, Raymond C.* 02623



**Sandberg, G. W.** See *Sumsion, C. T.* 03063

- 09554 **Sandberg, Philip A.** Skeletal ultrastructure and development in cheilostome bryozoa [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 672, 1970.

**Sanders, John E.** See *Kumar, Naresh.* 00165

- 00177 **Sanders, John E.; Kumar, Naresh; Friedman, G. M.** Shelf-edge carbonates — Anomalies to conventional ideas relating Quaternary climates and sea levels [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 34, 1970.

**Sanders, John E.** See *Friedman, Gerald M.* 03780

- 04079 **Sanders, John E.** Stratigraphy and structure of the Triassic strata of the Gaillard graben, south-central Connecticut: *Connecticut Geol. and Nat. History Survey Guidebook* 3, 15 p., illus., 1970.

**Sanders, John E.** See *Friedman, Gerald M.* 04726

- 09555 **Sanders, John E.; Friedman, Gerald M.; Caldwell, Donald; Kumar, Naresh.** Stratigraphic relationships, brown and gray relict Quaternary shelf sediments [abs]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 672-673, 1970.

- 09876 **Sanders, John E.** Coastal-zone geology and its relationship to water pollution problems, in *Water pollution in the Greater New York area* (Alan A. Johnson, editor): New York, London and Paris, Gordon and Breach, *Sci. Pub.*, p. 23-34; with discussions, p. 35-36, illus., 1970.

**Sanderson, G. A.** See *Verille, G. J.* 02152

- 03543 **Sanderson, G. A.** A bibliography of the family Fusulinidae, addendum 7: *Jour. Paleontology*, v. 44, no. 4, p. 770-775, 1970.

- 04701 **Sanderson, G. A.; Verville, G. J.** Morphologic variability of the genus *Schwagerina* in the Lower Permian Wreford Limestone of Kansas: *Palaeontology*, v. 13, pt. 2, p. 175-183, illus., 1970.

- 05499 **Sanderson, Robert L., Jr.; Reichmuth, Donald R.** Parametric effects on slope stability analysis, in *Engineering geology and soils engineering symposium*, 8th Ann., Pocatello, Idaho, 1970, *Proc.*: Boise, Idaho, Idaho Dept. Highways, p. 109-121, illus., tables, 1970.

- 03099 **Sanderson, Robert Michael.** Prediction equations for building vibrations [abs.]: *Dissert. Abs. Internat.*, Sec. B, *Sci. and Eng.*, v. 30, no. 10, p. 4611B, 1970.

**Sandhu, R. S.** See *Baker, L. E.* 07506

**Sandusky, C. L.** See *Barr, Jim L.* 01661

**Sandy, John.** See *Clements, T. H., Jr.* 07168

**Sandy, John.** See *Clements, T. H., Jr.* 07170

- 04612 **Sanfilippo, Annika; Riedel, W. R.** Post-Eocene "closed" theoperid radiolarians: *Micropaleontology*, v. 16, no. 4, p. 446-462, illus., 1970.

**Sanfilippo, Annika.** See *Riedel, W. R.* 06671

- 00354 **Sanford, Allan; Rush, Clayton; Alptekin, Omer.** Study of a seismically active segment of the Rio Grande rift zone [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 139-140, 1970.

**Sanford, B. V.** See *McGregor, D. C.* 05294

**Sanford, B. V.** See *Stockwell, C. H.* 07971

**Sanford, B. V.** See *Poole, W. H.* 07973

**Sanford, B. V.** See *Rose, E. R.* 08008

**Sanford, B. V.** See *Norris, A. W.* 10914

- 02444 **Sanger, Jon E.; Gorham, Eville.** The diversity of pigments in lake sediments and its ecological significance: *Limnology and Oceanography*, v. 15, no. 1, p. 59-69, tables, 1970.

- 08148 **Sangrey, D. A.** Evidence of glacial readvance over soft-layered sediments near Kingston, Ontario: *Canadian Jour. Earth Sci.*, v. 7, no. 5, p. 1331-1339, illus., table, 1970.

- 03224 **Sangrey, Dwight A.; Shanker, N. Babu.** Property interrelationships in sensitive clays — Discussion [of paper 6666 by W. N. Houston and J. K. Mitchell, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, Jour. Soil Mechanics and Found. Div., no. SM 3, p. 1067-1071, illus., table, 1970.

- 03454 **Sangster, A. L.; McCartney, W. D.** Metallogeny of the Grenville province of southeastern Ontario [abs.]: *Canadian Mining and Metall. Bull.*, v. 63, no. 695, p. 283, 1970.

- 04535 **Sangster, D. F.** Geological exploration guides for Canadian lead-zinc deposits in carbonate rocks: *Canadian Mining Jour.*, v. 91, no. 4, p. 49-51, table, 1970.

- 06448 **Sangster, D. F.** Metallogenesis of some Canadian lead-zinc deposits in carbonate rocks [with French abs.]: *Geol. Assoc. Canada Proc.*, v. 22, p. 27-36, illus., 1970.

**Santoliquido, P. M.** See *Ehmann, W. D.* 04781

- 05314 **Sanz, H. G.; Burnett, D. S.; Wasserburg, G. J.** A precise  $^{87}\text{Rb}/^{87}\text{Sr}$  age and initial  $^{87}\text{Sr}/^{86}\text{Sr}$  for the Colomera iron meteorite: *Geochim. et Cosmochim. Acta*, v. 34, no. 11, p. 1227-1239, illus., tables, 1970.

**Sapp, Cecil D.** See *Viksne, Andris.* 09789

**Sappenfield, K. M.** See *Barnes, I. L.* 10606

**Sappenfield, K. M.** See *Murphy, T. J.* 10607

- 00355 **Saragoni, Rudolfo; Hart, Gary C.** Nonstationary frequency content of earthquake bedrock motions [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 140, 1970.

- 00356 **Sargent, K. A.; Houser, F. N.** The Shingle Pass Tuff of central Nevada [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 140-141, 1970.

**Sargent, K. A.** See *McKay, Edward J.* 04513

- 05400 **Sargent, K. A.; McKay, Edward J.; Burchfiel, B. C.** Geologic map of the Striped Hills quadrangle, Nye County, Nevada: *U.S. Geol. Survey Geol. Quad. Map GQ-882*, scale 1:24,000, sections, 1970.

**Sargianis, Perry.** See *Senftle, Frank E.* 02932

- 09175 **Sarjeant, William Antony S.; Anderson, Roger Y.** A re-examination of some dinoflagellate cysts from the uppermost Lewis Shale (Late Cretaceous), New Mexico (U.S.A.): *rev. Palaeobotany and Palynology*, v. 9, nos. 3-4, p. 229-237, illus., 1969.

**Sarma, K. V. N.** See *Krishnamurthy, M.* 05239

- 02867 **Sartz, Richard S.** Natural freezing and thawing in a silt and a sand: *Soil Sci.*, v. 109, no. 5, p. 319-323, illus., tables, 1970.

**Sass, Daniel B.** See *Barnes, Christopher R.* 01050

00357 **Sass, J. H.** Heat flow in relation to the major structures of central California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 141, 1970.

03647 **Sass, J. H.; Munroe, Robert J.** Heat flow from deep boreholes in two island arcs: *Jour. Geophys. Research*, v. 75, no. 23, p. 4387-4395, illus., tables, 1970.

**Sato, Motoaki.** See *Huebner, J. Stephen.* 06511

09098 **Sato, Motoaki.** An electrochemical method of oxygen fugacity control of furnace atmosphere for mineral syntheses: *Am. Mineralogist*, v. 55, nos. 7-8, p. 1424-1431, illus., 1970.

**Sato, Y.** See *Landisman, M.* 03980

03816 **Satterly, J.** (compiler). Aeromagnetic maps of carbonatite-alkalic complexes in Ontario: Ontario Dept. Mines and Northern Affairs Prelim. Map P. 452 (revised), scales about 1 in. to 67 mi. and 1 in. to 4 mi., text, 1970; originally published 1968.

**Satyanarayana, K. V. S.** See *Krishna Murti, G. S. R.* 08027

10234 **Saucier, K. L.** Tests of rock cores Warren II study area, Wyoming: U.S. Army Corps Engineers Waterways Expt. Sta. Misc. Paper C-70-17, 98 p., illus., tables, 1970.

10237 **Saucier, K. L.; Buck, A. D.** Tests of rock cores Bergstrom study area, Texas: U.S. Army Corps Engineers Waterways Expt. Sta. Misc. Paper C-70-4, 134 p., illus., tables, 1970.

**Saucier, K. L.** See *Crisp, R. W.* 10238

10240 **Saucier, K. L.; Crisp, R. W.** Tests of rock cores Castle study area, California: U.S. Army Corps Engineers Waterways Expt. Sta. Misc. Paper C-69-16, 128 p., illus., tables, 1969.

00562 **Saucier, Roger T.; Fleetwood, Arthur R.** Origin and chronologic significance of late Quaternary terraces, Ouachita River, Arkansas and Louisiana: *Geol. Soc. America Bull.*, v. 81, no. 3, p. 869-890, illus., geol. map, tables, 1970.

04465 **Saucier, Roger T.** Origin of the St. Francis Sunk Lands, Arkansas and Missouri: *Geol. Soc. America Bull.*, v. 81, no. 9, p. 2847-2854, illus., 1970.

**Sauer, E. K.** See *MacDonald, A. B.* 06358

**Sauer, E. Karl.** See *MacDonald, A. B.* 02901

**Sauer, Herbert I.** See *Shacklette, Hansford T.* 00002

10491 **Sauer, Stanley P.; Pinder, George F.** Numerical simulation of flood wave modification due to bank storage [abs]: *EOS*, v. 51, no. 11, p. 747, 1970.

09556 **Saul, William E.; Peyrot, Alain H.** Second order effects on the earthquake response of multi-story postelastic buildings [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 673-674, 1970.

**Saunders, R. Stephen.** See *Smith, Norman D.* 01540

05817 **Savage, C. N.** Evaluation of minerals and mineral potential of the Salmon River drainage basin in Idaho: Idaho Bur. Mines and Geology Pamph. 147, 64 p., illus., tables, 1970.

04387 **Savage, Donald E.; Curtis, Garniss H.** The Villafranchian Stage-age and its radiometric dating, in *Radiometric dating and paleontologic zonation*: *Geol. Soc. America Spec. Paper* 124, p. 207-231, illus., tables, 1970.

- Savage, J. C.** See *Neave, K. G.* 00456
- Savage, J. C.** See *Pandit, B. I.* 01965
- Savage, J. C.** See *Hastie, L. M.* 04338
- 06464 **Savage, J. C.; Burford, R. O.** Accumulation of tectonic strain in California: *Seismol. Soc. America Bull.*, v. 60, no. 6, p. 1877-1896, illus., tables, 1970.
- 00358 **Savage, James C.** Migration of seismic activity along the west coast of North America [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 141, 1970.
- 01827 **Savage, James C.; Burford, Robert O.** Strain accumulation near Cholame, California, from 1932 to 1962 [abs.]: *EOS*, v. 51, no. 4, p. 427, 1970.
- Savage, W. U.** See *Boucher, Gary W.* 01626
- 00949 **Savin, Samuel M.; Epstein, Samuel.** The oxygen and hydrogen isotope geochemistry of clay minerals: *Geochim. et Cosmochim. Acta*, v. 34, no. 1, p. 25-42, illus., tables, 1970.
- 00974 **Savin, Samuel M.; Epstein, Samuel.** The oxygen and hydrogen isotope geochemistry of ocean sediments and shales: *Geochim. et Cosmochim. Acta*, v. 34, no. 1, p. 43-63, illus., tables, 1970.
- 01732 **Savin, Samuel M.; Epstein, Samuel.** The oxygen isotopic compositions of coarse grained sedimentary rocks and minerals: *Geochim. et Cosmochim. Acta*, v. 34, no. 3, p. 323-329, tables, 1970.
- Savin, Samuel M.** See *Hecht, Alan D.* 04673
- Savin, Samuel M.** See *Hecht, Alan D.* 07016
- Savin, Samuel M.** See *Hecht, Alan D.* 10174
- Savino, J.** See *Molnar, P.* 09680
- Savino, John.** See *Molnar, Peter.* 01288
- 01633 **Savino, John; Sykes, Lynn R.; Liebermann, Robert C.; Murphy, Andrew; Kelleher, John.** Tectonic strain release by the underground nuclear explosions JORUM and MILROW [abs.]: *EOS*, v. 51, no. 3, p. 204, 1970.
- Sawa, Takashi.** See *Conkin, James E.* 04515
- 07183 **Sawatzky, P.** A miniaturized digital data acquisition system for high resolution magnetometer surveying: *Canada Geol. Survey Paper* 70-59, 95 p., illus., tables, 1970.
- Sawdo, Richard M.** See *Simon, Ivan.* 01868
- 03121 **Sawhney, B. L.** Potassium and cesium ion selectivity in relation to clay mineral structure [with French, German and Russian abs.]: *Clays and Clay Minerals*, v. 18, no. 1, p. 47-52, illus., tables, 1970.
- 10746 **Sawyer, K. E.** Landscape studies — An introduction to geomorphology: [London], Edward Arnold (Pub.) Ltd., 148 p., illus., 1970.
- 07223 **Saxena, G. S.; Franklin, R. E.; Taylor, George S.** Importance of pulse-height analysis in the gamma-ray attenuation technique for measurement of soil moisture: *Soil Sci.*, v. 110, no. 4, p. 283-286, illus., table, 1970.
- 01828 **Saxena, Surendra K.; Ghose, Subrata.** Mg-Fe distribution isotherms at 500 and 800°C in orthopyroxenes [abs.]: *EOS*, v. 51, no. 4, p. 436, 1970.

**Saxena, Surendra K.** See *Mueller, Robert F.* 06794

- 09087 **Saxena, Surendra K.; Ghose, Subrata.** Order-disorder and the activity-composition relation in a binary crystalline solution — [Pt.] 1, Metamorphic orthopyroxene: *Am. Mineralogist*, v. 55, nos. 7-8, p. 1219-1225, illus., 1970.
- 09557 **Saxena, Surendra K.; Ghose, Subrata.**  $Mg^{2+}$ - $Fe^{2+}$  order-disorder and the thermodynamics of the orthopyroxene crystalline solution [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 675, 1970.
- 10595 **Saxena, Surendra K.**  $Mg^{2+}$ - $Fe^{2+}$  order-disorder in orthopyroxene and the  $Mg^{2+}$ - $Fe^{2+}$  distribution between coexisting minerals [abs.]: *EOS* v. 51, no. 11, p. 829, 1970.
- 03724 **Saxena, Surendra Kumar.** A statistical approach to the study of phase equilibria in multicomponent systems: *Lithos*, v. 3, no. 1, p. 25-36, illus., tables, 1970.
- Sayles, F. L.** See *Manheim, F. T.* 02652
- Sayles, F. L.** See *Manheim, F. T.* 04375
- 06666 **Sayles, F. L.; Manheim, F. T.; Chan, K. M.** Interstitial water studies on small core samples, Leg 4, Chap. 19 in Initial reports of the Deep Sea Drilling Project — V. 4, Leg 4 of cruises of *Glomar Challenger*, Rio de Janeiro, Brazil, to San Cristobal, Panama, Feb.-Mar. 1969 (R. G. Bader, and others): Washington, D. C., U.S. Govt. Printing Office, p. 401-414, tables, 1970.
- Sayles, F. L.** See *Manheim, F. T.* 07151
- 01829 **Sayles, Fred L.** Crystallization of magnesite and dolomite [abs.]: *EOS*, v. 51, no. 4, p. 452, 1970.
- 01972 **Sayles, Fred L.; Manheim, Frank T.; Chan, Kwan M.** Pore water diagenesis in deep cores from the Atlantic [abs.]: *EOS*, v. 51, no. 4, p. 327, 1970.
- Sayles, Fred L.** See *Bader, Richard G.* 06657
- 06673 **Sayles, Fred L.** Preliminary geochemistry, Chap. 26 in Initial reports of the Deep Sea Drilling Project — V. 4, Leg 4 of cruises of *Glomar Challenger*, Rio de Janeiro, Brazil, to San Cristobal, Panama, Feb.-Mar. 1969 (R. G. Bader, and others): Washington, D. C., U.S. Govt. Printing Office, p. 645-655, illus., table, 1970.
- Saylor, Timothy E.** See *Lapham, Davis M.* 09507
- Sayre, J. G.** See *Davies, Tudor T.* 00692
- Sayre, William W.** See *Jobson, Harvey E.* 01610
- 03437 **Sayre, William W.** Dispersion of silt particles in open channel flow — Closure [to discussion of paper 6579, 1969, with errata]: *Am. Soc. Civil Engineers Proc.*, v. 96, Jour. Hydraulics Div., no. HY 8, p. 1722-1723, 1970.
- 02282 **Sayyah, Taha; Gast, Paul W.; Whelan, J. A.** Raft River Range, in Radioactive and isotopic age determinations of Utah rocks: *Utah Geol. and Mineralog. Survey Bull.* 81 (*Utah Univ. Bull.*, v. 61, no. 18; *Utah Eng. Expt. Sta. Bull.* 135), p. 19, 1970.
- 01973 **Sbar, Marc L.; Rynn, John M. W.; Gumper, Frank J.; Lahr, John C.** An earthquake sequence and focal mechanism at Lake Hopatcong, northern New Jersey [abs.]: *EOS*, v. 51, no. 4, p. 352, 1970.
- 04431 **Sbar, Marc L.; Rynn, John M. W.; Gumper, Frank J.; Lahr, John C.** An earthquake sequence and focal mechanism solution, Lake Hopatcong, northern New Jersey: *Seismol. Soc. America Bull.*, v. 60, no. 4, p. 1231-1243, illus., 1970.

- 09558 **Sbar, Marc L.; Barazangi, Muawia.** Tectonics of the intermountain seismic belt, western United States — Pt. 1, Microearthquake seismicity and composite fault plane solutions [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 675, 1970.
- Schaber, G. G.** See *Shoemaker, E. M.* 06294
- 02847 **Schaber, Gerald G.** Radar and infrared in geological studies of northern Arizona, in *Earth resources aircraft program status review*, NASA, Houston, 1968 — V. 1, Geology, geography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 13-1 — 13-29, illus., [1970].
- 04169 **Schabillon, J. T.** *Sphenophyllum lescurianum*, morphology, development, and taxonomic implications [abs.]: *Am. Jour. Botany*, v. 57, no. 6, pt. 2, p. 756, 1970.
- 00580 **Schaeffer, Bobb; Mangus, Marlyn.** *Synorichthys* sp. (Palaeonisciformes) and the Chinle-Dockum and Newark (Upper Triassic) fish faunas: *Jour. Paleontology*, v. 44, no. 1, p. 17-22, illus., table, 1970.
- 08568 **Schaeffer, Bobb.** Mesozoic fishes and climate, in *Paleoclimatology — North Am. Paleont. Convention*, Chicago, Ill., 1969, Proc., Pt. D: Lawrence, Kans., Allen Press, p. 376-388, illus., 1970.
- Schaeffer, O. A.** See *Turekian, K. K.* 01700
- Schaeffer, O. A.** See *Funkhouser, J. G.* 05691
- 06437 **Schaeffer, O. A.; Funkhouser, J. G.; Bogard, D. D.; Zähringer, J.** Potassium-argon ages of lunar rocks from Mare Tranquillitatis and Oceanus Procellarum: *Science*, v. 170, no. 3954, p. 161-162, illus., table, 1970.
- 07747 **Schaeffer, R. M.; Schwarz, E. J.** The Mid-Atlantic Ridge near 45° N. — [Pt.] 9, Thermomagnetism of dredged samples of igneous rocks: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 268-273, illus., table, 1970.
- Schaem, William E.** See *Eckel, Edwin B.* 04962
- 02453 **Schafer, C. T.** Distribution of foraminifera along the west coasts of Hudson and James Bays, a preliminary report: *Maritime Sediments*, v. 5, no. 3, p. 90-94, illus., table, 1969 [1970].
- 09827 **Schafer, C. T.** Studies of benthonic Foraminifera in the Restigouche Estuary — [Pt.] 1, Faunal distribution patterns near pollution sources: *Maritime Sediments*, v. 6, no. 3, p. 121-134, illus., tables, 1970.
- 02105 **Schafer, Charles; Brooke, John.** Cores from the crest of the Mid-Atlantic Ridge: *Geotimes*, v. 15, no. 3, p. 14-16, illus., table, 1970.
- Schairer, J. F.** See *Kushiro, I.* 02250
- Schairer, J. F.** See *Mao, H. K.* 02253
- 02256 **Schairer, J. F.; Yoder, H. S., Jr.** Critical planes and flow sheet for a portion of the system  $\text{CaO-MgO-Al}_2\text{O}_3\text{-SiO}_2$  having petrological applications: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 202-214, illus., 1970.
- 02675 **Schanz, John J., Jr.** Economic aspects of exploration and development of mineral resources, viewpoint of educator [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 868, 1970.
- Scharff, John.** See *Jackman, E. R.* 05921
- 03484 **Schau, M. P.** RB/SR, S, and O isotopic analyses indicating source and date of contact metasomatic copper deposits, Craigmont, British Columbia, Canada — Discus-

sion [of paper by L. Christmas and others, 1969]: *Econ. Geology*, v. 65, no. 1, p. 62-63, table, 1970.

- 03281 **Schau, Mikkel.** Stratigraphy and structure of the type area of the Upper Triassic Nicola Group in south-central British Columbia, in *Structure of the southern Canadian Cordillera*: Geol. Assoc. Canada Spec. Paper 6, p. 123-135, illus., table, 1970.

- 01579 **Schau, Mikkel Paul.** Geology of the Upper Triassic Nicola Group in south central British Columbia [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 9, p. 4210B, 1970.

- 04165 **Scheckler, S. E.; Banks, H. P.** Evolutionary trends in primitive progymnosperms [abs.]: *Am. Jour. Botany*, v. 57, no. 6, pt. 2, p. 755-756, 1970.

**Scheidegger, A. E.** See *Thakur, T.* 01989

- 02462 **Scheidegger, A. E.** On the theory of evolution of river nets: *Internat. Assoc. Sci. Hydrology Bull.*, v. 15, no. 1, p. 109-114, illus., tables, 1970.

- 03424 **Scheidegger, A. E.** Comment on 'Comparison of Smart and Scheidegger stream length models' by J. S. Smart [1969]: *Water Resources Research*, v. 6, no. 3, p. 996-997, 1970.

- 05007 **Scheidegger, A. E.** On the rheology of rock creep [with German and French abs.]: *Rock Mechanics*, v. 2, no. 3, p. 138-145, 1970.

**Scheidegger, A. E.** See *Thakur, T. R.* 06932

- 04977 **Scheidegger, Adrian E.** Theoretical geomorphology (2d, revised edition): Berlin, Germany, and New York, Springer-Verlag, 435 p., illus., tables, 1970; originally published 1961.

- 05043 **Scheidegger, Adrian E.** The large-scale tectonic stress field in the earth, [Chap.] 10 in *The megatectonics of continents and oceans* (Helgi Johnson and Bennett L. Smith, editors): New Brunswick, N. J., Rutgers Univ. Press, p. 223-240, illus., 1970.

**Scheiner, Bernard J.** See *Radtko, Arthur S.* 04308

- 04519 **Schell, E. M.; Moore, K. P.** Stratigraphic sections and chemical analyses of phosphatic rocks of Permian and Mississippian age in Weber County, Utah: U.S. Geol. Survey Circ. 635, 11 p., illus., tables, 1970.

- 05602 **Schell, I. I.** On the absolute fall of sea level during the Quaternary — A discussion [of paper by J. W. Holmes, 1969]: *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 8, no. 1, p. 67-68, 1970.

**Schell, W. W.** See *Powell, J. Dan.* 06030

**Schelske, J. E.** See *Morawski, F. P.* 04801

- 08332 **Schenk, E.** Permafrost and frost structures in the subarctic area [with French abs.] in *Ecology of the subarctic regions, V. 1 of Ecology and conservation — A symposium*, Helsinki, 1966, *Proc.*: Paris, UNESCO, p. 155-159, tables, 1970.

- 05303 **Schenk, P. E.** Regional variation of the flysch-like Meguma Group (Lower Paleozoic) of Nova Scotia, compared to recent sedimentation off the Scotian Shelf, in *Flysch sedimentology in North America*: Geol. Assoc. Canada Spec. Paper 7, p. 127-153, illus., 1970.

- 03291 **Scherer, G.; Vergano, P. J.; Uhlmann, D. R.** A study of quartz melting: *Physics and Chemistry Glasses*, v. 11, no. 3, p. 53-58, illus., tables, 1970.

**Scheuch, Jörn.** See *Kullmann, Jürgen.* 05982

- 04680 **Schiemer, E. W.; Schubel, J. R.** A near-bottom suspended sediment sampling system for studies of resuspension: *Limnology and Oceanography*, v. 15, no. 4, p. 644-646, illus., 1970.
- 02353 **Schiffman, Robert L.; Whitman, Robert V.; Jordan, Jane C.** Settlement problem oriented computer language: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7178, *Jour. Soil Mechanics and Found. Div.*, no. SM2, p. 649-669, illus., tables, 1970.
- 03675 **Schiffman, Robert L.** The stress components of a porous medium: *Jour. Geophys. Research*, v. 75, no. 20, p. 4035-4038, 1970.
- 04226 **Schiffman, Robert L.; Chen, Albert T-F.; Jordan, Jane C.** An analysis of consolidation theories — Closure [to discussion of paper 6370, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, *Jour. Soil Mechanics and Found. Div.*, no. SM5, p. 1793-1795, 1970.
- 10905 **Schillat, Bodo.** Discussion of the detection of prehistoric earthquakes from fractured cave structures [by Arthur L. Lange, 1970]: *Caves and Karst*, v. 12, no. 5, p. 33-36, illus., 1970.
- 04321 **Schiller, W.-R.; Gehlen, K. V.; Nielsen, H.** Hydrothermal exchange and fractionation of sulfur isotopes in synthesized ZnS and PbS: *Econ. Geology*, v. 65, no. 3, p. 350-352, illus., tables, 1970.
- 09053 **Schindler, Peter; Ghose, Subrata.** Electron paramagnetic resonance of  $Mn^{2+}$  in dolomite and magnesite, and  $Mn^{2+}$  distribution in dolomites: *Am. Mineralogist*, v. 55, nos. 11-12, p. 1889-1896, illus., table, 1970.
- Schiner, George R.** See *Kimmel, Grant E.* 02125
- 00491 **Schirner, Silas W.** Study of student outcomes in earth science classes [abs.]: *Texas Jour. Sci.*, v. 21, no. 3, p. 375-376, 1970.
- 02676 **Schlaepfer, Carmen J.; Pablo Galán, Liberto de.** Clay mineralogy of series of redbeds in State of Oaxaca, Mexico, and its geologic significance [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 868, 1970.
- 04030 **Schlee, John; Pratt, Richard M.** Atlantic continental shelf and slope of the United States — Gravels of the northeastern part: *U.S. Geol. Survey Prof. Paper* 529-H, p. H1-H30, illus., 1970.
- Schleicher, D. L.** See *Shoemaker, E. M.* 06294
- 05335 **Schleicher, John A.; Kuhn, John K.** Studies of Lake Michigan bottom sediments — No. 5, Phosphorus content in unconsolidated sediments from southern Lake Michigan: *Illinois Geol. Survey Environmental Geology Note* 39, 15 p., illus., tables, 1970.
- 07250 **Schleicher, John A.; Heck, David B.** Alternate methods for the determination of boron in silicates, in *Developments in applied spectroscopy*, V. 8 — *Mid-America Spectroscopy Symposium*, 20th Ann., Chicago, Ill., 1969, Selected papers: New York and London, Plenum Press, p. 138-142, illus., tables, 1970.
- Schleifer, S.** See *Bhattacharji, S.* 10598
- 02013 **Schloessin, H. H.; Beck, A. E.** On the pressure and temperature dependence of lattice thermal conductivity of enstatite, silica, and pyrophyllite [abs.]: *EOS*, v. 51, no. 4, p. 420, 1970.
- Schlue, J. W.** See *Knopoff, L.* 07310
- Schlueter, Roger S.** See *Allen, Alan A.* 05607



00178 **Schmalz, Robert F.** Surface energy measurements for calcite, and textural equilibria of carbonate cements [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 34-35, 1970.

05264 **Schmertmann, J. H.** Suggested method for screw-plate load test, in *Special procedures for testing soil and rock for engineering purposes* (5th edition): Am. Soc. Testing and Materials Spec. Tech. Pub. 479, p. 81-85, illus., 1970.

**Schmid, Werner E.** See *Soydemir, Çetin*. 06778

03960 **Schmidt, Birger.** Gravitational stress field around a tunnel in soft ground — Discussion [of paper by B. Hoyaux and B. Ladanyi, 1970]: Canadian Geotech. Jour., v. 7, no. 3, p. 346-348, 1970.

04386 **Schmidt, Birger.** State of predictive art in subsidence engineering — Discussion [of paper 7187 by B. Voigt and W. Pariseau, 1970]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Soil Mechanics and Found. Div., no. SM5, p. 1841-1843, 1970.

06590 **Schmidt, Birger.** Settlements and ground movements associated with tunneling in soils [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 671B-672B, 1970.

03379 **Schmidt, Dwight L.; Mackin, J. Hoover.** Quaternary geology of Long and Bear Valleys, west-central Idaho: U.S. Geol. Survey Bull. 1311-A, p. A1-A22, illus., geol. maps, 1970.

05514 **Schmidt, Norbert O.; Tinoco, Fernando H.; Green, William Joel.** The effects of organic content, temperature, and stress level on the secondary consolidation of a clay, in *Engineering geology and soils engineering symposium*, 8th Ann., Pocatello, Idaho, 1970, Proc.: Boise, Idaho, Idaho Dept. Highways, p. 219-234, illus., table, 1970.

**Schmidt, V.** See *Dunn, J.* 10487

02677 **Schmidt, Volkmar.** Diagenesis of Keg River bioherms, Rainbow Lake, Alberta [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 868, 1970.

**Schmidt-Bleck, F.** See *Laul, J. C.* 00955

**Schmidt-Bleck, F.** See *Laul, J. C.* 03651

**Schmitt, R. A.** See *Rey, P.* 04232

**Schmitt, R. A.** See *Wakita, H.* 05729

**Schmitt, R. A.** See *Wakita, H.* 06848

**Schmitt, R. A.** See *Borchardt, G. A.* 07851

**Schmitt, Roman A.** See *Wakita, Hiroshi.* 04071

**Schmitt, Roman A.** See *Goles, Gordon G.* 05694

**Schmitt, Roman A.** See *Wakita, Hiroshi*. 06838

**Schmitter-Villada, Eduardo.** See *Cserna, Zoltan de*. 04180

- 08312 **Schmucker, Ulrich.** Anomalies of geomagnetic variations in the southwestern United States: California Univ. Scripps Inst. Oceanography Bull., v. 13, 165 p., illus., tables, 1970.

- 09104 **Schneer, Cecil J.** Morphological basis for the reticular hypothesis: *Am. Mineralogist*, v. 55, nos. 9-10, p. 1466-1488, illus., 1970.

- 01102 **Schneider, Allan F.; Reshkin, Mark.** Age and correlation of the Glenwood stage of glacial Lake Chicago [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 404, 1970.

- 04880 **Schneider, Allan F.** A significant Pleistocene exposure in south-central Indiana: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 3079-3083, illus., 1970.

**Schneider, Arland D.** See *Jones, Ordie*. 08711

**Schneider, Arland D.** See *Aronovici, V. S.* 08715

- 08717 **Schneider, Arland D.; Wiese, Allen F.; Jones, Ordie R.** Movement and recovery of herbicides in the Ogallala aquifer, in *Ogallala Aquifer Symposium*, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, p. 219-226, illus., table, 1970.

- 07436 **Schneider, Bernard.** Evaluation of geological factors in rock engineering, Chap. 3 in *Rock mechanics, theory and practice* — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 43-56, illus., 1970.

**Schneider, E. D.** See *Vogt, P. R.* 03670

- 05795 **Schneider, E. D.; Johnson, G. L.** Deep-ocean diapiric occurrences: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 11, p. 2151-2169, illus., 1970.

- 08356 **Schneider, E. D.; Johnson, G. L.** Deep ocean diapiric structures [with French and German abs.], in *The Geology of the East Atlantic Continental Margin* — IC-SU/SCOR Working Party 31 Symposium, Cambridge, England, 1970, [Pt.] 1, General and Economic Papers: [Great Britain] Inst. Geol. Sci. Rept., no. 70-13, p. 153-175, illus., 1970.

- 00642 **Schneider, Gary B.** Cenozoic stratigraphy of the Madison Bluffs area, Gallatin County, Montana [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 348, 1970.

- 01635 **Schneider, H.; Gelpi, E.; Bennett, E. O.; Oró, J.** Fatty acids of geochemical significance in microscopic algae: *Phytochemistry*, v. 9, no. 3, p. 613-617, tables, 1970.

**Schneider, H.** See *Gelpi, E.* 01683

- 06023 **Schneider, Howard John.** Paleobiochemistry of algae [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5619B, 1970.

**Schneider, William J.** See *Thomas, Harold E.* 02035

- 05840 **Schneider, William J.** Hydrologic implications of solid-waste disposal: *U.S. Geol. Survey Circ.* 601-F, p. F1-F10, illus., tables, 1970.

- 05717 **Schoen, Robert; Rye, Robert O.** Sulfur isotope distribution in solfataras, Yellowstone National Park: *Science*, v. 170, no. 3962, p. 1082-1084, illus., table, 1970.

**Schnetzler, C. C.** See *Philpotts, John A.* 06108

- 06850 **Schnetzler, C. C.; Philpotts, J. A.; Bottino, M. L.** Li, K, Rb, Sr, Ba and rare-earth concentrations, and Rb-Sr age of lunar rock 12013: Earth and Planetary Sci. Letters, v. 9, no. 2, p. 185-192, illus., table, 1970.
- Schnetzler, Charles C.** See *Philpotts, John A.* 09716
- 07854 **Schnitzer, M.; Ogner, G.** The occurrence of fatty acids in fulvic acid, a soil humic fraction: Israel Jour. Chemistry, v. 8, no. 3, p. 505-512, illus., 1970.
- Schnitzer, Morris.** See *Ogner, Gunnar.* 04558
- Schnoes, H. K.** See *Simoneit, B. R.* 00943
- 10400 **Schnoes, H. K.; Burlingame, A. L.** Applications of mass spectrometry to organic geochemistry, in Topics in organic mass spectrometry (A. L. Burlingame, editor), V. 8 of Advances in analytical chemistry and instrumentation: New York and London, Wiley-Interscience, p. 369-439, illus., 1970.
- 04637 **Schock, Hans H.; Puchelt, Harold R.** Distribution of Rb and Cs in potassium salts, experimental and analytical investigations, in Third symposium on salt, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 232-238, illus., tables, 1970.
- Schock, R. N.** See *Stephens, D. R.* 04127
- 07903 **Schock, R. N.** Dynamic elastic moduli of rocks under pressure, in Symposium on engineering with nuclear explosives — Am. Nuclear Soc. and U.S. Atomic Energy Comm., Las Vegas, Nev., 1970, Proc., V. 1: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., p. 110-126, illus., 1970.
- 10582 **Schock, R. N.; Duba, A.** Precise determination of the deformational properties of rocks to 4 kb confining pressure [abs]: EOS, v. 51, no. 11, p. 827, 1970.
- Schoelen, John.** See *Bell, John.* 04758
- 03167 **Schoen, Robert; Roberson, Charles E.** Structures of aluminum hydroxide and geochemical implications: Am. Mineralogist, v. 55, nos. 1-2, p. 43-77, illus., tables, 1970.
- 05471 **Schoen, Robert; Rye, Robert O.** Sulfur isotope distribution in solfataras, Yellowstone National Park: Science, v. 170, no. 3962, p. 1082-1084, illus., table, 1970.
- 09404 **Schoen, Robert; Rye, Robert O.** Distribution of sulfur isotopes in solfataras, Yellowstone National Park [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.], p. 118, 1970.
- 02966 **Schoenfeld, I.** Spectrographic determination of fluorine in standard rocks: Appl. Spectroscopy, v. 24, no. 3, p. 359-361, tables, 1970.
- Schoenwetter, J.** See *Oldfield, F.* 10186
- 09197 **Schoenwetter, James.** Archaeological pollen analysis — Purposes, methods, and results [abs.], in Perkins, B. F. (editor), Geoscience and Man — v. 1, Am. Assoc. Stratig. Palynologists Ann. Mtg., 1st 1968, Proc.: baton Rouge, La., Louisiana State Univ. School of Geoscience, p. 134, 1970.
- Scholl, D. W.** See *Marlow, M. S.* 01365
- 00062 **Scholl, David W.; vonHuene, Roland.** Comments on paper by R. L. Chase and E. T. Bunce, "Underthrusting of the eastern margin of the Antilles by the floor of the western North Atlantic Ocean, and origin of the Barbados ridge" [1969]: Jour. Geophys. Research, v. 75, no. 2, p. 488-490, illus., 1970.

- 00359 **Scholl, David W.; Marlow, Michael S.; Creager, Joe S.; Holmes, Mark L.; Wolf, Stephen C.; Cooper, Alan K.** A search for the seaward extension of the Kaltag fault beneath the Bering Sea [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 141-142, 1970.
- 01592 **Scholl, David W.; Marlow, Michael S.** Diapirs and diapirlike structures, southeastern Bering Sea [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 3, p. 555-556, 1970.
- 03531 **Scholl, David W.; Buffington, Edwin C.; Hopkins, David M.; Alpha, Tau Rho.** The structure and origin of the large submarine canyons of the Bering Sea: *Marine Geology*, v. 8, nos. 3-4, p. 187-210, illus., 1970.
- 04540 **Scholl, David W.; Marlow, Michael S.** Diapirlike structures in southeastern Bering Sea: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 9, p. 1644-1650, illus., 1970.
- 05962 **Scholl, David W.; Greene, H. Gary; Marlow, Michael S.** Eocene age of the Adak 'Paleozoic(?)' rocks, Aleutian Islands, Alaska: *Geol. Soc. America Bull.*, v. 81, no. 12, p. 3583-3591, illus., table, 1970.
- Scholl, David W.** See *Hopkins, David M.* 10055
- 10095 **Scholl, David W.; Buffington, Edwin C.** Structural evolution of Bering continental margin — Cretaceous to Holocene [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, abs. *Papers: Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2503, 1970.
- 05973 **Scholten, Robert.** Origin of the disturbed belt in northwestern Montana — Discussion [of paper by M. R. Mudge, 1970]: *Geol. Soc. America Bull.*, v. 81, no. 12, p. 3789-3792, 1970.
- 01439 **Scholz, C. H.** Comments on paper by J. C. Savage and B. B. Mohanty, 'Does creep cause fracture in brittle rocks?' [1969]: *Jour. Geophys. Research*, V. 75, no. 11, p. 2148-2150, illus., 1970.
- 01830 **Scholz, C. H.; Fitch, T.** Strain and creep in central California [abs.]: *EOS*, v. 51, no. 4, p. 427, 1970.
- 01831 **Scholz, C. H.; Page, Robert.** Buckling in island arcs [abs.]: *EOS*, v. 51, no. 4, p. 429, 1970.
- Scholz, C. H.** See *Gumper, Frank J.* 01918
- 03559 **Scholz, C. H.; Fitch, Thomas J.** Strain and creep in central California: *Jour. Geophys. Research*, v. 75, no. 23, p. 4447-4453, illus., tables, 1970.
- Scholz, C. H.** See *Sylvester, Arthur G.* 04332
- Scholz, Christopher.** See *Anderson, Orson L.* 06267
- 09137 **Scholz, Christopher.** The role of microfracturing in rock deformation [with French and German summ.], in *Internat. Soc. Rock Mechanics Cong.*, 2d, Belgrade, Yugoslavia, 1970, *Proc.*, V. 1: Belgrade, Jaroslav Cerni Inst. Devel. Water Resources, p. 323-327, illus., 1970.
- 10583 **Scholz, Christopher H.** Static fatigue of quartz [abs]: *EOS*, v. 51, no. 11, p. 827, 1970.
- Schonfeld, Ernest.** See *O'Kelley, G. Davis.* 05712
- Schoon, C. L.** See *Carlisle, V. W.* 07054
- 10875 **Schoon, Robert A.** (compiler). Results from drill stem tests of oil tests in South Dakota drilled before July 1, 1970: *South Dakota Geol. Survey Circ.* 41, 57 p., 1970.

- 03908 **Schopf, J. M.; Schwietering, J. F.** The *Foerstia* zone of the Ohio and Chattanooga Shales: U.S. Geol. Survey Bull. 1294-H, p. H1-H15, illus., 1970.
- 00545 **Schopf, J. William.** Electron microscopy of organically preserved Precambrian microorganisms: Jour. Paleontology, v. 44, no. 1, p. 1-6, illus., 1970.
- Schopf, J. William.** See *Smith, J. W.* 03638
- 05750 **Schopf, J. William.** Micropaleontological studies of Apollo 11 lunar samples, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1933-1934, illus., 1970.
- 09333 **Schopf, J. William.** Precambrian micro-organisms and evolutionary events prior to the origin of vascular plants, in Major evolutionary events and the geological record of plants — Symposium, Internat. Bot. Cong., 11th, Seattle, Wash., 1969: Cambridge Philos. Soc. Biol. Rev., v. 45, no. 3, p. 319-352, illus., 1970.
- 00555 **Schopf, Thomas J. M.; Simpson, Dale R.** A method for finding conodonts in large, nearly barren samples: Jour. Paleontology, v. 44, no. 1, p. 164-165, 1970.
- 03345 **Schopf, Thomas J. M.; Allan, J. R.** Phylum Ectoprocta, Order Cheilostomata — Microprobe analysis of calcium, magnesium, strontium, and phosphorus in skeletons: Science, v. 169, no. 3942, p. 280-282, illus., 1970.
- 05969 **Schopf, Thomas J. M.** Taxonomic diversity gradient of ectoprocts and bivalves and their geologic implications: Geol. Soc. America Bull., v. 81, no. 12, p. 3765-3768, illus., 1970.
- Schouten, J. A.** See *Collette, B. J.* 05324
- 03415 **Schram, Frederick R.** Isopod from the Pennsylvanian of Illinois: Science, v. 169, no. 3948, p. 854-855, illus., 1970.
- Schreiber, Edward.** See *Anderson, Orson L.* 06267
- Schreiber, Edward.** See *Fox, Paul J.* 06981
- Schrijver, K.** See *Martignole, J.* 07876
- 01724 **Schröder, Gert.** Lagerstätten nutzbarer Minerale im Staat Oaxaca, Mexiko: Erzmetall, v. 23, no. 2, p. 58-64, illus., 1970.
- 02678 **Schröder, Johannes H.; Friedman, Gerald M.; Miller, Donald S.** Uranium distributions in recent skeletal carbonates [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 869, 1970.
- 03602 **Schroeder, Johannes H.; Miller, Donald S.; Friedman, Gerald M.** Uranium distribution in Recent skeletal carbonates: Jour. Sed. Petrology, v. 40, no. 2, p. 672-681, illus., tables, 1970.
- Schubel, J. R.** See *Schiemer, E. W.* 04680
- Schubert, Carl.** See *Bonatti, Enrico.* 01694
- 03420 **Schubert, Gerald; Turcotte, D. L.; Oxburgh, E. R.** Phase change instability in the mantle: Science, v. 169, no. 3950, p. 1075-1077, illus., 1970.
- 09084 **Schuberth, Christopher J.** Barrier beaches of eastern America: Nat. History, v. 79, no. 6, p. 46-55, illus., 1970.
- Schuiling, R. D.** See *Weijsden, C. H. van der.* 05598
- Schulte, Kenneth C.** See *Minch, John A.* 04885

- 07638 **Schultz, C. Bertrand; Martin, Larry D.** The machairodont cats from the early Pleistocene Broadwater and Lisco local faunas: Nebraska Univ. State Mus. Bull., v. 9, no. 2, p. 33-38, illus., tables, 1970.
- 08051 **Schultz, C. Bertrand; Martin, Larry D.** Quaternary mammalian sequence in the central Great Plains, in Pleistocene and recent environments of the central Great Plains: Kansas Univ. Dept. Geology Spec. Pub. 3, p. 341-353, illus., table, 1970.
- 09405 **Schultz, C. Bertrand; Martin, Larry D.; Tanner, Lloyd G.** Mammalian distribution in the Great Plains and adjacent areas from 14,000 to 9,000 years ago [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont. 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 119-120, 1970.
- 04708 **Schultz, Gerald E.; Cheatum, Elmer P.** *Bison occidentalis* and associated invertebrates from the late Wisconsin of Randall County, Texas: Jour. Paleontology, v. 44, no. 5, p. 836-850, illus., table, 1970.
- 00781 **Schultze, Hans-Peter.** Folded teeth and the monophyletic origin of tetrapods: Am. Mus. Novitates, no. 2408, 10 p., illus., 1970.
- Schumann, Herbert H.** See *Eaton, Gordon P.* 00609
- 05751 **Schumm, S. A.** Experimental studies on the formation of lunar surface features by fluidization: Geol. Soc. America Bull., v. 81, no. 9, p. 2539-2552, illus., 1970.
- 09898 **Schumm, S. A.; Bird, J. B.; Starkel, L.** Report of work group on classification of hillslopes [with German and French abs.], in New contributions to slope evolution: Zeitschr. Geomorphologie, supp. 9, p. 85-87, table, 1970.
- 03436 **Schumm, Stanley A.** River metamorphosis — Closure [to discussion of paper 6352, 1969]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Hydraulics Div., no. HY 8, p. 1715-1716, 1970.
- Schuster, Robert L.** See *Anderson, Roy A., Jr.* 05510
- Schutt, Clarence E.** See *Mattson, James S.* 09134
- 02705 **Schutz, Donald F.; Senechal, Ronald C.** Applications of potassium-argon dating in oil exploration [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 869, 1970.
- 09865 **Schuyler, P. B.; Blomquist, D. S.; Gilheany, J. J.** A deep ocean nephelometer: Marine Technology Soc. Jour., v. 4, no. 1, p. 61-64, illus., tables, 1970.
- Schwab, F. A.** See *Knopoff, L.* 07310
- 04683 **Schwab, Fred.** Surface-wave dispersion computations — Knopoff's method: Seismol. Soc. America Bull., v. 60, no. 5, p. 1491-1520, illus., tables, 1970.
- 00179 **Schwab, Frederic L.** Petrology, paleocurrents, and depositional environments of the Harpers Formation in the central Appalachians [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 35, 1970.
- 01542 **Schwab, Frederic L.** Origin of the Antietam Formation (Late Precambrian, Lower Cambrian), central Virginia: Jour. Sed. Petrology, v. 40, no. 1, p. 354-366, illus., tables, 1970.
- 09559 **Schwab, Frederic L.** Geosynclinal compositions and the new global tectonics [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 677, 1970.
- 09560 **Schwab, Karl W.** Surface ornamentation and internal microstructure of platform conodonts [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 678, 1970.

- 06395 **Schwalb, Howard R.; Smith, Juanita G.** Catalog of well samples and cores on file at Kentucky Geological Survey: Kentucky Geol. Survey, ser. 10, Inf. Circ. 19, 182 p., illus., table, 1970.
- Schwalb, Howard R.** See *McGrain, Preston*. 07743
- Schwaller, H.** See *Eberhardt, P.* 05685
- Schwarcz, H. P.** See *Clarke, W. B.* 00008
- 04650 **Schwarcz, H. P.; Clayton, R. N.; Mayeda, Toshiko.** Oxygen isotopic studies of calcareous and pelitic metamorphic rocks, New England: Geol. Soc. America Bull., v. 81, no. 8, p. 2299-2315, illus., tables, 1970.
- Schwarcz, Henry P.** See *Sheppard, Simon M. F.* 03831
- 03111 **Schwartz, Maurice Leo.** Beach profile translation; scale of shore erosion [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 10, p. 4664B-4665B, 1970.
- Schwartz, R. J.** See *Wahl, J. S.* 09355
- 01832 **Schwartzman, David W.** Possible primordial Ar-36 in Stillwater pyroxenes [abs.]: EOS, v. 51, no. 4, p. 449, 1970.
- Schwarz, Charles.** See *Matthews, R. A.* 09441
- 04621 **Schwarz, E. J.; Symons, D. T. A.** Paleomagnetic field intensity during cooling of the Sudbury irruptive 1700 million years ago: Jour. Geophys. Research, v. 75, no. 32, p. 6631-6640, illus., tables, 1970.
- 06293 **Schwarz, E. J.** Thermomagnetics of lunar dust sample 10084-88, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 2389-2397, illus., table, 1970.
- Schwarz, E. J.** See *Laroche, A.* 06353
- Schwarz, E. J.** See *Symons, D. T. A.* 07676
- Schwarz, E. J.** See *Schaeffer, R. M.* 07747
- 08205 **Schwarz, E. J.; Harris, D. C.** Phases in natural pyrrhotite and the effect of heating on their magnetic properties and composition: Jour. Geomagnetism and Geoelectricity, v. 22, no. 4, p. 463-470, illus., 1970.
- 10623 **Schwarzacher, W.** The use of Markov chains in the study of sedimentary cycles: Internat. Assoc. Math. Geology Jour., v. 1, no. 1, p. 17-39, illus., tables, 1969.
- 06009 **Schwarzer, Rudolph Reynolds.** The concentration and distribution of uranium in coexisting pegmatite feldspars by the fission track method [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5560-5561, 1970.
- 09561 **Schwarzer, Theresa F.; Cook, Beverly Gatlin.** Low altitude gamma-spectrometric surveys from helicopters in Puerto Rico as an example of the remote sensing of thorium, uranium, and potassium in soils and rocks [abs.]: Geol. Soc. America Abs with Programs, v. 2, no. 7, p. 678-679, 1970.
- 01237 **Schwarzer, Theresa Frances.** The distribution of major and trace elements in coexisting feldspar pairs from selected pegmatites in New York State [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 8, p. 3712B-3713B, 1970.

**Schweinfurth, Stanley P.** See *Berryhill, Henry L., Jr.* 07216

- 04580 **Schwerdtner, W. M.** Relationships between anhydrite mineral lineations and directions of megascopic strain, in *Third symposium on salt*, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 317-326, illus., 1970.
- 05931 **Schwerdtner, W. M.** Lattice-orienting mechanisms in schistose anhydrite [with German abs.], in *Experimental and natural rock deformation — Internat. Symposium, Darmstadt, Germany, 1969*, Proc. (P. Paulitsch, editor): Berlin and Heidelberg, Germany, Springer-Verlag, p. 142-164, illus., tables, 1970.
- 07105 **Schwerdtner, W. M.** Distribution of longitudinal finite strain in lenticular boudins and bending folds: *Tectonophysics*, v. 9, no. 6, p. 537-545, illus., 1970.
- 07751 **Schwerdtner, W. M.** Hornblende lineations in Trout Lake area, Lac la Ronge map sheet, Saskatchewan: *Canadian Jour. Earth Sci.*, v. 7, no. 3, p. 884-899, illus., tables, 1970.

**Schwietering, J. F.** See *Schopf, J. M.* 03908

- 07361 **Schwietering, Joseph Francis.** Devonian shales of Ohio and their eastern equivalents [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 4, p. 2067B, 1970.
- 09028 **Schwimmer, David.** Analysis of the growth and development of the trilobite *Phacops rana* (green) [abs.], in *Guidebook to field excursions*, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N. Y., State Univ. Dept. Geology, New York State Geol. Assoc., p. 143, 1969.
- 02822 **Sclar, C. B.** High pressure studies in the system  $MgO-SiO_2-H_2O$  [abs.], in *Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969*, Proc.: *Physics Earth and Planetary Interiors*, v. 3, p. 333, 1970.
- 09562 **Sclar, Charles B.; Basu, Debabrata.** Experimental studies on the origin of kyanite-bearing quartz bodies [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 679, 1970.
- 00070 **Sclater, J. G.; Mudie, J. D.; Harrison, C. G. A.** Detailed geophysical studies on the Hawaiian arch near  $24^{\circ}25' N.$ ,  $157^{\circ}40' W.$  — A closely spaced suite of heat-flow stations: *Jour. Geophys. Research*, v. 75, no. 2, p. 333-348, illus., 1970.

**Sclater, J. G.** See *Francheteau, Jean.* 00587

**Sclater, J. G.** See *Francheteau, Jean.* 01445

**Sclater, J. G.** See *Francheteau, Jean.* 02197

- 07308 **Sclater, J. G.; Jones, E. J. W.; Miller, S. P.** The relationship of heat flow, bottom topography and basement relief in Peake and Freen deeps, northeast Atlantic, in *Geothermal problems — Symposium, Madrid, Spain, 1969*, Proc.: *Tectonophysics*, v. 10, nos. 1-3 (spec. issue), p. 283-300, illus., table, 1970.
- 01975 **Sclater, John G.; Francheteau, Jean.** Terrestrial heat flow observations and the plate theory of tectonics [abs.]: *EOS*, v. 51, no. 4, p. 330, 1970.



- 05478 **Sclater, John G.; Francheteau, Jean.** The implications of terrestrial heat flow observations on current tectonic and geochemical models of the crust and upper mantle of the Earth: Royal Astron. Soc. Geophys. Jour., v. 20, no. 5, p. 509-542, illus., tables, 1970.
- Scoffin, Terence P.** See *Neumann, A. Conrad*. 01538
- 01655 **Scoffin, Terence P.** The trapping and binding of subtidal carbonate sediments by marine vegetation in Bimini lagoon, Bahamas: Jour. Sed. Petrology, v. 40, no. 1, p. 249-273, illus., 1970.
- 03610 **Scoffin, Terence P.** A conglomeratic beachrock in Bimini, Bahamas: Jour. Sed. Petrology, v. 40, no. 2, p. 756-759, illus., 1970.
- 03432 **Scolaro, Reginald J.** Notes on Miocene Bryozoa from northwestern Florida: Tulane Studies Geology and Paleontology, v. 8, no. 2, p. 93-98, illus., 1970.
- 06755 **Scopel, Louis J.** Pressure injection disposal well, Rocky Mountain Arsenal, Denver, Colorado, in Engineering seismology — The works of man: Geol. Soc. America Eng. Geology Case Histories, no. 8, p. 19-24, illus., 1970.
- Scorgie, G. C.** See *Cameron, I. G.* 07834
- Scott, A. J.** See *McGowen, J. H.* 05464
- 08490 **Scott, A. J.; Fisher, W. L.** Delta systems and deltaic deposition, in Delta systems in the exploration for oil and gas — A research colloquium, Austin, Texas, 1969, *Syllabus* [No. 1] (W. L. Fisher; L. F. Brown, Jr.; A. J. Scott; J. H. McGowen, leaders): Austin, Texas, Univ. Texas at Austin Bur. Econ. Geology, p. 10-29, illus. [1970,].
- Scott, Alan J.** See *Fisher, W. L.* 08570
- Scott, B. P.** See *Money, P. L.* 08631
- Scott, C. H.** See *Culbertson, J. K.* 01492
- 02785 **Scott, Gerald L.** Bethany Falls Limestone (Missourian) sedimentation and diagenesis, Missouri and Kansas [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 869, 1970.
- 01556 **Scott, Glenn R.; Lindvall, Robert M.** Geology of new occurrences of Pleistocene bisons and peccaries in Colorado, in Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B141-B149, illus., 1970.
- 04241 **Scott, Glenn R.** Quaternary faulting and potential earthquakes in east-central Colorado, in Geological Survey research 1970, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C11-C18, illus., tables, 1970.
- Scott, Harold W.** See *Melton, William*. 01085
- Scott, J. B.** See *Kruse, G. H.* 07442
- Scott, J. S.** See *Hobson, George D.* 01457
- 10766 **Scott, J. S.** Engineering and environmental geology, in Background papers on the earth sciences in Canada (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 141-150, 1970.

**Scott, James H.** See *Yacoub, Nazieh K.* 03698

**Scott, Martha R.** See *Berner, Robert A.* 04679

- 08638 **Scott, Nina H.** Felt area and intensity, Santa Rosa, California, earthquakes, October 1, 1969, in *The Santa Rosa, California, earthquakes of October 1, 1969*: Rockville, Md., U.S. Coast and Geodetic Survey, p. 94-99, illus., 1970.

- 10845 **Scott, Nina H.** Felt area and intensity, Santa Rosa, California, earthquakes, October 1, 1969, in *The Santa Rosa, California, earthquakes of October 1, 1969*: Rockville, Md., U.S. Coast and Geodetic Survey, p. 94-99, illus., 1970.

**Scott, R. B.** See *Moore, E. M.* 00018

- 05110 **Scott, R. F.; Carrier, W. D.; Costes, N. C.; Mitchell, J. K.** Preliminary geologic investigation of the Apollo 12 landing site, — Pt. C, Mechanical properties of the lunar regolith, in *Apollo 12 preliminary science report*: U.S. Natl. Aeronautics and Space Adm. Spec. Pub. SP-235, p. 161-182, illus., 1970.

- 05247 **Scott, R. W.** The Santa Barbara Channel, in *How Humble plans to produce oil in the Santa Barbara Channel*: World Oil, v. 171, no. 7, p. 40, illus., 1970.

- 07142 **Scott, Ralph G.** Vladimir Voloshin (1934-1970): Assoc. Eng. Geologists Bull., v. 7, nos. 1-2, p. 123-125, portrait, 1970.

**Scott, Robert B.** See *Burkett, David H.* 06081

- 02335 **Scott, Robert W.** Stratigraphy and sedimentary environments of Lower Cretaceous rocks, southern western interior: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 7, p. 1225-1244, illus., table, 1970.

- 09236 **Scott, Robert W.** Paleogeology and paleontology of the Lower Cretaceous Kiowa Formation, Kansas: Kansas Univ. Paleont. Contr. Art. 52 (Cretaceous 1), 94 p., illus., tables, 1970.

**Scott, V. H.** See *Guymon, G. L.* 07468

**Scott, W. Frank.** See *Alwin, John A.* 01189

- 08702 **Scott, Walter H.** Oceanography and the continental shelf resources of Alaska, in *The use of remote sensing . . . of natural resources of Alaska*: Juneau, Alaska, Dept. of Econ. Devel., p. 55-57, illus. [1970].

- 01353 **Scott, Ward M.; Modzeleski, Vincent E.; Nagy, Bartholomew.** Pyrolysis of early Pre-Cambrian Onverwacht organic matter ( $>3 \times 10^9$  yr old): Nature, v. 225, no. 5238, p. 1129-1130, illus., table, 1970.

**Scott, Ward M.** See *Murphy, Mary E.* 05745

- 02860 **Scotter, D. R.; Raats, P. A. C.** Movement of salt and water near crystalline salt in relatively dry soil: Soil Sci., v. 109, no. 3, p. 170-178, illus., 1970.

**Scrudato, Ronald J.** See *Neff, James R.* 00743

- 00761 **Scrudato, Ronald J.; Bond, Thomas A.** Cretaceous-Tertiary boundary of east-central Georgia [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 240, 1970.

- 06882 **Scrudato, Ronald John.** Kaolin and associated sediments of east-central Georgia [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 1, p. 256B, 1970.

- 10399 **SE Wisconsin Regional Plan. Comm.; Berteau, George C.** (chairman). A comprehensive plan for the Fox River watershed — v. 1, Inventory findings and forecasts: southeastern Wisconsin Region Planning Comm. Planning Rept., no. 012, 445 p., illus., tables, 1969.

- 01485 **Seaburn, G. E.** Preliminary analysis of rate of movement of storm runoff through the zone of aeration beneath a recharge basin on Long Island, New York, in *Geological Survey research 1970*, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B196-B198, illus., table, 1970.
- Seager, W. R.** See *Baars, D. L.* 02073
- 01503 **Seager, William R.** Low-angle gravity glide structures in the Northern Virgin Mountains, Nevada and Arizona: *Geol. Soc. America Bull.*, v. 81, no. 5, p. 1517-1538, illus., table, 1970.
- Sealy, H. A.** See *Mesolella, Kenneth J.* 05246
- 09744 **Seaman, David M.** The paragenesis of the Walden pegmatite, Portland, Connecticut, Pt. 1: *Rocks and Minerals*, v. 45, nos. 7-8, p. 443-449, illus., 1970; Pt. 2, *ibid.*, v. 45, no. 9, p. 523-529, illus., 1970; Pt. 3, *ibid.*, v. 45, no. 10, p. 595-600, illus., 1970.
- Searles, Leonard C.** See *Lafayette Geological Society.* 04752
- 02340 **Sears, Joe M.** Albert Sidney Clinkscales (1894-1969): *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 7, p. 1306-1307, portrait, 1970.
- Sebastyan, G. Y.** See *Meyerhof, G. G.* 06740
- 09040 **Sechrest, Cynthia G.; Cooper, Arthur W.** An analysis of the vegetation and soils of upland hardwood stands in the piedmont and coastal plain of Moore County, North Carolina: *Castanea*, v. 35, no. 1, p. 26-57, illus., tables, 1970.
- 06441 **Sedam, A. C.; Stein, R. B.** Saline ground-water resources of Ohio: *U.S. Geol. Survey Hydrol. Inv. Atlas HA-366*, 2 sheets, scale 1:500,000, text, 1970.
- 06736 **Seddon, George.** Meteor Crater — A geological debate: *Geol. Soc. Australia Jour.*, v. 17, pt. 1, p. 1-11, illus., 1970.
- 07040 **Seddon, George.** Pre-Chappel conodonts of the Llano region, Texas: *Texas Univ. Austin Bur. Econ. Geology Rept. Inv.* 68, 130 p., illus., tables, 1970.
- 04687 **Seeber, Leonard; Barazangi, Muawia; Nowroozi, Ali.** Microearthquake seismicity and tectonics of coastal northern California: *Seismol. Soc. America Bull.*, v. 60, no. 5, p. 1669-1699, illus., tables, 1970.
- 01976 **Seeber, Leonardo; Barazangi, Muawia; Nowroozi, Ali A.** Seismicity and tectonics of coastal northern California [abs.]: *EOS*, v. 51, no. 4, p. 352, 1970.
- Seed, H. Bolton.** See *Kovacs, W. D.* 00298
- Seed, H. Bolton.** See *Lee, Kenneth L.* 02355
- Seed, H. Bolton.** See *Idriss, I. M.* 02413
- 03046 **Seed, H. Bolton.** Soil problems and soil behavior, Chap. 10 in *Earthquake engineering* (R. L. Wiegel, editor): Englewood Cliffs, N.J., Prentice-Hall, p. 227-251, illus., 1970.
- 03355 **Seed, H. Bolton; Idriss, I. M.** Analyses of ground motions at Union Bay, Seattle during earthquakes and distant nuclear blasts: *Seismol. Soc. America Bull.*, v. 60, no. 1, p. 125-136, illus., tables, 1970.
- 03448 **Seed, H. Bolton.** Earth slope stability during earthquakes, Chap. 15 in *Earthquake engineering* (R. L. Wiegel, editor): Englewood Cliffs, N.J., Prentice-Hall, p. 383-401, illus., table, reprinted 1970; originally published 1967.
- 03635 **Seed, H. Bolton; Idriss, I. M.; Kiefer, Fred W.** Characteristics of rock motions during earthquakes — Closure [to discussion of paper 6783, 1969]: *Am. Soc. Civil En-*

- gineers Proc., v. 96, paper 7385, Jour. Soil Mechanics and Found. Div., no. SM 4, p. 1468-1469, illus., 1970.
- 05507 **Seed, H. Bolton; Lee, K. L.; Idriss, I. M.** Analysis of the Sheffield Dam failure [abs.], in Engineering geology and soils engineering symposium, 8th Ann., Pocatello, Idaho, 1970, Proc.: Boise, Idaho, Idaho Dept. Highways, p. 235, 1970.
- Seed, H. Bolton.** See *Dezfulian, Houshang*. 06774
- 02071 **Seeger, C. Ronald.** Geophysical investigations of the Versailles cryptoexplosion structure, and the Middlesboro Basin cryptoexplosion structure, Kentucky [abs.]: EOS, v. 51, no. 4, p. 342, 1970.
- 09935 **SeEVERS, William J.** Geology and ground-water resources of Linn County, Kansas: Kansas Geol. Survey Bull. 193, 65 p., illus., tables, geol. map, 1969.
- Seewald, Ken.** See *West Texas Geological Society*. 05978
- Segalen, P.** See *Leon Vallejo, G.* 05899
- 07528 **Segall, R. Thomas.** Slag — Michigan's all-purpose construction aggregate, in Forum on Geology of Industrial Minerals, 6th, Ann Arbor, Mich., 1970, Proc.: Michigan Geol. Survey Miscellany 1, p. 117-126, illus., tables, 1970.
- Segerstrom, Kenneth.** See *Geyne, A. R.* 09738
- Seginer, Ido.** See *Poreh, Michael*. 05235
- 04050 **Segmüller, Armin.** Automated lattice parameter determination on single crystals, in Advances in X-ray analysis, V. 13 — Applications of X-ray analysis, 18th Ann. Conf., 1969, Proc.: New York, Plenum Press, p. 455-467, illus., tables, 1970.
- 06386 **Séguin, Maurice.** Exploration pour les gisements de taconite magnétique rentables et de minerais de fer enrichi — Nouvelles méthodes d'interprétation de relevés magnétiques, aéroportes et au sol, dans la partie centrale de la fosse du Labrador [Exploration for economic deposits of magnetic taconite and enriched iron ore — New methods of interpretation of aeromagnetic and ground magnetic surveys in the central part of the Labrador trough (with English abs.)]: Naturaliste Canadien, v. 97, no. 5, p. 585-615, illus., table, 1970.
- 01306 **Séguin, Maurice K.** Value of geophysical methods in finding soft iron ore in northern Canada: Soc. Mining Engineers AIME Trans., v. 247, no. 1, p. 14-22, illus., 1970.
- Seibold, E.** See *Revelle, R.* 08382
- 09450 **Seifert, Wolfgang; Teeter, Richard M.** Identification of polycyclic naphthenic, mono-, and diaromatic crude oil carboxylic acids: Anal. Chemistry, v. 42, no. 2, p. 180-189, illus., tables, 1970.
- 02956 **Seigel, Harold O.** The induced polarization method [with French abs.], in Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 123-137, illus., 1970.
- 02740 **Seiglie, George A.** Additional observations on the foraminiferal genus *Buliminoides* Cushman: Cushman Found. Foram. Research Contr., v. 21, pt. 3, p. 112-115, illus., 1970.
- Seiglie, George A.** See *Moussa, Mounir T.* 05179
- Seiglie, George A.** See *Bermúdez, Pedro J.* 06240

- 06366 **Seiglie, George A.** The distribution of the foraminifers in the Yabucoa Bay, southeastern Puerto Rico and its paleoecological significance [with Spanish abs.]: *Rev. Española Micropaleontologia*, v. 2, no. 2, p. 183-208, illus., tables, 1970.
- 10935 **Seiglie, George A.; Weaver, John D.** Glosario de terminos geologicos ingles-español, ed. preliminar: Mayaguez, P. R., Univ. de Puerto Rico, 84 p., 1968.
- Seitz, M.** See *Burnett, D. S.* 06846
- Seitz, M. G.** See *Hoyt, H. P., Jr.* 06287
- Seki, Yotaro.** See *Ernst, W. G.* 05079
- 08371 **Selander, Robert K.; Yang, Suh Y.; Lewontin, Richard C.; Johnson, Walter E.** Genetic variation in the horseshoe crab (*Limulus polyphemus*), a phylogenetic "relic": *Evolution*, v. 24, no. 2, 402-414, illus., tables, 1970.
- 05330 **Selig, E. T.; Grangaard, O. H., Jr.** A new technique for soil strain measurement: *Materials Research and Standards*, v. 10, no. 11, p. 19-21, 35-36, illus., 1970.
- Sellers, G. A.** See *Duke, M. B.* 06963
- 05031 **Sellers, J. B.** Rock mechanics instrumentation for salt mining, in *Third symposium on salt*, V. 2 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 236-248, illus., 1970.
- 08443 **Selley, Richard C.** Ancient sedimentary environments — A brief survey: Ithaca, New York, Cornell University Press, 237 p., illus., tables, 1970.
- 08257 **Sellmann, P. V.** Properties and distribution of two characteristic peat environments in Alaska [with French abs.], in *International Peat Congress*, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 157-162, illus., 1970.
- Semenov, G. P.** See *Lapina, N. N.* 10071
- Semken, Holmes A.** See *Nelson, Robert S.* 06117
- Semple, Robert M.** See *Mann, C. John.* 09864
- 01511 **Sen Gupta, Joy G.** Rapid combustion methods for determining sulfur in rocks, ores and stony meteorites — A comparative study of the usefulness of resistance-type and induction furnaces [with French and German abs.]: *Anal. Chim. Acta*, v. 49, no. 3, p. 519-525, tables, 1970.
- 04214 **Sen Gupta, Joy G.** Determination of carbon by non-aqueous titration after combustion in a high-frequency induction furnace — Application to rocks, stony meteorites and metallurgical samples [with French and German abs.]: *Anal. Chim. Acta*, v. 51, no. 3, p. 437-447, illus., tables, 1970.
- Sendlein, L. V. A.** See *Simon, D. E.* 04451
- 01103 **Sendlein, Lyle V. A.; Henkel, Donald.** Preglacial bedrock topography of southwestern Iowa [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 405, 1970.
- 09914 **Sendlein, Lyle V. A.** Field trip No. 2, Geology of U. S. Gypsum Company's Sperry mine, in *Geol. Soc. America, North-Central Sec., Ann. Mtg.*, 2d, May 1968, guidebook: Iowa City, Iowa, Univ. Iowa, p. 2-1 to 2-17, illus. [1968].
- Senechal, Ronald C.** See *Schutz, Donald F.* 02705
- Senftle, F. E.** See *Thorpe, A. N.* 06298

- 02932 **Senftle, Frank E.; Sarigianis, Perry; Philbin, Philip W.** Neutron activation techniques for precious metal exploration [with French abs.], in *Mining and groundwater geophysics*, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 462-469, illus., tables, 1970.
- 09844 **Senftle, Frank E.** Mineral exploration by nuclear techniques: *Mining Cong. Jour.*, v. 56, no. 1, p. 21, p. 24-28, illus., 1970.
- Sengupta, Surpriya.** See *Rao, J. S. 05014*
- Senko, E. E.** See *Styra, B. I. 03221*
- 09872 **Senturia, Stephen D.; Robinson, J. D.** Nuclear spin-lattice relaxation of liquids confined in porous solids: *Soc. Petroleum Engineers Jour.*, v. 10, no. 3, p. 237-244, illus., 1970.
- 09364 **SEPM Gulf Coast Sec.** Lone Star, Texas, iron deposits - 1970 field trip guidebook: *Soc. Econ. Paleontologists and Mineralogists Gulf Coast Sec.*, 22 p., illus., 1970.
- 05468 **S.E.P.M. Permian Basin Sec.** Geology of the southern Quitman Mountains area, Trans-Pecos Texas — Symposium and guidebook, 1970 biennial field trip: *Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub.* 70-12, 114 p., illus., tables, 1970.
- 05034 **Serata, Shosei.** Prerequisites for application of finite element method to solution cavities and conventional mines, in *Third symposium on salt*, V. 2 (J. L. Rau and L. F. Dellwig, editors): *Cleveland, Ohio, Northern Ohio Geol. Soc.*, p. 249-279, illus., 1970.
- Serata, Shosei.** See *Adachi, Toshihisa. 07449*
- Sergeant, Richard E.** See *Wigley, Perry B. 00976*
- Serra, J.** See *Marechal, A. 08615*
- Serson, P. H.** See *Haines, G. V. 07880*
- 09563 **Sever, Julia R.; Parker, Patrick L.** Hydrocarbons in near shore marine environments [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 679-680, 1970.
- 07383 **Sevian, Walter Andrew.** Nonlinear dispersion of groundwater disturbances [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 4, p. 1948B-1949B, 1970.
- 00180 **Sevon, William D.** Mississippian unconformity in northeastern Pennsylvania [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 35-36, 1970.
- 07480 **Sevon, William D.** Palmerton Sandstone as a source of sand in Carbon and northeastern Schuylkill Counties, Pennsylvania, in *Forum on geology of industrial minerals*, 5th, Harrisburg, Pa., 1969, *Proc.: Pennsylvania Geol. Survey, 4th ser., Bull. M64 (Mineral Resources Rept.)*, p. 119-137, illus., table, 1970.
- 10703 **Sevon, William D.** The Pocono Formation in northeastern Pennsylvania — guidebook, *Pennsylvania Geologists, 34th Ann. Field Conf.*, Hazleton, Pa., 1969: *Harrisburg, Pa., Pennsylvania Geol. Survey*, 1969.
- 06573 **Seychuk, J. L.** Load tests on bedrock [with French abs.]: *Canadian Geotech. Jour.*, v. 7, no. 4, p. 464-470, illus., 1970.
- Shabad, Theodore.** See *Halbouty, Michel T. 07768*
- Shabica, C. W.** See *Smith, W. H. 05533*
- Shabica, C. W.** See *Damberger, H. H. 05534*
- Shabica, C. W.** See *Damberger, H. H. 05535*

- 05537 **Shabica, Charles W.** Depositional environments in the Francis Creek Shale, *in* Depositional environments in parts of the Carbondale Formation, western and northern Illinois — Francis Creek Shale and associated strata and Mazon Creek biota — Geol. Soc. America, Coal Geology Div., Ann. Field Trip, Milwaukee, Wis., 1970: Illinois Geol. Survey Guidebook Ser. 8, p. 43-52, illus., tables, 1970.
- 00002 **Shacklette, Hansford T.; Sauer, Herbert I.; Miesch, A. T.** Geochemical environments and cardiovascular mortality rates in Georgia: U.S. Geol. Survey Prof. Paper 574-C, p. C1-C39, illus., tables, 1970.
- 01876 **Shacklette, Hansford T.; Lakin, Hubert W.; Hubert, Arthur E.; Curtin, Gary C.** Absorption of gold by plants: U.S. Geol. Survey Bull. 1314-B, p. B1-B23, illus., tables, 1970.
- 05562 **Shacklette, Hansford T.** Mercury content of plants, *in* Mercury in the environment: U.S. Geol. Survey Prof. Paper 713, p. 35-36, table, 1970.
- 09602 **Shacklette, Hansford T.** The U.S. Geological Survey study of elements in soils and other surficial materials in the United States, *in* Univ. Missouri Ann. Conf. on Trace Substances in Environmental Health, 4th, Columbia, Mo., 1970, Abs.: Columbia, Mo., Univ. Missouri, p. 9, 1970.
- 07536 **Shafer, G. H.** Ground-water resources of Aransas County, Texas: Texas Water Devel. Board Rept. 124, 81 p., illus., tables, geol. map, 1970.
- 06115 **Shafiqullah, M.; Tupper, W. M.; Cole, T. J. S.** K-Ar age of the carbonatite complex, Oka, Quebec, *in* Alkaline rocks, the Monteregian Hills — Symposium, Montreal, 1969, Proc.: Canadian Mineralogist, v. 10, pt. 3, p. 541-552, illus., table, 1970.
- Shah, K. R.** See *Filby, R. H.* 06554
- 07850 **Shah, K. R.; Filby, R. H.; Haller, W. A.** Determination of trace elements in petroleum by neutron activation analysis — [Pt.] 1, Determination of Na, S, Cl, K, Ca, V, Mn, Cu, Ga and Br: Jour. Radioanal. Chemistry, v. 6, no. 1, p. 185-192, illus., tables, 1970.
- 08588 **Shah, K. R.; Filby, R. H.; Haller, W. A.** Determination of trace elements in petroleum by neutron activation analysis — Pt. 2, Determination of Sc, Cr, Fe, Co, Ni, Zn, As, Se, Sb, Eu, Au, Hg, and U: Jour. Radioanal. Chemistry, v. 6, no. 2, p. 413-422, illus., tables, 1970.
- Shainberg, I.** See *Bar-On, P.* 02863
- 08177 **Shampine, William J.** Gazetteer of Louisiana lakes and reservoirs: Louisiana Dept. Public Works Basic Records Rept. 4, 31 p., illus., tables, 1970.
- Shane, K. C.** See *Clarke, W. B.* 00008
- 05832 **Shane, Lemay E.** Attenuation of acoustic logging signals: Log Analyst, v. 11, no. 6, p. 3-10, illus., 1970.
- Shanker, N. Babu.** See *Sangrey, Dwight A.* 03224
- 00061 **Shankland, T. J.** Pressure shift of infrared absorption bands in minerals and the effect on radiative heat transport: Jour. Geophys. Research, v. 75, no. 2, p. 409-413, illus., 1970.
- 10632 **Shankland, T. J.; Nitsan, U.** Electronic structure of olivine [abs.]: EOS, v. 51, no. 11, p. 829, 1970.
- 04918 **Shannon, Frank G.** Some unique geological features at the Bluebell mine, Riondel, British Columbia, [Chap.] 10 *in* Lead-zinc deposits in the Kootenay Arc, northeastern Washington and adjacent British Columbia — Soc. Econ. Geologists, 1970 Northwest Field Conf. Guidebook: Washington Div. Mines and Geology Bull. 61, p. 107-120, illus., 1970.

- 02679 **Shannon, John P., Jr.** Pennsylvanian deltaic stratigraphic traps, eastern shelf, Midland basin, Texas [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 869, 1970.
- Shao, C. -Y.** See *McCrosky, R. E.* 02262
- 09982 **Shapiro, Irwin I.; Knight, Curtis A.** Geophysical applications of long-baseline radio interferometry, in *Earthquake displacement fields and the rotation of the Earth* (I. Mansinha, D. E. Smylie, A. E. Beck, editors) - NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 284-301, tables, 1970.
- 07131 **Shapiro, Leonard.** Rapid rock analysis today, in *Developments in applied spectroscopy*, V. 8 — Mid-America Spectroscopy Symposium, 20th Ann., Chicago, Ill., 1969, Selected papers: New York and London, Plenum Press, p. 143-157, illus., table, 1970.
- 05628 **Shaposhnikov, K. K.; Shaposhnikova, K. I.** Novyy rayon na o. Kuba, perspektivnyy na neft' [A new potential oil region in Cuba]: *Akad. Nauk SSSR Doklady*, v. 190, no. 1, p. 180-182, illus., 1970; English translation, *Acad. Sci. USSR Doklady, Earth Sci. Sec.*, v. 190, nos. 1-6, p. 40-42, illus., 1970.
- 07717 **Sharma, Bijon; Geldart, L. P.; Gill, D. E.** Interpretation of gravity anomalies of dike-like bodies by Fourier transformation: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 512-516, illus., 1970.
- 01421 **Sharma, G. D.; Burrell, D. C.** Sedimentary environment and sediments of Cook Inlet, Alaska: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 4, p. 647-654, illus., table, 1970.
- 02680 **Sharma, G. D.** Cationic balance and early diagenesis of glaciomarine sediments [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 869-870, 1970.
- 03605 **Sharma, G. D.** Evolution of interstitial waters in Recent Alaskan marine sediments: *Jour. Sed. Petrology*, v. 40, no. 2, p. 722-733, illus., tables, 1970.
- 01138 **Sharma, Ghanshyam D.** Sediment-seawater interaction in glaciomarine sediments of southeast Alaska: *Geol. Soc. America Bull.*, v. 81, no. 4, p. 1097-1105, illus., table, 1970.
- 10096 **Sharma, Ghanshyam D.** Recent sedimentation on southern Bering shelf [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2503-2504, 1970.
- Sharma, K. N. M.** See *Wynne-Edwards, H. R.* 08121
- Sharman, G. F., 3d.** See *Chase, C. G.* 10201
- Sharp, B. J.** See *Austin, S. R.* 02200
- 07125 **Sharp, D. A.** Ontario's petroleum resources — How significant are they?, Tech. Paper 2 in *Ontario Petroleum Inst.*, 9th Ann. Conf., Ottawa, 1970: Chatham, Ontario, Ontario Petroleum Inst., 12 p., paged separately, illus., 1970.
- Sharp, Dennis A.** See *Burk, Cornelius F., Jr.* 10783
- Sharp, James M.** See *Lohse, Alan.* 09490
- 01553 **Sharp, Jonathan H.** Discussion of a paper by C. D. Gebelein [1969] entitled "Distribution, morphology, and accretion rate of recent subtidal algal stromatolites, Bermuda" [1969]: *Jour. Sed. Petrology*, v. 40, no. 1, p. 521, 1970.
- Sharp, R. P.** See *Shreve, R. L.* 01497



- Sharp, Robert V.** See *Duffield, Wendell A.* 00257
- 01857 **Sharp, William N.** Extensive zeolitization associated with hot springs in central Colorado, in *Geological Survey research 1970*, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B14-B20, 1970.
- Sharp, William N.** See *Parker, Raymond L.* 04015
- Sharp, William N.** See *Adams, John W.* 09102
- Shastal, J.** See *Reid, I. A.* 04807
- Shastal, J.** See *Campbell, P. I.* 10283
- Shattles, D. E.** See *Boswell, E. H.* 02765
- 03888 **Shattles, D. E.; Callahan, J. A.** Water-level and water-quality trends in aquifers along the Mississippi gulf coast, 1970: Mississippi Board Water Commissioners Bull. 70-1, 25 p., illus., tables, 1970.
- Shaver, Robert H.** See *Morgan, James P.* 06705
- 07650 **Shaver, Robert H.** (and others). Compendium of rock-unit stratigraphy in Indiana: Indiana Geol. Survey Bull. 43, 229 p., illus., tables, 1970.
- 02146 **Shaw, Alan B.** Joint Committee on Paleontologic Information: *Geotimes*, v. 15, no. 3, p. 17-18, 1970.
- 02566 **Shaw, Charles E., Jr.** Age and stratigraphic relations of the Talladega Slate, evidence of pre-Middle Ordovician tectonism in central Alabama: *Southeastern Geology*, v. 11, no. 4, p. 253-267, illus., table, 1970.
- 09564 **Shaw, Charles E., Jr.** Large-scale recumbent folds in the Valley and Ridge Province of Alabama [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 680-681, 1970.
- 07647 **Shaw, David Montgomery.** Thermodynamic studies of paleoclimates [abs.]: *Disert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 3, p. 1353B, 1970.
- 00480 **Shaw, Denis M.** Trace element fractionation during anatexis: *Geochim. et Cosmochim. Acta*, v. 34, no. 2, p. 237-243, illus., 1970.
- 05256 **Shaw, E. W.** Vertical uplift in orogenic belts: *Bull. Canadian Petroleum Geology*, v. 18, no. 3, p. 430-438, illus., 1970.
- Shaw, E. W.** See *Link, T. A.* 05288
- 09024 **Shaw, Frederick C.** Stratigraphy of the Chazy group (Middle Ordovician) in the northern Champlain Valley — Trip E in *Guidebook to field excursions*, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., p. 81-92, illus., 1969.
- Shaw, George H.** See *Campbell, K. Vincent.* 01186
- 08545 **Shaw, H. R.; Swanson, D. A.** Eruption and flow rates of flood basalts, in *Columbia River Basalt Symposium*, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 271-299, illus., 1970.
- 08643 **Shaw, H. R.; Swanson, D. A.** Speculations on the fluid mechanical history of Yakima Basalt flows [abs.], in *Columbia River Basalt Symposium*, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 330, 1970.
- 02119 **Shaw, Herbert R.** Earth tides, global heat flow, and tectonics: *Science*, v. 168, no. 3935, p. 1084-1087, illus., table, 1970.

- 07312 **Shaw, Nolan G.** (editor). Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Soc. Trans., v. 20, 335 p., illus., tables, 1970.
- Shaw, R. P.** See *Carrier, G. F.* 06653
- 07126 **Shaw, William.** Petroleum potential in the Maritime region of Canada, Tech. Paper 3 in Ontario Petroleum Inst., 9th Ann. Conf., Ottawa, 1970: Chatham, Ontario, Ontario Petroleum Inst., 13 p., paged separately, 1970.
- 02338 **Shawa, Monzer S.** Upper Cretaceous depositional pattern, Coalinga area, California: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 7, p. 1296-1305, illus., 1970.
- 02317 **Shawe, D. R.** Structure of the Slick Rock district and vicinity, San Miguel and Dolores Counties, Colorado: U.S. Geol. Survey Prof. Paper 576-C, p. C1-C18, illus., table, 1970.
- 04579 **Shea, F. S.** Salt basins in Nova Scotia, in Third symposium on salt, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 306-316, illus., 1970.
- 07127 **Shea, Frank S.** Industrial mineral potential of the Maritime Province region of Canada, Tech. Paper 4 in Ontario Petroleum Inst., 9th Ann. Conf., Ottawa, 1970: Chatham, Ontario, Ontario Petroleum Inst., 7 p., paged separately, 1970.
- 05383 **Shearman, D. J.** Recent halite rock, Baja California, Mexico: Inst. Mining and Metallurgy Trans., sec. B, v. 79, Bull. 765, p. B155-B162, illus., 1970.
- 02681 **Shearman, Douglas J.** Evaporite-carbonate relations in basin development [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 870, 1970.
- 04567 **Shearman, Douglas J.** Crystal fabrics in calcium sulphate deposits [abs.], in Third symposium on salt, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 119, 1970.
- 05720 **Shedlovsky, Julian P.** (and others). Pattern of bombardment-produced radionuclides in rock 10017 and in lunar soil, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1503-1532, illus., tables, 1970.
- 00360 **Sheehan, Peter M.** Development of Silurian marine communities in the Great Basin [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 143, 1970.
- 09498 **Sheets, Herman E.** The future of ocean programs, in Offshore Technology Conference, 2d Ann., Houston, Tex., 1970, Preprints — v. 1: Dallas, Tex., Offshore Technology Conf., p. I-639 — I-650, illus., table, 1970.
- 10714 **Sheffer, Herman W.; Goldsmith, Louis A.** Tantalum project Rociada, New Mexico: New Mexico Bur. Mines and Mineral Resources Mineral Resources Rept. 2, 15 p., illus., tables, 1969.
- 04485 **Sheikh, A. Mannan.** Geology and ore deposits of Las Guijas tungsten district, Pima County, Arizona: Econ. Geology, v. 65, no. 7, p. 875-882, illus., 1970.
- 08750 **Sheldon, Richard P.** Sedimentation of iron-rich rocks of Llandovery age (Lower Silurian) in the southern Appalachian Basin, in Correlation of the North American Silurian rocks: Geol. Soc. America Spec. Paper 102, p. 107-112, 1970.
- Shelton, J. W.** See *Matalucci, R. V.* 06732
- Shelton, John W.** See *Matalucci, Rudolph V.* 00909
- Shelton, John W.** See *Matalucci, Rudolph V.* 02306

- 02350 **Shelton, John W.; Mack, Douglas E.** Grain orientation in determination of paleocurrents and sandstone trends: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 7, p. 1108-1119, illus., table, 1970.
- Shen, C. K.** See *Lee, Kenneth L.* 03633
- Shepard, Francis P.** See *Andrews, James E.* 01137
- 02295 **Shepherd, W. W.; Hills, L. V.** Depositional environments, Bearpaw-Horseshoe Canyon (Upper Cretaceous) transition zone, Drumheller "Badlands," Alberta: *Bull. Canadian Petroleum Geology*, v. 18, no. 2, p. 166-215, illus., tables, 1970.
- 10196 **Shepherd, J. B.** On the accuracy of location of shallow earthquakes using a tripartite seismograph net: *West Indies Univ. Seismic Research Unit Spec. Pub.* 16, 14 p., illus., table, 1968.
- 06308 **Sheppard, Richard A.; Gude, Arthur J., 3d.** Calcic siliceous chabazite from the John Day Formation, Grant County, Oregon, in *Geological Survey research 1970*, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D176-D180, illus., tables, 1970.
- 09063 **Sheppard, Richard A.; Gude, Arthur J., 3d; Griffin, John J.** Chemical composition and physical properties of phillipsite from the Pacific and Indian Oceans: *Am. Mineralogist*, v. 55, nos. 11-12, p. 2053-2062, illus., tables, 1970.
- 03831 **Sheppard, Simon M. F.; Schwarcz, Henry P.** Fractionation of carbon and oxygen isotopes and magnesium between coexisting metamorphic calcite and dolomite: *Contr. Mineralogy and Petrology*, v. 26, no. 3, p. 161-198, illus., tables, 1970.
- 05389 **Sheppard, Simon M. F.; Epstein, Samuel.** D/H and  $^{18}\text{O}/^{16}\text{O}$  ratios of minerals of possible mantle or lower crustal origin: *Earth and Planetary Sci. Letters*, v. 9, no. 3, p. 232-239, illus., tables, 1970.
- Sheridan, Michael F.** See *Ragan, Donal H.* 00339
- 00561 **Sheridan, Michael F.** Fumarolic mounds and ridges of the Bishop Tuff, California: *Geol. Soc. America Bull.*, v. 81, no. 3, p. 851-867, illus., table, 1970.
- 02976 **Sheridan, Michael F.** Environmental geology [abs.]: *Arizona Acad. Sci. Jour.*, v. 6, 1970 Proc. Supp., p. 38, 1970.
- Sheridan, Michael F.** See *Royse, Chester F., Jr.* 02981
- 09060 **Sheridan, Michael F.; Royse, Chester F., Jr.** Alunite — A new occurrence near Wickenburg, Arizona: *Am. Mineralogist*, v. 55, nos. 11-12, p. 2016-2022, illus., table, 1970.
- 05792 **Sheridan, R. E.; Elliott, G. K.; Oostdam, B. L.** Seismic-reflection profile across Blake escarpment near Great Abaco Canyon: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 11, p. 2032-2039, illus., table, 1970.
- Sherif, M. A.** See *Bostrom, R. C.* 04114
- 05496 **Sherif, M. A.; Wu, M. J.** Pore pressure variation during cyclic static tests, in *Engineering geology and soils engineering symposium*, 8th Ann., Pocatello, Idaho, 1970, Proc.: Boise, Idaho, Idaho Dept. Highways, p. 37-54, illus., 1970.
- Sherif, M. A.** See *Bostrom, R. C.* 09870
- Sherif, M. A.** See *Bostrom, R. C.* 10514
- 10747 **Sherif, M. A.; Bostrom, R. C.; Wu, M. J.** The maximum deviator stress and effective stress ratio failure criteria as related to stress and strain-controlled tests during triaxial testing [with French résumé], in *Internat. Assoc. Eng. Geology Internat.*

- Cong., 1st, Paris, 1970, V. 1: Paris, Comité Français de Géologie de l'Ingénieur, p. 356-375, illus., 1970.
- 00181 **Sherwin, Jo-Ann.** Wavelength of folds in the Allegheny plateau [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 36, 1970.
- Sherwin, John R.** See *Fix, James E.* 06466
- Sherwood, H. G.** See *Anderson, C. D.* 08070
- 05440 **Sherwood, W. C.** Mineral-water equilibria in selected Virginia streams [abs.]: Virginia Jour. Sci., v. 21, no. 3, p. 136, 1970.
- 07671 **Shewman, R. W.; Clark, L. A.** Pentlandite phase relations in the Fe-Ni-S system and notes on the monosulfide solid solution: Canadian Jour. Earth Sci., v. 7, no. 1, p. 67-85, illus., table, 1970.
- Shideler, G. L.** See *Swift, D. J. P.* 10337
- 02076 **Shideler, Gerald L.** Provenance of Johns Valley boulders in late Paleozoic Ouachita facies, southeastern Oklahoma and southwestern Arkansas: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 789-806, illus., table, 1970.
- Shideler, Gerald L.** See *Swift, Donald J. P.* 04724
- 07554 **Shideler, Gerald L.** Petrography of the Johns Valley boulders, Ouachita Mountains: Oklahoma Geology Notes, v. 30, no. 5, p. 98-117, illus., 1970.
- Shido, Fumiko.** See *Miyashiro, Akiho.* 01642
- Shido, Fumiko.** See *Miyashiro, Akiho.* 03714
- Shieh, W. Y.** See *Baker, L. E.* 07506
- Shields, W. R.** See *Barnes, I. L.* 10606
- Shields, W. R.** See *Murphy, T. J.* 10607
- 03755 **Shiftan, Z. L.** Integration of geophysics and hydrogeology in the solution of regional groundwater problems [with French abs.], in *Mining and groundwater geophysics, 1967*: Canada Geol. Survey Econ. Geology Rept. 26, p. 507-512; discussion, p. 512-516, illus., 1970.
- Shigeno, Saburo.** See *Uchida, Kinsuke.* 02474
- 07947 **Shilts, William Weimer.** Pleistocene geology of the Lac Mégantic region, southeastern Québec, Canada [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3487B, 1970.
- 05115 **Shima, Makoto; Nagata, Takeshi; Okada, Akihiko.** Round particles on the lunar surface [in Japanese with English abs.]: Japanese Assoc. Mineralogists, Petrologists and Econ. Geologists Jour., v. 63, no. 6, p. 239-247, illus., tables, 1970.
- 06633 **Shimazaki, Hidehiko; Clark, L. A.** Synthetic FeS<sub>2</sub>-CuS<sub>2</sub> solid solution and fukuchilite-like minerals: Canadian Mineralogist, v. 10, pt. 4, p. 648-664, illus., tables, 1970.
- 09565 **Shimazaki, Hidehiko; Clark, Lloyd A.** Liquidus phase relations in part of the Na<sub>2</sub>O-FeS-FeO-SiO<sub>2</sub> system [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 681, 1970.
- Shimer, S. S.** See *Vallier, Tracy L.* 01109

- 02204 **Shimp, Neil F.; Leland, Harry V.; White, W. Arthur.** Studies of Lake Michigan bottom sediments — No. 2, Distribution of major, minor, and trace constituents in unconsolidated sediments from southern Lake Michigan: Illinois Geol. Survey Environmental Geology Note 32, 19 p., illus., tables, 1970.
- Shimp, Neil F.** See *Ruch, R. R.* 04488
- 07132 **Shimp, Neil F.** Silicate analysis as viewed by geological surveys, in *Developments in applied spectroscopy*, V. 8 — Mid-America Spectroscopy Symposium, 20th Ann., Chicago, Ill., 1969; Selected papers: New York and London, Plenum Press, p. 158-167, illus., tables, 1970.
- 11256 **Shimp, Neil F.; Leland, Harry V.** Distribution of trace elements in unconsolidated sediments of southern Lake Michigan [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 681-682, 1970.
- 02101 **Shindala, Adnan; Priest, Melville S.** The meandering of natural streams in alluvial materials: *Water Resources Bull.*, v. 6, no. 2, p. 269-276, 1970.
- 09733 **Shindala, Adnan; Priest, Melville S.** The meandering of natural streams in alluvial materials: *Mississippi Univ. Water Resources Research Inst.*, 21 p., illus., 1968.
- Shiner, V. J., Jr.** See *Meinschein, W. G.* 05762
- 10956 **Shinn, Anthony D.** Possible future petroleum provinces of Gulf Coast, upper Miocene-Pliocene [abs.]: *Am. Assoc. Petroleum Geologists*, v. 54, no. 9, p. 1790-1791, 1970; *Gulf Coast Assoc. Geol. Soc. Trans.*, v. 20, p. 69-71, 1970.
- Shipek, C. J.** See *Marlow, M. S.* 01365
- Shirk, William R.** See *Geyer, Alan R.* 02405
- 01703 **Shive, Peter N.** Deformation and remanence in magnetite: *Earth and Planetary Sci. Letters*, v. 7, no. 5, p. 451-455, illus., table, 1970.
- 02182 **Shive, Peter N.** Reply [to discussion by M. Fuller and W. Lowrie of "The effect of internal stress on the thermoremanence of nickel", 1969]: *Jour. Geophys. Research*, v. 75, no. 14, p. 2785-2786, 1970.
- 02303 **Shlien, Seymour; Toksöz, M. Nafi.** Frequency-magnitude statistics of earthquake occurrences: *Earthquake Notes*, v. 41, no. 1, p. 5-18, illus., tables, 1970.
- 06408 **Shlien, Seymour; Toksöz, M. Nafi.** A clustering model for earthquake occurrences: *Seismol. Soc. America Bull.*, v. 60, no. 6, p. 1765-1787, illus., tables, 1970.
- 10535 **Shlien, Seymour.** Automatic identification of seismic signals using large seismic arrays [abs.]: *EOS*, v. 51, no. 11, p. 777, 1970.
- 10516 **Shneiderov, Anatol J.** On the change of the strand line [abs.]: *EOS*, v. 51, no. 11, p. 762, 1970.
- 05091 **Shoemaker, E. M.; Morris, E. C.** Physical characteristics of the lunar regolith determined from Surveyor television observations, in *Symposium on planetary atmospheres and surfaces*, Woods Hole, Mass., 1969: *Radio Sci.*, v. 5, no. 2, p. 129-155, illus., 1970.
- 05108 **Shoemaker, E. M.** (and others). Preliminary geologic investigation of the Apollo 12 landing site, — Pt. A, Geology of the Apollo 12 landing site, in *Apollo 12 preliminary science report*: U.S. Natl. Aeronautics and Space Adm. Spec. Pub. SP-235, p. 113-156, illus., 1970.

- 06294 **Shoemaker, E. M.; Hait, M. H.; Swann, G. A.; Schleicher, D. L.; Schaber, G. G.; Sutton, R. L.; Dahlem, D. H.; Goddard, E. N.; Waters, A. C.** Origin of the lunar regolith at Tranquility Base, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 2399-2412, illus., 1970.
- 06866 **Shoemaker, Robert Earl.** Pollen and spores of the Judith River Formation (Campanian), central Montana [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 1, p. 85B-86B, 1970.
- Shoffner, Joseph E., Jr.** See *Hunsucker, John K.* 08341
- 04644 **Sholkovitz, Edward R.** A free vehicle bottom-water sampler: Limnology and Oceanography, v. 15, no. 4, p. 641-644, illus., 1970.
- Shomaker, John W.** See *Mourant, Walter A.* 10439
- 03354 **Shopland, Robert C.; Kirklin, Richard H.** Application of a vertical strain seismograph to the enhancement of P waves: Seismol. Soc. America Bull., v. 60, no. 1, p. 105-124, illus., 1970.
- 06765 **Shopland, Robert C.** Portable 30-day unattended system for recording earth strain in a 66-db range: IEEE Trans. Geosci. Electronics, v. GE-8, no. 4, p. 295-305, illus., table, 1970.
- Shor, G. G.** See *Karig, D. E.* 02330
- 10002 **Shor, G. G., Jr.; Menard, H. W.; Raitt, R. W.** Structure of the Pacific Basin, in *The sea* — v. 4, New concepts of sea floor evolution, Pt. 2, Regional observations (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 3-27, illus., tables, 1970.
- Short, H. A.** See *Conrod, A. C.* 02911
- 09397 **Short, Lester L., Jr.** Mid-Pleistocene birds from western Nebraska, including a new species of sheldgoose: Condor, v. 72, no. 3, p. 147-152, illus., 1970.
- 01166 **Short, Nicholas M.** Anatomy of a meteorite impact crater — West Hawk Lake, Manitoba, Canada: Geol. Soc. America Bull., v. 81, no. 3, p. 609-648, illus., tables, 1970.
- 05787 **Short, Nicholas M.** Progressive shock metamorphism of quartzite ejecta from the Sedan nuclear explosion crater: Jour. Geology, v. 78, no. 6, p. 705-732, illus., tables, 1970.
- Short, Nicholas M.** See *Hartung, Jack B.* 06393
- 03182 **Shotton, F. W.; Blundell, D. J.; Williams, R. E. G.** Birmingham University radiocarbon dates IV: Radiocarbon, v. 12, no. 2, p. 385-399, 1970.
- 08673 **Shotwell, J. Arnold.** Pliocene mammals of southeast Oregon and adjacent Idaho: Oregon Univ. Mus. Nat. History Bull. 17, 103 p., illus., tables, 1970.
- 02682 **Shouldice, David H.** Geology of western Canadian continental shelf [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 870-871, 1970.
- Showalter, D. L.** See *Ehmann, W. D.* 04781
- 01494 **Shown, Lynn M.** Evaluation of a method for estimating sediment yield, in *Geological Survey research 1970*, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B245-B249, illus., tables, 1970.
- 03999 **Shows, Thad N.** Water resources of Mississippi: Mississippi Geol. Econ. and Topog. Survey Bull. 113, 161 p., illus., tables, 1970.

- 10387 **Shows, Thad N.** The role of the Mississippi Geological Survey in ground-water development and investigation in Mississippi, in *Mississippi Water Resources Conf.*, 3d, 1968, Jackson, Proc.: State College, Miss. Water Resources Research Inst., p. 103-104, 1968.
- Shrader, Ross E.** See *Larach, Simon*. 04148
- 01497 **Shreve, R. L.; Sharp, R. P.** Internal deformation and thermal anomalies in lower Blue Glacier, Mount Olympus, Washington, U.S.A. [with French and German abs.]: *Jour. Glaciology*, v. 9, no. 55, p. 65-86, illus., tables, 1970.
- 09567 **Shreve, Ronald L.** Mainstream length vs. basin area in topologically random channel networks [abs.]: *Geol. Soc. America Abs. with programs*, v. 2, no. 7, p. 682, 1970.
- 04500 **Shreveport Geological Society.** Southeast Oklahoma and northeast Texas — 1970 spring field trip, guide book: Shreveport, La., Shreveport Geol. Soc., 33 p., illus., 1970.
- 00792 **Shrock, Robert R.** Memorial to Edgar Roscoe Cumings (1874-1967): *Geol. Soc. America Proc.* 1967, p. 177-183, portrait, 1970.
- 10967 **Shrock, Robert R.** Walter Lucius Whitehead (1891-1969): *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 2, p. 363-364, portrait, 1970.
- 09406 **Shroder, John F., Jr.** Quaternary landslides in Utah [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 121, 1970.
- Shuart, Susan G.** See *Ratcliffe, Nicholas M.* 00175
- Shubinski, Robert P.** See *Orlob, Gerald T.* 08471
- 01977 **Shuey, R. T.; Johnson, R. B.; Eardley, A. J.** Paleomagnetism of Lake Bonneville sediments [abs.]: *EOS*, v. 51, no. 4, p. 277, 1970.
- 08206 **Shuey, R. T.; Cole, E. R.; Mikulich, M. J.** Geographic correction of archeomagnetic data: *Jour. Geomagnetism and Geoelectricity*, v. 22, no. 4, p. 485-489, tables, 1970.
- 09611 **Shuey, Ralph T.** An evaluation of archeomagnetic dating [abs.]: *Utah Acad. Sci., Arts, and Letters Proc.*, v. 47, pt. 1, p. 273-274, 1970.
- Shugurova, N. A.** See *Sobolev, V. S.* 03577
- Shulgina, N. I.** See *Saks, V. N.* 10094
- 00643 **Shurr, George W.** Unconformable relationships between the Pierre Shale and Niobrara Formation in central South Dakota [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 348-349, 1970.
- Sibuet, Jean-Claude.** See *LePichon, Xavier*. 01946
- Sichler, Bertrand.** See *LePichon, Xavier*. 01946
- Sichler, Bertrand.** See *Olivet, Jean-Louis*. 05254
- Siddiqui, Shamsul H.** See *Parizek, Richard P.* 11018
- 06610 **Siddiqui, Shamsul Hasan.** Hydrogeologic factors influencing well yields and aquifer hydraulic properties of folded and faulted carbonate rocks in central Pennsylvania [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 2, p. 764B, 1970.
- Sides, Geoffrey R.** See *Barden, Laing*. 03627

- 07477 **Siebert, Harry L.** Connecticut's declining sand and gravel resources, *in* Forum on geology of industrial minerals, 5th, Harrisburg, Pa., 1969, Proc.: Pennsylvania Geol. Survey, 4th ser., Bull. M64 (Mineral Resources Rept.), p. 43-54, illus., table, 1970.
- Siebert, Robert M.** See *Hostetler, Paul B.* 01783
- 09568 **Siebert, Robert M.; Hostetler, Paul B.** The dissolution of dolomite below 100°C [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 682-683, 1970.
- Sieffermann, G.** See *Colmet-Daage, F.* 05900
- 09569 **Siegel, Frederic R.** Philosophy for geochemical education in developing nations [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 683, 1970.
- 07405 **Siegel, Harold O.** The diversity of I.P. responses of lead-zinc deposits in carbonate rocks [abs.]: Mining Eng., v. 22, no. 9, p. 52, 1970.
- 09570 **Siemers, Charles T.** Facies distribution of trace fossils in a deltaic environmental complex, upper part of the Dakota Formation (Upper Cretaceous), central Kansas [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 681-684, 1970.
- 06120 **Siemes, Heinrich.** Experimental deformation of galena ores [with German abs.], *in* Experimental and natural rock deformation — Internat. Symposium, Darmstadt, Germany, 1969, Proc. (P. Paulitsch, editor): Berlin and Heidelberg, Germany, Springer-Verlag, p. 165-208, illus., tables, 1970.
- Siemiatkowska, K.** See *Card, K. D.* 06420
- Siemiatkowska, K.** See *Card, K. D.* 06421
- Siemiatkowska, K.** See *Card, K. D.* 06422
- Signer, P.** See *Begemann, F.* 06821
- 04012 **Signer, Peter; McDowell, Fred W.** On-line Ar extraction system for rapid high-precision routine analysis, *in* Geochronology of Phanerozoic orogenic belts — Colloquium, Switzerland, 1969, Papers: Eclogae Geol. Helvetiae, v. 63, no. 1, p. 311-321, illus., table, 1970.
- 00077 **Signor, D. C.; Growitz, D. J.; Kam, William.** Annotated bibliography on artificial recharge of ground water, 1955-67: U.S. Geol. Survey Water-Supply Paper 1990, 141, p., 1970.
- 10132 **Sigstad, John S.** A field test for catlinite: Am. Antiquity, v. 35, no. 3, p. 377-382, tables, 1970.
- Sigvaldason, O. T.** See *Benson, R. P.* 09155
- 00361 **Silberling, N. J.** Thrust faulting of the Havallah sequence in the Sonoma Range, north-central Nevada [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 143-144, 1970.
- 10097 **Silberling, N. J.** Biostratigraphy of marine Triassic in northern Alaska [abs.], *in* Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2504, 1970.
- Silberman, M. L.** See *McKee, E. H.* 02198
- 04322 **Silberman, M. L.; Ashley, R. P.** Age of ore deposition at Goldfield, Nevada, from potassium-argon dating of alunite: Econ. Geology, v. 65, no. 3, p. 352-354, table, 1970.
- Silberman, M. L.** See *McKee, E. H.* 09654



**Silberman, Miles L.** See *McKee, Edwin H.* 00314

**Silberman, Miles L.** See *McKee, Edwin H.* 03832

- 05331 **Silva Pineda, Alicia.** Plantas del Pensilvanico de la region de Tehuacan, Puebla [Pennsylvanian flora from the Tehuacan region of Puebla]: Mexico Univ. Nac. Autonomia Inst. Geologia Paleontologia Mexicana, no. 29, 108 p., illus., table, 1970.

- 09448 **Silva Pineda, Alicia.** Paleobotanica y geologia de Tecamatlan, Estado de Puebla — pt. 1, Plantas fosiles del Jurasico Medio de Tecamatlan, Estado de Puebla [Paleobotany and geology of Tecamatlan, State of Puebla — pt. 1, Fossil plants of the Middle Jurassic of Tecamatlan, State of Puebla]: Mexico Univ. Nac. Autonomia Inst. Geologia Paleontologia Mexicana, no. 27, p. 1-77, illus., 1969.

- 10444 **Silva-Barcenas, Angel.** Localidades de vertebrados fosiles en la Republica Mexicana [with English abs.]: Mexico Univ. Nac. Autonomia Inst. Geologia Paleontologia Mexicana, no. 28, 34 p., illus., 1969.

**Silva-Barcenas, Angel.** See *Ochoterena F., H.* 11253

- 09571 **Silver, Eli A.** Gorda Basin deformation related to triple junction tectonics [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 684, 1970.

- 01586 **Silver, Eli Alfred.** Structure of the continental margin off northern California, north of the Gorda Escarpment [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 9, p. 4284B, 1970.

**Silver, L. T.** See *McGetchin, T. R.* 00064

**Silver, L. T.** See *McGetchin, T. R.* 01799

**Silver, Leon T.** See *McGetchin, Thomas R.* 02825

- 05721 **Silver, Leon T.** Uranium-thorium-lead isotopes in some Tranquillity Base samples and their implications for lunar history, in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc.* — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1533-1574, illus., tables, 1970.

**Silver, Leon T.** See *Anderson, Thomas H.* 06045

**Silver, Leon T.** See *McGetchin, Thomas R.* 09123

**Silver, Leon T.** See *Ludwig, Kenneth R.* 09650

- 03803 **Silverberg, Robert.** Mammoths, mastodons and man: New York and London, McGraw-Hill Book Co., 223 p., illus., 1970.

- 00004 **Silverman, Daniel.** Seismic holography — Oil-finding tool of the future: *Ocean Industry*, v. 5, no. 1, p. 40-43, illus., 1970.

- 04442 **Silverman, Melvin P.; Munoz, Elaine F.** Fungal attack on rocks, solubilization and altered infrared spectra: *Science*, v. 169, no. 3949, p. 985-987, illus., table, 1970.

**Silverman, Melvin P.** See *Oyama, Vance I.* 05748

- 00065 **Silverman, S. M.** On the thermal expansion and contraction of quartz: *Jour. Geophys. Research*, v. 75, no. 2, p. 406-408, illus., 1970.

**Silverstein, Joel.** See *Abdel-Gawad, Monem.* 01906

- 03717 **Silvester, Richard.** Growth of crenulate shaped bays to equilibrium: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7274, *Jour. Waterways and Harbors Div.*, no. WW 2, p. 275-287, illus., 1970.

- 10209 **Silvester, Richard; DelaCruz, Catalino del Rosario.** Pattern forming forces in deltas: Am. Soc. Civil Engineers Proc., v. 96, paper 7260, Jour. Waterways and Harbors Div., no. WW 2, p. 201-217, illus., tables, 1970.
- 04973 **Simard, Antoine.** A study of the peat-bogs of Mingan Islands, Duplessis County [also French edition]: Quebec Dept. Nat. Resources Prelim. Rept. 590, 16 p., illus., tables, 1970.
- 02017 **Simkin, Tom; Smith, J. V.** Minor-element distribution in olivine: Jour. Geology, v. 78, no. 3, p. 304-325, table, 1970.
- 09572 **Simkin, Tom.** Origin of some flat-topped volcanoes and guyots [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 685, 1970.
- Simmons, G.** See *VonHerzen, R. P.* 01496
- Simmons, G.** See *Nur, A.* 02404
- Simmons, G. C.** See *Gair, J. E.* 04692
- Simmons, Gene.** See *Horai, Ki-iti.* 00015
- Simmons, Gene.** See *Horai, Ki-iti.* 00584
- Simmons, Gene.** See *Combs, Jim.* 01750
- Simmons, Gene.** See *Chung, D. H.* 03969
- 05103 **Simmons, Gene; Calio, A. J.** Summary of scientific results, in Apollo 12 preliminary science report: U.S. Natl. Aeronautics and Space Adm. Spec. Pub. SP-235, p. 1-6, 1970.
- Simmons, Gene.** See *Horai, Ki-iti.* 06285
- Simmons, Gene.** See *Kanamori, Hiroo.* 06288
- Simmons, Gene.** See *Chung, D. H.* 06350
- 03659 **Simon, D. E.; Elwell, J. H.** Statistical methods for integrating populations of a fauna collected at various localities: Iowa Acad. Sci. Proc. 1969, v. 76, p. 267-274, illus., tables, 1970.
- 04451 **Simon, D. E.; Elwell, J. H.; Sendlein, L. V. A.; Lemish, J.** Measurement of physical and chemical changes induced during weathering of a carbonate rock unit: Iowa Acad. Sci. Proc. 1969, v. 76, p. 320-329, illus., tables, 1970.
- Simon, I.** See *Cabaniss, G. H.* 10479
- 01868 **Simon, Ivan; Sawdo, Richard M.; Sáenz R., Rodrigo; Melson, William G.** Preliminary results from tiltmeter recording at Arenal Volcano, Costa Rica [abs.]: EOS, v. 51, no. 4, p. 440, 1970.
- 00799 **Simon, Jack A.** Memorial to John Albert Harrison (1916-1967): Geol. Soc. America Proc. 1967, p. 215-217, portrait, 1970.
- 00948 **Simon, Ruth B.** Denver earthquakes: Science, v. 167, no. 3924, p. 1519, 1970.
- 00362 **Simonds, George.** Public policy requirements to minimize earthquake risk in Hayward, California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 144, 1970.
- 00943 **Simoneit, B. R.; Schnoes, H. K.; Haug, P.; Burlingame, A. L.** Nitrogenous compounds of the Colorado Green River Formation oil shale — A preliminary analysis by mass spectrometry: Nature, v. 226, no. 5240, p. 75-76, illus., table, 1970.

**Simoneit, B. R.** See *Burlingame, A. L.* 05736

**Simons, D. B.** See *Chang, H. Y.* 10503

- 05938 **Simons, P. Y.; Dacheille, Frank.** Possible topotaxy in the  $\text{TiO}_2$  system: *Am. Mineralogist*, v. 55, nos. 3-4, p. 403-415, illus., tables, 1970.

**Simonsen, Stanley H.** See *Cummings, John P.* 11023

- 03018 **Simony, P. S.; Wind, G.** Structure of the Dogtooth Range and adjacent portions of the Rocky Mountain Trench, in *Structure of the southern Canadian Cordillera*: *Geol. Assoc. Canada Spec. Paper* 6, p. 41-51, illus., geol. map, 1970.

- 11220 **Simpson, Bessie W.** *Gem trails of Texas* (3d rev. ed.): Glen Rose, Texas, Gem Trails Pub. Co., 88 p., illus., 1970.

**Simpson, Dale R.** See *Schopf, Thomas J. M.* 00555

- 01978 **Simpson, E. S.** On the dispersivity of real aquifers [abs.]: *EOS*, v. 51, no. 4, p. 284, 1970.

- 08432 **Simpson, E. S.; Thorud, David B.; Friedman, Irving.** Distinguishing winter from summer recharge to groundwater in southern Arizona by deuterium analysis [abs.] [also French, Spanish, and Russian versions, in *Symposium on World Water Balance*, V. 1: *Internat. Assoc. Sci. Hydrology-Unesco Pub.* 92, p. 100-101 [1970,].

- 02729 **Simpson, Frank.** Low depth Saskatchewan prospect: *Oilweek*, v. 21, no. 6, p. 14, 16, 58, illus., table, 1970.

- 04893 **Simpson, George Gaylord.** On randomness and determinism — Discussion [of 'Randomness in nature' by C. J. Mann, 1970]: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 3185-3186, 1970.

- 07247 **Simpson, George Gaylord.** Uniformitarianism — An inquiry into principle, theory, and method in geohistory and biohistory, [Chap.] 2 in *Essays in evolution and genetics in honor of Theodosius Dobzhansky — A supplement to evolutionary biology* (Max K. Hecht and William C. Steere, editors): New York, Appleton-Century-Crofts, p. 43-96, 1970.

- 04381 **Simpson, H. James.** Tritium in Crater Lake, Oregon: *Jour. Geophys. Research*, v. 75, no. 27, p. 5195-5207, illus., tables, 1970.

- 10969 **Simpson, J. W.; Strangway, D. W.** Stratigraphy in volcanic rocks of the Mogollon Plateau by K-Ar dating and paleomagnetism [abs.]: *EOS*, v. 51, no. 4, p. 271, 1970.

- 05441 **Simpson, M. G.; Kohler, J. A.; Johnson, G. H.** Effects of urbanization on sedimentation in Lake Matoaka, Williamsburg area [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 137, 1970.

**Simpson, Thomas A.** See *LaMoreaux, Philip E.* 06226

**Sims, J. D.** See *Connor, J. J.* 09601

- 01560 **Sims, John D.** Authigenic kaolinite in sand of the Wilcox Formation, Jackson Purchase region, Kentucky, in *Geological Survey research 1970*, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B27-B32, illus., table, 1970.

**Sims, P. K.** See *Morey, G. B.* 04971

- 05171 **Sims, P. K.** Geologic map of Minnesota — Bedrock geology: *Minnesota Geol. Survey Misc. Map* M-14, scale 1:1,000,000, 1970.

**Sims, P. K.** See *Gable, D. J.* 05858

- 07245 **Sims, P. K.; Westfall, I.** (editors). Summary of fieldwork, 1970: Minnesota Geol. Survey Inf. Circ. 8, 24 p., illus., 1970.
- Sims, P. K.** See *Austin, G. S.* 08291
- 08587 **Sims, P. K.; Morey, G. B.; Ojakangas, R. W.; Viswanathan, S.** Geologic map of Minnesota, Hibbing sheet, bedrock geology: [Minneapolis, Minn.] Minnesota Geol. Survey, scale 1:250,000, 1970.
- 03582 **Sims, Paul; Morey, G. B.** A teacher's guide for geologic field investigations in north-central Minnesota: [St. Paul, Minn.] Minnesota Dept. Education, 14 p., illus. [n.d.].
- 06892 **Sinclair, A. J.; Woodsworth, G. J.** Multiple regression as a method of estimating exploration potential in an area near Terrace, B.C.: *Econ. Geology*, v. 65, no. 8, p. 998-1003, illus., tables, 1970.
- Sinclair, A. J.** See *White, William H.* 08135
- 09177 **Singer, Donald A.; Wickman, Frans E.** Probability tables for locating elliptical targets with square, rectangular and hexagonal point nets: Pennsylvania State Univ. Mineral Sci. Expt. Sta. Spec. Pub., no. 1-69, 100 p., illus., tables, 1969.
- Singer, Harry.** See *Horenstein, Sidney.* 11212
- 09885 **Singer, Philip C.; Stumm, Werner.** The solubility of ferrous iron in carbonate-bearing water: *Am. Water Works Assoc. Jour.*, v. 62, no. 3, p. 198-202, illus., tables, 1970.
- 05678 **Singer, S. F.; Bandermann, L. W.** Where was the Moon formed?: *Science*, v. 170, no. 3956, p. 438-439, tables, 1970.
- 05083 **Singer, S. Fred.** Origin of the Moon by capture and its consequences: *EOS*, v. 51, no. 9, p. 637-641, illus., 1970.
- Singer, S. Fred.** See *Am. Assoc. Adv. Sci.* 09509
- 05502 **Singh, Awtar; Lee, Kenneth L.** Variability in soil parameters, in *Engineering geology and soils engineering symposium*, 8th Ann., Pocatello, Idaho, 1970, Proc.: Boise, Idaho, Idaho Dept. Highways, p. 159-185, illus., tables, 1970.
- 06776 **Singh, Awtar.** Shear strength and stability of man-made slopes: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7652, *Jour. Soil Mechanics and Found. Div.*, no. SM 6, p. 1879-1892, illus., 1970.
- 04592 **Singh Deshwar, K. H.** 'E-H' extensometer, a practical instrument for rock mechanics measurements: *Canadian Mining Jour.*, v. 91, no. 7, p. 45-47, illus., 1970.
- 03544 **Singh, Raman J.** On the validity of the name *Hallopora* for a genus of trepostome bryozoan: *Jour. Paleontology*, v. 44, no. 4, p. 784-785, 1970.
- Singh, Sarva Jit.** See *Ben-Menahem, Ari.* 09959
- Singh, Sri K.** See *Kuo, John T.* 03522
- 03632 **Singh, Sukhmander.** Bonding, effective stresses, and strength of soils — Discussion [of paper 6786 by J. K. Mitchell, Awtar Singh, and R. G. Campanella, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7385, *Jour. Soil Mechanics and Found. Div.*, no. SM 4, p. 1469-1470, 1970.
- 10507 **Singh, Teja.** A principal components regression model for predicting infiltration [abs.]: *EOS*, v. 51, no. 11, p. 755, 1970.
- Singhal, Ashok.** See *Somerton, Wilbur H.* 09135

- 01833 **Sinha, A. K.; Davis, T. E.** Isotopic composition of lead from Franciscan rocks [abs.]: EOS, v. 51, no. 4, p. 445, 1970.
- 05592 **Sinha, A. K.** Model lead and radiometric ages from the Churchill province, Canadian shield: Geochim. et Cosmochim. Acta, v. 34, no. 10, p. 1089-1106, illus., tables, 1970.
- 01252 **Sinha, Ajit K.** Theoretical studies on the rotary field electromagnetic method of prospecting: Geophysics, v. 35, no. 2, p. 310-330, illus., 1970.
- 00449 **Sinha, R. N.** Cardium Formation, Edson area, Alberta: Canada Geol. Survey Paper 68-30, 48 p., illus., tables, 1970.
- 04552 **Sinkankas, John.** Prospecting for gemstones and minerals (*formerly titled* Gemstones and minerals, how and where to find them): New York, Van Nostrand Reinhold Co., 397 p., illus., tables, revised 1970; originally published 1961.
- Siple, George E.** See *Bloxham, W. M.* 07608
- 06295 **Sippel, Robert F.; Spencer, Alexander B.** Luminescence petrography and properties of lunar crystalline rocks and breccias, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 2413-2426, illus., table, 1970.
- Sirkin, Leslie A.** See *Connally, G. Gordon.* 05191
- Sirkin, Leslie A.** See *Connally, G. Gordon.* 06103
- 06170 **Sirkin, Leslie A.; Owens, James P.; Minard, James P.; Rubin, Meyer.** Palynology of some Upper Quaternary peat samples from the New Jersey coastal plain, in Geological Survey research 1970, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D77-D87, illus., 1970.
- Sirkin, Leslie A.** See *Connally, G. Gordon.* 09036
- Siry, Joseph W.** See *Murphy, James P.* 05754
- 03916 **Sisco, H. G.; Whitehead, R. L.** Ground-water levels in Idaho, 1970: Idaho Dept. Water Adm. Water Inf. Bull. 18, 73 p., illus., tables, 1970.
- 05174 **Sisler, F. D.** Impact of land and sea pollution on the chemical stability of the atmosphere, in Global effects of environmental pollution — Am. Assoc. Adv. Sci. Symposium, Dallas, Tex., 1968 (S. F. Singer, editor): New York, Springer-Verlag, and Dordrecht-Holland, D. Reidel Publishing Co., p. 13-24, tables, 1970.
- Skaggs, Samuel R.** See *Blander, Milton.* 04119
- Skaggs, Samuel R.** See *Blander, Milton.* 05677
- Skehan, James W.** See *Abu-moustafa, Adel A.* 00440
- Skelton, John.** See *Harvey, Edward J.* 07410
- 02893 **Skermmer, N. A.; Hillis, S. F.** Gradation and shear characteristics of four cohesionless soils [with French abs.]: Canadian Geotech. Jour., v. 7, no. 1, p. 62-68, illus., tables, 1970.

- 07128 **Skidmore, Brian.** Petroleum potential in the Gaspé region of Quebec, Tech. Paper 5 in Ontario Petroleum Inst., 9th Ann. Conf., Ottawa, 1970: Chatham, Ontario, Ontario Petroleum Inst., 21 p., *pagé séparément*, illus., 1970.
- 07627 **Skidmore, E. L.; Fisher, P. S.; Woodruff, N. P.** Wind erosion equation — Computer solution and application: Soil Sci. Soc. America Proc., v. 34, no. 6, p. 931-935, illus., table, 1970.
- 08294 **Skiles, Durward D.** A method of interring the direction of drift of the geomagnetic field from paleomagnetic data: Jour. Geomagnetism and Geoelectricity, v. 22, no. 4, p. 441-462, illus., tables, 1970.
- 10377 **Skillman Woyski, Margaret.** The scientific method in physical geology [laboratory manual]: Belmont, Calif., Wadsworth Publishing Company, 14 *separément pagées* investigations, illus., tables, 1970.
- 00128 **Skinner, Brian J.** A sulfur lava flow on Mauna Loa: Pacific Sci., v. 24, no. 1, p. 144-145, table, 1970.
- Skinner, Brian J.** See *Petrović, Radomir*. 01814
- Skinner, Brian J.** See *Graf, Joseph L., Jr.* 04313
- 04903 **Skinner, Brian J.** Stability of the tetragonal polymorph of  $\text{Cu}_2\text{S}$ : Econ. Geology, v. 65, no. 6, p. 724-728, illus., table, 1970.
- 10341 **Skinner, Hubert C.** In memoriam — John Mark Jewett, 1886-1970: Compass, v. 47, no. 4, p. iii-iv, 1970.
- 02521 **Skinner, Jasper D., 2d.** *Donacia emarginata*, a Holocene long-horned leaf beetle from Milburn, Nebraska [abs.]: Nebraska Acad. Sci. Proc., 80th Ann. Mtg., p. 14, 1970.
- 01475 **Skipp, Betty; Mamet, B. L.** Stratigraphic micropaleontology of the type locality of the White Knob Limestone (Mississippian), Custer County, Idaho, in Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B118-B123, illus., 1970.
- 02683 **Skipper, Keith.** Antidune cross-stratification in turbidite sequence, Cloridorme Formation, Gaspé, Quebec [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 871, 1970.
- Skogerboe, Gaylord V.** See *Jeppson, Roland W.* 09902
- Skougstad, M. W.** See *Brown, Eugene*. 08199
- 03738 **Skvor, Vladimir.** Reply [to discussion by C. W. Hatten and A. A. Meyerhoff, 1970, of "The Caribbean area, a case of destruction and regeneration of a continent," 1969]: Geol. Soc. America Bull., v. 81, no. 6, p. 1863-1864, 1970.
- 04139 **Skwarko, S. K.** An Upper Jurassic *Apiotrigonia* from Mexico [with Spanish abs.]: Soc. Geol. Mexicana Bol. 1968, v. 31, no. 2, p. 75-78, illus., 1970.
- 01160 **Slabaugh, W. H.** Clay colloids: Chemistry, v. 43, no. 4, p. 8-12, illus., 1970.
- 03088 **Slade, D. V.; Gauger, J.; Vali, V.** Laser geophysical strain measurements on Kern River Fault: Modern Geology, v. 1, no. 3, p. 237-246, illus., 1970.
- 06624 **Slade, D. V.; Gauger, J.; Vali, V.** Laser interferometer measurement on Kern River fault, in Laser applications in the geosciences (J. Gauger and F. F. Hall, Jr., editors) - Symposium, Huntington Beach, Calif., 1969, Proc.: North Hollywood, Calif., Western Periodicals Co., p. 163-184, illus., table, 1970.
- Slagle, S. E.** See *Gillespie, J. B.* 07988

**Slagle, S. E.** See *Gillespie, J. B.* 09170

- 08083 **Slater, Philip N.; McKenney, Dean B.** Use of passband interference filters in multispectral photography, in *Earth Resources Aircraft Program, status review, 2d Ann.*, Houston, Tex., 1969 — V. 2, Agriculture, Forestry, and sensor studies: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 28-1-28-18, illus., [1970?].
- 02772 **Slaughter, A. L.** The Homestake mine, in *Guidebook and road logs for 23d Ann. Mtg., Rocky Mtn. Sec., Geol. Soc. America, Rapid City, S. Dak.*, 1970: Rapid City, S. Dak., South Dakota School Mines and Technology, Dept. Geology and Geol. Eng., p. 7-8, illus., 1970.
- 04187 **Slaughter, Bob.** Were the first Americans caucasoid?: *Texas Jour. Sci.*, v. 21, no. 4, p. 483-486, illus., 1970.
- 00489 **Slaughter, Bob H.** Evolutionary trends of chiropteran dentitions [abs.]: *Texas Jour. Sci.*, v. 21, no. 3, p. 361-362, 1970.
- Slaughter, Bob H.** See *Menzer, Fred J.* 00911
- 00616 **Slaughter, M.; Hamil, M.** Model for deposition of volcanic ash and resulting bentonite: *Geol. Soc. America Bull.*, v. 81, no. 3, p. 961-968, illus., 1970.
- 05936 **Slaughter, Maynard.** Crystal structure of stilbite: *Am. Mineralogist*, v. 55, nos. 3-4, p. 387-397, illus., tables, 1970.
- 09223 **Slaymaker, H. Olav.** Physiography-land use interactions in watershed management, in *Water balance in North America — Symposium, Banff, Alberta, 1969, Proc.: Am. Water Resources Assoc. Proc. Ser.*, no. 7, p. 170-181, 1969.
- Slebir, E. J.** See *Wallace, G. B.* 09308
- Slebir, Edward J.** See *Wallace, George B.* 07455
- 01834 **Sleep, Norman H.** Thermal effects of the formation of Atlantic continental margins by continental break-up [abs.]: *EOS*, v. 51, no. 4, p. 429, 1970.
- 02188 **Sleep, Norman H.; Biehler, Shawn.** Topography and tectonics at the intersections of fracture zones with central rifts: *Jour. Geophys. Research*, v. 75, no. 14, p. 2748-2752, illus., 1970.
- Slemmons, David B.** See *Brogan, George E.* 00233
- 00363 **Slemmons, David B.; Firby, James R.** Quaternary folding, warping, and faulting of post Tertiary lacustrine sediments of Owens Lake, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 144-145, 1970.
- 07961 **Slessor, D. K.** Benthonic foraminiferal ecology in Covehead Bay, Prince Edward Island — A preliminary study: *Maritime Sediments*, v. 6, no. 2, p. 48-64, illus., tables, 1970.
- 08304 **Sliter, T. Wentworth.** The Empire Mine and mill, Palmer, Michigan, in *Stonehouse, H. B., Precambrian of the Marquette area, in Guidebook for field trips — Geol. Soc. America North-Central Sec.*, May 1970: [East Lansing, Mich.], Michigan Basin Geol. Soc., p. 165-169, illus., 1970.
- 01872 **Sliter, William V.** Inner-neritic Bolivinitidae from the eastern Pacific margin: *Micropaleontology*, v. 16, no. 2, p. 155-175, illus., 1970.
- 01491 **Sloan, C. E.** Prairie potholes and the water table, in *Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B*, p. B227-B231, illus., table, 1970.

- 03220 **Sloan, Charles E.** Biotic and hydrologic variables in prairie potholes in North Dakota: *Jour. Range Management*, v. 23, no. 4, p. 260-263, illus., table, 1970.
- 03488 **Sloan, Robert.** A teacher's guide for geologic field investigations in southeastern Minnesota: [St. Paul, Minn.] Minnesota Dept. Education, 19 p., illus., table [n.d.].
- 08517 **Sloan, Robert E.** Cretaceous and Paleocene terrestrial communities of western North America, *in* Evolution of communities — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc., Pt. E: Lawrence, Kans., Allen Press, p. 427-453, illus., 1970.
- 10800 **Slocki, Stanley F.** Physical stratigraphy of the Georgetown Limestone equivalents in Tarrant, Denton, and Cooke Counties, Texas, *in* Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas (Leo Hendricks, editor): Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub., no. 67-8, p. 182-216, illus., tables, 1967.
- 01639 **Sloss, L. L.** Illinois basin has deep gas and oil potential: *World Oil*, v. 170, no. 6, p. 95-97, illus., 1970.
- 08481 **Slosson, James E.** The role of engineering geology in urban planning, *in* Governor's Conf. on Environmental Geology: Colorado Geol. Survey Spec. Pub., no. 1, p. 8-15 [1970].
- 09573 **Slosson, James E.** Hydrogeology in urban planning [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 685-686, 1970.
- 09574 **Sly, Peter G.** Submersible operations in Georgian Bay and Lake Erie, 1970 [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 686, 1970.
- 05763 **Smales, A. A.; Mapper, D.; Webb, M. S. W.; Webster, R. K.; Wilson, J. D.** Elemental composition of lunar surface material, *in* Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Suppl. 1), p. 1575-1581, tables, 1970.
- 01583 **Small, William David.** Cordilleran geochronology deduced from hydrothermal leads [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 9, p. 4212B-4213B, 1970.
- 04895 **Smalley, I. J.** Randomness in nature — Discussion [of 1970 paper by C. J. Mann]: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 3191-3193, 1970.
- 01502 **Smalley, Ian J.; Cabrera, José G.** The shape and surface texture of loess particles: *Geol. Soc. America Bull.*, v. 81, no. 5, p. 1591-1595, illus., 1970.
- 01980 **Smart, J. S.** Computer simulations of Clinch Mountain drainage networks [abs.]: *EOS*, v. 51, no. 4, p. 278, 1970.
- 03422 **Smart, J. S.** Use of topologic information in processing data for channel networks: *Water Resources Research*, v. 6, no. 3, p. 932-936, illus., table, 1970.
- 02849 **Smedes, Harry W.** Program statement for regional geologic studies in remote sensing, Yellowstone National Park, *in* Earth resources aircraft program status review, NASA, Houston, 1968 — V. 1, Geology, geography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 15-1 — 15-9, table [1970].
- 07772 **Smedes, Harry W.; Pierce, Kenneth L.; Tanguary, Marc G.; Hoffer, Roger M.** Digital computer terrain mapping from multispectral data, . . . Yellowstone National Park, preliminary report, *in* Earth Resources Aircraft Program, status review, V. 1: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 3-1 — 3-37, illus., tables, [1970?].



- 09289 **Smedes, Harry W.; Spencer, Margaret M.; Thomson, Frederick J.** Preprocessing of multispectral data and simulation of ERTS data channels to make computer terrain maps of a Yellowstone National Park test site, Sec. 10 of Earth Resources Program, 3d ann., review — v. 1, Geology and geography: Houston, Tex., NASA Manned Spacecraft Center, MSC-03742, p. 10-1 — 10-25, illus., tables, 1970.
- 09178 **Smedman, Gunilla.** An investigation of the diatoms from four Tertiary lake bed deposits in western Nevada: *PaleoBios*, no. 9, 16 p., illus., tables, 1969.
- 02949 **Smellie, Donald W.** Base metal exploration in the Cordillera [with French abs.], in *Mining and groundwater geophysics*, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 345-349, illus., 1970.
- 10098 **Smiley, Charles J.** Cretaceous floral sequences in Alaskan Arctic [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2504, 1970.
- Smith, A. L.** See *Peterman, Zell E.* 00038
- Smith, A. L.** See *Peterman, Zell E.* 01698
- Smith, A. L.** See *Carmichael, I. S. E.* 03177
- 03323 **Smith, A. L.** Sphene, perovskite and coexisting Fe-Ti oxide minerals: *Am. Mineralogist*, v. 55, nos. 1-2, p. 264-269, tables, 1970.
- 10124 **Smith, A. Richard.** Geology, in *Mayan cave discoveries: Explorers Jour.*, v. 46, no. 3, p. 160-163, illus., 1968.
- 02109 **Smith, Alan A.** The case for a procedure library in water resources [also French text]: *Jour. Hydraulic Research*, v. 8, no. 1, p. 89-108, illus., 1970.
- 06883 **Smith, Alan Lewis.** Petrology of Quaternary basic lavas of California and a note on sphene-perovskite parageneses [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 1, p. 256B, 1970.
- Smith, Alan Lewis.** See *Moussa, Mounir T.* 08317
- Smith, Alan R.** See *Wollenberg, Harold A.* 00072
- 10568 **Smith, Albert T.; Taksöz, M. Nafi.** Stress distribution within a downgoing slab [abs.]: *EOS*, v. 51, no. 11, p. 823, 1970.
- 09742 **Smith, Arthur E., Jr.** Minerals from Gulf Coast salt domes, Pt. 1: Rocks and Minerals, v. 45, no. 5, p. 299-303, illus., 1970; Pt. 2, *ibid.*, v. 45, no. 6, p. 371-378, illus., table, 1970.
- Smith, Bennett L.** See *Johnson, Helgi.* 05036
- 10850 **Smith, Bennett L.; Vogel, Thomas A.; Spence, William A.** Precambrian metaconglomerate mantling a granite dome at Plevna Lake in the Grenville Province of southeastern Ontario, Canada: *Geol. Soc. America Bull.*, v. 80, no. 2, p. 297-301, illus., 1969.
- 09385 **Smith, Bernard J.** Tidal movement — summary of the report, "the tides of San Francisco Bay" (1966), in *San Francisco Bay Conserv. and Devel. Comm.*, San Francisco Bay Plan Supplement: Sacramento, Calif., Documents and Publications Branch, p. 3-13, illus., 1969.
- 09386 **Smith, Bernard J.** Sedimentation in San Francisco Bay — Summary of the report, "sedimentation aspects of San Francisco Bay" (1966), in *San Francisco Bay Conserv. and Devel. Comm.*, San Francisco Bay Plan Supplement: Sacramento, Calif., Documents and Publications Branch, p. 15-23, 1969.

- Smith, Bernice Y.** See *Childers, Barbara S.* 07037
- Smith, Bruce D.** See *Hodge, Dennis S.* 03713
- 07240 **Smith, Bruce D.; Hodge, Dennis S.; Smithson, Scott B.** Geology and geophysics of syenites associated with Laramie anorthosite, Wyoming: Wyoming Univ. Contr. Geology, v. 9, no. 1, p. 27-38, illus., table, 1970.
- Smith, C. B.** See *Leeds, D. J.* 09641
- 10748 **Smith, C. H.** (editor). Background papers on the earth sciences in Canada: Canada Geol. Survey Paper 69-56, 318 p., illus., tables, 1970.
- 01981 **Smith, Carl W.; Murri, William J.; Petersen, Carl F.** Release adiabats of selected quartz rocks [abs.]: EOS, v. 51, no. 4, p. 419, 1970.
- Smith, Charles G., Jr.** See *Wintz, William A., Jr.* 07109
- 01104 **Smith, Charles I.; McClurg, James E.; Greene, John F.** Open-scheduled laboratory teaching in geology at the University of Michigan — An evaluation [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 405-406, 1970.
- 05912 **Smith, Charles I.** Lower Cretaceous sedimentation and tectonics of the Coahuila and West Texas platforms [summ.], in *The geologic framework of the Chihuahua tectonic belt — Symposium in honor of Ronald K. De Ford*, Midland, Tex., 1970: Midland, Tex., West Texas Geol. Soc., p. 33-37, illus., 1970.
- 04113 **Smith, Charles Isaac.** Lower Cretaceous stratigraphy, northern Coahuila, Mexico: Texas Univ. Austin Bur. Econ. Geology Rept. Inv. 65, 101 p., illus., tables, 1970.
- Smith, Charles W.** See *Higgins, Michael W.* 00714
- 04848 **Smith, Clay T.** Notes on the geology of the Colorado Plateau, in *Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region — Natl. Assoc. Geology Teachers, Southwest Sec., Field Conf. Earth Sci.*, Cedar City, Utah, 1970: Socorro, N. Mex., New Mexico Inst. Mining and Technology, p. 21-30, illus., 1970.
- 04853 **Smith, Clay T.** (compiler). First day road log from Albuquerque, New Mexico to Cameron Trading Post, Arizona, via the Navajo and Hopi Indian reservations, in *Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region — Natl. Assoc. Geology Teachers, Southwest Sec., Field Conf. Earth Sci.*, Cedar City, Utah, 1970: Socorro, N. Mex., New Mexico Inst. Mining and Technology, p. 62-78, 1970.
- 04856 **Smith, Clay T.; Miller, Paul T.; Cooper, Laurence C.** (compilers). Second day road log from Cameron Trading Post, Arizona to Cedar City, Utah, via Desert View, Page, Kanab and Long Valley Junction, in *Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region — Natl. Assoc. Geology Teachers, Southwest Sec., Field Conf. Earth Sci.*, Cedar City, Utah, 1970: Socorro, N. Mex., New Mexico Inst. Mining and Technology, p. 94-106, 1970.
- Smith, Clay T.** See *Bowman, Frank O., Jr.* 04859
- 04860 **Smith, Clay T.** (compiler). Sixth day road log from Cedar City to Moab, Utah, via Parowan, Kingston, Capital Reef National Monument and Green River, in *Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region — Natl. Assoc. Geology Teachers, Southwest Sec., Field Conf. Earth Sci.*, Cedar City, Utah, 1970: Socorro, N. Mex., New Mexico Inst. Mining and Technology, p. 136-145, 1970.
- 04863 **Smith, Clay T.** (compiler). Seventh day road log from Moab, Utah to Albuquerque, New Mexico, via Blanding, Aneth, Four Corners Monument, Farmington, and Cuba, in *Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region — Natl. Assoc. Geology Teachers, Southwest Sec., Field Conf. Earth Sci.*, Cedar City,

Utah, 1970: Socorro, N. Mex., New Mexico Inst. Mining and Technology, p. 155-168, 1970.

**Smith, Clay T.** See *Natl. Assoc. Geology Teachers*. 04953

- 09575 **Smith, Clay T.** Geology and the environment, the summer field conference approach [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 686-687, 1970.

**Smith, D. B.** See *Summerhayes, C. P.* 04902

- 03199 **Smith, D. G. W.; Tomlinson, M. C.** An APL language computer program for use in electron microprobe analysis: *Kansas Geol. Survey Computer Contr.* 45, 28 p., illus., tables, 1970.

**Smith, D. G. W.** See *Fritz, P.* 05224

**Smith, D. G. W.** See *Westgate, J. A.* 10394

- 10243 **Smith, D. I.** The residual hypothesis for the formation Jamaican bauxite — A consideration of the rate of limestone erosion: *Geol. Soc. Jamaica Jour.*, v. 11, p. 1-12, illus., tables, 1970.

**Smith, D. Masson.** See *Andrew, E. M.* 05835

**Smith, Deane K.** See *Wickman, Frans E.* 09518

- 09762 **Smith, Deane K.** X-ray data collection by computer-controlled instruments: *Earth and Mineral Sci.*, v. 39, no. 9, p. 68-69, 72, illus., 1970.

- 02347 **Smith, Derrell A.; Reeve, F. A. E.** Salt piercement in shallow Gulf Coast salt structures: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 7, p. 1271-1289, illus., table, 1970.

- 04404 **Smith, Donald E.; Murthy, M. K.** Silica-kaolin deposits of Algocen Mines Limited — Pt. 1, Exploration and geology: *Canadian Mining and Metall. Bull.*, v. 63, no. 699, p. 799-809, illus., tables, 1970.

- 02684 **Smith, Donald L.; Garrett, Peter; Patriquin, David; Wilson, Augustus O.** Physiography, ecology, and sediments of two Bermudan lagoon reefs [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 871, 1970.

**Smith, Douglas.** See *Lindsley, D. H.* 01795

- 01835 **Smith, Douglas.** Stability of Fe-rich, Ca-poor pyroxene [abs.]: *EOS*, v. 51, no. 4, p. 435, 1970.

- 02257 **Smith, Douglas.** Stability of iron-rich orthopyroxene: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 229-231, illus., 1970.

- 03772 **Smith, Douglas.** Mineralogy and petrology of the diabase rocks in a differentiated olivine diabase sill complex, Sierra Ancha, Arizona: *Contr. Mineralogy and Petrology*, v. 27, no. 2, p. 95-113, illus., tables, 1970.

- 09576 **Smith, Douglas; Lindsley, Donald H.** Contrasting augite crystallization trends in a single basalt flow [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 687, 1970.

- 00364 **Smith, Eugene I.** A pumiceous rhyolite dome, Mono Craters, California — An analog to small lunar cratered cones and relationship to a proposed Mono Craters eruptive sequence [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 145, 1970.

**Smith, Eugene I.** See *Elston, Wolfgang E.* 05327

**Smith, Eugene I.** See *Rhodes, Rodney C.* 10592

**Smith, G. W.** See *Hills, I. R.* 10428

- 09407 **Smith, Geoffrey W.** Late Pleistocene history of the Shuswap River drainage, south-central British Columbia [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 123, 1970.

- 00533 **Smith, Geoffrey Wayne.** Surficial geology of the Shuswap River drainage, British Columbia [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 7, p. 3244B-3245B, 1970.

**Smith, George I.** See *Friedman, Irving.* 03347

- 06162 **Smith, George I.; Ketner, Keith B.** Lateral displacement on the Garlock fault, southeastern California, suggested by offset sections of similar metasedimentary rocks, in *Geological Survey research 1970*, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D1-D9, illus., tables, 1970.

- 07481 **Smith, George I.** Geologic frontiers in exploration for sedimentary industrial minerals, in *Forum on geology of industrial minerals*, 5th, Harrisburg, Pa., 1969, Proc.: Pennsylvania Geol. Survey, 4th ser., Bull. M64 (Mineral Resources Rept.), p. 141-152, 1970.

- 09408 **Smith, George I.** Late Wisconsin lake fluctuations in Searles Valley, California [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 124, 1970.

- 09953 **Smith, George I.; Friedman, Irving; Matsuo, Sadao.** Salt crystallization temperatures in Searles Lake, California, in *Symposium on the mineralogy and geochemistry of non-marine evaporites — Fiftieth Anniversary Symposia* (Benjamin A. Morgan, editor): *Mineralog. Soc. America Spec. Paper* 3, p. 257-259, illus., 1970.

**Smith, Gilbert E.** See *McGrain, Preston.* 07743

- 00123 **Smith, Harriet W.** Guide to geological literature: *Jour. Geol. Education*, v. 18, no. 1, p. 13-25, illus., table, 1970.

- 04600 **Smith, J. Dungan.** Stability of a sand bed subjected to a shear flow of low Froude number: *Jour. Geophys. Research*, v. 75, no. 30, p. 5928-5940, illus., table, 1970.

- 08014 **Smith, J. Hiram.** Geologic map of the Wiborg quadrangle, McCreary County, Kentucky: U.S. Geol. Survey Geol. Quadrangle Map GQ-867, scale 1:24,000, sections and text, 1970.

**Smith, J. P.** See *Reid, L. R.* 10411

- 01676 **Smith, J. V.; Mason, Brian.** Pyroxene-garnet transformation in Coorara meteorite: *Science*, v. 168, no. 3933, p. 832-833, tables, 1970.

**Smith, J. V.** See *Simkim, Tom.* 02017

**Smith, J. V.** See *Moore, P. B.* 02870

- 05753 **Smith, J. V.; Anderson, A. T.; Newton, R. C.; Olsen, E. J.; Wyllie, P. J.** A petrologic model for the Moon based on petrogenesis, experimental petrology, and physical properties: *Jour. Geology*, v. 78, no. 4, p. 381-405, illus., table, 1970.

**Smith, J. V.** See *Louisnathan, S. J.* 10610

- 00945 **Smith, J. W.; Kaplan, I. R.** Endogenous carbon in carbonaceous meteorites: *Science*, v. 167, no. 3923, p. 1367-1370, illus., tables, 1970.

- 03638 **Smith, J. W.; Schopf, J. William; Kaplan, I. R.** Extractable organic matter in Precambrian cherts: *Geochim. et Cosmochim. Acta*, v. 34, no. 6, p. 659-675, illus., tables, 1970.
- Smith, J. W.** See *Kaplan, I. R.* 05705
- Smith, J. W.** See *Chang, S.* 05743
- 00213 **Smith, James G.; MacKevett, E. M., Jr.** The Skolai Group in the McCarthy B-4, C-4, and C-5 quadrangles, Wrangell Mountains, Alaska: U.S. Geol. Survey Bull. 1274-Q, p. Q1-Q26, illus., tables, geol. map, 1970.
- Smith, James G.** See *Noble, Donald C.* 06164
- 04645 **Smith, James T.** Ground-water resources of Collingsworth County, Texas: Texas Water Devel. Board Rept. 119, 115 p., illus., tables, geol. map, 1970.
- Smith, John Ward.** See *Thomas, Harold E.* 04063
- 03060 **Smith, Joseph V.** Physical properties of order-disorder structures with especial reference to feldspar minerals: *Lithos*, v. 3, no. 2, p. 145-160, illus., 1970.
- Smith, Juanita G.** See *Schwalb, Howard R.* 06395
- 01339 **Smith, Judith Terry.** Taxonomy, distribution, and phylogeny of the cymatiid gastropods *Argobuccinum*, *Fusitriton*, *Mediargo*, and *Priene*: *Bulls. Am. Paleontology*, v. 56, no. 254, p. 445-573, illus., 1970.
- Smith, Kenneth G.** See *Thompson, Raymond M.* 09485
- 04151 **Smith, L. A.** Joides Leg X, Gulf of Mexico [abs.]: *Houston Geol. Soc. Bull.*, v. 13, no. 1, p. 20, 1970.
- Smith, Lester B., Jr.** See *Benham, Steven R.* 00672
- Smith, M. D.** See *Hartronft, B. C.* 04364
- 08555 **Smith, M. H.** Identification of organic matter in thin section by staining and a study programme for carbonate rocks: *Jour. Sed. Petrology*, v. 40, no. 4, p. 1350-1351, 1970.
- 03322 **Smith, Marie Lindberg.** Delrioite and metadelrioite from Montrose County, Colorado: *Am. Mineralogist*, v. 55, nos. 1-2, p. 185-200, illus., tables, 1970.
- 01319 **Smith, Michael Oglesby.** The first Devonian cystoid from Tennessee, *Tetracystis* sp. from the Birdsong Shale [abs.]: *Georgia Acad. Sci. Bull.*, v. 28, no. 2, p. s24, 1970.
- 01540 **Smith, Norman D.; Saunders, R. Stephen.** Paleoenvironments and their control of acritarch distribution — Silurian of east-central Pennsylvania: *Jour. Sed. Petrology*, v. 40, no. 1, p. 324-333, illus., table, 1970.
- 04876 **Smith, Norman D.** The braided stream depositional environment — Comparison of the Platte River with some Silurian clastic rocks, north-central Appalachians: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 2993-3013, illus., tables, 1970.
- 10957 **Smith, Norman E.; Thomas, H. George.** Origins of abnormal fluid pressures [abs.]: *Am. Assoc. Petroleum Geologists*, v. 54, no. 9, p. 1791, 1970; *Gulf Coast Assoc. Geol. Soc. Trans.*, v. 20, p. 160, 1970.
- 05280 **Smith, P. C.** Suggested methods for rapid determination of approximate moisture content of soils for field control of embankment construction, in *Special procedures for testing soil and rock for engineering purposes* (5th edition): *Am. Soc. Testing and Materials Spec. Tech. Pub.* 479, p. 447-459, illus., table, 1970.
- Smith, P. J.** See *Marlow, M. S.* 01365

- 04005 **Smith, P. M.; Watson, R. A.** The development of the Cave Research Foundation: Studies Speleology 1969, v. 2, pt. 2, p. 81-92, illus., table, 1970.
- 01500 **Smith, Patsy B.** New evidence for a Pliocene marine embayment along the lower Colorado River area, California and Arizona: Geol. Soc. America Bull., v. 81, no. 5, p. 1411-1420, illus., table, 1970.
- 06545 **Smith, Peter J.** The intensity of the ancient geomagnetic field, A summary of conclusions, Chap. 10 in *Palaeogeophysics* (S. K. Runcorn, editor): London and New York, Academic Press, p. 79-90, illus., tables, 1970.
- Smith, Philip M.** See *Watson, Richard A.* 10821
- Smith, R. I.** See *Berg, R. B.* 04699
- Smith, R. I.** See *Hemphill, C. R.* 07756
- 01204 **Smith, R. L.; Bailey, R. A.; Ross, C. S.** Geologic map of the Jemez Mountains, New Mexico: U.S. Geol. Survey Misc. Geol. Inv. Map I-571, scale 1:125,000, sections, 1970.
- 02728 **Smith, R. M.; Twiss, P. C.; Krauss, Roland K.; Brown, Merle J.** Dust deposition in relation to site, season, and climatic variables: Soil Sci. Soc. America Proc., v. 34, no. 1, p. 112-117, illus., tables, 1970.
- Smith, Raymond E.** See *Jolly, Wayne T.* 10726
- 01982 **Smith, Robert B.; Mikulich, Matthew J.; Wold, Richard J.** Great Salt Lake seismic reflection survey, preliminary results [abs.]: EOS, v. 51, no. 4, p. 355, 1970.
- 02352 **Smith, Robert B.** Regional gravity survey of western and central Montana: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 7, p. 1172-1183, illus., 1970.
- 09577 **Smith, Robert B.** Tectonics of the intermountain seismic belt, western United States — pt. 2, Focal mechanisms of major earthquakes [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 687-688, 1970.
- 09578 **Smith, Robert C., 2d; Rose, Arthur W.** The occurrence and chemical composition of two distinct types of Triassic diabase in Pennsylvania [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 688, 1970.
- 10506 **Smith, Roger E.; Woolhiser, David A.** Overland flow on an infiltrating surface [abs.]: EOS, v. 51, no. 11, p. 755, 1970.
- 02354 **Smith, Ronald E.** Guide for depth of foundation exploration: Am. Soc. Civil Engineers Proc., v. 96, paper 7120, Jour. Soil Mechanics and Found. Div., no. SM2, p. 377-384, illus., table, 1970.
- 04865 **Smith, Roscoe M.** Treasure Hill reinterpreted: Econ. Geology, v. 65, no. 5, p. 538-540, illus., 1970.
- Smith, S. M.** See *Chase, C. G.* 10201
- 09579 **Smith, S. V.; Roy, K. J.; Chave, K. E.; Maragos, J. E.; Soegiarto, A.; Key, G.; Gordon, M. J.; Kam, D.** Calcium carbonate production and deposition in a modern barrier reef complex [abs.]: Geol. Soc. America Abs. with Program, v. 2, no. 7, p. 688-690, 1970.
- 08395 **Smith, Stephen V.** Calcium carbonate budget of the southern California continental borderland: Hawaii Inst. Geophysics [Rept.] HIG-70-11, 174 p., illus., tables, 1970.
- Smith, Stewart W.** See *Anderson, Don L.* 00811

- 01625 **Smith, Stewart W.; Archambeau, Charles B.** Tectonic strain readjustments as a result of a large underground explosion [abs.]: EOS, v. 51, no. 3, p. 203, 1970.
- 04068 **Smith, Stewart W.; Jungels, Pierre.** Phase delay of the solid earth tide: Physics Earth and Planetary Interiors, v. 2, no. 4, p. 223-238, illus., tables, 1970.
- Smith, Stewart W.** See *Sylvester, Arthur G.* 04332
- 09580 **Smith, Stewart W.; Archambeau, Charles B.** Explosion induced strain readjustments in Nevada [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 689, 1970.
- 06177 **Smith, Thomas E.** Gold resource potential of the Denali bench gravels, Valdez Creek mining district, Alaska, in Geological Survey research 1970, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D146-D152, illus., 1970.
- 05950 **Smith, W. Campbell.** Memorial of Arthur Francis Hallimond — January 17, 1890-September 2, 1968: Am. Mineralogist, v. 55, nos. 3-4, p. 561-568, portrait, 1970.
- 05877 **Smith, W. D. M.** Petrophysical relationships from the Western Canada area: Log Analyst, v. 11, no. 5, p. 3-16, illus., tables, 1970.
- Smith, W. E. T.** See *Milne, W. G.* 07688
- 05533 **Smith, W. H.; Nance, Roger B.; Hopkins, M. E.; Johnson, Ralph G.; Shabica, C. W.** (and others). Depositional environments in parts of the Carbondale Formation, western and northern Illinois — Francis Creek Shale and associated strata and Mazon Creek biota — Geol. Soc. America, Coal Geology Div., Ann. Field Trip, Milwaukee, Wis., 1970: Illinois Geol. Survey Guidebook Ser. 8, 119 p., illus., tables, 1970.
- Smith, W. H.** See *Damberger, H. H.* 05534
- 05535 **Smith, William H.** Lithology and distribution of the Francis Creek Shale in Illinois, in Depositional environments in parts of the Carbondale Formation, western and northern Illinois — Francis Creek Shale and associated strata and Mazon Creek biota — Geol. Soc. America, Coal Geology Div., Ann. Field Trip, Milwaukee, Wis., 1970: Illinois Geol. Survey Guidebook Ser. 8, p. 34-42, illus., 1970.
- 09605 **Smith, W. O.** Infiltration in sands and its relation to groundwater recharge, in Water in the unsaturated zone, V. 2: Internat. Assoc. Sci. Hydrology Pub. 83, p. 851-865, illus., 1968; excerpt from paper in Water Resources Research, v. 3, no. 2, 1967.
- Smith, William C.** See *Judd, James B.* 03721
- Smithson, Scott B.** See *Hodge, Dennis S.* 03713
- Smithson, Scott B.** See *Smith, Bruce D.* 07240
- 00644 **Smouse, DeForrest.** Inclusions within the lavas of Crater 160, San Francisco volcanic field, Arizona [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 349, 1970.

Smylie, D. E. See *Mansinha, L. 09956*

- 09965 **Smylie, D. E.; Clarke, G. K. C.** Deconvolution of the pole path, in Earthquake displacement fields and the rotation of the Earth (L. Mansinha, D. E. Smylie, A. E. Beck, editors) - NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 99-112, illus., 1970.

Smylie, D. E. See *Mansinha, L. 09967*

Smyth, C. Stephen. See *McManus, Dean A. 05652*

Smyth, C. Stephen. See *McManus, Dean A. 10922*

- 08642 **Snively, P. D., Jr.; MacLeod, N. S.** Local centers of Miocene volcanism along coastal Oregon and Washington [abs.], in Columbia River Basalt Symposium, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 329, 1970.

Snively, Parke D., Jr. See *MacLeod, Norman S. 02948*

- 09200 **Snead, Robert J.** A new approach to the classification of *Azolla* megaspore species [abs.], in Perkins, B. F. (editor), Geoscience and Man — v. 1, Am. Assoc. Stratig. Palynologists Ann. Mtg., 1st, 1968, Proc.: Baton Rouge, La., Louisiana State Univ. School of Geoscience, p. 135, 1970.

- 02761 **Sneath, P. H. A.** Planets and life: New York, Funk and Wagnalls, 216 p., illus., 1970.

- 08322 **Snelgrove, Alfred K.** Opportunities in geology and geological engineering: New York, Universal Publishing and Distributing Corp. (Vocational Guidance Manuals, Career Series), 159 p., 1970.

- 03204 **Snell, David E.** Big, big concretions: Pennsylvania Geology, v. 1, no. 6, p. 6-7, illus., 1970.

- 03382 **Snell, L. J.; Anderson, Warren.** Water resources of northeast Florida (St. Johns River basin and adjacent coastal areas): Florida Bur. Geology Rept. Inv. 54, 77 p., illus., tables, 1970.

Sniegocki, R. T. See *Bedinger, M. S. 11238*

- 02500 **Snow, C. Bruce.** Stratigraphy of basal sandstones in the Green River Formation, northeast Piceance basin, Rio Blanco County, Colorado: Mtn. Geologist, v. 7, no. 1, p. 3-32, illus., 1970.

- 00193 **Snow, D. T.** The frequency and apertures of fractures in rock: Internat. Jour. Rock Mechanics and Mining Sci., v. 7, no. 1, p. 23-40, illus., tables, 1970.

- 02433 **Snow, D. T.; Meidav, Tsvi; Ehrlich, Marvin.** Prediction of seepage to limestone quarry by geophysical and hydrogeological techniques [abs.]: Mining Eng., v. 22, no. 1, p. 44, 1970.

- 00946 **Snowden, J. O.** The Sangamon Soil in lower Mississippi Valley loess [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 240-241, 1970.

- 08683 **Snyder, Don O.** Fossil evidence of Eocene age of Baca Formation, New Mexico, in Guidebook of the Tyrone-Big Hatchet Mountains-Florida Mountains region — New Mexico Geol. Soc. Field Conf., 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, p. 65-67, illus., 1970.

- 07395 **Snyder, Frank G.** Structural lineaments and mineral deposits, eastern United States [abs.]: Mining Eng., v. 22, no. 8, p. 36, 1970.



- 08602 **Snyder, Frank G.** Structural lineaments and mineral deposits, eastern United States, in *AIME world symposium on mining and metallurgy of lead and zinc*, St. Louis, Missouri, 1970 [Proc.] — V. 1, Mining and concentrating of lead and zinc: New York, Am. Inst. Mining, Metallurgical, and Petroleum Engineers, p. 76-94, illus., tables, 1970.
- 03320 **Snyder, George L.** Bedrock geologic and magnetic maps of the Marlborough quadrangle, east-central Connecticut: U.S. Geol. Survey Geol. Quad. Map GQ-791, 2 sheets, scale 1:24,000, sections, separate text, 1970.
- 00365 **Snyder, Henry; Jensky, Wallace.** Mesozoic dike swarms in Baja California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 145-146, 1970.
- 09581 **Snyder, Jeremy E.; Bretsky, Peter W.** Life habits of diminutive bivalve molluscs in the Maquoketa Formation (Upper Ordovician) [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 689-690, 1970.
- 09347 **Snyder, Lloyd R.** Petroleum nitrogen compounds and oxygen compounds: *Accounts Chem. Research*, v. 3, no. 9, p. 290-299, illus., tables, 1970.
- So, C. L.** See *Pierce, J. W.* 00749
- 02179 **Sobczak, L. W.; Weber, J. R.; Roots, E. F.** Rock densities in the Queen Elizabeth Islands, Northwest Territories: *Geol. Assoc. Canada Proc.*, v. 21, p. 5-14, illus., tables, 1970.
- Sobczak, L. W.** See *Hornal, R. W.* 09779
- 10099 **Sobczak, L. W.; Weber, J. R.; Roots, E. F.** Crustal structure of Queen Elizabeth Islands and polar continental margin [Abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2505, 1970.
- 03577 **Sobolev, V. S.; Bararova, T. Y.; Shugurova, N. A.; Bazarov, L. Sh.; Dolgov, Yu. A.; Sörensen, H.** A preliminary examination of fluid inclusions in nepheline, soresenite, tugtupite and chkalovite from the Ilimaussaq alkaline intrusion, South Greenland [with Russian abs.]: *Medd. Grönland*, v. 181, no. 11, 33 p., illus., tables, 1970; *reprinted as Grönlands Geol. Undersögelse Bull.* 81, 1970.
- Sobolevskaya, R. F.** See *Kanygin, A. V.* 10063
- 02191 **Soc. Prof. Well Log Analysts.** Transactions of the SPWLA 11th annual logging symposium, Los Angeles, Calif., 1970: Houston, Tex., Soc. Prof. Well Log Analysts, papers paged separately, illus., tables, 1970.
- 04909 **Society of Economic Geologists; Weissenborn, A. E.; Armstrong, Frank C.; Fyles, James T.** (editors and chairmen). Lead-zinc deposits in the Kootenay Arc, northeastern Washington and adjacent British Columbia — 1970 Northwest field conference guidebook: Washington Div. Mines and Geology Bull. 61, 123 p., illus., table, 1970.
- 00797 **Socolow, Arthur A.** Memorial to James Lindsay Dyson (1912-1967): *Geol. Soc. America Proc.* 1967, p. 207-209, portrait, 1970.
- 07487 **Socolow, Arthur A.; Allen, George E.; Coxey, James R.; Dunn, James R.; Masland, Frank A., Jr.; Minnick, L. John.** Symposium on industrial minerals, land use and conservation problems (a panel discussion), in *Forum on geology of industrial minerals*, 5th, Harrisburg, Pa., 1969, Proc.: *Pennsylvania Geol. Survey*, 4th ser., Bull. M64 (Mineral Resources Rept.), p. 259-271, 1970.
- Soderlund, H. W.** See *Hedley, D. G. F.* 09833
- 02897 **Soderman, L. G.; Kim, Y. D.** Effect of groundwater levels on stress history of the St. Clair clay till deposit [with French abs.]: *Canadian Geotech. Jour.*, v. 7, no. 2, p. 173-187, illus., table, 1970.

- Soegiarto, A.** See *Smith, S. V.* 09579
- Soga, Naohiro.** See *Anderson, Orson L.* 06267
- Sohl, Norman F.** See *Owens, James P.* 05860
- Sokolov, B. A.** See *Olenin, V. B.* 07818
- Sokolov, V. N.** See *Tkatchenko, B. V.* 10108
- 06645 **Sokolowski, T.; Miller, G.** Identification of source region from a single seismic record, in *Tsunamis in the Pacific Ocean — Internat. Symposium on Tsunamis and Tsunami Research*, Honolulu, Hawaii, 1969, Proc.: Honolulu, Hawaii, East-West Center Press, p. 135-147, illus., tables, 1970.
- 01535 **Solohub, J. T.; Klován, J. E.** Evaluation of grain-size parameters in lacustrine environments: *Jour. Sed. Petrology*, v. 40, no. 1, p. 81-101, illus., 1970.
- Solomon, M.** See *Dunham, K. C.* 10208
- 03303 **Solomon, Sean C.; Toksöz, M. Nafi.** Lateral variation of attenuation of P and S waves beneath the United States: *Seismol. Soc. America Bull.*, v. 60, no. 3, p. 819-838, illus., tables, 1970.
- 10554 **Solomon, Sean C.** Surface wave attenuation and partial melting in the asthenosphere [abs.]: *EOS*, v. 51, no. 11, p. 781, 1970.
- 08256 **Solopov, S. G.; Volarovich, M. P.; Korchunov, S. S.; Tsuprov, S. A.; Mogilevskii, I. I.; Abakumov, O. N.** Physical and mechanical properties of peat [with French abs.], in *International Peat Congress*, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 155-156, 1970.
- Solorio-Munguía, José.** See *Cserna, Zoltan de.* 04180
- Solovyev, D. S.** See *Egiyarov, B. Kh.* 10036
- 09582 **Somers, Lee H.** Advanced underwater techniques utilized in Great Lakes research [abs.]: *Geol. Soc. America Abs. with programs*, v. 2, no. 7, p. 691, 1970.
- 07435 **Somerton, Wilbur H.** (editor). *Rock mechanics, theory and practice — 11th Symposium on Rock Mechanics*, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, 762 p., illus., tables, 1970.
- 09135 **Somerton, Wilbur H.; Masonheimer, Roy; Singhal, Ashok.** Study of pore and matrix anisotropies of porous rocks [with French and German summ.], in *Internat. Soc. Rock Mechanics Cong.*, 2d, Belgrade, Yugoslavia, 1970, Proc., V. 1: Belgrade, Jaroslav Černi Inst. Devel. Water Resources, p. 143-151, illus., tables, 1970.
- Somerville, M. R.** See *Bolt, Bruce A.* 01679
- 00366 **Sommer, Michael A.; Garcia, John.** Potassium-argon dates for Pliocene rhyolite sequences east of Puertocitos, Baja California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 146, 1970.
- 06621 **Sommer, Sheldon Emanuel.** Characterization and application of cathodoluminescence from manganese activated carbonate minerals [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 2, p. 828B, 1970.
- 02459 **Sommerfeld, R. A.; LaChapelle, E.** The classification of snow metamorphism: *Jour. Glaciology*, v. 9, no. 55, p. 3-17, illus., 1970.
- 06761 **Sommers, David A.** Put hydrogeology into planning: *Ground Water*, v. 8, no. 6, p. 2-7, 1970.

- 04061 **Sommers, L. E.; Harris, R. F.; Williams, J. D. H.; Armstrong, D. E.; Syers, J. K.** Determination of total organic phosphorus in lake sediments: Limnology and Oceanography, v. 15, no. 2, p. 301-303, tables, 1970.
- 06735 **Sonderegger, John L.; Kelley, James C.** Hydrology of limestone terraces — Geologic investigations: Alabama Geol. Survey Bull. 94, pt. B, 146 p., illus., tables, geol. maps, 1970.
- 07046 **Sonderegger, John L.** Hydrology of limestone terraces — Photogeologic investigations: Alabama Geol. Survey Bull. 94, pt. C, 26 p., illus., geol. maps, 1970.
- Sonett, C. P.** See *Dyal, P.* 05107
- 04986 **Sood, M. K.; Edgar, A. D.** Melting relations of undersaturated alkaline rocks from the Ilímaussaq Intrusion and Grönnedal-Ika Complex, South Greenland, under water vapour and controlled partial oxygen pressure: Medd. Grönland, v. 181, no. 12, 41 p., illus., tables, 1970.
- 06109 **Sood, M. K.; Platt, R. G.; Edgar, A. D.** Phase relations in portions of the system diopside-nepheline-kalsilite-silica and their importance in the genesis of alkaline rocks, in Alkaline rocks, the Monteregian Hills — Symposium, Montreal, 1969, Proc.: Canadian Mineralogist, v. 10, pt. 3, p. 380-394, illus., tables, 1970.
- 04985 **Soper, N. J.** A section through the north Peary Land fold belt [abs.]: Geol. Soc. London Proc. 1969, no. 1662, p. 60-62, discussion, 1970.
- Soper, N. J.** See *Dawes, Peter R.* 06242
- Soper, N. J.** See *Dawes, Peter R.* 10029
- 02685 **Sorauf, J. E.** Microstructure of rugosan skeleton (Coelenterata) [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 871, 1970.
- 00182 **Soren, Julian.** The Port Jervis thrust fault, Tri-States area, New York, New Jersey, and Pennsylvania [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 36-37, 1970.
- Sorensen, Fredrick H.** See *Kravitz, Joseph H.* 04725
- Sörensen, H.** See *Sobolev, V. S.* 03577
- Sörensen, H.** See *Petersilie, I. A.* 03711
- 08192 **Sörensen, H.** Low-grade uranium deposits in agpaitic nepheline syenites, south Greenland, in Uranium exploration geology — Panel on uranium exploration geology, Vienna, 1970, Proc.: Vienna, Austria, Internat. Atomic Energy Agency, p. 151-159, illus., tables, 1970.
- 07610 **Sorensen, Harry O.** Michigan's clay deposits and industry, in Forum on Geology of Industrial Minerals, 6th, Ann Arbor, Mich., 1970, Proc.: Michigan Geol. Survey Miscellany 1, p. 143-155, illus., tables, 1970.
- 06149 **Sörensen, Henning.** Internal structures and geological setting of the three agpaitic intrusions — Khibina and Lovozero of the Kola Peninsula and Ilímaussaq, South Greenland, in Alkaline rocks, the Monteregian Hills — Symposium, Montreal, 1969, Proc.: Canadian Mineralogist, v. 10, pt. 3, p. 299-334, illus., tables, 1970.
- 08293 **Sörensen, Henning; Leonardsen, Erik S.; Petersen, Ole V.** Trona and thermonatrite from the Ilímaussaq alkaline intrusion, South Greenland (Contribution to the mineralogy of Ilímaussaq No. 17): Geol. Soc. Denmark Bull., Dansk Geol. Foren. Medd., English edition, v. 20, pt. 1, p. 1-19, illus., tables, 1970.
- 03516 **Sörensen, Kai.** Some observations on the structural and metamorphic chronology on Agto and surrounding islands, central West Greenland: Grönlands Geol. Under-søgelse Rap. 27, 32 p., illus., table, 1970.

- 06245 **Sørensen, P. Brøgger.** Field work on marble and calc-silicate rocks in the Nordre Strömfjord region, in Report of activities, 1969: Grönlands Geol. Undersøgelse Rap. 28, p. 19-20, 1970.
- 03617 **Sorey, Michael L.; Matlock, William G.** Evaporation from an ephemeral streambed — Closure [to discussion of paper 6368, 1969]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Hydraulics Div., no. HY 6, p. 1354-1355, 1970.
- Sorrell, B. J.** See *Tipsworth, H. L.* 10949
- Soule, Courtney.** See *Desborough, George A.* 06176
- Soutar, Andrew.** See *Berger, Wolfgang H.* 00085
- Souter, J. Edwin.** See *Wanless, H. R.* 06708
- 05851 **Southard, A. R.; Williams, J. Stewart.** Patterned ground indicates unstable landscapes: Jour. Soil and Water Conserv., v. 25, no. 5, p. 194-196, illus., 1970.
- Southard, Alvin R.** See *Williams, J. Stewart.* 09225
- Southard, John.** See *Boucot, Arthur J.* 08184
- 01551 **Southard, John B.** Impossibility of Bernoulli pressure forces on particles suspended in boundary layers — Discussion of a paper by R. V. Fisher and J. M. Mattinson [1968]: Jour. Sed. Petrology, v. 40, no. 1, p. 518-519, illus., 1970.
- Southard, John B.** See *Cacchione, David A.* 06084
- Southard, John B.** See *Young, Robert A.* 10318
- 07682 **Souther, J. G.** Volcanism and its relationship to recent crustal movements in the Canadian Cordillera, in Symposium on recent crustal movements, Ottawa, Canada, 1969, Papers: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 2, p. 553-568, illus., 1970.
- 10396 **Souther, J. G.** Recent volcanism and its influence on early native cultures of northwestern British Columbia, in Early man and environments in northwest North America (R. A. Smith and J. W. Smith, editors) — Calgary Univ. Archaeol. Assoc. Ann. Paleoenvironmental Workshop, 2d, Proc.: Calgary, Alberta, Univ. Calgary Students' Press, p. 53-64, illus., table, 1970.
- 10558 **Southworth, John H.; Sutton, George H.** Variation in the acoustic signature of sediments [abs]: EOS, v. 51, no. 11, p. 763, 1970.
- 06302 **Soviet Correspondent.** Luna-16's cargo: Nature, v. 228, no. 5271, p. 492, illus., table, 1970.
- Sowayan, A. R.** See *McGinnis, L. D.* 01084
- Sowers, G. M.** See *Friedman, M.* 07715
- 03804 **Sowers, George B.; Sowers, George F.** Introductory soil mechanics and foundations (3d edition): New York and London, Macmillan Co., 556 p., illus., tables, 1970; originally published 1951.
- Sowers, George M.** See *Gallagher, John J.* 00897
- 09583 **Sowers, George M.** Theory of spacing of extension fracture [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 691-692, 1970.
- Sowinski, Kenneth P.** See *Economou, Thanasis E.* 06258
- 06778 **Soydemir, Çetin; Schmid, Werner E.** Deformation and stability of viscoelastic soil media: Am. Soc. Civil Engineers Proc., v. 96, paper 7708, Jour. Soil Mechanics and Found. Div., no. SM 6, p. 2081-2098, illus., 1970.

**Spackman, W.** See *Given, P. H.* 04091

06238 **Spall, Henry.** Paleomagnetism of basement granites in southern Oklahoma — Final report: Oklahoma Geology Notes, v. 30, no. 6, p. 136-150, illus., tables, 1970.

08010 **Spall, Henry.** Palaeomagnetism of the Pikes Peak granite, Colorado: Royal Astron. Soc. Geophys. Jour., v. 21, no. 5, p. 427-440, illus., tables, 1970.

09584 **Spall, Henry.** Precambrian polar wandering, North American evidence [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 692, 1970

10485 **Spall, Henry.** Paleomagnetism of the Pikes Peak Granite, Colorado [abs.]: EOS, v. 51, no. 11, p. 744, 1970.

10335 **Spang, John H.; Chapple, William M.** Mechanical origin of folds in sedimentary rocks, a comparison between theory and observation [abs.]: Geol. Soc. America Abs. with Programs, b. 2, no. 7, p. 754-755, illus., 1970. PAGE:

05001 **Spangle, William E.** A city planner's view of education in environmental geology: Jour. Geol. Education, v. 18, no. 5, p. 202-205, 1970.

**Spangler, D. P.** See *Wallace, D. E.* 03639

06731 **Spangler, D. P.; Wallace, D. E.** A simple method for the in situ determination of alluvial densities: Eng. Geology, v. 4, no. 4, p. 335-340, illus., tables, 1970.

02269 **Spannagel, Gert; Fireman, Edward L.** Radioactivities in the Lost City meteorite — A cosmic-ray space probe [abs.]: EOS, v. 51, no. 7, p. 581, 1970.

**Sparks, Dennis M.** See *Castano, John R.* 06090

**Sparks, G. E.** See *Likussar, W.* 06349

01340 **Sparling, Dale R.** The Bass Islands Formation in its type region: Ohio Jour. Sci., v. 70, no. 1, p. 1-33, illus., 1970.

01251 **Spector, A.; Grant, F. S.** Statistical models for interpreting aeromagnetic data: Geophysics, v. 35, no. 2, p. 293-302, illus., 1970.

00967 **Spector, Allan; Hornal, Robert W.** Gravity studies over three evaporite piercement domes in the Canadian Arctic: Geophysics, v. 35, no. 1, p. 57-65, illus., table, 1970.

03463 **Spector, Allan.** Deep uranium exploration with the aid of aeromagnetic maps [abs.]: Canadian Mining and Metall. Bull., v. 63, no. 695, p. 291, 1970.

07242 **Speden, Ian G.** The type Fox Hills Formation, Cretaceous (Maestrichtian), South Dakota — Pt. 2, Systematics of the Bivalvia [with German and Russian abs.]: Yale Univ. Peabody Mus. Nat. History Bull. 33, 222 p., illus., tables, 1970.

00367 **Speed, R. C.; MacMillan, J. R.** Deformation of the Triassic Augusta sequence, Augusta Mountains, western Nevada [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 146, 1970.

04476 **Speed, Robert C.** Gravity anomalies from cavities in salt beds — [Pt.] 1, The surface field, in Third symposium on salt, V. 2 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 367-385, illus., tables, 1970.

**Speer, P. R.** See *Cushing, E. M.* 04550

**Speers, G. C.** See *Hobson, G. D.* 04185

01666 **Speidel, David H.** Effect of magnesium on the iron-titanium oxides: Am. Jour. Sci., v. 268, no. 4, p. 341-353, illus., tables, 1970.

- 02117 **Speight, J. G.** A structural investigation of the constituents of Athabasca bitumen by proton magnetic resonance spectroscopy: *Fuel*, v. 49, no. 1, p. 76-90, illus., tables, 1970.
- 10543 **Spence, W. J.; Engdahl, E. R.** Relocation of large earthquakes in the Amchitka Island region [abs.]: *EOS*, v. 51, no. 11, p. 778, 1970.
- Spence, William A.** See *Smith, Bennett L.* 10850
- Spencer, A. M.** See *Cowie, J. W.* 09879
- Spencer, Alexander B.** See *Sippel, Robert F.* 06295
- Spencer, D. W.** See *Brewer, P. G.* 01640
- 02686 **Spencer, Derek W.; Koons, C. B.** Studies on origin of crude oil — Statistical analyses of crude oil data [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 871, 1970.
- 05599 **Spencer, Derek W.; Sachs, Peter L.** Some aspects of the distribution, chemistry, and mineralogy of suspended matter in the Gulf of Maine: *Marine Geology*, v. 9, no. 2, p. 117-136, illus., tables, 1970.
- 06407 **Spencer, Derek W.; Robertson, D. E.; Turekian, K. K.; Folsom, T. R.** Trace element calibrations and profiles at the Geosecs test station in the northeast Pacific Ocean: *Jour. Geophys. Research*, v. 75, no. 36, p. 7688-7696, illus., tables, 1970.
- 05956 **Spencer, Edgar Winston.** Memorial to Marcellus H. Stow — May 19, 1902-November 27, 1957: *Am. Mineralogist*, v. 55, nos. 3-4, p. 603-607, portrait, 1970.
- 00487 **Spencer, Jean M.** Geological influence on regional health problems [abs.]: *Texas Jour. Sci.*, v. 21, no. 3, p. 337-338, 1970.
- 04046 **Spencer, Jean M.** Geological influence on regional health problems: *Texas Jour. Sci.*, v. 21, no. 4, p. 459-469, illus., 1970.
- Spencer, Margaret M.** See *Smedes, Harry W.* 09289
- 00087 **Spencer, R. S.; Rogers, W. S.** Reworked Paleozoic fossils in Pleistocene sediments of southeastern Virginia: *Geol. Soc. America Bull.*, v. 81, no. 1, p. 263-265, illus., 1970.
- Spencer, R. S.** See *Rogers, W. S.* 05439
- 05801 **Spencer, R. S.** Evolution and geographic variation of *Neochonetes granulifer* (Owen) using multivariate analysis of variance: *Jour. Paleontology*, v. 44, no. 6, p. 1009-1028, illus., tables, 1970.
- 08315 **Spencer, Randall S.** Geology of the outer coastal plain, southeastern Virginia, Chesapeake-Norfolk-Virginia Beach, Pt. 1 of Atlantic Coastal Plain Geol. Assoc. Guidebook, 11th Ann. Field Conf., 1970: [Norfolk Va.] Old Dominion Univ., 32 p., illus., table, 1970.
- Spencer, Samuel A.** See *Lafayette Geological Society.* 04752
- Spettel, B.** See *Wänke, H.* 05730
- 01444 **Spetzler, Hartmut.** Equation of state of polycrystalline and single-crystal MgO to 8 kilobars and 800 °K: *Jour. Geophys. Research*, v. 75, no. 11, p. 2073-2087, illus., tables, 1970.
- 02027 **Spieker, Andrew M.** Water in urban planning, Salt Creek basin, Illinois — Water management as related to alternative land-use practices: U.S. Geol. Survey Water-Supply Paper 2002, 147 p., illus., tables, 1970.

- 09222 **Spieker, Andrew M.** Urbanization and the water balance, in *Water balance in North America — Symposium, Banff, Alberta, 1969*, Proc.: Am. Water Resources Assoc. Proc. Ser., no. 7, p. 182-187, illus., 1969.
- 09990 **Spiess, F. N.; Mudie, John D.** Small scale topographic and magnetic features, in *The sea — v. 4, New concepts of sea floor evolution, Pt. 1, General observations* (Arthur E. Maxwell, editor); New York and London, Wiley-Interscience, p. 205-250, illus., 1970.
- Spiess, Fred N.** See *Larson, Roger L.* 01944
- Spijkerman, J. J.** See *DeVoe, J. R.* 09454
- Spiker, Elliott.** See *Sullivan, Beverly Marsters.* 01371
- 11217 **Spiller, Judith.** Dimorphism in a species of fossil gastropod: New York Paleont. Soc. Notes, no. 2, p. 8-9, 1970.
- 03539 **Spinosa, Claude; Furnish, W. M.; Glenister, Brian F.** Araxoceratidae, Upper Permian ammonoids, from the Western Hemisphere: Jour. Paleontology, v. 44, no. 4, p. 730-736, illus., table, 1970.
- Spinosa, Claude.** See *Nassichuk, W. W.* 05807
- 10100 **Spiro, N. S.; Zelenova, A. F.** Effect of climatic changes on chemical content of deep-water muds exemplified by deposits of Arctic and Atlantic Oceans [abs.], in *Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2505-2506, 1970.
- Spivak, J.** See *Moody, J. D.* 07754
- 10352 **Spoljaric, Nenad.** Geology of Columbia sediments in the Middletown-Odessa area, Delaware, in *Geology, hydrology, and geophysics of Columbia sediments in the Middletown-Odessa area, Delaware: Delaware Geol. Survey Bull.*, no. 13, p. 1-74, 112-124, illus., tables, 1970.
- Spooner, A.** See *Campbell, F. H. A.* 11258
- 04626 **Spooner, C. M.; Fairbairn, H. W.** Strontium 87/strontium 86 initial ratios in pyroxene granulite terranes: Jour. Geophys. Research, v. 75, no. 32, p. 6706-6713, illus., tables, 1970.
- Spooner, C. M.** See *Brookins, D. G.* 05017
- 05964 **Spooner, Charles M.; Fairbairn, Harold W.** Relation of radiometric age of granitic rocks near Calais, Maine, to the time of Acadian orogeny: Geol. Soc. America Bull., v. 81, no. 12, p. 3663-3670, illus., tables, 1970.
- Spooner, Charles M.** See *Chaudhuri, S.* 06094
- 04628 **Sprenkel-Segel, E. L.** Recoilless resonance spectroscopy of meteoritic iron oxides: Jour. Geophys. Research, v. 75, no. 32, p. 6618-6630, illus., tables, 1970.
- 00368 **Springer, Robert K.** Plagioclase from the Pine Hill intrusive complex, El Dorado County, California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 147, 1970.
- Sproll, W. P.** See *Dietz, R. S.* 08693
- Sproll, Walter P.** See *Dietz, Robert S.* 02490
- Sproule, J. C.** See *Layer, D. B.* 02161
- 10125 **Sproule, J. C.** The geology of the Canadian Arctic: *Western Miner*, v. 43, no. 7, p. 24-26, 28-29, illus., 1970.

- 01522 **Squarer, David.** Friction factors and bed forms in fluvial channels: Am. Soc. Civil Engineers Proc., v. 96, paper 7245, Jour. Hydraulics Div., no. HY 4, p. 995-1017, illus., tables, 1970.
- 00043 **Squier, L. Radley.** Load transfer in earth and rockfill dams: Am. Soc. Civil Engineers Proc., v. 96, paper 7004, Jour. Soil Mechanics and Found. Div., no. SM 1, p. 213-233, illus., tables, 1970.
- 10681 **Squires, Donald F.** An information storage and retrieval system for biological and geological data — The first 18 months: Washington, D.C., U.S. Dept. Health, Education and Welfare, Office of Education (Interim Rept. Project No. 7-1159), 35 p., tables, 1969.
- 07285 **Squyres, John Benjamin.** Origin and depositional environment of uranium deposits of the Grants region, New Mexico [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2770B, 1970.
- 09585 **Sridhar, K.; Jackson, M. L.; Syers, J. K.** Micaceous vermiculite basal cleavages with blister-like lifting of layers as a function of exchangeable cation charge and hydration [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 692-693, 1970.
- Srinivasan, B.** See *Alexander, E. C., Jr.* 02066
- 01836 **Srinivasan, R.; Alexander, E. C., Jr.** Xenon in tellurium and cesium minerals [abs.]: EOS, v. 51, no. 4, p. 454, 1970.
- Srinivasan, R.** See *Ramachandran, G. N.* 05889
- 07385 **Srinivasan, Vajapeyam S.** The mechanics of flat bed flow and occurrence of bed forms in alluvial channels [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 1989B-1990B, 1970.
- Srivastava, G. S.** See *Ondrick, C. W.* 01351
- 00049 **Srivastava, Lakshman S.** Stability of rock slopes, a three-dimensional study — Discussion [of paper 6363 by P. Londe, G. Vigier, and R. Vormeringer, 1969]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Soil Mechanics and Found. Div., no. SM 1, p. 327-329, 1970.
- 03132 **Srivastava, Satish K.** Pollen biostratigraphy and paleoecology of the Edmonton Formation (Maestrichtian), Alberta, Canada: Palaeogeography, Palaeoclimatology, Palaeoecology, v. 7, no. 3, p. 221-276, illus., 1970.
- 04328 **Srivastava, Satish K.; Rouse, Glenn E.** Systematic revision of *Aquilapollenites* Rouse 1957: Canadian Jour. Botany, v. 48, no. 9, p. 1591-1601, illus., table, 1970.
- 10927 **Srivastava, Satish K.** Some angiosperm pollen from the Edmonton Formation (Maestrichtian), Alberta, Canada, in J. Sen Memorial Volume: Calcutta, India, Bot. Soc. Bengal, p. 47-67, illus., 1969.
- 05848 **Stacey, F. D.** Geomagnetism, in Global geophysics: New York, American Elsevier Publishing Company, p. 147-196, illus., 1970.
- 09972 **Stacey, F. D.** A re-examination of core-mantle coupling as the cause of the wobble, in Earthquake displacement fields and the rotation of the Earth (I. Mansinha, D. E. Smylie, A. E. Beck, editors) - NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 176-180, 1970.
- 09778 **Stacey, R. A.; Steele, J. P.** Geophysical measurements in British Columbia, with maps, no. 120, Strait of Georgia; no. 121, Juan de Fuca Strait: Canada Dept. Energy, Mines and Resources, Earth Physics Br. Gravity Map Ser., nos. 120, 121, 2 sheets, scale 1:250,000, with separate 17 page text, 1970.



- 00645 **Stach, R. L.; Mowatt, T. C.** Investigation of some basement rocks from South Dakota [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 349, 1970.
- Stadum, Carol J.** See *Ling, Hsin-Yi*. 03650
- 07912 **Staff Sediment Core Lab.** [J. E. Andrews, in charge]. Sediment core descriptions — Solomon Islands, 1968-1969, and Murray Fracture Zone, 1967: *Hawaii Inst. Geophysics Data Rept.*, no. 16 (HIG-70-25), unpaginated, tables, 1970.
- Stafford, Donald B.** See *Langfelder, Leonard J.* 03718
- 09586 **Stagg, Alan K.; Fischer, Frederick T.** Upper Knox stratigraphy of Middle Tennessee [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 693, 1970.
- 05976 **Stalker, A. MacS.** A probable late Pinedale terminal moraine in Castle River valley, Alberta — Reply [to discussion by W. P. Wagner and D. F. Eschman of 1969 paper]: *Geol. Soc. America Bull.*, v. 81, no. 12, p. 3775-3777, 1970.
- Stalker, A. MacS.** See *Churcher, C. S.* 08072
- 09409 **Stalker, A. MacS.** Late Wisconsin glaciation, and the Yukon-Alberta ice-free corridor [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 126, 1970.
- Stallard, Alvis H.** See *Burgat, Virgil A.* 08414
- Stalling, David L.** See *Gehrke, Charles W.* 05742
- 09604 **Stallman, R. W.; Reed, J. E.** Steady flow in the zone of aeration, in *Water in the unsaturated zone*, V. 2: *Internat. Assoc. Sci. Hydrology Pub.* 83, p. 565-575; discussion, p. 575-578, illus., tables, 1968.
- 10502 **Stallman, Robert W.** Problem caused by use of subsurface reservoirs [abs.]: *EOS*, v. 51, no. 11, p. 750, 1970.
- 03989 **Stanley, Daniel J.** The ten-fathom terrace on Bermuda, its significance as a datum for measuring crustal mobility and eustatic sea-level changes in the Atlantic [with German and French abs.]: *Zeitschr. Geomorphologie*, v. 14, no. 2, p. 186-201, illus., 1970.
- Stanley, Daniel J.** See *Kelling, Gilbert*. 05852
- 06129 **Stanley, Daniel J.; Kelling, Gilbert.** Interpretation of a levee-like ridge and associated features, Wilmington submarine canyon, eastern United States: *Geol. Soc. America Bull.*, v. 81, no. 12, p. 3747-3752, illus., 1970.
- 06447 **Stanley, Daniel J.** Flyschoid sedimentation on the outer Atlantic margin off northeast North America [with French abs.], in *Flysch sedimentology in North America*: *Geol. Assoc. Canada Spec. Paper* 7, p. 179-210, illus., 1970.
- Stanley, Daniel J.** See *Lyall, Anil K.* 09652
- 00183 **Stanley, E. A.** Stratigraphical and geographical distribution of the fossil pollen group *Triprojectacites* (*Aquilapollenites* and closely related forms) [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 37, 1970.
- 02455 **Stanley, Edward A.** The stratigraphical, biogeographical, paleoautecological, and evolutionary significance of the fossil pollen group *Triprojectacites*: *Georgia Acad. Sci. Bull.*, v. 28, no. 1, p. 1-44, illus., 1970.
- 10101 **Stanley, Edward A.** Maestrichtian plant microfossil assemblages and their paleogeographic and paleoclimatic implications for latest Mesozoic time [abs.], in

- Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2506, 1970.
- 10787 **Stanley, Edward A.** Marine palynology, in *Oceanography and marine biology—An annual review*, V. 7 (Harold Barnes, editor): New York, Hafner Publishing Co., p. 277-292, illus., table, 1969.
- Stanley, J. P.** See *Davis, J. B.* 06333
- 06676 **Stanley, Kenneth Oliver.** Tectonic and sedimentologic history of the Lower Jurassic Sunrise and Dunlap Formations, west-central Nevada [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 764B-765B, 1970.
- Stanley, R. S.** See *Chamberlain, E. W.* 00023
- Stanley, R. S.** See *Hatch, N. L., Jr.* 04029
- Stanley, Rolfe S.** See *Hatch, Norman L.* 00160
- 09022 **Stanley, Rolfe S.** Bedrock geology of the southern portion of the Hinesburg synclinorium—Trip C in *Guidebook to field excursions*, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., p. 37-64, illus., table, 1969.
- 10611 **Stanley, Rolfe S.** Metamorphic geology of the Collinsville area, Trip D-4 in *Guidebook for field trips in Connecticut—New England Intercollegiate Geol. Conf., 60th Ann. Mtg., New Haven, Conn., 1968: Connecticut Geol. and Nat. History Survey Guidebook 2*, 17 p., paged separately, illus., table, 1968.
- 08498 **Stanley, Steven M.** Relation of shell form to life habits of the Bivalvia (Mollusca): Geol. Soc. America Mem. 125, 296 p., illus., tables, 1970.
- 07767 **Stanley, T. B., Jr.** Vicksburg fault zone, Texas, in *Geology of giant petroleum fields—Symposium, AAPG, 53d Ann. Mtg., Oklahoma City, Okla., 1968: Am. Assoc. Petroleum Geologists Mem. 14*, p. 301-308, illus., 1970.
- Stanley, W. D.** See *Frischknecht, Frank C.* 10043
- 04312 **Stanton, R. L.; Willey, Helen Gorman.** Natural work-hardening in galena, and its experimental reduction: *Econ. Geology*, v. 65, no. 2, p. 182-194, illus., tables, 1970.
- 00369 **Stanton, Robert J., Jr.** Paleocology of upper Tertiary basin-margin sedimentary rocks, California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 147-148, 1970.
- Stanton, Robert J., Jr.** See *Dodd, J. Robert.* 01069
- 01689 **Stanton, Robert J., Jr.** Cyclicity in upper Tertiary basin-margin deposits of California Coast Ranges [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 3, p. 561, 1970.
- 03759 **Stanton, Robert J., Jr.** Paleocology of Claiborne shales, in *Outcrops of the Claiborne Group in the Brazos Valley, southeast Texas—Geol. Soc. America South-Central Sec., 4th Ann. Mtg., 1970, Guidebook: [College Station, Tex.] Texas A and M Univ., Dept. Geology*, p. 22-25, 1970.
- 05806 **Stanton, Robert J., Jr.; Dodd, J. Robert.** Paleocologic techniques—Comparison of faunal and geochemical analyses of Pliocene paleoenvironments, Kettleman Hills, California: *Jour. Paleontology*, v. 44, no. 6, p. 1092-1121, illus., tables, 1970.
- 09587 **Stanton, Robert J., Jr.; Evans, Ian.** Sample size, accuracy interrelations in paleocology [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 693-694, 1970.

**Staples, Lloyd W.** See *Evans, Howard T., Jr.* 06972

- 07948 **Stapleton, Richard Pierce.** Ultrastructure of tests of some recent benthic hyaline foraminifera [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 6, p. 3593B, 1970.

**Stark, Philip H.** See *Forgotson, James M., Jr.* 02618

**Stark, Philip H.** See *Forgotson, James M., Jr.* 07837

**Starkel, L.** See *Schumm, S. A.* 09898

- 03555 **Starkey, J.; Wainwright, J. E. N.** Ueber die Struktur des Tiefalbits aus Klüften in den Glaukophanschiefern Kaliforniens [abs.]: *Fortschr. Mineralogie*, v. 47, no. 1, p. 64-65, 1970.

- 05928 **Starkey, John.** A computer programme to construct spherical projections, in *Experimental and natural rock deformation — Internat. Symposium, Darmstadt, Germany, 1969*, Proc. (P. Paulitsch, editor): Berlin and Heidelberg, Germany, Springer-Verlag, p. 38-50, illus., table, 1970.

- 05929 **Starkey, John.** A computer programme to prepare orientation diagrams [with German abs.], in *Experimental and natural rock deformation — Internat. Symposium, Darmstadt, Germany, 1969*, Proc. (P. Paulitsch, editor): Berlin and Heidelberg, Germany, Springer-Verlag, p. 51-74, illus., tables, 1970.

- 00646 **Starmer, Robert J.; Koucky, Frank L.** Post-metamorphic deformation of the Precambrian core, Bighorn Mountains, Wyoming [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 350, 1970.

**Stateham, Raymond M.** See *Merrill, Robert H.* 07394

- 07654 **Statler, Anthony T.; Sykes, C. Ronald.** Geologic map (and coal maps) of the Duncan Flats quadrangle, Tennessee: Tennessee Div. Geology Geol. Map GM 129-NE, 7 sheets, scale 1:24,000, separate text, 1970.

- 03852 **Statton, C. Tom.** Faunal assemblage study of the Maryland Miocene [abs.]: *Indiana Acad. Sci. Proc.* 1969, v. 79, p. 253, 1970.

- 03270 **Staub, William Praed.** Seismic refraction, a technique for subsurface investigation in Iowa [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 11, p. 5108B, 1970.

**Stauble, Donald.** See *Warnke, Detlef A.* 10519

- 00434 **Stauder, William.** A detailed study of three groups of the smaller aftershocks of the Benham nuclear explosion [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 148, 1970.

- 03310 **Stauder, William; Nuttli, Otto W.** Seismic studies — South central Illinois earthquake of November 9, 1968: *Seismol. Soc. America Bull.*, v. 60, no. 3, p. 973-981, illus., tables, 1970.

- 03311 **Stauder, William; Pitt, Andrew M.** Note on an aftershock study, south central Illinois earthquake of November 9, 1968: *Seismol. Soc. America Bull.*, v. 60, no. 3, p. 983-986, illus., tables, 1970.

**Stauder, William.** See *Guha, Shyamal K.* 07534

- 07716 **Stauffer, Mel R.** Deformation textures in tectonites: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 498-511, illus., table, 1970.

- 07980 **Stearn, C. W.; Mehrotra, P. N.** Lower and Middle Devonian stromatoporoids from northwestern Canada: *Canada Geol. Survey Paper* 70-13, 43 p., illus., 1970.

- 09838 **Stearn, Enid W.** Environmental geology — A science and a point of view: *Rock Products*, v. 73, no. 6, p. 69-71, illus., 1970.
- Stearns, David W.** See *Friedman, Melvin*. 06984
- 07590 **Stearns, David W.** Drape folds over uplifted basement blocks with emphasis on the Wyoming province [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 3, p. 1253B, 1970.
- 09588 **Stearns, David W.; Graham, J. A.; Swolfs, Hans.** Drape folds over uplifted basement blocks in the Wyoming Province [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 694-695, 1970.
- Stearns, Harold T.** See *Lum, Daniel*. 00031
- 08333 **Stearns, Harold T.** Ages of dunes on Oahu, Hawaii: *Bernice P. Bishop Mus. Occasional Papers*, v. 24, no. 4, p. 51-72, illus., tables, 1970.
- 08607 **Stearns, Richard G.; Colvin, John M., Jr.; Johnson, Robert W., Jr.** Magnetic, gravity, and structural patterns of a part of north central Tennessee and adjacent Kentucky [Abs.], in *AIME world symposium on mining and metallurgy of lead and zinc*, St. Louis, Missouri, 1970 [Proc.] — V. 1, Mining and concentrating of lead and zinc: *New York, Am. Inst. Mining, Metallurgical, and Petroleum Engineers*, p. 997-998, 1970.
- 07210 **Stebbins, G. Ledyard.** Variation and evolution in plants — Progress during the past twenty years, [Chap.] 6 in *Essays in evolution and genetics in honor of Theodosius Dobzhansky — A supplement to evolutionary biology* (Max K. Hecht and William C. Steere, editors): *New York, Appleton-Century-Crofts*, p. 173-208, 1970.
- Steele, J. P.** See *Stacey, R. A.* 09778
- 00762 **Steele, Kenneth F.** Chemical differentiation of a Triassic(?) diabase dike, Pageland, South Carolina [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 241, 1970.
- 07857 **Steenland, N. C.** Recent developments in aeromagnetic methods: *Geoexploration*, v. 8, nos. 3-4, p. 185-204, illus., 1970.
- Stefanko, R.** See *Su, Y. L.* 07446
- Stefanko, R.** See *Hardy, H. R., Jr.* 07451
- 09447 **Stefanko, Robert.** Subsurface disposal of mine water: *Am. Inst. Mining, Metall. and Petroleum Engineers Trans.*, v. 247, p. 54-87, illus., tables, 1970.
- 01478 **Stefansson, Karl; Owens, James P.** Clay mineralogy of selected samples from the middle Miocene formations of southern Maryland, in *Geological Survey research 1970*, Chap. B: *U.S. Geol. Survey Prof. Paper 700-B*, p. B150-B156, illus., 1970.
- 10102 **Stehli, F. G.** Provincialism in Permian faunas and its application to paleoclimatic evolutionary biostratigraphic studies [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, *Abs. Papers: Am. Assoc. Petroleum Geologists bull.*, v. 54, no. 12, p. 2507, 1970.
- 00547 **Stehli, Francis G.; Grant, Richard E.** Permian brachiopods from Huehuetenango, Guatemala: *Jour. Paleontology*, v. 44, no. 1, p. 23-36, illus., 1970.
- 03691 **Stehli, Francis G.** A test of the Earth's magnetic field during Permian time: *Jour. Geophys. Research*, v. 75, no. 17, p. 3325-3342, illus., 1970.
- 07964 **Stehman, Charles F.** Eocene deep water sediment from the Northeast Providence Channel, Bahamas: *Maritime Sediments*, v. 6, no. 2, p. 65-67, illus., table, 1970.
- Steidtmann, James R.** See *Dorr, John A., Jr.* 05210

**Steiger, R. H.** See *Naylor, R. S.* 06453

**Stein, R. B.** See *Sedam, A. C.* 06441

**Steinborn, Terry L.** See *Goles, Gordon G.* 05695

**Steinbrugge, K. V.** See *Cloud, W. K.* 00858

- 03045 **Steinbrugge, Karl V.** Earthquake damage and structural performance in the United States, Chap. 9 in *Earthquake engineering* (R. L. Wiegel, editor): Englewood Cliffs, N.J., Prentice-Hall, p. 167-226, illus., tables, 1970.

- 05526 **Steinbrugge, Karl V.** Earthquake hazard abatement and land use planning — Directions toward solutions, in *Geologic hazards and public problems* (R. A. Olson and M. M. Wallace, editors) — [U.S.] Office Emergency Preparedness, Region 7, Conf., San Francisco, Calif., 1969, Proc.: Washington, D.C., U.S. Govt. Printing Office, p. 143-152 [1970].

- 08636 **Steinbrugge, Karl V.** Engineering aspects of the Santa Rosa, California, earthquakes, October 1, 1969, in *The Santa Rosa, California, earthquakes of October 1, 1969*: Rockville, Md., U.S. Coast and Geodetic Survey, p. 1-63, illus., tables, 1970.

**Steinbrunn, F.** See *Kirsten, T.* 05706

- 06369 **Steiner, Dieter.** Annotated bibliography of bibliographies on photo interpretation and remote sensing: *Photogrammetria*, v. 26, no. 4, p. 143-161, 1970.

- 01983 **Steiner, Maureen B.** Jurassic, a period of rapid polar wander, continental drift [abs.]: *EOS*, v. 51, no. 4, p. 272, 1970.

- 05529 **Steinhart, John S.** The federal interests in earthquake and geologic hazards programs, in *Geologic hazards and public problems* (R. A. Olson and M. M. Wallace, editors) — [U.S.] Office Emergency Preparedness, Region 7, Conf., San Francisco, Calif., 1969, Proc.: Washington, D.C., U.S. Govt. Printing Office, p. 211-219 [1970].

**Steinhilber, W. L.** See *Hershey, H. G.* 04930

- 09014 **Steinhilber, Walter L.; Horick, Paul J.** Ground-water resources of Iowa, in *Water resources of Iowa — A symposium*, Paul J. Horick, editor: Cedar Falls, Iowa, Iowa Acad. Sci., Geology Sec., p. 29-49, illus., table, 1970.

- 02687 **Stelck, C. R.** Cretaceous deltas, Alberta [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 871-872, 1970.

- 05370 **Stelck, C. R.** Percival Sidney Warren, 1890-1970: *Bull. Canadian Petroleum Geology*, v. 18, no. 3, p. 442-449, portrait, 1970.

- 08175 **Stelck, C. R.** Percival Sidney Warren, 1890-1970: *Royal Soc. Canada Minutes Proc.* 1970, ser. 4, v. 8, p. 157-161, portrait, 1970.

- 10754 **Stelck, C. R.** Palynology, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 49-53, 1970.

**Stelcl, Otakar.** See *Panos, Vladimir.* 10818

- 10819 **Stellmack, John A.** An alpine karst in the United States, in *Internat. Cong. Speleology*, 4th, Yugoslavia, 1965, Proc., V. 3: Ijubljana, Yugoslavia, Speleolog. Soc. Yugoslavia, p. 601-608, illus., 1968.

**Stellmack, John A.** See *White, William B.* 10877

**Stemprok, Miroslav.** See *Pouba, Zdenek.* 08766

**Stenning, Michael.** See *Weiss, Benjamin.* 00011

- 00647 **Stensrud, Howard L.; Gresens, Randall L.** Trace element partitioning between coexisting muscovite and biotite [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 350-351, 1970.
- 02402 **Stephens, D. R.; Lilley, E. M.; Louis, H.** Pressure-volume equation of state of consolidated and fractured rocks to 40 kb: *Internat. Jour. Rock Mechanics and Mining Sci.*, v. 7, no. 3, p. 257-296, illus., tables, 1970.
- 04127 **Stephens, D. R.; Heard, H. C.; Schock, R. N.** High-pressure mechanical properties of tuff from the Diamond Dust site — UCRL-50858: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., 15 p., illus., tables, 1970.
- 06296 **Stephens, D. R.; Lilley, E. M.** Loading-unloading pressure-volume curves to 40 kbar for lunar crystalline rock, microbreccia and fines, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 2427-2434, illus., tables, 1970.
- 07832 **Stephens, D. R.; Lilley, E. M.** Loading-unloading pressure-volume curves for rocks, in *Symposium on engineering with nuclear explosives* — Am. Nuclear Soc. and U.S. Atomic Energy Comm., Las Vegas, Nev., 1970, Proc., V. 1: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., p. 89-109, illus., tables, 1970.
- 05378 **Stephens, E. Vernon.** Geologic map of the Heart Butte NW quadrangle, Morton and Grant Counties, North Dakota: U.S. Geol. Survey Coal Inv. Map C-52, scale 1:24,000, text, 1970.
- 05379 **Stephens, E. Vernon.** Geologic map of the Heart Butte quadrangle, Morton and Grant Counties, North Dakota: U.S. Geol. Survey Coal Inv. Map C-53, scale 1:24,000, text, 1970.
- 07393 **Stephens, J. D.; Wittkopp, R. W.** The many-fingered microprobe: *Mining Eng.*, v. 22, no. 7, p. 120-122, illus., 1970.
- Stephens, Jerry C.** See *Christensen, Cleo M.* 06563
- Stephens, L. E.** See *Hornal, R. W.* 09779
- Stephens, Michael.** See *Johnson, J. G.* 05811
- Stephenson, A.** See *Runcorn, S. K.* 06292
- Stephenson, D.** See *Emeleus, C. H.* 06249
- Stephenson, G. R.** See *England, C. B.* 05005
- 01320 **Stephenson, Richard A.** Channel response on the upper Hiawasse River [abs.]: *Georgia Acad. Sci. Bull.*, v. 28, no. 2, p. s24-s25, 1970.
- 03134 **Stephenson, Richard A.** On the use of grain size analysis in geomorphological studies: *Prof. Geographer*, v. 22, no. 4, p. 200-203, illus., table, 1970.
- 00763 **Stephenson, Robert A.** Application of the critical point theorem to topographic surfaces [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 242, 1970.
- Stepp, J. C.** See *Algermissen, S. T.* 00221
- 04591 **Sterling, David A.; Malan, Roger C.** Distribution of uranium and thorium in Precambrian rocks of the southwestern United States: *Soc. Mining Engineers AIME Trans.*, v. 247, no. 3, p. 255-259, illus., table, 1970.
- 09235 **Stern, Daniel H.; Stern, Michele S.** Physical, chemical, bacterial, and plankton dynamics of Lake Ponchartrain, Louisiana: *Louisiana Water Resources Research Inst. Tech. Rept.* 4, 60 p., illus., tables, 1969.

- 11255 **Stern, Daniel H.; Atwell, B. Houston; Merz, Evelyn L.; Vinet, Marshall J.** A summer limnological study of Lake Ponchartrain, Louisiana: Water Resources Research Inst. Tech. Rept. 3, 83 p., illus., tables, 1968.
- Stern, Michele S.** See *Stern, Daniel H.* 09235
- Stern, T. W.** See *Marvin, Richard F.* 05646
- Stern, T. W.** See *Goldich, S. S.* 05965
- Stern, T. W.** See *Lee, Donald E.* 06209
- 08593 **Sternberg, Charles M.** Comments on dinosaurian preservation in the Cretaceous of Alberta and Wyoming [with French abs.]: Canada Natl. Mus. Nat. Sci. Pubs. Palaeontology, no. 4, 9 p., illus., 1970.
- 01984 **Stesky, R. M.; Strangway, D. W.** Magnetic studies of deep sea cores from the Mid-Atlantic Ridge [abs.]: EOS, v. 51, no. 4, p. 274, 1970.
- Stettler, A.** See *Eberhardt, P.* 05685
- Steven, Thomas A.** See *Lipman, Peter W.* 03777
- Steven, Thomas A.** See *Lipman, Peter W.* 04242
- Stevens, C. M.** See *Fields, P. R.* 05689
- 00370 **Stevens, Calvin H.** Permo-Pennsylvanian off-shelf deposits, eastern California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 148-149, 1970.
- 02688 **Stevens, Calvin H.** Geometry of Inyo-White Mountains allochthon, eastern California [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 872, 1970.
- Stevens, D. N.** See *DeVoto, R. H.* 02556
- 01221 **Stevens, Dale John.** The high Uintas — A landform analysis [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 8, p. 3703B-3704B, 1970.
- 07949 **Stevens, James Bowie.** Geology of the Castolon area, Big Bend National Park, Brewster County, Texas [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3487B, 1970.
- Stevens, Margaret S.** See *Lundelius, Ernest L.* 00581
- 04125 **Stevens, Margaret Skeels.** *Merychys verrucomalus*, a new species of oreodont (Mammalia, Artiodactyla) from the middle Miocene Runningwater Formation: Am. Mus. Novitates, no. 2425, 11 p., illus., table, 1970.
- Stevens, R. D.** See *Boyle, R. W.* 03478
- Stevens, R. D.** See *Wanless, R. K.* 04096
- Stevens, R. D.** See *Boyle, R. W.* 05076
- Stevens, R. D.** See *Wanless, R. K.* 05731
- 05304 **Stevens, R. K.** Cambro-Ordovician flysch sedimentation and tectonics in west Newfoundland and their possible bearing on a proto-Atlantic Ocean [with French abs.], in Flysch sedimentology in North America: Geol. Assoc. Canada Spec. Paper 7, p. 165-177, illus., 1970.
- Stevens, Robert D.** See *Wanless, Robert K.* 03926

- 06455 **Stevenson, D. L.** Trend-surface analysis of the structure of the Ste. Genevieve Limestone on the Effingham, Illinois, area: Illinois Geol. Survey Circ. 454, 12 p., illus., table, 1970.
- 00818 **Stevenson, F. J.; Cheng, C. N.** Amino acids in sediments — Recovery by acid hydrolysis and quantitative estimation by a colorimetric procedure: *Geochim. et Cosmochim. Acta*, v. 34, no. 1, p. 77-88, illus., tables, 1970.
- 04090 **Stevenson, F. J.; Tilo, S. N.** Nitrogenous constituents of deep-sea sediments, in *Advances in organic geochemistry — Internat. Cong., 3d, Proc.* (G. D. Hobson and G. C. Speers, editors): London and New York, Pergamon Press (Internat. Ser. Mons. Earth Sci., V. 32), p. 237-263, illus., tables, 1970.
- 03150 **Stevenson, I. M.** Rigolet and Groswater Bay map-areas, Newfoundland (Labrador): Canada Geol. Survey Paper 69-48, 24 p., geol. map, 1970.
- 06630 **Stevenson, John S.; Stevenson, Louise S.** Manganese nodules from the Challenger Expedition at Redpath Museum: *Canadian Mineralogist*, v. 10, pt. 4, p. 599-615, illus., tables, 1970.
- 03147 **Stevenson, Robert E.** Gross transport of suspended sediments over continental shelves as analyzed from Gemini and Apollo space photography [abs.]: *Corpus Christi Geol. Soc. Bull.*, v. 10, no. 9, p. 4, 1970.
- 03112 **Stevenson, Robert Louis.** The effects of a supplementary programmed textbook on transfer of training to particular geologic interpretations — An experimental study [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 10, p. 4665B, 1970.
- 02535 **Stevenson, T. H.** The search for the Yarmouth in the valley of the ancient Platte [abs.]: *Nebraska Acad. Sci. Proc.*, 80th Ann. Mtg., p. 37, 1970.
- 04299 **Stevenson, William G.** Role of the prospector in mineral exploration: *Canadian Mining and Metall. Bull.*, v. 63, no. 698, p. 708-710, tables, 1970.
- Stewart, D. B.** See *Ribbe, P. H.* 09537
- Stewart, D. H.** See *Burnham, J. B.* 07827
- 06314 **Stewart, David M.** The rock and bong techniques of measuring water levels in wells: *Ground Water*, v. 8, no. 6, p. 14-18, illus., tables, 1970.
- Stewart, J. H.** See *Davis, W. E.* 07500
- Stewart, J. M.** See *Donnay, Gabrielle.* 02708
- Stewart, J. M.** See *Petruk, W.* 03494
- Stewart, J. M.** See *Cabri, L. J.* 03500
- 02947 **Stewart, J. W.** Use of remote sensors in classifying lakes in west-central Florida, in *Earth resources aircraft program status review*, NASA, Houston, 1968 — V. 3, Hydrology, oceanography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 22B1-22B11, illus. [1970].
- Stewart, J. W.** See *Cherry, R. N.* 03383
- 04988 **Stewart, J. W.** Precambrian alkaline-ultramafic/carbonatite volcanism at Qagssiarssuk, South Greenland: *Medd. Grönland*, v. 181, no. 4, 70 p., illus., tables, geol. maps, 1970; *reprinted as Grönlands!Geol. Undersögelse Bull.* 84, 1970.
- 03380 **Stewart, John H.** Upper Precambrian and Lower Cambrian strata in the southern Great Basin, California and Nevada: U.S. Geol. Survey Prof. Paper 620, 206 p., illus., tables, 1970.



- 03862 **Stewart, John H.** Correlation of Lower Cambrian and some Precambrian strata in the southern Great Basin, California and Nevada, in *Geologic guide to the Death Valley area, California* — Geol. Soc. Sacramento, Ann. Field Trip Guidebook 1970: Sacramento, Calif., Geol. Soc. Sacramento, p. 1-7, illus., reprinted 1970; originally published 1966.
- 11022 **Stewart, John H.; Albers, John P.; Poole, Forrest G.** Summary of regional evidence for right-lateral displacement in the western Great Basin—Reply [to discussion by L. A. Wright; B. W. Troxel, 1970, of 1968 paper]: *Geol. Soc. America Bull.*, v. 81, no. 7, p. 2175-2179, illus., 1970.
- 07900 **Stewart, Joseph W.; Hanan, Robert V.** Hydrologic factors affecting the utilization of land for sanitary landfills in northern Hillsborough County, Florida: *Florida Bur. Geology Map Ser.*, no. 39, scale about 1 in to 1 mi, sections, text, 1970.
- 08074 **Stewart, Joseph W.** Synoptic remote-sensing survey of lakes in west-central Florida, in *Earth Resources Aircraft Program, status review, 2d Ann.*, Houston, Tex., 1969 — V. 3, Hydrology and oceanography: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 38-1-38-32, illus., [1970,].
- 07478 **Stewart, Nanna Bolling.** Detailed petrography, an aid in the evaluation of gravel aggregates for freeze-thaw resistance, in *Forum on geology of industrial minerals*, 5th, Harrisburg, Pa., 1969, *Proc.: Pennsylvania Geol. Survey, 4th ser., Bull. M64 (Mineral Resources Rept.)*, p. 55-89, illus., tables, 1970.
- 00371 **Stewart, Richard J.** Widespread occurrence of laumontite in the western Olympic Peninsula, Washington [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 149, 1970.
- 02973 **Stewart, Robert A.** Palynology of some early Tertiary deposits in northeastern Mississippi [abs.]: *Arizona Acad. Sci. Jour.*, v. 6, 1970 *Proc. Supp.*, p. 23, 1970.
- Stewart, Ronald C.** See *Walker, William R.* 03058
- 00372 **Stewart, S. W.; Lee, W. H. K.; Eaton, J. P.** Real-time detection of local seismic events by digital computer [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 149-150, 1970.
- 10832 **Stewart, S. W.; Lee, W. H. K.; Eaton, J. P.** Microearthquakes along the San Andreas fault system in central California [abs.] - *Internat. Symposium on Recent Crustal Movements and Associated Seismicity*, Wellington, N.Z., 1970, *Proc.: Wellington, N.Z., Royal Soc. of New Zealand*, p. 33-34, 1970.
- Stewart, Wendell J.** See *Kottlowski, Frank E.* 04326
- 04327 **Stewart, Wendell J.** Fusulinids of the Joyita Hills, Socorro County, central New Mexico: *New Mexico Bur. Mines and Mineral Resources Mem.* 23, p. 34-82, illus., tables, 1970.
- 09192 **Stichling, W.** Instrumentation and techniques in sediment surveying, in *Instrumentation and observation techniques, V. 1* — Hydrology Symposium, 7th, Victoria, B. C., 1969, *Proc.: [Ottawa]: Canada Dept. Energy, Mines and Resources Inland Waters Br.*, p. 81-139, illus. [1970,?].
- Stidd, B. M.** See *Hall, J. W.* 04161
- 04175 **Stidd, B. M.; Hall, J. W.** The reproductive organs of *Callistophyton* [abs.]: *Am. Jour. Botany*, v. 57, no. 6, pt. 2, p. 757-758, 1970.
- 04196 **Stidd, Benton M.; Hall, John W.** The natural affinity of the Carboniferous seed, *Callospermion*: *Am. Jour. Botany*, v. 57, no. 7, p. 827-836, illus., table, 1970.
- Stieglitz, Ronald D.** See *Hay, William W.* 07463

- 07286 **Stirewalt, Gerry Lewis.** Structural analysis of the Sauratown Mountains anticlinorium and the Brevard lithologic zone, North Carolina [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 5, p. 2770B-2771B, 1970.
- 07525 **Stith, David A.** Potential use of Ohio limestones and dolomites for architectural aggregate, in *Forum on Geology of Industrial Minerals*, 6th, Ann Arbor, Mich., 1970, *Proc.: Michigan Geol. Survey Miscellany* 1, p. 81-86, tables, 1970.
- 01105 **Stitt, James H.** Cambrian biostratigraphy, Wichita and Arbuckle Mountains, Oklahoma [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 406, 1970.
- 07861 **St-Julien, P.** (compiler). Orford-Sherbrooke area, Richmond, Sherbrooke, Shefford, Brome, Stanstead, and Compton Counties: Quebec Dept. Nat. Resources Map 1619, scale 1:50,000, 1970.
- 07971 **Stockwell, C. H.; McGlynn, J. C.; Emslie, R. F.; Sanford, B. V.; Norris, A. W.; Donaldson, J. A.; Fahrig, W. F.; Currie, K. L.** Geology of the Canadian Shield, Chap. 4 in *Geology and economic minerals of Canada: Canada Geol. Survey Econ. Geology Rept. 1* (5th edition), p. 43-150, illus., tables, 1970.
- 05722 **Stoenner, R. W.; Lyman, W. J.; Davis, Raymond, Jr.** Cosmic-ray production of rare-gas radioactivities and tritium in lunar material, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, *Proc.* — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1583-1594, illus., tables, 1970.
- Stoiber, R. E.** See *Rose, W. I., Jr.* 06916
- 10885 **Stoiber, R. E.; Eberl, D.** Fumaroles of Guatemala [with Spanish and English abs.], in *Trabajos técnicos presentados en la segunda reunión de geólogos de América Central: Inst. Centroamericano Inv. y Tecnología Indus. Pubs. Geol.*, no. 2, p. 39-43, 1969.
- 01837 **Stoiber, Richard E.; Rose, William I., Jr.** Geochemistry of Central American volcanic gas condensates [abs.]: *EOS*, v. 51, no. 4, p. 440, 1970.
- 04873 **Stoiber, Richard E.; Rose, William I., Jr.** The geochemistry of Central American volcanic gas condensates: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 2891-2911, illus., tables, 1970.
- Stokes, W. L.** See *Thompson, A. E.* 07038
- 04137 **Stokes, William Lee.** Scanty fossil evidence emphasizes correlation problems in northeastern Utah and southcentral Idaho: *Brigham Young Univ. Geology Studies*, v. 17, pt. 1, p. 41-49, illus., 1970.
- 06546 **Stone, D. B.** Paleosecular variation in Alaska, Chap. 13 in *Palaeogeophysics* (S. K. Runcorn, editor): London and New York, Academic Press, p. 117-126, table, illus., 1970.
- 03156 **Stone, D. S.** Principal horizontal stress in the central Rocky Mountains versus California: *Mtn. Geologist*, v. 7, no. 2, p. 69-82, illus., 1970.
- Stone, David B.** See *Cameron, Christopher P.* 02776
- 04179 **Stone, David B.; Cameron, Christopher P.** Paleomagnetic investigations in Alaska in *Alaska Sci. Conf.*, 20th, College, 1969, *Proc.: Sci. Alaska* 1969, p. 311-318, 1970.
- Stone, David B.** See *Cameron, Christopher P.* 07642
- 09589 **Stone, George Thomas.** Highly evolved basaltic lavas in the western Snake River Plain, Idaho [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 695-696, 1970.

- 10679 **Stone, H. L.** Probability model for estimating three-phase relative permeability: Jour. Petroleum Technology, v. 22, February, p. 214-218, illus., tables, 1970.

**Stone, J. F.** See *Nichols, J. D.* 03933

- 03489 **Stone, John.** A teacher's guide for geologic field investigations in the Twin Cities area: [St. Paul, Minn.] Minnesota Dept. Education, 18 p., illus., table [n.d.].
- 02735 **Stone, W. J.** Stratigraphic significance of fossil rhinoceros remains in Slope County, North Dakota [abs.]: North Dakota Acad. Sci. Proc., v. 24, pt. 1, p. 32, 1970.
- 00979 **Stone, William J.** Source and significance of cobbles in the Chadron Formation (Oligocene) of North Dakota [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 351, 1970.
- 04035 **Stone, William J.; Erickson, J. Mark.** A FORTRAN program for Folk's sandstone classification: Compass, v. 47, no. 3, p. 163-168, illus., 1970.

**Stonehouse, H. B.** See *Ellis, J. G.* 06451

- 08303 **Stonehouse, Harold B.** Precambrian of the Marquette area, Michigan, in Guidebook for field trips — Geol. Soc. America North-Central Sec., May 1970: [East Lansing, Mich.], Michigan Basin Geol. Soc., p. 159-177, illus., geol. map, 1970.

**Stonehouse, Harold B.** See *Institute on Lake Superior Geology.* 09508

**Stonehouse, Harold B.** See *Michigan Basin Geological Society.* 10945

- 10948 **Stonehouse, Harold B.** Appendix — The Penokean Province, in Studies of the Precambrian — Michigan Basin Geol. Soc. Ann. Field Excursion, 1969: [East Lansing, Mich.], Michigan Basin Geol. Soc., p. 94-95, 1969.
- 11257 **Stonehouse, Harold B.** The Precambrian around and under the Michigan Basin, in Studies of the Precambrian of the Michigan Basin — Michigan Basin Geol. Soc. Ann. Field Excursion, 1969: [East Lansing, Mich.], Michigan Basin Geol. Soc., p. 15-27, illus., 1969.
- 11259 **Stonehouse, Harold B.** Geology of selected areas on the north shore of Lake Huron and their relation to the Michigan Basin, in Studies of the Precambrian of the Michigan Basin — Michigan Basin Geol. Soc. Ann. Field Excursion, 1969: [East Lansing, Mich.], Michigan Basin Geol. Soc., p. 1-14, illus., 1969.
- 08132 **Storer, John E.** New rodents and lagomorphs from the Upper Miocene Wood Mountain Formation of southern Saskatchewan: Canadian Jour. Earth Sci., v. 7, no. 4, p. 1125-1129, illus., 1970.
- 04642 **Storey, Taras P.** Evaporite basin configuration — Structural versus sedimentary interpretation, in Third symposium on salt, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 8-19, illus., 1970.

**Storm, David R.** See *Burgy, Robert H.* 10504

- 03172 **Stormer, J. C., Jr.; Carmichael, I. S. E.** Villiaumite and the occurrence of fluoride minerals in igneous rocks: Am. Mineralogist, v. 55, nos. 1-2, p. 126-134, illus., 1970.
- 06787 **Stormer, J. C., Jr.; Carmichael, I. S. E.** The Kudo-Weill geothermometer and porphyritic acid glasses: Contr. Mineralogy and Petrology, v. 28, no. 4, p. 306-309, illus., 1970.
- 01838 **Stormer, John C., Jr.** The free energy of sodalite and the fugacity of halogens in igneous rocks [abs.]: EOS, v. 51, no. 4, p. 434, 1970.
- 09590 **Stormer, John C., Jr.; Carmichael, I. S. E.; Hemming, Robert.** The distribution of fluorine, chlorine, and hydroxyl in minerals and possible applications to geothermometry [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 696, 1970.

**Storzer, D.** See *Wagner, G. A.* 01846

**Storzer, D.** See *Reimer, G. M.* 06824

- 07898 **Stott, D. F.** Jurassic and Cretaceous rocks of Pine River region, British Columbia, in *Peace River, Pine Pass, Yellowhead 1970* — Edmonton Geol. Soc. Field Conf., 12th, Guidebook: Edmonton, Alberta, Edmonton Geological Society, p. 58-83, illus., table, 1970.

**Stott, D. F.** See *Douglas, R. J. W.* 07974

**Stott, D. F.** See *Little, H. W.* 07975

- 03645 **Stott, Donald F.** The southern Interior Plains, in *Geological provinces of Canada, exploration and outlook: Canadian Mining and Metall. Bull.*, v. 63, no. 694, p. 191-194, 1970.

- 04499 **Stout, George H.; Jensen, Lyle H.** X-ray structure determination — A practical guide: New York, Macmillan Co., 467 p., illus., tables, 1970.

- 00373 **Stout, Martin L.** Stabilization of an active landslide, eastern Puente Hills, Orange County, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 150, 1970.

- 05575 **Stout, Martin L.** Consideration of slip surface geometry of landslides in designing stabilization measures, in *Engineering geology and soils engineering symposium*, 8th Ann., Pocatello, Idaho, 1970, *Proc.: Boise, Idaho, Idaho Dept. Highways*, p. 85-89, illus., 1970.

- 02536 **Stout, Thompson M.** A new approach to intercontinental correlations [abs.]: *Nebraska Acad. Sci. Proc.*, 80th Ann. Mtg., p. 37, 1970.

- 03486 **Stow, S. H.** Arsenic in phosphorite and apatite — A reply [to 1970 discussion by D. McConnell of 1969 paper]: *Econ. Geology*, v. 65, no. 1, p. 65-66, 1970.

**Strabala, J. M.** See *Caldwell, John W.* 04473

**Stradling, Dale.** See *McKee, Bates.* 02392

**Stradling, Dale.** See *Gilmour, Ernest H.* 08528

- 09410 **Stradling, Dale F.** Landslides of the central Horse Heaven Hills, southern Washington [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, *Abs.: [Bozeman, Mont., Montana State Univ.?]*, p. 127, 1970.

- 00829 **Strahler, Arthur N.** *Introduction to physical geography* (2d edition): New York and London, John Wiley and Sons, 457 p., illus., 1970; originally published 1965.

- 05374 **Strain, William S.** Bolson integration in the Texas-Chihuahua border region, in *Geology of the southern Quitman Mountains area, Trans-Pecos Texas* — S.E.P.M. Permian Basin Sec., 1970 Biennial Field Trip, Symposium and Guidebook: Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub. 70-12, p. 88-90, illus., 1970.

- 05918 **Strain, William S.** Late Cenozoic bolson integration in the Chihuahua tectonic belt [summ.], in *The geologic framework of the Chihuahua tectonic belt* — Symposium in honor of Ronald K. De Ford, Midland, Tex., 1970: Midland, Tex., West Texas Geol. Soc., p. 56-59, 1970.

- 04372 **Straka, Joseph J., 2d; Lane, H. Richard.** Evolution of some Lower Pennsylvanian conodont species: *Lethaia*, v. 3, no. 1, p. 41-49, illus., 1970.

- 01682 **Straka, Joseph John, 2d.** Age and correlation of the Goddard and Springer Formations in southern Oklahoma as determined by conodonts [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 9, p. 4285B, 1970.
- Strange, J. N.** See *Whalin, R. W.* 06723
- 02915 **Strange, W. E.** The use of gravimeter measurements in mining and groundwater exploration [with French abs.], in *Mining and groundwater geophysics, 1967*: Canada Geol. Survey Econ. Geology Rept. 26, p. 46-50, 1970.
- Strange, William E.** See *Henderson, Garry C.* 09481
- Strangway, D. W.** See *Stesky, R. M.* 01984
- 02918 **Strangway, D. W.; Vozoff, K.** Mining exploration with natural electromagnetic fields [with French abs.], in *Mining and groundwater geophysics, 1967*: Canada Geol. Survey Econ. Geology Rept. 26, p. 109-122, illus., 1970.
- 06297 **Strangway, D. W.; Larson, E. E.; Pearce, G. W.** Magnetic studies of lunar samples — breccia and fines, in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 3, Physical properties*: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 2435-2451, illus., table, 1970.
- Strangway, D. W.** See *Simpson, J. W.* 10969
- Strangway, David W.** See *Saint Amant, M.* 03737
- 03892 **Strangway, David W.** History of the Earth's magnetic field: New York and London, McGraw-Hill Book Co., 168 p., illus., 1970.
- Streatfield, David.** See *Twiss, Robert.* 06920
- 06655 **Street, R. L.; Chan, R. K. C.; Fromm, J. E.** The numerical simulation of long water waves — Progress on two fronts, in *Tsunamis in the Pacific Ocean — Internat. Symposium on Tsunamis and Tsunami Research, Honolulu, Hawaii, 1969, Proc.*: Honolulu, Hawaii, East-West Center Press, p. 453-473, illus., 1970.
- Streeter, S. Stephen.** See *Buchanan, Hugh.* 00143
- 07111 **Streib, Donald L.** Tectonic analysis of the area of Wheeling, West Virginia: West Virginia Acad. Sci. Proc. 1969, v. 41 (West Virginia Univ. Bull., ser. 70, no. 11-3), p. 189-193, illus., 1970.
- Strezheva, K. M.** See *Troitskiy, V. S.* 05096
- 03473 **Strick, E.** A predicted pedestal effect for pulse propagation in constant-Q solids: Geophysics, v. 35, no. 3, p. 387-403, illus., table, 1970.
- Strimple, H. L.** See *Burdick, D. W.* 07555
- 02495 **Strimple, Harrell L.** The occurrence of *Onychaster strimplei* in Oklahoma: Oklahoma Geology Notes, v. 30, no. 2, p. 42, 1970.
- Strimple, Harrell, L.** See *Pabian, Roger K.* 02533
- 03727 **Strimple, Harrell L.; McGinnis, Michael R.** A new platycrinid from Gilmore City, Iowa: Iowa Acad. Sci. Proc. 1969, v. 76, p. 263-266, illus., 1970.
- 11219 **Strimple, Harrell L.; Watkins, William T.** Carboniferous crinoids of Texas with stratigraphic implications: *Palaeontographica Americana*, v. 6, no. 40, p. 141-275, illus., 1969.

- 06857 **Strom, Robert G.; Fielder, Gilbert.** Multiphase eruptions associated with the lunar craters Tycho and Aristarchus: Arizona Univ. Lunar and Planetary Lab. Commun., v. 8, pt. 4, no. 150, p. 235-288, illus., 1970.
- 09390 **Stromberg, Peter A.** Oil and gas production in and around San Francisco Bay — A special report, in San Francisco Bay C. D. Conserv. and Devel. Comm., San Francisco Bay Plan Supplement: Sacramento, Calif., Documents and Publications Branch, p. 551-571, 1969.
- 06611 **Strong, Ceylon Perseus, Jr.** Physical and biostratigraphic relations of the Colorado Group in west-central Montana [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 765B, 1970.
- Strong, James F.** See *Rogers, Lewis W.* 10666
- Struble, Richard A.** See *Mintzer, Olin W.* 09358
- Stuart, A.** See *Hartshorne, N. H.* 09924
- 01985 **Stuart, William D.** Bermuda gravity anomalies and pedestal evolution [abs.]: EOS, v. 51, no. 4, p. 316, 1970.
- 10103 **Stuart-Smith, J. H.** Hydrocarbon potential of northern Greenland [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2507, 1970.
- Stubbs, T. F.** See *Terhune, R. W.* 05515
- 01327 **Stuckenrath, Robert, Jr.; Mielke, James E.** Smithsonian Institution radiocarbon measurements VI: Radiocarbon, v. 12, no. 1, p. 193-204, 1970.
- 04936 **Stuckey, Jasper L.** Mineral industry of North Carolina from 1960 through 1967: North Carolina Div. Mineral Resources Econ. Paper 68, 25 p., illus., tables, 1970.
- 04842 **Stude, Gerald R.** Application of paleobathymetry in exploration [abs.]: Am. Assoc. Petroleum Geologists, v. 54, no. 9, p. 1791, 1970.
- 07326 **Stude, Gerald R.** Application of paleobathymetry in exploration, in Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Soc. Trans., v. 20, p. 194-200, illus., 1970.
- Studer, H. P.** See *McLaughlin, W. A.* 01801
- 08742 **Stuiver, M.** Long-term C-14 variations, in Radiocarbon variations and absolute chronology — Nobel Symposium, 12th, Uppsala, 1969, Proc.: New York, John Wiley and Sons, and Stockholm, Almqvist and Wiksell, p. 197-213, illus., table, 1970.
- 04238 **Stuiver, Minze.** Oxygen and carbon isotope ratios of fresh-water carbonates as climatic indicators: Jour. Geophys. Research, v. 75, no. 27, p. 5247-5257, illus., table, 1970.
- 05120 **Stuiver, Minze.** Tree ring, varve and carbon-14 chronologies: Nature, v. 228, no. 5270, p. 454-455, illus., 1970.
- 09411 **Stuiver, Minze.** Oxygen isotope ratio of fresh-water carbonates as a climatic indicator [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 128, 1970.
- 00374 **Stull, Robert J.** Feldspars as a guide to the origin of the Golden Horn batholith [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 150-151, 1970.

- 07872 **Stumm, Erwin C.** Corals of the Traverse Group of Michigan — Pt. 13, Hexagonaria: Michigan Univ. Mus. Paleontology Contr., v. 23, no. 5, p. 81-91, illus., table, 1970.

**Stumm, Werner.** See *Hahn, Hermann H.* 01665

- 08400 **Stumm, Werner; Morgan, James J.** Aquatic chemistry — An introduction emphasizing chemical equilibria in natural waters: New York and London, Wiley-Interscience, 583 p., illus., tables, 1970.

**Stumm, Werner.** See *Singer, Philip C.* 09885

**Stumpfl, E. F.** See *Halls, Chris.* 04647

- 06504 **Stumpfl, E. F.** New electron probe and optical data on gold tellurides: Am. Mineralogist, v. 55, nos. 5-6, p. 808-814, illus., tables, 1970.

- 06768 **Stumpfl, E. F.; Halls, C.** Tektonik und Vererzung im Cobalt-Gebiet, Canada — Einige neue Aspekte (Tectonics and mineralization in the Cobalt area of Canada — Some new aspects (with English abs.)), in *Experimental and natural rock deformation — Internat. Symposium, Darmstadt, Germany, 1969, Proc.* (P. Paulitsch, editor): Berlin and Heidelberg, Germany, Springer-Verlag, p. 517-525, illus., 1970.

**Stumpfl, E. F.** See *Gibb, F. G. F.* 06855

**Sturges, F. C.** See *Lundgren, Raymond.* 05325

- 02987 **Sturgul, John R.; Irwin, Thomas D.** Earthquake history of Arizona and New Mexico, 1850-1966 [abs.]: Arizona Acad. Sci. Jour., v. 6, 1970 Proc. Supp., p. 67, 1970.

- 01839 **Sturm, Edward.** A model for subaqueous slump structures [abs.]: EOS, v. 51, no. 4, p. 431, 1970.

- 03221 **Styra, B. I.; Nedveckaite, T. N.; Senko, E. E.** New methods of measuring thoron (radon 220) exhalation: Jour. Geophys. Research, v. 75, no. 18, p. 3635-3638, illus., tables, 1970.

- 07446 **Su, Y. L.; Wang, Y. J.; Stefanko, R.** Finite element analysis of underground stresses utilizing stochastically simulated material properties, Chap. 15 in *Rock mechanics, theory and practice — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.*: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 253-266, illus., tables, 1970.

**Sucharitakul, Mrs. N.** See *Buravas, S.* 04368

**Suddueth, J. E.** See *Nargolwalla, S. S.* 06553

- 00447 **Suess, Erwin.** Interaction of organic compounds with calcium carbonate — [Pt.] 1, Association phenomena and geochemical implications: *Geochim. et Cosmochim. Acta*, v. 34, no. 2, p. 157-168, illus., tables, 1970.

**Suess, Erwin.** See *Chave, Keith E.* 04616

- 08745 **Suess, H. E.** The three causes of the secular C-14 fluctuations, their amplitudes and time constants, in *Radiocarbon variations and absolute chronology — Nobel Symposium, 12th, Uppsala, 1969, Proc.*: New York, John Wiley and Sons, and Stockholm, Almqvist and Wiksell, p. 595-604, discussion, p. 604-605, illus., 1970.

**Suess, Hans E.** See *Lal, D.* 09239

- 04732 **Suess, Steven T.** Some effects of gravitational tides on a model earth's core: Jour. Geophys. Research, v. 75, no. 32, p. 6650-6661, illus., table, 1970.

- 03461 **Suffel, G. G.; Hutchinson, R. W.; Ridler, R. H.** Metallogenic relationships in Archean rocks [abs.]: *Canadian Mining and Metall. Bull.*, v. 63, no. 695, p. 289, 1970.  
**Suganuma, T.** See *Oshima, T.* 09795
- 02537 **Suhm, Raymond W.** Members of the Everton Formation (early medial Ordovician) in northern Arkansas [abs.]: *Nebraska Acad. Sci. Proc.*, 80th Ann. Mtg., p. 38, 1970.  
**Suhr, N. H.** See *Medlin, J. H.* 04083
- 01371 **Sullivan, Beverly Marsters; Spiker, Elliott; Rubin, Meyer.** U.S. Geological Survey radiocarbon dates XI: *Radiocarbon*, v. 12, no. 1, p. 319-334, 1970.
- 04301 **Sullivan, Charles John.** Relative discovery potential of the principal economic metals: *Canadian Mining and Metall. Bull.*, v. 63, no. 699, p. 773-784, illus., table, 1970.  
**Sullivan, L. B.** See *Brede, E. C.* 06737  
**Sullivan, Raymond.** See *McGrew, Paul O.* 10258  
**Sullivan, S.** See *Thorpe, A. N.* 06298
- 04902 **Summerhayes, C. P.; Hazelhoff-Roelfzema, B. H.; Tooms, J. S.; Smith, D. B.** Phosphorite prospecting using a submersible scintillation counter: *Econ. Geology*, v. 65, no. 6, p. 718-723, illus., table, 1970.  
**Summerhayes, C. P.** See *Tooms, J. S.* 10786
- Summers, A. L.** See *Fricker, P. E.* 01883
- 00217 **Summerson, C. H.; Swann, D. H.** Patterns of Devonian sand on the North American craton and their interpretation: *Geol. Soc. America Bull.*, v. 81, no. 2, p. 469-490, illus., 1970.  
**Summerson, C. H.** See *Lindsay, John F.* 01550
- 03884 **Summerson, Charles H.** Patterns of Devonian sand on the North American craton and their interpretation — Reply [to discussion of 1970 paper by L. F. Rooney and C. H. Ault, 1970]: *Geol. Soc. America Bull.*, v. 81, no. 8, p. 2521-2522, 1970.
- 02959 **Sumner, John S.** Geophysical aspects of porphyry copper deposits [with French abs.], in *Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26*, p. 322-335, illus., table, 1970.
- 09591 **Sumner, John S.** Mining geophysics, past, present and future [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 696-697, 1970.
- 03063 **Sumsion, C. T.; Bjorklund, L. J.; Bolke, E. L.; Mower, R. W.; Herbert, L. R.; Cordova, R. M.; Butler, R. G.; Sandberg, G. W.** Ground-water conditions in Utah, spring of 1970: *Utah Div. Water Resources Coop. Inv. Rept. 8*, 71 p., illus., tables, 1970.
- 08575 **Sumsion, Carlton T.** Geology and ground-water resources of Pitt County, North Carolina: *North Carolina Div. Ground Water Ground Water Bull.*, no. 18, 75 p., illus., tables, 1970.  
**Sun, Meng-Cherng.** See *Wang, Fun-Den.* 02439  
**Sun, S. S.** See *Hoyt, H. P., Jr.* 06287  
**Sunada, Daniel K.** See *Reddell, Donald Lee.* 07631  
**Sundara Raja Iyengar, K. T.** See *Narayana Iyengar, R.* 03203



**Sundeen, Dan.** See *West Texas Geological Society*. 05978

- 09592 **Sundeen, Daniel A.** Partial melting, a petrogenetic model for the Hillsboro plutonic series, southeastern New Hampshire [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 697, 1970.
- 10263 **Sundstrom, R. W.; Pickett, T. E.** The availability of ground water in western Sussex County, Delaware: Newark, Del., Univ. Delaware, Water Resources Center, 118 p., illus., tables, 1970.
- 10264 **Sundstrom, R. W.; Pickett, T. E.** The availability of ground water in eastern Sussex County, Delaware: Newark, Del., Univ. Delaware, Water Resources Center, 136 p., illus., tables, 1970.
- 10265 **Sundstrom, R. W.; Pickett, T. E.** The availability of ground water in Kent County, Delaware, with special reference to the Dover area: Newark, Del., Univ. Delaware Water Resources Center, 123 p., illus., tables, 1970.
- 10266 **Sundstrom, R. W.** (and others). The availability of ground water from the Potomac Formation in the Chesapeake and Delaware Canal area, Delaware: Newark, Del., Univ. Delaware, Water Resources Center, 95 p., illus., tables, 1970.
- 00375 **Suppe, John.** Times of high-pressure metamorphism in the Franciscan terrain of California and Baja California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 151, 1970.
- 05188 **Suppe, John.** Offset of late Mesozoic basement terrains by the San Andreas fault system: *Geol. Soc. America Bull.*, v. 81, no. 11, p. 3253-3257, illus., 1970.
- 10336 **Suppe, John.** Relationship between low-angle faulting and metamorphism in Franciscan tectonics. California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 756-757, illus., 1970.
- 01238 **Suppe, John Edward.** Franciscan geology of the Leech Lake Mountain-Anthony Peak region, northeastern Coast Ranges, California [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 8, p. 3713B, 1970.
- Surdam, R. C.** See *Turner, D. L.* 00383
- 00376 **Surdam, Ronald C.; Turner, Donald L.; Hall, Clarence.** Distribution and genesis of authigenic silicates in the Obispo Formation [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 151-152, 1970.
- Surdam, Ronald C.** See *Mariner, Robert H.* 05608
- 07238 **Surdam, Ronald C.** The petrology and chemistry of the Karmutsen Group volcanic rocks: Wyoming Univ. Contr. Geology, v. 9, no. 1, p. 9-12, illus., table, 1970.
- Surdam, Ronald C.** See *Mariner, Robert H.* 09660
- 02922 **Sutherland, Don B.** AFMAG for electromagnetic mapping [with French abs.], in *Mining and groundwater geophysics, 1967*: Canada Geol. Survey Econ. Geology Rept. 26, p. 228-237, illus., 1970.
- Sutter, J.** See *Burchfiel, B. C.* 00026
- 07950 **Sutter, John Frederick.** Application of the K/Ar method to the dating of cataclastically deformed rocks [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 6, p. 3487B-3488B, 1970.
- Sutton, A. L., Jr.** See *Antweiler, J. C.* 09755
- Sutton, G. H.** See *Latham, G. V.* 05758

- 02779 **Sutton, George H.; Odegard, Mark E.; Mark, Norman; Letourneau, Nelson J.** Research in seismology related to the Columbia ocean-bottom seismograph — AFCRL Contract F19628-68-C-0083, Final Rept.: Hawaii Inst. Geophysics [Rept.] HIG-70-12 (AFCRL-70-0125), 66 p., illus., 1969 [1970].
- Sutton, George H.** See *Southworth, John H.* 10558
- 05844 **Sutton, Graham.** (editor). Global geophysics: New York, American Elsevier Publishing Company, 199 p., illus., table, 1970.
- Sutton, R. L.** See *Shoemaker, E. M.* 06294
- 04950 **Sutton, Robert G.; Bowen, Zeddie P.; McAlester, A. Lee.** Marine shelf environments of the Upper Devonian Sonyea Group of New York: Geol. Soc. America Bull., v. 81, no. 10, p. 2975-2992, illus., tables, 1970.
- 01869 **Suzuoki, Tetsuro; Epstein, Samuel.** Hydrogen isotope fractionation factors (a's) between muscovite, biotite, hornblende and water [abs.]: EOS, v. 51, no. 4, p. 451-452, 1970.
- 05987 **Svensson, Harald.** Remote sensing — U.S. Air Force Cambridge Research Labs. Translation 79 (AFCRL-70-0277): Springfield, Va., Natl. Tech. Inf. Service, 16 p., illus., 1970; originally published in Swedish, 1969.
- Swafford, B. F.** See *Bedinger, M. S.* 05473
- 04095 **Swain, F. M.; Pakalns, G. V.; Bratt, J. G.** Possible taxonomic interpretation of some Palaeozoic and Precambrian carbohydrate residues, in *Advances in organic geochemistry — Internat. Cong., 3d, Proc.* (G. D. Hobson and G. C. Speers, editors): London and New York, Pergamon Press (Internat. Ser. Mons. Earth Sci., V. 32), p. 469-491, illus., tables, 1970.
- 07217 **Swain, Frederick M.** Non-marine organic geochemistry: Cambridge, England, University Press, 445 p., illus., tables, 1970.
- 00435 **Swain, Frederick W.; Bratt, Judy M.; Kirkwood, Samuel.** Carbohydrates from Precambrian and Cambrian rocks and fossils: Geol. Soc. America Bull., v. 81, no. 2, p. 499-504, 1970.
- 10859 **Swain, P. M.; Gunther, F. J.** Recent Ostracoda from San Juan del Sur, Nicaragua, and their relationship to other ostracode populations of Western Central America (with Spanish and English abs.)2, in *Trabajos tecnicos presentados en la segunda reunion de geologos de America Central*: Inst. Centroamericano Inv. y Tecnologia Indus. Pubs. Geol., no. 2, p. 54-55, table, 1969.
- Swanberg, Chandler A.** See *Menzer, Fred J., Jr.* 03403
- Swann, D. H.** See *Summerson, C. H.* 00217
- 03059 **Swann, D. H.; DuMontelle, P. B.; Mast, R. F.; VanDyke, L. H.** ILLIMAP, a computer-based mapping system for Illinois: Illinois Geol. Survey Circ. 451, 24 p., illus., table, 1970.
- Swann, G. A.** See *Shoemaker, E. M.* 06294
- Swanson, D. A.** See *Shaw, H. R.* 08545
- Swanson, D. A.** See *Shaw, H. R.* 08643
- Swanson, Donald A.** See *Jackson, Dallas B.* 01784
- 01840 **Swanson, Donald A.; Jackson, Dallas B.** 1968-70 Kilauea deformation — Summit [abs.]: EOS, v. 51, no. 4, p. 440-441, 1970.

- 10137 **Swanson, Earl H., Jr.** Sources for Plateau prehistory [discussion of "Columbia Plateau prehistory..." by D. L. Browman and D. A. Munsell, 1969]: *Am. Antiquity*, v. 35, no. 4, p. 495-496, 1970.
- Swanson, Frederick J.** See *Boggs, Sam, Jr.* 09809
- Swanson, Mary.** See *Emiliani, Cesare.* 00813
- 01436 **Swanson, Roger W.** Mineral resources in Permian rocks of southwest Montana: U.S. Geol. Survey Prof. Paper 313-E, p. 661-777, illus., tables, 1970.
- 06696 **Swanson, Roger W.** Geologic map of the Melber quadrangle, Graves and McCracken Counties, Kentucky: U.S. Geol. Survey Geol. Quad. Map GQ-860, scale 1:24,000, section, text, 1970.
- 10591 **Swanson, Samuel E.** Potash enrichment in andesites [abs.]: *EOS*, v. 51, no. 11, p. 828, 1970.
- 06591 **Swanson, Stephen Robert.** Development of constitutive equations for rocks [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 2, p. 711B, 1970.
- 03667 **Swanson, Vernon E.** Reconnaissance for dam sites in remote areas: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7244, *Jour. Surveying and Mapping Div.*, no. SU1, p. 97-111, illus., 1970.
- Swanson, Vernon E.** See *Ong, H. Ling.* 04256
- Swanston, D. N.** See *Barr, D. J.* 07234
- 10879 **Swanston, Douglas N.** Mechanics of debris avalanching in shallow till soils of southeast Alaska: Juneau, Alaska, U.S. Dept. Agriculture Forest Service Research Paper, Pnw-103, 17 p., illus., 1970.
- 10880 **Swanston, Douglas N.** Mass wasting in coastal Alaska: U.S. Dept. Agriculture Forest Service Research Paper, Pnw-83, 15 p., illus., 1969.
- 09903 **Swartz, Frank M.; Rones, M.; Donaldson, A. C.; Hea, J. P.** Stratigraphy of Ordovician limestones and dolomites of Nittany Valley from Bellefonte to Pleasant Gap, Pennsylvania, Field Trip No. 1 itinerary, *from* Guidebook, 21st Ann. Field Conf. Pennsylvania Geologists, University Park, Pa., 1955; reissued with appendix, 1966.
- 09904 **Swartz, Frank M.** Stratigraphy and structure in the Ridge and Valley area from University Park to Tyrone, Mount Union and Lewistown, Field Trip No. 2 itinerary, *from* Guidebook, 21st Ann. Field Conf. Pennsylvania Geologists, University Park, Pa., 1955; reissued with appendices, 1966.
- 00027 **Swe, Win; Dickinson, William R.** Sedimentation and thrusting of late Mesozoic rocks in the Coast Ranges near Clear Lake, California: *Geol. Soc. America Bull.*, v. 81, no. 1, p. 165-187, illus., tables, geol. map, 1970.
- Swe, Win.** See *Randazzo, Anthony F.* 05630
- 01881 **Sweeney, John W.; Hasslacher, Robert N.** The phosphate industry in the southeastern United States and its relationship to world mineral fertilizer demand: U.S. Bur. Mines Inf. Circ. 8459, 76 p., illus., tables, 1970.
- Sweeney, M.** See *Holbert, D. R.* 10343
- 04106 **Sweet, John M.** Petroleum exploration in the north [abs.], *in* Alaska Sci. Conf., 20th, College, 1969, *Proc.: Sci. Alaska* 1969, p. 48, 1970.
- Sweet, Palmer C.** See *Johnson, Stanley S.* 02781

- 00764 **Sweet, Walter C.; Bergström, Stig M.** Stratigraphic significance of conodonts from the Lexington Limestone and Kope Formation in the Cincinnati region [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 242-243, 1970.
- Sweet, Walter C.** See *Bergstrom, Stig M.* 01054
- 08509 **Sweet, Walter C.; Bergström, Stig M.** The generic concept in conodont taxonomy, in *The genus, a basic concept in paleontology* — North Am. Paleont. Convention, Chicago, Ill., 1969, *Proc.*, Pt. C: Lawrence, Kans., Allen Press, p. 157-173, illus., 1970.
- 09593 **Sweet, Walter C.; Bergström, Stig.** A revised time-stratigraphic classification of the North American Upper Middle and Upper Ordovician [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 698, 1970.
- 01488 **Swenson, Frank A.** Meandering of the Arkansas River since 1833 near Bent's Old Fort, Colorado, in *Geological Survey research 1970*, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B210-B213, illus., 1970.
- 10104 **Swett, K.** Cambro-Ordovician depositional environments in central East Greenland [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, *Abs. Papers*: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2507, 1970.
- 10472 **Swift, Camm; Wing, Elizabeth.** Fossil bony fishes from Florida: Plaster Jacket, no. 7, 11 p., illus., 1968.
- 10337 **Swift, D. J. P.; Shideler, G. L.; Avignone, N. F.; Holliday, B. W.** Holocene transgressive sand sheet of the Middle Atlantic Bight, a model for generation by shore face erosion [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 757-759, illus., 1970.
- 01366 **Swift, Donald J. P.** Quaternary shelves and the return to grade: *Marine Geology*, v. 8, no. 1, p. 5-30, illus., 1970.
- 03292 **Swift, Donald J. P.; Pirie, R. Gordon.** Fine-sediment dispersal in the Gulf of San Miguel, western Gulf of Panama, a reconnaissance: *Jour. Marine Research*, v. 28, no. 1, p. 69-95, illus., tables, 1970.
- 03745 **Swift, Donald J. P.; Pelletier, Bernard R.; Lyall, Anil K.; Miller, James A.** Sediments of the Bay of Fundy, a preliminary report: *Maritime Sediments*, v. 5, no. 3, p. 95-100, illus., 1969 [1970].
- 04724 **Swift, Donald J. P.; Shideler, Gerald L.; Avignone, Nicholas F.; Holliday, Barry W.; Dill, Charles E., Jr.** Quaternary sedimentation on the inner Atlantic shelf between Cape Henry and Cape Hatteras — A preliminary report: *Maritime Sediments*, v. 6, no. 1, p. 5-11, illus., 1970.
- Swift, Robert N.** See *Oostdam, B. L.* 00172
- 00765 **Swinchatt, Jonathan P.** Mississippian carbonate facies in northeastern Kentucky — Tidal flat-island complexes on a terrigenous-carbonate shelf [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 243, 1970.
- 02689 **Swinchatt, Jonathan P.** Sedimentary and faunal associations of protected carbonate shelves and platforms [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 872, 1970.
- Swindale, L. D.** See *El-Swaify, S. A.* 02547
- Swindale, L. D.** See *Hussain, M. S.* 05124
- Swindale, L. D.** See *El-Swaify, S. A.* 11021

- 00184 **Swinehart, James B.; Williams, Eugene G.** Influence of paleotopography on the continental and marine cycles of the lowest Conemaugh and Allegheny, western Pennsylvania [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 38-39, 1970.
- Swinnerton, John W.** See *Lamontagne, Robert A.* 09631
- 07805 **Swinton, W. E.** The dinosaurs: London, George Allen and Unwin Ltd., 331 p., illus., tables, 1970.
- 10242 **Swinzow, George K.** Permafrost tunneling by a continuous mechanical method: U.S. Army Corps Engineers Cold Regions Research and Eng. Lab. Tech. Rept. 221, 37 p., illus., tables, 1970.
- 10984 **Swirsky, Lillian.** (compiler). List of translations in the library of the Geological Survey of Canada, No. 1: Canada Geol. Survey Paper 70-62, 25 p., 1970.
- 00563 **Switzer, George; Melson, William G.; Thompson Geoffrey.** Garnet from the Mid-Atlantic Ridge near 43° N. latitude: *Geol. Soc. America Bull.*, v. 81, no. 3, p. 895-897, table, 1970.
- 08611 **Switzer, Paul.** Numerical classification, in *Geostatistics — A colloquium* (D. F. Merriam, editor), Lawrence, Kan., 1970, Proc.: New York, Plenum Press, p. 31-43, illus., 1970.
- Swoboda, A. R.** See *Thomas, G. W.* 05475
- Swolfs, Hans.** See *Stearns, David W.* 09588
- 09594 **Swolfs, Hans; Logan, John M.** Experimental evidence of the role of pore fluid chemistry on the mechanism of fracture of sandstones [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 699, 1970.
- Swolfs, Hans S.** See *Tieh, Thomas T.* 05376
- 01986 **Syed, Atiq A.; Nuttli, Otto W.** Effects of earthquake source mechanism on P wave amplitude [abs.]: *EOS*, v. 51, no. 4, p. 358, 1970.
- Syers, J. K.** See *Mokma, D. L.* 02545
- Syers, J. K.** See *Sommers, L. E.* 04061
- Syers, J. K.** See *Dolcater, D. L.* 04674
- Syers, J. K.** See *Jacobs, L. W.* 07431
- Syers, J. K.** See *Henderson, J. H.* 07853
- Syers, J. K.** See *Sridhar, K.* 09585
- Syers, J. K.** See *May, H. M.* 09663
- Sykes, C. Ronald.** See *Statler, Anthony T.* 07654
- 08017 **Sykes, C. Ronald.** Mineral resources summary of the Buena Vista quadrangle, Tennessee: Nashville, Tenn., Tennessee Div. Geology, 6 p., tables, 1970.
- Sykes, Lynn R.** See *Molnar, Peter.* 01288
- Sykes, Lynn R.** See *Savino, John.* 01633
- Sykes, Lynn R.** See *Murphy, Andrew J.* 01956
- Sykes, Lynn R.** See *Murphy, Andrew J.* 03829

- 04689 **Sykes, Lynn R.** Focal mechanism solutions for earthquakes along the world rift system: *Seismol. Soc. America Bull.*, v. 60, no. 5, p. 1749-1752, illus., table, 1970.
- 04729 **Sykes, Lynn R.** Earthquake swarms and sea-floor spreading: *Jour. Geophys. Research*, v. 75, no. 32, p. 6598-6611, illus., 1970.
- 09432 **Sykes, Lynn R.; Kay, Robert; Anderson, Orson L.** Mechanical properties and processes in the mantle: *EOS*, V. 51, no. 12, p. 874-878, illus., 1970.
- 09595 **Sykes, Lynn R.** Earthquake swarms and sea-floor spreading [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 700, 1970.
- 09993 **Sykes, Lynn R.; Oliver, Jack; Isacks, Bryan.** Earthquakes and tectonics, *in* *The sea — v. 4, New concepts of sea floor evolution*, Pt. 1, General observations (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 353-420, illus., 1970.
- 03992 **Sylvester, A. G.** Fluid pressure variations and prediction of shallow earthquakes: *Science*, v. 169, no. 3951, p. 1231-1232, 1970.
- 04332 **Sylvester, Arthur G.; Smith, Stewart W.; Scholz, C. H.** Earthquake swarm in the Santa Barbara Channel, California, 1968: *Seismol. Soc. America Bull.*, v. 60, no. 4, p. 1047-1060, illus., tables, 1970.
- Symons, D. T. A.** See *Schwarz, E. J.* 04621
- 07672 **Symons, D. T. A.** Paleomagnetism of the Nipissing diabase, Cobalt area, Ontario: *Canadian Jour. Earth Sci.*, v. 7, no. 1, p. 86-90, illus., table, 1970.
- 07676 **Symons, D. T. A.; Schwarz, E. J.** Paleointensity study of late Miocene igneous rocks from British Columbia, Canada: *Canadian Jour. Earth Sci.*, v. 7, no. 1, p. 176-181, illus., tables, 1970.
- Syono, Y.** See *Nagata, T.* 06352
- Syrstad, Oddveig.** See *Nydal, Reider.* 01326
- 01470 **Szabo, B. J.; Dooley, J. R., Jr.; Taylor, R. B.; Rosholt, J. N.** Distribution of uranium in uranium-series dated fossil shells and bones shown by fission tracks, *in* *Geological Survey research 1970*, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B90-B92, illus., table, 1970.
- 09140 **Szabo, Barna A.** Stress concentrations around pores in saturated rocks of low permeability [with French and German summ.], *in* *Internat. Soc. rock Mechanics Cong.*, 2d, Belgrade, Yugoslavia, 1970, Proc., V. 1: Belgrade, Jaroslav Černi Inst. Devel. Water Resources, p. 467-472, illus., table, 1970.
- Szabo, F.** See *Hemphill, C. R.* 07756
- Szabo, Michael W.** See *Clarke, Otis M., Jr.* 08678
- Szekely, Julian.** See *Reitan, Paul H.* 01820
- 00185 **Szucs, F. K.** Pre-Pleistocene drainages of Slippery Rock and Muddy Creeks determined by subsurface exploration [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 39, 1970.
- 01106 **Szucs, F. K.** The hierarchical anomaly of the Au Sable and Saginaw drainage basins, Michigan [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 406-407, 1970.
- 05119 **Szuwalski, Andre.** Littoral Environment Observation Program in California — Prelim. Rept., February-December 1968: U.S. Army Corps Engineers Coastal Eng. Research Center Misc. Paper 2-70, [242] p., illus., tables, 1970.

- 09083 **Szymansky, Leon P.** Devil's Postpile National Monument: Natl. Parks and Conserv. Mag., v. 44, no. 276, p. 4-7, illus., 1970.
- 03932 **Tabatabai, M. A.; Bremner, J. M.** Use of the Leco automatic 70-second carbon analyzer for total carbon analysis of soils: Soil Sci. Soc. America Proc., v. 34, no. 4, p. 608-610, illus., tables, 1970.
- 08487 **Tabor, Guy F., Jr.** Problem soils in Colorado, a summary, in Governor's Conf. on Environmental Geology: Colorado Geol. Survey Spec. Pub., no. 1, p. 53-54 [1970?]
- 00377 **Tabor, R. W.; Cady, W. M.; Yeats, Robert S.** Broken formations and thrust faulting in the northeastern Olympic Mountains, Washington [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 152, 1970.
- Tabuchi, Hiroyoshi.** See *Honjo, Susumu*. 06371
- 01274 **Tackett, Stanford L.; Tucker, Ray A.; Duncan, Floyd R.** Electrolytic corrosion of iron meteorites: Meteoritics, v. 5, no. 1, p. 43-55, illus., tables, 1970.
- 02960 **Tackett, Stanford L.; Ong, Patricia T.** Polarographic determination of cobalt and nickel in iron meteorites: Anal. Letters, v. 3, no. 4, p. 169-175, illus., tables, 1970.
- Taft, W. H.** See *McLester, M. E.* 00787
- Taft, W. H.** See *Allen, R. J.* 04421
- 01654 **Taggart, Ralph E.** A preliminary report on the pollen and spore flora of Miocene lignites and lignitic shales from the Sucker Creek area of eastern Oregon [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 407, 1970.
- 07075 **Tailleur, I. L.; Brosgé, W. P.** Tectonic history of northern Alaska, in Geological seminar on the North Slope of Alaska, Palo Alto, Calif., 1970, Proc.: Los Angeles, Calif., Am. Assoc. Petroleum Geologists Pacific Sec., p. E1-E20, illus., discussion, 1970.
- Tailleur, I. L.** See *Brosgé, W. P.* 07104
- 10105 **Tailleur, I. L.** Probable rift origin of Canada Basin, Arctic Ocean [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2508, 1970.
- 10106 **Tailleur, I. L.** Structure and stratigraphy of western Arctic Alaska [abs.], in Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2508, 1970.
- Tailleur, Irvin L.** See *Brosgé, William P.* 02592
- Tailleur, Irvin L.** See *Forbes, Robert B.* 10040
- Takagi, Robert S.** See *Berry, William B. N.* 00549
- 06784 **Takagi, Shunsuke.** Comparison of plane strain and triaxial tests on sand — Discussion [of paper 7276 by Kenneth L. Lee, 1970]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Soil Mechanics and Found. Div., no. SM 6, p. 2163-2167, illus., 1970.
- Takahashi, T.** See *Liu, L. G.* 01949
- Takahashi, T.** See *Mao, H. K.* 02254
- Takahashi, T.** See *Mao, H. K.* 02255
- Takahashi, Taro.** See *Ahrens, Thomas J.* 00006
- Takahashi, Taro.** See *Hammond, Douglas E.* 02012

**Takahashi, Taro.** See *Mao, H. K.* 02812

- 04277 **Takahashi, Taro; Liu, Lin-gun.** Compression of ferromagnesian garnets and the effect of solid solutions on the bulk modulus: *Jour. Geophys. Research*, v. 75, no. 29, p. 5757-5766, illus., tables, 1970.
- 06400 **Takahashi, Taro.** (and others). A carbonate chemistry profile at the 1969 Geosecs intercalibration station in the eastern Pacific Ocean: *Jour. Geophys. Research*, v. 75, no. 36, p. 7648-7666, illus., tables, 1970.
- Takahashi, Taro.** See *Bassett, William A.* 10587
- 10688 **Takahashi, Taro.** Isothermal compression of fayalite at room temperature [abs.]: *EOS*, v. 51, no. 11, p. 827, 1970.
- 05637 **Takasaki, K. J.; Yamanaga, George.** Preliminary report on the water resources of northeast Maui: *Hawaii Div. Water and Land Devel. Circ. C60*, 41 p., illus., tables, 1970.
- 09116 **Takeno, Setsuo; Zoka, Hisanori; Niihara, Toshihiro.** Metastable cubic iron sulfide — with special reference to mackinawite: *Am. Mineralogist*, v. 55, nos. 9-10, p. 1639-1649, illus., tables, 1970.
- 09596 **Takeno, Setsuo; Zoka, Hisanori; Clark, Alan H.** Stability range of natural mackinawite [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 700, 1970.
- 00658 **Takeuchi, H.; Sakata, S.** Convection in a mantle with variable viscosity: *Jour. Geophys. Research*, v. 75, no. 5, p. 921-927, illus., 1970.
- 08285 **Takeuchi, H.; Uyeda, S.; Kanamori, H.** Debate about the Earth — Approach to geophysics through analysis of continental drift (revised edition): San Francisco, California, Freeman, Cooper and Company, 281 p., illus., tables, 1970; originally published 1967.
- 06703 **Talwani, Manik.** A system for the reduction, display, and storage of marine geophysical data, in *Marine geodesy, a practical view — Symposium on Marine Geodesy*, 2d, 1969: Washington, D. C., Marine Technology Soc., p. 169-187, illus., table, 1970.
- 07856 **Talwani, Manik.** Developments in navigation and measurement of gravity at sea: *Geoexploration*, v. 8, nos. 3-4, p. 151-183, illus., table, 1970.
- 09991 **Talwani, Manik.** Gravity, in *The sea — v. 4, New concepts of sea floor evolution*, Pt. 1, General observations (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 251-297, illus., table, 1970.
- 10571 **Talwani, Pradeep; Kovach, Robert L.** Dislocation models and piezomagnetic calculations for fault creep [abs.]: *EOS*, v. 51, no. 11, p. 823, 1970.
- 03185 **Tamers, M. A.** Instituto Venezolano de Investigaciones Cientificas natural radiocarbon measurements V: *Radiocarbon*, v. 12, no. 2, p. 509-525, table, 1970.
- 05673 **Tamers, M. A.** Validity of radiocarbon dates on terrestrial snail shells: *Am. Antiquity*, v. 35, no. 1, p. 94-100, illus., tables, 1970.
- Tamplin, M. J.** See *Bannatyne, B. B.* 09628
- Tamrazyan, G. P.** See *Ovnatanov, S. T.* 06139
- 07443 **Tamuly, A. L.; Phukan, K. Y. Lo; LaRochelle, P.** Stresses and deformations of vertical slopes in elasto-plastic rocks, Chap. 11 in *Rock mechanics, theory and practice — 11th Symposium on Rock Mechanics*, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 193-212, illus., 1970.



**Tamura, Tsuneo.** See *Francis, C. W.* 02553

- 03953 **Tan, K. H.; McCreery, R. A.** Possibility of the silylation technique in gas liquid chromatography of fulvic and humic acids: *Geoderma*, v. 4, no. 2, p. 119-126, illus., 1970.
- 09172 **Tan, Li-Ping.** Possibility of a garnet geothermometer: *Geol. Soc. China Proc.* 1968, no. 12, p. 129-133, illus., table, 1969.
- 01597 **Taner, M. T.** Limitations of reflection-seismic method — Lessons from computer simulations [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 3, p. 557-558, 1970.
- Tanguary, Marc G.** See *Smedes, Harry W.* 07772
- 01568 **Tanguay, Marc Gilles.** Aerial photography and multispectral remote sensing for engineering soils mapping [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 9, p. 4125B-4126B, 1970.
- 07878 **Tank, R. W.; McNeely, L.** Clay minerals associated with the Precambrian Gowganda Formation of Ontario: *Clay Minerals*, v. 8, no. 4, p. 471-477, illus., table, 1970.
- 02830 **Tank, Ronald W.** Ventifacts associated with the Cambrian-Precambrian unconformity at Nekoosa, Wisconsin: *Wisconsin Acad. Sci., Arts and Letters Trans.* 1970, v. 58, p. 147-151, illus., 1970.
- 04496 **Tanner, Hans.** (editor). *The complete guide to rocks, gems and minerals*: Los Angeles, Calif., Peterson Publishing Co., 88 p., illus., 1970.
- 10774 **Tanner, J. G.; Gibb, R. A.** Gravity, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor): *Canada Geol. Survey Paper* 69-56, p. 218-230, 1970.
- 07379 **Tanner, James Thomas.** The determination of antimony in natural materials by neutron activation [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 4, p. 1770B, 1970.
- 02538 **Tanner, Lloyd G.** Notes on the genera *Aphelops* and *Peraceras* with a suggested tribal classification [abs.]: *Nebraska Acad. Sci. Proc.*, 80th Ann. Mtg., p. 38, 1970.
- Tanner, Lloyd G.** See *Schultz, C. Bertrand.* 09405
- Tanner, W. F.** See *Osmond, J. K.* 00089
- Tanner, W. F.** See *Niedoroda, A. W.* 03704
- 06370 **Tanner, William F.** Pacific basin motion: *Pacific Geology*, v. 2, p. 1-10, 1970.
- 08193 **Tanner, William F.** Triassic-Jurassic lakes in New Mexico: *Mtn. Geologist*, v. 7, no. 4, p. 281-289, illus., 1970.
- Tappan, Helen.** See *Loeblich, Alfred R., Jr.* 02144
- 05600 **Tappan, Helen.** Phytoplankton abundance and late Paleozoic extinctions — A reply [to discussion of "Primary production, isotopes, extinctions and the atmosphere," 1968, by C. W. Pitrat, 1970]: *Palaeogeography, Palaeoclimatology, Palaeoecology*, v. 8, no. 1, p. 56-66, table, 1970.
- Tappan, Helen.** See *Loeblich, Alfred R., Jr.* 07045
- 10870 **Tappan, Helen; Loeblich, Alfred R., Jr.** Geobiologic implications of fossil phytoplankton evolution and time-space distribution, in *Symposium on palynology of the Late Cretaceous and early Tertiary*, San Francisco, Calif., 1966: *Geol. Soc. America Spec. Paper* 127, p. 247-340, illus., tables, 1970.

- 10133 **Tappen, N. C.; Peske, G. Richard.** Weathering cracks and split-line patterns in archaeological bone: *Am. Antiquity*, v. 35, no. 3, p. 383-386, illus., table, 1970.
- Tappen, N. C.** See *Peske, G. Richard.* 10134
- 06903 **Tarkoy, Peter J.** Upper Cambrian Maynardville Formation within the Clinchport fault belt of East Tennessee: *Illinois Acad. Sci. Trans.*, v. 63, no. 3, p. 305-318, illus., 1970.
- Tarnocai, C.** See *Barakso, J. J.* 04295
- Tarr, A. C.** See *Engdahl, E. R.* 06970
- 04688 **Tarr, Arthur C.** New maps of polar seismicity: *Seismol. Soc. America Bull.*, v. 60, no. 5, p. 1745-1747, illus., 1970.
- 10852 **Tarr, Russell S.; Jordan, Louise; Rowland, T. L.** Geologic map and section of pre-Woodfordian rocks in Oklahoma, showing surface and subsurface distribution: *Oklahoma Geol. Survey Map Gm-9*, scale 1:750,000, 1965.
- Tarver, Gilbert W.** See *Alexander, Stephen H.* 09004
- 04571 **Tasch, Paul.** Biochemical and geochemical aspects of the White Salt Pan, Bonaire, Netherlands Antilles, in *Third symposium on salt*, V. 1 (J. L. Rau and L. F. Dellwig, editors): *Cleveland, Ohio, Northern Ohio Geol. Soc.*, p. 204-210, illus., 1970.
- 04740 **Tate, Donald M.** The drainage evolution of the Kawartha Lakes district, Ontario [abs.]: *Ontario Geography*, no. 5, p. 88-89, 1970.
- 00378 **Tatsch, J. H.** Global seismicity patterns as interpreted in accordance with a dual primeval planet hypothesis [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 153, 1970.
- 05723 **Tatsumoto, Mitsunobu.** Age of the Moon — An isotopic study of U-Th-Pb systematics of Apollo 11 lunar samples, [Pt.] 2, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1595-1612, illus., tables, 1970.
- Tatsumoto, Mitsunobu.** See *Rosholt, John N.* 05761
- 06851 **Tatsumoto, Mitsunobu.** U-Th-Pb age of Apollo 12 rock 12013: *Earth and Planetary Sci. Letters*, v. 9, no. 2, p. 193-200, illus., tables, 1970.
- 08533 **Taubeneck, William H.** Dikes of Columbia River Basalt in northeastern Oregon, western Idaho, and southeastern Washington, in *Columbia River Basalt Symposium*, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 73-96, illus., tables, 1970.
- 09412 **Tauber, Henrik.** Glacier O-18 content and paleoclimate [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 130-131, 1970.
- 03756 **Tavenas, F.; Capelle, J. F.; LaRochelle, P.** Étude des sablés submergés par échantillonnage non remanie [Study of submerged sand by undisturbed sampling (with English abs.)]: *Canadian Geotech. Jour.*, v. 7, no. 1, p. 37-53, illus., tables, 1970.
- 07139 **Taylor, Charles L.** Geometric analysis of geological separation for slope stability investigations: *Assoc. Eng. Geologists Bull.*, v. 7, nos. 1-2, p. 67-85, illus., 1970.
- 07187 **Taylor, Dwight W.** West American freshwater Mollusca — [Pt.] 1, Bibliography of Pleistocene and Recent species: *San Diego Soc. Nat. History Mem.* 4, 73 p., 1970.

- 09348 **Taylor, Edward C.; McKillop, Alexander.** Thallium in organic synthesis: Accounts Chem. Research, v. 3, no. 10, p. 338-346, illus., 1970.
- 04359 **Taylor, Edward M.** The Three Sisters area [summ.]: Geol. Soc. Oregon Country News Letter, v. 36, no. 3, p. 16-17, 1970.
- 05313 **Taylor, F. C.** Reconnaissance geology of a part of the Precambrian Shield, northeastern Quebec and northern Labrador, Pt. 2: Canada Geol. Survey Paper 70-24, 10 p., geol. map, 1970.
- Taylor, F. C.** See *Bridgwater, D.* 10017
- 07207 **Taylor, G. C.; MacKenzie, W. S.** Devonian stratigraphy of northeastern British Columbia [with French abs.]: Canada Geol. Survey Bull. 186, 62 p., illus., tables, 1970.
- 07897 **Taylor, G. C.; Bamber, E. W.** Paleozoic stratigraphy of Pine Pass, northeastern British Columbia, in Peace River, Pine Pass, Yellowhead 1970 — Edmonton Geol. Soc. Field Conf., 12th, Guidebook: Edmonton, Alberta, Edmonton Geological Society, p. 46-57, illus., table, 1970.
- 03640 **Taylor, G. J.; Heymann, D.** Electron microprobe study of metal particles in the Kingfisher meteorite: Geochim. et Cosmochim. Acta, v. 34, no. 6, p. 677-687, illus., 1970.
- 07951 **Taylor, G. Jeffrey.** Electron microprobe study of the metallic minerals in ordinary chondrites [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3591B, 1970.
- Taylor, George S.** See *Saxena, G. S.* 07223
- Taylor, Gordon C.** See *Norris, D. K.* 03477
- Taylor, H. C.** See *Menzer, Fred J., Jr.* 03403
- 01841 **Taylor, Hugh P.** Oxygen isotope evidence for large-scale interaction between meteoric ground waters and Tertiary diorite intrusions, western Cascade Range, Oregon [abs.]: EOS, v. 51, no. 4, p. 453, 1970.
- 05724 **Taylor, Hugh P., Jr.; Epstein, Samuel.** O-18:O-16 ratios of Apollo 11 lunar rocks and minerals, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1613-1626, illus., tables, 1970.
- 06853 **Taylor, Hugh P., Jr.; Epstein, Samuel.** Oxygen and silicon isotope ratios of lunar rock 12013: Earth and Planetary Sci. Letters, v. 9, no. 2, p. 208-210, illus., table, 1970.
- Taylor, Hugh P., Jr.** See *Lawrence, James R.* 09639
- Taylor, Hugh P., Jr.** See *Lawrence, James R.* 09662
- Taylor, Hugh P., Jr.** See *Wenner, David B.* 10299
- 02258 **Taylor, L. A.; Kullerud, G.** The system Cu-S-O: Carnegie Inst. Washington Year Book 68, 1968-69, p. 273-276, illus., 1970.
- 02259 **Taylor, L. A.** Low-temperature phase relations in the Fe-S system: Carnegie Inst. Washington Year Book 68, 1968-69, p. 259-270, illus., tables, 1970.

- 03723 **Taylor, L. A.** The system Ag-Fe-S, phase equilibria and mineral assemblages [with German abs.]: *Mineralium Deposita*, v. 5, no. 1, p. 41-58, illus., tables, 1970.
- 01842 **Taylor, Lawrence A.; Kullerud, Gunnar.** Mineral assemblages in the Cu-Fe-S-O system [abs.]: *EOS*, v. 51, no. 4, p. 452, 1970.
- Taylor, Lawrence A.** See *Finger, Larry W.* 06976
- 09117 **Taylor, Lawrence A.** Smythite,  $\text{Fe}_{3+x}\text{S}_4$ , and associated minerals from the Silverfields Mine, Cobalt, Ontario: *Am. Mineralogist*, v. 55, nos. 9-10, p. 1650-1658, illus., table, 1970.
- Taylor, Michael E.** See *Yochelson, E. L.* 01501
- 04303 **Taylor, O. James.** Optimization of conjunctive use of water in a stream-aquifer system, using linear programming, in *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C218-C221, illus., tables, 1970.
- 10509 **Taylor, O. James; Luckey, Richard R.** Determination of percent recharge by digital modeling [abs.]: *EOS*, v. 51, no. 11, p. 755, 1970.
- 01987 **Taylor, P. T.; Wall, R. E.** Sediment structure associated with the GILLISS Seamount, New England Seamount chain [abs.]: *EOS*, v. 51, no. 4, p. 334, 1970.
- 01988 **Taylor, P. T.; O'Neill, N. J.; Brennan, J. A.** Aeromagnetic data west of Baja California and across the lower California rift system [abs.]: *EOS*, v. 51, no. 4, p. 275, 1970.
- Taylor, R. B.** See *Szabo, B. J.* 01470
- Taylor, R. E.** See *Bucha, V.* 00952
- Taylor, R. E.** See *Hare, P. Edgar.* 10173
- 05356 **Taylor, R. K.** (compiler). Penetration charts — Laramie basin, eastern Colorado and southern Wyoming along the Front Range, and North Park basin, in *Dakota and related rocks of the Front Range — Guidebook issue: Mtn. Geologist*, v. 7, no. 3, p. 150-155, illus., 1970.
- Taylor, R. M.** See *Blackburn, G.* 07513
- Taylor, Robert L.** See *Goodman, Richard E.* 00053
- Taylor, Ronald S.** See *Davis, Darrell E.* 07335
- 05725 **Taylor, S. R.; Johnson, P. H.; Martin, R.; Bennett, D.; Allen, J.; Nance, W.** Preliminary chemical analyses of Apollo 11 lunar samples, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1627-1635, illus., tables, 1970.
- Taylor, T. N.** See *Brack, S. D.* 04167
- Taylor, T. N.** See *Rothwell, G. W.* 04170
- 04174 **Taylor, T. N.** Studies of pteridosperm fructifications [abs.]: *Am. Jour. Botany*, v. 57, no. 6, pt. 2, p. 757, 1970.
- 01874 **Taylor, Thomas N.** The morphology of *Bowmanites dawsoni* spores: *Micropaleontology*, v. 16, no. 2, p. 243-248, illus., 1970.
- Taylor, Thomas N.** See *Good, Charles W.* 02022
- 04217 **Taylor, Thomas N.** *Lasiostrobus* gen.n., a staminate strobilus of gymnospermous affinity from the Pennsylvanian of North America: *Am. Jour. Botany*, v. 57, no. 6, pt. 1, p. 670-690, illus., 1970.

**Taylor, Thomas N.** See *Millay, Michael A.* 05568

**Taylor, W. A.** See *Davis, C. E.* 07869

**Taylor, W. A.** See *Davis, C. E.* 09339

**Taylor, W. A.** See *Davis, C. E.* 09341

**Taylor, W. A.** See *Holdridge, D. A.* 10354

**Taylor, W. A.** See *Holdridge, D. A.* 10355

02410 **Tchalenko, J. S.** Similarities between shear zones of different magnitudes: *Geol. Soc. America Bull.*, v. 81, no. 6, p. 1625-1639, illus., tables, 1970.

02425 **Teague, Kefton H.** Evaluation of feldspar deposits [abs.]: *Mining Eng.*, v. 22, no. 1, p. 40-41, 1970.

04307 **Teasdale, W. E.; Johnson, A. I.** Evaluation of installation methods for neutron-meter access tubes, in *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C237-C241, illus., 1970.

02756 **Techter, David.** Stereogram book of rocks, minerals and gems: Northbrook, Ill., Hubbard Press, 64 p., illus., 1970.

04989 **Tedrow, J. C. F.** Soil investigations in Inglefield Land, Greenland: *Medd. Grønland*, v. 188, no. 3, 93 p., illus., tables, 1970.

05924 **Tedrow, J. C. F.** Soils of the subarctic regions [with French abs.], in *Ecology of the subarctic regions (Ecologie des régions subarctiques)* — Helsinki, Symposium, Proc.: Paris, UNESCO, p. 189-205, illus., tables, discussion, 1970.

01107 **Teeter, James W.** Paleoecology of a Pleistocene microfossil assemblage at the Fairlawn, Ohio mastodon site [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 407, 1970.

04395 **Teeter, James W.** Paleoecology of a Pleistocene microfossil assemblage at the Fairlawn, Ohio, mastodon site: *Am. Midland Naturalist*, v. 83, no. 2, p. 583-594, illus., tables, 1970.

**Teeter, Richard M.** See *Seifert, Wolfgang.* 09450

**Teeter, Steven.** See *Hunkins, Kenneth.* 05623

07496 **Teichert, C.** Barrande cephalopod type species: *Cas. Mineralogii a Geologii*, v. 15, no. 1, p. 44-52, illus., tables, 1970.

**Teichert, C.** See *Clarke, E. de C.* 09186

05626 **Teichert, Curt.** Runzelmarken (wrinkle marks): *Jour. Sed. Petrology*, v. 40, no. 3, p. 1056-1057, 1970.

06137 **Teichert, Curt.** Oolite, oolith, ooid — Discussion [of "Reynolds oolite of southern Arkansas," by R. H. Akin, Jr., and R. W. Graves, Jr., 1969]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 9, p. 1748-1749, 1970.

**Tek, M. Rasin.** See *Katz, Donald L.* 05064

09597 **Teller, James T.** Nebraskan glaciation and associated drainage changes in southeastern Indiana and southwestern Ohio [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 702, 1970.

08411 **Tempelman-Kluit, D. J.** Stratigraphy and structure of the "Keno Hill Quartzite" in Tombstone River — Upper Klondike River map-areas, Yukon Territory (116 B/7, B/8): *Canada Geol. Survey Bull.* 180, 102 p., illus., tables, geol. map, 1970.

- 08149 **Tempelman-Kluit, Dirk J.** The relationship between sulfide grain size and metamorphic grade of host rocks in some strata-bound pyritic ores: Canadian Jour. Earth Sci., v. 7, no. 5, p. 1339-1345, illus., tables, 1970.
- 05075 **Templeman-Kluit, D. J.** Sulphur isotopic investigations of the lead-zinc-silver-cadmium deposits of the Keno Hill-Galena Hill area, Yukon, Canada [discussion of paper by R. W. Boyle; R. K. Wanless; R. D. Stevens, 1970]: Econ. Geology, v. 65, no. 6, p. 731, 1970.
- Ten Brink, N. W.** See *Weidick, A.* 06247
- 09598 **Tendall, Dorris M.** Seismic amplitude variations from Nts [abs.]: Geol. Soc. Amer. Spec. Pub., no. 1, p. 29-32 [1970?].
- 08484 **TenEyck, Thomas W.** Natural resources — Their protection, utilization and conservation, in Governor's Conf. on Environmental Geology: Colorado Geol. Survey Spec. Pub., no. 1, p. 29-32 [1970?].
- 10440 **Tenore, Kenneth R.** The macrobenthos of the Pamlico River estuary, North Carolina: north Carolina Univ. Water Resources Research Inst. Rept., no. 40, 113 p., illus., tables, 1970.
- 10617 **Tenorio, Pedro A.; Young, Reginald H. F.; Whitehead, H. Collins.** Identification of return irrigation water in the subsurface — Water quality: Hawaii Univ. Water Resources Research Center Tech. Rept. 33, 90 p., illus., tables, 1969.
- Tera, F.** See *Eugster, O.* 01701
- Tera, F.** See *Eugster, O.* 02137
- 05726 **Tera, F.; Eugster, O.; Burnett, D. S.; Wasserburg, G. J.** Comparative study of Li, Na, K, Rb, Cs, Ca, Sr and Ba abundances in achondrites and in Apollo 11 lunar samples, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1637-1657, illus., tables, 1970.
- 07711 **Terasmae, J.; Anderson, T. W.** Hypsithermal range extension of white pine (*Pinus strobus* L.) in Quebec, Canada: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 1, p. 406-413, illus., table, 1970.
- Terasmae, J.** See *Karrow, P. F.* 07722
- 08308 **Terasmae, J.** Quaternary palynology — Its scope, problems and potential uses, in Perkins, B. F., editor, Geoscience and Man — V. 1, Proceedings of Am. Assoc. Stratig. Palynologists, Ann. Mtg., 1st, 1968: Baton Rouge, La., Louisiana State Univ., School of Geoscience, p. 23-27, 1970.
- 05515 **Terhune, R. W.; Stubbs, T. F.; Cherry, J. T.** Nuclear cratering on a digital computer — UCRL-50898: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., 29 p., illus., table, 1970.
- 07362 **Terlecky, Peter Michael.** The origin, stratigraphy, and post depositional history of a late Pleistocene marl deposit near Caledonia, New York [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2067B, 1970.
- Ternes, Elizabeth B.** See *Tourtetot, Harry A.* 00648
- 00379 **Terry, Ann.** The Whipple Mountain thrust fault and associated mylonites near Parker Dam, California [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 153, 1970.
- Tervo, R. O.** See *Lyll, K. D.* 09836

- 04471 **Terzaghi, Ruth D.** Brinefield subsidence at Windsor, Ontario, *in* Third symposium on salt, V. 2 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 298-307, illus., 1970.
- Teschke, F.** See *Wänke, H.* 05730
- 01303 **Tesone, V. P.** Twenty-three rigs seek Muddy sand pay in one Wyoming field: *World Oil*, v. 170, no. 5, p. 87-88, 92, 95, illus., table, 1970.
- 10468 **Tessman, Norman.** Cenozoic sharks of Florida: Plaster Jacket, No. 1, [7] p., illus., 1966.
- 10475 **Tessman, Norman.** Fossil land carnivores of Florida: Plaster Jacket, no. 11, [14] p., illus., 1969.
- Tettenhorst, R.** See *Lincoln, J. B.* 04439
- 06502 **Tettenhorst, Rodney; McGuire, Robert C.** Implications of hydroxyl-oxygen juxtaposition in layer silicates: *Am. Mineralogist*, v. 55, nos. 5-6, p. 735-741, illus., tables, 1970.
- Tew, M. J.** See *Burns, Roger G.* 06082
- 08228 **Tewinkel, G. C.** Remote sensing services of the Coast and Geodetic Survey, *in* The use of remote sensing . . . of natural resources of Alaska: Juneau, Alaska, Dept. of Econ. Devel., p. 39-42, illus., table [1970].
- 01646 **Texas A and M University.** (Activation Analysis Research Laboratory). 14-MeV neutron activation analysis of selected Leg 2 core samples [Chap.] 12 *in* Initial reports of the Deep Sea Drilling Project — V. 2, Leg 2 of cruises of *Glomar Challenger*, Hoboken, N. J., to Dakar, Senegal, Oct.-Nov. 1968: Washington, D. C., U.S. Govt. Printing Office, p. 347-348, table, 1970.
- 04789 **Texas Planning Agency Council.** (Water Oriented Data Programs Sec. of Interagency Nat. Resources Council, compiler). Catalog of water oriented data (available from eight Texas state agencies) — V. 1, Canadian River basin: Austin, Tex., Texas Water Devel. Board, 29 p., illus., tables, 1970.
- 09465 **Texas Univ. Austin.** (Bureau Economic Geology). Limitations of the earth, a compelling focus for geology — A symposium held at the dedication of the new Geology Building, Austin, Tex., 1967, *Proc.: Texas Quart.*, v. 11, no. 2, p. 7-154, illus., 1968.
- 05172 **Texas Univ. Austin Bur. Econ. Geology.** Geologic atlas of Texas, Perryton sheet — Charles Newton Gould Memorial Edition: Austin, Tex., Univ. Texas Austin Bur. Econ. Geology, scale 1:250,000, 1970.
- 03810 **Texas Univ. Austin Bur. Econ. Geology.** Geologic atlas of Texas, Waco sheet — Lloyd William Stephenson Memorial Edition: Austin, Tex., Univ. Texas Austin Bur. Econ. Geology, scale 1:250,000, separate text, 1970.
- Texas University at Austin.** See *West Texas Geological Society.* 05978
- Textoris, D. A.** See *Dennison, J. M.* 06791
- 09214 **Textoris, Daniel.** Preliminary investigation of the petrology of the Castle Hayne Limestone, *in* Symposium on hydrology of the coastal waters of North Carolina, Raleigh, N. C., 1967, *Proc.: North Carolina Univ. Water Resources Research Inst. Rept.*, no. 5, p. 3-23, illus., 1967[2].
- Textoris, Daniel A.** See *Falls, Darryl L.* 00699
- 01175 **Textoris, Daniel A.; Dennison, John M.** Petrology of Devonian Tioga Bentonite [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 243-244, 1970.

- 01989 **Thakur, T.; Scheidegger, A. E.** Chain model of river meanders [abs.]: EOS, v. 51, no. 4, p. 278, 1970.
- 06932 **Thakur, T. R.; Scheidegger, A. E.** Chain model of river meanders: Jour. Hydrology, v. 12, no. 1, p. 25-47, illus., 1970.
- 08125 **Thapar, M. R.** Rayleigh wave propagation and perturbed boundaries: Canadian Jour. Earth Sci., v. 7, no. 6, p. 1449-1461, illus., tables, 1970.
- 01990 **Thatcher, Wayne.** An oceanic ridge earthquake swarm, northern Gulf of California, March 1969 [abs.]: EOS, v. 51, no. 4, p. 357, 1970.
- Thatcher, Wayne.** See *Lomnitz, Cinna. 10888*
- 09599 **Thayer, Charles W.** Adaptive significance of oblique adductor muscles in swimming Monomyarian bivalves [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 703, 1970.
- Thayer, Paul A.** See *Justus, Philip S. 00726*
- 02578 **Thayer, Paul A.** Geology of Davie County Triassic Basin, North Carolina: Southeastern Geology, v. 11, no. 3, p. 187-198, illus., tables, 1970.
- 05605 **Thayer, Paul A.** Stratigraphy and geology of Dan River Triassic Basin, North Carolina: Southeastern Geology, v. 12, no. 1, p. 1-31, illus., table, geol. map, 1970.
- 09381 **Thenius, Erich.** Einige jungpleistozane Säugetiere (*Platygonus*, *Arctodus* und *Canis dirus*) aus dem Valsequillo, Mexiko [some late Pleistocene mammals (*Platygonus*, *Arctodus*, and *Canis dirus*) from Valsequillo, Mexico] [with English abs.]: Quartar, v. 21, p. 57-66, illus., tables, 1970.
- 00436 **Theodore, Ted G.** Petrogenesis of mylonites of high metamorphic grade in the Peninsular Ranges of southern California: Geol. Soc. America Bull., v. 81, no. 2, p. 435-449, illus., tables, 1970.
- Theodore, Ted G.** See *Wrucke, Chester T. 00590*
- Theyer, Fritz.** See *Morin, Robert. 02795*
- 07632 **Thibault, Camille.** Clermont township, Abitibi-West county [also French edition]: Quebec Dept. Nat. Resources Geol. Rept. 138, 45 p., tables, geol. maps, 1970.
- 01649 **Thirlaway, H. I. S.** Earthquakes and explosions — Comment on Molnar et al [1969]: Nature, v. 225, no. 5239, p. 1237-1238, 1970.
- 00558 **Thiruvathukal, John V.; Berg, Joseph W., Jr.; Henrichs, Donald F.** Regional gravity of Oregon: Geol. Soc. America Bull., v. 81, no. 3, p. 725-738, illus., 1970.
- Thode, H. G.** See *Grinenko, V. A. 08703*
- 09946 **Thode, H. G.** Sulfur isotope geochemistry and fractionation between coexisting sulfide minerals, in Symposium on sulfides — Fiftieth Anniversary Symposia (Benjamin A. Morgan, editor): Mineralog. Soc. America Spec. Paper 3, p. 133-144, illus., table, 1970.
- 09205 **Thom, B. G.** Permafrost in the Knob Lake iron mining region, in Canadian Conf. on Permafrost, 3d, 1969, Proc. (R. J. E. Brown, editor): Natl. Research Council Canada, Associate Comm. Geotech. Research Tech. Memo. 96, p. 9-20, illus., 1969.
- 00560 **Thom, Bruce G.** Carolina Bays in Horry and Marion Counties, South Carolina: Geol. Soc. America Bull., v. 81, no. 3, p. 783-813, illus., tables, 1970.
- 04890 **Thom, Bruce G.** Carolina Bays — Reply [to discussion of 'Carolina Bays in Horry and Marion Counties, South Carolina' by C. W. Cooke, 1970]: Geol. Soc. America Bull., v. 81, no. 10, p. 3173-3174, 1970.



**Thomas, C. W.** See *Young, J. A.* 02507

- 02690 **Thomas, Carroll M.** Petrology of Pennsylvanian carbonate bank and associated environments, Azalea field, Midland County, Texas [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 872-873, 1970.

**Thomas, Chester E., Jr.** See *Ryder, Robert B.* 04536

**Thomas, D. V.** See *O'Hora, N. P. J.* 09971

**Thomas, G. B.** See *Holbert, D. R.* 10343

- 05475 **Thomas, G. W.; Swoboda, A. R.** Anion exclusion effects on chloride movements in soils: *Soil Sci.*, v. 110, no. 3, p. 163-166, illus., 1970.

**Thomas, H. George.** See *Smith, Norman E.* 10957

- 02035 **Thomas, Harold E.; Schneider, William J.** Water as an urban resource and nuisance: *U.S. Geol. Survey Circ.* 601-D, p. D1-D9, 1970.

- 04063 **Thomas, Harold E.; Smith, John Ward.** Caliper location of leached zones in Colorado oil shale: *Log Analyst*, v. 11, no. 4, p. 12-16, illus., table, 1970.

**Thomas, J. A.** See *Wright, H. E., Jr.* 07732

- 05319 **Thomas, J. B.** Illinoian-Wisconsinan Pleistocene deposits at Eaton, Ohio: *Geol. Soc. America Bull.*, v. 81, no. 11, p. 3433-3436, illus., table, 1970.

- 10416 **Thomas, J. M.** The chemistry of deformed and imperfect crystals: *Endeavour*, v. 29, no. 108 p. 149-155, illus., 1970.

- 10570 **Thomas, Lloyd K.; Bufe, Charles G.** Telluric potential observations on the San Andreas fault [abs.]: *EOS*, v. 51, no. 11, p. 823, 1970.

**Thomas, Mendall P.** See *Ryder, Robert B.* 04536

**Thomas, R. L.** See *Cronan, D. S.* 06941

**Thomas, R. L.** See *Cronan, D. S.* 08150

- 10273 **Thomas, Richard L.; Kemp, Anthony L. W.; Lewis, Christopher F. M.** The distribution and characteristics of Lake Ontario surface sediments [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 703, 1970.

- 02345 **Thomas, W. A.** Arthur Henry Petsch (1895-1969): *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 7, p. 1310, portrait, 1970.

- 00767 **Thomas, William A.** Paleozoic stratigraphy of Mississippi [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 244, 1970.

- 10274 **Thomas, William A.; Bearce, Denny N.; Drahovzal, James A.** Paleozoic folding of the Birmingham anticlinorium, Alabama [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 703-704, 1970.

**Thomlinson, A. G.** See *Chase, R. L.* 06093

**Thomlinson, Catherine.** See *Berner, Robert A.* 04679

- 07038 **Thompson, A. E.; Stokes, W. L.** Stratigraphy of the San Rafael Group, southwest and south central Utah: *Utah Geol. and Mineralog. Survey Bull.* 87, 50 p., illus., 1970.

- 02162 **Thompson, Alan Bruce.** A note on the kaolinite-pyrophyllite equilibrium: *Am. Jour. Sci.*, v. 268, no. 5, p. 454-458, illus., table, 1970.

- 04522 **Thompson, Alan Bruce.** Laumontite equilibria and the zeolite facies: *Am. Jour. Sci.*, v. 269, no. 3, p. 267-275, illus., 1970.
- 01146 **Thompson, Allan M.** Lithofacies and formation nomenclature in Upper Ordovician stratigraphy, central Appalachians: *Geol. Soc. America Bull.*, v. 81, no. 4, p. 1255-1260, illus., 1970.
- 03596 **Thompson, Allan M.** Geochemistry of color genesis in red-bed sequence, Juniata and Bald Eagle Formations, Pennsylvania: *Jour. Sed. Petrology*, v. 40, no. 2, p. 599-615, illus., tables, 1970.
- 08551 **Thompson, Allan M.** Tidal-flat deposition and early dolomitization in Upper Ordovician rocks of southern Appalachian Valley and Ridge: *Jour. Sed. Petrology*, v. 40, no. 4, p. 1271-1286, illus., 1970.
- Thompson, B. E.** See *Davis, C. E.* 07869
- Thompson, B. E.** See *Davis, C. E.* 09339
- Thompson, B. E.** See *Davis, C. E.* 09340
- Thompson, B. E.** See *Davis, C. E.* 09341
- 00415 **Thompson, Erik G.; Mack, Lawrence R.** Remarks on paper by J. H. Dieterich and E. T. Onat, 'Slow finite deformation of viscous solids' [1969]: *Jour. Geophys. Research*, v. 75, no. 8, p. 1625-1627, 1970.
- 06906 **Thompson, Esther H.** Morphology and taxonomy of *Cyclonema* Hall (Gastropoda), Upper Ordovician, Cincinnati province: *Bulls. Am. Paleontology*, v. 58, no. 261, p. 219-284, illus., 1970.
- Thompson, G.** See *Melson, W. G.* 01859
- 03365 **Thompson, G.; Livingston, H. D.** Strontium and uranium concentrations in aragonite precipitated by some modern corals: *Earth and Planetary Sci. Letters*, v. 8, no. 6, p. 439-442, table, 1970.
- Thompson, Gary G.** See *Cross, Aureal T.* 02601
- 06010 **Thompson, Gary Gene.** Paleocology of palynomorphs in the Mancos Shale, southwestern Colorado [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 12, pt. 1, p. 5561B, 1970.
- Thompson Geoffrey.** See *Switzer, George.* 00563
- 00853 **Thompson, Geoffrey; Bankston, Donald C.; Pasley, Susan M.** Trace element data for U.S.G.S. reference silicate rocks: *Chem. Geology*, v. 5, no. 3, p. 215-221, tables, 1970.
- 02025 **Thompson, Geoffrey; Melson, William G.** Boron contents of serpentinites and metabasalts in the oceanic crust, implications for the boron cycle in the oceans: *Earth and Planetary Sci. Letters*, v. 8, no. 1, p. 61-65, illus., tables, 1970.
- 02964 **Thompson, Geoffrey; Bankston, Donald C.** Sample contamination from grinding and sieving determined by emission spectrometry: *Appl. Spectroscopy*, v. 24, no. 2, p. 210-219, tables, 1970.
- 04084 **Thompson, Geoffrey; Bankston, Donald C.; Pasley, Susan M.** Trace element data for reference carbonate rocks: *Chem. Geology*, v. 6, no. 2, p. 165-170, table, 1970.
- 10275 **Thompson, Idaho L.; Barnwell, Franklin H.** Biological clock control and shell growth in the bivalve *Mercenaria mercenaria* [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 704, 1970.

- 09626 **Thompson, J. E.** Willet Green Miller [1925], Ontario's first Provincial Geologist: Ontario Dept. Mines Misc. Paper 38, 18 p., illus., portrait, 1970.
- 05947 **Thompson, James B., Jr.** Chemical reactions in crystals — Corrections and clarification [of 1969 paper]: *Am. Mineralogist*, v. 55, nos. 3-4, p. 528-532, 1970.
- Thompson, James B., Jr.** See *Hovis, Guy L.* 07029
- 10276 **Thompson, John F.** The student and his environment, a matter of choice [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 705, 1970.
- 09496 **Thompson, Louis J.; Colp, John L.** Application of earth penetration technology to ocean bottom penetration, in *Offshore Technology Conference*, 2d Ann., Houston, Tex., 1970, Preprints — v. 1: Dallas, Tex., *Offshore Technology Conf.*, p. I-571 — I-576, illus., 1970.
- Thompson, M. R.** See *Robnett, Q. L.* 10454
- Thompson, Margaret D.** See *Burger, H. Robert*, 3d. 02376
- Thompson, R. N.** See *Tilley, C. E.* 02122
- 10277 **Thompson, R. R.; Benedict, L. G.** Vitrinite reflectance as an indicator of coal metamorphism for coke-making [abs.]: *Geol. Soc. America Abs. with Programs*, no. 7, p. 706, 1970.
- 09485 **Thompson, Raymond M.; Smith, Kenneth G.** Undersea lode mining in Alaska, in *Offshore Technology Conference*, 2d Ann., Houston, Tex., 1970, Preprints — v. 2: Dallas, Tex., *Offshore Technology Conf.*, p. II-819 — II-826, illus., 1970.
- Thompson, T. D.** See *Brindley, G. W.* 07906
- 00534 **Thompson, Thomas Dick**, 3d. Adsorption of purines, pyrimidines and nucleosides on montmorillonites and illites [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 7, p. 3245B, 1970.
- 01350 **Thompson, Thomas L.; Fellows, L. D.** Stratigraphy and conodont biostratigraphy of Kinderhookian and Osagean (Lower Mississippian) rocks of southwestern Missouri and adjacent areas: *Missouri Geol. Survey and Water Resources Rept. Inv.* 45, 263 p., table 1969 [1970].
- 05802 **Thompson, Thomas L.** Lower Pennsylvanian conodonts from McDonald County, Missouri: *Jour. Paleontology*, v. 44, no. 6, p. 1041-1048, illus., tables, 1970.
- 02341 **Thompson, Wallace C.** Thornton Davis (1892-1969): *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 7, p. 1307-1308, portrait, 1970.
- 09276 **Thompson, Will F.** Theoretical and observed altitudinal relationship of timberline and perennial soil frost in mountains [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyp., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.], p. 132, 1970.
- Thoms, Robert L.** See *Martinez, Joseph D.* 05030
- 03113 **Thomsen, Leon.** On the fourth-order anharmonic equation of state of solids [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 10, p. 4665B, 1970.
- 10588 **Thomsen, Leon.** New equations for  $v_p(\rho, T_6, v_s(\rho T))$  [abs.]: *EOS*, v. 51, no. 11, p. 828, 1970.
- Thomson, Alan.** See *McBride, Earle F.* 02309

- 10405 **Thomson, Don W.** The Geological Survey of Canada — Thirty years of mapping. 1917-1947, Chap. 15 in *Men and meridians, the history of surveying and mapping in Canada*, v. 3, 1917-1947: Ottawa, Ontario, Canada Dept. Energy Mines and Resources, p. 241-256, illus., geol. maps, 1969.
- 10406 **Thomson, Don W.** Thematic maps in Canada, Chap. 14 in *Men and meridians, the history of surveying and mapping in Canada* — v. 3, 1917-1947: Ottawa, Ontario, Canada Dept. Energy Mines and Resources, p. 233-240, illus., 1969.
- Thomson, F. H.** See *Boswell, E. H.* 02765
- Thomson, F. H.** See *Wasson, B. E.* 03141
- Thomson, F. H.** See *Newcome, Roy, Jr.* 10462
- Thomson, Frederick J.** See *Smedes, Harry W.* 09289
- 09274 **Thompson, J. E.** A discussion of Sudbury geology and sulphide deposits: Ontario Dept. Mines Misc. Paper 30, 22 p., illus., 1969.
- 10284 **Thomson, Keith Stewart.** The biology of the lobe-finned fishes: Cambridge Philos. Soc. Biol. Rev., v. 44, no. 1, p. 91-154, illus., tables, 1969.
- 02287 **Thomson, Kenneth C.** Deep Creek Mountains, in *Radioactive and isotopic age determinations of Utah rocks: Utah Geol. and Mineralog. Survey Bull. 81 (Utah Univ. Bull., v. 61, no. 18; Utah Eng. Expt. Sta. Bull. 135)*, p. 29, 1970.
- 07952 **Thomson, Kenneth Clair.** Mineral deposits of the Deep Creek Mountains, Tooele and Juab Counties, Utah [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3488B, 1970.
- Thomson, Ker C.** See *Toksöz, M. Nafi.* 10289
- Thomson, N. S.** See *Coker, A. E.* 08410
- 02952 **Thomson, S.** Riverbank stability study at the University of Alberta, Edmonton [with French abs.]: Canadian Geotech. Jour., v. 7, no. 2, p. 157-168, illus., table, 1970.
- 05254 **Thorsen, Gerald W.** Washington's landslide survey (a progress report), in *Engineering geology and soils engineering symposium, 8th Ann., Pocatello, Idaho, 1970, Proc.: Boise, Idaho, Idaho Dept. Highways*, p. 285-293, illus., 1970.
- 04177 **Thorley, A.; Broise, Y.; Calhoon, M. L.; Zeman, Z. P.; Watt, W. G.** Borehole instruments for economical strength and deformation in-situ testing, Paper 13 in *In situ investigations in soils and rocks — British Geotechnical Soc., Conf., London, 1969, Proc.: London, British Geotechnical Soc.*, p. 155-165, illus., tables; discussion, p. 189-220, illus., tables, 1970.
- 03778 **Thorman, Charles H.** Metamorphosed and nonmetamorphosed Paleozoic rocks in the Wood Hills and Pequop Mountains, northeast Nevada: Geol. Soc. America Bull., v. 81, no. 8, p. 2417-2447, illus., tables, geol. map, 1970.
- 06298 **Thorpe, A. N.; Senftle, F. E.; Sullivan, S.; Alexander, C. C.** Magnetic studies of individual glass spherules from the lunar sample 10084-86-2, Apollo 11, in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1)*, p. 2453-2462, illus., tables, 1970.
- 07184 **Thorpe, R. I.** Geological exploration in the Coppermine River area, Northwest Territories, 1966-1968: Canada Geol. Survey Paper 70-47, 150 p., tables, 1970.

- 05511 **Thorsen, Gerald W.** Washington's landslide survey (a progress report), in Engineering geology and soils engineering symposium, 8th Ann., Pocatello, Idaho, 1970, Proc.: Boise, Idaho, Idaho Dept. Highways, p. 285-293, illus., 1970.
- 07976 **Thorsteinsson, R.; Tozer, E. T.** Geology of the Arctic Archipelago, Chap. 10 in Geology and economic minerals of Canada: Canada Geol. Survey Econ. Geology Rept. 1 (5th edition), p. 547-590, illus., 1970.
- 03163 **Thorstenson, Donald C.** Equilibrium distribution of small organic molecules in natural waters: Geochim. et Cosmochim. Acta, v. 34, no. 7, p. 745-770, illus., tables, 1970.
- Thorud, David B.** See *Simpson, E. S.* 08432
- Thrailkill, John.** See *Johnson, John T.* 01172
- 10278 **Thrailkill, John.** Limestone vadose seepage, saturation with respect to calcite and time invariance of composition [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 706, 1970.
- 08744 **Thurber, D. L.; Broecker, W. S.** The behavior of radiocarbon in the surface waters of the Great Basin, in Radiocarbon variations and absolute chronology — Nobel Symposium, 12th, Uppsala, 1969, Proc.: New York, John Wiley and Sons, and Stockholm, Almquist and Wiksell, p. 379-398, discussion, p. 398-400, illus., tables, 1970.
- Thurber, David.** See *Habib, Daniel.* 08521
- 09877 **Thurber, David L.** Chemical pollution of waters — a modern hydra, in Water pollution in the Greater New York area (Alan A. Johnson, editor): New York, London and Paris, Gordon and Breach, Sci. Pub., p. 75-83; with discussion, p. 83-90, illus., 1970.
- Thurber, Horace K.** See *Irwin, William P.* 02334
- 07377 **Thurmond, John Tydings.** Lower vertebrates and paleoecology of the Trinity Group (Lower Cretaceous) in north central Texas [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2156B, 1970.
- 03791 **Thurston, P. C.; Carter, M. W.** Operation Fort Hope — Lansdowne House-Fort Hope sheet, District of Kenora (Patricia Portion): Ontario Dept. Mines Prelim. Geol. Map P. 562 (revised), scale 1 in. to 2 mi., 1970; originally published 1969.
- Thurston, R. N.** See *Fritz, T. C.* 00414
- 10412 **Thurston, W. M.** Automatic mass spectrometric analysis of the deuterium to hydrogen ratio in natural water: Rev. Sci. Instruments, v. 41, no. 7, p. 963-966, illus., 1970.
- 03017 **Thyssen, F.** Bernhard Brockamp [1902-1968]: Polar Rec., v. 15, no. 94, p. 77-78, 1970.
- 03526 **Thyssen-Bornemisza, Stephen.** Discussion on "Variations of vertical gravity gradient in New York City and Alpine, New Jersey", by John T. Kuo, Mario Ottaviani, and Shri K. Singh (Geophysics, April 1969, p. 235-248): Geophysics, v. 35, no. 3, p. 521-522, table, 1970.
- 08237 **Tibbetts, T. E.** (chairman). International Peat Congress, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, 405 p., illus., tables, 1970.
- 08238 **Tibbetts, T. E.** Report on world peat resources, in International Peat Congress, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 8-9, tables, 1970.

- 08239 **Tibbetts, T. E.** Canada — A brief review of peat in Canada, 1968, in *International Peat Congress*, 3d, Quebec, Canada, 1968, *Proc.*: Ottawa, Canada, National Research Council of Canada, p. 9-10, table, 1970.
- Tice, Allen R.** See *McGaw, Richard W.* 10075
- Tice, Allen R.** See *Anderson, Duwayne M.* 10121
- 00768 **Tidball, R. R.; Connor, J. J.** Distribution of elements in a black shale parent and its derivative soil, western Kentucky [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 244-245, 1970.
- 09600 **Tidball, R. R.** Geochemical variation in midwest soils, in *Univ. Missouri Ann. Conf. on Trace Substances in Environmental Health*, 4th, Columbia, Mo., 1970, *Abs.*: Columbia, Mo., Univ. Missouri, p. 7, 1970.
- 01677 **Tidwell, William D.; Rushforth, Samuel R.; Reveal, James L.; Behunin, Homer.** *Palmoxylon simperi* and *Palmoxylon pristina*, two pre-Cretaceous angiosperms from Utah: *Science*, v. 168, no. 3933, p. 835-840, illus., 1970.
- 03452 **Tidwell, William D.; Rushforth, Samuel R.** *Osmundacaulis wadei*, a new osmundaceous species from the Morrison Formation (Jurassic) of Utah: *Torrey Bot. Club. Bull.*, v. 97, no. 3, p. 137-144, illus., 1970.
- 00933 **Tieh, Thomas T.; Cook, Earl F.** Carbonatitic dikes in ignimbrites of Lincoln County, Nevada [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 301-302, 1970.
- Tieh, Thomas T.** See *Pyle, Thomas E.* 02442
- 05376 **Tieh, Thomas T.; Swolfs, Hans S.** Tridymite-garnet-montmorillonite in cavities of welded tuff, Little Box Canyon, Quitman Mountains, Trans-Pecos Texas, in *Geology of the southern Quitman Mountains area, Trans-Pecos Texas — S.E.P.M. Permian Basin Sec.*, 1970 Biennial Field Trip, Symposium and Guidebook: *Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub.* 70-12, p. 104-106, illus., 1970.
- 01198 **Tien, Pei-lin; Waugh, Truman C.** Epsomite and hexahydrite from an underground storage area, Atchison, Kansas, in *Short papers in research in 1969: Kansas Geol. Survey Bull.* 199, pt. 1, p. 3-7, illus., tables, 1970.
- 06915 **Tien, Pei-lin; Bauleke, Maynard P.** A method for preparing pelleted clay samples of semi-micro quantity for differential thermal analysis [with French, German, and Russian abs.]: *Clays and Clay Minerals*, v. 18, no. 3, p. 179-181, illus., 1970.
- 03467 **Tikkanen, G. D.** Results of deeply penetrating geophysical surveys in Manitoba [abs.]: *Canadian Mining and Metall. Bull.*, v. 63, no. 695, p. 295, 1970.
- Tilak, S. T.** See *Agashe, Shripad N.* 04794
- 01659 **Till, Roger.** The relationship between environment and sediment composition (geochemistry and petrology) in the Bimini lagoon, Bahamas: *Jour. Sed. Petrology*, v. 40, no. 1, p. 367-385, illus., table, 1970.
- 02122 **Tilley, C. E.; Thompson, R. N.** Melting and recrystallization relations of the Snake River basalts of southern Idaho, USA: *Earth and Planetary Sci. Letters*, v. 8, no. 1, p. 79-92, illus., tables, 1970.
- 01411 **Tilling, Robert I.; Gottfried, David; Dodge, F. C. W.** Radiogenic heat production of contrasting magma series — Bearing on interpretation of heat flow: *Geol. Soc. America Bull.*, v. 81, no. 5, p. 1447-1462, illus., table, 1970.
- 01139 **Tillman, C. G.** Metamorphosed trilobites from Arvonnia, Virginia: *Geol. Soc. America Bull.*, v. 81, no. 4, p. 1189-1199, illus., 1970.

- 10279 **Tillman, C. G.; Ketner, K. B.** Devonian conodonts from Lone Mountain, Elko County, Nevada [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 707, 1970.
- 03124 **Tillman, John R.** The age, stratigraphic relationships, and correlation of the lower part of the Olentangy Shale of central Ohio: *Ohio Jour. Sci.*, v. 70, no. 4, p. 202-217, illus., table, 1970.
- 02691 **Tillman, R. W.** Discriminant analysis versus factor analysis of grain-size data from different environments and sedimentary structures [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 873, 1970.
- 10107 **Til'man, S. M.** Tectonics and geologic history of Arctic sector of East Asia and America [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2508-2509, 1970.
- Tilo, S. N.** See *Stevenson, F. J.* 04090
- Tilton, G. R.** See *Church, Stanley E.* 01747
- 10280 **Tilton, G. R.; Hopson, C. A.** Isotopic composition of lead in plutonic and volcanic rocks from the northern Cascade Mountains [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 707, 1970.
- Timko, Donald J.** See *Fertl, Walter H.* 02209
- Timko, Donald J.** See *Fertl, Walter H.* 02210
- 08282 **Tinkle, Lon. Mr. De** — A biography of Everette Lee DeGolyer: Boston, Mass., and Toronto, Ontario, Little, Brown and Company, 381 p., portrait, 1970.
- 00109 **Tinkler, Keith J.** Pools, riffles and meanders: *Geol. Soc. America Bull.*, v. 81, no. 2, p. 547-552, illus., 1970.
- Tinoco, Fernando H.** See *Schmidt, Norbert O.* 05506
- 07633 **Tiphane, Marcel.** Gypsum deposits of the Magdalen Islands: *Quebec Dept. Nat. Resources Spec. Paper* 7, 27 p., illus., 1970.
- Tipper, H. W.** See *Frebold, Hans.* 07667
- Tipper, Howard W.** See *Campbell, Richard B.* 04302
- 10949 **Tipsword, H. L.; Fowler, W. A., Jr.; Sorrell, B. J.** Future petroleum provinces of United States western gulf basin, lower Miocene-Oligocene [abs.]: *Am. Assoc. Petroleum Geologists*, v. 54, no. 9, p. 1791-1792, 1970; *Gulf Coast Assoc. Geol. Socs. Trans.*, v. 20, p. 85-86, 1970.
- 02692 **Tissot, B. P.** Present knowledge of fundamental processes of oil and gas origin and migration applied to petroleum prospecting [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 873, 1970.
- 10285 **Titley, S. R.** Paleotectonic environment of Arizona porphyry copper deposits [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 707-708, 1970.
- Titulaer, C.** See *Fryer, R.* 06842

- 00503 **Tiwari, Suresh Chandra.** Source and behavior of potassium in Cecil soils [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 7, p. 2985B-2986B, 1970.
- Tixier, M.** See *Elloy, R.* 07901
- 00962 **Tixier, M. P.; Alger, R. P.** Log evaluation of nonmetallic mineral deposits: *Geophysics*, v. 35, no. 1, p. 124-142, illus., tables, 1970.
- 06264 **Tjia, H. D.** Lunar wrinkle ridges indicative of strike-slip faulting: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 3095-3099, illus., table, 1970.
- 10108 **Tkatchenko, B. V.; Egiazarov, B. Kh.; Atlasov, I. P.; Bondarev, V. I.; Lazurkin, V. M.; Markov, F. G.; Ravich, M. G.; Romanovich, B. S.; Sokolov, V. N.** Main structural features of Arctic [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, *Abs. Papers: Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2509, 1970.
- 05322 **Tobaillem, Jacques; Nordemann, Daniel.** Mesure par spectrométrie  $\gamma$  de la radioactivité d'une chondrite carbonée de chute récente — Allende [Measurement by gamma spectrometry of the radioactivity of a carbonaceous chondrite of recent fall — Allende]: *Acad. Sci. Comptes Rendus*, ser. D, v. 271, no. 15, p. 1249-1251, table, 1970.
- Tobaillem, Jacques.** See *Nordemann, Daniel.* 05457
- 03114 **Tobin, Don Graybill.** Microscopic criteria for defining macroscopic modes of deformation in experimentally deformed oolitic limestone [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 10, p. 4666B, 1970.
- Tobisch, Othmar T.** See *McIntyre, David H.* 00130
- Tocher, D.** See *Cloud, W. K.* 00858
- 00127 **Tocher, Don.** [Discussion of a chart comparing energies in earthquakes and explosions, 1969]: *California Div. Mines and Geology Mineral Inf. Service*, v. 23, no. 1, p. 16-17, illus., 1970.
- Tocher, Don.** See *Hofmann, R. B.* 00286
- Tocher, Don.** See *Romig, P. R.* 00349
- Tocher, Don.** See *Romig, Philip R.* 01624
- Tocher, Don.** See *Bufe, Charles G.* 06078
- Tocher, Don.** See *Nason, Robert D.* 09978
- Tocher, Don.** See *King, Chi-Yu.* 10736
- 06031 **Todd, David Keith.** The water encyclopedia — A compendium of useful information on water resources: Port Washington, N.Y., Water Information Center, 559 p., illus., tables, 1970.
- 00784 **Todd, Ruth.** Recent literature on the Foraminifera: *Cushman Found. Foram. Research Contr.*, v. 21, pt. 1, p. 40-46, 1970.
- 03904 **Todd, Ruth; Low, Doris.** Smaller Foraminifera from Midway drill holes: *U.S. Geol. Survey Prof. Paper* 680-E, p. E1-E49, illus., tables, 1970.
- 07189 **Todd, Ruth.** Recent literature on the Foraminifera: *Cushman Found. Foram. Research Contr.*, v. 21, pt. 4, p. 168-176, 1970.
- Todd, Terry.** See *Boore, David M.* 10551



- 01710 **Todorovic, P.** A stochastic model of longitudinal diffusion in porous media: *Water Resources Research*, v. 6, no. 1, p. 221-222, illus., tables, 1970.
- 07731 **Toebes, C.; Ouryvaev, V.** (editors). Representative and experimental basins — An international guide for research and practice: Paris, UNESCO (Studies and reports in hydrology, no. 4), 348 p., illus., tables, 1970.
- Toebes, G. H.** See *Chang, T. P.* 02715
- 03618 **Toffaletti, Fred B.** Definitive computations of sand discharge in rivers — Closure [to discussion of paper 6350, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, Jour. Hydraulics Div., no. HY 6, p. 1352-1353, 1970.
- 08290 **Tokarsky, O.** Hydrogeological map, Grimshaw-Chinook Valley, NTS 84C/4 and 84C/5, Alberta: Edmonton, Alberta, Research Council Alberta, with hydrogeologic profiles, explanatory notes and expanded legend available, 1970.
- 10886 **Tokarsky, O.** Hydrogeological map, Grimshaw-Chinook Valley, NTS 84 C/4 and 84C/5, Alberta [also accompanies RCA rept. 71-2, 1970]: Edmonton, Alberta, Research Council Alberta, scale 1:250,000, 1970.
- Tokonami, Masayasu.** See *Morimoto, Nobuo.* 01860
- Toksoz, M. Nafi.** See *Minear, John W.* 00416
- 01991 **Toksöz, M. Nafi; Wiggins, Ralph A.; Husebye, Eystein S.** Structure and properties of the Earth's core [abs.]: *EOS*, v. 51, no. 4, p. 359, 1970.
- Toksöz, M. Nafi.** See *Shlien, Seymour.* 02303
- Toksöz, M. Nafi.** See *Solomon, Sean C.* 03303
- Toksöz, M. Nafi.** See *Shlien, Seymour.* 06408
- Toksöz, M. Nafi.** See *Minear, John W.* 07311
- 10289 **Toksöz, M. Nafi; Kehler, Harold H.; Thomson, Ker C.; Alexander, Shelton S.** Nuclear explosions in pre-stressed media and mechanisms of tectonic strain release [abs.]: *Geol. Soc. America Abs. with Programs* v. 2, no. 7, p. 708, 1970.
- Toksoz, M. Nafi.** See *Smith, Albert T.* 10568
- 06299 **Tolansky, S.** Interferometric examination of small glassy spherules and related objects in a 5-gram lunar dust sample, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 3, Physical properties: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 2463-2466, illus., 1970.
- Tolderlund, D. S.** See *Ruddiman, W. F.* 01643
- 09424 **Toledo Toledo, Manuel.** Que trascendencia tiene Arenque [how important is Arenque]: *Petróleo Interamericano*, v. 28, no. 11, p. 23-25, illus., 1970.
- 06033 **Tolkunov, A. Ye.** Sovetskiye geologi na Kube [Soviet geologists in Cuba]: *Akad. Nauk SSSR Vestnik* 1970, no. 5, p. 90-95, illus., 1970.
- 10363 **Tomblin, J. F.; Jutsum, P. J.** A program for calculating the C.I.P.W. norms from rock analyses using an IBM 1620 computer: *West Indies Univ. Seismic Research Unit Spec. Pub.* , 25 p., illus., tables, 1967.
- 10364 **Tomblin, J. F.** Chemical analysis of rocks — Methods used at the seismic Research Unit: *West Indies Univ. Seismic Research Unit Spec. Pub.* 8, 20 p., illus., table, 1967.

- 10366 **Tomblin, J. F.** Earth tilt measurements in Montserrat and Nevis, Leeward Islands, West Indies: West Indies Univ. Seismic Research Unit Spec. Pub. 14, 25 p., illus., tables, 1967.
- 10367 **Tomblin, J. F.** Chemical analyses of volcanic rocks from the Lesser Antilles: West Indies Univ. Seismic Research Unit Spec. Pub. 15, 23 p., tables, 1968.
- Tomblin, J. F.** See *Jutsum, P. J.* 10368
- 10833 **Tomblin, J. F.** Seismicity and recent tectonics of the eastern Caribbean [abs.]-Internat. Symposium on Recent Crustal Movements and Associated Seismicity, Wellington, N.Z., 1970, Proc.: Wellington, N.Z., Royal Soc. of New Zealand, p. 35, 1970.
- Tomlinson, M.** See *Westgate, J. A.* 10394
- Tomlinson, M. C.** See *Smith, D. G. W.* 03199
- 02030 **Tooker, E. W.; Morris, H. T.; Fillo, Paul V.** Mineral resources of the Emigrant Basin primitive area, California, *with a section on Geophysical studies by H. W. Oliver*: U.S. Geol. Survey Bull. 1261-G, p. G1-G70, illus., tables, geol. map, 1970.
- 05326 **Tooker, E. W.** Radial movements in the western Wyoming salient of the Cordilleran overthrust belt — Discussion [of paper by G. W. Crosby, 1969]: Geol. Soc. America Bull., v. 81, no. 11, p. 3503-3506, illus., 1970.
- 05446 **Tooker, E. W.; Roberts, Ralph J.** Upper Paleozoic rocks in the Oquirrh Mountains and Bingham mining district, Utah, *with a section on Biostratigraphy and correlation by Mackenzie Gordon, Jr. and Helen M. Duncan*: U.S. Geol. Survey Prof. Paper 629-A, p. A1-A76, illus., tables, 1970.
- 07970 **Toombs, R. B.** The Canadian mineral industry, Chap. 3 in *Geology and economic minerals of Canada*: Canada Geol. Survey Econ. Geology Rept. 1 (5th edition), p. 31-42, illus., tables, 1970.
- 02292 **Toomey, Donald Francis; Mamet, B. L.** Annotated bibliography of Paleozoic non-fusulinid Foraminifera, Addendum 7: Cushman Found. Foram. Research Contr., v. 21, pt. 2, p. 50-70, 1970.
- 08066 **Toomey, Donald Francis; Mountjoy, Eric W.; MacKenzie, Warren S.** Upper Devonian (Frasnian) algae and foraminifera from the Ancient Wall carbonate complex, Jasper National Park, Alberta, Canada: Canadian Jour. Earth Sci., v. 7, no. 3, p. 946-981, illus., tables, 1970.
- 08552 **Toomey, Donald Francis.** An unhurried look at a Lower Ordovician mound horizon, southern Franklin Mountains, West Texas: Jour. Sed. Petrology, v. 40, no. 4, p. 1318-1334, illus., tables, 1970.
- Toomey, Donald Francis.** See *Finks, Robert M.* 09038
- 09039 **Toomey, Donald Francis; Finks, Robert M.** Middle Ordovician (chazyan) mounds, southern Quebec, Canada — a summary report, in *Guidebook to field excursions*, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., p. 121-134, illus., tables, 1969.
- Tooms, J. S.** See *Summerhayes, C. P.* 04902
- 10786 **Tooms, J. S.; Summerhayes, C. P.; Cronan, D. S.** Geochemistry of marine phosphate and manganese deposits, in *Oceanography and marine biology — an annual review*, V. 7 (Harold Barnes, editor): New York, Hafner Publishing Co., p. 49-100, illus., tables, 1969.
- Toots, Heinrich.** See *Parker, Ronald B.* 00569

- Toots, Heinrich.** See *Voorhies, M. R.* 07237
- Tordon, F.** See *Samson, L.* 09206
- Tornberg, Gordon F.** See *Wiegel, Robert L.* 03719
- 10972 **Torrance, J. Kenneth.** Causes of clay sensitivity — discussion [of paper 6568, by J. K. Mitchell and W. N. Houston, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, *Jour. Soil Mechanics and Found. Div.*, no. Sm 1, p. 360-361, 1970.
- 02110 **Toth, J.** A conceptual model of the groundwater regime and the hydrogeologic environment: *Jour. Hydrology*, v. 10, no. 2, p. 164-176, illus., 1970.
- 08068 **Toth, J.** Relation between electric analogue patterns of groundwater flow and accumulation of hydrocarbons: *Canadian Jour. Earth Sci.*, v. 7, no. 3, p. 988-1007, illus., tables, 1970.
- Toth, S. J.** See *Riemer, D. N.* 09884
- 05566 **Toth, Stephen J.; Ott, Arthur N.** Characterization of bottom sediments — Cation exchange capacity and exchangeable cation status: *Environmental Sci. and Technology*, v. 4, no. 11, p. 935-939, tables, 1970.
- 07041 **Touchet, B. A.; Daniels, R. B.** A post-Montgomery pre-Prairie age loess near Ville Platte, Louisiana: *Southeastern Geology*, v. 12, no. 2, p. 83-93, illus., tables, 1970.
- Tournier, J. P.** See *Milović, D. N.* 04411
- Tournier, Jean-Pierre.** See *Milović, Dušan M.* 09161
- Tourtlot, Elizabeth B.** See *Vine, James D.* 00650
- 01875 **Tourtlot, Elizabeth B.** Selected annotated bibliography of minor-element content of marine black shales and related sedimentary rocks: *U.S. Geol. Survey Bull.* 1293, 118 p., 1970.
- Tourtlot, Elizabeth B.** See *Vine, James D.* 04317
- 00648 **Tourtlot, Harry A.; Gantner, Robert F.; Ternes, Elizabeth B.** Gold in sedimentary rocks of Tertiary age and terrace gravels east of the Black Hills and the Rocky Mountain front, South Dakota, Wyoming, and Nebraska [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 351-352, 1970.
- Tourtlot, Harry A.** See *Peterman, Zell E.* 00956
- 10413 **Toussaint, C. J.; Gunther, K. H.; Vos, G.** An X-ray macroprobe analyzer using electron excitation, design, and applications: *Rev. Sci. Instruments*, v. 41, no. 7, p. 973-977, illus., table, 1970.
- Touzot, G.** See *Milovic, D. N.* 04411
- 02131 **Towe, K. M.; Malone, Philip G.** Precipitation of metastable carbonate phases from seawater: *Nature*, v. 226, no. 5243, p. 348-349, illus., tables, 1970.
- Towe, K. M.** See *Malone, Ph. G.* 08658
- Towell, David G.** See *Klusman, Ronald W.* 00625
- 07846 **Townsend, M. G.** On the dichroism of tourmaline: *Jour. Physics and Chemistry Solids*, v. 31, no. 11, p. 2481-2488, illus., table, 1970.
- 04505 **Tozer, D. C.** Temperature, conductivity, composition and heat flow, in *Symposium on multidisciplinary studies of unusual regions of the upper mantle, Madrid, Spain, 1969, Proc.*: *Jour. Geomagnetism and Geoelectricity*, v. 22, nos. 1-2, p. 35-51, illus., 1970.

- 06746 **Tozer, D. C.** Factors determining the temperature evolution of thermally convecting earth models, *in* Geophysical studies on the evolution of the Earth's deep interior — A symposium, Madrid, 1969, Proc.: Physics Earth and Planetary Interiors, v. 2, no. 5 (spec. issue), p. 393-398, illus., 1970.
- Tozer, E. T.** See *Thorsteinsson, R.* 07976
- 10373 **Trabant, Peter K.** Coastal microbathymetry off Fort Lauderdale, Florida: Marine Technology Soc. Jour., v. 3, no. 3, p. 47-52, illus., 1969.
- Trace, R. D.** See *Connor, J. J.* 06165
- Tracey, Joshua I., Jr.** See *Oriel, Steven S.* 02318
- 04617 **Traill, R. J.** A catalogue of Canadian minerals: Canada Geol. Survey Paper 69-45, 649 p., 1970.
- 00649 **Trammell, John.** Stratabound base metal sulfides in the Belt Supergroup of Montana [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 352, 1970.
- Trammell, Michael D.** See *Breslau, Lloyd R.* 09484
- 08265 **Trapp, Henry, Jr.** Geology and ground-water resources of the Asheville area, North Carolina: North Carolina Div. Ground Water Ground-Water Bull., no. 16, 127 p., illus., tables, geol. map, 1970.
- 05090 **Trask, N. J.** Ranger photographs of the Moon, *in* Symposium on planetary atmospheres and surfaces, Woods Hole, Mass., 1969: Radio Sci., v. 5, no. 2, p. 123-128, illus., 1970.
- 07551 **Trask, N. J.** Geologic map of Apollo landing sites 3 and 3R — Part of Oppolzer A region, Sinus Medii: U.S. Geol. Survey Misc. Geol. Inv. Map I-621 [ORB II-8 (25)], scale 1:25,000, separate text, 1970.
- 02206 **Traugott, M. O.** Log evaluation of a heterogeneous carbonate reservoir, Cato San Andres field, *in* SPWLA Logging Symposium, 11th Ann., Los Angeles, Calif., 1970, Trans.: Houston, Tex., Soc. Prof. Well Log Analysts, p. E1-E8, illus., 1970.
- 07137 **Trautwein, William B.** Use of water temperature study to define seepage paths: Assoc. Eng. Geologists Bull., v. 7, nos. 1-2, p. 11-20, illus., tables, 1970.
- Trautz, Otto R.** See *LeGeros, Racquel Z.* 02803
- Trautz, Otto R.** See *Klein, Edward.* 02878
- 03702 **Traverse, A.; Ames, H. T.** (compilers). Catalog of fossil spores and pollen — V. 32, Devonian spores: University Park, Pa., Pennsylvania State Univ. Palynol. Labs., 344 p., illus., 1970.
- 03886 **Traverse, A.; Ames, H. T.** (compilers). Catalog of fossil spores and pollen — Cumulative index, V. 21-30: University Park, Pa., Pennsylvania State Univ. Palynol. Labs., 166 p., 1970.
- 02349 **Travis, Russell B.** Nomenclature for sedimentary rocks: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 7, p. 1095-1107, illus., 1970.
- 09009 **Traxler, Ralph N.** Rheology and rheological modifiers other than elastomers — structure and time, [chap.] 4 *in* Bituminous materials — asphalts, tars, and pitches, A. J. Hoiberg, editor — v. 1: New York, Intersci. Publishers, p. 143-211, illus., tables, 1964.
- 09018 **Traxler, Richard W.** Microbial action on bituminous materials, [chap.] 7 *in* Bituminous materials — asphalts, tars, and pitches, A. J. Hoiberg, editor — v. 1: New York, Intersci. Publishers, p. 323-346, illus., tables, 1964.

- 09909 **Trefzger, Robert E.** Red Bluff Diversion Dam, in *Geologic guide to the Lassen Peak, Burney Falls, and Lake Shasta area, California* — Geol. Soc. Sacramento Ann. Field Trip, 1969: Davis, Calif., Univ. California, Geology Dept., p. 93-99, illus., table, 1969.
- Trembath, L. T.** See *Ghosh-Dastidar, P. 04487*
- 07706 **Tremblay, L. P.** The significance of uranium in quartzite in the Beaverlodge area, Saskatchewan: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 1, p. 280-305, illus., tables, 1970.
- Tremblay, L. P.** See *Fraser, J. A. 08662*
- Tremblay, L. P.** See *Fraser, J. A. 08664*
- 07372 **Trent, Donald Eugene.** High pressure synthesis and influence of pressure on cation distribution in 2-3 and 2-4 spinels [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2152B, 1970.
- 01608 **Trescott, Peter C.; Pinder, George F.; Jones, John F.** Digital model of alluvial aquifer: Am. Soc. Civil Engineers Proc., v. 96, paper 7264, Jour. Hydraulics Div., no. HY 5, p. 1115-1128, illus., 1970.
- 02418 **Trescott, Peter C.; Pinder, George F.** Air pump for small-diameter piezometers: Ground Water, v. 8, no. 3, p. 10-15, illus., 1970.
- Trescott, Peter C.** See *Wanless, H. R. 06708*
- 09621 **Trescott, Peter C.** Piezometer nests and the groundwater flow system near Berwick, Kings County, Nova Scotia: Nova Scotia Dept. Mines, Groundwater Sec. Rept. 70-1, 29 p., illus., table, 1970.
- 05297 **Trettin, H. P.** Ordovician-Silurian flysch sedimentation in the axial trough of the Franklinian geosyncline, northeastern Ellesmere Island, Arctic Canada [with French abs.], in *Flysch sedimentology in North America*: Geol. Assoc. Canada Spec. Paper 7, p. 13-35, illus., tables 1970.
- 10109 **Trettin, Hans P.** Canada Basin and Lomonosov Ridge — Inferences based on Precambrian and Lower Paleozoic geology of Canadian Arctic Islands [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2509, 1970.
- 10110 **Trettin, Hans P.** Early Paleozoic evolution of northern parts of Canadian Arctic Islands [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2509-2510, 1970.
- Trexler, D. T.** See *Edgerton, A. T. 09623*
- 00380 **Trifunac, M. D.; Hudson, D. E.** Analysis of the station no. 2 seismoscope record — 1966, Parkfield, California, earthquake [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 153-154, 1970.
- 03032 **Trifunac, M. D.; Hudson, D. E.** Analysis of the station no. 2 seismoscope record, 1966, Parkfield, California, earthquake: Seismol. Soc. America Bull., v. 60, no. 3, p. 785-794, illus., 1970.
- 03356 **Trifunac, Mihailo D.; Brune, James N.** Complexity of energy release during the Imperial Valley, California, earthquake of 1940: Seismol. Soc. America Bull., v. 60, no. 1, p. 137-160, illus., tables, 1970.
- 00512 **Trifunac, Mihailo Dimitrije.** Investigation of strong earthquake ground motion [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 3170B, 1970.
- 01321 **Trimble, Stanley W.** Culturally accelerated sedimentation on the Middle Georgia Piedmont [abs.]: Georgia Acad. Sci. Bull., v. 28, no. 2, p. s25, 1970.

- 07064 **Trimble, Stanley W.** The Alcovy River swamps — The result of culturally accelerated sedimentation: *Georgia Acad. Sci. Bull.*, v. 28, no. 4, p. 131-141, illus., 1970.
- 05670 **Triplehorn, D. M.** Clay mineral diagenesis in Atoka (Pennsylvanian) sandstones, Crawford County, Arkansas, in *Symposium on environmental aspects of clay minerals: Jour. Sed. Petrology*, v. 40, no. 3, p. 838-847, illus., 1970.
- 09368 **Trivedi, R.** Growth of dendritic needles from a supercooled melt: *Acta Metallurgica*, v. 18, no. 3, p. 287-296, illus., table, 1970.
- 05096 **Troitskiy, V. S.; Bondar', L. N.; Zelinskaya, M. R.; Strezhneva, K. M.** Comparison of the chemical composition of lunar surface material determined by radioastronomical observations with the results of chemical analysis obtained by Surveyor, in *Symposium on planetary atmospheres and surfaces*, Woods Hole, Mass., 1969: *Radio Sci.*, v. 5, no. 2, p. 247-251, illus., 1970.
- Trollman, W. M.** See *Maher, J. C.* 02114
- Trollope, D. Hugh.** See *Brown, Edwin T.* 02359
- 04182 **Troncales, Alfred C.** Study of amplitude-period relation of volcanic tremors on basaltic volcanoes, in *Individual studies by participants at the International Institute of Seismology and Earthquake Engineering*, V. 5: Tokyo, Internat. Inst. Seismology and Earthquake Eng., p. 11-23, illus., tables, 1970.
- Troup, Arthur G.** See *Harriss, Robert C.* 06564
- 02510 **Trowell, N. F.** Bell Lake-Sturgeon Lake area, Districts of Kenora and Thunder Bay: Ontario Dept. Mines Prelim. Geol. Maps P. 588, 589, 590, 591, scale 1 in. to 1/4 mi., text, 1970.
- 00381 **Troxel, Bennie W.** Anatomy of a fault zone, southern Death Valley, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 154, 1970.
- Troxel, Bennie W.** See *Wright, Lauren A.* 02399
- 03865 **Troxel, Bennie W.** Guide to selected features of Death Valley geology, in *Geologic guide to the Death Valley area, California* — *Geol. Soc. Sacramento, Ann. Field Trip Guidebook 1970: Sacramento, Calif., Geol. Soc. Sacramento*, p. 40-55, table, 1970.
- 10270 **Troyer Max L.** Bibliography of Wyoming geology, 1917-1945: *Wyoming Geol. Survey Bull.* 53, 73 p., 1969.
- Truesdell, A. H.** See *White, Donald E.* 01850
- Truesdell, A. H.** See *Muffler, L. J. P.* 09277
- 09413 **Truesdell, A. H.; Fournier, R. O.; White, D. E.; Muffler, L. J. P.** Silica budget for the Upper and Lower Geyser Basins of Yellowstone National Park, Wyoming, U.S.A. [abs.], in *American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?]*, p. 133, 1970.
- Truesdell, A. H.** See *White, D. E.* 09422
- Truesdell, A. H.** See *Fournier, R. O.* 10165
- 02720 **Tryggvason, E.; Qualls, B. R.** Seismic refraction measurements of crustal structure in Oklahoma: *Shale Shaker*, v. 20, no. 9, p. 174-175, illus., 1970.
- Trzcienski, W. E., Jr.** See *Carmichael, Dugald M.* 01865
- 03302 **Tsai, N. C.** A note on the steady-state response of an elastic half-space: *Seismol. Soc. America Bull.*, v. 60, no. 3, p. 795-808, illus., table, 1970.

- 04686 **Tsai, N. C.; Housner, G. W.** Calculation of surface motions of a layered half-space: *Seismol. Soc. America Bull.*, v. 60, no. 5, p. 1625-1651, illus., tables, 1970.
- 01219 **Tsai, Nien Chien.** Influence of local geology on earthquake ground motion [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 8, p. 3635B, 1970.
- Tsai, Y. B.** See *Aki, K.* 06039
- 01992 **Tsai, Yi-Ben; Aki, Keiiti.** Surface wave amplitude spectra from explosions and earthquakes in southwestern United States [abs.]: *EOS*, v. 51, no. 4, p. 353, 1970.
- 04276 **Tsai, Yi-Ben; Aki, Keiiti.** Precise focal depth determination from amplitude spectra of surface waves: *Jour. Geophys. Research*, v. 75, no. 29, p. 5729-5743, illus., table, 1970.
- 04333 **Tsai, Yi-Ben; Aki, Keiiti.** Source mechanism of the Truckee, California, earthquake of September 12, 1966: *Seismol. Soc. America Bull.*, v. 60, no. 4, p. 1199-1208, illus., 1970.
- Tsay, Fun-Dow.** See *Manatt, Stanley L.* 06290
- 03396 **Tschanz, C. M.; Pampeyan, E. H.** Geology and mineral deposits of Lincoln County, Nevada: *Nevada Bur. Mines Bull.* 73, 187 p., illus., tables, geol. maps, 1970.
- 10867 **Tschudy, Bernadine D.; Leopold, Estella B.** Aquilapollenites (rouse) Funkhouser — Selected Rocky Mountain taxa and their stratigraphic ranges, in *Symposium on palynology of the Late Cretaceous and early Tertiary*, San Francisco, Calif., 1966: *Geol. Soc. America Spec. Paper* 127, p. 113-167, illus., 1970.
- 00420 **Tschudy, Robert H.** Two new pollen genera (Late Cretaceous and Paleocene) with possible affinity to the Illiciaceae: *U. S. Geol. Survey Prof. Paper* 643-F, p. F1-F13, illus., table, 1970.
- 01506 **Tschudy, Robert H.; VanLoenen, Sharon D.** Illustrations of plant microfossils from the Yazoo Clay (Jackson Group, upper Eocene), Mississippi: *U.S. Geol. Survey Prof. Paper* 643-E, p. E1-E3, illus., 1970.
- 10866 **Tschudy, Robert H.** Palynology of the Cretaceous-Tertiary boundary in the northern Rocky Mountain and Mississippi Embayment regions, in *Symposium on palynology of the Late Cretaceous and early Tertiary*, San Francisco, Calif., 1966: *Geol. Soc. America Spec. Paper* 127, p. 65-111, illus., 1970.
- Tsong, F.** See *Cumming, G. L.* 05339
- Tsuprov, S. A.** See *Solopov, S. G.* 08256
- 10339 **Tucholke, Brian E.; Hollister, Charles D.** Deposition and composition of acoustically transparent deep sea sediments (greater Antilles Outer Ridge) [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 710, 1970.
- Tucker, Brian.** See *Brune, James.* 06076
- 05845 **Tucker, R. H.** Prologue — The Earth in space, in *Global geophysics*: New York, American Elsevier Publishing Company, p. 1-23, illus., 1970.
- Tucker, Ray A.** See *Tackett, Stanford L.* 01274
- Tuke, M. F.** See *Barnes, C. R.* 05553
- 08618 **Tukey, John W.** Some further inputs, in *Geostatistics — A colloquium* (D. F. Merriam, editor), Lawrence, Kan., 1970, *Proc.*: New York, Plenum Press, p. 163-174, illus., 1970.
- 01843 **Tullis, Jan.** Dauphine twinning produces preferred orientation in quartz aggregates [abs.]: *EOS*, v. 51, no. 4, p. 425, 1970.

- 03070 **Tullis, Jan.** Quartz — Preferred orientation in rocks produced by Dauphine twinning: *Science*, v. 168, no. 3937, p. 1342-1344, illus., 1970.
- 01844 **Tullis, Terry E.** Preferred orientations of mica after high and low temperature deformation [abs.]: *EOS*, v. 51, no. 4, p. 425, 1970.
- 02839 **Tully, Philip C.; King, Billy Joe; Dowdy, Emily.** Helium — Bibliography of technical and scientific literature, 1963, including papers on alpha-particles: *U.S. Bur. Mines Inf. Circ.* 8467, 831 p., 1970.
- 02864 **Tunny, J.** The influence of Saran Resin coatings on swelling of natural soil clods: *Soil Sci.*, v. 109, no. 4, p. 254-256, tables, 1970.
- Tupper, W. M.** See *Shafiqullah, M.* 06115
- 04803 **Turcan, A. N., Jr.; Winslow, A. G.** Quantitative mapping of salinity, volume, and yield of saline aquifers using borehole geophysical logs, in *Saline water symposium: Water Resources Research*, v. 6, no. 5, p. 1478-1481, illus., 1970.
- Turcotte, D. L.** See *Oxburgh, E. R.* 02369
- Turcotte, D. L.** See *Schubert, Gerald.* 03420
- 06261 **Turcotte, D. L.; Oxburgh, E. R.** Lunar convection: *Jour. Geophys. Research*, v. 75, no. 32, p. 6549-6552, illus., 1970.
- 08071 **Turek, A.; Peterman, Z. E.** Rb-Sr contribution to the location of Churchill-Superior boundary in Manitoba: *Canadian Jour. Earth Sci.*, v. 7, no. 3, p. 1017-1020, illus., table, 1970.
- 01700 **Turekian, K. K.; Kharkar, D. P.; Funkhouser, J.; Schaeffer, O. A.** An evaluation of the uranium-helium method of dating of fossil bones: *Earth and Planetary Sci. Letters*, v. 7, no. 5, p. 420-424, table, 1970.
- Turekian, K. K.** See *Walker, J. C. G.* 03223
- Turekian, K. K.** See *Bertine, K. K.* 03641
- Turekian, K. K.** See *Spencer, Derek W.* 06407
- 05727 **Turekian, Karl K.; Kharkar, D. P.** Neutron activation analysis of milligram quantities of Apollo 11 lunar rocks and soil, in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc.* — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1659-1664, table, 1970.
- 09414 **Turekian, Karl K.** Inferring conditions in the Atlantic Ocean and on its adjacent lands during the Wisconsin from the geochemistry of deep-sea deposits [abs.], in *American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.*: [Bozeman, Mont., Montana State Univ.?], p. 134-135, 1970.
- Turekian, Karl K.** See *Brass, Garret W.* 10523
- Turk, L. J.** See *Flawn, Peter T.* 02784
- 07999 **Turk, L. J.** Hydrology in the urban environment, in *Environmental geology — AGI short course lecture notes*, Milwaukee, Wis., 1970: Washington, D. C., Am. Geol. Inst., 37 p., paged separately, illus., tables, 1970.
- 08002 **Turk, L. J.** Disposal of solid wastes — Acceptable practice or geological nightmare., in *Environmental geology — AGI short course lecture notes*, Milwaukee, Wis., 1970: Washington, D. C., Am. Geol. Inst., 42 p., illus., tables, 1970.
- 06011 **Turk, Leland Jan.** Hydrogeology of the Bonneville Salt Flats, Utah [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 12, pt. 1, p. 5561B-5562B, 1970.



**Turkevich, Anthony L.** See *Patterson, James H.* 05094

**Turkevich, Anthony L.** See *Economou, Thanasis E.* 06258

**Turnbull, J. MacNeil.** See *Edge, Duane E.* 03225

- 03370 **Turnbull, William D.** Mammalian masticatory apparatus: Fieldiana — Geology, v. 18, no. 2, p. 149-356, illus., tables, 1970.

**Turner, Brian B.** See *Bickford, M. E.* 06062

- 05433 **Turner, G.** Argon-40/argon-39 dating of lunar rock samples, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1665-1684, illus., tables, 1970.

- 00382 **Turner, D. L.; Curtis, G. H.; Berry, F. A. F.; Jack, R. N.** Age relationship between the Pinnacles and Parkfield felsites and felsite clasts in the southern Temblor Range, California — Implications for San Andreas fault displacement [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 154-155, 1970.

- 00383 **Turner, D. L.; Surdam, R. C.; Hall, C. A.** The Obispo Formation and associated volcanic rocks in the central California Coast Ranges — K-Ar ages and biochronologic significance [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 155, 1970.

**Turner, Donald L.** See *Surdam, Ronald C.* 00376

- 04390 **Turner, Donald L.** Potassium-argon dating of Pacific Coast Miocene foraminiferal stages, in *Radiometric dating and paleontologic zonation*: Geol. Soc. America Spec. Paper 124, p. 91-129, illus., tables, 1970.

**Turner, F. J.** See *Paterson, M. S.* 05930

**Turner, Francis J.** See *Verhoogen, John.* 03811

- 05933 **Turner, Francis J.** Uniqueness versus conformity to pattern in petrogenesis: Am. Mineralogist, v. 55, nos. 3-4, p. 339-348, 1970.

- 05728 **Turner, G.** Argon-40/argon-39 dating of lunar rock samples, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1665-1684, illus., tables, 1970.

- 07068 **Turner, Grenville.** Ar-40:Ar-39 age determination of lunar rock 12013: Earth and Planetary Sci. Letters, v. 9, no. 2, p. 177-180, tables, 1970.

- 07363 **Turner, Neil Lee.** Carboniferous stratigraphy of western San Saba County, Texas [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 4, p. 2068B, 1970.

- 08687 **Turner, Philip A.** RAPLOT, a computer program for data processing and graphical display for radioisotopic sand tracer study: U.S. Army Corps Engineers Coastal Eng. Research Center Misc. Paper, no. 3-70, 60 p., illus., tables, 1970.

- 05459 **Turner, W. J.** Deep well disposal: Water and Wastes Eng., v. 7, no. 9, p. E28-E31, illus., 1970.

- 06726 **Turnock, A. C.** A pyroxene solvus section: Canadian Mineralogist, v. 10, pt. 4, p. 744-747, illus., 1970.

- 01580 **Tuthill, Samuel James.** A comparison of the Late Wisconsinan molluscan fauna of the Missouri Coteau district (North Dakota) with a modern Alaskan analogue [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 9, p. 4211B, 1970.

- 02115 **Tuttle, Sherwood D.** Landforms and landscapes: Dubuque, Iowa, Wm. C. Brown Publishers, 136 p., illus., 1970.
- 02416 **Tweto, Ogden; Bryant, Bruce; Williams, Frank E.** Mineral resources of the Gore Range-Eagles Nest Primitive Area and vicinity, Summit and Eagle Counties, Colorado: U.S. Geol. Survey Bull. 1319-C, p. C1-C127, illus., tables, geol. map, 1970.
- Twiss, P. C.** See *Smith, R. M.* 02728
- 05916 **Twiss, Page C.** Cenozoic history of Rim Rock Country, trans-Pecos Texas [summ.], in *The geologic framework of the Chihuahua tectonic belt — Symposium in honor of Ronald K. De Ford*, Midland, Tex., 1970: Midland, Tex., West Texas Geol. Soc., p. 50-52, illus., 1970.
- Twiss, Page C.** See *Chaudhuri, S.* 06094
- 06920 **Twiss, Robert; Streatfield, David; Kojan, Eugene; Magill, Arthur W.** Nicasio — Hidden valley in transition: San Rafael, Calif., Marin County Plan. Dept., 50 p., illus., tables, geol. map [1970?].
- 05050 **Tychsen, Paul C.** "Firsts" in the geological record, [Chap.] 8 in *Rock strata and the Bible record* (P. A. Zimmerman, editor): St. Louis, Mo., and London, England, Concordia Publishing House, p. 124-132, 1970.
- 05052 **Tychsen, Paul C.** Geology and the flood, [Chap.] 11 in *Rock strata and the Bible record* (P. A. Zimmerman, editor): St. Louis, Mo., and London, England, Concordia Publishing House, p. 193-200, 1970.
- Tynan, Edmund C.** See *Vaughan, George B.* 06799
- Tyner, Edward H.** See *Cescas, Michel P.* 03934
- 07953 **Tysdal, Russell Gene.** Geology of the north end of the Ruby Range, southwestern Montana [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3488B-3489B, 1970.
- 02474 **Uchida, Kinsuke; Ichisugi, Norio; Aratake, Nagaharu; Shigeno, Saburo.** Application of two-dimensional trend surface analysis for the ore reserve estimation at Lornex mine, B.C., Canada [in Japanese, with English abs.]: *Mining Geology*, v. 20 (2), no. 100, p. 92-105, illus., tables, 1970.
- Uchupi, Elazar.** See *Emery, K. O.* 00099
- 00135 **Uchupi, Elazar.** Atlantic continental shelf and slope of the United States — Shallow structure: U.S. Geol. Survey Prof. Paper 529-I, p. 11-144, illus., 1970.
- Uchupi, Elazar.** See *Oldale, R. N.* 01481
- Uchupi, Elazar.** See *Ballard, Robert D.* 04490
- 04745 **Uchupi, Elazar; Phillips, J. D.; Prada, K. E.** Origin and structure of the New England Seamount Chain: *Deep-Sea Research*, v. 17, no. 3, p. 483-494, illus., 1970.
- Uchupi, Elazar.** See *Luyendyk, B. P.* 10576
- Udintsev, G.** See *Revelle, R.* 08382
- 09997 **Udintsev, G. B.; Dmitriyev, L. V.** Ultrabasic rocks, in *The sea — v. 4, New concepts of sea floor evolution, Pt. 1, General observations* (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 521-573, illus., tables, 1970.
- Uhlmann, D. R.** See *Scherer, G.* 03291

- 04755 **Uhrenholdt, Soren.** Bayou White Field, Pointe Coupee Parish, Louisiana, *in* Typical oil and gas fields of southwestern Louisiana, V. 2: Lafayette, La., Lafayette Geol. Soc., p. 3-3d, illus., 1970.
- 03342 **Ulbrich, Mabel C.** Chemical individuality of lunar, meteoritic, and terrestrial silicate rocks: *Science*, v. 168, no. 3937, p. 1375-1376, illus., 1970.
- 03100 **Ulugur, Mustafa Elmas.** Fluvial physiography as a factor in basin response [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 10, p. 4612B, 1970.
- 09748 **Un dept. Econ. and Social Affairs.** Mineral resources development with particular reference to the developing countries: *United Nations Pub. E.70.Ii.B.3*, 74 p., 1970.
- 00425 **Underwood, James R., Jr.** Steeply dipping strata, Marion County, Florida: *Florida Acad. Sci. Quart. Jour.*, v. 32, no. 2, p. 99-107, illus., 1969 [1970].
- Unger, J. D.** See *Cloud, W. K.* 00858
- 10593 **Unger, J. D.; Coakley, J. M.** Microearthquakes near Lassen Peak, California [abs.]: *EOS*, v. 51, no. 11, p. 929, 1970.
- 00384 **Unger, John D.; Eaton, Jerry P.** Aftershocks of the October 1, 1969, Santa Rosa, California, earthquakes [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 155, 1970.
- 06462 **Unger, John D.; Decker, Robert W.** The microearthquake activity of Mt. Rainier, Washington: *Seismol. Soc. America Bull.*, v. 60, no. 6, p. 2023-2035, illus., 1970.
- Unger, William L.** See *Meyer, Robert P.* 09671
- Updegrove, W. S.** See *Levy, Ram L.* 02737
- Updegrove, W. S.** See *Oró, J.* 05088
- 03371 **Updike, R. G.; Péwé, T. L.** A new Quaternary formation in northern Arizona: *Plateau*, v. 43, no. 1, p. 21-26, illus., 1970.
- 04850 **Updike, R. G.; Péwé, T. L.** The glacial and related Quaternary events of the San Francisco Peaks, Arizona, *in* Guidebook to Four Corners, Colorado Plateau, central Rocky Mountain region — Natl. Assoc. Geology Teachers, Southwest Sec., Field Conf. Earth Sci., Cedar City, Utah, 1970: Socorro, N. Mex., New Mexico Inst. Mining and Technology, p. 39-42, illus., 1970.
- Updike, Randall G.** See *Péwé, Troy L.* 05011
- 01479 **Upson, Joseph E.** The Gardiners Clay of eastern Long Island, New York — A reexamination, *in* Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B157-B160, illus., table, 1970.
- 06248 **Upton, B. G. J.** Basic rocks of the Gardar igneous province, *in* Report of activities, 1969: *Grönlands Geol. Undersøgelse Rap.* 28, p. 26-29, 1970.
- 03806 **Upton, William Bayly, Jr.** Landforms and topographic maps, illustrating landforms of the continental United States: New York and London, John Wiley and Sons, 134 p., illus., 1970.
- 04356 **Urban, J. B.; Padovani, E. Reeves.** A new scanning electron microscope specimen holder for palynology [with French abs.]: *Pollen et Spores*, v. 12, no. 1, p. 131-139, illus., 1970.
- 09196 **Urban, J. B.** Chitinozoa of the Devonian Callaway Formation of Missouri [abs.], *in* Perkins, B. F. (editor), *Geoscience and Man* — v. 1, Am. Assoc. Stratig. Palynologists Ann. Mtg., 1st, 1968, Proc.: Baton Rouge, La., Louisiana State Univ. School of Geoscience, p. 133-134, 1970.

- 00576 **Urban, James B.; Kline, Judith K.** Chitinozoa of the Cedar City Formation, Middle Devonian of Missouri: Jour. Paleontology, v. 44, no. 1, p. 69-76, illus., 1970.
- 00934 **Urban, James B.** Palynology of the Mineral Coal, Desmoinesian Series of Oklahoma and Kansas [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 302, 1970.
- 00935 **Urban, James B.** Some new chitinozoans from the Cedar Valley Formation of Iowa [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 302-303, 1970.
- 01873 **Urban, James B.** *Ancyrospora fallacia*, a new sporomorph exhibiting deceptive variations in preservation: Micropaleontology, v. 16, no. 2, p. 221-226, illus., 1970.
- Urey, H. C. See *Marti, K.* 05707
- Urey, Harold C. See *Murphy, Mary E.* 05745
- 06921 **U.S. Bureau of Reclamation.** Senator Wash Dam, Dikes, and Pumping-Generating Plant — Technical record of design and construction: Denver, Colo., U.S. Bur. Reclamation, 198 p., illus., tables, geol. maps, 1970.
- 09167 **U.S. Bureau of Reclamation.** Glen Canyon dam and powerplant — technical record of design and construction: Denver, Colo., Bur. Reclamation, 658 p., illus., tables, 1970.
- 02775 **U.S. Coast and Geodetic Survey.** Isogonic chart for the United States (and Alaska and Hawaii), 1970.0 (lines of equal magnetic declination and equal annual change): Washington, D.C., U.S. Dept. Commerce, scale 1:5,000,000, revised 1970.
- 03700 **U.S. Coast and Geodetic Survey.** (compiler). Magnetic variation (6th edition), epoch 1970.0 — H.O. 1706: Washington, D.C., U.S. Naval Oceanog. Office, scale 1:39,000,000, 1970.
- 06034 **U.S. Coast and Geodetic Survey.** (Natl. Earthquake Inf. Center). Seismicity of Alaska — NEIC 3011: Washington, D.C., U.S. Dept. Commerce, Environmental Sci. Services Adm., 1 sheet, 1970.
- 06035 **U.S. Coast and Geodetic Survey.** (Natl. Earthquake Inf. Center). Seismicity of the United States — NEIC 3012: Washington, D.C., U.S. Dept. Commerce, Environmental Sci. Services Adm., 1 sheet, 1970.
- 06036 **U.S. Coast and Geodetic Survey.** (Natl. Earthquake Inf. Center). Seismicity of Middle America — NEIC 3013: Washington, D.C., U.S. Dept. Commerce, Environmental Sci. Services Adm., 1 sheet, 1970.
- 06037 **U.S. Coast and Geodetic Survey.** (Natl. Earthquake Inf. Center). World seismicity 1961-1969 — NEIC 3005: Washington, D.C., U.S. Dept. Commerce, Environmental Sci. Services Adm., 1 sheet, 1970.
- 00495 **U.S. Geological Survey.** Aeromagnetic map of parts of the Kramer and Boron quadrangles, southeastern California: U. S. Geol. Survey Geophys. Inv. Map GP-680, scale 1:62,500, 1970.
- 01152 **U.S. Geological Survey; U.S. National Park Service.** The river and the rocks — The geologic story of Great Falls and the Potomac River Gorge: Washington, D. C., U.S. Govt. Printing Office, 46 p., illus., 1970.
- 01254 **U.S. Geological Survey.** Ground-water levels in the United States, 1963-67 — Northeastern states: U.S. Geol. Survey Water-Supply Paper 1977, 238 p., illus., tables, 1970.
- 01515 **U.S. Geological Survey.** Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B1-B267, illus., tables, 1970.

- 01653 **U.S. Geological Survey.** Apollo 6 photomap — West-east corridor from the Pacific Ocean to northern Louisiana: Washington, D. C., U.S. Geol. Survey, 4 sheets, 1970.
- 02039 **U.S. Geological Survey.** Aeromagnetic map of the Shutesbury quadrangle and part of the Millers Falls quadrangle, Franklin and Hampshire Counties, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-697, scale 1:24,000, 1970.
- 02040 **U.S. Geological Survey.** Aeromagnetic map of the Boston North quadrangle, Middlesex, Suffolk and Essex Counties, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-708, scale 1:24,000, 1970.
- 02041 **U.S. Geological Survey.** Aeromagnetic map of part of the Salem Depot quadrangle, Rockingham County, New Hampshire, and Essex County, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-712, scale 1:24,000, 1970.
- 02042 **U.S. Geological Survey.** Aeromagnetic map of part of the Newburyport West quadrangle, Essex County, Massachusetts, and Rockingham County, New Hampshire: U.S. Geol. Survey Geophys. Inv. Map GP-714, scale 1:24,000, 1970.
- 02043 **U.S. Geological Survey.** Aeromagnetic map of parts of the Gloucester and Rockport quadrangles, Essex County, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-724, scale 1:24,000, 1970.
- 02044 **U.S. Geological Survey.** Aeromagnetic map of the Quabbin Reservoir quadrangle, Franklin, Worcester, and Hampshire Counties, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-698, scale 1:24,000, 1970.
- 02045 **U.S. Geological Survey.** Aeromagnetic map of the Petersham quadrangle, Worcester County, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-699, scale 1:24,000, 1970.
- 02046 **U.S. Geological Survey.** Aeromagnetic map of the Barre quadrangle, Worcester County, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-700, scale 1:24,000, 1970.
- 02047 **U.S. Geological Survey.** Aeromagnetic map of the Wachusett Mountain quadrangle, Worcester County, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-701, scale 1:24,000, 1970.
- 02048 **U.S. Geological Survey.** Aeromagnetic map of the Sterling quadrangle, Worcester County, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-702, scale 1:24,000, 1970.
- 02049 **U.S. Geological Survey.** Aeromagnetic map of the Clinton quadrangle, Worcester County, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-703, scale 1:24,000, 1970.
- 02050 **U.S. Geological Survey.** Aeromagnetic map of the Hudson quadrangle, Worcester and Middlesex Counties, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-704, scale 1:24,000, 1970.
- 02051 **U.S. Geological Survey.** Aeromagnetic map of the Maynard quadrangle, Middlesex County, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-705, scale 1:24,000, 1970.
- 02052 **U.S. Geological Survey.** Aeromagnetic map of the Concord quadrangle, Middlesex County, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-706, scale 1:24,000, 1970.
- 02053 **U.S. Geological Survey.** Aeromagnetic map of the Lexington quadrangle, Middlesex County, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-707, scale 1:24,000, 1970.

- 02054 **U.S. Geological Survey.** Aeromagnetic map of part of the Marblehead South quadrangle, Essex and Suffolk Counties, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-710, scale 1:24,000, 1970.
- 02055 **U.S. Geological Survey.** Aeromagnetic map of part of the Haverhill quadrangle, Essex County, Massachusetts, and Rockingham County, New Hampshire: U.S. Geol. Survey Geophys. Inv. Map GP-713, scale 1:24,000, 1970.
- 02056 **U.S. Geological Survey.** Aeromagnetic map of part of the Newburyport East quadrangle, Essex County, Massachusetts, and Rockingham County, New Hampshire: U.S. Geol. Survey Geophys. Inv. Map GP-715, scale 1:24,000, 1970.
- 02057 **U.S. Geological Survey.** Aeromagnetic map of the Lawrence quadrangle, Essex and Middlesex Counties, Massachusetts, and Rockingham and Hillsborough Counties, New Hampshire: U.S. Geol. Survey Geophys. Inv. Map GP-716, scale 1:24,000, 1970.
- 02058 **U.S. Geological Survey.** Aeromagnetic map of the South Groveland quadrangle, Essex County, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-717, scale 1:24,000, 1970.
- 02059 **U.S. Geological Survey.** Aeromagnetic map of the Georgetown quadrangle, Essex County, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-718, scale 1:24,000, 1970.
- 02060 **U.S. Geological Survey.** Aeromagnetic map of part of the Ipswich quadrangle, Essex County, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-719, scale 1:24,000, 1970.
- 02061 **U.S. Geological Survey.** Aeromagnetic map of the Wilmington quadrangle, Middlesex and Essex Counties, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-720, scale 1:24,000, 1970.
- 02062 **U.S. Geological Survey.** Aeromagnetic map of the Reading quadrangle, Middlesex and Essex Counties, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-721, scale 1:24,000, 1970.
- 02063 **U.S. Geological Survey.** Aeromagnetic map of the Salem quadrangle, Essex County, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-722, scale 1:24,000, 1970.
- 02064 **U.S. Geological Survey.** Aeromagnetic map of part of the Marblehead North quadrangle, Essex County, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-723, scale 1:24,000, 1970.
- 03209 **U.S. Geological Survey.** Aeromagnetic map of the Lynn quadrangle, Essex and Suffolk Counties, Massachusetts: U.S. Geol. Survey Geophys. Inv. Map GP-709, scale 1:24,000, 1970.
- 03794 **U.S. Geological Survey.** Bibliography of North American geology, 1966: U.S. Geol. Survey Bull. 1266, 1069 p., 1970.
- 03795 **U.S. Geological Survey.** Bibliography of North American geology 1967: U.S. Geol. Survey Bull. 1267, 1029 p., 1970.
- 03813 **U.S. Geological Survey.** Aeromagnetic map of part of western Minnesota: U.S. Geol. Survey Geophys. Inv. Map GP-692, scale 1:250,000, 1970.
- 03814 **U.S. Geological Survey.** Aeromagnetic map of Antelope Valley and part of the Garlock fault zone, south-central California: U.S. Geol. Survey Geophys. Inv. Map GP-695, scale 1:250,000, 1970.

- 03875 **U.S. Geological Survey.** Aeromagnetic map of the Menominee-Northland area, Dickinson, Marquette, and Menominee Counties, Michigan, and Marinette County, Wisconsin: U.S. Geol. Survey Geophys. Inv. Map GP-711, 2 sheets, scale 1:62,500, 1970.
- 04239 **U.S. Geological Survey.** Geological Survey research 1970, Chap. C: U.S. Geol. Survey Prof. Paper 700-C, p. C1-C251, illus., tables, 1970.
- 05612 **U.S. Geological Survey.** Mercury in the environment: U.S. Geol. Survey Prof. Paper 713, 67 p., illus., tables, 1970.
- 06161 **U.S. Geological Survey.** Geological Survey research 1970, Chap. D: U.S. Geol. Survey Prof. Paper 700-D, p. D1-D317, illus., tables, 1970.
- 06562 **U.S. Geological Survey.** Geological Survey research 1970, Chap. A: U.S. Geol. Survey Prof. Paper 700-A, p. A1-A425, illus., 1970.
- 06699 **U.S. Geological Survey.** The national atlas of the United States of America: Washington, D. C., U.S. Geol. Survey, 417 p., illus., 1970.
- 07074 **U.S. Geological Survey; Am. Association of Petroleum Geologists; Northern California Geological Society; Adkison, W. L.; Brosge, Mary M. (editors).** Proceedings of the geological seminar on the North Slope of Alaska, Palo Alto, Calif., 1970: Los Angeles, Calif., Am. Assoc. Petroleum Geologists Pacific Sec., papers paged separately, illus., table, 1970.
- 07208 **U.S. Geological Survey.** Annual report on ground water in Arizona, spring 1969 to spring 1970: Arizona Land Dept. Water-Resources Rept. 43, 44 p., illus., table, 1970.
- 10691 **U.S. Geological Survey.** Water resources data for North Dakota — pt. 2, Water quality records, 1969: Washington, D.C., U.S. Govt. Printing Office, 77 p., illus., tables, 1969.
- U.S. National Park Service.** See *U.S. Geological Survey. 01152*
- 04589 **U.S. Natl. Aeronaut. and Space Adm.** Remote sensing of earth resources, a literature survey with indexes — NASA SP-7036: Springfield, Va., Clearinghouse Federal Sci. and Tech. Inf., 1276 p., 1970.
- 07769 **U.S. Natl. Aeronaut. and Space Adm.** Earth Resources Aircraft Program, status review, 2d Ann., Houston, Tex., 1969 — V. 1, Geology and geography; V. 2, Agriculture, forestry, and sensor studies; V. 3, Hydrology and oceanography: Houston, Texas, U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, paged separately, illus., tables [1970,].
- 09162 **U.S. Natl. Aeronaut. and Space Adm. (Sci. and Technology Div.).** Ecological surveys from space: U.S. Natl. Aeronautics and Space Adm. Spec. Pub. 230, 75 p., illus., tables, 1970.
- 02841 **U.S. Natl. Aeronaut. and Space Adm.** Earth resources aircraft program status review, Houston, 1968 — V. 1, Geology, geography, and sensor studies: Houston, Tex., Manned Spacecraft Center, papers paged separately, illus., tables [1970,].
- 09734 **U.S. Office Sci. and Technology.** Report of the task force on earthquake hazard reduction — Program priorities: U.S. Govt. Printing Office, 54 p., illus., 1970.
- Usami, T.** See *Landisman, M. 03980*
- 01845 **Uzdowski, E.; Knoke, R.** Paleo-humidity indicators in marine evaporites [abs.]: EOS, v. 51, no. 4, p. 452, 1970.

- 10111 **Ustritskiy, V. I.; Chernyak, G. E.** Marine upper Paleozoic deposits of Arctic [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2510, 1970.
- Utgaard, John.** See *Fraunfelter, G. H.* 01209
- Uyeda, S.** See *Takeuchi, H.* 08285
- Uyeda, S.** See *Revelle, R.* 08382
- Uyeno, T. T.** See *Norford, B. S.* 04100
- 05554 **Uyeno, T. T.; Barnes, C. R.** Conodonts from the Levis Formation (zone D1) (Middle Ordovician), Levis, Quebec [with French abs.], in *Contributions to Canadian paleontology: Canada Geol. Survey Bull.* 187, p. 99-123, illus., table, 1970.
- 00769 **Vacher, H. Leonard.** Coarse and fine structure of the Bermuda eustatic curve — Significance to coastal plain stratigraphy [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 245, 1970.
- 02693 **Vacher, H. Leonard; Mackenzie, Fred T.** Pleistocene calcarenite lithosomes of Bermuda [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 873-874, 1970.
- Vaidya, S. N.** See *Kennedy, G. C.* 00586
- Vail, Ruth S.** See *Wanless, H. R.* 06708
- 09768 **Vakrushev, V. A.; Prokoptsev, N. G.** Pervichno magmaticheskoye ul'fidnyye obrazovaniya v bazal'takh okeanicheskoy kory i vo vklucheniyyakh ul'traosnovnykh porod [primary magmatic sulfides in oceanic basalts and in inclusions of ultrabasic rocks]: *Akad. Nauk Sssr geologiya Rud. Mestorozhdeniy*, v. 11, no. 6, p. 14-26, illus., table, 1969.
- 01329 **Valastro, S., Jr.; Davis, E. Mott.** University of Texas at Austin radiocarbon dates VII: Radiocarbon, v. 12, no. 1, p. 249-280, 1970.
- 03187 **Valastro, S., Jr.; Davis, E. Mott.** University of Texas at Austin radiocarbon dates VIII: Radiocarbon, v. 12, no. 2, p. 617-639, table, 1970.
- Valencia, Mark J.** See *Leffingwell, Harry A.* 02297
- 06450 **Valentine, J. W.; Moores, E. M.** Plate-tectonic regulation of faunal diversity and sea level — A model: *Nature*, v. 228, no. 5272, p. 657-659, illus., 1970.
- 00385 **Valentine, James W.; Conoboy, John T.** Genetic strategies associated with resource regimes and their effects on taxonomic diversity in the fossil record [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 156, 1970.
- 00386 **Valentine, James W.** How many marine invertebrate fossil species — A new approximation [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 156, 1970.
- 02086 **Valentine, James W.** How many marine invertebrate fossil species — A new approximation: *Jour. Paleontology*, v. 44, no. 3, p. 410-415, illus., tables, 1970.
- 03346 **Valentine, James W.; Lipps, Jere H.** Marine fossils at Rancho LaBrea: *Science*, v. 169, no. 3942, p. 277-278, illus., 1970.
- Valentine, James W.** See *Lipps, Jere H.* 04927
- 10290 **Valentine, James W.** Plate tectonics and the history of marine life [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 710, 1970.
- Valentine, L. B.** See *Herz, Norman.* 04245



**Valentine, L. D.** See *Herz, Norman*. 00214

**Vali, V.** See *Slade, D. V.* 03088

**Vali, V.** See *Slade, D. V.* 06624

- 06675 **Vali, V.** Earth strain measurements with a one kilometer laser interferometer, in *Laser applications in the geosciences* (J. Gauger and F. F. Hall, Jr., editors) — Symposium, Huntington Beach, Calif., 1969, Proc.: North Hollywood, Calif., Western Periodicals Co., p. 153-162, illus., 1970.

**Vali, V.** See *Bostrom, R. C.* 10822

- 09975 **Vali, Victor.** Some earth strain measurements with laser interferometer, in *Earthquake displacement fields and the rotation of the Earth* (L. Mansinha, D. E. Smylie, A. E. Beck, editors) - NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 206-216, illus., 1970.

- 06214 **Valiquette, Guy; Archambault, Ginette.** Les gabbros et syenites du complexe de Brome [The gabbros and the syenites of the Brome Complex (with English abs.)], in *Alkaline rocks, the Monteregian Hills* — Symposium, Montreal, 1969, Proc.: Canadian Mineralogist, v. 10, pt. 3, p. 485-510, illus., tables, 1970.

- 03527 **Vallee, Marcel; Dubuc, Fernand.** The St. Honore carbonatite complex, Dubuc County, Que. [abs.]: Canadian Mining and Metall. Bull., v. 63, no. 695, p. 299, 1970.

- 10675 **Vallee, Marcel; Dubuc, Fernand.** The St-Honore carbonatite complex, Quebec [with English and French abs.]: Canadian Mining and Metall. Bull., v. 63, no. 704, p. 1384-1394, illus., tables, 1970.

**Vallye, James L.** See *O'Neill, James F.* 08578

**Vallier, Tracy.** See *McManus, Dean A.* 07143

**Vallier, Tracy.** See *McManus, Dean A.* 07249

- 01108 **Vallier, Tracy L.** Deep Sea Drilling Project — An opportunity for student involvement in current oceanographic research [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 408, 1970.

- 01109 **Vallier, Tracy L.; Waldrip, James; Shimer, S. S.** Granitic clasts in Upper Triassic conglomerates, Snake River Canyon, Oregon and Idaho [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 408, 1970.

- 07145 **Vallier, Tracy L.** Grain size analysis, Chap. 14 in *Initial reports of the Deep Sea Drilling Project — V. 5, Leg 5 of cruises of Glomar Challenger*, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office, p. 421-430, illus., table, 1970.

- 07146 **Vallier, Tracy L.** Carbon carbonate results, Chap. 15 in *Initial reports of the Deep Sea Drilling Project — V. 5, Leg 5 of cruises of Glomar Challenger*, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office, p. 431-440, table, 1970.

- 07154 **Vallier, Tracy L.** Volcanism, Chap. 24 in *Initial reports of the Deep Sea Drilling Project — V. 5, Leg 5 of cruises of Glomar Challenger*, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office, p. 531-534, tables, 1970.

- 07252 **Vallier, Tracy L.** The mineralogy of some turbidite sands from sites 32 and 35, Chap. 25 in *Initial reports of the Deep Sea Drilling Project — V. 5, Leg 5 of cruises of Glomar Challenger*, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office, p. 535-539, tables, 1970.

- 09811 **Vallier, Tracy L.; Brooks, Howard C.** Geology and copper deposits of the Homestead area, Oregon and Idaho: Ore Bin, v. 32, no. 2, p. 37-57, illus., tables, 1970.
- Van, Tran K.** See *Droz, Karel*. 09147
- 01465 **VanAlstine, Ralph E.** Allochthonous Paleozoic blocks in the Tertiary San Luis-Upper Arkansas graben, Colorado, in Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B43-B51, illus., 1970.
- VanAndel, S. I.** See *Hospers, J.* 06686
- 08462 **VanAtta, Robert E.** Device for field determination of heavy metals in natural waters: Illinois Univ. Water Resources Center Research Rept., no. 35, 28 p., illus., tables, 1970.
- 10344 **VanBavel, C. H. M.** The three-phase domain in hydrology, in Water in the unsaturated zone. V. 1: Internat. Assoc. Sci. Hydrology Pub. 82, p. 23-30, discussion p. 30-32, 1968.
- vanBoeckel, J.** See *Gibb, R. A.* 07675
- vanBreemen, O.** See *Baadsgaard, H.* 03893
- 00806 **VanBurkalow, Anastasia.** Memorial to Henry Dewey Thompson (1898-1967): Geol. Soc. America Proc. 1967, p. 273-275, portrait, 1970.
- Vand, V.** See *Kanamaru, F.* 09110
- Vandenberg, A.** See *Lennox, D. H.* 06931
- 10858 **VandenBold, W. A.** Estado de nuestro conocimiento de los ostracodos fosiles de America Central [status of knowledge of fossil ostracods of Central America (with Spanish and English abs.)2, in Trabajos tecnicos presentados en la segunda reunion de geologos de America Central: Inst. Centroamericano Inv. y Tecnologia Indus. Pubs. Geol., no. 2, p. 51-53, illus., 1969.
- 07514 **VanDenburgh, A. S.; Glancy, Patrick A.** Water-resources appraisal of the Columbus Salt Marsh-Soda Spring Valley area, Mineral and Esmeralda Counties, Nevada: Nevada Div. Water Resources, Water Resources-Reconn. Ser. Rept. 52, 66 p., illus., tables, 1970.
- VanDenburgh, A. S.** See *Glancy, Patrick A.* 09934
- 06585 **Vandergraaf, Tjalle Thys.** Some aspects of neutron activation analysis of silicate rocks [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 557B-558B, 1970.
- 10652 **VandeWalle, Marc.** Geology of the southwest quarter of Verneuil township [Abitibi-East county] - Preliminary report [also French edition]: Quebec Dept. Nat. Resources Prelim. Rept. 591, 17 p., illus., tables, ge. l. map. 1970.
- 10654 **VandeWalle, Marc.** Geology of the northwest quarter of Lesueur township, Abitibi-East county [also French edition]: Quebec Dept. Nat. Resources Prelim. Rept. 599, 17 p., illus., tables, geol. map, 1970.
- 01667 **VanDiver, Bradford B.** Origin of biotite orbicules in "Bullseye Granite" of Craftsbury, Vermont: Am. Jour. Sci., v. 268, no. 4, p. 322-340, illus., tables, 1970.
- 05019 **VanDiver, Bradford B.; Rabson, Gustave.** Modal analysis of closed banded structures by radial point counting: Jour. Geology, v. 78, no. 5, p. 589-596, illus., table, 1970.

- 09037 **VanDiver, Bradford B.** Meta-anorthosite of the Jay-Whiteface nappe, Ausable Forks-Lake Placid quadrangles, northeastern Adirondacks, New York — trip H in Guidebook to field excursions, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., 14 unnumbered p. illus., tables, 1969.
- vanDonk, Jan.** See *Broecker, Wallace S.* 02142
- 09415 **VanDonk, Jan.** The oxygen isotope record in deep sea sediments [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970. Abs.: [Bozeman, Mont., Montana State Univ.?], p. 136, 1970.
- 04899 **VanDorn, William G.** Tsunami response at Wake Island, a model study: Jour. Marine Research, v. 28, no. 3, p. 336-344, illus., 1970.
- 06642 **VanDorn, William G.** A model experiment on the generation of the tsunami of March 28, 1964 in Alaska, in Tsunamis in the Pacific Ocean — Internat. Symposium on Tsunamis and Tsunami Research, Honolulu, Hawaii, 1969, Proc.: Honolulu, Hawaii, East-West Center Press, p. 33-45, illus., table, 1970.
- 02351 **Vandorston, P. L.** Environmental analysis of Swan Peak Formation in Bear River Range, north-central Utah and southeastern Idaho: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 7, p. 1140-1154, illus., 1970.
- VanDyke, L. H.** See *Swann, D. H.* 03059
- 08036 **vanEverdingen, R. O.** The Ink Pots, a group of karst springs in the Rocky Mountains near Banff, Alberta — Reply to R. F. Legget [1970 discussion of 1969 paper]: Canadian Jour. Earth Sci., v. 7, no. 2, pt. 1, p. 552, 1970.
- 08057 **vanEverdingen, R. O.** The Paint Pots, Kootenay National Park, British Columbia — Acid spring water with extreme heavy-metal content: Canadian Jour. Earth Sci., v. 7, no. 3, p. 831-852, illus., tables, 1970.
- vanHinte, J. E.** See *Berggren, W. A.* 06160
- VanHorn, Richard.** See *Arnow, Ted.* 06188
- 11235 **vanHylckama, T. E. A.** Effect of soil salinity on the loss of water from vegetated and fallow soil, in Water in the unsaturated zone, V. 2: Internat. Assoc. Sci. Hydrology Pub. 83, p. 635-644, illus., tables, 1968.
- VanLandingham, Sam L.** See *Messina-Allen, S.* 03585
- VanLoenen, Richard E.** See *Lee, Donald E.* 06183
- VanLoenen, Sharon D.** See *Tschudy, Robert H.* 01506
- VanNoy, Ronald M.** See *Becraft, George E.* 01878
- 10445 **Vanorny, Patricia M.** A history of the South Dakota Geological Survey: South Dakota Geol. Survey Educ. Ser. 4, 116 p., illus., portraits, 1970.
- 10659 **VanPoolen, H. K.; Hoover, D. B.** Waste disposal and earthquakes at the Rocky Mountain Arsenal, Derby, Colorado: Jour. Petroleum Technology, v. 22, August, p. 983-993, illus., tables, 1970.
- 09495 **VanReenan, Earl D.** Geophysical approach to submarine pipeline surveys, in Offshore Technology Conference, 2d Ann., Houston, Tex., 1970, Preprints — v. 1: Dallas, Tex., Offshore Technology Conf., p. I-367 — I-378, illus., 1970.
- 00505 **vanRyswyk, Albert Leonard.** Forest and alpine soils of south-central British Columbia [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 7, p. 2993B, 1970.

**Vanstrum, V. V.** See *Puri, Harbans S.* 09752

- 08518 **VanValen, Leigh.** Late Pleistocene extinctions, in *Evolution of communities — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc., Pt. E: Lawrence, Kans., Allen Press, p. 469-485, table, 1970.*

- 01531 **VanVoast, W. A.; Jerabek, L. A.; Novitzki, R. P.** Water resources of the Redwood River watershed, southwestern Minnesota: U.S. Geol. Survey Hydrol. Inv. Atlas HA-345, 3 sheets, various scales, text, 1970.

**VanVoorhis, Gerald D.** See *Hohmann, Gerald W.* 04785

**VanWormer, J. D.** See *Romig, P. R.* 00349

**VanWormer, J. D.** See *Romig, Philip R.* 01624

- 05261 **VanZelst, T. W.** Suggested method for subsurface testing by electrical resistivity measurements, in *Special procedures for testing soil and rock for engineering purposes (5th edition): Am. Soc. Testing and Materials Spec. Tech. Pub. 479, p. 32-35, illus., table, 1970.*

- 09369 **Varma, C. K. R.** Some observations on the reported evidence of slip during growth of natural diamond crystals: *Acta Metallurgica*, v. 18, no. 10, p. 1113-1119, illus., 1970.

- 07452 **Varnes, D. J.** Model for simulation of residual stress in rock, Chap. 22 in *Rock mechanics, theory and practice — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 415-426, illus., 1970.*

- 05026 **Vastano, A. C.; Reid R. O.** Tsunami response at Wake Island — Comparison of the hydraulic and numerical approaches: *Jour. Marine Research*, v. 28, no. 3, p. 345-356, illus., 1970.

- 04093 **Vastola, F. J.; Given, P. H.; Dutcher, R. R.; Pirone, A. J.** A laser-micropyrolysis system for the study of organic sediments and inclusions [abs.], in *Advances in organic geochemistry — Internat. Cong., 3d, Proc. (G. D. Hobson and G. C. Speers, editors): London and New York, Pergamon Press (Internat. Ser. Mons. Earth Sci., V. 32), p. 427, 1970.*

**Vaughan, David J.** See *Burns, Roger G.* 09112

- 10291 **Vaughan, David J.; Burns, Roger G.; Burns, Virginia Mee.** Mineralogy and bonding of thiospinel minerals [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 711, 1970.

- 09925 **Vaughan, Francis E.** Andrew C. Lawson — scientist, teacher, philosopher: *Glendale, California, Arthur H. Clark Company, 474 p., illus., 1970.*

- 06799 **Vaughan, George B.; Tynan, Edmund C.; Yen, Teh Fu.** Vanadium complexes and porphyrins in asphaltene — [Pt.] 2, The nature of highly aromatic substituted porphyrins and their vanadyl chelates: *Chem. Geology*, v. 6, no. 3, p. 203-219, illus., tables, 1970.

**Vaughan, Robert W.** See *Manatt, Stanley L.* 06290

- 05257 **Vaughn, Peter Paul.** Alternation of neural spine height in certain Early Permian tetrapods: *Southern California Acad. Sci. Bull.*, v. 69, pt. 2, p. 80-86, illus., 1970.

- 08515 **Vaughn, Peter Paul.** Lower Permian vertebrates of the Four Corners and the Mid-continent as indices of climatic differences, in *Paleoclimatology — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc., Pt. D: Lawrence, Kans., Allen Press, p. 388-408, illus., 1970.*

- 06681 **Vaz, Jesús Eduardo.** Thermoluminescence-metamictization relations in zircon [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 765B, 1970.
- 06012 **Veatch, Maurice Deyo.** Ground-water occurrence, movement and hydrochemistry within a complex stratigraphic framework, Jefferson County, Nebraska [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5562B, 1970.
- Vedam, K.** See *Caslavsky, J. L.* 09115
- 04344 **Vedder, J. G.; Wallace, Robert E.** Map showing recently active breaks along the San Andreas and related faults between Cholame Valley and Tejon Pass, California: U.S. Geol. Survey Misc. Geol. Inv. Map I-574, 2 sheets, scale 1:24,000, text, 1970.
- 06377 **Vedder, J. G.** Geologic map of the Wells Ranch and Elkhorn Hills quadrangles, San Luis Obispo and Kern Counties, California, showing juxtaposed Cenozoic rocks along the San Andreas fault: U.S. Geol. Survey Misc. Geol. Inv. Map I-585, 2 sheets, scale 1:24,000, sections, 1970.
- 08527 **Velasco Hernandez, Juan.** Levantamiento gravimetrico zona geotermica de Mexicali, Baja California [Gravimetric survey of the Mexicali geothermal zone, Baja California]: México Consejo Recursos Nat. no Renovables Bol. 74, 19 p., illus., 1970.
- Velde, Bruce.** See *Sabatier, Henri.* 09552
- 10292 **Velde, Bruce.** Low temperature phases associated with chlorites in the system  $\text{MgO-Al}_2\text{O}_3\text{-SiO}_2\text{+H}_2\text{O}$  [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 711, 1970.
- Vemuri, Narasimhamurty.** See *Vemuri, Venkateswararao.* 03547
- 03547 **Vemuri, Venkateswararao; Vemuri, Narasimhamurty.** On the systems approach in hydrology: Internat. Assoc. Sci. Hydrology Bull., v. 15, no. 2, p. 17-38, illus., 1970.
- 10921 **VenkataRathnam, Kolla.** Clastic sediments on the continental shelf of the northern Bering Sea, in Research on the continental shelf off Washington and western Alaska from August 1968 through June 1969 — Univ. Washington Dept. Oceanography Spec. Rept. 41: Seattle, Wash., Univ. Washington, P. 40-61, illus., tables, 1969.
- 10925 **VenkataRathnam, Kolla.** Size distribution and mineral composition of the sediments of the inner continental shelf off northern Washington, in Research on the continental shelf off Washington and western Alaska from August 1968 through June 1969 — Univ. Washington Dept. Oceanography Spec. Rept. 41: Seattle, Wash., Univ. Washington, p. 93-113, illus., tables, 1969.
- Venkitasubramanyan, C. S.** See *Wenk, H. R.* 01870
- Vergano, P. J.** See *Scherer, G.* 03291
- 03811 **Verhoogen, John; Turner, Francis J.; Weiss, Lionel E.; Wahrhaftig, Clyde; Fyfe, William S.** The earth, an introduction to physical geology: New York and London, Holt, Rinehart and Winston, 748 p., illus., tables, 1970.
- 06550 **Verhoogen, John.** Paleoheat flow, Chap. 38 in *Palaeogeophysics* (S. K. Runcorn, editor): London and New York, Academic Press, p. 359-363, illus., 1970.
- 02152 **Verille, G. J.; Sanderson, G. A.; Rea, B. D.** Missourian fusulinids from the Tensleep Sandstone, Bighorn Mountains, Wyoming: Jour. Paleontology, v. 44, no. 3, p. 478-479, illus., 1970.
- 07309 **Verma, R. K.; Hamza, V. M.; Panda, P. K.** Further study of the correlation of heat flow with age of basement rocks, in *Geothermal problems — Symposium, Madrid, Spain, 1969, Proc.: Tectonophysics, V. 10, nos. 1-3 (Spec. issue), p. 301-320, illus., tables, 1970.*

- 03684 **Verma, Rameshwar D.; Brutsaert, Wilfried.** Unconfined aquifer seepage by capillary flow theory: Am. Soc. Civil Engineers Proc., v. 96, paper 7363, Jour. Hydraulics Div., no. HY 6, p. 1331-1344, illus., 1970.
- 05996 **Verma, Rameshwar Dayal.** Physical analysis of the outflow from an unconfined aquifer [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 30, no. 12, pt. 1, p. 5490B, 1970.
- Vernon, M. J.** See *Compston, W.* 05760
- 07511 **Vernon, R. O.** The beneficial uses of zones of high transmissivities in the Florida subsurface for water storage and waste disposal: Florida Bur. Geology Inf. Circ. 70, 39 p., illus., tables, 1970.
- Vernon, Robert O.** See *García-Bengochea, José I.* 04808
- 10389 **Vernon, Robert O.** Review of Florida's water pollution problems — Groundwater, in Florida's Environmental Eng. Conf. on Water Pollution Control, Gainesville, 1969, Proc.: Florida Univ. Eng. and Indus. Exp. Sta. Bull. Ser. 135, p. 28-43, illus., tables, 1970.
- 10950 **Vernon, Roger C.** Possible future petroleum provinces of United States western gulf basin, pre-Jurassic [abs.]: Am. Assoc. Petroleum Geologists, v. 54, no. 9, p. 1792-1793, 1970; Gulf Coast Assoc. Geol. Soc. Trans., v. 20, p. 177-180, 1970.
- Verville, G. J.** See *Sanderson, G. A.* 04701
- 07761 **Vest, E. L., Jr.** Oil fields of Pennsylvanian-Permian Horseshoe atoll, West Texas, in Geology of giant petroleum fields — Symposium, AAPG, 53d Ann. Mtg., Oklahoma City, Okla., 1968: Am. Assoc. Petroleum Geologists Mem. 14, p. 185-203, illus., table, 1970.
- 10458 **Vetter, Richard C.** (compiler). Oceanography information sources — 70: Washington, D.C., Natl. Acad. Sci., 1 p., 1970.
- Vey, Eben.** See *Wetzel, Richard A.* 04223
- 02993 **Vice, Daniel H.** The geology of the Babocomari Ranch in Cochise-Santa Cruz Counties, Arizona [abs.]: Arizona Acad. Sci. Jour., v. 6, 1970 Proc. Supp., p. 67, 1970.
- 04233 **Viebrock, J. M.** Determination of chromium, cobalt, iron, manganese, and nickel in silver by atomic absorption spectrophotometry: Anal. Letters, v. 3, no. 7, p. 373-383, tables, 1970.
- 00936 **Viele, George W.** Displacement by flow in imbricate thrust fault belts [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 302-303, 1970.
- Vierbuchen, Richard C.** See *Doehring, Donald O.* 06956
- 05925 **Viereck, L. A.** Soil temperatures in river bottom stands in interior Alaska [with French abs.], in Ecology of the subarctic regions (Écologie des régions subarctiques) — Helsinki, Symposium, Proc.: Paris, UNESCO, p. 223-233, illus., tables, discussion, 1970.
- Viger, H. L.** See *Brede, E. C.* 06737
- 00048 **Viggiani, Carlo; Davis, Edward H.; Poulos, Harry G.** An analysis of consolidation theories — Discussion [of paper 6370, by R. L. Schiffman, A. T.-F. Chen, and J. C. Jordan, 1969]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Soil Mechanics and Found. Div., no. SM 1, p. 331-336, illus., 1970.
- Vigier, Gaston.** See *Londe, Pierre.* 03631
- Vigier, Gaston.** See *Londe, Pierre.* 04392

- 09789 **Viksne, Andris; Liston, Thomas C.; Sapp, Cecil D.** SLR reconnaissance of Panama: Photogramm. Eng., v. 36, no. 3, p. 253-259, illus., 1970.

**Vilcsek, E.** See *Begemann, F.* 05683

**Vilcsek, E.** See *Begemann, F.* 06821

- 08755 **Vilks, G.; Anthony, E. H.; Williams, W. T.** Application of association-analysis to distribution studies of Recent foraminifera: Canadian Jour. Earth Sci., v. 7, no. 6, p. 1462-1469, illus., tables, 1970.

**Villamar V., M.** See *Sánchez Z., J.* 07791

**Vincent, C. Linwood.** See *Howard, Alan D.* 07465

**Vincent, Edith.** See *Morin, Robert.* 02795

- 00770 **Vincent, Jerry W.** Lithofacies of the Haney Limestone (Mississippian) along the eastern edge of the Illinois basin [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 245-246, 1970.

**Vincenz, S. A.** See *Guja, N. H.* 01917

- 01333 **Vine, F. J.** Sea-floor spreading and continental drift: Jour. Geol. Education, v. 18, no. 2, p. 87-90, illus., tables, 1970.

- 09721 **Vine, F. J.; Hess, H. H.** Sea-floor spreading, in *The sea — v. 4, New concepts of sea floor evolution, Pt. 3, Concepts* (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 587-622 (in Pt. 2 volume), illus., tables, 1970.

- 00650 **Vine, James D.; Tourtelot, Elizabeth B.** Hydrothermal alteration of arkosic sandstones in the Spanish Peaks region, Colorado [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 352-353, 1970.

- 04317 **Vine, James D.; Tourtelot, Elizabeth B.** Geochemistry of black shale deposits — A summary report: Econ. Geology, v. 65, no. 3, p. 253-272, illus., tables, 1970.

**Vinet, Marshall J.** See *Stern, Daniel H.* 11255

- 07540 **Vineyard, Jerry D.** Bibliography of the geology of Missouri, 1969: Missouri Geol. Survey and Water Resources Inf. Circ. 23, 44 p., 1970.

- 07848 **Viniegra O., Francisco; Castillo-Tejero, Carlos.** Golden Lane fields, Veracruz, Mexico, in *Geology of giant petroleum fields — Symposium, AAPG, 53d Ann. Mtg., Oklahoma City, Okla., 1968*: Am. Assoc. Petroleum Geologists Mem. 14, p. 309-325, illus., tables, 1970.

- 05116 **Vinogradov, A. P. K.** proiskhozhdeniyu lunnykh porod [On the origin of the lunar rocks (with English summ.)]: Geokhimiya, no. 1, p. 3-14, tables, 1970.

**Vinot, A. C.** See *Duplessy, J. C.* 01280

- 06793 **Viramonte, J. G.; DiScala, L.** Summary of the 1968 eruption of Cerro Negro, Nicaragua: Bull. Volcanol., v. 34, no. 1, p. 347-351, illus., table, 1970.

- 09165 **Virginia Div. Water Resources.** James River basin comprehensive water resources plan — v. 3, Hydrologic analysis: Virginia Div. Water Resources Plan. Bull. 215, 369 p., illus., tables, 1970.

- 09189 **Virginia Div. Water Resources.** York River basin — Comprehensive water resources plan, V. 1 — Introduction: Virginia Div. Water Resources Plan. Bull. 225, 112 p., illus., tables, 1970.

- 10230 **Virginia Div. Water Resources.** Potomac-Shenandoah River Basins comprehensive water resources plan — v. 33, Hydrologic analysis: Virginia Div. Water Resources Plan. Bull. 209, 294 p., illus., tables, 1969.
- 10231 **Virginia Div. Water Resources.** Ground water of southeastern Virginia: Virginia Div. Water Resources Plan. Bull. 261, 53 p., illus., tables, 1970.
- 10701 **Virginia Div. Water Resources.** James River basin, comprehensive water resources plan — v. 1, Introduction: Virginia Div. Water Resources Planning Bull. 213, 193 p., illus., tables, 1969.
- 11226 **Virginia Div. Water Resources.** Potomac-Shenandoah River Basin — Comprehensive water resources plan, V. 4, Water resource requirement: Virginia Div. Water Resources Plan. Bull. 210, 195 p., illus., tables, 1969.
- 11227 **Virginia Div. Water Resources.** Ground water of southeastern Virginia: Virginia Div. Water Resources Plan. Bull. 261, 53 p., illus., tables, 1970.
- 09272 **Virginia Division Water Resources.** Rappahannock River Basin comprehensive water resources plan — v. 3, Hydrologic resources analysis: Virginia Div. Water Resources Plan. Bull. 221, 176 p., illus., tables, geol. map, 1970.
- 09273 **Virginia Division Water Resources.** Rappahannock River Basin comprehensive water resources plan — v. 1, Introduction: Virginia Div. Water Resources Plan. Bull. 219, 122 p., illus., tables, 1970.
- Virgo, D.** See *Bush, W. R.* 03905
- 03175 **Virgo, David; Hafner, Stefan S.**  $\text{Fe}^{2+}$ , Mg order-disorder in natural orthopyroxenes: *Am. Mineralogist*, v. 55, nos. 1-2, p. 201-223, illus., tables, 1970.
- Virgo, David.** See *Hafner, Stefan S.* 04426
- Virgo, David.** See *Hafner, Stefan S.* 06282
- 02694 **Visher, Glenn S.; Saitta-Bertoni, Sandro; Phares, Roderick S.** Pennsylvanian delta patterns and oil occurrences in eastern Oklahoma [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 874, 1970.
- Visman, J.** See *Walsh, J. H.* 04561
- 01153 **Visocky, Adrian P.** Estimating the ground-water contribution to storm runoff by the electrical conductance method: *Ground Water*, v. 8, no. 2, p. 5-10, illus., 1970.
- 08287 **Vistelius, Andrew B.** Statistical model of silicate analysis and results of investigation of G-1 and W-1 samples: *Jour. Internat. Assoc. Math. Geology*, v. 2, no. 1, p. 1-14, illus., tables, 1970.
- 06493 **Viswanathan, S.** A classification of granitic rocks with reference to Giants Range batholith, northern Minnesota [abs.], in *Inst. Lake Superior Geology*, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 40-43, illus., 1970.
- Viswanathan, S.** See *Sims, P. K.* 08587
- Vita, O. A.** See *Walker, C. R.* 02219
- 04073 **Vita-Finzi, C.** Alluvial history of central Mexico: *Nature*, v. 227, no. 5258, p. 596-597, illus., table, 1970.
- Vitaliano, Charles J.** See *Eckerty, Donald G.* 00610



- 06752 **Vitousek, Martin; Miller, Gaylord.** An instrumentation system for measuring tsunamis in the deep ocean, in *Tsunamis in the Pacific Ocean — Internat. Symposium on Tsunamis and Tsunami Research*, Honolulu, Hawaii, 1969, Proc.: Honolulu, Hawaii, East-West Center Press, p. 239-252, illus., 1970.
- 00068 **Vittori A., O.** Earth accretion in "black spherules": *Jour. Geophys. Research*, v. 75, no. 2, p. 371-374, illus., table, 1970.
- 00771 **Vlangas, Louis P.** On the glaciation of the Mid-Atlantic Coastal Plain [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 246, 1970.
- Vlisidis, Angelina C.** See *Erd, Richard C.* 05934
- Vogan, R. W.** See *Quigley, R. M.* 02902
- 00857 **Vogel, Thomas A.** Albite-rich domains in potash feldspar: *Contr. Mineralogy and Petrology*, v. 25, no. 2, p. 138-143, illus., 1970.
- Vogel, Thomas A.** See *Woodbury, Jerry L.* 09066
- 09095 **Vogel, Thomas A.** The origin of some antiperthites — a model based on nucleation: *Am. Mineralogist*, v. 55, nos. 7-8, p. 1390-1395, illus., 1970.
- 10286 **Vogel, Thomas A.; Ehrlich, Robert; Weinberg, Bernhard.** Quantification and evaluation of shape, surface area and packing of grains in rocks [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 712, 1970.
- Vogel, Thomas A.** See *Smith, Bennett L.* 10850
- 02133 **Vogt, P. R.** Magnetized basement outcrops on the south-east Greenland continental shelf: *Nature*, v. 226, no. 5247, p. 743-744, illus., 1970.
- 03670 **Vogt, P. R.; Anderson, C. N.; Bracey, D. R.; Schneider, E. D.** North Atlantic magnetic smooth zones: *Jour. Geophys. Research*, v. 75, no. 20, p. 3955-3968, illus., 1970.
- 03962 **Vogt, P. R.; Ostenso, N. A.** Magnetic and gravity profiles across the Alpha cordillera and their relation to Arctic sea-floor spreading: *Jour. Geophys. Research*, v. 75, no. 26, p. 4925-4937, illus., 1970.
- Vogt, Peter R.** See *Johnson, G. Leonard.* 01934
- 01993 **Vogt, Peter R.; Lorentzen, G. R.; Dennis, L. S.** An aeromagnetic survey of the KEATHLEY magnetic anomaly sequence between 34° N and 40° N in the western North Atlantic [abs.]: *EOS*, v. 51, no. 4, p. 274, 1970.
- Vogt, Peter R.** See *Bracey, Dewey R.* 05634
- Vogt, Peter R.** See *Johnson, G. Leonard.* 10060
- 02361 **Voight, Barry; Pariseau, William.** State of predictive art in subsidence engineering: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7187, *Jour. Soil Mechanics and Found. Div.*, no. SM2, p. 721-750, illus., tables, 1970.
- 08056 **Voight, Barry; Dahl, H. D.** Numerical continuum approaches to analysis of non-linear rock deformation: *Canadian Jour. Earth Sci.*, v. 7, no. 3, p. 814-830, illus., 1970.
- 08340 **Voight, Barry.** On the functional classification of rocks for engineering purposes [with French and German abs.], in *International Symposium on Rock Mechanics [2d]*, Madrid, 1968, Proc.: Madrid, Spain, Soc. Espanola de Mecanica de Rocas, p. 131-135, illus., 1970.
- Voight, Barry.** See *Pariseau, W. G.* 09146

- 03427 **Vokes, Emily H.** Notes on the fauna of the Chipola Formation — [Pt.] 2, *Chicoreus* (*Siratus*) *juliagardnerae*, new name for *Murex gardnerae* Vokes *non* Dall, with observations on the species: Tulane Studies Geology and Paleontology, v. 8, no. 1, p. 51-52, 1970.
- 03431 **Vokes, Emily H.** Notes on the fauna of the Chipola Formation — Pt. 3, Two new species of *Vasum* (Mollusca: Gastropoda), with comments on *Vasum haitense* (Sowerby): Tulane Studies Geology and Paleontology, v. 8, no. 2, p. 88-92, illus., 1970.
- 03524 **Vokes, Emily H.** Cenozoic Muricidae of the western Atlantic region — Pt. 5, *Pterynotus* and *Poirieria*: Tulane Studies Geology and Paleontology, v. 8, no. 1, p. 1-50, illus., 1970.
- 03525 **Vokes, Emily H.** *Hexaplex* (*Hexaplex*) *engonatus* (Conrad) — Errata and corrigenda [to "Cenozoic Muricidae of the western Atlantic region," Pt. 4, 1968]: Tulane Studies Geology and Paleontology, v. 8, no. 1, p. 51, 1970.
- Volarovich, M. P.** See *Solopov, S. G.* 08256
- 09351 **Volborth, Alexis; Fabbi, Brent P.** Total instrumental analysis of rocks — Pt. C, Sec. 1, Semiquantitative X-ray spectrographic determination of 38 elements in a Nevada granite and in standard granite G-1: Nevada Bur. Mines Rept. 6, Pt. C, p. C1-C29, illus., tables, 1970.
- Volborth, Alexis.** See *Fabbi, Brent P.* 09352
- 07226 **Volk, G. M.; Hensel, D. R.** Aggregation of mineral and organic matter in Rutlege, Ona, and Leon fine sands of the southeastern coastal plains: Soil Sci., v. 110, no. 5, p. 333-338, tables, 1970.
- Vollmers, Hans.** See *Gourlay, Michael R.* 05238
- Volz, Gary.** See *Mooney, Harold M.* 04007
- Volz, Gary.** See *Mooney, Harold M.* 05876
- Volz, Gary.** See *Mooney, Harold M.* 06582
- 09999 **VonArx, William S.** Marine geodesy, in The sea — v. 4, New concepts of sea floor evolution, Pt. 1. General observations (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 597-635, illus., table, 1970.
- von Bitter, Peter H.** See *Morency, Maurice.* 01200
- 07153 **vonderBorch, C. C.** Glassy objects in deep sea clays, Chap. 23 in Initial reports of the Deep Sea Drilling Project — V. 5, Leg 5 of cruises of *Glomar Challenger*, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office, p. 525-529, illus., table, 1970.
- 07155 **vonderBorch, C. C.; Rex, R. W.** Amorphous iron oxide precipitates in sediments cored during Leg 5, Deep Sea Drilling Project, Chap. 26 in Initial reports of the Deep Sea Drilling Project — V. 5, Leg 5 of cruises of *Glomar Challenger*, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office, p. 541-544, illus., 1970.

- vonderBorch, C. C.** See *McManus, Dean A.* 07249
- vonderBorch, Christopher V.** See *McManus, Dean A.* 07143
- vonEngelhardt, W.** See *Dence, M. R.* 01902
- VonGonten, W. D.** See *Osoba, J. S.* 03520
- 01496 **VonHerzen, R. P.; Simmons, G.; Folinsbee, A.** Heat flow between the Caribbean Sea and the Mid-Atlantic Ridge: *Jour. Geophys. Research*, v. 75, no. 11, p. 1973-1984, illus., tables, 1970.
- 01994 **VonHerzen, Richard P.; Anderson, Roger N.** Heat-flow variability in the eastern equatorial Pacific [abs.]: *EOS*, v. 51, no. 4, p. 317, 1970.
- VonHerzen, Richard P.** See *Langseth, Marcus G., Jr.* 09992
- vonHuene, Roland.** See *Scholl, David W.* 00062
- vonHuene, Roland.** See *Holmes, Mark L.* 01925
- vonHuene, Roland.** See *Reimnitz, Erk.* 04244
- 07739 **VonOsinski, W. P. C.** Geology and production history of the Bakken Formation of the Rocanville area, southeastern Saskatchewan: [Regina] Saskatchewan Dept. Mineral Resources, 25 p., illus., 1970.
- 04450 **vonSeggern, David.** The effects of radiation patterns on magnitude estimates: *Seismol. Soc. America Bull.*, v. 60, no. 2, p. 503-516, illus., tables, 1970.
- 05222 **vonSeggern, David; Lambert, D. G.** Theoretical and observed Rayleigh-wave spectra for explosions and earthquakes: *Jour. Geophys. Research*, v. 75, no. 35, p. 7382-7402, illus., table, 1970.
- vonSury, H.** See *Federer, B.* 03644
- VONThuna, P. C.** See *Aronson, J. R.* 03695
- VonTiehl, R. D.** See *Holbert, D. R.* 10343
- 00772 **Voorhies, M. R.** Paleontological evidence for Pliocene age of "high-level gravels", Taylor County, Georgia [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 246-247, 1970.
- 07237 **Voorhies, M. R.; Toots, Heinrich.** An unusual burrow of a Tertiary vertebrate: *Wyoming Univ. Contr. Geology*, v. 9, no. 1, p. 7-8, illus., 1970.
- 08563 **Voorhies, M. R.** Sampling difficulties in reconstructing late Tertiary mammalian communities, in *Evolution of communities — North Am. Paleont. Convention*, Chicago, Ill., 1969, Proc., Pt. E: Lawrence, Kans., Allen Press, p. 454-468, illus., 1970.
- Vormeringer, Raymond.** See *Londe, Pierre.* 00042
- Vormeringer, Raymond.** See *Londe, Pierre.* 03631
- Vormeringer, Raymond.** See *Londe, Pierre.* 04392
- Vortman, L. J.** See *Cress, J. P.* 05460

- 10895 **Vorzimmer, Peter J.** Charles Darwin, the years of controversy — the Origin of Species and its critics 1859-1882: Philadelphia [Pa.], Temple University Press, 300 p., illus., 1970.
- Vos, G.** See *Toussaint, C. J.* 10413
- Vos, M. A.** See *Hewitt, D. F.* 03455
- Voshage, H.** See *Hintenberger, H.* 05702
- Voss, J. D.** See *Brookins, D. G.* 00460
- Voytko, George A.** See *Orchard, R. J.* 06782
- Vozoff, K.** See *Strangway, D. W.* 02918
- 03206 **Vredenburg, L. D.; Cheney, E. S.** Sulfur isotopic fractionation accompanying maturation of Paleozoic petroleum, Wind River Basin, Wyoming, a synopsis: *Mtn. Geologist*, v. 7, no. 2, p. 83-87, illus., 1970.
- 00651 **Waag, Charles J.** Gravity tectonics accompanying mantled gneiss domes in the Basin and Range province of Arizona [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 353, 1970.
- Wada, Ronald N.** See *Williams, John A.* 08596
- 02576 **Waddell, Galen G.** Progress on techniques of investigating and controlling rock bursts: *Soc. Mining Engineers AIME Trans.*, v. 247, no. 2, p. 186-192, illus., table, 1970.
- 09416 **Waddington, Jean C. B.; Wright, H. E., Jr.** Late-Quaternary vegetational changes on the east side of Yellowstone Park, Wyoming [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 139-140, illus., 1970.
- 05104 **Wade, L. C.** Photographic summary of the Apollo 12 mission, in *Apollo 12 preliminary science report*: U.S. Natl. Aeronautics and Space Adm. Spec. Pub. SP-235, p. 7-27, illus., 1970.
- Wadell, James S.** See *Royse, Chester F.* 04954
- Wadleigh, W. F.** See *Ramspott, L. D.* 05516
- 10287 **Waechter, Noel B.** Braided stream deposits of the Red River, Texas Panhandle [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 713, 1970.
- 03340 **Wagener, H. D.** Geology of the southern two-thirds of the Winnsboro 15-minute quadrangle, South Carolina: *South Carolina Div. Geology Map Ser.* MS-17, scale about 1 in. to 1 mi., separate text, 1970.
- 09362 **Wagener, H. D.** Notes on beach erosion in the Charleston Harbor area: *South Carolina Div. Geology, Environ. Geol. Ser.*, no. 1, 11 p., illus., 1970.
- Wager, L. R.** See *Kempe, D. R. C.* 07059
- 06807 **Wagner, Donald E.** Nuclear yields from Rayleigh waves: *Earthquake Notes*, v. 41, no. 3, p. 9-20, illus., tables, 1970.
- 07535 **Wagner, Frances J. E.** Faunas of the Pleistocene Champlain Sea [with French, German, and Russian abs.]: *Canada Geol. Survey Bull.* 181, 104 p., illus., tables, 1970.
- 01846 **Wagner, G. A.; Reimer, M.; Storzer, D.** Critical consideration of experimental values used in fission track dating [abs.]: *EOS*, v. 51, no. 4, p. 450, 1970.

**Wagner, G. A.** See *Reimer, G. M.* 06824

- 00387 **Wagner, J. Ross.** Late Cenozoic deformation in the central Coast Ranges, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 156-157, 1970.
- 09345 **Wagner, Ray G.** Guidebook to the highway geology of Missouri, Route 79Tr, Hannibal to Clarksville — *Assoc. Missouri Geologists, Ann. Field Trip and Mtg. 17th, Sept. 1970: Hannibal, Mo., Missouri State Highway Dept.*, 18 p., illus., 1970.
- 09747 **Wagner, Richard E.** Galena, Missouri's state mineral: *Rocks and Minerals*, v. 45, no. 12, p. 790-793, illus., 1970.
- 02427 **Wagner, Richard J.** Geology and zonation of the southeast Missouri barite district [abs.]: *Mining Eng.*, v. 22, no. 1, p. 41, 1970.
- 00029 **Wagner, W. Philip.** Ice movement and shoreline modification, Lake Champlain, Vermont: *Geol. Soc. America Bull.*, v. 81, no. 1, p. 117-126, illus., 1970.
- 03781 **Wagner, W. Philip.** Pleistocene mountain glaciation, northern Vermont: *Geol. Soc. America Bull.*, v. 81, no. 8, p. 2465-2469, illus., 1970.
- 04655 **Wagner, W. Philip.** Pleistocene mountain glaciation, northern Vermont: *Geol. Soc. America Bull.*, v. 81, no. 8, p. 2465-2469, illus., 1970.
- 05975 **Wagner, W. Philip; Eschman, Donald F.** A probable late Pinedale terminal moraine in Castle River valley, Alberta — Discussion [of paper by A. M. Stalker, 1969]: *Geol. Soc. America Bull.*, v. 81, no. 12, p. 3773-3774, illus., 1970.
- 09023 **Wagner, W. Philip.** The late Pleistocene of the Champlain Valley, Vermont — trip D in Guidebook to field excursions, New York State Geol. Assoc., 41st Ann. Mtg., 1969, Plattsburgh, N.Y.: Brockport, N.Y., State Univ. Dept. Geology, New York State Geol. Assoc., p. 65-80, illus., table, 1969.
- 07562 **Wagner, W. R.** Characteristics and depositional environments of the rocks of Allegheny County, [Chap.] 3 in *Geology of the Pittsburgh area: Pennsylvania Geol. Survey, 4th ser.*, [Bull.] G 59 (General Geology Rept.), p. 8-40, illus., 1970.
- 07563 **Wagner, W. R.** Structural geology, [Chap.] 5 in *Geology of the Pittsburgh area: Pennsylvania Geol. Survey, 4th ser.*, [Bull.] G 59 (General Geology Rept.), p. 60-71, illus., 1970.
- Wagner, W. R.** See *Heyman, Louis.* 07568
- 07645 **Wagner, W. R.** Stratigraphy, [Chap.] 4 in *Geology of the Pittsburgh area: Pennsylvania Geol. Survey, 4th ser.*, [Bull.] G 59 (General Geology Rept.), p. 41-59, illus., table, 1970.
- 08025 **Wagner, W. R.** Invertebrate and plant fossils, [Chap.] 6 in *Geology of the Pittsburgh area: Pennsylvania Geol. Survey, 4th ser.*, [Bull.] G 59 (General Geology Rept.), p. 71-80, illus., 1970.
- Wagner, Walter R.** See *Kelley, Dana R.* 06534
- 07843 **Wagner, Walter R.** (and others). *Geology of the Pittsburgh area: Pennsylvania Geol. Survey, 4th ser.*, [Bull.] G 59 (General Geology Rept.), 145 p., illus., 1970.
- Wagner, Walter R.** See *Kelley, Dana R.* 09382
- 09355 **Wahl, J. S.; Nelligan, W. B.; Frentrop, A. H.; Johnstone, C. W.; Schwartz, R. J.** The thermal neutron decay time log: *Soc. Petroleum Engineers Jour.*, v. 10, no. 4, p. 365-379, illus., table, 1970.

**Wahl, K. D.** See *Hershey, H. G.* 04930

- 00388 **Wahrhaftig, Clyde.** The trouble with the rate of erosion [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 157, 1970.  
**Wahrhaftig, Clyde.** See *Wolfe, Jack A.* 01302
- 02034 **Wahrhaftig, Clyde.** Geologic maps of the Healy D-2, D-3, D-4, and D-5 quadrangles, Alaska: U.S. Geol. Survey Geol. Quad. Maps GQ-804-807, scale 1:63,360, sections, 1970.
- 02085 **Wahrhaftig, Clyde.** Geologic map(s) of the Fairbanks A-2, A-3, A-4, and A-5 quadrangles, Alaska: U.S. Geol. Survey Geol. Quad. Maps GQ-808-811, scale 1:63,360, sections, 1970.  
**Wahrhaftig, Clyde.** See *Verhoogen, John.* 03811
- 10288 **Wahrhaftig, Clyde.** Late Cenozoic orogeny in the Alaska Range [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 713-714, 1970.
- 10338 **Wahrhaftig, Clyde; Cox, Allan.** Have geology students a role in stopping environmental deterioration? [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 759, 1970.
- 08329 **Wai, C. M.** The metal phase of Horse Creek, Mount Egerton, and Norton County enstatitic meteorites: *Mineralog. Mag.*, v. 37, no. 292, p. 905-908, illus., table, 1970.  
**Wai, C. M.** See *Ernst, W. G.* 09088  
**Wai, Chien M.** See *Wasson, John T.* 00476
- 01863 **Wai, Chien M.; Wasson, John T.** Silicon in the Nedagolla ataxite and the relationship between Si and Cr in reduced iron meteorites: *Geochim. et Cosmochim. Acta*, v. 34, no. 3, p. 408-410, table, 1970.  
**Wainerdi, R. E.** See *Hoffman, B. W.* 03564  
**Wainerdi, R. E.** See *Fite, L. E.* 05208  
**Wainerdi, R. E.** See *Kuykendall, W. E., Jr.* 06664  
**Wainerdi, R. E.** See *Kuykendall, W. E., Jr.* 07148  
**Wainwright, J. E. N.** See *Starkey, J.* 03555
- 04265 **Wait, Robert L.** Notes on the position of a phosphate zone and its relation to ground water in coastal Georgia, in *Geological Survey research 1970*, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C202-C205, illus., 1970.
- 06569 **Wakeley, John R.** The unique beach sand at Rodeo Cove: California Div. Mines and Geology Mineral Inf. Service, v. 23, no. 12, p. 238-241, illus., 1970.  
**Wakita, H.** See *Rey, P.* 04232
- 05729 **Wakita, H.; Schmitt, R. A.; Rey, P.** Elemental abundances of major, minor and trace elements in Apollo 11 lunar rocks, soil and core samples, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1685-1717, illus., tables, 1970.

- 06848 **Wakita, H.; Schmitt, R. A.** Elemental abundances in seven fragments from lunar rock 12013: *Earth and Planetary Sci. Letters*, v. 9, no. 2, p. 169-176, illus., tables, 1970.
- 04071 **Wakita, Hiroshi; Schmitt, Roman A.** Rare earth and other elemental abundances in the Allende meteorite: *Nature*, v. 227, no. 5257, p. 478-479, table, 1970.
- Wakita, Hiroshi.** See *Goles, Gordon G. 05694*
- 06838 **Wakita, Hiroshi; Schmitt, Roman A.** Lunar anorthosites — Rare-earth and other elemental abundances: *Science*, v. 170, no. 3961, p. 969-974, illus., tables, 1970.
- Wako, Y.** See *Yumi, S. 09963*
- 03732 **Walcott, R. I.** Flexural rigidity, thickness, and viscosity of the lithosphere: *Jour. Geophys. Research*, v. 75, no. 20, p. 3941-3954, illus., tables, 1970.
- 05474 **Walcott, R. I.** Flexure of the lithosphere at Hawaii: *Tectonophysics*, v. 9, no. 5, p. 435-446, illus., 1970.
- 07699 **Walcott, R. I.** Reply [to panel discussion on isostasy], in *Symposium on recent crustal movements*, Ottawa, Canada, 1969, *Papers: Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 2, p. 733-734, 1970.
- 07746 **Walcott, R. I.** Isostatic response to loading of the crust in Canada, in *Symposium on recent crustal movements*, Ottawa, Canada, 1969, *Papers: Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 2, p. 716-727, illus., 1970.
- 08064 **Walcott, R. I.** An isostatic origin for basement uplifts: *Canadian Jour. Earth Sci.*, v. 7, no. 3, p. 931-937, illus., 1970.
- 09781 **Walcott, R. I.; Boyd, J. B.** The gravity field of northern Alberta, and part of Northwest Territories and Saskatchewan: *Canada Dept. Energy, Mines and Resources, Earth Physics Br. Gravity Map Ser.*, nos. 103-111, 9 sheets, scale 1:500,000 [with separate 13 page text, 1971], 1969.
- 05788 **Waldbaum, D. R.; Robie, R. A.** An internal sample container for hydrofluoric acid solution calorimetry: *Jour. Geology*, v. 78, no. 6, p. 736-741, illus., 1970.
- Waldbaum, David R.** See *Hovis, Guy L. 07029*
- 07723 **Waldman, M.** A teiid lizard jaw from the Cretaceous of Alberta, Canada: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 542-547, illus., 1970.
- 08069 **Waldman, M.** Comments on a Cretaceous coprolite from Alberta, Canada: *Canadian Jour. Earth Sci.*, v. 7, no. 3, p. 1008-1012, illus., 1970.
- 08195 **Waldman, M.; Hopkins, W. S., Jr.** Coprolites from the Upper Cretaceous of Alberta, Canada, with a description of their microflora: *Canadian Jour. Earth Sci.*, v. 7, no. 5, p. 1295-1303, illus., 1970.
- Waldrip, James.** See *Vallier, Tracy L. 01109*
- Waldron, Howard H.** See *Crandell, Dwight R. 05522*
- 07228 **Waldron, L. J.; Manbeian, T.** Soil moisture characteristics by osmosis with polyethylene glycol — A simple system with osmotic pressure data and some results: *Soil Sci.*, v. 110, no. 6, p. 401-404, illus., table, 1970.
- 09418 **Waldrop, Henry A.** Glaciation of west-central Yellowstone National Park [abs.], in *American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 142-143, 1970.*

- 10474 **Waldrop, John.** Fossil horses of Florida: Plaster Jacket [No. 9], [10] p. illus., [1968?].
- 02970 **Waldrop, Lyneve.** The crystal structure of triploidite and its relation to the structures of other minerals of the triplite-triploidite group [with German abs.]: *Zeitschr. Kristallographie*, v. 131, nos. 1-2, p. 1-20, illus., tables, 1970.
- 02219 **Walker, C. R.; Vita, O. A.** The precise determination of uranium in impure uranyl nitrate and uranium oxides [with French and German abs.]: *Anal. Chim. Acta*, v. 49, no. 3, p. 391-400, illus., tables, 1970.
- 03746 **Walker, D. A.; Buckley, D. E.** Some techniques and applications of scanning electron microscopy in the fields of marine science: *Maritime Sediments*, v. 5, no. 3, p. 113-118, illus., 1969 [1970].
- Walker, E. H.** See *Crosthwaite, E. G.* 07532
- 08622 **Walker, George W.** Some comparisons of basalts of southeast Oregon with those of the Columbia River Basin Group, in *Columbia River Basalt Symposium*, 2nd, Cheney, Wash., 1969, Proc.: Eastern Washington State College Press, p. 223-237, illus., table, 1970.
- 09815 **Walker, George W. W.** Cenozoic ash-flow tuffs of Oregon: *Ore Bin*, v. 32, no. 6, p. 97-115, illus., 1970.
- 08667 **Walker, H. J.** Some aspects of erosion and sedimentation in an arctic delta during breakup [with French abs.], in *Symposium on the Hydrology of Deltas*, V. 1: Internat. Assoc. Sci. Hydrology-Unesco Pub. 90, p. 209-219, illus., discussion, 1970.
- 03223 **Walker, J. C. G.; Turekian, K. K.; Hunten, D. M.** An estimate of the present-day deep mantle degassing rate from data on the atmosphere of Venus: *Jour. Geophys. Research*, v. 75, no. 18, p. 3558-3561, table, 1970.
- 04942 **Walker, J. R.; Massingill, J. V.** Slump features on the Mississippi Fan, northeastern Gulf of Mexico: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 3101-3108, illus., 1970.
- 05873 **Walker, Jack R.; Ensminger, H. Robert.** Effect of diapirism on sedimentation in Gulf of Mexico: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 11, p. 2058-2069, illus., table, 1970.
- Walker, John L.** See *Bradshaw, Peter M. D.* 01728
- Walker, John L.** See *Bradshaw, Peter M. D.* 04663
- Walker, John L.** See *Bradshaw, Peter M. D.* 04672
- 04716 **Walker, Kenneth R.; LaPorte, Léo F.** Congruent fossil communities from Ordovician and Devonian carbonates of New York: *Jour. Paleontology*, v. 44, no. 5, p. 928-944, illus., tables, 1970.
- 07591 **Walker, Kenneth Russell.** The stratigraphy, environmental sedimentology, and community ecology of the Middle Ordovician Black River Group of New York State [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 3, p. 1353B-1354B, 1970.
- 03743 **Walker, Laurence G.** Physical stratigraphy of the Ordovician Martinsburg Formation and its lateral equivalents in southwestern Virginia: *Southeastern Geology*, v. 11, no. 4, p. 215-229, illus., 1970.
- 00421 **Walker, Myrl V.** George Fryer Sternberg, August 26, 1883-October 23, 1969: *Soc. Vertebrate Paleontology News Bull.* 88, p. 77, 1970.



- 10460 **Walker, Patrick N.** Water in Maryland—A review of the free state's liquid assets: Baltimore, Md., Maryland Geol. Survey (in cooperation with U.S. Geol. Survey), 52 p., illus., 1970.
- Walker, R.** See *Burnett, D. S.* 06846
- Walker, R. M.** See *Hoyt, H. P., Jr.* 06287
- 01588 **Walker, Robert D.** Geologic data processing — An effective exploration tool [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 3, p. 554, 1970.
- 06523 **Walker, Robert F.; Motts, Ward S.** Reconnaissance geology of Big Smoky Playa, Nevada, Chap. 4 in *Geology and hydrology of selected playas in western United States* (Ward S. Motts, editor) — Univ. Massachusetts, Geology Dept., Contract AF19(628)-2486, Final Sci. Rept., Pt. 2: Bedford, Mass., U.S. Air Force Office Aerospace Research, p. 137-165, illus., tables, 1970.
- 02695 **Walker, Roger G.; Harms, J. C.** Thin marine-nonmarine alternations in Upper Devonian "Catskill delta" [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 874, 1970.
- 02696 **Walker, Roger G.; Pettijohn, F. J.** Archean turbidite basin, northwestern Ontario [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 874, 1970.
- 05306 **Walker, Roger G.** Review of the geometry and facies organization of turbidites and turbidite-bearing basins [with French abs.], in *Flysch sedimentology in North America*: Geol. Assoc. Canada Spec. Paper 7, p. 219-251, illus., tables, 1970.
- 03058 **Walker, William R.; Stewart, Ronald C.** Deep-well disposal of wastes — Closure [to 1969 discussion of paper 6171, 1968]: Am. Soc. Civil Engineers Proc., v. 96, Jour. Sanitary Eng. Div., no. SA2, p. 610, 1970.
- 03931 **Wall, Charles A.; Wall, Janet E.** "Where can I find. . ." — Resources and references in earth sciences: Jour. Geol. Education, v. 18, no. 4, p. 178-183, 1970.
- Wall, R. E.** See *Taylor, P. T.* 01987
- Wallace, Alfred T.** See *Abegglen, Donn E.* 08463
- Wallace, Alfred T.** See *Williams, Roy E.* 08585
- 03639 **Wallace, D. E.; Spangler, D. P.** Estimating storage capacity in deep alluvium by gravity-seismic methods [with French abs.]: Internat. Assoc. Sci. Hydrology Bull., v. 15, no. 2, p. 91-104, illus., tables, 1970.
- 04130 **Wallace, D. E.; Cooper, L. R.** Dispersion of naturally occurring ions in groundwater from various rock types in a portion of the San Pedro River basin, Arizona: Jour. Hydrology, v. 10, no. 4, p. 391-405, illus., table, 1970.
- 05878 **Wallace, D. E.** Some limitations of seismic refraction methods in geohydrological surveys of deep alluvial basins: Ground Water, v. 8, no. 6, p. 8-13, illus., table, 1970.
- Wallace, D. E.** See *Spangler, D. P.* 06731
- 09308 **Wallace, G. B.; Slebir, E. J.; Anderson, F. A.** *In situ* methods for determining deformation modulus used by the Bureau of Reclamation, in *Determination of the in situ modulus of deformation of rock* (Symposium, Astm, Winter Mtg., Denver, Colo., 1969): Am. Soc. Testing and Materials Spec. Tech. Pub. 477, p. 3-26, illus., 1970.
- 09318 **Wallace, G. B.** General discussion, in *Determination of the in situ modulus of deformation of rock* (Symposium, Astm, Winter Mtg., Denver, Colo., 1969): Am. Soc. Testing and Materials Spec. Tech. Pub. 477, p. 197-198, 1970.

- 07455 **Wallace, George B.; Slebir, Edward J.; Anderson, Fred A.** Foundation testing for Auburn Dam, Chap. 25 in *Rock mechanics, theory and practice* — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 461-498, illus., tables, 1970.
- Wallace, H.** See *Wolfe, W. J.* 02516
- Wallace, H.** See *Wolfe, W. J.* 02734
- Wallace, Joe C.** See *Deusch, Morris.* 10810
- Wallace, Mildred M.** See *Olson, Robert A.* 05582
- Wallace, Robert E.** See *Vedder, J. G.* 04344
- 04872 **Wallace, Robert E.** Earthquake recurrence intervals on the San Andreas fault: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 2875-2889, illus., 1970.
- Wallace, Robert J.** See *Peters, Walter G.* 01096
- Wallace, Sandra.** See *Hills, L. V.* 02160
- Wallace, William A.** See *Dunn, James R.* 07482
- Waller, Benjamin I.** See *Bullen, Ripley P.* 10130
- Waller, J. O.** See *Dumper, T. A.* 05421
- 03423 **Wallick, Edward I.; Knauer, George A.** A modification of the benzene synthesis method for tritium analysis: *Water Resources Research*, v. 6, no. 3, p. 986-988, illus., tables, 1970.
- 06722 **Walling, James M.; Freeman, Dale; Adams, William M.** Initiating an IBM System/360 Document Processing System for tsunami research using an existing KWIC index data base, in *Tsunamis in the Pacific Ocean* — Internat. Symposium on Tsunamis and Tsunami Research, Honolulu, Hawaii, 1969, Proc.: Honolulu, Hawaii, East-West Center Press, p. 477-484, 1970.
- 04972 **Wallis, R. H.** The geology of the Dufferin Lake area (west half), Saskatchewan: Saskatchewan Dept. Mineral Resources Rept. 132, 60 p., illus., tables, geol. map, 1970.
- 08059 **Wallis, R. H.** A geological interpretation of gravity and magnetic data, northwest Saskatchewan: *Canadian Jour. Earth Sci.*, v. 7, no. 3, p. 858-868, illus., 1970.
- Wallis, R. H.** See *Money, P. L.* 08631
- 00652 **Wallis, Roger H.** The Virgin River belt and the evolution of northwest Saskatchewan [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 353-354, 1970.
- Walper, Jack.** See *Kuehn, Jack.* 00485
- 07100 **Walper, Jack L.** Wrench faulting in the mid-continent: *Shale Shaker*, v. 21, no. 2, p. 32-40, illus., 1970.
- 04561 **Walsh, J. H.; Visman, J.; Whalley, B. J. P.; Ahmed, S. M.** Removal of pyrite from Cape Breton coals destined for use in metallurgical processes, in *Mineral processing and extractive metallurgy* — Commonwealth Mining and Metall. Cong., 9th, 1969, Proc., V. 3: London, Inst. Mining and Metallurgy, p. 143-177, illus., tables, 1970.
- 01995 **Walsh, Joseph B.** Correcting dK/dp for porosity [abs.]: *EOS*, v. 51, no. 4, p. 419, 1970.

**Walter, L. S.** See *Dence, M. R.* 01902

02267 **Walter, Louis S.; Doan, Arthur S., Jr.** Mineralogy of the Lost City meteorite [abs.]: EOS, v. 51, no. 7, p. 581, 1970.

05258 **Walter, M. R.** Stromatolites used to determine the time of nearest approach of Earth and Moon: *Science*, v. 170, no. 3964, p. 1331-1332, 1970.

**Walther, C.** See *Haupt, W.* 08728

10293 **Walton, Anthony W.** Possible effects of aluminum hydroxide complexes on low-temperature mineral formation [abs.]: *Geol. Soc. American Abs. with Programs*, v. 2, no. 7, p. 714, 1970.

08353 **Walton, Brian J.; Arnold, Allan.** Plutonic nodules in lamprophyric carbonatite dykes near Frederikshaab, south-west Greenland: *Grönlands Geol. Undersögelse Bull.*, no. 91, 26 p., illus., tables, 1970.

02106 **Walton, William C.** Groundwater resource evaluation: New York, McGraw-Hill Book Co., 664 p., illus., tables, 1970.

06032 **Walton, William C.** The world of water: New York, Taplinger Publishing Co., 318 p., illus., 1970.

09489 **Walton, William R.** Modern and ancient hurricane deposits, in *Offshore Technology Conference*, 2d Ann., Houston, Tex., 1970, Preprints—v. 1: Dallas, Tex., Offshore Technology Conf., p. I-37 — i-39, 1970.

08771 **Waltz, James P.** Water transfer at bedrock-alluvium contacts, in *Ogallala Aquifer Symposium*, Lubbock, Texas, 1970 [Proc.]: Lubbock, Tex., Texas Tech. Univ. Special Report No. 39, Internat. Center for Arid and Semi-Arid Land Studies, p. 145-153, illus., 1970.

10835 **Waltz, James P.** Water and land management considerations in oil shale development, in *Public land policy* (Phillip O. Foss, editor), in *Public land policy—Western Resources Conference*, Ft. Collins, Colo., 1968, Proc.: boulder, Colo, Colorado Assoc. Univ. Press, p. 199-204, 1970.

**Walz, David H.** See *Best, David M.* 00675

**Wampler, J. M.** See *Weaver, Charles E.* 05200

07734 **Wampler, J. Marion; Neathery, Thornton L.; Bentley, Robert D.** Age relations in the Alabama Piedmont, in *Geology of the Brevard fault zone and related rocks of the Inner Piedmont of Alabama—Alabama Geol. Soc. field trip, 8th Ann.*, 1970, guidebook: University, Ala., Alabama Geol. Soc., p. 81-90, illus., table, 1970.

**Wane, M. T.** See *Barla, G.* 01283

01996 **Wang, Chi-yuen.** The upper mantle beneath tectonic regions [abs.]: EOS, v. 51, no. 4, p. 358, 1970.

02818 **Wang, Chi-Yuen.** Can mantle minerals have the NiAs structure?, in *Phase transformations and the Earth's interior—Symposium, Canberra, Australia, 1969, Proc.: Physics Earth and Planetary Interiors*, v. 3, p. 213-217, 1970.

03728 **Wang, Chi-Yuen.** Density and constitution of the mantle: *Jour. Geophys. Research*, v. 75, no. 17, p. 3264-3284, illus., tables, 1970.

04076 **Wang, Chi-Yuen.** Phase change in the upper mantle above 350 km: *Nature*, v. 227, no. 5261, p. 938-940, illus., 1970.

10572 **Wang, Chi-yuen.** Temperature in the lower mantle [abs.]: EOS, v. 51, no. 11, p. 823-824, 1970.

- 11234 **Wang, Frank Feng-hui.** (compiler). Mineral resources of the sea: New York, United Nations Pub. E.70.II.B.4., 49 p., 1970.
- 02439 **Wang, Fun-Den; Panek, Louis A.; Sun, Meng-Cherng.** Stability analysis of underground openings using a Coulomb-Navier share [sic] failure criterion [abs.]: *Min-ing Eng.*, v. 22, no. 1, p. 45, 1970.
- Wang, Herbert.** See *Chung, D. H.* 03969
- Wang, Ru-yih.** See *Williams, John A.* 08596
- Wang, Y. J.** See *Su, Y. L.* 07446
- Wang, Y. J.** See *Hardy, H. R., Jr.* 07451
- 06013 **Wang, Yun Fei.** Geological and geophysical studies of the Gilson Mountains and vicinity, Juab County, Utah [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 12, pt. 1, p. 5562B-5563B, 1970.
- Wanke, H.** See *Begemann, F.* 05683
- Wanke, H.** See *Hintenberger, H.* 05702
- 05730 **Wänke, H.; Rieder, R.; Baddenhausen, H.; Spettel, B.; Teschke, F.; Quijano-Rico, M.; Balacescu, A.** Major and trace elements in lunar material, in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc.* — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1719-1727, illus., tables, 1970.
- 06708 **Wanless, H. R.; Baroffio, James R.; Gamble, James C.; Horne, John C.; Orlopp, Donald R.; Rocha-Campos, Antonio; Souter, J. Edwin; Trescott, Peter C.; Vail, Ruth S.; Wright, Cynthia R.** Late Paleozoic deltas in the central and eastern United States, in *Deltaic sedimentation, modern and ancient: Soc. Econ. Paleontologists and Mineralogists Spec. Pub.* 15, p. 215-245, illus., tables, 1970.
- 02697 **Wanless, Harold R.** Influence of preexisting bedrock topography on bars of "lime" mud and sand, Biscayne Bay, Florida [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 5, p. 875, 1970.
- Wanless, Harold R.** See *Ginsburg, Robert N.* 10328
- Wanless, R. K.** See *Boyle, R. W.* 03478
- 04096 **Wanless, R. K.; Stevens, R. D.; Lachance, G. R.; Delabio, R. N.** Age determinations and geological studies — K-Ar isotopic ages, Rept. 9: Canada Geol. Survey Paper 69-2A, 78 p., illus., 1970.
- Wanless, R. K.** See *Boyle, R. W.* 05076
- 05731 **Wanless, R. K.; Loveridge, W. D.; Stevens, R. D.** Age determinations and isotopic abundance measurements on lunar samples (Apollo 11), in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc.* — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 1729-1739, illus., tables, 1970.
- 03926 **Wanless, Robert K.; Stevens, Robert D.; Loveridge, William D.** Anomalous parent-daughter isotopic relationships in rocks adjacent to the Grenville front near Chibougamau, Quebec, in *Geochronology of Phanerozoic orogenic belts — Colloquium, Switzerland, 1969, Papers: Eclogae Geol. Helvetiae*, v. 63, no. 1, p. 345-364, illus., tables, 1970.
- 05614 **Ward, F. N.** Analytical methods for determination of mercury in rocks and soils, in *Mercury in the environment: U.S. Geol. Survey Prof. Paper* 713, p. 46-49, 1970.
- Ward, J.** See *Boyne, H. S.* 06627

**Ward, Stanley H.** See *Fuller, Brent D.* 00082

- 02917 **Ward, Stanley H.** Airborne electromagnetic methods [with French abs.], in *Mining and groundwater geophysics*, 1967: Canada Geol. Survey Econ. Geology Rept. 26, p. 81-108, illus., 1970.

**Ward, Stanley H.** See *Hohmann, Gerald W.* 04785

**Ward, William C.** See *Wilson, James Lee.* 03607

- 03682 **Ward, William C.; Folk, Robert L.; Wilson, James Lee.** Blackening of eolianite and caliche adjacent to saline lakes, Isla Mujeres, Quintana Roo, Mexico: *Jour. Sed. Petrology*, v. 40, no. 2, p. 548-555, illus., 1970.

- 07954 **Ward, William Cruse.** Diagenesis of Quaternary eolianites of NE Quintana Roo, Mexico [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 6, p. 3489B, 1970.

**Warden, F. F.** See *Cress, J. P.* 05460

- 04572 **Wardlaw, N. C.** Effects of fusion, rates of crystallization and leaching on bromide and rubidium solid solutions in halite, sylvite and carnallite, in *Third symposium on salt*, V. 1 (J. L. Rau and L. F. Dellwig, editors): Cleveland, Ohio, Northern Ohio Geol. Soc., p. 223-231, illus., tables, 1970.

**Wardle, Ronald.** See *Brindley, G. W.* 09089

**Ware, N. G.** See *Essene, Eric.* 06971

- 06147 **Wark, J. W.; Keller, F. J.; Feltz, H. R.** Reconnaissance of sedimentation and chemical quality of surface water in the Potomac River basin, App. H in *Potomac River basin report*, V. 4: U.S. Cong., 91st, 2d sess., House Doc. 91-343, 75 p., paged separately, illus., tables, 1970.

**Warman, James C.** See *Wilson, Gary V.* 05068

- 09221 **Warman, James C.; LaMoreaux, Philip E.; Joiner, Thomas J.** New techniques in the search for water in limestone, in *Water balance in North America—Symposium*, Banff, Alberta, 1969, *Proc.: Am. Water Resources Assoc. Proc. Ser.*, no. 7, p. 144-146, 1969.

**Warne, A. H.** See *Dibblee, T. W., Jr.* 08015

- 10294 **Warner, Don L.** Integration of geologic concepts into environmental protection laws [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 715, 1970.

- 10519 **Warnke, Detlef A.; Stauble, Donald.** Reflected-light Dic microscopy, an application in nearshore studies [abs.]: *EOS*, v. 51, no. 11, p. 763, 1970.

**Warr, Jesse J., Jr.** See *Overstreet, William C.* 06180

**Warr, Jesse J., Jr.** See *Overstreet, William C.* 06184

**Warren, C.** See *Adams, William.* 09807

**Warren, C. G.** See *Jacobs, M. L.* 01483

- 04509 **Warren, Charles R.** Surficial geologic map of the Litchfield quadrangle, Litchfield County, Connecticut: U.S. Geol. Survey Geol. Quad. Map GQ-848, scale 1:24,000, text, 1970.

- 07498 **Warren, Charles R.** Surficial geologic map of the Winsted quadrangle, Litchfield and Hartford Counties, Connecticut: U.S. Geol. Survey Geol. Quad. Map GQ-871, scale 1:24,000, separate text, 1970.

- 09863 **Warren, H. V.; Green, A. J.; Cross, C. H.** Agricultural data as a mine-finding tool: *Western Miner*, v. 43, no. 11, p. 50-54, illus., tables, 1970.
- 10781 **Warren, H. V.; Delavault, Robert E.** Biogeochemistry in Canada, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 276-289, 1970.
- 07419 **Warren, Harry V.; Delavault, Robert E.; Cross, Christine H.** Base metal pollution in soils, in *Trace substances in environmental health III — Conf. on Trace Substances in Environmental Health*, 3d Ann., Columbia, Mo., 1969, Proc.: Columbia, Mo., Univ. Missouri, p. 9-19, tables, 1970.
- Warren, Nicholas.** See *Anderson, Orson L.* 06267
- 04444 **Warren, Nicholas W.; Latham, Gary V.** An experimental study of thermally induced microfracturing and its relation to volcanic seismicity: *Jour. Geophys. Research*, v. 75, no. 23, p. 4455-4464, illus., tables, 1970.
- 01847 **Warren, Richard C.** Electron microprobe investigations of almandine garnets from a quartz diorite stock and adjacent metamorphic rocks, British Columbia [abs.]: *EOS*, v. 51, no. 4, p. 444, 1970.
- 07622 **Warrick, A. W.** A mathematical solution to a hillside seepage problem: *Soil Sci. Soc. America Proc.*, v. 34, no. 6, p. 849-853, illus., 1970.
- 07097 **Washburn, A. L.** An approach to a genetic classification of patterned ground, in *Problemy Czwartorzędu: Acta Geog. Lodzienia* 24, p. 437-446, table, 1970.
- 09900 **Washburn, A. L.** Instrumental observations of mass-wasting in arctic climate [with German and French abs.], in *New contributions to slope evolution: Zeitschr. Geomorphologie*, supp. 9, p. 102-118, illus., tables, 1970.
- 00459 **Washburn, Robert H.** Paleozoic stratigraphy of Toiyabe Range, southern Lander County, Nevada: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 2, p. 275-284, illus., 1970.
- Wasserburg, G. J.** See *Eugster, O.* 01701
- Wasserburg, G. J.** See *O'Connell, Richard J.* 01808
- Wasserburg, G. J.** See *Eugster, O.* 02137
- Wasserburg, G. J.** See *Sanz, H. G.* 05314
- Wasserburg, G. J.** See *Tera, F.* 05726
- Wasserburg, G. J.** See *Naylor, R. S.* 06453
- 03141 **Wasson, B. E.; Thomson, F. H.** Water resources of Lee County, Mississippi: U.S. Geol. Survey Water-Supply Paper 1899-B, p. B1-B63, illus., tables, 1970.
- 00476 **Wasson, John T.; Wai, Chien M.** Composition of the metal, schreibersite and per-ryite of enstatite achondrites and the origin of enstatite chondrites and achondrites: *Geochim. et Cosmochim. Acta*, v. 34, no. 2, p. 169-184, illus., tables, 1970.
- Wasson, John T.** See *Wai, Chien M.* 01863
- Wasson, John T.** See *Baedecker, Philip A.* 01901
- 04605 **Wasson, John T.** Ni, Ga, Ge and Ir in the metal of iron-meteorites-with-silicate-inclusions: *Geochim. et Cosmochim. Acta*, v. 34, no. 9, p. 957-964, illus., table, 1970.
- 05333 **Wasson, John T.** The chemical classification of iron meteorites — [Pt.] 4, Irons with Ge concentrations greater than 190 ppm and other meteorites associated with Group I: *Icarus*, v. 12, no. 3, p. 407-423, illus., 1970.

- 05732 **Wasson, John T.; Baedeker, Philip A.** Ga, Ge, In, Ir and Au in lunar, terrestrial and meteoritic basalts, in *Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1741-1750, illus., tables, 1970.*
- 09380 **Wasylikowa, Krystyna; Wright, H. E., Jr.** Late-glacial plant succession on an abandoned drainageway, northeastern Minnesota, USA [with Polish summ.]: *Acta Palaeobot.*, v. 11, no. 1, p. 23-43, illus., 1970.
- Water Levels Section Staff.** See *Wyatt, A. Wayne.* 08439
- 10112 **Waterhouse, J. B.** Comparison of Canadian Arctic brachiopods to Australian Permian brachiopods—Significance for continental drift [abs.], in *Internat. Arctic Geology Symposium, 2d, San Francisco, 1971, Abs. Papers: Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2512, 1970.
- Waters, A. C.** See *Shoemaker, E. M.* 06294
- Waters, Aaron C.** See *Fisher, Richard V.* 01173
- Waters, Aaron C.** See *Higgins, Michael W.* 04463
- 08538 **Waters, Aaron C.; Fisher, Richard V.** Maar volcanoes, in *Columbia River Basalt Symposium, 2nd, Cheney, Wash., 1969, Proc.: Cheney, Eastern Washington State College Press, p. 157-170, illus., 1970.*
- Watkins, Curtis.** See *Langhus, Bruce G.* 09632
- 04636 **Watkins, F. A., Jr.; Heisel, J. E.** Electrical-analog-model study of water resources of the Columbus area, Bartholomew County, Indiana: *U.S. Geol. Survey Water-Supply Paper 1981, 22 p., illus., tables, 1970.*
- Watkins, Joel S.** See *Best, David M.* 00675
- Watkins, Joel S.** See *Eaton, Gordon P.* 02999
- 10575 **Watkins, Joel S.; Huggett, Thomas.** Evidence of middle Paleozoic sea-floor spreading in the Southern Appalachians [abs.]: *EOS*, v. 51, no. 11, p. 824, 1970.
- 01997 **Watkins, N. D.; Cambray, W.; Richardson, A.** Paleomagnetism of Cretaceous dikes from Jamaica [abs.]: *EOS*, v. 51, no. 4, p. 270, 1970.
- 10295 **Watkins, N. D.** Paleomagnetic dating of the Plio-Pleistocene boundary [abs.]: *GEOL. Soc. America Abs. with Programs*, v. 2, no. 7, p. 716, 1970.
- Watkins, N. D.** See *Kennett, James P.* 10825
- 10834 **Watkins, N. D.; Krause, D. C.** North Atlantic crustal genesis in the vicinity of the Azores [abs.]-*Internat. Symposium on Recent Crustal Movements and Associated Seismicity, Wellington, N.Z., 1970, Proc.: Wellington, N.Z., Royal Soc. of New Zealand, p. 35-36, 1970.*
- Watkins, Norman D.** See *Gunn, Bernard M.* 01412
- Watkins, William T.** See *Strimple, Harrell L.* 11219
- 06106 **Watkinson, David H.** Experimental studies bearing on the origin of the alkalic rock-carbonatite complex and niobium mineralization at Oka, Quebec, in *Alkaline rocks, the Monteregian Hills — Symposium, Montreal, 1969, Proc.: Canadian Mineralogist*, v. 10, pt. 3, p. 350-361, illus., table, 1970.
- Watkinson, David H.** See *Wyllie, Peter J.* 06107

- 06494 **Watkinson, David H.** Geology of the alkalic rock-carbonatite complex at Prairie Lake, Ontario [abs.], in *Inst. Lake Superior Geology*, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 44, 1970.
- 09011 **Watson, Clyde D.; Parkinson, W. W.** Irradiation of bituminous materials, [Chap.] 6 in *Bituminous materials—Asphalts, tars, and pitches*, A. J. Hoiberg, editor—v. 1: New York, Intersci. Publishers, p. 289-321, illus., tables, 1964.
- Watson, D. E.** See *Kellogg, Karl*. 04799
- Watson, G. H.** See *Macpherson, J. G.* 06747
- 08609 **Watson, Geoffrey S.** The statistical treatment of orientation data, in *Geostatistics—A colloquium* (D. F. Merriam, editor), Lawrence, Kan., 1970, Proc.: New York, Plenum Press, p. 1-9, 1970.
- 00083 **Watson, Jerry A.; Johnson, G. Leonard.** Deep ocean structures off Grand Banks may contain oil: *Ocean Industry*, v. 5, no. 2, p. 57-60, illus., 1970.
- 07707 **Watson, Jerry A.; Johnson, G. Leonard.** Seismic studies in the region adjacent to the Grand Banks of Newfoundland: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 306-316, illus., 1970.
- Watson, K. D.** See *Morton, D. M.* 00320
- Watson, Kenneth.** See *Rowan, L. C.* 05960
- Watson, Kenneth.** See *Rowan, L. C.* 07774
- Watson, Kenneth.** See *Rowan, L. C.* 09291
- 09292 **Watson, Kenneth.** A thermal model for analysis of infrared images, Sec. 13 of *Earth Resources Program*, 3d ann., review—v. 1, *Geology and geography: Houston, Tex., NASA Manned Spacecraft Center*, Msc-03742, p. 13-1—13-16, illus., 1970.
- 09073 **Watson, Patty Jo; Yarnell, Richard A.** The prehistory of Salts Cave, Kentucky: *Illinois State Mus. Rept. Inv.* 16, 86 p., illus., tables, 1969.
- 10809 **Watson, Patty Jo.** Archeological investigations in Salts Cave, Mammoth Cave National Park, Kentucky, U.S.A., in *Internat. Cong. Speleology*, 4th, Yugoslavia, 1965, Proc., V. 4-5, Sec. 3—Paleontology and prehistoric speleology: Ljubljana, Yugoslavia, *Speleol. Soc. Yugoslavia*, p. 403-407, 1969.
- Watson, R. A.** See *Smith, P. M.* 04005
- Watson, R. D.** See *Rowan, L. C.* 05960
- Watson, R. D.** See *Rowan, L. C.* 07774
- Watson, R. D.** See *Offield, T. W.* 09290
- Watson, Richard A.** See *White, William B.* 00012
- 10820 **Watson, Richard A.** Big canyons in the central Kentucky karst [abs.], in *Internat. Cong. Speleology*, 4th, Yugoslavia, 1965, Proc., V. 3: Ljubljana, Yugoslavia, *Speleolog. Soc. Yugoslavia*, p. 643, 1968.
- 10821 **Watson, Richard A.; Smith, Philip M.** The Flint Ridge Cave Research Center, Mammoth Cave National Park, Kentucky, in *Internat. Cong. Speleology*, 4th, Yugoslavia, 1965, Proc., V. 3: Ljubljana, Yugoslavia, *Speleolog. Soc. Yugoslavia*, p. 645-654, illus., 1968.



- 03357 **Watson, T. H.** A note on fast computation of Rayleigh wave dispersion in the multilayered elastic half-space: *Seismol. Soc. America Bull.*, v. 60, no. 1, p. 161-166, 1970.
- 03796 **Watt, Arthur D.** Catalog of the illustrated Paleozoic plant specimens in the National Museum of Natural History: *Smithsonian Contr. Paleobiology*, no. 5, 53 p., 1970.
- Watt, W. G.** See *Thorley, A.* 04177
- 09443 **Watt, W. Stuart.** Preliminary report of the mapping of the basalt area, south Scoresby Sund, in Report on the 1969 geological expedition to Scoresby Sund, East Greenland: *Grönlands Geol. Undersögelse Rap.* 30, p. 30-37, illus., 1970.
- Watterson, J.** See *Escher, A.* 06763
- Watts, J. W.** See *Couch, E. J.* 09251
- 03668 **Watts, W. A.** The full-glacial vegetation of northwestern Georgia: *Ecology*, v. 51, no. 1, p. 17-33, illus., tables, 1970.
- Waugh, A. B.** See *Bond, A. M.* 09458
- Waugh, Truman C.** See *Tien, Pei-lin.* 01198
- 05595 **Wawersik, W. R.; Fairhurst, C.** A study of brittle rock fracture in laboratory compression experiments: *Internat. Jour. Rock Mechanics and Mining Sci.*, v. 7, no. 5, p. 561-575, illus., 1970.
- 01848 **Wawersik, Wolfgang R.; Brace, William F.** Post-failure study of granite and diabase [abs.]: *EOS*, v. 51, no. 4, p. 423, 1970.
- Way, G.** See *Hendron, A. J., Jr.* 09315
- Wayman, M. L.** See *Evans, M. E.* 06822
- 03742 **Wayman, R. A.; Collings, R. K.; Buchanan, R. M.** Some unusual aspects of Canadian industrial minerals [abs.]: *Mining Eng.*, v. 22, no. 1, p. 42, 1970.
- 00653 **Wayne, William J.** Geologic studies for use in regional and local planning [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 354, 1970.
- 02539 **Wayne, William J.** Slope evolution in southeastern Nebraska [abs.]: *Nebraska Acad. Sci. Proc.*, 80th Ann. Mtg., p. 38-39, 1970.
- 10296 **Wayne, William J.** Place of environmental geology in urban planning [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 716-717, 1970.
- 10902 **Wayne, William J.** Native Indiana iron ores and 19th century ironworks: *Indiana Geol. Survey Bull.* 42-E, 25 p., illus., 1970.
- 05200 **Weaver, Charles E.; Wampler, J. M. K.** Ar, illite burial: *Geol. Soc. America Bull.*, v. 81, no. 11, p. 3423-3430, illus., tables, 1970.
- Weaver, John D.** See *Seiglie, George A.* 10935
- 03158 **Weaver, P. F.; Yuen, P. C.; Prolss, G. W.; Furumoto, A. S.** Acoustic coupling into the ionosphere from seismic waves of the earthquake at Kurile Islands on August 11, 1969: *Nature*, v. 226, no. 5252, p. 1239-1241, illus., 1970.
- 07955 **Weaver, Robert Michael.** Montmorillonite genesis in soils as influenced by the activities of monosilicic acid and various cations in the matrix solution [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 6, p. 3110B, 1970.

- 03333 **Webb, H. W.; Nunan, W. E.; Penley, H. M.** Road log — Storm-damaged areas in central Virginia: *Virginia Minerals*, v. 16, no. 1, p. 1-10, illus., 1970.
- Webb, J. B.** See *Link, T. A.* 05185
- Webb, J. B.** See *Link, T. A.* 05288
- Webb, J. S.** See *Nichol, Ian.* 04870
- 05763 **Webber, G. R.; Horska, S. J.** Mercury and sulphur in two intrusive complexes, Rougemont and Lake Dufault, Quebec [with French abs.]: *Geol. Assoc. Canada Proc.*, v. 22, p. 11-18, illus., tables 1970.
- Webb, R. W.** See *Wichmann, P. A.* 09248
- 08362 **Webb, S. David.** Fossil xenarthrans of Florida: *Plaster Jacket*, no. 13, [9] p., illus., 1970.
- Webb, S. David.** See *Patton, Thomas H.* 08363
- 10123 **Webb, S. David.** The Pliocene Canidae of Florida: *Florida State Mus. Bull. Bio. Sci.*, v. 14, no. 4, p. 273-308, illus., tables, 1969.
- Webb, S. David.** See *Bullen, Ripley P.* 10130
- 10470 **Webb, S. David.** Fossil proboscideans of Florida: *Plaster Jacket*, no. 4, 11 p., illus., 1967.
- 09419 **Webb, Thompson, 3d.** The postglacial climatic sequence in Wisconsin and eastern Minnesota—Estimates derived from multivariate statistical analysis of fossil pollen data [abs.], in *American Quaternary Assoc. Mtg.*, 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 146, 1970.
- 10297 **Webb, Thompson, 3d.** A comparison of climatic change during the postglacial between Wisconsin and east-central Minnesota [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 717, 1970.
- Webb, Wayne E.** See *Weigle, James M.* 01607
- Webb, Wayne E.** See *Weigle, James M.* 03584
- 07476 **Webb, William M.** Sand and gravel resources of the Ohio River valley — Lawrenceburg to Jeffersonville, Indiana, in *Forum on geology of industrial minerals*, 5th, Harrisburg, Pa., 1969, *Proc.: Pennsylvania Geol. Survey*, 4th ser., *Bull. M64* (Mineral Resources Rept.), p. 23-42, illus., tables, 1970.
- Webb, William M.** See *Carr, Donald D.* 10901
- 05367 **Webber, G. R.; Horska, S. J.** Mercury and sulphur in two intrusive complexes, Rougemont and Lake Dufault, Quebec [with French abs.]: *Geol. Assoc. Canada Proc.*, v. 22, p. 11-18, illus., tables 1970.
- 07708 **Webber, P. J.; Richardson, J. W.; Andrews, J. T.** Post-glacial uplift and substrate age at Cape Henrietta Maria, southeastern Hudson Bay, Canada: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 317-325, illus., tables, 1970.
- 00124 **Weber, Dwight.** Kornelite at Coso Hot Springs: *California Div. Mines and Geology Mineral Inf. Service*, v. 23, no. 1, p. 6, 1970.
- 01509 **Weber, Florence R.; Péwé, Troy L.** Surficial and engineering geology of the central part of the Yukon-Koyuk lowland, Alaska: *U.S. Geol. Survey Misc. Geol. Inv. Map I-590*, 2 sheets, scale 1:125,000, table, 1970.
- Weber, Florence R.** See *Foster, Helen L.* 10041

**Weber, H. P.** See *Hafner, S. S.* 01772

**Weber, H. W.** See *Hintenberger, H.* 05702

- 01451 **Weber, J. R.; Andrieux, Pierre.** Radar soundings on the Penny Ice Cap, Baffin Island [with French and German abs.]: *Jour. Glaciology*, v. 9, no. 55, p. 49-54, illus., 1970.

**Weber, J. R.** See *Sobczak, L. W.* 02179

**Weber, J. R.** See *Sobczak, L. W.* 10099

**Weber, Walter J., Jr.** See *Mattson, James S.* 07130

- 04224 **Weber, William G.** Performance of embankments constructed over peat — Closure [to discussion of paper 6333, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, *Jour. Soil Mechanics and Found. Div.*, no. SM5, p. 1791, 1970.

- 01359 **Webster, D. S.; Proctor, J. F.; Marine, I. W.** Two-well tracer test in fractured crystalline rock: *U.S. Geol. Survey Water-Supply Paper 1544-I*, p. 11-122, illus., tables, 1970.

- 01208 **Webster, G. D.; Lane, N. Gary.** Carboniferous echinoderms from the southwestern United States: *Jour. Paleontology*, v. 44, no. 2, p. 276-296, illus., tables, 1970.

**Webster, G. D.** See *Ovenshine, A. T.* 04260

**Webster, R. K.** See *Smales, A. A.* 05763

**Wechter, M.** See *Laul, J. C.* 03651

**Wedow, Helmuth, Jr.** See *Ericksen, George E.* 03818

**Weed, S. B.** See *Leonard, R. A.* 07615

**Weed, S. B.** See *Leonard, R. A.* 07616

- 01490 **Weeks, John B.** The relationship between surface water and ground water in Ship Creek near Anchorage, Alaska, in *Geological Survey research 1970*, Chap. B: *U.S. Geol. Survey Prof. Paper 700-B*, p. B224-B226, illus., table, 1970.

**Weeks, R. A.** See *Chaterlain, A.* 04402

- 06300 **Weeks, R. A.; Kolopus, J. L.; Kline, D.; Chatelain, A.** Apollo 11 lunar material — Nuclear magnetic resonance of Al-27 and electron resonance of Fe and Mn, in *Apollo 11 Lunar Sci. Conf.*, Houston, Tex., 1970, *Proc.* — V. 3, *Physical properties*: New York, and Oxford, England, Pergamon Press (*Geochim. et Cosmochim. Acta Supp.* 1), p. 2467-2490, illus., table, 1970.

- 01425 **Weems, John H.** In memoriam — George Irwin McFerron (1895-1969): *Houston Geol. Soc. Bull.*, v. 12, no. 6, p. 20-21, 1970.

- 02343 **Weems, John H.** George Irwin McFerron (1895-1969): *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 7, p. 1309, 1970.

- 02103 **Weertman, J.** The creep strength of the Earth's mantle: *Rev. Geophysics and Space Physics*, v. 8, no. 1, p. 145-168, illus., tables, 1970.

- 01998 **Weertman, Bruce G.; Davis, L. L.; Foote, R. Q.; Hays, W. W.** Seismic anomaly at NRDS, Nevada [abs.]: *EOS*, v. 51, no. 4, p. 359, 1970.

- 00045 **Weggel, Harold A.** Bridge foundation behavior in Alaska earthquake — Discussion [of paper 6664 by G. S. Ross, H. B. Seed, and R. R. Migliaccio, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, *Jour. Soil Mechanics and Found. Div.*, no. SM 1, p. 365-367, illus., 1970.

- Wegner, M. W.** See *Grossman, J. J.* 06281
- 10599 **Wegner, M. W.; Hansen, W. M.; Grossman, J. J.** Experimental investigation of surfaces, and defect structure of terrestrial and lunar material [abs.]: *EOS*, v. 51, no. 11, p. 830, 1970.
- 10298 **Wehmiller, John; Hare, P. E.** Amino acid diagenesis in fossil carbonates [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 718, 1970.
- Weiblen, P. W.** See *Grant, James A.* 01766
- Weiblen, P. W.** See *Gable, D. J.* 05858
- Weiblen, Paul.** See *Green, John.* 03581
- Weiblen, Paul W.** See *Roedder, Edwin.* 09542
- Weichert, D. H.** See *Basham, P. W.* 00417
- Weide, David L.** See *Orme, Antony R.* 00330
- 06247 **Weidick, A.; Ten Brink, N. W.** Quaternary deposits between the Sukkertoppen ice cap and Nordre Stromfjord, in Report of activities, 1969: *Grönlands Geol. Under-søgelse Rap.* 28, p. 23-25, 1970.
- 01418 **Weidie, A. E.; Martinez, Joseph D.** Evidence for evaporite diapirism in northeastern Mexico: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 4, p. 655-657, illus., 1970.
- 09890 **Weidie, A. E.; Wolleben, J. A.; McBride, E. F.** Regional geologic framework of northeastern Mexico, in Spring field trip, 1970, Hidalgo Canyon and La Popa Valley [Mexico]: [*Corpus Christi, Texas, Corpus Christi Geol. Soc.*], p. 5-16 [1970].
- 09891 **Weidie, A. E.; Wolleben, J. A.; McBride, E. F.** Geology of Potrero Chico anticline, Sierra del Fraile, Nuevo Leon, in Spring field trip, 1970, Hidalgo Canyon and La Popa Valley [Mexico]: [*Corpus Christi, Texas, Corpus Christi Geol. Soc.*], p. 30-44, illus. [1970].
- Weidie, A. E.** See *Wolleben, James A.* 09892
- Weidie, A. E.** See *Wolleben, James A.* 09893
- 03329 **Weidler, Jay B., Jr.; Paslay, Paul R.** Constitutive relations for inelastic granular medium: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7475, *Jour. Eng. Mechanics Div.*, no. EM 4, p. 395-406, illus., 1970.
- 03013 **Weidner, Donald; Madariaga, Raul.** Discussion of paper by M. Kumazawa, "The elastic constant of polycrystalline rocks and nonelastic behavior inherent to them" [1969]: *Jour. Geophys. Research*, v. 75, no. 14, p. 2787-2789, 1970.
- Weidner, Jerry R.** See *Ghose, Subrata.* 06988
- Weigand, Peter.** See *Justus, Philip S.* 00726
- 00773 **Weigand, Peter W.** Major element geochemistry of the eastern North American Triassic(?) dikes [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 247, 1970.
- 08275 **Weigand, Peter W.; Ragland, Paul C.** Geochemistry of Mesozoic dolerite dikes from eastern North America: *Contr. Mineralogy and Petrology*, v. 29, no. 3, p. 195-214, illus., tables, 1970.
- 01607 **Weigle, James M.; Webb, Wayne E.; Gardner, Richard A.** Water resources of southern Maryland: *U.S. Geol. Survey Hydrol. Inv. Atlas HA-365*, 3 sheets, scales about 1 in. to 4 mi. and 1 in. to 8 mi., text, 1970.

- 03584 **Weigle, James M.; Webb, Wayne E.** Southern Maryland records of six selected wells, water levels, and chemical analyses of water: Maryland Geol. Survey Basic Data Rept. 4, 48 p., illus., tables, 1970.
- 05598 **Weijden, C. H. van der; Schuiling, R. D.; Das, H. A.** Some geochemical characteristics of sediments from the North Atlantic Ocean: *Marine Geology*, v. 9, no. 2, p. 81-99, illus., tables, 1970.
- 00186 **Weil, Charles B.** Sediment distribution in the upper Delaware River Estuary [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 40, 1970.
- Weiler, James P.** See *Bonine, Michael E.* 07191
- Weiler, Roland R.** See *Lerman, Abraham.* 08273
- 00964 **Weill, D. F.; Bottinga, Y.** Thermodynamic analysis of quartz and cristobalite solubilities in water at saturation vapor pressure: *Contr. Mineralogy and Petrology*, v. 25, no. 2, p. 125-132, illus., tables, 1970.
- Weill, D. F.** See *Bottinga, Y.* 01740
- Weill, D. F.** See *Drake, M. J.* 06844
- Weill, Daniel F.** See *Kudo, Albert M.* 00856
- Weill, Daniel F.** See *Bottinga, Y.* 04659
- 05351 **Weimer, R. J.** (1934-1970) in Dakota and related rocks of the Front Range—Guidebook issue: *Mtn. Geologist*, v. 7, no. 3, p. [101], 1970.
- 05357 **Weimer, Robert J.** Dakota Group (Cretaceous) stratigraphy, southern Front Range, South and Middle Parks, Colorado, in Dakota and related rocks of the Front Range — Guidebook issue: *Mtn. Geologist*, v. 7, no. 3, p. 157-184, illus., tables, 1970.
- Weimer, Robert J.** See *McGookey, Donald P.* 05364
- 06711 **Weimer, Robert J.** Rates of deltaic sedimentation and intrabasin deformation, Upper Cretaceous of Rocky Mountain region, in Deltaic sedimentation, modern and ancient: *Soc. Econ. Paleontologists and Mineralogists Spec. Pub.* 15, p. 270-292, illus., table, 1970.
- Weinaug, Charles F.** See *Green, Don W.* 03073
- Weinberg, Bernhard.** See *Ehrlich, Robert.* 01537
- Weinberg, Bernhard.** See *Vogel, Thomas A.* 10286
- 00654 **Weinberg, David M.** Significance of folding in the disturbed belt, northern Big Belt Mountains, Montana [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 354-355, 1970.
- 07459 **Weinbrandt, R. M.; Fatt, Irving.** Scanning electron microscope study of the pore structure of sandstone, Chap. 31 in *Rock mechanics, theory and practice* — 11th Symposium on Rock Mechanics, Berkeley, Calif., 1969, *Proc.*: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 629-641, illus., 1970.
- Weiner, Catherine.** See *Greenfield, Leonard J.* 03052
- Weinke, H. H.** See *Kiesl, W.* 04370
- Weinstein, B. B.** See *Orr, W. N.* 09813

- 00774 **Weir, G. W.; Gualtieri, J. L.** The "Rockcastle freestone," a turbidite in the upper part of the Borden Formation in southeast-central Kentucky [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 247-248, 1970.
- 03858 **Weir, Gordon W.** Field trip No. 3, Borden Formation (Mississippian) in southeast-central Kentucky, in *Guidebook for field trips* — *Geol. Soc. America, Southeastern Sec.*, 18th Ann. Mtg., Lexington, Ky., 1970: Lexington, Ky., Kentucky Geol. Survey, p. 29-48, illus., tables, 1970.
- 03859 **Weir, Gordon W.** Field trip No. 4, Paleozoic section on east flank of Cincinnati Arch along Interstate 64, Lexington to Olive Hill, Kentucky — Pt. 1, Lexington eastward to valley of Licking River, in *Guidebook for field trips* — *Geol. Soc. America, Southeastern Sec.*, 18th Ann. Mtg., Lexington, Ky., 1970: Lexington, Ky., Kentucky Geol. Survey, p. 49-56, illus., 1970.
- 00011 **Weiss, Benjamin; Boettner, Edward A.; Stenning, Michael.** Determination of quartz — Evaluation of the differential thermal analysis method: *Archives Environmental Health*, v. 20, no. 1, p. 37-44, illus., tables, 1970.
- Weiss, Clair W.** See *Heald, Emerson F.* 07015
- Weiss, Lionel E.** See *Verhoogen, John.* 03811
- 03542 **Weiss, Malcolm P.** Oncolites forming on snails (*Goniobasis*): *Jour. Paleontology*, v. 44, no. 4, p. 765-769, illus., 1970.
- Weiss, Malcolm P.** See *Odom, I. Edgar.* 09723
- Weiss, Malcolm P.** See *Odom, I. Edgar.* 09724
- 01281 **Weiss, R. F.** Helium isotope effect in solution in water and seawater: *Science*, v. 168, no. 3928, p. 247-248, table, 1970.
- Weiss, R. F.** See *Craig, H.* 06399
- 04867 **Weissberg, B. C.** Solubility of gold in hydrothermal alkaline sulfide solutions: *Econ. Geology*, v. 65, no. 5, p. 551-556, illus., 1970.
- Weissenborn, A. E.** See *Society of Economic Geologists.* 04909
- Weist, W. G., Jr.** See *Davidson, E. S.* 01645
- Weist, William G., Jr.** See *Johnston, Paul M.* 06146
- Welby, C. W.** See *Leith, C. J.* 09216
- 00775 **Welby, Charles W.** Observations on the origin of the North Carolina Outer Banks — Results from a geophysical study [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 248, 1970.
- Welby, Charles W.** See *Davis, Darrell E.* 07335
- 10702 **Welby, Charles W.** Groundwater yields in the Raleigh quadrangle: North Carolina Univ. Water Resources Research Inst. Rept. 8, 61 p., illus., tables, 1968.
- 01184 **Welch, D. M.** Substitution of space for time in a study of slope development: *Jour. Geology*, v. 78, no. 2, p. 234-239, illus., 1970.
- 08224 **Welch, Robin I.** (editor). The use of remote sensing in conservation, development, and management of the natural resources of the State of Alaska: Juneau, Alaska, Dept. of Econ. Devel., 133 p., illus., tables [1970].
- 08234 **Welch, Robin I.** The use of remote sensing in water resource management, in *The use of remote sensing . . . of natural resources of Alaska*: Juneau, Alaska, Dept. of Econ. Devel., p. 98-102, illus. [1970].

- 02036 **Weld, Betsy A.; Griffin, Margaret S.; Brett, George W.** Reports and maps of the Geological Survey released only in the open files, 1969: U.S. Geol. Survey Circ. 618, 23 p., 1970.

**Welday, E. E.** See *Baird, A. K.* 00226

- 07162 **Welge, E. A.** Olcese 12-21 pool of Greeley oil field: California Oil Fields — Summ. Operations 1970, v. 56, no. 1, p. 15-23, illus., tables, 1970.

- 10965 **Welge, E. A.** Valpredo oil field: California Oil Fields — Summ. Operations 1969, v. 55, no. 1, p. 45-50, illus., tables, 1970.

- 04723 **Welles, S. P.** *Dilophosaurus* (Reptilia: Saurischia), a new name for a dinosaur: Jour. Paleontology, v. 44, no. 5, p. 989, 1970.

- 04738 **Wellman, Thomas R.** Fugacities and activity coefficients of NaCl in NaCl-H<sub>2</sub>O fluids at elevated temperatures and pressures: Am. Jour. Sci., v. 269, no. 4, p. 402-413, illus., table, 1970.

- 01452 **Wellman, Thomas Robert.** The stability of sodalite in a synthetic syenite plus aqueous chloride fluid system: Jour. Petrology, v. 11, no. 1, p. 49-71, illus., tables, 1970.

- 00454 **Wellmer, Friedrich-Wilhelm.** Der US Geological Survey [The U.S. Geological Survey]: Erzmetall, v. 23, no. 1, p. 34-39, illus., 1970.

**Wells, C. J.** See *Bedinger, M. S.* 05473

**Wells, D. M.** See *Claborn, B. J.* 08710

- 08465 **Wells, John D.; Elliott, James E.** Geochemical reconnaissance of the Cortez-Buckhorn area, southern Cortez Mountains, Nevada: U.S. Geol. Survey Bull. 1312-P, 18 p., illus., tables, 1970(?).

- 06685 **Wells, John W.** Problems of annual and daily growth-rings in corals, Chap. 1 in Palaeogeophysics (S. K. Runcorn, editor): London and New York, Academic Press, p. 3-9, illus., 1970.

- 10713 **Wells, John W.** Aspects of Pacific coral reefs: Micronesica, v. 5, no. 2, p. 317-322, 1969.

- 10414 **Wells, Oliver C.; Bremer, Conrad G.** Collector turret for scanning electron microscope: Rev. Sci. Instruments, v. 41, no. 7, p. 1034-1037, illus., 1970.

- 08049 **Wells, Philip V.** Vegetational history of the Great Plains — A post-glacial record of coniferous woodland in southeastern Wyoming, in Pleistocene and recent environments of the central Great Plains: Kansas Univ. Dept. Geology Spec. Pub. 3, p. 185-202, illus., tables, 1970.

- 09420 **Wells, Philip V.** Vegetation of the Southwest between 14,000 and 9,000 years ago — The macrofossil record [abs.], in America Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?], p. 147-148, 1970.

- 10380 **Wells, Raymond H.** River basin planning concepts and their use in resource development, in Mississippi Water Resources Conf., 4th, 1969, Jackson, Proc.: State College, Miss. Water Resources Research Inst., p. 113-120, 1969.

**Wells, Richard B.** See *Fail, Rodger T.* 01248

- 03218 **Wells, Steve; Wilson, Ted.** Parker's Pit Cave (challenge in 3 dimensions): Natl. Speleol. Soc. NSS News, v. 28, no. 7, p. 94-97, illus., 1970.

- 09916 **Welp, T. L.; Isenberger, K. J.; Dubberke, W.; Myers, J.** Field trip No. 4, Middle River traverse of Iowa Pennsylvanian stratigraphy, in Geol. Soc. America, North-

- Central Sec., Ann. Mtg., 2d, May 1968, guidebook: Iowa City, Iowa, Univ. Iowa, p. 4-1 to 4-26, illus. [1968].
- 02698 **Welte, Dietrich H.** Petroleum exploration and organic geochemistry [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 875, 1970.
- 09866 **Weltman, Gershon; Golden, Howard.** Computer handling of the Sealab Iii operations scenario: Marine Technology Soc. Jour., v. 4, no. 1, p. 67-70, illus., tables, 1970.
- 05442 **Wendell, P. B.** Electron microscopy of weathered quartz grain surfaces, Pleistocene(?) sediments of York-James Peninsula [abs.]: Virginia Jour. Sci., v. 21, no. 3, p. 137, 1970.
- Wenderoth, Sondra.** See *Canney, F. C.* 09297
- Wendland, Wayne M.** See *Bryson, Reid A.* 08045
- Wendland, Wayne M.** See *Bryson, Reid A.* 09515
- 08043 **Wendorf, Fred.** The Lubbock subpluvial, in Pleistocene and recent environments of the central Great Plains: Kansas Univ. Dept. Geology Spec. Pub. 3, p. 23-35, illus., 1970.
- 08652 **Wengerd, Sherman A.** Petroleum prospects in southwesternmost New Mexico, in Guidebook of the Tyrone-Big Hatchet Mountains-Florida Mountains region — New Mexico Geol. Soc. Field Conf., 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, p. 90-104, illus., tables, 1970.
- 08671 **Wengerd, Sherman A.** Robert A. Zeller, Jr. [1925-1970] — A memorial, in Guidebook of the Tyrone-Big Hatchet Mountains-Florida Mountains region — New Mexico Geol. Soc. Field Conf., 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, p. v, portrait, 1970.
- 10979 **Wengerd, Sherman A.** Western Paradox basin is a potential oil giant in Pennsylvanian rocks, Pts. 1-3: Oil and Gas Jour., v. 68, no. 4, p. 172, 174, 176, 183-184; *ibid.*, no. 5, p. 142-143, 146-147; *ibid.*, no. 6, p. 96-97, 100-102, illus., tables, 1970.
- 01870 **Wenk, H. R.; Baker, D. W.; Brimhall, G.; Venkitesubramanyan, C. S.** Preferred orientation in experimentally deformed Solenhofen Limestone. [abs.]: EOS, v. 51, no. 4, p. 425, 1970.
- 03833 **Wenk, Hans-Rudolf.** Submicroscopical twinning in lunar and experimentally deformed pyroxenes: Contr. Mineralogy and Petrology, v. 26, no. 4, p. 315-323, illus., tables, 1970.
- 10299 **Wenner, David B.; Taylor, Hugh P., Jr.** Temperatures of serpentinization of ultramafic rocks based on  $O^{18}/O^{16}$  fractionation between coexisting serpentine and magnetite [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 718-719, 1970.
- Wenninger, Guenther.** See *McCammon, Richard B.* 02381
- 06710 **Wermund, E. G.; Jenkins, W. A., Jr.** Recognition of deltas by fitting trend surfaces to upper Pennsylvanian sandstones in north-central Texas, in Deltaic sedimentation, modern and ancient: Soc. Econ. Paleontologists and Mineralogists Spec. Pub. 15, p. 256-269, illus., 1970.
- 02879 **Werner, Christian.** Horton's law of stream numbers for topologically random channel networks [with French abs., p. 89]: Canadian Geographer, v. 14, no. 1, p. 57-66, illus., 1970.



- 04394 **Werner, Stuart D.; Adham, Samy A.** Seismic response of soil deposits — Discussion [of paper 7175 by I. M. Idriss and H. B. Seed, 1970]: *Am. Soc. Civil Engineers Proc.*, v. 96, Jour. Soil Mechanics and Found. Div., no. SM5, p. 1838-1841, illus., 1970.
- 04086 **Wershaw, R. L.; Friedman, Irving; Heller, S. J.** Hydrogen isotopic fractionation of water passing through trees, in *Advances in organic geochemistry — Internat. Cong.*, 3d, Proc. (G. D. Hobson and G. C. Speers, editors): London and New York, Pergamon Press (Internat. Ser. Mons. Earth Sci., V. 32), p. 55-67, illus., tables, 1970.
- 05560 **Wershaw, R. L.** Sources and behavior of mercury in surface waters, in *Mercury in the environment: U.S. Geol. Survey Prof. Paper 713*, p. 29-31, 63-65, tables, 1970.
- 02742 **Wertz, Jacques B.** The start of an ephemeral stream [with German and French abs.]: *Zeitschr. Geomorphologie*, new ser., v. 14, no. 1, p. 96-102, illus., 1970.
- 04311 **Wertz, Jacques B.** The Texas lineament and its economic significance in southeast Arizona: *Econ. Geology*, v. 65, no. 2, p. 166-181, illus., 1970.
- 07391 **Wertz, Jacques B.** Arizona's copper province and the Texas lineament: *Mining Eng.*, v. 22, no. 5, p. 80-81, illus., 1970.
- Weser, Oscar.** See *McManus, Dean A.* 07143
- Weser, Oscar.** See *McManus, Dean A.* 07249
- 01591 **Weser, Oscar E.** Stratigraphy and sedimentation of JOIDES holes off California coast [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 3, p. 555, 1970.
- 07255 **Weser, Oscar E.** Lithologic summary, Chap. 30 in *Initial reports of the Deep Sea Drilling Project — V. 5, Leg 5 of cruises of Glomar Challenger*, San Diego, Calif., to Honolulu, Hawaii, Apr.-June 1969 (D. A. McManus and others): Washington, D. C., U.S. Govt. Printing Office, p. 569-620, illus., tables, 1970.
- 09886 **Wesner, G. M.; Baier, D. C.** Injection of reclaimed wastewater into confined aquifers: *Am. Water Works Assoc. Jour.*, v. 62, no. 3, p. 203-210, illus., tables, 1970.
- Wesolowski, E. A.** See *Croft, Mack G.* 00602
- Wesolowski, E. A.** See *Croft, Mack G.* 01484
- 01999 **Wesson, Robert L.; Kovach, Robert L.** Laterally inhomogeneous velocity models along the San Andreas fault [abs.]: *EOS*, v. 51, no. 4, p. 361, 1970.
- 03576 **Wesson, Robert L.** A time integration method for computation of the intensities of seismic rays: *Seismol. Soc. America Bull.*, v. 60, no. 2, p. 307-316, illus., tables, 1970.
- 05406 **West, D. W.; Black, J. D. F.** Determination of a water table in a soil profile using the platinum oxygen cathode: *Soil Sci.*, v. 110, no. 2, p. 119-123, illus., 1970.
- 02958 **West, G. F.; Martin, L.; Grant, F. S.** Geophysical applications of modern computer systems [with French abs.], in *Mining and groundwater geophysics, 1967: Canada Geol. Survey Econ. Geology Rept. 26*, p. 191-201, illus., 1970.
- 07454 **West, L. J.; Perry, R. M.** Rock mechanics studies for a high cut at a nuclear power station in Pennsylvania, Chap. 24 in *Rock mechanics, theory and practice — 11th Symposium on Rock Mechanics*, Berkeley, Calif., 1969, Proc.: New York, Soc. Mining Engineers, Am. Inst. Mining, Metall. and Petroleum Engineers, p. 445-459, illus., tables, 1970.
- West, P. J.** See *Housner, G. W.* 03031
- West, Philip W.** See *Sachdev, Sham L.* 03955

- 00389 **West, Robert M.** Distribution and correlative importance of the early Tertiary Phenacodontidae (Condylarthra — Mammalia) [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 2, p. 157-158, 1970.
- 00553 **West, Robert M.** Sequence of mammalian faunas of Eocene age in the northern Green River Basin, Wyoming: Jour. Paleontology, v. 44, no. 1, p. 142-147, illus., table, 1970.
- 00942 **West, Robert M.; Atkins, Edward G.** Additional middle Eocene (Bridgerian) mammals from Tabernacle Butte, Sublette County, Wyoming: Am. Mus. Novitates, no. 2404, 26 p., illus., tables, 1970.
- 04709 **West, Robert M.** *Tetraclaenodon puericensis* (Mammalia: Phenacodontidae), Goler Formation, Paleocene of California, and distribution of the genus: Jour. Paleontology, v. 44, no. 5, p. 851-857, illus., 1970.
- 00937 **West, Ronald R.** Biocoenoses of a Pennsylvanian strophomenid [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 303, 1970.
- 06612 **West, Ronald Robert.** Marine communities of a portion of the Wewoka Formation (Pennsylvanian) in Hughes County, Oklahoma [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 2, p. 766B, 1970.
- 05978 **West Texas Geological Society; Texas University at Austin; Seewald, Ken; Sundeen, Dan.** (editors). The geological framework of the Chihuahuan tectonic belt — Symposium in honor of Ronald K. De Ford, Midland, Tex., 1970: Midland, Tex., West Texas Geol. Soc., 75 p., illus., 1970.
- West, W. S.** See *Heyl, A. V.* 07202
- 06438 **Westermann, G. E. G.** Occurrence of *Monotis subcircularis* Gabb in central Chile and the dispersal of *Monotis* (Triassic Bivalvia): Pacific Geology, v. 2, p. 35-40, illus., 1970.
- Westfall, I.** See *Sims, P. K.* 07245
- 10394 **Westgate, J. A.; Smith, D. G. W.; Tomlinson, M.** Late Quaternary tephra layers in southwestern Canada, in Early man and environments in northwest North America (R. A. Smith and J. W. Smith, editors) — Calgary Univ. Archaeol. Assoc. Ann. Paleoenvironmental Workshop, 2d, Proc.: Calgary, Alberta, Univ. Calgary Students' Press, p. 13-33, illus., tables, 1970.
- 09421 **Westgate, John A.** Yellowstone Plateau pyroclastics of late Pleistocene age in southern Saskatchewan, Canada [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ. ?], p. 149, table, 1970.
- Westin, F. C.** See *Frazee, C. J.* 09299
- 04586 **Westine, P. S.** Explosive cratering [with French and German abs.]: Jour. Teramechanics, v. 7, no. 2, p. 9-19, illus., table, 1970.
- Westphal, W. B.** See *Chung, D. H.* 06350
- 05635 **Westphal, W. H.; Lange, A. L.** Mini-earthquakes — The noise can help map buried faults: Eng. and Mining Jour., v. 171, no. 1, p. 86-89, illus., table, 1970.
- Wetherill, G. W.** See *Gopalan, K.* 03696
- Wetherill, G. W.** See *Gopalan, K.* 05696
- Wetherill, George W.** See *Kaushal, Sushil K.* 00088

- 10300 **Wetmiller, Robert J.** An earthquake swarm on the Queen Charlotte Islands fracture zone [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 719, 1970.
- 04223 **Wetzel, Richard A.; Vey, Eben.** Axisymmetric stress wave propagation in sand: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7539, *Jour. Soil Mechanics and Found. Div.*, no. SM5, p. 1763-1786, illus., tables, 1970.
- 04677 **Wetzel, Robert G.** Recent and postglacial production rates of a marl lake: *Limnology and Oceanography*, v. 15, no. 4, p. 491-503, illus., 1970.
- Wexler, James A.** See *Donahue, Jack*. 07651
- 00474 **Weyl, Peter K.** *Oceanography, an introduction to the marine environment*: New York and London, John Wiley and Sons, 535 p., illus., 1970.
- 04933 **Weyl, Richard.** Mittelamerika — Krustenbau und paläogeographische Entwicklung [Central America — Crustal structure and paleogeographic history]: *Umschau*, v. 70, no. 10, p. 295-299, illus., 1970.
- 04968 **Weyl, Richard.** Geologische Bilder aus Mittelamerika — [Pt.] 3, An der pazifischen Flachlandküste von Costa Rica [Geologic illustrations from Central America — (Pt.) 3, On the Pacific lowland coast of Costa Rica]: *Natur u. Mus.*, v. 100, no. 3, p. 120-128, illus., 1970.
- 04969 **Weyl, Richard.** Geologische Bilder aus Mittelamerika — [Pt.] 5, In den Ignimbritplateaus von Honduras und Nicaragua [Geologic illustrations from Central America — (Pt.) 5, In the ignimbrite plateaus of Honduras and Nicaragua]: *Natur u. Mus.*, v. 100, no. 8, p. 362-370, illus., 1970.
- 05067 **Weyl, Richard.** Geologische Bilder aus Mittelamerika — [Pt.] 4, Die Vulkane der Cordillera de Guanacaste und ihr Vorfeld [Geologic illustrations from Central America — (Pt.) 4, The volcanoes of the Cordillera de Guanacaste and their base areas]: *Natur u. Mus.*, v. 100, no. 6, p. 269-278, illus., 1970.
- 10857 **Weyl, Richard.** Problems of tectonic and magmatic activity in Central America and the West Indies (with Spanish and English abs.)2, in *Trabajos tecnicos presentados en la segunda reunion de geologos de America Central*: *Inst. Centroamericano Inv. y Tecnologia Indus. Pubs. Geol.*, no. 2, p. 47-51, illus., 1969.
- 06723 **Whalin, R. W.; Bucci, D. R.; Strange, J. N.** A model study of wave run-up at San Diego, California, in *Tsunamis in the Pacific Ocean — Internat. Symposium on Tsunamis and Tsunami Research*, Honolulu, Hawaii, 1969, *Proc.*: Honolulu, Hawaii, East-West Center Press, p. 427-451, illus., tables, 1970.
- Whalley, B. J. P.** See *Walsh, J. H.* 04561
- Wheeler, E. F.** See *Bartholomew, R. L.* 04609
- 08535 **Wheeler, Harry E.; Mallory, V. Standish.** Oregon Cascades in relation to Cenozoic stratigraphy, in *Columbia River Basalt Symposium*, 2nd, Cheney, Wash., 1969, *Proc.*: Cheney, Eastern Washington State College Press, p. 97-124, illus., 1970.
- 08536 **Wheeler, Harry E.; Mallory, V. Standish.** Reply [to discussion by D. L. Peck, J. A. Wolfe, and A. E. Griggs of "Oregon Cascades in relation to Cenozoic stratigraphy" (1970)], in *Columbia River Basalt Symposium*, 2nd, Cheney, Wash., 1969, *Proc.*: Cheney, Eastern Washington State College Press, p. 131-132, 1970.
- 03021 **Wheeler, J. O.** Summary and discussion, in *Structure of the southern Canadian Cordillera*: *Geol. Assoc. Canada Spec. Paper* 6, p. 155-166, illus., 1970.
- 03272 **Wheeler, J. O.** (editor). *Structure of the southern Canadian Cordillera*: *Geol. Assoc. Canada Spec. Paper* 6, 166 p., illus., tables, geol. maps, 1970.
- Wheeler, J. O.** See *McTaggart, K. C.* 03273

- 03274 **Wheeler, J. O.** Introduction, in *Structure of the southern Canadian Cordillera*: Geol. Assoc. Canada Spec. Paper 6, p. 1-5, illus., 1970.
- 03476 **Wheeler, J. O.** The Western Cordillera, in *Geological provinces of Canada, exploration and outlook*: Canadian Mining and Metall. Bull., v. 63, no. 693, p. 37-44, 1970.
- Wheeler, J. O.** See *Douglas, R. J. W.* 07974
- Wheeler, Walter H.** See *Randazzo, Anthony F.* 05630
- 02281 **Whelan, J. A.** (compiler). Radioactive and isotopic age determinations of Utah rocks: Utah Geol. and Mineralog. Survey Bull. 81 (Utah Univ. Bull., v. 61, no. 18; Utah Eng. Expt. Sta. Bull. 135), 75 p., illus., tables, 1970.
- Whelan, J. A.** See *Sayyah, Taha.* 02282
- 02285 **Whelan, J. A.** Mineral Range granite, in *Radioactive and isotopic age determinations of Utah rocks*: Utah Geol. and Mineralog. Survey Bull. 81 (Utah Univ. Bull., v. 61, no. 18; Utah Eng. Expt. Sta. Bull. 135), p. 25, 1970.
- 02288 **Whelan, J. A.** Notch Peak, House Range, in *Radioactive and isotopic age determinations of Utah rocks*: Utah Geol. and Mineralog. Survey Bull. 81 (Utah Univ. Bull., v. 61, no. 18; Utah Eng. Expt. Sta. Bull. 135), p. 35, 1970.
- 02290 **Whelan, J. A.** Rocky Range quartz monzonite, in *Radioactive and isotopic age determinations of Utah rocks*: Utah Geol. and Mineralog. Survey Bull. 81 (Utah Univ. Bull., v. 61, no. 18; Utah Eng. Expt. Sta. Bull. 135), p. 37, 1970.
- Whelan, J. A.** See *Hashad, A. H.* 02367
- Whelan, J. A.** See *El-Shatoury, H. M.* 02746
- 08455 **Whetten, John T.; Hawkins, James W., Jr.** Diagenetic origin of graywacke matrix minerals: *Sedimentology*, v. 15, nos. 3-4, p. 347-361, illus., tables, 1970.
- 10540 **Whipple, Arthur P.** Seismic response at Beatty, Nevada from underground nuclear detonations [abs.]: *EOS*, v. 51, no. 11, p. 778, 1970.
- 01239 **Whipple, Janice M.** Glacial geology of the area from Little Falls to Richfield Springs, New York [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 8, p. 3714B, 1970.
- 10348 **Whisler, F. D.; Klute, A.** Analysis of infiltration into stratified soil columns, in *Water in the unsaturated zone, V. 1*: *Internat. Assoc. Sci. Hydrology Pub.* 82, p. 451-470, illus., 1968.
- 05631 **Whisonant, Robert C.** Influence of texture upon the response of detrital quartz to deformation of sandstones: *Jour. Sed. Petrology*, v. 40, no. 3, p. 1018-1025, illus., 1970.
- 05645 **Whisonant, Robert C.** Paleocurrents in basal Cambrian rocks in eastern Tennessee: *Geol. Soc. America Bull.*, v. 81, no. 9, p. 2781-2786, illus., table, 1970.

- 07052 **Whisonant, Robert C.** Paleocology and depositional environments of the Parkwood Formation, Central Alabama: *Southeastern Geology*, v. 12, no. 2, p. 135-149, illus., tables, 1970.
- 04661 **Whitcomb, James H.; Anderson, Don L.** Reflection of P'P' seismic waves from discontinuities in the mantle: *Jour. Geophys. Research*, v. 75, no. 29, p. 5713-5728, illus., tables, 1970.
- 10564 **Whitcomb, James H.** Array analysis of P'P' and P'dP' seismic phases [abs.]: *EOS*, v. 51, no. 11, p. 782, 1970.
- White, Amos M.** See *Overstreet, William C.* 06180
- White, Amos M.** See *Overstreet, William C.* 06184
- 10301 **White, Brian.** Algal stromatolites, depositional environments and age of the Altyn formation of Montana [abs.]: *geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 719-720, 1970.
- 05559 **White, D. E.; Hinkle, M. E.; Barnes, Ivan.** Mercury contents of natural thermal and mineral fluids, in *Mercury in the environment*: U.S. Geol. Survey Prof. Paper 713, p. 25-28, 62-63, tables, 1970.
- White, D. E.** See *Muffler, L. J. P.* 09277
- White, D. E.** See *Truesdell, A. H.* 09413
- 09422 **White, D. E.; Muffler, L. J. P.; Truesdell, A. H.; Fournier, R. O.** Preliminary results of research drilling in Yellowstone thermal areas [abs.], in *American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.*: [Bozeman, Mont., Montana State Univ. ?], p. 150, 1970.
- White, D. E.** See *Fournier, R. O.* 10165
- 05201 **White, David A.; Roeder, Dietrich H.; Nelson, Thomas H.; Crowell, John C.** Subduction: *Geol. Soc. America Bull.*, v. 81, no. 11, p. 3431-3432, illus., 1970.
- 01850 **White, Donald E.; Truesdell, A. H.; Muffler, L. J. P.** Vapor-dominated hydrothermal systems [abs.]: *EOS*, v. 51, no. 4, p. 453, 1970.
- 03002 **White, Donald E.; Miller, Lee D.** Geothermal infrared anomalies of low intensity, Yellowstone National Park, in *Earth resources aircraft program status review*, NASA, Houston, 1968 — V. 1, *Geology, geography, and sensor studies*: Houston, Tex., Manned Spacecraft Center, p. 16-1 — 16-4 [1970].
- 05983 **White, E. J.; Marchant, L. C.** Reservoir rock characteristics of the Madison Limestone in the Williston basin: *Log Analyst*, v. 11, no. 5, p. 17-25, illus., tables, 1970.
- 05405 **White, E. M.** Giant desiccation cracks in central South Dakota soils: *Soil Sci.*, v. 110, no. 1, p. 71-73, illus., 1970.
- 10442 **White, Elizabeth; White, William B.** Processes of cavern breakdown: *Natl. Speleol. Soc. Bull.*, v. 31, no. 4, p. 83-96, illus., 1969.
- White, Elizabeth L.** See *White, William B.* 10906
- White, G.** See *Kuo, J. T.* 01674
- White, G.** See *Kuo, J. T.* 05611
- 00804 **White, George W.** Memorial to Vincent Chester Shepps (1928-1967): *Geol. Soc. America Proc.* 1967, p. 259-261, portrait, 1970.

- 08178 **White, George W.** (editor). James Hutton's System of the Earth, 1785; Theory of the Earth, 1788; Observations on granite, 1794; together with Playfair's Biography of Hutton: Darien, Connecticut, Hafner Publishing Company, 203 p., illus., 1970.
- 10302 **White, George W.** History of investigation and classification of Wisconsinan drift in the central interior [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 720, 1970.
- 00464 **White, Gerald T.** California's other mineral: California Div. Mines and Geology Mineral Inf. Service, v. 23, no. 2, p. 23-33, illus., 1970.
- White, Joe L.** See *Low, Philip F.* 01725
- White, Joe L.** See *Low, Philip F.* 03123
- 04124 **White, John A.** Late Cenozoic porcupines (Mammalia, Erethizontidae) of North America: Am. Mus. Novitates, no. 2421, 15 p., illus., tables, 1970.
- 04218 **White, John S., Jr.** New data for plattnerite: Mineralog. Rec., v. 1, no. 2, p. 75-80, illus., tables, 1970.
- 07635 **White, John S., Jr.; Jarosewich, Eugene.** Second occurrence of benstonite: Mineralog. Rec., v. 1, no. 4, p. 140-141, illus., table, 1970.
- White, John S., Jr.** See *Leavens, Peter B.* 08346
- 01110 **White, Owen L.** Pre-glacial re-entrant valleys of the Niagara escarpment [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 6, p. 409, 1970.
- 10303 **White, R. E.** Digital processing of seismograms from large underwater explosions [abs.]: Geol. Soc. America Abs. with programs, v. 2, no. 7, p. 720-721, 1970.
- 01534 **White, Stan M.** Mineralogy and geochemistry of continental shelf sediments off the Washington-Oregon coast: Jour. Sed. Petrology, v. 40, no. 1, p. 38-54, illus., tables, 1970.
- White, W. A.** See *Gross, D. L.* 02118
- White, W. Arthur.** See *Collinson, Charles.* 01064
- White, W. Arthur.** See *Shimp, Neil F.* 02204
- 10304 **White, Walter S.** A paleohydrologic model for mineralization of the White Pine copper deposit, northern Michigan [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 721, 1970.
- White, Wilbert I.** See *Gillard, Douglas R.* 07986
- 00098 **White, William A.** Erosion of cirques: Jour. Geology, v. 78, no. 1, p. 123-126, illus., 1970.
- 00012 **White, William B.; Watson, Richard A.; Pohl, E. R.; Brucker, Roger.** The central Kentucky karst: Geog. Rev., v. 60, no. 1, p. 88-115, 150, illus., 1970.
- White, William B.** See *Rutstein, Martin S.* 01825
- 01851 **White, William B.** Vibrational spectra of olivine [abs.]: EOS, v. 51, no. 4, p. 436, 1970.
- White, William B.** See *Rauch, Henry W.* 01970
- White, William B.** See *Rauch, Henry W.* 04064
- White, William B.** See *Brucker, Roger W.* 06075

- 09074 **White, William B.** Mineralogy of the Salts Cave archaeological site—Appendix, in *The prehistory of Salts Cave, Kentucky: Illinois State Mus. Rept. Inv. 16*, p. 79-82, 1969.
- White, William B.** See *White, Elizabeth*. 10442
- 10815 **White, William B.** Sulfate mineralogy in some caves in the United States, in *Internat. Cong. Speleology*, 4th, Yugoslavia 1965, Proc., V. 3: Ljubljana, Yugoslavia, Speleolog. Soc. Yugoslavia, p. 253-259, illus., 1968.
- 10877 **White, William B.; Stellmack, John A.** Seasonal fluctuations in the chemistry of karst groundwater, in *Internat. Cong. Speleology*, 4th, Yugoslavia, 1965, Proc., V. 3: Ljubljana, Yugoslavia, Speleolog. Soc. Yugoslavia, p. 261-267, illus., 1968.
- 10906 **White, William B.; White, Elizabeth L.** Channel hydraulics of free-surface streams in caves: *Caves and Karst*, v. 12, no. 6, p. 41-48, illus., tables, 1970.
- 08135 **White, William H.; Sinclair, A. J.; Harakal, J. E.; Dawson, K. M.** Potassium-argon ages of Topley Intrusions near Endako, British Columbia: *Canadian Jour. Earth Sci.*, v. 7, no. 4, p. 1172-1178, illus., table, 1970.
- White, William H.** See *Richards, T.* 08138
- Whitehead, E. V.** See *Hills, I. R.* 10428
- Whitehead, H. Collins.** See *Tenorio, Pedro A.* 10617
- Whitehead, J. A.** See *Howard, L. N.* 04120
- Whitehead, R. L.** See *Sisco, H. G.* 03916
- 08698 **Whiteman, C. D., Jr.; Calandro, A. J.; Broussard, W. L.** Water resources of the Slagle-Simpson-Flatwoods area, Louisiana: Louisiana Geol. Survey and Dept. Public Works Water Resources Pamph., no. 24, 23 p., tables, 1970.
- 03573 **Whitesides, D. V.** Common errors in developing a ground-water aquifer: *Ground Water*, v. 8, no. 4, p. 25-28, illus., 1970.
- Whitham, K.** See *Niblett, E. R.* 04501
- 10771 **Whitham, K.** Seismology and physics of the Earth's interior, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 187-199, 1970.
- 00833 **Whitman, Robert V.** Basic concepts and important problems, in *Seismic design for nuclear power plants* (Robert J. Hansen, editor): Cambridge, Mass., M.I.T. Press, p. 1-68, illus., table, 1970.
- 00836 **Whitman, Robert V.** Soil-structure interaction, in *Seismic design for nuclear power plants* (Robert J. Hansen, editor): Cambridge, Mass., M.I.T. Press, p. 245-269, illus., 1970.
- 01174 **Whitman, Robert V.** Evaluation of soil properties for site evaluation and dynamic analysis of nuclear plants, in *Seismic design for nuclear power plants* (Robert J. Hansen, editor): Cambridge, Mass., M.I.T. Press, p. 270-305, illus., 1970.
- Whitman, Robert V.** See *Schiffman, Robert L.* 02353
- Whitman, Robert V.** See *Hashiba, Tomonori.* 10127
- Whitmarsh, Robert.** See *Berggren, W. A.* 06160
- 03458 **Whitmore, D. R. E.** Metallogeny and characteristics of sulphide deposits of the Precambrian of Canada [abs.]: *Canadian Mining and Metall. Bull.*, v. 63, no. 695, p. 287, 1970.

**Whitmore, D. R. E.** See *Land, A. H.* 07972

- 03101 **Whitney, Harold Tichenor, Jr.** Plastic movement of soft clay in a sheeted excavation [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 10, p. 4612B-4613B, 1970.

**Whitney, J. A.** See *Hamilton, E. L.* 03725

**Whitney, J. A.** See *Hamilton, E. L.* 10646

- 01852 **Whitney, James A.; Luth, W. C.** Water undersaturated melting of natural granites at 2 kb [abs.]: *EOS*, v. 51, no. 4, p. 438, 1970.

- 01111 **Whitney, Marion I.** The role of differential pressure in the formation of embossed aeolian vortex pits [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 409, 1970.

- 01853 **Whitney, Philip R.** Significance of coronitic reactions in Adirondack metagabbros [abs.]: *EOS*, v. 51, no. 4, p. 446, 1970.

- 06581 **Whittaker, E. J. W.; Wicks, F. J.** Chemical differences among the serpentine "polymorphs", a discussion [of paper by N. J. Page, 1968]: *Am. Mineralogist*, v. 55, nos. 5-6, p. 1025-1047, illus., tables, 1970.

- 09979 **Whitten, Charles A.** Crustal movement from geodetic measurements, in *Earthquake displacement fields and the rotation of the Earth* (L. Mansinha, D. E. Smylie, A. E. Beck, editors)-NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 255-268, illus., 1970.

- 10639 **Whitten, E. H. Timothy.** Orthogonal polynomial trend surfaces for spaced data: *Internat. Assoc. Math. Geology Jour.*, v. 2, no. 2, p. 141-152, illus., tables, 1970.

**Wichmann, P. A.** See *Youmans, A. H.* 02214

- 09248 **Wichmann, P. A.; Webb, R. W.** Neutron activation logging for silicon to aluminum ratios: *Jour. Petroleum Technology*, v. 22, Feb., p. 201-206, 1970.

- 01849 **Wickham, J. S.; Elliott, D. E.** Rotation and strain history in folded carbonates, Front Royal area, Virginia [abs.]: *EOS*, v. 51, no. 4, p. 422, 1970.

**Wickman, Frans E.** See *Fronzel, Judith W.* 09051

**Wickman, Frans E.** See *Singer, Donald A.* 09177

- 09518 **Wickman, Frans E.; Smith, Deane K.** Molybdenite polytypes in theory and occurrence—[pt.] 1, Theoretical considerations of polytypism in molybdenite: *Am. Mineralogist*, v. 55, nos. 11-12, p. 1843-1856, illus., tables, 1970.

- 10700 **Wickman, Frans E.** Determination of repose-period patterns of volcanoes from sequences of ash layers: *Internat. Assoc. Math. Geology Jour.*, v. 2, no. 2, p. 277-283, illus., 1970.

**Wicks, F. J.** See *Whittaker, E. J. W.* 06581

**Wideman, C. J.** See *Romig, P. R.* 00349

**Wideman, C. J.** See *Romig, Philip R.* 01624

- 00030 **Wiebe, Robert A.** Relations of granitic and gabbroic rocks, northern Santa Lucia Range, California: *Geol. Soc. America Bull.*, v. 81, no. 1, p. 105-116, illus., geol. map, 1970.

- 02377 **Wiebe, Robert A.** Pre-Cenozoic tectonic history of the Salinian block, western California: *Geol. Soc. America Bull.*, v. 81, no. 6, p. 1837-1842, illus., 1970.



- 03986 **Wiebenga, William A.; Ellis, W. R.; Kevi, L.** Empirical relations in properties of unconsolidated quartz sands and silts pertaining to water flow: *Water Resources Research*, v. 6, no. 4, p. 1154-1161, illus., tables, 1970.
- Wiedmann, Jost.** See *Kullmann, Jurgen. 09841*
- 07141 **Wiegand, Jeffery W.** Evidence of a San Diego Bay-Tijuana fault: *Assoc. Eng. Geologists Bull.*, v. 7, nos. 1-2, p. 107-121, illus., 1970.
- 03040 **Wiegel, Robert L.** (editor). *Earthquake engineering*: Englewood Cliffs, N.J., Prentice-Hall, 518 p., illus., tables, 1970.
- 03446 **Wiegel, Robert L.** Tsunamis, Chap. 11 in *Earthquake engineering* (R. L. Wiegel, editor): Englewood Cliffs, N.J., Prentice-Hall, p. 253-306, illus., tables, 1970.
- 03719 **Wiegel, Robert L.; Noda, Edward K.; Kuba, Edward M.; Gee, Dennis M.; Tornberg, Gordon F.** Water waves generated by landslides in reservoirs: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7279, *Jour. Waterways and Harbors Div.*, no. WW 2, p. 307-333, illus., 1970.
- 05523 **Wiegel, Robert L.** Seismic sea waves (tsunamis), in *Geologic hazards and public problems* (R. A. Olson and M. M. Wallace, editors) — [U.S.] Office Emergency Preparedness, Region 7, Conf., San Francisco, Calif., 1969, *Proc.: Washington, D.C.*, U.S. Govt. Printing Office, p. 53-74, illus. [1970].
- 00506 **Wieluns, Robert.** The thermal behavior of wollastonite [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 30, no. 7, p. 3159B, 1970.
- Wiens, J. H.** See *Lavkulich, L. M. 07432*
- 03853 **Wier, Charles E.** Factors affecting coal roof rock in Sullivan County, Indiana: *Indiana Acad. Sci. Proc.* 1969, v. 79, p. 263-269, illus., 1970.
- 07621 **Wierenga, P. J.; deWit, C. T.** Simulation of heat transfer in soils: *Soil Sci. Soc. America Proc.*, v. 34, no. 6, p. 845-848, illus., 1970.
- Wiese, Allen F.** See *Schneider, Arland D. 08717*
- Wiesmann, H.** See *Gast, P. W. 05693*
- Wiesmann, Henry.** See *Hubbard, Norman J. 06849*
- 04186 **Wiethe, John D.** Textural parameters of a modern point bar: *Compass*, v. 47, no. 2, p. 110-118, illus., tables, 1970.
- Wiggins, Jack L.** See *Damon, Norman. 04493*
- Wiggins, Ralph A.** See *Toksoz, M. Nafi. 01991*
- 00976 **Wigley, Perry B.; Sergeant, Richard E.** Penecontemporaneous sedimentary structures in the Ravenna facies of the New Albany Shale [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 248-249, 1970.
- 04315 **Wignall, T. K.** Generalized Bayesian classification functions, K classes — A reply [to 1970 discussion by E. C. Dahlberg of 1969 paper]: *Econ. Geology*, v. 65, no. 2, p. 221-222, 1970.
- Wignall, T. K.** See *DeGeoffroy, J. 04480*
- Wignall, T. K.** See *DeGeoffroy, J. 10668*
- Wiik, H. B.** See *Maxwell, J. A. 05708*

- 10803 **Wilbert, William P.** Stratigraphy of the Georgetown Formation, central Texas, in Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas (Leo Hendricks, editor): Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub., no. 67-8, p. 256-285, illus., 1967.
- Wilcox, Ray E.** See *Izett, G. A.* 00622
- Wilcox, Ray E.** See *Izett, G. A.* 05344
- 09423 **Wilcox, Ray E.; Izett, Glen A.; Powers, Howard A.** The Yellowstone Park region as the source of the Pearllette-like ash beds of the Great Plains [abs.], in American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ. ?], p. 151, 1970.
- 06122 **Wilcox, Ronald E.** Memorial of Arie Poldervaart — July 6, 1919-October 28, 1964: Am. Mineralogist, v. 55, nos. 3-4, p. 591-593, portrait, 1970.
- 03429 **Wilcoxon, James A.** *Cyclococcolithina* Wilcoxon *nom. nov.* (nom. subst. pro *Cyclococcolithus* Kamptner, 1954): Tulane Studies Geology and Paleontology, v. 8, no. 2, p. 82-83, 1970.
- Wilcoxon, James A.** See *Bandy, Orville L.* 04874
- 10415 **Wild, P. J.** A phasemeter for photoelectric measurement of magnetic fields: Rev. Sci. Instruments, v. 41, no. 8, p. 1163-1167, illus., 1970.
- 01335 **Wilde, P.; Holden, J.; Isselhardt, C.** Non-destructive wet weighing of marine sediments: Marine Geology, v. 8, no. 2, p. 173-178, 1970.
- Wilde, P.** See *Corwin, R. F.* 09479
- 00851 **Wildeman, Thomas R.** The distribution of  $Mn^{2+}$  in some carbonates by electron paramagnetic resonance: Chem. Geology, v. 5, no. 3, p. 167-177, illus., tables, 1970.
- Wilder, Hugh B.** See *Lloyd, Orville B., Jr.* 10943
- Wiley, M. A.** See *Muehlberger, W. R.* 05906
- 00938 **Wiley, Michael A.** Gravity and magnetics near the Texas lineament, Van Horn-Sierra Blanca region, Trans-Pecos, Texas [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 304, 1970.
- Wilhelm, E. J.** See *Winkler, E. M.* 00111
- 05755 **Wilhelms, Don D.** Summary of lunar stratigraphy—Telescopic observations: U.S. Geol. Survey Prof. Paper 599-F, p. F1-F47, illus., tables, 1970.
- 07549 **Wilhelms, Don E.** Geologic map of Apollo landing site 1 — Part of Maskelyne DA region, southeastern Mare Tranquillitatis: U.S. Geol. Survey Misc. Geol. Inv. Map I-617 [ORB II-2 (25)], scale 1:25,000, text, 1970.

- 04792 **Wilhelmy, H.** Gestalt eines Grossen — Alexander von Humboldt in der Sicht seiner amerikanischen Reise [One phase of a great man — Alexander von Humboldt in light of his American journeys], in *Alexander von Humboldt, eigene und neue Wertungen der Reisen, Arbeit und Gedankenwelt — Erdkundliches Wissen*, Heft 23: Wiesbaden, Germany, Franz Steiner Verlag GMBH, p. 1-22, 1970.
- Wilkins, A. L.** See *Jongejan, A.* 02111
- Wilkins, A. L.** See *Jongejan, A.* 03296
- 09059 **Wilkins, R. W. T.** Iron-magnesium distribution in the tremolite-actinolite series: *Am. Mineralogist*, v. 55, nos. 11-12, p. 1993-1998, illus., table, 1970.
- Wilkinson, J. F. G.** See *Nash, W. P.* 03161
- Wilkniss, P. E.** See *Brewer, P. G.* 01640
- 02000 **Wilkniss, Peter E.; Carr, Roderick A.; Hoover, John I.** Submarine volcanism and chemical changes in seawater [abs.]: *EOS*, v. 51, no. 4, p. 328, 1970.
- Willey, Helen Gorman.** See *Stanton, R. L.* 04312
- 07235 **Williams, D. W.; Kennedy, G. C.** The melting of jadeite to 60 kilobars: *Am. Jour. Sci.*, v. 269, no. 5, p. 481-488, illus., tables, 1970.
- 01854 **Williams, David L.; Roy, Robert F.** Measurement of heat flow in lakes by a combination of oceanic and continental techniques [abs.]: *EOS*, v. 51, no. 4, p. 425-426, 1970.
- 05498 **Williams, Dennis A.; Armstrong, Joseph E.** Investigation of a large landslide associated with construction of I-15 near Dillon, Montana, in *Engineering geology and soils engineering symposium*, 8th Ann., Pocatello, Idaho, 1970, Proc.: Boise, Idaho, Idaho Dept. Highways, p. 91-108, illus., 1970.
- 04427 **Williams, Dennis E.** Use of alluvial faults in the storage and retention of ground water: *Ground Water*, v. 8, no. 5, p. 25-29, illus., 1970.
- Williams, E. G.** See *Lowright, R. H.* 00166
- Williams, Ernest E.** See *Estes, Richard.* 03915
- Williams, Eugene G.** See *Bragonier, William A.* 00142
- Williams, Eugene G.** See *Swinehart, James B.* 00184
- Williams, Eugene G.** See *Wright, Lauren A.* 10314
- Williams, Frank E.** See *Tweto, Ogden.* 02416
- 08259 **Williams, G. P.** The thermal regime of a *Sphagnum* peat bog [with French abs.], in *International Peat Congress*, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 195-200, illus., tables, 1970.
- 02082 **Williams, Garnett P.** Flume width and water depth effects in sediment-transport experiments: *U.S. Geol. Survey Prof. Paper* 562-H, p. H1-H37, illus., tables, 1970.
- Williams, H.** See *Anderson, F. D.* 05461
- Williams, H.** See *Poole, W. H.* 07973
- 00187 **Williams, Harold.** Relationships between late Precambrian and Paleozoic rocks at Belle Bay, eastern Newfoundland [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 40-41, 1970.

- 01505 **Williams, Harold; Kennedy, M. J.; Neale, E. R. W.** The Hermitage Flexure, the Cabot Fault, and the disappearance of the Newfoundland Central Mobile Belt: *Geol. Soc. America Bull.*, v. 81, no. 5, p. 1563-1567, illus., 1970.
- 08115 **Williams, Harold H.; Harriss, Robert C.** Chloride and bromide in carbonate rocks in relation to the chemical history of ocean water: *Canadian Jour. Earth Sci.*, v. 7, no. 6, p. 1539-1551, illus., tables, 1970.
- Williams, Harvell P.** See *Bell, Curtis C.* 07995
- 09905 **Williams, Howel.** Geology of the Lassen Volcanic National Park, California, *in* Geologic guide to the Lassen Peak, Burney Falls, and Lake Shasta area, California — *Geol. Soc. Sacramento Ann. Field Trip, 1969: Davis, Calif., Univ. California, Geology Dept.*, p. 1-42, illus., geol. map, abridged 1969; originally published 1932.
- 10353 **Williams, J. B.** The water resources of Jamaica, a review—Evaluation and conservation: *Information—Jamaica Sci. Research Council Bull.*, v. 9, nos. 1-4, p. 1-24, illus., 1969.
- Williams, J. D. H.** See *Sommers, L. E.* 04061
- Williams, J. Stewart.** See *Southard, A. R.* 05851
- 09225 **Williams, J. Stewart; Southard, Alvin R.** Stone stripes at low altitudes in north central Utah and southeastern Idaho [abs.], *in* American Quaternary Assoc. Mtg., 1st, Yellowstone park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ. ?], p. 152, 1970.
- Williams, John A.** See *Rhodes, Frank H. T.* 01101
- 06652 **Williams, John A.; Jordaan, Jan M., Jr.** A laboratory model of a double-humped wave impinging on a plane, sloping beach, *in* Tsunamis in the Pacific Ocean — *Internat. Symposium on Tsunamis and Tsunami Research, Honolulu, Hawaii, 1969, Proc.*: Honolulu, Hawaii, East-West Center Press, p. 367-376, illus., 1970.
- 08596 **Williams, John A.; Wada, Ronald N.; Wang, Ru-yih.** Model studies of tidal effects on ground water hydraulics: *Hawaii Univ. Water Resources Research Center Tech. Rept.* 39, 80 p., illus., tables, 1970.
- 02331 **Williams, John R.** Ground water in the permafrost regions of Alaska: *U.S. Geol. Survey Prof. Paper* 696, 83 p., illus., tables, 1970.
- 04123 **Williams, John R.** A review of water resources of the Umiat area, northern Alaska: *U.S. Geol. Survey Circ.* 636, 8 p., illus., table, 1970.
- 02260 **Williams, K. L.; Kullerud, G.** The Ni-Sb-S system: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 270-273, illus., 1970.
- 06884 **Williams, Karl Wendel.** Principles of cementation, environmental framework and diagenesis of the Grayburg and Queen Formations, New Mexico and Texas [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 1, p. 257B-258B, 1970.
- 07165 **Williams, P. A.** Todhunters Lake gas field: *California Oil Fields — Summ. Operations* 1970, v. 56, no. 1, p. 45-51, illus., tables, 1970.
- 09896 **Williams, P. J.** Processes of slope formation—Recent quantitative studies in Canada [with German and French abs.], *in* New contributions to slope evolution: *Zeitschr. Geomorphologie, supp.* 9, p. 67-70, 1970.
- 01685 **Williams, P. M.; Gordon, L. I.** Carbon-13/carbon-12 ratios in dissolved and particulate organic matter in the sea: *Deep-Sea Research*, v. 17, no. 1, p. 19-27, illus., tables, 1970.
- 05190 **Williams, Paul F.** A criticism of the use of style in the study of deformed rocks: *Geol. Soc. America Bull.*, v. 81, no. 11, p. 3283-3295, illus., 1970.

- Williams, Peter M.** See *Kinney, Patrick J.* 10737
- Williams, R. E. G.** See *Shotton, F. W.* 03182
- Williams, R. S., Jr.** See *Cronin, J. F.* 06942
- Williams, Ray.** See *Douglas, Bruce M.* 04685
- 10305 **Williams, Richard J.; Eugster, Hans P.** Variations of oxygen fugacity in the Skaergaard intrusion [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 721-722, 1970.
- 02337 **Williams, Roy E.** Groundwater flow systems and accumulation of evaporite minerals: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 7, p. 1290-1295, illus., 1970.
- Williams, Roy E.** See *Kealy, Dan.* 05495
- Williams, Roy E.** See *Abegglen, Donn E.* 08463
- 08497 **Williams, Roy E.** Applicability of mathematical models of ground-water flow systems to hydrogeochemical exploration: *Idaho Bur. Mines and Geology Pamph.*, no. 144, 13 p., illus., 1970.
- 08585 **Williams, Roy E.; Wallace, Alfred T.** Hydrogeological aspects of the selection of refuse disposal sites in Idaho: *Idaho Bur. Mines and Geology Pamph.* 145, 31 p., illus., tables, 1970.
- Williams, Roy E.** See *Kealy, Dan.* 10731
- 03505 **Williams, Sidney A.; Millett, Frank B., Jr.** Complex silver ores from Morey, Nevada — A correction: *Canadian Mineralogist*, v. 10, pt. 2, p. 275-276, illus., tables, 1970.
- 04133 **Williams, Sidney A.** Bideauxite, a new Arizona mineral: *Mineralog. Mag.*, v. 37, no. 290, p. 637-640, tables, 1970.
- 04213 **Williams, Sidney A.** Tilasite from Bisbee, Arizona: *Mineralog. Rec.*, v. 1, no. 2, p. 68-69, illus., tables, 1970.
- 06575 **Williams, Sidney A.; McLean, W. John; Anthony, John W.** A study of phenicochroite, its structure and properties: *Am. Mineralogist*, v. 55, nos. 5-6, p. 784-792, illus., tables, 1970.
- 09045 **Williams, Sidney A.; Anthony, John W.** Hemihedrite, a new mineral from Arizona: *Am. Mineralogist*, v. 55, nos. 7-8, p. 1088-1102, illus., tables, 1970.
- 02001 **Williams, Spencer L.; Davis, L. L.; Foote, R. Q.; Hays, W. W.** Seismic response at Tonopah, Nevada, to underground nuclear explosions [abs.]: *EOS*, v. 51, no. 4, p. 345, 1970.
- Williams, T. E.** See *Powell, J. Dan.* 06030
- Williams, W. T.** See *Wilks, G.* 08755
- Williamson, Douglas B.** See *Duncan, William M.* 07090
- Williamson, Edward F.** See *Font, Robert G.* 04383
- 06806 **Willis, David E.; Wilson, James T.** A note on the Anna, Ohio earthquake of July 26, 1968: *Earthquake Notes*, v. 41, no. 3, p. 21-25, illus., 1970.
- 10306 **Willis, David E.** Microearthquake studies in connection with the Jorum underground nuclear detonation [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 722, 1970.

**Willis, Eric H.** See *Buckley, James D.* 01325

- 10381 **Willis, J. C.; Bowie, A. J.; Parsons, D. A.** Sediment transport rates for Coles Creek and Buffalo River near Natchez, Mississippi—Progress Report, in *Mississippi Water Resources Conf.*, 4th, 1969, Jackson, Proc.: State College, Miss. Water Resources Research Inst., p. 85-99, illus., tables, 1969.

- 05584 **Willman, H. B.; Lineback, Jerry A.** (compilers). Surficial geology of the Chicago region: Urbana, Ill., Illinois State Geol. Survey, scale 1:250,000, 1970.

- 05818 **Willman, H. B.; Frye, John C.** Pleistocene stratigraphy of Illinois: Illinois Geol. Survey Bull. 94, 204 p., illus., tables, geol. maps, 1970.

**Willman, H. B.** See *Frye, John C.* 06985

**Willman, H. B.** See *Frye, John C.* 09728

- 08437 **Willman, Leon D.** Gem and mineral localities of southeastern United States, V. 2: Jacksonville, Ala., privately printed, 271 p., illus., 1970.

- 10359 **Willmore, P. L.** The earthquake series in St. Kitts-Nevis, 1950-51: West Indies Univ. Seismic Research Unit Spec. Pub. 12, 13 p., illus., tables, 1967.

- 10365 **Willmore, P. L.** Windward and Leeward Islands, B.W.I.—Preliminary notes on soufriere activity in 1951: West Indies Univ. Seismic Research Unit Spec. Pub. 11, illus., 1967.

**Wilmeth, R.** See *Lowdon, J. A.* 03183

- 07085 **Wilmoth, Benton M.** Environmental geologic hazards of West Virginia: West Virginia Acad. Sci. Proc. 1969, v. 41 (West Virginia Univ. Bull., ser. 70, no. 11-3), p. 174-183, illus., 1970.

**Wilmoth, Roger C.** See *Hill, Ronald D.* 07409

**Wilson, Augustus O.** See *Smith, Donald L.* 02684

- 03051 **Wilson, Charles W., Jr.** Geologic map of the Belleville quadrangle, Tennessee: Tennessee Div. Geology Geol. Map GM 72-SE, scale 1:24,000, separate text, 1970.

- 04077 **Wilson, Charles W., Jr.; Barnes, Robert H.** Geologic map of the Bodenham quadrangle, Tennessee: Tennessee Div. Geology Geol. Map GM 59-NW, scale 1:24,000, separate text, 1970.

**Wilson, Charles W., Jr.** See *Barnes, Robert H.* 07099

- 07612 **Wilson, Charles W., Jr.** Geologic map of the Shop Springs quadrangle, Tennessee: Tennessee Div. Geology Geol. Map GM 318-NW, scale 1:24,000, separate text, 1970.

- 07613 **Wilson, Charles W., Jr.** Geologic map of the Olivehill quadrangle, Tennessee: Tennessee Div. Geology Geol. Map GM 23-SE, scale 1:24,000, separate text, 1970.

- 08358 **Wilson, Charles W., Jr.** Geologic map of the Normandy quadrangle, Tennessee: Tennessee Div. Geology Geol. Map GM 79-NE, scale 1:24,000, separate text, 1970.

- 08359 **Wilson, Charles W., Jr.** Geologic map of the Hollow Springs quadrangle, Tennessee: Tennessee Div. Geology Geol. Map GM 85-NE, scale 1:24,000, separate text, 1970.

- 08360 **Wilson, Charles W., Jr.** Geologic map of the Ovoca quadrangle, Tennessee: Tennessee Div. Geology Geol. Map GM 86-NW, scale 1:24,000, separate text, 1970.

**Wilson, Charles W., Jr.** See *Russell, Ernest E.* 08361

- 07544 **Wilson, Edward C.** *Conocardium langenheimi* sp.n. (Mollusca: Bivalvia) in the Lower Permian Series of the McCloud Limestone, northern California: Los Angeles County Mus. Contr. Sci., no. 184, 14 p., illus., 1970.
- 07614 **Wilson, Edward C.; Bing, Donald E.** Type specimens of fossil Invertebrata in the Los Angeles County Museum of Natural History, exclusive of paleoentomology: Los Angeles County Mus. Contr. Sci., no. 181, 20 p., 1970.
- 00776 **Wilson, Edward Norman.** Rock-stratigraphy, time significance, and geosemantics along the Mississippian-Pennsylvanian boundary in northeastern Kentucky [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 3, p. 249, 1970.
- 04103 **Wilson, G.** The square tube in subsurface exploration, Paper 11 in *In situ investigations in soils and rocks* — British Geotechnical Soc., Conf., London, 1969, Proc.: London, British Geotechnical Soc., p. 135-143, illus.; discussion, p. 189-220, illus., tables, 1970.
- 05068 **Wilson, Gary V.; Joiner, Thomas J.; Warman, James C.** Evaluation, by test drilling, of geophysical methods used for ground-water development in the Piedmont area, Alabama: Alabama Geol. Survey Circ. 65, 15 p., illus., table, 1970.
- 03568 **Wilson, H. D. Bruce.** The Superior province, in *Geological provinces of Canada, exploration and outlook*: Canadian Mining and Metall. Bull., v. 63, no. 694, p. 195-199, 1970.
- Wilson, I. F.** See *Geyne, A. R.* 09738
- Wilson, J. D.** See *Smales, A. A.* 05763
- 05909 **Wilson, J. L.** Upper Paleozoic history of the western Diablo Platform, West Texas and south-central New Mexico [summ.], in *The geologic framework of the Chihuahua tectonic belt* — Symposium in honor of Ronald K. De Ford, Midland, Tex., 1970: Midland, Tex., West Texas Geol. Soc., p. 24-26, 1970.
- 10951 **Wilson, J. L.** North Slope potential and effect on domestic exploration in the seventies [abs.]: Am. Assoc. Petroleum Geologists, v. 54, no. 9, p. 1793, 1970; Gulf Coast Assoc. Geol. Soc. Trans., v. 20, p. 135, 1970.
- 10307 **Wilson, J. T.** Some possible effects if North America has overridden part of the East Pacific Rise [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 7, p. 722-723, 1970.
- 10762 **Wilson, J. T.** Tectonophysics, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 99-112, 1970.
- 05044 **Wilson, J. Tuzo.** Science of the earth, [Chap.] 12 in *The megatectonics of continents and oceans* (Helgi Johnson and Bennett L. Smith, editors): New Brunswick, N. J., Rutgers Univ. Press, p. 253-268, 1970.
- 09722 **Wilson, J. Tuzo.** Continental drift, transcurrent, and transform faulting, in *The sea* — v. 4, New concepts of sea floor evolution, Pt. 3, Concepts (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 623-644, illus., tables, 1970.
- 02699 **Wilson, James Lee.** Facies in organic buildups in epeiric seas and along shelf margins [abs.]: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 5, p. 875, 1970.
- 03607 **Wilson, James Lee; Ward, William C.; Brady, Michael J.** Northeast Yucatan, Mexico — A new area opens for study of carbonate-evaporite sediments: Jour. Sed. Petrology, v. 40, no. 2, p. 745-749, illus., 1970.

**Wilson, James Lee.** See *Ward, William C.* 03682

- 08692 **Wilson, James Lee.** Depositional facies across carbonate shelf margins, *in* Exploration concepts for the Seventies: Gulf Coast Assoc. Geol. Soc. Trans., v. 20, p. 229-233, illus., 1970.
- 11225 **Wilson, James Robert.** The geology of the Ossipee Lake quadrangle, New Hampshire: New Hampshire Dept. Resources and Econ. Devel. Bull. 3, 116 p., illus., tables, geol. map, 1969.
- 00794 **Wilson, James T.; Zumberge, James H.** Memorial to Reynolds McConnell Denning (1916-1967): Geol. Soc. America Proc. 1967, p. 193-196, portrait, 1970.
- Wilson, James T.** See *Willis, David E.* 06806
- 09488 **Wilson, Jerry C.** Engineering properties of surficial marine sediments, *in* Offshore Technology Conference, 2d Ann., Houston, Tex., 1970, Preprints—v. 1: Dallas, Tex., Offshore Technology Conf., p. I-25 — i-36, illus., tables, 1970.
- 05917 **Wilson, John Andrew.** Vertebrate biostratigraphy of trans Pecos Texas and northern Mexico [summ.], *in* The geologic framework of the Chihuahuan tectonic belt — Symposium in honor of Ronald K. De Ford, Midland, Tex., 1970: Midland, Tex., West Texas Geol. Soc., p. 54-55, 1970.
- Wilson, John M.** See *Hershey, Robert E.* 03065
- 10846 **Wilson, John M.; Johnson, Alfred M. F.** Water use in Tennessee—Pt. D, Summary: Nashville, Tenn., Tennessee Dept. Conservation Div. Water Resources and U.S. Geol. Survey Water Resources Div., 20 p., illus., tables, 1970.
- 00939 **Wilson, L. R.** Palynology of Oklahoma's ten-foot coal seam [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 304-305, 1970.
- 03377 **Wilson, L. R.; Morrison, J. L.; Reid, W. E.** Development of palynological computer information at the University of Oklahoma: Oklahoma Geology Notes, v. 30, no. 4, p. 75-83, illus., table, 1970.
- 08566 **Wilson, L. R.** Palynology in the university curriculum, *in* Teaching paleontology — North Am. Paleont. Convention, Chicago, Ill., 1969, Proc., Pt. A: Lawrence, Kans., Allen Press, p. 46-53, illus., table, 1970.
- 04750 **Wilson, Leonard G.** Sir Charles Lyell's scientific journals on the species question: New Haven, Conn., and London, England, Yale Univ. Press, 572 p., illus., 1970.
- 09226 **Wilson, Michael.** Fossil bison in North America, 14,000 to 9,000 B.P. [abs.], *in* American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ. ?], p. 154, 1970.
- 10650 **Wilson, Michael.** Problems in the speciation of American fossil bison, *in* Chacmool 1969 (R. G. Forbis, L. B. Davis, O. A. Christensen, G. Fedirchuk, editors)-Calgary Univ. Archaeol. Assoc., Ann. Paleo-Environmental Workshop, 1st, Calgary, 1969, Proc.: [Calgary, Alberta] Calgary Univ., Students' Press, p. 178-194 [1969].
- 05249 **Wilson, Michael D.** Upper Cretaceous-Paleocene synorogenic conglomerates of southwestern Montana: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 10, p. 1843-1867, illus., 1970.
- 08245 **Wilson, N. E.** Influence of track design on soil pressures and deformations [with French abs.], *in* International Peat Congress, 3d, Quebec, Canada, 1968, Proc.: Ottawa, Canada, National Research Council of Canada, p. 60-64, illus., 1970.
- Wilson, N. E.** See *Glynn, T. E.* 08252
- 00188 **Wilson, Peter G.** Role of geology in a comprehensive environmental-urban planning program for West Virginia [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 1, p. 41, 1970.



- 00940 **Wilson, Raymond C.** Shale lubrication of the Lewis overthrust, Glacier National Park, Montana [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 305, 1970.
- 10308 **Wilson, Raymond C.** Viscous adhesion, a new theory of clay mechanics and its application to overthrust faulting [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 723, 1970.
- Wilson, Richard L.** See *Cavender, Ted M.* 04630
- 00052 **Wilson, Stanley D.; Marano, David.** Performance of Muddy Run Embankment — Closure [to discussion of paper 6026, 1968]: *Am. Soc. Civil Engineers Proc.*, v. 96, *Jour. Soil Mechanics and Found. Div.*, no. SM 1, p. 300-301, illus., 1970.
- 04219 **Wilson, Stanley D.** Observational data on ground movements related to slope instability: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7508, *Jour. Soil Mechanics and Found. Div.*, no. SM5, p. 1519-1544, illus., 1970.
- Wilson, Ted.** See *Wells, Steve.* 03218
- Wilson, W. Feather.** See *Hendricks, Leo.* 10789
- 10794 **Wilson, W. Feather.** Paleontological zonation of the subsurface Comanchean rocks in Texas and northern Mexico, in *Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas* (Leo Hendricks, editor): *Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub.*, no. 67-8, p. 71-74, illus., 1967.
- Wilson, William E.** See *Grossman, I. G.* 03744
- Wilt, Jan Carol.** See *Peirce, H. Wesley.* 07209
- 10001 **Wimbush, Mark; Munk, Walter.** The benthic boundary layer, in *The sea — v. 4, New concepts of sea floor evolution, Pt. 1, General observations* (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 731-758, illus., tables, 1970.
- Winchell, Robert E.** See *Ehrreich, Albert L.* 00258
- Winchell, Robert E.** See *Ehrreich, Albert L.* 00259
- Wind, G.** See *Simony, P. S.* 03018
- Winder, C. G.** See *Mukherji, K. K.* 08124
- 10916 **Winder, C. G.** Petrography of Paleozoic sandstones in southern Ontario, in *Ontario Petroleum Inst. Conf.*, 7th, Windsor, 1968 [Proc.]: Chatham (Ontario), Ontario Petroleum Inst., Tech. Paper No. 4, 17 p., illus., 1968.
- 10749 **Winder, C. Gordon.** Stratigraphy, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor): *Canada Geol. Survey Paper* 69-56, p. 5-9, 1970.
- Windisch, C.** See *Ewing, J.* 04271
- Windley, B. F.** See *Bridgwater, D.* 10017
- 07473 **Windley, Brian F.** Primary quartz ferro-dolerite/garnet amphibolite dykes in the Sukkertoppen region of West Greenland, in *Mechanism of igneous intrusion* (Geoffrey Newall and Nicholas Rast, editors) — *Liverpool Geol. Soc. Symposium*, Liverpool, England, 1969, *Proc.: Geol. Jour., Spec. Issue* no. 2, p. 79-92, illus., tables, 1970.
- 04947 **Windom, Herbert L.** Atmospheric dust records in permanent snowfields, implications to marine sedimentation — Reply [to discussion of 1969 paper by W. L. Hamilton, 1970]: *Geol. Soc. America Bull.*, v. 81, no. 10, p. 3177, 1970.

- 01480 **Winegard, Charles I.** Settling velocity of grains of quartz and other minerals in sea water versus pure water, in *Geological Survey research 1970*, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B161-B166, illus., tables, 1970.
- Wing, Elizabeth.** See *Swift, Camm. 10472*
- 10561 **Wing, Elizabeth.** Fossil skates and rays of Florida: Plaster Jacket, no. 2, [7] p., illus., 1966.
- 00040 **Wing, R. S.; Dellwig, L. F.** Radar expression of Virginia Dale Precambrian ring-dike complex, Wyoming/Colorado: *Geol. Soc. America Bull.*, v. 81, no. 1, p. 293-298, illus., 1970.
- 00941 **Wing, R. S.; MacDonald, H. C.; Dellwig, L. F.** Tectonic analysis from radar — Central and eastern Panama [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 4, p. 305-306, 1970.
- 10962 **Wing, R. S.** Cholame area, San Andreas Fault zone, California, a study in SLAR: *Modern Geology*, v. 1, no. 3, p. 173-186, illus., 1970; errata, *ibid.*, no. 4, p. 305, 1970.
- 05202 **Wing, Richard S.; Overbey, William K., Jr.; Dellwig, Louis F.** Radar lineament analysis, Burning Springs area, West Virginia — An aid in the definition of Appalachian Plateau thrusts: *Geol. Soc. America Bull.*, v. 81, no. 11, p. 3437-3444, illus., 1970.
- 10309 **Wing, Richard S.; Dellwig, Louis F.** Tectonic development of the eastern Panamanian Isthmus as revealed through the analysis of radar imagery [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 723-724, 1970.
- Wingard, N. E.** See *Herbert, T. A. 07526*
- 01112 **Wingard, Norman E.** Distribution of lithologies in glacial drift over the southern peninsula of Michigan [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 409-410, 1970.
- 06014 **Wingard, Norman Edward.** Economic and petrographic evaluation of gravel resources in southern Michigan [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 12, pt. 1, p. 5563B, 1970.
- 00111 **Winkler, E. M.; Wilhelm, E. J.** Salt burst by hydration pressures in architectural stone in urban atmosphere: *Geol. Soc. America Bull.*, v. 81, no. 2, p. 567-572, illus., tables, 1970.
- 06720 **Winkler, E. M.** The importance of air pollution in the corrosion of stone and metals: *Eng. Geology*, v. 4, no. 4, p. 327-334, illus., 1970.
- 00573 **Winkler, Erhard M.** Errors in using modern stream-load data to estimate natural rates of denudation — Discussion [of paper R. H. Meade, 1969]: *Geol. Soc. America Bull.*, v. 81, no. 3, p. 983-984, illus., 1970.
- 10310 **Winkler, Erhard M.** Rock weathering by osmotic pressure [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 724, 1970.
- 10383 **Winkley, Brien R.; Robbins, Lamont G.** Geometric stability analysis of an alluvial river, in *Mississippi Water Resources Conf.*, 5th, 1970, Jackson, Proc.: State College, Miss. Water Resources Research Inst., p. 75-102, illus., tables, 1970.
- 01155 **Winograd, Isaac J.** Noninstrumental factors affecting measurement of static water levels in deeply buried aquifers and aquitards, Nevada Test Site: *Ground Water*, v. 8, no. 2, p. 19-28, illus., 1970.

**Winslow, A. G.** See *Turcan, A. N., Jr. 04803*

- 05490 **Winter, T. C.; Bidwell, L. E.; Maclay, R. W.** Water resources of the Wild Rice River watershed, northwestern Minnesota: U.S. Geol. Survey Hydrol. Inv. Atlas HA-339, 4 sheets. scale 1:250,000, text, 1970.

**Winter, T. C.** See *Bidwell, L. E.* 07049

- 10500 **Winter, T. C.** An approach toward the design of water information systems [abs.]: EOS, v. 51, no. 11, p. 749, 1970.

**Winters, Harold A.** See *Folsom, Michael M.* 02749

**Winters, R. W.** See *Murmann, R. P.* 08191

- 07109 **Wintz, William A., Jr.; Kazmann, Raphael G.; Smith, Charles G., Jr.** Subsidence and ground-water offtake in the Baton Rouge area: Louisiana Water Resources Research Inst. Bull. 6, [90] p., illus., tables, 1970.

- 03417 **Wise, Sherwood W., Jr.** Scleractinian coral exoskeletons, surface microarchitecture and attachment scar patterns: Science, v. 169, no. 3949, p. 978-980, illus., 1970.

**Wise, Sherwood W., Jr.** See *Hay, William W.* 07463

- 07786 **Wise, Sherwood W., Jr.** Microarchitecture and mode of formation of nacre (mother-of-pearl) in pelecypods, gastropods, and cephalopods: Eclogae Geol. Helvetiae, v. 63, no. 3, p. 775-797, illus., table, 1970.

- 07287 **Wise, Sherwood Willing, Jr.** Scanning electron microscope study of molluscan shell ultrastructures [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2771B, 1970.

**Wise, W. S.** See *Moore, E. M.* 00318

- 08369 **Wise, William S.** Cenozoic volcanism in the Cascade Mountains of southern Washington: Washington Div. Mines and Geology Bull. 60, 45 p., illus., tables, geol. map, 1970.

- 09805 **Wiss, John F.** Blasting shakes the earth: Rock Products, v. 73, no. 8, p. 81-84, illus., 1970.

- 04812 **Wissler, Stanley G.** Earl Bart Noble (1894-1970): Am. Assoc. Petroleum Geologists Bull., v. 54, no. 9, p. 1755-1757, portrait, 1970.

- 07267 **Witczak, Matthew Walter.** A generalized investigation of selected highway design and construction factors by regional geomorphic units within the Continental United States (Volumes I and II) [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 5, p. 2670B, 1970.

**Witherspoon, P. A.** See *Sahores, J. J.* 04088

**Witherspoon, Paul A.** See *Neuman, Shlomo P.* 03076

**Witherspoon, Paul A.** See *Neuman, Shlomo P.* 05056

- 00655 **Withington, Charles F.** Application of remote sensing to environmental geology [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 355, 1970.
- 01466 **Witkind, I. J.; Kleinkopf, M. D.; Keefer, W. R.** Geologic and gravity evidence for a buried pluton, Little Belt Mountains, central Montana, *in* Geological Survey research 1970, Chap. B: U.S. Geol. Survey Prof. Paper 700-B, p. B63-B65, illus., 1970.
- 04419 **Witkind, Irving J.** Composite dikes in the Little Belt Mountains, central Montana, *in* Geological Survey research 1970, Chap. C.: U.S. Geol. Survey Prof. Paper 700-C, p. C82-C88, illus., table, 1970.
- Wittels, M. C.** See *Hoyt, H. P., Jr.* 06287
- Wittine, Arthur H.** See *Miller, Barry B.* 01088
- Wittkopp, R. W.** See *Stephens, J. D.* 07393
- 03936 **Witty, J. E.; Arnold, R. W.** Some Folists on Whiteface Mountain, New York: *Soil Sci. Soc. America Proc.*, v. 34, no. 4, p. 653-657, illus., table, 1970.
- Wlotzka, F.** See *Hintenberger, H.* 05702
- 03130 **Wobber, Frank J.** Oblique orbital photography, many advantages for regional exploration: *World Mining* (U.S. edition), v. 6, no. 1, p. 32, illus., 1970.
- 09794 **Wobber, Frank J.** Orbital photos applied to the environment: *Photogramm. Eng.*, v. 36, no. 8, p. 852-864, illus., tables, 1970.
- 10223 **Wobber, Frank J.** How to use thermal infrared imagery as an airborne exploration tool: *World Mining*, v. 24, no. 7, p. 41, 1970.
- 10311 **Wodinsky, Jerome.** Characteristics of recent and fossil octopus boreholes [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 724-725, 1970.
- Woelfle, R.** See *Herr, W.* 05759
- Wogman, N. A.** See *Rancitelli, L. A.* 02272
- Wogman, N. A.** See *Young, J. A.* 02507
- Wogman, N. A.** See *Perkins, R. W.* 05716
- Wolaver, Thomas G.** See *Blackman, Abner.* 01899
- 00777 **Wolcott, Don E.** Interim report on the stratigraphy of part of the Breathitt Formation of eastern Kentucky [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 249-250, 1970.
- 01272 **Wolcott, Don E.** Geologic map of the Buckeye quadrangle, central Kentucky: U.S. Geol. Survey Geol. Quad. Map GQ-843, scale 1:24,000, text, 1970.
- 05010 **Wold, R. J.; Woodzick, T. L.; Ostenso, N. A.** Structure of the Beaufort Sea continental margins: *Geophysics*, v. 35, no. 5, p. 849-861, illus., 1970.
- Wold, Richard J.** See *Smith, Robert B.* 01982
- 10113 **Wold, Richard J.; Ostenso, Ned A.** Aeromagnetic evidence for origin of Arctic Ocean basin [abs.], *in* *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2512, 1970.
- 03287 **Wolf, Barry.** Propagation of Love waves in layers with irregular boundaries: *Pure and Appl. Geophysics*, v. 78, p. 48-57, illus., 1970.

**Wolf, Clarence J.** See *Levy, Ram L.* 02737

**Wolf, Clarence J.** See *Levy, Ram L.* 05329

**Wolf, Frederick A.** See *Nease, Felton R.* 02274

02275 **Wolf, Frederick A.; Nease, Felton R.** Nonpetrified fossils from the site of a phosphate mine in eastern North Carolina: *Elisha Mitchell Sci. Soc. Jour.*, v. 86, no. 1, p. 44-48, illus., table, 1970.

05619 **Wolf, Karl H.** A collection of scientific sayings and quotations, [Pt.] 1: *Earth-Sci. Rev.*, v. 6, no. 4, p. 289-296, 1970.

06800 **Wolf, Karl H.** A collection of scientific sayings and quotations [Pt.] 2: *Earth-Sci. Rev.*, v. 6, no. 5, p. 353-368, 1970.

07879 **Wolf, Karl H.** A collection of scientific sayings and quotations, [Pt.] 3: *Earth-Sci. Rev.*, v. 6, no. 6, p. 467-472, 1970.

**Wolf, Ronald J.** See *Daniel, James F.* 01489

**Wolf, S. C.** See *Grantz, Arthur.* 07076

**Wolf, Stephen C.** See *Scholl, David W.* 00359

03734 **Wolf, Stephen C.** Coastal currents and mass transport of surface sediments over the shelf regions of Monterey Bay, California: *Marine Geology*, v. 8, no. 5, p. 321-336, illus., 1970.

02996 **Wolfe, Edward W.** Geologic evaluation of thermal infrared imagery, Caliente and Temblor Ranges, southern California, in *Earth resources aircraft program status review*, NASA, Houston, 1968 — V. 1, Geology, geography, and sensor studies: Houston, Tex., Manned Spacecraft Center, p. 12-1 — 12-27, illus., table [1970].

10114 **Wolfe, J. A.** Biostratigraphy of nonmarine Tertiary of northern Pacific basin [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971, Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2512-2513, 1970.

01302 **Wolfe, Jack A.; Wahrhaftig, Clyde.** The Cantwell Formation of the central Alaska Range, in *Changes in stratigraphic nomenclature by the U.S. Geological Survey*, 1968: *U.S. Geol. Survey Bull.* 1294-A, p. A41-A46, illus., 1970.

**Wolfe, Jack A.** See *Peck, Dallas L.* 08534

09846 **Wolfe, John A.** Exploration: *Mining Cong. Jour.*, v. 56, no. 2, p. 76-81, illus., tables, 1970.

04147 **Wolfe, L. A.; Zeitlin, H.** An X-ray fluorescence spectroscopic method for the determination of total manganese in rocks and marine sediments [with French and German abs.]: *Anal. Chim. Acta*, v. 51, no. 3, p. 349-354, illus., tables, 1970.

09091 **Wolfe, Stephen H.; Horz, Friedrich.** Shock effects in scapolite: *Am. Mineralogist*, v. 55, nos. 7-8, p. 1313-1328, illus., tables, 1970.

02516 **Wolfe, W. J.; Wright, G. R.; McIlwaine, W. H.; Wallace, H.** (and others). Operation Maple Mountain — Biogeochemical distribution of cobalt in second year aspen and birch twigs, Whitson and Van Nostrand Townships, District of Timiskaming: Ontario Dept. Mines Prelim. Geol. Map P. 600, scale 1 in. to 1/2 mi., text, 1970.

02734 **Wolfe, W. J.; Wright, G. R.; McIlwaine, W. H.; Wallace, H.** (and others). Operation Maple Mountain — Biogeochemical distribution of cobalt in second year aspen twigs, Charters and Donovan Townships, District of Timiskaming: Ontario Dept. Mines Prelim. Geol. Map P. 599, scale 1 in. to 1/2 mi., text, 1970.

- 09075 **Wolfe, W. J.** Distribution of copper, nickel, cobalt, and sulphur in mafic intrusive rocks of the Kamiskotia-Whitesides area, District of Cochrane: Ontario Dept. Mines and Northern Affairs Misc. Paper 44, 28 p., illus., tables, 1970.
- 01712 **Wolff, Roger G.** Field and laboratory determination of the hydraulic diffusivity of a confining bed: *Water Resources Research*, v. 6, no. 1, p. 194-203, illus., table, 1970.
- 07416 **Wolff, Roger G.** Relationship between horizontal strain near a well and reverse water level fluctuation: *Water Resources Research*, v. 6, no. 6, p. 1721-1728, illus., 1970.
- 04449 **Wolgemuth, K.; Broecker, W. S.** Barium in sea water: *Earth and Planetary Sci. Letters*, v. 8, no. 5, p. 372-378, illus., tables, 1970.
- 06406 **Wolgemuth, K.** Barium analyses from the first Geosecs test cruise: *Jour. Geophys. Research*, v. 75, no. 36, p. 7686-7687, illus., table, 1970.
- 08436 **Wolhuter, L. E.** Geology of the northwest quarter of Lévy township, Abitibi-East electoral district—Preliminary report [also French edition]: Quebec Dept. Nat. Resources Prelim. Rept. P.R.-595, 26 p., table, geol. map, 1970.
- Wolleben, J. A.** See *Weidie, A. E.* 09890
- Wolleben, J. A.** See *Weidie, A. E.* 09891
- 09892 **Wolleben, James A.; McBride, Earle F.; Weidie, A. E.** Upper Cretaceous stratigraphic relationships in northeastern Mexico, in *Spring field trip, 1970, Hidalgo Canyon and La Popa Valley [Mexico]: [Corpus Christi, Texas, Corpus Christi Geol. Soc.]*, p. 45-56, illus. [1970].
- 09893 **Wolleben, James A.; McBride, Earle F.; Weidie, A. E.** Geology of the La Popa area, in *Spring field trip, 1970, Hidalgo Canyon and La Popa Valley [Mexico]: [Corpus Christi, Texas, Corpus Christi Geol. Soc.]*, p. 59-66, illus. [1970].
- Wollenberg, H. A.** See *Dodge, F. C. W.* 00255
- 00072 **Wollenberg, Harold A.; Smith, Alan R.** Radiogenic heat production in prebatholithic rocks of the central Sierra Nevada: *Jour. Geophys. Research*, v. 75, no. 2, p. 431-438, illus., table, 1970.
- 09227 **Wollin, Goesta; Ericson, David B.** Worldwide late Pleistocene climates recorded in deep-sea sediments [abs.], in *American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970 Abs.: [Bozeman, Mont., Montana State Univ. ?]*, p. 155, 1970.
- 07092 **Wollin, Jay C.** Dig that coral — Rockhounding in Florida: *Gems and Minerals*, no. 399, p. 24-26, 42-45, illus., 1970.
- 06538 **Wolman, M. Gordon; Leopold, Luna B.** Flood plains, [Chap.] 6 in *Rivers and river terraces* (G. H. Dury, editor): London, Macmillan and Co. Ltd., p. 166-196, illus., tables, condensed 1970; originally published 1957.
- Wolman, M. Gordon** See *Leopold, Luna B.* 06539
- 09868 **Woloshin, Aaron J.** Geoenvironmental information systems — Their use in urban planning [with French résumé], in *Internat. Assoc. Eng. Geology Internat. Congress, 1st, Paris, 1970, V. 2: Paris, Comité Français de Géologie de l'Ingénieur*, p. 871-881, illus., 1970.
- Wondratschek, Hans.** See *Merker, Ludwig.* 09100
- Wones, D. R.** See *Buma, Grant.* 06079
- Wones, David.** See *Horai, Ki-iti.* 06285

Wones, David R. See *Czamanske, Gerald K.* 06945

- 01641 **Wong, C. S.** Quantitative analysis of total carbon dioxide in sea water — A new extraction method: *Deep-Sea Research*, v. 17, no. 1, p. 9-17, illus., tables, 1970.

**Wong, H. K.** See *Loring, D. H.* 03707

- 03271 **Wong, Her Yue.** Clay petrology of the Atoka Formation, eastern Oklahoma [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 11, p. 5105B-5106B, 1970.

**Woo, C. C.** See *Duke, M. B.* 06963

- 10360 **Woo, D. A.** Preliminary report of a microseismic survey on the island of Barbados, West Indies: *West Indies Univ. Seismic Research Unit Spec. Pub.* 4, 7 p., illus., 1967.

- 04192 **Wood, Albert E.** The early Oligocene rodent *Ardynomys* (Family *Cylindrodontidae*) from Mongolia and Montana: *Am. Mus. Novitates*, no. 2418, 18 p., illus., table, 1970.

- 01342 **Wood, G. V.** Sediment thin section data, Leg 2, [Chap.] 10 in *Initial reports of the Deep Sea Drilling Project — V. 2, Leg 2 of cruises of Glomar Challenger*, Hoboken, N. J., to Dakar, Senegal, Oct.-Nov. 1968: Washington, D. C., U.S. Govt. Printing Office, p. 323-328, table, 1970.

- 06662 **Wood, G. V.** Sediment thin section data, Chap. 14 in *Initial reports of the Deep Sea Drilling Project — V. 4, Leg 4 of cruises of Glomar Challenger*, Rio de Janeiro, Brazil, to San Cristobal, Panama, Feb.-Mar. 1969 (R. G. Bader, and others): Washington, D. C., U.S. Govt. Printing Office, p. 315-323, table, 1970.

**Wood, Gordon H., Jr.** See *Hosterman, John W.* 04248

**Wood, J. A.** See *Marvin, Ursula B.* 00958

- 06495 **Wood, John.** Evidence for a tropical climate and oxygenic atmosphere in upper Huronian rocks of the Rawhide Lake-Flack Lake area, Ontario [abs.], in *Inst. Lake Superior Geology*, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 45-46, 1970.

- 06351 **Wood, John A.** Petrology of the lunar soil and geophysical implications: *Jour. Geophys. Research*, v. 75, no. 32, p. 6497-6513, illus., tables, 1970.

**Wood, Joseph M.** See *Basson, Philip W.* 00972

- 10312 **Wood, M. D.; Levine, Stephen R.** An interactive system for the study of multivariate geophysical data [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 725-726, 1970.

- 06501 **Wood, Michael M.** The crystal structure of ransomite: *Am. Mineralogist*, v. 55, nos. 5-6, p. 729-734, illus., tables, 1970.

- 11007 **Wood, Michael Manning.** The crystal structures of ransomite,  $\text{CuFe}_2(\text{SO}_4)_6\text{H}_2\text{O}$ , and roemerite,  $\text{Fe}^{2+}\text{Fe}^{3+}(\text{SO}_4)_4\text{14H}_2\text{O}$ , and a proposed classification for the transition metal sulfate hydrates [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 8, p. 3714B, 1970.

- 01269 **Wood, Milton Darroll.** The influence of ocean tidal loading on solid earth tides and tilts in the San Francisco Bay region, California [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 8, p. 3717B, 1970.

- 09806 **Wood, Peter.** Television from space: *Photogramm. Eng.*, v. 36, no. 2, p. 141-150, tables, 1970.

- 09228 **Wood, W. Raymond; King, James E.** Wisconsinan vegetational and faunal history in the Ozark Highlands, Missouri [abs.], in *American Quaternary Assoc. Mtg.*, 1st,

Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ. ?], p. 157, 1970.

- 07592 **Wood, Warren W.** Geochemistry of ground water of the Saginaw Formation in the upper Grand River basin, Michigan [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 3, p. 1354B, 1970.

- 01533 **Wood, William H.** Rectification of wind-blown sand: Jour. Sed. Petrology, v. 40, no. 1, p. 29-37, illus., table, 1970.

**Woodbury, H. O.** See *Powell, L. C.* 05639

**Woodbury, H. O.** See *Powell, L. C.* 07315

- 09066 **Woodbury, Jerry L.; Vogel, Thomas A.** A rapid economical method for polishing thin sections for microprobe and petrographic analyses: Am. Mineralogist, v. 55, nos. 11-12, p. 2095-2102, illus., table, 1970..

- 03162 **Woodcock, A. H.; Furumoto, A. S.; Woollard, G. P.** Fossil ice in Hawaii: Nature, v. 226, no. 5248, p. 873, illus., 1970.

- 07461 **Woodfill, Robert D.** Interpretation of gravity anomalies in Precambrian rocks of the central Laramie Mountains, Wyoming: Wyoming Univ. Contr. Geology, v. 9, no. 1, p. 17-25, illus., table, 1970.

**Woodfork, Larry D.** See *Cardwell, Dudley H.* 07199

**Woodhams, F. W. D.** See *Knop,*

- 03381 **Woodring, W. P.** Geology and paleontology of Canal Zone and adjoining parts of Panama—Description of Tertiary mollusks (gastropods: Eulimidae, marginellidae to Helminthoglyptidae): U.S. Geol. Survey Prof. Paper 306-D, p. 299-452, illus., 1970.

- 01253 **Woodruff, James L.** A self-deactivating piston for a piston corer: Ocean Eng., v. 1, no. 6, p. 597-599, illus., 1970.

- 10351 **Woodruff, Kenneth D.** Hydrology and geophysics of Columbia sediments in the Middletown-Odessa area, Delaware, *in* Geology, hydrology, and geophysics of Columbia sediments in the Middletown-Odessa area, Delaware: Delaware Geol. Survey Bull., no. 13, p. 75-156, illus., table, 1970.

- 09873 **Woods, E. G.** Pulse-test response of a two-zone reservoir: Soc. Petroleum Engineers Jour., v. 10, no. 3, p. 245-246, illus., tables, 1970.

- 04039 **Woods, Mary Louise.** Geolibrarianship: Compass, v. 47, no. 3, p. 188-191, 1970.



- 00589 **Woodward, Lee A.** Lamprophyre dikes of Sandia Mountains and vicinity, New Mexico [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 5, p. 355-356, 1970.
- 01415 **Woodward, Lee A.** Tectonic implications of structure of Beaver and northern San Francisco Mountains, Utah: *Geol. Soc. America Bull.*, v. 81, no. 5, p. 1577-1583, illus., 1970.
- 05866 **Woodward, Lee A.** Differentiation trends of spessartite dikes, Sandia Mountains, New Mexico: *Jour. Geology*, v. 78, no. 6, p. 741-745, illus., table, 1970.
- 05902 **Woodward, Lee A.** Time of emplacement of Pinto Diorite, Little Belt Mountains, Montana: *Earth Sci. Bull.*, v. 3, no. 3, p. 15-26, illus., tables, 1970.
- Woodward, Lee A.** See *New Mexico Geol. Soc.* 08646
- 08648 **Woodward, Lee A.** Precambrian rocks of southwestern New Mexico, in *Guidebook of the Tyrone-Big Hatchet Mountains-Florida Mountains region — New Mexico Geol. Soc. Field Conf.*, 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, p. 27-31, illus., 1970.
- Woodward, Lee A.** See *Corbitt, L. L.* 08650
- 08670 **Woodward, Lee A.** [J.]. Memorial to Harrison A. Schmitt [1896-1966], in *Guidebook of the Tyrone-Big Hatchet Mountains-Florida Mountains region — New Mexico Geol. Soc. Field Conf.*, 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, p. vi, 1970.
- Woodzick, T. L.** See *Wold, R. J.* 05010
- Woolhiser, David A.** See *Smith, Roger E.* 10506
- 02875 **Woollard, G. P.** Evaluation of the isostatic mechanism and role of mineralogic transformations from seismic and gravity data, in *Phase transformations and the Earth's interior — Symposium, Canberra, Australia, 1969*, *Proc.: Physics Earth and Planetary Interiors*, v. 3, p. 484-498, illus., tables, 1970.
- Woollard, G. P.** See *Woodcock, A. H.* 03162
- 06323 **Woollard, G. P.; Daugherty, K. I.** Collection, processing, and geophysical analysis of gravity and magnetic data — Gravity gradients associated with sea-floor topography: *Hawaii Inst. Geophysics [Rept.] HIG-70-19*, 253 p., illus., tables, 1970.
- Woollard, G. P.** See *Malahoff, Alexander.* 09271
- Woollard, G. P.** See *Malahoff, Alexander.* 10004
- Woollard, George P.** See *Khan, Mohammad Asadullah.* 02129
- 10198 **Woollard, George P.; Khan, Mohammad Asadullah.** A review of satellite derived figures of the geoid and their geophysical significance: *Pacific Sci.*, v. 24, no. 1, p. 1-28, illus., tables, 1970.
- Woolsey, James R.** See *Levy, John S.* 01168
- 02866 **Woolson, E. A.; Axley, J. H.; Kearney, P. C.** Soil calcium determination using a calcium-specific ion electrode: *Soil Sci.*, v. 109, no. 5, p. 279-281, illus., table, 1970.
- Woolum, D.** See *Burnett, D. S.* 06846
- Worl, R. G.** See *Popenoe, Peter.* 01171
- 01686 **Wornardt, W. W., Jr.** Fossil diatoms and silicoflagellates from Newport Beach, California, studied with scanning electron microscope [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 3, p. 558, 1970.

- 01354 **Worsley, T.; Martini, E.** Late Maastrichtian nannoplankton provinces: *Nature*, v. 225, no. 5239, p. 1242-1243, illus., table, 1970.
- Worstell, Paula.** See *Eicher, Don L.* 01291
- Worstell, Paula.** See *Eicher, Don L.* 04705
- 04958 **Worthington, Joseph E.; Kiff, Irving T.** A suggested volcanigenic origin for certain gold deposits in the slate belt of the North Carolina Piedmont: *Econ. Geology*, v. 65, no. 5, p. 529-537, illus., 1970.
- 06113 **Woussen, Gérard.** La géologie du complexe igné du Mont Royal [The geology of the Mount Royal igneous complex (with English abs.)], in *Alkaline rocks, the Monteteregian Hills — Symposium, Montreal, 1969, Proc.: Canadian Mineralogist*, v. 10, pt. 3, p. 432-451, illus., tables, 1970.
- 03548 **Wozab, David; Jovel, J. Roberto.** Hydrological analysis of volcanic terrane, lower basin of the Rio Grande de San Miguel, El Salvador: *Internat. Assoc. Sci. Hydrology Bull.*, v. 15, no. 2, p. 47-66, illus., tables, 1970.
- Wrathall, Don M.** See *Buttgereit, Charles D.* 07406
- 07890 **Wray, John L.; Playford, Phillip E.** Some occurrences of Devonian reef-building algae in Alberta: *Bull. Canadian Petroleum Geology*, v. 18, no. 4, p. 544-555, illus., tables, 1970.
- 10340 **Wray, John L.** Upper Devonian calcareous algae — A comparison of floras from Alberta and Western Australia [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 726, 1970.
- 03198 **Wray, William B., Jr.** FORTRAN IV CDC 6400 computer program for constructing isometric diagrams: *Kansas Geol. Survey Computer Contr.* 44, 58 p., illus., 1970.
- 05887 **Wright, Anthony D.** A note on the shell structure of the triplasiacean brachiopods: *Lethaia*, v. 3, no. 4, p. 423-426, illus., 1970.
- Wright, Cynthia R.** See *Wanless, H. R.* 06708
- 02002 **Wright, F. F.** Turbid layer sedimentation in Alaskan fiords [abs.]: *EOS*, v. 51, no. 4, p. 335, 1970.
- Wright, F. F.** See *Reimnitz, Erk.* 04244
- Wright, Frances W.** See *Hodge, Paul W.* 00195
- Wright, G. A.** See *Griffin, James B.* 10138
- Wright, G. R.** See *Wolfe, W. J.* 02516
- Wright, G. R.** See *Wolfe, W. J.* 02734
- 07732 **Wright, H. E., Jr.; Mattson, L. A.; Thomas, J. A.** Geology of the Cloquet quadrangle, Carlton County, Minnesota: *Minnesota Geol. Survey Geol. Map Ser. GM-3*, 30 p., illus., tables, geol. map, 1970.
- 08047 **Wright, H. E., Jr.** Vegetational history of the Central Plains, in *Pleistocene and recent environments of the central Great Plains: Kansas Univ. Dept. Geology Spec. Pub.* 3, p. 157-172, illus., 1970.
- 09229 **Wright, H. E., Jr.** Retreat of the Laurentide ice sheet from 14,000 to 9,000 years ago [abs.], in *American Quaternary Assoc. Mtg., 1st, Yellowstone Park, Wyo., and Bozeman, Mont., 1970, Abs.: [Bozeman, Mont., Montana State Univ.?]*, p. 157-159, 1970.
- Wright, H. E., Jr.** See *Wasylikowa, Krystyna.* 09380

**Wright, H. E., Jr.** See *Waddington, Jean C. B.* 09416

10313 **Wright, H. E., Jr.; Matsch, Charles L.** Wisconsin history of the Superior and Des Moines Lobes [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 726-727, 1970.

03590 **Wright, Herbert.** A teacher's guide for geologic investigations in northwestern Minnesota: [St. Paul, Minn.] Minnesota Dept. Education, 7 p., illus. [n.d.].

07719 **Wright, J. A.** Anisotropic apparent resistivities arising from non-homogeneous, two-dimensional structures: *Canadian Jour. Earth Sci.*, v. 7, no. 2, pt. 1, p. 527-531, illus., 1970.

06017 **Wright, James Arthur.** Geothermal investigations using in situ techniques [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 12, pt. 1, p. 5565B, 1970.

**Wright, James C.** See *Finch, Warren I.* 08707

09005 **Wright, James R.** Weathering, theoretical and practical aspects of asphalt durability [Chap.] 8 in *Bituminous materials—Asphalts, tars, and pitches*, A. J. Hoiberg, Editor—v. 2, *Asphalts*, pt. 1: New York, Intersci. Publishers, p. 249-306, illus., tables, 1965.

06142 **Wright, L. D.** Above-bottom acoustic reflections, Mississippi River delta: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 11, p. 2208-2213, 1970.

02399 **Wright, Lauren A.; Troxel, Bennie W.** Summary of regional evidence for right-lateral displacement in the western Great Basin — Discussion [of paper by J. H. Stewart; J. P. Albers; F. G. Poole, 1968]: *Geol. Soc. America Bull.*, v. 81, no. 7, p. 2167-2173, illus., 1970.

10314 **Wright, Lauren A.; Williams, Eugene G.** Precambrian reef complex, Death Valley, evidence for tectonic control of facies patterns and for antiquity of a major fault [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 727, 1970.

**Wright, R. J.** See *Manuel, O. K.* 04273

00390 **Wright, Robert H.** Paleocology and zoogeography of a late Pleistocene marine terrace at Goleta, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 158-159, 1970.

02003 **Wright, Robert J.; Manuel, O. K.; Miller, D. K.** Xenon and krypton from step-wise heating experiments in carbonaceous chondrites [abs.]: *EOS*, v. 51, no. 4, p. 339-340, 1970.

08696 **Wright, Ruth V.; Chadbourne, Robert L.** Gems and minerals of the Bible: New York, Harper and Row, 148 p., illus., 1970.

02389 **Wright, Thomas L.; Doherty, Patrick C.** A linear programming and least squares computer method for solving petrologic mixing problems: *Geol. Soc. America Bull.*, v. 81, no. 7, p. 1995-2007, tables, 1970.

**Wright, Thomas L.** See *Jackson, Everett D.* 04350

10315 **Wright, Thomas L.** Presentation and interpretation of chemical data for igneous rocks [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 727-729, illus., 1970.

**Wright, W. B.** See *Cohee, G. V.* 04694

**Wright, Wilna B.** See *Cohee, George V.* 01362

08677 **Wright-Broughton, C.; Chamney, T. P.; Hennessey, W. J.; Eccles, J. K.; Brady, W. B.** A geological guide along the highways between Drumheller-Calgary-Lake Louise

- Prepared for AAPG and SEPM 1970 Convention: Calgary, Alberta, Alberta Soc. Petroleum Geologists, 44 p., illus., geol. map, 1970.
- 02273 **Wrigley, Robert C.** Cosmogenic radionuclides in the Lost City, Oklahoma, meteorite [abs.]: EOS, v. 51, no. 7, p. 582, 1970.
- 05733 **Wrigley, Robert C.; Quaide, William L.** Al-26 and Na-22 in lunar surface materials — Implications for depth distribution studies, in Apollo 11 Lunar Sci. Conf., Houston, Tex., 1970, Proc. — V. 2, Chemical and isotope analysis: New York, and Oxford, England, Pergamon Press (Geochim. et Cosmochim. Acta Supp. 1), p. 1751-1755, table, 1970.
- 03083 **Wroblewski, E. F.** New look at a major deep drilling area, the Anadarko basin: World Oil, v. 171, no. 2, p. 29-32, illus., 1970.
- 00590 **Wrucke, Chester T.; Theodore, Ted G.** Direction of movement of the Roberts Mountains thrust determined from folds, northern Shoshone Range and Battle Mountain, Nevada [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 356, 1970.
- Wu, C. H.** See *Prewitt, C. T.* 09524
- 00971 **Wu, Dah Cheng; Mankin, Charles J.** Clay mineralogy and geochemistry of the upper Flowerpot Shale in Major and Blaine Counties, Oklahoma [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 4, p. 306, 1970.
- 02004 **Wu, Francis T.; Kanamori, Hiroo.** Body and surface waves source mechanisms of the 1965 Rat Island earthquake [abs.]: EOS, v. 51, no. 4, p. 355, 1970.
- 10556 **Wu, Francis T.** Ellipticity of Rayleigh waves in the frequency range of 150-300 seconds [abs.]: EOS, v. 51, no. 11, p. 781, 1970.
- Wu, M. J.** See *Sherif, M. A.* 05496
- Wu, M. J.** See *Sherif, M. A.* 10747
- Wu, S. M.** See *DeGoffroy, J.* 03988
- Wu, S. M.** See *DeGoffroy, J.* 04282
- Wu, S. M.** See *DeGoffroy, J.* 04432
- Wuensch, B. J.** See *Dangel, Philip N.* 09126
- Wulf, George R.** See *McGookey, Donald P.* 05364
- 08439 **Wyatt, A. Wayne; Water Levels Section Staff.** Water-level data from observation wells in the Southern High Plains of Texas, 1965-70: Texas Water Devel. Board Rept. 121, 361 p., illus., tables, 1970.
- 03433 **Wyckoff, Ralph W. G.** Deux espèces de chalcopryrites mises en évidence par les bactéries [Two kinds of chalcopryrites demonstrated by bacterial [oxidation]]: Soc. Française Minéralogie et Crystallographie Bull., v. 93, no. 1, p. 120-122, 1970.
- Wyder, J. E.** See *Klassen, R. W.* 07862
- Wyder, J. E.** See *Klassen, R. W.* 10938
- Wyllie, P. J.** See *Piwnskii, A. J.* 00095
- Wyllie, P. J.** See *Lambert, I. B.* 02872
- Wyllie, P. J.** See *Merrill, R. B.* 05643

Wyllie, P. J. See *Smith, J. V.* 05753

Wyllie, Peter J. See *Lambert, Ian B.* 03412

- 06107 **Wyllie, Peter J.; Watkinson, David H.** Phase equilibrium studies bearing on genetic links between alkaline and subalkaline magmas, with special reference to the limestone assimilation hypothesis, in *Alkaline rocks, the Monteregian Hills — Symposium, Montreal, 1969*, Proc.: Canadian Mineralogist, v. 10, pt. 3, p. 362-374, table, 1970.
- 09937 **Wyllie, Peter J.** Ultramafic rocks and the upper mantle, in *Symposium on the mineralogy and petrology of the upper mantle—Fiftieth Anniversary Symposia* (Benjamin A. Morgan, editor): Mineralog. Soc. America Spec. Paper 3, p. 3-32, illus., tables, 1970.
- 09042 **Wyman, Richard V.** Distribution of ground water  $U_3O_8$  on the Colorado Plateau: Mining Eng., v. 22, no. 12, p. 39-40, illus., 1970.
- Wynne, F. L.** See *Allen, J. M.* 03465
- 10721 **Wynne, Frederick.** The image of time: New York, Vantage Press, 333 p., illus., table, 1970.
- 01668 **Wynne-Edwards, H. R.; Hasan, Zia-Ul.** Intersecting orogenic belts across the North Atlantic: Am. Jour. Sci., v. 268, no. 4, p. 289-308, illus., tables, 1970.
- 08121 **Wynne-Edwards, H. R.; Laurin, A. F.; Sharma, K. N. M.; Nandi, A.; Kehlenbeck, M. M.; Franconi, A.** Computerized geological mapping in the Grenville Province, Quebec: Canadian Jour. Earth Sci., v. 7, no. 6, p. 1357-1373, illus., tables, 1970.
- 10760 **Wynne-Edwards, H. R.** Structural geology, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor): Canada Geol. Survey Paper 69-56, p. 90-94, 1970.
- 10316 **Wynne-Edwards, Hugh R.** A geological field data system for the Grenville project in Quebec [abs.]: Geol. Soc. America Abs. with programs, v. 2, no. 7, p. 729-730, 1970.
- 08586 **Wyoming Geological Survey.** Mines and mineral map of Wyoming: Laramie, Wyo., Wyoming Geol. Survey, scale 1:500,000, 1970.
- 10944 **Wyrick, Granville G.; Dean, Roberta B.** Ground-water supply of Cape Hatteras National Seashore Recreational Area, North Carolina—Pt. 5, Ocracoke Island lateral well supply: North Carolina Div. Ground Water Rept. Inv. 6, 29 p., illus., table, 1968.
- 02005 **Wyss, Max; Brune James N.** Moments, energies, and dimensions of earthquakes with magnitudes from 1 to 3 [abs.]: EOS, v. 51, no. 4, p. 357, 1970.
- 03313 **Wyss, Max.** Apparent stresses of earthquakes on ridges compared to apparent stresses of earthquakes in trenches: Royal Astron. Soc. Geophys. Jour., v. 19, no. 5, p. 479-484, tables, 1970.
- 07956 **Wyss, Max.** Observation and interpretation of tectonic strain release mechanisms [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 6, p. 3498B-3490B, 1970.
- 10994 **Yaalon, D. H.** Note on high-iron montmorillonites — Discussion of "Significance of magnesium and iron montmorillonite formation from basic igneous rocks" [by G. S. R. Krishna Murti; K. V. S. Satyanarayana, 1969]: Soil Sci., v. 110, no. 1, p. 74-76, illus., 1970.

- 03698 **Yacoub, Nazieh K.; Scott, James H.; McKeown, F. A.** Computer ray tracing through complex geological models for ground motion studies: *Geophysics*, v. 35, no. 4, p. 586-602, illus., 1970.
- 10891 **Yacoub, Nazieh K.** A computer program to trace seismic ray distribution complex two-dimensioned geological models: Springfield, Va., Natl. Tech. Inf. Service (PB 197, 583), 11 p., illus., computer program, unpaginated, 1970.
- 05952 **Yagi, Kenzo.** Memorial of Hisashi Kuno — January 7, 1910-August 6, 1969: *Am. Mineralogist*, v. 55, nos. 3-4, p. 573-583, portrait, 1970.
- Yahner, Joseph E.** See *Persinger, Ival D.* 05850
- Yamanaga, George.** See *Takasaki, K. J.* 05637
- 07609 **Yamanaga, George; Huxel, C. J., Jr.** Preliminary report on the water resources of the Wailuku area, Maui: Hawaii Div. Water and Land Devel. Circ. C61, 43 p., illus., tables, 1970.
- 10430 **Yamaoka, Shinobu; Fukunaga, Osamu; Saito, Shinroku.** Phase equilibrium in the system  $MgO-H_2O$  at high temperatures and very high pressures: *Am. Ceramic Soc. Jour.*, v. 53, no. 4, p. 179-181, illus., 1970.
- Yamasaki, Kazuo.** See *Iida, Chuzo.* 02961
- 01855 **Yanase, Y.; York, Derek.** Elucidation of Grenville thermal histories with Ar-40/Ar-39 measurements [abs.]: *EOS*, v. 51, no. 4, p. 434, 1970.
- 00391 **Yancey, Thomas E.** Provenance and accumulation of sediment on the continental shelf in Monterey Bay, California [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 159, 1970.
- 07373 **Yang, Houn-Yi.** Phase equilibria of the join akermanite-anorthite-forsterite in the system  $CaO-MgO-Al_2O_3-SiO_2$  at atmospheric pressure [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 4, p. 2152B, 1970.
- 07466 **Yang, Jung Hsi.** Behavior of anisotropic rocks under combined stresses [abs.]: *Dissert. Abs. Internat.*, Sec. B, Sci. and Eng., v. 31, no. 4, p. 2023B, 1970.
- 03180 **Yang, Kyung Rin.** Atomic Energy Research Institute of Korea radiocarbon measurements I: *Radiocarbon*, v. 12, no. 2, p. 350-352, 1970.
- Yang, Suh Y.** See *Selander, Robert K.* 03871
- 02006 **Yang, Tsung.** The concept of entropy in stream morphology [abs.]: *EOS*, v. 51, no. 4, p. 278, 1970.
- Yanggen, Douglas A.** See *Parker, Dale E.* 02384
- Yaniv, Akiva.** See *Heymann, Dieter.* 05700
- Yaniv, Akiva.** See *Heymann, Dieter.* 05701
- 02168 **Yardley, D. H.** Public works create great demand for geological engineering services: *Mining Eng.*, v. 22, no. 2, p. 80-81, illus., 1970.
- Yarger, Richard D.** See *Cranson, K. R.* 01065
- Yarnell, Richard A.** See *Watson, Patty Jo.* 09073
- 04911 **Yates, Robert G.** Geologic background of the Metaline and Northport mining districts, Washington, [Chap.] 3 in *Lead-zinc deposits in the Kootenay Arc, northeastern Washington and adjacent British Columbia* — Soc. Econ. Geologists, 1970 Northwest Field Conf. Guidebook: Washington Div. Mines and Geology Bull. 61, p. 17-39, illus., 1970.

- 10317 **Yates, Robert S.; Engels, Joan C.** Potassium-argon ages of Tertiary plutons in the North Cascades of Washington [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 730, 1970.
- Yeager, Joan E.** See *Eitel, Dean F.* 01134
- Yeats, Robert S.** See *Tabor, R. W.* 00377
- 00392 **Yeats, Robert S.; Cole, Mark R.; Merschat, Walter R.** Eocene paleogeography of the southern California borderland [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 2, p. 159-160, 1970.
- 02398 **Yeats, Robert S.** Stratigraphic evidence for Catalina Schist basement north of Channel Islands, California: *Geol. Soc. America Bull.*, v. 81, no. 7, p. 2147-2151, illus., tables, 1970.
- 04208 **Yeats, Robert S.; McLaughlin, W. A.** Potassium-argon mineral age of an ash bed in the Pico Formation, Ventura basin, Calif., in *Radiometric dating and paleontologic zonation*: *Geol. Soc. America Spec. Paper* 124, p. 173-206, illus., tables, 1970.
- 10552 **Yeatts, F. Richard.** A multipole representation of earthquake source mechanisms [abs.]: *EOS*, v. 51, no. 11, p. 780, 1970.
- 08039 **Yeh, H. C.** Interpretation of phase diagrams, in *Phase diagrams, materials science and technology — V. 1, Theory, principles, and techniques of phase diagrams*: New York and London, Academic Press, p. 167-197, illus., table, 1970.
- 01516 **Yeh, William Wen-Gong.** Nonsteady flow to surface reservoir: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7137, *Jour. Hydraulics Div.*, no. HY 3, p. 609-618, illus., table, 1970.
- Yemel'yanov, Ye. M.** See *Barash, M. S.* 00830
- 07211 **Yemel'yanov, Ye. M.; Litvin, V. M.; Kharin, G. S.** Ekskursiya v krater vulkana [Excursion to a volcano crater]: *Priroda*, no. 10, p. 90-93, illus., 1970.
- 03634 **Yen, Bing C.** Stability of slopes undergoing creep deformation — Errata [to paper 6675, 1969]: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7385, *Jour. Soil Mechanics and Found. Div.*, no. SM 4, p. 1467, 1970.
- 01704 **Yen, Chin-lien.** Bed topography effect on flow in a meander: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7003, *Jour. Hydraulics Div.*, no. HY 1, p. 57-73, illus., table, 1970.
- Yen, Teh Fu.** See *Rho, Joon H.* 05749
- Yen, Teh Fu.** See *Vaughan, George B.* 06799
- 00778 **Yewisiak, Paul P.** Geology of the Culpeper Triassic basin, Virginia [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 250, 1970.
- Yiu, S. K.** See *Howell, B. F., Jr.* 03307
- 01501 **Yochelson, E. L.; Pierce, J. W.; Taylor, Michael E.** *Salterella* from the Lower Cambrian of central Nevada: *U.S. Geol. Survey Prof. Paper* 643-H, p. H1-H7, illus., tables, 1970.
- 00014 **Yochelson, Ellis L.** North American Paleontological Convention: *Science*, v. 167, no. 3917, p. 398-400, 1970.
- 00779 **Yochelson, Ellis L.** Gastropoda and minor classes of mollusks in the Ordovician of Kentucky [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 3, p. 250, 1970.
- 04189 **Yochelson, Ellis L.** The Early Cambrian fossil *Salterella conulata* Clark in eastern North America: *U.S. Geol. Survey Prof. Paper* 683-B, p. B1-B10, illus., 1970.

- Yoder, H. S., Jr.** See *Kushiro, I.* 02251
- Yoder, H. S., Jr.** See *Schairer, J. F.* 02256
- 02261 **Yoder, H. S., Jr.** Phlogopite-H<sub>2</sub>O-CO<sub>2</sub> — An example of the multicomponent gas problem: *Carnegie Inst. Washington Year Book* 68, 1968-69, p. 236-240, illus., 1970.
- Yoder, H. S., Jr.** See *Huckenholz, H. G.* 04287
- Yoho, W. H.** See *Pirkle, E. C.* 03480
- Yorath, C. J.** See *Balkwill, H. R.* 03374
- Yorath, C. J.** See *Balkwill, H. R.* 11237
- 10115 **Yorath, Christopher J.** Geology of Beaufort-Mackenzie basin and eastern northern Interior Plains [abs.], in *Internat. Arctic Geology Symposium*, 2d, San Francisco, 1971. Abs. Papers: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 12, p. 2513, 1970.
- 01169 **York, D.; Berger, G. W.** <sup>40</sup>Ar/<sup>39</sup>Ar age determinations on nepheline and basic whole rocks: *Earth and Planetary Sci. Letters*, v. 7, no. 4, p. 333-336, table, 1970.
- York, D.** See *Baksi, A. K.* 01887
- York, D.** See *Gittins, J.* 03435
- York, Derek.** See *Berger, Glen W.* 01737
- York, Derek.** See *Yanase, Y.* 01855
- York, Derek.** See *Berger, Glenn W.* 05338
- 07967 **York, Derek.** Recent developments in potassium-argon dating: *Comments Earth Sci. — Geophysics*, v. 1, no. 2, p. 47-54, 1970.
- 10776 **York, Derek.** Geochronology and stable isotope studies, in *Background papers on the earth sciences in Canada* (C. H. Smith, editor): *Canada Geol. Survey Paper* 69-56, p. 234-240, tables, 1970.
- 08084 **Yost, Edward.** Multispectral viewers, in *Earth Resources Aircraft Program, status review*, 2d Ann., Houston, Tex., 1969 — V. 2, Agriculture, Forestry, and sensor studies: Houston, Tex., U.S. Natl. Aeronautics and Space Admin., Manned Spacecraft Center, p. 29-1 — 2918, illus., [1970?].
- Yost, Edward.** See *Canney, F. C.* 09297
- Youd, T. L.** See *Cloud, W. K.* 00858
- 03028 **Youd, T. Leslie.** Densification and shear of sand during vibration: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7272, *Jour. Soil Mechanics and Found. Div.*, no. SM 3, p. 863-880, illus., tables, 1970.
- 03626 **Youd, T. Leslie; Castle, Robert O.** Borrego Mountain earthquake of April 8, 1968: *Am. Soc. Civil Engineers Proc.*, v. 96, paper 7396, *Jour. Soil Mechanics and Found. Div.*, no. SM 4, p. 1201-1219, illus., tables, 1970.
- 02214 **Youmans, A. H.; Bishop, W. Don; Wichmann, P. A.** Applications of the neutron lifetime log in new wells, in *SPWLA Logging Symposium*, 11th Ann., Los Angeles, Calif., 1970, *Trans.: Houston, Tex., Soc. Prof. Well Log Analysts*, p. N1-N20, illus., table, 1970.
- Young, A.** See *Harris, D. G.* 02626



- 07072 **Young, Davis Alan.** Petrology and structure of the west-central New Jersey highlands [abs.]: Dissert. Abs. Internat., Sec. B, Sci. and Eng., v. 31, no. 1, p. 258B, 1970.
- 03946 **Young, Fred D.** Soil grinding mill [with French abs.]: Canadian Geotech. Jour., v. 7, no. 3, p. 339-340, illus., 1970.
- Young, G. M.** See *Church, W. R.* 08062
- 00591 **Young, George E.** A Lower Ordovician trilobite faunule from the Pogonip Group of western Utah [abs.]: Geol. Soc. America Abs. with Programs, v. 2, no. 5, p. 356, 1970.
- 03133 **Young, Grant M.** An extensive early Proterozoic glaciation in North America.: Palaeogeography, Palaeoclimatology, Palaeoecology, v. 7, no. 2, p. 85-101, illus., tables, 1970.
- 05316 **Young, Grant M.** Precambrian sedimentation in the Canadian Shield: Science, v. 170, no. 3963, p. 1239-1240, 1970.
- 06496 **Young, Grant M.** Widespread occurrence of aluminous minerals in Aphebian quartzites [abs.], in Inst. Lake Superior Geology, 16th Ann., Thunder Bay, Ontario, 1970, Tech. Sess. Abs. and Field Guides: Thunder Bay, Ontario, Lakehead Univ., p. 47-48, 1970.
- 02507 **Young, J. A.; Thomas, C. W.; Wogman, N. A.** Cosmogenic radionuclide production rates in argon in the stratosphere: Nature, v. 227, no. 5254, p. 160-161, tables, 1970.
- 07998 **Young, Keith.** Geology and man — The geological basis of man's environment, in Environmental geology — AGI short course lecture notes, Milwaukee, Wis., 1970: Washington, D. C., Am. Geol. Inst., 120 p., paged separately, 1970.
- 08001 **Young, Keith.** Man in the geobiocoenose, in Environmental geology — AGI short course lecture notes, Milwaukee, Wis., 1970: Washington, D. C., Am. Geol. Inst., 23 p., paged separately, illus., tables, 1970.
- 08004 **Young, Keith.** Map exercises for *The paradox of man and earth*, App. B in Environmental geology — AGI short course lecture notes, Milwaukee, Wis., 1970: Washington, D. C., Am. Geol. Inst., [15] p., paged separately, 1970.
- 08005 **Young, Keith.** Sample field trips (Austin, Texas area), App. C in Environmental geology — AGI short course lecture notes, Milwaukee, Wis., 1970: Washington, D. C., Am. Geol. Inst., [4] p., paged separately, 1970.
- 08029 **Young, Keith.** Erosion is here to stay, in Environmental geology — AGI short course lecture notes, Milwaukee, Wis., 1970: Washington, D. C., Am. Geol. Inst., 24 p., paged separately, illus., table, 1970.
- 08030 **Young, Keith.** Comments on environmental geology curricula, App. A in Environmental geology — AGI short course lecture notes, Milwaukee, Wis., 1970: Washington, D. C., Am. Geol. Inst., 2 p., paged separately, 1970.
- 10790 **Young, Keith.** Comanche Series (Cretaceous), south central Texas, in Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas (Leo Hendricks, editor): Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub., no. 67-8, p. 8-29, illus., tables, 1967.
- 10793 **Young, Keith.** Ammonite zonations, Texas Comanchean (Lower Cretaceous), in Comanchean (Lower Cretaceous) stratigraphy and paleontology of Texas (Leo Hendricks, editor): Soc. Econ. Paleontologists and Mineralogists Permian Basin Sec. Pub., no. 67-8, p. 65-70, tables, 1967.
- 06331 **Young, Leonard M.** Early Ordovician sedimentary history of Marathon geosyncline, Trans-Pecos, Texas: Am. Assoc. Petroleum Geologists Bull., v. 54, no. 12, p. 2303-2316, illus., 1970.

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- 10318 **Young, Robert A.; Hollister, Charles D.; Southard, John B.** Experimental erosion of deep sea muds [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 7, p. 730-731, 1970.

- 05353 **Young, Robert G.** Lower Cretaceous of Wyoming and the southern Rockies, in *Dakota and related rocks of the Front Range — Guidebook issue: Mtn. Geologist*, v. 7, no. 3, p. 105-121, illus., 1970.

- 05443 **Young, W. F., Jr.** Earth science education in Virginia and the professional geologist [abs.]: *Virginia Jour. Sci.*, v. 21, no. 3, p. 137, 1970.

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- 05089 **Younkin, Robert L.** Optical reflectance of local areas of the Moon: *Astron. Jour.*, v. 75, no. 7, p. 831-841, illus., tables, 1970.

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- 07913 **Yudin, I. A.** O muassanite v zheleznom meteorite Canyon Diablo [On moissanite in the Canyon Diablo meteorite]: *Meteoritika*, no. 30, p. 93-94, illus., 1970.

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- 09961 **Yumi, S.** Stability of station and the Earth's figure, in *Earthquake displacement fields and the rotation of the Earth* (L. Mansinha, D. E. Smylie, A. E. Beck, editors)-*NATO Advanced Study Inst. Conf.*, London, Ontario, 1969: New York, Springer-Verlag New York, p. 63-68, illus., 1970.

- 09963 **Yumi, S.; Wako, Y.** Secular motion of the pole, in *Earthquake displacement fields and the rotation of the Earth* (L. Mansinha, D. E. Smylie, A. E. Beck, editors)-NATO Advanced Study Inst. Conf., London, Ontario, 1969: New York, Springer-Verlag New York, p. 82-87, illus., 1970.
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- 04349 **Yund, Richard A.; Hall, Henry T.** Kinetics and mechanism of pyrite exsolution from pyrrhotite: *Jour. Petrology*, v. 11, no. 2, p. 381-404, illus., tables, 1970.
- 06207 **Zabriskie, Walter E.** Petrology and petrography of Permian carbonate rocks, Arc-turus Basin, Nevada and Utah: *Brigham Young Univ. Geology Studies*, v. 17, pt. 2, p. 83-160, illus., 1970.
- Zahary, G.** See *Hedley, D. G. F.* 09833
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- Zakharov, V. A.** See *Saks, V. N.* 10094
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- 02090 **Zakrzewski, Richard J.** Notes on kangaroo rats from the Pliocene of southwestern Kansas, with the description of a new species: *Jour. Paleontology*, v. 44, no. 3, p. 474-477, illus., tables, 1970.
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- 10544 **Zanetti, John; McEvilly, T. V.** Source dimensions for three types of microearthquake sequences [abs.]: *EOS*, v. 51, no. 11, p. 779, 1970.
- 02211 **Zanier, Aldo M.; Overton, Harold L.** Use of acoustic logging technique for determination of intergrain cementation properties, in *SPWLA Logging Symposium*, 11th Ann., Los Angeles, Calif., 1970, *Trans.: Houston, Tex., Soc. Prof. Well Log Analysts*, p. K1-K11, illus., tables, 1970.
- 06015 **Zantop, Half.** Trace element distribution in manganese oxides and iron oxides from the San Francisco manganese deposit, Jalisco, Mexico [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 12, pt. 1, p. 5564B, 1970.

- 10527 **Zapffe, Carl A.** Unified theory for loess, tektites, meteorites, the Carolina Bays, Quaternary glaciation and pluviation, and Moon origin [abs.]: *EOS*, v. 51, no. 11, p. 771, 1970.
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- Zawodniak, C. D.** See *Keene, P.* 08243
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- 05263 **Zegarra, E. J.** Suggested method for subsurface exploration recording, in *Special procedures for testing soil and rock for engineering purposes (5th edition): Am. Soc. Testing and Materials Spec. Tech. Pub.* 479, p. 78-80, 1970.
- Zeitlen, J. G.** See *Komornik, A.* 02457
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- 08669 **Zeller, Robert A., Jr.** Petroleum geology of southwestern New Mexico [abs.], in *Guidebook of the Tyrone-Big Hatchet Mountains-Florida Mountains region — New Mexico Geol. Soc. Field Conf.*, 21st, 1970: Socorro, N. Mex., New Mexico Bur. Mines and Mineral Resources, p. 87, 1970.
- 10438 **Zeller, Robert A., Jr.** Geology of the Little Hatchet Mountains, Hidalgo and Grant Counties, New Mexico: *New Mexico Bur. Mines and Mineral Resources Bull.* 96, 23 p., illus., geol. map, 1970.
- Zeman, Z. P.** See *Thorley, A.* 04177
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- 03556 **Zen, E-an.** Evaluation of thermodynamic data on pyrophyllite and their petrologic implications [abs.]: *Fortschr. Mineralogie*, v. 47, no. 1, p. 83-84, 1970.
- Zen, Ean.** See *Albee, Arden L.* 10998

- 07292 **Zengeni, Teddy Godfrey.** PKKP and the fine structure of the Earth's core [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 31, no. 5, p. 2474B, 1970.
- 00118 **Zenger, Donald H.** The role of rapid events in earth history: *Jour. Geol. Education*, v. 18, no. 1 p. 42-43, 1970.
- 01603 **Zenger, Donald H.** Supratidal dolostones — An overemphasis on their significance in geologic record? [abs.]: *Am. Assoc. Petroleum Geologists Bull.*, v. 54, no. 3, p. 561, 1970.
- Zerneke, K. L.** See *Kruse, G. H.* 07442
- 06656 **Zetler, B. D.** Report of the International Union of Geodesy and Geophysics Tsunami Committee, in *Tsunamis in the Pacific Ocean — Internat. Symposium on Tsunamis and Tsunami Research*, Honolulu, Hawaii, 1969, *Proc.*: Honolulu, Hawaii, East-West Center Press, p. 485-487, 1970.
- 02279 **Zetler, Bernard D.; Adams, William Mansfield.** International tsunami symposium: *EOS*, v. 51, no. 5, p. 479-480 and 511, 1970.
- 10973 **Zetler, Bernard D.** International symposium on Earth tides: *EOS*, v. 51, no. 1, p. 9-10, 1970.
- 08762 **Ziegler, A. M.; Boucot, A. J.** North American Silurian animal communities, in *Correlation of the North American Silurian rocks: Geol. Soc. America Spec. Paper* 102, p. 95-106, illus., 1970.
- 01113 **Ziegler, Willi.** On microstructure and surface ornamentation of conodonts [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 410, 1970.
- 01114 **Ziegler, Willi.** On some aspects of phylogenetic and homeomorphic development among Silurian, Devonian, and Lower Carboniferous genera [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 6, p. 410-411, 1970.
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- 05125 **Zietz, Isidore; Kirby, John R.** Aeromagnetic map of Minnesota: *U.S. Geol. Survey Geophys. Inv. Map GP-725*, scale 1:1,000,000, 1970.
- 09718 **Zietz, Isidore.** Eastern continental margin of the United States — Pt. 1, A magnetic study, in *The sea — v. 4, New concepts of sea floor evolution*, Pt. 2, *Regional observations* (Arthur E. Maxwell, editor): New York and London, Wiley-Interscience, p. 293-310, illus., 1970.
- 00190 **Zimmerman, Herman B.** Bottom current data for the continental rise off New England [abs.]: *Geol. Soc. America Abs. with Programs*, v. 2, no. 1, p. 42, 1970.
- 02008 **Zimmerman, Herman B.; Hollister, Charles D.** Contour currents on the continental rise [abs.]: *EOS*, v. 51, no. 4, p. 336, 1970.
- Zimmerman, Herman B.** See *Dillon, William P.* 03680
- 06833 **Zimmerman, J. H.** Plant ecology of the Baraboo hills [summ.], in *Geology of the Baraboo district, Wisconsin: Wisconsin Univ. Geol. and Nat. History Survey Inf. Circ.* 14, 78-81, 1970.
- 00080 **Zimmerman, Joan.** The strange world of helium: *Chemistry*, v. 43, no. 2, p. 14-17, illus., 1970.

- 05045 **Zimmerman, Paul A.** (editor). *Rock strata and the Bible record*: St. Louis, Mo., and London, England, Concordia Publishing House, 209 p., illus., tables, 1970.
- 03889 **Zimmerman, Richard A.** Sedimentary features in the Meggen barite-pyrite-sphalerite deposit and a comparison with the Arkansas barite deposits: *Neues Jahrb. Mineralogie Abh.*, v. 113, no. 2, p. 179-214, illus., 1970.
- 04178 **Zimmermann, Joan.** Answering the question when?: *Chemistry*, v. 43, no. 7, p. 22-27, illus., 1970.
- 07494 **Zinsmeister, William J.** A Late Pliocene macrofossil fauna of Newport Beach, Orange County, California: *Southern California Acad. Sci. Bull.*, v. 69, nos. 3-4, p. 121-125, table, 1970.
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- 03089 **Zoghet, Mouine Fahed.** Alpine surface soil movement [abs.]: *Dissert. Abs. Internat., Sec. B, Sci. and Eng.*, v. 30, no. 10, p. 4453B-4454B, 1970.
- 03378 **Zohdy, Adel A. R.** Geometric factors of bipole-dipole arrays: *U.S. Geol. Survey Bull.* 1313-B, p. B1-B26, illus., tables, 1970.
- 04026 **Zohdy, Adel A. R.** Electrical resistivity sounding with an L-shaped array: *U.S. Geol. Survey Bull.* 1313-C, p. C1-C20, illus., table, 1970.
- 05126 **Zohdy, Adel A. R.** Variable azimuth Schlumberger resistivity sounding and profiling near a vertical contact: *U.S. Geol. Survey Bull.* 1313-A, p. A1-A22, illus., 1970.
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 British Columbia, Hellroaring Creek stock, Rb-Sr: Ryan, Barry D. 00352  
 British Columbia, southern, Cretaceous-Tertiary, K-Ar: Richards, T. 08138  
 California, Death Valley, Artist Drive Fm.: Fleck, R. J. 05028  
 California, Saline Range-Inyo Mts. region, K-Ar: Ross, Donald C. 02154  
 Colorado, Iron Hill and McClure Mtn. complexes, Rb-Sr whole rock: Fenton, M., D. 08154  
 Colorado, San Juan Mts., Ute Creek melasyenite: Barker, Fred. 00132  
 Costa Rica, Nicoya complex and vicinity: Barr, K. W. 10856

**Absolute age, dates—Continued***Igneous rocks—Continued*

- Greenland, East, Tertiary, K-Ar: Beckinsale, Robert D. 08690
- Kansas, Riley County, Stockdale kimberlite, xenoliths: Brookins, Douglas G. 06555
- Massachusetts, Blue Hills igneous complex, Rb-Sr: Bottino, M. L. 06128
- Mexico, Baja California, San Matias Pass, K-Ar: Estavillo, William. 00262
- Mexico, Chihuahua, Placer de Guadalupe, rhyolite: Cserna, Zoltan de. 04180
- Mexico, Sonora, Precambrian intrusives, U-Pb: Anderson, Thomas H. 06045
- Minnesota, northeastern, mafic dikes, K-Ar: Hanson, G. N. 06480
- Montana, Rainy Creek alkaline-ultramafic complex, Rb-Sr: Fenton, M. D. 08155
- Montana, Stillwater Complex, U-Pb: Nunes, Paul D. 01807
- Montana, Wyoming, Beartooth Mts., mafic, whole-rock K-Ar: Mueller, Paul A. 09687
- Montana, Wyoming, Beartooth Mts., relation to TiO<sub>2</sub> content: Mueller, Paul A. 06825
- Nevada, Lander County, Tertiary, K-Ar: McKee, Edwin H. 03832
- Nevada, northwestern, K-Ar: Noble, Donald C. 06164
- Nevada, Nye, Lincoln Counties, volcanics, plutons: Marvin, Richard F. 05646
- New England, White Mountain magma series, K-Ar: Foland, K. A. 00154
- New York, Hudson Highlands, Rosetown complex, K-Ar: Ratcliffe, Nicholas M. 00175
- Oregon, Laurel Hill-Still Creek intrusions, K-Ar: Bikerman, Michael. 09819
- Quebec, Castignon Lake complex: Dimroth, Erich. 01722
- Quebec, Chicoutimi area, St-Honore carbonate complex, K-Ar: Vallee, Marcel. 10675
- Quebec, Grenville front area, whole-rock isochron: Wanless, Robert K. 03926
- San Juan Mountains, volcanics, eruptive history, K-Ar: Lipman, Peter W. 03777
- South Dakota, Black Hills, Harney granite and pegmatites, Rb-Sr: Riley, G. H. 03551
- Texas, Balcones province, alkaline, K-Ar: Baldwin, Otha D. 00482
- United States, eastern and Idaho, Triassic, K-Ar: Armstrong, Richard Lee. 04016
- United States, southeastern, Piedmont, intrusions, Rb-Sr: Fullagar, Paul D. 06986
- Utah, 1961-66, collected papers: Whelan, J. A. 02281
- Utah, Wasatch Mts., central: Hashad, A. H. 02367
- Utah-Nevada, Basin and Range province, precision, Tertiary chronology: Armstrong, Richard Lee. 00478
- Washington, Cascade Range, Tertiary plutons, K-Ar: Yates, Robert S. 10317

*Igneimbrite*

- Nevada, central, K-Ar cf. fission-track: McKee, Edwin H. 00313
- Strontium, isotopic composition, Central America: Pushkar, Paul. 09260

*Interpretation*

- Alberta-Montana, Cretaceous-Tertiary boundary: Folinsbee, Robert E. 03923
- Arizona, Dos Cabezas Mountains, metamorphism and intrusive activity, multiple: Erickson, Rolf C. 09264

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- California, Catalina Island, Cretaceous schist, Miocene pluton: Forman, John A. 04206
- California, Mexico, Franciscan terrane: Suppe, John. 00375
- California-Nevada, Sevier orogenic belt, thrusting: Fleck, R. J. 02371
- Canada, deglaciation chronology, uplift: Grachev, A. F. 07215
- Canada-Sweden, carbonatites, alkaline rocks: Doig, Ronald. 07668
- Chondrites, unequilibrated, cold accretion: Podosek, F. A. 03366
- Greenland, Peary Land, dolerite intrusions, K-Ar: Henriksen, N. 06348
- K-Ar, changes with burial depth, delta: Weaver, Charles E. 05200
- Mexico, New Mexico, Texas, basement rocks, history: Denison, Rodger. 05905
- Montana, Little Belt Mts., Pinto Diorite, emplacement: Woodward, Lee A. 05902
- Nevada, Great Basin, postglacial climate, cultural patterns: Ranere, Anthony J. 07493
- Nevada, Snake Range, K-Ar age, modification by thrusting: Lee, Donald E. 06209
- New England, Permian thermal disturbance: Zartman, Robert E. 05194
- Orogens, ancient, northern Appalachian geochronology as model: Fairbairn, Harold W. 03922
- Paleozoic correlations, upper, cf. fossil zonation: Ross, Charles A. 04205
- Pliocene-Pleistocene boundary, Europe, N. Am.: Savage, Donald E. 04387
- Plio-Pleistocene boundary, major cold waves: Chemekov, Yu. F. 06439
- Rocky Mountains, northern, lead geochronology: Small, William David. 01583
- Washington, Cascade Mountains, northern, U-Pb chronology: Mattinson, James M. 00311
- Wyoming, Louis Lake pluton, effect of metamorphism: Naylor, R. S. 06453
- Kimberlite*
- Kansas, Riley County, pyrope, K-Ar: Brookins, Douglas G. 06558
- Lamprophyre*
- Maryland, Virginia, Great Falls area, dikes, K-Ar: Reed, John C., Jr. 04258
- Metamorphic rocks*
- Alabama, Piedmont region, fault zones, structural blocks, K-Ar: Wampler, J. Marion. 07734
- Alaska, Coast Range batholith, related rocks, K-Ar: Forbes, Robert B. 10202
- Alaska, Seward Peninsula, Precambrian metamorphism, Rb-Sr: Sainsbury, C. L. 10093
- Continental age provinces, literature review: Hurley, Patrick M. 09998
- Greenland, Precambrian rocks, K-Ar: Bridgwater, D. 06347
- Idaho, Belt Supergroup: Reid, R. R. 00568
- Manitoba, Churchill-Superior boundary, Rb-Sr: Turek, A. 08071
- Mexico, Baja California, basement, K-Ar: Krumenacher, Daniel. 00299
- Mexico, Baja California, San Matias Pass, K-Ar: Estavillo, William. 00262
- Michigan, Southern Peninsula, Michigan basin, Precambrian, structural provinces: Hinze, William J. 10946
- Minnesota, Morton, Montevideo areas, granitic gneisses: Goldich, S. S. 05965

**Absolute age, dates—Continued***Metamorphic rocks—Continued*

- Ontario, Chibougamau-Surprise Lake area, Rb-Sr: Krogh, T. E. 02248
- Ontario, Grenville province, Rb-Sr: Krogh, T. E. 01789
- Ontario, Sudbury area, Onaping Fm., inclusions: Bottino, Michael R. 01741
- Quebec, Chibougamau-Surprise Lake area, Rb-Sr isochron: Krogh, T. E. 01614
- Quebec, Grenville front area, whole-rock isochron: Wanless, Robert K. 03926
- Saskatchewan, Hanson Lake area, thermal events, Rb-Sr: Coleman, L. C. 07748
- Saskatchewan, Tazin Lake region, Precambrian, K-Ar: Koster, F. 08063
- Tennessee-North Carolina, Blue Ridge province, interpretation: Carpenter, Robert Heron. 00753
- Utah, 1961-66, collected papers: Whelan, J. A. 02281
- Utah, Wasatch Mts., central: Hashad, A. H. 02367

*Metasediments*

- Ontario, Gunflint Fm., Rb-Sr: Misra, A. 01181

*Metavolcanics*

- Connecticut, southern, Prospect, Ansonia, Milford Fms.: Armstrong, R. L. 06217
- Ontario, Michipicoten area, Rb-Sr: Brooks, C. 01617

*Meteorites*

- Allende, U, Th-He, K-Ar: Fireman, E. L. 04555
- Carbonaceous chondrites, Rb-87: Sr-87: Kaushal, Sushil K. 00088
- Colomera iron, Rb-Sr: Sanz, H. G. 05314
- Enstatite chondrites, Rb-Sr: Gopalan, K. 03696
- Feldspar phase, Al-26:Mg-26: Clarke, W. B. 00008
- Hypersthene chondrite falls, fission track: Fisher, David E. 01696
- Lost City: Bogard, D. D. 02270
- Schenectady meteorite, K-Ar, U-He: Fleisher, R. L. 05334
- Stone, Kr-81 radiation, cf. H-3: Rowe, M. W. 00442
- Xe-129, iodine correlated: Podosek, F. A. 01729

*Minerals*

- British Columbia, Irishman Creek sill, amphibole, K-Ar: Hunt, Graham. 00788
- Canada, Churchill province, galena, feldspar: Sinha, A. K. 05592
- Kansas, Willard Shale, muscovite in sandstone: Brookins, D. G. 00460
- South Dakota, Homestake mine, K-Ar: Chinn, William. 07350

*Monzonite*

- Utah, Gold Hill monzonite stock, Pb-alpha on zircon: El-Shatoury, Hamad. 02286

*Moon*

- Oceanus Procellarum, Rb-Sr: Schnetzler, C. C. 06850
- Oceanus Procellarum, sample 12013, argon: Turner, Grenville. 07068
- Oceanus Procellarum, sample 12013, fission-track: Burnett, D. S. 06846
- Oceanus Procellarum, sample 12013, rare gases: Alexander, E. C., Jr. 06852
- Oceanus Procellarum, U-Th-Pb: Tatsumoto, Mitsunobu. 06851
- Tranquillity Base, Ar-40: Ar-39, exposure ages: Turner, G. 05728
- Tranquillity Base, exposure age, rocks, fines: Stoenner, R. W. 05722

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- Tranquillity Base, exposure ages: Eberhardt, P. 05685
- Tranquillity Base, exposure ages: Hohenberg, C. M. 05703
- Tranquillity Base, K-Ar: Heymann, Dieter. 05701
- Tranquillity Base, K-Ar: Perkins, R. W. 05716
- Tranquillity Base, K-Ar, exposure ages: Funkhouser, J. G. 05691
- Tranquillity Base, K-Ar, exposure ages: Kirsten, T. 05706
- Tranquillity Base, K-Ar, exposure ages: O'Kelly, G. Davis. 05712
- Tranquillity Base, K-Ar, Kr-Kr-81: Marti, K. 05707
- Tranquillity Base, K-Ar, Rb-Sr: Wanless, R. K. 05731
- Tranquillity Base, lead-lead: Kohman, Truman P. 06436
- Tranquillity Base, Oceanus Procellarum materials: Schaeffer, O. A. 06437
- Tranquillity Base, Rb-Sr: Murthy, V. Rama. 05711
- Tranquillity Base, Rb-Sr, U, Th-Pb: Gopalan, K. 05696
- Tranquillity Base, rocks, fines: Compston, W. 05760
- Tranquillity Base, U-Pb, Pb-Pb: Silver, Leon T. 05721
- Tranquillity Base, U-Pb, rocks, breccia, fines: Tatsumoto, Mitsunobu. 05723
- Tranquillity Base, whole-rock Rb-Sr: Hurley, P. M. 05704

*Mylonite*

- North Carolina, Brevard Zone, Devonian movements, Rb-Sr: Odom, A. Leroy. 09699

*Ore deposits*

- Intercontinental correlations: Crawford, Arthur Raymond. 03479
- Nevada, Goldfield, alunite, K-Ar: Silberman, M. L. 04322
- North America, western, molybdenum: Clark, K. F. 02440
- Porphyry copper: Lowell, J. David. 04280
- Rb-Sr, North Carolina: Fullagar, Paul D. 04866
- Rb-Sr, Tennessee: Fullagar, Paul D. 04866

*Pegmatite*

- Alaska, Mentasta Mts., K-Ar: Richter, Donald H. 04249
- Connecticut, Middletown area, summary: Brookins, Douglas G. 06216
- Utah, Granite Mountain, Muscovite, K-Ar: Park, G. M. 02283

*Pegmatites*

- K-Ar, Rb-Sr, discordant patterns, Rutherford and Morefield, Virginia: Laughlin, A. William. 11274

*Quartz monzonite*

- Utah, House Range, Notch Peak, zircon, Pb-alpha: Whelan, J. A. 02288
- Utah, Rocky Range, Pb-alpha: Whelan, J. A. 02290

*Rhyolite*

- Mexico, Baja California, Puertocitos area, K-Ar: Sommer, Michael A. 00366
- Utah, Sheeprock Mts., Pb-alpha: Cohenour, Robert E. 02365
- Utah, Thomas Range, volcanics, Rb-Sr, K-Ar: Park, G. M. 02284

## Absolute age, dates—Continued

*Sedimentary rocks*

- California, biostratigraphic units, Tertiary, planktonic events: Brandy, Orville L. 04388
- California, Sacramento area, vertebrate bones: Hansen, R. O. 03406
- Miocene foraminiferal stages, Pacific Coast, K-Ar: Turner, Donald L. 04390

*Sediments*

- Iowa, Lake Calvin terraces: Ruhe, Robert V. 00615

*Shale*

- Kansas, eastern, Eskridge Shale, Rb-Sr: Brookins, Douglas G. 04112
- Kansas, Manhattan area, Permian, K-Ar, Rb-Sr: Brookins, Douglas G. 00872

*Shells*

- Florida, Cape Kennedy, barrier-lagoon complex: Osmond, J. K. 00089

*Volcanics*

- Arizona, Chiricahua volcanic field, K-Ar: Marjaniemi, Darwin Keith. 06003
- Arizona, Chiricahua Mountains, K-Ar: Marjaniemi, Darwin. 09266
- Arizona, Del Bac Hills, K-Ar: Percious, J. K. 09265
- Arizona, Samaniego Hills, K-Ar: Eastwood, Raymond Lester. 05997
- Arizona, southeastern, Rhyolite Canyon Fm., K-Ar: Marjaniemi, Darwin K. 00310
- California, Baja California, Cenozoic, late: Hawkins, James W. 05251
- California, Coast Ranges, Obispo Fm., K-Ar: Turner, D. L. 00383
- California, Temblor Range, K-Ar: Turner, D. L. 00382
- California, Ventura basin, Pico Formation, K-Ar: Yeats, Robert S. 04208
- Colorado, northwestern, Browns Park Fm., K-Ar: Izett, G. A. 04259
- Mexico, Baja California, K-Ar: Gastil, Gordon. 00266
- Nevada, ash-flow tuffs, fission-track, K-Ar: Naeser, C. W. 05195
- Nevada, north-central, Tertiary: McKee, Edwin H. 00314
- New Mexico, southwestern, K-Ar: Elston, Wolfgang E. 09262

## Absolute age, methods

*Argon-argon*

- Basaltic rocks, precision: Berger, Glenn W. 05338
- Nepheline, basic whole rock, nuclear reactor irradiated: York, D. 01169
- Precision, cf. K-Ar method: Berger, Glen W. 01737

*Carbon-14*

- Extension, tree ring and varve chronologies: Stuiver, Minze. 05120
- Ground water, effects of dissolved carbonate species sources: Pearson, F. J., Jr. 08478
- Isotope fractionation during oxalic acid combustion: Lowdon, J. A. 03179
- Method review and reliability: Libby, W. F. 08011
- Progress, review: Damon, P. E. 08747
- Radiocarbon and calendar time scales, relation of climatic changes: Rubin, Meyer. 09401
- Radiocarbon variations and absolute chronology, symposium, Uppsala, Sweden, 1969: Olsson, Ingrid U. 08754

## Absolute age, methods—Continued

*Carbon-14—Continued*

- Review, 20 years' experience, original assumptions, validity: Libby, W. F. 08746
- Sediments, varve chronology, atmospheric  $C-14$  variations, magnetic field changes, correlation: Stuiver, M. 08742
- Snail shells, terrestrial, validity, tests: Tamers, M. A. 05673

*Electron spin resonance*

- Conodont dating: Morency, Maurice. 01200

*Fission-track*

- Ash-flow tuffs, minerals, cf. K-Ar: Naeser, C. W. 05195
- Epidote minerals: Naeser, C. W. 00410
- Experimental values, critical considerations: Wagner, G. A. 01846
- Fossil shells, bones, uranium distribution: Szabo, B. J. 01470
- Geometry factor, cations: Reimer, G. M. 06824
- Glass, uranium contents, determination: Hart, H. R., Jr. 01778
- Mica, erosion rates: Miller, Donald K. 00913
- Muscovite, water pressure effects: Lakatos, Stephen. 01791
- Trace erasure in glasses and silicates by shock: Ahrens, Thomas J. 03363

*General*

- History: Beeson, Marvin H. 04675
- Nuclide diffusion under hydrothermal conditions, experimental: Hofmann, Albrecht. 04011
- Research, development, trends in Canada: York, Derek. 10776
- Sample preparation, lead removal by volatilization, effect: Cumming, G. L. 05339
- Summary: Currie, Kenneth L. 05048
- Summary, applications: Zimmermann, Joan. 04178

*Lead-lead*

- Validity of closed system evolution model: Sinha, A. K. 05592

*Lutetium-hafnium*

- Application, minerals with rare earths, gram quantities: Boudin, Andre. 02120

*Potassium-argon*

- Alunite, suitability: Silberman, M. L. 04322
- Ar analysis, isotope dilution cf. neutron activation: Armstrong, Richard Lee. 00479
- Argon analysis, improvement with MS 10 mass spectrometer: Rex, David C. 03919
- Basalt, deep-sea pillows: Dymond, Jack. 01135
- Basalt, importance of fresh rock: Hart, S. R. 00475
- Basalt, sea floor, problems: Hart, S. R. 01613
- Cenozoic rocks, materials suitable for dating, accuracy: Evernden, Jack F. 04207
- Diffusional losses, escape constant, K-Ar clock theory: Damon, Paul E. 03920
- Error, sample inhomogeneity effect: Engels, J. C. 04526
- Granitic melt, excess Ar-40: Roy, D. M. 03834
- Isochron method, initial argon ratios: Hayatsu, A. 02123
- Metamorphic minerals, K-40 loss, graphic solutions: Harper, Christopher T. 03918
- On-line Ar extraction system: Signer, Peter. 04012
- Petroleum exploration, applications: Schutz, Donald F. 02705
- Phillipsite, marine, suitability for dating: Bernat, Michel. 05590
- Recent trends, improvements: York, Derek. 07967

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- Rocks, cataclastic and parent, U.S., western:  
Sutter, John Frederick. 07950  
Volcanics, Tertiary, accuracy: Armstrong,  
Richard Lee. 00478

*Protactinium-ionium*

- Deep-sea cores, detection system for Pa, Th:  
Heye, Dietrich. 01731

*Radiation damage*

- Electron spin resonance detection: McMorris,  
Daniel W. 01289

*Rubidium-strontium*

- Adamellite, Rb, Sr migration, thermally induced: Baadsgaard, H. 03893  
Illitic sediments, Paleozoic: McLaughlin, W. A. 01801  
Isochron regression models, use problems: Brooks, C. 01615  
Pegmatites, zoned, discordant ages: Riley, G. H. 03551  
Phosphates, pegmatitic, Sr-87 excess: Riley, G. H. 03552  
Whole-rock, fresh cf. weathered: Fullagar, Paul D. 00703

*Uranium-actinium series*

- Vertebrate bones, California: Hansen, R. O. 03406

*Uranium-helium*

- Inapplicability to bone material: Turekian, K. K. 01700

*Uranium-thorium-lead*

- Limestone, Phanerozoic, evaluation: Doe, Bruce R. 03921

**Alabama***Absolute age*

- Piedmont rocks, fault zones and structural blocks, K-Ar: Wampler, J. Marion. 07734

*Areal geology*

- East-central, Apollo 9 photographs, interpretation: Powell, W. J. 01427  
Eastern, Brevard fault zone and Inner Piedmont rocks, guidebook: Alabama Geological Society. 07735

*Economic geology*

- Coal, Fabius area, strippable resources, exploration: Daniel, Thomas W., Jr. 10437  
Gold, Devils Backbone area, production and possibilities: O'Neill, James F. 08578  
Iron, Birmingham area: LaMoreaux, Philip E. 06226  
Iron, Red Mountain Fm., genesis, Clinton ore: Sheldon, Richard P. 08750  
Mineral resources, Wilcox County: Clarke, Otis M., Jr. 08678  
Talc, occurrence, Tallapoosa County: Neathery, Thornton L. 07400

*Engineering geology*

- Waste disposal, acid-mine drainage, Cane Creek basin: Hyde, Luther W. 10464  
Waste disposal, Baldwin, Escambia, Mobile Counties: Alverson, Roy M. 04974

*Geochemistry*

- Alabama, effect on water quality and corrosiveness: Hyde, Luther W. 10890

*Geomorphology*

- East-central, Apollo 9 photography, lineaments: Drahovzal, James A. 00694  
New Fern Cave, exploration: Hale, Dan. 03995

*Geophysical surveys*

- Baldwin County, gravity: McWilliams, Richebourg G., Jr. 06690  
Clarke County, gravity: McWilliams, R. G. 07167

**Alabama—Continued***Geophysical surveys—Continued*

- East-central, remote sensing, Apollo 9: Powell, W. J. 01611  
Heflin area, seismic, electrical, ground-water resources: Wilson, Gary V. 05068  
Marengo County, gravity: McWilliams, Richebourg G., Jr. 06689  
Marion County, gravity: Clements, T. H., Jr. 07168  
Wilcox County, gravity: McWilliams, Richebourg G., Jr. 07169  
Winston County, gravity: Clements, T. H., Jr. 07170

*Hydrogeology*

- Heflin area, ground-water, geophysical exploration: Wilson, Gary V. 05068  
Resource development, ground-water network design: LaMoreaux, Philip E. 11248

*Maps, gravity*

- Baldwin County: McWilliams, Richebourg G., Jr. 06690  
Clarke County: McWilliams, R. G. 07167  
Marengo County: McWilliams, Richebourg G., Jr. 06689  
Marion County: Clements, T. H., Jr. 07168  
Wilcox County: McWilliams, Richebourg G., Jr. 07169  
Winston County: Clements, T. H., Jr. 07170

*Maps, mineral resources*

- Strippable coal in the Fabius area, Jackson County: Daniel, Thomas W., Jr. 10437  
Wilcox County: Clarke, Otis M., Jr. 08678

*Paleontology*

- Angiosperms, Cretaceous, Upper: Cahoon, E. J. 04159  
Bryozoa, Ordovician, Chickamauga Group, northeastern: McKinney, Frank K. 00739  
Bryozoa-Anthozoa, Eocene, intergrowths: Greeley, Ronald. 01212  
Foraminifera, Paleocene, basal, Millers Ferry, zones: Olsson, Richard K. 03535  
Gastropoda, Eocene, Claiborne Group, muricid, corrections: Vokes, Emily H. 03525  
Mammalia, Quaternary, New Fern Cave: Hale, Dan. 03995  
Ostracoda, Silurian, northwestern, correlation, n.spp.: Lundin, Robert F. 06566  
Palynology, Eocene, Jackson Stage, western: Frederiksen, Norman Oliver. 01573  
Pisces, Cretaceous, Mooreville Chalk, taxonomy, paleoecology: Applegate, Shelton P. 02832  
Reptilia, Cretaceous, Mooreville Chalk, mosasaurs: Russell, Dale A. 02831  
Tracks and trails, *Ophiomorpha*, Cretaceous, Eutaw Fm.: Pryor, Wayne A. 09527

*Sedimentary petrology*

- Appalachians, Paleozoic lutites, paleocurrent studies: Jones, Michael L. 03598  
Central, Parkwood Fm., depositional environments: Whisonant, Robert C. 07052  
Northern, Carboniferous shorelines systems, model: Hobday, David Kenneth. 03259  
Tertiary claystone formations, clay minerals: Reynolds, William R. 05669

*Stratigraphy*

- Carboniferous, Parkwood Fm., paleoecology: Whisonant, Robert C. 07052  
Ordovician-Devonian, Talladega slate, central: Shaw, Charles E., Jr. 02566  
Paleocene, Clayton Fm., type locality: Davis, Darrell E. 07335

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- Paleozoic, Birmingham area, road cut: LaMoreaux, Philip E. 06226  
 Silurian, northwestern, subsurface, correlation: Lundin, Robert F. 06566  
 Silurian, Red Mountain Fm., Birmingham region: Sheldon, Richard P. 08750  
 Silurian, Red Mountain Fm., conglomerate, central: Bearce, Denny N. 00671

*Structural geology*

- Birmingham anticlinorium, Paleozoic folding: Thomas, William A. 10274  
 Brevard fault zone: Bentley, Robert D. 00673  
 Brevard fault zone, terminus: Neathery, Thornton L. 00742  
 Central, Ordovician tectonism, pre-Middle, evidence: Shaw, Charles E., Jr. 02566  
 Eastern, Brevard fault zone, Inner Piedmont thrust, meganappe: Alabama Geological Society. 07735  
 Piedmont zone, inner, tectonic style, major changes: Bentley, Robert D. 06059  
 Valley and Ridge province, large-scale recumbent folds: Shaw, Charles E., Jr. 09564  
 Wetumpka area, impact-type structure: Bentley, Robert D. 01903

*Weathering*

- Cusseta Sand, mineralogy, changes: Hester, Norman C. 00713

**Alaska***Absolute age*

- Alaska Range and Peninsula, plutonic episodes, K-Ar: Reed, Bruce L. 10091  
 Bering Sea area, plutonic rocks, K-Ar: Miller, Thomas P. 10078  
 C-14, general listing, U.S. Geological Survey laboratory: Sullivan, Beverly Marsters. 01371  
 Coast Range batholith and related rocks, K-Ar: Forbes, Robert B. 10202  
 Glacier Bay National Monument, sediments, wood: McKenzie, Garry D. 03000  
 Mentasta Mountains, pegmatite, K-Ar: Richter, Donald H. 04249  
 Northern, poplar log, early Holocene warm interval: Detterman, Robert L. 04796  
 Southeastern, Adams Inlet, glacial deposits: McKenzie, Garry D. 08464

*Areal geology*

- Aleutian Islands: Cameron, Christopher P. 02776  
 Arctic area, Mesozoic history: Detterman, Robert L. 10031  
 Arctic area, western, geologic history: Tailleux, I. L. 10106  
 Boundary area, Eagle A-1 quadrangle: Asher, R. R. 07198  
 Cosmos Hills area: Fritts, Crawford E. 07159  
 McCarthy B-4 quadrangle: MacKevett, E. M., Jr. 07490  
 North Slope, exploration history: Gryc, George. 07103  
 North Slope, geological seminar, 1970: U.S. Geological Survey. 07074  
 Nuka Bay area: Richter, Donald H. 01437  
 Serpentine Hot Springs area: Sainsbury, C. L. 03334  
 Seward Peninsula: Sainsbury, C. L. 10093  
 Seward Peninsula, Belt Creek-Libby River area: Asher, R. R. 09517  
 Seward Peninsula, Solomon D-6 quadrangle, Iron Creek area: Asher, R. R. 09431

**Alaska—Continued***Areal geology—Continued*

- Southeastern, Spirit Mountain nickel-copper prospect: Herreid, Gordon. 10255  
 Tanacross quadrangle: Foster, Helen L. 02032  
 Yukon-Koyukuk province, Mesozoic history: Patton, William W., Jr. 10087  
 Yukon-Tanana Upland: Foster, Helen L. 10041

*Earthquakes*

- 1964, aftershocks, P-wave traveltime residuals: Gibowicz, Slawomir J. 04069  
 1964, dislocation model: Hastie, L. M. 04338  
 1964, effects in larger communities, human response: Norton, Frank R. B. 04963  
 1964, effects on human ecology: National Research Council. 04960  
 1964, effects on human ecology, conclusions, recommendations: Kates, Robert W. 04961  
 1970, February 27, Aleutian Trench, aftershocks: Engdahl, E. R. 10545  
 1964, Good Friday, tsunami generation: Hwang, Li-San. 05624  
 1964, land-use planning: Eckel, Edwin B. 04962  
 1964, long-period surface waves, source mechanism: Kanamori, Hiroo. 01936  
 1964, March 28, conclusions, U.S. Geol. Survey studies: Eckel, Edwin B. 04594  
 1964, March 28, effects on Alaska Railroad: McCulloch, David S. 02316  
 1964, March 28, strain observations, spherical model, application: Ben-Menahem, Ari. 09959  
 1964, March 28, tsunami, British Columbia: Murty, T. S. 06646  
 1964, March 28, tsunami source model: Vandorn, William G. 06642  
 1964, mechanism, source model, surface wave analysis: Kanamori, Hiroo. 04006  
 1965, Rat Island, elastic waves, mechanism: Wu, Francis T. 02004  
 1964, soil stability, cf. Niigata, Japan and Chile: Seed, H. Bolton. 03046  
 1964, tectonic displacement, tsunami propagation: Wiegel, Robert L. 05523  
 1964, tsunami ray paths: Braddock, R. D. 06651  
 1964, tsunamis, Prince William Sound area: Norton, Frank R. B. 04964  
 Aleutian Islands, mechanism, P-wave amplitude: Syed, Atiq A. 01986  
 Amchitka Island area, large, epicenter relocation: Spence, W. J. 10543  
 Amchitka Island region, seismicity: Engdahl, E. R. 06970  
 Denali fault, microseismicity: Boucher, Gary Wynn. 07365  
 Prediction, Alaska-Aleutian zone, space-time patterns: Kelleher, John A. 04408
- Economic geology*  
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 Gold, Nuka Bay area: Richter, Donald H. 01437

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- Gold, Nuka Bay, bottom sediments, possibility: Reimnitz, Erk. 04244
- Gold, offshore deposits, Bering Sea, northern, potential: Nelson, C. Hans. 04176
- Gold, Valdez Creek district, Denali bench gravels, potential: Smith, Thomas E. 06177
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- Metals, Kanuti River region, exploration, occurrence: Patton, William W., Jr. 00129
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- Petroleum, natural gas, Arctic coast, exploration, potential: Reed, John C. 03241
- Petroleum, natural gas, Prudhoe Bay field, production regulations: Marshall, Thomas R., Jr. 04980
- Petroleum, North Slope, exploration history: Gryc, George. 07103
- Petroleum, North Slope, possible oil province: Gryc, George. 04105
- Petroleum, North Slope potential: Wilson, J. L. 10951
- Petroleum, northern, exploration techniques: Sweet, John M. 04106
- Petroleum, Prudhoe Bay field, economic model, cf. Bell Creek field: Norman, Charles A. 10085
- Petroleum, Prudhoe Bay field, occurrence: Rickwood, Frank K. 07079
- Petroleum, Prudhoe Bay, Sadlerochit reservoir: Penttila, Bill. 10088
- Tin, gold, lead, Serpentine Hot Springs area, exploration: Sainsbury, C. L. 03334
- Tin, Lost River mine, occurrence: Desborough, George A. 06893
- Uranium, southeastern, Bogan Mtn. area, exploration: Eakins, Gilbert R. 07251
- Uranium, thorium, rare-earth elements, map: Cobb, Edward H. 06430

*Engineering geology*

- Engineer Creek Valley, experimental permafrost tunnel: Swinzow, George K. 10242
- Land use, post-earthquake evaluation: Eckel, Edwin B. 04962
- Land use, urban, Anchorage area: Dobrovolsky, Ernest. 00607
- Landslides, Lituya Bay, July 1958, tsunami wave amplitude: Noda, Edward. 05859
- Materials, properties, Yukon-Koyukuk lowland: Weber, Florence R. 01509
- Nuclear explosions, Milrow, Amchitka, effects: Merritt, Melvin L. 07989
- Organic soils, types, peat-forming environments: Sellmann, P. V. 08257
- Permafrost, ground settlement with thawing: Crory, Frederick E. 10027
- Permafrost, hot oil pipeline, potential effects: Lachenbruch, Arthur H. 00010
- Permafrost, Prudhoe Bay area, oilfield operations: Marshall, Thomas R., Jr. 04980
- Permafrost, Prudhoe Bay oil field, soils properties: Howitt, Frank. 10056
- Permafrost, thermal regime problems: Peyton, Harold R. 10660

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- Pipelines, Trans-Alaska, foundation problems: Pecora, William T. 08227
- Powersite, Baranof Island, Takatz Creek area: Callahan, James E. 05455
- Problems, permafrost, frost environment, remote-sensing use: Rinker, Jack N. 08236
- Slope stability, Prince of Wales Island, Maybeso Creek valley: Swanston, Douglas N. 10879
- Slope stability, soil creep, measurements, southeastern: Barr, D. J. 07234
- Soils, subsurface, Trans-Alaska pipeline: Migliaccio, Ralph R. 10077

*General*

- Bibliography, north slope: Maher, J. C. 02114
- Bibliography, water resources, arctic, subarctic: Hartman, Charles W. 07877
- Geologic research program, U.S. Geological Survey: Gryc, George. 08229
- Remote sensing symposium, 1969: Welch, Robin I. 08224
- Remote-sensing programs, Coast and Geodetic Survey: Tewinkel, G. C. 08228
- Sea ice, Barrow area, pressure ridges, airphoto interpretation: Anderson, V. H. 08383

*Geochemistry*

- Boundary area, Eagle A-1 quadrangle, geochemical prospecting, metals: Asher, R. R. 07198
- Brooks Range, Chandalar area, geochemical prospecting, stream sediments: Chipp, E. R. 07160
- Fairweather pluton, mafic, ultramafic rocks, analyses: Plafker, George. 01463
- Fortymile area, geochemical prospecting: Foster, Helen L. 01295
- Glaciomarine sediments, cationic balance, diagenesis: Sharma, G. D. 02680
- Kanuti River region, geochemical prospecting: Patton, William W., Jr. 00129
- Permafrost areas, soils, sediments: Allan, Roderick James. 00501
- Seward Peninsula, Belt Creek-Libby River area: Asher, R. R. 09517
- Seward Peninsula, Solomon D-6 quadrangle, Iron Creek area: Asher, R. R. 09431
- Southeastern, glacio-marine sediments, interstitial water evolution: Sharma, G. D. 03605
- Southeastern, glaciomarine sediment-sea water interaction: Sharma, G. D. 01138
- Southwestern, Kontrashibuna Lake area, geochemical prospecting: Eakins, Gilbert R. 07197
- Wood River-Tikchik Lakes area, anomalous mercury area: Eakins, Gilbert R. 11223
- Yakutat-Mount Saint Elias quadrangles, geochemical prospecting: MacKevett, E. M., Jr. 05577

*Geomorphology*

- Barrow area, permafrost erosion, man induced, drainage changes: Lewellen, Robert. 04108
- Bering Sea shelf, silt transport to Chukchi Sea: McManus, Dean A. 05652
- Chena River flood plain, permafrost, soils, plant-succession sequences: Viereck, L. A. 05925
- Coastal slopes, mass movements: Swanston, Douglas N. 10880
- Colville River delta, erosion, sedimentation during breakup: Walker, H. J. 08667
- Cook Inlet, sedimentation processes: Sharma, G. D. 01421
- Environments, peat deposits, distribution and characteristics: Sellmann, P. V. 08257



## Alaska—Continued

*Geomorphology*—Continued

- Fairbanks area, terraces, early Quaternary alluviation: Pewe, Troy L. 07096  
 Kuskokwim River, braided channels, model: Howard, Alan D. 07465  
 Major rivers, flood-plain phases: permafrost relations: Pewe, Troy L. 08331  
 Nome area, beach, microrelief evolution: Greene, H. Gary. 01544  
 Northern, coastal plain, periglacial features: Journaux, Andre. 03440  
 Pingos, Alaska, North Slope: Koranda, John J. 09784  
 Southeastern, snow-bank kames, genesis and collapse rate: McKenzie, G. D. 01341  
 Southeastern, soil creep on steep slope: Barr, D. J. 07234  
 Umiat area, bentonite debris flows, over permafrost: Anderson, Duwayne M. 00815  
 Umiat area, bentonitic debris flows: McGaw, Richard W. 10075

*Geophysical surveys*

- Airborne magnetometer, applicability of Canadian methods: Morley, L. W. 08233  
 Bering Sea, northern, seismic, bottom features: Grim, Muriel S. 10920  
 Cleary Summit area, electrical: Anderson, Lennart A. 06174  
 Continental margin, southeastern, gravity, seismic: Gemperle, Michael. 01913  
 Fairbanks area, placer deposits, magnetic, electrical: Anderson, L. A. 04251  
 Nixon Fork district, aeromagnetic, interpretation: Anderson, Lennart A. 06175  
 Nome area, beach and permafrost, gold placers, seismic: Greene, H. Gary. 01879  
 Northeastern, aeromagnetic, interpretation: Brosge, William P. 00467  
 Northern, gravity, magnetic, summary: Barnes, David F. 07110  
 Remote sensing, ecologic tool: Johnson, Philip L. 05923  
 Southeastern, crustal thickness, seismic refraction: Couch, Richard. 10565  
 Trans-Alaska pipeline route, electrical: Frischknecht, Frank C. 10043  
 Valley of Ten Thousand Smokes, gravity: Kienle, Jurgen. 04731  
 Valley of Ten Thousand Smokes, seismic, 1912 lava flow: Gedney, Larry. 02140  
 Yakutat-Mount Saint Elias quadrangles, magnetic: MacKevett, E. M., Jr. 05577

*Glacial geology*

- Capps Glacier, supraglacial streams, channel adjustment: Dozier, Jeff. 03038  
 Glacier Bay, iceberg rafting: Ovenshine, A. Thomas. 00574  
 Martin River Glacier, history: Reid, John R. 06125  
 Martin River Glacier, neoglacial limit, surging: Reid, John R. 00637  
 Martin River Glacier, terminal area: Reid, John R., Jr. 07195  
 Muldrow Glacier, recovery from 1956 surge: Harrison, A. E. 05220  
 Periglacial phenomena, permafrost, thermal considerations: Lachenbruch, Arthur H. 07077  
 Southeastern, Adams Inlet, sequence of events, stratigraphy: McKenzie, Garry D. 08464  
 Southeastern, Casement Glacier, investigations 1965-67: Peterson, Donald N. 08525

## Alaska—Continued

*Glacial geology*—Continued

- Wrangell Narrows-Cook Inlet, glacier regimes, 1964-62: Miller, Maynard M. 05838

*Heat flow*

- Data, Amchitka Island, deep boreholes: Sass, J. H. 03647

*Hydrogeology*

- Anchorage area, Ship Creek, ground-surface water relations: Weeks, John B. 01490  
 Haines-Port Chilkoot area, ground-water resources: McConaghy, James A. 02037  
 Permafrost regions, ground-water resources and quality: Williams, John R. 02331  
 Permafrost regions, water-resource exploration, remote sensing: Barnwell, W. W. 08235  
 Tanana basin, ground-water resources: Anderson, G. S. 01529  
 Umiat area, ground-water resources, possibilities: Williams, John R. 04123

*Maps, engineering geology*

- Yukon-Koyukuk lowland: Weber, Florence R. 01509

*Maps, geochemical*

- Southwestern, Kontrashibuna Lake area: Eakins, Gilbert R. 07197  
 Yakutat-Mount Saint Elias quadrangles: MacKevett, E. M., Jr. 05577

*Maps, geologic*

- Black River quadrangle: Brabb, Earl E. 06379  
 Brooks Range, Chandalar area: Chipp, E. R. 07160  
 Brooks Range, De Long Mts., Lisburne Hills: Martin, A. J. 05963  
 Cosmos Hills area: Fritts, Crawford E. 07159  
 Fairbanks quadrangle: Wahrhaftig, Clyde. 02085  
 Healy quadrangle: Wahrhaftig, Clyde. 02034  
 Juneau D-6 quadrangle, surficial: McKenzie, Garry D. 08464  
 McCarthy C-5 quadrangle: MacKevett, E. M., Jr. 05403  
 McCarthy C-4 quadrangle: MacKevett, E. M., Jr. 06416  
 McCarthy quadrangle, Skolai Group: Smith, James G. 00213  
 Northeastern: Brosge, William P. 00467  
 Nuka Bay area: Richter, Donald H. 01437  
 Prince of Wales Island, northwest coastal area: Eberlein, G. Donald. 02332  
 Serpentine Hot Springs area: Sainsbury, C. L. 03334  
 Southwestern, Kontrashibuna Lake area: Eakins, Gilbert R. 07197  
 Spirit Mountain nickel-copper prospect area: Herreid, Gordon. 10255  
 Takatzi Lake and Creek reservoir- and damsite: Callahan, James E. 05455  
 Tanacross quadrangle: Foster, Helen L. 02032  
 Yakutat-Mount Saint Elias quadrangles: MacKevett, E. M., Jr. 05577  
 Yukon-Koyukuk lowland, surficial: Weber, Florence R. 01509

*Maps, hydrogeologic*

- Tanana basin: Anderson, G. S. 01529

*Maps, magnetic*

- Isogonic chart, 1970.0: U.S. Coast and Geodetic Survey. 02775  
 Northeastern, airborne: Brosge, William P. 00467

*Maps, mineral resources*

- Antimony: Cobb, Edward H. 06427  
 Bismuth: Cobb, Edward H. 06428

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*Maps, mineral resources*—Continued

- Mercury: Cobb, Edward H. 06429  
 Uranium, thorium, rare-earth elements: Cobb, Edward H. 06430

*Maps, seismicity*

- General: U.S. Coast and Geodetic Survey. 06034

*Maps, structure*

- Brooks Range, De Long Mts., major features: Martin, A. J. 05963

*Mineralogy*

- Clay minerals, permafrost areas, soils, sediments: Allan, Roderick James. 00501

*Paleoclimatology*

- Holocene, early warm interval in northern: Dettnerman, Robert L. 04796  
 Pleistocene, late, silts, peats, interior: Matthews, John V., Jr. 06131  
 Quaternary, geologic-climate unit, formal names: Kopf, Rudolph W. 07083  
 Southwestern, late-glacial climatic model, spruce pollen distribution correlation: Hopkins, David M. 10175

*Paleomagnetism*

- Cenozoic, Aleutian Islands, Shemya and Adak Islands, pole positions: Cameron, Christopher P. 02776  
 Miocene, andesite-sediment contact, Shemya Island: Cameron, Christopher P. 07642  
 Tertiary, volcanics, Aleutian Islands, relative movements: Stone, David B. 04179  
 Tertiary-Holocene, secular variation, lava flows: Stone, D. B. 06546

*Paleontology*

- Angiosperms, late Pleistocene, lake sediments, spruce pollen: Hopkins, David M. 10175  
 Anthozoa, Mississippian, Kogruk Fm., lithostrophia: Armstrong, Augustus K. 06805  
 Anthozoa, Mississippian, Peratrovich Fm.: Armstrong, Augustus K. 04922  
 Cephalopoda, ammonite succession, correlation, Europe: Imlay, Ralph W. 10057  
 Diatoms, silicoflagellates, Pliocene, Pribilof Islands: Hanna, G. Dallas. 00462  
 Flora, Cretaceous, sequential record, arctic area: Smiley, Charles J. 10098  
 Flora, fauna, Pleistocene, Kodiak Island, ice-free refugia: Lindroth, Carl H. 10434  
 Foraminifera, Anthozoa, Carboniferous, Lisburne Group, Brooks Range: Armstrong, Augustus K. 01687  
 Foraminifera, Carboniferous, assemblages, northern: Mamet, B. L. 10073  
 Foraminifera, Carboniferous, Lisburne Group, Brooks Range, zonation: Armstrong, Augustus K. 02072  
 Foraminifera, Mesozoic, zoning, northern: Bergquist, H. R. 10010  
 Foraminifera, Pennsylvanian, southeastern: Douglass, Raymond C. 02609  
 Foraminifera, Permian, Mankomen Fm., Alaska Range, fusulinids: Petocz, Ronald G. 03907  
 Gastropoda, Holocene, Tasnuna Valley, gigantism: Bickley, William B., Jr. 04038  
 Gastropoda, Pliocene, Cape Tachilini, *Beringius*, n. sp.: MacNeil, F. Stearns. 09394  
 Graptolithina, Devonian, southeastern, zones, n.spp.: Churkin, Michael, Jr. 11015  
 Graptolithina, Ordovician-Silurian, Descon Fm., Esquibel Island: Churkin, M., Jr. 05004  
 Graptolithina, Silurian, early, southeastern, n.spp., correlation: Churkin, Michael, Jr. 02084

## Alaska—Continued

*Paleontology*—Continued

- Insecta, Pliocene, Seward Peninsula, micropepline beetles, n. spp.: Matthews, John V., Jr. 09842  
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 Mammalia, Pleistocene, outwash gravels, Nome area: Harrington, C. R. 08147  
 Mollusca, Devonian, Lower, east-central, new cricoconarids, zonation: Churkin, Michael, Jr. 10978  
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- Petrology*
- Alaska Range and Peninsula, plutons, chronology, composition: Reed, Bruce L. 10091  
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 De Long Mountains, ultramafic plutons: Martin, A. J. 05963  
 Fairweather pluton, mafic, ultramafic rocks: Plafker, George. 01463  
 Koyukuk Valley, obsidian deposits, artifact source: Patton, William W., Jr. 03413  
 Mentasta Mountains, gneiss, pegmatite, corundum-bearing: Richter, Donald H. 04249  
 Seward Peninsula, blueschist facies rocks, mineral assemblages: Sainsbury, C. L. 01464  
 Southeastern, Glacier Bay Natl. Monument, volcanic ash: McKenzie, Garry D. 03000  
 Valley of 10,000 Smokes, tuff deposits, pre-1912: Kienle, Jurgen. 10594
- Sedimentary petrology*
- Alaska Range, Permian volcanic-sedimentary sequence: Bond, Gerard Clark. 07345  
 Bering Sea shelf, northern, clastic sediments: VenkataRathnam, Kolla. 10921  
 Bristol Bay, shelf sediments: Sharma, Ghanshyam D. 10096  
 Brooks Range, Lisburne Group, carbonate facies: Armstrong, Augustus K. 02072  
 Brooks Range, Lisburne Group, carbonate rocks: Armstrong, Augustus K. 00406  
 Cook Inlet, sediments, lithofacies: Sharma, G. D. 01421  
 Copper River delta, braided-stream sedimentation: Boothroyd, Jon C. 02590  
 Fiords, sedimentation, turbid layer: Wright, F. F. 02002  
 Glacier Bay, clay-size sediments, mineralogy, distribution: O'Brien, Neal R. 03599  
 Glacier Bay, ice-raftered deposits, recognition: Ovenshine, A. Thomas. 00574  
 Knik River, sedimentation: Bradley, William C. 00597  
 North Slope basin, Cretaceous delta system: Brown, L. F., Jr. 08494  
 Nuka Bay, sediments: Reimnitz, Erk. 04244  
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*Stratigraphy*

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 Carboniferous, northern, biostratigraphy: Dutro, J. T., Jr. 11278  
 Cenozoic, Tlevak Basalt, new, Prince of Wales Island: Eberlein, G. Donald. 01298  
 Cretaceous, Kuparuk River sands, Prudhoe Bay field: Alaska Geological Society. 07082  
 Devonian, Lower, east-central sections, cricoconarid zonation: Churkin, Michael, Jr. 10978  
 Devonian-Cretaceous, Brooks Range, De Long Mts.: Martin, A. J. 05963  
 Eocene, Andrew Lake Fm., Aleutian Islands, Adak Island: Scholl, David W. 05962  
 Fairbanks quadrangle, sections: Wahrhaftig, Clyde. 02085  
 Healy quadrangle, sections: Wahrhaftig, Clyde. 02034  
 Jurassic, biostratigraphy, paleogeography: Im-lay, Ralph W. 10057  
 Mesozoic, marine clastics, biostratigraphy, northern: Bergquist, H. R. 10010  
 Mesozoic-Tertiary, Cook Inlet basin, northern: Kirschner, C. E. 10066  
 Mississippian, Kogruk Fm., sections, carbonate facies: Armstrong, Augustus K. 06805  
 Mississippian, Lisburne Group, measured sections, Brooks Range: Armstrong, Augustus K. 00406  
 Mississippian, Peratrovich Fm., members: Armstrong, Augustus K. 04922  
 Nomenclature, changes, U.S. Geol. Survey: Cohee, G. V. 04694  
 Nomenclature, geographic name sources, North Slope, list: Orth, Donald J. 07084  
 Nomenclature, lexicon, formal names, northern: Kopf, Rudolph W. 07083  
 Nomenclature, North Slope, principles: Cohee, George V. 07657  
 North Slope, summary: Brosge, W. P. 07104  
 Paleocene, Cantwell Fm., central Alaska Range, nomenclature: Wolfe, Jack A. 01302  
 Paleozoic, northern, central: Brosge, William P. 10019  
 Paleozoic, pre-Carboniferous sequences, Shublik, Sadlerochit Mts.: Dutro, J. Thomas, Jr. 07080  
 Paleozoic, Prince of Wales Island, northwest coastal area: Eberlein, G. Donald. 02332  
 Permian, Lower, paleogeography, Alaska Range: Bond, Gerard C. 10014  
 Permian, Mankomen Fm., members, Alaska Range, fusulinid zones, correlation: Petocz, Ronald G. 03907  
 Permian, Skolai Group, McCarthy quadrangle: Smith, James G. 00213  
 Permian, volcanic-sedimentary sequence, Alaska Range: Bond, Gerard Clark. 07345  
 Permian-Quaternary, McCarthy C-4 quadrangle: MacKevett, E. M., Jr. 06416

## Alaska—Continued

*Stratigraphy—Continued*

- Permian-Quaternary, McCarthy C-5 quadrangle, sections: MacKevett, E. M., Jr. 05403  
 Permian-Triassic, Sadlerochit and Shublik Fms.: Determan, Robert L. 07658  
 Quaternary, southeastern, Adams Inlet: McKenzie, Garry D. 08464  
 Silurian, Heceta Limestone, Sea Otter Sound area: Ovenshine, A. T. 04260  
 Silurian, Lower, graptolite zonation, southeastern: Churkin, Michael, Jr. 02084  
 Silurian-Quaternary, Brooks Range, northeastern, summary: Reiser, Hillard N. 07078  
 Tertiary, Amchitka, Banjo Point, Chitka Point Fms., Aleutians: Carr, W. J. 04690  
 Tertiary, nonmarine, biostratigraphy: Wolfe, J. A. 10114  
 Tertiary, nonmarine sediments, correlation, Asia: Biske, S. F. 11279  
 Triassic, marine sequence, biostratigraphy, northern: Silberling, N. J. 10097  
 Triassic, Sag River Sandstone, Prudhoe Bay field: Alaska Geological Society. 07082
- Structural geology*  
 Alaska Range, central, Cenozoic Nenana Gravel orogeny: Wahrhaftig, Clyde. 10288  
 Alaska Range, eastern, faults, folds, tectonic history: Richter, D. H. 10092  
 Aleutian arc, genesis, tectonic model: Perry, Richard B. 10089  
 Aleutian Arc, plate tectonics, Tertiary transition: Grow, John A. 06118  
 Aleutian Islands, evolution: Oliver, Jack. 06744  
 Aleutian Ridge, Buldir Depression, genesis: Marlow, M. S. 01365  
 Bering Sea-Aleutian Ridge region, tectonics: Anderson, R. Ernest. 10008  
 Brooks Range, De Long Mts., tectonic history: Martin, A. J. 05963  
 Brooks Range, northeastern: Reiser, Hillard N. 07078  
 Circum-oceanic and plate tectonics, implication of blueschist terranes: Forbes, Robert B. 10040  
 Cook Inlet basin, tectonic development: Kirschner, C. E. 10066  
 Cordilleran fold belt, correlated with Canada, Siberia: Churkin, Michael, Jr. 02597  
 Denali and Fairweather faults, movement, geodetic triangulation: Page, Robert. 01810  
 Fairweather fault, 1958 rupture, effect on tree rings: Page, Robert. 04881  
 Fairweather fault zone, faulting episodes, tree-ring dating: Page, Robert. 01964  
 Fold belts, cf. Siberia, continental drift: Churkin, Michael, Jr. 07102  
 North Slope: Gryc, George. 04105  
 Northern, central, tectonic framework: Latham, Ernest H. 10072  
 Northern, tectonic history, review: Tailleux, I. L. 07075  
 Northern, tectonics, related sedimentation, history: Brosge, William P. 02592  
 Seward Peninsula, thrust sheets: Sainsbury, C. L. 01464  
 Southern, late Mesozoic tectonics: Jones, D. L. 10062  
 Southern, tectonics, ancient trench: Gedney, Larry. 06409

**Alberta***Absolute age*

Castle River valley, Pinedale terminal moraine, bison: Stalker, A. MacS. 05976

Castle River valley, Pinedale terminal moraine, bison: Wagner, W. Philip. 05975

*Areal geology*

Drumheller-Calgary-Lake Louise area, guidebook: Wright-Broughton, C. 08677

Edmonton to Dawson Creek, guidebook: Bush, Gordon L. 07892

Marble Mountain area: Ollerenshaw, N. C. 00828

*Earthquakes*

1970, March 8, Snipe Lake: Milne, W. G. 08118

*Economic geology*

Bitumen, geochemistry, proton magnetic resonance: Speight, J. G. 02117

Oil sands, Athabasca area, occurrence, resources: Camp, Frederick W. 05984

Petroleum, Cretaceous deltas, occurrence: Stelck, C. R. 02687

Petroleum, natural gas, Rainbow area, exploration, production: Hriskevich, Michael E. 06431

Petroleum, natural gas, Swan Hills area, Beaverhill Lake reefs: Hemphill, C. R. 07756

Petroleum, natural gas, western, Woodbend reefs, occurrence: DeMille, George. 02603

Petroleum, Rainbow area, Middle Devonian reefs: Barss, D. L. 07755

Petroleum, Redwater reef, exploration tools, compaction anticlines: Ferris, Craig. 09374

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 Northeastern, field conference guidebook: Natl. Assoc. Geology Teachers. 04953  
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*Am. Assoc. Advancement of Science*

Symposium, global effects of environmental pollution: Am. Assoc. Adv. Sci. 09509

*Am. Assoc. Petroleum Geologists*

Symposium, giant oil and gas fields of the world, geology: Halbouty, Michel T. 07752

*Am. Assoc. Stratig. Palynologists*

Proceedings, first annual meeting, 1968: Perkins, Bob F. 08307

*Am. Inst. Mining, Metall., Petroleum Engineers*

Geologists, professional role: Michell, Wilson D. 05434

*American Geological Institute*

Committee on Geoscience Information: Hambleton, William W. 07003

History, projects, organization: Am. Geological Institute Staff. 06224

Short course lecture notes, environmental geology, 1970: Am. Geological Institute. 07996

*American Institute of Professional Geologists*

Committee on Professional Employment Standards, questionnaire: Krinitzsky, E. L. 06222

*American Water Resources Assoc.*

Symposium, 1969, Baniff, Alberta, water balance, N. Am.: Laycock, Arleigh H. 09218

*Assoc. Eng. Geologists*

Field trip for Annual Mtg., 1970, Pennsylvania, northeastern New Jersey: Association Eng. Geologists. 10227

Field trips, 1970 meeting, Chesapeake and Ohio Canal: Association Eng. Geologists. 11236

Guidebook, Puerto Rico, post-meeting field trip, 1970: Association Eng. Geologists. 10226

*Assoc. Missouri Geologists*

Field trip guidebook, Missouri, Hannibal-Clarks ville highway geology, Route 79Tr: Wagner, Ray G. 09345

*Atlantic Coastal Plain Geol. Assoc.*

Field conference, Virginia, York-James Peninsula area, guidebook: Johnson, Gerald H. 11246

*Calgary Univ. Archaeological Assoc.*

Paleo-environmental workshop, 1969, proceedings: Forbis, R. G. 10647

*Canadian Association of Geographers*

Ad hoc committee, geomorphology recommendations: Jopling, A. 02778

## Associations—Continued

*Carnegie Institution*

Geophysical Laboratory, crystallography, history, 1919-69: Donnay, Gabrielle. 02238

*Cave Research Foundation*

United States, organization, history: Smith, P. M. 04005

*Corpus Christi Geological Society*

Mexico, Nuevo Leon, Hidalgo Canyon, La Popa Valley, guide book: Corpus Christi Geological Soc. 09889

*Engineering Institute Canada*

Geotechnical research, construction problems, report: Natl. Research Council Canada. 09763

*Geol. Assoc. Canada*

Field trip guidebook, Manitoba, Moak-Setting Lakes area: Quirke, Terence T., Jr. 09606

Guidebook, Manitoba, Flin Flon-Snow Lake and Lynn Lake-Fox Lake areas: Campbell, F. H. A. 11258

*Geological Association of Canada*

Southern Cordillera Structure Project, progress report: Wheeler, J. O. 03272

*Geological Society of America*

Cordilleran Section, field trip, California, central, Coast Ranges: Dickinson, William R. 11728

Guidebook, Pleistocene geology, southeastern Wisconsin: Black, Robert F. 06809

North-Central Section, guidebook, Michigan, field trips: Michigan Basin Geol. Society. 08688

Penrose Conference, 1969, global tectonics: Dickinson, W. R. 02205

Penrose Conference, 1969, new global tectonics: Dickinson, William R. 01428

Rocky Mountain Section, 1970 meeting, guidebook, South Dakota: Geol. Soc. America, Rocky Mtn. Sec. 02829

South-Central Section, 1970 meeting, guidebook: Geol. Soc. America So.-Central Sec. 02798

South-Central Section, annual meeting, guidebook: Dort, Wakefield, Jr. 10682

Southeastern Section, guidebook, Kentucky: Geol. Soc. America SE Sec. 03861

Wisconsin, field trip, 1970: Holt, C. L. R., Jr. 05617

*Great Lakes Basin Commission*

Great Lakes basin, water, other resources, institutions concerned: Great Lakes Basin Comm. 09911

*Gulf Coast Association of Geol. Societies*

Twentieth annual Mtg. papers, 1970: Shaw, Nolan G. 07312

*Gulf Universities Research Corp.*

Gulf Environmental Program, scope: Lohse, Alan. 09490

*Highway Geology Symposium*

University of Kansas, 1970 meeting, field trip guidebook: Burt, Virgil A. 08414

*Icefield Ranges Research Project*

Yukon, scientific results, 1965-68: Bushnell, Vivian C. 07725

*ICSU*

Geodynamics project, Inter-Union Commission: Am. Geophysical Union. 05070

*Idaho Department of Highways*

Symposium, engineering geology, 8th annual: Idaho Department of Highways. 05493

## Associations—Continued

- Internat. Assoc. for Math. Geology*  
Organization, history, publications: Krumbein, William C. 06311
- Internat. Assoc. Hydraulic Research*  
Thirteenth Congress, proceedings: Internat. Assoc. Hydraulic Research. 11232
- Internat. Assoc. on Genesis of Ore Deposits*  
Symposium, problems of hydrothermal ore deposition: Poubas, Zdenek. 08766
- Internat. Assoc. Sci. Hydrology*  
Symposium on hydrology of deltas: IASH-Unesco. 08572  
Symposium, research on representative and experimental basins: IASH-Unesco. 08475  
Symposium, world water balance: IASH-Unesco. 08429
- Internat. Bot. Cong.*  
Symposium, evolution and geological record of plants: Banks, Harlan P. 09332
- Internat. Union Geodesy and Geophysics*  
Tsunami Committee, 1969 meeting, report: Zetler, B. D. 06656
- International Association of Geodesy*  
Commission on Earth Tides, symposium 1969: Zetler, Bernard D. 10973
- International Atomic Energy Agency*  
Panel reports, 1970: International Atomic Energy Agency. 08156
- International Peat Society*  
Proceedings, 3d Congress: Tibbetts, T. E. 08237
- Internatl. Comm. Nomenclature Clay Minerals*  
Rulings, 1969: Brindley, G. W. 07847
- Joint Committee on Paleontologic Information*  
Origin, duties: Shaw, Alan B. 02146
- Lafayette Geological Society*  
Oil and gas fields, southwestern Louisiana: Lafayette Geological Society. 04752
- Lamont Geological Observatory*  
Seismic reflection surveying, marine, since 1963: Ewing, John. 09984
- Lawrence Radiation Laboratory*  
Geophysics Research Group, explosion technology: Hearst, Joseph R. 07218
- Michigan Basin Geological Society*  
Field excursion, Precambrian, Michigan basin, Great Lakes region: Michigan Basin Geological Society. 10945
- Mineralog. Assoc. Canada*  
Field trip guidebook, Manitoba, Moak-Setting Lakes area: Quirke, Terence T., Jr. 09606  
Guidebook, Manitoba, Flin Flon-Snow Lake and Lynn Lake-Fox Lake areas: Campbell, F. H. A. 11258
- National Association of Geology Teachers*  
Southwest Section, field conference, guidebook: Natl. Assoc. Geology Teachers. 04953
- National Earthquake Information Center*  
Function, activities: Lander, J. F. 05528
- National Research Council Canada*  
Geotechnical research, construction problems, report: Natl. Research Council Canada. 09763
- Natl. Council Marine Resources and Eng. Devel.*  
Great Lakes basin, water, other resources, institutions concerned: Great Lakes Basin Comm. 09911
- Natl. Research Council Canada*  
Assoc. Comm. Geotech. Research Muskeg Subcomm., engineering problems, report: Radforth, N. W. 09764

## Associations—Continued

- Natl. Research Council Canada—Continued*  
Assoc. Comm. Geotech. Research Permafrost Subcomm., soil mechanics report: LaRochelle, P. 09766  
Permafrost Subcomm. Assoc. Comm. Geotech. Research report: Harwood, T. A. 09765'
- New Mexico Geological Society*  
Field conference, 1970, guidebook, Tyrone-Big Hatchet Mts.-Florida Mts. area: New Mexico Geol. Soc. 08646
- New York State Geol. Assoc.*  
Annual meeting, 1969, field excursions, guidebook: New York State Geol. Assoc. 09019  
42nd annual meeting, guidebook: New York State Geol. Assoc. 11233
- North American Paleontological Convention*  
Meeting 1969: Yochelson, Ellis L. 00014
- Northern Ohio Geological Society*  
Symposium on salt, 3d: Rau, Jon L. 04562  
Symposium on salt, third: Rau, Jon L. 04466
- Offshore Technology Conference*  
Preprints: Offshore Technology Conference. 09486
- Ohio and Pittsburgh Geological Societies*  
Joint field trip, Upper Ohio Valley, Allegheny delta deposits: Ferm, John C. 09921
- Ohio Geological Society*  
Field trip, 1970, north-central, guidebook: Janssens, A. 02764  
Guidebook, Ohio, Middle Devonian rocks: Janssens, A. 08372
- Pan American Institute Geography and History*  
Objectives, activities, accomplishments: Gerlach, Arch C. 08368
- Pennsylvania Geologists*  
Guidebook, northeastern, Pocono Fm.: Sevon, William D. 10703
- Rocky Mountain Assoc. Geologists*  
Colorado, guidebook, Front Range, Cretaceous stratigraphy: Rocky Mountain Assoc. Geologists. 05350
- SEPM*  
Symposium, clay mineralogy, environmental aspects: Mankin, Charles J. 05667
- Shreveport Geological Society*  
Field trip, Oklahoma, southeastern, Texas, northeastern: Shreveport Geological Society. 04500
- Smithsonian Institution*  
Geoscience programs and collections: Collier, F. J. 05479  
Science Information Exchange: Riva, Joseph P., Jr. 10375
- Society Econ. Paleontologists and Mineralogists*  
History, 1926-46: Russell, R. Dana. 11004
- Society of Professional Well Log Analysts*  
Symposium transactions, 1970: Soc. Prof. Well Log Analysts. 02191
- Tulsa Geological Society*  
Oklahoma, Tulsa Metropolitan Area guidebook, geologic map: Bennisson, Allan P. 10708
- Virginia Geol. Field Conf.*  
Field conference, Virginia, York-James Peninsula area, guidebook: Johnson, Gerald H. 11246
- West Texas Geol. Soc.-Texas Univ.*  
Symposium, geological framework of Chihuahua tectonic belt: West Texas Geological Society. 05978

**Asterozoa****Catalog**

Field Museum, Chicago, types: Golden, Julia. 06900

***Drepanaster wrightii*, n.sp.**

Ontario, Arkona Shale, protasterid ophiuroid: Kesling, Robert V. 08674

***Onychaster strimplei***

Mississippian, Oklahoma, Fayetteville Fm., ophiuroid: Strimble, Harrell L. 02495

***Ophiocrassota baconi*, n.sp.**

Eocene, Oregon, Coaledo Fm., and California: Blake, D. Bryan. 04715

***Protasteridae***

Ordovician, North America, taxonomic revision: Hotchkiss, Frederick H. C. 02752

***Taenaster spinosus***

Ordovician, North America, revision, synonymy: Hotchkiss, Frederick H. C. 02752

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Sand, silica, Virginia-Florida, resources: Olson, Norman K. 07475

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South Carolina, Carolina Bays, origin, age: Thom, Bruce G. 00560

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Deep Sea Drilling Project, Leg 2: Gartner, Stefan, Jr. 03080

Deep-sea drilling, *Glomar Challenger* program, initial results: Pimm, Anthony Charles. 04538

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Northwestern, Deep Sea Drilling Project, Leg 11: Deep Sea Drilling Project. 04023

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Abyssal sediments, organic carbon, hydrocarbon: Koons, Charles B. 06796

Deep Sea Drilling Project, Leg 2, sediments, interstitial water: Chan, K. M. 01658

Deep Sea Drilling Project, Leg 2, sediments, interstitial water: Kaplan, I. R. 01346

Deep Sea Drilling Project, Leg 2, sediments, major elements: Texas A and M University. 01646

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Deep-water muds, chemical composition, change with climate: Spiro, N. S. 10100

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 Mid-Atlantic Ridge-Atlantis Fracture Zone, magnetic, gravity: Phillips, J. D. 01967  
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- O and CO<sub>2</sub> balance: Johnson, Francis S. 05173
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**Automatic data processing***Applications*

- Computer, earth sciences, Canada: Burk, Cornelius F., Jr. 10783

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- Computer mapping: Wynne-Edwards, H. R. 08121

*Bibliography*

- Index systems: Smith, Harriet W. 00123

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- Two-dimensional data, interpolation: Bhattacharyya, B. K. 04288

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- Museums, information storage and retrieval system: Squires, Donald F. 10681

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*Earthquakes*

- Ground motion studies, body-wave propagation, geologic effects: Yacoub, Nazieh K. 03698
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- Rayleigh wave dispersion: Watson, T. H. 03357
- Regional, focal parameters, determination, IBM 1620 computer program: Jutsum, P. J. 10362
- Surface-wave dispersion, computer computation, Knopoff method: Schwab, Fred. 04683

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- Coal, stereoplot of fractures by computer: Jeran, P. W. 00827
- Iron, taconite availability, computer models, Minnesota: Michelson, R. W. 04435
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- Petroleum exploration, evaluation, computer techniques: Oldaker, Richard B. 02665
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- Petroleum production data, plotting: Meyer, Richard F. 02339
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- Porphyry copper deposits, parameters, North America: Barnes, Marvin Peterson. 07270
- Uranium, resource prediction, application, Arizona-New Mexico: Bostick, Neil H. 01305

*Engineering geology*

- Earthquake engineering, simulated motion of high-rise building: Lord, James. 06360
- Exploration data, advantages: Grice, R. H. 09867
- Foundations, settlement, problem-oriented computer language: Giroud, Jean Pierre. 06781
- Foundations, settlement, problem-oriented computer language: Schiffman, Robert L. 02353
- Hydraulic problems, proposed procedure library: Smith, Alan A. 02109
- Land use, hazards, resource mapping, computer program: Belcher, Donald J. 03327
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- Mine rocks, strength determination, variables: Chan, Samuel S. M. 09143
- Rock mass, elasto-plastic analysis, finite-element method: Baker, L. E. 07506
- Rock, soil mechanics, elastic-plastic problems, finite-element analysis: Pariseau, W. G. 09146
- Slope stability analysis, computer: Sanderson, Robert L., Jr. 05499

**Automatic data processing—Continued***Engineering geology—Continued*

Slope stability problems: Sanderson, Robert L., Jr. 05499

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Well logging data reduction, computer program: Hearst, Joseph R. 07218

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Canadian index to geoscience data: McGee, Brian A. 09653

Cluster analysis, distance function with printed dendrogram: Parks, James M. 03200

Earth sciences in Canada, review: Robinson, S. C. 10643

FORTAN IV program, open-ended data file, New Mexico: Peterson, J. B. 09713

Geologic samples, numerical classification: Switzer, Paul. 08611

Geological data, documentation, filing, retrieval, application, small library: Loudon, T. Victor. 10628

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Information systems, design, Michigan Univ.: Briggs, Darinka Z. 03062

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Minimum entropy criterion, analytic rotation: McCammon, Richard B. 01282

Multivariate arrays, dendrogram, two-dimensional diagram: McCammon, Richard B. 02381

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Simulation, geologic models: Harbaugh, John W. 04790

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Variance analysis, canonical variates, FORTAN IV program: Reymont, Richard A. 02382

West Virginia Geological and Economic Survey, geologic data: Eddy, Greg E. 07089

*Geochemistry*

Electron microprobe analysis, quantitative, computer programs, critical examination: Beaman, D. R. 09462

Mass spectrometer-computer system: Klimowski, Richard Joseph. 05994

Neutron activation experiments, computer simulation: Horn, M. K. 10638

Rock analyses, storage, manipulation: Chayes, F. 02234

Rocks and chondrites, trace elements, analyses, neutron activation data: Laul, J. C. 03651

Solid-solution problems, X-ray diffraction analysis: Johnson, Gerald G., Jr. 04052

Trace-element analyses, sediments, FORTAN IV program: Heiner, Lawrence E. 10262

*Geochronology*

Tree rings, width and density data, electronic system: Jones, F. W. 07814

**Automatic data processing—Continued***Geological exploration*

Aeromagnetic data, digital recording, computer interpretation: Bolton, R. J. 02492

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Mapping system, computer-based, Illinois: Swann, D. H. 03059

Statistical zonation method, log analysis: Gill, Dan. 02074

*Geomorphology*

Computer terrain mapping, multispectral data, Yellowstone Park: Smedes, Harry W. 07772

Spits, shingle, formation, simulation, computer program: McCullagh, M. J. 03201

Terrain analysis, roughness: McCue, G. A. 09790

Trend analyses, rectilinear profile segments, computer program: Ongley, E. D. 08202

Wind erosion, soils, equation for computer solution: Skidmore, E. L. 07627

*Geophysical methods*

Aeromagnetic data, miniaturized digital system: Sawatzky, P. 07183

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Interpolation, randomly spaced data, error evaluation: Naidu, Prabhakar S. 05571

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Petroleum exploration: Hingorani, G. G. 02529

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*Geophysical surveys*

Underwater explosions, seismogram processing: White, R. E. 10303

*Glacial geology*

Glacier flow, 3-dimensional time-dependent model: Campbell, William J. 08213

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*Gravity field, Earth*

Variations, tidal, statistical techniques: Pan, Chieh. 02710

*Heat flow*

Conductivity in soils, computer simulation: Wierenga, P. J. 07621

*Hydrogeology*

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Aquifer parameters, pumping tests, analysis: Saleem, Z. A. 04331

Aquifer simulation, digital model, Kansas, Ogallala Fm.: McClain, Thomas J. 08709

Aquifer simulation, digital model, Texas, Ogallala Fm.: Claborn, B. J. 08710

Aquifer systems, vertical variability, Mississippi: Keady, Donald M. 09608

Channel networks, topology, binary digit representation: Smart, J. S. 03422

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- Data collection, interpretation, computer programs: McNellis, Jesse M. 10847
- Digital model, alluvial aquifer, evaluation, Nova Scotia: McFall, Robert L. 05245
- Digital model, alluvial aquifer, evaluation, Nova Scotia: Trescott, Peter C. 01608
- Electric analog vs. digital computer model: Phillips, H. Boyd. 04229
- Flood simulation model, method: Girard, G. 07812
- Ground-water anomaly, nonsteady gravity decay, analysis: Korver, John A. 04025
- Ground-water contour maps, accuracy, description: Hanson, Hal C. 10496
- Ground-water flow, miscible fluid dispersion, computer simulation: Reddell, Donald Lee. 07631
- Ground-water flow systems, dispersion: Reddell, Donald Lee. 07594
- Ground-water movement, multiaquifer systems, three-dimensional model: Bredehoeft, J. D. 03075
- Ground-water simulation, applications to hydrologic response modeling: Freeze, R. Allan. 05518
- Ground-water simulation techniques, trends: Prickett, Thomas A. 05521
- Hydraulic problems, proposed procedure library: Smith, Alan A. 02109
- Mapping, plotter applications, ground-water engineers: Evans, Gomer E. 05519
- Mathematical model, ground-water flow, vertical: Green, Don W. 03073
- Recharge, determination by digital modeling: Taylor, O. James. 10509
- Representative and experimental basins, methods, international guide: Toebes, C. 07731
- Saline-water data, Delaware basin, New Mexico, Texas: Hiss, W. L. 04804
- Seepage-salinity surveys, Kansas, application: Leonard, Robert B. 00470
- Soils, movement of salts, FORTRAN IV program: Ortiz, Jaime. 04385
- Statewide systems development: Botz, M. K. 06391
- Strata simulation, reservoir problems, injection wells: Bateman, Barry Lynn. 07595
- Stream-aquifer management problems, simulation model: Bredehoeft, John D. 05517
- Stream-aquifer system, conjunctive water use, optimization: Taylor, O. James. 04303
- Systems research, simulated models, problems, validating needs: Vemuri, Venkateswararao. 03547
- Transmissibility distributions from minimum field measurements: Cearlock, D. B. 10510
- Water resources systems analysis, dynamic programming: Heidari, Manoutchehr. 10342
- Water-quality and geophysical data, FORTRAN-IV program: Kent, Douglas C. 07171
- igneous rocks*
- Geochemistry, variation diagrams, computer use: Pearce, Thomas H. 09711
- Magnetic methods*
- Airborne data, display techniques for interpretation: Margherita, Lucio. 03580
- Airborne surveys, interpretation, digital processing: Buttgerit, Charles D. 07406

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- Marine geology*
- Data acquisition, shipboard computer, need, elements in decision: Gurke, John L. 08223
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- Shipboard computers: Coughran, Edward H. 04436
- Shipboard computers, types, applications: Coughran, Edward H. 01684
- Mineral collections*
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- Paleontology*
- Biofacies analysis, quantification, computer application: Buzas, Martin A. 08506
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- California Univ. Mus. Paleontology collections, catalogs: Berry, William B. N. 02095
- Collections, catalogs, computerizing: Juskevics, John A. 01417
- Computer applications: Mello, James F. 08503
- Evolution of form, variance analysis: Gould, Stephen Jay. 03369
- Information storage, foraminifera, U.S., Canada: Kent, Harry C. 02639
- Joint Committee on Paleontologic Information: Shaw, Alan B. 02146
- Morphology simulation, successful models need: Raup, David M. 08504
- Numerical methods, application to phylogeny of Calceocrinidae: Rowell, A. J. 10631
- Numerical taxonomy, computer application: Kaesler, Roger L. 08505
- Research, computer applications: Olson, Everett C. 08508
- Smithsonian Inst. information retrieval system: Creighton, Reginald. 09184
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- Oklahoma University program: Wilson, L. R. 03377
- Programs: Oltz, Donald. 09201

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- Directional surveys, geologic interpretation:  
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Well-data files: Forgotson, James M., Jr. 02618  
Well-data system: Fitzgerald, J. D. 02617

*Petrology*

- CIPW norms from rock analyses, calculating,  
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CORFAN-FORTRAN IV rock classification:  
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Magma mixing problem, computer solution:  
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Orientation diagrams, computer program: Star-  
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Petrofabric studies, spherical projections, com-  
puter program: Starkey, John. 05928  
Smithsonian Inst. information retrieval system:  
Creighton, Reginald. 09184  
Volcanic rocks, West Indies, Lesser Antilles:  
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Zircon morphology, geometrics, computer anal-  
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*Radioactivity methods*

- Liquid scintillation data: Reich, A. R. 08589  
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*Remote-sensing methods*

- Satellite data, NASA processing facility: Levy,  
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*Sedimentary petrology*

- Environments, isopachous residual maps, com-  
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Cache Valley area, gravity data: Peterson, Donald L. 04252

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Mesozoic, intrusive epochs, absolute age: Evernden, J. F. 00207

Sierra Nevada, central, chemical variation patterns: Bateman, P. C. 00210

Sierra Nevada, contact metamorphism: Kerrick, D. M. 05648

Sierra Nevada, radiogenic heat in pregranitic rocks: Wollenberg, Harold A. 00072

Southern, chemical variations: Baird, A. K. 00226

**Batholiths—Continued***Colorado*

Pikes Peak Granite, absolute age: Hedge, C. E. 01469

Wet Mountains, San Isabel quartz monzonite: Murray, Marc Michael. 07937

*Differentiation*

Orogenic arcs, granitic belts, relation to deep structure: Dickinson, William R. 04982

*Minnesota*

Granitic rocks, classification, revision, Giants Range: Viswanathan, S. 06493

*Nevada*

Mesozoic, intrusive epochs, absolute age: Evernden, J. F. 00207

*New Brunswick*

Charlotte, Pokiok complexes, magnetic studies: McGrath, P. H. 10970

*Ontario*

Gravity surveys, Round Lake, Ontario: Gibb, R. A. 07675

*Washington*

Golden Horn granite, genesis, feldspar guide: Stull, Robert J. 00374

**Bauxite***Composition*

Clay minerals, quantitative differential thermal analysis, gibbsite and goethite: Davis, C. E. 09344

*Exploration*

Photogeology, multispectral data, resource inventory, experimental applications: Mallon, Harry J. 09288

*Jamaica*

Genesis, residual hypothesis, limestone erosion rate: Smith, D. I. 10243

*Resources*

Evaluation, lateritic deposits: Dreyer, Robert M. 02429

**Bentonite***Montana*

Ingomar-Vananda area, occurrence, properties: Berg, Richard B. 04620

*Northwest Territories*

Inuvik area, occurrence: Mackenzie, Angus G. 10126

**Bering Sea***Areal geology*

Shelf, northern, Cenozoic history: Nelson, C. Hans. 10082

*Economic geology*

Gold, northern, reworked sediments, potential: Nelson, C. Hans. 04176

*Geochemistry*

Southeastern, surface water, carbon dioxide: Kelley, John J. 10689

*Geomorphology*

Alaskan shelf, silt transport to Chukchi Sea: McManus, Dean A. 05652

Northern, suspended sediment transport: McManus, Dean A. 10922

Submarine canyons, genesis: Scholl, David W. 03531

*Geophysical surveys*

East-central, seismic, sedimentary framework, Holocene: Knebel, Harley J. 10068

Gulf of Anadyr, seismic, structure, sediments: Kummer, John T. 10070

Northern, subsurface, seismic: Grim, Muriel S. 03706

Southeastern, diapirlike structures, seismic: Scholl, David W. 04540



**Bering Sea—Continued****Petrology**

Volcanic islands, basalts, sequence, genesis:  
Hoare, J. M. 10054

**Sedimentary petrology**

Alaskan shelf, clastic sediments: Venkata-  
Rathnam, Kolla. 10921

Bristol Bay, shelf sediments: Sharma, Ghan-  
shyam D. 10096

**Structural geology**

Bering continental margin, evolution: Scholl,  
David W. 10095

Southeastern, diapirlike structures: Scholl,  
David W. 04540

Southeastern, diapirs: Scholl, David W. 01592

**Bermuda****Absolute age**

Gibb's Hill and Ferry Reach, basalt, K-Ar: Gees,  
Rudolf A. 03924

**Geomorphology**

Harrington Sound, trapezohedral shape, vol-  
canic subbottom sediments interface, caldera  
or doline?: Gees, R. A. 09826

Platform, terrace at 10 fm, crustal mobility, sea-  
level change: Stanley, Daniel J. 03989

**Geophysical surveys**

Castle Harbor, seismic, volcanics-sediments  
contact: Gees, Rudolph A. 04611

Gravity, pedestal evolution: Stuart, William D.  
01985

Harrington Sound, seismic, volcanic subbottom,  
Pleistocene sediments: Gees, R. A. 09826

**Paleontology**

Gastropoda, Pleistocene, form, diversity, cli-  
mate effect: Gould, Stephen Jay. 08519

Gastropoda, Pleistocene, shell diversity: Gould,  
Stephen Jay. 01203

**Sedimentary petrology**

Belmont Fm., beach limestones, diagenesis,  
phreatic, vadose: Land, Lynton S. 06234

Northern, red clayey soils, genesis from  
limestone: Blackburn, G. 07513

Northern, red clayey soils, genesis from  
limestone: Bricker, O. P. 07512

Pleistocene limestones, eolian-marine facies:  
Vacher, H. Leonard. 02693

Subtidal algal stromatolites, growth: Gebelein,  
Conrad D. 01554

Subtidal algal stromatolites, growth: Sharp,  
Jonathan H. 01553

**Stratigraphy**

Pleistocene eustatic curve, correlation, Atlantic  
Coastal Plain: Vacher, H. Leonard. 00769

**Structural geology**

Castle Harbor, sediments-volcanics contact, cal-  
dera: Gees, Rudolph A. 04611

**Beryllium****Analysis**

Chemical: Novoselova, A. V. 09305

**Utah**

Gold Hill district, occurrence: El-Shatoury, H.  
M. 02746

**Bibliography****Absolute age**

Metamorphic rocks, continental: Hurley,  
Patrick M. 09998

**Alaska**

North slope: Maher, J. C. 02114

**Arctic**

Water resources: Hartman, Charles W. 07877

**Authors**

Butler, Bertram Theodore: O'Connell, Daniel T.  
05948

**Bibliography—Continued****Authors—Continued**

Cummings, Edgar Roscoe: Shrock, Robert R.  
00792

Davidson, Charles Findlay: Nolan, Thomas B.  
00793

Denning, Reynolds McConnell: Wilson, James  
T. 00794

Dobbin, Carroll Edward: Brainerd, Arthur E.  
00795

Dunn, Paul Heaney: Laswell, Troy J. 00796

Dyson, James Lindsay: Socolow, Arthur A.  
00797

Fraser, Horace John: Mitchell, G. P. 05949

Graham, Joseph John: Keen, A. Myra. 00798

Hallimond, Arthur Francis: Smith, W. Campbell.  
05950

Harrison, John Albert: Simon, Jack A. 00799

Hertlein, Leo George, 1925-70: Addicott, War-  
ren O. 09392

Higazy, Riad Abdel-Megid: El-Baz, Farouk.  
05951

Jones, Owen Thomas: Pugh, William J. 00800

Kuno, Hisashi: Yagi, Kenzo. 05952

Marliave, Elmer Chester: O'Neill, A. L. 00950

Miller, Buford Maxwell: Kay, Marshall. 00801

Miser, Hugh Dinsmore: Cohee, George V.  
05953

Poldervaart, Arie: Wilcox, Ronald E. 06122

Pruvost, Pierre: Fanshawe, John R. 00802

Rosenholtz, Joseph Leon: Katz, Samuel. 05954

Sayre, Albert Nelson: McGuinness, C. L. 00803

Schoep, Alfred: DeLeenheer, L. 05955

Shepps, Vincent Chester: White, George W.  
00804

Stille, Hans: Brinkmann, Roland. 01118

Stow, Marcellus H.: Spencer, Edgar Winston.  
05956

Stringham, Bronson F.: Lovering, T. S. 05957

Thomas, Horace Davis: McGrew, Paul O. 00805

Thompson, Henry Dewey: VanBurkalow,  
Anastasia. 00806

Treasher, Raymond Clarence: Johnston, Paul M.  
00791

Visher, Stephen Sargent: Meyerhoff, Howard A.  
00808

Warren, Percival Sidney: Stelck, C. R. 05370

Wright, Harold Douglas: Barnard, Walther M.  
05958

**Brachiopoda**

Carboniferous, North America: Carter, John L.  
06770

**British Columbia**

Puget Sound, Pleistocene events and processes:  
Folsom, Michael M. 03410

University research 1969-1970, annotated:  
British Columbia University. 04118

**California**

Lake Tahoe Basin, geology, soils: Matthews, R.  
A. 09441

Publications, Div. Mines and Geology:  
Oakeshott, Gordon B. 04748

**Canada**

Hydrology, 1965-67, selected: Canada Natl.  
Research Council. 10695

Nickel: Canada Geological Survey. 04190

Publications, 1969-70, Geological Survey, ab-  
stracts: Canada Geological Survey. 03050

Quaternary, Lake Agassiz area: Bannatyne, B. B.  
09628

Vertebrata, Cretaceous and Tertiary, western:  
Fox, Richard C. 02298

## Bibliography—Continued

- Carbonate rocks*: LaMoreaux, Philip E. 06734  
*Central America*  
 Mineral deposits: Dengo, Gabriel. 00466  
*Cephalopoda*  
 Ammonoidea, Mesozoic, annotated: Haas, Otto. 02097  
*Coal*  
 Kentucky: Kentucky Geological Survey. 05981  
*Comprehensive*  
 List, selected: Smith, Harriet W. 00123  
*Conodonts*  
 Taxonomy and function, theories: Globensky, Yvon. 03189  
*Deserts*  
 General, 1966-1970: Paylore, Patricia. 11221  
*Energy sources*  
 Selected, annotated: Averitt, Paul. 03878  
*Erosion*  
 North America and British Isles coasts, control: Mitchell, James Kenneth. 10693  
*Foraminifera*  
 Fusulinidae, addendum: Sanderson, G. A. 03543  
 Nonfusulinid, Paleozoic: Toomey, Donald Francis. 02292  
 Recent literature, annotated: Todd, Ruth. 00784  
 Recent literature, annotated: Todd, Ruth. 07189  
*General*  
 1969: Geological Society of America. 04791  
 Geo-Ref, applications: Lloyd, Joel J. 09645  
 Terrain sciences: Eitel, Dean F. 01134  
 U.S. Congress publications, 19th, early 20th centuries: Pestana, Harold R. 00564  
*Geomorphology*  
 Coastal, Latin America: Psuty, Norbert P. 05834  
 Glacial chattermarks, annotated: Laverdiere, Camille. 03128  
*Ground water*  
 Recharge, artificial, 1955-67: Signor, D. C. 00077  
*Gulf Coastal Plain*  
 General, through 1968: Braunstein, Jules. 03731  
*Helium*  
 Occurrence, meteorites, minerals, natural gas: Tully, Philip C. 02839  
*Hydrogeology*  
 United States and Canada, 1966-68: Engineering-Science, Inc. 04518  
*Indexing systems*  
 Computer technique: Smith, Harriet W. 00123  
*Mammalia*  
 Pleistocene local faunas, Tex.-N.Mex.-Nebr.: Hibbard, Claude W. 08053  
*Manitoba*  
 Quaternary: Bannatyne, B. B. 09628  
*Mercury*  
 General: Jonasson, I. R. 04202  
 World literature, annotated: Fleischer, Michael. 05555  
*Missouri*  
 1969: Vineyard, Jerry D. 07540  
*Mollusca*  
 Quaternary, fresh-water, North America, western: Taylor, Dwight W. 07187  
*Nevada*  
 Lake Tahoe Basin, geology, soils: Matthews, R. A. 09441  
*New Mexico*  
 Theses, Inst. Mining and Technology, 1931-69: Youngblood, Irma. 04795  
*New York*  
 Geology, New York City area: Horenstein, Sidney. 11216

## Bibliography—Continued

- North America*  
 General, 1966: U.S. Geological Survey. 03794  
*North Carolina*  
 Water resources inventory of information and data: McJunkin, Frederick Eugene. 10441  
*Oklahoma*  
 1969: Johnson, Kenneth S. 02494  
*Oregon*  
 Geology and mineral resources, 1956-60: Roberts, Miriam 03193  
*Paleobotany*  
 Generic names, index: Andrews, Henry N., Jr. 01880  
*Paleontology*  
 Vertebrata and related subjects: Matsumoto, Mayme. 02714  
*Palynology*  
 Catalogs, cumulative index: Traverse, A. 03886  
*Photogeology*  
 Annotated, of bibliographies: Steiner, Dieter. 06369  
*Protista*  
 Calcareous nannoplankton, index to taxa: Loeblich, Alfred R., Jr. 02144  
 Pyrrhophyta (dinoflagellates), index to genera: Loeblich, Alfred R., Jr. 02096  
*Quebec*  
 Oceanography, Saint Lawrence estuary: Brunel, Pierre. 03234  
*Remote-sensing methods*  
 Annotated, of bibliographies: Steiner, Dieter. 06369  
 Earth resources: U.S. Natl. Aeronaut. and Space Adm. 04589  
 Selected references: Rabchevsky, George A. 07987  
*Rock mechanics*  
 Canadian contributions, 1969: Canadian Adv. Comm. Rock Mechanics. 10669  
*Sedimentary rocks*  
 Minor-element content, marine black shales, related rocks, annotated: Tourtelot, Elizabeth B. 01875  
*Sedimentation*  
 United States and Canada, 1966-68: Engineering-Science, Inc. 04518  
*Shorelines*  
 Quaternary, annotated, 1965-1969: Richards, Horace G. 08190  
*Texas*  
 Cretaceous, Comanche Series, graduate theses: Lokke, Donald H. 10807  
 Cretaceous, Comanche Series, paleontology: Lokke, Donald H. 10806  
*United States*  
 Quaternary, Lake Agassiz area: Bannatyne, B. B. 09628  
 Radioactive occurrences: Krusiewski, S. Victoria. 04101  
*United States Geological Survey*  
 Open-file reports and maps, 1969: Weld, Betsy A. 02036  
*Utah*  
 Theses, annotated: Childers, Barbara S. 07037  
*Vanadium*  
 Geology and resources: Fischer, R. P. 01877  
*Washington*  
 Puget Sound, Pleistocene events and processes: Folsom, Michael M. 03410  
*Wyoming*  
 Geology, 1917-1945: Troyer, Max L. 10270

**Biogeochemical prospecting***Experimental studies*

Gold absorption by plants: Shacklette, Hansford T. 01876

*Methods*

Plant sampling density, heavy metals, mobile laboratories, Ontario: Hornbrook, E. H. W. 06449

Research, data collecting technique, project levels, Canada: Fortescue, J. A. C. 05569

*Plants*

Mercury, abundance, toxicity: Shacklette, Hansford T. 05562

*Practice*

Application, research, activity, training, Canada: Warren, H. V. 10781

*Soils*

Trace elements, relation to concentration in plants: Hodgson, J. F. 07421

*Uranium*

Plant ash, fluorimetric method: Huffman, Claude, Jr. 01482

**Biogeochemical surveys***Alaska*

Bokan Mountain area, U in plants, stream sediments: Eakins, Gilbert R. 07251

*Arizona*

Oracle area, metals, mesquite ash: Brown, R. G. 02979

*British Columbia*

Huckleberry Mountain, Cu-Mo, methods: Hornbrook, E. H. W. 03151

Southwestern, plant life on serpentines: Kruckeberg, Arthur R. 10250

*Ontario*

Chalk River area, heavy metals: Hornbrook, E. H. W. 06449

Charters-Donovan Townships, Timiskaming District, Co in aspen twigs: Wolfe, W. J. 02734

Whitson-Van Nostrand Townships, Co in aspen and birch twigs: Wolfe, W. J. 02516

*United States*

Basin and Range, lithium, plants, sediments: Cannon, Helen L. 06087

Northwestern, plant life on serpentines: Kruckeberg, Arthur R. 10250

**Biography**

*Aurin, Fritz Love*: Clark, Stuart K. 02077

*Bell, Walter Andrew*: Nowlan, J. P. 02178

*Beltz, Edward W.*: Kotick, Ottmar F. 04810

*Bradley, Everett L.*: Bear, Melvern F. 01423

*Brockamp, Bernhard*: Thyssen, F. 03017

*Butler, Bertram Theodore*

Bibliography: O'Connell, Daniel T. 05948

*Clinkscates, Albert Sidney*: Sears, Joe M. 02340

*Coates, James Aubrey*: McTaggart, K. C. 03273

*Cummings, Edgar Roscoe*

Bibliography: Shrock, Robert R. 00792

*Darwin, Charles*

Theory of evolution, controversy, 1859-82: Vorzimmer, Peter J. 10895

*Davidson, Charles Findlay*

Bibliography: Nolan, Thomas B. 00793

*Davis, Thornton*: Thompson, Wallace C. 02341

*Day, Willard L.*: Barker, James C. 02469

*DeGolyer, Everette Lee*: Tinkle, Lon. 08282

*DeLury, Justin Sarsfield*: Brownell, G. M. 08172

*Denning, Reynolds McConnell*

Bibliography: Wilson, James T. 00794

**Biography - Continued**

*Dobbin, Carroll Edward*

Bibliography: Brainerd, Arthur E. 00795

*Dunn, Paul Heaney*

Bibliography: Laswell, Troy J. 00796

*Dyson, James Lindsay*

Bibliography: Socolow, Arthur A. 00797

*Ellis, Charles W., Jr.*: Weimer, R. J. 05351

*Fettke, Charles R.*: Finn, Fenton H. 07560

*Fraser, Horace John*

Bibliography: Mitchell, G. P. 05949

*Frost, Jack*: Heard, Nancy. 02342

*Graham, Joseph John*

Bibliography: Keen, A. Myra. 00798

*Grimes, Russell Winters*: Grimes, Mollie J. 05183

*Hallimond, Arthur Francis*

Bibliography: Smith, W. Campbell. 05950

*Ham, William E.*: Johnson, Kenneth S. 07556

*Harrison, John Albert*

Bibliography: Simon, Jack A. 00799

*Hatfield, Willis Charles*: Notestein, Frank B. 05184

*Higazy, Riad Abdel-Megid*

Bibliography: El-Baz, Farouk. 05951

*Hobbs, William Herbert*: Laursen, Dan. 00844

*Humboldt, Alexander von*

American work and travels: Wilhelmy, H. 04792

*Hutton, James*

Playfair's biography, reprinting: White, George W. 08178

*Illing, Vincent Charles*: Kugler, Hans G. 01131

*Jewett, John M.*

--: Skinner, Hubert C. 10341

*Johnson, Norman Lee*: Riker, E. P. 06334

*Riker, Edward P.* 05352

*Jones, Owen Thomas*

Bibliography: Pugh, William J. 00800

*Kuno, Hisashi*

Bibliography: Yagi, Kenzo. 05952

*Landes, Robert William*: Layer, D. B. 02161

*Lawson, Andrew C.*

--: Vaughan, Francis E. 09925

*Maebius, Jed B.*

--: Newcombe, R. B. 00401

*Marliave, Elmer Chester*

Bibliography: O'Neill, A. L. 00950

*McFerron, George Irwin*: Weems, John H. 01425

Weems, John H. 02343

*Miller, Buford Maxwell*

Bibliography: Kay, Marshall. 00801

*Miller, Willet Green*

Ontario's first Provincial Geologist: Thompson, J. E. 09626

*Miser, Hugh Dinsmore*

Bibliography: Cohee, George V. 05953

*Moore, Gilbert Parvin*: Norton, George H. 04811

*Moorhouse, Walter Wilson*: Nuffield, E. W. 08173

*Nicholson, Alex., Jr.*: Mankin, Charles J. 06237

*Nicollet, Joseph Nicolas*: Bray, Martha Coleman. 00423

*Noble, Earl Bart*: Wissler, Stanley G. 04812

*Norvang, Aksel*: Roen, Ulrik. 04813

*Petsch, Arthur Henry*: Thomas, W. A. 02345

*Poldervaart, Arie*

Bibliography: Wilcox, Ronald E. 06122

*Pruvost, Pierre*

Bibliography: Fanshawe, John R. 00802

*Reed, Lyman Coleman*: Cook, Carroll L. 04814

*Rosenholtz, Joseph Leon*

Bibliography: Katz, Samuel. 05954

## Biography—Continued

- Row, Charles Herbert*: Coldwell, Charles H. 04815
- Sayre, Albert Nelson*  
Bibliography: McGuinness, C. L. 00803
- Schmitt, Harrison A.*  
Bibliography: Woodward, Lee A. [?]. 08670
- Schoep, Alfred*  
Bibliography: DeLeenheer, L. 05955
- Shead, Arthur Curtis*: Goodman, George J. 07634
- Shepps, Vincent Chester*  
Bibliography: White, George W. 00804
- Speed, Carleton D., Jr.*: Eby, J. Brian. 03661
- Meyer, Willis G.* 02344
- Sproule, John Campbell*: Kupsch, W. O. 08174
- Link, T. A.* 05185
- Link, T. A.* 05288
- Sternberg, George Fryer*: Walker, Myrl V. 00421
- Stille, Hans*  
Bibliography: Brinkmann, Roland. 01118
- Stow, Marcellus H.*  
Bibliography: Spencer, Edgar Winston. 05956
- Stringham, Bronson F.*  
Bibliography: Lovering, T. S. 05957
- Teas, Livingston Pierson*: Carsey, J. Ben. 04152
- Thomas, Horace Davis*  
Bibliography: McGrew, Paul O. 00805
- Thompson, Henry Dewey*  
Bibliography: VanBurkalow, Anastasia. 00806
- Todd, Thomas W.*: Miller, D. N., Jr. 02078
- Treasher, Raymond Clarence*  
Bibliography: Johnston, Paul M. 00791
- Trice, Edwin Leslie, Jr.*: Muehlberger, William R. 00807
- Visher, Stephen Sargent*  
Bibliography: Meyerhoff, Howard A. 00808
- Voloshin, Vadim*: Scott, Ralph G. 07142
- Wadsley, Arthur David*: Newnham, Ivan. 02809
- Warren, Percival Sidney*: Stelck, C. R. 08175
- Bibliography: Stelck, C. R. 05370
- Whitehead, Walter Lucius*  
--: Shrock, Robert R. 10967
- Wisser, Edward H.*: Hollister, Victor F. 02346
- Wright, Harold Douglas*  
Bibliography: Barnard, Walther M. 05958
- Zeller, Robert A., Jr.*: Wengerd, Sherman A. 08671
- Bismuth**
- Alaska*  
Occurrence, map: Cobb, Edward H. 06428
- Analysis*  
Neutron activation, chondrites: Laul, J. C. 00955
- Geochemistry*  
Chondrites, analyses: Laul, J. C. 00955
- United States*  
Resources, reserves, production: Persse, Franklin H. 00473
- Bitumens**
- Geochemistry*  
Chemical structures, proton magnetic resonance: Speight, J. G. 02117
- Trinidad*  
Pitch Lake, general description: Barash, M. S. 00830
- Utah*  
Uintah-Grand Counties, Green River Fm., tars, genesis: Gwynn, John Wallace. 07295
- Blastoides**
- Mississippian*  
Nevada, Indian Springs Fm., n. spp., index value: Webster, G. D. 01208

**Boron***Analysis*

Silicates, spectrographic vs. colorimetric techniques: Schleicher, John A. 07250

*California*

Death Valley area, mines and mineral deposits: Clark, William B. 03863

Death Valley, Furnace Creek borate area, occurrence, mineralogy: McAllister, James F. 08689

*Geochemistry*

Arid-zone soils, ferromagnesian minerals, adsorption: Rhoades, J. D. 07628

Oceanic crust, serpentinites, metabasalts: Thompson, Geoffrey. 02025

Shale, continental, anomalous content, Colorado: Cody, Robert D. 03608

**Boulders***Erratic*

Virginia, Christiansburg area, thrust sheets: Glass, F. R., Jr. 05425

*Iowa*

Iowan drift, granite, large, Minnesota source: Dirks, Richard A. 03654

*Precambrian*

Quebec, Obalski Township, Proterozoic? conglomerate: Duquette, Gilles. 06757

*Provenance*

Oklahoma-Arkansas, Johns Valley Fm.: Shideler, Gerald L. 07554

**Brachiopoda***Atrypa hystrix*

Devonian, Iowa, Lime Creek Fm., Cerro Gordo Member: Simon, D. E. 03659

*Bibliography*

Carboniferous, North America: Carter, John L. 06770

*Carboniferous*

North America, bibliography and index: Carter, John L. 06770

*Clintonella*

Silurian, Middle, New York, redescription, rhynchonelliform atrypid: Boucot, A. J. 04713

*Cretaceous*

Texas, Georgetown Limestone equivalents, north-central: Slocki, Stanley F. 10800

*Crurithyris subfissa*, new name

Devonian, Nevada, West Range Limestone: Johnson, J. G. 05811

*Cryptothyrella*

Silurian, Ohio-Kentucky, Brassfield Ls., shell structure: Gauri, K. L. 00550

*Devonian*

Nevada, central, early Middle, zonation, n. spp.: Johnson, J. G. 01205

Nevada, central, Lower, zonation, n.spp.: Johnson, J. G. 05567

Nevada, Nevada Group, zoning: Murphy, Michael A. 00041

New York, Green Pond outlier, Lower: Boucot, Arthur J. 08184

New York, shell morphology, environmental relations, Helderberg Group: Epstein, Claude M. 00695

North America, Taghanic Stage, western, descriptions: Johnson, J. G. 02395

Yukon, Michelle Fm., Ogilvie Mts., biostratigraphy: Ludvigsen, Rolf. 05369

*Discomyorthis*, n.gen.

Devonian, Lower, Nevada, central: Johnson, J. G. 05567

## Brachiopoda — Continued

- Dubaria megaeroides*, n. sp.  
Silurian, Nevada, central, Tor Limestone: Johnson, J. G. 01206
- Glypterina*, n. gen.  
Ordovician, worldwide, for pre-Silurian ptychopleurellids: Boucot, A. J. 04721
- Kingena wacoensis*  
Cretaceous, Texas, Georgetown Ls., central: Dixon, James W. 10802
- Kingeninae* Elliott  
Revision, description, illustrations: Owen, Ellis Frederic. 10932
- Leptathyris circula* zone  
Devonian, early Middle, Nevada, central, zonation, n. spp.: Johnson, J. G. 01205
- Leptocoelina squamosa*, n. gen., n. sp.  
Devonian, Lower, Nevada, central: Johnson, J. G. 05567
- Lyttoniacea*  
Paleozoic, paleoecology, morphology, cf. modern *Tridacna*: Cowen, Richard. 08328
- Morphology**  
Covariance structure, morphometric analysis: Reymont, Richard Arthur. 10630  
Prismatic shell layer in articulate, origin: Gauri, K. L. 10327
- Neochonetes granulifer*  
Pennsylvanian-Permian, Kansas, evolution, geographic variation: Spencer, R. S. 05801
- Ordovician**  
Appalachians, central, Upper, paleoecology, subltloral: Bretsky, Peter William, Jr. 07462  
Illinois, Missouri, Edgewood Fm., Ashgillian fauna: Amsden, Thomas W. 06042  
Indiana, Richmond Group, paleoecology, analysis: Fox, William T. 08507  
Nevada, Lower, Middle, taxonomy: Ross, Reuben James, Jr. 05485  
Northern Hemisphere, Middle, Whiterock stage, faunal correlation: Ross, Reuben James, Jr. 00209  
Oklahoma, Missouri, Tennessee: Alberstadt, Leonard P. 00667  
United States, Late, costation, geographic variations: Howe, Herbert J. 02634  
United States, Middle, Upper, morphology: Howe, Herbert J. 00717  
Wyoming, Bighorn Fm., upper: Macomber, R. W. 02087
- Oxoplectra gouldi*  
Ordovician, Oklahoma, Bromide Fm., microstructure: Wright, Anthony D. 05887
- Permian**  
Canadian Arctic cf. Australian, continental drift relations: Waterhouse, J. B. 10112  
Guatemala, Huehuetenango, Chochal Ls., Leonard age: Stehli, Francis G. 00547  
Texas, western, nomenclature, type selections: Cooper, G. Arthur. 02100
- Precambrian**  
Virginia, Mount Rogers Volcanic Group: Bartlett, C. S., Jr. 05414
- Pseudoparazyga*, n. gen.  
Devonian, Lower, Nevada, central: Johnson, J. G. 05567
- Quaternary**  
Modern habitats cf. Paleozoic, lingulids: Paine, Robert T. 01367
- Richthofeniacea**  
Paleozoic, paleoecology, morphology, cf. modern *Tridacna*: Cowen, Richard. 08328

## Brachiopoda — Continued

- Silurian**  
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 Northeastern, Prince George-Jasper (Alberta) area: Campbell, R. B. 07899  
 Peace River, Pine Pass, Yellowhead area, guidebook: Bush, Gordon L. 07892  
 Southeastern, lead-zinc deposits, guidebook: Society of Economic Geologists. 04909  
 Vancouver Island and Gulf Islands: Muller, J. E. 04440

*Earthquakes*

- 1967, August swarm, Queen Charlotte Islands fracture zone: Wetmiller, Robert J. 10300  
 Effects, 1964 Alaskan, tsunami, Alberni Inlet: Murty, T. S. 06646  
 Mount Edziza area, seismicity, microearthquake study: Milne, W. G. 07688

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 Lead-zinc, southeastern: Society of Economic Geologists. 04909  
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- Metals, Peachland and Highland Valley areas, exploration history: Stevenson, William G. 04299  
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 Mineral resources, potential, probability analysis: Barry, George S. 10671  
 Mineral resources, review, 1969: British Columbia Department of Mines. 04967  
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 Tungsten, Salmo area, Invincible ore zone: Pastoor, D. W. 04917

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- Dams, W.A.C. Bennett Dam, Peace River Canyon: Jory, Lisle T. 07894  
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 Slope stability, open-pit mines, case studies: Brawner, C. O. 05509  
 Soils, strength tests, Mica Dam site, Columbia River: Skermer, N. A. 02893

*General*

- Bibliography, annotated, University research 1969-1970: British Columbia University. 04118  
 Bibliography, Puget Sound, Pleistocene events and processes: Folsom, Michael M. 03410

*Geochemistry*

- Bluebell mine, fluid inclusions: Ohmoto, Hiroshi. 04416  
 Coast Ranges, quartz diorite stock, garnets, electron probe study: Warren, Richard C. 01847  
 Craigmont, copper deposits, isotopes: Folinsbee, R. E. 03485  
 Craigmont, copper deposits, isotopes: Schau, M. P. 03484  
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 Huckleberry Mountain Cu-Mo deposit, biogeochemical prospecting: Hornbrook, E. H. W. 03151  
 Irishman Creek sill, amphibole, metamorphism, effects: Hunt, Graham. 00788  
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- Fiord region, cf. Chile, relation to world rift system: Bostrom, R. C. 06392  
 Shuswap River, drainage, late Pleistocene history: Smith, Geoffrey W. 09407  
 Shuswap River drainage, surficial geology: Smith, Geoffrey Wayne. 00533  
 Southwestern, Manning Park, Lightning Creek Valley: Mathews, W. H. 10249

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- Cascade Mountains, seismic, crustal studies: Johnson, Stephen H. 04334

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 Northeastern, magnetotelluric data, Triassic-Paleozoic dip line sections, resistivities: Densmore, A. A. 09376  
 Project Edzoe, refraction data, deconvolution: Berry, Michael J. 00229  
 Revelstoke to Vancouver Island, seismic: Jacoby, Wolfgang R. 01931  
 Western, crustal thickness, seismic refraction: Couch, Richard. 10565  
 Western, geomagnetic-depth sounding, anomalies: Cochran, N. A. 08139

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- Columbia Icefield and outlet glaciers: Harrington, Lyn. 03528  
 Fraser Valley area, ice movement from till fabric: Roberts, M. C. 08136  
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 Southern and Queen Charlotte Islands, Pleistocene, stages: Nasmith, Hugh. 10392  
 Southern, end moraines, ice-cored, airphoto interpretation: Ostrem, G. 06828

*Hydrogeology*

- Kootenai River valley, Libby Reservoir bank storage, model study: Coffin, Donald L. 05445  
 Kootenay Park, Paint Pots, acid waters, heavy metals: vanEverdingen, R. O. 08057  
 Okanagan Highland, Trapping Creek basin, ground-water flow, analysis: Lawson, D. W. 08473

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- Cariboo Mountains: Campbell, R. B. 03277  
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 Pine River valley: Bush, Gordon L. 07892  
 Quesnel trough area: Campbell, Richard B. 04302  
 Vancouver Island and Gulf Islands, Nanaimo Group: Muller, J. E. 04440

*Maps, geologic index*

- Sheet 93: Canada Geological Survey. 02768  
 Sheets 94 and 103: Canada Geological Survey. 01259  
 Southeastern, Sheet 82: Canada Geological Survey. 00398

*Maps, glacial*

- Southern, glaciers and moraines: Ostrem, G. 06828

*Maps, glaciers*

- Topographic surveys: Reid, I. A. 04807

*Maps, gravity*

- Juan de Fuca Strait: Stacey, R. A. 09778  
 Strait of Georgia: Stacey, R. A. 09778

*Maps, magnetic*

- Ankwill Creek area, airborne: Canada Geological Survey. 01038

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- Gunanoot Lake area, airborne: Canada Geological Survey. 01040  
 Hazelton area, airborne: Canada Geological Survey. 02326  
 Hilary Lake area, airborne: Canada Geological Survey. 01043  
 Juan de Fuca Strait: Stacey, R. A. 09778  
 Kenny Creek area, airborne: Canada Geological Survey. 01037  
 Kisgegas area, airborne: Canada Geological Survey. 01041  
 Kotsine River area, airborne: Canada Geological Survey. 01044  
 Lion Creek area, airborne: Canada Geological Survey. 01045  
 Nilkitwa River area, airborne: Canada Geological Survey. 01039  
 Ogden Creek area, airborne: Canada Geological Survey. 01046  
 Shedin Creek area, airborne: Canada Geological Survey. 01042  
 Strait of Georgia: Stacey, R. A. 09778

*Maps, oil and gas*

- Northeastern pools: Ball, N. L. 08170

*Maps, structure*

- Kootenay arc: Ross, John V. 03278

*Paleomagnetism*

- Miocene, late, lava flows, gabbro plugs, field intensity: Symons, D. T. A. 07676

*Paleontology*

- Cephalopoda, Jurassic, Pliensbachian ammonoids, northern: Frebold, Hans. 08479  
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Lower Belt-Purcell Supergroup, turbidites: Bishop, Donald. 06064

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Triassic, Nicola Group, south-central: Schau, Mikkel Paul. 01579

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Southeastern, Shuswap metamorphic complex: Reesor, J. E. 03276

Southern, Manning Park area: Coates, J. A. 03283

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Stephen-Dennis fault, nonexistence: Cook, Donald G. 03029

Sukunka area, folds, faults: Matwe, L. 07893

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*Batostoma? cornula*, n.comb.

Ordovician, Upper, Illinois, intrazoocelial spines, structure: Corneliusen, Eric F. 05870

*Calopora* Hall

Paleozoic, lower, nomenclature: Ross, June R. P. 03545

*Cheilostomata*

Miocene, Florida, northwestern, paleoecology: Scliaro, Reginald J. 03432

Skeletons, Ca, Mg, Sr, P, microprobe analysis: Schopf, Thomas J. M. 03345

*Dianulites utahensis*, n.sp.

Ordovician, Utah, Millard County, Pogonip Group: Hinds, Robert W. 04136

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- Hallopora* Bassler  
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Alberta, Pekisko Fm., 'Waulsortian' carbonate mound: Morgan, G. R. 02159
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Cheilostomes, skeletal structure and development: Sandberg, Philip A. 09554
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Kentucky, Lexington Limestone, biostratigraphy: Karklins, Olgers L. 00728  
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- Phyllocictya crystalaria*, n.sp.  
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- Pseudotrictoporella typicalis*, n. gen., n. sp.  
Ordovician, New York-Ontario, Rockland Fm.: Ross, June Phillips. 01271
- Rhombopora lepidodendroides* Meek  
Pennsylvanian, Upper, Nebraska, variability, lectotype: Huffman, Samuel F. 03537
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## Isotopes

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## California

## Absolute age

- Borax Lake area, obsidian artifact: Meighan, Clement W. 00980  
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Mesozoic granitic rocks, intrusive epochs: Evernden, J. F. 00207  
Mono Lake area, Wilson Creek Fm., C-14, paleomagnetism: Denham, Charles R. 10488  
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Sacramento area, Riverbank-San Joaquin soil, vertebrate bones: Hansen, R. O. 03406  
Saline Range-Inyo Mountains region, trachyan-desite, volcanics: Ross, Donald C. 02154  
Searles Lake, saline deposits, Th-U: Goddard, John G. 06991  
Sevier orogenic belt, thrust faulting: Fleck, R. J. 02371  
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Agua Tibia Primitive area: Irwin, William P. 02334  
Bolsa-Sunset area: California Dept. Water Resources. 09173  
Bradley, San Miguel, Adelaida, Paso Robles quadrangles: Burch, Stephen H. 01432  
Central, Coast Ranges, field trip: Dickinson, William R. 11228  
Cummings Mountain quadrangle: Dibblee, T. W., Jr. 08015  
Death Valley area, guidebook: Geological Society of Sacramento. 03951  
Diablo Canyon Nuclear Power-Plant Site, field trip guide: Jahns, Richard H. 11229  
Emigrant Basin primitive area: Tooker, E. W. 02030  
Hayward-Hollister field trip: Nason, Robert D. 11230  
Klamath Mountains: Irwin, W. P. 09430  
Klamath Mountains, Castle Crags area: Aune, Quintin A. 09429  
Lake Tahoe basin: Crippen, J. R. 03056

**California—Continued***Areal geology—Continued*

- Lassen Peak-Burney Falls-Lake Shasta area, guidebook: Geological Society Sacramento. 09910
- Mojave Desert: Dibblee, T. W., Jr. 04806
- Nicasio Valley: Twiss, Robert. 06920
- Peninsular Ranges: Peterson, G. L. 02995
- Popular account: Camp, Charles L. 11270
- San Andreas 15-minute quadrangle: Clark, Lorin D. 08182
- San Bernardino Mountains, north flank: Hollenbaugh, Kenneth M. 00287
- San Francisco Bay, geomorphology, earthquake effects, mud fill, ground water, subsidence: Goldman, Harold. 09389
- Santa Barbara Channel, environment, geologic effects of oil spill: Kolpack, Ronald L. 11268
- South Fork Eel River area, water development projects: California Dept. Water Resources. 09504
- Southern, Transverse Ranges: Dibblee, T. W., Jr. 00452
- Tehachapi quadrangle: Dibblee, T. W., Jr. 08028
- Yosemite Valley, popular account: Oakeshott, Gordon B. 02806

*Earthquakes*

- 1906, April 18, atlas of maps and seismograms: Lawson, Andrew C. 10896
- 1968, April 8, Borrego Mountain, ground effects: Youd, T. Leslie. 03626
- 1968, April 9, Borrego Mtn., aftershocks, location method: Hamilton, Robert M. 03583
- 1968, April 9, Borrego Mtn., ground motion: Housner, G. W. 03031
- 1968, April 9, Borrego Mtn., seismograph records, analysis: Maley, Richard P. 09658
- 1968, April 9, southern, Borrego Mtn., geologic effects: Clark, M. M. 10824
- 1970, Danville swarm, magnitude, relation to frequency: Bufo, Charles G. 06808
- 1969, Death Valley area, microearthquake seismicity: Gumper, Frank J. 01918
- 1968, December 4, microearthquake aftershocks: Zanetti, John. 00394
- 1971, February 9, San Fernando: Earthquake Notes. 07882
- 1940, Imperial Valley, energy release study: Trifunac, Mihailo D. 03356
- 1920, June 21, Inglewood, magnitude: Richter, C. F. 03511
- 1966, June 28-29, Parkfield, focal depths: Bakun, William H. 10546
- 1970, May to July, Danville area, Pleasanton fault, extension: Lee, W. H. K. 10547
- 1969, October 1, Santa Rosa: Cloud, W. K. 00858
- 1969, October 1, Santa Rosa, aftershocks: Unger, John D. 00384
- 1969, October 1, Santa Rosa, engineering aspects: Steinbrugge, Karl V. 08636
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- 1966, Parkfield, acceleration component, analysis: Trifunac, M. D. 03032
- 1966, Parkfield, ground accelerations: Trifunac, M. D. 00380
- 1966, Parkfield-Cholame, aftershocks: Eaton, J. P. 04420

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- 1968, Santa Barbara Channel swarm: Sylvester, Arthur G. 04332
- 1925, Santa Barbara, Sheffield Dam failure, analysis: Seed, H. Bolton. 05507
- 1966, Sept. 12, Truckee, source mechanism: Tsai, Yi-Ben. 04333
- Borrego Mountain, aftershocks: Wyss, Max. 02005
- Central, seismic risk, strain rate, creep on faults: Scholz, C. H. 03559
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- Northern, coastal areas, seismicity: Seeber, Leonardo. 01976
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- Shallow, long-period SH<sub>1</sub> wave forms: Filson, John. 04336
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- Gold, occurrence: Clark, William B. 02777
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Dams, Sheffield, failure during earthquake, analysis: Seed, H. Bolton. 05507

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Diablo Canyon Nuclear Power-Plant Site, field trip guide: Jahns, Richard H. 11229

Earthquakes cf. explosions, ground motion, San Francisco Bay area: Borchardt, R. D. 03352

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Shorelines, San Francisco Bay area, planning program: Assoc. Bay Area Governments. 10388

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- Waterways, stream-bed roughness, Manning coefficient: Limerinos, J. T. 07489

*General*

- Bibliography, Lake Tahoe Basin, geology, soils: Matthews, R. A. 09441
- Bibliography, publications of Div. Mines and Geology: Oakeshott, Gordon B. 04748
- Digital mapping program: Chambers, Charles E. 01595
- Division of Mines and Geology, Geological Hazards Program: Oakeshott, Gordon B. 05573
- Education, Bakersfield College, geologic technician course: Karp, Stanley E. 02407
- Geologist's Act, 1968, provisions: Peak, Wilfred W. 01589
- Index to graduate theses, 1968: McClure, Duane. 04437
- Jet Propulsion Laboratory, Earth Resources Program 1969: Blinn, John C., 3d. 08085

*Geochemistry*

- Cascade Range, lavas, Sr isotopes, mantle source: Peterman, Zell E. 00038
- Central, granitic rocks, K-Rb ratios: Dodge, F. C. W. 06211
- Coast Ranges, blueschist, inclusions, element distribution: Ernst, W. G. 05894
- Franciscan rocks, lead isotopes: Sinha, A. K. 01833
- Kaiser Peak quadrangle, granitic, metamorphic rocks, analyses: Bateman, Paul C. 04014
- Madera County, basalt flow, analysis, not "Catoctin schist": Hooker, Marjorie. 06173
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- Saline Range-Inyo Mountains region, trachyan-desite, volcanics, analyses: Ross, Donald C. 02154
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- Coastal, littoral drift, heavy minerals as indicators: Judge, C. W. 08318
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- Dry Creek, bed-load movement: Keller, E. A. 08554
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- Great Valley, relic eolian features: Christian, Louis B. 05117
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- Lake Tahoe, Pleistocene history, sediments: Hyne, Norman John, Jr. 07276
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- Marin County, Rodeo Lagoon, barrier beach, tidal inlets, storm wave genesis: Hill, Mary R. 06570
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- Mojave Desert, dune formation ground-water effect: Groat, Charles G. 00484
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- Mojave Desert, stream channels, cf. lunar rilles: Burke, J. D. 01287
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- Monterey Bay, sedimentation, shelf region: Wolf, Stephen C. 03734
- Monterey Deep-Sea Fan, fan-valley genesis: Normark, W. R. 06816
- Owens Lake outlet, Pleistocene, fossil falls: Hafer, George. 04410
- Race Track playa, tracks, origin, ice cake hypothesis: Howell, Paul W. 04360
- Redondo Beach, rip currents, transport, sedimentation: Cook, David O. 06340
- Redondo submarine fan, morphologic segments, environments: Haner, Barbara E. 07007
- San Bernardino County, mudflows, 1969: Morton, D. M. 00319

**California—Continued***Geomorphology—Continued*

- San Dimas Experimental Forest, basin physiography, factor analysis, flood prediction: Rice, Raymond M. 08467
- San Francisco Bay area, coastline study: Assoc. Bay Area Governments. 10388
- San Francisco Bay, shore features, marshes and mudflats, ecological aspects: Harvey, H. Thomas. 09388
- Santa Barbara Basin, flood sediment, transport and deposition: Drake, David E. 10520
- Searles Lake playa, tufa pinnacles, genesis: Flint, Gordon W. 06372
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- Southern, offshore sand transport, shoaling waves: Cook, David Olney. 07351
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- Southern, watershed erosion, vegetation changes, effects: Orme, Antony R. 00330
- Stream runoff, relation to channel geometry: Hedman, E. R. 03793
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- White Mountains, Milner Creek alluvial fan, growth, rate: Beatty, Chester B. 00058
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- Continental shelf off San Francisco, seismic, crustal structure: Cooper, Alan K. 10513
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- Mono Basin, gravity, seismic, revised interpretation: Christensen, M. N. 03677
- Mono Basin, gravity, seismic, revised interpretation: Pakiser, L. C. 03676
- Mono Basin, shoreline springs, infrared: Lee, Keenan. 06020
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- Monterey Deep-Sea Fan, fan-valley genesis, seismic: Normark, W. R. 06816
- Mount Lassen area, multifrequency microwave radiometry: Blinn, John C., 3d. 02851
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- San Jacinto fault zone, gravity, interpretation: Bartholomew, M. J. 04956
- San Jacinto fault zone, stress measurement: Aki, Keiiti. 00219
- Santa Lucia Range, Franciscan serpentinite bodies, gravity: Grannell, Roswitha Barenberg. 07367
- Santa Lucia Range, southern, serpentinite, gravity: Grannell, Roswitha B. 00273
- Seismic data, cooperative exchange with Nevada: Hofmann, R. B. 00286
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- Lake Tahoe basin: Crippen, J. R. 03056
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- Mojave Desert, Troy Playa: Groat, Charles G. 06524
- Mojave River basin, ground-water recharge, nuclear subsidence craters: Downs, Charles E. 10560
- North coastal area, data, 1968: California Dept. Water Resources. 02967
- Northeastern, ground-water levels, quality, basic data 1968: California Dept. Water Resources. 07863
- Owens Valley, alluvial faults, recharge, extraction, salvage: Williams, Dennis E. 04427
- San Joaquin Valley, ground-water levels, quality, basic data 1969: California Dept. Water Resources. 07864
- San Joaquin Valley, Wheeler Ridge alluvial fans, aquifer compaction, surface tilting: Riley, Francis S. 01507
- South Fork Eel River area, water development projects: California Dept. Water Resources. 09504
- Southern, ground-water levels: California Dept. Water Resources. 02968
- Southern, ground-water quality, 1968: California Dept. Water Resources. 00422

*Maps, geologic*

- Agua Tibia Primitive area: Irwin, William P. 02334
- Bradley, San Miguel, Adelaida, Paso Robles quadrangles: Burch, Stephen H. 01432
- Coast Ranges, Goat Mtn. and San Luis Flat-Pacheco Pass areas: Ernst, W. G. 05079
- Cummings Mountain quadrangle: Dibblee, T. W., Jr. 08015
- Daggett quadrangle: Dibblee, T. W., Jr. 05615
- Death Valley area: Geological Society of Sacramento. 03951
- Death Valley, Furnace Creek borate area: McAllister, James F. 08689
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- Mesozoic granitic rocks, distribution: Evernden, J. F. 00207
- Nicasio Valley: Twiss, Robert. 06920
- Olaf P. Jenkins edition, 1958-1969: California Div. Mines and Geology. 09923
- Paraiso Springs quadrangle: Durham, David L. 02333
- San Andreas 15-minute quadrangle: Clark, Lorin D. 08182
- Santa Lucia Range, Ventana Cones area: Wiebe, Robert A. 00030
- Senator Wash Dam and Dikes: U.S. Bureau of Reclamation. 06921
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- Bradley, San Miguel, Adelaida, Paso Robles quadrangles: Burch, Stephen H. 01432

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- Agua Tibia Primitive area, airborne: Irwin, William P. 02334
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- Gold, districts: Clark, William B. 02777

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- Cholame Valley to Tejon Pass, recent fault breaks: Vedder, J. G. 04344
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- Albite, Tiburon Peninsula, glaucophane schist, structure: Starkey, J. 03555
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- Kornelite, Coso Hot Springs, new occurrence: Weber, Dwight. 00124
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- Modal data, granitic rocks, Kaiser Peak quadrangle: Bateman, Paul C. 04014
- Plagioclase, El Dorado County, Pine Hill intrusion: Springer, Robert K. 00368
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## California—Continued

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Cephalopoda, Jurassic-Cretaceous, biostratigraphy, descriptions: Imlay, Ralph W. 01431

Collecting, Humboldt County, Eel River, Scotia-Rio Dell area, Pliocene: Pugh, Wally. 03869

Diatoms, Protista, Miocene, Newport Beach, electron microscopy: Wornardt, W. W., Jr. 01686

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 Mineral resources, production 1969, future possibilities: Mining in Canada. 01727  
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 Bibliography, hydrology, 1965-67: Canada Natl. Research Council. 10695  
 Bibliography, hydrology and sedimentation, 1966-68: Engineering-Science, Inc. 04518  
 Bibliography, Quaternary, Lake Agassiz area: Bannatyne, B. B. 09628  
 Bibliography, rock mechanics, 1969: Canadian Adv. Comm. Rock Mechanics. 10669  
 Canada Geological Survey, storage, retrieval, geologic data: Robinson, S. C. 08724  
 Current research, geologic and geophysical, Cordillera, western: Wheeler, J. O. 03476  
 Current research, geologic exploration, Appalachian region: Poole, W. H. 03569  
 Current research, geologic, geophysical, Cordillera, eastern: Norris, D. K. 03477  
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 Gravity field, research, development, activities, trends: Tanner, J. G. 10774  
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 Index to geoscience data, storage, retrieval system: McGee, Brian A. 09653  
 List of translations, Geological Survey library: Swirsky, Lillian. 10984  
 Publication list, Geological Survey of Canada, 1959-69: Canada Geological Survey. 07798  
 Publications, 1969-70, Geological Survey, abstracts: Canada Geological Survey. 03050  
 Publications list, 1969-70, Geological Survey: Canada Geological Survey. 04099  
 Research, 1969-70: Henderson, J. F. 07194  
 Research, Geological Survey, 1969: Blackadar, R. G. 00001  
 Research, Geological Survey, 1969-70: Canada Geological Survey. 04098  
 Research in geomagnetism, applications, activities, trends: Carmichael, C. M. 10772

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- Appalachian region, sulfides, trace elements, partitioning: Dastidar, Priyabrata Ghosh. 00542  
 Biogeochemical research, trace-element role in earth science: Warren, H. V. 10781  
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- Magnetic and gravity anomalies: Douglas, R. J. W. 08007

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- Mapping status, 1969, magnetic, geologic: Canada Geological Survey. 03054

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- General: Douglas, R. J. W. 08007  
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San Saba County, western, stratigraphy: Turner, Neil Lee. 07363

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Northeastern, microseismicity: Murphy, Andrew J. 03829

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Bibliography, coastal geomorphology: Psuty, Norbert P. 05834

Geological research, status, Dec. 1970: Moussa, Mounir T. 08317

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Humid zones, karst features, comparison, processes: Corbel, J. 08201

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Cenozoic, deep-sea cores, biostratigraphy: Bukry, David. 07643  
Pliocene-Pleistocene boundary, criteria: Bock, Wayne D. 04994

*Structural geology*

- Basin, origin, development, research review: Ewing, J. I. 09719  
Beata Ridge, crustal structure and evolution: Fox, Paul J. 08600  
Eastern margin, Lesser Antilles arc, geologic, geophysical data review: Bunce, Elizabeth T. 09720  
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*Catalogs**Canada*

- Minerals: Traill, R. J. 04617

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- California Academy of Sciences: Zullo, Victor A. 03797

*Paleobotany*

- Mesozoic and Cenozoic plants, North America, proposed: Becker, Herman F. 04215  
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*Samples and cores*

- Kentucky Geological Survey well file: Schwalb, Howard R. 06395

*Texas*

- Water oriented data, Canadian River basin: Texas Planning Agency Council. 04789

*Trilobita*

- Field Museum of Natural History, Chicago: Nitecki, Matthew H. 05819

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- Cave Research Foundation, organization: Smith, P. M. 04005  
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Salts Cave, mineralogy, water-soluble sulfates: White, William B. 09074

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Western Grand Canyon area, basalt flows, ero-  
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Western Grand Canyon region, basalts: Best, M.  
G. 06926  
Western Grand Canyon region, faulting, lava  
flows: Hamblin, W. K. 06924  
Western Grand Canyon region, tectonics and  
volcanism, guidebook: Hamblin, W. K. 06923

*Atlantic Ocean*

- Northern, faunal history, surface temperatures,  
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Tehachapi quadrangle, stratigraphy: Dibblee, T.  
W., Jr. 08028  
Volcanism, tectonics: Hawkins, James W. 05251  
Western, tectonics, history, model: Ernst, W. G.  
00659

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07683  
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07682

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- Deep Sea Drilling Project, Leg 4 cores: Bader,  
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Deep-sea cores, Foraminifera, biostratigraphy:  
Blow, W. H. 06665  
Deep-sea cores, Protista, coccoliths, biostrati-  
graphy: Bukry, David. 07643  
Pliocene-Pleistocene boundary, Foraminifera:  
Bock, Wayne D. 04994

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- Pinar del Rio Province, Neogene subcomplexes:  
Iturralde-Vinent, Manuel A. 01422

*Florida*

- Caloosahatchee River area, Pliocene-Pleisto-  
cene, stratigraphy: Brooks, H. K. 09753  
Southern, late: Olsson, Axel A. 09754  
Southern, Miocene, Pleistocene, stratigraphy:  
Puri, Harbans S. 09752  
Southern, Neogene, stratigraphy: DuBar, Jules  
R. 09750  
Southwestern, late, stratigraphy, field trip: Gulf  
Coast Assoc. Geol. Societies. 09749  
Vertebrata, Eocene-Pleistocene, localities,  
popular guide: Patton, Thomas H. 08363

*Fungi*

- Spores, stratigraphic importance: Elsik, William  
C. 00893

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- Cancellariidae, taxonomy, n.spp.: Petit, Richard  
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- Drill cores, stratigraphy: Deep Sea Drilling Pro-  
ject. 03294

*Honduras*

- Tegucigalpa area, stratigraphy: Honduras In-  
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*Illinois*

- Northeastern, pre-Pleistocene landforms, val-  
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*Indiana*

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*Jamaica*

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Cascade Range, Little Butte Volcanic Series, true position: Wheeler, Harry E. 08536

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Western Grand Canyon region, basalts: Best, M. G. 06926

Western Grand Canyon region, faulting, lava flows: Hamblin, W. K. 06924

Western Grand Canyon region, tectonics and volcanism, guidebook: Hamblin, W. K. 06923

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Mineral resources, metallogenic provinces: Levy, Enrique. 00450

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Bibliography, coastal geomorphology: Psuty, Norbert P. 05834

Bibliography, mineral deposits: Dengo, Gabriel. 00466

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*Anagymnotoceras tozeri*, n.sp.

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*Christioceras* sp.

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*Cravenoceras inyoense*, n.sp.

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*Delepinoceras californicum*, n.sp.

Mississippian, California, Perdido Fm., Inyo Range: Gordon, Mackenzie, Jr. 09770

*Didymoceras stevensoni*

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*Eoaraxoceras ruzhencevi*, n.gen., n.sp.

Permian, Upper, Mexico, Coahuila, ancestral araxoceratid: Spinosa, Claude. 03539

*Eumorphoceras paucinodeum*, n.sp.

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*Exiteloceras jenneyi*

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*Grambergia tetsaensis*, n.sp.

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*Hollandites pelletieri*, n.sp.

Triassic, British Columbia, northeastern, Toad Fm.: McLearn, F. H. 10839

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*Lenotropites tardus*, n.sp.

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*Metacoceras mcchesneyi*, n.sp.

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Bibliography: Kentucky Geological Survey.  
05981

Blackford quadrangle, occurrence: Amos,  
Dewey H. 05398

Nolansburg quadrangle, occurrence: Csejtey,  
Bela, Jr. 05396

Wiborg quadrangle: Smith, J. Hiram. 08014

*Mexico*

Occurrence, resources for iron industry: Salas,  
Guillermo P. 09804

*New Mexico*

San Juan Basin, resources, production:  
Bieberman, Robert A. 07885

*Nova Scotia*

Cape Breton coals, sulfur content, pyrite  
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*Pennsylvania*

Allegheny County, resources: Heyman, Louis.  
07568

Clearfield 15-minute quadrangle, southern half:  
Glover, Albert D. 10942

Washington area, occurrence, resources: Ber-  
ryhill, Henry L., Jr. 07216

Waynesburg quadrangle, occurrence: Roen,  
John B. 05393

*Physical properties*

Vitrinite reflectance, indicator of metamorphic  
stage: Thompson, R. R. 10277

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*Properties*

Electrical, radio-wave frequencies: Cook, John  
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*Tennessee*

Cumberland Plateau area, northern, reserves:  
Johnson, Robert C. 10370

Duncan Flats quadrangle, occurrence, maps:  
Statler, Anthony T. 07654

Norma quadrangle, occurrence: Avery, Gleason  
G. 07543

Production trends, mining methods: Leamon, A.  
R. 09640

*United States*

Pennsylvanian basins, coalification patterns:  
Damberger, Heinz H. 06946

Resources, stripping, recoverable: Averitt, Paul.  
04028

*Virginia*

Hylas and Midlothian quadrangles: Goodwin,  
Bruce K. 07838

*West Virginia*

Bituminous, original minable extent of seams:  
Lotz, Charles W. 04809

*Cobalt**Analysis*

Atomic absorption spectroscopy, solvent extrac-  
tion method: Mountjoy, Wayne. 01557

Chemical: Pyatnitskii, I. V. 09306

Solvent extraction, sea water: Kentner, Edward.  
01512

*Geochemistry*

Arsenopyrite, association, Manitoba: Coats, C.  
J. A. 06890

Lithiophorite, cryptomelane, Tennessee: Lar-  
son, L. T. 06896

*Jamaica*

Phillips Gully prospect, geochemical prospect-  
ing, soils: Black, C. D. G. 10246

*Collections**Echinodermata*

Field Museum, Chicago, catalog, types, Echin-  
oidea, Cyclocystoidea: Golden, Julia. 06898

Field Museum, Chicago, catalog, types,  
Edrioasteroidea: Golden, Julia. 06899

Field Museum, Chicago, catalog, types, Stelle-  
roidea: Golden, Julia. 06900

*Invertebrata*

California, Los Angeles County Mus., type  
specimens, catalog: Wilson, Edward C. 07614

*Minerals*

New Mexico Bureau of Mines Mineralogical  
Museum, computerization: Renault, Jacques.  
04116

Pennsylvania, Swarthmore-Leidy specimens, at  
Lafayette College: Montgomery, Arthur.  
08345

Pennsylvania, Swarthmore-Leidy specimens,  
transfer to Lafayette College: Montgomery,  
Arthur. 04141

*Paleontology*

California Univ. Mus. Paleontology: Berry, Wil-  
liam B. N. 02095

Catalogs, fossils, computerizing: Juskevics, John  
A. 01417

New York State Museum, type specimens,  
catalog: Kilfoyle, Clinton F. 09767

**Colorado***Absolute age*

- Colorado, Iron Hill and McClure Mtn. complexes, Rb-Sr whole rock: Fenton, M. D. 08154  
 Front Range, Boulder Creek basin, peat, C-14: Bonnett, Richard Brian. 07346  
 Northwestern, Browns Park Fm., K-Ar: Izett, G. A. 04259  
 Pikes Peak batholith, Rosalie lobe, Rb-Sr: Hedge, C. E. 01469  
 San Juan Mountains, Ute Creek melasyenite: Barker, Fred. 00132  
 San Juan Mountains, volcanics, K-Ar: Lipman, Peter W. 03777

*Areal geology*

- Breckenridge to Granby, road log: Hall, Gary. 05362  
 Canon City-Fairplay-Breckenridge, road log: Gerhard, Lee C. 05361  
 Denver-Golden-Plainview, road log: Boos, C. M. 05363  
 Denver-Palmer Lake-Canon City, road log: Boos, C. M. 05360  
 Durango to Denver, road log: Bowman, Frank O., Jr. 04864  
 Gore Range-Eagles Nest Primitive area: Tweto, Ogden. 02416  
 Rocky Mountains, Front Range and Park basins, guidebook: Rocky Mountain Assoc. Geologists. 05350  
 Southwestern, salt anticline region: Cater, Fred W. 07491

*Earthquakes*

- 1962-68, Denver, Rocky Mtn. Arsenal well, pumping effect: Harrison, J. C. 02791  
 Denver area, cause, fluid injection: Karp, Edwin. 00953  
 Denver area, cause, tectonic strain not fluid injection: Simon, Ruth B. 00948  
 Denver area, fluid injection area, cf. Nevada Test Site events: Healy, J. H. 03974  
 Denver area, relation to fluid injection, statistical analysis: Bardwell, George E. 05308  
 Denver area, relation to waste disposal, Rocky Mtn. Arsenal: Evans, David M. 05231  
 East-central, Quaternary faults, potential: Scott, Glenn R. 04241  
 Rangely oil field: Raleigh, C. Barry. 01969  
 Rangely oil field, relation to fluid injection: Munson, R. C. 06458  
 Rangely oil field, relation to waterflooding: Raleigh, C. B. 09532

*Economic geology*

- Aluminum, Green River Formation, potential: DeVoto, R. H. 02556  
 Gold, placer, composition as ore guide: Desborough, George A. 06897  
 Gold, Russellville placers: Desborough, George A. 06176  
 Gold, silver, Cripple Creek district, exploration: Kleinkopf, M. Dean. 03472  
 Lead, manganese, silver, zinc, Leadville district, reserves: Meeves, Henry C. 02738  
 Mineral resources, Gore Range-Eagles Nest Primitive area, limited: Tweto, Ogden. 02416  
 Oil shale, Piceance Creek basin, Green River Fm.: Donnell, John R. 10903  
 Oil shale, Piceance Creek Basin, resources: Donnell, John R. 02424

**Colorado—Continued***Economic geology—Continued*

- Petroleum, natural gas, eastern, North Park, stratigraphic penetration charts: Taylor, R. K. 05356  
 Petroleum, natural gas, South Park basin, exploration: Clement, James H. 05359  
 Petroleum, North Park basin, Lower Cretaceous, production: Haverfield, J. Joseph. 05355  
 Petroleum, Piceance Creek field, Green River-Wasatch Fms.: Snow, C. Bruce. 02500  
 Petroleum, Red Wash field: Koesoemadinata, R. P. 04078  
 San Juan Mountains, Platoro caldera, mineralization: Lipman, Peter W. 04242

*Engineering geology*

- Application, highway planning and maintenance: Robinson, Charles S. 08488  
 Dams, Morrow Point site, rock mechanics studies, cf. other dams: Jaeger, Charles. 03332  
 Earthquakes, relation to fluid injection, Rangely oil field: Munson, R. C. 06458  
 Field trip, Denver area, road log: Conference Field Trip Committee. 08489  
 Land use and resources inventory, Clari project, computer processing: McNair, Arthur J. 10350  
 Land use, role of Colorado Geol. Survey: Rold, John W. 08483  
 Pollution, surface water, control: Gahr, William N. 08571  
 Rock mechanics, Idaho Springs granite gneiss, fracturing effects, tests: Panek, Louis A. 09139  
 Soils, properties: Tabor, Guy F., Jr. 08487  
 Tunnels, Rocky Mountains, seismic, electrical studies: Johnson, Robert B. 05494  
 Waste disposal, Rocky Mtn. Arsenal, drilling problems: Scopel, Louis J. 06755  
 Waste disposal, Rocky Mtn. Arsenal, relation to earthquakes: Evans, David M. 05231  
 Waste disposal, Rocky Mtn. Arsenal, relation to earthquakes: VanPoolen, H. K. 10659  
 Waste disposal, Rocky Mtn. Arsenal, relation to earthquakes, statistical analysis: Bardwell, George E. 05308

*General*

- Education, Boulder Valley public schools, learning environment: Thompson, John F. 10276  
 Education, Grand Junction, energy fuels field course, Oklahoma Univ.: Moore, Carl A. 02721  
 Environmental geology, Governor's conference: Ivey, John B. 08480  
 Geological Survey, role in environmental geology: Rold, John W. 08483

*Geochemistry*

- Durango area, Dakota Sandstone, organic material, trace elements: Houston, Robert S. 04257  
 Eastern, continental shales, boron, anomalous: Cody, Robert D. 03608  
 Gold, placer, composition: Desborough, George A. 06897  
 Green River Fm., extractable nitrogen compounds: Simoneit, B. R. 00943  
 Leadville carbonates, Mn distribution: Wildeman, Thomas R. 00851  
 Northwestern, Green River Fm., halite, bromine-bearing: Dyni, John R. 04569  
 Paradox basin, bromine content, paleosalinity: Raup, Omer B. 04643

**Colorado—Continued***Geochemistry—Continued*

Pegmatite Points area, granitic rocks, thermodynamic properties: Puffer, John Harold. 06007

Rocky Mountains, annual snowpack, deuterium variations: Judy, Clark. 01717

Ute Creek melasyenite, analyses, Sr isotopes: Barker, Fred. 00132

*Geomorphology*

Bent's Old Fort, Arkansas River, meanders: Swenson, Frank A. 01488

Front Range, frost cracks, widths, seasonal variations: Benedict, James B. 06826

Front Range, Niwot Ridge, downslope soil movement: Benedict, James B. 04183

Golden area, Clear Creek sand transport, tracer experiment: Kennedy, Vance C. 01285

Grand Junction area, watersheds, plant-runoff-sediment yield relations: Branson, F. A. 03071

North-central, alpine soil, erosion mechanism: Zoghet, Mouine Fahed. 03089

Rocky Mountain National Park, tarn, disturbed sediments: Reed, Edward B. 05054

Rocky Mountains, gully morphology, analysis: Heede, Burchard H. 03549

South Platte River, braided pattern, bars: Smith, Norman D. 04876

*Geophysical surveys*

Cripple Creek district, interpretation, ore localization: Kleinkopf, M. Dean. 03472

North-central, gravity, magnetic lineations, Tertiary plutonism, relations: Popenoe, Peter. 01171

Rocky Mountains, central, tunnel site, seismic and resistivity: Johnson, Robert B. 05494

Trinidad quadrangle, gravity, magnetic: Kleinkopf, M. Dean. 01468

Virginia Dale Precambrian ring-dike complex, radar: Wing, R. S. 00040

*Glacial geology*

Front Range, Boulder Creek basin, stages, tills: Bonnett, Richard Brian. 07346

Front Range, Boulder Creek drainage basin, moraines, soils: Bonnett, Richard B. 10148

*Hydrogeology*

Arkansas River valley, ground-water withdrawal, estimating, regression analysis: Luckey, Richard R. 10497

Arkansas River valley, recharge, determination by digital modeling: Taylor, O. James. 10509

Grand Junction area, watersheds, sediment yield: Branson, F. A. 03071

Ground-water basins, water transfer at bedrock-alluvium contacts: Waltz, James P. 08771

Ground-water resources, role of geologist: Owens, Willard C. 08486

High Plains, Ogallala aquifer, recharge problems: Jenkins, C. T. 08713

High Plains, Ogallala Fm. recharge, calculation, model: Reddell, Donald L. 08714

Plains Ground Water Management District, recharge resources: Jenkins, C. T. 00859

Rocky Mountains, snowpacks, melting, temporary water tables, movement: DeWalle, David Russell. 00538

San Luis Valley, water-salvage plan, evaluation model: Emery, Philip A. 04122

*Maps, geologic*

Drake quadrangle: Braddock, William A. 04507

Front Range, northeastern, generalized: Braddock, William A. 00202

Gem Park area: Parker, Raymond L. 04015

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Gore Range-Eagles Nest Primitive area: Tweto, Ogden. 02416

Hayden Peak quadrangle: Bryant, Bruce. 03205

Masonville quadrangle: Braddock, William A. 06415

Raven Ridge area: Koesoemadinata, R. P. 04078

Snowmass Mountain quadrangle: Mutschler, Felix E. 03194

Southwestern, salt anticline region: Cater, Fred W. 07491

*Maps, ground water*

San Luis Valley, transmissivity: Emery, Philip A. 04122

*Maps, magnetic*

Gore Range-Eagles Nest Primitive area, airborne: Tweto, Ogden. 02416

*Mineralogy*

Allanite, Boulder Creek Batholith, chemical, optical, X-ray data: Hickling, Nelson L. 02388

Delrioite, metadelrioite, intergrown, Montrose County: Smith, Marie Lindberg. 03322

Leonhardtite, genesis, Mt. Princeton Quartz Monzonite: Sharp, William N. 01857

*Paleoclimatology*

Quaternary, late, Navajo archeological sites, marmots as indicators: Harris, Arthur H. 10131

*Paleomagnetism*

Cambrian-Ordovician, pole position, anomalous: Larson, Edwin E. 10486

Triassic-Jurassic, Pikes Peak Granite, remagnetization from Precambrian direction: Spall, Henry. 10485

*Paleontology*

Dinosaurs, collecting, popular account: Firby, Jean. 09782

Foraminifera, Cretaceous, Turonian beds, new heterohelcid: Eicher, Don L. 01291

Invertebrata, Cambrian-Ordovician, Mosquito Range, assemblages: Anderson, Thomas B. 02499

Mammalia, Pleistocene, bison, peccary, new occurrences: Scott, Glenn R. 01556

Mammalia, Pleistocene, Canon City, Denver areas: Lewis, G. Edward. 01477

Palynology, Holocene, bog sediments, evidence of drainage: Maher, Louis J., Jr. 10180

Palynology, paleoecology, Cretaceous, Mancos Shale: Cross, Aureal T. 02601

Palynomorphs, Cretaceous, Mancos Shale, southwestern, paleoecology: Thompson, Gary Gene. 06010

*Petrology*

Boulder County, Audubon-Albion stock: Mathews, Geoffrey William. 07935

Clear Creek County, Urad, Henderson molybdenite deposits, hydrothermal alteration: MacKenzie, Wallace Bruce. 07280

Custer and Fremont Counties, Gem Park Complex: Parker, Raymond L. 04015

Fremont County, Goldie carbonatite, cryolite occurrence: Heinrich, E. W. 01074

Mount Princeton, hot springs, quartz monzonite, zeolitization: Sharp, William N. 01857

Powderhorn, Iron Hill carbonatite complex: Nash, W. P. 09691

San Juan Mountains, older and younger volcanics, composition change: Lipman, Peter W. 03777

San Juan Mountains, Ute Creek melasyenite stock: Barker, Fred. 00132

## Colorado—Continued

*Petrology—Continued*

Spanish Peaks region, arkosic sandstones, hydrothermal alteration: Vine, James D. 00650

Wet Mountains, carbonatite complexes, feldspar rocks, metasomatism: Moore, Dwight Garrison, Jr. 07587

Wet Mountains, San Isabel quartz monzonite: Murray, Marc Michael. 07937

*Sedimentary petrology*

Leadville Limestone, chert: Banks, Norman G. 04878

Morrison area, Fountain and Lyons Fms., cross-bedding: Blood, W. A. 02501

Northwestern, Green River Fm., evaporite facies: Dyni, John R. 04569

West-central, Dyer Fm., shelf carbonates: Campbell, John A. 03155

*Stratigraphy*

Cambrian-Ordovician, Mosquito Range: Anderson, Thomas B. 02499

Cretaceous, Carlile Shale, Codell Sandstone Member, environments: Krutak, Paul R. 05358

Cretaceous, Dakota Group and related rocks, Front Range region: Rocky Mountain Assoc. Geologists. 05350

Cretaceous, Dakota Group, Front Range region, correlation: Weimer, Robert J. 05357

Cretaceous, Lower, lithofacies, environments: Young, Robert G. 05353

Cretaceous, Lower, North Park basin: Haverfield, J. Joseph. 05355

Cretaceous, Purgatoire Fm., paleogeography, correlation: Scott, Robert W. 02335

Devonian, Chaffee Group, west-central: Campbell, John A. 00408

Devonian, western, correlation: Pampe, William R. 02300

Eocene, Green River Fm., Red Wash-Raven Ridge area: Koesoemadinata, R. P. 04078

Front Range, southern, pre-Pennsylvanian, conodonts: Goebel, Edwin D. 01073

Hayden Peak quadrangle, sections: Bryant, Bruce. 03205

Jurassic, Morrison Fm., northwestern: Dawson, James Clifford. 06950

Masonville quadrangle, sections: Braddock, William A. 06415

Mississippian, Leadville Limestone, central: Nadeau, Joseph E. 00757

Pennsylvanian, Paradox basin, carbonate facies, control by salinity: Hite, Robert J. 04565

Pennsylvanian-Permian, Casper, Ingleside Fms., unconformity: Howe, Dennis Milton. 07585

Pennsylvanian-Permian, Fountain and Lyons Fms., Morrison section: Blood, W. A. 02501

Pleistocene, Broadway Alluvium, eolian sand, Denver area: Scott, Glenn R. 01556

Pleistocene, Louviers Alluvium, Parker area: Scott, Glenn R. 01556

Pleistocene, Slocum Alluvium, Canon City area: Scott, Glenn R. 01556

Precambrian-Quaternary, southwestern, salt anticline region: Cater, Fred W. 07492

Precambrian-Tertiary, Rocky Mtn. Arsenal: Scopel, Louis J. 06755

Snowmass Mountain quadrangle, sections: Mutschler, Felix E. 03194

Tertiary, Wasatch and Green River Fms., Piceance basin: Snow, C. Bruce. 02500

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*Structural geology*

Denver area, deformation without earthquakes, creep mechanism: Romig, P. R. 09546

Denver basin, northern, adjacent uplifts: DeGraw, Harold M. 00606

East-central, faults, Quaternary movement: Scott, Glenn R. 04241

Front Range, Big Thompson anticline, fold mechanics: LeMasurier, Wesley E. 00104

Front Range, metasediments, slaty cleavage genesis: Braddock, William A. 00202

Front Range, tectonic history, mechanism: Richter, Dieter. 03055

North Park basin, faults, folds: Haverfield, J. Joseph. 05355

Rocky Mountains, ancestral, paleotectonic framework: Baars, D. L. 02584

San Juan Mountains, Platoro caldera, evolution: Lipman, Peter W. 04242

San Luis-Upper Arkansas graben, gravity slide blocks: VanAlstine, Ralph E. 01465

Slick Rock district area, faults, folds: Shawe, D. R. 02317

South Park basin, faults and folds: Clement, James H. 05359

Uncompahgre Plateau, drape folding: Stearns, David W. 07590

## Colorado Plateau

*Areal geology*

Field conference guidebook: Natl. Assoc. Geology Teachers. 04953

Summary: Smith, Clay T. 04848

*Economic geology*

Uranium, genesis, review: Fischer, R. P. 04481

*Geochemistry*

Sedimentary rocks, mercury, distribution: Cadigan, R. A. 05557

Volcanic rocks, Sr-87/Sr-86 ratios: Pushkar, Paul. 01817

*Geomorphology*

Colorado River, origin and history: Breed, Carol S. 04849

*Hydrogeology*

Ground water,  $U_3O_8$ : Wyman, Richard V. 09042

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Crustal-upper mantle model: McGetchin, Thomas R. 02825

Kimberlite pipes, pyrope, mineral inclusions: McGetchin, T. R. 01799

## Concretions

*British Columbia*

Cedar District Fm., genesis, petrography, Upper Cretaceous: Rahmani, R. A. 02299

*Composition*

Ferromanganese, lakes, Ontario, Nova Scotia, genesis: Harris, Robert C. 06564

*Genesis*

Ferromanganiferous, in silt loam, Illinois: Cescas, Michel P. 03934

Lake Ontario, ferromanganese: Cronan, D. S. 08150

*Kansas*

Wilson County, Plattsburg Limestone, pisoliths, deformation patterns: Manger, Walter L. 09659

*Pennsylvania*

Clearfield County, limonite, coal strip mines: Glass, Gary B. 07558

Tyrone area: Snell, David E. 03204

**Connate water***Alberta*

- Oil and gas fields, composition, controls: Hitchon, Brian. 02630

*Composition*

- Atlantic Ocean, deep-sea cores: Chan, K. M. 01658
- Atlantic Ocean, deep-sea cores: Kaplan, I. R. 01346
- Changes, sediments in near-shore environments: Friedman, Gerald M. 05657
- Deep-sea sediments, Caribbean Sea: Presley, B. J. 06667
- Deep-sea sediments, Caribbean Sea: Sayles, F. L. 06666
- Marine sediments, element abundances, Pacific Ocean: Presley, Bobby Joe. 07644
- Marine sediments, temperature effect in analysis: Bischoff, James L. 00981
- Pacific Ocean, deep-sea cores: Presley, B. J. 07152
- Phase, pore water in cold rocks: Mellor, Malcolm. 08394
- Salinity, increase, drill cores, Gulf of Mexico: Manheim, F. T. 04375

*Genesis*

- Sediments, glacio-marine, Alaska: Sharma, G. D. 03605

*Geochemistry*

- Salinity, cf. oil field brines, Gulf of Mexico sediments: Perry, Douglas. 08022

*United States*

- Pacific coast area, composition, metamorphism effects: Barnes, Ivan. 01673

*Washington*

- Composition, thermal springs: Campbell, K. Vincent. 01186

**Connecticut***Absolute age*

- Middletown area, pegmatites, summary: Brookins, Douglas G. 06216
- Southern, Prospect, Ansonia, Milford Fms., K-Ar, Rb-Sr: Armstrong, R. L. 06217
- Western, Nonewaug Granite, Rb-Sr: Besancon, James R. 06312

*Areal geology*

- Collinsville area, field trip: Stanley, Rolfe S. 10611
- Connecticut River mouth, environmental research: Friedman, Gerald M. 04726
- Marlborough quadrangle: Snyder, George L. 03320
- Torrington quadrangle: Martin, Charles W. 06218
- Waterbury and Thomaston quadrangles, field trip log: Gates, Robert M. 10676

*Economic geology*

- Gravel, sand, declining resources: Siebert, Harry L. 07477
- Gravel, Woodbury quadrangle: Pessl, Fred, Jr. 06417

*Engineering geology*

- Beaches, artificial, Long Island Sound: McCabe, Robert A. 05784
- Clays, varved, Connecticut Valley, consolidation characteristics: Ramanjaneya, Gundarlalhalli Sankarasetty. 00510

*General*

- Bibliography, water resources: Kennard, William C. 02750

**Connecticut—Continued***Geochemistry*

- Iron, sedimentary pyrite formation: Berner, Robert A. 00037

*Geomorphology*

- Tariffville quadrangle, drainage patterns: Randall, Allan D. 05391

*Geophysical surveys*

- Marlborough quadrangle, magnetic: Snyder, George L. 03320

*Glacial geology*

- Litchfield quadrangle: Warren, Charles R. 04509
- Winsted quadrangle, general: Warren, Charles R. 07498
- Woodbury quadrangle, history: Pessl, Fred, Jr. 06417

*Hydrogeology*

- Gales Ferry area, crystalline aquifer, groundwater contamination: Grossman, I. G. 01487
- Housatonic River basin, lower, data 1965-67: Grossman, I. G. 03744
- Housatonic River basin, upper, basic data: Melvin, Robert L. 05901
- Southwestern, coastal river basins, water resources: Ryder, Robert B. 04536

*Maps, geologic*

- Litchfield quadrangle, surficial: Warren, Charles R. 04509
- Marlborough quadrangle: Snyder, George L. 03320
- Tariffville quadrangle, surficial: Randall, Allan D. 05391
- Torrington quadrangle: Martin, Charles W. 06218
- Winsted quadrangle, surficial: Warren, Charles R. 07498
- Woodbury quadrangle, surficial: Pessl, Fred, Jr. 06417

*Maps, hydrogeologic*

- Southwestern coastal river basins: Ryder, Robert B. 04536

*Maps, magnetic*

- Marlborough quadrangle, airborne: Snyder, George L. 03320

*Mineralogy*

- Bavenite, Haddam area, description: Henderson, William A., Jr. 04146
- Rutile, Watertown area, crystals in schist cavity: Henderson, William A., Jr. 08344
- Triploidite, Branchville area, crystal structure: Waldrop, Lyneve. 02970

*Petrology*

- Portland area, Walden pegmatite, paragenesis: Seaman, David M. 09744
- South-central, micaceous limestone, metamorphism: Hewitt, David A. 07021
- South-central, volcanics, pillows, breccias, Gaillard graben: Sanders, John E. 04079
- Southeastern, pegmatite, microcline-, orthoclase-bearing: Godchaux, M. M. 01764
- Wepawaug Fm., micaceous limestones, progressive metamorphism: Hewitt, David Allyn. 07925

*Stratigraphy*

- Pleistocene, east-central, two-till problem: Pease, Maurice H., Jr. 06166
- Triassic, south-central, Gaillard graben: Sanders, John E. 04079

*Structural geology*

- South-central, Gaillard graben, Triassic strata: Sanders, John E. 04079

**Conodonts****Age**

Electron spin resonance dating: Morency, Maurice. 01200

**Cambrian-Ordovician**

United States, central, zonation, correlation: Miller, James F. 09676

**Carboniferous**

Lower, evolution: Austin, Ronald L. 01185  
Oklahoma, Goddard, Springer Fms., biostratigraphy: Straka, Joseph John, 2d. 01682  
United States, western, Chester-Morrow, phylogeny: Dunn, D. L. 01211  
United States, western, Mississippian-Pennsylvanian boundary: Dunn, David L. 04875

**Classification**

Affinities, review: Lindstrom, Maurits. 01080

**Devonian**

Nevada, Elko County, Lone Mtn., biostratigraphy: Tillman, C. G. 10279  
Yukon, Michelle Fm., Ogilvie Mts., biostratigraphy: Ludvigsen, Rolf. 05369

**Devonian-Mississippian**

Iowa, Iowa City area: Glenister, Brian F. 09920

**Evolution**

Silurian-Carboniferous, phylogeny, homeomorphic development: Ziegler, Willi. 01114

**Exochognathus**, n.gen., spp.

Silurian, Lower, Michigan, Ontario: Pollock, Charles A. 03541

**General**

Ammonium molybdate method, finding in residue: Schopf, Thomas J. M. 00555  
Research, problems, programs, priorities: Rhodes, F. H. T. 01100  
Stratigraphic mixing, criteria: Seddon, George. 07040  
Taxonomy and function, review of theories: Globensky, Yvon. 03189  
Trace-element analyses, bone material: Bradshaw, L. E. 01056

**Geographic distribution**

Paleozoic: Collinson, Charles. 01063  
Paleozoic, Lower, provinces: Barnes, Christopher R. 01049  
Paleozoic, upper: Druce, Edric. 01071

**Idiognathoides noduliferus-sulcatus**

Pennsylvanian, Arkansas-Oklahoma, evolution, intergradation: Straka, Joseph J., 2d. 04372

**Mississippian**

Missouri, Kinderhook-Osage Series, biostratigraphy: Thompson, Thomas L. 01350  
Nevada, Monte Cristo Group, Arrow Canyon Range: Pierce, Robert William. 06605  
Surface patterns: Pierce, R. W. 05187

**Morphology**

Animal, Pennsylvanian: Melton, William. 01085  
Holoconodont, microstructure: Ziegler, Willi. 01113  
Micromorphologic studies, stratigraphic significance: Rhodes, Frank H. T. 01101  
Surface ornamentation, internal microstructure: Schwab, Karl W. 09560

**Ordovician**

Evolution, prioniodid: Bergstrom, Stig M. 01054  
Newfoundland, correlation, Balto-Scandia sequence: Fahraeus, Lars E. 02394  
Newfoundland, St. George Fm., correlation, n.spp.: Barnes, C. R. 05553  
North America, northeastern, ultrastructure: Barnes, Christopher R. 01050

**Conodonts—Continued****Ordovician—Continued**

North America, use in time-stratigraphic classification: Sweet, Walter C. 09593  
Quebec, Levis Formation, correlation: Uyeno, T. T. 05554

**Paleozoic**

Nevada, West Range Limestone, Pilot Shale, zoning: Sandberg, Charles A. 00353  
Texas, Llano region, Ordovician-Mississippian pre-Chappel, correlation: Seddon, George. 07040

**Paleozoic-Mesozoic**

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Permafrost factor: Brown, R. J. E. 05922

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Terrestrial, Great Plains, symposium: Dort, Wakefield, Jr. 08040

*Wisconsin*

Terrestrial, Baraboo district, plant, relation to geology: Zimmerman, J. H. 06833

**Economic geology***Bibliography*

Energy sources, selected, annotated: Averitt, Paul. 03878

*Education*

University curricula, suggested courses: Behre, Charles H., Jr. 01331

*Methods*

Mineral deposits, correlation and chronology: Damon, Paul E. 11271

Mineral deposits, correlation and chronology: Damon, Paul E. 11273

*Practice*

Exploration, statistical methods: Sinclair, A. J. 06892

Geologist's role in property evaluation: Oliver, William B. 02666

Industrial minerals, exploitation: Dreyer, Robert M. 06962

Mineral industry, scientific advances, major periods, future course: Forward, Frank Arthur. 03566

Petroleum geologist, changing role: Jones, Charles F. 09471

Reserves estimation, terms, definitions: Blondel, Fernand. 04696

Review, 1969: Brown, Severn P. 02167

Students, industry support: Kalliokoski, J. 04871

Terminology, metamorphism, mobilization: Mookherjee, Asoke. 05123

*Resources*

Canadian Shield, prediction: DeGeoffroy, J. 04282

General, world supply: Grossling, Bernardo F. 04320

Metavolcanic rocks, orebodies, root severance, tectonic transport: Jenks, William F. 06483

Oceans, occurrence, exploration, mining methods: Wang, Frank Feng-hui. 11234

Oceans, past, present, future: Mero, John L. 03466

World, distribution, realities, need for research: Cloud, Preston E., Jr. 09472

*Textbooks*

Prospecting methods, Canada: Lang, A. H. 10851

**Education***Curriculum*

Environmental geology: Dickinson, William R. 04999

Environmental geology: Pestrone, Raymond. 05000

Environmental geology, relation to city planning: Spangle, William E. 05001

ESCP vs. non-ESCP, student outcome study: Schirner, Silas W. 00491

Introductory, "geohumanities": Howe, Robert C. 07030

**Education—Continued***Curriculum—Continued*

- Introductory, urban, relevancy: Hayward, O. T. 07014  
 Laboratory program, problem approach, guidelines: Baldwin, Brewster. 03927  
 North Dakota, 1968-1969: Reith, Howard Cartnick. 06880  
 Ohio State University, teachers: Mayer, Victor J. 01083  
 Secondary, ESCP instructional material, research on results: Champlin, Robert F. 00120  
 Training and needs: Reeves, Robert G. 03285  
 Undergraduate, creative approach: Baldwin, Brewster. 01334  
 Undergraduate, field course, Ohio State Univ.: Mayer, Victor J. 02406

*Earth science*

- Mathematics and science center, role: Batten, R. Wesley. 05477  
 Public schools, professional geologists, role: Young, W. F., Jr. 05443

*Economic geology*

- Carbonate deposition, marine process, Bahamas-Florida region as model: Friedman, Gerald M. 05012  
 Curricula, university level, suggested courses: Behre, Charles H., Jr. 01331  
 Energy fuels field course, Colorado, Grand Junction, Oklahoma Univ.: Moore, Carl A. 02721  
 Industry support: Kalliokoski, J. 04871

*Electron microscopy*

- Television, closed circuit: Rosauer, Elmer A. 03658

*Engineering geology*

- American Geological Inst., environmental geology course, 1970: Am. Geological Institute. 07996  
 Curricula, introductory graduate-level, United States: Monahan, E. J. 11250  
 Curriculum, environmental geologic approach: Young, Keith. 08030  
 Curriculum, map exercises, environmental geology: Young, Keith. 08004  
 Earthquakes, short course, practicing engineers, collected papers: Wiegel, Robert L. 03040  
 Field trips, environmental geology, Texas, Austin area: Young, Keith. 08005  
 Research, Natl. Research Council Canada, Permafrost Subcomm. report: Harwood, T. A. 09765  
 Soils, properties, measurement methods, laboratory manual: Bowles, Joseph E. 10398

*General*

- Amateur activities, contribution: Eno, Gene. 02523  
 Curricula, environmental geology, summer field conference: Smith, Clay T. 09575  
 Curricula, environmental programs: Hilpman, Paul L. 07022  
 Curricula, geologic illustration for art majors, Oregon, Portland State Univ.: Allen, John Eliot. 01426  
 Curricula, non-geology majors: Foote, Richard M. 06979  
 Earth history, interpretation, laboratory manual: Petersen, Morris S. 10836  
 Earth science, textbook, with teacher's guide: Bishop, Margaret S. 09922  
 Environmental geology course, outline of lectures: Young, Keith. 07998

**Education—Continued***General—Continued*

- Environmental geology, role of geologists and teachers: Flawn, Peter T. 07997  
 Environmental problems, role of students: Wahrhaftig, Clyde. 10338  
 Environmental Studies Project, new philosophy: Samples, Robert E. 09553  
 Geologic technician course, Bakersfield College, Calif.: Karp, Stanley E. 02407  
 Hazards, earthquake, associated effects, communication problems: Perlman, David. 05572  
 Interdisciplinary approach, panel for science teachers: Renaud, Jane W. 09535  
 Materials, laboratory manual, college level: Clarke, E. de C. 09186  
 Materials, laboratory manual, physical geology, scientific method: Skillman Woyski, Margaret. 10377  
 Materials, projection slides, guide to preparation and use: Am. Assoc. Petroleum Geologists. 10409  
 Materials, sourcebook for elementary and secondary schools: American Geological Institute. 10378  
 Public schools, role of industrial geologist: Regis, A. J. 09534  
 Relevance today: Madeley, Hulon M. 01323  
 Scientific quotations for thought: Wolf, Karl H. 05619  
 Scientific quotations for thought: Wolf, Karl H. 06800  
 Scientific quotations for thought: Wolf, Karl H. 07879  
 Selected papers from original sources: Cloud, Preston. 05893  
 Status, Illinois: Qutub, Musa Yacub. 03929  
 Student enrollment survey: Henderson, Bonnie C. 06223  
 Teacher preparation, environmental geology: Romey, William D. 09545  
 Teaching, graduate school, research incompatibility concept, error: Hatfield, Craig B. 00117  
 Texas, University Dept. Geology, leadership, Ronald K. DeFord: Owen, Edgar W. 10892  
 Virginia and geology, textbook: Dietrich, Richard V. 09163
- Geochemistry*  
 Curricula, universities, developing nations: Siegel, Frederic R. 09569  
 Exploration geochemist, methods, workshop: Bloom, Harold. 02435
- Geology*  
 Community college: Funkhouser, John W. 05422  
 Curricula, geology majors, relevancy: Morisawa, Marie E. 09684  
 Oklahoma, Oklahoma City, secondary teacher training, introductory: Espach, Ralph. 02719  
 Programs, Virginia, colleges and universities: Goodwin, B. K. 05427  
 Student enrollment survey: Henderson, Bonnie C. 06223
- Geomorphology*  
 Field problem, micro-landscape, methods: Goodman, James M. 07173
- Geophysics*  
 Solid earth, program of study: Drake, Charles L. 00424
- Materials*  
 Experiments, demonstrations, junior, senior high school: Boyer, Robert E. 08281



**Education—Continued**

*Materials—Continued*

- Minnesota, field trip, central, teacher's guide: Hogberg, Rudolph. 03491
- Minnesota, field trip, Minnesota River valley, teacher's guide: Parham, Walter. 03490
- Minnesota, field trip, northwestern, teacher's guide: Wright, Herbert. 03590
- Minnesota, field trip, southeastern, teacher's guide: Sloan, Robert. 03488
- Minnesota, field trip, Twin Cities area, teacher's guide: Stone, John. 03489
- Minnesota, field trips, teacher's guides: Phinney, William C. 03487
- Minnesota, north-central, field trip, teacher's guide: Sims, Paul. 03582
- Minnesota, northeastern, field trip, teacher's guide: Green, John. 03581
- Minnesota, southwestern, field trip, teacher's guide: Austin, George. 03492
- Physical, introductory, field laboratories: Cranson, K. R. 01065
- Resources and references, lists: Wall, Charles A. 03931
- Secondary school, teacher training, Pennsylvania, summary: Geyer, Alan R. 02405
- Textbook, physical geography: Strahler, Arthur N. 00829
- Textbooks, need for combination of all fields: Wilson, J. Tuzo. 05044

*Methods*

- Inquiry, open-ended: Lueck, Gail G. 00119
- Inquiry process: Dexter, William A. 00490
- Introductory courses, module system: Dean, Walter E., Jr. 06952
- Michigan University, open-scheduled laboratory teaching: Smith, Charles I. 01104
- Programmed textbook presentation: Stevenson, Robert Louis. 03112

*Micropaleontology*

- Teaching, course planning suggestions: Kesling, Robert V. 08502

*Museums*

- Functions, South Dakota School of Mines and Technology: Green, Morton. 03928

*Oceanography*

- Deep Sea Drilling Project, raw data, student involvement: Vallier, Tracy L. 01108

*Paleobiology*

- Professional training, future: Beerbower, James R. 08501

*Paleontology*

- Materials, Nebraska, handbook of invertebrate fossils: Pabian, Roger K. 07542
- Traditional courses, integration with paleoecology: Laporte, Leo F. 01079
- Undergraduate, modernized approach: Linsley, Robert M. 08499
- Vertebrate, necessary background in biology: Romer, Alfred Sherwood. 08565

*Palynology*

- Curricula, needs, general: Wilson, L. R. 08566

*Remote-sensing methods*

- Curricula, Pennsylvania State University: Lattman, Laurence H. 01182

*Seismology*

- Seismicity of Earth, 1961-67, motion picture: Levy, Michael A. 03312

*Stratigraphy*

- Stratigraphic paleontology, teaching, approach: Berry, W. B. N. 08500

**Education—Continued**

*Structural geology*

- Dynamic, rock deformation apparatus and experiments: Donath, Fred A. 00122

**El Salvador**

*Geochemistry*

- Izalco Volcano, fumarole condensates: Stoiber, Richard E. 04873

*Geomorphology*

- Lake Ilopango, erosion, processes, causes: Martinez H., Maximiliano. 10863

*Heat flow*

- Geothermal energy, exploration, potential sources: Bailey, Darrel G. Fallen. 10884
- Geothermal energy, hydrothermal zones, potential: Alonso E., Hector. 11006

*Hydrogeology*

- San Miguel River basin, lower, volcanic terrane, water resources: Wozab, David. 03548

*Maps, soils*

- Sesori quadrangle: Campos Morataya, Ernesto. 10282

**Elastic properties**

*Anisotropic crystals*

- Elastic constants, Reuss and Hill methods: Kumazawa, Mineo. 02180
- Elastic constants, Reuss and Hill methods: Weidner, Donald. 03013

*Anisotropic rocks*

- Ground stress determination, borehole strain gauge technique: Barla, G. 01283

*Coesite*

- Compressional-wave velocities: Mizutani, H. 02138

*Crust*

- Tidal loading effects, Nova Scotia: Lambert, A. 03211

*Cubic lattices*

- Equations for constants and pressure derivatives: Anderson, Orson L. 02814

*Fayalite*

- Compressional-wave velocities: Mizutani, H. 02138

*Forsterite*

- Elastic coefficients, pressure-temperature derivatives: Graham, Earl Kendall, Jr. 06614

*Granite*

- Strain, recoverable: Brown, Anton. 00874

*Greenschist*

- Experimental study, oceanic crust, layer 3: Christensen, Nikolas I. 00565

*Iron oxides*

- Iron contents, effects: Liebermann, Robert Cooper. 03267

*Mantle*

- Upper, thermal effects, new equations: Thomson, Leon. 10588

*Methods*

- Pressure coefficients, P, S velocities, estimation: Chung, Dae-Hyun. 02010

*MgO*

- Single crystal and polycrystalline, experimental: Spetzler, Hartmut. 01444

*Muscovites*

- Isotropic, anisotropic, basal plane: Caslavsky, J. L. 09115

*Olivine*

- Effects of Fe:Mg ratio: Chung, D. H. 10586
- Forsterite-fayalite solid solutions: Fujisawa, Hideyuki. 01912
- P-, S-wave velocities, Fe:Mg ratio effect: Chung, D. H. 05315

**Elastic properties—Continued***Oxides*

- Spinel phases, velocity-density systematics: Liebermann, Robert C. 03674

*Polycrystalline rocks*

- Anisotropy, Reuss and Hill methods: Kumazawa, Mineo. 02180
- Anisotropy, Reuss and Hill methods: Weidner, Donald. 03013

*Porous rocks*

- Stress concentrations around pores, saturation effects: Szabo, Barna A. 09140

*Quartz rocks*

- Release adiabats: Smith, Carl W. 01981

*Rock mass*

- Testing methods, in situ and laboratory, evaluation: Bukovansky, Michal. 09138

*Rocks*

- Dynamic moduli under pressure: Schock, R. N. 07903
- Relation to pressure-volume curves: Stephens, D. R. 07832
- Shock-wave studies: Petersen, Carl Frank. 11011
- Velocity-density relations: Anderson, Don L. 00413

*Sedimentary rocks*

- Strain, recoverable: Brown, Anton. 00874

*Sediments*

- Pacific Ocean, northern: Hamilton, E. L. 10645
- Pacific Ocean off San Diego, Calif.: Hamilton, E. L. 10646
- Sound velocity, Pacific Ocean, northern: Hamilton, Edwin L. 03558

*Silicates*

- Olivine phases, velocity-density systematics: Liebermann, Robert C. 03674

*Soils*

- Anisotropic parameters, theoretical bounding values: Pickering, D. J. 04352

*Spinel*

- Compressional-wave velocities: Mizutani, H. 02138
- Equation of state, 10 kb, 800°C: O'Connell, Richard J. 01962

*Theoretical studies*

- Cubic minerals, pressure derivatives, equations of state: Anderson, Orson L. 08425
- Lattice theory, sound velocities, pressure derivatives: Anderson, Orson L. 02011
- Magnetoelastic interactions, hematite: Liebermann, Robert C. 01947
- Phase changes, effects on shear, P-wave velocities: Demarest, Harold H., Jr. 02009
- Rock with cracks, velocity anisotropy, stress effects: Nur, Amos. 01960

**Electrical methods***Applications*

- Ground-water exploration: Breusse, J. J. 02939
- Ground-water exploration: O'Connor, James P. 09887
- Mineral exploration, multiparameter system, airborne: Barringer, A. R. 02920
- Mineral exploration, submarine metallic bodies, self-potential system: Corwin, R. F. 09479
- Mineral exploration, sulfides, weathered regions: Dolan, William M. 02926

*Conductance*

- Hydrogeology, ground-water contribution to storm runoff: Visocky, Adrian P. 01153

*Electromagnetic*

- AFMAG, mapping, advantages: Sutherland, Don B. 02922

**Electrical methods—Continued***Electromagnetic—Continued*

- AFMAG, mineral exploration: Strangway, D. W. 02918
- Application, sea-floor studies: Coggon, J. H. 03470
- Applications, mineral and ground-water exploration, airborne: Ward, Stanley H. 02917
- Applications, mineral and ground-water exploration, ground: Bosschart, Robbert A. 02916
- Applications, mineral exploration, asbestos: Conn, H. M. K. 03760
- Applications, Precambrian shield, Canada, polymetallic ores: Paterson, Norman R. 02945
- Applications, resistivity mapping: Collett, L. S. 03761
- Depth sounder, depth to water table, strata conductivities: Inouye, George T. 06859
- Depth sounding, variable coil separation mode: Duckworth, K. 07517
- Induction prospecting, buried structure effect, theoretical: Geyer, Richard G. 04373
- Instruments, Geonics EM-18 airborne VLF system: Paterson, Norman R. 10898
- Instruments, SLINGRAM, TURAM, CRONE compared: Gaucher, Edwin. 04297
- Reflectivity contrast, air-water interface, sea and pure water: Lepley, Larry K. 11265
- Remote-sensing systems, input cf. Radiophase: Barringer, A. R. 00557
- Rotary field technique: Sinha, Ajit K. 01252

*Induced polarization*

- Applications, mineral exploration: Seigel, Harold O. 02956
- Applications, polymetallic ores, exploration: Hallof, Philip G. 02924
- Differential, mineral exploration, new technique: Labounsky, Alex. 04997
- Lead-zinc deposits in carbonate rock: Siegel, Harold O. 07405
- Measurement with inductive system, evaluation: Hohmann, Gerald W. 04785

*Interpretation*

- Anisotropic resistivities from two-dimensional structures: Wright, J. A. 07719
- Electromagnetic field scattering, two-dimensional inhomogeneities, formulation: Parry, John Robert. 07369

*Resistivity*

- Application, mineral and ground-water exploration: Keller, George V. 02946
- Application, permafrost mapping: MacKay, D. K. 08426
- Ground-water exploration: Gay, S. Parker, Jr. 02434
- Interpretation, hydrogeology: Flathe, H. 02937
- L-shaped array, value of apparent resistivity: Zohdy, Adel A. R. 04026
- Schlumberger sounding near vertical contact, variable azimuth: Zohdy, Adel A. R. 05126
- Subsurface testing, technique: VanZelst, T. W. 05261

*Techniques*

- Bipole-dipole electrode arrays, geometric factors, computation: Zohdy, Adel A. R. 03378
- Direction of mineralization from single drill hole: Morrison, Bert C. 07836
- Radiowave, airborne: Barringer, A. R. 02920

**Electrical properties***Bituminous coal*

- Radio-wave transparency: Cook, John C. 07516

**Electrical properties—Continued**

- Clay*
  - Conductance, Na-bentonite-water systems: Jorgensen, P. 07852
- Crust*
  - Conductivity, Canada, western: Caner, Bernard. 06885
- Mantle*
  - Conductivity, Canada, western: Caner, Bernard. 06885
- Metamorphic rocks*
  - Conductivity, dielectric constant tensors: Hill, Donald Gardner. 06615
- Methods*
  - Rock core samples, resistivity: Cress, Glynn. 04374
- Quartz-dolomite rock*
  - Experimental study, mine pillars: Russell, James E. 07444
- Rocks*
  - Dry, dielectrics: Saint Amant, M. 03737
  - Parameters, linear system analogy: Fuller, Brent D. 00082
- Sedimentary rocks*
  - British Columbia, Triassic-Paleozoic sections, magnetotelluric data, dip and strike resistivities: Densmore, A. A. 09376
- Sediments*
  - Potentials, coastal, reduced biome under oxidized layer: Riedl, Rupert J. 07816
- Soils*
  - Conductivity, calculated, measured: McNeal, B. L. 07229
  - Dielectric constants, determination from P-wave velocity: Hayre, Harbhajan S. 07093
- Sulfides*
  - Applications, possible: Pickart, Stanley J. 09947
- Electrical surveys**
- Alabama*
  - Heflin area, ground-water development: Wilson, Gary V. 05068
- Alaska*
  - Cleary Summit area, IP and resistivity: Anderson, Lennart A. 06174
  - Fairbanks area, placer deposits: Anderson, L. A. 04251
  - Trans-Alaska pipeline route: Frischknecht, Frank C. 10043
- Atlantic Ocean*
  - Laurentian Channel, diapir: Keen, M. J. 08117
- Colorado*
  - Rocky Mountains, central, tunnel site, resistivity: Johnson, Robert B. 05494
- Delaware*
  - Middletown-Odessa area, Columbia Fm., ground-water exploration: Woodruff, Kenneth D. 10351
- Hawaii*
  - Kohala Mountain, west slope, ground-water exploration: Adams, William Mansfield. 07782
  - Mahukona-Kawaihae area, ground water: Adams, William M. 10613
- Manitoba*
  - Electromagnetic, deeply penetrating, results: Tikkanen, G. D. 03467
- Missouri*
  - Reynolds County, mineral exploration, single hole method: Morrison, Bert C. 07836
- Northwest Territories*
  - Mackenzie delta, permafrost mapping, resistivity: MacKay, D. K. 08426

**Electrical surveys—Continued**

- Ontario*
  - Cavendish township, airborne, VLF-EM test: Paterson, Norman R. 10898
  - Timmins area, airborne, ground, anomaly, Kidd Creek mine: Donohoo, H. V. 09847
- Saskatchewan*
  - Southwestern, ground-water study: Dyck, John Henry. 01220
- Texas*
  - Western, High Plains, aquifer thickness: Blumentritt, Russel. 01892
- United States*
  - Southwestern, upper mantle conductivity, temperatures: Madden, T. 04502
- Washington*
  - Southeastern, subloess basalt topography: Ringe, Don. 04951
- Electron microscopy**
- Applications*
  - Carbonate sediments, scanning technique: Hay, William W. 07463
  - Chitinozoa, Devonian, wall layers: Urban, James B. 00576
  - Loess particles, shape and texture: Smalley, Ian J. 01502
  - Magnetic particles, detection: Evans, M. E. 06822
  - Marine geology, biologic, micropaleontologic, mineralogic: Walker, D. A. 03746
  - Nannofossil research: Charm, Walter B. 01133
  - Paleobotany, opalized wood, ultrastructure: Greer, Raymond T. 10604
  - Periglacial eolian sand recognition: Krinsley, David. 08625
  - Pore structure in sandstone: Weinbrandt, R. M. 07459
  - Precambrian microfossils, ultrastructures, cf. modern: Schopf, J. William. 00545
  - Sediment age, quartz grain surfaces, Virginia, York-James Peninsula: Wendell, P. B. 05442
  - Television, closed-circuit, for teaching: Rosauer, Elmer A. 03658
- Data*
  - Anthozoa, scleractinian exoskeletons, attachment scars: Wise, Sherwood W., Jr. 03417
  - Concretions, ferromanganiferous, Illinois: Cescas, Michel P. 03934
  - Diatoms, Protista, California, Miocene rocks: Wornardt, W. W., Jr. 01686
  - Foraminifera, *Globigerina pachyderma*: Kennett, James P. 02291
  - Graptolithina, periderm layer structures: Berry, William B. N. 00549
  - Illite, flocculated, flake orientation: O'Brien, Neal R. 07962
  - Leda clay micrographs: Gillott, J. E. 02307
  - Molluscan shell ultrastructures: Wise, Sherwood Willing, Jr. 07287
  - Muscovite, cation exchange capacity, weathering: Mokma, D. L. 02545
  - Palynomorphs, structures: Brack, S. D. 04167
  - Sandstone, quartz overgrowths, genesis: Pittman, Edward D. 09521
  - Shale, genesis of fabric: O'Brien, Neal R. 08454
- Instruments*
  - Collector turret, signal detector changer for scanning electron microscope: Wells, Oliver C. 10414
  - Field emission scanning microscope, secondary electron mode operation: Crewe, A. V. 10410

**Electron microscopy—Continued***Instruments—Continued*

Scanning, specimen holder for palynomorphs: Urban, J. B. 04356

*Methods*

Carbonate sediments, scanning technique: Hay, William W. 07463

Epoxy embedding-casting preparation, endolithic algae and fungi: Golubic, Stjepko. 03872

Muscovite, cation exchange capacity, weathering: Mokma, D. L. 02545

Palynology, mounting, metal-coating: Urban, J. B. 04356

Pore geometry, scanning of pore casts: Pittman, Edward D. 08621

Scanning electron microscopy, sample preparation, size analysis: Walker, D. A. 03746

Scanning microscope, stereomicrography, applications: Oshima, T. 09795

Scanning, use with electron probe microanalysis: Radcliffe, Dennis. 01317

Soil fabrics, scanning procedures, selected surfaces: Lynn, Warren C. 04019

**Electron paramagnetic resonance***Applications*

Conodont dating: Morency, Maurice. 01200

*Data*

Carbonate minerals, Mn distribution: Wildeman, Thomas R. 00851

Homestead and Allende chondrites: Chaterlain, A. 04402

**Elements***Abundance*

Marine sediments, interstitial water, Pacific Ocean: Presley, Bobby Joe. 07644

*Analysis*

Neutron activation, small geologic samples: Allen, R. O. 07907

*Geochemistry*

Feldspar, coexisting pairs, New York, pegmatite: Schwarzer, Theresa Frances. 01237

Oil-field brines, recovery possibilities: Angino, Ernest E. 05063

**Engineering geology***Applications*

Arctic, permafrost soils, petroleum exploration: Hemstock, R. A. 10049

Environmental problems, role of geologists and teachers: Flawn, Peter T. 07997

Geotechnical sciences, construction problems, Canada: Natl. Research Council Canada. 09763

Highway planning and maintenance, Colorado: Robinson, Charles S. 08488

Oil shale development, United States: Waltz, James P. 10835

Peatlands, exploitation, interdisciplinary research: Radforth, N. W. 08313

Public works, review, 1969: Yardley, D. H. 02168

Submerged sand deposits, sampling technique, Quebec: Tavenas, F. 03756

*Canals*

Dams and locks, Maryland-Virginia-West Virginia, Chesapeake and Ohio Canal, field trip guidebook, hi story: Davies, William E. 10229

*Clays*

Adsorptive properties, pesticides: Huang, Ju-Chang. 05871

Anisotropic consolidation, Leda clay, experimental: Mitchell, R. J. 02894

Banks, harmonic excitation, response: Kovacs, W. D. 00298

**Engineering geology—Continued***Clays—Continued*

Compacted, properties, relation to structure: Barden, Laing. 03627

Compacted swelling, stresses, laboratory testing: Komornik, A. 02457

Compressibility, physico-chemical model analysis: Erel, Bilgin. 07264

Consolidation characteristics, varved, Connecticut: Ramanjaneya, Gundarlalhalli Sankarasetty. 00510

Consolidation, secondary, factors influencing: Schmidt, Norbert O. 05506

Consolidation, shear strength, triaxial compression tests: Lee, Kenneth L. 06777

Differential thermal analysis, frozen layer silicate-water mixtures: Anderson, Duwayne M. 10121

Leda clay, mechanical strength, triaxial tests: Mitchell, R. J. 03942

Load-deformation-time behavior: Kim, Jong Sol. 06594

Mechanical properties, gyratory compacted kaolin: Jagannath, Banad Nandiswar. 03096

Mineral structure, X-ray diffraction analysis, relation to properties: Moore, C. A. 05272

Overconsolidation, climatic influences, St. Clair clay till, Ontario: Dreimanis, A. 02887

Overconsolidation, Saint Clair clay till, Ontario, southern: Adams, J. I. 02886

Overconsolidation, Saint Clair clay till, Ontario, southwestern: Soderman, L. G. 02897

Plastic movement, sheeted excavation: Whitney, Harold Tichenor, Jr. 03101

Pore pressure-strain relation, theoretical: Ladanyi, B. 03958

Properties, Leda clay: Gillott, J. E. 02307

Sensitive, properties, interrelationships: Majumdar, Dalim K. 00044

Sensitivity, causal factors, effects of environment: Ramanatha Iyer, T. S. 02362

Sensitivity, causes: Torrance, J. Kenneth. 10972

Sensitivity, property interrelations, naturally cemented: Sangrey, Dwight A. 03224

Shear strength, parameters, Ontario, Welland area: Gill, Ajit Singh. 03095

Shear strength, undrained, consolidation, principal stress difference: Khara, Raj P. 09383

Slope stability, excavations, shear stresses: Chowdhury, R. N. 00047

Strength, excavations below ground-water level: Milligan, V. 02899

Strength tests, Washington, Seattle clay: Sherif, M. A. 10747

Strength-size relation, fissured: Brown, E. T. 04351

Strength-size relation, fissured, equation: Lo, K. Y. 02421

Stress wave propagation: Dodds, Robert Brian. 07382

Stress-strain behavior: Namy, Dominique. 07938

Stress-strain behavior, three dimensional: McKyes, Shirley Edward. 00509

Surface area, estimating by glycol adsorption: Am. Soc. Testing and Materials. 05271

Swelling pressure, prediction: Komornik, Amos. 04225

Swelling pressure, prediction: Livneh, Moshe. 00054

Texas, Beaumont Clay, strength: Al-Layla, Mohamad Tayeb Hussain. 07577

**Engineering geology — Continued***Construction materials*

Corrosion, role of air pollutants: Winkler, E. M. 06720

*Dams*

- California, southeastern, Senator Wash Dam: U.S. Bureau of Reclamation. 06921  
 Crack formation, prediction: Cappleman, Homer L., Jr. 00050  
 Earth and rockfill, load transfer studies: Squier, L. Radley. 00043  
 Earth, earthquake response: Mathur, Jagdish Narain. 06588  
 Earth, failure during earthquake, California, Sheffield Dam: Seed, H. Bolton. 05507  
 Earth, vibrational characteristics: Frazier, Gerald Alvin. 06025  
 Field trip, New Jersey, Pennsylvania: Association Eng. Geologists. 10227  
 Foundation, British Columbia, Bennett Dam, Peace River: Jory, Lisle T. 07894  
 Foundation, problems, Washington, Skagit River: Coombs, A. 09869  
 Foundation studies, California, Red Bluff Diversion Dam: Trefzger, Robert E. 09909  
 Pennsylvania, Holtwood area, Muddy Run project: Wilson, Stanley D. 00052  
 Remote areas, reconnaissance techniques: Swanson, Vernon E. 03667  
 Ridge and Valley province, Pennsylvania, Raystown Dam, Devonian sedimentary rocks, field trip: Franklin, Wesley D. 10228  
 Rock mechanics, case histories: Jaeger, Charles. 03332  
 Seepage, Pennsylvania, Alvin R. Bush Dam, water temperature method: Trautwein, William B. 07137  
 Site and material properties, Quebec, Outardes River, project 4: Dussault, R. 02890  
 Washington, Skagit River, Ross Dam: Coombs, Howard A. 06148

*Earthquakes*

- Alaska, March 28, 1964, bridge foundation behavior: Weggel, Harold A. 00045  
 Analysis, model based: Narayana Iyengar, R. 03203  
 Building damage, geologic and soils aspects: Steinbrugge, Karl V. 08636  
 Building vibrations, prediction equations: Sanderson, Robert Michael. 03099  
 California, active fault zones, planning and zoning status: Radbruch, D. H. 10830  
 California, Hayward, risks, public policy: Simonds, George. 00362  
 California, Los Angeles area, effects, Borrego Mtn. event: Maley, Richard P. 00309  
 Colorado, Rangely oil field, relation to fluid injection: Munson, R. C. 06458  
 Damage control, recommendations, Utah: Cook, Kenneth L. 10964  
 Damage, structural performance, United States: Steinbrugge, Karl V. 03045  
 Damage, wood frame structures, losses, California: Algermissen, S. T. 00221  
 Design for nuclear power plants, symposium, 1969: Hansen, Robert J. 00970  
 Design spectrum of structures: Housner, G. W. 03044  
 Earth structures, elastic-viscoplastic response: Byrne, Peter Michael. 01566

**Engineering geology — Continued***Earthquakes — Continued*

- Education, practicing engineers, collected papers for short course: Wiegel, Robert L. 03040  
 Energy, California, Imperial Valley, 1940: Trifunac, Mihailo Dimitrije. 00512  
 Energy release, building vibrations, California, Imperial Valley: Trifunac, Mihailo D. 03356  
 Ground motion, building site: Duke, C. M. 04667  
 Ground motion, California, San Onofre Nuclear Station, 1968: Housner, G. W. 03031  
 Ground motion, causes, nature: Housner, G. W. 03043  
 Ground motion, cf. explosions, Washington, Seattle: Seed, H. Bolton. 03355  
 Ground motion, effect of local geology: Tsai, Nien Chien. 01219  
 Ground motion, engineering intensity scale: Blume, John A. 03358  
 Ground motion, measurement, instrumentation: Hudson, Donald E. 03445  
 Ground motion, prediction from explosions: Borchardt, R. D. 03352  
 Ground motion, theoretical study: Tsai, N. C. 03302  
 Ground response, soils on sloping rock boundaries, analysis: Dezfulian, Houshang. 06774  
 Hazard reduction, recommendations: U.S. Office Sci. and Technology. 09734  
 Hazards, California, San Francisco Bay area: Steinbrugge, Karl V. 05526  
 Hazards, reduction, role of Federal Govt.: Steinhart, John S. 05529  
 High-rise buildings, seismic analysis and design: Newmark, Nathan M. 03048  
 Human activities as trigger, collected papers: Adams, William Mansfield. 05228  
 Magnitude, attenuation effects, nuclear power plants, U.S.: Linehan, Daniel. 00832  
 Magnitude, ground motion, response and design of structures: Whitman, Robert V. 00833  
 Microseismic zonation technique, Washington: Bostrom, R. C. 09870  
 Missouri, New Madrid region: Fischer, Joseph A. 06977  
 Multistoried building, analysis, response spectrum solution: Gibson, R. E. 00269  
 Multistoried building, free vibration: Gibson, R. E. 00268  
 Multi-storied buildings, response spectrum solution: Gibson, Richard Ernest. 07580  
 Multistory structures, responses, probabilistic study: Ruiz, Patricio. 03102  
 Occurrence around dams, manmade water bodies: Mickey, Wendell V. 09672  
 Offshore tower structures, response: Malhotra, Anil Kumar. 03098  
 Potential damage, urban areas, U.S., western: Gates, George O. 05581  
 Probability, eastern, earthquake resistant design: Fox, Fred L. 07138  
 Response of structures, analysis techniques: Clough, Ray W. 03047  
 Rock motions, characteristics, computation procedure: Seed, H. Bolton. 03635  
 Second order effects, multistory buildings: Saul, William E. 09556  
 Seismic acceleration spectra, prediction, dislocation theory: Aki, Keiiti. 00834

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- Seismic motions, geologic formations, effect, mathematical analysis: Frazier, Gerald A. 05513
- Seismic response of multistory buildings, 3 sec. periods: Korf, M. G. 10465
- Shear-wave amplification in layered soils: Roeset, J. M. 00835
- Simulated motion of high-rise structures, computer program: Lord, James. 06360
- Slope stability, analysis: Seed, H. Bolton. 03448
- Soil and engineering structure interaction, model study: Whitman, Robert V. 00836
- Soil stability: Seed, H. Bolton. 03046
- Soil stratum-building interaction, mass-spring system: Hashiba, Tomonori. 10127
- Soil-pile foundation interaction, bridges: Penzien, Joseph. 03447
- Strong-motion observation system, headquarters station, construction: Ohta, Yutaka. 00327

*Education*

- Curriculum, environmental geologic approach: Young, Keith. 08030
- Curriculum, environmental geology: Young, Keith. 07998
- Curriculum, map exercises, environmental geology: Young, Keith. 08004
- Field trips, environmental geology, Texas: Young, Keith. 08005
- Introductory graduate-level course, United States, teacher survey: Monahan, E. J. 11250
- Short course lecture notes, environmental geology, American Geol. Inst.: Am. Geological Institute. 07996

*Estuaries*

- Resources protection, methods: Committee on Tidal Hydraulics. 10717

*Experimental studies*

- Coulomb-Navier method, underground openings: Wang, Fun-Den. 02439
- Cratering, Montana, Ft. Peck, Project Pre-Gondola: Cress, J. P. 05460
- Dynamic amplification spectra, thin alluvial layers: Alcock, Edward D. 00220
- Rapid excavation, systems analysis of geologic, hydrologic conditions: Roach, Carl H. 09538
- Sediment transport, silt particles, dispersion, open-channel flow: Hagist, Warren M. 01709
- Soils, erosion, effect of unit weight and slope: Faddick, Robert R. 04230

*Foundations*

- Arizona, Glen Canyon dam area: U.S. Bureau of Reclamation. 09167
- California, Sacramento and San Joaquin Rivers delta area, peat: Bigham, Robert E. 00051
- Clay, mudstone, swelling due to gypsum formation *in situ*: Morgenstern, N. R. 02882
- Compaction tests on sand, impulse loading: Wetzel, Richard A. 04223
- Construction hazards, control, Utah: Hewitt, William P. 10960
- Dam, tunnel, powerhouse, Alaska, Baranof Island: Callahan, James E. 05455
- Earth and rockfill dam, Quebec, Outardes River, project 4: Dussault, R. 02890
- Exploration, depth determination guide: Smith, Ronald E. 02354
- Exploration, depth determination guide, nonuniform load distribution: Giroud, Jean Pierre. 06779
- Frost-heaving forces, Leda clay, Canada, Ottawa area: Penner, E. 02889

**Engineering geology—Continued***Foundations—Continued*

- Glacial lake strata, North Dakota, Fargo area, strength variation: Nordlund, Raymond L. 02358
- Infinite media, dynamic analysis, finite model: Novak, M. 03202
- Muskeg, descriptive system, Canada: MacFarlane, I. C. 05277
- Muskeg environment, Canada, peat, permafrost problems, research, development: Radforth, N. W. 09764
- Muskeg, highway embankment construction: Raymond, G. P. 08244
- Peat, California, Sacramento and San Joaquin Rivers delta areas: Weber, William G. 04224
- Peat, compressibility, shear strength, test: Keene, P. 08243
- Peat, consolidation tests, response to plate loading: Forrest, J. B. 06783
- Peat, determination of threshold stress: Glynn, T. E. 08252
- Peat, dike construction, performance: Hardy, R. M. 08242
- Peat, response to plate loading, field studies: LoPinto, Victor J. 00086
- Permafrost, geotechnical research, Canada, cf. U.S.A.: Harwood, T. A. 09765
- Permafrost, reservoir dikes, thaw rates: Macpherson, J. G. 06747
- Permafrost, thaw and settlement rates, prediction: Brown, W. G. 06739
- Polar regions, snow deformation under load, experimental: Abele, Gunars. 03336
- Sand, liquefaction during earthquakes, densification, California: Miller, Eugene A. 05504
- Sand, subsidence, surface vibration experiments: Brumund, William Frank. 01565
- Settlement, prediction cf. actual, British Columbia: Meyerhof, G. G. 06740
- Settlement, varied clays, New Jersey, Hackensack Meadows: Lobdell, Herbert L. 03628
- Shale, compressibility characteristics, laboratory and *in situ* tests: Hendron, A. J., Jr. 09315
- Shale, drained black, heave, causes, bacterial action: Quigley, R. M. 02902
- Shale, drained black, heave, oxidation, nonbacterial causes: Berard, J. 02883
- Shale heave, Ontario, Billings fm., weathered pyrite: Penner, E. 03945
- Shale, limestone, clay overburden, load tests, Ontario: Seychuk, J. L. 06573
- Soil settlement, prediction, reliability: Folan, Joseph Ibikunle. 01218
- Soil stability analyses, safety factors, probability concepts: Meyerhof, G. G. 06738
- Soils, settlement, problem-oriented computer language: Giroud, Jean Pierre. 06781
- Soils, settlement, problem-oriented computer language: Schiffman, Robert L. 02353
- Subsurface structure, testing, electrical resistivity: VanZelst, T. W. 05261
- Surveying methods, materials, differential movements of earth and structures: Anderson, Edward K. 02711
- Gas storage*
- Kansas, Kansas River basin, feasibility: Kansas Geological Survey. 10711
- Problems, effects of pressure and water densities in aquifer: Bond, D. C. 10665
- Saline aquifers: Katz, Donald L. 05064
- Salt caverns, Gulf Coastal Plain, current and future technology: Martinez, Joseph D. 08735

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- Salt cavities, solution collapse breccia, bulking: Jaron, Michael G. 04582
- Sandstones, Minnesota, Freeborn Co., suitability: Austin, G. S. 07990
- Underground, geologic requirements: Keen, Gerald F. 09726
- Underground reservoirs, mechanical stability, model studies: Hardy, H. Reginald, Jr. 09154

*General*

- Exploration data, automatic data processing: Grice, R. H. 09867
- Man's alteration of natural systems, consequences: Legget, Robert F. 09467
- Symposium, Idaho Department of Highways, 8th annual: Idaho Department of Highways. 05493

*Geologic hazards*

- Conference, 1969, papers, U.S., western: Olson, Robert A. 05582
- Earthquake damage, California, minimization, role of engineers: Degenkolb, H. J. 05527
- Earthquakes, California, Tehachapi: Pond, Richard B. 07176
- Erosion and sedimentation, water pollution: Randolph, Jennings. 08386
- Floods, mud-rock flows, Utah: Marsell, Ray E. 03034
- Floods, reduction by floodplain zoning: Turk, L. J. 07999
- Oil leaks, natural, causes, California, Santa Barbara Channel: Curry, Robert R. 05580
- Prevention, role of geologist: Jahns, Richard H. 01332
- Reduction program, California Div. Mines and Geology: Oakeshott, Gordon B. 05573
- Reduction, role of Federal Govt.: Steinhart, John S. 05529
- Slow earth movements, increasing urban problems: Kehle, Ralph O. 08000
- Types, recognition, role of geologist in prevention: Jahns, Richard H. 09470
- Volcanic eruptions, potential effects, U.S., Cascade Range: Crandell, Dwight R. 05522

*Harbor problems*

- Sedimentation, waste disposal, California, San Francisco Bay, ecological effects, erosion control: Smith, Bernard J. 09386

*Highways*

- Aggregate, high friction, specifications, New York: Cutcliffe, William E. 07479
- Design and construction problems, Kansas, northeastern: Burgat, Virgil A. 08414
- Design factors, regional geomorphic units, United States: Witczak, Matthew Walter. 07267
- Distressed areas, delineation, photography: Hoskins, Earl R. 07028
- Earth roads, laterite aggregate-gravel mixtures: Assezz, L. O. 06047
- Erosion and sediment problems, control: Herr, Lester A. 08390
- Field trip guidebook, Missouri, Hannibal-Clarksville, Route 79Tr, stratigraphic sequence, structure: Wagner, Ray G. 09345
- Frost penetration, prediction, literature review: Moulton, Lyle K. 10881
- Program, Virginia, need for geologists: Dvorak, W. E., Jr. 05420

*Hydrocarbon storage*

- Salt solution cavities: Jacoby, Charles H. 05641

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- Pressure meter, testing soft bedrock: Dixon, S. J. 09314

*Land subsidence*

- Brinefield collapse, Ontario, Windsor area: Terzaghi, Ruth D. 04471
- Causes, man-induced, remedies, U.S., western: Poland, Joseph F. 05524
- Collapsing soils, magnitudes of settlement, factors: Dudley, John H. 03227
- Dams, crack formation, prediction: Cappleman, Homer L., Jr. 00050
- Ground movement prediction during and after mining: Lautsch, H. 08729
- Ground-water withdrawal, Louisiana: Wintz, William A., Jr. 07109
- Horizontal movement, prediction: Lee, Kenneth L. 03633
- Measurement, techniques, instrumentation: Panek, Louis A. 04472
- Mines, Pennsylvania, Pittsburgh area, support methods: Gray, Richard E. 03629
- Petroleum withdrawal, California, control, saline-water injection: Pierce, Robert L. 04805
- Prediction, current techniques, coal mines: Orchard, R. J. 06782
- Prediction methods, current techniques: Schmidt, Birger. 04386
- Prediction methods, current techniques: Voight, Barry. 02361
- Seasonal tilting, aquifer compaction, California: Riley, Francis S. 01507
- Solution cavern closure: Martinez, Joseph D. 05030

*Land use*

- Earthquake hazards, planning, California, San Francisco Bay area: Steinbrugge, Karl V. 05526
- Effect of geology, Washington, King County: Mullineaux, Donal R. 04640
- Environment destruction: Laycock, George. 07733
- Environmental geology, methods, mapping, atlas: Brown, L. F., Jr. 08003
- Environmental hazards, West Virginia, natural and man-made: Wilmoth, Benton M. 07085
- Environmental, natural bases, California, Nicasio Valley: Twiss, Robert. 06920
- Environmental pollution study site, Illinois, Champaign: DuMontelle, Paul B. 02463
- Erosion and sedimentation control, Contra Costa County: Brown, F. Raymond. 08388
- Geologic factors, Texas, Waco area: Font, Robert G. 04383
- Illinois, Crescent City area, planning data: Bergstrom, Robert E. 04237
- Mineral extraction effects, conservation needs, Texas: Flawn, Peter T. 02709
- Mining, surface, public attitudes, problems, Wisconsin: Friz, Thomas Otto. 06593
- Missouri, Saint Louis County: Rockaway, John D. 07401
- Multipurpose, mineral development, Idaho: Savage, C. N. 05817
- Physical environment, Saskatchewan, Saskatoon area, folio: Christiansen, Earl A. 06354
- Pits and quarries, rehabilitation, Ontario: Hewitt, D. F. 03455
- Planning, Alaska, post-earthquake evaluation: Eckel, Edwin B. 04962

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- Planning, environmental geology: Frye, John C. 09469
- Planning, hydrogeology, role: Sommers, David A. 06761
- Planning, Wisconsin, Fox River watershed: SE Wisconsin Regional Plan. Comm. 10399
- Relation to sediment yields, Wisconsin: Hindall, S. M. 03982
- Resource inventory from high-altitude and spacecraft photos: Pettinger, Lawrence R. 08080
- Resources inventory, Colorado, computer processing: McNair, Arthur J. 10350
- Rural planning, Illinois, De Kalb County: Gross, David L. 03669
- Sediment control, urban development, Geological Survey studies: Cywin, Allen. 08389
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- Site planning, Utah, Bear Lake area: Kaliser, Bruce N. 02438
- Soils, Indiana, St. Joseph County, percolation rates, textures: Persinger, Ival D. 05850
- Texas Gulf Coast, environmental geologic atlas: Flawn, Peter T. 01372
- Urban, Alaska, Anchorage area: Dobrovolsky, Ernest. 00607
- Urban, Arizona, Phoenix basin: Sheridan, Michael F. 02976
- Urban construction sites, Potomac River basin, erosion: Guy, Harold P. 06390
- Urban development, effect on hydrologic system, correction: Turk, L. J. 07999
- Urban development, environmental geology application: Hilpman, Paul L. 08482
- Urban development, sediment control, technology: Robinson, A. R. 08419
- Urban environment, Virginia, Roanoke area, Gainsboro Community: Dumper, T. A. 05421
- Urban, Pennsylvania, Harrisburg area, environmental study project: McGlade, William G. 06829
- Urban planning, geoenvironmental information, data bank systems: Woloshin, Aaron J. 09868
- Urban planning, hydrogeologic models: Remson, Irwin. 00638
- Urban planning, physical factors, analysis, methodology: Hackett, James E. 05428
- Urban planning, role: Slosson, James E. 08481
- Urban planning, role of geology: Wayne, William J. 10296
- Urban, planning, role of hydrogeology: Slosson, James E. 09573
- Urban planning, Virginia, Williamsburg area, Green Cove basin: Maloney, J. F. 05433
- Urban, reports for planning commissions: Wayne, William J. 00653
- Urbanization and water balance: Spieker, Andrew M. 09222
- Water-management, New York, Long Island: Cohen, Philip. 07488
- West Virginia, planning program: Wilson, Peter G. 00188

*Landslides*

- Ancient, slip-surface geometry, stabilization measures: Stout, Martin L. 05575
- Bedrock, overburden, California, southern: Leighton, F. Beach. 05525
- Detection by tiltmeter: Parry, W. T. 07413
- Effects, waves generated in reservoir, model tests: Wiegel, Robert L. 03719

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- Experimental studies, water-wave generation: Law, L. 09350
- Friction coefficient, rock surfaces: Hamel, James V. 04228
- Friction coefficient, rock surfaces, stereographic projection: Paulding, Bartlett W., Jr. 02414
- Geotechnical investigation, Quebec, Desbiens area: Chagnon, Jean-Y. 05293
- Irrigation effects, Washington, Pasco Basin: Brown, Randall E. 00598
- Leda clay, Canada, Ottawa area, mechanics: Eden, W. J. 03941
- Leda clay, Ontario, Ottawa area, mechanics: Ladanyi, B. 07070
- Leda clay, Ontario, Ottawa area, Rockcliffe slide: Jarrett, Peter M. 06741
- Marine clay, valleys in underlying bedrock, effect, Quebec: LaRoche, P. 02898
- Pennsylvania, highway construction: Flint, Norman K. 00153
- Pennsylvanian rock sequences, Kentucky, Pineville-Harlan area: Froelich, Albert J. 03950
- Potential, detection, control, Utah: Goode, Harry D. 10963
- Prevention, city programs, California, Los Angeles: Jahns, Richard H. 05531
- Progressive failures, mechanism, field observation data: Wilson, Stanley D. 04219
- Seacliffs, California, Diablo Canyon coastal area: Jahns, Richard H. 11229
- Shale interbeds in Columbia River Basalt, highway relocation: Anderson, Roy A., Jr. 05510
- Stabilization, California, Orange County: Stout, Martin L. 00373
- Stabilization, Idaho, Orofino area: Jones, Walter V. 05500
- Stabilization, Montana, Dillon area: Williams, Dennis A. 05498
- Till soils, debris-avalanching mechanics, Alaska, Prince of Wales Is.: Swanston, Douglas N. 10879
- Tsunami propagation: Wiegel, Robert L. 05523
- Tsunamis, genesis, wave amplitude, model study: Noda, Edward. 05859
- Materials, properties*
- Alaska, Yukon-Koyukuk lowland: Weber, Florence R. 01509
- Bitumens, irradiation effect: Watson, Clyde D. 09011
- Bitumens, range, physical tests: Abson, Gene. 09010
- Building stone, weathering in urban atmosphere: Winkler, E. M. 00111
- Classification, Oklahoma, east-central: Hartonft, B. C. 04364
- Clays, compressibility, mechanical and physicochemical effects: Olson, Roy E. 06775
- Clays, shear strength, anisotropically consolidated, triaxial tests: Lee, Kenneth L. 06777
- Clays, shear strength, Washington, Seattle: Sherif, M. A. 05496
- Cores, California, Castle area: Saucier, K. L. 10240
- Cores, Maine, Machias area: Crisp, R. W. 10233
- Cores, Michigan, Michigamme area: Crisp, R. W. 10235
- Cores, Minnesota, Duluth-Vermillion area: Crisp, R. W. 10238



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- Cores, New Hampshire, Pease area: Crisp, R. W. 10236
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- Cores, Wisconsin, Michigan, Pembine area: Crisp, R. W. 10225
- Cores, Wyoming, Warren II study area: Saucier, K. L. 10234
- Dessicated clays, influence of negative pore water pressure: Carlson, C. A. 10241
- Dolomitic limestone, aggregate, reaction with cement alkalies: Ozol, Michael A. 09705
- Granular medium, inelastic deformation, experimental and analytic program: Weidler, Jay B., Jr. 03329
- Gravel, Michigan, southern: Wingard, Norman Edward. 06014
- Leda clay, mechanical strength, triaxial tests: Mitchell, R. J. 03942
- Limestone, sandstone, granite, tensile strength, determination: Hardy, H. Reginald, Jr. 09156
- Loess, triaxial shear strength, fabric anisotropies: Matalucci, R. V. 06732
- Montmorillonite: Mesri, Gholamreza. 06589
- Montmorillonite, shear strength, triaxial tests: Mesri, G. 04353
- Peat, compressibility, shear strength: Keene, P. 08243
- Peat, consolidation, stress-strain relation, formula: Hanrahan, E. T. 08253
- Peat, frozen, strength, cf. frozen soils: MacFarlane, I. C. 08254
- Peat, permeability, relation to degree of decomposition: Boelter, D. H. 08255
- Peat, shear strength: Hardy, R. M. 08242
- Peat, strength, relation to composition and dispersion: Solopov, S. G. 08256
- Peat, strength, stress-strain, influence of fibers: Helenelund, K. V. 08314
- Pleistocene sediments, Saskatchewan, Saskatoon area: MacDonald, A. B. 02901
- Quartz, static fatigue, water influence: Scholz, Christopher H. 10583
- Rock and water mixtures, homogeneous, equation of state, hydrodynamic: Kirsch, Jeffrey W. 10580
- Rockfill materials, strength, deformation: Marachi, Nezameddin. 03097
- Rockfill, shearing strength, testing: Leps, Thomas M. 03625
- Rocks, geologic factors affecting: Schneider, Bernard. 07436
- Rocks, multilithologic specimens, strength, sliding friction: Logan, John M. 09646
- Sand and clay soils, damping constants, tests, evaluation: Coyle, Harry M. 03228
- Sand, liquefaction resistance, shear strain history effect, tests: Finn, W. D. Liam. 06773
- Sand, Ottawa, shear tests: Singh, Awtar. 05502
- Sand, strength, plane strain cf. triaxial tests: Lee, Kenneth L. 03226
- Sand, strength, plane strain cf. triaxial tests: Takagi, Shunsuke. 06784
- Sand, strength, triaxial tests, evaluation: Bell, James M. 05508
- Sand, vibration tests, densification, shear: Youd, T. Leslie. 03028
- Sands, strength, anisotropically consolidated, saturated: Lee, Kenneth L. 02355

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- Sands, submerged deposits, sampling technique, Quebec: Tavenas, F. 03756
- Sand-size particles, air permeability: Elgabaly, M. M. 05484
- Sediments, estuarine, consolidation, Virginia: Faas, Richard W. 00698
- Sediments, marine, surficial: Wilson, Jerry C. 09488
- Sediments, particle-size ranges, standardization: Edge, Duane E. 03225
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- Shale, compressibility characteristics, laboratory and in situ tests: Hendron, A. J., Jr. 09315
- Shale, cratering effects, Pre-Gondola chemical explosion: LaFrenz, Robert L. 10562
- Site selection, hard rock silo, prototype, United States, western: Kolb, Charles R. 10232
- Size classification, Wentworth's scale, adaptation to standard sieves: Archer, A. A. 02423
- Soil and bedrock, Missouri, Creve Coeur quadrangle: Rockaway, John D., Jr. 07904
- Soils, permafrost zone, Alaska, Prudhoe Bay area: Howitt, Frank. 10056
- Till, Saskatchewan, Saskatoon and Sutherland Groups: MacDonald, A. B. 06358
- Tuff, strength, elasticity, Nevada, Diamond Dust site: Stephens, D. R. 04127

*Methods*

- Infrared imagery, airborne, subsurface drainage: Abdel-Hady, M. 07248

*Mines*

- Acid mine drainage, neutralization: Hill, Ronald D. 07409
- Drainage problems, prevention in coal mines: Parizek, Richard R. 07411
- Loose rock detection, infrared studies: Merrill, Robert H. 07394

*Nuclear explosions*

- Applications, underground, summary: Higgins, Gary H. 03809
- Ground effects, predictions, results: Carder, Dean S. 05230
- Ground motion, prediction: Mueller, R. A. 07825
- Ground motion, seismic damage, genesis, prediction: Rodean, Howard C. 07824
- Land subsidence, cause and prevention: Hakala, W. W. 07830
- Milrow, October 1969, Amchitka, Alaska, effects: Merritt, Melvin L. 07989
- Plowshare program, applications: Johnson, Gerald W. 03212
- Prestressed media, strain release mechanism: Toksoz, M. Nafi. 10289
- Rapid excavation: Hamburger, Richard. 07004
- Seismic motions from project Rulison: Loux, P. C. 07911

*Permafrost*

- Alaska, hot oil pipeline, potential effects: Lachenbruch, Arthur H. 00010
- Arctic, oil exploration, heat flow, permafrost base: Jessop, A. M. 00093
- Construction problems in Arctic: Pewe, Troy L. 10090
- Construction problems, thaw subsidence, Canada: Brooker, E. W. 05979
- Distribution, acoustical methods: Nelson, Joseph L. 10083
- Frost penetration, prediction, literature review: Moulton, Lyle K. 10881

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- Ground settlement with thawing: Crory, Frederick E. 10027  
 Pipelines, foundation problems, Alaska: Pecora, William T. 08227  
 Remote-sensing applications, environmental analysis: Rinker, Jack N. 08236  
 Tunneling, method, Alaska: Swinzow, George K. 10242

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- Side-looking airborne radar, interpretation, site selection: Barr, David J. 09802

*Pipelines*

- Soils, subsurface studies, trans-Alaska system: Migliaccio, Ralph R. 10077  
 Test loop, Northwest Territories, Inuvik loop: Gilchrist, Joseph T. 10044

*Pollution*

- Groundwater, U.S., southwestern, Ogallala Fm., movement, recovery: Schneider, Arland D. 08717  
 Mercury, aquatic and human environment: Greeson, Phillip E. 05561  
 Mercury, environmental contamination, detection, prevention: Knapp, Carol E. 05565  
 Natural oil seeps, California, Santa Barbara: Allen, Alan A. 05607  
 New York metropolitan area, water, effects of chemicals: Thurber, David L. 09877  
 Petroleum seepage, detection, Gulf of Mexico: Frank, D. J. 05181  
 Petroleum spills, causes, California, Santa Barbara Channel: Curry, Robert R. 05580  
 Problems, lake basins, eutrophication, Florida: Brezonik, Patrick Lee. 10390  
 Surface water, mercury, natural and industrial: Wershaw, R. L. 05560  
 Water, control approach: Gahr, William N. 08571

*Practice*

- Environmental geology, training: Bergstrom, Robert E. 01053  
 Geotechnical sciences, construction problems, Canada: Natl. Research Council Canada. 09763  
 History, applicability: Roberts, George D. 07884  
 Reconnaissance for dam sites in remote areas: Swanson, Vernon E. 03667  
 Reconnaissance surveys, construction sites: Johnson, A. I. 05311  
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 Vocational guidance manual: Snelgrove, Alfred K. 08322

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- Bank storage, model study, Montana-British Columbia: Coffin, Donald L. 05445

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 Channels, bed forms, statistical properties, laboratory study: Annambhotla, Venkata Subramanya. 02220  
 Erosion, deposition rates, determination: Am. Soc. Civil Engineers. 03622  
 Sediment problems, urban areas, control measures: Guy, Harold P. 07048

*Rock mechanics*

- Anisotropic rocks, strength-deformation behavior: Yang, Jung Hsi. 07466

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- Anisotropic yielding, gravity loaded, finite-element model: Dahl, Hilbert Douglas. 06592  
 Applications and value: Abel, John F. 04468  
 Bedding and jointing planes, limestone, dolomite, effects on blasting: Pugliese, Joseph M. 09529  
 Behavior mode in crust: Price, Neville J. 07509  
 Bibliography, 1969 Canadian contributions: Canadian Adv. Comm. Rock Mechanics. 10669  
 Brittle fracture, initiation, ultimate failure, mine stopes: Barron, K. 09144  
 Brittle rock, fracture, intermediate principal stress effect: Brady, B. T. 07447  
 Compressive strength measurement, triaxial, cores: Heck, W. J. 05282  
 Continuum theories, development, tensor testing: Adachi, Toshihisa. 07338  
 Creep, rheology, stress-strain relation, equation: Scheidegger, A. E. 05007  
 Dam sites, case histories: Jaeger, Charles. 03332  
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 Damsite, field and laboratory tests, California, Auburn Dam: Wallace, George B. 07455  
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 Deformation, in situ modulus prediction, rock quality indexes: Coon, R. F. 09316  
 Deformation, modulus, determination, in situ: Wallace, G. B. 09318  
 Deformation, modulus, determination, in situ methods, Bureau of Reclamation: Wallace, G. B. 09308  
 Deformation, modulus, determination, in situ, symposium: Am. Soc. Testing and Materials. 09307  
 Deformation, modulus, in situ determination, radial jacking tests, data analysis: Misterek, D. L. 09309  
 Deformational properties, determination to 4 kb: Schock, R. N. 10582  
 Dynamic loading effects, natural rocks, structural materials: Ricketts, T. E. 02403  
 Dynamic strain, in situ measurement: Favreau, R. F. 09829  
 Effective stress law, tests: Ladanyi, B. 00826  
 Elastic moduli, static and dynamic, dry sandstone under pressure: King, M. S. 07507  
 Elastic properties, determination, in situ and laboratory tests: Bukovansky, Michal. 09138  
 Elasticity, analysis, constitutive equations: Barla, Giovanni. 07445  
 Elastic-plastic problems, rock and soil, finite-element analyses: Pariseau, W. G. 09146  
 Experimental deformation, brittle rock, role of microfracturing: Scholz, Christopher. 09137  
 Experimental studies, deformation modulus and in situ stress determination, equipment: Deklotz, E. J. 09313  
 Failure around circular opening: Hoyaux, B. 07448  
 Failure, deep mines, broadband seismic monitoring: Blake, Wilson. 07453  
 Failure, pore fluid effects, boundary porosity calculation: Robinson, Leon H. 07457  
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 Finite element method of stress analysis, applications: Radhakrishnan, N. 10128

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- Finite element method, salt mines, solution cavities: Serata, Shosei. 05034
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- Fracture and failure mechanics in loess, application: Lutton, R. J. 10716
- Fracture, brittle rock, intermediate principal stress effect: Brady, B. T. 07447
- Fracture characteristics, impact tests: Lyall, K. D. 09836
- Fracturing, effect on modulus, borehole dilation tests: Panek, Louis A. 09139
- Gas storage reservoirs, underground, stability, model studies: Hardy, H. Reginald, Jr. 09154
- Granular rock, failure criteria, deformational moduli: Ko, Kyung Chul. 07299
- Granulation, load-transfer effects, control techniques: Adler, Lawrence. 02575
- Ground stress tensor, data interpretation: Barla, G. 01283
- Igneous rocks, microcrack genesis, experimental study: Nur, A. 02404
- Inelasticity, effect of environment, nuclear detonation area: Heard, Hugh C. 07833
- Instrumentation for salt mines: Sellers, J. B. 05031
- Instruments, extensometer, electrical-hydraulic: Singh Deshwar, K. H. 04592
- Instruments for in-place measurements: Pegler, A. V. 08730
- International symposium, 2d, Spain, 1968: Jimenez Salas, Jose A. 08337
- Jointed rock, California, Crestmore mine, room and pillar structures: Heuze, Francois E. 09153
- Jointed rock, mathematical model: Goodman, Richard E. 00053
- Jointed rock, plane stress model, apparatus: Rosenblad, J. Lyndon. 07440
- Jointed rock, strength, deformability evaluation: John, Klaus W. 07438
- Jointed rock, strength, model tests: Brown, Edwin T. 02359
- Jointed rock, tests for properties: Jaeger, J. C. 07437
- Joints, deformability, testing: Goodman, R. E. 09317
- Limestone, sandstone, granite, tensile strength, determination: Hardy, H. Reginald, Jr. 09156
- Mine wall slide, strength parameters, Arizona, Pima mine: Hamel, James V. 00619
- Observations, techniques, needs: Judd, William R. 08339
- Potash creep: King, M. S. 04470
- Potash-salt pillar in mine, stress determination: Haupt, W. 08728
- Powerhouse excavation, roof arch behavior, British Columbia, Peace River: Imrie, A. S. 11245
- Practice, review, 1969: Agarwal, R. K. 02166
- Pressure-volume curves, loading-unloading, experimental: Stephens, D. R. 07832
- Pressure-volume equation at 40 kb, 25°C, application: Stephens, D. R. 02402
- Projectile penetration tests: Bauer, Alan. 09835
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- Residual strain measurements: Hoskins, Earl R. 10581

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- Rock bursts, detection, preliminary acoustic emission: Armstrong, Baxter H. 06413
- Rock bursts, detection, preliminary acoustic emission: Osterwald, Frank W. 06414
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- Salt pillar behavior, data interpretation: Baar, C. A. 05035
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- Size reduction, energy equation, theoretical study: Oka, Y. 05006
- Slope stabilities, discontinuities, importance: Srivastava, Lakshman S. 00049
- Solution cavern closure, model: Martinez, Joseph D. 05030
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- Stress-deformation, stability analyses of deep boreholes: Desai, Chandrakant S. 09149
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- Stress-induced effects, stress-wave propagation model: Cherry, J. T. 07908
- Stress-strain behavior, experimental, theoretical study: Swanson, Stephen Robert. 06591
- Symposium, 11th, 1969: Somerton, Wilbur H. 07435
- Synclinal orebody, Ontario, Wawa area, McLeod iron mine: Hedley, D. G. F. 09833
- Tabular shaped bodies, fractures, isotropic strain patterns: Christiansen, Francis W. 09136
- Temperature, humidity effects and control, Michigan: Parker, Jack. 02573
- Tunnel openings, stresses, Labrador, Churchill Falls powerhouse complex: Benson, R. P. 09155
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- Tsunami damage, protective construction, Hawaii: Adams, William Mansfield. 05233

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- Estuarine, California, San Francisco Bay, oxidation and flushing of pollutants: San Francisco Bay C. D. Comm. 09387

*Slope stability*

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- Shear stresses, initial stress effect, clays: Duncan, James M. 04227
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- Silty clay soils, undrained shearing strength, Ontario: DeLory, F. A. 04009
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- California, San Luis Canal, hydrocompaction: Prokopovich, Nikola P. 00338
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- Plane strain problems, solution, finite elements method: Radhakrishnan, Narayanaswamy. 10974
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- Properties, measurement, laboratory manual: Bowles, Joseph E. 10398
- Properties, shear tests, California, Pacific Palisades: Singh, Awtar. 05502
- Properties, sieving method, improved: Lyles, Leon. 02862
- Properties, textbook: Sowers, George B. 03804
- Properties, United States, Ozark Highlands, Enders stony loam: Coston, Wendell Ray. 00541
- Radiography, application: Krinitzsky, E. L. 02759
- Relation to sediment yields, Wisconsin: Hindall, S. M. 03982
- Salt and water movement near crystalline salt: Scott, D. R. 02860
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- Seismic response, horizontal layers, analytical procedure: Werner, Stuart D. 04394
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- Viscoelasticity, multiple integral description: Adeyeri, Joseph Babalola. 03092
- Yield strength prediction, quartz type: Koerner, Robert M. 05503
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- Combined techniques: Mintzer, Olin W. 09358
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- Environmental geology: Flawn, Peter T. 02767
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- Clay till, Alberta, Edmonton area, roof failure: Matheson, David S. 03943
- Construction in coal seam, Wyoming: Falvey, Arthur E. 10426
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- Stress and displacement fields, in surrounding clay: Hoyaux, B. 03961
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Estuarine, California, San Francisco Bay, ecological and earthquake aspects, mud fill problems: San Francisco Bay C. D. Comm. 09384

*Waste disposal*

Acid mine drainage, Ohio, Todd, McDaniel mines, prevention: Ahmad, Moid Uddin. 06315

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Acid-mine drainage, Alabama, Cane Creek basin: Hyde, Luther W. 10464

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Coal mine waters, deep-well injection: Stefanko, Robert. 09447

Colorado, Rocky Mountain Arsenal, earthquakes, statistical analysis: Bardwell, George E. 05308

Colorado, Rocky Mountain Arsenal, relation to earthquakes: Evans, David M. 05231

Colorado, Rocky Mountain Arsenal, relation to earthquakes: VanPoolen, H. K. 10659

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Dispersion in granular medium, theory: Ogata, Akio. 01435

Drain wells, effect on ground-water quality, Idaho: Abegglen, Donn E. 08463

Drilling problems, Colorado, Rocky Mountain Arsenal: Scopel, Louis J. 06755

Earth's tolerance for wastes, limits: McGauhey, P. H. 09468

Estuarine, California, San Francisco Bay, ecological and earthquake aspects, mud fill problems: San Francisco Bay C. D. Comm. 09384

Estuarine, California, San Francisco Bay, oxidation and flushing of pollutants: San Francisco Bay C. D. Comm. 09387

Estuarine environment, California, San Francisco Bay, tidal movement: Smith, Bernard J. 09385

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 Kinematic fault model, particle motion: King, Chi-Yu. 00294  
 Metamorphic rocks, emplacement along thrust faults, California, northern: Suppe, John. 10336  
 Oceanic trenches, gravity and thrust: Malahoff, Alexander. 01495  
 Solution problems, interactive computer graphics: Peikert, Ernest W. 01594  
 Sporadic and swarm seismicity: Richter, C. F. 10831  
 Stick-slip motion during frictional sliding: Byerlee, J. D. 05413  
 Vermont, Hinesburg synclinorium area, southern, Champlain thrust: Stanley, Rolfe S. 09022

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- Strike-slip and transform, San Andreas fault, California: Kupfer, Donald H. 01790

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- Arizona, Oro Blanco mining district: Knight, Louis Harold, Jr. 06873  
 California, Coast Ranges, major zones: Oakeshott, Gordon B. 00215  
 Nevada, Shoshone Mountains, Cenozoic: Bonham, Harold F. 06381  
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 Prince Edward Island, central: Frankel, L. 04097  
 Texas, Quitman Mountains, northern, intrusion control: Gieger, Ronald M. 05375

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- Saskatchewan, Beaverlodge area, ABC fault: Beecham, A. W. 08142

*Observations*

- California, Kern River, strain, laser interferometer: Slade, D. V. 06624  
 California, San Andreas, geodimeter and laser: Hofmann, R. B. 06623  
 Instruments, laser interferometer: Vali, Victor. 09975  
 Instruments, laser strainmeter, error source: Gangi, Anthony F. 09976  
 Instruments, strainmeter, servo-controlled laser: Gangi, A. F. 06625

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- Alabama, Inner Piedmont, early Mississippian meganappe: Alabama Geological Society. 07735  
 Alaska, Brooks Range, De Long Mts.: Martin, A. J. 05963  
 Alaska, Cosmos Hills area: Fritts, Crawford E. 07159  
 Alaska, Seward Peninsula: Sainsbury, C. L. 01464  
 British Columbia, Main Ranges, Tete Jaune Cache to Jasper (Alberta): Mountjoy, Eric W. 08006  
 British Columbia, Rocky Mtn. Foothills: Hughes, J. E. 07896  
 California, Buena Vista fault, creep: Nason, Robert D. 00322  
 California, Coast Ranges, Mesozoic crust: Bailey, Edgar H. 04418  
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 California, Great Valley sequence, basal, Coast Range thrust: Bailey, Edgar H. 00225  
 California, Inyo Mountains: Olson, Robert C. 00331  
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 California, Lake County, Clear Lake area: Swe, Win. 00027  
 California, Mojave Desert-Death Valley region, Winters Pass plate: Burchfiel, B. C. 00876  
 California, Pope-Chiles Valley area, Mesozoic rocks: Rich, Ernest I. 00344  
 California, San Gabriel Mts., Sierra Madre zone: Proctor, R. J. 00426  
 California, Whipple Mountain fault, mylonites: Terry, Ann. 00379  
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 Duration of movement, peak temperatures: Pierce, William H. 00025  
 Folded and abraded, distinction: Kopf, Rudolph W. 00296  
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- Montana, Flint Creek Range: Csejtey, Bela, Jr. 00603  
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 Nevada, Battle Mountain, Shoshone Range, Roberts Mts. thrust: Wrucke, Chester T. 00590  
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 Nevada, Elko County, central: Ketner, Keith B. 01473  
 Nevada, HD Range: Riva, John. 05027  
 Nevada, Sonoma Range, Havallah sequence: Silberling, N. J. 00361  
 Nevada, Swales Mountain quadrangle, age: Ketner, Keith B. 06163  
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 New Mexico, Florida Mts., regional tectonics: Corbitt, L. L. 08650  
 New York, New Jersey, Pennsylvania, Port Jervis fault: Soren, Julian. 00182  
 Regional, California, Diablo Range, age limitation: Raymond, Loren A. 02485  
 Tennessee, Cumberland Plateau, Ozone decollement, mechanism: Milici, Robert C. 09675  
 Tennessee, eastern, Dumlupın Valley zone: Hatcher, Robert D., Jr. 03066  
 Tennessee, Greene-Washington Counties, Dunham block: Little, Robert Lewis. 03268  
 Tobin thrust, reinterpretation, Nevada, west-central: Burke, Dennis B. 00239  
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 Utah, Beaver and San Francisco Mts.: Woodward, Lee A. 01415  
 Vermont, Champlain thrust: Powell, Robert E. 09033  
 Virginia, Christiansburg area, Pulaski and Max Meadows sheets, erratics: Glass, F. R., Jr. 05425  
 Virginia, Christiansburg-Radford area, window complex: Glass, F. R. 00705  
 Virginia, Pine Mountain, Cumberland block, stratigraphic horizons: Miller, R. L. 05476  
 Virginia, west-central, Pulaski-Staunton thrust sheet: McGuire, Odel S. 07537  
 Washington, Olympic Mountains: Tabor, R. W. 00377  
 Washington, Olympic Peninsula, stratigraphic evidence: McWilliams, Robert G. 00400  
 Water-saturated clays and shales as lubricants: Wilson, Raymond C. 10308  
 Wyoming, Bighorn Mountains, Five Springs thrust: Hoppin, Richard A. 03823

*Patterns*

- Alabama, Brevard fault zone, strike change, Horseshoe Bend: Alabama Geological Society. 07735  
 Arizona-Utah, western Grand Canyon region: Hamblin, W. K. 07073  
 California-Nevada, Death Valley-Furnace Creek faults: Brogan, George E. 00233  
 New Mexico, Big Burro Mountains: Gillerman, Elliot. 08680  
 Tennessee, east-west lines, ancient: Maher, Stuart W. 03971

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- British Columbia, Sukunka area: Matwe, L. 07893

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- General description, Pennsylvania, Hazelton area: Fail, Rodger T. 01248  
 New York-Quebec, high angle in shale, postglacial: Oliver, Jack. 07687

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- Worldwide, relation to fiord regions, British Columbia cf. Chile: Bostrom, R. C. 06392

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- Ontario, Lake Timiskaming valley: Lovell, H. L. 09255  
 United States, Basin and Range province, earthquakes, mechanism: Smith, Robert B. 09577  
 United States, Basin and Range province, seismicity: Sbar, Marc L. 09558

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- Appalachians, Brevard, subduction scar, sea-floor spreading: Watkins, Joel S. 10575  
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 Nevada, Clark-Nye Counties, Las Vegas Valley zone: Fleck, Robert J. 00611  
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*Stress indicators*

- Rock salinity variations: Overton, Harold L. 09483

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- Acadian left-lateral displacement, Newfoundland: Williams, Harold. 01505  
 Active slippage, Hayward, Calaveras, San Andreas faults, California: Nason, Robert D. 11230  
 Active traces, California, Garlock fault: Clark, Malcolm M. 00245  
 British Columbia, Kootenay Lake, magnetic induction anomaly: Lajoie, J. J. 08700  
 California, Calaveras, Hayward faults, creep, rates: Nason, Robert D. 00323  
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 California, central, creep slippage, relation to fault movement: Nason, Robert D. 10829  
 California, Coast Ranges, major zones: Oakeshott, Gordon B. 00215  
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 California, Hollister area, creep events: Nason, Robert D. 10549  
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 California, San Andreas, creep, static stress field, piezomagnetic anomalies: Talwani, Pradeep. 10571  
 California, San Andreas fault, local deformations: Bufo, Charles G. 06078  
 California, San Andreas fault, movement, amount: Ross, Donald C. 06119  
 California, San Andreas fault, relation to plate tectonics: Atwater, Tanya. 06124  
 California, San Andreas, horizontal movement, surveys: Meade, Buford K. 10827  
 California, San Andreas, movement, measurement: Nason, Robert D. 09978

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- California, San Andreas, movement observations, earthquake precursors: Hofmann, Renner B. 09977  
 California, San Andreas, slip, stress drops, friction: Byerlee, James D. 00063  
 California, San Andreas system, two-stage movement: Suppe, John. 05188  
 California, San Andreas, telluric potential observations, Hollister area: Thomas, Lloyd K. 10570  
 California, San Andreas zone, Cholame area, side-looking radar survey: Wing, R. S. 10962  
 California, San Jacinto fault zone: Bartholomew, M. J. 04956  
 California, southeastern, Garlock fault: Smith, George I. 06162  
 California, strain and slip, geodimeter measurements: Hofmann, Renner B. 11005  
 California, Tehachapi and Garlock faults, Tehachapi quadrangle: Dibblee, T. W., Jr. 08028  
 California, Temblor Range, San Andreas fault, displacement: Turner, D. L. 00382  
 Caribbean region, Central America, structural evolution, left-lateral motion: Noltmeyer, H. C. 10577  
 Creep, earthquake recurrence, California, San Andreas: Wallace, Robert E. 04872  
 Dislocation model, two-dimensional moving: Boore, David M. 10551  
 Displacement fields, source dimensions, mechanism, deep movements relations: Chinnery, Michael A. 09958  
 Greenland, Qagssiarssuk area, dike offsets: Emeleus, C. H. 06249  
 Nevada, Wood Hills and Pequop Mts.: Thorman, Charles H. 03778  
 New Brunswick, north-central, Catamaran fault: Anderson, F. D. 00137  
 New Jersey-New York, Ramapo fault, ancient tectonics: Ratcliffe, Nicholas M. 08325  
 North Dakota, Nesson and Antelope anticlines, genesis: Erickson, A. Kirth. 04032  
 Tertiary offset, California, San Andreas fault: Huffman, O. Frank. 00289  
 Theory, characteristics, ocean basin tectonics, review: Wilson, J. Tuzo. 09722  
 United States, southeastern, Cross Mountain wrench fault: Harris, Leonard D. 00710  
 Utah, Stansbury Island: Palmer, Dennis E. 06306
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- Alabama, Brevard zone: Bentley, Robert D. 00673  
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 Arizona-Utah, western Grand Canyon region: Hamblin, W. K. 06924  
 British Columbia, Halfway River area: Irish, E. J. W. 03148  
 California, Bolsa-Sunset area, Newport-Englewood zone: California Dept. Water Resources. 09173  
 California, Death Valley zone: Troxel, Bennie W. 00381  
 California, Salton Sea, northeast margin: Babcock, Elkanah A. 00224  
 California, Transverse Ranges, crustal shortening: Dibblee, T. W., Jr. 00452  
 Colorado, Slick Rock district area: Shawe, D. R. 02317

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- Great Lakes region, Michigan basin, Paleozoic trends, framing elements: Ells, Garland D. 11243
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- Montana, genesis of disturbed belt, northwestern: Mudge, Melville R. 05974
- Montana, genesis of disturbed belt, northwestern: Scholten, Robert. 05973
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- New York, Ramapo fault, Rosetown pluton, relation: Ratcliffe, Nicholas M. 00175
- Oceanic fracture zones, general: Menard, H. W. 09994
- Ontario, Lake Huron shore areas, Murray Fault and others, field trip: Stonehouse, Harold B. 11259
- United States, southeastern, Brevard zone: Hatcher, Robert D., Jr. 00711
- Theoretical studies**
- Stochastic model, earthquake prediction: Knopoff, Leon. 10550
- Transform**
- Americas plate thrust under Caribbean plate: Bracey, Dewey R. 05634
- Rotation by Coriolis force, midocean ridges: Howell, B. F., Jr. 02195
- Theory, characteristics, ocean basin tectonics, review: Wilson, J. Tuzo. 09722
- Wrench**
- Pennsylvania, Clearfield 15-minute quadrangle, southern half, high-angle: Glover, Albert D. 10942

**Feldspar****Illinois**

- Resources, Mississippi River terrace sands, possibilities: Ehrlinger, H. P., 3d. 07246
- Researches**
- Evaluation, classification, economics: Teague, Kefton H. 02425

**Florida****Absolute age**

- Cape Kennedy, barrier-lagoon complex, shells, beach rock: Osmond, J. K. 00089

**Areal geology**

- Southwestern, guidebook, Cenozoic, late: Gulf Coast Assoc. Geol. Societies. 09749

**Economic geology**

- Heavy minerals, Trail Ridge: Pirkle, E. C. 03480
- Peat, Everglades, genesis, processes: Given, P. H. 04091
- Peat, microtome sections, structural affinity to Carboniferous coals: Cohen, Arthur D. 03783
- Petroleum, Jurassic, Cretaceous discoveries: Kornfeld, Joseph A. 03789
- Petroleum, natural gas, activities summary, 1967: Babcock, Clarence. 04751
- Phosphate, central, ore control program: Fountain, Richard C. 00701

**Engineering geology**

- Pollution, lakes, eutrophication, north-central: Brezonik, Patrick Lee. 10390
- Waste disposal, Hillsborough County, northern, sanitary landfill: Stewart, Joseph W. 07900
- Waste disposal, injection wells, zones of high transmissivity: Vernon, R. O. 07511
- Waste disposal, southern, deep-well, Floridan aquifer, Boulder Zone: Garcia-Bengochea, Jose I. 04808

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- Central, Tertiary carbonate aquifers, cf. Yucatan: Back, William. 04129
- Florida Bay, carbonates, organic matter, decomposition: Lee, Chun Chi. 06022
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- Peninsula, carbonate aquifers, cf. Yucatan: Back, William. 01584
- Phosphate: McConnell, Duncan. 03591
- Phosphate: Stow, S. H. 03486

**Geomorphology**

- Bahia Honda Key, carbonate sand bar: Huffman, Samuel F. 00721
- Biscayne Bay, offshore bars, bedrock topography, effects: Wanless, Harold R. 02697
- Continental shelf, submerged archeological sites: Bullen, Ripley P. 10141
- Fort Lauderdale area, offshore microbathymetry, photomosaic study: Trabant, Peter K. 10373
- Gulf coast, transverse bars, effect on current transport: Niedoroda, A. W. 03704
- North-central lakes, eutrophication, natural and human factors: Brezonik, Patrick Lee. 10390
- Sea-level changes, eustatic vs. relative, botanical criteria: Rosenberg, Gary D. 10199
- Straits of Florida, bathymetry, genesis: Malloy, R. J. 02387
- Straits of Florida, currents and bottom features: Neumann, A. Conrad. 04943
- Suwannee River delta, oyster reefs, evolution: Grinnell, Robert S., Jr. 00706
- West-central, lakes, classification by remote sensing: Stewart, J. W. 02947

**Geophysical surveys**

- Bartow area, remote sensing, sinkhole discrimination: Coker, A. E. 08410
- Jacksonville area, well logging, ground water: Leve, G. W. 03880
- Straits of Florida, seismic: Malloy, R. J. 02387
- West-central coast, lakes, infrared, natural photography: Stewart, Joseph W. 08074
- West-central, offshore, fresh-water springs, photography and infrared: Hunn, J. D. 08075

**Hydrogeology**

- Alachua County, Floridan Aquifer, potential pollution by Lake Alice: Cason, James H. 10684
- Central, Tertiary limestone aquifers, cf. Yucatan: Back, William. 04129
- Citrus, Hernando Counties, springs, large: Mann, J. A. 03912
- Ground water, artesian and shallow aquifers, pollution problems: Vernon, Robert O. 10389
- Ground-water levels, 1965-66: Healy, Henry G. 00081
- Ground-water storage, zones of transmissivity: Vernon, R. O. 07511
- Hillsboro Canal area, lower, ground-water resources: McCoy, H. J. 03913
- Jacksonville area, well-logging data: Leve, G. W. 03880
- Middle Gulf area, ground-water levels, quality: Cherry, R. N. 03383
- Northeastern, ground-water resources: Snell, L. J. 03382
- Remote-sensing techniques, use of vegetation patterns: Kolipinski, Milton C. 02906

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- Southern, Floridan aquifer, Boulder Zone, waste disposal: Garcia-Bengochea, Jose I. 04808  
 Water use, estimated, 1965: Pride, R. W. 04433

*Maps, bathymetric*

- Straits of Florida: Malloy, R. J. 02387

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- Hillsborough County, northern, sanitary-landfill problems: Stewart, Joseph W. 07900  
 Water use, estimated, 1965: Pride, R. W. 04433

*Maps, hydrologic*

- Hillsborough County, northern: Stewart, Joseph W. 07900

*Mineralogy*

- Chalcedony, Tampa area, coral geodes from Tampa Fm.: Wollin, Jay C. 07092  
 Halloysite, tabular, Weston soils: Carson, C. D. 02571

*Paleontology*

- Bryozoa, Miocene, northwestern, cheilostome, paleoecology: Sclaro, Reginald J. 03432  
 Foraminifera, Cretaceous, peninsular, analysis of larger: Cole, W. Storrs. 04658  
 Gastropoda, Miocene, Chipola Fm., muricid: Vokes, Emily H. 03427  
 Gastropoda, Miocene, Chipola Fm., n.spp.: Vokes, Emily H. 03431  
 Mammalia, Cenozoic, horses, popular guide: Waldrop, John. 10474  
 Mammalia, Cenozoic, land carnivores, popular guide: Tessman, Norman. 10475  
 Mammalia, Pleistocene, aquatic rodents, popular guide: Martin, Robert A. 10473  
 Mammalia, Pleistocene, Santa Fe River, mammoth bone, butcher marks: Bullen, Ripley P. 10130  
 Mammalia, Pleistocene, Sumter County: Martin, Robert Allen. 07845  
 Mammalia, Pliocene, Canidae: Webb, S. David. 10123  
 Mammalia, Pliocene-Pleistocene, proboscideans, popular guide: Webb, S. David. 10470  
 Mammalia, Pliocene-Pleistocene, xenarthrans, popular guide: Webb, S. David. 08362  
 Mammalia, Quaternary, bison species, popular guide: Robertson, Jesse S. 10476  
 Mollusca, Pleistocene, "Glades" unit, faunal list: Hoerle, Shirley E. 03425  
 Mollusca, Pleistocene, "Glades" unit, paleoecology: McGinty, Thomas L. 03428  
 Pisces, Cenozoic, ray-finned, popular guide: Swift, Camm. 10472  
 Pisces, Cenozoic, sharks, popular guide: Tessman, Norman. 10468  
 Pisces, Cenozoic, skates and rays, popular guide: Wing, Elizabeth. 10561  
 Pisces, fossil shark teeth, collecting guide: Kelley, K. V., Jr. 07427  
 Pisces, Pleistocene, Itchtucknee River area, palatine: Cavender, Ted M. 04630  
 Protista, Silurian, north-central, Chitinozoa, rejuvenation: Cramer, Fritz H. 03197  
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 Reptilia, Miocene-Holocene, crocodilians, popular guide: Auffenberg, Walter. 10471  
 Vertebrata, Eocene-Pleistocene, localities, popular guide: Patton, Thomas H. 08363  
 Vertebrata, Pleistocene, Caloosahatchee Fm.: DuBar, J. R. 09751

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- Atlantic continental margin, sediments, mineralogy, provenance: Hathaway, John C. 05576  
 Bahia Honda Key, carbonate sediments: Benham, Steven R. 00672  
 Barracuda Keys, carbonate bank, sedimentation: Basan, Paul B. 00670  
 Big Pine Key, sediments: Fowler, Michael L. 00702  
 Florida Keys, Coupon Bight, sediment facies, depositional environment: Howard, James F. 02386  
 Florida Keys, lower, Holocene limestone, homogenization: Eutsler, Robert L. 00697  
 Florida Keys, tidal flats sediments, dolomitization: Atwood, D. K. 03788  
 Florida platform, post-Oligocene sediments, provenance: Isphording, Wayne C. 00724  
 Fort Pierce area, Indian River Field Laboratory, soil, stratified: Carlisle, V. W. 07054  
 Southern, marine carbonate deposition: Friedman, Gerald M. 05012  
 Straits of Florida, sediments, mineral, chemical composition, sources: Gassaway, John D. 08548

*Stratigraphy*

- Cenozoic, late, southern: Olsson, Axel A. 09754  
 Cenozoic, late, southwestern, field trip: Gulf Coast Assoc. Geol. Societies. 09749  
 Cenozoic, southern, Neogene: DuBar, Jules R. 09750  
 Miocene, Pleistocene, southern: Puri, Harbans S. 09752  
 Paleozoic-Tertiary, peninsular, review: Rainwater, E. H. 07316  
 Pleistocene, "Glades" unit, southern: McGinty, Thomas L. 03428  
 Pliocene-Pleistocene, Caloosahatchee River area: Brooks, H. K. 09753

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- Ocala area, asymmetrical anticline, steeply dipping: Underwood, James R., Jr. 00425

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- Lead-zinc ores, British Columbia, isotopes: Ohmoto, Hiroshi. 04416  
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- Washington, Mount Rainier Park, Carbon River stock: Fischer, Joseph F. 00264

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- Mississippi Valley type, brine, cf. sabkha sediment brines: Bush, P. R. 05388

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- Greenland, Ilimaussaq alkaline intrusion: Sobolev, V. S. 03577

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- Gas bubbles, analysis by crushing, microscope stage: Roedder, Edwin. 03299

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- Greenland, Ilimaussaq alkaline intrusion: Sobolev, V. S. 03577

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- Nova Scotia, bubbles, Brownian Movement, viscosity: Friedlaender, C. G. I. 04446  
 Nova Scotia, Halifax County, Dunbrack prospect, gas bubble movement: Friedlaender, C. G. I. 03298



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Lincoln-Torrance Counties, Gallinas Mts., occurrence, resources: Perhac, Ralph M. 04022

Southwestern, occurrences, production, possibilities: Rothrock, Howard E. 08654

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Development, prospects: Fleming, J. M. 04533

**Folds***Anticlinal*

Alabama, Birmingham anticlinorium, Paleozoic folding: Thomas, William A. 10274

Compaction over reefs, gravity profiles, Alberta, Michigan, Ohio: Ferris, Craig. 09374

Florida, Ocala area, asymmetrical, steeply dipping: Underwood, James R., Jr. 00425

Mexico, Nuevo Leon, Sierra del Fraile, Potrero Chico anticline: Weidie, A. E. 09891

Montana, Carmichael Creek anticline, fracture analysis: Burger, H. Robert, 3d. 02376

Montana, Teton anticline, stresses, macrofractures, relations: Friedman, Melvin. 06984

Prince Edward Island, central: Frankel, L. 04097

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Colorado-Wyoming, uplifted basement blocks: Stearns, David W. 07590

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Illinois, La Salle anticlinal belt: Clegg, Kenneth E. 05545

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Canada, Cordillera, eastern: Norris, D. K. 00920

*General*

British Columbia, Cariboo Mts., infra- to supras-structures: Campbell, R. B. 03277

British Columbia, Shuswap complex: Reesor, J. E. 03276

British Columbia, Western Ranges, Golden area: Balkwill, Hugh Robert. 00516

California, Coast Ranges, Salinian block: Wiebe, Robert A. 02377

Montana, Big Belt Mountains, northern: Weinberg, David M. 00654

New York, Adirondack Mts., Rossie complex: Lewis, John Richard. 06002

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North Carolina, Sauratown Mts. anticlinorium-

Brevard zone: Stirewalt, Gerry Lewis. 07286

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Saskatchewan, Lac La Ronge area, analysis: Padgham, William Albert. 06877

South Carolina, Oconee County, deformation episodes: Roper, Paul James. 07284

Utah, Capitol Reef National Monument, Water-pocket fold: Follows, Donald S. 10213

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British Columbia, Dogtooth Range area: Simony, P. S. 03018

British Columbia, Halfway River area: Irish, E. J. W. 03148

California, Sierra Nevada, relation to pluton loci: Kistler, Ronald W. 10739

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Wyoming, Cordilleran overthrust belt: Crosby, G. W. 05205

Wyoming, Cordilleran overthrust belt: Tooker, E. W. 05326

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New Brunswick, Siegas area: Hamilton-Smith, T. 05387

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Colorado, Slick Rock district area: Shawe, D. R. 02317

Columbia River Plateau, Columbia River Basalt: Newcomb, R. C. 08540

Connecticut, Gaillard graben, Triassic strata: Sanders, John E. 04079

Greenland, Peary Land, Cambrian-Silurian rocks: Dawes, Peter R. 06242

Obalski Township, Chibougamau anticline: Duquette, Gilles. 06757

Saskatchewan, Compulsion River metasedimentary belt: Karup, Moller, S. 09859

Texas, Hill County, Ouachita belt, anticlinal complex: Rozendal, R. A. 01424

Virginia, west-central: McGuire, Odel S. 07537

Wisconsin, Baraboo Syncline, genesis, geometry: Dalziel, I. W. D. 06832

Wyoming, Laramie basin: Blackstone, D. L., Jr. 02743

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Chevron, kink, geometric stability: Ramsay, John G. 00927

Colorado, Front Range, Big Thompson anticline: LeMasurier, Wesley E. 00104

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Finite amplitude folds, computer simulation: Dieterich, James H. 07714

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Sedimentary rocks, intragranular strain and slip on discrete surfaces: Spang, John H. 10335

Strain distribution, longitudinal, lenticular bending folds: Schwerdtner, W. M. 07105

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Arizona, Grand Canyon, eastern, Laramide: Huntton, Peter. 03769

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Slaty cleavage, Idaho, Coeur d'Alene district, Belt Supergroup: Clark, Bruce R. 04879

## Foraminifera

*Archias angulatus*

Chamber formation: Marszalek, Donald Stanley. 06603

*Bibliography*

Nonfusulinid, Paleozoic: Toomey, Donald Francis. 02292  
Recent literature, annotated: Todd, Ruth. 00784  
Recent literature, annotated: Todd, Ruth. 07189

*Bolivinitidae*

Holocene, Pacific Ocean, morphology: Sliter, William V. 01872

*Bulminoides*

Morphology, redescription: Seiglie, George A. 02740

*Bulminoididae*, n.fam.

Description: Seiglie, George A. 02740

*Carboniferous*

Alaska, Lisburne Group, assemblage zones, Brooks Range: Armstrong, Augustus K. 02072  
Nova Scotia-New Brunswick, Windsor Group, carbonate microfacies: Mamet, Bernard L. 06733  
Yukon, Lisburne Group, British Mts., microfau-nas, cf. Alaska: Mamet, B. L. 07891

## Foraminifera—Continued

*Catalogs*

General, supplement: Saito, Tsunemasa. 07787

*Cenozoic*

Caribbean Sea, deep-sea cores, biostratigraphy: Blow, W. H. 06665  
Midway Islands, Miocene, post-Miocene cores: Todd, Ruth. 03904  
Pacific Ocean, deep-sea sediments, biostratigraphy: Olson, R. K. 07158  
Washington, continental shelf sediments: Echols, Ronald J. 10924  
Washington, Quinault Fm., Point Grenville-Raft River coastal area: Rau, Weldon W. 08374

*Cretaceous*

California, Budden Canyon Fm., Sacramento Valley, northwestern, n.spp.: Dailey, Donald H. 02741  
California, planktonic, taxonomic status nomenclature: Douglas, Robert G. 00783  
Florida, subsurface, peninsular, analysis of larger: Cole, W. Storrs. 04658  
Guatemala, Altaverrapaz, Sepur Fm., planktonic Esker, George C., 3d. 10466  
Montana, Colorado Group, biostratigraphy Strong, Ceylon Perseus, Jr. 06611  
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United States, Canada, western interior, computer-based information bank: Kent, Harry C. 02639  
United States, Greenhorn-Carlile Fms., Great Plains, paleoecology: Eicher, Don L. 04705  
United States, subsurface, southeastern, review of larger: Cole, W. Storrs. 04658  
Utah, Mancos Shale, Tununk Member: Lessard Robert Henry. 07278  
Wyoming, south-central, Medicine Bow Fm. Fox, James E. 10259

*Cretaceous-Cenozoic*

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*Cretaceous-Pleistocene*

Atlantic Ocean, deep-sea cores, biostratigraphy Blow, W. H. 01345

*Cretaceous-Quaternary*

Atlantic Ocean, deep-sea cores, carbonate solution: Cita, Maria Bianca. 06362  
Atlantic Ocean, deep-sea cores, correlation Cita, Maria B. 01348

*Cyclammina*

Distribution, bathymetric, changes, ancient to modern: Robinson, Gray S. 04839

*Cyclammina* spp.

Bathymetric distribution, past, present: Robinson, Gray S. 08024

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Assemblage changes with depth: Biel, Ralph 07331  
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Nearshore environments, indicators of processes: Phleger, Fred B. 04835

## Foraminifera—Continued

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 Trophic position in marine communities: Lipps, Jere H. 04927

*Fusulinidae*

- Bibliography, addendum: Sanderson, G. A. 03543  
 Pennsylvanian, New Mexico, Joyita Hills fauna: Stewart, Wendell J. 04327  
 Pennsylvanian, Upper, Wyoming, Bighorn Mts., correlation: Verille, G. J. 02152  
 Permian, Alaska, Alaska Range, Mankomen Fm.: Petocz, Ronald G. 03907  
 Permian, British Columbia, Cache Creek Group: Ross, Charles A. 03643

*General*

- Mineral cycling, Ca-45 and Sr-90 tracer experiments: McEnery, Marie. 04058  
 Nearshore environments, indicators of processes: Phleger, Fred B. 10958  
 Planktonic assemblage diversity, preservation state: Berger, Wolfgang H. 03343  
 Staining and thin-sectioning, in marine sediments: Frankel, Larry. 02098

*Geographic distribution*

- Jurassic, assemblage types: Gordon, W. A. 02370  
 Marine marshes, zonation, environmental indicators: Phleger, Fred B. 04678

*Globigerina pachyderma*

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*Globigerinacea*

- Biostratigraphic correlation, validity: Blow, W. H. 04704  
 Tertiary, accessory spiral apertures as intraspecific feature: Heerden, J. van. 06365

*Hyalinea baltica*

- Pliocene-Pleistocene boundary relations, Caribbean Sea: Bock, Wayne D. 04994

*Koskinobillerina brevisseptata procera*, n. subsp.

- Mississippian, Tennessee, Pennington Fm., Chesterian index: Hewitt, Philip C. 09183

*Lunatriella spinifera*, n. gen., n. sp.

- Cretaceous, Turonian beds, United States, western interior: Eichler, Don L. 01291

*Mississippian*

- Alberta, Rundle Group and Banff Fm., zonation: Petryk, A. A. 03014  
 Canada, Windsor Group, Atlantic Provinces: Globensky, Yvon. 08416  
 Idaho, White Knob Limestone, zonation: Skipp, Betty. 01475  
 Tennessee, Chattanooga area, Upper, cf. Eurasia, index spp.: Hewitt, Philip C. 09183

*Morphology*

- Benthic hyaline, tests, ultrastructure: Stapleton, Richard Pierce. 07948  
 Covariance structure, morphometric analysis: Reymont, Richard Arthur. 10630  
 Electron microscopy, *Rosalina* tests, photomicrographs: Walker, D. A. 03746  
 Planktonic, variation, paleoclimatic indicators: Hecht, Alan D. 10174  
 Regression analysis, *Pellatispira*, growth curves: Ghose, Benoy K. 05015  
 Wall construction, physico-chemical processes: Greiner, Gary O. G. 06995

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*Morphology*—Continued

- Wall structures, biofacies determination: Buchanan, Hugh. 00143  
*Neoarchaediscus postrugosus*  
 Mississippian, Tennessee, Pennington Fm., Chesterian index: Hewitt, Philip C. 09183

*Paleozoic*

- United States, midwestern, popular account: Douglas, Dale. 09435  
*Parafusulinella mexicana*, n. gen., n. sp.  
 Pennsylvanian, Mexico, Boca Grande Mts.: Stewart, Wendell J. 04327  
*Parafusulinella propria*, n. gen., n. sp.  
 Pennsylvanian, New Mexico, Joyita Hills: Stewart, Wendell J. 04327

*Pennsylvanian*

- Alaska, southeastern, fusulinids: Douglass, Raymond C. 02609

*Permian*

- British Columbia, Cache Creek Group, fusulinids: Nestell, M. K. 02664  
 Kansas, Wreford Limestone, Chase County, fusulinid fauna: Sanderson, G. A. 04701

*Planktonic*

- O-18 content, temperature dependence, distribution, climatic change indicators: Van-Donk, Jan. 09415  
 Oxygen isotope study: Hecht, Alan D. 04673

*Pseudohastigerina*

- Tertiary, phylogenetic trends: Cordey, W. G. 02016

*Quaternary*

- Atlantic Ocean, northern, paleoclimate indicators: Ruddiman, William F. 09551  
 California, Santa Barbara Basin, shell preservation: Berger, Wolfgang H. 00085  
 California, Tanner Basin, paleoecology: Kheradpir, Ahmad. 01292  
 Canada, Champlain Sea fauna, Pleistocene: Wagner, Frances J. E. 07535  
 Cuba, Cayo Chico de Moa, Holocene sediments, assemblages: Naprstek, Vladimir. 09618  
 Manitoba, Hudson Bay estuaries, sediments, cf. older marine banks: Schafer, C. T. 02453  
 Mexico, Baja California, planktonic, ecology, kummerforms: Berger, Wolfgang H. 04059  
 Northwest Territories, MacKenzie King Island, association-analysis: Vilks, G. 08755  
 Ontario, Hudson Bay-James Bay estuaries, sediments, cf. older marine banks: Schafer, C. T. 02453  
 Pacific Ocean, cores, California Current area, biostratigraphy: Morin, Ronald W. 01599  
 Pacific Ocean off Oregon, abundance, stratigraphic parameter: Duncan, John R. 00437  
 Planktonic, abundances, temperature increase, Pacific Ocean, California Current: Morin, Ronald W. 10183  
 Planktonic, deep-sea cores, paleoecological model, Pleistocene climate, evidence: Imbrie, John. 10177  
 Puerto Rico, Yabucoa Bay, Holocene, benthonic biofacies: Seiglie, George A. 06366  
 Virginia, Rappahannock Estuary, benthonic ecology, biofacies: Ellison, Robert L. 00782  
 Worldwide, deep-sea sediments, indicators of late Pleistocene climate changes: Wollin, Goesta. 09227  
*Schwagerina* spp.  
 Permian, Kansas, morphology, variations: Sanderson, G. A. 04701

## Foraminifera — Continued

*Silurian*

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*Tertiary*

Alabama, Millers Ferry, basal Paleocene, zones: Olsson, Richard K. 03535

Arizona-California, Colorado River area, Pliocene marine embayment: Smith, Patsy B. 01500

Bahamas, deep-water sediment, Eocene, Northeast Providence Channel: Stehman, Charles F. 07964

Caribbean Sea, deep-sea cores, correlation: Bollen, Hans M. 06672

Greenland, Nugsuaq, Agatdal Fm., Danian zonation, n.spp.: Hansen, Hans Jorgen. 08198

Louisiana, Miocene assemblages, paleobathymetry: Biel, Ralph. 04819

Louisiana, Wilcox Fm., paleoecology: Anisgard, Harry W. 04817

Louisiana, Wilcox Group, assemblages, paleoecology: Anisgard, Harry W. 07325

Maryland, Choptank Fm., Miocene, paleoecology, biostratigraphy: Gernant, Robert E. 05385

Miocene assemblages, changes with depth: Biel, Ralph. 07331

New Jersey, Paleocene, zonation, paleozoogeography: Olsson, Richard K. 03534

Puerto Rico, northern, Camuy Fm., Miocene-Pliocene, correlation: Bermudez, Pedro J. 06240

*Triticites* sp.

Pennsylvanian, Wyoming, Bighorn Mts., Ten-sleep Ss., Missourian: Verille, G. J. 02152

*Truncorotaloides* Bronniman and Bermudez

Eocene, Trinidad, invalid genus: Heerden, J. van. 06365

*Tuberitina*

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*Umbellaceae*

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*Webbinelloidea* Stewart and Lampe

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*Salterella conulata*

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Frequency and apertures in undisturbed rocks: Snow, D. T. 00193

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Jointed rock masses, plane stress, geomechanical model, failure modes: Rosenblad, J. Lyndon. 09142

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Limestone, anisotropic: McGill, George E. 04944

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Orientation in sandstone, residual elastic strain effect: Friedman, M. 00066

Sandstones, role of absolute pore pressure, temperature: Swolfs, Hans. 09594

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Brittle rock, creep as cause: Scholz, C. H. 01439

Shear, Montana, Carmichael Creek anticline: Burger, H. Robert, 3d. 02376

Shear, underground openings: Wang, Fun-Den. 02439

Shear, Vicksburg loess, model: Matalucci, Rudolph V. 00909

Stress failure, tabular bodies, planar theory, strain patterns: Christiansen, Francis W. 09136

Theory, initiation in brittle solid, triaxial stress: Murrell, S. A. F. 02718

Triaxial stress, theory of brittle: Murrell, S. A. F. 03318

*Granite*

Nova Scotia, deformation mechanics, mylonitic rocks: Eisbacher, G. H. 02390

*Joints*

Deformability, testing: Goodman, R. E. 09317

Limestone, dolomite, bedding planes, effects on blasting: Pugliese, Joseph M. 09529

Pennsylvania, Allegheny County: Wagner, W. R. 07563

Relation to overthrust plates, radar imagery analysis, West Virginia: Wing, Richard S. 05202

Sag-flowout structure in basalt, Washington: McKee, Bates. 02392

South Carolina, Blue Ridge Front area: Acker, Louis L. 04358

Vermont, Willoughby Arch area, effect on topography: Newell, Wayne L. 06827

Virginia, Richmond area, Petersburg Granite: Campana, M. E. 05416

West Virginia, Wheeling area, tectonic analysis: Streib, Donald L. 07111

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Minnesota, Cloquet quadrangle, Precambrian: Wright, H. E., Jr. 07732

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Popular account: Pampe, William R. 02804

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Pacaya and Santiaguito Volcanoes: Stoiber, R. E., Eberl, D. 10885

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Rice Creek field, occurrence: Hill, F. L. 07166

San Francisco Bay area, exploration, production, urban planning aspects: Stromberg, Peter A. 09390

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## Canada

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## Colorado

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## Florida

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## Genesis

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## Geochemistry

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## Gulf Coastal Plain

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## Gulf of Mexico

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## Kansas

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## Kentucky

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*North America*

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*Oklahoma*

Hugoton field, occurrence: Pippin, Lloyd. 07762

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*Ontario*

Elgin County, Willey Pool, occurrence, production: Hancock, W. P. 10917

Exploration, drilling, production, summary, 1969 data: Petroleum Resources Section. 08679

*Pennsylvania*

Allegheny County, resources: Heyman, Louis. 07568

Developments, summary 1969: Kelley, Dana R. 06534

Erie County, Pierce Field, occurrence: Kelley, D. R. 10919

Kinzua quadrangle, occurrence: Lytle, William S. 08495

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*United States*

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Composition, analyses: Cardwell, L. E. 00078

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Giant fields, discovery, exploration, reserves: Halbouty, Michel T. 07757

Midcontinent, Pennsylvanian occurrence: Chenoweth, Philip A. 02788

Southwestern, occurrence: Kornfeld, J. A. 01638

*West Virginia*

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Production, maps: Cardwell, Dudley H. 07199

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*Cancellariidae*

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*Charcolleria distinguenda*, n.sp.

Miocene, Florida, Chipola Fm., cancellariid: Petit, Richard E. 03430

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James E. 03426
- Fusitriton* sp.  
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- Goniobasis*  
Holocene, algal oncolite formation on living  
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- Gyraulus parvus*  
Holocene, Alaska, gigantism: Bickley, William  
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- Kelletia kanakoffi*, n.sp.  
Plio-Pleistocene, California, San Pedro, Lomita  
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Taxonomy, distribution, and phylogeny: Smith,  
Judith Terry. 01339
- Morphology*  
Cancellariid radula, description, interpretation:  
Olsson, Axel A. 04020
- Nematoglossa*, n. order  
Cancellariids: Olsson, Axel A. 04020
- Olssonella vokesi*, n.gen., n.sp.  
Miocene, North Carolina, Silverdale beds, can-  
cellariid: Petit, Richard E. 03430
- Ordovician*  
Appalachians, central, Upper, paleoecology,  
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- Pazinotus*, n.subgen.  
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fects: Gould, Stephen Jay. 08519  
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Stephen Jay. 01203  
Canada, Champlain Sea fauna, Pleistocene:  
Wagner, Frances J. E. 07535  
Florida, "Glades" unit, Pleistocene, faunal list:  
Hoerle, Shirley E. 03425  
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McGinty, Thomas L. 03428  
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- Ohio, Pleistocene, land snails: LaRocque, Au-  
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- Trigonostoma bullatum*  
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Biblical varieties, nomenclature, sources,  
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Occurrences: Pabian, Roger K. 02531
- Rhodolite*  
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Field guide to collecting: Simpson, Bessie W.  
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- Tugtupite*  
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Southeastern, localities, with index maps: Will-  
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Indiana: Kingsbury, Robert C. 08444
- Catalogs*  
Well samples and cores, Kentucky Geol. Survey  
file: Schwalb, Howard R. 06395
- Education*  
Collection of readings, classical to recent, nature  
of geology: Mears, Brainerd, Jr. 10841  
Earth science, mathematics and science center,  
role: Batten, R. Wesley. 05477  
Public schools, role of industrial geologist:  
Regis, A. J. 09534  
Sourcebook for elementary and secondary  
schools: American Geological Institute. 10378  
Teacher preparation, environmental geology:  
Romey, William D. 09545  
Teacher training, secondary, Natl. Sci. Found.  
institutes: Passero, Richard N. 09708
- Environmental geology*  
California, Santa Barbara Channel, effects of oil  
spill: Kolpack, Ronald L. 11268

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- Curricula, summer field conference format: Smith, Clay T. 09575  
 Education, new philosophy: Samples, Robert E. 09553  
 Geologic concepts, incorporation in protective laws: Warner, Don L. 10294  
 Hydrogeology, role in urban planning: Slosson, James E. 09573  
 Practice, philosophy, Illinois State Geological Survey: Frye, J. C. 09839  
 Practice, programs, Illinois State Geological Survey: Stearn, Enid W. 09838  
 Regional planning, role of geologists: Dickinson, William R. 10323  
 Resources and environment: Pecora, W. T. 09850  
 Responsibility of geologists: Gastil, R. Gordon. 10326  
 Role in urban planning, curriculum: Wayne, William J. 10296  
 Role of geology students: Wahrhaftig, Clyde. 10338

*Foreign literature*

- Translations, Geological Survey Canada library, listing: Swirsky, Lillian. 10984

*Historical literature*

- Continents and islands genesis, Raspe's 1763 text, translation: Raspe, Rudolf Erich. 05588

*History*

- Geology and the Flood: Tychsen, Paul C. 05052  
 Pre-Huttonian observations: Gould, Stephen Jay. 00959  
 Pre-Huttonian observations: Harrington, J. W. 00850

*Literature*

- Foreign, translations, Geological Survey Canada library, listing: Swirsky, Lillian. 07813  
 Serials, importance to geologists: Fenner, Peter. 03284

*Methods*

- Autoassociation, computer comparison of sequential geologic data: Sackin, M. J. 10622  
 Geological data, documentation, filing, retrieval, computer application: Loudon, T. Victor. 10628  
 Geostatistical, colloquium, 1970: Merriam, Daniel F. 08608  
 Isometric diagram construction, computer program: Wray, William B., Jr. 03198  
 Mathematical, autocorrelation functions, estimation: Agterberg, F. P. 08616  
 Models, statistical, choice, relation to data collection: Link, Richard F. 08610  
 Numerical classification of geologic samples: Switzer, Paul. 08611  
 Orientation data treatment, statistical: Watson, Geoffrey S. 08609  
 Random functions application: Matheron, G. 08614

*Natural environment*

- Man's impact, conservation movements: Nicholson, Max. 07254

*Philosophy*

- Geologic reasoning, ontology: Harrington, John W. 04523  
 Geological concepts, role in man's intellectual development: Gilluly, James. 11244  
 Geological revolution, Condon lectures, Oregon: Drake, Charles L. 06918  
 Hutton's theories, reprints of papers: White, George W. 08178

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- Methodology and strategy of research in geology: Seddon, George. 06736  
 Randomness in nature: Mann, C. John. 00035  
 Randomness in nature: Mann, C. John. 04894  
 Randomness in nature: Mann, C. John. 04896  
 Randomness in nature: Simpson, George Gaylord. 04893  
 Randomness in nature: Smalley, I. J. 04895  
 Scientific quotations for thought: Wolf, Karl H. 05619  
 Scientific quotations for thought: Wolf, Karl H. 06800  
 Scientific quotations for thought: Wolf, Karl H. 07879  
 Uniformitarianism, application, geohistory, biohistory: Simpson, George Gaylord. 07247  
 Uniformitarianism, development, Lyell's strategy: Rudwick, Martin J. S. 06751

*Practice*

- Am. Inst. Mining, Metall., Petroleum Engineers, geologists, role: Michell, Wilson D. 05434  
 Automatic data processing, application, geological data files: Hubaux, A. 10624  
 California Division of Mines and Geology, Geological Hazards Program: Oakeshott, Gordon B. 05573  
 California Geologist's Act, 1968, provisions: Peak, Wilfred W. 01589  
 Communication problems, geologic hazards: Perlman, David. 05572  
 Dropouts, questionnaire: Krinitzsky, E. L. 06222  
 Earth science, field research, McGill Univ. Sub-Arctic Research Lab.: Adams, W. P. 09284  
 Earth sciences, development history, Canada: Hall, D. H. 10782  
 Environmental geology: Frye, John C. 09469  
 Environmental geology, training: Bergstrom, Robert E. 01053  
 Extractive industry, challenge: Bourne, H. L. 07530  
 Geolibrarianism: Woods, Mary Louise. 04039  
 Geologic hazards, prevention, role of geologist: Jahns, Richard H. 01332  
 Geologist and engineer, roles in earthquake damage reduction: Degenkolb, H. J. 05527  
 Geology, bibliography, Geo-Ref, application: Lloyd, Joel J. 09645  
 Hydrogeology, manpower, supply and demand 1970-80: Lewis, James E. 05885  
 Leadership, Ronald K. DeFord: Owen, Edgar W. 10892  
 Manpower supply and demand, 1969-74: Am. Geological Institute. 02774  
 Mineral economics, geologist's participation, new: Bergendahl, Maximilian M. 02588  
 New Mexico State Highway Commission, role of geologists: James, Harold L. 05505  
 Presentation of papers, slides, guide to preparation and use: Am. Assoc. Petroleum Geologists. 10409  
 Profession, growth and history: Honkala, A. U. 05430  
 Professional geologists, role in earth science, public schools: Young, W. F., Jr. 05443  
 Requirements, results of questionnaire: Reeves, Robert G. 04588  
 Role of geomathematics: Griffiths, J. C. 03368  
 Scientific reasoning, progress in 200 years: Currie, Kenneth L. 05047  
 Search for resources, new developments: Pecora, William T. 09474



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- Teaching, graduate school, research incompatibility concept, error: Hatfield, Craig B. 00117  
 U.S. Geological Survey, activities, objectives, past, present: Pecora, William T. 08723  
 Vocational guidance manual: Snelgrove, Alfred K. 08322  
 Wellhead geology: Rueff, Serge. 07985

*Textbooks*

- Ancient sedimentary environments, introductory survey: Selley, Richard C. 08443  
 Clays, weathering, sedimentology, geochemistry: Millot, Georges. 05837  
 Crystallography, geometry, theory, methods: Buerger, Martin J. 04492  
 Earth history, selected papers from original sources: Cloud, Preston. 05893  
 Earth science, with teacher's guide: Bishop, Margaret S. 09922  
 Elementary practical geology, laboratory manual: Clarke, E. de C. 09186  
 Engineering geology, soils, vibrations, foundation design: Richart, F. E. 03799  
 Environmental geology: Flawn, Peter T. 02767  
 Evolution of Man: Pilbeam, David. 02782  
 Evolution, role of species: Mayr, Ernst. 03805  
 Geochemistry, nonmarine organic: Swain, Frederick M. 07217  
 Geology of Michigan: Dorr, John A., Jr. 02113  
 Geomorphology: Tuttle, Sherwood D. 02115  
 Geomorphology, physical geography: Patton, Clyde P. 04126  
 Geomorphology, theoretical approach: Scheidegger, Adrian E. 04977  
 Geomorphology, United States, physiography, topographic maps: DeBruin, Richard. 06802  
 History of the Earth, introduction to historical geology: Kummel, Bernhard. 08401  
 How to know rocks and minerals, identification keys, elementary: Helfer, Jacques R. 08335  
 Laboratory manual, physical geology, scientific method: Skillman Woyski, Margaret. 10377  
 Landscape studies: Sawyer, K. E. 10746  
 Lithology, sedimentary, igneous, metamorphic: Jackson, Kern C. 04021  
 Network analysis in geography: Haggett, Peter. 08581  
 Oceanography: Weyl, Peter K. 00474  
 Ore deposits: Park, Charles F., Jr. 08398  
 Petroleum geology, reservoir engineering: Guerrero, E. T. 10706  
 Petroleum geology, United States: Landes, Kenneth K. 04978  
 Physical geography: Strahler, Arthur N. 00829  
 Physical geography, principles: Monkhouse, F. J. 08580  
 Physical geology: Verhoogen, John. 03811  
 Physical processes in geology, application of mechanics: Johnson, Arvid M. 08367  
 Revision need, theories of global tectonics: Wilson, J. Tuzo. 05044  
 Rock weathering: Carroll, Dorothy. 06151  
 Soil micromorphology, global and local comparisons, fabric elements: Kubiena, Walter L. 10837  
 Soils: Gibson, J. Sullivan. 02757  
 Soils, engineering properties: Sowers, George B. 03804  
 Source book, 1400-1900: Mather, Kirtley F. 02758  
 Stereogram illustrations, rocks, minerals: Techter, David. 02756

**General—Continued***Textbooks—Continued*

- Vertebrata, morphology: Romer, Alfred Sherwood. 04498

**Geochemical prospecting***Analytical techniques*

- Copper-zinc extraction, rocks, comparison of methods: Brabec, Dragan. 02437  
 Fluorine, rocks, soils, ion-selective electrode: Ficklin, Walter H. 04670  
 Hydrogeochemical, mathematical models, ground-water flow systems: Williams, Roy E. 08497  
 Mercury, atomic absorption: Meyer, W. T. 04323  
 Mercury, atomic absorption: Pyrih, Roman Z. 04324  
 Mineral exploration, permafrost effects: Allan, R. J. 04660  
 Nickel, soils, stream sediments: Nowlan, Gary A. 01558  
 Stream sediment, error, sources: Brown, Bahngrell W. 04284

*Applications*

- Hydrothermal ore deposits, exploration: Mantel, Erwin. 04666  
 Mineral exploration, sampling techniques: Bradshaw, Peter M. D. 01728

*General*

- Exploration, research, current activity: Boyle, R. W. 10778  
 Primary dispersion, types, application to mineral exploration: Bradshaw, Peter M. D. 04672  
 Review, 1969: Carpenter, Robert H. 02170  
 Review of status and future: Boyle, R. W. 01697  
 Sample collecting and analysis procedures: Bradshaw, Peter M. D. 04663

*Geochemical logging*

- Well-bore cuttings, petroleum exploration: Feugere, G. 00194

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- Base, precious metals exploration: McNerney, John J. 02980

*Petroleum*

- Gasmap method, soils: Feugere, G. 02616  
 Ocean, seep-detector system: Jeffrey, D. A. 02635  
 Plants, soils, evaluation: Horvitz, Leo. 02632  
 Reliability, Canada: Lucon, C. 03790

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- Bayesian classification functions: Dahlberg, Eric C. 04314  
 Regression analysis: DeGeoffroy, J. 04480  
 Regression analysis: Rose, Arthur W. 04310

*Stream sediments*

- Copper, zinc, Arizona, Bradshaw Mts.: Awald, John T. 02436  
 Statistical analysis: Nichol, Ian. 04870

*Sulfur isotopes*

- Pb-Zn-Ag-Cd deposit, oxidized zone: Boyle, R. W. 03478  
 Pb-Zn-Ag-Cd deposit, oxidized zone: Boyle, R. W. 05076

**Geochemical prospecting—Continued***Sulfur isotopes—Continued*

Pb-Zn-Ag-Cd deposit, oxidized zone: Templeman-Kluit, D. J. 05075

*Zinc*

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Boundary area, Eagle A-1 quadrangle, metals: Asher, R. R. 07198

Brooks Range, Chandalar area, stream sediments, analyses: Chipp, E. R. 07160

Fortymile area, metals: Foster, Helen L. 01295

Iron Creek area, stream sediments: Asher, R. R. 09431

Kontrashibuna Lake area, stream sediments, metals: Eakins, Gilbert R. 07197

Serpentine Hot Springs area, metals: Sainsbury, C. L. 03334

Seward Peninsula, Belt Creek-Libby River area, metals: Asher, R. R. 09517

Spirit Mountain nickel-copper prospect area: Herreid, Gordon. 10255

Yakutat-Mount Saint Elias quadrangles, metals: MacKevett, E. M., Jr. 05577

*Appalachians*

Massive sulfide deposits, Rb-Sr: Fullagar, Paul D. 04866

*Arizona*

Greaterville mining district, metals: Drewes, Harald. 00418

Pima County, Cu, Mo dispersion: Huff, Lyman C. 00498

Southern, Cu in biotite, ore indicator: Lovering, T. G. 01461

*California*

Agua Tibia Primitive area: Irwin, William P. 02334

Emigrant Basin primitive area: Tooker, E. W. 02030

*Canada*

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*Colorado*

Cripple Creek district, interpretation: Kleinkopf, M. Dean. 03472

*Georgia*

Trace elements in plants and soils: Shacklette, Hansford T. 00002

*Idaho*

Coeur d'Alene district, polymetallic ores: Gott, Garland B. 07403

Stibnite area, humus sampling, Au, Ag, Sb: Banister, D'Arcy P. 04934

*Kansas*

Tri-state district, lead, zinc: Hansuld, John A. 07402

*Missouri*

Stoutland quadrangle, sediments, heavy metals: Nichols, Chester E. 00916

Tri-state district, lead, zinc: Hansuld, John A. 07402

*Montana*

Marysville stock, polymetallic ores: Mantel, Erwin. 04666

*Nevada*

Cortez-Buckhorn area, silver, other metals: Wells, John D. 08465

*New Brunswick*

Southwestern, stream and spring sediments, metals, dispersion: Austria, V. B., Jr. 03160

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Copper River area, basalt belt, copper exploration feasibility study: Hornbrook, E. H. W. 03022

Coppermine River region, copper, permafrost effects: Allan, R. J. 04660

*Oklahoma*

Tri-state district, lead, zinc: Hansuld, John A. 07402

*Ontario*

Kamiskotia-Whitesides area, mafic intrusive rocks, element distribution: Wolfe, W. J. 09075

*Quebec*

Baby township, stream sampling, metals: Imreh, L. 10653

Lesueur township, stream-sediment studies, sulfates: VandeWalle, Marc. 10654

Stream sediments, Clermont township, Cu, Zn, Mn, and Mo: Thibault, Camille. 07632

Verneuill township, sediments, metals: VandeWalle, Marc. 10652

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Eastern, zinc, lead, Knox Dolomite: Carpenter, Robert Heron. 00682

*Texas*

Panhandle, Lake Meredith, Na-K, chlorides, sulfates: Cooper, W. A. 00488

Terlingua district, mercury: Geddes, Richard W. 01226

*United States*

Review, 1969: Carpenter, Robert H. 02170

Western, Great Basin, lakes, C-14, exchange rates: Thurber, D. L. 08744

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Deep Creek Mountains, metals: Thomson, Kenneth Clair. 07952

*Washington*

Central, soils, properties, seasonal variation: Anderson, T. D. 01190

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University curricula, developing nations: Siegel, Frederic R. 09569

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Application to bottom sediment characterization: Toth, Stephen J. 05566

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Calcium in soils, measurement method: Woolson, E. A. 02866

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Clay minerals, radiotracer technique: Murrmann, R. P. 03337

Clay minerals, sea water, Mexico, Rio Ameca: Russell, Kenneth Lloyd. 06609

Clay minerals, surface area determination, method: Hang, Pham Thi. 07617

Estuary sediments, pore and bottom water-clay interactions: Dobbins, David A. 03956

Glaciomarine sediments: Sharma, Ghanshyam D. 01138

Montmorillonite, Fe, Mg: Yaalon, D. H. 10994

Muscovite flakes, radioisotopic techniques, weathering: Mokma, D. L. 02545

Soil clays, diquat<sup>2+</sup>-K<sup>2+</sup> reactions: Dixon, J. B. 07433

Soil clays, West Indies, experiments, surface area relationships, mineralogical parameter: Davis, C. E. 09342

Soils, chloride movement: Thomas, G. W. 05475

Soils, nitrogen cycle, transformations, dynamics, effects of cultivation, pollution: Keeney, Dennis R. 09514

Soils, Panama: Martini, J. A. 02868

Soils, United States, southeastern, variations: Fiskell, John G. A. 07429

Stream sediments, variation with particle size: Malcolm, Ronald L. 03331

Tropical soil clays, Panama: Reneau, R. B., Jr. 07434

Vermiculite, montmorillonite, illite: Barshad, Isaac. 05404

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Pollutant emissions, urban and natural sources, S and N compounds and Co cycles: Robinson, Elmer. 09512

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Organic, research, advances, Internat. Cong., 3d, 1966, proceedings: Hobson, G. D. 04185

*Ionic strength*

Aqueous solutions, estimation from specific conductance: Lind, Carol J. 06190

*Mass transfer*

Definitions: Mookherjee, Asoke. 05123

Rate calculations, veins: Helgeson, Harold C. 04318

*Mercury*

Behavior in water: Hem, John D. 05558

Rocks, air, water, analyses: U.S. Geological Survey. 05612

Rocks, air, water, analyses, literature summary: Fleischer, Michael. 05555

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Analytical determination of nickel: Lewis, Clyde L. 08280

Computer applications, basic rocks, chemical variation and analysis diagrams: Pearce, Thomas H. 09711

Factor analysis, multivariate procedures: Miesch, A. T. 10629

Quasi-chemical model, halite-sylvite subsolidus: Green, E. Jewett. 09121

Tin in rocks and sediments, quantitative determination, polarography: Bond, A. M. 09458

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Chemical structure, gas chromatography, carbon-skeletal method, microgram level: Beroza, Morton. 09370

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Biogenic, sulfur: Davis, J. B. 04309

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Brine mixing, mechanism for basin evaporite, genesis: Raup, Omer B. 06329

Dehydration reaction, curve calculation method: Anderson, G. M. 04629

Diffusion, Cu, Mn, Zn in clay minerals: Ellis, J. H. 07624

Diffusion, ionic conductances, prediction: Nigrini, Andrew. 04231

Diffusion, Rb, Sr, K in biotite, hydrothermal conditions: Hofmann, Albrecht. 04011

Diffusion, unconsolidated sediments: Manheim, F. T. 06820

Equilibrium crystallization, zeolite facies, CO<sub>2</sub> and H<sub>2</sub>O relations: Albee, Arden L. 10998

Gas transfer, carbon monoxide air pollutants, technical and natural sources, global emissions, removal: Jaffe, Louis S. 09511

Hydrogen bonding, clay-water systems, poly-water evidence: Low, Philip F. 03123

Ion exchange, chlorites in sedimentary rocks, genesis, polytypism: Hayes, John B. 07666

Ion exchange, mica weathering, K release rates: Leonard, R. A. 07615

Ion exchange, phlogopite micas, K removal, effects on b-dimension: Leonard, R. A. 07616

Liquid-solid partition, fresh water-marine interface, transition metal: Burrell, D. C. 10522

Mineral reactions, high pressure, pyroxenite granulite nodule: Brookins, Douglas G. 06556

Oxidation-reduction, Fe in mica structures: Ismail, F. T. 05410

Solid-solid reaction, aragonite-calcite transformation, kinetics: Kunzler, R. H. 04737

Sulfate ion association in sea water, P-T effect: Kester, Dana R. 05589

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Carbon monoxide, nonequilibrium: Lamontagne, Robert A. 09631

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Calcite in deep oceans: Heath, G. Ross. 04886

Clay minerals, hydroxyl-Mg interlayers formation: Carstea, D. D. 07618

Copper, sulfide solutions: Romberger, S. B. 07066

Ferrous iron in carbonate-bearing ground water: Singer, Philip C. 09885

Gold, experimental studies: Weissberg, B. C. 04867

Kaolinite, precipitation stability, room temperature: Kittrick, J. A. 07665

PbS in NaCl solutions, elevated temperatures: Nriagu, J. O. 09695

Quartz, cristobalite, low temperature, in water: Weill, D. F. 00964

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Rhyolite glass, increase with alkalinity of solution: Mariner, Robert H. 09660

*Standard samples*

Sources, revised list: Flanagan, F. J. 00819

*Textbooks*

Marine chemistry: Martin, Dean F. 03802

Nonmarine organic: Swain, Frederick M. 07217

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Marine sediments, Atlantic Ocean: Bada, Jeffrey L. 04992

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Comparison with radiometric dates: Hare, P. Edgar. 10173

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Obsidian artifacts, test for stratigraphy and artifact reuse: Michels, Joseph W. 10139

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Periodic, experiments, environmental effects: Rhoads, Donald C. 03885

*Paleomagnetism*

Holocene basalt flows, evaluation: Shuey, Ralph T. 09611

Pliocene-Pleistocene boundary dating: Watkins, N. D. 10295

Reversals, determination of Paleozoic-Mesozoic boundary: Burek, Peter J. 02348

*Paleontologic zonation*

Mid-Atlantic Ridge, bottom sediments: Cifelli, Richard. 04399

*Radiation damage*

Zircon, thermoluminescence, relations: Vaz, Jesus Eduardo. 06681

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Meteorites, stone: Christodoulides, Costas. 06443

Tektites: Durrani, S. A. 00585

*Time scales*

Biostratigraphic units, Tertiary, radiometric dates, California: Bandy, Orville L. 04388

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*Tree rings*

Application to C-14 chronology: Stuiver, Minze. 05120

Environmental analysis, hydrologic and sedimentation changes: Phipps, Richard L. 07842

Faulting episode dating, Alaska, Fairweather fault: Page, Robert. 04881

Martin River Glacier, Alaska: Reid, John R. 06125

Ring-width and density measurements, X-ray methods: Parker, M. L. 07815

Scanning densitometer and data acquisition system: Jones, F. W. 07814

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Application to C-14 chronology: Stuiver, Minze. 05120

Correlation, sedimentation rate, atmospheric C-14 variations, Minnesota: Stuiver, M. 08742

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*Illinois*

Griggsville area, quartz crystals, Dauphine penetration twins: Gricius, Anthony. 03515

Warsaw Shale, Mississippian, Hamilton-Warsaw area: Illinois State Geological Survey. 06327

*Utah*

Dugway Mountains, descriptions: Rennix, Mark T. 07086

**Geodesy***Figure of Earth*

Determination, modern developments, review: Cook, A. H. 05846

Geoidal highs and lows, satellite data analysis: Woollard, George P. 10198

Latitude variation, geopotential surface change: Yumi, S. 09961

*General*

Research, development, activity, trends in Canada: Gale, L. A. 10775

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Laser, applications: Gauger, J. 06622

Marine: VonArx, William S. 09999

**Geologic barometry***Methods*

Quartz, depositional temperature and pressure: Coveney, Raymond M. 08406

**Geologic thermometry***Data*

Marble, schist, metamorphic zones, Vermont: Sheppard, Simon M. F. 03831

Metasediments, Vermont: Schwarcz, H. P. 04650

*Fluid inclusions*

British Columbia, Bluebell mine: Ohmoto, Hiroshi. 04416

*Methods*

Carbonaceous complex as indicator: Mueller, G. 04654

Fluorine, chlorine, hydroxyl distribution, between apatites, micas: Stormer, John C., Jr. 09590

Garnet, possibility: Tan, Li-Ping. 09172

Isotope fractionation, experimental studies: Schiller, W.-R. 04321

Kudo-Weill, porphyritic acid glass: Stormer, J. C., Jr. 06787

Mg-Fe distribution, olivine, orthopyroxene, questioned: Olsen, Edward. 09702

Oxygen isotopes, metasediments: Schwarcz, H. P. 04650

Plagioclase, experimental study: Kudo, Albert M. 00856

Probe for *in situ* temperature measurements: Aamot, Haldor W. C. 08211

Pyrite-pyrrhotite-chalcocopyrite-galena-sphalerite systems: Kajiwar, Yoshimichi. 10727

Quartz, depositional temperature and pressure: Coveney, Raymond M. 08406

Sedimentary rock metamorphism, organic particles as indicators: Bostick, Neely H. 00232

Thermoluminescence, spectral distribution: McDougall, David J. 04484

Trace aluminum in quartz: Dennen, William H. 05618

Ultramafic rocks, serpentinization, O-isotope fractionation: Wenner, David B. 10299

## Geologic thermometry—Continued

*Orthopyroxene*

Crystallization temperature,  $Mg^{2+}$ - $Fe^{2+}$  order-disorder: Saxena, Surendra K. 10595

## Geological exploration

*Applications*

Engineering geology, reconnaissance for construction sites: Johnson, A. I. 05311

Geoscience exploration program, phase: data correlation: North American Rockwell. 09233

*General*

Rock salinity variations, earth stress indicators: Overton, Harold L. 09483

Seaching out resource limits: Pecora, William T. 09474

*Mapping*

Panama, program: Elliott, D. E. 10854

Computer terrain maps, preprocessing multispectral data, Yellowstone Natl. Park: Smedes, Harry W. 09289

*Methods*

Aeromagnetic, digital recording, computer interpretation: Bolton, R. J. 02492

Airborne, thermal scanning, identification of anomalies: Adams, William. 09807

Automatic data processing, advantages: Grice, R. H. 09867

Automatic data processing as tool: Walker, Robert D. 01588

Borehole surveying, down-hole camera: Lundgren, Raymond. 05325

Changing approaches, collaborating disciplines: Drake, Charles L. 06918

Earth-resources technology satellite, NASA processing facility: Levy, Harold H. 06338

Electromagnetic, AFMAG, mapping: Sutherland, Don B. 02922

Electromagnetic, resistivity mapping: Collett, L. S. 03761

Gravity, diagrams for rock thickness: Jacoby, W. R. 03471

Infrared, linear structures and mafic rocks, discrimination: Offield, T. W. 09290

Laser, applications: Gauger, J. 06622

Magnetic, airborne, mapping: Boyd, David. 02921

Magnetotelluric, variation anomalies, conductive structure strike: Porath, H. 05336

Mapping, subsurface, trend-surface analysis, use of orthogonal polynomials: Whitten, E. H. Timothy. 10639

Microwave radiometry, selected mine areas, western U.S.: Edgerton, A. T. 09623

Microwave techniques, passive: Edgerton, A. T. 09293

Mineral associations and typicalities, base-metal districts, computer modeling: Botbol, Joseph Moses. 02222

Mini-earthquake monitoring, fault mapping: Westphal, W. H. 05635

Modeling, computer techniques: Harbaugh, John W. 04790

Ocean floor, oriented hard-rock cores: Brooke, J. 04549

Oceanographic mapping, bathymetric, geophysical: McAlinden, John M. 10349

Paleobathymetry: Stude, Gerald R. 07326

Radar, evaluation: Dellwig, L. F. 02848

Radar, infrared, evaluation, Arizona: Schaber, Gerald G. 02847

Radar, side-looking, mosaics, geologic overlays, Panama: Viksne, Andris. 09789

## Geological exploration—Continued

*Methods—Continued*

Remote sensing, NASA Earth Resources Aircraft Program, review: U.S. Natl. Aeronaut. and Space Adm. 02841

Remote sensing, other, applications to natural resources development: North American Rockwell. 09233

Remote-sensing, automatic cartography techniques, instrumentation: Edson, Dean T. 09298

Remote-sensing, Yellowstone Natl. Park project: Smedes, Harry W. 02849

Satellite, geologic mapping, multiband spectral data: Lyon, R. J. P. 06762

Seismic, acoustical hydrography imaging: Metherell, A. F. 06629

Submarine, Canadian submersible operations, Lake Erie: Sly, Peter G. 09574

Submarine, underwater laboratories, Great Lakes region: Somers, Lee H. 09582

Subsurface contour maps, anomalies, probability study: Dunn, Darrel E. 06754

Subsurface, recording data: Zagarra, E. J. 05263

Subsurface rock formations from surface, Vibroseis system: Dunster, D. E. 10878

Ultraviolet reflectance, stimulated luminescence: Hemphill, William R. 02852

## Geomorphology

*Bibliography*

Coastal, Latin America: Psuty, Norbert P. 05834

Glacial chattermarks, annotated: Laverdiere, Camille. 03128

*Education*

Micro-landscape, field study, methods: Goodman, James M. 07173

*Environment*

Alpine, soil erosion, Colorado: Zoghet, Mouine Fahed. 03089

Arctic, beaches, ice effects, N.W.T., Devon Island: Owens, E. H. 02164

Arctic, subarctic, Greenland: Malaurie, J. 05926

Beach, California shoreline, littoral processes: Szuwalski, Andre. 05119

Desert, Big Smoky Playa, Nevada: Walker, Robert F. 06523

Desert, California, Great Valley, relic eolian features: Christian, Louis B. 05117

Desert, Coyote Playa, California: Hagar, David J. 06521

Desert, Coyote Playa, California: Motts, Ward S. 06522

Desert, ephemeral streams, pediment gullies, Arizona: Wertz, Jacques B. 02742

Desert, high-arctic, generic soils: Tedrow, J. C. F. 04989

Desert, playas: Motts, Ward S. 06519

Desert, playas, development processes: Motts, Ward S. 06527

Desert, playas, U.S., western: Motts, Ward S. 06578

Desert, Rogers and Rosamond Playas, California: Motts, Ward S. 06520

Desert, Troy Playa, California: Groat, Charles G. 06524

Desert, Troy Playa, California, 1968: Motts, Ward S. 06525

Deserts, North America: Larson, Peggy Pickering. 07860

Estuarine, California, San Francisco Bay, marshes and mudflats: Harvey, H. Thomas. 09388

**Geomorphology—Continued***Environment—Continued*

- Estuarine, fine-sediment dispersal: Swift, Donald J. P. 03292
- Land, sea, air interaction: Rumney, George R. 02199
- Muskeg, general description, Canada: MacFarlane, I. C. 05277
- Muskeg, patterned ground, marbloid, Canada: Korpiaakko, E. O. 08246
- Nearshore, processes, foraminifers as indicators: Phleger, Fred B. 10958
- Peatlands, development problems: Radforth, N. W. 08313
- Semi-arid to humid, caliche formation: Reeves, C. C., Jr. 02018
- Symposium, 1970: Coates, Donald R. 09187
- Tundra, frost action, solifluction, Yukon: Price, Larry W. 03901

*Eolian features*

- Dunes, Great Lakes region, origin and movement: Roberts, John M. 04085
- Dunes, Illinoian to Holocene, changes of level, Hawaii: Stearns, Harold T. 08333
- Dunes, Mojave Desert, California, Dumont area, genesis: MacDonald, Angus A. 00125
- Dunes, North Carolina, reddening with time: Dolan, Robert. 03614
- Dunes, stabilization, Texas, barrier islands: Gage, Bard O. 07204
- Erosion, Mexico: Jauregui Ostos, Ernesto. 07795
- Ventifacts, Wisconsin, Nekoosa area, late Precambrian: Tank, Ronald W. 02830
- Vortex pits, genesis, differential pressure: Whitney, Marion I. 01111

*Erosional features*

- Stone stripes, relation to clay substratum of diamicton, Idaho, Utah: Williams, J. Stewart. 09225

*Fluvial features*

- Alluvial fan, California, age, growth rate: Beaty, Chester B. 00058
- Arroyos, California coastal ranges: Reeves, R. W. 02977
- Bars, Ohio, Whitewater River, Big Ann's point bar, statistical study: Wiethe, John D. 04186
- Bed topography, effect on flow in meanders: Desaulniers, G. 05242
- Bed topography, effect on flow in meanders: Yen, Chin-lien. 01704
- Bed-form geometry, friction factors: Squarer, David. 01522
- Bolson integration, Rio Grande capture, Texas: Strain, William S. 05374
- Braided streams, bars, evolution: Smith, Norman D. 04876
- Braided streams, geometric and topologic properties, model: Howard, Alan D. 07465
- Braided streams, sedimentation, Red River, Texas: Waechter, Noel B. 10287
- Buried valley, Ontario, Niagara River gorge: Karrow, P. F. 07722
- Buried valleys, Manitoba, Virden area: Klassen, R. W. 10938
- Channel geometry, bedforms, relation to seepage: Harrison, Samuel S. 01140
- Channel geometry, relation to runoff: Hedman, E. R. 03793
- Channel geometry, sediment yield, U.S., precipitation effect: Rango, Albert. 07417
- Channel patterns: Chitale, Shrikrishna V. 01706

**Geomorphology—Continued***Fluvial features—Continued*

- Channel response, Georgia, Hiwassee River: Stephenson, Richard A. 01320
- Channel scarps, North Dakota, western, processes: Hamilton, Thomas M. 04305
- Channels, aggrading and degrading, mechanics, flume study: Chang, H. Y. 10503
- Channels, alluvial, relation between variables: Maddock, Thomas, Jr. 05236
- Channels, alluvial, ripple concentrations, friction factor: Chang, Fred F. M. 00115
- Channels, bedforms, flume-width effect: Crickmore, Maurice J. 00116
- Channels, bed-roughness, transport, experimental: Khanna, Sat Dev. 06460
- Channels, characteristics, Ontario, Bronte Creek: Dolling, Raymond H. 04739
- Channels, desert streams, cf. lunar rilles: Burke, J. D. 01287
- Channels, entrenchment, recent, California: Reeves, Richard Wayne. 07340
- Channels, geometry, alteration, variables: Schumm, Stanley A. 03436
- Channels, geometry, gear-bearing: Fahnestock, Robert K. 06973
- Channels, geometry, Iowa, Wisconsin: Knox, James Clarence. 07932
- Channels, in caves, geometry, flow-regimes: White, William B. 10906
- Channels, Kansas, Kansas River: Ratzlaff, John R. 00928
- Channels, networks, mainstream length, relation to basin area: Shreve, Ronald L. 09567
- Channels, open, dunes and antidunes, genesis: Fuhrboter, Alfred. 05243
- Channels, open, dunes and antidunes on erodible bed, genesis: Hayashi, Taizo. 00114
- Channels, patterns, braided and straight: Leopold, Luna B. 06539
- Channels, sequences and braiding, Texas: Kessler, L. G., 2d. 07330
- Delta, sedimentation, bar-finger sand, role of salt: Moore, George T. 00461
- Delta, Texas, Nueces Bay, fan delta model: McGowen, J. H. 10200
- Deltas, accretion pattern, forming forces: Silvester, Richard. 10209
- Deltas, Yukon, Blow River: McCloy, James Murl. 01180
- Dendritic basin model, overland flow length: Magorian, Thomas R. 01951
- Drainage basin, axial and shape parameters: Ongley, E. D. 02880
- Drainage basins, James River, Pleistocene history, Virginia: Spencer, R. S. 00087
- Drainage basins, stream lengths, Horton's law: Scheidegger, A. E. 03424
- Drainage changes, bends, piracy, Oklahoma, South Canadian River: Harris, Sherod A. 02787
- Drainage changes, Nebraskan glaciation, Indiana, Ohio: Teller, James T. 09597
- Drainage density, drift-covered basins: Roberts, Michael C. 03620
- Drainage density, drift-covered basins, Wisconsin: Orsborn, John F. 01705
- Drainage, patterns, Arizona, Colorado River tributaries, Hualapai Plateau: Young, Richard A. 00472
- Drainage patterns, Connecticut, Tariffville quadrangle: Randall, Allan D. 05391

**Geomorphology—Continued***Fluvial features—Continued*

- Drainage patterns, joint control, South Carolina, Blue Ridge Front: Acker, Louis L. 04358
- Drainage patterns, structural control, Texas-N. Mex.: Reeves, C. C., Jr. 08708
- Drainage systems, mapping, U.S.G.S. topographic quadrangles, suitability: Coffman, Daniel M. 03855
- Drainage systems, organization: Folsom, Michael M. 02749
- Ephemeral streams, gullies, Arizona, Dome Rock Mts. pediment: Wertz, Jacques B. 02742
- Erosion, bed removal rate, sediment pick-up: LeFeuvre, Albert R. 05234
- Erosion, channel geometry and sediment morphometry as measures: Orme, Antony R. 00330
- Erosion, chemical vs. mechanical, Maryland watershed: Cleaves, Emery T. 04877
- Erosion, Mexico: Jauregui Ostos, Ernesto. 07795
- Erosion, rate, sediment yield, Alberta: Campbell, Ian A. 04929
- Erosion, rate, stream-load data, error: Winkler, Erhard M. 00573
- Erosion, sill-controlled flow transitions: Rand, Walter. 01521
- Erosion, storm damage, Virginia, 1969: Webb, H. W. 03333
- Erosion, transport, construction sites, environmental effects: Guy, Harold P. 06390
- Erosion, valleys, Puerto Rico, cf. periglaciated Europe: Pippin, Therese. 09901
- Experimental study, stream table, ice as bedrock: Prusok, Rudi. 03930
- Flood plain delineation, use of soils map: Parker, Dale E. 02384
- Flood plains, accretion forms: Carey, Walter C. 05240
- Flood plains, delineation from aerial photos: Parker, Dale E. 09800
- Flood plains, formation: Wolman, M. Gordon. 06538
- Flood plains, meanders, migration: Neill, Charles R. 01708
- Floods, Utah, Wasatch Front, hazard: Marsell, Ray E. 03034
- General, Gulf Coastal Plain, Beaumont Clay: Aronow, Saul. 00862
- Gullies, channel geometry, Colorado, Rocky Mts.: Heede, Burchard H. 03549
- Gully widening, pedimentation in case-hardened gravels: Lattman, Laurence H. 09638
- Major rivers, flood-plain phases: permafrost relations: Pewe, Troy L. 08331
- Meander belts, Pleistocene Trinity River, on Beaumont erosion surface: Aronow, Saul. 00481
- Meander planforms, Wabash and White Rivers, Indiana: Chang, T. P. 02715
- Meanders, behavior in alluvial materials, bank caving: Shindala, Adnan. 09733
- Meanders, chain model: Thakur, T. 01989
- Meanders, Colorado, Arkansas River: Swenson, Frank A. 01488
- Meanders, incised, genesis, Texas, Mason County: Blank, Horace R. 04948
- Meanders, minimum variance theory: Langbein, Walter B. 06540
- Meanders, natural streams in alluvial material, review: Shindala, Adnan. 02101

**Geomorphology—Continued***Fluvial features—Continued*

- Meanders, Texas, Brazos River, cf. abandoned Pleistocene valley: Epps, Lawrence W. 00496
- Meanders, Texas, Mason County: Blank, Horace R. 00866
- Meanders, underfit streams: Dury, G. H. 06682
- Mississippi Valley, St. Francis sunk lands: Saucier, Roger T. 04465
- Overland flow hydraulics, erosion, sedimentation: Emmett, William W. 01352
- Pediments, alluvial fans, differentiation from topographic maps: Doehring, Donald O. 04945
- Pediments, genesis, U.S., western: Mackin, J. H. 06143
- Point bars, modern cf. ancient: McGowen, J. H. 03136
- Pools, riffles, transformation to meanders: Tinkler, Keith J. 00109
- River nets, evolution theory: Scheidegger, A. E. 02462
- Rivers, channel geometry, metamorphosis: Chitale, Shrikrishna V. 00113
- Rivers, Colorado River, Grand Canyon, origin and history: Breed, Carol S. 04849
- Rivers, meander patterns, chain model, statistical analysis: Thakur, T. R. 06932
- Rivers, sedimentation, channel changes, lower Rio Grande: Day, John C. 09349
- Sandbar development and transport, New Mexico: Culbertson, J. K. 01492
- Scour and fill processes, Ohio River, Kentucky: Moore, Bruce R. 01547
- Sedimentary structures, ephemeral streams: Picard, M. Dane. 09612
- Sedimentation, culturally accelerated, measurement: Am. Soc. Civil Engineers. 01525
- Sedimentation, gravel bars, intertidal zone, Quebec: Costello, W. R. 07963
- Sedimentation, Texas, Canadian River: Kessler, L. G., 2d. 00624
- Stream capture, mechanism, Utah, Henry Mts.: Godfrey, Andrew E. 10168
- Stream piracy, abandoned, Florence Valley, Ohio: Hole, Thornton J. F. 06836
- Terraces, ancestral, present Greybull River, Wyoming: Merrill, Robert D. 09669
- Terraces, Arizona, Salt River Valley: Pewe, Troy L. 02994
- Terraces, genesis, Massachusetts, Vermont: Davis, W. M. 06677
- Terraces, genetic process and types: Miller, Hugh. 06536
- Terraces, Indiana, Ohio River valley: Webb, William M. 07476
- Terraces, Louisiana-Arkansas, Ouachita River: Cooke, C. Wythe. 04888
- Terraces, Louisiana-Arkansas, Ouachita River: Saucier, Roger T. 00562
- Terraces, microrelief, North Carolina, method: Daniels, R. B. 03990
- Terraces, modern development, Nevada, Truckee River: Born, Stephen M. 01245
- Terraces, research, anthology, 1877-1966: Dury, G. H. 06535
- Terraces, South Dakota, White River: Kahil, Alain A. 00623
- Terraces, Texas, Presidio Bolson: Groat, Charles G. 06997
- Transport, alluvial channel, experimental study: Williams, Garnett P. 02082

## Geomorphology—Continued

*Fluvial features—Continued*

- Transport, alluvial channel, flat bed flow: Srinivasan, Vajapeyam S. 07385
- Transport, bed-load, California, Dry Creek: Keller, E. A. 08554
- Transport, bed-load formulas, extension to high sediment rates: Abdel-Aal, Farouk Mostafa. 07384
- Transport, fine sand, initial entrainment: Gourlay, Michael R. 05238
- Transport, fine sand, initial entrainment: Grass, Anthony J. 01517
- Transport, Idaho-Washington, Palouse River basin: Boucher, P. R. 05444
- Transport, meander bends, velocity zones: Hooke, Roger LeB. 01523
- Transport, measurement, laboratory, sediment shape factor: Rao, Udayagiri Mohan. 01528
- Transport, nonequilibrium, suspended sediment: Hjelmfelt, Allen T. 03683
- Transport, pool and riffle stream, Michigan: Hansen, Edward E. 08468
- Transport, rates, measurement techniques: Guy, Harold P. 01527
- Transport, sampling, two-dimensional slots: Poreh, Michael. 05235
- Transport, sand channels, particle motion: Grigg, Neil Sadler. 00513
- Transport, sediment discharge, computer computation: Toffaleti, Fred B. 03618
- Transport, sediment discharge, U.S., Potomac River basin: Wark, J. W. 06147
- Transport, sediment measurement, laboratory: Fleming, George. 01609
- Transport, sediment measurement, techniques, equipment: Fleming, George. 01524
- Transport, sediment transfer coefficient: Coleman, Neil L. 03072
- Transport, sediment yield, strip mining effect, Kentucky: Collier, C. R. 05452
- Transport, silt, deposition in gravel bed: Einstein, H. A. 00112
- Transport, silt particles, dispersion, open-channel flow: Hagist, Warren M. 01709
- Transport, single-particle movement, alluvial channel: Grigg, Neil S. 05237
- Transport, suspended sediments, California, southern: Rodolfo, Kelvin S. 03601
- Transport, suspended sediments, discharge estimation: Nelson, Leonard M. 04306
- Transport, tracer experiment, Colorado: Kennedy, Vance C. 01285
- Transport, vertical transfer: Jobson, Harvey E. 01610
- Valleys, buried, Pennsylvania, Slippery Rock, Muddy Creeks: Szucs, F. K. 00185
- Valleys, Iowa, southwestern, preglacial: Sindlein, Lyle V. A. 01103
- Valleys, Michigan, Grand Valley: Ferrand, William R. 06975
- Valleys, North Dakota, orientation, bison trails: Clayton, Lee. 02503
- Valleys, Ontario, Niagara escarpment, preglacial: White, Owen L. 01110
- Waterfalls, retreat, Niagara Falls, New York-Ontario: Philbrick, Shailer S. 05967
- Watersheds, plant-runoff-sediment yield relations: Branson, F. A. 03071
- Watersheds, sediment yield estimates, examples: Shown, Lynn M. 01494

## Geomorphology—Continued

*Frost action*

- Soil movement, causes, effect on vegetation, subarctic regions: Jahn, Alfred. 08298
- Till, weathering, Wisconsin, east-central: Harrison, Samuel S. 05197

*Glacial features*

- Bibliography, Puget Sound, Washington-British Columbia: Folsom, Michael M. 03410
- Chattermarks, concave, trains, Quebec, Lake Temiskaming: Laverdiere, Camille. 03239
- Cirques, formation by floor erosion: White, William A. 00098
- Deglaciation, rates, Northwest Territories, Southampton Island: Bird, J. Brian. 07095
- Drift, Illinois, Kane County: Gross, David Lee. 06597
- Drift, Prince Edward Island, Rustico area: Crowl, G. H. 05820
- Drumlins, distribution, orientation, statistical model, Wisconsin: Hole, F. D. 06813
- Drumlins, moraines, Ontario, Thornhill area: Karrow, P. F. 02554
- Drumlins, Wisconsin, Jefferson County, origin, composition: Lasca, Norman P. 06812
- End moraines, relation to previously glaciated topography: Deal, Dwight E. 10157
- Erosion forms, glaciers, New Hampshire, Presidential Range: Goldthwait, Richard P. 02175
- Erratics, striations, Quebec, Ungava, northern, late Wisconsinan: Matthews, Barry. 09282
- General, Alaska, Martin River Glacier, terminal area: Reid, John R., Jr. 07195
- General, Atlantic Coastal Plain, middle: Vlangas, Louis P. 00771
- General, Canada: Douglas, R. J. W. 08007
- General description, Wyoming, Yellowstone Park: Pierce, Kenneth L. 10187
- General, Labrador, southwestern, ice movement directions: Harrison, D. A. 09285
- General, Maine, northwestern: Borns, Harold W., Jr. 00140
- General, New England, Hudson-Champlain Valley, Wisconsinan history: Connally, G. Gordon. 06103
- General, New York, Little Falls-Richfield Springs area: Whipple, Janice M. 01239
- General, Quebec, Lac Megantic region: Shilts, William Weimer. 07947
- General, Saskatchewan, Hudson Bay area: Moran, Stephen Royse. 06875
- General, Wisconsin, Northern Kettle Moraine State Forest: Black, Robert F. 05833
- General, Wyoming, Bighorn Mts., Clear Creek headwaters area: Nelson, Robert Stanley, Jr. 07940
- General, Yukon, Snag-Klutlan area: Rampton, Vernon Neil. 01236
- Glacial history, New York, upper Wallkill Valley: Connally, G. Gordon. 05191
- Glacierization, past, present, Canada, Baffin Island: Andrews, J. T. 05217
- Hummocky topography, North Dakota, evolution: Bluele, John P. 00596
- Kame-moraine, ice advances, Ontario: Harris, Stuart A. 08204
- Kames, Kansas, Doniphan County: Dort, Wakefield, Jr. 00892
- Kames, origin, depositional history, Alberta, Edmonton area: Keeble, A. B. 03082



## Geomorphology—Continued

*Glacial features—Continued*

- Lake, deposits, Manitoba, Grand Rapids area: Grice, R. H. 08409
- Landforms, Alberta, North Saskatchewan Valley: McPherson, H. J. 02881
- Landforms, lakes, Canada: Prest, V. K. 07978
- Mapping deposits, magnetic survey as tool: Onesti, Lawrence J. 05320
- Moated ice mounds, genesis, Northwest Territories: Ferguson, Laing. 05627
- Moraines, Alberta, Banff Natl. Park, Peyto Glacier: Henoch, W. E. S. 05586
- Moraines and drainageways, Minnesota, northeastern, Wisconsin: Wasylkova, Krystyna. 09380
- Moraines, Colorado, Front Range, Boulder Creek drainage basin: Bonnett, Richard B. 10148
- Moraines, drift, lake plains, North Dakota, Grand Forks County: Hansen, Dan E. 00445
- Moraines, ice-cored, Alberta-British Columbia, airphoto interpretation: Ostrem, G. 06828
- Moraines, medial, morphology, structure: Loomis, Stuart R. 03443
- Moraines, New England, late Wisconsin ice fluctuations: Borns, Harold W., Jr. 06069
- Moraines, Newfoundland, Long Range plateau: Grant, Douglas R. 02452
- Moraines, outwash plains, tarns, cirques, Vermont: Wagner, W. Philip. 04655
- Moraines, Pleistocene, Pinedale III and IV stades, correlation, Montana-Wyoming: Graf, William L. 10171
- Moraines, protalus, Quebec, Outaouais Valley: Lengelle, Jean-G. 03237
- Moraines, Quebec, Great Whale River estuary: Portmann, Jean-Pierre. 07253
- Moraines, Quebec, St-Narcisse system: LaSalle, Pierre. 07718
- Moraines, terminal, Wisconsin, Cross Plains area: Black, Robert F. 06814
- Moraines, till, lake shores, Vermont, Champlain Valley, late Pleistocene events: Wagner, W. Philip. 09023
- Moraines, washboard, remnant shear moraines, North Dakota: Nielson, Dennis N. 04132
- Moraines, Wisconsin, Baraboo district: Black, R. F. 07065
- Moraines, Wisconsin, eastern, Kettle Interlobate Moraine: Lasca, Norman P. 06910
- Newfoundland, southwestern, striae, erratic, new interpretation: Brookes, Ian A. 08122
- Ontario, Kingston area, glacial readvance evidence: Sangrey, D. A. 08148
- Patterns, minor moraine topography, Iowa, Cary age drift: Foster, John D. 03655
- Prairie potholes, hydrology, chemical analyses, North Dakota: Sloan, Charles E. 03220
- Proglacial lakes drainage, Glacial Grand Valley, Michigan: Eschman, Donald F. 08302
- Supraglacial streams, Alaska, Capps Glacier, channel adjustment: Dozier, Jeff. 03038
- Supraglacial streams, Yukon, Kaskawulsh Glacier: Ewing, Karen. 03039
- Till, Colorado, Boulder Creek basin, sequence: Bonnett, Richard Brian. 07346
- Till, Great Lakes region, Wisconsin advances: Dreimanis, Aleksis. 06960
- Till, Michigan, Wisconsin, Valders drift border: Farrand, William R. 01183
- Wisconsin glacial advances, Ohio, Eaton area: Thomas, J. B. 05319

## Geomorphology—Continued

*Lacustrine features*

- Alpine tarn, disturbed ice blocks and sediments, Colorado: Reed, Edward B. 05054
- Carolina Bays, genesis, age: Thom, Bruce G. 00560
- General, North Dakota, Lake Souris: Moran, Stephen R. 01091
- Glacial lakes, Minnesota, northwestern, field trip, teacher's guide: Wright, Herbert. 03590
- Ice effects on shoreline, Vermont, Lake Champlain: Wagner, W. Philip. 00029
- Lakemounts, Indiana, Pretty Lake, genesis: Wetzel, Robert G. 04677
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- Glossary, world bathymetric terms and English equivalents: Cherkis, Norman Z. 09326  
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 Pockmarks, shelf off Nova Scotia: King, Lewis H. 04884  
 Sand waves, transport, Chesapeake Bay, entrance: Ludwick, John C. 05463  
 Sea-floor scour, obstacles: Palmer, Harold Dean. 06005  
 Strandlines, glacio-isostatic, age prediction: Andrews, J. T. 05970  
 Submarine canyons, Astoria Canyon-Fan, off Oregon-Washington: Nelson, C. Hans. 03532  
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 Submarine fans, California, La Jolla fan: Piper, D. J. W. 03652  
 Submarine fans, California, segmented model: Haner, Barbara E. 07007  
 Terraces, Cenozoic, evolution, correlation, Cuba: Tolkunov, A. Ye. 06033  
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*Mass movements*

- Ancient, Tertiary landslide, Wyoming, Washakie Basin: McAuslan, E. R. 07236  
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 Bentonitic debris flows, Alaska, Umiat area: McGaw, Richard W. 10075  
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 Erosion, avalanches, Alberta, Lake Louise area: Gardner, J. 02174  
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 Landslides, bentonite debris flows, climatic control questioned: Prior, D. B. 00814  
 Landslides, bentonite debris flows, features over permafrost: Anderson, Duwayne M. 00815  
 Landslides, debris-avalanche type, Virginia, 1969: Webb, H. W. 03333  
 Landslides, delta underwater slopes, ocean wave role: Henkel, D. J. 02422  
 Landslides, geotechnical investigation, Quebec: Chagnon, Jean-Y. 05293  
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 Laboratory manual, scientific investigations: Skillman Woyski, Margaret. 10377  
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- Patterns, Greenland, Sondre Stromfjord area: Weidick, A. 06247
- Permafrost, peat plateaus, palsas as indicators, Canada: Brown, R. J. E. 08258
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- Tundra polygons, North Dakota, southwestern: Clayton, Lee. 01062

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- Canada, committee report, recommendations: Jopling, A. 02778

*Quantitative geomorphology*

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- Drainage basin evolution, changes with time, computer analysis: Moultrie, William. 02558
- Drainage basin parameters, moment measurement: Ongley, E. D. 02880
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- Stream analysis, division ratio: Coffman, Daniel M. 06100
- Stream morphology, concept of entropy: Yang, Tsung. 02006
- Streams, bifurcation ratios: Flint, Jean-Jacques. 00152
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- Terrain analysis, roughness, computer simulation: McCue, G. A. 09790
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- Watershed shape and size, bare cf. vegetated: Magorian, Thomas R. 07469
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*Shore features*

- Bar and trough topography, nearshore, sedimentation: Davis, Richard A., Jr. 06949
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- Barrier island, Texas, Saint Joseph Island, washover fan, delta: Andrews, Peter B. 06728
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- Barrier islands, genesis, migration: Hoyt, John H. 05971
- Barrier islands, genesis, migration: Otvos, Ervin G., Jr. 05972
- Barrier islands, North Carolina, sedimentation: Byrnes, John B. 02595
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- Bars, Florida, Biscayne Bay: Wanless, Harold R. 02697
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- Beach profiles, changes, erosion scales, models: Schwartz, Maurice Leo. 03111
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- Beaches, ice effects, Arctic environment: Owens, E. H. 02164

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- Coasts, bibliography, Latin America: Psuty, Norbert P. 05834
- Erosion, drift-ice action, St. Lawrence River banks: Dionne, Jean-Claude. 11275
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- Erosion, sedimentation, Lake Michigan, eastern: Davis, Richard A., Jr. 06948
- Estuary, Rhode Island, Narragansett Bay, structural control: Fisher, John J. 00150
- Evolution, barrier islands, dune ridges, beach processes, New Brunswick, Kouchibouguac Bay: McCann, S. B. 09825
- Inlets, migration, sedimentation, New York: Kumar, Naresh. 00165
- Quebec, Hudson Strait, raised beaches, postglacial: Rogerson, R. J. 09281
- Raised shorelines, botanical markers: Rosenberg, Gary D. 10199
- Sand bars, depositional, dispersal dynamics, Nova Scotia: Klein, George de Vries. 08546
- Sand waves, New Brunswick, Cape Hatteras: Dolan, Robert. 09772
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- Transport, offshore sand, shoaling waves: Cook, David Olney. 07351
- Transport, sedimentation, barrierbar-lagoon complex: Dillon, William P. 00096
- Transport, sedimentation, rip currents, California: Cook, David O. 06340
- Transverse bars, effect on current transport, Florida: Niedoroda, A. W. 03704

*Solution features*

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- Patterns, fracture traces, joints, limestones, Kentucky: Hine, George T. 07501
- Sinkholes, collapse prediction, remote-sensing methods: Coker, A. E. 02905

*Textbooks*

- Landform description and evolution: Tuttle, Sherwood D. 02115
- Landscape studies: Sawyer, K. E. 10746
- Physical geography: Patton, Clyde P. 04126
- Physical geography: Strahler, Arthur N. 00829
- Physiographic features, topographic maps, United States: DeBruin, Richard. 06802
- Principles of physical geography: Monkhouse, F. J. 08580
- Theoretical approach: Scheidegger, Adrian E. 04977

*Volcanic features*

- Maar, Oregon, Big Hole maar, evolution: Lorenz, Volker. 02375

*Weathering*

- Basalt, red soils, Mexico, central: Leon Vallejo, G. 05899
- Chemical, calcite saturation in vadose seepage, Mammoth Cave, Ky.: Thrailkill, John. 10278
- Soils, micromorphologic features, textbook: Kubiena, Walter L. 10837

**Geophysical methods***Applications*

- Elastic waves, Earth structure: Backus, G. 01730
- Ground water, review: Mabey, Don R. 02944
- Ground-water exploration, Canada, prairie provinces: Lennox, D. H. 02935
- Ground-water exploration, limestone terrane: Warman, James C. 09221

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- Ground-water investigations, well logging: Keys, W. Scott. 03004
- Ground-water problems, regional: Shiftan, Z. L. 03755
- Marine, progress since 1963: Maxwell, Arthur E. 09983
- Mineral exploration, copper, porphyry, U.S., southwestern: Sumner, John S. 02959
- Mineral exploration, diamonds, marine placers: Oostdam, B. L. 02931
- Mineral exploration, lead-zinc, Mississippi Valley-Appalachian type: Callahan, William H. 02927
- Mineral exploration, nickel: Dowsett, John S. 02925
- Mineral exploration, polymetallic ores, N. America, Cordilleran region: Smellie, Donald W. 02949
- Mineral exploration, review: Rayner, J. M. 02943
- Mineral exploration, uranium, well logging: Dodd, Philip H. 02929
- Mineral, petroleum exploration, use of geologic technology: DelCastillo G., Luis. 08452
- Mineral resources exploration, ocean floor: McAlinden, John M. 10349
- Mining, 1969, review: Campbell, Robert E. 02171
- Mining, 1968, worldwide, review, expenditures: Hood, Peter. 02172
- Submarine pipeline surveys, techniques: Van-reenan, Earl D. 09495
- United Nations exploration programs: Brown, J. M. 02940

*General*

- Exploration methods, applications, programs in Canada: Morley, L. W. 10768

*Interpretation*

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- Interpolation of randomly spaced data, error, statistical study: Naidu, Prabhakar S. 05571
- Marine data, reduction, display, storage system, IBM computer: Talwani, Manik. 06703
- Mineral and ground-water exploration, computer processing: West, G. F. 02958
- Plate tectonics and ocean-floor spreading: Dobrin, Milton B. 05865
- Two-dimensional data, automatic contouring, bicubic spline interpolation: Holroyd, M. T. 06303
- Wedge problem: Nabighian, Misac Noubar. 07589

*Techniques*

- Acoustic signals, near sub-bottom profiling, high resolution: Chramiec, M. A. 09493
- Ocean floor, small-scale features, deep-towed instrumentation: Spiess, F. N. 09990
- Regional mapping, advantages, mineral exploration: Morley, L. W. 02942

**Geophysical surveys***Arctic Ocean*

- Basin, shape and structure, interpretation, review: Dementitskaya, R. M. 10007
- Fletcher's Ice Island, tectonic interpretation: Hall, John K. 10046

**Geophysical surveys—Continued***Atlantic Ocean*

- Baffin Bay, Davis Strait, past and future exploration: Manchester, K. S. 10074
- Barracuda fault zone: Birch, Francis Sylvanus. 03246

*Canada*

- Continental margin, Georges Bank to Kane Basin, interpretation, review: Keen, M. J. 09717
- General: Douglas, R. J. W. 08007

*Caribbean Sea*

- Eastern margin, Lesser Antilles arc, interpretation, review: Bunce, Elizabeth T. 09720
- Interpretation, review: Ewing, J. I. 09719

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- Cripple Creek district, interpretation: Kleinkopf, M. Dean. 03472

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- Interpretation, review: Ewing, J. I. 09719

*Hawaii*

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*Pacific Ocean*

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- Basin structure, interpretation, review: Shor, G. G., Jr. 10002
- Hawaiian Ridge, Murray Fracture Zone relations: Malahoff, Alexander. 10004
- Northeastern, interpretation, review: Dehlinger, Peter, Couch, R. W. 10005

*Utah*

- Jordan Valley, sediments, thickness: Mattick, Robert E. 04253

**Geophysics***Education*

- Solid earth geophysics, program of study: Drake, Charles L. 00424

*General*

- Conference, mining and ground water: Morley, L. W. 02913
- Global geophysics, collected papers: Sutton, Graham. 05844
- Paleogeophysics, symposium, 1968: Runcorn, S. K. 06541

*Practice*

- Contribution to global tectonics: Dobrin, Milton B. 05865
- Exploration, interdisciplinary approach, recommendation: DelCastillo G., Luis. 08452
- Human resources and geophysical exploration: Mabey, D. 02941
- Mining geophysics, methods, achievements, review: Sumner, John S. 09591

*Textbooks*

- Well-log analysis, geologic interpretation: Pirson, Sylvain J. 09624

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Geological Survey, list of publications, 12th: Auvil, J. H., Jr. 10808

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Northern, Hiwassee River, channel response: Stephenson, Richard A. 01320

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Piedmont, sedimentation, culturally-accelerated: Trimble, Stanley W. 01321

*Geophysical surveys*

Georgia Nuclear Laboratory area, radioactivity map, airborne: Higgins, Michael W. 00714

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Brunswick area, water levels, fluctuations, rock movements: Gregg, Dean O. 04264

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Palynomorphs, Quaternary, Okefenokee Swamp: Bond, T. A. 01369

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*Sedimentary petrology*

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Paleozoic-Tertiary, southern, review: Rainwater, E. H. 07316

Precambrian-Cambrian, Brevard-Poor Mtn.-Henderson sequences, correlation: Hatcher, Robert D., Jr. 00570

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Brunswick area, rock movement, water-level change trigger: Gregg, Dean O. 04264

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Sedimentation, Permian, Alaska: Bond, Gerard Clark. 07345

Tectonics, radial movements in western Wyoming salient: Crosby, G. W. 05205

Tectonics, radial movements in western Wyoming salient: Tooker, E. W. 05326

Tectonics, ultramafics and orogeny, model study: Moores, Eldridge. 06385

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Continental margins, plate tectonics, kinegeosyncline: Dewey, John F. 08665

Michigan basin, autogeosyncline, structural elements: Ells, Garland D. 11243

Orderly cycles unlikely: Coney, Peter J. 00500

Precambrian, North America: Lowry, W. D. 00737

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Flysch sedimentology, North America, symposium: Lajoie, J. 05295

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Illinois, Hamilton-Warsaw area: Illinois State Geological Survey. 06327

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Illinois, Mount Carroll area: Illinois State Geological Survey. 06326

Illinois, Winchester area: Illinois State Geological Survey. 06324

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- Athabasca Glacier, excess pressure in water-filled cavity: Paterson, W. S. B. 01448

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- Athabasca glacier, icequakes: Neave, K. G. 00456
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- Athabasca, Saskatchewan Glaciers, volumetric changes: Campbell, P. I. 10283
- Banff National Park, Peyto Glacier: Henoch, W. E. S. 05586
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*British Columbia*

- Columbia Icefield, outlet: Harrington, Lyn. 03528
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- Fluctuations, relation to climate fluctuations: Dort, Wakefield, Jr. 08041
- World Data Centers, interdisciplinary subjects, suggestions for collection: Goldthwait, Richard P. 03867

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- Ice sheet, Camp Century, chemical profile: Leung, Samuel S. 00733
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- Icecap, core, stratigraphic analysis: Langway, Chester C., Jr. 08722
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*Ice*

- Accumulation, annual layers, Greenland, use of cationic ratios: Linkletter, George O. 08207
- Accumulation, Antarctica and Greenland: Benson, Carl S. 08695
- Composition, Greenland, Camp Century, cosmic dust, radioisotopes: McCorkell, R. H. 08214
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- Movement, sliding, theory and observation: Kamb, Barclay. 06363
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- Physical properties, deep polar-core measurements, methods: Langway, Chester C., Jr. 08208
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- Physical properties, P-wave absorption, Greenland: Kohnen, Heinz. 05857
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- Polar ice sheet, dating by O-isotope analysis, Greenland: Dansgaard, W. 08209

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Natazhat and Klutlan, fluctuations, Neoglacial: Rampton, Vern. 08141

**Glossaries***English-Spanish*

Geology: Seiglie, George A. 10935

*Geography*

Dictionary, physical and social: Monkhouse, F. J. 05890

*Geomorphology*

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*Marine geology*

World bathymetric terms and English equivalents: Cherkis, Norman Z. 09326

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Petroleum geology: Franco, Alvaro. 10214

**Gold***Abundance*

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## United States

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## Yukon

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- Winnsboro quadrangle, occurrence: Wagener, H. D. 03340

## Graptolithina

## Devonian

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## Didymograptus spp.

- Ordovician, Arkansas, Smithville area: Berry, William B. N. 06168

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- Acetate peel technique: Chiang, Kam. 04722

## Isograptus forcipiformis latus

- Ordovician, Lower, Arkansas, tectonic distortion: Cooper, R. A. 04720

## Monograptidae

- Silurian-Devonian, taxonomy, nomenclature: Bulman, O. M. B. 08179

## Monograptus

- Devonian, Alaska, southeastern, zones, n.spp.: Churkin, Michael, Jr. 11015

## Nomenclature

- Ordovician, *Trigonograptus* Nicholson, invalid: Jackson, Dennis Edward. 05642

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## Ordovician

- Alaska, Descon Fm., Esquibel Island, faunal succession: Churkin, M., Jr. 05004
- Michigan, Rapid City area, correlation, Eden age: Berry, William B. N. 01207
- New York, Pennsylvania, late Middle, zone 13: Berry, William B. N. 04521

## Orthograptus quadrimucronatus

- Ordovician, Iowa, periderm layer structures, electron microscopy: Berry, William B. N. 00549

## Paleozoic

- United States, midwestern, popular account: Douglas, Dale. 09433

## Silurian

- Alaska, Descon Fm., Esquibel Island, faunal succession: Churkin, M., Jr. 05004
- Alaska, southeastern, n.spp., zonation: Churkin, Michael, Jr. 02084

## Taxonomy

- Treatise: Bulman, O. M. B. 08197
- Tristichograptus ensiformis* (Hall), n.gen. Ordovician, Quebec, for *Graptolithis* (0 *Retiolites*): Jackson, Dennis Edward. 05642

## Gravel

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## Minnesota

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## New York

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## Ohio

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- Maumee River, Maumee-Toledo dredging corridor, properties, reserves: Herdendorf, Charles E. 02482

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## Pennsylvania

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Geochemistry, San Pedro River basin, ionic dispersion vs. rock types: Wallace, D. E. 04130

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Levels, quality, north coastal area, 1968: California Dept. Water Resources. 02967

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Levels, quality, San Joaquin Valley, basic data 1969: California Dept. Water Resources. 07864

Levels, southern: California Dept. Water Resources. 02968

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Resources, well index: Hawaii Div. Water and Land Devel. 08567

*Idaho*

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**Nebraska**

- Levels, 1969: Keech, C. F. 02560
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- Resources, Water Resources Board Region 1: Oklahoma Water Resources Board. 09209
- Resources, Water Resources Board Region 2: Oklahoma Water Resources Board. 09210
- Resources, Water Resources Board Region 3: Oklahoma Water Resources Board. 09211
- Resources, Water Resources Board Region 4: Oklahoma Water Resources Board. 09212
- Resources, Water Resources Board Regions 5 and 6: Oklahoma Water Resources Board. 09213

*Ontario*

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*Interpretation*

Crust and upper mantle, model, heat flow, temperature data inversion: Minster, Jean B. 10634

Crustal temperature and heat production: Lachenbruch, Arthur H. 03690

Mid-ocean ridges, cf. rift valleys, petrogenic model: Murray, C. G. 05337

Ore deposits: Rose, Arthur W. 07067

Radiogenic production in magma series, differentiation indices: Tilling, Robert I. 01411

Terrestrial flow, conductivity, gradient relations: Horai, Ki-iti. 01447

*Island arcs*

Genesis of high values: Oxburgh, E. R. 02369

## Heat flow — Continued

*Mantle*

Model, asymmetric convection: DelaCruz Reyna, Servando. 10889

Upper, heat transfer mechanism: Shankland, T. J. 00061

*Measurement*

Drill hole, probe response, inverse filter for true temperature: Costain, John K. 03671

Heat loss, wellbore temperature, computer evaluation: Eickmeier, J. R. 09252

Lakes, oceanic and continental techniques, Minnesota, Wisconsin: Williams, David L. 01854

Ocean floor, benthic boundary layer, theory, technique: Wimbush, Mark. 10001

*Mechanism*

Vapor-dominated hydrothermal systems: White, Donald E. 01850

*Montana*

Marysville area, magma pocket, conduction effects: Blackwell, David D. 10574

*Nevada*

Lake Tahoe, measurements, Sierra Nevada-Basin and Range transition: Lee, T. C. 10573

*Northwest Territories*

Mackenzie delta, Reindeer well, data: Jessop, A. M. 00093

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*Pacific Ocean*

Deep-sea sediments, measurement difficulties, estimates: Burns, Robert E. 07157

Hawaiian arch crest, local scatter: Sclater, J. G. 00070

Northeastern, west of Juan de Fuca Ridge: Lister, C. R. B. 02192

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North America, Australia, correlation with igneous activity: Verma, R. K. 07309

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Development, activities, trends in Canada: Jessop, A. M. 10777

*Rocky Mountains*

Southern, long-lived anomalies: Gough, D. L. 04445

*Theoretical studies*

Intrusions, contact, temperature distribution, numerical analysis: Hodge, Dennis S. 01782

Plate tectonics, downgoing slab, thermal regime: Minear, John W. 07311

*United States*

North-central: Combs, Jim. 01750

*Virginia*

Southwestern, Cripple Creek area: Reiter, Marshall Allan. 06887

*Wyoming*

Yellowstone National Park, geysers: Rinehart, John. 07306

**Heavy minerals***Alaska*

Bering Sea shelf, northern, abundance, provenance: VenkataRathnam, Kolla. 10921

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Trail Ridge, occurrence: Pirkle, E. C. 03480

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Long and Bear Valleys, monazite, euxenite placers: Schmidt, Dwight L. 03379

*Methods*

Separation, laboratory and panning, comparison: Callahan, John. 02565

## Heavy minerals—Continued

*North Carolina*

Piedmont, igneous rocks, saprolite, source-rock determination: Callahan, John. 02565

*United States*

Continental margin, Nova Scotia to New Jersey: Ross, David A. 02081

*Virginia*

Roseland district, rutile-ilmenite placers: Herz, Norman. 00214

*Washington*

Northern shelf sediments: Venkatarathnam, Kolla. 10925

*Yukon*

Klondike area, bedrock and gravels, occurrence: Gleeson, C. F. 06304

**Helium***Arizona*

Occurrence: Peirce, H. Wesley. 07209

*Bibliography*

Occurrence, meteorites, minerals, natural gas: Tully, Philip C. 02839

*General*

Discovery, origin, properties, isotopes: Zimmerman, Joan. 00080

*Geochemistry*

Rocks, minerals, generation: Esfandiari, Bijan. 11012

Solution in surface- and seawater, isotope effect: Weiss, R. F. 01281

*Isotopes*

He-3, excess in sea water, Pacific Ocean, northern: Clarke, W. B. 06403

He-3, He-4, solubilities in water: Weiss, R. F. 01281

He-3, primordial, deep-sea basalts: Fisher, David E. 02124

He-3:He-4, meteorites, correlation with Ne-20:Ne-22: Black, David C. 00820

He-3:He-4 ratios, carbonaceous chondrites: Anders, Edward. 00969

*United States*

Resources, content in natural gas: Cardwell, L. E. 00078

**History***Arizona*

Geology, mineral resources, 1878 account: Hinton, Richard J. 10999

*Canada Geological Survey*

Eozoon Canadense, organic-inorganic controversy: O'Brien, Charles F. 06552

Exploration, western and arctic areas: Irish, E. J. W. 02493

*Engineering geology*

Chesapeake and Ohio Canal, D. C., Md., Va., W. Va.: Davies, William E. 10229

*Floods*

Geology and the Bible: Tychsen, Paul C. 05052

*General*

Geological concepts, role in man's intellectual development: Gilluly, James. 11244

Pre-Huttonian observations: Gould, Stephen Jay. 00959

Pre-Huttonian observations: Harrington, J. W. 00850

Research, financing, 19th century, private philanthropy: Miller, Howard S. 02107

*Geologic reasoning*

Ontology: Harrington, John W. 04523

## History—Continued

*Greenland*

Scientific exploration, Norsemen to present: Loewe, F. 09926

*Hydrogeology*

General: Biswas, Asit K. 06713

*Man, fossil*

Origin, early 19th century concepts: Lyon, John. 06551

*Mineral economics*

California, petroleum, development history, production: White, Gerald T. 00464

Ohio, petroleum and natural gas, 110-yr period: Norling, Donald L. 04979

*Mineralogy*

New England, "new" mineral species, present status: Frondel, Clifford. 04144

*Society Econ. Paleontologists and Mineralogists*

1926-46: Russell, R. Dana. 11004

*Structural geology*

Dynamic concept, vertical movements, Hooke and Raspe: Carozzi, Albert V. 06678

*Uniformitarianism*

Development, aspects, interpretation of geohistory, biohistory: Simpson, George Gaylord. 07247

Development, Lyell's strategy: Rudwick, Martin J. S. 06751

**Holothuroidea***Protocaulina kansansensis*

Devonian, Ontario, Dundee Limestone: Frerking, Kenneth F. 04188

**Honduras***Economic geology*

Construction materials, ignimbrite, Tegucigalpa area: Weyl, Richard. 04969

Mineral resources, mining industry, history: Elvir A., Reniery. 10855

*Maps, geologic*

Nueva Armenia area: Honduras Instituto Geografico Nac. 01157

San Buenaventura area: Honduras Instituto Geografico Nac. 01159

San Juan de Flores area: Honduras Instituto Geografico Nac. 03801

Tegucigalpa area: Honduras Instituto Geografico Nac. 01158

*Petrology*

Central, ignimbrite plateaus: Weyl, Richard. 04969

*Stratigraphy*

Cretaceous-Quaternary, Tegucigalpa area: Honduras Instituto Geografico Nac. 01158

**Hydrogen***Analysis*

Tritium, benzene synthesis method, modification: Wallick, Edward I. 03423

*Isotopes*

Analyses, ocean-core samples, carbonate-free fraction: Savin, Samuel M. 00974

D:H ratio, igneous minerals, mantle or crust: Sheppard, Simon M. F. 05389

Deuterium, ancient kaolinites, coexisting meteoric waters: Lawrence, James R. 09662

Deuterium, gibbsites, Al-Si-Fe hydroxides, Holocene weathering zones: Lawrence, James R. 09639

Deuterium, snow cores, California, Sierra Nevada: Friedman, Irving. 03347

Deuterium, variations in annual snowpack, Colorado: Judy, Clark. 01717

**Hydrogen—Continued***Isotopes—Continued*

- Fractionation, clay minerals: Savin, Samuel M. 00949
- Fractionation factors, mineral-water pairs: Su-zuoki, Tetsuro. 01869
- Fractionation, water in tree leaves: Wershaw, R. L. 04086
- Ratios, fluid inclusions: Ohmoto, Hiroshi. 04416
- Tritium, Oregon, Crater Lake water: Simpson, H. James. 04381
- Tritium, profile in sea water, Pacific Ocean, northern: Roether, Wolfgang. 06402
- Water, tritium, Oregon, Crater Lake, source: Simpson, H. James. 04381

**Hydrogeology***Aquifer properties*

- Boundary envelopes, well-drawdown data analysis: Lennox, D. H. 06931
- Carbonate rocks, permeability, development, distribution: LeGrand, Harry E. 09642
- Density variations, dissolved solids, flow calculation: Bond, D. C. 10665
- Dewatering, aquifer response, analysis, Ontario, Welland Canal area: Frind, E. O. 02896
- Dewatering, effects, Ontario, Welland Canal area: Farvolden, R. N. 02895
- Dewatering, methods, results, Ontario, Welland Canal area: Olpinski, K. 02888
- Dispersivity, semi-arid basins: Simpson, E. S. 01978
- Evaluating, methods, comparison: Nawrocki, Michael A. 10508
- Permeability, average coefficient from field data, method: Pearl, Richard Howard. 08712
- Saline, natural gas storage: Katz, Donald L. 05064
- Specific yield, method, Texas, Ogallala Fm.: Jones, Ordie. 08711
- Storage-transmissibility ratio, response to tides, models: Williams, John A. 08596
- Thermal variations, infrared sensing: Myers, Victor I. 09329
- Transmissibility trends, Maryland, coastal plain: Hansen, Harry J. 00159
- Unconfined, outflow, physical analysis: Verma, Rameshwar Dayal. 05996

*Automatic data processing*

- Channel networks, topology, binary digit representation: Smart, J. S. 03422
- Computer programs, Kansas: Lowell, Brent H. 03373
- Computer simulated modeling: Vemuri, Venkateswararao. 03547
- Data collection, interpretation, computer programs: McNellis, Jesse M. 10847
- Digital simulation, Ogallala aquifer, Kansas: McClain, Thomas J. 08709
- Digital simulation, Ogallala aquifer, Texas: Claborn, B. J. 08710
- FORTAN-IV program, water-quality and geophysical data: Kent, Douglas C. 07171
- Ground-water contour maps, accuracy, description: Hanson, Hal C. 10496
- Ground-water flow systems, dispersion: Reddell, Donald Lee. 07594
- Ground-water simulation techniques, trends: Prickett, Thomas A. 05521
- Injection wells, reservoir problems, strata simulation: Bateman, Barry Lynn. 07595
- Mapping, plotter applications, ground-water engineers: Evans, Gomer E. 05519

**Hydrogeology—Continued***Automatic data processing—Continued*

- Seepage-salinity surveys, Kansas, application: Leonard, Robert B. 00470
- Statewide systems development: Botz, M. K. 06391
- Stream-aquifer management problems, simulation model: Bredehoeft, John D. 05517
- Stream-aquifer system, conjunctive water use, optimization: Taylor, O. James. 04303
- Transmissibility distributions from minimum field measurements: Cearlock, D. B. 10510

*Bibliography*

- Connecticut, water resources: Kennard, William C. 02750
- Ground-water recharge, artificial, 1955-67: Signor, D. C. 00077
- United States and Canada, 1966-68: Engineering-Science, Inc. 04518

*Experimental studies*

- Aquifer models, partially penetrating rivers, simulation: Herbert, Robin. 01156
- Clays, water movement in Wyoming bentonite, Poiseuille analog: Blackmore, A. V. 04784
- Fresh-water storage, saline aquifers, recovery, calculation: Kumar, Anil. 08026
- Ground-water recharge, instruments, Alberta: Freeze, R. A. 05812
- Ground-water recharge, mechanism, laboratory and field data: Freeze, R. Allan. 01715
- Ground-water regime, conceptual model, relation to environment: Toth, J. 02110
- Hele-Shaw model, oceanic island simulation, pumping tests: Rochester, Eugene Wallace, Jr. 07381
- Infiltration rate, prediction, principal components model: Singh, Teja. 10507
- Rangeland watersheds, hydrologic performance, response unit for evaluating: England, C. B. 05005
- Recharge, semiarid areas, ephemeral streams, evaporation rates: Sorey, Michael L. 03617
- Saline aquifers, fresh-water storage, fluid models: Kimbler, Oscar K. 05065
- Salt-water intrusion study: Bachmat, Y. 01714
- Soil profile, water table determination: West, D. W. 05406
- Soils, hydraulic conductivity, entrapped air effect: Poullovassilis, A. 02859
- Soils, salt and water movement near crystalline salt: Scotter, D. R. 02860
- Soils, transmission properties, method: Hillel, D. 02858
- Water-conducting fractures, frequency and apertures: Snow, D. T. 00193

*Exploration methods*

- Drift-filled valleys, gravity, interpretation technique: Rankin, William E. 04057
- Electrical, resistivity: Flathe, H. 02937
- Electrical resistivity: Keller, George V. 02946
- Electrical, seismic, magnetic: Breusse, J. J. 02939
- Electromagnetic, airborne: Ward, Stanley H. 02917
- Electromagnetic, ground: Bosschart, Robbert A. 02916
- Geophysical, automatic data processing: West, G. F. 02958
- Geophysical, conference: Morley, L. W. 02913
- Geophysical, ground water, coordination with geology and drilling: Shiftan, Z. L. 03755
- Geophysical, review: Mabey, Don R. 02944
- Geothermal: Birman, J. H. 01141

**Hydrogeology—Continued***Exploration methods—Continued*

- Geothermal, term questioned: Cartwright, Keros. 01142  
 Glaciers, mass balance, volumetric changes, Alberta: Campbell, P. I. 10283  
 Gravimeter measurements: Strange, W. E. 02915  
 Gravity, seismic refraction: Eaton, Gordon P. 02999  
 Ground water, electrical resistivity: Gay, S. Parker, Jr. 02434  
 Remote sensing, aquifer location, application: Hollyday, Este F. 02908  
 Seismic: Hobson, George D. 02919  
 Seismic, surficial aquifers: Burke, Kenneth B. S. 02936  
 Well logging: Keys, W. Scott. 03004

*General*

- Basic data collection, U.S., status, applications: Nace, Raymond L. 04587  
 Geography of water, popular account: Olson, Ralph E. 03800  
 Hydrologic atlas of Utah: Jeppson, Roland W. 09902  
 Hydrological maps, classification: Heindl, L. A. 07018  
 Instrumentation, observation techniques, 1969 symposium: National Research Council of Canada. 09190  
 Lake management, role: Born, Stephen M. 06068  
 Water encyclopedia, resources, needs, quality: Todd, David Keith. 06031

*Geochemistry*

- Carbonate aquifers, Florida, Mexico: Back, William. 01584  
 Chloride determination, potentiometric titration, automated: Fishman, Marvin J. 04429  
 Ferrous iron solubility in carbonate-bearing water: Singer, Philip C. 09885  
 Ground-water salinity, relation to evapotranspiration by phreatophytes: vanHylckama, T. E. A. 11235  
 Hydrologic environment, strip-mining effect, Kentucky: Musser, J. J. 05454  
 Ionic strength, estimation from specific conductance: Lind, Carol J. 06190  
 Limestone vadose seepage, calcite saturation, time variance: Thraikill, John. 10278  
 Mercury, environmental contamination, detection: Knapp, Carol E. 05565  
 Pollutants, effect on mineralization of water bodies: Winkler, Erhard M. 00573  
 Spring water, carbonate rocks, Pennsylvania: Jacobson, Roger L. 02486  
 Titrimetry, chloride, sulfate, alkalinity analyses: Fishman, Marvin J. 04304  
 Water, chemical characteristics, study, interpretation: Hem, John D. 03142  
 Water quality, relation to sediments: Grissinger, E. H. 01364  
 Zinc in wells, anomalous, Tennessee: Hershey, Robert E. 03065

*Ground-water budget*

- Water balance, variations, geologic factors: Farvolden, Robert N. 09220

*Ground-water contamination*

- Control, waste disposal site selection, Idaho: Williams, Roy E. 08585  
 Dispersion in granular medium, theory: Ogata, Akio. 01435  
 Manmade wastes, tolerance limits: McGauhey, P. H. 09468

**Hydrogeology—Continued***Ground-water contamination—Continued*

- Radioactive ions, method to predict flow: Grove, David B. 10122  
 Rural areas: McDermott, James H. 05520  
 Salt, deicing runoff, lake, ground water, Michigan: Judd, John H. 05891  
 Sanitary landfill, effects, prevention: Turk, L. J. 08002  
 Solid-waste disposal, effects: Schneider, William J. 05840  
 Viral, prevention capabilities of soils: Hori, Daniel H. 10840  
 Waste disposal, deep-well method: Walker, William R. 03058  
 Waste disposal, subsurface reservoirs: Stallman, Robert W. 10502  
 Waste disposal, liquid, deep-well injection, possibilities: Hadjithodorou, C. 10505

*Ground-water levels*

- Measuring, rock and bong techniques in wells: Stewart, David M. 06314

*Ground-water management*

- Fresh-water resources, problems: Heindl, L. A. 07201  
 Fresh-water storage, saline aquifers, bubble concept: Moulder, E. A. 05066  
 Fresh-water storage, saline aquifers, model studies: Kimbler, Oscar K. 05065  
 Oceanic islands, floating fresh-water lens: Rochester, Eugene W., Jr. 05785  
 River basin planning concepts, resource development: Wells, Raymond H. 10380  
 Safe yield of aquifers, alternative net economic yield: Young, Robert A. 05822  
 Temporal allocation, simulation models: Bredehoeft, John D. 01718  
 United States, southwestern, arid regions: Fogel, Martin M. 10912

*Ground-water movement*

- Aquifer seepage, unconfined, analysis by capillary flow theory: Verma, Rameshwar D. 03684  
 Base-flow problem, recession: Appleby, F. Victor. 05057  
 Buried channels, preglacial, Saskatchewan, Saskatoon area: Meneley, W. A. 06356  
 Capillarity, channel-drainage systems seepage: Bruch, John C., Jr. 05823  
 Carbonate aquifers, vertical shafts: Brucker, Roger W. 06075  
 Confined and unconfined, variational principles: Neuman, Shlomo P. 05056  
 Confining bed, diffusivity, field and laboratory values: Wolff, Roger G. 01712  
 Contribution to storm runoff, electrical conductance method: Visocky, Adrian P. 01153  
 Diffusion-convection equation, one-dimensional, finite element solution: Guymon, Gary L. 01711  
 Dispersion in granular medium, theory: Ogata, Akio. 01435  
 Downward moisture flow of ponded rainfall, numerical analysis: Rubin, J. 10347  
 Hillside seepage problem, mathematical solution: Warrick, A. W. 07622  
 Hydraulic conductivity, vertical, zone of aeration: Stallman, R. W. 09604  
 Infill rate, nuclear rubble chimney: Fenske, Paul R. 10511  
 Infiltration into stratified soil columns, numerical solution: Whisler, F. D. 10348  
 Lateral encroachment, relation to interfingering of rock types: Hnatuk, John. 09250

**Hydrogeology—Continued***Ground-water movement—Continued*

- Level changes, Arizona, Gila River valley, observation-well network: Myrick, R. M. 01246
- Mathematical model, compared with field data: Green, Don W. 03073
- Mathematical models, flow through tailings-pond embankments: Kealy, Dan. 05495
- Methods, moire pattern technique: Freeze, R. Allan. 02717
- Multiaquifer systems, digital analysis: Bredehoeft, J. D. 03075
- Multiple leaky aquifers, equations for numerical treatment, lag time: Herrera, Ismael. 01713
- Percolation, limestone catchments: Drew, David P. 04329
- Pollutant migration, sanitary landfills in glacial till, Wisconsin: Kaufmann, Robert F. 10730
- Porous media, longitudinal dispersion, stochastic model: Todorovic, P. 01710
- Pumping well area, horizontal strains vs. reverse water-level fluctuations: Wolff, Roger G. 07416
- Radioactive tracers, cobalt-60 complexes, evaluation: Bruscato, Frank N. 04056
- Rates, two-dimensional, confined aquifer, unsteady, calculation: Garrison, C. J. 01707
- Rates, two-dimensional, confined aquifer, unsteady, calculation: Hunt, Bruce W. 03619
- Response to stream stage, Boussinesq equation, numerical solution: Hornberger, George M. 02716
- Role in evaporite accumulation: Williams, Roy E. 02337
- Saturated-unsaturated flow model: Freeze, R. Allan. 06982
- Seepage, flow rates, from Dupuit's approximation: Hunt, Bruce W. 01518
- Seepage, free surface, finite-element analysis: Neuman, Shlomo P. 03076
- Seepage, sand bed, effect on incipient sediment motion: Martin, C. S. 03987
- Seepage toward sink beneath free surface, unsteady: Hunt, Bruce W. 01520
- Shallow systems, tracing, soil temperatures: Cartwright, Keros. 06089
- Soil infiltration, hindering capillary forces: Adrian, Donald Dean. 00430
- Soils, hysteresis behavior: Poulouvasilis, A. 02856
- Soils in forested area: Cole, Dale W. 09219
- Soils, miscible displacement measurements, method: Corey, J. C. 10987
- Texas soils, effect of electrolyte composition: Naghshineh-Pour, B. 05407
- Total movement cf. chloride: Thomas, G. W. 05475
- Tracer techniques, capabilities, review: Elrick, D. E. 09193
- Transport away from buried heat source: Reed, Walter E. 00073
- Unconfined aquifer to surface reservoir, water-table change: Higgins, David T. 05244
- Unconfined aquifer to surface reservoir, water-table change: Hunt, Bruce W. 03621
- Unconfined aquifer to surface reservoir, water-table change: Yeh, William Wen-Gong. 01516
- Unconsolidated sediments, properties, empirical relations, experimental: Wiebenga, William A. 03986
- Unsaturated zone, three-phase system: Van-Bavel, C. H. M. 10344
- Velocity partition: Dunn, Darrel E. 03571

**Hydrogeology—Continued***Ground-water movement—Continued*

- Volcanic terrane, El Salvador: Wozab, David. 03548
- Ground-water recharge*
- Ephemeral stream, estimating, convolution relation: Moench, Allen F. 03985
- History*
- General: Biswas, Asit K. 06713
- Hydraulic research*
- International Association, 1969: Internat. Assoc. Hydraulic Research. 11232
- Hydrodynamics*
- Hydraulic and pressure head, measurement, strain gauge pressure transducers: Klute, A. 10345
- Two-dimensional ground-water mound, nonlinear dispersion: Seviran, Walter Andrew. 07383
- Instruments*
- Piezometers, small-diameter, air pump: Trescott, Peter C. 02418
- Mathematical models*
- Aquifer simulation, Ogallala Fm., application limits: Rayner, F. A. 08772
- Chamber within thick aquitard, nonsteady inflow: Dudley, W. W., Jr. 04266
- Composite soil-moisture ground-water systems: Hornberger, George Milton. 07370
- Conjunctive use, ground and surface water, Nevada, Las Vegas area: Cochran, Gilbert F. 09502
- Digital simulation, Ogallala aquifer, Kansas: McClain, Thomas J. 08709
- Digital simulation, Ogallala aquifer, Texas: Claborn, B. J. 08710
- Estuaries, water quality, dynamics: Orlob, Gerald T. 08471
- Experimental, application to data gathering: Meyer, Charles F. 10499
- Fluid dispersion, tritium tracer test, fractured crystalline rock: Webster, D. S. 01359
- Glacial terrain complex, ground-water, thermal regime: Parsons, Myles L. 08023
- Ground water-open channel flow, bank storage, influence on flood wave: Sauer, Stanley P. 10491
- Ground-water anomaly, nonsteady gravity decay analysis, computer: Korver, John A. 04025
- Ground-water basins, drawdown, unrestricted cf. regulated withdrawals: Bredehoeft, John D. 01718
- Ground-water contamination, computer simulation, miscible fluid dispersion: Reddell, Donald Lee. 07631
- Ground-water flow, application: Haefeli, Charles. 03983
- Ground-water flow systems, application, hydrogeochemical exploration: Williams, Roy E. 08497
- Ground-water hydraulics, Laplace equation, numerical solution: Karadi, Gabor M. 09499
- Ground-water movement, cf. field experiment data: Green, Don W. 03073
- Ground-water recharge, net distribution, Colorado: Reddell, Donald L. 08714
- Ground-water simulation, applications to hydrologic response modeling: Freeze, R. Allan. 05518
- Ground-water, surface-water systems, conjunctive use: Milligan, James Homer. 05995
- Ground-water systems, transient, three-dimensional: Reisenauer, A. E. 10512

**Hydrogeology—Continued***Mathematical models—Continued*

- Information theory, application: Domenico, Patrick A. 10324  
 Overland flow infiltration rate, unsaturated soil: Smith, Roger E. 10506  
 Porous media: Liao, Kao Hsiung. 06617  
 Reservoir bank storage, Montana-British Columbia, Kootenai River: Coffin, Donald L. 05445  
 Semiconfined aquifers, volumetric relationships: Figueroa Vega, German Efrain. 05640  
 Soils, anisotropic, movement of salts, FORTRAN IV program: Ortiz, Jaime. 04385  
 Transmissivity computation, Theirs recovery formula, modification: Harrill, J. R. 04414

*Methods*

- Aerial photography, drainage basins, discharge properties, estimation: Majtenyi, Steven Istvan. 00508  
 Alluvial densities, in-situ determination, core-barrel: Spangler, D. P. 06731  
 Basic data systems, design: Winter, T. C. 10500  
 Comparative, classification of settings for processes: LeGrand, Harry E. 01148  
 Electrical resistivity, aquifer evaluation: Dyck, John Henry. 01220  
 Electromagnetic depth sounding, water table location: Inouye, George T. 06859  
 Flood simulation model, method: Girard, G. 07812  
 Ground-water age, C-14, effects of dissolved carbonate species sources: Pearson, F. J., Jr. 08478  
 Ground-water data collection, principles: Gilliland, John A. 10493  
 Ground-water data collection, program design: Hickey, John J. 10492  
 Ground-water exploration, seismic, electrical: O'Connor, James P. 09887  
 Ground-water instrumentation, observation techniques, review: Gilliland, J. A. 09191  
 Ground-water levels, data networks, design criteria: Peters, Helen J. 10495  
 Ground-water mapping, current source in drill hole: Merkel, Richard H. 01954  
 Ground-water recharge studies, well logging: Keys, W. S. 08770  
 Karst hydrology: Brown, M. C. 01891  
 Limestone terrane, exploration techniques: Warman, James C. 09221  
 Neutron-meter access tubes, installation methods, evaluation: Teasdale, W. E. 04307  
 Remote sensing, ground-water aquifer location, electrical techniques: Collett, L. S. 09194  
 Remote sensing, resources studies, infrared: Cox, Edward R. 08077  
 Representative and experimental basins, international guide: Toebes, C. 07731  
 Semi-arid regions, alluvial basins, storage capacity: Wallace, D. E. 03639  
 Soil density and water content, fast neutron and gamma ray attenuation: Corey, J. C. 02216  
 Springflow sources, carbonate terranes, determination: Feder, G. L. 04267  
 Systems approach in hydrology: Vemuri, Venkateswararao. 03547  
 Trend-surface analysis, Indiana, Bartholomew County: Rockaway, John D., Jr. 02419  
 Water sampling and analysis for minerals and gases, manual: Brown, Eugene. 08199  
 Watershed evaluation, photogeologic techniques: Howe, Robert H. L. 08474

**Hydrogeology—Continued***Mathematical models—Continued**Practice*

- Manpower 1970-80, supply and demand: Lewis, James E. 05885  
 Representative and experimental basins, international guide: Toebes, C. 07731  
 Review, 1969, mining industry applications: Moulder, E. A. 02169  
 Status and prospects, worldwide: Nace, Raymond L. 08430  
 Urban development, role in planning: Sommers, David A. 06761  
 Urban planning, application: Slosson, James E. 09573

*Resource development*

- Alluvial faults, ground water, recharge, extraction, salvage: Williams, Dennis E. 04427  
 Aquifer boundary envelopes, well-drawdown data: Lennox, D. H. 06931  
 Aquifer evaluation, pumping tests, computer methods: Saleem, Z. A. 04331  
 Arid regions, phreatophyte control, Arizona, Gila River project: Culler, R. C. 01149  
 Desalination, ground water and sea water, effect on water balance: Kohout, Francis A. 09224  
 Fresh-water storage, saline aquifers, recovery, calculation: Kumar, Anil. 08026  
 Fresh-water supplies, management problems: Heindl, L. A. 07201  
 General, world of water: Walton, William C. 06032  
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- Petrology, relation to kimberlite: Mitchell, R. H. 05786

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- CORFAN-FORTRAN IV computer program: Ondrick, C. W. 01351

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- Ontario, Bancroft-Madoc area, Grenville province, minerals, field trip guidebook: Institute on Lake Superior Geology. 09508
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**Diabase**

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- Geochemistry, North America, eastern, Triassic dikes: Weigand, Peter W. 00773
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- Absolute age, Connecticut, Nonewaug Granite: Besancon, James R. 06312
- Absolute age, Ontario, Chibougamau-Surprise Lake area: Krogh, T. E. 02248
- Absolute age, Ontario, Georgian Bay-Sudbury area: Krogh, T. E. 02247
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- Genesis, lower crust: Lambert, I. B. 02872
- Geochemistry, standard sample analyses, variations, causes: Vistelius, Andrew B. 08287
- Melting, water undersaturated at 2 kb: Whitney, James A. 01852
- Mineral composition, "quartz-eye", Manitoba: Hunt, G. H. 07820
- Petrology, absolute age, Georgia, Siloam Granite: Humphrey, Ronald. 00722
- Petrology, "Bulseye Granite," biotite orbicules, Vermont: VanDiver, Bradford B. 01667
- Petrology, Maine, Tunk Lake Granite, xenoliths: Karner, Frank R. 02736
- Petrology, Massachusetts, Rhode Island, genesis: Buma, Grant. 06079
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- Physical properties, brittle deformation, experimental: Friedman, M. 02401
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- Textures, sheet structure, Bethel Granite, Vermont, Randolph quadrangle: Morse, Dexter A. 09032

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- Absolute age, Washington, Okanogan Range: Menzer, Fred J., Jr. 00199
- Classification, Minnesota, Giants Range batholith: Viswanathan, S. 06493
- Elastic properties, dynamic moduli under pressure: Schock, R. N. 07903
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- General description, Montana, Mount Wood quadrangle: Page, Norman J. 00631
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- Geochemistry, California, Sierra Nevada, K-decrease westward: Dodge, F. C. W. 00255
- Geochemistry, dikes, element migration, diffusion: Lifshin, Arthur. 06602
- Geochemistry, equilibrium at 10 kb, experimental: Piwinski, A. J. 07661
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- Geochemistry, mineralogy, analytical data, California: Bateman, Paul C. 04014
- Geochemistry, Nevada, Shoal composite, trace elements, X-ray emission, cf. G-1 and W-1: Volborth, Alexis. 09351
- Mineral composition, trends, Virginia, Petersburg granite, drill cores: Dickey, N. 05419
- Mineral composition, Virginia, Petersburg granite: Condit, C. D. 05480
- Petrology, California, Coast Ranges: Ross, Donald C. 00351
- Petrology, California, Santa Lucia Range: Wiebe, Robert A. 00303
- Petrology, Devonian batholith belts, New Brunswick: Martin, Robert F. 01669
- Petrology, Grandfather Mtn. window, vicinity, N.C.-Tenn.: Bryant, Bruce. 08176
- Petrology, perthites, potassic phase, petrogenetic relations: Ragland, Paul C. 03703
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- Petrology, zonal structure, Ontario, Perth Road monzonite: Ermanovics, I. F. 07712
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- General description, Caribbean Sea, Cayman Trench: Fox, Paul J. 06981
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- Mineral composition, geochemistry, texture, genesis: Barker, Daniel S. 05193
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- Absolute age, Nevada, central: McKee, Edwin H. 00313

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- Composition, amygdules, minerals, California, Shoshone area: Ehrreich, Albert L. 00258  
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 Geochemistry, comendite, Na loss during crystallization, Nevada: Noble, Donald C. 05033  
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 Petrology, Nevada, northwestern: Korrington, Marjorie K. 00297  
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- Composition, Kansas, Randolph pipes, mineral abundances, chemical analysis: Brookins, D. G. 09615  
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*Lamprophyre*

- Absolute age, Maryland, Virginia, Great Falls area: Reed, John C., Jr. 04258  
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*Latite*

- Petrology, Utah, Bingham mining district, dikes: Moore, William J. 04247

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- Petrology, schistose structure, Greenland, Ilimaussaq: Ferguson, John. 08292

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- Absolute age, geochemistry, Montana, Wyoming, Beartooth Mts.: Mueller, Paul A. 09687  
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- General description, Colorado, Gem Park Complex: Parker, Raymond L. 04015

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- Basalt- $H_2O \pm CO_2$  to 30 kb: Hill, Robin E. T. 01781  
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*Myrmekite*

- Mineral composition, geochemistry, texture, genesis: Barker, Daniel S. 05193

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- Petrology, Georgia, Monroe County: Prather, Preston. 10977

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- General description, Alaska, Koyukuk Valley, artifact source: Patton, William W., Jr. 03413  
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- Genesis, composition, Labrador geosyncline: Dimroth, Erich. 07780

*Pegmatite*

- Genesis, quartz-carbonate, Montana, western: Rosenberg, P. E. 09549  
 Geochemistry, phosphates, excess Sr-87: Riley, G. H. 03552  
 Mineral zoning, South Dakota, Keystone: Norton, James J. 06512  
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- Geochemistry, alpine type, rare-earth abundances: Frey, Fred A. 02827  
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 Mineral composition, andradite, Mid-Atlantic Ridge: Switzer, George. 00563  
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Absolute age, Mexico, Baja California: Sommer, Michael A. 00366

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Mineral composition, scandium-rich minerals, Utah: Frondel, Clifford. 06517

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Alteration, leaching of quartz, Texas: Barker, Daniel S. 06785

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*Syenite*

Differentiation, Quebec, Montreal area, Brome Complex: Valiquette, Guy. 06214

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Petrology, composition, absolute age, Colorado, Ute Creek stock: Barker, Fred. 00132

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General description, Atlantic Ocean, Mid-Atlantic Ridge, cores: Engel, A. E. J. 01347

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Absolute age, Montana, Rainy Creek complex, Libby area: Fenton, M. D. 08155

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General description, North America, northwestern, plant life: Kruckeberg, Arthur R. 10250

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Genesis, hypotheses, relation to upper mantle: Wyllie, Peter J. 09937

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Petrology, geochemistry, Alaska, Fairweather pluton: Plafker, George. 01463

Petrology, Greenland, Qagssiarssuk area: Stewart, J. W. 04988

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Petrology, peridotite serpentinization, shearing, California, Coast Ranges: Cowan, Darrel S. 04452

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*Volcanic ash*

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Composition, provenance, Saskatchewan, Waskama Creek ash: Westgate, John A. 09421

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Deposition from mushroom cloud, model: Slaughter, M. 00616

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- General description, Alaska, Glacier Bay Natl. Monument: McKenzie, Garry D. 03000
- General description, Pearllette-like ash beds, United States, Great Plains: Wilcox, Ray E. 09423
- General description, tuffs, chronology, Cenozoic, Oregon: Walker, George W. 09815
- Genesis, properties, significance, ash flows: Peterson, Donald W. 01330
- Identification, Mazama Ash, Saskatchewan, Leader area: David, Peter P. 08119
- Occurrence, welded ash flows, Wyoming, Yellowstone Park, caldera: White, D. E. 09422
- Petrology, geochemistry, United States, western, beds, correlation: Izett, G. A. 05344
- Physical properties, Kansas, Calvert ash, cf. Pearllette: Bauleke, Maynard P. 01199
- Stratigraphy, sequences, volcano repose-period patterns: Wickman, Frans E. 10700

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- Absolute age, California, Obispo Fm.: Turner, D. L. 00383
- Absolute age, composition, Colorado, San Juan Mts.: Lipman, Peter W. 03777
- Absolute age, Mexico, Baja California: Gastil, Gordon. 00266
- Absolute age, Miocene hiatus, U.S., Great Basin region: McKee, E. H. 02198
- Absolute age, Nevada, Nye, Lincoln Counties: Marvin, Richard F. 05646
- Alteration, siliceous tuffs, zeolitization in saline alkaline lakes: Mariner, Robert H. 09660
- Alteration, Virginia, Hylas area, metamorphism: Clement, S. C. 05417
- Alteration, zeolite and prehnite-pumpellyite facies, Puerto Rico: Jolly, Wayne T. 03820
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- Composition, textures, Ontario, Mt. St. Joseph: Clifford, Paul M. 06476
- Composition, West Indies, Lesser Antilles, analyses: Tomblin, J. F. 10367
- Correlation and chronology: Damon, Paul E. 11271
- Correlation and chronology: Damon, Paul E. 11273
- Correlation, Texas, western, Tertiary, Big Bend region: Maxwell, Ross A. 07206
- Differentiation, Nevada, north-central, Tertiary: McKee, Edwin H. 00314
- Eruptive history, phenocryst resorption: Noble, Donald C. 00431
- General description, Arizona, Chiricahua volcanic field: Marjanemi, Darwin Keith. 06003
- General description, base surge density flows, maar volcanoes: Fisher, Richard V. 01173
- General description, California, Lassen Volcanic National Park: Williams, Howel. 09905
- General description, California, Nevada, Mono Basin: Al-Rawi, Yehya Tawfeq. 03103
- General description, Colorado, Platoro caldera: Lipman, Peter W. 04242
- General description, Costa Rica, Meseta Volcanica de Santa Rosa: Weyl, Richard. 05067
- General description, Costa Rica, Nicoya complex: Barr, K. W. 10856
- General description, Cretaceous-Tertiary series, Puerto Rico: McIntyre, David H. 00130
- General description, Idaho, Craters of the Moon: Bullard, Fred M. 00875

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- General description, Minnesota, Vermilion district: Morey, G. B. 04971
- General description, Montana, Elkhorn Mountains Volcanics: Eckerty, Donald G. 00610
- General description, Nevada, Fish Creek Mts. Tuff: McKee, Edwin H. 05815
- General description, New Mexico, Mogollon Plateau: Elston, Wolfgang E. 08651
- General description, New Mexico, Mogollon Plateau: Rhodes, Rodney Charles. 07360
- General description, Ontario, Michipicoten Island: Annells, R. N. 06470
- General description, Oregon, South Umpqua Falls area: Kays, M. Allan. 09814
- Geochemistry, Absaroka volcanics, Pb-Sr isotopes, Wyoming, source: Peterman, Zell E. 03826
- Geochemistry, Ar isotope ratios, cause of anomalous: Krummenacher, Daniel. 02187
- Geochemistry, dispersed elements in oceanic: Gast, Paul W. 02819
- Geochemistry, Eu concentrations, redox estimation: Philpotts, John A. 01867
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Hamilton-Warsaw area, field trip guide: Illinois State Geological Survey. 06327

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Millstadt-Dupo area, field trip guide: Illinois State Geological Survey. 06454

Mississippi Valley zinc-lead district, guidebook: Heyl, A. V. 07202

Mount Carroll area, field trip guide: Illinois State Geological Survey. 06326

North-central, field trip: Odom, I. Edgar. 09724

Northeastern, guidebook: Odom, I. Edgar. 09723

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Western, field trip: Damberger, H. H. 05534

Winchester area, field trip guide: Illinois State Geological Survey. 06324

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1968, Nov. 9, seismic studies: Stauder, William. 03310

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- Mississippi Valley zinc-lead district, guidebook: Heyl, A. V. 07202

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- Decay of extinct, Kapoeta meteorite: Rowe, M. W. 04525

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- Moon, Tranquillity Base: Murthy, V. Rama. 05711
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- Ratios, coexisting sulfides, Yukon: Boyle, R. W. 05076
- Ratios, coexisting sulfides, Yukon: Templeman-Kluit, D. J. 05075
- Ratios, strata-bound sulfur deposits: Davis, J. B. 04309
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- Dickite, Job's Hill, St. Mary, kandite veins: Davis, C. E. 09339
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Doniphan County, guidebook, Pleistocene geology: Dort, Wakefield, Jr. 10682

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Gas storage, Kansas River basin, feasibility: Kansas Geological Survey. 10711

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- North-central, Falls of the Ohio River: Powell, Richard L. 08773
- Pineville-Harlan area, field-trip guide: Froelich, Albert J. 03950
- Southeastern, guidebook: Geol. Soc. America SE Sec. 03861

**Economic geology**

- Clays, gravel, Melber quadrangle, occurrence: Swanson, Roger W. 06696
- Coal, bibliography: Kentucky Geological Survey. 05981
- Coal, Nolansburg quadrangle: Csejty, Bela, Jr. 05396
- Coal, Wiborg quadrangle: Smith, J. Hiram. 08014
- Gravel, Buchanan quadrangle, resources: Ferguson, Carl C. 08186
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- Limestone, Brassfield fm., chemical cf. physical properties: Carr, Donald D. 07529
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- Petroleum, natural gas, Glen Dean quadrangle: Goudarzi, Gus H. 05392

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- Landslides, Pineville-Harlan area, field-trip guide: Froelich, Albert J. 03950

**General**

- Bibliography, coal: Kentucky Geological Survey. 05981
- Flint Ridge Cave Research Center, environments, remote-sensing devices: Watson, Richard A. 10821
- Well samples and cores on file, catalog, Kentucky Geol. Survey: Schwab, Howard R. 06395

**Geochemistry**

- Beaver Creek basin, Cane Branch creek water, strip-mining effect: Musser, J. J. 05454
- Lexington Limestone, Clays Ferry Fm.: Connor, J. J. 00685
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- Beaver Creek basin, Cane Branch, erosion, transport, strip mining effect: Collier, C. R. 05452
- Caves, breakdown processes, central, karst region: White, Elizabeth. 10442
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- Kentucky River basin, lower, drainage changes: Kane, Henry E. 00727
- Mammoth Cave area, exploration history: Smith, P. M. 04005
- Mammoth Cave, popular account: Powell, Richard L. 02805
- Ohio River, hole in bed, scour and fill: Moore, Bruce R. 01547

**Geophysical surveys**

- Knobs, Bluegrass regions, radar, thematic mapping: Holmes, Robert F. 00715
- Middlesboro Basin, Versailles, cryptoexplosion structure: Seeger, C. Ronald. 02071

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- Beaver Creek basin, ground water, strip-mining effects: Hopkins, H. T. 05453
- Beaver Creek basin, hydrologic environment, strip mining effect: Collier, C. R. 05449
- Bryantville quadrangle, Ordovician limestones, ground-water movement: Hine, George T. 07501
- Centerville quadrangle, limestone, ground-water occurrence, variables: Johnson, John T. 01172
- Northeastern, Pennsylvanian, Lee Fm., ground-water flow: Hopkins, Herbert T. 01861

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Ohio River area, ground-water development, errors: Whitesides, D. V. 03573

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Alton-Derby quadrangles, parts: Amos, Dewey H. 06452

Blackford quadrangle: Amos, Dewey H. 05398

Buckeye quadrangle: Wolcott, Don E. 01272

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Eastern Coal Field region, Lee Fm.: Hopkins, Herbert T. 01861

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Man, fossil, Holocene, Salts Cave, dietary and mining evidence: Watson, Patty Jo. 10809

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- Precambrian, Labrador trough, history: Dimroth, Erich. 04456

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- Labrador geosyncline, ophiolite complex, global tectonics: Dimroth, Erich. 06954  
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 Labrador trough, tectonic history: Dimroth, Erich. 04456  
 Michikamau intrusion area: Emslie, R. F. 01723

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 King Frederick IX's Land, salt lakes, geochemistry: Hansen, Kaj. 08405

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Arizona-Utah, western Grand Canyon region, Cenozoic: Hamblin, W. K. 06924

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## Lexicons

*Stratigraphic names*

- Alaska, north of Brooks Range: Kopf, Rudolph W. 07083  
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## Louisiana

*Areal geology*

Central, guidebook, Tertiary, stratigraphy: Lafayette Geological Society. 10692

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- Northeastern, Triassic-Paleozoic dip line sections, data interpretation, resistivities: Den-smore, A. A. 09376

**Canada**

- Arctic area, variation anomaly, conducting body in crust: Niblett, E. R. 04501
- Western, crust-mantle conductivity structure: Caner, B. 04503
- Western, deep sounding, reinterpretation: Cochran, N. A. 01886

**United States**

- California-Nevada-Arizona-Texas, Z-variations, mantle conductivity: Schmucker, Ulrich. 08312
- Great Plains, Anadarko basin area, conductivity anomalies: Dziewonski, Adam. 01885
- Western, mantle: Reitzel, J. S. 01856
- Western, mantle, conductive structures: Porath, H. 01680

**Wisconsin**

- Wisconsin arch, resistivity models, crustal structure: Dowling, Forrest L. 02196

**Maine****Absolute age**

- Calais area, granitic rocks, relation to Acadian orogeny: Spooner, Charles M. 05964
- Oak Point and Stonington Granites, Rb-Sr: Brookins, D. G. 05017

**Areal geology**

- Hancock County, Blue Hill-Castine mining district: Cheney, E. S. 00144
- Mount Desert Island: Chapman, Carleton A. 02763
- Northwestern, Moose River and Roach River synclinoria: Heath, Edward W. 10271

**Economic geology**

- Copper, zinc, Penobscot Bay shore, open-pit mine: Beck, Frederick M. 09477
- Lead-zinc-silver, southwestern, occurrence: Cox, Dennis P. 00133

**Engineering geology**

- Machias area, cores, mechanical properties: Crisp, R. W. 10233

**Geochemistry**

- Catheart Mountain, soil, relation to vegetation reflectance, exploration aid: Canney, F. C. 09297

- Northern, Deboullie Stock, syenite-granodiorite, melting relations: Robertson, J. K. 09539
- Western, Smalls Falls Fm., pyrrhotite: Mallio, William Joseph. 07281

## Maine—Continued

*Geomorphology*

Saco River and Scarboro estuaries, shoreline changes: Farrell, Stewart C. 09237

*Geophysical surveys*

Catheart Mountain, remote sensing, geochemical soil anomalies: Canney, F. C. 07776

*Glacial geology*

Northwestern, glaciation, deglaciation history: Borns, Harold W., Jr. 00140

*Maps, geologic*

Attean, Brassua Lake, and First Roach Pond quadrangles, parts: Heath, Edward W. 10271

Long Pond quadrangle, Moosehead Lake, North East Carry, and Pierce Pond Forks quadrangles, parts: Heath, Edward W. 10271

Mount Desert Island: Chapman, Carleton A. 02763

Munsungun anticlinorium, southern part: Hall, Bradford A. 07874

Ragged Lake, Seboomook, and Spencer Lake quadrangles, parts: Heath, Edward W. 10271

*Paleontology*

Fauna, Paleozoic, Munsungun anticlinorium, collections: Hall, Bradford A. 07874

Periophytes, Devonian, Trout Valley Fm., northern: Kasper, Andrew E., Jr. 04164

*Petrology*

Machias area, cores, physical properties: Crisp, R. W. 10233

Northern, prehnite-pumpellyite facies metamorphism: Coombs, D. S. 00848

Oquossoc area, sillimanite zone, lower to upper, transition: Guidotti, Charles V. 04348

Tunk Lake Granite, xenoliths: Karner, Frank R. 02736

Tunk Lake Granite, zonation, zircon distribution: Karner, Frank R. 03876

Tunk Lake pluton, zoning by convection, evidence: Karner, Frank R. 10728

*Sedimentary petrology*

Central, Silurian rocks, slump structure: Griffin, John R. 06996

Saco River and Scarboro estuaries, sediment distribution: Farrell, Stewart C. 09237

*Stratigraphy*

Cambrian (?)—Devonian, Munsungun anticlinorium, southern end: Hall, Bradford A. 07874

Silurian, Perham Fm., turbidite sequence, variations: Roy, David C. 09550

*Structural geology*

Munsungun anticlinorium, orogenies, faults: Hall, Bradford A. 07874

Rangeley area, down-to-basin faulting, folding: Moench, Robert H. 01504

## Major-element analyses

*Allanite*

Colorado, Boulder Creek Batholith: Hickling, Nelson L. 02388

*Alluvium*

Nevada, Yucca Flat, CO<sub>2</sub> content: Ramspott, L. D. 05516

*Amphibole*

Greenland, Kangerdlugssuaq intrusion: Kempe, D. R. C. 08404

*Amphibolite*

British Columbia, Grand Forks Group: Preto, V. A. G. 00559

Greenland, southwestern: Kalsbeek, Feiko. 08355

## Major-element analyses—Continued

*Andesite*

Montana, Gallatin Range and Emigrant Peak area: Chadwick, Robert A. 00021

Texas, El Paso, Campus Andesite: Hoffer, Jerry M. 02396

*Basalt*

California, Madera County, not "Catoctin schist": Hooker, Marjorie. 06173

Idaho, Snake River Plain lava, iron, alkali content: Stone, George Thomas. 09589

Mexico, Socorro Island: Bryan, W. B. 02232

New Mexico, Potrillo, Carrizozo, McCarty's fields: Renault, Jacques. 10448

Oregon, Steens Mountain: Gunn, Bernard M. 01412

Utah, Gunlock flow, lateral and vertical variations: Embree, Glenn F. 04138

*Behoite*

New mineral, Texas, description: Ehlmann, Arthur J. 03166

*Biotite*

Greenland, Kangerdlugssuaq intrusion: Kempe, D. R. C. 08404

*Biotite gneiss*

Greenland, southwestern: Kalsbeek, Feiko. 08355

*Brines*

Louisiana, petroleum-associated, source rocks relations: Collins, A. Gene. 05380

*Caliche*

New Mexico, high plains: Aristarain, L. F. 01122

*Carbonatite*

Lamprophyric dikes, Greenland, southwestern: Walton, Brian J. 08353

*Connate water*

Deep-sea sediments, Atlantic Ocean: Chan, K. M. 01658

Deep-sea sediments, Atlantic Ocean: Kaplan, I. R. 01346

*Dacite*

Montana, Gallatin Range and Emigrant Peak area: Chadwick, Robert A. 00021

*Diabase*

W-1, variations, cause: Vistelius, Andrew B. 08287

*Diabase dikes*

Pennsylvania, southeastern, chemical: Lapham, Davis M. 09507

*Dolerite*

Arizona, Sierra Ancha sill complex: Nehru, C. E. 02373

*Dolerite dikes*

United States, eastern, chemical types: Weigand, Peter W. 08275

*Feldspar, alkali*

Greenland, Kangerdlugssuaq intrusion: Kempe, D. R. C. 08404

*Gadolinite*

Texas, Rode Ranch: Gibson, Shirley J. 03178

*Garnet*

New York, Canton area: Bloomer, Robert O. 09168

*Gneiss*

Ontario, Glamorgan Township, origin: Chesworth, Ward. 08269

*Granite*

G-1 samples, variations, cause: Vistelius, Andrew B. 08287

*Granitic rocks*

California, Kaiser Peak quadrangle, Sierra Nevada: Bateman, Paul C. 04014

## Major-element analyses—Continued

*Ground water*

- Alaska, Tanana basin: Anderson, G. S. 01529  
 California, southern: California Dept. Water Resources. 00422  
 Louisiana, Saint Landry Parish area, northwestern: Hosman, R. L. 00448  
 Maryland, southern: Weigle, James M. 01607  
 Minnesota, southwestern, Redwood River watershed: VanVoast, W. A. 01531  
 Missouri, Missouri River alluvium, Miami to Kansas City: Emmett, L. F. 01530  
 New Jersey, Salem County: Rosenau, Jack C. 10940  
 New York, Suffolk County, southwestern: Perlmutter, N. M. 01255  
 Texas, Angelina-Nacogdoches Counties: Guyton, William F., and Associates. 01357  
 Texas, Bastrop County: Follett, C. R. 11010  
 Washington, Mason County, southeastern: Molenaar, Dee. 00786

*Igneous rocks*

- Greenland, Kangerdlugssuaq intrusion: Kempe, D. R. C. 07059  
 Keweenaw lavas, Duluth gabbro, Minnesota: Phinney, William C. 03821  
 Sills, lavas, Greenland, Midternaes area: Higgins, A. K. 07792

*Iron formation*

- Wyoming, Atlantic City deposit: Pride, Douglas Elbridge. 06607

*Iron ores*

- New York, Benson Mines: Palmer, Donald F. 03481

*Kakortokite*

- Greenland, Ilimaussaq intrusion: Ferguson, John. 08719

*Lamprophyre*

- Montana, Little Belt Mts., composite dikes: Wit-kind, Irving J. 04419

*Latite*

- Utah, Bingham mining district, dikes: Moore, William J. 04247

*Leonhardtite*

- Colorado, Mount Princeton Quartz Monzonite: Sharp, William N. 01857

*Lignite*

- C, H, OH, ash: Chomnanti, S. 04369

*Limestone*

- Kansas, flame photometry, Na, Pb and Ba in Cottonwood and Burr beds, vertical variations: Lanning, F. C. 09616  
 Pennsylvania, Lancaster County, Annville Limestone: Becher, Albert E. 02221

*Mafic rocks*

- Alaska, Fairweather layered pluton: Plafker, George. 01463

*Malachite-bearing sandstone*

- Virginia, Fairfax County: D'Agostino, John P. 04250

*Melasyenite*

- Colorado, San Juan Mts.: Barker, Fred. 00132

*Metamorphic rocks*

- California, Kaiser Peak quadrangle, Sierra Nevada: Bateman, Paul C. 04014

*Meteorites*

- Allende, Mexico: Clarke, Roy S., Jr. 10268  
 Chondrites, V, Cu abundance: Nichiporuk, Walter. 04990  
 Lost City: Clarke, R. S., Jr. 02265  
 Lost City (Okla.) and Murchison (Australia): Ehmann, W. D. 04781

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*Mica*

- Utah, Bingham mining district, dikes: Moore, William J. 04247

*Minerals*

- Ontario, Sudbury irruptive: Naldrett, A. J. 04413

*Moon rocks*

- Surveyor mission, alpha-scattering technique: Economou, Thanasis E. 06258

*Mugearite*

- Mexico, Clarion Island, minerals: Bryan, W. B. 02231

*Oil shale*

- C, H, OH, ash: Chomnanti, S. 04369

*Pegmatite*

- Alaska, Mentasta Mountains, corundum-bearing: Richter, Donald H. 04249

*Phosphate rock*

- Nevada, Nye County, adjacent areas: Rogers, C. L. 04246

*Plutonic nodule minerals*

- Inclusions in lamprophyric carbonatite dikes, Greenland: Walton, Brian J. 08353

*Porphyry*

- Montana, Little Belt Mts., composite dikes: Wit-kind, Irving J. 04419

*Pyroxene*

- Greenland, Kangerdlugssuaq intrusion: Kempe, D. R. C. 08404

*Rhyodacite*

- Montana, Gallatin Range and Emigrant Peak area: Chadwick, Robert A. 00021

*Ruby-bearing nodules*

- Georgia, Habersham County, emission spectroscopy: Giardini, A. A. 01310

*Sea water*

- Bahamas, Bimini lagoon: Till, Roger. 01659

*Sediments*

- Atlantic Ocean, deep-sea, neutron activation: Texas A and M University. 01646  
 Bahamas, Bimini lagoon: Till, Roger. 01659  
 Caribbean Sea cores, neutron activation: Kuykendall, W. E., Jr. 06664  
 Lake Michigan, southern, unconsolidated: Shimp, Neil F. 02204  
 Pacific Ocean cores: Kuykendall, W. E., Jr. 07148

*Silicate minerals and rocks*

- Ferrous iron, semimicrodecomposition, fusion cf. acid: Meyrowitz, Robert. 09457

*Silicate rocks*

- Si, Al, Fe, Mg, Ca, Na, K: Abbey, Sydney. 02031

*Standard rocks*

- Neutron activation analysis, short half-life nuclides: Filby, R. H. 06554

*Sulfur*

- Rocks, ores, meteorites, rapid combustion method: Sen Gupta, Joy G. 01511

*Ultramafic rocks*

- Alaska, Fairweather layered pluton: Plafker, George. 01463

*Underclay*

- Pennsylvania Anthracite region: Hosterman, John W. 04248

*Volcanic rocks*

- California, Inyo Mountains-Saline Range region: Ross, Donald C. 02154  
 California, Baja California, Cenozoic: Hawkins, James W. 05251

**Major-element analyses—Continued**

*Volcanic rocks*—Continued

Newfoundland, Harbour Main Group: Papezik, V. S. 08127

Oxygen isotope exchange: Garlick, G. D. 02397

*Water*

Caribbean Sea, deep-sea cores, interstitial: Presley, B. J. 06667

Caribbean Sea, deep-sea cores, interstitial: Sayles, F. L. 06666

Colorado, Mount Princeton hot springs: Sharp, William N. 01857

Connecticut, southwestern coastal river basins, surface and ground: Ryder, Robert B. 04536

Florida, Hillsboro Canal area, lower, ground water: McCoy, H. J. 03913

Florida, Middle Gulf area, ground: Cherry, R. N. 03383

General: Hem, John D. 03142

Hawaii, Hawaii island, ground water: Hawaii Div. Water and Land Devel. 02456

Hawaii, Maui, northeastern, surface and ground: Takasaki, K. J. 05637

Hawaii, silica content, ground: Davis, Stanley N. 10618

Idaho, Ada and Elmore Counties, ground water: Ralston, Dale R. 04013

Idaho, Owyhee, Twin Falls Counties, Blue Gulch area, ground: Chapman, Sheri L. 10450

Idaho, Portneuf River basin, ground water: Norvitch, R. F. 03750

Indiana, Patoka River watershed, surface: Corbett, Don M. 09171

Kansas, Finney County, ground: Meyer, Walter R. 03768

Louisiana, Baton Rouge area, surface and ground: Kazmann, Raphael G. 05886

Louisiana, public supply wells: Dial, Don C. 05585

Maryland, southern, surface and ground: Weigle, James M. 03584

Michigan, Keweenaw Peninsula, ground: Doonan, C. J. 07106

Minnesota, Grand Rapids area, ground: Oakes, Edward L. 02127

Mississippi, east-central, ground water: Boswell, E. H. 02765

Mississippi, ground: Shows, Thad N. 03999

Mississippi, gulf coast, ground: Shattles, D. E. 03888

Mississippi, Lee County, ground and surface: Wasson, B. E. 03141

Na, K, Ca, Mg, atomic absorption spectrophotometry, interference studies: McDowell, L. L. 10385

Nevada, Columbus Salt Marsh-Soda Spring Valley area: VanDenburgh, A. S. 07514

New Jersey, Gloucester County, ground: Hardt, William F. 04937

New York, Champlain-Upper Hudson basins: Giese, G. L. 05489

New York, Orange-Ulster Counties, ground: Frimpter, Michael H. 04066

North Carolina, Craven County, ground: Floyd, E. O. 08342

North Carolina, Stanly County, ground: Berry, Edward L. 08343

North Carolina-Tennessee, Great Smoky Mts. Natl. Park: McMaster, W. M. 04425

North Dakota, Buxton area, ground: Naplin, Charles E. 08461

North Dakota, Columbus area, ground: Naplin, Charles E. 09933

**Major-element analyses—Continued**

*Water*—Continued

North Dakota, Grand Forks County, ground water: Kelly, T. E. 02148

North Dakota, Makoti area, ground: Naplin, Charles E. 09932

North Dakota, Nelson County, ground: Downey, Joe S. 05491

North Dakota, prairie potholes, surface: Sloan, Charles E. 03220

North Dakota, Willow City area, ground: Naplin, Charles E. 09931

Ohio, saline ground water: Sedam, A. C. 06441

Oregon, Clatsop Plains sand-dune area, surface and ground: Frank, F. J. 04597

Pennsylvania, Loysville-Mifflintown quadrangles, ground: Johnston, Herbert E. 04970

Pennsylvania, State College area, springs: Jacobson, Roger L. 02486

Saskatchewan, Old Wives Lake drainage basin, ground: Freeze, R. A. 10678

South Carolina, Spartanburg County, surface and ground: Bloxham, W. M. 07608

South Dakota, Campbell County, ground: Koch, Neil C. 05841

South Dakota, Campbell County, ground water: Hedges, Lynn S. 04003

South Dakota, Clay County, ground: Christensen, Cleo M. 06563

Texas, Collingsworth County, ground: Smith, James T. 04645

Texas, Throckmorton County, ground: Preston, Richard D. 01884

United States, Mississippi embayment, surface and ground: Cushing, E. M. 04550

Utah, Goshen and southern Utah Valleys, ground: Cordova, R. M. 05825

Utah, Heber-Kamas-Park City area, ground: Baker, C. H., Jr. 03191

Utah, Sanpete County, surface and ground: Pratt, Alan R. 07036

Utah, Sink Valley area, ground: Price, Don. 05824

Utah, thermal springs: Mundorff, J. C. 08582

**Malacostraca**

*Hesslerella shermani*

Pennsylvanian, Illinois, Middle, isopod: Schram, Frederick R. 03415

**Mammala**

*Scottimus exiguus* (Wood) Black

Oligocene, North America, Great Plains, not *Paracricetodon*: Dawson, Mary R. 02094

**Mammalia**

*Allodesmus*

Miocene, California, Round Mtn. Silt, Shark-tooth Hill bonebed, mandibles: Barnes, Lawrence G. 08380

*Aphelops*

Tertiary, tribal classification: Tanner, Lloyd G. 02538

*Arctodus simus* (Cope)

Pleistocene, Mexico, Puebla, Valsequillo sink: Thenius, Erich. 09381

*Ardynomys*

Oligocene, Montana and Mongolia: Wood, Albert E. 04192

*Artiodactyla*

Tertiary, Arizona, Maricopa County, oreodont: Lundin, Robert F. 02982

*Basilosaurus cetoides*

Eocene, Mississippi, collecting: Applegate, Shelton P. 01266

## Mammalia—Continued

- Bison*  
Pleistocene, North America; taxonomy: Wilson, Michael. 10650  
Quaternary, Florida, species, popular guide: Robertson, Jesse S. 10476  
Quaternary, North America, environmental adaptation, evolution: Wilson, Michael. 09226  
*Bison antiquus*  
Pleistocene, Northwest Territories, Liard River bank, skull: Gordon, Bryan C. 04802  
*Bison antiquus figginsi*  
Pleistocene, Wyoming, Shirley Basin mining district: Fletcher, Calvin D. 02301  
*Bison (Gigantobison) latifrons*  
Pleistocene, Colorado, Canon City area: Lewis, G. Edward. 01477  
*Bison occidentalis*  
Pleistocene, Texas, Randall County, marsh fauna: Schultz, Gerald E. 04708  
*Bison (Simobison)? alleni?*  
Pleistocene, Colorado, Denver area: Lewis, G. Edward. 01477  
*Canis (aenocyon) dirus Leidy*  
Pleistocene, Mexico, Puebla, Valsequillo sink: Thénus, Erich. 09381  
*Carnivora*  
Pliocene, Idaho, Hagerman local fauna, systematics: Bjork, Philip Reese. 06694  
Pliocene, Texas, Hemphill County, Coffee Ranch: Dalquest, Walter W. 10220  
*Carpocyon limosus*, n.gen., n.sp.  
Pliocene, Florida, Bone Valley Fm., cf. other spp.: Webb, S. David. 10123  
*Cenozoic*  
West Indies, Greater Antilles, insectivores, evolution: Arredondo, Oscar. 10192  
*Chiroptera*  
Dentition, evolutionary trends: Slaughter, Bob H. 00489  
*Condylarthra*  
Tertiary, distribution, correlation, phenacodontids: West, Robert M. 00389  
*Cuvieronius arellanoi*, n.sp.  
Pleistocene, Mexico, Oaxaca: Ochoterena F., H. 11253  
*Didelphis marsupialis*  
Holocene, molar occlusion, chewing cycle, cf. Cretaceous therians: Crompton, A. W. 01261  
*Elephantoides*  
Pleistocene, Atlantic Coastal Plain, submerged shelf, popular: Drummond, A. H., Jr. 03993  
*Equidae*  
Cenozoic, Florida, popular guide: Waldrop, John. 10474  
*Equus francisci*  
Pleistocene, Texas, morphology, nomenclature: Lundelius, Ernest L. 00581  
*Equus (Plesippus) simplicidens*  
Pleistocene, Nebraska, Broadwater quarries: Howe, John A. 04718  
*Erethizon dorsatum*  
Quaternary, United States, eastern, distribution: Ray, Clayton E. 01318  
*Erethizontidae*  
Cenozoic, North America, evolution, systematics: White, John A. 04124  
"Eumys" *exiguus*  
Oligocene, North America, Great Plains, = *Scottimus*: Dawson, Mary R. 02094

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- Eutheria*  
Cretaceous, Alberta, Milk River Fm., molar: Fox, Richard C. 04074  
*Evolution*  
Man, other primates, physical and behavioral characters: Napier, John. 07796  
Origin from therapsids, dentary-squamosal joint: Barghusen, Herbert R. 01202  
Triassic origin, cynodonts, living monotremes: Jenkins, Fafish A., Jr. 08663  
*Extinctions*  
Effect of man: Krantz, Groves S. 08584  
*Perinestrix vorax*, n.gen., n.sp.  
Pliocene, Idaho, Hagerman local fauna: Bjork, Philip Reese. 06694  
*Fissipedia*  
Cenozoic, Florida, popular guide: Tessman, Norman. 10475  
*General*  
Mammoths, mastodons, man, popular account: Silverberg, Robert. 03803  
*Geographic distribution*  
Environmental factors, U.S., Great Plains, northern: Hoffmann, Robert S. 08052  
United States, Great Plains, Quaternary: Schultz, C. Bertrand. 09405  
*Gravigrada*  
Pleistocene, Nevada, Gypsum Cavern, ground sloth: Lawlor, Florine. 04407  
*Ischyrosmilus* spp.  
Pleistocene, Nebraska, Broadwater and Lisco Local Faunas, machairodont: Schultz, C. Bertrand. 07638  
*Lagomorpha*  
Miocene, Wood Mtn. Fm., Kleinfelder Farm locality: Storer, John E. 08132  
*Leporidae*  
Pleistocene, Arizona, San Pedro Valley: Downey, Joe S. 01476  
*Leptomeryx*  
Oligocene, South Dakota, Brule Fm., Scenic Member, death assemblages: Clark, John. 10207  
*Mammut americanus*  
Quaternary, Pennsylvania, Bradford County, age: Coates, Donald R. 03321  
*Mammuthus*  
Pleistocene, Florida, Santa Fe River, vertebra, butcher marks: Bullen, Ripley P. 10130  
Quaternary, Washington, Touchet Beds, Horse Heaven Plateau: Newcomb, R. C. 01188  
*Mammuthus jeffersoni*  
Pleistocene, Michigan, Midland County, pre-Late Wisconsin interstadial: Kapp, Ronald O. 08350  
*Mammuthus primigenius*  
Morphology, hair,  $\alpha$ -keratin structure, proteins: Gillespie, J. M. 05382  
*Maridae*  
Oligocene-Holocene, taxonomic review, phylogeny: Emry, Robert J. 07981  
*Marmota flavicentris*  
Quaternary, late, Colorado-New Mexico, Navajo sites, climatic indicator: Harris, Arthur H. 10131  
*Martes*  
Quaternary evolution, distribution, North America, Eurasia: Anderson, Elaine. 06691



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- Martes nobilis* n.comb.  
Pleistocene; United States, northwestern: Anderson, Elaine. 06691
- Marychys verrucosus* n.sp.  
Miocene, Nebraska, Runningwater Formation: Stevens, Margaret Skeels. 04125
- Megantereon*  
Pleistocene, Nebraska; Broadwater Local Fauna, machairodont: Schultz, C. Bertrand. 07638
- Meshippus bairdii*  
Oligocene, South Dakota, Big Badlands, teeth: Forsten, Ann-Marie. 02963
- Meshippus* spp.  
Oligocene, South Dakota, Chadron Fm., cf. Brulean: Forsten, Ann. 08373
- Microtoscopes disjunctus*  
Pliocene, Idaho, Wyoming, arvicoline? rodent: Hibbard, Claude W. 07873
- Microtus*  
Quaternary, phylogeny: Martin, Larry D. 02530
- Morphology*  
Jaw function mechanism, opossum, cf. Cretaceous therians: Crompton, A. W. 01261  
Masticatory apparatus, musculature relation to skeleton: Turnbull, William D. 03370  
Tooth form, phyletic relation indicator: Schultz, Hans-Peter. 00781
- Nebraskomys mcgrewi* n.sp.  
Pliocene, Kansas, Rexroad Local Fauna, microtine: Hibbard, Claude W. 07641
- Neodiadexis emryi* n.sp.  
Eocene, Wyoming, Bridge Fm., Tabernacle Butte: West, Robert M. 00942
- Nesophontes* n.spp.  
Holocene, Cuba, pre-Colombian caves, Havana area: Arredondo, Oscar. 10192
- Ondatra*  
Quaternary, phylogeny: Martin, Larry D. 02530
- Ondatra* spp.  
Pleistocene, length:width ratio, climatic significance: Nelson, Robert S. 06117
- Ovibos moschatus*  
Alaska, Pleistocene, outwash gravels, Nome area: Harington, C. R. 08147  
Quaternary, Manitoba, Grandview area, postglacial, zoogeography: Harington, C. R. 06132
- Paleoparadoxia*  
Miocene, California, Palo Alto area: Zuidema, Henry P. 02786
- Pareumys guensburgi* n.sp.  
Eocene, Utah, Duchesne River Fm., La Point Member: Black, Craig C. 03646
- Patriomanis americanus* n.gen., n.sp.  
Oligocene, Wyoming, Alcova area: Emry, Robert J. 07981
- Peraceras*  
Tertiary, tribal classification: Tanner, Lloyd G. 02538
- Perognathus huastecensis* n.sp.  
Pleistocene, Mexico, Tamaulipas, Cueva de Abra: Dalquest, Walter W. 05381
- Pholidota*  
Taxonomy, new classification including palaeoanodonts: Emry, Robert J. 07981
- Platygonus* cf. *compressus alemanii* Duges  
Pleistocene, Mexico; Puebla, Valsequillo sink: Thenius, Erich. 09381
- Platygonus compressus*  
Pleistocene, Colorado, Denver area: Lewis, G. Edward. 01477

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- Platygonus compressus*—Continued  
Pleistocene, Pennsylvania; Olean Drift, Mosher-ville area: Ray, Clayton E. 00036
- Primates*  
Evolution, adaptations: Arthur, Don R. 09757
- Proboscidea*  
Pliocene-Pleistocene, Florida; popular guide: Webb, S. David. 10470  
*Prodipodomys griggsorum* n.sp.  
Pliocene, Kansas, Rexroad Fm., cf. other spp.: Zakrzewski, Richard J. 02090
- Protoreodon pumilus*  
Eocene, New Mexico, Baca Fm.: Snyder, Don O. 08683
- Quaternary*  
Alabama, New Fern Cave: Hale, Dan. 03995  
Alaska, Yukon, collecting areas for Pleistocene, identification: Harrington, C. R. 10395  
Alberta, Pashley area, postglacial horse: Churcher, C. S. 08072  
Extinctions, late Pleistocene, possible causes: VanValen, Leigh. 08518  
Extinctions, Pleistocene, role of early man: Adams, William H. 03947  
Florida, Sumter County, Pleistocene: Martin, Robert Allen. 07845  
Mexico, Puebla, Pleistocene fauna, artifact associations, discussion: Irwin Williams, Cynthia. 10140  
Mexico, Tamaulipas, cave, Pleistocene, rodents, bats: Dalquest, Walter W. 05381  
Nebraska, sequence: Schultz, C. Bertrand. 08051  
New Mexico, Eddy County, Dry Cave, Pleistocene: Harris, Arthur H. 09736  
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- Suspended-sediment sampler, near bottom, fixed levels: Schiemer, E. W. 04680
- Vane shear tester, strength, *in situ*: McNary, J. F. 03708

*Methods*

- Acoustic signals, profiling, near sub-bottom, high resolution: Chramiec, M. A. 09493
- Data processing, shipboard computers: Coughran, Edward H. 04436
- Drilling techniques for oriented hard-rock cores: Brooke, J. 04549
- Electrical logging, ocean bottom surveys, application: Chmielek, Frank B. 02541

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- Electromagnetic exploration, application: Coggon, J. H. 03470
- Geophysical, federal program, review, future: Sheets, Herman E. 09498
- Geophysical, Vibroseis, continuous sweep: Broding, R. A. 09497
- Gravity anomaly calculation, from satellite altimetry: Koch, Karl-Rudolf. 06729
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- Magnetic, magnetometer types: Gotla, Peter. 01637
- Maine, Penobscot Bay shore, copper-zinc open-pit mine: Beck, Frederick M. 09477
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- Paleomagnetism, crustal movements: Heirtzler, J. R. 04504
- Pipeline surveys: VanReenan, Earl D. 09495
- Remote sensing, photography, spectrography: Conrod, A. C. 02911
- Remote sensing, submerged features: Polcyn, F. C. 02912
- Remote-sensing, applications: Helgeson, Gaylord A. 04366
- Sea-floor mapping, side-scanning sonar, California, La Jolla Fan-Valley: Mudie, J. D. 01413
- Sea-water sampling, particulate iron content, Nansen bottle contamination: Betzer, Peter R. 04743
- Sediment sampling, submersible diver lock-out facility, Nova Scotia, Bay of Fundy, results, textural analysis: Pelletier, B. R. 09822
- Seismic profiling, high-resolution, sub-bottom system: Moore, T. C., Jr. 02458
- Seismic profiling with sonar: Edgerton, Harold E. 04001

*Mineral resources*

- California, southern, offshore phosphate deposits, Coronado Bank, delineation techniques: Barnes, Burton B. 09480
- California, southern, offshore phosphate deposits, low-grade: Inderbitzen, Anton L. 09478
- Coastal areas, planning and management, information system: Ellis, Robert H. 09494
- Diamond placers, geophysical exploration: Oostdam, B. L. 02931
- Exploration, mining developments: Flipse, John E. 09849
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- Mining and recovery operations, 1969: Cruickshank, Michael J. 08221
- Past, present, future: Mero, John L. 03466
- Petroleum exploration, Canada, eastern shelf: Howie, R. D. 05869
- Phosphate, geophysical exploration: Summerhayes, C. P. 04902
- Prospecting, ships, design: Johnson, Peter A. 09475

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- Arctic, Pacific coast, Caribbean region, remote sensing, New England: Carlson, Paul R. 09296

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- Anthozoa, post-Pleistocene changes in reef communities: Goreau, Thomas F. 10712
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- Opportunistic species, ecology, paleoecology: Levinton, Jeffrey S. 04371

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- Pacific Ocean, northwestern, biostratigraphy: Bukry, D. 02723

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- Ocean-floor rocks, composition, nature, origin: Engel, Albert E. 10934
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- Magnetic properties, changes due to submarine weathering: Marshall, Monte. 10489

*Processes*

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- Sea-floor spreading, Atlantic Ocean, underthrust of Antilles: Scholl, David W. 00062
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*Sediments*

- Abyssal cores, organic carbon, hydrocarbon: Koons, Charles B. 06796
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- Atlantic Ocean, Deep Sea Drilling Project, Leg 2: Peterson, Melvin N. A. 01260
- Atlantic Ocean, Demerara Plateau, age: Fox, Paul J. 09426
- Atlantic Ocean, northwestern: Hollister, Charles Davis. 07355
- Barracuda Fault Zone, Atlantic Ocean: Birch, Francis S. 07640
- Biostratigraphy, pre-Quaternary, review: Saito, Tsunemasa. 09989
- Carbonate level, age of horizon A: Gartner, Stefan, Jr. 03080
- Carbonate, lithification, oceanic ridges, seamounts: Bartlett, Grant A. 07704
- Carbonate sand, Mn leaching, isotope study: Gomberg, David N. 03758
- Composition, geochemistry: Mel'nik, V. I. 07802
- Compressional and shear-wave velocities, in situ determination: Hamilton, E. L. 03725
- Continental shelf, United States, northeastern, gravels: Schlee, John. 04030
- Cretaceous-Quaternary, clay minerals, Atlantic Ocean: Jacobs, Marian B. 05651
- Dating, racemization of amino acids: Bada, Jeffrey L. 04992
- Deep Sea Drilling Project, Leg 11, Atlantic Ocean: Deep Sea Drilling Project. 04023
- Deep Sea Drilling Project, Leg 5, Pacific Ocean, regional aspects: McManus, Dean A. 07249
- Deep-sea fan growth patterns: Normark, William R. 05872
- Deep-sea fan, transport, deposition, off California: Piper, D. J. W. 03652

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- Deep-water muds, geochemistry, climatic change effect: Spiro, N. S. 10100
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- Density, water content, determination in core: Corey, J. C. 06819
- Depositional environment, Florida Keys, Couston Bight, carbonate facies, biota: Howard, James F. 02386
- Distribution, thickness, Mid-Atlantic Ridge: Keen, M. J. 08054
- Diversity of origins, Barbados, off west coast: Macintyre, Ian G. 03735
- Elasticity, in situ measurements, Pacific Ocean off San Diego: Hamilton, E. L. 10646
- Electrokinetic potential, effect of seawater salinity: Pravidic, V. 04060
- Engineering properties, in-situ testing, sampling methods: Noorany, Iraj. 04222
- Eocene horizon, JOIDES cores, correlation, seismic Horizon A: Ewing, J. 04271
- Evaporite basins, role of wind and water depth: Brongersma-Sanders, Margaretha. 05636
- Flyschoid facies, Atlantic continental margin: Stanley, Daniel J. 06447
- General description, Alaska, Bristol Bay shelf: Sharma, Ghanshyam D. 10096
- General description, Arctic Ocean: Hunkins, Kenneth. 05623
- Geochemistry, Eh, pH, element correlation, Atlantic Ocean: Weijden, C. H. van der. 05598
- Geochemistry, nitrogen distribution, forms, Pacific Ocean: Stevenson, F. J. 04090
- Geochemistry, organic materials: Hare, P. E. 07010
- Granitic rocks, continental margin, Blake Plateau, erratics: Pratt, Richard M. 04882
- Gulf of Mexico, Caribbean Sea, core sample: Mel'nik, V. I. 07802
- Holocene sand sheet, genesis on continental shelf: Swift, D. J. P. 10337
- Inorganic components, climate indicators, criteria: McManus, Dean A. 05386
- Interstitial waters, analysis, temperature of squeezing effect: Bischoff, James L. 00981
- Light-scattering vectors of suspended particles, biologic vs. geologic: Pak, Hasong. 06727
- Magnetic minerals: Haggerty, S. E. 02243
- Magnetic properties, polarity, reversals, Arctic Ocean: Clark, David L. 04946
- Magnetic properties, remanence, reversal chronology: Opdyke, N. D. 09988
- Mass property variability, Caribbean Sea: Bennett, Richard H. 05661
- Mercury dispersion, waste disposal cf. weathering: Klein, David H. 03954
- Mineral composition, provenance, Florida continental margin: Hathaway, John C. 05576
- Mineralogy, geochemistry, shelf off Washington, Oregon: White, Stan M. 01534
- Mn-rich layers, genesis, Arctic Ocean: Bostrom, Kurt. 10015
- Motion, incipient, internal gravity waves: Cacchione, David A. 06084
- Movement by wave action, experimental equipment: Mogridge, Geoffrey R. 03623
- O-isotope exchange, volcanics and sea water: Garlick, G. D. 02397
- Organic material, distribution, composition, Arctic Ocean: Lapina, N. N. 10071

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- Pacific Ocean, Cascadia Basin, clay mineralogy, provenance: Duncan, John R. 01121
- Pelagic, manganese accumulation rates: Bender, M. L. 02136
- Pelitic, macrostructures, changes during consolidation: Chmelik, Frank Bernard. 07596
- Physical properties, elasticity, constants, Pacific Ocean: Hamilton, E. L. 10645
- Physical properties, environmental control, Pacific Ocean: Hamilton, E. L. 10644
- Physical properties, mass variations: Keller, George H. 06764
- Physical properties, shear strength-sedimentation rate relations: Inderbitzen, A. L. 08560
- Piston coring, disturbance mode: Igarashi, Y. 08623
- Popular account: Lay, E. P. 03215
- Pore water in anoxic muds, geochemistry, carbonate alkalinity: Berner, Robert A. 04679
- Processes, Mississippi delta, Gulf of Mexico: Huang, Ter-Chien. 05793
- Provenance, Cascadia Basin off Oregon: Duncan, John R. 05653
- Provenance, New England, Gulf of Maine, Georges Bank: Ross, David A. 05656
- Provenance, wind-derived material, interpretation: Folger, D. W. 02415
- Sampling, earth penetration technology, application: Thompson, Louis J. 09496
- Sedimentation, coastal currents, mass transport, California: Wolf, Stephen C. 03734
- Sequence, distribution, abyssal plains: Needham, H. D. 09693
- Shear strength, sedimentation rate relations: Inderbitzen, Anton Louis. 07357
- Size distribution, continental shelf, New York: McKinney, Thomas F. 01656
- Sound velocity, related properties, Pacific Ocean, northern: Hamilton, Edwin L. 03558
- Straits of Florida, provenance, composition: Gassaway, John D. 08548
- Suspended matter, composition, distribution, Gulf of Maine: Spencer, Derek W. 05599
- Suspended, source, distribution, U.S., Chesapeake Bay: Biggs, R. B. 06345
- Textures, variance analysis, shelf deposits, off Washington: Kelley, James C. 08553
- Thickness, structure, Labrador, continental slope: Orlenok, V. V. 08412
- Transport, Bering Sea to Chukchi Sea: McManus, Dean A. 05652
- Volumes, Phanerozoic, continental margin, U. S.: Gilluly, James. 00102
- Stratigraphy**
- Continental rise, North America: Emery, K. O. 00099
- Continental shelf, New York: Garrison, Louis E. 00100
- Cretaceous, Nova Scotia, Scotian Shelf: King, Lewis H. 07679
- Cretaceous, Nova Scotia, Scotian Shelf, biostratigraphy: King, Lewis H. 07674
- Quaternary, biostratigraphy, off Oregon: Duncan, John R. 00437
- Structure**
- Arctic Ocean basin, evolution: Churkin, Michael, Jr. 10023
- Barracuda Fault Zone, Atlantic Ocean: Birch, Francis S. 07640
- Buried ridge, seismic data, Atlantic Ocean off Labrador: Zdorovenin, V. V. 07823



**Marine geology—Continued****Structure—Continued**

Continental rise, North America, genesis, history: Emery, K. O. 00099

Crustal, 6.9-7.6 km/ps layer, Pacific Ocean: Maynard, G. Lafayette. 00785

Diapiric features: Schneider, E. D. 05795

Diapirs, Bering Sea, southeastern: Scholl, David W. 04540

Diapirs, Scotian Shelf, seismic studies: King, Lewis H. 04727

Fault zone, spreading, New England Seamount Chain, Atlantic Ocean: Uchupi, Elazar. 04745

Fracture zone, Newfoundland-Grand Banks to 40° W.: Auzende, Jean-Marie. 06446

Fracture zones-central rift intersections, tectonics, topography: Sleep, Norman H. 02188

Gibbs transform fault, opening of North Atlantic: Olivet, Jean-Louis. 05254

Gorda Basin, faults, relation to triple junction tectonics, Pacific Ocean: Silver, Eli A. 09571

Mid-Atlantic Ridge, double fracture zone, 53° N.: Fleming, Henry S. 05214

Newfoundland Ridge and salt diapirs, Atlantic Ocean: Watson, Jerry A. 07707

Nyckel Ridge, near Wilmington Canyon off eastern U.S.: Stanley, Daniel J. 06129

Panama fracture, Costa Rica rift, Galapagos rift: Grim, Paul J. 05213

Parallel dikes off western Newfoundland: Ruffman, Alan. 07709

Recent crustal upwarp, Atlantic Ocean, Labrador shelf: Grant, A. C. 07685

Ridge, seismic profiles, Caribbean region, Yucatan to Cuba: Baie, Lyle F. 05797

Sea-floor spreading, concept, evidence, review: Vine, F. J. 09724

Sea-floor spreading, off California: Moore, George W. 04461

Sediments-volcanics contact, Bermuda, Castle Harbor: Gees, Rudolph A. 04611

**Maryland****Absolute age**

Great Falls area, lamprophyre dikes, K-Ar: Reed, John C., Jr. 04258

**Areal geology**

Baltimore County, Baltimore gneiss domes areas, field trip: Crowley, William. 05829

Cecil-Harford Counties, metavolcanics, plutons, field trip: Higgins, Michael W. 05828

Eastern Piedmont, metamorphic rocks, guidebook: Pennsylvania Geologists. 05826

Great Falls area, guidebook: U.S. Geological Survey. 01152

**Economic geology**

Iron, titanium, Harford County serpentinite belt: Herz, Norman. 04245

**Engineering geology**

Canals, dams and locks, Chesapeake and Ohio Canal, history, field trip guidebook: Davies, William E. 10229

**General**

Catalog of deep wells: Edwards, Jonathan, Jr. 07810

Chesapeake and Ohio Canal, field trip guidebook, engineering geology, historical: Association Eng. Geologists. 11236

Environmental preservation, Patuxent River basin: Maryland State Plan. Dept. 11249

**Geomorphology**

Appalachian area, caves, soils genesis: Fanning, D. S. 02543

Pond Branch watershed, chemical vs. mechanical erosion: Cleaves, Emery T. 04877

**Maryland—Continued****Geomorphology—Continued**

Washington County, caves, soils genesis: Fanning, D. S. 02543

**Geophysical surveys**

Delmarva Peninsula, ground-water inflow to streams, infrared: Hollyday, Este F. 07750

**Hydrogeology**

Coastal plain, aquifers, transmissibility trends: Hansen, Harry J. 00159

Ground-water resources, summary: Walker, Patrick N. 10460

Southern, ground-water basic data: Weigle, James M. 03584

Southern, ground-water resources, quality: Weigle, James M. 01607

**Maps, ground water**

Southern: Weigle, James M. 01607

**Maps, soils**

Talbot County, soil associations: Reybold, William U., 3d. 08442

Talbot County, soil series: Reybold, William U., 3d. 08442

**Paleontology**

Invertebrata, Cretaceous, Upper, faunas: Owens, James P. 05860

Invertebrata, Miocene, Choptank Fm., paleoecology, biostratigraphy: Gernant, Robert E. 05385

Miocene, Calvert, Choptank, St. Mary's Fms., Chesapeake Bay shore: Stanton, C. Tom. 03852

**Petrology**

Cecil-Harford Counties, metavolcanics, plutons, field trip: Higgins, Michael W. 05828

Eastern Piedmont, metamorphics, interpretations, review: Crowley, William. 05827

State Line Serpentinite, modal, size data, statistical evaluation: McKague, H. Lawrence. 01800

**Sedimentary petrology**

Southern, Miocene formations, clay minerals: Stefansson, Karl. 01478

Talbot County, soils, survey: Reybold, William U., 3d. 08442

Western, Pennsylvanian rocks, lithologies, model: Henderson, Barry Keith. 03258

**Stratigraphy**

Cambrian?, Baltimore Gneiss-Glenarm Series, Baltimore County: Crowley, William. 05829

Cretaceous, post-Magothy fms., eastern: Owens, James P. 05860

Deep-well data, catalog: Edwards, Jonathan, Jr. 07810

Devonian, Greenland Gap Group, Allegany County, new names: Dentison, John M. 05606

Miocene, Choptank Fm., members: Gernant, Robert E. 05385

**Structural geology**

Baltimore County, Baltimore gneiss domes areas, field trip: Crowley, William. 05829

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Blue Hills igneous complex, Rb-Sr open system: Bottino, M. L. 06128

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Chester quadrangle: Hatch, Norman L., Jr. 06695

**Engineering geology**

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*Glacial geology*

Chatham quadrangle, deposits and history: Oldale, Robert N. 05402

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Chatham quadrangle, surficial: Oldale, Robert N. 05402

Chester quadrangle: Hatch, Norman L., Jr. 06695

*Maps, magnetic*

Barre quadrangle, airborne: U.S. Geological Survey. 02046

Boston North quadrangle, airborne: U.S. Geological Survey. 02040

Clinton quadrangle, airborne: U.S. Geological Survey. 02049

Concord quadrangle, airborne: U.S. Geological Survey. 02052

Georgetown quadrangle, airborne: U.S. Geological Survey. 02059

Gloucester-Rockport quadrangles, parts, airborne: U.S. Geological Survey. 02043

Haverhill quadrangle, airborne: U.S. Geological Survey. 02055

Hudson quadrangle, airborne: U.S. Geological Survey. 02050

Ipswich quadrangle, part, airborne: U.S. Geological Survey. 02060

Lawrence quadrangle, airborne: U.S. Geological Survey. 02057

Lexington quadrangle, airborne: U.S. Geological Survey. 02053

Lynn quadrangle, airborne: U.S. Geological Survey. 03209

Marblehead North quadrangle, part, airborne: U.S. Geological Survey. 02064

Marblehead South quadrangle, part, airborne: U.S. Geological Survey. 02054

Maynard quadrangle, airborne: U.S. Geological Survey. 02051

Newburyport East quadrangle, part, airborne: U.S. Geological Survey. 02056

Newburyport West quadrangle, part, airborne: U.S. Geological Survey. 02042

Petersham quadrangle, airborne: U.S. Geological Survey. 02045

Quabbin Reservoir quadrangle, airborne: U.S. Geological Survey. 02044

Reading quadrangle, airborne: U.S. Geological Survey. 02062

Salem Depot (N.H.) quadrangle, airborne: U.S. Geological Survey. 02041

Salem quadrangle, airborne: U.S. Geological Survey. 02063

Shutesbury quadrangle, airborne: U.S. Geological Survey. 02039

South Groveland quadrangle, airborne: U.S. Geological Survey. 02058

## Massachusetts—Continued

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Sterling quadrangle, airborne: U.S. Geological Survey. 02048

Wachusett Mountain quadrangle, airborne: U.S. Geological Survey. 02047

Wilmington quadrangle, airborne: U.S. Geological Survey. 02061

*Mineralogy*

Biotite, garnet, Orange area, mica schists, compositional variations: Hall, David Joseph. 09379

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Pteridophytes, Pennsylvanian, Worcester coal mine: Grew, Edward S. 00954

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Eastern, Salem gabbro-diorite complex, evolution: Morgenstern, Lillian Nimitz. 07282

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Orange area, mica schists, metamorphic history, biotite, garnet: Hall, David Joseph. 09379

Wachusett-Marlborough Tunnel, Nashoba Fm.: Abu-moustafa, Adel A. 00440

*Sedimentary petrology*

Merrimack River estuary, Holocene sedimentation: Hartwell, Allan D. 09238

Squantum "Tillite," long-axis clast fabric, cf. Gowanda Fm.: Lindsay, John F. 01550

*Stratigraphy*

Holocene, Merrimack River estuary marshes, cross sections: Hartwell, Allan D. 09238

Paleozoic, early, western, correlation: Hatch, Norman L. 00160

Quaternary, Chatham quadrangle: Oldale, Robert N. 05402

Silurian, Russell Mountain Fm., western: Hatch, N. L., Jr. 04029

Worcester area, metasediments, age relations, revision: Grew, Edward S. 00157

## Mercury

*Abundance*

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*Alaska*

Occurrence, map: Cobb, Edward H. 06429

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Atomic absorption, dithiozone extraction: Pyrih, Roman Z. 04324

Atomic absorption spectrophotometry, fresh waters: Fishman, Marvin J. 09461

Rocks, soils, plants, field technique: Barakso, J. J. 04295

Spectroscopy, methods review: Ward, F. N. 05614

Water, atomic absorption spectroscopy: Grønlund, P. D. 07784

*Bibliography*

General: Jonasson, I. R. 04202

Geochemistry, world literature, annotated: Fleischer, Michael. 05555

*Colorado Plateau*

Sedimentary rocks, distribution: Cadigan, R. A. 05557

## Mercury—Continued

## General

- Environmental contamination, natural and industrial: Knapp, Carol E. 05565  
Occurrence, distribution, geochemistry, collected papers: U.S. Geological Survey. 05612

## Geochemistry

- Atmosphere, abundance, variation, source: McCarthy, J. H., Jr. 05563  
Behavior in water: Hem, John D. 05558  
Natural fluids, thermal, mineral, abundance: White, D. E. 05559  
Plants, abundance, toxicity: Shacklette, Hansford T. 05562  
Review, recent research: Jonasson, I. R. 04202  
Surface water, source, behavior: Wershaw, R. L. 05560  
Toxicity, aquatic and human environment: Greeson, Phillip E. 05561  
Transport, atmospheric, and fluvial: Jenne, E. A. 05564  
World literature, summary: Fleischer, Michael. 05555

## Texas

- Terlingua district, geochemical prospecting: Geddes, Richard W. 01226

## Merostomata

*Limulus polyphemus*

- Holocene, genetic variation in living fossil, protein test: Selander, Robert K. 03871

## Mesozoic

## Alaska

- Arctic area, chronology: Dettnerman, Robert L. 10031  
Brooks Range, De Long Mts., stratigraphy, tectonics: Martin, A. J. 05963  
Brooks Range, northeastern, review: Reiser, Hillard N. 07078  
Northern, foraminiferal biostratigraphy: Bergquist, H. R. 10010  
Yukon-Koyukuk province: Patton, William W., Jr. 10087

## Arctic

- Jurassic-Neocomian, paleozoogeography: Saks, V. N. 10094

## Arizona

- Mule and Huachuca Mts., stratigraphy: Hayes, Philip T. 00134  
Northwestern, continental clastics and lacustrine limestones: Seager, William R. 01503

## British Columbia

- Halfway River map-area, stratigraphy: Irish, E. J. W. 03148  
Hope map-area, western: Monger, J. W. H. 04203  
Insular Tectonic belt, Triassic-Jurassic sedimentation, orogeny: Jeletzky, J. A. 03149  
Northeastern, magnetotelluric surveys, dip and strike resistivities: Denamore, A. A. 09376

## California

- Coast Ranges, Franciscan blueschists, cf. Japan, Sanbagawa terrane: Ernst, W. G. 05079  
Coast Ranges, Great Valley sequence, Franciscan assemblage, relations: Bailey, Edgar H. 04418  
Diablo Range, Del Puerto-Lotta Creek rocks, reassigned: Raymond, Loren A. 00340  
Granitic rocks, absolute age: Evernden, J. F. 00207  
Great Valley, clastics, sedimentation, tectonic setting: Dickinson, William R. 00254

## Mesozoic—Continued

## California—Continued

- Meso-Cordilleran geanticline a possible deformation belt: Burchfiel, B. C. 00026  
San Luis Obispo area, oceanic crustal remnant: Page, Benjamin M. 09706  
Western, Franciscan rocks, sedimentation, deformation: Blake, M. C., Jr. 00231  
Western, tectonics, history, model: Ernst, W. G. 00659

## Cephalopoda

- Ammonoidea, recent literature, review: Haas, Otto. 02097

## Colorado Plateau

- Stratigraphy, summary: Smith, Clay T. 04848

## Florida

- Peninsular: Rainwater, E. H. 07316

## Georgia

- Peninsular: Rainwater, E. H. 07316

## Greenland

- Carlsberg Fjord-Fossilbjerget area, stratigraphy: Callomon, J. H. 08720  
Eastern, stratigraphy: Birkelund, Tove. 10011  
Jameson-Scoresby Lands, Werner Bjerger, stratigraphy: Perch-Nielsen, K. 06254

## Mexico

- Chihuahua trough, stratigraphy: Cordoba, Diego A. 05913  
Vertebrata, localities: Silva-Barcenas, Angel. 10444

## Micropaleontology

- Deep-sea sediments, biostratigraphy, review: Saito, Tsunemasa. 09989

## Nevada

- Lincoln County, general: Tschanz, C. M. 03396  
Meso-Cordilleran geanticline a possible deformation belt: Burchfiel, B. C. 00026  
Western, granitic rocks, absolute age: Evernden, J. F. 00207

## New Mexico

- Nacimiento uplift, western margin, stratigraphy: Anderson, John B. 00593

## North America

- British Columbia, Washington, Oregon, Triassic-Cretaceous flysch: Danner, W. R. 05298  
Southern, angiosperms development, continental drift effect: Axelrod, Daniel I. 06797

## Northwest Territories

- Sverdrup basin, marine transgressions: Henao-Londono, Diego. 10050

## Oregon

- Klamath Mountains, May Creek Schist, metamorphism: Kays, M. Allan. 04457

## Paleoclimatology

- Fishes as indicators: Schaeffer, Bobb. 08568  
Paleobotanical evidence for changes: Dorf, Erling. 08513

## Reptilia

- Proterosuchia, archosaur evolution: Reig, Osvaldo A. 02498

## Utah

- High Plateaus, eastern Basin Ranges, stratigraphy: Bissell, H. J. 04851

## Yukon

- Northern, stratigraphy, paleogeography: Mountjoy, Eric W. 10079

## Metals

## Alaska

- Boundary area, Eagle A-1 quadrangle, exploration: Asher, R. R. 07198  
Cleary Summit, exploration, electrical: Anderson, Lennart A. 06174

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- Exploration, U.S. Geological Survey role: Berg, H. C. 04607  
 Fortymile area, exploration: Foster, Helen L. 01295  
 Kanuti River region, exploration, occurrence: Patton, William W., Jr. 00129  
 Nixon Fork district, exploration, aeromagnetic: Anderson, Lennart A. 06175  
 Seward Peninsula, Belt Creek-Libby River area, geochemical prospecting: Asher, R. R. 09517

*Analysis*

- Electron probe, mass absorption coefficients, thin film technique: Lublin, P. 04128

*Arizona*

- Greaterville mining district, exploration, geochemical: Drewes, Harald. 00418  
 History and resources: Knight, F. P. 10939

*British Columbia*

- Vancouver Island, genesis: Carson, David John Temple. 07348

*Canada*

- Archean rocks, genetic relations: Suffel, G. G. 03461  
 Canadian Shield, occurrence, reserves: Land, A. H. 07972  
 Cordillera, distribution, relation to tectonic evolution: Brown, A. Sutherland. 03464  
 Production 1969, future possibilities: Mining in Canada. 01727  
 Shield, prediction: DeGeoffroy, J. 04282  
 Western, occurrence, resources, production: Little, H. W. 07975

*Central America*

- Metallogenic provinces, summary: Levy, Enrique. 00450

*Exploration*

- Activation analysis, mobile laboratory: Senftle, Frank E. 02932  
 Biogeochemical method, plant sampling density, Ontario: Hornbrook, E. H. W. 06449  
 Discovery potential, relation to concentratability: Sullivan, Charles John. 04301  
 Geochemical prospecting: Nichol, Ian. 04870  
 Statistical methods: Rose, Arthur W. 04310  
 Well logging: Baltosser, R. W. 00843

*Genesis*

- Hydrothermal ore deposition, symposium: Pouba, Zdenek. 08766

*Geochemistry*

- Analysis, mass spectroscopy, spark source, electrical detection: Evans, C. A., Jr. 03666

*Greenland*

- Sarqa Fjord area, occurrence: Berrange, Jevan P. 08721

*Idaho*

- Sawtooth primitive area, possibilities: Kiilsgaard, Thor H. 03207

*Kansas*

- Occurrence, production, summary: Hardy, Ronald G. 05849

*Labrador*

- Development, prospects: Fleming, J. M. 04533

*Mexico*

- Chihuahua tectonic belt, possibilities: McAnulty, W. N., Sr. 05920

*Mississippi Valley*

- Wisconsin-Iowa-Illinois, ore deposits: Heyl, A. V. 07202

*Montana*

- Lincoln and Flathead Counties, general: Johns, Willis M. 07541

**Metals—Continued***Nevada*

- Cortez-Buckhorn area, occurrence, exploration: Wells, John D. 08465  
 Lincoln County, occurrence: Tschanz, C. M. 03396

*New Brunswick*

- Southwestern, geochemical prospecting: Austria, V. B., Jr. 03160

*Newfoundland*

- Development, prospects: Fleming, J. M. 04533  
 Resources, structural-metallogenic zones, prospecting environments: Fogwill, W. D. 09328

*Nova Scotia*

- Occurrences, map and text: Nova Scotia Dept. Mines, Cartog. Div. 10680

*Ontario*

- Archean greenstone belt: Hutchinson, R. W. 06482  
 Chalk River area, exploration, biogeochemical method: Hornbrook, E. H. W. 06449  
 Lingman Lake map-area: Bennett, G. 09275  
 Southeastern, Grenville province, genesis: Sangster, A. L. 03454  
 Superior province, potential: Wilson, H. D. Bruce. 03568

*Pennsylvania*

- Mines and occurrences, atlas: Rosé, Arthur W. 08319

*Quebec*

- Labrador Trough, occurrence: Dugas, J. 09620  
 Superior province, potential: Wilson, H. D. Bruce. 03568

*Reserves*

- Estimation problems, economics: Lovering, T. S. 09473

*South Dakota*

- Galena-Roubax district, exploration: Bayley, R. W. 01363

*United States*

- Chihuahua tectonic belt, possibilities: McAnulty, W. N., Sr. 05920

*Utah*

- Deep Creek Mountains, geochemical survey: Thomson, Kenneth Clair. 07952  
 Gold Hill district, occurrence: El-Shatoury, H. M. 02746

**Metamorphic rocks***Alkalic*

- Genesis, metasomatic potash feldspar rocks, carbonatite association: Heinrich, E. William. 06116

*Amphibolite*

- Absolute age, tectonic mixing, evidence, Oregon, California: Lanphere, Marvin A. 09636

- General description, pre-Triassic intrusion, S. Carolina: Griffin, Villard S., Jr. 06715

- Genesis, geochemistry, analyses, Greenland, southwestern: Kalsbeek, Feiko. 08355

- Geochemistry, mineral composition, igneous origin, British Columbia: Preto, V. A. G. 00559

*Blueschist*

- General description, California, cf. Japan, Sanbagawa terrane: Ernst, W. G. 05079

- Genesis, at continental margins, Franciscan Fm., Calif.: Gresens, Randall L. 00039

- Geochemistry, inclusions, element distribution, tectonics: Ernst, W. G. 05894

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Absolute age, tectonic mixing, evidence, Oregon, California: Lanphere, Marvin A. 09636

**Classification**

Quebec, Precambrian green rock, ambiguous term: Katz, Michael B. 05292

**Composition**

Ontario, Bancroft-Madoc area, Grenville province, minerals, field trip guidebook: Institute on Lake Superior Geology. 09508

**Eclogite**

Genesis, amphibole compositions, significance: Mottana, A. 03710

Genesis, Arizona, diatremes: Essene, Eric. 06971

Geochemistry, chemical variations: Chen, Juchin. 01746

**General**

Absolute age, Juneau Ice Field area, Alaska: Forbes, Robert B. 10202

Absolute age, Mexico, Baja California: Estavillo, William. 00262

Absolute age, Ontario, Chibougamau-Surprise Lake area: Krogh, T. E. 02248

Absolute age, Quebec, Chibougamau-Surprise Lake area: Krogh, T. E. 01614

Absolute age, Saskatchewan, Tazin Lake region: Koster, F. 08063

Alteration, Greenland, Scoresby Sund area, Caledonian complex: Henriksen, Niels. 06253

Alteration, regional metamorphism, British Columbia, Prince Rupert region: Hutchison, W. W. 07744

General description, allochthonous assemblage, Caribbean boundary area: Nagle, Frederick. 09689

General description, California, Mojave Desert region: Dibblee, T. W., Jr. 04806

General description, California, Transverse Ranges: Dibblee, T. W., Jr. 00452

General description, Manitoba, Lake St. Martin crater structure: McCabe, H. R. 10261

General description, Maryland, eastern Piedmont, guidebook: Pennsylvania Geologists. 05826

General description, Massachusetts, western, Russell Mountain Fm.: Hatch, N. L., Jr. 04029

General description, Minnesota, Gabbro Lake quadrangle: Green, John C. 07605

General description, New Jersey, Franklin, Hamburg quadrangles: Baker, Donald R. 05451

General description, Ontario, Precambrian groups, Lake Huron shore: Stonehouse, Harold B. 11259

General description, Texas, Purdy Hill quadrangle: Mutis-Duplat, Emilio. 00915

General description, Washington, Okanogan area: Menzer, Fred J., Jr. 03403

Geochemistry, mineralogy, analytical data, California: Bateman, Paul C. 04014

Lithologic assemblages, Great Lakes region, Precambrian, structural provinces: Stonehouse, Harold B. 11257

Petrology, Connecticut, Waterbury-Thomaston quadrangles: Gates, Robert M. 10676

Petrology, correlation, California, Salinian block: Wiebe, Robert A. 02377

Petrology, Grandfather Mtn. window, vicinity, N.C.-Tenn.: Bryant, Bruce. 08176

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Petrology, Massachusetts, Wachusett-Marlbrough Tunnel: Abu-moustafa, Adel A. 00440

Petrology, Montana, Beartooth Mts., Hellroaring Lakes area: Rowan, Lawrence C. 01176

Physical properties, effective stress law, tests: Ladanyi, B. 00826

Structural features, British Columbia, Shuswap Lake area: Fyson, W. K. 03015

Structural features, interpretation, Mexico, Oaxaca: Kesler, Stephen E. 03782

Structural features, May Creek Schist, Klamath Mountains, Oregon: Kays, M. Allan. 04457

Structural features, New Brunswick, McKendrick Lake area: Anderson, F. D. 06309

Structural features, paracrystalline microboudinage, Washington: Misch, Peter. 03784

Structural features, Pennsylvania, Bryn Mawr area: Keppie, J. Duncan. 00439

Structural features, Pennsylvania, Wissahickon Fm.: Amenta, Roddy V. 00136

Structural features, Saskatchewan, Lac La Ronge region: Padgham, William Albert. 06877

Structural features, Wyoming, Laramie Mts., Precambrian: Woodfill, Robert D. 07461

Textures, Virginia, Goode quadrangle: Khoury, S. G. 00163

Uniqueness versus conformity in petrogenesis: Turner, Francis J. 05933

**Geochemistry**

Carbohydrate residues, taxonomic interpretation: Swain, F. M. 04095

Mg-Fe partitioning, garnet, biotite, New Hampshire: Lyons, J. B. 03176

Oxygen isotopes, metasediments, Vermont: Schwarcz, H. P. 04650

Plagioclase, subsolidus phase relations: Crawford, Maria Luisa. 06940

Pyroxene, Fe-Mg order-disorder: Virgo, David. 03175

Vermont, Ontario, isotope fractionation, calcite, dolomite: Sheppard, Simon M. F. 03831

**Gneiss**

Absolute age, Minnesota, oldest in N.A.: Goldich, S. S. 05965

Absolute age, New York, Adirondack Mts., domes: Bickford, M. E. 06062

Absolute age, Ontario, Georgian Bay, French River areas: Krogh, T. E. 02246

Alteration, thermal, cordierite-garnet-biotite to hornblende-hornfels: Gable, D. J. 05858

Composition, Quebec, Labrieville area, Precambrian groups, age relations: Morin, Marcel. 09361

General description, British Columbia, southeastern, Shuswap complex: Reesor, J. E. 03276

General description, Greenland, Agto-Nordre Stromfjord region: Bondesen, E. 06244

General description, Greenland Tasiussaq area: Dawes, Peter R. 08354

Geochemistry, genesis, from dacitic volcanics or greywackes: Chesworth, Ward. 08269

Petrology, Alaska, Mentasta Mts., corundum-bearing: Richter, Donald H. 04249

Petrology, compositional layering, thickness distribution: Katz, Michael B. 03709

Petrology, New Jersey, Reading Prong: Young, Davis Alan. 07072

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- Structural features, British Columbia, Frenchman's Cap dome: Fyles, James T. 03279
- Structural features, British Columbia, Frenchman's Cap dome: McMillan, W. J. 03280
- Structural features, hornblende lineations, Saskatchewan: Schwerdtner, W. M. 07751
- Structural features, Precambrian, Wyoming, Sheephead Mountain anticline: Banks, Carl E. 10257

*Granulite*

- Absolute age, Kansas, Stockdale kimberlite, xenoliths, Rb-Sr: Brookins, Douglas G. 06555
- Geochemistry, genesis, pyroxene-bearing terranes, Sr-87: Sr-86: Spooner, C. M. 04626
- Mineral composition, Quebec, Mont Tremblant Park: Katz, M. B. 03501

*Greenschist*

- Geochemistry, mineral assemblages, zeolite paragenesis, geothermal gradients: Albee, Arden L. 10998
- Physical properties, elasticity, crustal studies: Christensen, Nikolas I. 00565

*Iron formation*

- General description, New Mexico: McLeroy, Donald F. 04412
- Mineral composition: Hoffman, David J. 04283

*Lapis Lazuli*

- Petrology, Northwest Territories, Baffin Island: Hogarth, David D. 07023

*Marble*

- Geochemistry, Sr-isotope ratios: Gittins, J. 03435
- Physical properties, brittle creep under uniaxial compression: Cruden, D. M. 03694
- Physical properties, failure under compression, experimental: Wawersik, W. R. 05595

*Meta-anorthosite*

- Petrology, New York, Ausable Forks-Lake Placid quadrangles, Jay-Whiteface nappe: VanDiver, Bradford B. 09037

*Metabasalt*

- Geochemistry, oceanic crust, boron: Thompson, Geoffrey. 02025

*Metaconglomerate*

- Mineralogy, relation to underlying granite, Ontario: Smith, Bennett L. 10850

*Metagabbro*

- Absolute age, Kansas, Stockdale kimberlite, xenoliths, Rb-Sr: Brookins, Douglas G. 06555
- Petrology, Mecklenburg Complex, North Carolina, mafic silicates: Hermes, O. Don. 00028

*Metigneous*

- Structural features, New Brunswick, Tetagouche Group: Helmstaedt, H. 07809

*Metallic ores*

- Deformed crystals, interpretation: Stanton, R. L. 04312
- New York, Benson Mines: Palmer, Donald F. 03481

*Metasediments*

- Absolute age, Ontario, Gunflint Fm.: Misra, A. 01181
- Alteration, South Carolina, Tamassee, Satolah, Cashiers quadrangles: Roper, Paul J. 06433
- General description, Brevard-Poor Mtn. area, South Carolina: Hatcher, Robert D., Jr. 00570
- General description, Chuacús Group, western, Guatemala: Kesler, Stephen E. 05192

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- General description, Connecticut, Torrington quadrangle: Martin, Charles W. 06218
- General description, Greenland, Agto-Nordre Stromfjord region: Bondesen, E. 06244
- General description, Saskatchewan, Compulsion River fold belt: Karup, Moller, S. 09859
- Geochemistry, Si-Al-Fe ratios trend, parent-rock type: Moore, Bruce R. 08549
- Structural features, Michigan, Menominee Group: Powell, C. McA. 06490
- Structural features, slaty cleavage, Colorado: Braddock, William A. 00202

*Metavolcanics*

- General description, Connecticut, Torrington quadrangle: Martin, Charles W. 06218
- General description, Maryland, Cecil-Harford Counties: Higgins, Michael W. 05828
- General description, Ontario, Lake Superior Provincial Park: Ayres, Lorne Dale. 06596
- Geochemistry, Sr isotopes, calcite, Lake Superior region: Brooks, C. 01616
- Geochemistry, Sr isotopes, Ontario, cf. modern volcanics: Brooks, C. 01618
- Geochemistry, trace elements, Precambrian, cf. modern volcanics: Hart, S. R. 01620
- Ore deposits, deformation, root severance, tectonic transport: Jenks, William F. 06483

*Methods*

- Absolute age, K-Ar, K-40 loss, graphic solutions: Harper, Christopher T. 03918
- Zircon morphology, computer analysis: Hedberg, Marion R. 02201

*Migmatite*

- Genesis, Washington, Skagit Gneiss: Babcock, Randall Scott. 00594
- Petrology, mineral composition, Greenland, southwestern: Kalsbeek, Feiko. 02478

*Mineral assemblages*

- Alaska, Seward Peninsula, blueschist facies rocks: Sainsbury, C. L. 01464
- British Columbia, Horsethief Creek Fm., P-T conditions: Jones, J. W. 00755
- California, Diablo Range, Franciscan rocks: Raymond, Loren A. 00341
- California, Sierra Nevada batholith, contact metamorphic: Kerrick, D. M. 05648
- California, Whipple Mountain thrust, mylonites: Terry, Ann. 00379
- California, White Mountains, andalusite deposits, quartzite and schist, geochemistry, paragenesis: Gross, Eugene B. 09131
- Connecticut, micaceous limestone: Hewitt, David A. 07021
- Kansas, Stockdale kimberlite, pyroxenite granulite nodule: Brookins, Douglas G. 06556
- Manitoba, Leftbrook Lake area, Precambrian units: Bristol, C. C. 07819
- Manitoba, Thompson nickel-copper mine, K-Ar ages, sulfide ores, paragenesis: Quirk, Terence T., Jr. 09606
- Matrix analysis, isogradic reaction products: Carmichael, Dugald M. 01865
- New Mexico, Santa Rita copper stock area: Nielsen, Richard L. 08682
- New Mexico, Tres Hermanas Mts.: Homme, Frank C. 08656
- North Carolina, South Carolina, Piedmont, layered gneiss, genesis: Hadley, Jarvis B. 00708
- Nova Scotia, Cape Breton, George River series: Milligan, G. C. 10900

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- Oregon, Klamath Mountains, May Creek Schist, zonation: Kays, M. Allan. 04457  
 Quebec, Clermont township, Precambrian: Thibault, Camille. 07632  
 Quebec, Noranda region, dalmatianite, contact: Machairas, G. 10983  
 Saskatchewan, Dufferin Lake area, Precambrian units: Wallis, R. H. 04972

*Mineral facies*

- Alaska, Annette Island: Berg, Henry C. 00227  
 Alaska, Cosmos Hills area, Devonian-Cretaceous, anticlinal window: Fritts, Crawford E. 07159  
 British Columbia, Thor-Odin area, gneiss dome, P-T conditions: Froese, E. 08079  
 California, Franciscan rocks, P-T conditions: Suppe, John Edward. 01238  
 Element distribution coefficients, variations, nonpredicted, Ontario: Kwak, Teunis A. P. 03830  
 Gradation in grade under high carbon dioxide: water ratios: Liou, J. G. 05583  
 Greenland, Agto area, structural complexes, chronology: Sorensen, Kai. 03516  
 Greenland, Nanortalik-Tasermit region, Kettlidian rocks: Allaart, J. H. 06252  
 Greenland, Nordre Stromfjord region, marble and calc-silicates: Sorensen, P. Brogger. 06245  
 Greenland, Peary Land, Cambrian-Silurian folded zone: Dawes, Peter R. 06242  
 Greenland, Sondre Stromfjord area, gneisses: Escher, A. 06763  
 Greenschist, stilpnomelane, phase relations: Brown, Edwin H. 06159  
 Incipient, recognition in mudrock, state of organic matter: Baker, Donald R. 01126  
 Maine, northern, prehnite-pumpellyite facies metamorphisms: Coombs, D. S. 00848  
 Manitoba, southeastern, tectonic variation model: Ermanovics, I. F. 06477  
 Michigan, Marquette Iron Range, iron formations: Gair, Jacob E. 05647  
 Michigan, Marquette Iron Range, Precambrian units: Boyum, Burton H. 04966  
 Michigan, northern, Portage Lake Lava Series: Jolly, Wayne T. 10726  
 Minnesota, Rainy Lake-Lake of the Woods greenstone belt: Ojakangas, Richard W. 06488  
 New Mexico, southwestern, Precambrian: Woodward, Lee A. 08648  
 Ontario, Kirkland-Larder Lakes area, volcano-sedimentary complex: Ridler, R. H. 06492  
 Ontario, Whetstone Lake area, isograds: Carmichael, Dugald M. 01453  
 Oregon, Greyback intrusive complex, contact aureole: Godchaux, Martha Miller. 01229  
 Phase equilibria, statistical study, charnockite, iron formation: Saxena, Surendra Kumar. 03724  
 Pyroxenes, blueschist, California: Coleman, R. G. 05895  
 Quebec, Kegashka area, Precambrian basement: Bassaget, Jean-Pierre. 08435  
 Quebec, Lac a la Croix area, Precambrian complexes: Chown, E. H. 08469  
 Quebec, Lake Lagace area, Precambrian formations: Charre, Roger. 08434  
 Quebec, Obalski Township, Precambrian units: Duquette, Gilles. 06757

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- Relation to thermoluminescence: McDougall, David J. 03131  
 Saskatchewan, Dufferin Lake area, Precambrian units: Wallis, R. H. 04972  
 Tennessee-North Carolina, Blue Ridge province: Carpenter, Robert Heron. 00753  
 Washington, Olympic Peninsula, zeolite-facies: Stewart, Richard J. 00371

*Mylonite*

- Petrology, paragenesis, California, southern: Theodore, Ted G. 00436

*Pelitic*

- Geochemistry, New Hampshire, element fractionation: Minard, Lane Hall. 07936

*Physical properties*

- Electrical conductivity, dielectric constant tensors: Hill, Donald Gardner. 06615  
 Northwest Territories, Queen Elizabeth Islands, density: Sobczak, L. W. 02179

*Quartzite*

- Deformation, plastic-flow mechanisms, Appalachians: Elliott, David. 07649  
 Elastic properties, dynamic moduli under pressure: Schock, R. N. 07903  
 Orientation distribution function symmetry, X-ray pole-figure goniometer: Baker, David W. 04049

*Schist*

- Geochemistry, Na<sub>2</sub>O, Caledonian-Appalachian orogen, evaporite source: de Wit, M. J. 04075  
 Geochemistry, New Mexico, Las Tablas area, trace elements: Stensrud, Howard L. 00647  
 Geochemistry, pelitic, chloritoid-staurolite reaction relations: Albee, Arden L. 06040  
 Mineral assemblages, biotite zone, Horsethief Creek Fm., British Columbia: Ghent, E. D. 06786  
 Petrology, Ontario, Rainy River area, Seine conglomerate: Hsu, Mao-Yang. 06481  
 Petrology, Quebec, Lac McGillivray region: Pourret, G. 08562

*Serpentinite*

- General description, associated rocks, Caribbean boundary area: Nagle, Frederick. 09689  
 General description, flows, shear strength, California, Joaquin Ridge: Cowan, Darrel S. 04452  
 Genesis, at continental margins, relation to blueschists: Gresens, Randall L. 00039  
 Geochemistry, oceanic crust, boron: Thompson, Geoffrey. 02025  
 Geochemistry, petrology, Cuba, central and eastern massifs: Kudelasek, Vladimir. 04537

*Slate*

- Physical properties, strength-deformation behavior, experimental: Yang, Jung Hsi. 07466

*Tectonite*

- Textures, deformation at low temperatures: Stauffer, Mel R. 07716

*Textbooks*

- Lithology, processes, petrography: Jackson, Kern C. 04021

*Textures*

- Shape, surface area, packing of grains, quantification, evaluation: Vogel, Thomas A. 10286

**Metamorphism***Contact*

- Ca-Fe-Si skarn, wollastonite effect on Cu-Zn mineralogy: Austria, B. S. 10597  
 Calcareous rocks, New Mexico, Santa Rita copper district: Nielsen, Richard L. 08682

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- Canada, Grenville Limestone, "Eozoon": O'Brien, Charles F. 06552  
 Idocrase, phase relations: Ito, Jun. 06580  
 Mineral assemblages, Sierra Nevada batholith, California: Kerrick, D. M. 05648  
 Ontario, Cutler area, contact aureole: Cannon, William F. 00034  
 Thrust faults, temperatures: Pierce, William H. 00025  
 Zoning, New Mexico, Tres Hermanas Mts.: Homme, Frank C. 08656

*Dynamic*

- Analysis, use of rotated garnets: Rosenfeld, John L. 04236

- Deformation, sulfides: Gill, J. E. 05638

*Experimental studies*

- Calcite crystal aggregates, deformation mechanism: Paterson, M. S. 05930  
 Franciscan rocks, jadeite-aragonite-bearing rocks, genesis: Brace, William F. 00870  
 Franciscan rocks, tectonic overpressure, strength, California: Brace, William F. 01409  
 Muscovite stability: Eugster, H. P. 03553  
 Rb, Sr, Na in biotite, equilibrium, diffusion kinetics: Hofmann, Albrecht Werner. 06872  
 Recrystallization, quartz aggregates, preferred orientation: Green, H. W., 2d. 06759  
 Shale, graywacke, anatexis: Kilinc, Ishak Atilla. 06601  
 Siliceous dolomites, products: Gordon, T. M. 00966  
 Zeolite facies, mineral assemblages, paragenesis,  $\text{CO}_2$  and  $\text{H}_2\text{O}$  chemical potentials: Albee, Arden L. 10998  
 Zeolites, stability relations: Liou, Juhn-Guang. 07586

*Grade*

- Blueschist, pyroxene facies: Coleman, R. G. 05895  
 Coal, vitrinite reflectance as indicator: Thompson, R. R. 10277  
 Greenschist facies, oceanic crust, possibilities in layer 3: Christensen, Nikolas I. 00565  
 Indicators, phytoclasts, California: Bostick, Neely H. 06158  
 Isograds, Ontario, Whetstone Lake area: Carmichael, Dugald M. 01453  
 Low, amphiboles, heat-treated, cation ordering and dehydrogenation: Ernst, W. G. 09088  
 Prehnite-pumpellyite facies, Maine, northern: Coombs, D. S. 00848  
 Relation to sulfide mineral grain size, strata-bound ores: Tempelman-Kluit, Dirk J. 08149  
 Zeolite facies, progressive dehydration: Miyashiro, Akiho. 03714

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- Massachusetts, Orange area, kyanite and sillimanite zone mica schists: Hall, David Joseph. 09379

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- Effects on organic matter in mudrock: Baker, Donald R. 01126

*Migration of elements*

- Granitic dikes-contact zones, diffusion patterns: Lifshin, Arthur. 06602  
 Ionic equilibria, applications: Fisher, George W. 01761  
 Iron, folds: Hoffman, David J. 04869  
 Mineral deposits, genesis: Mookherjee, Asoke. 05123  
 Trace elements, sulfides, Canada, Appalachians: Dastidar, Priyabrata Ghosh. 00542

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- Connecticut, Wepawaug Fm., micaceous limestones: Hewitt, David Allyn. 07925  
 Sillimanite zone, transition, lower to upper, Maine: Guidotti, Charles V. 04348

*P-T conditions*

- Biotite zone assemblage, British Columbia, Horstshief Creek Fm.: Ghent, E. D. 06786  
 California, Franciscan melange: Ernst, W. G. 10996  
 Mylonitization, California, southern: Theodore, Ted G. 00436  
 Pennsylvania Anthracite region, underclays: Hosterman, John W. 04248  
 Quartz-almandine, sillimanite-almandine pairs, piezothermometry: Adams, Herbert G. 06038  
 Quenching conditions, variations, gneiss dome, British Columbia: Froese, E. 08079  
 Sedimentary rocks, vitrinite reflectance measurements: Castano, John R. 06090  
 Zeolite facies, mineral assemblages, paragenesis,  $\text{CO}_2$  and  $\text{H}_2\text{O}$  chemical potentials: Albee, Arden L. 10998

*Regional*

- Blueschists, California, cf. Japan, Sanbagawa terrane: Ernst, W. G. 05079  
 British Columbia, Kootenay arc: Fyles, James T. 04912  
 California, northern, relation to low-angle faulting in Franciscan tectonics: Suppe, John. 10336  
 Idaho, Elk City, augen-gneiss intrusive complex, Belt Supergroup: Reid, R. R. 00568  
 Kink bands in biotite, geometry: Horz, Friedrich. 00657  
 Massive sulfide deposits, time relations, criteria: Mookherjee, Asoke. 05129  
 Minnesota, northeastern, field trip, teacher's guide: Green, John. 03581  
 North Carolina-Tennessee, Grandfather Mtn. window, vicinity: Bryant, Bruce. 08176  
 Ontario, Rainy River area, Archean, Seine conglomerate: Hsu, Mao-Yang. 06481  
 Oregon, Klamath Mts., May Creek Schist: Kays, M. Allan. 04457  
 Paleozoic rocks, Nevada, Grant Range, central: Hyde, Jack H. 01129  
 Precambrian, Greenland, west-central, chronology: Sorensen, Kai. 03516  
 Quebec, Gatineau Park, southern: Hogarth, D. D. 04941  
 South Carolina, Greenwood County, Charlotte and Kings Mtn. belts: McSween, Harry Y., Jr. 04428  
 Sulfide mineralization, haloes as guide, Nova Scotia: Milligan, G. C. 04606

*Retrograde*

- Gneiss, Greenland, Sondre Stromfjord area: Escher, A. 06763

*Shock*

- Manitoba, Lake St. Martin cryptoexplosion structure: McCabe, H. R. 10261  
 Manitoba, West Hawk Lake, cataclasis, meteor impact: Short, Nicholas M. 01166  
 Quartzite, nuclear event: Short, Nicholas M. 05787

*Theoretical studies*

- Anatexis, trace-element fractionation: Shaw, Denis M. 00480

*Thermal*

- Gneiss, cordierite-garnet-biotite to hornblende-hornfels: Gable, D. J. 05858



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- Assimilation, Texas, Marble Canyon igneous complex: Kuehn, Jack. 00485
- Coal, Canada, Atlantic provinces: Hacquebard, P. A. 08133
- Precambrian, Greenland, Scoresby Sund area, Caledonian complex: Henriksen, Niels. 06253
- Precambrian sequence, Saskatchewan, Dufferin Lake area: Wallis, R. H. 04972

**Metasomatism****Crystalline rocks**

- Precambrian basement, Hudsonian orogeny: Burwash, R. A. 08143

**Potash-feldspar rocks**

- Carbonatite complexes: Heinrich, E. William. 06116

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Chihuahua, southern, Paleozoic history: Bridges,  
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Nuevo Leon, Hidalgo Canyon, La Popa Valley,  
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Society. 09889

Nuevo Leon, La Popa area: Wolleben, James A.  
09893

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Midland County, mammoth tooth: Kapp, Ronald O. 08350

Precambrian, Southern Peninsula, Michigan basin rocks, structural provinces: Hinze, William J. 10946

*Areal geology*

Iron River-Crystal Falls area: James, H. L. 02780

Marquette area, Precambrian terrane: Stonehouse, Harold B. 08303

Marquette Iron Range, Marquette to Lake Michigan, guidebook: Gair, Jacob E. 05647

Monroe County: Mozola, Andrew J. 06396

Northern, central, southern, guidebook: Michigan Basin Geol. Society. 08688

Textbook, general: Dorr, John A., Jr. 02113

*Economic geology*

Clays, deposits, uses: Sorensen, Harry O. 07610

Construction material, slag: Segall, R. Thomas. 07528

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- Copper, White Pine deposit, genesis, paleohydrologic model: White, Walter S. 10304
- Copper, White Pine, genesis: Brown, Alexander C. 03483
- Gypsum, Lower Peninsula: Briggs, Louis I. 07524
- Iron, Crystal Falls area, Riverton Iron-formation: Pettijohn, F. J. 04325
- Iron, Marquette area, Empire mine, Negaunee Iron Fm.: Sliter, T. Wentworth. 08304
- Iron, Marquette Range, Precambrian, occurrence, genesis: Boyum, Burton H. 04966
- Petroleum, Boyd-Peters field, exploration tools: Ferris, Craig. 09374
- Petroleum, exploration, Michigan basin: Burgess, R. J. 01279
- Petroleum, natural gas, northern, new discovery: Ellis, Garland D. 00059
- Petroleum, natural gas, northern, Niagaran reef belt: Mantek, William. 07129
- Potash, Kent County, exploration drilling: Anderson, Raymond J. 07520
- Potash, Michigan basin, genesis: Matthews, R. David. 01082
- Potash, Midland area, Salina Group: Matthews, R. David. 07603
- Potash, Midland area, Salina salt: Anderson, Raymond J. 07519

*Engineering geology*

- Materials, properties, gravel, southern: Wingard, Norman Edward. 06014
- Michigan area, cores, mechanical properties: Crisp, R. W. 10235
- Pembine area, cores, mechanical properties: Crisp, R. W. 10225
- Rock mechanics, White Pine copper mine: Parker, Jack. 02573
- Salt solution collapse, Salina rocks, bulking: Jaron, Michael G. 04582
- Soils, Sault Ste. Marie clay, frozen, creep-stress relations: Akil, W. 02447

*General*

- Department State Highways, soil classification: Michigan Dept. State Highways. 05275
- Geologic map index, 1843-1962: Kirkby, Edward A. 06531
- Information and retrieval system, Michigan Univ.: Briggs, Darinka Zigic. 03062
- Michigan University, open-scheduled laboratory teaching: Smith, Charles I. 01104
- Willow Run Laboratories, remote-sensing studies, 1969: Holter, M. R. 08082

*Geochemistry*

- Grand River basin, Saginaw Fm., ground water: Wood, Warren W. 07592
- Salina Group: Kramer, J. R. 02644
- Soils, cation exchange capacities, variations. Pailoor, Govind. 07262

*Geomorphology*

- Au Sable, Saginaw drainage basins, hierarchical anomaly: Szucs, F. K. 01106
- Glacial Grand Valley, related features: Eschman, Donald F. 08302
- Grand Valley, gradient, alluvial surfaces: Ferland, William R. 06975
- Lake Michigan, southeastern shore, beach dynamics: Davis, Richard A., Jr. 01068
- Lower Peninsula, drainage systems, organization: Folsom, Michael M. 02749
- Pine River, sediment transport, pool and riffle stream: Hansen, Edward E. 08468

**Michigan—Continued***Geomorphology—Continued*

- River Rouge basin, physiographic data, selected streams: Knutilla, R. L. 08289
- Southern, erosion rates: Davis, Margaret B. 06947

*Geophysical surveys*

- Crystal Falls area, magnetic, iron mine areas: Pettijohn, F. J. 04325
- Eskers, adjacent till plains, magnetic: Onesti, Lawrence J. 05320
- Iron River-Crystal Falls area, magnetic: James, H. L. 02780
- Kalamazoo County, bedrock topography, gravity: Ibrahim, Abdelwahid. 01076
- Lake Superior floor near Freda, sonar: Berkson, J. M. 06472
- Southern Peninsula, Michigan basin, gravity configurations, magnetic depths: Hinze, William J. 10946
- Upper Peninsula, western, aeromagnetic, interpretation: Meshref, W. M. 07185

*Glacial geology*

- Eskers, till plains, mapping, magnetic survey as tool: Onesti, Lawrence J. 05320
- Grand Rapids region, Glacial Grand Valley history: Eschman, Donald F. 08302
- Lake Michigan lobe, Valdres drift border, revision: Farrand, William R. 01183

*Hydrogeology*

- Ann Arbor, ground-water pollution, salt from deicing: Judd, John H. 05891
- Black River basin, ground-water resources: Knutilla, R. L. 04342
- Keweenaw Peninsula, ground-water resources: Doonan, C. J. 07106

*Maps, geologic*

- Crystal Falls area, iron mine areas, magnetic data: Pettijohn, F. J. 04325
- Iron River-Crystal Falls area: James, H. L. 02780
- Marquette area: Stonehouse, Harold B. 08303
- Monroe County: Mozola, Andrew J. 06396
- Upper Peninsula, western, bedrock: Meshref, W. M. 07185

*Maps, ground water*

- Black River basin: Knutilla, R. L. 04342

*Maps, hydrogeologic*

- Keweenaw Peninsula: Doonan, C. J. 07106

*Maps, magnetic*

- Iron River-Crystal Falls area: James, H. L. 02780
- Menominee-Northland area, airborne: U.S. Geological Survey. 03875
- Upper Peninsula, western: Meshref, W. M. 07185

*Maps, water resources*

- River Rouge basin: Knutilla, R. L. 08289

*Paleoclimatology*

- Pleistocene-Holocene, upper, chronology: Black, Robert F. 10147

*Paleontology*

- Anthozoa, Devonian, Traverse Group, *Hexagonaria*: Stumm, Erwin C. 07872
- Conodonts, Silurian, Lower, northern, n.gen., n.spp., zonation: Pollock, Charles A. 03541
- Graptolithina, Ordovician, Rapid City area, Eden age: Berry, William B. N. 01207
- Invertebrata, Devonian, Presque Isle Counties, assemblages, field trip: Ehlers, George M. 08306
- Mammalia, Pleistocene, pre-Late Wisconsin interstadial, Midland County: Kapp, Ronald O. 08350

**Michigan—Continued***Paliontology—Continued*

Ostracoda, Silurian, Middle, leperditid zone fossil: Copeland, M. J. 05547

*Petrology*

Michigan area, cores, physical properties: Crisp, R. W. 10235  
 Negaunee area, Siamo Slate, clastic dikes: Janke, N. C. 04892  
 Negaunee area, Siamo Slate, clastic dikes: Powell, C. McA. 04891  
 Northern, Portage Lake Lava Series, mineral facies: Jolly, Wayne T. 10726  
 Pembine area, cores, physical properties: Crisp, R. W. 10225

*Sedimentary petrology*

Clinton County, Pleistocene terraces, soils: Al-Agidi, Waleed Khalid Hassan. 07260  
 Ferromanganese nodules, lakes, electron probe, X-ray studies: Bowser, Carl J. 06070  
 Lake Saint Clair, delta sediments, variability index: Mandelbaum, Hugo. 01662  
 Lansing area, drift, contorted beds, origin, founding: McArthur, David S. 07958  
 Lower peninsula, outwash soils, texture bands, tree growth: Hannah, Peter R. 02544  
 Lower Peninsula, Traverse Group, back-reef carbonates: Roche, J. E. 06908  
 Michigan basin, Paleozoic sedimentary environments, structural controls: Prouty, C. E. 01098  
 Michigan basin, Silurian salt, cycles: Kunasz, Ihor A. 04566  
 Southeastern, Silurian reef, lithofacies, reservoir properties: Gill, Dan. 02620  
 Southern, gravel: Wingard, Norman Edward. 06014  
 Southern peninsula, glacial drift, lithofacies: Wingard, Norman E. 01112  
 Southern Peninsula, Traverse Group, carbonates: Roche, James Edward. 06608  
 St. Clair River delta, sediments, depositional environment: Pezzetta, J. M.-09714

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Devonian, Alpena-Presque Isle Counties, field trip: Ehlers, George M. 08306  
 Devonian, Traverse Group, Lower Peninsula, microfacies: Roche, J. E. 06908  
 Michigan basin, Bedford, Berea, Sunbury fms., correlation: deWitt, Wallace, Jr. 00131  
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 Precambrian, Marquette area, metasediments, intrusives: Stonehouse, Harold B. 08303  
 Precambrian, Marquette Range Supergroup, new name: Cannon, W. F. 04464  
 Precambrian, Michigan basin, peripheral outcrops, structural provinces: Stonehouse, Harold B. 11257  
 Precambrian, Negaunee Iron-Formation, Negaunee area, sills: Gair, J. E. 04692  
 Precambrian, Upper Peninsula, western: Meshref, W. M. 07185  
 Silurian, Michigan basin: Burgess, R. J. 01279

*Structural geology*

Baraga area, Limestone Mtn. complex, syncline not astrobloeme: Read, W. F. 06491  
 Lansing area, contorted beds, Pleistocene, origin, founding: McArthur, David S. 07958  
 Marquette Synclinorium, Menominee Group, deformation: Powell, C. McA. 06490  
 Michigan basin, development, folds and faults, Paleozoic, trends, framing elements: Ellis, Garland D. 11243

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 Upper Peninsula, western, synclines, faults, folds: Meshref, W. M. 07185

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California, Pliocene-Pleistocene boundary markers: Bandy, Orville L. 04874  
 Panama, eastern, paleobathymetric assemblages: Bandy, Orville L. 04959

*Cretaceous*

Alberta, in coprolites, Oldman Fm.: Waldman, M. 08195  
 Maestrichtian provinces, nannofossil restriction: Worsley, T. 01354  
 Mexico, Maestrichtian: Bonet, F. 07789  
 Texas, Cenomanian to Maestrichtian, Gulf Coastal Plain: Powell, J. Dan. 06152  
 Texas, Gulf Coastal Plain, Interamerican Colloquium guidebook: Powell, J. Dan. 06030  
 Utah, Mancos Shale, Tununk Member: Lessard, Robert Henry. 07278

*Education*

Teaching, course planning suggestions: Kesling, Robert V. 08502

*Evolution*

Marine microplankton, extinctions, radiations, temperatures: Lipps, Jere H. 03664

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Marine sediments, pre-Quaternary biostratigraphy, review: Saito, Tsunemasa. 09989

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 Phosphatic fossils, finding in residue, ammonium molybdate: Schopf, Thomas J. M. 00555  
 Radiography, black shale: Peters, Walter G. 01096

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 Greenland, Eocambrian? dolomite, Peary Land: Pedersen, K. Raunsgaard. 06243

*Preparations*

Microfauna in marine sediments, in-place staining, sectioning: Frankel, Larry. 02098  
 Microvertebrates, recovery with acetic acid, field, laboratory: Green, Morton. 10874  
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Cuba, Cayo Chico de Moa, Holocene sediments, assemblages: Naprstek, Vladimir. 09618

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Mineral-grain surfaces, nearshore studies: Warnke, Detlef A. 10519

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Microscope attachment, interference contrast, siliceous skeletons: Ling, Hsin-Yi. 03650

Orienting stage, plexiglass: Barnett, Stockton G. 05863

Stromatoporoidea, structure, reflected light: Birkhead, Paul K. 06758

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Dolomite ghosts, peels under crossed nicols: Braun, Moshe. 01660

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Endolithic algae and fungi, epoxy embedding-casting method: Golubic, Stjepko. 03872

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Thin sections, carbonate rocks, organic matter staining: Smith, M. H. 08555

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Spectral elements in common with earthquake waves, Washington: Bostrom, R. C. 09870

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Geologic mapping, radiometry, field and laboratory studies: Edgerton, A. T. 09623

**Microwave surveys***California*

Mount Lassen, ground-truth: sensor correlation: Chapman, Peter. 07793

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Vitrinite reflectance, indicator of coal metamorphism: Thompson, R. R. 10277

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Minerals, small quantities, mounting, polishing: Jedwab, Jacques. 06518

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Deformed crystals, interpretation: Stanton, R. L. 04312

Sulfides, Ontario: Mookherjee, Asoke. 04901

**Mineral collecting***Arizona*

Localities, compilation: Galbraith, Frederic W. 06766

*Florida*

Tampa area, chalcedony geodes, silicified corals: Wollin, Jay C. 07092

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Preservation of localities, mines and quarries: Arem, Joel E. 04142

*Guides*

General: Sinkankas, John. 04552

Popular account: Tanner, Hans. 04496

Rocks and minerals, Quebec-Ontario: Sabina, Ann P. 03049

*New England*

Early collections, history: Frondel, Clifford. 02747

*New Hampshire*

Grafton area, Ruggles mica mine, mineral variety: Brady, Philip. 03914

*Ontario*

Bancroft-Madoc area, guidebook, descriptions, old mines and quarry locations: Institute on Lake Superior Geology. 09508

*Pennsylvania*

Localities: Gregory, Gardiner E. 03868

*United States*

Southeastern, gem and mineral localities, with index maps: Willman, Leon D. 08437

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Structure, Greenland, related to sapphirine:  
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*Akermanite*

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*Alleghanyite*

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san, Farkhonda. 07844

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*Antigorite*

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Crystal chemistry, halide sites, empty, lead ions:  
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Phosphoria Fm., CO<sub>2</sub> content, regional facies,  
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Structure, carbonate as part, isotope study:  
Kolodny, Yehoshua. 05658

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03174

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Recrystallization to calcite, amino acids effects:  
Allen, R. J. 04421

Structure, refinement: deVilliers, Johan Pieter  
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Transformation to calcite, kinetics of solid-solid  
reaction: Kunzler, R. H. 04737

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Transformation rates, parameters: Kunzler,  
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*Beraunite*

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*Brucite*

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*Bultfonteinite*

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*Calaverite*

Gold content, electron probe and optical data: Stumpff, E. F. 06504

*Calciostroantianite(?)*

Pennsylvania, X-ray pattern, not stroantianite?: Lapham, D. M. 06831

*Calcite*

Calcium complexing with carbonate ion, experimental: Lafon, G. Michel. 04560

Crystal chemistry, physical properties, Quebec, Oka complex: Pouliot, Gaston. 06114

Experimental study, replacement by fluorite: Baer, N. S. 05942

Formation from aragonite, amino acids role: Allen, R. J. 04421

Geochemistry, Sr isotopes, Precambrian metavolcanics: Brooks, C. 01616

Geochemistry, topochemical reactions: Baer, Norbert Sebastian. 01217

Laser-induced luminescence: Gross, H. Gerald. 10526

Polymorph, new high-pressure: Cifrutlak, S. David. 06505

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Strain induced transformation to aragonite: Northwood, D. O. 03498

Surface energy measurements: Schmalz, Robert F. 00178

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Refractive indices, analysis, point dipole approximation: Cowley, E. R. 06560

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*Cassiterite*

Exsolution, magnetite, Alaska: Desborough, George A. 06893

*Cavansite*

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*Chabazite*

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*Chalcedony*

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*Chalcocite*

Phase transitions, differential thermal analysis: Bollin, E. M. 07425

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*Chalcopyrite*

Oxidation, bacterial, susceptibility: Wyckoff, Ralph W. G. 03433

*Chlorapatite*

Description, Ontario, Frontenac County, Bob's Lake, monoclinic: Hounslow, A. W. 03502

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*Chlorite*

Epigenetic crystals, New York, Kingston area, fault plane in mudstone: Borst, Roger L. 09092

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*Chloritoid*

Synthesis, low pressure: Grieve, R. A. F. 05945

*Chondrodite*

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*Chromite*

Composition, North Carolina: Bentzen, Edwin H., 3d. 04486

*Chrysotile*

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*Cinnabar*

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*Clinoamphibole*

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*Clinoptilolite*

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*Colusite*

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Gaussian dispersion, diffractometer profiles, variation: Alberti, Alberto. 09124

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- Cookeite*  
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- Coquimbite*  
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- Coquimbite-paracoquimbite*  
Structure, polytypism: Fang, Jen-Ho. 06974
- Cornetite*  
Description, Arizona, Tucson area, Saginaw Hill copper prospect: Khin, BaSaw. 08348
- Corundum*  
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- Covellite*  
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- Cristobalite*  
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- Cryptomelane*  
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- Cubanite*  
Structure, refinement, polymorphism: Fleet, M. E. 10609
- Cummingtonite*  
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- Darapskite*  
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- Daubreeilite*  
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- Delrioite*  
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- Diamond*  
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- Diaphorite*  
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- Digenite*  
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- Diopside*  
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- Djurleite*  
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- Dolomite*  
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- Dufrenite*  
Crystal chemistry, pleochroism, paragenesis: Moore, Paul B. 03173
- Eakerite*  
Description, North Carolina, Kings Mtn., new tin silicate: Leavens, Peter B. 08346
- Endlichite*  
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- Enstatite*  
Meteoritic, thermoluminescence-chemical composition correlation: Greer, Raymond T. 04924  
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- Epididymite*  
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- Epidote group*  
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- Epsomite*  
Kansas, efflorescences in underground storage area, Atchison area: Tien, Pei-lin. 01198
- Ewaldite*  
Structure: Donnay, G. 02235
- Fabianite*  
Structure, cf. synthetic dimorph, computer program: Konnert, Judith A. 10608
- Fairfieldite*  
Structure, North Carolina, Foote mine sample: Fanfani, L. 02990
- Fayalite*  
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- Feldspar*  
Antiperthites, origin, model based on nucleation: Vogel, Thomas A. 09095  
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Carbonate rocks, provenance, physicochemical indicators: Kastner, Miriam. 10729  
Coexisting pairs, uranium concentration, fission track analysis: Schwarzer, Rudolph Reynolds. 06009  
Composition, New York, Adirondack Mts., anorthosite: Crosby, Percy. 00147  
Descriptions, analyses, Greenland, Kangerdlugssuaq intrusion: Kempe, D. R. C. 08404  
Electron probe analysis: Klusman, Ronald William. 03023  
Geochemistry, New York, pegmatite: Schwarzer, Theresa Frances. 01237  
Geochemistry, Texas, Enchanted Rock granite batholith: Ragland, Paul C. 00758  
Louisiana, continental shelf sediments, Ca-rich: Donnellan, Monica S. 00891  
Potassium diffusion coefficients: Lin, Tsen-Hsiung. 09643  
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- Synthetic alkali, thermodynamics, solvus relations: Luth, W. C. 09651
- Texas, Big Bend region, alkaline rocks, crystallization: Carman, Max F. 06088
- Unit cell parameters, variation in alkali series: Luth, W. C. 00855
- Virginia, Amelia Court House area pegmatites, perthite: Laughlin, A. William. 11274

*Ferrierite*

- Composition, occurrence, central Nevada: Regis, A. J. 09533

*Fluorapatite*

- Crystal chemistry: McConnell, Duncan. 03591
- Crystal chemistry: Stow, S. H. 03486
- Crystal chemistry, hydroxyl ions orientation, infrared spectra: Levitt, S. R. 02998

*Fluorite*

- Experimental study, replacement of calcite: Baer, N. S. 05942
- Thermoluminescence, spectral distribution: McDougall, David J. 04484

*Fukuchilite*

- Composition, variation, new analysis: Shimazaki, Hidehiko. 06633

*Gadolinite*

- Metamict, experimental recrystallization, Texas, Rode Ranch: Gibson, Shirley J. 03178

*Galena*

- Deformation, experimental: Siemes, Heinrich. 06120
- Properties, occurrence, Missouri: Wagner, Richard E. 09747
- Work-hardening, experimental: Stanton, R. L. 04312

*Garnet*

- Andradite, high-Ti, California, San Benito County, spectroscopy: Manning, P. G. 03503
- Composition, Arizona, pyrope, cf. South Africa and Czechoslovakia: Reid, Arch M. 09093
- Composition, element distribution, thermodynamic behavior: Mueller, Robert F. 09056
- Composition, properties, paragenesis, New York, Canton area: Bloomer, Robert O. 09168
- Composition, variations, Massachusetts, mica schists: Hall, David Joseph. 09379
- Crystal chemistry: Dowty, Eric. 07352
- Deformation, rotational phenomena: Rosenfeld, John L. 04236
- Lattice parameters, expansion, free and included in diamond: Harris, J. W. 04409
- Occurrence, cavities in welded tuff, Texas: Tieh, Thomas T. 05376
- Pyrope, chrome, inclusion in diamond, structure, refinement, cf. synthetic pyrope: Novak, Gary A. 09068
- Rhodolite, composition, properties, North Carolina, cf. others: Martin, B. F. 02460
- Spectral properties: Moore, Raymond Kenworthy. 06604
- Structure, Ti-Zr, refinement: Dowty, Eric. 06959

*Gedrites*

- Structure, cation distribution, intracrystalline: Papike, J. J. 09057

*Gehlenite*

- Strontium, isomorphism with akermanite: Dear, P. S. 03722

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- Origin from kaolinite, chemical model: Gardner, Leonard Robert. 09094
- Synthesis, dependence on pH: Schoen, Robert. 03167

*Goethite*

- Stability relative to hematite plus water, particle size effect: Langmuir, Donald. 09634

*Gold*

- Composition, placer grains: Desborough, George A. 06897

*Graphite*

- Deformation, creep, stored energy: Green, W. V. 00091

*Grunerite*

- Oxygen, hydroxyl, water, position in structure, recognition: Donnay, Gabrielle. 06513

*Guildite*

- Physical and chemical data: Laughon, R. B. 05944

*Gustavite*

- New sulfosalt, Greenland, Ivigtut area: Karup-Moller, S. 03495

*Gypsum*

- Synthetic crystal, inclusion hourglass pattern, origin: Kastner, Miriam. 09069

*Halite*

- Structure, chevron, Mexico, Baja California: Shearman, D. J. 05383

*Hematite*

- Ferromagnetism, intrinsic and defect: Dunlop, D. J. 03414
- Magnetizability, superparamagnetic threshold, revised: Banerjee, Subir K. 10484
- Reaction with water=goethite, particle size effect: Langmuir, Donald. 09634

*Hemihedrite*

- Arizona: Williams, Sidney A. 09045
- Crystal structure: McLean, W. John. 09046

*Heulandite*

- Dehydration curves, infrared studies: Breger, Irving A. 06506

*Hexahydrite*

- Kansas, efflorescences in underground storage area, Atchison area: Tien, Pei-lin. 01198

*Hornblende*

- Twinning, deformation: Rooney, Thomas P. 02794

*Howlite*

- Structure: Finney, J. J. 06500

*Humberstonite*

- New saline mineral, Chilean nitrate deposits: Mrose, Mary E. 09106

*Hypersthene*

- Zoning, Ontario, Sudbury: Naldrett, A. J. 04413

*Idocrase*

- Synthesis, phase relations: Ito, Jun. 06580

*Ilmenite*

- Composition, Mn-enrichment due to oxidation of Fe: Mihalik, Peter. 09674
- Thermodynamic properties, granitic rocks, Colorado: Puffer, John Harold. 06007

*Iron oxides*

- Elastic properties, Fe contents, effects: Liebermann, Robert Cooper. 03267

*Iron phosphate minerals*

- Crystal chemistry, pleochroism, paragenesis: Moore, Paul B. 03173
- New, X-ray powder data: Haggerty, S. E. 02244

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*Iron silicate minerals*

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Fe<sub>2</sub>SiO<sub>4</sub>, disproportionation: Bassett, William  
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*Iron sulfide minerals*

Cubic FeS, new metastable phase: deMedicis,  
Rinaldo. 05207  
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George A. 04904

*Jadeite*

Experimental study, melting to 60 kb: Williams,  
D. W. 07235  
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*Jarosite*

Synthetic, potassium-hydronium: Brown, J. B.  
06636

*Kinoite*

New mineral, Arizona: Anthony, John W. 06574  
Structure, Arizona: Laughon, Robert Bush.  
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*Kornelite*

New occurrence, California, Coso Hot Springs:  
Weber, Dwight. 00124

*Krennerite*

Gold content, electron probe and optical data:  
Stumpfl, E. F. 06504

*Langbanite*

Structure, partial solution: Crane, Robert Lee.  
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*Laubmannite*

Crystal chemistry, pleochroism, paragenesis:  
Moore, Paul B. 03173

*Laumontite*

New occurrence, sandstone, California, Coast  
Ranges: Madsen, Beth M. 06182  
Phase equilibria, zeolite facies stability: Thomp-  
son, Alan Bruce. 04522

*Layered silicates*

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*Lepidocrocite*

Occurrence in spherulitic dahlite, Wyoming,  
Big Horn Basin: Mitchell, Richard S. 09739

*Leucite*

Crystal lattice, K replacement by Rb, effect on  
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*Leucophoenicite*

Edge-sharing silicate tetrahedra: Moore, Paul B.  
09049

*Limonite*

Pennsylvania, Houtzdale quadrangle, concre-  
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*Linnaeite*

Composition, variation, Missouri: Hach-Ali, P.  
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*Lithiophorite*

Crystallinity, cobalt, nickel: Larson, L. T. 06896

*Livingstonite*

Synthesis, stability: Craig, James R. 06510

*Lizardite*

Composition: Whittaker, E. J. W. 06581

*Loewite*

Structure and chemistry: Fang, J. H. 05935

*Mackinawite*

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Structure, refinement: Finger, Larry W. 06976

*Maghemite*

Occurrence, properties, Ontario, Steep Rock  
Lake: McLeod, C. R. 04940

*Magnetite*

Mn electron paramagnetic resonance: Schindler,  
Peter. 09053

*Magnesium silicate*

Dissolution: Luce, Robert William. 01231

*Magnetic minerals*

Oceanic sediments: Haggerty, S. E. 02243

*Magnetite*

Differential thermal study: Chaklader, A. C. D.  
06929

Exsolution, cassiterite, Alaska: Desborough,  
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Geochemistry, trace ferrides, variations: Leung,  
Samuel S. 00734

Phase relations, high P-T conditions: Mao, H. K.  
02255

Properties, magnetic, changes by experimental  
oxidation: Hargraves, R. B. 01776

Solubility, hydrothermal: Helz, G. R. 01780

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Colorado: Puffer, John Harold. 06007

Titaniferous, coexisting ilmenite, Mn fractiona-  
tion: Dasgupta, H. C. 01179

West Indies, Saint Vincent, Soufriere Volcano:  
Lewis, John F. 06579

*Malachite*

Virginia, Fairfax County, Triassic sandstone:  
D'Agostino, John P. 04250

*Manganese-nickel oxides*

Fugacity: Huebner, J. Stephen. 06511

*Manganite*

Manganese nodules, data, Pacific Ocean:  
Stevenson, John S. 06630

*Manganostibite*

Structure: Moore, Paul B. 09105

*Marcasite*

Inversion to pyrite, structural aspects: Fleet, M.  
E. 03499

*Melilite*

Synthetic, crystal structure, soda: Louisnathan,  
S. John. 04923

*Metadelirioite*

Colorado, intergrown with delirioite: Smith,  
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*Metamict minerals*

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*Metastibnite*

General description, California, The Geysers:  
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*Mica*

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Territories: Kretz, Ralph. 08140

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06507

Experimental studies, Rb, Sr ion selectivity:  
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Geochemistry, weathering, K-release rates:  
Leonard, R. A. 07615

K-depleted, hydration characteristics: Clark,  
Lee Jay. 06583

Radioactivity, giant halos, new, genesis: Gentry,  
Robert V. 03079

Solubility, stability of trioctahedral: Sabatier,  
Henri. 09552

Structural formula, oxidized and hydroxyl-defi-  
cient: Rimsaite, J. 03387

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Moore, William J. 04247

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- Microcline**  
Structure, correction: Bailey, S. W. 09129  
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- Moissanite**  
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- Molybdenite**  
Hexagonal, rhombohedral, composition, differences: Clark, A. H. 01278  
Polytypes, X-ray diffraction analysis: Mandarino, J. A. 06639  
Structure, polytypes, natural: Frondel, Judith W. 09051  
Structure, polytypism, theoretical considerations: Wickman, Frans E. 09518
- Mordenite**  
Genesis, Arizona, Galiuro Volcanics: Gisler, Patrick. 00271
- Muscovite**  
Adsorption, hydroxy-aluminum polymers: Huang, P. M. 05286  
Colloform hydrothermal: Frondel, Clifford. 09101  
Mechanical properties, dislocation structures: Caslavsky, Jaroslav Ladislav. 03250  
Stability, thermal and ionic: Eugster, H. P. 03553  
Synthesis, fluorine substitution, cf. pyrophyllite: Rosenberg, P. E. 09548
- Nagyagite**  
Gold content, electron probe and optical data: Stumpff, E. F. 06504
- Nepheline**  
Descriptions, analyses, Greenland, Kangerdlugssuaq intrusion: Kempe, D. R. C. 08404  
Structure, refinement, low-temperature environment: Foreman, Neil. 06700  
Structure, refinement, plutonic: Dollase, W. A. 06701  
Zoning, composition: Brown, F. H. 09119
- Nisbite**  
New, Ontario, Red Lake area: Cabri, L. J. 03500
- Nordsrandite**  
Synthesis, dependence on pH: Schoen, Robert. 03167
- Oligoclase**  
Infrared spectra, thermal conductivity: Aronson, J. R. 03695
- Olivine**  
Composition, nodules in basalt, New Mexico, Kilbourne Hole: Carter, James L. 02391  
Compressibility, relation to Fe content: Mao, Nai-Hsien. 03730  
Crystal chemistry, absorption spectra, cation ordering: Burns, Roger G. 09114  
Elastic properties, effects of Fe:Mg ratio: Chung, D. H. 10586  
Electronic structure: Shankland, T. J. 10632  
Element distribution, Ca, Ni, Mn: Simkim, Tom. 02017  
High pressure studies: Sclar, C. B. 02822  
Infrared spectra, cation determinative curves, ordering: Burns, Roger G. 06083  
Infrared spectra, thermal conductivity: Aronson, J. R. 03695  
Magnesium-rich, Fe, Mg ordering: Bush, W. R. 03905  
Structure, cell parameters, compressions to 100 kb: Olinger, Bart. 10585  
Vibrational spectra: White, William B. 01851
- Opal**  
Presence in peat, biologic origin, provenance: Finney, H. R. 08250
- Ore minerals**  
Reflectivity, pyrite-type, interpretation: Burns, Roger G. 09112
- Orthoclase**  
Albite-rich domains, perthite genesis theory: Vogel, Thomas A. 00857
- Orthopyroxene**  
Composition, nodules in basalt, New Mexico, Kilbourne Hole: Carter, James L. 02391  
Crystalline solution, thermodynamics, Mg-Fe order-disorder: Saxena, Surendra K. 09557  
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Structure, symmetry: Prewitt, C. T. 09524  
Temperature of crystallization,  $Mg^{2+}$ -Fe $^{2+}$  order-disorder: Saxena, Surendra K. 10595
- Orthosilicate minerals**  
Crystal chemistry: Brown, G. E. 06074
- Osumilite**  
Composition: Olsen, Edward. 06576
- Oxide minerals**  
Bulk modulus-volume relations: Anderson, Don L. 03697  
Stability in mantle, lattice calculations, shock-wave data: Gaffney, Edward S. 02817
- Paracostibite**  
New, Ontario, Red Lake area: Cabri, L. J. 03500
- Pentlandite**  
Ontario, Sudbury area, Mossbauer spectroscopy: Knop, Osvald. 09047  
Phase relations in Fe-Ni-S system: Shewman, R. W. 07671
- Perovskite**  
Composition, electron-probe analysis: Smith, A. L. 03323  
Composition, phase equilibria studies: Jongejan, A. 03296  
Stability in mantle, lattice calculations, shock-wave data: Gaffney, Edward S. 02817
- Perrierite**  
Virginia, Chamblissburg area, *not* chevkinite: Lowenhaupt, D. E. 05432
- Pertite**  
Composition, structure, potassic phase, granitic pluton petrogenesis: Ragland, Paul C. 03703  
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- Phillipsite**  
Composition, physical properties, Pacific and Indian Oceans, deep-sea: Sheppard, Richard A. 09063  
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- Phlogopite**  
Cleavage surface energy: Gutshall, Paul L. 09099  
Composition, biabsorption, Mossbauer spectra: Hogarth, D. D. 06638  
Geochemistry, ion exchange, K removal, effects on *b*-dimension: Leonard, R. A. 07616  
O, H isotope ratios, alkalic rocks, crust-mantle origin: Sheppard, Simon M. F. 05389  
Stability in upper mantle, experimental: Kushiro, I. 02252

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Stability in upper mantle, model: Modreski, Peter J. 09679

*Phoenicochroite*

Arizona, data: Williams, Sidney A. 06575

*Pigeonite*

Structure, refinement: Morimoto, Nobuo. 09085  
Symmetry transition: Prewitt, C. T. 03367

*Plagioclase*

Albite twinning, stress analysis: Lawrence, Robert D. 03786

California, El Dorado County, Pine Hill intrusion: Springer, Robert K. 00368

Composition, Ca zonation, Montana, Tobacco

Root batholith: Klusman, Ronald W. 00625

Deformation, experimental: Borg, I. Y. 06121

Lattice parameters, variations: Ribbe, P. H. 09537

Metamorphic rocks, subsolidus phase relations:

Crawford, Maria Luisa. 06940

Properties, analyses, pale-yellow variety: Bank, H. 08598

Zoning, Ontario, Sudbury: Naldrett, A. J. 04413

*Plattnerite*

General description, Mexico, Durango, Ojuela mine: White, John S., Jr. 04218

*Priceite*

Oregon, Curry County, Lone Ranch: Hoffman, Charles S. 09810

*Proustite*

Cell dimensions, stability: Roland, G. W. 04316

*Pyrite*

Deformation: Graf, Joseph L., Jr. 04313

Exsolution from pyrrhotite: Yund, Richard A. 04349

Sedimentary, genesis: Berner, Robert A. 00037

*Pyrochlore*

Crystal chemistry, luminescence: McCauley, Ronald Arthur. 07371

*Pyrochlore-microlite series*

Metamict relations, experimental study, Virginia: Mitchell, Richard S. 02727

*Pyrophyllite*

Structure, mono- and triclinic, X-ray powder patterns: Brindley, G. W. 09089

Synthesis, fluorine substitution, cf. mica: Rosenberg, P. E. 09548

Thermodynamic data, petrologic implications: Zen, E-an. 03556

*Pyroxene*

Ca-rich, Fe enrichment, Beaver Bay gabbro complex, Minnesota: Konda, Tadashi. 08277

Cation distribution, temperature dependent, lunar cf. earth: Hafner, Stefan S. 04426

Cation distributions, Moon cf. terrestrial material: Hafner, Stefan S. 06282

Composition, Ontario, Sudbury: Hewins, R. H. 07020

Descriptions, analyses, Greenland, Kangerdlugssuaq intrusion: Kempe, D. R. C. 08404

Forms in blueschist facies, California: Coleman, R. G. 05895

High calcium, optical, infrared spectra: Rutstein, Martin S. 01825

High pressure studies: Sclar, C. B. 02822

Jadeitic, composition, California, Franciscan metagraywackes: Kerrick, D. M. 10734

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Order-disorder, gamma-ray absorption of Fe-57: Hafner, S. S. 07135

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Quebec, Mont Tremblant Park, granulites, coexisting pairs: Katz, M. B. 03501

Solvus section, experimental: Turnock, A. C. 06726

Synthetic, contents, high temperatures, pressures: Erlank, A. J. 02239

Synthetic, K abundances: Erlank, A. J. 01621

*Pyrrhotite*

Chondrites, carbonaceous, electron-probe identification: Kerridge, J. F. 04991

Deformation: Graf, Joseph L., Jr. 04313

Geochemistry, Maine, Smalls Falls Fm.: Mallio, William Joseph. 07281

Hexagonal and monoclinic, X-ray diffraction determination: Clark, Alan H. 03506

Magnetic phases, differences, compositions, methods: Schwarz, E. J. 08205

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Structure: Fleet, M. E. 06978

Texture of polycrystalline, reflectance measurements, X-ray pole figures: Larson, L. T. 09637

*Quartz*

Dauphine penetration twins, geode, Illinois: Gricius, Anthony. 03515

Dauphine twinning, mechanically induced: Tullis, Jan. 03070

Determination, differential thermal analysis, evaluation: Weiss, Benjamin. 00011

Fluid inclusion, gas bubble movement, Brownian: Friedlaender, C. G. I. 03298

Geochemistry, sodium diffusion: Frischat, G. H. 10431

Geologic barometer, method: Coveney, Raymond M. 08406

Growth, experimental study: Drake, Gerald. 07087

Kyanite content, genesis, experimental studies: Sclar, Charles B. 09562

Melting rate, no direct transformation to cristobalite: Scherer, G. 03291

Nova Scotia, Halifax County, Dunbrack prospect, paragenesis: Friedlaender, C. G. I. 03297

Overgrowths in supermature sandstones: Pittman, Edward D. 09521

Rosettes, Pennsylvania, Mechanicsburg area, genesis: Bolles, William H. 07559

Solubility in water at saturation vapor pressure: Weill, D. F. 00964

Solubility, pH and disturbed surface-layer effects: Henderson, J. H. 07853

Strength, static fatigue, water influence: Scholz, Christopher H. 10583

Thermal activation energy: Manconi, John W. 05937

Thermal expansion and contraction: Silverman, S. M. 00065

Twinning, Japan law, multiple, Arizona: Bideaux, Richard A. 02748

Vein, indexes, guide to mineralized areas, Canada: Brochu, Michel. 05071

*Ransomite*

Structure: Wood, Michael M. 06501

Structure, classification: Wood, Michael Manning. 11007

*Realgar*

Polymorphism, thermal, photochemical studies: Hall, H. T. 10603

*Rectorite*

Structure: Henderson, G. V. 04279

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- Rhonite**  
Chemical, optical, crystallographic data, Texas, Big Bend Natl. Park: Cameron, K. L. 06509
- Richterite**  
Sodium-potassium, model for amphiboles: Huebner, J. Stephen. 09058
- Rockbridgeite**  
Crystal chemistry, pleochroism, paragenesis: Moore, Paul B. 03173
- Roemerite**  
Structure, classification: Wood, Michael Manning. 11007  
Structure, composition, Utah: Fanfani, L. 03168
- Rutile**  
Crystal form, schist cavity, Connecticut, Water-town area: Henderson, William A., Jr. 08344  
Maryland, Harford County serpentinite belt: Herz, Norman. 04245  
Thermal expansion: Rao, K. V. Krishna. 10423
- Samarskite**  
Structure, metamict, X-ray diffraction study, Virginia: Mitchell, Richard S. 07051
- Sanidine**  
Crystal lattice, K replacement by Rb, effect on parameters: Martin, Robert-F. 08375
- Scapolite**  
Shock damage, resistance, Quebec: Wolfe, Stephen H. 09091
- Serpentine**  
Composition of varieties: Whittaker, E. J. W. 06581
- Silicate minerals**  
Analyses, Mexico, Clarion Island, mugearite: Bryan, W. B. 02231  
Analyses, Mexico, Socorro Island, basalt: Bryan, W. B. 02232  
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- Palynology, Cretaceous-Tertiary boundary, em-bayment, cf. Rocky Mts.: Tschudy, Robert H. 10866

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- Lower, loess, Sangamon Soil: Snowden, J. O. 00946  
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- Ordovician, Platteville, Decorah, Galena Fms.: Heyl, A. V. 07202  
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- Brooks Range, Lisburne Group: Armstrong, Augustus K. 00406  
 Kograk Fm., carbonate facies, Anthozoa: Armstrong, Augustus K. 06805  
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- Northern, Pekisko Fm., 'Waulsortian' carbonate mound, bryozoans: Morgan, G. R. 02159  
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- Johns Valley Fm., boulder assemblage: Shideler, Gerald L. 07554  
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- Ouachita Mountains, Stanley Fm., distribution: Picha, Frantisek. 09519

## California

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- Eastern, Windsor Group, Foraminifera: Globensky, Yvon. 08416

## Colorado

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## Conodonts

- Surface patterns: Pierce, R. W. 05187

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- Camerate, water vascular system: Haugh, Bruce N. 07012

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- Evolution of heterospory, seed habit: Pettitt, John. 09336

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- Custer County, White Knob Limestone, Foraminifera, biostratigraphy: Skipp, Betty. 01475

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- Salem, Saint Louis Limestones, sedimentation: Lineback, Jerry A. 01081  
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## Indiana

- Illinois basin, Haney Limestone, sedimentation: Vincent, Jerry W. 00770  
 New Albany Shale, depositional environment: Lineback, Jerry A. 06934  
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- Crinoidea, Gilmore City Fm.: Strimple, Harrell L. 03727  
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- Michigan basin, Kinderhookian, correlation, Appalachian basin: deWitt, Wallace, Jr. 00131

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- Galloway quadrangle, stratigraphy: Fellows, Larry D. 10993  
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- Ichnofossils, transitional from Devonian: Rodriguez, J. 09882

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- Arrow Canyon Range, conodonts, Monte Cristo Group: Pierce, Robert William. 06605  
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- Appalachian basin, Berea, Bedford, Sunbury fms., correlation: deWitt, Wallace, Jr. 00131  
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- Bonne Terre area, lead mines, field trip: Association of Missouri Geologists. 09231  
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- Barite, occurrence, genesis, southeastern: Wagner, Richard J. 02427  
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- Bibliography, 1969: Vineyard, Jerry D. 07540

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- Stoutland quadrangle, geochemical prospecting, heavy metals: Nichols, Chester E. 00916

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- Bravoite, linnaeite, Fredericktown polymetallic deposits: Hach-Ali, P. Fenoll. 01460  
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- Decaturville astrobleme, structure, origin, age: Offield, Terry W. 09700
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- Nevada, Great Basin, evolution: Firby, James R. 00263

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- Texas, Georgetown Limestone equivalents, north-central: Slocki, Stanley F. 10800

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- Nacreous layer, microarchitecture, formation mode: Wise, Sherwood W., Jr. 07786
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- Oregon, Eugene Fm., fauna: Hickman, Carole Jean Stentz. 10269

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- United States, midwestern, popular account: Douglas, Dale. 09437

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- Florida, "Glades" unit, Pleistocene, faunal list: Hoerle, Shirley E. 03425
- Florida, "Glades" unit, Pleistocene, paleoecology: McGinty, Thomas L. 03428
- Kansas, Sandahl fauna, Illinoian, Smoky Hill River valley: Miller, Barry B. 01361
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- California, Kettleman Hills, Pliocene, environmental analyses: Stanton, Robert J., Jr. 05806
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- Sea water, thorium hydroxide as collector: Kim, Young S. 04216
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- Pima County, exploration, geochemical: Huff, Lyman C. 00498

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- Brenda mine, Peachland area, exploration history: Lang, A. H. 04593
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Ground water, data-processing needs, statewide system, geologic code: Botz, M. K. 06391  
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- Kootenai River valley, Libby Reservoir bank storage, model study: Coffin, Donald L. 05445
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- Plagioclase, Tobacco Root batholith, calcium zonation: Klusman, Ronald W. 00625
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- Conodonts, Pennsylvanian, central, animal morphology: Melton, William. 01085
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Mesozoic granitic rocks, intrusive epochs: Evernden, J. F. 00207

North-central, Tertiary ash-flow tuffs: Naeser, C. W. 05195

North-central, Tertiary igneous activity: McKee, Edwin H. 00314

Northwestern, volcanic rocks, K-Ar: Noble, Donald C. 06164

Nye and Lincoln Counties, volcanics, plutons, K-Ar: Marvin, Richard F. 05646

Sevier orogenic belt, thrust faulting: Fleck, R. J. 02371

Snake Range, granitoid rocks, age modification by thrusting: Lee, Donald E. 06209

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Elko County, central: Ketner, Keith B. 01473

Lake Tahoe basin: Crippen, J. R. 03056

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Lincoln County, Bristol mine area, Silverhorn mining district: Langenheim, R. L., Jr. 00303

Nye County, Grant Range, central: Hyde, Jack H. 01129

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1966, August 16, focal mechanism from S-waves: Hirasawa, Tomowo. 06718

1969, southwestern, microearthquake seismicity: Gumper, Frank J. 01918

Lake Mead area, relation to reservoir loading: Carder, Dean S. 05232

Microearthquakes, amplitude spectra: Douglas, Bruce M. 04685

Nevada Test Site area, correlation with nuclear events: Anderson, Don L. 00811

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Clays, bentonite, resources, genesis, properties: Papke, Keith G. 09737

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Gold, Carlin, Cortez deposits, deposition, organic carbon role: Radtke, Arthur S. 09531

Gold, Cortez-Buckhorn area, exploration: Wells, John D. 08465

Gold, other metals, Pamlico mining district: Archbold, N. L. 03217

Metals, phosphate, oil shale, possibilities, Elko County: Ketner, Keith B. 01473

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- Metals, Tertiary volcanic centers, structural controls: Albers, John P. 04240  
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- Materials, properties, tuff, strength, elasticity, Diamond Dust site: Stephens, D. R. 04127  
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 Slope stability, microseismic monitoring devices, Kimbley pit: Broadbent, C. D. 09832

*General*

- Bibliography, Lake Tahoe Basin, geology, soils: Matthews, R. A. 09441

*Geochemistry*

- Belted Range Tuff, comendite, Na loss: Noble, Donald C. 05033  
 Cortez-Buckhorn area, geochemical prospecting: Wells, John D. 08465  
 Montmorillonite, bentonite, fuller's earth, DTA, X-ray diffraction analysis: Papke, Keith G. 09737  
 Shoal granite, trace elements analyses, cf. G-1, W-1: Volborth, Alexis. 09351  
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- Big Smoky Playa, general description: Walker, Robert F. 06523  
 Clayton Playa, ground-water discharge effects: Motts, Ward S. 06526  
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*Geophysical surveys*

- Austin area, magnetic: Davis, W. E. 07500  
 Calico area, mineral deposits: Lawrence, Edmond Francis. 03109  
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 Las Vegas area, nuclear explosions, seismic responses: Davis, L. L. 00251  
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 Nuclear Rocket Development Station, seismic anomaly: Weetman, Bruce G. 01998  
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- Big Smoky Playa, ground water: Walker, Robert F. 06523

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- Clayton Playa, ground-water discharge, morphologic effects: Motts, Ward S. 06526  
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 Lake Tahoe basin: Crippen, J. R. 03056  
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- Pyramid Lake: Harris, E. E. 04343

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- Cortez-Buckhorn area, Cu, Te, Zn, Mb distribution: Wells, John D. 08465

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- Austin area: Davis, W. E. 07500  
 Cortez-Buckhorn area, generalized: Wells, John D. 08465  
 Grant Range, south-central: Hyde, Jack H. 01129  
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 Lathrop Wells quadrangle: McKay, Edward J. 04513  
 Lincoln County: Tschanz, C. M. 03396  
 Montmorillonite and other clay deposits: Papke, Keith G. 09737  
 Nye County, southern Grant Range: Cebull, S. E. 05177  
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 Shoshone Mountains, Lander-Nye Counties: Bonham, Harold F. 06381  
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 Topopah Spring quadrangle: Orkild, Paul P. 08013  
 Western, Mesozoic granitic rocks, distribution: Evernden, J. F. 00207  
 Wood Hills: Thorman, Charles H. 03778

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- Yerington area: Erwin, John W. 06382

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- Columbus Salt Marsh-Soda Spring Valley area: VanDenburgh, A. S. 07514  
 Escalante Desert: Glancy, Patrick A. 09934

*Maps, magnetic*

- Austin area, airborne: Davis, W. E. 07500

*Maps, mineral resources*

- Lincoln County, general and mining districts: Tschanz, C. M. 03396

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- Southern, generalized: Fleck, R. J. 02371

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- Northern Virgin Mountains: Seager, William R. 01503

*Mineralogy*

- Diaphorite, Morey district, structure, correction: Williams, Sidney A. 03505  
 Ferrierite, properties, occurrence in altered pyroclastics: Regis, A. J. 09533  
 Plattnerite, White Pine County, twinned crystal: White, John S., Jr. 04218

*Paleoclimatology*

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- Cenozoic, late, Lake Tahoe, secular variation studies: Goldstein, Alan S. 01915

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- Blastoidea, Crinoidea, Carboniferous, n. spp., index value: Webster, G. D. 01208  
 Brachiopoda, Devonian, early Middle, central: Johnson, J. G. 01205  
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 Brachiopoda, Devonian, West Range Limestone, nomenclature: Johnson, J. G. 05811  
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 Diatoms, Miocene-Pliocene, lake bed deposits, western: Smedman, Gunilla. 09178  
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 Graptolithina, Devonian, Lower, zoning: Berry, William B. N. 00216  
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 Mammalia, Pleistocene, Gypsum Cavern, ground sloth, camel: Lawlor, Florine. 04407  
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- Big Smoky Valley, southern, authigenic minerals, Esmeralda Formation, zoning: Moiola, Richard J. 09120  
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 Fish Creek Mountains Tuff: McKee, Edwin H. 05815  
 Humboldt County, Buffalo Mtn. pluton: Neff, Thomas Rodney. 01267  
 Lincoln County, ignimbrite, carbonatitic dikes: Tieh, Thomas T. 00933  
 Mono Basin, Bodie Hills, Cenozoic volcanics: Al-Rawi, Yehya Tawfeq. 03103  
 Northwestern, ash-flow sheet: Korrigan, Marjorie K. 00297  
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- Arcturus basin, Permian carbonates: Zabriske, Walter E. 06207  
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 Southern, Lower Triassic marine carbonates: Bissell, H. J. 05888  
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 Precambrian-Cambrian, Great Basin, southern, correlation: Stewart, John H. 03862  
 Silurian, Tor Limestone, central, not Devonian: Johnson, J. G. 01206  
 Silurian-Devonian boundary, graptolite zones: Berry, William B. N. 00216  
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- Buffalo Mountain pluton dike swarm, mechanism: Neff, Thomas R. 00324
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- Esmeralda County, Mineral Ridge: Kirsch, Stephen A. 00295
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- HD Range, thrust plates: Riva, John. 05027
- Humboldt County, Buffalo Mtn. pluton, emplacement: Neff, Thomas Rodney. 01267
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- Round Mountain, strain observations, tidal and secular: Malone, Stephen D. 10536
- Sevier orogenic belt, thrust faults, folds, crustal shortening: Fleck, R. J. 02371
- Shoshone Range, Battle Mountain, Roberts Mts. thrust: Wrucke, Chester T. 00590
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- Swailes Mountain quadrangle, thrust faults, age: Ketner, Keith B. 06163
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- White Pine-grant Range region, tectonics, Tertiary: Moores, E. M. 00018
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- Fish Creek Mountains volcano, Miocene history: McKee, Edwin H. 05815

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- Big Bald Mountain area: Anderson, F. D. 04080
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- Gypsum, resources, production: Hamilton, J. B. 06383

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- Metals, Johnson Croft, Annidale, Jordan Mtn., Black River areas: Ruitenberg, A. A. 10453
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- Polymetallic ores, Caribou sulfide deposit: Cavalero, R. A. 03453
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- Johnson Croft, Annidale, Jordan Mtn., Black River areas: Ruitenberg, A. A. 10453
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- Kouchibouguac Bay, shore features, barrier islands, beach processes, changes: McCann, S. B. 09825

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- McKendrick Lake-Catamaran Brook area, seismic: Hobson, George D. 06310
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- Southwestern, Cu, Mo, Zn, Mn, Pb: Austria, V. B., Jr. 03160

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- Big Bald Mountain area: Anderson, F. D. 04080
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- McKendrick Lake area: Anderson, F. D. 06309
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- Head of Middle River and Wildcat Brook area O-6: Helmstaedt, H. 07809

*Paleontology*

- Foraminifera, algal microflora, Carboniferous, Windsor Group, assemblages: Mamet, Bernard L. 06733
- Foraminifera, Holocene, Restigouche Estuary, bottom sediment cores, benthonic faunal distribution: Schafer, C. T. 09827

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- Granite batholiths, two provinces, tectonic implications: Martin, Robert F. 01669

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- Bay of Fundy, bottom sediments, textural provinces, deposition: Swift, Donald J. P. 03745
- Mississippian, evaporites, sedimentation: Evans, Robert. 08151
- Restigouche Estuary, bottom sediments benthonic foraminifera, faunal distribution near pollution sources: Schafer, C. T. 09827

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- Carboniferous, Windsor Group, carbonates, biostratigraphy: Mamet, Bernard L. 06733
- Ordovician-Silurian, Siegas area: Hamilton-Smith, T. 05387

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- Head of Middle River and Wildcat Brook area, mesoscopic fabric: Helmstaedt, H. 07809
- McKendrick Lake-Catamaran Brook area, seismic profiles: Hobson, George D. 06310
- North-central, Catamaran fault: Anderson, F. D. 00137

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- Siegas area, folds, Taconic(?) and Acadian orogenies: Hamilton-Smith, T. 05387  
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**New England***Absolute age*

- Interpretation, Permian thermal disturbance: Zartman, Robert E. 05194  
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- Laurentide ice sheet, late Wisconsin fluctuations, moraines: Borns, Harold W., Jr. 06069

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- Early collections: Frondel, Clifford. 02747  
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 Tourmaline, occurrence: Gallup, Ronald W. 09741

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- Ostracoda, Holocene, continental margin assemblages: Hazel, Joseph E. 02080

*Sedimentary petrology*

- Continental shelf, gravels: Schlee, John. 04030  
 Estuarine sand bodies, primary structures: Hayes, Miles O. 02628  
 Gulf of Maine, Georges Bank, sediments, provenance: Ross, David A. 05656  
 Gulf of Maine, suspended matter, composition, distribution: Spencer, Derek W. 05599

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- Acadian orogeny, result of continental collision: Naylor, Richard S. 09692  
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- Pease area, cores, mechanical properties: Crisp, R. W. 10236

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- Southeastern, Exeter pluton, gravity: Bothner, Wallace A. 00141

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 Northern, till sheets, stratigraphy, evidence of multiple glaciations: Koteff, Carl. 10179  
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- Milford quadrangle, surficial: Koteff, Carl. 04512  
 Ossipee Lake quadrangle: Wilson, James Robert. 11225

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- Haverhill (Mass.) quadrangle, airborne: U.S. Geological Survey. 02055  
 Salem Depot quadrangle, part, airborne: U.S. Geological Survey. 02041

*Mineralogy*

- Grafton area, Ruggles mica mine, history, collecting site: Brady, Philip. 03914

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- Hillsboro plutons, genesis, partial melting: Sundeen, Daniel A. 09592  
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- Belle Mead area, Roaring Brook, origin: Banino, George M. 09359  
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- 1969, Lake Hopatcong, mechanism: Sbar, Marc L. 01973  
 1969, Lake Hopatcong sequence, focal mechanism: Sbar, Marc L. 04431

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- Iron, magnetite occurrence, Franklin, Hamburg quadrangles: Baker, Donald R. 05451

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- Hackensack Meadows area, varved clays, building settlement: Lobdell, Herbert L. 03628

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- Palisades sill, variation diagrams, graphic technique: Pearce, T. H. 01454  
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- Belle Mead area, Roaring Brook, large boulder fill, origin: Banino, George M. 09359

*Geophysical surveys*

- Alpine area, gravity, vertical variations: Kuo, John T. 03522  
 Alpine area, gravity, vertical variations: Thysen-Bornemisza, Stephen. 03526

*Hydrogeology*

- Gloucester County, ground-water resources: Hardt, William F. 04937  
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Franklin and Hamburg (part) quadrangles: Baker, Donald R. 05451

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Gloucester County: Hardt, William F. 04937

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Gloucester County: Hardt, William F. 04937

Salem County: Rosenau, Jack C. 10940

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Cretaceous, post-Magothy fms., southern: Owens, James P. 05860

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Miocene, Kirkwood Fm., members, coastal plain: Isphording, Wayne C. 05659

Silurian-Devonian, Upper Cayuga and Helderbergian strata, northern: Barnett, Stockton Gordon. 03827

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Port Jervis thrust fault: Soren, Julian. 00182

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Mogollon Plateau, Tertiary volcanics, K-Ar: Simpson, J. W. 10969

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Diablo platform, western, upper Paleozoic history: Wilson, J. L. 05909

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Mogollon Plateau volcanic province: Elston, Wolfgang E. 08651

Northwestern, field conference guidebook: Natl. Assoc. Geology Teachers. 04953

Southwestern: Wenger, Sherman A. 08652

Southwestern, Paleozoic history: Kottowski, Frank E. 05907

Tyrone-Big Hatchet Mts.-Florida Mts. area, guidebook: New Mexico Geol. Soc. 08646

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- Petroleum, Kemnitz field, genesis, migration: Malek-Aslani, Morad. 06335  
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 Uranium, exploration, reconnaissance reports, 1950-58: AEC Grand Junction Office. 08321  
 Uranium, Grants region, genesis: Squyres, John Benjamin. 07285

*Engineering geology*

- Highways, role of geologists: James, Harold L. 05505  
 Nuclear explosions, San Juan Basin, Gasbuggy shock, microfracturing: Borg, I. Y. 07984

*General*

- Bibliography, theses, Inst. Mining and Technology, 1931-69: Youngblood, Irma. 04795  
 Bureau of Mines Mineralogical Museum, file-data computerization: Renault, Jacques. 04116  
 Data file, computer based, U.S. Geol. Survey program: Peterson, J. B. 09713  
 Oil and gas well tests, index to samples, 1966-70: Bieberman, Robert A. 03441  
 State Highway Commission, role of geologists: James, Harold L. 05505

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- Ambrosia Lake district, uranium ore, organic material analysis: Jacobs, M. L. 01483  
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 Central district, sulfides, trace-element zoning, genesis: Rose, Arthur W. 05130  
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- De Baca County, water resources, reconnaissance: Mourant, Walter A. 10439  
 Delaware basin, saline-water data, computer compilation: Hiss, W. L. 04804  
 Ground-water levels, 1968: Busch, F. E. 03701  
 Portales Valley, ground-water analog: Phillips, H. Boyd. 04229  
 Rio Grande drainage basin, saline ground-water resources: Kelly, T. E. 04921  
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- Tularosa Basin, saline ground-water resources: McLean, J. S. 07467

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- 1955-68: McIntosh, Willard L. 04497

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- Black Range Primitive area: Erickson, George E. 03818

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- Paleozoic, Cretaceous, Big Hatchet Mts., correlation: Zeller, Robert A., Jr. 08647
- Pennsylvanian-Permian, Joyita Hills area, paleogeography: Kottowski, Frank E. 04326
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- Adirondack Mountains, gneiss domes, Rb-Sr: Bickford, M. E. 06062
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- Florida area, mammal bones, C-14: Funk, Robert E. 00963
- Hudson Highlands, Rosetown complex, K-Ar: Ratcliffe, Nicholas M. 00175

*Areal geology*

- Adirondacks and Lake Champlain areas, guidebook to field trips: New York State Geol. Assoc. 09019
- Champlain Valley, field trip, Chazy Group: Shaw, Frederick C. 09024
- East-central, guidebook: New York State Geol. Assoc. 11233
- Lake Champlain-Lake George lowland, field trip, deglacial history: Connally, G. Gordon. 09036
- Long Island, Great South Bay, environmental research: Friedman, Gerald M. 04726
- Southeastern, field trip, Connelly Fm., associated strata: Rosenshein, Arthur N. 09027
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- Bibliography, geology, New York City area: Horenstein, Sidney. 11216
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- Long Island area, marine resource planning and management, information system: Ellis, Robert H. 09494
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- Adirondack Mountains, anorthosite, feldspars, composition: Crosby, Percy. 00147
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- Little Falls-Richfield Springs area: Whipple, Janice M. 01239
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- Long Island, Magothy aquifer, water, dissolved carbonate: Pearson, F. J., Jr. 07464
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- Lake Ontario drainage basin, bedrock well yields: Ontario Water Resources Commission. 03812
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*Stratigraphy*

Cretaceous-Pleistocene, possible stratigraphic units, Long Island: Foord, Eugene E. 02218

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Devonian, east-central, guidebook: New York State Geol. Assoc. 11233

Devonian, Hamilton Group: Cooper, Gustav Arthur. 01224

Devonian, Sonyea Group, Catskill delta environments: Sutton, Robert G. 04950

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- C-14, general listing, Trondheim laboratory: Nydal, Reider. 01326

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- Gander Lake area, west half: Anderson, F. D. 05461  
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- Metals, fluoride, development, prospects: Fleming, J. M. 04533  
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- Western, offshore Odd-Twins magnetic anomaly, interpretation: Ruffman, Alan. 07709

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- Gander Lake area, west half: Anderson, F. D. 05461  
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 Effects, tectonic strain release: Savino, John. 01633  
 Ground motions: Lahoud, J. A. 00301  
 Hydroacoustic signals: Northrop, John. 01959  
 Residual strains: Major, M. W. 00307  
 Seismic magnitudes, site effects: Basham, P. W. 07720

*Nevada*

- Handley event, mechanisms, multipole representation: Yeatts, F. Richard. 10552

*Petrologic effects*

- Shocked rocks, feldspar, K-Ar analysis: Hartung, Jack B. 06393

*Plowshare*

- Preshot studies, dynamic elastic moduli of rocks: Schock, R. N. 07903  
 Preshot studies, inelasticity of rocks: Heard, Hugh C. 07833

*Products*

- Cavity and land subsidence, cause and prevention: Hakala, W. W. 07830  
 Cratering, media, variations effect, computer analysis: Terhune, R. W. 05515  
 Mineralogical transformations in granite: Faure, Jean. 07829  
 Shock metamorphism, quartzite, Sedan event: Short, Nicholas M. 05787

*Rulison*

- Ground motion: Foote, Richard Q. 01911  
 Seismic motions: Loux, P. C. 07911

*Salmon*

- Source parameters: King, Chi-Yu. 01939

*Seismic effects*

- 1961-66, correlation with earthquakes, negative: Healy, J. H. 02792  
 Benham, Jorum, Handley, aftershocks: Hamilton, Robert M. 07005  
 Boxcar, Pipkin events, P-waves, attenuation, Dorman's model, application: Power, Frederick W. 10553  
 Cabriolet, Schooner, Buggy I: Murphy, J. R. 00321  
 Distance-amplitude relations, large explosions: Porter, Lawrence D. 10539  
 Earthquake trigger, new data: Emiliani, Cesare. 00813



**Nuclear explosions—Continued***Seismic effects—Continued*

- Earthquake trigger, United States, western: Ryall, Alan. 00944
- Elastic wave propagation, heterogeneous media: Beaudet, Paul R. 03301
- Energy release, dissipation: Tocher, Don. 00127
- Energy release, relations: Hadley, James W. 00126
- Ground motion, application to earthquakes: Borchardt, R. D. 03352
- Ground motion, cf. earthquakes, Washington, Seattle: Seed, H. Bolton. 03355
- Ground motion, genesis, prediction for seismic damage: Rodean, Howard C. 07824
- Ground motion, prediction: Mueller, R. A. 07825
- Ground motions, Handley event, Nevada, Beatty area: Whipple, Arthur P. 10540
- Ground, predictions, results, damage: Carder, Dean S. 05230
- Jorum, September 16, 1969: Willis, David E. 10306
- Lg phases, magnitude determination: Baker, R. G. 06411
- Local magnitudes, determination, universe theory, cf. earthquakes: Porter, Lawrence D. 01968
- Microearthquakes: Boucher, Gary Wynn. 07365
- Microearthquakes, 1969, Nevada: Mickey, Wendell V. 09673
- Mississippi, Tatum salt-dome stock, Salmon event: Eargle, D. Hoye. 08738
- Nevada, Las Vegas area: Davis, L. L. 00251
- Nevada Test Site, earthquake trigger: Anderson, Don L. 00811
- Nevada Test Site, elastic wave amplitude variations, analysis: Tendall, Dorris M. 09598
- Nevada, Tonopah area: Williams, Spencer L. 02001
- P-coda, short-period characteristics, Canadian Shield: Hasegawa, H. S. 03304
- P-wave amplitude decay, magnitude relations, 1°-98°: Kaila, K. L. 03509
- P-wave spectra, source-time function, cf. earthquake spectra: Molnar, P. 09680
- Radiation field, tectonic stress measurement: Archambeau, Charles. 03977
- Rayleigh waves, crust structure effect, atmospheric explosion: Harkrider, David G. 03978
- Rayleigh waves, surface energy release: Wagner, Donald E. 06807
- Rayleigh-wave spectra, separation from earthquake source: vonSeggern, David. 05222
- Secondary, following large events: Boucher, Gary. 10537
- Seismic decoupling theory evaluation, Scroll event: Lane, Stephen S. 10538
- SH, Love waves, large cf. small explosions: Aki, K. 06039
- Soil strain, Nevada Test Site: Olsen, C. W. 06412
- Stress release possibilities, tectonically active areas: Allen, Joe H. 00812
- Stress-wave propagation, numerical simulation: Cherry, J. T. 07908
- Surficial, buried phenomena, similarity to earthquake effects: McKeown, F. A. 09657
- Tectonic strain release, relation to prestressed media: Toksoz, M. Nafi. 10289
- Teleseismic signals, four geologic environments: Hasegawa, H. S. 07011

**Nuclear explosions—Continued***Sterling*

Source parameters: King, Chi-Yu. 01939

**Nuclear magnetic resonance***Data*

- Bitumens, structures of aromatics: Speight, J. G. 02117
- Homestead and Allende chondrites: Chaterlain, A. 04402
- Topaz, Al-27 quadrupole splitting: Lumsden, Jesse Beadles, 3d. 07388

*Methods*

Porous materials, porosity, permeability, surface area: Kumar, J. 01264

**Oceanography***Bibliography*

Information sources: Vetter, Richard C. 10458

*Education*

Deep Sea Drilling Project, raw data, student involvement: Vallier, Tracy L. 01108

*Instruments*

- Deep Ocean Sediment Probe: Lewis, Lloyd. 09482
- Nephelometer, deep-sea, turbidity measurements: Schuyler, P. B. 09865
- Sea-water salinity estimation, review: Johnston, R. 10785
- Shipboard computers, data processing: Coughran, Edward H. 04436

*Methods*

- Electron microscopy, sample preparation, size analysis: Walker, D. A. 03746
- Geophysical, federal program, review, future: Sheets, Herman E. 09498
- Remote-sensing, applications: Helgeson, Gaylord A. 04366
- Sea-water salinity estimation, review: Johnston, R. 10785

*Textbooks*

- Introductory: Ross, David A. 08189
- Introductory: Weyl, Peter K. 00474

**Olio***Areal geology*

- North-central, guidebook, Middle Devonian: Janssens, A. 02764
- North-central, guidebook, Middle Devonian, Columbus to Lake Erie: Janssens, A. 08372
- Upper Ohio Valley, guidebook, Allegheny deltaic deposits: Fern, John C. 09921

*Earthquakes*

- 1968, July 26, Anna, magnitude, intensity, energy: Willis, David E. 06806

*Economic geology*

- Construction materials, architectural aggregate: Stith, David A. 07525
- Gravel, Madeira quadrangle: Osborne, Robert H. 03817
- Gravel, sand, Maumee River estuary: Herdendorf, Charles E. 07527
- Gravel, sand, Maumee-Toledo dredging corridor, properties, reserves: Herdendorf, Charles E. 02482
- Limestone, Brassfield fm., chemical cf. physical properties: Carr, Donald D. 07529
- Mineral resources, public lands: Gebhart, Ernest J. 04981
- Petroleum, central, Cambrian strata, accumulation factors: Dolly, Edward Dawson. 00521
- Petroleum, Denmark field, exploration tools: Ferris, Craig. 09374
- Petroleum, exploration, Cambrian, Ordovician: Ebright, J. R. 02484

**Ohio—Continued***Economic geology—Continued*

Petroleum, natural gas, production, 110-yr history: Norling, Donald L. 04979

Petroleum, reservoirs, lithologic descriptions: Rough, R. L. 02739

*Engineering geology*

Salt mines, gravity faults, problems: Jacoby, Charles H. 04478

Seepage, acid mine drainage prevention, Ohio, Todd and McDaniel mines: Ahmad, Moid Uddin. 06315

Terrain investigations, combined techniques, Guernsey and Wood Counties: Mintzer, Olin W. 09358

*General*

Education, earth science field course, undergraduate, Ohio State Univ.: Mayer, Victor J. 02406

Geology-vegetation relations: Forsyth, Jane L. 03125

Ohio State University, earth science teachers, preparation: Mayer, Victor J. 01083

*Geochemistry*

Franklin County, Miami soil, beech stemflow water effects: Gersper, P. L. 07504

*Geomorphology*

Erie County, Florence Valley, Pleistocene capture: Hole, Thornton J. F. 06836

Southwestern, drainage changes, Nebraskan glaciation, cf. Indiana: Teller, James T. 09597

Whitewater River, Big Ann's point bar, statistical study: Wiethe, John D. 04186

*Glacial geology*

Eaton area, Wisconsin glacial advances: Thomas, J. B. 05319

*Hydrogeology*

Akron area, ground-water resources, development: Rau, Jon L. 01099

East-central, Pennsylvanian limestone aquifers, hydrology: Caswell, William Bradford, Jr. 00537

Ground-water resources, saline: Sedam, A. C. 06441

Maumee River basin, Silurian-Devonian aquifer, recharge: Rowland, Mark R. 02489

Mill Creek valley, ground-water recharge: Fidler, Richard E. 07244

Piketon area, stream bed leakage to aquifer: Norris, Stanley E. 06189

*Maps, geologic*

Madeira quadrangle: Osborne, Robert H. 03817

*Maps, geologic index*

General: McIntosh, Willard L. 06528

*Maps, ground water*

Saline resources: Sedam, A. C. 06441

*Maps, isopach*

Subsurface, Silurian-Devonian "Big Lime" sequence: Owens, Gordon L. 03219

*Maps, structure*

Subsurface, Silurian-Devonian "Big Lime" sequence: Owens, Gordon L. 03219

*Paleontology*

Amphibia, Permian, Creston Shale, Marietta area: Olson, Everett C. 01262

Anthozoa, Silurian, Brassfield Fm., cf. Holocene: Kissling, Don L. 00730

Brachiopoda, Silurian, Brassfield Ls., athyroidoid, structure: Gauri, K. L. 00550

Cephalopoda, Pennsylvanian, Brush Creek Ls., nautiloids: Murphy, James L. 11013

Foraminifera, Devonian, Middle, *Webbinielloidea* revision: Conkin, James E. 01648

**Ohio—Continued***Paleontology—Continued*

Gastropoda, Ordovician, *Cyclonema*, Cincinnati area: Thompson, Esther H. 06906

Gastropoda, Pleistocene, land snails: LaRocque, Aurele. 02481

Ostracoda, other invertebrates, Olentangy Shale, Delaware County: Tillman, John R. 03124

Ostracoda, Pleistocene, Fairlawn mastodon site, paleoecology: Teeter, James W. 04395

Trace fossils, Ordovician, Cincinnati area: Osgood, Richard G., Jr. 10267

*Sedimentary petrology*

Central, Berne Conglomerate, Mississippian environment: Bork, Kennard B. 05660

Garfield Heights, Pleistocene sediments, environment: Miller, Barry B. 01088

Hamilton County, Cincinnati calcarenites, depositional environment: Osborne, Robert H. 02021

Ohio, southeastern, flint, aboriginal quarry sites: Carskadden, Jeff. 01456

Whitewater River, Big Ann's point bar, sands, textural properties: Wiethe, John D. 04186

*Stratigraphy*

Appalachian basin, Bedford, Berea, Sunbury fms., Kinderhook age: deWitt, Wallace, Jr. 00131

Devonian, Columbus Limestone, north-central: Janssens, A. 02764

Devonian, Middle, north-central: Janssens, A. 08372

Devonian, northwestern, Middle: Janssens, A. 04585

Devonian, Olentangy Shale, lower: Tillman, John R. 03124

Devonian, shales, regional correlation: Schwietering, Joseph Francis. 07361

Mississippian, Borden Fm., Farmers Siltstone Member: Moore, Bruce R. 05305

Pleistocene, Illinoian-Wisconsinan deposits, Eaton area: Thomas, J. B. 05319

Precambrian-Cambrian, Sauk sequence, subsurface: Janssens, A. 01078

Silurian, Bass Islands Fm., members, Bass Islands: Sparling, Dale R. 01340

Silurian, Salina Group, correlation, genesis: Rickard, Lawrence V. 04564

Silurian-Devonian, "Big Lime" sequence: Owens, Gordon L. 03219

*Structural geology*

Cleveland area, gravity faults in salt mines: Jacoby, Charles H. 04478

*Weathering*

Newark area, Pleistocene terraces, soils: Khengar, Agam Singh. 00504

**Oil and gas fields***Alberta*

Rainbow and Rainbow South fields: Barss, D. L. 07755

Rainbow field, exploration, Middle Devonian reef: Hriskevich, Michael E. 06431

*Arizona*

Dineh bi Keyah oil field: McKenny, J. W. 00009

*California*

Clarksburg gas field: Lorshbough, A. L. 01247

Cymric field: Anderson, David N. 01162

Greeley oil field, Olcese pool: Welge, E. A. 07162

Las Cienegas oil field, Murphy area: Mefferd, M. G. 07161

Northwest San Joaquin gas field: Hill, F. L. 01163

**Oil and gas fields—Continued***California—Continued*

- Prado-Corona oil field: Gaede, Verne F. 01652  
 Rancho Capay gas field: Land, P. E. 07164  
 Rice Creek gas field: Hill, F. L. 07166  
 Strand oil field, East area, southeastern: Campbell, G. E. 07163  
 Todhunters Lake gas field: Williams, P. A. 07165  
 Valpredo oil field: Welge, E. A. 10965

*Illinois*

- Oil fields, size, development, properties: Mast, R. F. 04598

*Louisiana*

- Abbeville field: Fambrough, James W. 04753  
 Bayou Pigeon field: Denning, Ellis. 04754  
 Bayou White field: Uhrenholdt, Soren. 04755  
 Bear-Ragley fields: Paine, William R. 04756  
 Belle Isle field: Bates, Fred W. 04757  
 Cecelia field: Mills, Lee. 04759  
 East Basile field: Paine, William. 04760  
 Fordoche field: Pierson, J. R., Jr. 04761  
 Gillis-English Bayou field: Landry, Paul R. 04762  
 Glenmora field: Hensarling, Larry. 04763  
 Grand Coulee field: Gibson, G. G. 04764  
 Holmwood-South Manchester field: Hauck, Raymond J. 04765  
 Jeanerette field: Dobie, C. Walter. 04766  
 Kings Bayou gas field: Bethke, W. M. 04767  
 Lake Arthur field: Parker, Phillip D. 04768  
 Lewisburg gas field: Bales, J. R. 04769  
 Main Pass Block 35 field: Paynter, Donald D. 02075  
 Mamou field: Broussard, Francis A. 04770  
 Maurice gas field: Harrison, Frank W., Jr. 04771  
 Mud Lake and Second Bayou fields: Hoffmann, Edward A., Jr. 04772  
 Neale field: Paine, William. 04773  
 North Elton field: Frazell, W. D. 04775  
 Phoenix Lake oil field: Alba, Roy S. 04774  
 Rayne field: Jacques, T. E. 04776  
 Ridge gas field: Fuselier, George R. 04777  
 South Jennings gas field: Anderson, Michael M. 04516  
 Tigre Lagoon field: Chadeayne, Dennis. 04778  
 Topsy-Thompson Bluff-Indian Village fields: Bellamy, James J. 04517  
 Ville Platte field: Ogden, Park. 04779  
 West Cameron Block 180 gas field: Bell, John. 04758  
 West Lake Verret field: Gallaspy, I. L. 04780

*Michigan*

- Gaylord-Tecon field, Otsego County: Ells, Garland D. 00059  
 Onaway field, Presque Isle County: Ells, Garland D. 00059  
 South Boardman field, Grand Traverse County: Ells, Garland D. 00059

*New Mexico*

- Kemnitz field, occurrence: Malek-Aslani, Morad. 06335

*Ontario*

- Elgin County, Willey Pool: Hancock, W. P. 10917

*Pennsylvania*

- Erie County, Pierce gas field: Kelley, D. R. 10919

- Kinzua quadrangle: Lytle, William S. 08495

*Texas*

- Las Tiendas gas field: Hughes, Dan A. 00005  
 Mobeetie field, Wheeler County: Sahl, Howard Leroy. 03068  
 Mobeetie oil field: Sahl, H. L. 02312

**Oil and gas fields—Continued***Texas—Continued*

- North LaWard field, Frio formation, shale diapir: Brooner, Frank I., Jr. 03145  
 Structure contour maps, new, 1969: Brook, R. P., Jr. 04494  
 Tom O'Connor field, Refugio County: Mills, Herbert G. 07766  
 West Terryville gas field: Bryant, Leonard C. 00468

*Texas-Oklahoma-Kansas*

- Panhandle-Hugoton field: Pippin, Lloyd. 07762

*United States*

- Giant fields, summary: Artyunova, N. M. 02223

*World*

- Giant fields, Am. Assoc. Petroleum Geologists, symposium: Halbouty, Michel T. 07752  
 Giant fields, distribution, formation, reserves: Halbouty, Michel T. 07768  
 Giant fields, symposium, introduction: Halbouty, Michel T. 07753

*Wyoming*

- Hilgait field: Tesone, V. P. 01303

**Oil sands***Alberta*

- Athabasca area, occurrence, resources: Camp, Frederick W. 05984

**Oil shale***Colorado*

- Green River Fm., extractable nitrogen compounds: Simoneit, B. R. 00943  
 Piceance Creek Basin, resources: Donnell, John R. 02424  
 Resources, Piceance Creek basin, Green River Fm.: Donnell, John R. 10903

*Development*

- Waste disposal, planning: Hand, John W. 08485

*Exploration*

- Vugular porosity, caliper logging system, Wyoming, Green River Fm.: Thomas, Harold E. 04063

*Geochemistry*

- Composition, structure, cf. lignite: Chomnanti, S. 04369

- Fossil porphyrins, high molecular wgt., analyses: Blumer, M. 08564

- Tar-base concentrates, naphtha, nitrogen identification, spectrometric, gas-liquid chromatography: Brown, Dennis. 09133

*Rocky Mountains*

- Green River Fm., genesis, modern analog: Bradley, W. H. 01243

*United States*

- Production, future, engineering geological problems: Waltz, James P. 10835

- Production, potential developers: Mead, Walter J. 10882

**Oklahoma***Areal geology*

- General, review: Johnson, Kenneth S. 10685  
 Southeastern, field trip guide: Shreveport Geological Society. 04500

- Tulsa Metropolitan Area, guidebook: Bennison, Allan P. 10708

- Water Resources Board Region 1: Oklahoma Water Resources Board. 09209

- Water Resources Board Region 2: Oklahoma Water Resources Board. 09210

- Water Resources Board Region 3: Oklahoma Water Resources Board. 09211

- Water Resources Board Region 4: Oklahoma Water Resources Board. 09212

- Water Resources Board Regions 5 and 6: Oklahoma Water Resources Board. 09213

## Oklahoma—Continued

*Economic geology*

- Lead-zinc, Picher field: McKnight, Edwin T. 00206  
 Mineral resources, review: Johnson, Kenneth S. 10685  
 Natural gas, western, Anadarko basin, exploration: Kornfeld, Joseph A. 05169  
 Petroleum, Anadarko basin, Marmaton Group: Cambridge, Thomas R. 11020  
 Petroleum, Arbuckle carbonate, possibilities: Gatewood, Lloyd E. 10119  
 Petroleum, Healdton field, occurrence, production history: Latham, Jack W. 07764  
 Petroleum, natural gas, Anadarko basin, deep potential: Wroblewski, E. F. 03083  
 Petroleum, natural gas, Hugoton field, occurrence: Pippin, Lloyd. 07762  
 Petroleum, Oklahoma City field, production history, occurrence: Gatewood, Lloyd E. 07763  
 Salt, Woods County, Big Salt Plain, production: Johnson, Kenneth S. 02496

*Engineering geology*

- Dams, Arkansas-Verdigris Rivers, effects on alluvial aquifers: Bedinger, M. S. 05473  
 Materials, properties, east-central, classification: Hartronit, B. C. 04364  
 Materials properties, shale, strength, consolidation: Anessi, Thomas Joseph. 07263  
 Waste disposal, Panhandle area, Glorieta and Ogallala fms.: Irwin, James H. 08706

*General*

- Bibliography, 1969: Johnson, Kenneth S. 02494  
 Education, secondary teacher training, introductory geology: Espach, Ralph. 02719

*Geochemistry*

- Major-Blaine Counties, Flowerpot Shale, clay minerals: Wu, Dah Cheng. 00971  
 Mill Creek area, limestone, dolomite, granite, multispectral analysis: Rowan, L. C. 09291  
 Seminole and Pontotoc Counties, Ada Fm., trace elements: Iranpanah, Assad. 00471

*Geomorphology*

- South Canadian River, regional, relation to drainage changes: Harris, Sherod A. 02787  
 Washita County, Washita Bat Caves, general description: Looney, Mary. 08379

*Geophysical surveys*

- Arbuckle Mountains, infrared imagery, geologic applications: Rowan, L. C. 05960  
 Arbuckle Mountains, Mill Creek area, infrared, rock types, structures: Rowan, L. C. 07774  
 Chelsea-Manitou area, seismic, crustal structure: Tryggvason, E. 02720  
 Mill Creek area, remote-sensing, radar, infrared: Rowan, L. C. 06236  
 Mill Creek area, thermal-infrared images, analysis, mathematical model: Watson, Kenneth. 09292  
 Mill Creek syncline, magnetic, airborne: Austin, Charles Thomas. 02014  
 Oklahoma, seismic, gravity, crustal studies: Mitchell, B. J. 04454

*Hydrogeology*

- Arkansas-Verdigris River valleys, dam effects, alluvial aquifers: Bedinger, M. S. 05473  
 Ground water resources, popular account: Oklahoma Water Resources Board. 07186

*Maps, geologic*

- Precambrian-Devonian: Tarr, Russell S. 10852  
 Tulsa Metropolitan Area: Bennisson, Allan P. 10708

## Oklahoma—Continued

*Maps, geologic—Continued*

- Wyandotte quadrangle: McKnight, Edwin T. 00206

*Maps, isopach*

- East-central, Pennsylvanian: Dogan, Nevzat. 03190

- Nemaha ridge, east flank, Marmaton Group: Cole, J. Glenn. 07101

*Maps, lithofacies*

- Nemaha ridge, east flank, Marmaton Group: Cole, J. Glenn. 07101

*Mineralogy*

- Clay minerals, Desmoinesian rocks, diagenesis, effects: Bucke, David Perry, Jr. 01222

*Paleomagnetism*

- Precambrian, Troy and Tishomingo Granites, southern: Spall, Henry. 06238  
 Spavinaw Granite, re-evaluation of Hawes' data: Noltmeyer, H. C. 00917

*Paleontology*

- Asterozoa, Mississippian, Fayetteville Fm., Vinita area, ophiuroid: Strimple, Harrell L. 02495

- Brachiopoda, Ordovician, Bromide Fm., triplesiid: Wright, Anthony D. 05887

- Conodonts, Mississippian-Pennsylvanian, Goddard, Springer Fms.: Straka, Joseph John, 2d. 01682

- Conodonts, Pennsylvanian, Morrowan rocks, northeastern: Lane, Harold Richard. 00528

- Conodonts, Pennsylvanian, southern, evolution, intergradation: Straka, Joseph J., 2d. 04372

- Crinoidea, Mississippian, Fayetteville Fm., *Pterotocrinus*: Burdick, D. W. 07555

- Mammalia, Pleistocene, faunal sequence: Hibbard, Claude W. 08053

- Palynology, Permian, Flowerpot Fm., paleogeography: Clapham, W. B., Jr. 01177

- Palynology, Quaternary, Kingsdown Fm., Illinoian, Sangamon ages: Kapp, Ronald O. 08691

- Palynomorphs, Pennsylvanian, Anadarko basin, *Cordaitina*: Kirkland, D. W. 08576

- Palynomorphs, Permian, Flowerpot Fm., western: Clapham, W. B., Jr. 01294

- Palynomorphs, Permian, Upper, basic groups, statistical analysis: Clapham, W. B., Jr. 08516

- Pennsylvanian, Keystone Reservoir area, palynology, paleoecology: Potter, Delbert E. 00925

- Pennsylvanian, paleoecology, Wewoka Fm., Hughes County: West, Ronald Robert. 06612

- Porifera, Mississippian-Pennsylvanian, Ouachita Mts.: Rigby, J. Keith. 04706

- Protista, Devonian, Haragan Fm., acritarch, n.gen.: Loeblich, Alfred R., Jr. 07045

- Protista, Devonian, Woodford Fm., tasmanitid, catalog: Traverse, A. 03702

- Protista, Ordovician, Viola-Fernvale Limestones, zonation: Jenkins, W. A. M. 09182

- Protozoa, Ordovician, Sylvan Shale, chitinozoans: Jenkins, W. A. M. 04702

- Reptilia, Permian, captorhinds, spinal morphology: Vaughn, Peter Paul. 05257

- Reptilia, Permian, Lower, Logan County, captorhinomorph, braincase: MacLean, William P., 3d. 02088

- Tracks and trails, Mississippian-Pennsylvanian, Ouachita Mts.: Chamberlain, Charles Kent. 06869

- Vertebrata, Permian, Wellington and Hennessey Fms.: Olson, Everett C. 03407

**Oklahoma—Continued***Paleontology—Continued*

Vertebrata, Quaternary, Panhandle Aspect  
archeologic sites: Duffield, Lathel Flay. 07920

*Petrology*

Southeastern, Johns Valley boulder assemblage,  
provenance: Shideler, Gerald L. 07554

*Sedimentary petrology*

Briggs-Cookson area, Morrow Fm., carbonate  
rocks: Rowland, Tommy Lee. 07945

Eastern, Atoka Fm., clay minerals, provenance:  
Wong, Her Yue. 03271

Hughes and Coal Counties, Thurman Sand-  
stone: Hare, Ben D. 10687

Nemaha ridge, east flank, Marmaton Group,  
members: Cole, J. Glenn. 07101

Northeastern, Red Fork-Burbank Sands, deposi-  
tional environment: Hudson, Adonnis S.  
06136

Ouachita Mountains, flysch, distribution of in-  
dividual beds: Picha, Frantisek. 09519

Ouachita Mountains, Mississippian-Pennsylvani-  
an flysch: Cline, L. M. 05301

Pennsylvanian, sandstone, deltaic model:  
Visher, Glenn S. 02694

Soils, moisture measurements, characteristics,  
new classification system: Nichols, J. D.  
03933

Southeastern, Johns Valley Shale, boulders:  
Shideler, Gerald L. 02076

*Stratigraphy*

Cambrian, Wichita-Arbuckle Mts., biostratig-  
raphy: Stitt, James H. 01105

Cambrian-Ordovician, Pennsylvanian, Healdton  
oil field: Latham, Jack W. 07764

Carboniferous, Jackfork Group, Springer age:  
Felix, C. J. 09174

Cretaceous, Cheyenne, Kiowa Fms., paleogeog-  
raphy, correlation: Scott, Robert W. 02335

Mississippian, Kinderhook-Osage Series,  
northeastern, conodont zones: Thompson,  
Thomas L. 01350

Mississippian-Pennsylvanian, flysch facies,  
Ouachita Mts.: Cline, L. M. 05301

Ordovician, Viola-Fernvale Limestones, bios-  
tratigraphy: Jenkins, W. A. M. 09182

Paleozoic, Ouachita Mountains, pre-Womble  
Shale section: Madeley, Hulon M. 01314

Pennsylvanian, east-central, cross sections:  
Dogan, Nevzat. 03190

Pennsylvanian, Marmaton Group, Nemaha  
ridge, east flank: Cole, J. Glenn. 07101

Precambrian-Devonian, section: Tarr, Russell S.  
10852

Wyandotte quadrangle: McKnight, Edwin T.  
00206

*Structural geology*

Crustal structure: Mitchell, B. J. 04454

Payne County, high-angle faults, model study:  
James, W. R. 01420

Wichita, megashear: Walper, Jack L. 07100

*Weathering*

Kiowa County, King Mtn., diabase argillation:  
Nichols, Clayton R. 05671

**Ontario***Absolute age*

Chibougamau-Surprise Lake area, Grenville  
front, Rb-Sr: Krogh, T. E. 02248

Georgian Bay, French River areas, gneiss,  
metamorphic events, Rb-Sr: Krogh, T. E.  
02246

Georgian Bay-Sudbury area, granite, Rb-Sr:  
Krogh, T. E. 02247

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Grenville province, metamorphic events, Rb-Sr:  
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Algoma District, Township 1B: Robertson, J. A.  
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Algonquin Provincial Park, Highway 60, guide-  
book: Guillet, G. R. 10718

Auld Township: McIlwaine, W. H. 00465

Bancroft-Madoc area, field trip guidebook,  
Grenville rocks, minerals structure: Institute  
on Lake Superior Geology. 09508

Beardmore-Geraldton area, field-trip guide:  
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book: Michigan Basin Geological Society.  
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- Current research, geologic, geophysical exploration, Superior province: Wilson, H. D. Bruce. 03568  
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- Cochrane area, glacial deposits, ground-water thermal regime: Parsons, Myles L. 08023  
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 Ottawa area, postglacial clay terrace, ground-water flow: Jarrett, P. M. 03944  
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Eastern, late Middle, graptolite zones: Berry, William B. N. 04521

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Limestones: Jenkins, W. A. M. 09182

Viola Fm., palynology: Nygreen, Paul W. 00921

*Ontario*

Bancroft-Madoc area, Middle formations,  
lithology, field trip guidebook: Institute on  
Lake Superior Geology. 09508

Echinodermata, edrioblastoid, Hull Limestone:  
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Kirkfield area, Porifera, brachiospongiid,  
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Franklin County, western, carbonate rocks:  
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Gaspe, Cloridorme Fm.: Parkash, Barham.  
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Levis area, conodonts, Levis Fm., correlation:  
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Saint Lawrence Lowlands, Nicolet River-Pont-  
grave River Fms., paleoecology: Bretsky,  
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Southern, Laval Formation, Chazyan mounds,  
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Brachiopoda, Middle and Upper: Alberstadt,  
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Central basin, carbonates, lithofacies: Al-  
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Cambrian boundary, age discrepancies: Miller,  
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Central, conodonts, Lower, zonation: Miller,  
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- Arvonian district, Trilobita, Arvonian Slate: Tillman, C. G. 01139  
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 Southwestern, Martinsburg Fm.: Walker, Laurence G. 03743  
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 Western, Lower-Middle, sedimentation, lithotopes: Ostrom, Meredith E. 07423

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- Cascade Range, blueschist, amphibolite, K-Ar: Lanphere, Marvin A. 09636  
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- Land use, Willamette Valley, soils, geomorphology: Parsons, R. B. 02955  
 Landslides, Arlington area, causes: Anderson, Roy A., Jr. 05510

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- Bibliography, geology and mineral resources, 1956-60: Roberts, Miriam 03193

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- Coyote Flat, artifacts: Butler, B. Robert. 03339  
 Education, Portland State Univ., geologic illustration for art majors: Allen, John Eliot. 01426

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 Willamette Valley, Pleistocene, soil development: Parsons, R. B. 02568

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 Regional, gravity: Thiruvathukal, John V. 00558

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 Eugene-Springfield area, ground-water, basic: Frank, F. J. 08381  
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- Klamath Mountains, May Creek Schist belt: Kays, M. Allan. 04457  
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- Clatsop Plains sand-dune area: Frank, F. J. 04597

- Thermal springs and wells: Bowen, R. G. 07188

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- Angiosperms, Eocene, Clarno Fm., Mammal quarry: McKee, Thomas M. 09812  
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Diatoms, Holocene, Davis Lake deposit, paleoecology: Messina-Allen, S. 03585  
Fossil beds, general description, John Day Basin: Ouellette, Cecil. 09787  
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- Ash-flow tuffs, Cenozoic, flow chronology: Walker, George W. 09815  
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Klamath Mountains, May Creek Schist, metamorphism: Kays, M. Allan. 04457  
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Needle Point pluton, melting relations, experimental study: Piwinski, A. J. 00095  
Newberry caldera, basalt-obsidian relations, East Lake fissure: Higgins, Michael W. 04463  
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Cenozoic, Little Butte Volcanic Series, true position, Cascades: Wheeler, Harry E. 08535  
Devonian-Eocene, flysch facies, sedimentation: Danner, W. R. 05298  
Jurassic-Cretaceous, Otter Point-Humbug Mtn.-Rocky Point fms., flysch: Aalto, K. R. 05299  
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Tertiary, Columbia River Basalt, correlation: Holmgren, Dennis Arthur. 06599  
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- Columbia River Basalt, faults, folds: Newcomb, R. C. 06378  
Columbia River Basalt group, folds, faults: Newcomb, R. C. 08540  
Medford area, Cretaceous (?) sandstone, slump structure: Boggs, Sam, Jr. 09809  
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Regional, crustal structure, thickness: Thiruvathukal, John V. 00558  
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Cascade Range, Sand Mountain Lava Field, spatter cone pits: Nieland, Jim. 09820  
Cascade Range, Three Sisters area: Taylor, Edward M. 04359  
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- Abyssal sediments, Gulf of Mexico, Atlantic Ocean: Koons, Charles B. 06796
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- Carbohydrates, Precambrian and Cambrian rocks, fossils: Swain, Frederick W. 00435
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Pleistocene, fluvial, North Dakota, cf. modern Alaskan: Tuthill, Samuel James. 01580

Pleistocene, marine nearshore, Florida, "Glades" unit: McGinty, Thomas L. 03428

Pliocene-Quaternary, terrestrial, Arizona, San Pedro Valley: Russell, Richard H. 02972

*Ordovician*

Benthonic, Wisconsin, Platteville Fm.: Bretsky, Peter W. 06155

Marine, Quebec, Nicolet River-Pontgrave River Fms.: Bretsky, Peter W. 02725

Marine sublittoral, Upper, Appalachians, central: Bretsky, Peter William, Jr. 07462

Supratidal-subtidal, New York, Black River Group: Walker, Kenneth Russell. 07591

*Ordovician-Silurian*

Reef, Newfoundland, Goldson Fm., coral-algal boulders: Horne, Gregory S. 05803

*Ostracoda*

Lagoonal, post-Paleozoic: Krutak, Paul R. 00904

Miocene, marine, West Indies, St. Croix, St. Martin, Anguilla: Bold, W. A. van den. 06342

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Marine, carbonate shelf, North America: Ross, Charles A. 00350

Marine infauna, evolution, pelecypods and other invertebrates: Nicol, David. 09395

Marine, nearshore, community models: Anderson, Edwin J. 02582

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## Paleoecology — Continued

*Pelecypoda*

Cretaceous, marine, South Dakota, Fox Hills: Speden, Ian G. 07242

Ordovician, marine, Illinois, Iowa, Maquoketa Fm.: Snyder, Jeremy E. 09581

Paleozoic, marine infauna, evolution, proportions: Nicol, David. 09395

Pectinid shells, growth experiments: Clark, George Richmond, 2d. 00519

Permian, reef, Pteriina, oyster-like: Newell, Norman D. 07866

Shell ultrastructure, physical stresses: Davies, Tudor T. 00692

Taxonomic diversity gradients: Schopf, Thomas J. M. 05969

Tertiary, littoral, tropical, Lucinacea: Jackson, Jeremy B. C. 07035

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Marine, Oklahoma, Wewoka Fm.: West, Ronald Robert. 06612

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*Pisces*

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Cretaceous, freshwater-brackish, Alberta, Oldman Fm.: Langston, Wann., Jr. 08666

Cretaceous, marine, Alabama, Mooreville Chalk: Applegate, Shelton P. 02832

Paleozoic, fresh-water vs. marine, Sarcopterygii, evolution: Thomson, Keith Stewart. 10284

Quaternary, fresh water, U.S. Central Plains: Cross, Frank B. 08050

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Environmental analysis, Pleistocene-Holocene, role of man: Forbis, R. G. 10647

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Lacustrine, Ohio, Fairlawn mastodon site: Teeter, James W. 01107

Lacustrine, Pleistocene, Ohio, Ostracoda: Teeter, James W. 04395

Marine, California, Goleta area, Pleistocene: Wright, Robert H. 00390

Marine-brackish, Canada, Champlain Sea, Pleistocene: Wagner, Frances J. E. 07535

Postglacial, North America, eastern, early man, readaptation: Fitting, James E. 10116

Terrestrial, marsh, Texas, Randall County, Pleistocene: Schultz, Gerald E. 04708

Terrestrial, Oklahoma, Texas, archeologic sites: Duffield, Lathel Flay. 07920

Terrestrial, Pleistocene-Holocene, U.S., Great Plains, symposium: Dort, Wakefield, Jr. 08040

Terrestrial, stress due to climate fluctuations: Dort, Wakefield, Jr. 08041

Terrestrial, Texas-New Mexico, Lubbock subpluvial environment: Wendorf, Fred. 08043

Terrestrial, Vermont, north-central, postglacial: Dole, Robert Malcolm, Jr. 06584

*Reptilia*

Cretaceous, marine, mosasaurs, Alabama, Mooreville Chalk: Russell, Dale A. 02831

**Paleoecology—Continued***Reptilia*—Continued

Cretaceous, Upper, terrestrial-deltaic, Alberta, Wyoming, dinosaurs: Sternberg, Charles M. 08593

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*Scaphopoda*

Ordovician, marine benthic, Iowa, Maquoketa Fm.: Bretsky, Peter W. 04714

*Sedimentation*

Pelecypod shells, in marine environment: Driscoll, Egbert G. 05655

Pennsylvanian, Oklahoma: Potter, Delbert E. 00925

*Silurian*

Marine, Nevada, Utah, Great Basin: Sheehan, Peter M. 00360

Marine, New York, Rondout Fm.: Harper, John David. 06871

Marine to terrestrial, acritarch indicators, Pennsylvania: Smith, Norman D. 01540

*Tertiary*

Marine, California, Kettleman Hills, Pliocene: Stanton, Robert J., Jr. 05806

Marine, California, Newport Beach, Pliocene: Zinsmeister, William J. 07494

Marine, Maryland, Choptank Fm., Miocene: Gernant, Robert E. 05385

Marine, New Jersey, Eocene: Enright, Richard Louis Charles, Jr. 01225

Marine, North America, Pacific: Addicott, W. O. 08327

Marine sublittoral, Mississippi, Jackson Group units, ostracodes: Huff, William J. 05346

Marine, Texas, southeastern, Claiborne shales, Eocene: Stanton, Robert J., Jr. 03759

Marine-continental, basin-margin, California, Miocene-Pliocene: Stanton, Robert J., Jr. 00369

*Tracks and trails*

Burrows, fossil cf. living organisms: Frey, Robert W. 02092

*Vertebrata*

Cretaceous, marine, Texas, Trinity Group: Thurmond, John Tydings. 07377

Permian, marine-deltaic, lacustrine, Texas: Berman, David S. 05211

**Paleogeography***Cambrian*

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United States, midcontinent, Upper, basement relief: Meyerhoff, Howard A. 01087

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North America, western craton, Sauk sequence: Poort, Jon Michael. 06878

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Nova Scotia-New Brunswick, Windsor Group: Mamet, Bernard L. 06733

*Cenozoic*

Washington, Camas area, Prune Hill: Aviolo, Gennaro. 01191

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Arizona, southeastern: Hayes, Philip T. 04031

Colorado, Dakota Group, Front Range region: Weimer, Robert J. 05357

Greenland, Cenomanian to Danian seaways, fauna: Rosenkrantz, Alfred. 06683

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Wyoming and southern Rocky Mts., Early: Young, Robert G. 05353

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California, San Luis Obispo-Santa Barbara Counties: Chipping, David H. 00433

*Cretaceous-Paleocene*

Montana, southwestern: Wilson, Michael D. 05249

*Cycles*

Marine transgressions, tidal amplitudes, lunar orbital effects: Olson, Walter S. 03213

*Jurassic*

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*Mesozoic*

Arctic, Jurassic-Neocomian: Saks, V. N. 10094

Ocean-floor spreading, effect on angiosperm distribution: Axelrod, Daniel I. 06797

Yukon, northern: Mountjoy, Eric W. 10079

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Kentucky, central, Lexington Limestone: Cressman, Earle R. 00689

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Appalachians, southern, paleoslope: Jones, Michael L. 03598

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World patterns, continental fragmentation and reassembly: Moores, Eldridge M. 09681

*Paleozoic-Cenozoic*

Plate tectonics, effect on marine life evolution: Valentine, James W. 10290

*Pennsylvanian*

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Missouri, Blackjack Creek Fm., Excello Shale: James, Gerard W. 03613

*Pennsylvanian-Permian*

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*Permian*

Arctic: Dutro, J. T., Jr. 10034

Oklahoma, middle: Clapham, W. B., Jr. 01177

*Precambrian*

Canada, Circum-Ungava craton area: Dimroth, E. 08629

Canada, Superior province: Ayres, Lorne Dale. 06596

*Precambrian-Holocene*

Great Lakes region: McKee, Edith M. 09656

*Precambrian-Paleozoic*

Wisconsin, Baraboo region: Dalziel, I. W. D. 06832

*Precambrian-Permian*

Arctic-North Atlantic Oceans: Meyerhoff, A. A. 03879

*Precambrian-Quaternary*

New Jersey, Sussex County, geologic history in brief: Lucey, Carol S. 10893

*Quaternary*

Virginia, James River drainage basin, Pleistocene: Spencer, R. S. 00087

Wisconsin, Two Rivers area, beach ridge deposits: Zakrzewska, Barbara. 02755

*Silurian*

North America: Berry, W. B. N. 08748

North America, Upper: Ziegler, A. M. 08762

## Paleogeography—Continued

*Tertiary*

- Arizona-California, Colorado River area, marine embayment: Smith, Patsy B. 01500
- California, Baja California, palinspastic reconstruction: Suppe, John. 05188
- California, Santa Cruz Mts., Butano Sandstone: Nilsen, Tor H. 09694
- California, Sierra Madre Mts., Miocene: Fritzsche, Albert Eugene. 03255
- California, southern, borderland, Eocene: Yeats, Robert S. 00392
- South Dakota, Slim Buttes area, Oligocene: Lillegården, Jason A. 00613

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- New Mexico, northern, lakes, slopes: Tanner, William F. 08193

**Paleomagnetism***Applications*

- Atlantic Ocean, genesis, time, rate: Larson, E. E. 03362
- Continental drift, conflicting evidence, review: Facer, R. A. 04787
- Continental drift, conflicting evidence, review: Meyerhoff, A. A. 00094
- Continental drift, conflicting evidence, review: Meyerhoff, A. A. 04786
- Continental drift, evidence: Hood, Peter. 03514
- Continental drift, method, interpretation: Collinson, David W. 05038
- Continental drift, North Atlantic basin opening: Hospers, J. 06686
- Crustal movements analysis, marine studies: Heirtzler, J. R. 04504
- Geophysical aspects, critical review: Fuller, Michael D. 09758
- Paleozoic-Mesozoic boundary determination, reversals: Burek, Peter J. 02348
- Polar wandering, sea-floor spreading, Pacific Ocean: Francheteau, Jean. 01445

*Cambrian-Ordovician*

- Colorado, pole position, anomalous: Larson, Edwin E. 10486

*Cenozoic*

- Alaska, Aleutian Islands, Shemya and Adak Islands, pole positions: Cameron, Christopher P. 02776
- Hawaii, Oahu, Ewa Plain, cores: Hammond, Stephen R. 03438
- Jamaica, Plio-Pleistocene events, cf. foraminiferal succession: Robinson, E. 04065
- Oregon, Yakima Basalt, Yakima Canyon: Holmgren, Dennis A. 08756
- Pacific Ocean, Miocene-Recent sediments, magnetic epochs: Foster, John H. 03729
- Pacific Ocean, Pliocene-Pleistocene reversals, relation to volcanism: Kennett, James P. 10825

*Cretaceous*

- JOIDES deep-sea cores, station 10, field inclination, paleolatitude: Cox, Allan. 03392

*Cretaceous-Tertiary*

- Atlantic Ocean, deep-sea cores: Opdyke, N. D. 01657

*General*

- Geophysical aspects, critical review: Fuller, Michael D. 09758
- Review: Stacey, F. D. 05848
- Textbook, history of Earth's field: Strangway, David W. 03892
- U.S.-Japan Cooperative Science Program, 4th meeting: Doell, Richard R. 03138

## Paleomagnetism—Continued

*Geochronology*

- Extension to Miocene, Pacific Ocean cores: Opdyke, N. D. 09703
- Pliocene-Pleistocene boundary, Gilsa, major Matuyama event: Watkins, N. D. 10295

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- Constancy in time, relation to Earth's core: Nagata, Takesi. 06742
- Precambrian to present: Carmichael, C. M. 06544
- Summary of data to end of 1967: Smith, Peter J. 06545

*Methods*

- Archeomagnetic data, geographic correction: Shuey, R. T. 08206
- Basalt, data reliability: Banerjee, Subir K. 07965
- Field dispersion, angular, determination: Cox, Allan. 04546
- Geomagnetic field drift direction: Skiles, Durward D. 08294
- Intensity, alternating field method, test: Abranson, Christian E. 08012
- Interpretation of seamount magnetic anomalies: Grossling, B. F. 09987
- Mechanical analog calculator, 3-dimensional rotation problems: Chamberlain, E. W. 00023
- Polar wandering test: Francheteau, Jean. 00587
- Polar wandering test: Irving, E. 00656

*Ordovician*

- Newfoundland, Bell Island, Wabana Group: Deutsch, Ernst R. 01888

*Paleosecular variations*

- Alaska, techniques, data: Stone, D. B. 06546

*Permian*

- Northern Hemisphere, field model, cf. paleontologic data: Stehli, Francis G. 03691

*Phanerozoic*

- Relation to mass faunal extinction: Hatfield, Craig B. 00567

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- Polar curve, Pacific Ocean, northeastern, seamounts: Francheteau, Jean. 01445

*Precambrian*

- Colorado, Pikes Peak granite, pole position: Spall, Henry. 08010
- Colorado, Pikes Peak Granite, titanomagnetite as carrier: Spall, Henry. 10485
- Lake Superior region, Middle Keweenawan rocks: Palmer, H. C. 08123
- Minnesota, Keweenawan intrusives: Beck, Myrl E., Jr. 03966
- Minnesota, Keweenawan intrusives: Beck, Myrl Emil, Jr. 03245
- Montana, Stillwater Complex: Bergh, H. W. 06548
- North America, polar wandering evidence: Spall, Henry. 09584
- Oklahoma, Spavinaw Granite, re-evaluation of Hawes' data: Noltimier, H. C. 00917
- Oklahoma, Troy and Tishomingo Granites, southern: Spall, Henry. 06238
- Ontario, Cobalt area, Nipissing diabase: Symons, D. T. A. 07672
- Ontario, Sudbury irruptive, field intensity: Schwarz, E. J. 04621

*Quaternary*

- California, Lassen Peak, volcanics: Crandell, Dwight R. 00248
- California, Mono Lake area, Laschamp event a secular variation: Denham, Charles R. 10488

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- Caribbean Sea, Leg 4 cores, interpretation difficulty: Henry, K. W. 06669  
 Chronology, oceanic islands and cores, data summary: Opdyke, N. D. 09988  
 Faunal extinctions, relations: Hays, James D. 07013  
 Frequency, statistical models: Cox, Allan. 05223  
 Marine sediments, Arctic Ocean, sedimentation rates: Clark, David L. 04946  
 Miocene-Pliocene intrusions, Mt. Rainier-Mt. Hood, Wash.-Oreg.: Dunn, J. 10487  
 Process, Pliocene, Oregon, Laurel Hill stock: Ito, H. 06547  
 Quaternary, late,  $\Gamma$  C-14 curve, comparison: Damon, P. E. 08764  
 Role in selective organic evolution, Pacific Ocean: Hays, James D. 08449

*Tertiary*

- Alaska, Aleutian Islands, relative movements: Stone, David B. 04179  
 British Columbia, upper Miocene, field intensity: Symons, D. T. A. 07676  
 Nevada, Swett ignimbrite, Condor Canyon, Miocene: Gose, Wulf Achim. 04547  
 Oregon, lavas, intensity, Miocene: Abranson, Christian E. 08012  
 Oregon, Washington, Columbia River basalt: Holmgren, Dennis Arthur. 06599

*Triassic-Jurassic*

- Colorado, Pikes Peak Granite, Laramide remagnetization: Spall, Henry. 10485

**Paleontology***Bibliography*

- Vertebrata and related subjects: Matsumoto, Mayme. 02714

*Catalogs*

- Computerized collection: Juskevici, John A. 01417  
 Echinodermata, types, Field Museum, Chicago, Echinoidea, Cyclocystoidea: Golden, Julia. 06898  
 Echinodermata, types, Field Museum, Chicago, Edrioasteroidea: Golden, Julia. 06899  
 Echinodermata, types, Field Museum, Chicago, Stelleroidea: Golden, Julia. 06900  
 Foraminifera, supplement: Saito, Tsunemasa. 07787  
 Invertebrata, Los Angeles County Mus., type specimens: Wilson, Edward C. 07614  
 New York State Museum, type specimens of fossils: Kilfoyle, Clinton F. 09767  
 Plants, Mesozoic and Cenozoic, North America, proposed: Becker, Herman F. 04215  
 Protista, calcareous nannoplankton, index: Loeblich, Alfred R., Jr. 02144

*Collecting*

- California, Oceanside area, vertebrata, popular account: Frazier, Ken. 09743  
 Colorado, Nevada, dinosaurs, popular account: Firby, Jean. 09782  
 Eocene whales, Mississippi: Applegate, Shelton P. 01266  
 Guide, U.S. localities by states: Casanova, Richard. 07426  
 New York City: Horenstein, Sidney. 11211  
 Ordovician fossils, Ontario, Peterborough area: Sabina, Ann P. 03049  
 Oregon, John Day fossil beds, general description: Ouellette, Cecil. 09787

**Paleontology—Continued***Collecting—Continued*

- Pennsylvania, Penfield area, new locality: Berg, Thomas M. 06830  
 Pennsylvania, Pike County, Egypt Mills area, Invertebrata: Novak, Bill. 09745  
 Pennsylvania, sites: Gregory, Gardiner E. 03868  
 Trilobita, Utah, popular account: Rowe, Royle C. 02277

*Education*

- Principles, laboratory manual, interpreting earth history: Petersen, Morris S. 10836  
 Stratigraphic paleontology, teaching, approach: Berry, W. B. N. 08500  
 Traditional courses, integration with paleoecology: Laporte, Leo F. 01079  
 Undergraduate, modernized approach: Linsley, Robert M. 08499  
 Vertebrate, necessary background in biology: Romer, Alfred Sherwood. 08565

*Extinctions*

- Conodonts, evolutionary, ecologic, geographic observations: Mosher, L. Cameron. 01092  
 Environmental factors: Bretsky, Peter W. 03779  
 Invertebrata, late Paleozoic, phytoplankton decrease: Pitrat, Charles W. 05601  
 Invertebrata, late Paleozoic, phytoplankton decrease: Tappan, Helen. 05600  
 Magnetic field reversals, relations: Hays, James D. 07013  
 Major taxa, oxygen consumption, atmospheric oxygen variations: McAlester, A. Lee. 02149  
 Megafauna, man's effect: Krantz, Grover S. 08584  
 Periodicity, related to galactic events: Hatfield, Craig B. 00567  
 Permian, hypersaline sea waters: Bowen, Richard L. 10953  
 Pleistocene, late, Mammalia, causes: VanValen, Leigh. 08518

*Fossilization*

- Bone, archeological humar, microscopic structure: Peske, G. Richard. 10134  
 Bone, archeological, weathering cracks and split-line patterns: Tappen, N. C. 10133  
 Marine invertebrates, number of fossil species: Valentine, James W. 02086  
 Palynomorphs, Devonian, Missouri, spores: Urban, James B. 01873  
 Pelecypod shells, destruction in marine environment: Driscoll, Egbert G. 05655  
 Potential fossil communities, destruction by abrasion, boring: Driscoll, Egbert G. 10325  
 Wood petrifications, apatite, Illinois: Gluskoter, Harold J. 08624

*Index fossils*

- Appearances, extinctions, orderly succession: Tychen, Paul C. 05050

*Life, origin*

- Chemical evolution, primitive Earth, experimental studies: Lemmon, Richard M. 00079  
 Conference: Margulis, Lynn. 10215  
 Earth, possibilities on other planets: Sneath, P. H. A. 02761  
 Organic materials, hydrothermal metamorphism, evolutive steps: Mueller, George. 04107  
 Popular account: Camp, Charles L. 11270  
 Porphyrin-chlorin-amino acid bonding: Hodgson, Gordon W. 05591

*Methods*

- Acetate peels, graptolites: Chiang, Kam. 04722

**Paleontology—Continued****Methods—Continued**

- Association-analysis, Foraminifera distribution: Vilks, G. 08755
- Biofacies analysis, quantification, computer application: Buzas, Martin A. 08506
- Biofacies analysis, shale: Griesemer, Allan D. 02526
- Carbohydrate residues in ancient rocks, taxonomic interpretation: Swain, F. M. 04095
- Catalogs, computer produced, Univ. California Mus. Paleontology: Berry, William B. N. 02095
- Collecting sieve, shallow water: Greeley, Ronald. 05808
- Community reconstruction, Mammalia, Tertiary: Voorhies, M. R. 08563
- Computer numerical methods, applications to phylogeny, analysis: Rowell, A. J. 10631
- Data storage and retrieval, computer applications: Mello, James F. 08503
- Evolution of form, variance analysis, computer analogy: Gould, Stephen Jay. 03369
- Microvertebrates, recovery with acetic acid, field, laboratory: Green, Morton. 10874
- Mixed fossil populations, frequency analysis: Ghose, Benoy K. 10642
- Morphology simulation, computers, model need: Raup, David M. 08504
- Morphometric analysis, covariance structure, application, paleogenetics: Reymont, Richard Arthur. 10630
- Photography, megafossils: Sakamoto, Kenji. 06187
- Preparations, small fossils, amine and methyl amyl alcohol: Lund, Richard. 02099
- Regression analysis, reappraisal, growth curves, foraminifera: Ghose, Benoy K. 05015
- Research, computer applications: Olson, Everett C. 08508
- Shell analysis in archeological middens, cost evaluation: Koloseike, Alan. 10136
- Taxonomy, numerical, computer application: Kaesler, Roger L. 08505
- Tectonic distortion analysis, graptolites: Cooper, R. A. 04720
- Vertebrate macrofossils, collecting, plaster jacket: Auffenberg, Walter. 10931

**Migrations**

- Angiosperms, maples: Deschenes, Jean-Marc. 02479
- Mammoth hunters, Old to New World: Haynes, C. Vance. 08046

**Nomenclature**

- Invertebrata, names proposed by L. G. Hertlein, 1925-70: Roth, Barry. 09393
- Taxa proposed in honor of L. G. Hertlein, 1926-69: Roth, Barry. 09391

**Phylogeny**

- Ammonoidea, sutural development: Kullmann, Jürgen. 09841

**Practice**

- Assumptions: Klotz, John W. 05046
- Joint Committee on Paleontologic Information, history: Shaw, Alan B. 02146
- North American Paleontological Convention, 1969: Yochelson, Ellis L. 00014

**Principles**

- Criteria of Stage boundary definition, biostratigraphic: McLaren, D. J. 04619

**Taxonomy**

- Generic concept, numerical taxonomy contribution: Rowell, A. J. 08569

**Paleontology—Continued****Taxonomy—Continued**

- Invertebrata, comparative anatomy, principles, promorphology: Beklemishev, W. N. 09232
- Invertebrate treatise, Graptolithina, Pterobranchia: Bulman, O. M. B. 08197

**Textbooks**

- Dinosaurs: Swinton, W. E. 07805
- Invertebrate treatise, Graptolithina, Pterobranchia: Bulman, O. M. B. 08197
- Invertebrate treatise, Mollusca, Bivalvia, index omission: Moore, Raymond C. 10968
- Popular, and collecting guide: Casanova, Richard. 07426

**United States**

- Foraminifera, Porifera, midwestern, popular account: Douglas, Dale. 09435
- Ostracoda, Graptolithina, midwestern, popular account: Douglas, Dale. 09433

**Paleozoic****Absolute age**

- Upper strata, correlations, cf. fossil zonation, lithology: Ross, Charles A. 04205

**Alabama**

- Birmingham anticlinorium, folding: Thomas, William A. 10274
- Birmingham area, stratigraphy, road cut: LaMoreaux, Philip E. 06226

**Alaska**

- Brooks Range, De Long Mts., stratigraphy: Martin, A. J. 05963
- Brooks Range, northeastern, review: Reiser, Hil-lard N. 07078
- Northern, central, stratigraphy: Brosge, William P. 10019
- Prince of Wales Island, northwest coastal area, stratigraphy: Eberlein, G. Donald. 02332
- Seward Peninsula: Sainsbury, C. L. 10093
- Shublik, Sadlerochit Mts., pre-Carboniferous sequences: Dutro, J. Thomas, Jr. 07080

**Arctic**

- Upper, biostratigraphy: Ustritskiy, V. I. 10111

**Arctic Ocean**

- Canada basin, stratigraphy, interpretation: Churkin, Michael, Jr. 02311

**Arizona**

- Mogollon Rim, flora: Blazey, Edward B. 02974
- Western Grand Canyon region, summary: Hamblin, W. K. 06928

**Arkansas**

- Ouachita Mountains, pre-Womble Shale section: Madeley, Hulon M. 01314

**Brachiopoda**

- Paleoecology, lingulids, sediment preference: Paine, Robert T. 01367
- Upper, paleoecology, cf. modern *Tridacna*: Cowen, Richard. 08328

**British Columbia**

- Halfway River map-area, stratigraphy: Irish, E. J. W. 03148
- Hope map-area, western: Monger, J. W. H. 04203

- Kootenay arc: Fyles, James T. 04912

- Northeastern, Pine Pass area, stratigraphy: Taylor, G. C. 07897

**British Honduras**

- Maya Mountains, Maya-Macal unit: Kesler, Stephen E. 10735

**Bryozoa**

- Biometric procedures in taxonomy: Anstey, Robert L. 01213
- Tabulipora*, morphology, taxonomy: Gautier, T. Gary. 11224

## Paleozoic—Continued

*California*

Death Valley area, stratigraphy: Troxel, Bennie W. 03865

Inyo Mountains, submarine rockslide deposits: Ridley, Albert P. 00346

Salinian block, correlation across San Andreas fault: Wiebe, Robert A. 02377

San Andreas 15-minute quadrangle, stratigraphy: Clark, Lorin D. 08182

San Bernardino County, Goodsprings Dolomite, Lower: Gans, William Thomas. 07923

*Central America*

Maya-Macal unit, correlation: Kesler, Stephen E. 10735

*Cephalopoda*

"Nautiloid" genera based on Barrande types: Teichert, C. 07496

*Colorado*

Front Range, pre-Pennsylvanian, conodonts, stratigraphy: Goebel, Edwin D. 01073

*Colorado Plateau*

Stratigraphy, summary: Smith, Clay T. 04848

*Connecticut*

Torrington quadrangle, metamorphic sequence: Martin, Charles W. 06218

*Conodonts*

Geographic distribution: Collinson, Charles. 01063

Lower, provinces: Barnes, Christopher R. 01049

Taxonomy, suprageneric, new classification: Lindstrom, Maurits. 06769

Upper, geographic distribution: Druce, Edric. 01071

*Crinoidea*

Classification and nomenclature based on stem parts, descriptions: Moore, Raymond C. 11251

*Florida*

Peninsular: Rainwater, E. H. 07316

*Foraminifera*

Nonfusulinid, bibliography: Toomey, Donald Francis. 02292

*Georgia*

Peninsular: Rainwater, E. H. 07316

*Graptolithina*

Taxonomy, stratigraphic distribution: Bulman, O. M. B. 08197

*Great Lakes region*

Correlation, Cambrian-Devonian, Michigan basin terminology, structural complexity: Fisher, James H. 10947

Michigan basin, early history, Cambrian, Ordovician, Silurian, Devonian isopach maps: Fisher, James H. 10947

*Greenland*

Jameson-Scoresby Lands, Werner Bjerger, stratigraphy: Perch-Nielsen, K. 06254

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*Alberta*

Southern, end moraines, ice-cored, identification: Ostrem, G. 06828

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Ecological surveys, aerial and space photography: U.S. Natl. Aeronaut. and Space Adm. 09162

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Hydrogeology, watershed evaluation: Howe, Robert H. L. 08474

Land-use maps, high-altitude and spacecraft photos: Pettinger, Lawrence R. 08080

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*Bibliography*

Annotated, of bibliographies: Steiner, Dieter. 06369

*British Columbia*

Fractures, Christina Lake area: Haman, Peter J. 09858

Southern, end moraines, ice-cored, identification: Ostrem, G. 06828

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Garlock, Coyote Creek, San Andreas and other faults: Clark, Malcolm M. 07777

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Peat plateaus, palsas, permafrost indicators, Canada: Brown, R. J. E. 08258

Slope failure forms, aerial photography: Poole, Donald Hudson. 00515

Watershed planning, development: Burgess, Lawrence Charles Norman. 07917

*Methods*

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Remote sensing, multispectral photography: Hodder, D. T. 09082

Satellite, multiband spectral data, geologic mapping: Lyon, R. J. P. 06762

Satellite, television imaging: Wood, Peter. 09806

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Low sun-angle vertical, cf. infrared scanning: Howard, Arthur D. 00106

Mexico, Gulf of California area, Apollo 6 photomap: U.S. Geological Survey. 01653

Multispectral, use of passband interference filters: Slater, Philip N. 08083

North America, Apollo spacecraft: Nicks, Oran W. 08371

Oblique, orbital, advantages: Wobber, Frank J. 03130

Offshore studies, new techniques: Merrell, William J., Jr. 03216

Small-scale airphotos, geologic applications: Clark, Malcolm M. 07777

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United States, Mexico, Apollo flight, interpretation: Clayton, Keith. 07636

United States, north-central, airphoto atlas: Baker, Simon. 07806

United States, Pacific Ocean to Louisiana, Apollo 6 photomap: U.S. Geological Survey. 01653

*South Dakota*

Highways, distressed areas, delineation: Hoskins, Earl R. 07028

*Techniques*

Aerial photography, simulation of side-looking radar: Lyon, R. J. P. 09803

*Texas*

Dallas-Fort Worth area, land use, Apollo photography: Boyer, Robert E. 00869

Southwestern, Gemini and Apollo flights, interpretation: Dupre, William R. 00483

*United States*

Midcontinent, bison trails, distinguished from joint traces: Clayton, Lee. 01061

## Pisces

*Actinopterygii*

Cenozoic, Florida, popular guide: Swift, Camm. 10472

*Agnatha*

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*Batoidea*

Cenozoic, Florida, popular guide: Wing, Elizabeth. 10561

*Cimolichthys nepaholica* (Cope)

Cretaceous, Kansas-Wyoming, Niobrara-Pierre Fms., morphology: Goody, Peter C. 08752

*Cretaceous*

Alabama, Mooreville Chalk, taxonomy, paleoecology: Applegate, Shelton P. 02832

Montana, Wyoming, Bighorn Basin, Cloverly Fm.: Ostrom, John H. 07243

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*Crossopterygii*

Devonian-Holocene, functional morphology, ecology, evolution: Thomson, Keith Stewart. 10284

*Cylindracanthus*

Cretaceous, Texas, Eagle Ford Shale, rostrum: McNulty, C. L., Jr. 00486

*Dipnoi*

Devonian-Holocene, functional morphology, ecology, evolution: Thomson, Keith Stewart. 10284

*Elasmobranchii*

Fossil shark teeth, collecting guide: Kelley, K. V., Jr. 07427

*Enchodus*

Cretaceous, Goody, Peter C. 04047

*Enchodus lewisiensis*

Cretaceous, Texas, Eagle Ford Shale, mandible: McNulty, C. L., Jr. 04131

*Esox lucius*

Pleistocene, Yukon, Old Crow area, late deposits: Crossman, E. J. 08194

*Esox masquinongy*

Miocene, Oregon, Deer Butte Fm.: Cavender, Ted M. 04630

*Esox niger*

Pleistocene, Florida, fluvial deposits: Cavender, Ted M. 04630

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Pleistocene, Ontario, Don River Valley, Sangamon deposits: Crossman, E. J. 08194

*Evolution*

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*Geographic distribution*

United States, Central Plains, Pleistocene-Recent environments: Cross, Frank B. 08050

*Helicoprion* sp.

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*Hypsodoris farsonensis*, n.gen., n.sp.

Eocene, Wyoming, Green River Fm., catfish: Lundberg, John G. 02150

*Mesozoic*

Distribution, paleoclimate indicator: Schaeffer, Bobb. 08568

*Moorevillia hardi*, n.gen., n.sp.

Cretaceous, Alabama, Mooreville Chalk, new elopoid fam., superfam.: Applegate, Shelton P. 02832

*Morphology*

Agnatha, ostracoderm, and placoderm, oral region: Robertson, George M. 04397

*Mylephus*? sp.

Cretaceous, Alberta, southeastern, Oldman Fm., batoid: Langston, Wann., Jr. 08666

*Osteostraci*

Ordovician, Illinois, Platteville Limestone: Fraunfelder, George H. 02468

*Palelops eutawensis*, n.gen., n.sp.

Cretaceous, Alabama, Mooreville Chalk, elopid: Applegate, Shelton P. 02832

*Paratarpon apogeronius*, n.gen., n.sp.

Cretaceous, Alabama, southeastern, Oldman Fm., elopid: Bardack, David. 08635

*Permian*

Texas, Baylor County, Lueders Fm., paleoecology, n.spp.: Berman, David S. 05211

*Placodermi*

Superclass revision, jaw criteria: Robertson, George M. 04397

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*Propenser hewletti*, n.gen., n.sp.

Cretaceous, Alabama, Mooreville Chalk, acipenserid: Applegate, Shelton P. 02832

**Pteraspidae**

Classification, revision, n.gen., n.sp.: Denison, Robert H. 07883

**Quaternary**

California, Palos Verdes Sand, otoliths, teeth, Pleistocene: Fitch, John E. 09775

United States, Great Basin, Holocene, evidence of late Pleistocene hydrography: Hubbs, Carl L. 10176

**Sarcopterygii**

Devonian-Holocene, functional morphology, ecology, evolution: Thomson, Keith Stewart. 10284

**Selachii**

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**Synorichthys sp.**

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**Taxonomy**

Pteraspidae, review, new forms: Denison, Robert H. 07883

**Teleostei**

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**Tertiary**

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Wyoming, Fossil Lake beds, predators-planktivores, equitability: Perkins, Philip L. 04928

**Triassic**

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**Placers****Alaska**

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**Gold**

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Colorado, grains, composition: Desborough, George A. 06897

Grains, low-silver rims: Desborough, George A. 04319

Oregon, Sixes River basin, distribution: Boggs, Sam, Jr. 01721

Yukon, Klondike area, evaluation problems: Hester, B. W. 03589

Yukon, Klondike area, heavy mineral associations: Gleeson, C. F. 06304

**Rutile-ilmenite**

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**Platinum****Analysis**

Emission spectroscopy, gold bead, fire-assay fusion: Dorrzapf, Anthony F., Jr. 03887

**Geochemistry**

Platinum group: Keays, Reid R. 04417

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**Polymetallic ores****Canada**

Base-metal deposits, ore density: Anderson, C. D. 08070

Carbonate-rock deposits, exploration guides: Sangster, D. F. 04535

Precambrian Shield, stratiform deposits, volcanic-sedimentary origin: Gross, G. A. 04534

Precambrian sulfide deposits, genesis: Whitmore, D. R. E. 03458

**General**

Sulfides, Mineralog. Soc. America, symposium: Evans, Howard T., Jr. 09951

Sulfides, Mineralog. Soc. America symposium: Morgan, Benjamin A. 09944

**Geochemistry**

Coexisting sulfides, sulfur-isotopes, fractionation: Thode, H. G. 09946

Phase relations in sulfides: Kullerud, Gunnar. 09950

Sulfide minerals, crystal chemistry, bonding: Pauling, Linus. 09945

**Georgia**

Jasper County, Gladesville Norite, exploration: Carpenter, Robert H. 05255

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**Mexico**

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Pachuca-Real del Monte area, occurrence, mineralogy: Geyne, A. R. 09738

**Montana**

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Park County, New World district, genesis: Eyrich, Henry Theodore. 00522

Western, stratabound, Belt Supergroup: Trammell, John. 00649

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**Nova Scotia**

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**Ontario**

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*Earth*

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*Education*

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*Fossils*

Arkansas, collecting guide: Freeman, Tom. 11266

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Florida, Eocene-Pleistocene, vertebrate localities: Patton, Thomas H. 08363

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Florida, Pisces, skates and rays: Wing, Elizabeth. 10561

Florida, Reptilia, crocodilians: Auffenberg, Walter. 10471

Florida, Reptilia, snakes: Auffenberg, Walter. 10469

Shark teeth, collecting guide: Kelley, K. V., Jr. 07427

Textbook and collecting guide: Casanova, Richard. 07426

*Fumaroles*

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*Gems and minerals*

Biblical, general description, history, nomenclature: Wright, Ruth V. 08696

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*Geochronology*

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*Geysers*

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*Hydrogeology*

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Stereogram illustrations: Techter, David. 02756

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*Mud volcanoes*

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Gypsum Cavern, fossils: Lawlor, Florine. 04407  
Petrology, "crazy balls," volcanics (?): Cleghorn, Arthur, Sr. 09740

*North Dakota*

Burleigh County, guidebook: Bluemle, John P. 02480

*Oklahoma*

Water and related land resources: Oklahoma Water Resources Board. 07186

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United States, midwestern, annelids, conodonts: Douglas, Dale. 09436

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*Textbooks*

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*Brachiospongia tuberculata*

Ordovician, Ontario, Kirkfield area, Trentonian:  
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Oklahoma, Ouachita Mountains, lithistids, lyssakids: Rigby, J. Keith. 04706

*Ellesmerespongia feildeni*, n.gen., n.sp.

Permian, Lower, Northwest Territories, Ellesmere Island: Rigby, J. Keith. 05861

*Haplison apletum*, n.sp.

Pennsylvanian, Oklahoma, Wapanucka  
Limestone, lithistid: Rigby, J. Keith. 04706

*Lyssakida*

Devonian, Upper, Alberta, new families and genera: Rigby, J. Keith. 00546

*Mattaspongia apaches*, n.gen., n.sp.

Devonian, Upper, Alberta, Front Ranges: Rigby, J. Keith. 00546

*Paleozoic*

United States, midwestern, popular account:  
Douglas, Dale. 09435

*Pelicaspongia sterea*, n.gen., n.sp.

Devonian, Upper, Alberta, Front Ranges: Rigby, J. Keith. 00546

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Choquette, Philip W. 00405

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Rubidium and cesium distribution in salts:  
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*Exploration*

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*Genesis*

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*Michigan*

Michigan basin, genesis: Matthews, R. David. 01082

Midland area, Salina salt, occurrence: Anderson, Raymond J. 07519

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Midland area, Silurian, Salina Group, occurrence: Matthews, R. David. 07603

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*North America*

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Pyroxene, synthetic: Erlank, A. J. 01621

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Grand Canyon, Carbon Butte, stratigraphy: Ford, Trevor D. 03372

Sierra Basin, dolerite sill complex: Nehru, C. E. 02373

*British Columbia*

Lower Belt-Purcell Supergroup, turbidites, sedimentation: Bishop, Donald. 06064

Northeastern, Prince George-Jasper (Alberta) area, Kaza and Cariboo Groups: Campbell, R. B. 07899

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*California*

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Death Valley, reef complex, tectonic control of facies: Wright, Lauren A. 10314

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Southeastern, protista, Crystal Spring Fm., eucaryote: Cloud, Preston E., Jr. 04932

Spring Mountains-Death Valley and White-Inyo Mts. regions, correlation: Stewart, John H. 03862

*Canada*

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Archean, metallogenic relations: Suffel, G. G. 03461

Circum-Ungava geosyncline, history: Dimroth, E. 08629

Great Lakes Region, Huronian stratigraphy, nomenclature: Church, W. R. 08062

Shield, northwestern, Helikian sediments, environment: Fraser, J. A. 08664

Shield, sedimentary basins, research status: Pettijohn, F. J. 08634

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Shield, sedimentary basins, research status: Pettijohn, F. J. 08661

Shield, sedimentary basins, research status: Roscoe, S. M. 08633

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*Colorado*

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*Connecticut*

Torrington quadrangle, metamorphic sequence: Martin, Charles W. 06218

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*Great Lakes region*

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Michigan basin, basement rocks, structures, field trip guidebook: Michigan Basin Geological Society. 10945

Michigan basin, Shield provinces, lithology, structure, peripheral outcrops, projections: Stonehouse, Harold B. 11257

*Greenland*

Agto area, structural complexes, metamorphic chronology: Sorensen, Kai. 03516

Correlation, crustal development, cf. Labrador and Scandinavia: Bridgwater, D. 06771

Eastern, boundary with Cambrian, trace fossils: Cowie, J. W. 09879

Frederikshaab Isblink area, gneiss-granite-amphibolite complex: Dawes, Peter R. 08188

Julianehaab District, Igaliok Nepheline Syenite Complex: Harry, W. T. 11001

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Nanortalik-Tasermit region, Ketilidian rocks: Allaart, J. H. 06252

Peary Land, Bronlunds Fjord area, Eocambrian? dolomite, microfossils: Pedersen, K. Raunsgaard. 06243

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Qagssiarssuk area, Gardar volcanism, rock types: Stewart, J. W. 04988

Sarqa fjord area, 2d Ketilidian plutonism, ultramafic dikes: Berrange, Jevan P. 08721

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Lower Belt-Purcell Supergroup, turbidites, sedimentation: Bishop, Donald. 06064

*Labrador*

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Michikamau intrusion: Emslie, R. F. 01723

Northern, reconnaissance study: Taylor, F. C. 05313

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Iskwassum Lake area, east half: Rousell, D. H. 07821

Iskwassum Lake area, west half: Hunt, G. H. 07820

Leftrook Lake area, metamorphic rocks: Bristol, C. C. 07819

Thompson nickel-copper mine, metamorphic rocks, K-Ar ages, structure, sulfide mineralization: Quirke, Terence T., Jr. 09606

*Mexico*

Oaxaca, metamorphic rocks, Grenville age, fabric: Kesler, Stephen E. 03782

Review, interpretative synthesis: Cserna, Zoltan de. 06029

Sonora, northwestern, absolute age: Anderson, Thomas H. 06045

*Michigan*

Crystal Falls area, Animikie Series: Pettijohn, F. J. 04325

Marquette area, Negaunee Iron Fm.: Sliter, T. Wentworth. 08304

Marquette area, stratigraphy: Stonehouse, Harold B. 08303

Marquette Iron Range, Animikie Series, Keweenaw intrusions: Boyum, Burton H. 04966

Marquette Iron Range, guidebook, Marquette to Lake Michigamme: Gair, Jacob E. 05647

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- Monteregian Hills, Mount Johnson intrusion, zoning: Philpotts, A. R. 07681
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- Cambrian-Ordovician, Cap Enrage Fm., L'Islet, St-Fabien sections: Hubert, C. 05302
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 Eastern, postglacial bedrock faulting: Oliver, Jack. 07687  
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 Lac McGillivray region, folds, fractures: Pourret, G. 08562  
 Lac Saint Jean area, vertical movement, recent: Gale, L. A. 07689  
 Montereian Hills, emplacement of igneous rocks, tectonic control: Currie, K. L. 06111  
 Montereian Hills, intrusions: Philpotts, A. R. 06110  
 Mount Johnson intrusion, emplacement mechanism: Bhattacharji, S. 07680  
 Mount Johnson intrusion, emplacement mechanism: Philpotts, A. R. 07681

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 Earth Resources Program 1968: Blinn, John C., 3d. 08085  
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 Geological exploration, evaluation, Arizona: Schaber, Gerald G. 02847  
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 Landform analysis, coastal regions: MacDonald, Harold C. 00907  
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- Virginia Dale Precambrian ring-dike complex: Wing, R. S. 00040

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- Mineral exploration, airborne: Pemberton, R. H. 02930  
Mineral exploration, automatic data processing, mapping: Foote, R. S. 02957  
Mineral exploration, current research: Doig, Ronald. 02928

*Instruments*

- Core scintillation counter, bulk density measurement: Brier, Chester. 08559  
Core scintillation counter, bulk density measurement: Rose, Vincent C. 08558  
Gamma-ray spectrometry, airborne: Denham, G. M. 03462  
Nuclear probe, underwater mineral detection: Ocean Industry. 06384  
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Gamma X-ray spectrometry, nuclear rotational excitation: Rasmussen, John O. 09346  
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**Radioactivity surveys***Canada*

- Gamma-ray spectrometry, uranium exploration: Darnley, A. G. 04528  
Western, coal: Cameron, A. R. 05821

*Georgia*

- Georgia Nuclear Laboratory area, airborne, map: Higgins, Michael W. 00714

*Greenland*

- Kvanefeld area, Ilimaussaq intrusion, uranium mineralization: Nielsen, Bjarne Leth. 06250

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**Radiolaria***Cenozoic*

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Pacific Ocean, deep-sea sediments, biostratigraphy: Olson, R. K. 07158  
Pacific Ocean, northern, evolution, extinctions, zoning: Hays, James D. 08449

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Gulf of Mexico, basin, drill cores: Deep Sea Drilling Project. 03294

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*Cretaceous-Quaternary*

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*Cretaceous-Tertiary*

- Caribbean Sea, deep-sea cores: Riedel, W. R. 06671

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- Ratios in sediments, paleotemperature change indicators: Casey, Richard E. 10322

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- Pacific Ocean, northern, temperature curves, water circulation: Nigrini, Catherine. 08448  
Pacific Ocean off Oregon, abundance, stratigraphic parameter: Duncan, John R. 00437  
*Rotaliiformidae*, n.fam.

- Cretaceous, California, Great Valley Sequence: Pessagno, Emile A., Jr. 04198

*Tertiary*

- Atlantic Ocean, deep-sea cores, Eocene, description: Cita, Maria B. 01348

*Theoporidae*

- Cenozoic, taxonomy: Sanfilippo, Annika. 04612

**Radium***Geochemistry*

- Sea water, surface cf. bottom, Pacific Ocean, northern: Broecker, Wallace S. 06404

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- Ra-226, profile, sea water, Pacific Ocean: Broecker, Wallace. 06405

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- Atmosphere, influx from Earth, calculation: Kirichenko, L. V. 03222  
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*Geochemistry*

- Sea water, surface cf. bottom, Pacific Ocean, northern: Broecker, Wallace S. 06404

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- Rn-220, exhalation at surface, measurement: Styra, B. I. 03221  
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- Ultramafic rocks, alpine type: Frey, Fred A. 02827

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*Alaska*

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*Analysis*

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Neutron activation: Denechaud, E. B. 08697  
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*Geochemistry*

Abundance, lunar anorthosites: Wakita, Hiroshi. 06838  
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Thorium, determination method, gamma-ray spectrometry: Persiani, C. 02965

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Devonian, Keg River Fm., Rainbow Member: Bars, D. L. 07755  
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Devonian, Miette bank, evolution: Cook, H. E. 02790  
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Devonian, Miette Reef complex, biofacies: Noble, J. P. A. 07889  
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Devonian, Swan Hills Fm.: Hemphill, C. R. 07756  
Devonian, trends, structural controls: Mountjoy, Eric W. 02661  
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Devonian, Zama area, model: Cox, Gordon L. 03084  
Keg River bioherms, diagenesis: Schmidt, Volkmar. 02677

*Atlantic Ocean*

Continental margin, south of Cape Hatteras, N. C.: Uchupi, Elazar. 00135

*Bahamas*

Holocene, sediments, ecology: Smith, Donald L. 02684

*Barbados*

Pleistocene, facies geometries, sedimentation model: Mesolella, Kenneth J. 05246

*California*

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*Florida*

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Backreef, lagoonal carbonate sediments, facies, fauna: Swinchatt, Jonathan P. 02689  
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Holocene, calcium carbonate production deposition, rate: Smith, S. V. 09579

*Iowa*

Silurian, Hopkinton Fm., coral bioherms: Philcox, M. E. 00752  
Silurian, Palisades Reef Complex: Philcox, Michael E. 10971

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*Michigan*

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Silurian, southeastern, lithofacies: Gill, Dan. 02620  
Traverse Group, back-reef carbonates: Roche, James Edward. 06608

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*Pacific Ocean*

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Aquifers, shallow, detection in glacial drift:  
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Milton C. 02906

Drainage basins, analysis: McCoy, Roger M.  
02910

Earth's surface imagery, geologic studies and re-  
lated fields: Rabchevsky, George A. 07987

Ecological surveys, aerial and space photog-  
raphy: U.S. Natl. Aeronaut. and Space  
Adm. 09162

Engineering soils mapping: Tanguay, Marc  
Gilles. 01568

Environmental geology: Withington, Charles F.  
00655

Estuarine studies: Paulson, Richard W. 02907

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Geochemical soil anomaly detection, tree spec-  
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Geologic, Earth Resources Program, 1969,  
1970: Hemphill, William R. 07770

Geologic mapping, satellite, multiband spectral  
data: Lyon, R. J. P. 06762

Geology, geography, NASA Earth Resources  
Aircraft Program: U.S. Natl. Aeronaut. and  
Space Adm. 02841

Ground-water inflow to streams, infrared  
radiometry: Hollyday, Este F. 07750

Hydrogeology, ground-water aquifer detection,  
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Hydrology, effects of urban development, New  
York, Long Island: Pluhowski, E. J. 02904

Hydrology, lake classification in karst topog-  
raphy, Florida: Stewart, J. W. 02947

Lakes, synoptic surveys, infrared, natural  
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Carolina: Peplies, Robert W. 02844

Location of water supplies, Alaska, permafrost  
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Marine geology and hydrology, preliminary  
tests: Latham, Ernest H. 02850

Marshlands, estuaries, color infrared photog-  
raphy: Anderson, Richard R. 02909

Mineral exploration: Barringer, A. R. 08232

Mineral exploration, capabilities, review: Lyon,  
R. J. P. 04482

Multispectral data, discrimination of sinkholes:  
Coker, A. E. 08410

**Remote-sensing methods—Continued***Applications—Continued*

Multispectral photography, engineering, geolog-  
ic features, Alabama: Powell, W. J. 01611

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Natural resources management: Colwell, Robert  
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Oceanography, multispectral photography: Hel-  
geson, Gaylord A. 04366

Offshore spring detection, Florida: Hunn, J. D.  
08075

Permafrost, frost environment, engineering  
problems: Rinker, Jack N. 08236

Petroleum exploration: Lintz, Joseph, Jr. 02646

Programs, Coast and Geodetic Survey, Alaska:  
Tewinkel, G. C. 08228

Radar system research, geologic analysis:  
Moore, Richard K. 09303

Resource and environmental data, acquisition,  
interpretation problems: Grossling, Bernardo  
F. 08753

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Sinkhole collapse, prediction: Coker, A. E.  
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Snow and ice studies, evaluation of techniques:  
Meier, M. F. 02903

Snowpacks and glaciers, passive microwave  
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Soils, limitations in agricultural areas, detection:  
Frazee, C. J. 09299

Soils, pattern recognition, computer programs:  
Nelson, Gerald D. 09300

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Subarctic regions, ecologic tool: Johnson, Philip  
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Submerged oceanographic features, location,  
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Synoptic analysis, surface features, automatic  
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Terrain analysis, site selection, side-looking  
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Th-, U-, K-content of soils and rocks, gamma-  
spectrometry: Schwarzer, Theresa F. 09561

Volcanic area, multifrequency microwave  
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C., 3d. 02851

Water quality, wetlands, identification, spectral  
reflectance: Anderson, Richard R. 09331

Water resources, management: Welch, Robin I.  
08234

Water-resources studies, infrared imagery: Cox,  
Edward R. 08077

Yellowstone National Park project, geologic,  
sensing results, summary: Smedes, Harry W.  
02849

**Bibliography**

Annotated, of bibliographies: Steiner, Dieter.  
06369

Earth resources: U.S. Natl. Aeronaut. and Space  
Adm. 04589

**Education**

Pennsylvania State University: Lattman, Lau-  
rence H. 01182

**General**

Applications, history, trends in Canada: Grego-  
ry, A. F. 10769

**Remote-sensing methods—Continued***General—Continued*

- Data processing, interpretation, utilization, tests, 1969: Holter, M. R. 08082  
 Review: Svensson, Harald. 05987  
 State of art, literature review: Rabchevsky, George. 06387  
 State-of-the-art, literature review: Rabchevsky, George A. 03439

*Instruments*

- Development, multispectral sensing, mapping: U.S. Natl. Aeronaut. and Space Adm. 02841  
 Input and Radiophase systems, capabilities: Barringer, A. R. 00557  
 Literature review: Rabchevsky, George. 06387  
 Multispectral viewer, application: Yost, Edward. 08084  
 Optical mechanical scanners, expansion, improvement: Lowe, D. S. 08081  
 Recent improvements, application to solid earth physics: Kaula, William M. 07994  
 Scanning digitizer, binary mode, earth resources research: Edson, Dean T. 09298

*Interpretation*

- Aerial photography, slope failure forms: Poole, Donald Hudson. 00515  
 Computer terrain mapping from multispectral data: Smedes, Harry W. 07772  
 Earth Resources Program, status review, data analysis: U.S. Natl. Aeronaut. and Space Adm. 07769  
 Lithospheric surface, radiometric reflectivity, Nova Scotia: Cronin, John F. 03747  
 Multispectral data, discrimination of sinkholes: Coker, A. E. 08410  
 Multispectral signatures, rock soil types: Legault, Richard R. 09304  
 Satellite data, earth-resources, NASA processing facility: Levy, Harold H. 06338  
 Spatial registration, digital system, fast Fourier transform: Anuta, Paul E. 06339  
 Terrain mapping, earth-satellite and ultra-high airphotos: Morrison, R. B. 09295

*Techniques*

- Devices, platforms, data analysis: Colwell, Robert N. 08225  
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 Infrared photography, color, filters, evaluation: Anderson, Richard R. 02909  
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 Input cf. Radiophase systems: Barringer, A. R. 00557  
 Laser-induced luminescence as tool: Gross, H. Gerald. 10526  
 Microwave, ground truth: sensor correlation, California, Mt. Lassen: Chapman, Peter. 07793  
 Microwave measurements, snow and ice: Meier, Mark F. 09330  
 Mineral exploration applications, review: Barringer, A. R. 04646  
 Multisensor tests for geographic applications, USGS Mission 73: Alexander, Robert H. 02842  
 Multispectral photography, earth resources research: Hodder, D. T. 09082  
 Multispectral photography, oceanographic applications: Helgeson, Gaylord A. 04366  
 Multispectral photography, passband interference filters, use: Slater, Philip N. 08083  
 Multispectral scanning, instrumentation review: Legault, Richard R. 09304

**Remote-sensing methods—Continued***Techniques—Continued*

- Multispectral viewer, use: Yost, Edward. 08084  
 Optical correlation for trace gas detection: Barringer, A. R. 07724  
 Photographic sensors, synoptic feature analysis, surface features: MacDonald, R. B. 09301  
 Radar, developments, NASA Earth Resources Aircraft Program: Moore, R. K. 02853  
 Radar imagery, edge-enhancement method, drainage analysis: McCoy, Roger M. 02910  
 Review: Landgrebe, D. A. 09302  
 Sensor capability tests, geographic investigations: Bowden, Leonard W. 02843

**Remote-sensing surveys***Alabama*

- East-central, Apollo 9, multispectral, interpretation: Powell, W. J. 01611

*Arizona*

- Tucson to Ajo, terrain mapping, earth-satellite and ultra-high airphotos: Morrison, R. B. 09295

*California*

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Wollaston basin, radioactivity, magnetic, airborne: Pemberton, R. 04634

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Hudson Bay area, features, sediments: Moran, Stephen Royse. 06875

*Hydrogeology*

Good Spirit Lake drainage basin, ground-water recharge: Freeze, R. Allan. 01715

Gravelbourg aquifer, ground-water resources: Freeze, R. Allan. 10710

Old Wives drainage basin, ground water, regional flow, geochemistry: Freeze, R. A. 10678

Saskatoon area, aquifers: Meneley, W. A. 06356

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 Zin Bay area: Koster, F. 09230

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- Sheet 73: Canada Geological Survey. 00664  
 Sheets 62 and 64: Canada Geological Survey. 00663  
 Southwestern, Sheet 72: Canada Geological Survey. 00397

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- Lac la Biche-Peter Pond area: Walcott, R. I. 09781

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- Saskatoon area, Tyner Valley Aquifer system: Meneley, W. A. 06356

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*Maps, oil and gas*

- Southern pools: Ball, N. L. 08171

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- Saskatoon area, soil associations: Ellis, J. G. 06451

*Mineralogy*

- Athabascaite, Martin Lake area, new Cu-selenide: Harris, D. C. 03497  
 Berzelianite, properties, composition, Martin Lake area: Harris, D. C. 06753  
 Tyrrellite, new data, Beaverlodge area: Harris, D. C. 06724

*Paleontology*

- Amphibia, Miocene, Wood Mtn. Fm., Kleinfelder farm: Holman, J. Alan. 08146  
 Jurassic, Shaunavon Fm., southwestern, paleoecology: Ruffin, James H. 00932  
 Mammalia, Pleistocene, Sangamon interglacial, Fort Qu'Appelle: Khan, Ehsanullah. 08594  
 Mammalia, Tertiary, Wood Mtn. Fm., southern: Storer, John E. 08132  
 Protista, Cretaceous, Regina area, dinoflagellates, acritarchs: Davey, Roger Jack. 08672  
 Reptilia, Miocene, Wood Mtn. Fm., Kleinfelder farm: Holman, J. Alan. 08146

*Petrology*

- Burchall Lake area, Precambrian, granodiorite-diorite series: Koster, F. 10899  
 Dufferin Lake area, Precambrian, Athabasca Fm. and basement units: Wallis, R. H. 04972  
 Southern, Pleistocene Waskama Creek ash, Yellowstone Plateau pyroclastics, source: Westgate, John A. 09421  
 Zin Bay area, Northeastern Basement Complex: Koster, F. 09230

## Saskatchewan—Continued

*Sedimentary petrology*

- Athabasca sandstone, provenance, pre-Athabasca regolith: Johns, R. W. C. 09860  
 Saskatoon area, soils, parent materials, associations: Ellis, J. G. 06451  
 Southeastern, Birdbear Fm., sedimentation history: Nichols, R. A. H. 07055  
 Southwestern, Viking Fm., sandstone members, imbrication, linearity: Evans, W. E. 01127

*Stratigraphy*

- Devonian-Mississippian, Bakken Fm., Rocanville area: VonOsinski, W. P. C. 07739  
 Pleistocene, Echo Lake gravels, Fort Qu'Appelle, Sangamon age: Khan, Ehsanullah. 08594  
 Pleistocene, engineering applications, Saskatoon area: MacDonald, A. B. 02901  
 Precambrian, Wollaston Lake Belt, Aphebian rocks: Money, P. L. 08631  
 Quaternary, Mazama Ash, Leader area: David, Peter P. 08119

*Structural geology*

- Beaverlodge area, ABC fault, movement: Beecham, A. W. 08142  
 Burchinal Lake area, trends, change: Koster, F. 10899  
 Dufferin Lake area, Precambrian deformation: Wallis, R. H. 04972  
 Hanson area, Kenoran deformation: Coleman, Leslie C. 06101  
 Lac La Ronge region, deformation: Padgham, William Albert. 06877  
 Trout Lake area, hornblende lineations, tectonics: Schwerdtner, W. M. 07751  
 Virgin River belt, evolution: Wallis, Roger H. 00652

**Scaphopoda***Paleozoic*

- Paleoecology, analysis, reconstruction of environment: Bretsky, Peter W. 04714  
*Plagioglypta iowaensis*  
 Ordovician, Iowa, Maquoketa Fm., paleoecology: Bretsky, Peter W. 04714

**Sea water***Circulation*

- Control of deep-sea sedimentation, Atlantic and Pacific Oceans: Berger, Wolfgang H. 01410

*Composition*

- Alkalinity determination, pH method: Culbertson, Charles. 03293  
 Barium content, Atlantic and Pacific Oceans: Wolgemuth, K. 04449  
 Carbon dioxide, Bering Sea surface water: Kelley, John J. 10689  
 Carbon dioxide, quantitative analysis, new extraction method: Wong, C. S. 01641  
 Chloride-bromide ratio, variation with age: Williams, Harold H. 08115  
 Fluoride concentration, anomalous, North Atlantic: Brewer, P. G. 01640  
 Gold content, analyses, compilation: Jones, Robert S. 01304  
 Mercury dispersion, natural and pollution, organic activity: Klein, David H. 03954  
 Salinity, estimation methods, review: Johnston, R. 10785  
 Strontium, absorption spectroscopy, salinity effects: Carr, Roderick A. 04062  
 Strontium distribution: Brass, Garret W. 10523  
 Strontium isotopes, Phanerozoic time: Peterman, Zell E. 00956

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- Strontium-chlorinity ratio: Andersen, N. R. 03996  
 Sulfur isotopes, variations: Rees, C. E. 00822  
 Tertiary, Atlantic Ocean, JOIDES cores: Mannheim, F. T. 02652

*Evolution*

- Chemical, model: Lafon, Guy Michel. 03108

*Geochemistry*

- Atmospheric CO<sub>2</sub>, exchange with atmosphere, surface and subsurface rates, possible enzymatic control: Berger, Rainer. 11239  
 Barium profile, Pacific Ocean, Geosecs station: Wolgemuth, K. 06406  
 Bottom water, chemical gradients, free-vehicle sampler: Sholkovitz, Edward R. 04644  
 C-13, in inorganic carbon, Pacific Ocean, northern: Kroopnick, P. 06760  
 C-14 profile, Pacific Ocean, northern: Ostlund, H. Gote. 06467  
 Calcite saturation, dissolution, compensation depth: Heath, G. Ross. 04886  
 Calcium carbonate, saturation degree, calculation: Edmond, John M. 06917  
 Carbon monoxide, nonequilibrium: Lamontagne, Robert A. 09631  
 Carbon, organic, producers and vertical flux: Menzel, David W. 09665  
 Carbonate, phosphate coprecipitation: Gulbrandsen, R. A. 04254  
 Carbonate precipitation, experimental, inhibitors: Chave, Keith E. 04616  
 Carbonate profile, Pacific Ocean, eastern: Takahashi, Taro. 06400  
 Carbonate-organic interactions: Chave, Keith E. 06095  
 Chemical exchange with basalts: Hart, Roger. 05340  
 Cobalt determination, solvent extraction: Kentner, Edward. 01512  
 CO<sub>2</sub>-O<sub>2</sub> relations, Pacific Ocean, Geosecs station 1969: Craig, H. 06399  
 Dissolved salic acid cycle, mathematical model: Grill, E. V. 02329  
 Equilibria with silicates, model study: Helgeson, Harold C. 06818  
 Foraminifera solution, lysocline, Pacific Ocean: Berger, Wolfgang H. 01337  
 He-3, excess, Pacific Ocean, northern: Clarke, W. B. 06403  
 Magnesium removal, diagenesis, reducing environment: Drever, James I. 06961  
 Metastable carbonate precipitation, experimental: Towe, K. M. 02131  
 Organic compounds, interaction with calcium carbonate: Suess, Erwin. 00447  
 Organic matter, C-13:C-12 ratios: Williams, P. M. 01685  
 Organic matter, in situ decomposition effects: Menzel, David W. 05069  
 Organic molecules, equilibrium distribution: Thorstenson, Donald C. 03163  
 Pollution effects: Goldberg, Edward D. 05175  
 Ra-226, profile, Pacific Ocean, northern: Broecker, Wallace. 06405  
 Radioactivity, radon, Pacific Ocean, surface cf. bottom: Broecker, Wallace S. 06404  
 Reaction with decaying organic material, experimental: Malone, Ph. G. 08658  
 Review, popular: MacIntyre, Ferren. 06361  
 Salt, cyclic nature: Gilluly, James. 00102  
 Seasonal variations, California, San Francisco area: Conomos, T. John. 00247

**Sea water—Continued***Geochemistry—Continued*

Sulfate ion association, P-T effect: Kester, Dana R. 05589

Textbook: Martin, Dean F. 03802

Thermodynamic principles: Gieskes, Joris M. 06989

Trace elements, Pacific Ocean, northeastern: Spencer, Derek W. 06407

Tritium profile, Pacific Ocean, northern: Roether, Wolfgang. 06402

*Sampling*

Nansen bottles, particulate iron contamination: Betzer, Peter R. 04743

**Seamounts***Atlantic Ocean*

Magnetization, direction, implications: Harrison, C. G. A. 04491

*Pacific Ocean*

Hawaiian Ridge area, northern, bathymetric lineations: Naugler, Frederic P. 09771

Northeastern, magnetization, polar curve: Francheteau, Jean. 01445

Paleomagnetism, interpretation from magnetic anomalies, methods: Grossling, B. F. 09987

**Sedimentary petrology***Methods*

Sedimentary basins, development, simulation, computer program: Ojakangas, Dennis R. 03325

**Sedimentary rocks***Anhydrite*

Genesis, Mexico, Gulf of California, sabkha: Butler, Godfrey P. 04568

*Argillite*

Deformation, clay-platelet preferred orientation: Clark, Bruce R. 04625

*Arkose*

Petrology, detrital modes, interpretation: Dickinson, William R. 03688

*Bentonite*

Petrology, United States, Tioga Bentonite: Textoris, Daniel A. 01175

*Bibliography*

Minor-element content, marine black shales, related rocks, annotated: Tourtelot, Elizabeth B. 01875

*Carbonate rocks*

Alteration, diagenesis of calcareous algae: Moberly, Ralph, Jr. 03135

Alteration, weathering, Iowa, Iowa Falls Member: Simon, D. E. 04451

Bibliography: LaMoreaux, Philip E. 06734

Depositional environment, Pennsylvanian, Utah: Hite, Robert J. 04565

Diagenesis, feldspar, physicochemical indicator: Kastner, Miriam. 10729

Diagenesis, reefs, associated rocks: Matthews, R. K. 02653

General description, Alberta, Saskatchewan River Crossing: Dolphin, Dale R. 05289

General description, Guatemala, Chiantla area: Blount, Don N. 10467

General description, new study area, Mexico, Yucatan coast: Wilson, James Lee. 03607

General description, Oklahoma, Arbuckle carbonate: Gatewood, Lloyd E. 10119

General description, Pennsylvania, Franklin County, western: Clark, John H. 05884

General description, Pennsylvania, Path Valley area: Okuma, Angelo. 05883

General description, Trona pinnacles, California: Jackson, George F. 09788

**Sedimentary rocks—Continued***Carbonate rocks—Continued*

Genesis, calcite precipitate at glacier sole, Alberta: Ford, D. C. 01726

Genesis, pinnacles, California, Searles Lake: Flint, Gordon W. 06372

Geochemistry, analysis, sample preparation: Miller, Don R. 04045

Geochemistry, calcite and aragonite, precursors: Marland, Gregg. 10601

Geochemistry, C-content, rapid determination: Foscolos, A. E. 04384

Geochemistry, chloride-bromide ratio: Williams, Harold H. 08115

Geochemistry, Kentucky, Lexington Limestone, Clays Ferry Fm.: Connor, J. J. 00685

Geochemistry, sorption of SO<sub>2</sub>, relation to petrography, mineralogy: Harvey, Richard D. 05853

Geochemistry, trace-element distributions: Honjo, Susumu. 06371

Microfabric, geochemistry, Ordovician carbonates, Ontario: Mukherji, K. K. 08124

Mineral composition, Virginia, volcanic zone: Heyman, Louis. 00205

Permeability, development, distribution: LeGrand, Harry E. 09642

Petrography, Tennessee, central basin, Ordovician, Middle and Upper: Maniatis, Jessie Klyce. 03973

Petrology, Colorado, west-central, Dyer Fm.: Campbell, John A. 03155

Petrology, Lower Triassic marine, Nevada: Bisell, H. J. 05888

Petrology, Michigan, Traverse Group: Roche, James Edward. 06608

Petrology, Oklahoma, Morrow Fm.: Rowland, Tommy Lee. 07945

Petrology, organic mounds, Ordovician, Quebec, Laval Fm., cf. Lake Champlain region: Toomey, Donald Francis. 09039

Physical properties, porosity, North Dakota, Williston basin: White, E. J. 05983

Porosity classification and nomenclature: Choquette, Philip W. 00405

Structural features, discontinuity surfaces, submarine origin: Rose, Peter R. 04459

Terminology, oolite, oolith, ooid: Akin, R. H., Jr. 06138

Terminology, oolite, oolith, ooid: Teichert, Curt. 06137

*Chert*

Alteration, Virginia, Ordovician limestone: Bain, Roger J. 06050

Diagenesis in Leadville Limestone, Colorado: Banks, Norman G. 04878

Genesis, Texas, Marathon basin, Caballos novaculite: Folk, Robert L. 06980

Geochemistry, organic matter, Precambrian: Smith, J. W. 03638

Petrology, Caballos Novaculite, Texas: McBride, Earle F. 02309

*Classification*

Flysch, meaning of term, history of use: Hsu, K. Jinghwa. 05296

*Clastics*

Fabric, primary, vertical sheet structure as indicator: Laird, M. G. 01545

Fabric, Squantum "Tillite," mud-flow origin, cf. Gowganda Fm.: Lindsay, John F. 01550

**Sedimentary rocks—Continued***Plastics*—Continued

General description, British Columbia, Sustut and Bowser Fms.: Allen, Gary Wayne. 01164

General description, flysch facies, British Columbia, Washington, Oregon: Danner, W. R. 05298

General description, Nevada, Sunrise-Dunlap Fms.: Stanley, Kenneth Oliver. 06676

Petrology, provenance, Northwest Territories, Ellesmere Island, flysch: Trettin, H. P. 05297

Petrology, Wyoming, Willwood Fm.: Neasham, John West. 07939

Provenance, North Dakota, Chadron Fm., cobbles: Stone, William J. 00979

Provenance, Utah, Garfield County, Kaiparowits Fm.: Lohrengel, C. Frederick, 2d. 03231

Textures, Newfoundland, early Paleozoic flysch and conglomerates: Kay, Marshall. 06445

Textures, structures, flysch depositional processes, experimental: Middleton, Gerard V. 05307

*Coal*

Structural features, fractures, stereoplot by computer: Jeran, P. W. 00827

*Composition*

Clay mineralogy, chlorites, genesis, polytypism: Hayes, John B. 07666

Michigan, Devonian, Middle, Alpena-Presque Isle Counties: Ehlers, George M. 08306

*Conglomerate*

General description, provenance, California, Lusardi Fm.: Nordstrom, Charles E. 00203

Genesis, beachrock, Bahamas: Scoffin, Terence P. 03610

Petrology, Devonian alluvial fans, Peel Sound Fm., Northwest Territories: Miall, Andrew D. 03593

Provenance, Idaho, Oregon, Triassic, granitic clasts: Vallier, Tracy L. 01109

Provenance, transport, California, Cretaceous: Perkins, Michael E. 00333

Thickness, littoral deposition, marine transgressions, tidal amplitude effects: Olson, Walter S. 03213

*Depositional environments*

Alaska, Kograk Fm., carbonate facies: Armstrong, Augustus K. 06805

Alaska, Peratrovich Fm., Mississippian, marine phases: Armstrong, Augustus K. 04922

Alberta, Devonian-Mississippian, Exshaw Fm.: Macqueen, Roger W. 02155

Alberta, Upper Cretaceous, Drumheller "Badlands": Shephard, W. W. 02295

Braided stream, identification: Smith, Norman D. 04876

California, San Miguel Island, beachrock, calcareous eolianite: Johnson, Donald Lee. 07174

California-Nevada, upper Precambrian-Lower Cambrian strata: Stewart, John H. 03380

Cambrian-Ordovician flysch, Quebec: Hubert, C. 05302

Cambrian-Ordovician, Greenland, East: Swett, K. 10104

Canadian Rocky Mts., southern, Ranger Canyon, Mowitch Fms.: Rapson-McGugan, J. E. 08456

Carboniferous, Alabama, Parkwood Fm.: Whisonant, Robert C. 07052

Colorado, Cretaceous, Dakota Group, Front Range region: Weimer, Robert J. 05357

Continental-marine transition, Devonian, N.W.T., Prince of Wales Island: Miall, A. D. 07673

**Sedimentary rocks—Continued***Depositional environments*—Continued

Cretaceous, Kansas, Dakota Fm.: Siemers, Charles T. 09570

Cretaceous, Nebraska, Niobrara Chalk: Gerken, A. N. 02525

Cretaceous, Texas, Comanchean Series: Mosteller, Moice A. 07044

Cretaceous, Texas, Parker County, Glen Rose Limestone: Renner, Richard E. 10796

Devonian, Michigan, Detroit River Group: Fagerstrom, J. A. 08034

Flysch basins, turbidite facies, paleocurrent markings: Walker, Roger G. 05306

Geologic record, role of protistan evolution: Tappan, Helen. 10870

Idaho-Utah, Swan Peak Fm., Ordovician: Vandorston, P. L. 02351

Illinois, Carbondale Fm., guidebook: Smith, W. H. 05533

Illinois, Francis Creek Shale: Shabica, Charles W. 05537

Jurassic-Cretaceous, Oregon, southwestern, flysch: Aalto, K. R. 05299

Kansas-Oklahoma, Cherokee Group, Pennsylvanian: Hudson, Adonnis S. 06136

Kentucky, Ordovician, Lexington Limestone: Cressman, Earle R. 03857

Marine, Alberta, Cardium Fm., Edson area: Sinha, R. N. 00449

Mechanical-energy level, time-trend analysis, calcarenites: Osborne, Robert H. 02021

Minnesota, Thomson Fm.: Morey, G. B. 05345

Mississippian, Ohio, Berne Conglomerate: Bork, Kennard B. 05660

Mississippian, turbidites, Ohio-Kentucky, Cincinnati Arch: Moore, Bruce R. 05305

Mississippian-Pennsylvanian, deltas, U.S.: Wanless, H. R. 06708

Mississippian-Pennsylvanian, Texas, Marathon region, flysch: McBride, Earle F. 05300

New Jersey, Miocene, Kirkwood Fm.: Isphording, Wayne C. 05659

New York, Sonyea Group, Catskill delta: Sutton, Robert G. 04950

Nonmarine, North Carolina, Dan River basin, Triassic: Thayer, Paul A. 05605

Ordovician, Late, Appalachians, southern: Thompson, Allan M. 08551

Pennsylvania, Allegheny County: Wagner, W. R. 07562

Pennsylvania, Silurian, acritarch indicators: Smith, Norman D. 01540

Precambrian, Canadian Shield, Helikian sediments: Fraser, J. A. 08664

Precambrian, Northwest Territories, Hurwitz Group: Bell, R. T. 08659

Precambrian-Cambrian, paleotides, cross-bedding as indicator: Merfield, P. M. 06542

Recognition criteria, reservoir sandstones: Berg, Robert R. 04818

Tertiary, South Dakota to Texas, Ogallala Fm.: Frye, John C. 08704

Texas, southeastern, Claiborne Group: Davies, David K. 02801

Texas, Upper Cretaceous rocks, Gulf Coastal Plain: Powell, J. Dan. 06152

Texas, Yucca Fm., Mountain facies: Campbell, Donald H. 05469

United States, Appalachian basin, Silurian, Lower: Sheldon, Richard P. 08750

United States, western interior, Cretaceous, Lower: Scott, Robert W. 02335



**Sedimentary rocks—Continued***Depositional environments—Continued*

- Wisconsin, Baraboo district, Cambrian-Ordovician: Dalziel, I. W. D. 06832
- Wisconsin, western, Lower Cambrian-Middle Ordovician: Ostrom, Meredith E. 07423
- Wyoming, Upper Cretaceous, marine: Asquith, D. O. 02417

*Diagenesis*

- Canadian Rocky Mts., southern, Ranger Canyon, Mowitch Fms.: Rapson-McGugan, J. E. 08456
- Organic particles as indicators: Bostick, Neely H. 00232
- Phosphatization, calcitization, silicification, Phosphoria Fm.: Cook, P. J. 02385

*Distribution*

- Greenland, Kameson-Scoresby Lands and Werner Bjerre: Perch-Nielsen, K. 06254
- Volumes, on and adjacent to U. S., Phanerozoic: Gilluly, James. 00102

*Dolomite*

- Absolute age, genesis, Texas, Baffin Bay: Behrens, E. William. 06057
- Alteration, dedolomitization, recognition in peels: Braun, Moshe. 01660
- Alteration, dissolution, artificial saline solutions, aragonite production: Orr, Patricia. 09704
- Dolomitization, rock control, petroleum reservoirs: Murray, R. C. 02663
- Genesis, environments: Zenger, Donald H. 01603
- Geochemistry, C-isotope variation, Quaternary, continental shelf: Deuser, W. G. 02135
- Geochemistry, isotopic composition of secondary: Fritz, P. 05224
- Geochemistry, solubility below 100°C: Siebert, Robert M. 09568
- Petrology, Arkansas, Everton Fm.: Minke, Joseph Garrett. 03110

*Evaporites*

- Alteration, Caledonian-Appalachian orogen: de Wit, M. J. 04075
- Alteration, replacement by length-slow chalcocite: Pittman, J. Stuart. 09522
- Alteration, schistose anhydrite, lattice-orienting mechanism: Schwerdtner, W. M. 05931
- Deformation, microfolding, tectonic origin: Kirkland, Douglas W. 05189
- Depositional environment, Silurian, Michigan, Ontario: Kunasz, Ihor A. 04566
- Diagenesis, Holocene supratidal, Gulf of California: Butler, Godfrey Philip. 07347
- General description, new study area, Mexico, Yucatan coast: Wilson, James Lee. 03607
- Genesis, anhydrite-gypsum, nucleation kinetics: Cruft, Edgar F. 04638
- Genesis, basin currents, wind and water depth roles: Brongersma-Sanders, Margaretha. 05636
- Genesis, carbonate relations: Shearman, Douglas J. 02681
- Genesis, geochemistry, potash deposits: Garrett, Donald E. 04648
- Genesis, Nova Scotia, New Brunswick, Mississippian: Evans, Robert. 08151
- Genesis, Nova Scotia, Wallace area: Evans, Robert. 04573
- Genesis, role of ground water: Williams, Roy E. 02337
- Genesis, sodium sulfate deposits, low-temperature: Dort, Wakefield, Jr. 04570
- Geochemistry, Br, Rb in sylvite from carnallite: Wardlaw, N. C. 04572

**Sedimentary rocks—Continued***Evaporites—Continued*

- Geochemistry, bromide distribution, Texas: Holser, William T. 07026
- Geochemistry, bromine, Colorado, Green River Fm.: Dyni, John R. 04569
- Geochemistry, Netherlands Antilles, Bonaire Island, organic acids: Tasch, Paul. 04571
- Palynology, application: Klaus, Wilhelm. 04563
- Petrology, New Mexico, Texas, Grayburg-Queen Fms.: Williams, Karl Wendel. 06884
- Sedimentation, distribution, Michigan, Salina Group: Matthews, R. David. 07603
- Structural features, North America, basin configuration: Storey, Taras P. 04642

*Flint*

- Mineral composition, aboriginal quarry sites, Ohio, southeastern: Carskadden, Jeff. 01456

*General*

- Clay minerals, provenance, Oklahoma, Atoka Fm.: Wong, Her Yue. 03271
- Crustal composition, mean percent quartz: Blatt, Harvey. 00022
- Deformation, shear strain parallel to bedding, fold mechanism: Spang, John H. 10335
- Diagenesis, clay minerals, effects, Oklahoma: Bucke, David Perry, Jr. 01222
- Fabric, magnetic grain: Iorwerth, H. ab. 01604
- General description, California, Mojave Desert region: Dibblee, T. W., Jr. 04806
- General description, provenance, North Carolina, Triassic basin: Thayer, Paul A. 02578
- Mineral composition, South Dakota, Brule Fm., Scenic Member: Helgeson, R. N. 00620
- Petrology, mineralogy, Kansas, Lawrence Fm.: Jamkhindikar, Suresh M. 06000
- Petrology, New York, Clinton Group, relations to Shawangunk Fm.: Muskatt, Herman Solomon. 06153
- Petrology, stratigraphy, Pennsylvanian-Permian, Allegheny County, Pa.: Wagner, W. R. 07645
- Provenance, Atlantic and Gulf Coast geosynclines: Gibson, T. G. 03753

*Geochemistry*

- Carbohydrate residues, taxonomic interpretation: Swain, F. M. 04095
- Carbonate carbon determination, gas chromatography: Marinenko, John. 06172
- Fatty acids, transformations, distributions: Kvenvolden, Keith A. 04092
- Mercury, distribution, Colorado Plateau: Cadigan, R. A. 05557
- Michigan, Ontario, Salina Group: Kramer, J. R. 02644
- Variations, geosynclinal sequences, global tectonic implications: Schwab, Frederic L. 09559

*Graywacke*

- Geochemistry, mineralogy, Belt rocks, Montana, Idaho: Harrison, J. E. 04514
- Mineral composition, matrix, diagenetic origin, experimental study: Whetten, John T. 08455
- Petrology, detrital modes, interpretation: Dickinson, William R. 03688
- Textures, changes, Cloridome Fm., Quebec, Gaspe: Parkash, Barham. 06341

*Gypsum*

- Petrology, secondary rocks, review: Holliday, D. W. 03606

*Iron formation*

- General description, South Dakota, Estes Creek area: Bayley, Richard W. 01471
- Genesis, New Mexico: Beutner, E. L. 06894

**Sedimentary rocks—Continued***Iron formation—Continued*

Genesis, New Mexico: McLeroy, Donald F. 06895

*Limestone*

Absolute age, U-Th-Pb whole-rock method, evaluation: Doe, Bruce R. 03921

Alteration, dolomitization, Kentucky, Camp Nelson Limestone: Fisher, Irving S. 07043

Diagenesis, Mexico, Quintana Roo, Quaternary eolianites: Ward, William Cruse. 07954

Fabric, alteration, Florida, Holocene: Eutsler, Robert L. 00697

General description, karst, Guatemala, Lanquin-Senahu area: Smith, A. Richard. 10124

General description, Pennsylvania, Annville Limestone: Becher, Albert E. 02221

Genesis, carbonate, phosphate coprecipitation, experimental: Gulbrandsen, R. A. 04254

Genesis, continental borderland, California: Smith, Stephen V. 08395

Geochemistry, analysis, New Brunswick, Carys Mills Fm.: Hamilton-Smith, T. 05387

Geochemistry, Kansas, Burr Limestone beds, vertical variations: Hiebert, Clyde. 09614

Geochemistry, Kentucky, central: Fisher, Irving S. 00700

Geochemistry, solution kinetics: Curl, Rane L. 10813

Geochemistry, Sr isotopic concentration, acid-leaching effects: Chaudhuri, S. 06094

Lithology, Pennsylvania, Nittany Valley, cave distribution: Rauch, Henry W. 04064

Petrology, Castle Hayne Limestone, North Carolina: Textoris, Daniel. 09214

Petrology, cyclic sedimentation, Virginia, Ordovician: Hayes, A. W. 05429

Petrology, eolianite, Bahamas, North Bimini: Muller, German. 07538

Petrology, statistical analysis, Nevada, Bird Springs Group: McDougall, Donald S. 01593

Physical properties, brittle deformation, experimental: Friedman, M. 02401

Physical properties, compressive strength: McGill, George E. 04944

Physical properties, load tests, Ontario, Nanticoke: Seychuk, J. L. 06573

Provenance, La Salle fm., exotic pebbles, Illinois: Jansa, Lubomir F. 03603

*Lithofacies*

Alabama, northern, Carboniferous shorelines systems: Hobday, David Kenneth. 03259

Alberta, Athabasca tar sands, deltaic: Carrigy, Maurice A. 02596

Alberta, Rainbow area, Elk Point Group: Barss, D. L. 07755

Appalachians, Cayugan-Helderbergian carbonates: Head, James William, 3d. 06598

Appalachians, central, Upper Ordovician, nomenclature: Thompson, Allan M. 01146

Arizona, southeastern, Earp Fm.: Lodewick, Richard Ballard. 07279

Bermuda, Pleistocene limestones, eolian-marine facies: Vacher, H. Leonard. 02693

California, Tertiary basin-margin deposits, cycles: Stanton, Robert J., Jr. 01689

California, western, Franciscan rocks: Blake, M. C., Jr. 00231

California-Nevada, upper Precambrian-Lower Cambrian strata: Stewart, John H. 03380

Carbonate shelf margins, identification: Wilson, James Lee. 08692

**Sedimentary rocks—Continued***Lithofacies—Continued*

Carbonate shelves, platforms, faunal association: Swinchatt, Jonathan P. 02689

Colorado, Cretaceous, Carlile Shale, Codell Sandstone Member: Krutak, Paul R. 05358

Colorado, Cretaceous, Dakota Group, Front Range region: Weimer, Robert J. 05357

Colorado, Piceance basin, Wasatch and Green River Fms.: Snow, C. Bruce. 02500

Deltaic complexes, petroleum exploration, principles: Busch, Daniel A. 02594

Idaho-Wyoming, Red Peak-Thaynes Fms.: Picard, M. Dane. 02703

Illinois, Salem, St. Louis Limestones: Lineback, Jerry A. 01081

Illinois, Summum and Liverpool Cyclothems, Pennsylvanian: Nance, Roger B. 05540

Indiana, Sainte Genevieve Limestone, oolitic: Carr, Donald Dean. 03249

Kansas, Swope Limestone, Pennsylvanian: Mossler, John Hamilton. 07588

Kentucky, Borden Fm., deltaic: Kepferle, Roy C. 02640

Kentucky, central, Borden Fm.: Peterson, Warren L. 00747

Kentucky, Mississippian carbonate sequence: Swinchatt, Jonathan P. 00765

Mexico, Parras Basin, Canon del Tule Fm.: Baker, Robert Allison, 3d. 07343

Michigan, Devonian, Middle, Alpena-Presque Isle Counties: Ehlers, George M. 08306

Michigan, southeastern, Silurian reef: Gill, Dan. 02620

Nevada-Utah, Permian patterns: Bissell, H. J. 00407

New Jersey-New York, Upper Cayugan-Helderbergian strata: Barnett, Stockton Gordon. 03827

New York, Black River Group: Walker, Kenneth Russell. 07591

New York, Pennsylvania, Devonian, Upper: Walker, Roger G. 02695

Newfoundland, western, Cambrian-Ordovician flysch sequences: Stevens, R. K. 05304

Nonmarine, North Carolina, Dan River basin, Triassic: Thayer, Paul A. 05605

Northwest Territories, Prince of Wales Island, Peel Sound Fm.: Miall, A. D. 07673

Nova Scotia, Mabou Group, Carboniferous: Belt, Edward Scudder. 07344

Ohio, Middle Devonian carbonates, north-central: Janssens, A. 08372

Oklahoma, Ouachita Mts., Mississippian-Pennsylvanian flysch: Cline, L. M. 05301

Pennsylvania, Allegheny, Conemaugh rocks: Swinehart, James B. 00184

Pennsylvania, Allegheny Fm., fluvio-deltaic: Cavaroc, Victor Viosca, Jr. 03251

Pennsylvania, Catskill Fm., economic significance: Glaeser, J. Douglas. 00156

Pennsylvania, Pocono Fm., Jim Thorpe section: Sevon, William D. 10703

Pennsylvania, Washington area, Pennsylvanian-Permian: Berryhill, Henry L., Jr. 07216

Pleistocene reefs, geometries: Mesolella, Kenneth J. 05246

Quebec, Cambrian-Ordovician flysch, conglomerate-sandstone fans: Hubert, C. 05302

Quebec, Cloridorme Fm., flysch sequence analysis: Walker, Roger G. 05306

Reefs, ancient, processes: Wilson, James Lee. 02699

**Sedimentary rocks—Continued***Lithofacies—Continued*

- Submarine fan facies, segmented fan model: Haner, Barbara E. 07007
- Texas, Carrizo-Reklaw Fms., Eocene: Boenig, Charles M. 00867
- Texas, Edwards Fm.: Rose, Peter Robert. 06008
- Texas, Edwards Limestone, reef facies: Frost, Jack G. 10798
- Texas, Jackson Group, coastal plain: Fisher, William L. 04823
- Texas, Traces-Pecos, Marathon Fm.: Young, Leonard M. 06331
- Texas, western, Tertiary formations, Big Bend region: Maxwell, Ross A. 07206
- United States, Appalachian basin, Silurian, Lower: Sheldon, Richard P. 08750
- United States, Cincinnati arch area, Brassfield Fm.: O'Donnell, Edward. 00170
- United States, Great Basin, Cambrian, carbonate: Kepper, John Charles. 11025
- Utah, Green River Fm., deltaic: Jacob, Arthur Frank. 03105
- Utah, Kaiparowits region, Upper Cretaceous: Peterson, Fred. 06006
- Virginia, Harpers Fm., Precambrian-Cambrian: Schwab, Frederic L. 00179
- Wisconsin, western, Franconia Fm.: Dapples, E. C. 01067
- Wyoming and southern Rocky Mts., Cretaceous, Lower: Young, Robert G. 05353
- Wyoming, northwestern, Harebell Fm., Pinyon Conglomerate: Lindsey, David A. 00629

*Methods*

- Ancient environments, recognition, textbook: Selley, Richard C. 08443
- Carbonate, Markov chain analysis, Nevada: Lumsden, D. M. 02648
- Carbonate, organic remains, observation, dye technique: Glover, E. D. 02621
- Crossbedding, correcting direction, computer analysis: Parks, James M. 00107
- Dedolomitization fabric in peels: Braun, Moshe. 01660
- Depositional environment, analysis: Stanton, Robert J., Jr. 03759
- Grain orientation, dielectric anisotropy measurement: Shelton, John W. 02350
- Grain-size distribution tests, environmental analysis: Bork, Kennard B. 05660
- Instrument, pre-tectonic current direction, measurement: Okada, Hakuyu. 05664
- Isopachous residual maps, computer preparation: Egbert, R. L. 08153
- Kerogen characterization by pyrolysis and chromatography: Giraud, A. 01125
- Lateral facies changes, mapping from cross-plotted geophysical logs: Berry, Cameron G. 10915
- Laumontite-bearing, preparation for microscope: Madsen, Beth M. 06182
- Lithologic variations, mathematical model, Maryland: Henderson, Barry Keith. 03258
- Magnetic properties, red beds, acid-leaching: Park, J. K. 08166
- Microsplitter, inexpensive, student model: Newton, Geoffrey B. 05625
- Modal analysis, X-ray diffractometry: Braun, Robert L. 07200
- Organic materials, laser-micropyrolysis system: Vastola, F. J. 04093
- Organic matter in thin sections, identification by staining: Smith, M. H. 08555

**Sedimentary rocks—Continued***Methods—Continued*

- Pore geometry, electron microscopy of pore casts: Pittman, Edward D. 08621
- Sandstone disaggregation, ultrasonic: Overbey, W. K., Jr. 01549
- Size analysis, correlation of mean, thin-section, loose-grain methods: Sahu, Basanta K. 02674
- Size analysis, perspex grain-size comparator, construction: Lewis, D. W. 01663
- Statistical, mineralogic components estimation: McCammon, Richard B. 08612
- Thermal history studies, vitrinite reflectance measurements: Castano, John R. 06090
- Thin-section analysis, depositional environments delineated: Davies, David K. 02789

*Mineral composition*

- Heavy mineral associations, Greenland, Scoresby, Jameson Lands: Bromley, R. G. 09444

*Mudrock*

- Alteration, incipient metamorphism, effect on organic matter: Baker, Donald R. 01126

*Nomenclature*

- New system: Travis, Russell B. 02349

*Ore deposits*

- Uranium reserves, Canada, Colorado, and other: Bowie, S. H. U. 06144

*Orthoquartzite*

- Alteration, shock metamorphism, Sedan explosion: Short, Nicholas M. 05787

*Phosphate rocks*

- General description, Nevada, Nye County, adjacent areas: Rogers, C. L. 04246
- Geochemistry, percent  $P_2O_5$ , Utah, Weber County: Schell, E. M. 04519
- Geochemistry, U-isotopes, deep-sea floor: Kolodny, Yehoshua. 00816
- Geochemistry, X-ray emission analysis, model, computer programs: McKinney, Charles N. 04048

*Physical properties*

- Alberta, Viking Fm., pressure patterns: Harris, D. G. 02626
- Anisotropic masses, stresses, displacements, finite element analysis: Milovic, Dusan M. 09161
- Dynamic loading effects, experimental study: Ricketts, T. E. 02403
- Failure planes, orientation, directional ultrasonic pulses: Komar, C. A. 07112
- Northwest Territories, Queen Elizabeth Islands, density: Sobczak, L. W. 02179
- Nova Scotia, Minas Basin shore, red beds, Paddy Island, radiometric reflectivity: Cronin, John F. 03747
- Strain measurement, clamp-on transducer: Hardy, H. Reginald, Jr. 03994
- Stress failure, planar theory, isotropic strain patterns: Christiansen, Francis W. 09136
- Tensile strength, determination methods: Hardy, H. Reginald, Jr. 09156
- Virginia, southwestern, thermal conductivity: Reiter, Marshall Allan. 06887

*Provenance*

- Northwest Territories, Melville Island, Bjorne Fm.: Hills, L. V. 02160
- Ontario-Quebec, Lorrain Fm.: Hadley, Donald G. 02624
- Wyoming-Idaho, Jurassic-Cretaceous non-marine strata: Furer, Lloyd C. 06330

## Sedimentary rocks—Continued

*Red beds*

Provenance, United States, midcontinent: Sable, Edward G. 06171

*Sandstone*

Absolute age, provenance, Willard Shale, Kansas: Brookins, D. G. 00460

Alteration, Colorado, Spanish Peaks region: Vine, James D. 00650

Alteration, mechanical disintegration, Utah, Zion Canyon: Robinson, Edwin S. 04460

Classification, automatic data processing, FORTRAN program: Stone, William J. 04035

Depositional environment, Claiborne Group, Texas: Davies, David K. 02801

Depositional environments, recognition, criteria: Berg, Robert R. 07321

Diagenesis, experimental study: Cecil, Charles Blaine. 00518

Elasticity, ultrasonic wave velocities, tests: King, M. S. 09834

General description, New Mexico, Glorieta Sandstone, Hondo Sandstone Member: Harbour, Robert L. 04261

Geochemistry, salinity anomalies, compaction relations: Overton, Harold L. 00922

Geochemistry, trace elements, Colorado, Dakota Sandstone: Houston, Robert S. 04257

Mineral composition, California, Great Valley sequence: Gilbert, Wyatt G. 00614

Mineral composition, clay mineral diagenesis, Arkansas: Triplehorn, D. M. 05670

Mineral composition, clay minerals, Kentucky, Wilcox Fm.: Sims, John D. 01560

Mineral composition, Minnesota, Wisconsin, Franconia Fm.: Odom, I. Edgar. 01094

Mineral composition, New Brunswick, Siegas Fm.: Hamilton-Smith, T. 05387

Permeability, determination from properties: Berg, Robert R. 07334

Petrology, New York, Oriskany Sandstone: Hodgson, Edward Askew. 07584

Petrology, Oklahoma, Hughes and Coal counties, Thurman Sandstone: Hare, Ben D. 10687

Petrology, Paleozoic, Ontario, southern: Winder, C. G. 10916

Petrology, Tennessee, Macon County, Chattanooga Shale, Dowelltown Member: Miller, Robert C. 04042

Petrology, Washington, Swauk Fm., high silica: Lowther, J. Stewart. 01194

Physical properties, brittle creep under uniaxial compression: Cruden, D. M. 03694

Physical properties, elastic moduli under pressure, experimental: King, M. S. 07507

Physical properties, elastic strain effect on fracture orientation: Friedman, M. 00066

Physical properties, fracture, role of pore fluid chemistry: Swolfs, Hans. 09594

Physical properties, pore and matrix anisotropies: Somerton, Wilbur H. 09135

Physical properties, pore structure, scanning electron microscope: Weinbrandt, R. M. 07459

Provenance, Antietam Quartzite, Virginia: Schwab, Frederic L. 01542

Provenance, Eocene strata, Wyoming, Washakie Basin: Roehler, Henry W. 06181

Provenance, Kentucky, Lee Fm., Hazel Patch Sandstone Member: Blancher, Donald W. 00678

Textures, quartz overgrowths, genesis: Pittman, Edward D. 09521

## Sedimentary rocks—Continued

*Shale*

Absolute age, Kansas, Permian: Brookins, Douglas G. 00872

Alteration, by water adsorption: Chenevert, Martin E. 10661

Alteration, iron sulfide oxidation, heave: Quigley, R. M. 02902

Diagenesis, chemical trends: Mackenzie, Fred T. 02649

Diagenesis, Gulf Coastal Plain: Perry, Edward Adams, Jr. 07943

Elastic properties, dynamic moduli under pressure: Schock, R. N. 07903

Fabric, electron-microscope study: O'Brien, Neal R. 08454

Geochemistry, C-content, rapid determination: Foscolos, A. E. 04384

Geochemistry, fatty acid content, Green River Shale: Douglas, A. G. 04193

Geochemistry, iron sulfide crystals, relation to organic content: Funkhouser, John W. 05423

Geochemistry, Kentucky, New Albany Shale: Tidball, R. R. 00768

Geochemistry, nitrogen compounds, Colorado: Simoneit, B. R. 00943

Geochemistry, ocean cores, O and H isotope analyses: Savin, Samuel M. 00974

Geochemistry of black: Vine, James D. 04317

Geochemistry, Oklahoma, Flowerpot Shale: Wu, Dah Cheng. 00971

Geochemistry, selenium, U.S.: Howard, James Hatten, 3d. 05999

Geochemistry, U.S., midcontinent, Excello black shale: James, Gerard W. 07927

Lithology and distribution, Illinois, Francis Creek Shale: Smith, William H. 05536

Mineral composition, clay, X-ray diffraction, pelletized samples: Hidalgo, Robert V. 08393

Mineral composition, North, South Dakota, Fort Union and Ludlow Fms.: Crabb, D. E. 00601

Mineral composition, provenance, environment, N.W.T., Mackenzie Delta: Bayliss, P. 02157

Petrology, Texas, Woods Hole Fm., exotic boulders: King, Philip B. 02378

Petrology, Wyoming, Mowry Shale: Davis, John Clements. 01128

Physical properties, adsorptive pore pressures, measurement: Chenevert, Martin E. 07458

Physical properties, cratering effects, Pre-Gondola chemical explosion: LaFrenz, Robert L. 10562

Physical properties, high pressure-low resistivity facies, Louisiana: Otvos, Ervin G., Jr. 01543

Physical properties, instability due to water adsorption, wellbore swelling: Chenevert, M. E. 10663

Physical properties, load tests, Ontario: Seychuk, J. L. 06573

Physical properties, multiple logging, computer analysis: Konen, C. E. 01263

Physical properties, porosity, water saturation, evaluation technique: Fons, Lloyd. 09081

Physical properties, strength, consolidation, Oklahoma: Anessi, Thomas Joseph. 07263

Physical properties, strength-deformation behavior, experimental: Yang, Jung Hsi. 07466

Porosity profile, salinity compaction coefficient: Overton, Harold L. 10224

Provenance, Arkansas-Oklahoma, Johns Valley fm. boulders: Shideler, Gerald L. 02076

**Sedimentary rocks—Continued***Shale—Continued*

Vermont, Lake Champlain area, lithofacies, field trip: Hawley, David. 09020

*Subsurface phenomena*

Abnormal pressure zones, temperature, effects: Barker, Colin. 06054

*Textbooks*

Lithology, processes, petrography: Jackson, Kern C. 04021

*Textures*

Shape, surface area, packing of grains, quantification, evaluation: Vogel, Thomas A. 10286

*Tillite*

Fabric, orientation of stones in till: Lindsay, John F. 05020

Thickness, littoral deposition, marine transgressions, tidal amplitude effects: Olson, Walter S. 03213

*Travertine*

Geochemistry, isotope composition, Wyo., Yellowstone Park: Friedman, Irving. 06922

*Turbidites*

Bed thickness, experimental studies: Middleton, Gerard V. 02657

General description, Ontario, Precambrian: Walker, Roger G. 02696

Provenance, Kentucky, Borden Fm.: Moore, Bruce R. 00744

**Sedimentary structures***Abyssal lamination*

Pacific Ocean, sedimentation processes: Allen, David William. 06688

*Bedding*

California, Wheeler Gorge, turbidites, conglomerates, inverse: Mattinson, James M. 01552

California, Wheeler Gorge, turbidites, conglomerates, inverse: Southard, John B. 01551

Carbonate reef areas, density contrasts, differential compaction, gravity anomalies enigma: Gretener, P. E. 09378

Ephemeral streams: Picard, M. Dane. 09612

New Brunswick, Ordovician-Silurian, Siegas area: Hamilton-Smith, T. 05387

*Biogenic*

Anthozoan burrows, Holocene, North Carolina beaches: Frey, R. W. 01270

Burrows, Holocene, North Carolina beaches, environment indicators: Frey, Robert W. 02092

Carbonate mounds, Texas, McKelligan Canyon Fm.: Toomey, Donald Francis. 08552

Continental shelf, Carolinas, relict sediments, microborings: Halsey, S. D. 07002

Fossil orientations, current indicator: Jones, Michael L. 03598

Shoreface sediments: Reineck, Hans-Erich. 02672

*Channels*

Colorado, Cretaceous, Dakota Group, Front Range region: Weimer, Robert J. 05357

*Compaction anticlines*

Carbonate reef areas, Alberta, Michigan, Ohio: Ferris, Craig. 09374

*Crossbedding*

California, Simi Hills, Chico Fm.: Colburn, Ivan P. 01605

Colorado, Fountain and Lyons Fms., Morrison area: Blood, W. A. 02501

Direction, variance analysis, hierarchical sampling: Rao, J. S. 05014

Interpretation, Tennessee, Chilhowee Group, Cambrian: Whisonant, Robert C. 05645

**Sedimentary structures—Continued***Crossbedding—Continued*

Interpretation, tidal amplitude effects: Olson, Walter S. 03213

Kentucky, central, Tanglewood Limestone: Hrabar, S. V. 00719

Marine shelf deposits, paleotides, Earth-Moon distance: Merifield, P. M. 06542

Orientation, bimodal data, vector analysis, Indiana, Salem Limestone: Jones, Thomas A. 10626

Quebec, Cloridorme Fm., turbidite sequence: Skipper, Keith. 02683

Ratio to horizontal, braided stream environment: Smith, Norman D. 04876

Rotation to original position, computer program: Parks, James M. 00107

Sandstone, ancient, Pennsylvania, Phillipsburg area: Eason, J. E. 03972

Tilted strata, original inclination, determination, computer program: Parks, James M. 00441

Tongue River and Sentinel Butte strata, differentiation, North Dakota: Royce, Chester F., Jr. 03286

Trough, paleocurrent analysis, limitations: Dott, R. H., Jr. 02608

Virginia, Antietam Quartzite: Schwab, Frederic L. 01542

*Current markings*

California, Coalinga area, Upper Cretaceous strata: Shawa, Monzer S. 02338

Colorado, Fountain and Lyons Fms., Morrison area: Blood, W. A. 02501

Devonian, provenance evidence, N.W.T., Prince of Wales Island: Miall, A. D. 07673

Directions, pre-tectonic, field measurement instrument: Okada, Hakuyu. 05664

Downcurrent changes, Quebec, Gaspe, Cloridorme Fm.: Parkash, Barham. 03594

Fan deposit, California, Santa Cruz Mts., Butano Sandstone: Nilsen, Tor H. 09694

Fluvial-lacustrine environments, Utah, Wasatch-Green River Fms.: Picard, M. Dane. 04401

Flysch facies, transport processes: Middleton, Gerard V. 05307

Nova Scotia, continental shelf, Browns Bank, bottom sand waves: Drapeau, Georges. 09821

Rip-current channel deposits, paleoshoreline interpretation: Cook, David O. 06340

Slump folds and turbidite sole markings, facies analysis: Walker, Roger G. 05306

Turbidites, Kentucky-Ohio, Borden Fm.: Moore, Bruce R. 05305

*General*

Alberta, Athabasca tar sands, deltaic facies: Carig, Maurice A. 02596

Deltaic structures, recognition, trend-surface fitting: Wermund, E. G. 06710

Ephemeral streams: Picard, M. Dane. 09612

Flysch features, Oklahoma, Ouachita Mts.: Cline, L. M. 05301

Kentucky, Ohio River, deep hole, scour and fill: Moore, Bruce R. 01547

Mapping, alkali-type magnetometer: Isaacs, K. N. 00428

Massachusetts, Merrimack River estuary environments, Holocene: Hartwell, Allan D. 09238

Michigan, Precambrian units, Marquette Iron Range: Gair, Jacob E. 05647

Mississippian-Pennsylvanian flysch, Texas, Marathon region: McBride, Earle F. 05300

New England, estuarine sand bodies: Hayes, Miles O. 02628

**Sedimentary structures—Continued***General—Continued*

Paleotidal flow criteria: Klein, George deVries. 10740

Regional variation, Meguma Group, flysch facies, Nova Scotia: Schenk, P. E. 05303

Sand bodies, fluvial, shoreline, width-thickness relations: Lennor, R. B. 02645

Synorogenic conglomerates, Montana: Wilson, Michael D. 05249

Texas, Nueces Bay, Gum Hollow fan delta: McGowen, Joseph Hobbs. 00530

Tidal flat sediments, exposure indices, Bahamas: Ginsburg, Robert N. 10328

Utah, White Rim Sandstone: Baars, D. L. 02073

*Imbrication*

Saskatchewan, Viking Fm., linear sandstone members: Evans, W. E. 01127

*Interpretation*

California, Cretaceous-Eocene flysch deposits: Chipping, David H. 06096

Deltaic complexes, petroleum reservoirs, prospecting principles: Busch, Daniel A. 02594

Gulf of Mexico, Mississippi Cone: Huang, Ter-Chien. 07274

Kentucky, New Albany Shale, Ravenna facies: Wigley, Perry B. 00976

Marine bar environment, recent, ancient: Davies, David K. 00886

Virginia, Fossil Point Limestone: Balsam, William L. 00139

*Intraformational clasts*

Iceberg rafted sequences: Ovenshine, A. Thomas. 00574

*Keystone vugs*

Carbonate beach deposits, genesis: Dunham, Robert J. 02611

*Macrostructures*

Sediments, pelitic, changes during consolidation: Chmelik, Frank Bernard. 07596

*Methods*

Paleocurrents, grain orientation by dielectric anisotropy: Shelton, John W. 02350

*Molar-tooth structure*

Deformation, Idaho, Belt Supergroup: Clark, Bruce R. 04879

*Mud polygons*

Concave downward, genesis: Minter, W. E. Lawrence. 03609

*Oolites*

Deformation, strain ellipse: Elliot, David. 03819

Genesis, Indiana, Ste. Genevieve Ls.: Carr, Donald Dean. 03249

Georgia, chamosite-hematite, Sequatchie Fm.: Chown, T. M. 01309

Terminology, oolite, oolith, ooid: Akin, R. H., Jr. 06138

Terminology, oolite, oolith, ooid: Teichert, Curt. 06137

*Pisolites*

Deformation patterns, Kansas, Wilson County, Plattsburg Limestone: Manger, Walter L. 09659

*Point bars*

Modern and ancient streams compared, Texas and Louisiana: McGowen, J. H. 03136

*Ripple marks*

Current indicators, nautiloids, Ordovician, Quebec: Dixon, Owen A. 03687

Eolian microridges, *Runzelmarken*, Pennsylvania: Teichert, Curt. 05626

Interference, genesis by ephemeral stream: Picard, M. Dane. 03604

**Sedimentary structures—Continued***Ripple marks—Continued*

Interpretation, Tennessee, Chilhowee Group, Cambrian: Whisonant, Robert C. 05645

Nova Scotia, continental shelf, Browns Bank, bottom sand waves: Drapeau, Georges. 09821

Wavelength, relation to wave orbital diameter: Baker, R. A. 01416

Wind-rain, genesis: Kelly, Allan O. 02978

*Slump structure*

Flysch and t-uldery mudstone, Newfoundland, Notre Dame Bay area: Kay, Marshall. 06445

Maine, Silurian rocks: Griffin, John R. 06996

Model, subaqueous: Sturm, Edward. 01839

Newfoundland, Ordovician sediments: Helwig, James. 01120

Penecontemporaneous, genesis, Virginia, Edinburg Limestone: Lowry, W. D. 05182

Quebec, Lac-Saint-Jean area, fluvio-glacial deposits: Dionne, Jean-Claude. 03233

Sandstone, Oregon, Medford area: Boggs, Sam, Jr. 09809

*Stylolites*

Genesis, solutional erosion, deep-sea carbonates: Bartlett, Grant A. 07705

*Tadpole holes*

Overbank pools, Arizona, application to ancient: Ford, Trevor D. 05662

*Varves*

Marine sediments, C-14 study, British Columbia, Saanich Inlet: Buddemeier, Robert Worth. 03247

Montana, glacial Lake Missoula, deposition, drainage sequence: Alt, D. 10142

Washington, Lake Washington, X-radiographs: Edmondson, W. T. 02443

*Vertical sheet structures*

Primary fabric and paleocurrent indicators, turbidites: Laird, M. G. 01545

**Sedimentation***Bibliography*

United States and Canada, 1966-68: Engineering-Science, Inc. 04518

*Biogenic*

Barrier reefs, calcium carbonate production, deposition: Smith, S. V. 09579

*Cyclic*

Mathematical models, use of Markov chains: Schwarzscher, W. 10623

Ordovician shales, Vermont, Lake Champlain area: Hawley, David. 09020

Oregon, Cape Blanco area, Pleistocene, relation to eustatic sea-level changes: Janda, Richard J. 10178

*Environment*

Alluvial-deltaic plains, Texas, southeastern coast, guidebook: Bernard, Hugh A. 05896

Anaerobic water, planktonic shells, California: Berger, Wolfgang H. 00085

Atlantic continental margin: Macintyre, I. G. 05032

Barrier island complex, Texas, Galveston area, model: Bernard, Hugh A. 05897

Barrier island, Texas, Saint Joseph Island: Andrews, Peter B. 06728

Bay, California, San Francisco Bay: Pestrong, Raymond. 00335

Beach, artificial, Long Island Sound, Connecticut: McCabe, Robert A. 05784

Beach, barrier bar-lagoon complex, Rhode Island: Dillon, William P. 00096

Beach, barrier islands complex, shoreline changes, New Brunswick, Kouchibouguac Bay: McCann, S. B. 09825

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*Canada*

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*Crustal studies*

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*Mexico*

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*Michigan*

- Lake Superior floor near Freda, side-scan sonar profiles: Berkson, J. M. 06472  
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*Minnesota*

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 Midcontinent gravity high, refraction profiling: Mooney, Harold M. 05876  
 Midcontinent Gravity High, St. Croix Horst: Mooney, Harold M. 06582

*Nevada*

- Yucca fault, effect on wave propagation: Hays, Walter W. 00281

*New Brunswick*

- McKendrick Lake-Catamaran Brook area, hammer refraction: Hobson, George D. 06310

*North America*

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*North Carolina*

- Outer Banks, evolution: Welby, Charles W. 00775  
 Pamlico Sound area, ground-water exploration, boomer technique: Leith, C. J. 09216

*Northwest Territories*

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*Nova Scotia*

- Salt domes, reflection: Bidgood, D. E. T. 05649  
 Scotian shelf, Cretaceous strata: King, Lewis H. 07674  
 Wallace area, evaporites: Bidgood, D. E. T. 03003

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- Mer Bleue peat bog area, bedrock topography: Hobson, George D. 10690

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 Deep-sea sediments, sonic velocity measurements: McManus, Dean A. 07156  
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*United States*

- Crustal studies, Columbia Plateau: Hill, David P. 00284  
 Crustal studies, western: Prodehl, Claus. 04453  
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*Washington*

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*Wisconsin*

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 Northwestern, midcontinent gravity high, refraction profiling: Mooney, Harold M. 05876

*World oceans*

- Reflection profiling since 1963, summary: Ewing, John. 09984  
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## Seismology

*Education*

- Seismicity of Earth, 1961-67, motion picture: Levy, Michael A. 03312

*Elastic waves*

- Acceleration spectra, prediction, dislocation theory application: Aki, Keiiti. 00834  
 Amplitude spectra, microearthquakes, application: Douglas, Bruce M. 04685  
 Applications, core density calculations: Bolt, Bruce A. 04115  
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 Compressional, shear velocities, application, strain theory: Sammis, Charles. 03561  
 Core, shadow boundary: Richards, Paul Grans-ton. 07283  
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 Dynamics near source area, layered conformable medium: Bolt, Bruce A. 03444  
 Electromagnetic damping, experimental: Lilley, F. E. M. 08144  
 Free oscillations, traveling wave relations: Landisman, M. 03980  
 Inhomogeneous media, numerical calculation: Landers, Tom. 10532  
 Longitudinal wave traveltimes, Earth's structure: Bolt, Bruce A. 04539

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- PKIKP residuals, North American stations: Cleary, John. 03360
- PKKP velocity model, core structure: Zengeni, Teddy Godfrey. 07292
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- Pn traveltimes, Nevada-California, crustal studies: Carder, D. S. 06410
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- Shear velocities, lower mantle, core radius: Hales, A. L. 04681
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- Shear waves, transformed, amplitude, traveltime, ocean floor: Helmberger, Donald V. 03507
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*North Carolina*

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Northern, erosion: Pierce, J. W. 00749

*Quaternary*

Bibliography, annotated, 1965-1969: Richards, Horace G. 08190

*South Carolina*

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*Virginia*

Southern, erosion: Pierce, J. W. 00749

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Sea Otter Sound, Pelecypoda, Stromatoporoidea, Heceta fm.: Ovenshine, A. T. 04260

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*Appalachians*

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Clinton Group, ostracode zonation, correlation: Berdan, Jean M. 08760

*Arctic*

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Devonian boundary, correlation, U.S.S.R.: Cherkasova, S. V. 10022

*Canada*

Hudson Bay Lowland, Ostracoda, zone fossil, Middle: Copeland, M. J. 05547

Hudson Bay, stromatolitic algae, effect on sedimentation: Elloy, R. 07901

*Correlation*

Devonian boundary, stratotype selection: McLaren, D. J. 04619

*Florida*

North-central, Protista, Chitinozoa: Cramer, Fritz H. 03197

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*Indiana*

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*Iowa*

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Eastern, Palisades Reef Complex: Philcox, Michael E. 10971

Iowa City area, Gower Dolomite, bioherms: Hinman, Eugene E. 09913

*Kentucky*

Brachiopoda, Brassfield Ls., athyroidoid, structure: Gauri, K. L. 00550

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*Maine*

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*Massachusetts*

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*Michigan*

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Michigan basin, Salina Group, sedimentation: Kunasz, Ihor A. 04566

Northern, conodonts, Lower, zonation, n.gen., n.spp.: Pollock, Charles A. 03541

Northern, Ostracoda, leperditid zone fossil: Copeland, M. J. 05547

Southeastern, reef, sedimentation: Gill, Dan. 02620

*Nevada*

Central, Brachiopoda, Tor Limestone, age: Johnson, J. G. 01206

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Central, graptolite-bearing rocks, sedimentation: Berry, William B. N. 00230

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*New Brunswick*

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*New Jersey*

Northern, Upper Cayugan and Helderbergian strata: Barnett, Stockton Gordon. 03827

Shawangunk and Green Pond Conglomerates, Tuscarora Sandstone: Smith, Norman D. 04876

*New York*

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Eastern, Rondout Fm., correlation, sedimentation: Harper, John David. 06871

Green Pond outlier, Brachiopoda, stratigraphy, Upper: Boucot, Arthur J. 08184

Southeastern, Upper Cayugan and Helderbergian strata: Barnett, Stockton Gordon. 03827

Subsurface, Salina Group, correlation, genesis: Rickard, Lawrence V. 04564

Union Springs area, stratigraphy: Duskin, Douglas J. 09035

Western, Brachiopoda, Clinton Group, rhynchonelliform atrypid: Boucot, A. J. 04713

*Newfoundland*

Central Volcanic Belt, flysch and conglomerate sequences: Kay, Marshall. 06445

Goldson Formation, conglomerates, age relations: Horne, Gregory S. 05803

*North America*

Acritarch facies and continental drift: Cramer, Fritz H. 08271

Algae, Cyclocriniteae, taxonomy, morphology: Nitecki, Matthew H. 06227

Biostratigraphy, paleogeography, Upper Llandovery: Ziegler, A. M. 08762

Correlation, biostratigraphy: Berry, W. B. N. 08748

Correlation, conodont zonation, evaluation: Klapper, Gilbert. 08749

Niagara Peninsula, Neagha Fm., acritarchs: Cramer, Fritz H. 08165

Nomenclature, rock unit alphabetical list, distribution, correlation: Berry, W. B. N. 08748

*Northwest Territories*

Ellesmere Island, Franklinian geosyncline, flysch sedimentation: Trettin, H. P. 05297

*Nova Scotia*

Arisaig Beach, Protista, Ross Brook Fm.: Cramer, Fritz H. 05789

Pelecypoda, Arisaig Group: Bambach, Richard Karl. 07600

*Ohio*

Anthozoa, Brassfield Fm., cf. Holocene: Kissling, Don L. 00730

Bass Islands, Bass Islands Fm., members: Sparling, Dale R. 01340

Brachiopoda, Brassfield Ls., athyroid, structure: Gauri, K. L. 00550

Subsurface, Salina Group, correlation, genesis: Rickard, Lawrence V. 04564

*Ontario*

Hamilton, ichnofossils, Thorold Sandstone: Langille, Gerald B. 09633

Lake Timiskaming region, Echinodermata, n.spp., correlation: Bolton, Thomas E. 05551

Michigan basin, Salina Group, sedimentation: Kunasz, Ihor A. 04566

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Southern, conodonts, Lower, zonation, n.gen., n.spp.: Pollock, Charles A. 03541

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Subsurface, Salina Group, correlation, genesis: Rickard, Lawrence V. 04564

University Park-Tyrone-Mt. Union-Lewistown, stratigraphy, field trip: Swartz, Frank M. 09904

*Protista*

Acritarch provinces, relation to paleoclimate: Cramer, Fritz H. 08727

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*Quebec*

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Gaspe Peninsula, stratigraphy, correlation: Lesperance, Pierre J. 05178

Lake Timiskaming region, Echinodermata, n.spp., correlation: Bolton, Thomas E. 05551

*Tennessee*

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*United States*

Appalachian basin, Lower, Clinton iron ore sedimentation: Sheldon, Richard P. 08750

Cincinnati arch area, Brassfield Fm., sedimentation: O'Donnell, Edward. 00170

Georgia-Florida-Alabama, correlation, chitinozoan biostratigraphy: Goldstein, Robert F. 10204

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Illinois Basin and Cincinnati Arch area, conodont zonation, correlation: Rexroad, Carl B. 08761

*Utah*

Great Basin, marine communities, paleoecology: Sheehan, Peter M. 00360

*Yukon*

Prongs Creek area, Brachiopoda, Road River Fm., Pridolian age: Lenz, A. C. 02153

**Silver***California*

Death Valley area, mines and mineral deposits: Clark, William B. 03863

*Colorado*

Cripple Creek district, exploration, interpretation: Kleinkopf, M. Dean. 03472

Leadville district, occurrence, reserves: Meeves, Henry C. 02738

*Geochemistry*

System Ag-As-S: Roland, G. W. 04316

*Mexico*

Oaxaca, Totolapan District, resources, reserves: Schroder, Gert. 01724

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*New England*

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## Snow

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Accumulation rates, Antarctic and Greenland ice sheets: Benson, Carl S. 08695

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## Sodium sulfate

*North America*

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Northern, red clayey, genesis from limestone: Bricker, O. P. 07512

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Popular account: Camp, Charles L. 11270

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- Subsurface, correlative tops, descriptive classification: Iglehart, Charles F. 04543
- Systems analysis, information theoretic approach: McCammon, R. B. 00167

**Nomenclature**

- Changes, 1968, U.S. Geological Survey: Cohee, George V. 01362
- Code, as amended from 1961: Am. Comm. Stratigraphic Nomenclature. 03877
- Illinois, Pleistocene deposits, classification: Willman, H. B. 05818
- Principles and procedures: Cohee, George V. 07657
- United States, Alaska, changes, U.S. Geol. Survey: Cohee, G. V. 04694
- United States, lexicon, 1961-67: Keroher, Grace C. 05456
- Wyoming correlation chart, revised: House, Eldon. 02302

**Principles**

- Biostratigraphic time planes, time transgressive across latitude gradients: Stehli, F. G. 10102
- Geologic record, review: Currie, Kenneth L. 05049
- Lithofacies, flysch basins, turbidite current hypothesis: Walker, Roger G. 05306
- Lithostratigraphic units, nomenclature, classification, international subcommittee report: Hedberg, Hollis D. 08590
- Stratigraphic boundaries, ISSC conclusions: Hedberg, Hollis D. 04545
- Stratotypes, international subcommittee report: Hedberg, Hollis D. 08591
- Symposium, rock strata and Bible record: Zimmerman, Paul A. 05045
- Time-stratigraphic stage boundaries, definition, criteria: McLaren, D. J. 04619

**Terminology**

- Flysch, meaning, history of use: Hsu, K. Jinghua. 05296
- Time-stratigraphic terms: Mann, C. John. 05790

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- Ontario, Detroit River Group, cryptalgal structures: Fagerstrom, J. A. 08034

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- Growth, Bermuda: Sharp, Jonathan H. 01553
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- Devonian, Alberta, Waterways Fm., structure: Birkhead, Paul K. 06758

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- Alberta, Swan Hills Fm., central: Fischbuch, N. R. 01882
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- Devonian, Alberta, Swan Hills Fm.: Fischbuch, N. R. 01882

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- Sr-87:Sr-86, alkalic rocks, U.S., western: Powell, J. L. 03771
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- Sr-87: Sr-86, basalt, Pacific Ocean, north-eastern rises: Hedge, Carl E. 03773
- Sr-87:Sr-86, calcite, Precambrian metavolcanics: Brooks, C. 01616
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 Distribution, solfataras, Wyoming, Yellowstone Park: Schoen, Robert. 09404  
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 Sulfide minerals, influence of pH, oxygen fugacity of hydrothermal fluids: Ohmoto, Hiroshi. 09701

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Geologic data storage and retrieval system: Robinson, S. C. 08724

History, 1917-1947: Thomson, Don W. 10405

Index of publications, 1959-69: Canada Geological Survey. 07798

Publications list, 1969-70: Canada Geological Survey. 04099

Research, 1969: Blackadar, R. G. 00001

Research, 1969-70: Canada Geological Survey. 04098

*Colorado Geological Survey*

Environmental geology role: Rold, John W. 08483

*Georgia Geological Survey*

List of publications, 12th edition: Auvil, J. H., Jr. 10808

*Greenland Geological Survey*

Progress report, activities, 1969: Ellitsgaard-Rasmussen, K. 06241

*Illinois State Geological Survey*

Analytical work, silicate rocks, general: Shimp, Neil F. 07132

ILLIMAP system, computer based: Swann, D. H. 03059

*Illinois State Water Survey*

Publications, 1895-1970, annotated list: Ivems, J. Loreena. 08438

*Joint Oceanog. Inst. Deep Earth Sampling*

Deep Sea Drilling Project, Leg 2: Peterson, Melvin N. A. 01260

*Kansas Geological Survey*

Colloquium on geostatistics, 1970: Merriam, Daniel F. 08608

*McGill University*

Sub-Arctic Research Laboratory, 1954-64, Labrador-Ungava: Adams, W. P. 09283

*Minnesota Geological Survey*

Field work, 1970, summaries: Sims, P. K. 07245

*Mississippi Geological Survey*

Role in ground-water development and investigation: Shows, thad N. 10387

*South Dakota Geological Survey*

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Open-file reports and maps, 1969: Weld, Betsy A. 02036

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Research 1970, summaries: U.S. Geological Survey. 06161

Research, 1970, summary: U.S. Geological Survey. 06562

Research summaries 1970: U.S. Geological Survey. 01515

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*Washington Department of Natural Resources*

Landslide survey, progress report: Thorsen, Gerald W. 05511

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Quebec, Monteregian Hills: Perrault, Guy. 06105

*Am. Assoc. Advancement of Science*

Global effects of environmental pollution: Am. Assoc. Adv. Sci. 09509

*Am. Assoc. Petroleum Geologists*

Giant oil and gas fields, world, geology: Halbouty, Michel T. 07752

*American Geophysical Union*

Saline water, a resource: Johnson, A. I. 05059

*American Water Resources Assoc.*

Water balance in North America, Banff, Alberta, 1969: Laycock, Arleigh H. 09218

*Am.Inst.Mining,Metall.,Petroleum Engineers*

Mining and metallurgy of lead and zinc, 1970: Rausch, Donald O. 08601

*Canada Geological Survey*

Canadian Shield, basins and geosynclines, 1970: Baer, A. J. 08626

*Canadian Conference on Permafrost*

Proceedings of 3d, 1969: Brown, R. J. E. 09203

*Crystallography*

Intermolecular forces, packing in crystals: Bus-ing, William R. 06568

*Douglas Advanced Research Labs.*

Laser applications in geosciences: Gauger, J. 06622

*Earth, interior*

Evolution, Madrid, 1969: Lubimova, E. A. 06861

*Environmental geology*

Limitations of the earth, Austin, Tex., 1967: Texas Univ. Austin. 09465

Limitations of the earth, introduction: Muehlberger, W. R. 09466

*Geological Association of Canada*

Flysch sedimentology in North America, 1969: Lajoie, J. 05295

Southern Cordillera Structure, Vancouver, British Columbia, 1968: Wheeler, J. O. 03272

*Geological Society America Coal Division*

Palynology, Cretaceous-Tertiary boundary, central, western North America: Kosanke, Robert M. 10864

*Geological Society of America*

Penrose Conference, 1969, new global tectonics: Dickinson, William R. 01428

*Geology of industrial minerals*

Fifth, 1969: Hoover, Karl V. 07474

Sixth, 1970: Kneller, W. A. 07518

## Symposia—Continued

- Geomorphology*  
Environmental, 1970: Coates, Donald R. 09187
- Gravity methods*  
Advances in dynamic gravimetry, Fort Worth, Texas, 1970: Kattner, Wilbur T. 07992
- Highway problems*  
Highway geology, 21st annual, field trip: BURGAT, Virgil A. 08414
- Hydrogeology*  
Instrumentation and observation techniques, 1969: National Research Council of Canada. 09190
- Idaho Department of Highways*  
Engineering geology, 8th annual: Idaho Department of Highways. 05493
- Internat. Assoc. Sci. Hydrology*  
Deltas, hydrology: IASH-Unesco. 08572  
Research on representative and experimental basins: IASH-Unesco. 08475  
World water balance: IASH-Unesco. 08429
- Internat. Center Arid, Semi-Arid Land Studies*  
Ogallala aquifer: Mattox, Richard B. 10212
- International Association of Geodesy*  
Earth tides, 1969: Zetler, Bernard D. 10973
- International Atomic Energy Agency*  
Isotope hydrology, 1970, Austria: International Atomic Energy Agency. 08476
- Intersociety Committee on Rock Mechanics*  
Rock mechanics, theory and practice, 1969: Somerton, Wilbur H. 07435
- Iowa*  
Water resources: Horick, Paul J. 09013
- Kansas Geological Survey*  
Geostatistics, Lawrence, Kansas, 1970: Merriam, Daniel F. 08608
- Kansas University*  
Pleistocene and Recent environments of the central Great Plains: Dort, Wakefield, Jr. 08040
- Liverpool Geological Society*  
Mechanism of igneous intrusion, 1969: Newall, Geoffrey. 07471  
Trace fossils, international conference, Liverpool, 1970: Crimes, T. P. 09878
- Louisiana State Univ. Dept. Geology*  
Geology and technology of Gulf Coast salt, 1967: Louisiana State University. 08734
- Massachusetts Institute of Technology*  
Seismic design for nuclear power plants, 1969: Hansen, Robert J. 00970
- Mechanical properties and processes in the mantle*  
First, 1970, review: Sykes, Lynn R. 09432
- Mineralogical Society of America*  
Evaporites, non-marine, geochemistry: Morgan, Benjamin A. 09952  
Mineralogy and petrology of the upper mantle: Morgan, Benjamin A. 09936  
Sulfides: Morgan, Benjamin A. 09944  
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- Moon*  
Apollo 11 lunar science conference, 1970: Levinson, A. A. 06265
- NATO Advanced Study Institute*  
Earthquake displacement fields and rotation of Earth, 1969: Mansinha, L. 09956  
Paleogeophysics, 1968: Runcorn, S. K. 06541
- Northern Ohio Geological Society*  
Salt, 3d, 1969: Rau, Jon L. 04562
- Northwest Scientific Association*  
Columbia River Basalt Symposium, 1969: Gil-mour, Ernest H. 08528

## Symposia—Continued

- Organic geochemistry, International Cong., 3d*  
London, 1966, proceedings: Hobson, G. D. 04185
- Paleobotany*  
Major evolutionary events and geological record: Banks, Harlan P. 09332
- Remote sensing*  
Natural resources, applications, Alaska 1969: Welch, Robin I. 08224
- Rock deformation*  
Modulus, determination, in situ: Am. Soc. Testing and Materials. 09307
- Rock mechanics*  
International symposium on rock mechanics, 2d, Spain: Jimenez Salas, Jose A. 08337
- Salt*  
Third, 1969: Rau, Jon L. 04466
- Soc. Econ. Paleontologists and Mineralogists*  
Clay mineralogy, environmental aspects, 1968: Mankin, Charles J. 05667  
Permian Basin Sec., Comanchean stratigraphy, paleontology, Texas: Hendricks, Leo. 10788  
Radiometric dating and paleontologic zonation: Bandy, Orville L. 04204
- Soil moisture*  
Saskatoon, Sask., 1967: Coulson, A. 10694
- Spectroscopy*  
Mid-America, 19th annual, developments in applied: Grove, E. L. 02877
- Stratigraphy*  
Rock strata and the Bible record: Zimmerman, Paul A. 05045
- Tsunamis*  
Hawaii, 1969, summary: Zetler, Bernard D. 02279  
Pacific Ocean area, Hawaii, 1969: Adams, William Mansfield. 06641
- University of Arizona*  
Mining and ecology, arid environment, 1970: Peters, W. C. 08299
- Upper Mantle Committee*  
Phase transformations and the Earth's interior, Australia, 1969: Bullen, K. E. 02869
- U.S. Natl. Aeronaut. and Space Adm.*  
Earth Resources Program review, remote-sensing data: U.S. Natl. Aeronaut. and Space Adm. 07769
- USGS, AAPG, Northern Calif. Geol. Soc.*  
Geologic seminar on the North Slope of Alaska, 1970: U.S. Geological Survey. 07074
- Water pollution*  
Greater New York area, 1969: Johnson, Alan A. 09875
- West Texas Geol. Soc.-Texas Univ.*  
Geologic framework of Chihuahua tectonic belt: West Texas Geological Society. 05978
- Western Ontario University*  
Precambrian sedimentation, summary of papers: Young, Grant M. 05316

## Talc

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 Lone Star iron deposits, guidebook: SEPM Gulf Coast Sec. 09364  
 Northeastern, field trip guide: Shreveport Geological Society. 04500  
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Tsunami Committee of IUGG, 1969 meeting, report: Zetler, B. D. 06656

## Genesis

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- Michigan basin, Precambrian, field trip guidebook: Michigan Basin Geological Society. 10945
- Northwestern, Precambrian System, Belt Series: Ross, Clyde P. 06028
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- Southeastern, Precambrian System, distribution, review: King, Philip B. 06027

*Earthquakes*

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- Rio Grande rift zone, seismicity: Sanford, Allan. 00354
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- Western, microseismicity: Boucher, Gary Wynn. 07365
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- Western, nuclear events as trigger: Ryall, Alan. 00944
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*Economic geology*

- Bismuth, resources, production, reserves: Perse, Franklin H. 00473
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- Coal, stripping, resources 1970: Averitt, Paul. 04028
- Energy sources, bibliography, annotated: Averitt, Paul. 03878
- Gold, western, Tertiary-Quaternary sediments, occurrence: Tourtelot, Harry A. 00648
- Heavy minerals, Atlantic continental margin: Ross, David A. 02081
- Iron, occurrence: Klemic, Harry. 04698
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- Metals, province distribution, western: Noble, James A. 02368
- Molybdenum, demand, supply through 1966: Bieniewski, Carl L. 02836
- Natural gas, analyses, 1969: Cardwell, L. E. 03165
- Natural gas, composition, analyses: Cardwell, L. E. 00078
- Natural gas, southwestern, occurrence: Kornfeld, J. A. 01638
- Nickel, resources: Kingston, Gary A. 03208
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- Peat, resources, production cf. world: Tibbetts, T. E. 08238
- Petroleum, future provinces: National Petroleum Council. 10894
- Petroleum, natural gas, giant fields, exploration: Halbouty, Michel T. 07757
- Petroleum, natural gas, midcontinent, occurrence, Pennsylvanian: Chenoweth, Philip A. 02788
- Petroleum, natural gas, review, 1969: Damon, Norman. 04493
- Petroleum, textbook: Landes, Kenneth K. 04978
- Phosphate, southeastern, resources: Sweeney, John W. 01881
- Polymetallic ores, Mississippi Valley type, genesis: Heyl, A. V. 08732
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- Earthquakes, damage, structural performance: Steinbrugge, Karl V. 03045
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- Geologic hazards, western, conference, 1969, papers: Olson, Robert A. 05582
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- Urban development, sediment control, technology: Robinson, A. R. 08419
- Waste disposal, southwestern, mining areas: Rigg, John B. 10913

*General*

- Bibliography, hydrology and sedimentation, 1966-68: Engineering-Science, Inc. 04518
- Bibliography, Quaternary, Lake Agassiz area: Bannatyne, B. B. 09628
- Bibliography, radioactive occurrences: Krusiewski, S. Victoria. 04101
- Bibliography, U.S. Congress publications, early: Pestana, Harold R. 00564
- Columbia River Basalt Symposium, 1969: Gil-mour, Ernest H. 08528
- Department of Interior, role in sediment control, urban problems: Cywin, Allen. 08389
- National atlas: U.S. Geological Survey. 06699
- National water atlas, proposal: Heindl, L. A. 01368
- Natural resources programs, BIA, remote sensing applications: North American Rockwell. 09233
- North-Central States, airphoto atlas: Baker, Simon. 07806
- U.S. Geological Survey, activities, objectives, past, present: Pecora, William T. 08723
- U.S. Geological Survey, research 1970: U.S. Geological Survey. 04239

*Geochemistry*

- Basin and Range, basalt, late Cenozoic, Sr-isotopes: Leeman, William P. 04554
- Basin and Range Province, sediments, plants, lithium: Cannon, Helen L. 06087
- Cascade Mountains, andesite, basalt, Pb, Sr isotopes: Church, Stanley E. 01747
- Continental shelf, northeastern, dolomite, C-isotopes: Deuser, W. G. 02135
- General, geochemical prospecting, review, 1969: Carpenter, Robert H. 02170
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- Pacific Ocean to Louisiana, Apollo 6 photomap: U.S. Geological Survey. 01653
- Physiographic features, topographic maps, manual: DeBruin, Richard. 06802
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- Midcontinent gravity high, structure: Craddock, Campbell. 06938
- Midcontinent, seismic, tectonic interpretation, mineral deposit genesis: Ocola, Leonidas C. 01961
- North-central, heat flow: Combs, Jim. 01750
- Northwestern, magnetotelluric: Camfield, P. A. 02065
- Remote-sensing, geologic applications, Earth Resources Program, 1969: Hemphill, William R. 07770
- Satellite observations, magnetic, anomaly patterns: Zietz, Isidore. 03672
- Southwestern, electrical, upper mantle conductivity: Madden, T. 04502
- Southwestern, magnetotelluric, upper mantle structure: Porath, Hartmut. 02067
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- Western, seismic: Prodehl, Claus. 04453

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- High Plains, Ogallala Fm. aquifer, symposium: Mattox, Richard B. 10212
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- North-central, experimental studies, peat-bog basins, relation to water table: Bay, Roger R. 08428
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- Northeastern, continental margin, New England-New Jersey: Schlee, John. 04030
- Maps, general*
- National atlas: U.S. Geological Survey. 06699
- Maps, geologic*
- Mid-Atlantic region, highway series: Renfro, H. B. 05672
- Maps, ground water*
- Mississippi embayment: Cushing, E. M. 04550
- Maps, magnetic*
- Isogonic chart, 1970.0: U.S. Coast and Geodetic Survey. 02775
- Maps, metal provinces*
- Copper, gold, mercury, molybdenum, silver: Noble, James A. 02368
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- Conterminous, molybdenum: King, Rubert U. 03434
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- General: U.S. Coast and Geodetic Survey. 06035
- Mineralogy*
- Clay minerals, Ozark Highlands, Enders stony loam: Coston, Wendell Ray. 00541
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- Annelida, conodonts, midwestern, popular account: Douglas, Dale. 09436
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- Brachiopoda, Ordovician, Middle, Upper, morphology: Howe, Herbert J. 00717
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- Conodonts, Carboniferous, Chester-Morrow, western, phylogeny: Dunn, D. L. 01211
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- Crinoidea, Paleozoic, Cretaceous, descriptions based on stem parts: Raymond C. 09323
- Crinoidea, Paleozoic, Cretaceous, stem parts, collecting localities: Moore, Raymond C. 09325
- Crinoidea, Pennsylvanian, Middle, erisocrinid: Burke, J. J. 03289
- Foraminifera, Cretaceous, Greenhorn-Carlile Fms., Great Plains, paleoecology: Eicher, Don L. 04705
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- Gastropoda, Cenozoic, southeastern, cancellariids: Petit, Richard E. 03430
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1970: International Atomic Energy Agency.  
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 Southeastern, field conference guidebook: Natl. Assoc. Geology Teachers. 04953  
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Great Salt Lake, salt budget: Eardley, A. J. 05633

Kaiparowits region, Cretaceous strata, environments: Peterson, Fred. 06006

North-central, Swan Peak Fm., depositional environments: Vanderston, P. L. 02351

Phosphoria Formation, diagenesis, mobility of phosphate: Cook, P. J. 02385

P.R. Spring area, Wasatch-Green River Fms., paleocurrents: Picard, M. Dane. 04401

Southeastern, White Rim Sandstone, bar deposits: Baars, D. L. 02073

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Cretaceous, Mancos Shale, Tununk Member, paleoecology: Lessard, Robert H. 00627

Eocene, Green River Fm., Red Wash-Raven Ridge area: Koesoemadinata, R. P. 04078

Eocene, Wasatch-Green River Fms., P.R. Spring area: Picard, M. Dane. 04401

**Utah—Continued***Stratigraphy—Continued*

Heber quadrangle, sections: Bromfield, Calvin S. 04511

Jurassic, Curtis Fm., Uinta Mts. area, environment: Hoggan, Roger D. 06305

Jurassic, Morrison Fm., northeastern: Dawson, James Clifford. 06950

Jurassic, San Rafael Group, southwestern, south-central: Thompson, A. E. 07038

Mississippian-Permian, Oquirrh Mts., biostratigraphy, correlation: Gordon, Mackenzie, Jr. 05447

Mississippian-Permian, Rogers Canyon and Bingham sequences, Oquirrh Mts.: Tooker, E. W. 05446

Paleozoic, Grand Canyon region, western, summary: Hamblin, W. K. 06928

Pennsylvanian?, Dove Creek Group, correlation problems: Stokes, William Lee. 04137

Pennsylvanian, Paradox basin, carbonate facies, control by salinity: Hite, Robert J. 04565

Pennsylvanian, Paradox basin, summary: Wengert, Sherman A. 10979

Permian, carbonate rocks, Arcturus basin, sections: Zabriskie, Walter E. 06207

Permian, summary, sedimentation history: Bissell, H. J. 00407

Permian-Mississippian, phosphatic rocks, Weber County: Schell, E. M. 04519

Precambrian-Mississippian, Stansbury Island: Palmer, Dennis E. 06306

Triassic, Chinle Fm., division A, nomenclature: O'Sullivan, Robert B. 01433

*Structural geology*

Beaver and San Francisco Mts., thrust faults: Woodward, Lee A. 01415

Cane Creek anticline, salt tectonics: Evans, Robert. 04578

Cordilleran overthrust belt, radial movements: Crosby, G. W. 05205

Cordilleran overthrust belt, radial movements: Tooker, E. W. 05326

Juab County, Gilson Mountains, faults: Wang, Yun Fei. 06013

Lake Bonneville, isostatic adjustment: Crittenden, M. D., Jr. 07696

Red Canyon area, Sevier fault, vegetation distribution as indicator: Brooks, William H. 01197

Stansbury Island, faults: Palmer, Dennis E. 06306

Wasatch fault, strain characteristics: Cook, Kenneth L. 05530

Wasatch fault, strain characteristics: Cook, Kenneth L. 09012

Western Grand Canyon region, faults: Hamblin, W. K. 06924

Western Grand Canyon region, tectonics, volcanism: Best, M. G. 06927

*Volcanology*

Grand Canyon National Monument, Cenozoic lava cascades and dams: Hamblin, W. K. 07107

Western Grand Canyon area, Cenozoic basalt flows: Hamblin, W. K. 06925

Western Grand Canyon, concurrent tectonism: Best, M. G. 06927

**Vanadium***Abundance*

Meteorites, chondrites, analyses: Nichiporuk, Walter. 04990

**Vanadium—Continued***Analysis*

Activation, concentration in natural waters, California and other states: Linstedt, K. Daniel. 09132

*Bibliography*

Geology and resources: Fischer, R. P. 01877

*Canada*

Titaniferous magnetite deposits, occurrence, possibilities: Rose, E. R. 02855

*General*

Physical, chemical properties, occurrence, minerals: Paist, Donald A. 05074

**Veins***Arsenopyrite*

Newfoundland, Moreton's Harbour area: Gibbons, R. V. 05291

*Wallrock alteration*

Rate calculations: Helgeson, Harold C. 04318

**Vermont***Absolute age*

North-central, bogs, C-14: Dole, Robert Malcolm, Jr. 06584

*Areal geology*

Ausable Forks-Lake Placid quadrangles, field trip, Jay-Whiteface nappe: VanDiver, Bradford B. 09037

Champlain Valley, field trip, Chazy Group: Shaw, Frederick C. 09024

Champlain Valley, field trip, late Pleistocene history: Wagner, W. Philip. 09023

Isle La Motte, field trip, Chazyan reefs, faunal zonation, paleoecology: Finks, Robert M. 09038

Lake Champlain area, field trip, Ordovician shale units: Hawley, David. 09020

Northwestern, field trip, Hinesburg synclinorium, southern: Stanley, Rolfe S. 09022

*Geochemistry*

Metasediments, O-isotopes: Schwarcz, H. P. 04650

*Geomorphology*

Lake Champlain area: Hunt, Allen S. 09021

Lake Champlain, ice movement, shoreline modification: Wagner, W. Philip. 00029

Saxtons and Connecticut River valleys, terraces: Davis, W. M. 06677

Willoughby Arch, topographic grain, structural factors: Newell, Wayne L. 06827

*Geophysical surveys*

Champlain Valley and thrust, Green Mtn. front, gravity profiles: Powell, Robert E. 09033

*Glacial geology*

Champlain Valley, glacial features, Lake Vermont shorelines: Wagner, W. Philip. 09023

Champlain Valley, Laurentide ice sheet, retreat, water levels: Philip, Wagner W. 09417

Green Mountains, valley glaciation features: Wagner, W. Philip. 04655

*Paleontology*

Invertebrata, Ordovician, Chazy reefs, Isle La Motte, paleoecology: Finks, Robert M. 09038

Lake Champlain, Pleistocene relicts: Hunt, Allen S. 09021

*Petrology*

Ausable Forks-Lake Placid quadrangles, Jay-Whiteface nappe, meta-anorthosite: VanDiver, Bradford B. 09037

Brandon Gap area, Pinnacle and Hoosac Fms., Mt. Holly Complex, metamorphism: Goulard, Lee H. 09034

**Vermont—Continue***Petrology—Continued*

Chester dome area, marble, schist, metamorphism, isotopes: Sheppard, Simon M. F. 03831

Craftsbury area, Bullseye Granite, biotite orbicules: VanDiver, Bradford B. 01667

Randolph quadrangle, Bethel Granite: Morse, Dexter A. 09032

*Stratigraphy*

Ordovician, Chazy Group, Champlain Valley: Shaw, Frederick C. 09024

Ordovician, Glens Falls-Hathaway Fms., shales, lithofacies, sedimentation: Hawley, David. 09020

Precambrian-Ordovician, Hinesburg synclinorium area, correlation: Stanley, Rolfe S. 09022

*Structural geology*

Champlain Valley and thrust, Green Mtn. front, structure sections: Powell, Robert E. 09033

Hinesburg synclinorium area, southern, Champlain thrust: Stanley, Rolfe S. 09022

Randolph quadrangle, Bethel Granite, sheet structure: Morse, Dexter A. 09032

Southern, deformation, analysis from rotated garnets: Rosenfeld, John L. 04236

Willoughby Arch area, fractures, relation to topography: Newell, Wayne L. 06827

**Vertebrata***Cenozoic*

Arizona, St. David Fm., Plio-Pleistocene: Lammers, George Eber. 07298

Florida, Eocene-Pleistocene localities, popular guide: Patton, Thomas H. 08363

*Cretaceous*

Canada, western, bibliography: Fox, Richard C. 02298

Montana, Wyoming, Hell Creek Fm., paleoecology: Estes, Richard. 02754

Texas, Trinity Group: Thurmond, John Tydings. 07377

*Evolution*

Fish-tetrapod transition, breathing changes: Gans, Carl. 06837

Origin, relation to carpooids as chordates: Eaton, Theodore H. 04719

Prototetrapods, land habits of juvenile: Holman, J. Alan. 08351

Speciation based on climate, concepts, Matthew vs. Darlington: Dillon, Lawrence S. 04631

*General*

Fossil bone, trace-element analyses: Parker, Ronald B. 00569

Macrofossil collecting, plaster jacket preparation: Auffenberg, Walter. 10931

*Mesozoic*

Terrestrial, paleoclimate indicators: Ostrom, John H. 08514

*Morphology*

Ordovician, dental microstructure, cf. echinoids: Adshead, Patricia C. 02581

*Permian*

Oklahoma, Hennessey Fm., Norman area: Olson, Everett C. 03407

Texas, Baylor County, Lueders Fm., paleoecology, n.spp.: Berman, David S. 05211

*Permian-Pleistocene*

Mexico, localities: Silva-Barcenas, Angel. 10444

*Quaternary*

Florida, Caloosahatchee Fm., Pleistocene: DuBar, J. R. 09751

**Vertebrata—Continued***quaternary—Continued*

Missouri, Crankshaft Cave, faunas: Parmalee, Paul W. 09446

Oklahoma, Texas, Panhandle Aspect archeologic sites: Duffield, Lathel Flay. 07920

Texas, Red Light Bolson fill, climate changes: Akersten, William A. 05465

*Tertiary*

California, Pliocene, Oceanside area, collecting locality: Frazier, Ken. 09743

Canada, western, bibliography: Fox, Richard C. 02298

Georgia, Monroe County, high-level gravels, Pliocene: Voorhies, M. R. 00772

Mexico, Baja California, Rosarito Beach Fm.: Minch, John A. 04885

South Dakota, Brule Fm., Slim Buttes area: Lillegren, Jason A. 00613

South Dakota, Wounded Knee faunas, Miocene, review, new taxa: Macdonald, J. R. 05310

*Tetrapoda*

Evolution, folded teeth, evidence: Schultze, Hans-Peter. 00781

*Textbooks*

Morphology: Romer, Alfred Sherwood. 04498

**Virginia***Absolute age*

Rutherford and Morefield pegmatites, K-Ar, Rb-Sr, discordant patterns: Laughlin, A. William. 11274

*Areal geology*

Augusta Springs quadrangle: Kozak, Samuel J. 02745

Craigsville quadrangle: Kozak, Samuel J. 02745

Deerfield quadrangle: Kozak, Samuel J. 02745

Eagle Rock, Strom, Oriskany, and Salisbury quadrangles: McGuire, Odel S. 07537

Elliott Knob quadrangle: Kozak, Samuel J. 02745

Great Falls area, guidebook: U.S. Geological Survey. 01152

Hylas and Midlothian quadrangles: Goodwin, Bruce K. 07838

James River basin: Virginia Div. Water Resources. 10701

Philpott Reservoir quadrangle: Conley, James F. 03762

Rappahannock River basin: Virginia Division Water Resources. 09273

Richmond-Midlothian area, guidebook: Goodwin, Bruce K. 08316

Southeastern, guidebook: Spencer, Randall S. 08315

York-James Peninsula area, guidebook: Johnson, Gerald H. 11246

*Earthquakes*

1969, December 11, central: Hopper, Margaret G. 04018

1969, November 20, December 11, seismic studies: Hopper, Margaret. 05431

Buchanan County, microearthquakes, related to coal mining: Bollinger, G. A. 06066

Seismicity: Bollinger, G. A. 05415

*Economic geology*

Copper, Fairfax County, Triassic sandstone: D'Agostino, John P. 04250

Heavy minerals, rutile-ilmenite placers, Roseland district: Herz, Norman. 00214

Mineral resources, Philpott Reservoir quadrangle, occurrence: Conley, James F. 03762

## Virginia—Continued

*Engineering geology*

- Canals, dams and locks, Chesapeake and Ohio Canal, history, field trip guidebook: Davies, William E. 10229
- Highways, program, need for geologists: Dvorak, W. E., Jr. 05420
- Land use, urban environment, Roanoke area, Gainsboro Community: Dumper, T. A. 05421
- Land use, urban, Williamsburg area, Green Cove basin: Maloney, J. F. 05433
- Land use, Williamsburg area, Lake Matoaka, sedimentation: Simpson, M. G. 05441
- Materials, properties, estuarine sediments, consolidation: Faas, Richard W. 00698
- Soils, survey and interpretation program: Pettry, D. E. 05437

*General*

- Chesapeake and Ohio Canal, field trip guidebook, engineering geology, historical: Association Eng. Geologists. 11236
- Colleges and universities, geology programs: Goodwin, B. K. 05427
- Textbook, introductory earth science: Dietrich, Richard V. 09163

*Geochemistry*

- Amelia Court House area, Rutherford and Morefield pegmatites, trace-element studies: Laughlin, A. William. 11274
- Chuckatuck area, Yorktown Fm., coquina, Ca-Mg, flame photometry: Cole, J. E. 05418
- Piedmont streams, analyses, cf. Valley and Ridge streams: Sherwood, W. C. 05440

*Geomorphology*

- Appalachian area, caves, soils genesis: Fanning, D. S. 02543
- Central, landslides, debris-avalanche type, August 1969: Webb, H. W. 03333
- Claremont area, karst topography: Huber, William G. 00720
- Clinch Mountain, drainage networks, computer simulations: Smart, J. S. 01980
- James River basin, Pleistocene history: Spencer, R. S. 00087
- Lexington area, Cave Springs cave, development by flooding: Doehring, Donald O. 06956
- Midlothian area, upland gravels, Carolina-Bay type depressions: Goodwin, Bruce K. 08316
- Rappahannock River basin, major river profiles, physiographic provinces: Virginia Division Water Resources. 09273
- Southern, coastal erosion: Pierce, J. W. 00749

*Geophysical surveys*

- Northampton-Accomack Counties, gravity: Johnson, Stanley S. 02781
- Spotsylvania area, aeromagnetic and -radioactivity, interpretation: Neuschel, Sherman K. 05961

*Heat flow*

- Thermal conductivity, Cripple Creek area: Reiter, Marshall Allan. 06887

*Hydrogeology*

- Dismal Swamp area, ground-water resources: Ramsey, Elmer W. 05486
- Ground-water program: Ramsey, E. W. 05438
- James River basin, ground-water resources, quality: Virginia Div. Water Resources. 09165
- James River basin, resources, comprehensive plan: Virginia Div. Water Resources. 10701
- Potomac-Shenandoah River Basin, resource development: Virginia Div. Water Resources. 11226

## Virginia—Continued

*Hydrogeology*—Continued

- Potomac-Shenandoah River basins, water resources, planning: Virginia Div. Water Resources. 10230
- Rappahannock River basin, water resources, planning: Virginia Division Water Resources. 09272
- Rappahannock River basin, water resources, planning: Virginia Division Water Resources. 09273
- Southeastern, ground-water quality and structural control: Rogers, W. S. 05439
- Southeastern, ground-water resources: Virginia Div. Water Resources. 10231
- Southeastern, ground-water resources, quality: Virginia Div. Water Resources. 11227
- York River basin, resources, comprehensive plan: Virginia Div. Water Resources. 09189

*Maps, geologic*

- Augusta Springs quadrangle: Kozak, Samuel J. 02745
- Craigsville quadrangle: Kozak, Samuel J. 02745
- Deerfield quadrangle: Kozak, Samuel J. 02745
- Eagle Rock, Strom, Oriskany, and Salisbury quadrangles: McGuire, Odel S. 07537
- Elliott Knob quadrangle: Kozak, Samuel J. 02745
- Hylas quadrangle: Goodwin, Bruce K. 07838
- Midlothian quadrangle: Goodwin, Bruce K. 07838
- Philpott Reservoir quadrangle: Conley, James F. 03762
- Rappahannock and York River basins: Virginia Division Water Resources. 09272

*Maps, magnetic*

- Spotsylvania area, airborne: Neuschel, Sherman K. 05961

*Maps, mineral resources*

- Roseland district, heavy minerals: Herz, Norman. 00214

*Maps, radioactivity*

- Spotsylvania area, airborne: Neuschel, Sherman K. 05961

*Mineralogy*

- Perrierite, pegmatite, Chamblissburg area, not chevkinite: Lowenhaupt, D. E. 05432
- Piedmont province, pyrochlore-microlite metamicts: Mitchell, Richard S. 02727
- Samarskite, metamict, X-ray diffraction study, occurrences: Mitchell, Richard S. 07051

*Paleontology*

- Brachiopoda, Precambrian, Mount Rogers Volcanic Group, Washington Co.: Bartlett, C. S., Jr. 05414
- Foraminifera, Holocene, Rappahannock Estuary, benthonic, biofacies: Ellison, Robert L. 00782
- Trilobita, Ordovician, Arvonja Slate, Arvonja district: Tillman, C. G. 01139

*Petrology*

- Goode quadrangle, metamorphic rocks, textures: Khoury, S. G. 00163
- Highland County, felsic, mafic intrusions: Ketten, Leroy P., Jr. 00729
- Hylas area, volcanics, metamorphism: Clement, S. C. 05417
- Richmond area, Petersburg granite, compositional trends, drill cores: Dickey, N. 05419
- Richmond area, Petersburg granite, mineral composition: Condit, C. D. 05480

*Sedimentary petrology*

- Austinville, Fossil Point Limestone, structures: Balsam, William L. 00139

## Virginia—Continued

*Sedimentary petrology—Continued*

- Central, Antietam Quartzite, provenance: Schwab, Frederic L. 01542
- Coastal Plain, soils, plinthite, new genetic horizon: Pettry, D. E. 05436
- Dismal Swamp, soils, classification, distribution, properties: Henry, Elvin F. 04920
- Harpers Fm., paleocurrents, environments: Schwab, Frederic L. 00179
- Harrisonburg area, Edinburg Limestone, penecontemporaneous slump structures: Lowry, W. D. 05182
- James River basin, Nansemond Fm., gravel zones, basin history: Spencer, R. S. 00087
- Russell County, Blackford Fm., mineral compositions, volcanic zone: Heyman, Louis. 00205
- Southwestern, limestones, cyclic sedimentation, dolomitization: Hayes, A. W. 05429
- Staunton area, Ordovician limestone, chert alteration: Bain, Roger J. 06050
- York River, sedimentation by amphipods: Lynch, M. P. 01546
- York-James Peninsula, sediment age, quartz grain surfaces, electron microscopy: Wendell, P. B. 05442

*Stratigraphy*

- Cambrian, Honaker and Elbrook fms., equivalence questioned: Cooper, Byron N. 02165
- Cambrian-Mississippian, west-central: McGuire, Odel S. 07537
- Cenozoic, southeastern: Spencer, Randall S. 08315
- Devonian, Greenland Gap Group, Highland County, new names: Dennison, John M. 05606
- Miocene, Saint Marys and Yorktown Fms. contact, unconformity: Huber, W. G. 05488
- Miocene-Holocene, York-James Peninsula area: Johnson, Gerald H. 11246
- Ordovician, Martinsburg Fm., southwestern: Walker, Laurence G. 03743

*Structural geology*

- Arvonla Slate district, superposed folds: Brown, William R. 00679
- Bath-Highland Counties, 38th parallel fracture zone, Tertiary intrusions: Dennison, John M. 00693
- Christiansburg area, thrust sheets, erratic boulders: Glass, F. R., Jr. 05425
- Christiansburg-Radford area, window complex, fault: Glass, F. R. 00705
- Culpeper Triassic basin: Yewisiak, Paul P. 00778
- Front Royal area, folded carbonates, rotation, strain history: Wickham, J. S. 01849
- Lee and Wise Counties, Cumberland overthrust block, Pine Mtn. fault: Miller, R. L. 05476
- Richmond area, joints, Petersburg Granite: Campana, M. E. 05416
- Southeastern, faults, ground-water control: Rogers, W. S. 05439
- Southwestern, Pulaski-Seven Springs faults, equivalence: Cooper, Byron N. 02165

*Weathering*

- Centerville area, diabase: Grubbs, Donald Keeble. 07653
- Charlottesville area, Catoclin Greenstone: Bain, Roger J. 00668

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- Climatic fluctuation, eruptions since 1855, cf. man's pollutants: Mitchell, J. Murray, Jr. 09516

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- Maar volcanoes: Fisher, Richard V. 01173

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- Concurrent tectonism, western Grand Canyon, Arizona-Utah: Best, M. G. 06927
- Crustal movements, Canadian Cordillera: Souther, J. G. 07682
- Crustal movements, Yukon: Hughes, O. L. 07683
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*Fissure emissions*

- Oceanic ridges, crust genesis: Bonatti, E. 03891

*General*

- Cenozoic activity, Pacific Ocean, no relation to plate tectonics: McBirney, Alexander R. 10333
- Current aspects, review: McBirney, Alexander R. 06919

*Mechanism*

- Ash flows, eruptive processes, products: Peterson, Donald W. 01330
- Concurrent tectonism, western Grand Canyon, Arizona-Utah: Best, M. G. 06927
- Explosive volcano, mushroom cloud, expansion, ash deposition, model: Slaughter, M. 00616
- Flood basalts: Shaw, H. R. 08545
- Island arcs, relation to depth of underthrusting: Hays, James D. 08450
- Relation to geomagnetic reversals, Pliocene-Pleistocene boundary: Kennett, James P. 10825

**Volcanoes***Arizona*

- San Francisco Peaks, general: Pewe, Troy L. 05011
- Southeastern, Rhyolite Canyon Fm., caldera: Marjanemi, Darwin K. 00310

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- Northwestern, Holocene, types, effect on man: Souther, J. G. 10396

*California*

- Cascade Range, thermal anomalies, 1964-66: Moxham, R. M. 06792
- Lassen Peak, Brokeoff Mountain, history: Williams, Howel. 09905
- Lassen Peak, eruptions, 1914-1915, eye-witness accounts: Hill, Mary R. 09907
- Mono Craters, eruptive stages: Smith, Eugene I. 00364
- Mount Lassen, activity, 1914-1919, popular account: Hill, Mary R. 05814

*Canada*

- Cordillera, Cenozoic, relation to tectonics: Hughes, O. L. 07683
- Cordillera, Cenozoic, relation to tectonics: Souther, J. G. 07682

*Central America*

- Active, summary: Parsons, Willard H. 01866

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- Eruption prediction, gas condensate composition changes: Stoiber, Richard E. 04873  
 Surveillance, geophysical, Institute for Volcanology, establishment: Robson, G. R. 10369  
 Vent chain, tectonic control: Dengo, Gabriel. 06229

*Colorado*

- San Juan Mountains, Platoro caldera, mineralization: Lipman, Peter W. 04242

*Costa Rica*

- Arenal, 1968 eruptions: Miller, Clinton T. 09783  
 Arenal Volcano, tilt: Simon, Ivan. 01868  
 Cordillera de Guanacaste, Arenal Volcano, eruption, 1968: Weyl, Richard. 05067

*General*

- Repose-period patterns, determination by ash-fall sequences: Wickman, Frans E. 10700

*Guatemala*

- Inventory: Bohnenberger, Otto H. 10883  
 Santiaguito dome: Rose, William Ingersoll, Jr. 07944  
 Santiaguito Volcano, activity, 1968-69: Rose, W. I., Jr. 06916

*Hawaii*

- General: McDougall, Harry. 04443  
 General, history: Macdonald, Gordon A. 05856  
 Kilauea, east rift, 1968-70 deformation: Jackson, Dallas B. 01784  
 Kilauea, Mauna Loa, magma composition: Murata, K. J. 01695  
 Kilauea, summit region, 1968-70 deformation: Swanson, Donald A. 01840  
 Kilauea Volcano, 1959-60 eruption, chronology: Richter, D. H. 06692  
 Mauna Loa, Sulphur Cone, sulfur flow: Skinner, Brian J. 00128  
 Oahu, Koolau Volcano, Tertiary history: Lum, Daniel. 00031

*Mexico*

- Paricutin, eruption 1943, ecologic changes: Rees, John D. 08396

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- Flat-topped, circumferential vents, surface flows: Simkin, Tom. 09572

*Nevada*

- Fish Creek Mountains, Miocene history: McKee, Edwin H. 05815  
 Tertiary calderas, mineral deposits: Albers, John P. 04240

*New Mexico*

- Mount Taylor volcanic field, genesis: Baker, Ian. 06052  
 Squirrel Springs volcano-tectonic depression, buried cauldron, evidence: Rhodes, Rodney C. 10592

*Nicaragua*

- Cerro Negro, 1968 eruption: Viramonte, J. G. 06793  
 Cerro Negro Volcano, October 1968 eruption: Parsons, Willard H. 02364

*North America*

- Western, maar type, evidence: Waters, Aaron C. 08538

*Oregon*

- Cascade Range, Three Sisters area: Taylor, Edward M. 04359  
 Sand Mountain lava field, spatter cone pits, formation, general description: Nieland, Jim. 09820

**Volcanoes—Continued***Pacific Ocean*

- Submarine eruptions, detection by Sofar: Norris, Roger A. 01438

*United States*

- Cascade Range, activity, past, potential, geologic hazards: Crandell, Dwight R. 05522  
 Northwestern, cones, volcanics, general description: Finson, Bruce. 09786

*Washington*

- Cascade Range, relation to gravity trends, earthquake alignments: Danes, Z. F. 00057  
 Cascade Range, thermal anomalies, 1964-66: Moxham, R. M. 06792  
 Cenozoic, Wind River area: Wise, William S. 08369  
 Mount Rainier, crestal craters, fumaroles, glaciers, volcanic scree: Miller, Maynard. 09246  
 Mount Rainier, microearthquakes, 1968: Unger, John D. 06462  
 Mount Saint Helens, Y ash layer, distribution: Norgren, J. A. 01196  
 Whitman, Adams Counties, vent features, Yakima Basalt: Bingham, J. W. 08539

*West Indies*

- Lesser Antilles, andesite, genesis: Rea, W. J. 04788  
 Montserrat, tilt measurements: Tomblin, J. F. 10366  
 Nevis, tilt measurements: Tomblin, J. F. 10366  
 Soufriere Volcano, activity, hot springs: Yemel'yanov, Ye. M. 07211

*Wake Island**Engineering geology*

- Tsunami response, hydraulic cf. numerical approach: Vastano, A. C. 05026  
 Tsunami response, model study: VanDorn, William G. 04899

*Washington**Absolute age*

- Cascade Mountains, northern, U-Pb chronology: Mattinson, James M. 00311  
 Cascade Range, Tertiary plutons, K-Ar: Yates, Robert S. 10317  
 Coast Ranges, Miocene foraminiferal stages, K-Ar: Turner, Donald L. 04390  
 Marmes rock shelter, organic strata, shells, C-14: Kirk, Ruth. 08378  
 Okanogan Range, Cretaceous orogenic phase: Menzer, Fred J., Jr. 00199  
 Yakima Canyon, type Yakima Basalt, K-Ar: Holmgren, Dennis A. 08756

*Areal geology*

- Columbia River Basalt area, field-trip guidebook: Basalt Symposium. 08644  
 Mount Rainier National Park, popular account: Allen, John Eliot. 02807  
 Northeastern, lead-zinc deposits, guidebook: Society of Economic Geologists. 04909  
 Renton, Auburn, Black Diamond quadrangles: Mullineaux, Donal R. 04640

*Earthquakes*

- 1968, Mount Rainier, microearthquake activity: Unger, John D. 06462  
 Alignment, relation to Cascade volcanoes, gravity trends: Danes, Z. F. 00057  
 Puget Sound area, small, activity, new data: Crosson, Robert S. 10548  
 Seattle, Union Bay, ground motion cf. nuclear blast: Seed, H. Bolton. 03355



**Washington—Continued***Earthquakes—Continued*

Seattle, Union Bay, surface motions, cf. calculated: Tsai, N. C. 04686

*Economic geology*

Lead-zinc, Metaline and Northport districts, genesis: Yates, Robert G. 04911

Lead-zinc, Metaline district, occurrence, genesis: Addie, George G. 04914

Lead-zinc, northeastern: Society of Economic Geologists. 04909

Lead-zinc, Stevens County, Van Stone mine: Kesten, S. Norman. 04919

Magnesite, Stevens County, genesis: Bamford, Robert Wendell. 07269

*Engineering geology*

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Bibliography, Puget Sound, Pleistocene events and processes: Folsom, Michael M. 03410

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Okanogan area, Darling Lake pluton: Menzer, Fred J., Jr. 03403

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Okanogan area, Darling Lake pluton: Menzer, Fred J., Jr. 03403

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*Textbooks*

Rock weathering: Carroll, Dorothy. 06151

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- Petroleum exploration, digitized logs, applications: Jeffries, F. 02636
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- Status and trends: Evans, Hilton B. 00841
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- Techniques, porosity log: Kennedy, John L. 09079

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"Big Lime" sequence, drillers' logs and well records: Owens, Gordon L. 03219

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Southwestern, well records 1964-1967: Ontario Water Resources Commission. 10451

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Nevis, tilt measurements: Tomblin, J. F. 10366

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Chesapeake and Ohio Canal, field trip guidebook, engineering geology, historical: Association Eng. Geologists. 11236

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General: Cardwell, Dudley H. 07199

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Fox River watershed, summary for land-use planning: Se Wisconsin Regional Plan. Comm. 10399

Milwaukee area: Nelson, Katherine G. 06225

Mississippi Valley zinc-lead district, guidebook: Heyl, A. V. 07202

Precambrian: Dutton, Carl E. 07499

Southeastern, field-trip road log: Black, Robert F. 06810

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Southeastern, guidebook: Black, Robert F. 06809

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Western, Cambrian-Ordovician outcrops, guidebook: Ostrom, Meredith E. 07422

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Land use, Fox River watershed, comprehensive plan: SE Wisconsin Regional Plan. Comm. 10399

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Streams, sediment yields: Hindall, S. M. 03982

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Midcontinent gravity high, seismic study: Mooney, Harold M. 04007

Midcontinent Gravity High, St. Croix Horst, seismic: Mooney, Harold M. 06582

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Northwestern, midcontinent gravity high, seismic: Mooney, Harold M. 05876

Wisconsin arch, magnetotelluric, crustal structure: Dowling, Forrest L. 02196

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Baraboo district, glacial features: Black, R. F. 07065

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Eastern, Valderan glaciation, guidebook: Black, Robert F. 05833

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Milwaukee area: Nelson, Katherine G. 06225

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Streams, sediment yields: Hindall, S. M. 03982

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Northwestern: Craddock, Campbell. 04382

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Menominee-Northland (Mich.) area, airborne: U.S. Geological Survey. 03875

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Northern: Dutton, Carl E. 07499

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- Bentonites, model study, deposition of volcanic ash: Slaughter, M. 00616  
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- Cenozoic, Granite Mountains area: Love, J. D. 01284  
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- Pleistocene, Tower Creek Gravel Member, Yellowstone Park, new name: Pierce, Kenneth L. 04693  
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 Wind River basin, history, genesis: Keefer, William R. 02079  
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 Wyoming province, drape folds over uplifted basement blocks: Stearns, David W. 09588

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- Old Faithful Geyser, eruptions, earth tide effects: Rinehart, John S. 01822

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- Atmosphere, natural gases: Bennett, G. A. 03140

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- Anomalies, meteorites, mass fractionation: Kurroda, P. K. 03906  
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- Allanite, Colorado, Boulder Creek Batholith: Hickling, Nelson L. 02388  
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- Apatite, synthetic, structural fields: Kreidler, Eric R. 03174
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- Clay minerals, ion exchange capacity: Hang, Pham Thi. 07617
- Clay minerals, Ontario, Gowganda Fm.: Tank, R. W. 07878
- Clay minerals, structure, relation to engineering properties: Moore, C. A. 05272
- Clay minerals, Utah, Manning Canyon Shale: Henderson, G. V. 07663
- Clay-mineral identification: Carroll, Dorothy. 02116
- Deep-sea cores, mineral abundances, Atlantic Ocean: Rex, R. W. 01343
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- Manganese nodules, magnetic particles, source: Finkelman, R. B. 00810
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- Molybdenite polytypes, Royal Ontario Museum: Mandarino, J. A. 06639
- Mowry Shale, Wyoming: Davis, John Clements. 01128
- Phoenicochroite, Arizona: Williams, Sidney A. 06575
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- Quartz, calcite, dolomite, quantitative phase analyses: Braun, Robert L. 07200
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- Carbonate minerals, errors due to solid-solution variation: Runnells, Donald D. 08620
- Clay minerals in shale, pelletized sample technique: Hidalgo, Robert V. 08393
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- Clay minerals, quantitative determination quartz-calcite and quartz-kaolinite systems intensities: Davis, C. E. 09343
- Clay-mineral identification: Carroll, Dorothy. 02116
- Crystal structure determination, guide: Stout George H. 04499
- Crystallography, high-speed photography: Prewitt, C. T. 09319
- Deep-sea cores, mineral abundances: Rex, R. W. 01343
- Lattice parameter determination, automated Segmüller, Armin. 04050
- Marine sediments, Nova Scotia, shelf facies: Phipps, C. V. G. 02448
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- Structure, mono- and triclinic: Brindley, G. W. 09089

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- Sediments, Washington, Lake Washington, laminations: Edmondson, W. T. 02443

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Lead-zinc, Keno Hill-Galena Hill area, geochemistry: Templeman-Kluit, D. J. 05075

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