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# Bibliography of North American Geology, 1956

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GEOLOGICAL SURVEY BULLETIN 1075







# Bibliography of North American Geology, 1956

By RUTH REECE KING *and others*

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*This bibliography represents work done jointly by Ruth Reece King, Virginia M. Jussen, Elisabeth S. Loud, Georgianna D. Conant, and Herbert C. Crandell, Jr.*



**UNITED STATES DEPARTMENT OF THE INTERIOR**

**FRED A. SEATON, *Secretary***

**GEOLOGICAL SURVEY**

**Thomas B. Nolan, *Director***

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# BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY

## 1956

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By RUTH REECE KING and others<sup>1</sup>

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### INTRODUCTION

The current annual volume lists publications that appeared during 1956 concerning the geology of the North American continent, including Greenland, the West Indies, and other adjacent islands, and Hawaii, Guam, and other island possessions, but not the trust territories of the United States. A few articles published before 1956, but not included in previous volumes, are cited also. 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 with foreign areas. Articles by foreign authors on North America are included regardless of place of publication; those of a general nature are included 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.

Assistance of Margaret E. Barcroft, Lois F. Idleman, Mildred C. Mead, and Yetta C. Millman in the preparation of this volume is gratefully acknowledged.

The Bibliography of North American Geology comprises the following bulletins: 746-747 (1785-1918), 823 (1919-28), 937 (1929-39), 1049 (1940-49), 985 (1950), 1025 (1951), 1035 (1952-53), 1054 (1954), and 1065 (1955).

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<sup>1</sup> This bibliography represents work done jointly by Ruth Reece King, Virginia M. Jussen, Elisabeth S. Loud, Georgianna D. Conant, and Herbert C. Crandell, Jr.



## SERIALS

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The following list gives both the abbreviated citation and the full name of periodicals and serials that have been most commonly cited in this bibliography. A few of the less common ones, whose place of publication appears in the citation within the bibliography proper, have not been included here. Publications that include many articles, such as guidebooks, conferences, congresses, symposiums, etc., will not be found in this list of serials.

- A. I. M. E., Mining Geology Geophysics Div. Ann. Mtg., Min. Br. Abs.—American Institute of Mining and Metallurgical Engineers, Mining, Geology, and Geophysics Division Annual Meeting, Mining Branch Abstracts. New York.
- A. I. M. E. Trans.—American Institute of Mining, Metallurgical, and Petroleum Engineers Transactions. New York.
- Acta Crystallographica. Copenhagen.
- Ala. Acad. Sci. Jour.—Alabama Academy of Science Journal. Montevallo, Ala.
- Alberta Research Council Prelim. Rept.; Rept.—Alberta Research Council, Preliminary Report; Report. Edmonton, Alberta.
- Alberta Soc. Petroleum Geologists Jour.—Alberta Society of Petroleum Geologists Journal. Calgary, Alberta.
- Am. Alpine Jour.—American Alpine Journal. New York.
- Am. Antiquity—American Antiquity. Menasha, Wis.
- Am. Assoc. Petroleum Geologists Bull.—American Association of Petroleum Geologists Bulletin. Tulsa, Okla.
- Am. Ceramic Soc. Bull.; Jour.—American Ceramic Society Bulletin; Journal. Columbus, Ohio.
- Am. Geol. Inst. Rept.—American Geological Institute Report. Washington, D. C.
- Am. Geophys. Union Trans.—American Geophysical Union Transactions. Washington, D. C.
- Am. Jour. Sci.—American Journal of Science. New Haven, Conn.
- Am. Malacolog. Union Ann. Rept.—American Malacological Union Annual Report. Buffalo, N. Y.
- Am. Midland Naturalist—American Midland Naturalist. Notre Dame, Ind.
- Am. Mineralogist—American Mineralogist. Ann Arbor, Mich.
- Am. Mus. Nat. History Bull.—American Museum of Natural History Bulletin. New York.
- Am. Mus. Novitates—American Museum Novitates. New York.
- Am. Philos. Soc. Proc.; Yearbook—American Philosophical Society Proceedings; Yearbook. Philadelphia, Pa.
- Am. Scientist—American Scientist. New Haven, Conn.
- Am. Soc. Civil Engineers Proc. Jour. Hydraulics Div.—American Society of Civil Engineers Proceedings Journal of the Hydraulics Division. New York.
- Anal. Chemistry—Analytical Chemistry. Washington, D. C.
- Arctic. Montreal, Quebec.
- Ark. Acad. Sci. Proc.—Arkansas Academy of Science Proceedings. Fayetteville, Ark.
- Ark. Geol. and Conserv. Comm. Water Res. Circ.—Arkansas Geological and Conservation Commission Water Resources Circular. Little Rock, Ark.
- Asoc. Mexicana Geólogos Petroleros Bol.—Asociación Mexicana de Geólogos Petroleros Boletín. México, D. F.
- Assoc. Am. Geographers Annals—Association of American Geographers Annals. Lancaster, Pa.
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- Calif. Jour. Mines and Geology—California Journal of Mines and Geology. San Francisco, Calif.
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- Calif. Univ. Pubs. Geol. Sci.—California University, Publications in Geological Sciences. Berkeley, Calif.
- Canada Dominion Observatory Pub.—Canada Dominion Observatory Publications. Ottawa.
- Canada Geol. Survey Bull.; Geophysics Paper; Mem.; Paper—Canada Geological Survey Bulletin; Geophysics Paper; Memoir; Paper. Ottawa.
- Canada Natl. Mus. Bull.—Canada National Museum Bulletin. Ottawa.
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- Canadian Geog. Jour.—Canadian Geographical Journal. Montreal, Quebec.
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- Canadian Inst. Mining and Metallurgy Trans.—Canadian Institute of Mining and Metallurgy Transactions. Montreal, Quebec.
- Canadian Min. Jour.—Canadian Mining Journal. Gardenvale, Quebec.
- Canadian Min. Metall. Bull.—Canadian Mining and Metallurgical Bulletin. Montreal, Quebec.
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- Colo. School Mines Quart.—Colorado School of Mines Quarterly. Golden, Colo.
- Colo. Sci. Soc. Proc.—Colorado Scientific Society Proceedings. Denver, Colo.
- Compass—The Compass. Provo, Utah.
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- [U. S.] Beach Erosion Board Tech. Memo.—[United States] Beach Erosion Board Technical Memorandum. Washington, D. C.
- U. S. Bur. Mines Inf. Circ.; Rept. Inv.—United States Bureau of Mines Information Circular; Report of Investigations. Washington, D. C.
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| U. S. Geol. Survey             | United States Geological Survey           |
| Bull.                          | Bulletin                                  |
| Circ.                          | Circular                                  |
| Coal Inv. Map                  | Coal Investigations Map                   |
| Geol. Quadrangle Map           | Geologic Quadrangle Map                   |
| Geophys. Inv. Map              | Geophysical Investigations Map            |
| Hydrol. Inv. Atlas             | Hydrologic Investigations Atlas           |
| Mineral Inv. Field Studies Map | Mineral Investigations Field Studies Map  |
| Mineral Inv. Res. Map          | Mineral Investigations Resource Map       |
| Misc. Geol. Inv. Map           | Miscellaneous Geologic Investigations Map |
| Oil and Gas Inv. Chart         | Oil and Gas Investigations Chart          |
| Oil and Gas Inv. Map           | Oil and Gas Investigations Map            |
| Prof. Paper                    | Professional Paper                        |
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- [U. S. Office] Chief Naval Operations Polar Proj.—[United States Office of] Chief of Naval Operations Polar Projects. Washington, D. C.
- Uranium. Denver, Colo.
- Utah Geol. Mineralog. Survey Bull.—Utah Geological and Mineralogical Survey Bulletin. Salt Lake City, Utah.
- Utah Univ. Anthropol. Papers—Utah University Anthropological Papers. Salt Lake City, Utah.
- Va. Div. Geology Bull.—Virginia Division of Geology Bulletin. Charlottesville, Va.
- Va. Div. Mineral Res., Mineral Res. Circ.—Virginia Division of Mineral Resources, Mineral Resources Circular. Charlottesville, Va.
- Va. Jour. Sci.—Virginia Journal of Science. Charlottesville, Va.
- Va. Minerals—Virginia Minerals. Charlottesville, Va.
- Vt. Geol. Survey Bull.—Vermont Geological Survey Bulletin. Montpelier, Vt.
- W. Va. Geol. Survey Bull.; Rept. Inv.—West Virginia Geological Survey Bulletin; Report of Investigations. Morgantown, W. Va.
- Wagner Free Inst. Sci. Bull.—Wagner Free Institute of Science Bulletin. Philadelphia, Pa.
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[A double dagger (‡) indicates material produced by means other than ordinary printing. Superscript letters are used to identify different authors with the same name: as, Meadows<sup>a</sup>, Paul; Meadows<sup>b</sup>, Paul. An analytical citation in which the author or editor name follows *in* refers the reader to the author or editor citation, to be found in this volume, where full title and place of publication are given; but if the title follows *in*, full information is contained within the citation]

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- 269, Harrys River, Newfoundland.
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- 271, Little Grand Lake, Newfoundland.
- 272, Corner Brook, Newfoundland.
- 273, Rainy Lake, Newfoundland.
- 275, Serpentine, Newfoundland.
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- 281, Smoothwater Lake, Ontario.
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- 283, Elk Lake, Ontario.
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- Ground and surface waters, analysis: Fix, P. F.
- Igneous rocks, content and distribution: Neuerburg, G. J., 1.
- Uranium deposits, hypotheses of genesis, diverse types: McKelvey, V. E., 4.
- Uranium minerals, age, nuclear physical stability: Kuroda, P. K., 1.
- Oxygen isotope variations: Hoekstra, H. R., 3.

## Geochemistry—Continued

Uranium-lead age determination: Eckelmann, W. R., 1.

Leakage: Wickman, F. E.

Zinc ion diffusion through carbonate systems: Wehrenberg, J. P.

Geochronology. *See* Geologic time.

## Geologic formations.

Abrigo limestone, Cambrian, Arizona: Gilluly, J.

Admiralty group, Ordovician, Baffin Island, new: Blackadar, R. G., 1.

Alachua formation, Miocene-Pleistocene, Florida: Pirkle, E. C., Jr., 2.

Alaska Bench formation, Carboniferous, Montana: Mundt, P. A., 3.

Mississippian-Pennsylvanian (?), Montana: Mundt, P. A., 2.

Alberta group, Cretaceous, Alberta: Scruggs, G. G.

Aldrich Station formation, Miocene-Pliocene, Nevada, new: Axelrod, D. I.

Allegheny series, Pennsylvanian, Ohio: Lamborn, R. E.

Amatitlan formation, Cretaceous, Mexico, new: Calderón García, A., 2.

Amsden formation, Carboniferous, Montana: Mundt, P. A., 1.

Mississippian (?)—Pennsylvanian, Montana—Wyoming—North Dakota—South Dakota: Mundt, P. A., 4.

Pennsylvanian, Montana: Mundt, P. A., 3.

Antelope Valley limestone, Ordovician, Nevada, new: Nolan, T. B.

Applegate group, Triassic(?), Oregon: Wells, F. G., 1.

Arctomys formation, Cambrian, Alberta: DeWit, R., 1.

Arroyo Peñasco formation, Mississippian, New Mexico: Fitzsimmons, J. P.

Athabasca series, Precambrian, Alberta-Saskatchewan: Blake, D. A. W., 2.

Aycross formation, Eocene, Wyoming: Hay, R. L.

Aiyak member of Seabee formation, Cretaceous, Alaska: Gryc, G., 1.

Bakken formation, Mississippian, Saskatchewan: Fuller, J. G. C. M., 1.

Bedford shale, Mississippian, Appalachian basin: Pepper, J. F., 1.

Bell Valley andesite, Tertiary, Texas: Hay-Roe, H.

Belly River formation, Cretaceous, Alberta: Williams, G. K.

Berea sandstone, Mississippian, Appalachian basin: Pepper, J. F., 1.

Bern limestone, Pennsylvanian, United States, midcontinent: Moore, R. C., 2.

## Geologic formations—Continued

Bernardston formation, Devonian, Massachusetts: Balk, R., 1, 2.

Big Valley formation, Devonian, Alberta: Wonfor, J. S.

Bighorn formation, Cretaceous, Alberta: Stott, D. F., 3.

Bird Spring formation, Pennsylvanian, California: Hewett, D. F., 1.

Bivouac formation, Pliocene or Pleistocene, Wyoming: Love, J. D., 1, 4.

Biwabik formation, Precambrian, Minnesota: Gruner, J. W., 2.

Bluffport marl member of Demopolis chalk, Cretaceous, Alabama, new: Monroe, W. H.

Bolsa quartzite, Cambrian, Arizona: Gilluly, J.

Bonanza King formation, Cambrian, California-Nevada: Palmer, A. R., 3.

Bone Valley formation, Pliocene, Florida: Altschuler, Z. S.

Brazer formation, Mississippian, Idaho-Utah: Strickland, J. W., 1.

Brentwood limestone member of Bloyd formation, Pennsylvanian, Arkansas: Cook, V. O.

Brooklyn formation, Carboniferous, British Columbia: Seraphim, R. H.

Brule formation, Oligocene, South Dakota: Bump, J. D.

Cabaniss subgroup, Pennsylvanian, Kansas: Howe, W. B.

Camp Davis formation, Pliocene, Wyoming: Love, J. D., 1.

Camp Davis formation(?), Miocene-Pliocene, Wyoming: Dorr, J. A., Jr., 1.

Caney shale, Mississippian, Oklahoma, new members: Elias, M. K., 1.

Oklahoma, restricted: Westheimer, J. M., 2.

Capistrano formation, Miocene-Pliocene, California: White, W. R.

Carbon Ridge formation, Permian(?), Nevada, new: Nolan, T. B.

Carlmona member of Platteville formation, Ordovician, Minnesota, new: Weiss, M. P., 1.

Carmen formation, Miocene(?), Idaho: Anderson, A. L.

Cayetano formation, Jurassic, Cuba: Krömmelbein, K.

Cedar Mesa sandstone member of Cutler formation, Permian, Utah: Sears, J. D.

Chadron formation, Oligocene, Nebraska, provenance: Vondra, C. F.

Chainman shale, Mississippian, Nevada: Nolan, T. B.

Challis volcanics, Oligocene, Idaho: Anderson, A. L.

## Geologic formations—Continued

- Champ Clark group, Devonian (?)—Mississippian, Illinois, new: Workman, L. E.
- "Charles" evaporites, Mississippian, Saskatchewan: Fuller, J. G. C. M., 1.
- Charny formation, Cambrian, Quebec: Osborne, F. F., 3.
- Chattanooga shale, Devonian, Tennessee: Brown, Andrew; Hass, W. H., 1; Maher, S. W.
- United States, southeastern: Conant, L. C.
- Chepultepec dolomite, Ordovician, Tennessee: Bridge, J.
- Cherokee group, Pennsylvanian, Kansas: Howe, W. B.
- Chester group, Mississippian, Kentucky: McFarlan, A. C.
- Chinle formation, Triassic, Arizona: Wilson, R. L.
- Colorado Plateau: Holyoak, D. M.
- Chloropagus formation, Miocene-Pliocene, Nevada, new: Axelrod, D. I.
- Chuska sandstone, Miocene(?), Arizona—New Mexico: Wright, H. E., Jr., 5.
- Ciudad formation, Cretaceous, Mexico: Calderón García, A., 1.
- Citadel formation, Ordovician, Quebec: Osborne, F. F., 3.
- Citronelle formation, Pliocene, Mississippi: Vestal, F. E.
- Clayton formation, Tertiary, Georgia: Furcron, A. S., 2.
- Cleary coal member of Menefee formation, Cretaceous, New Mexico: Beaumont, E. C.
- Cliff House sandstone, Cretaceous, New Mexico: Beaumont, E. C.
- Coal Valley formation, Pliocene, Nevada, new: Axelrod, D. I.
- Coatzacoatlán formation, Oligocene, Mexico, new: Internat. Geol. Cong. Mexico, 15.
- Coffee Creek formation, Mississippian, Oregon: Mamay, S. H.
- Colestin formation, Eocene, Oregon: Wells, F. G., 1.
- Coleville sand member of Bakken formation, Mississippian, Saskatchewan, new: Reasoner, M. A.
- Colter formation, Miocene, Wyoming: Love, J. D., 1, 4.
- Colville group, Cretaceous, Alaska, revised: Gryc, G., 1.
- Comanche series, Cretaceous, Arizona: Gilluly, J.
- Conemaugh series, Pennsylvanian, Ohio: Lamborn, R. E.
- Copper Ridge dolomite, Cambrian, Tennessee: Bridge, J.
- Cornfield Springs formation, Cambrian, California-Nevada: Palmer, A. R., 3.

## Geologic formations—Continued

- Corwin formation, Cretaceous, Alaska: Sable, E. G.
- Cow Head breccia, Ordovician, Newfoundland, discredited: Kindle, C. H.
- Cowlitz formation, Eocene, Washington, members: Henriksen, D. A.
- Coyote Butte formation, Permian, Oregon: Mamay, S. H.
- Crag Mtn. formation, Silurian-Devonian (?), Massachusetts: Balk, R., 2.
- Crowsnest formation, Cretaceous, Alberta: MacKenzie, H. N. S., 1.
- Cummingsville member of Galena formation, Ordovician, Minnesota, new: Weiss, M. P., 1.
- Curley limestone member of Gardner formation, Mississippian, Utah: Proctor, P. D., 2.
- Dakota(?) sandstone, Cretaceous, New Mexico: Kottlowski, F. E., 1; Pray, L. C.
- Darby formation, Devonian, Wyoming: Andrichuk, J. M., 1.
- Decorah formation, Ordovician, upper Mississippi Valley: Agnew, A. F., 3.
- Deer Creek formation, Pennsylvanian, Colorado: Bolyard, D. W.
- Desert Peak formation, Pliocene, Nevada, new: Axelrod, D. I.
- Des Moines series, Pennsylvanian, New Mexico: Kottlowski, F. E., 1.
- Devils Gate limestone, Devonian, Nevada, new members: Nolan, T. B.
- Devil's Hole formation, Miocene(?), Colorado, new: Johnson, Ross B.
- Diamond Peak formation, Mississippian, Nevada: Nolan, T. B.
- Dockum group, Triassic, Colorado, units: Oriel, S. S.
- Eastend formation, Cretaceous, Saskatchewan: Kupsch, W. O., 1.
- Edwards formation, Cretaceous, Texas, biostrome facies: Matthews, W. H., 3d.
- Eldorado dolomite, Cambrian, Nevada: Nolan, T. B.
- Elk Point group, Devonian, Alberta to Manitoba: Van Hees, H.
- Williston basin, new: Baillie, A. D., 1.
- El Paso group, Ordovician, New Mexico: Kottlowski, F. E., 1.
- Ely limestone, Pennsylvanian, Nevada: Nolan, T. B.
- Emerson formation, Cambrian-Ordovician, Montana: Knechtel, M. M., 2.
- Emporia limestone, Pennsylvanian, United States, midcontinent: Moore, R. C., 2.

## Geologic formations—Continued

- English Head formation, Ordovician, Quebec: Sinclair, G. W., 3.
- Entrada sandstone, Jurassic, Colorado: Ortel, S. S.
- Eqalulik group, Precambrian-Cambrian, Baffin Island, new: Blackadar, R. G., 1.
- Escabrosa limestone, Mississippian, Arizona: Gilluly, J.
- Escolin formation, Oligocene, Mexico, new: Internat. Geol. Cong. Mexico, 15.
- Eunice formation, Pleistocene, Gulf Coastal Plain: Doering, J. A.
- Eureka group, Ordovician, California: Langenheim, R. L., Jr., 1.
- Exshaw formation, Mississippian, Alberta: Mountjoy, E. W.
- Fairbury trachyte, Tertiary, Texas: Hay-Roe, H.
- Fairholme group, Devonian, Alberta: Belyea, H. R., 1.
- Farisita conglomerate, Oligocene(?), Colorado, new; Johnson, Ross B.
- Ferry Lake anhydrite, Cretaceous, Gulf Coastal Plain: Forgotsen, J. M., Jr.
- Fleming formation, Miocene, Texas: Wilson, J. A.
- Foley formation, Miocene, Louisiana, new members: Jones, P. H., 2.
- Fort Union formation, Paleocene, Montana: Smith, J. F., Jr.
- Fortress Mtn. formation, Cretaceous, Alaska, new: Gryc, G., 1.
- Frio formation, Tertiary, Texas, lithofacies: Grayshon, J. E.
- Frontier formation, Cretaceous, Wyoming: Love, J. D., 1.
- Galena formation, Ordovician, upper Mississippi Valley: Agnew, A. F., 3.
- Gano formation, Pennsylvanian, Oklahoma, new: Branson, C. C., 4.
- Garden Valley formation, Permian(?), Nevada, new: Nolan, T. B.
- Gardner formation, Mississippian, Utah: Clark, D. L., 1.
- Garren group, Tertiary, Texas: Hay-Roe, H.
- Gasport dolomite, Silurian, Ontario: Sturgeon, E. S.
- Geddes limestone, Cambrian, Nevada: Nolan, T. B.
- Gene Autry shale, Pennsylvanian, Oklahoma, new: Elias, M. K., 1.
- Ghost River formation, Cambrian, Alberta: DeWit, R., 1, 2.
- Gilmore City formation, Mississippian, Iowa: Thomas, L. A.
- Glorieta sandstone, Permian, Colorado: Shaw, G. L., 1.
- Goddard formation, Mississippian, Oklahoma: Westheimer, J. M., 2.
- Oklahoma, new members: Elias, M. K., 1.

## Geologic formations—Continued

- Goliad formation, Miocene, Texas: Wilson, J. A.
- Goodwin limestone, Ordovician, Nevada: Nolan, T. B.
- Goose Egg formation, Permian-Triassic, Wyoming: Burk, C. A.
- Green River formation, Eocene, Colorado: Cashion, W. B., Jr.
- Utah: Ray, R. G., 4.
- Greenbrier series, Mississippian, West Virginia: Flowers, R. R.
- Grosmont formation, Devonian, Alberta: Belyea, H. R., 2.
- Guilmette formation, Devonian, Utah: Petersen, M. S.
- Gunflint formation, Precambrian, Ontario: Goodwin, A. M.
- Gypsum Spring formation, Jurassic, South Dakota-Wyoming: Mappel, W. J.
- Williston basin: Francis, D. R.
- Hale formation, Pennsylvanian, Arkansas: Scougale, D.
- Hallett formation, Pennsylvanian, Oklahoma, new: Branson, C. C., 4.
- Hammett shale of Trinity group, Cretaceous, Texas, new: Lozo, F. E.
- Harebell formation, Cretaceous, Wyoming: Love, J. D., 1, 4.
- Hartshorne formation, Mississippian, Oklahoma, units: Branson, C. C., 3.
- Hawthorn formation, Miocene, Florida: Bergendahl, M. H.; Pirkle, E. C., Jr., 2.
- Heath formation, Mississippian, Montana: Mundt, P. A., 3.
- Helderbergian series, Devonian, New York: Rickard, L. V.
- Heppsie andesite, Miocene(?), Oregon: Wells, F. G., 1.
- Hidden Falls member of Platteville formation, Ordovician, Minnesota: Sloan, R. E.
- Hilltop formation, Pennsylvanian, Oklahoma, new: Tanner, W. F., Jr., 2.
- Hoback formation, Paleocene-Eocene, Wyoming: Dorr, J. A., Jr., 1.
- Hogeye tuff, Tertiary, Texas: Hay-Roe, H.
- Holloway Prairie formation, Pleistocene, Gulf Coastal Plain: Doering, J. A.
- Hornbrook formation, Cretaceous, California-Oregon: Peck, D. L.
- Humbog formation, Mississippian, Utah: Livingston, V. E., Jr.
- Hunter Mtn. quartz monzonite, Cretaceous(?), California, new: McAllister, J. F.
- Idaho Springs formation, Precambrian, Colorado: Harrison, J. E.

## Geologic formations—Continued

- Interlake group, Silurian, Manitoba, new formations: Stearn, C. W., 2.
- Jackfork group, Carboniferous, Oklahoma: Cline, L. M., 1.
- Pennsylvanian (?), Oklahoma: Cline, L. M., 2.
- Jackson group, Eocene, Georgia: Connell, J. F. L.
- Jacksonian sediments, Eocene, Gulf Coastal Plain: Sun, M.-S.
- Janesville shale, Permian, United States, midcontinent: Moore, R. C., 2.
- Joana limestone, Mississippian, Nevada: Nolan, T. B.
- Johns Valley shale, Carboniferous, Oklahoma: Cline, L. M., 1.
- Kingsport limestone, Ordovician, Tennessee: Bridge, J.
- Kingston Range monzonite porphyry, Cretaceous-Tertiary, California: Hewett, D. F., 1.
- Knox group, Cambrian-Ordovician, Tennessee: Bridge, J.
- Kosciusko formation, Eocene, Mississippi: Vestal, F. E.
- Krebs subgroup, Pennsylvanian, Kansas: Howe, W. B.
- Kukpowruk formation, Cretaceous, Alaska, new: Sable, E. G.
- La Caja formation, Jurassic, Mexico: Rogers, C. L.
- Lafayette formation, age (?), origin (?), United States, southeastern: Harper, R. M.
- Lake Idaho formation, Pliocene, Idaho: Stearns, H. T., 5.
- Lake Valley formation, Mississippian, New Mexico, members: Kottlowski, F. E., 1.
- Laketown dolomite, Silurian, United States, Great Basin: McFarlane, J. J.
- Lauzon formation, Cambrian, Quebec: Osborne, F. F., 3.
- Laverne formation, Tertiary, Kansas-Oklahoma: Schoff, S. L.
- Lazy Bend formation, Pennsylvanian, Texas: Russell, W. E.
- Le Moyan formation, Recent, Louisiana, new members: Jones, P. H., 2.
- Levis formation, Ordovician, Quebec: Osborne, F. F., 3.
- Little Butte volcanic series, Oligocene (?), Oregon: Wells, F. G., 1.
- Lodgepole formation, Mississippian, Manitoba, members: Atkinson, R. F.; Stanton, M. S.
- Long Spring formation, Pliocene-Pleistocene (?), Idaho-Wyoming: Merritt, Z. S.
- Longview dolomite, Ordovician, Tennessee: Bridge, J.
- Love Ranch formation, Cretaceous, New Mexico: Kottlowski, F. E., 1.

## Geologic formations—Continued

- Loyalhanna limestone, Mississippian, West Virginia: Flowers, R. R.
- Lukfata sandstone, Cambrian (?), Oklahoma, new: Pitt, W. D.
- Lykins formation, Permian-Triassic, Colorado: Broin, T. L.
- Lynchburg formation, Precambrian, Virginia: Gooch, E. O.
- Lyre formation, Eocene, Washington, redefined: Brown, R. D., Jr.
- McCombs limestone member of Bell Canyon formation, Permian, Texas: King, P. B.
- Madison group, Mississippian, Montana-Wyoming: Andrichuk, J. M., 2.
- Wyoming: Strickland, J. W., 1.
- Madison limestone, Mississippian, Saskatchewan, units: Fuller, J. G. C. M., 1; Saskatchewan Geol. Soc. Mississippian Names and Correlations Comm.
- Manitoba group, Devonian, Williston basin, new: Baillie, A. D., 1.
- Martin limestone, Devonian, Arizona: Gilluly, J.
- Mascot dolomite, Ordovician, Tennessee: Bridge, J.
- Maury formation, Devonian (?) - Mississippian, Tennessee: Hass, W. H., 1.
- Maynardville limestone member of Nolichucky shale, Cambrian, Tennessee: Bridge, J.
- Mazapil conglomerate, Tertiary, Mexico, new: Rogers, C. L.
- Mazourka formation, Ordovician, California: Langenheim, R. L., Jr., 1.
- Meade formation, Pleistocene, Kansas: Hibbard, C. W., 1.
- Meadow Lake beds, Devonian, Saskatchewan: Van Hees, H.
- Means trachyte, Tertiary, Texas: Hay-Roe, H.
- Metapán beds, age (?), El Salvador: Dürr, F., 2.
- Methy formation, Devonian, Alberta: Greiner, H. R.
- Miahuatepec formation, Cretaceous, Mexico, new: Calderón García, A., 1.
- Middlegate formation, Pliocene, Nevada, new: Axelrod, D. I.
- Milk River formation, Cretaceous, Alberta: Tovell, W. M.
- Mississagi formations, Precambrian, Ontario: Joubin, F. R., 2.
- Monarch Mill formation, Pliocene, Nevada, new: Axelrod, D. I.
- Monte Cristo limestone, Mississippian, California-Nevada: Ross, W. A.
- Moon trachyte, Tertiary, Texas: Hay-Roe, H.
- Morgan Ranch formation, Pliocene, Nevada, new: Axelrod, D. I.

## Geologic formations—Continued

- Morrison formation, Jurassic, Colorado Plateau: Dodd, P. H.  
 New Mexico: Freeman, V. L.  
 Williston basin: Francis D. R.  
 Mosheim member of Lenoir limestone, Ordovician, Tennessee: Bridge, J.  
 Mt. Olympus granite, Colorado: Boos, M. F.  
 Muav limestone, Cambrian, Arizona, members: Wood, W. H.  
 Naco group, Pennsylvanian-Permian, Arizona: Gilluly, J.  
 Nanushuk group, Cretaceous, Alaska, new and redefined: Gryc, G., 1.  
 Naples group, Devonian, New York: Kuenen, P. H., 3.  
 Nevada formation, Devonian, Nevada, new members: Nolan, T. B.  
 New Albany formation, Mississippian, Illinois: Workman, L. E.  
 New York City group, Paleozoic(?), New York: Prucha, J. J., 3.  
 Newark Canyon formation, Cretaceous, Nevada, new: Nolan, T. B.  
 Ninemile formation, Ordovician, Nevada, new: Nolan, T. B.  
 Nodosaria sands, Oligocene, Louisiana: Grigg, R. P., Jr.  
 Nutwood member of Maple Mill formation, Mississippian, Illinois, new: Workman, L. E.  
 Oakville formation, Miocene, Texas: Wilson, J. A.  
 Oberlin formation, Pleistocene, Gulf Coastal Plain: Doering, J. A.  
 Ogallala formation, Miocene-Pliocene, Kansas, members: Frye, J. C., 1.  
 Ohio shale, Devonian, Appalachian basin, members: Pepper, J. F., 1.  
 Old Gregory formation, Miocene, Nevada, new: Axelrod, D. I.  
 Onaga shale, Permian, United States, midcontinent: Moore, R. C., 2.  
 Ono formation, Cretaceous, California: Murphy, M. A.  
 Onondaga limestone, Devonian, New York, new members: Oliver, W. A., Jr., 3.  
 Organ Rock tongue of Cutler formation, Permian, Utah: Sears, J. D.  
 Osceola mudflow, Recent, Washington: Crandell, D. R.  
 Otatera formation, Jurassic, Mexico, new: Erben, H. K., 1.  
 Oumalik formation, Cretaceous, Alaska: Gryc, G., 1.  
 Pahrum series, Precambrian, California-Nevada: Hewett, D. F., 1.  
 Pakowki formation, Cretaceous, Alberta: Tovell, W. M.  
 Palliser limestone, Devonian, Alberta: Beales, F. W., 1.  
 Palouse soil, Pleistocene, Idaho-Washington: Carmichael, V. W.

## Geologic formations—Continued

- Paltotecoya formation, Jurassic, Mexico, new: Erben, H. K., 2.  
 Pantera trachyte, Tertiary, Texas: Hay-Roe, H.  
 Panther Seep formation, Pennsylvanian, New Mexico: Kottlowski, F. E., 4.  
 Park City formation, Permian, United States, western: McKelvey, V. E., 5.  
 Paskapoo formation, Paleocene, Alberta: Tozer, E. T., 2.  
 Pass Creek sandstone, Pennsylvanian-Permian(?), Colorado: Bolyard, D. W.  
 Pass Peak formation, Eocene(?), Wyoming: Dorr, J. A., Jr., 1.  
 Payette group, Miocene, Idaho: Stearns, H. T., 4.  
 Petalcingo limestone, Cretaceous, Mexico: Erben, H. K., 1.  
 Phosphoria formation, Permian, Idaho-Montana-Utah: Swanson, R. W.  
 United States, western, members: McKelvey, V. E., 5.  
 Western, phosphorites: McKelvey, V. E., 3.  
 Wyoming: Sheldon, R. P., 1.  
 Pico formation, Pliocene, California: Poland, J. F., 1.  
 Pillsbury shale, Pennsylvanian, United States, midcontinent: Moore, R. C., 2.  
 Pilot shale, Devonian-Mississippian, Nevada: Nolan, T. B.  
 Pinal schist, Precambrian, Arizona: Gilluly, J.  
 Pinyon Peak limestone, Devonian, Utah: Petersen, M. S.  
 Pioche shale, Cambrian, Nevada: Nolan, T. B.  
 Piper formation, Jurassic, Montana, members: Rayl, R. L.  
 Williston basin: Francis, D. R.  
 Pitchfork formation, Eocene, Wyoming: Hay, R. L.  
 Platteville formation, Ordovician, upper Mississippi Valley: Agnew, A. F., 3.  
 Pogonip group, Ordovician, Nevada: Nolan, T. B.  
 Pottsville formation, Pennsylvanian, Pennsylvania, new members: Wood, G. H., Jr., 2.  
 Pottsville series, Pennsylvanian, Ohio: Lamborn, R. E.  
 Prairie du Chien formation, Ordovician, upper Mississippi Valley, members: Heller, R. L.  
 Puebla group, Cretaceous, Mexico: Erben, H. K., 1.  
 Qu'Appelle group, Devonian, Williston basin, new: Baillie, A. D., 1.  
 Quebec City formation, Ordovician, Quebec: Osborne, F. F., 3.

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- Ralston formation, Jurassic, Colorado : Frederickson, E. A., 2.
- Ravenscrag formation, Paleocene, Saskatchewan : Kupsch, W. O., 1.
- Rector formation, Cretaceous, California : Murphy, M. A.
- Reelsville limestone, Mississippian, Indiana : Gray, H. H., 1.
- Rhoda Creek formation, Pennsylvanian, Oklahoma, new : Elias, M. K., 1.
- Rierdon formation, Jurassic, Williston basin : Francis, D. R.
- Rocky Mtn. formation, Pennsylvanian-Permian (?), Alberta, members : Warren, P. S., 3.
- Root shale, Pennsylvanian, United States, midcontinent : Moore, R. C., 2.
- Rosario formation, Jurassic, Mexico, new : Erben, H. K., 1.
- Sacajawea formation, Mississippian, Wyoming : Strickland, J. W., 1.
- Sangre de Cristo formation, Pennsylvanian, Colorado : Shaw, G. L., 1.
- San Juan Raya formation, Cretaceous, Mexico : Calderón García, A., 1.
- San Pedro formation, Pleistocene, California : Poland, J. F., 1.
- San Rafael group, Jurassic, Utah : Sears, J. D.
- Sappington formation, Mississippian, Montana - Wyoming : Strickland, J. W., 1.
- Sarten formation, Cretaceous, New Mexico : Kottlowski, F. E., 1.
- Saskatchewan group, Devonian, Williston basin, new : Baillie, A. D., 1.
- Scranton shale, Pennsylvanian, United States, midcontinent : Moore, R. C., 2.
- Secret Canyon shale, Cambrian, Nevada, new members : Nolan, T. B.
- Sevy dolomite, Devonian, Utah : Petersen, M. S.
- Sharon Springs member of Pierre shale, Cretaceous, United States, Great Plains : Tourtelot, H. A.
- Shedhorn sandstone, Permian, United States, western : McKelvey, V. E., 5.
- Shinarump conglomerate, Triassic, Colorado : Holyoak, D. M.  
Utah : Stewart, D. G.
- Shunda formation, Mississippian, Alberta : Stearn, C. W., 3.
- Sicily Island formation, Recent, Louisiana : Doering, J. A.
- Simon formation, Jurassic, Mexico, new : Erben, H. K., 1.
- Simonson dolomite, Devonian, Utah : Petersen, M. S.
- Simpson group, Ordovician, Oklahoma : Disney, R. W.
- Spotted Ridge formation, Pennsylvanian, Oregon : Mamay, S. H.

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- Starrs Cave formation, Mississippian, Illinois, new : Workman, L. E.
- Stettler formation, Devonian, Alberta : Wonfor, J. S.
- Stoddart formation, upper Paleozoic, British Columbia, new : Rutgers, A. T. C.
- Stones River group, Ordovician, Pennsylvania, discredited : Prouty, C. E.
- Stonewall formation, Ordovician, Manitoba : Stearn, C. W., 2.
- Stotler limestone, Pennsylvanian, United States, midcontinent : Moore, R. C., 2.
- Sundance formation, Jurassic, Williston basin : Francis, D. R.
- Swift formation, Jurassic, Williston basin : Francis, D. R.
- Syracuse formation, Silurian, New York : Leutze, W. P., 2.
- Taberna formation, Jurassic, Mexico, new : Erben, H. K., 1.
- Tallahatta formation, Eocene, Mississippi : Vestal, F. E.
- Tamabra limestone, Cretaceous, Mexico : Barnetche, A.
- Tatman formation, Eocene, Wyoming : Hay, R. L.
- Teewinot formation, Pliocene, Idaho - Wyoming : Merritt, Z. S.  
Wyoming : Love, J. D., 1, 4.
- Tehuitzingo formation, Cretaceous, Mexico, new : Calderón García, A., 2.
- Temple Mtn. member of Chinle formation, Triassic, Utah : Robeck, R. C.
- Tensleep sandstone, Pennsylvanian, Wyoming-Montana : Zapp, A. D.
- Tepee Trail formation, Eocene, Wyoming : Keefer, W. R., 2.
- Tepexic calcarenite, Jurassic, Mexico, new : Erben, H. K., 2.
- Tesnus formation, Pennsylvanian, Texas : Fan, P. H.-T.
- Teutonia quartz monzonite, Cretaceous-Tertiary, California : Hewett, D. F., 1.
- Tiglukpak formation, Jurassic, Alaska, new : Gryc, G., 1.
- Todilto limestone, Jurassic, New Mexico-Colorado : Gabelman, J. W., 1.
- Topagoruk formation, Cretaceous, Alaska : Gryc, G., 1.
- Toreva formation, Cretaceous, Arizona, new : Repenning, C. A.
- Torok formation, Cretaceous, Alaska, redefined : Gryc, G., 1.
- Travis Peak formation, Cretaceous, Texas, revision : Lozo, F. E.
- Trekant series, Precambrian, Greenland : Peacock, J. D., 1.



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- Trinity group, Cretaceous, Gulf Coastal Plain: Forgotson, J. M., Jr.
- Troublesome Creek sandstone member of Jelm formation, Triassic, Wyoming, new: Hubbell, R. G.
- Trout Lake limestone, Precambrian, Saskatchewan: Blake, D. A. W., 2.
- Tyler formation, Mississippian, Montana: Mundt, P. A., 2, 3.
- Uinta formation, Eocene, Utah: Ray, R. G., 4.
- Uluksan group, Precambrian-Cambrian, Baffin Island, new: Blackadar, R. G., 1.
- Vamoosa formation, Pennsylvanian, Oklahoma, new members: Tanner, W. F., Jr., 1.
- Victoria quartzite, Devonian, Utah: Petersen, M. S.
- Viking formation, Cretaceous, Saskatchewan: Magdich, F. S.
- Wagonwheel formation, Oligocene, California: Smith, H. P.
- Watrous formation, Triassic(?), Saskatchewan: Cumming, A. D.
- Wepo formation, Cretaceous, Arizona, new: Repenning, C. A.
- West Falls formation, Devonian, New York: Pepper, J. F., 2.
- White Limestone formation, Tertiary, Jamaica: Hose, H. R.
- Whitemud formation, Cretaceous, Saskatchewan: Kupsch, W. O., 1.
- Wiggins formation, Oligocene, Wyoming: Keefer, W. R., 2.
- Wilcox group, Eocene, Texas, southern: Fox, H. B.
- Willow Creek formation, Cretaceous-Paleocene, Alberta: Tozer, E. T., 2.
- Willwood formation, Eocene, Wyoming: Hay, R. L.
- Wind River formation, Eocene, Wyoming: Hay, R. L.; Keefer, W. R., 2.
- Windfall formation, Cambrian, Nevada, new members: Nolan, T. B.
- Wood Siding formation, Pennsylvanian, United States, midcontinent: Moore, R. C., 2.
- Yale Point sandstone, Cretaceous, Arizona, new: Repenning, C. A.
- Yellow Limestone formation, Tertiary, Jamaica: Hose, H. R.
- Yeso formation, Permian, Colorado: Shaw, G. L., 1.
- Yucufuti formation, Jurassic, Mexico, new: Erben, H. K., 1.
- Zeandale limestone, Pennsylvanian, United States, midcontinent: Moore, R. C., 2.
- Zebra series, Precambrian, Greenland: Peacock, J. D., 1.
- Zilpha formation, Eocene, Mississippi: Vestal, F. E.

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- Zopilote breccia, Tertiary, Texas: Hay-Roe, H.
- Zorillo formation, Jurassic, Mexico, new: Erben, H. K., 1.
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- Alaska, Matanuska Valley, Big Delta, and Fairbanks areas, measured sections: Stump, R. W., 1.
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- Shaktolik River area, Cretaceous, cross sections: Patton, W. W., Jr.
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- Alberta, Alberta group, Upper Cretaceous, Rocky Mtn. foothills: Stott, D. F., 2.
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- Banff-Jasper area, Cambrian-Devonian: DeWit, R., 1.
- Belly River formation, Cretaceous: Williams, G. K.
- Bighorn formation, Cretaceous, central foothills: Stott, D. F., 3.
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- Canmore coal basin, Bow Valley area: Crockford, M. B. B.
- Cheviot formation, Devonian, Nordegg area: Fox, F. G., 3.
- Fairholme group, Devonian, Bow Valley and adjacent areas: Belyea, H. R., 1.
- Flume-Alexo formations, Devonian, Nordegg area: Fox, F. G., 3.
- George Creek area, cross sections: Douglas, R. J. W., 2.
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- Loon Lake area, Devonian: Belyea, H. R., 2.
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- Pennsylvanian-Permian (?), Panther River: Fox, F. G., 4.
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- Shunda formation, Mississippian, type section: Stearn, C. W., 3.
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- Black Mesa: Kiersch, G. A.
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- Carrizo Mts. area: Strobell, J. D., Jr.
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- Christmas mine, cross sections, Cambrian - Quaternary: Peterson, N. P.
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- Mineral Hill area, section: Heinrichs, W. E., Jr.
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- Drew County, Paleocene-Recent, aquifers: Onellion, F. E., 1.

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- Ordovician-Pennsylvanian: Kans. Geol. Soc., 2.
- Stephens oil field, Cretaceous: Meadows<sup>b</sup>, P.
- Atlantic coast, upland erosion surfaces, geomorphic correlation: Adams, G. F.
- Black Hills area, Morrison formation, Jurassic: Tank, R. W.
- British Columbia, Vancouver area, Pleistocene-Recent: Armstrong, J. E., 1, 3.
- California, central coast ranges, Jurassic-Quaternary, correlation chart: VanderHoof, V. L.
- Chino Hills area, San Bernardino County: Gaede, V. F.
- Cretaceous, correlation: Peck, D. L.
- Devils Den district, Tertiary: Smith, H. P.
- Edison oil field areas, producing zones, cross sections: White, James L.
- Hayward quadrangle, Jurassic (?) - Quaternary, cross sections: Robinson, G. D.
- Hornbrook formation, Cretaceous, Hornbrook area: Peck, D. L.
- Ivanpah quadrangle, Precambrian-Quaternary: Hewett, D. F., 1.
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- Ono area, Lower Cretaceous: Murphy, M. A.
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- Santa Margarita River watershed, Triassic-Quaternary, aquifers: Calif. Dept. Public Works Div. Water Res., 5.
- Ubehebe Peak quadrangle, cross sections: McAllister, J. F.
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- Garcia and Model domes, Pennsylvanian - Cretaceous: Clair, J. R., 1.
- Gulnare - Cuchara Pass - Stonewall area: Wood, G. H., Jr., 1.
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- Raton basin, Cretaceous-Tertiary: Johnson, Ross B.
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- Sangre de Cristo Range, northern, Paleozoic: Litsey, L. R.
- San Juan region: Larsen, E. S., Jr., 2.
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- Southeastern, correlation chart: Rocky Mtn. Assoc. Geologists.
- Southwestern, Jurassic: Craig, L. C.
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- Tennessee Pass area: Tweto, O. L.
- Trinidad-Aguilar areas, Cretaceous-Quaternary: Harbour, R. L.
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- Cross sections: Hunt, C. B., 1.
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- Hawthorn and Alachua formations, Miocene-Pleistocene, Alachua County: Pirkle, E. C., Jr., 2.
- Highlands County, Tertiary-Quaternary: Bishop, E. W.
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- Dronning Louise Land, Precambrian: Peacock, J. D., 1.
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- Tertiary correlation chart, generalized: Troutman, A., 3.
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- Preston quadrangle, Paleozoic and Cenozoic: Coulter, H. W., 2.
- Sublett Range, Pennsylvanian-Permian: Youngquist, W. L., 1.
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- East St. Louis area: Bergstrom, R. E., 2.
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- Southwestern, Pennsylvanian, correlation, plants: Shutts, C. F.
- Vanderburgh County, Pennsylvanian and Quaternary: Friedman, S. A., 2.
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- Jamaica, Tertiary limestone succession: Hose, H. R.
- Kansas, Comanche County, to Baca County, Colorado: King, W. R., Jr., 2.
- Eastern, Ordovician: Merriam, D. F., 4.
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- Northern, Ogallala formation, Tertiary: Frye, J. C., 1.
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- Rawlins County, Cretaceous-Quaternary: Walters, K. L.
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- Kentucky, eastern, Chester group, Mississippian, cross sections: McFarlan, A. C.
- Green County, Paleozoic: Jillson, W. R., 4.
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- Hopkinsville quadrangle, Mississippian: Walker, E. H., 1.
- Jefferson County, Ordovician-Mississippian, Quaternary: MacCary, L. M.
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- Cretaceous, correlation: Hughes, W.
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- Northwest Sumatra oil field, Carboniferous: Foster, D. I.
- Carboniferous, correlation: Mundt, P. A., 3.
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- Richland County, Cretaceous-Pleistocene: Sahinen, U. M., 1.
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- Yellowstone River valley, lower, Cretaceous-Quaternary aquifers: Torrey, A. E.
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Concepción del Oro district, Zacatecas, Jurassic-Recent: Rogers, C. L.  
Northeastern, Jurassic-Cretaceous: Humphrey, W. E., 1.  
Oaxaca, Oaxaca, to México, D. F.: López Rubio, J. M.  
Parral, Chihuahua, to Monterrey, Nuevo León: Cserna, Z. de, 1.  
San Juan Raya region, Puebla: Calderón García, A., 1.  
Sierra Madre Oriental, Torreon to Monterrey: Cserna, Z. de, 2.  
Tuxtla Gutiérrez, Chiapas, to Oaxaca, Oaxaca: Olivás Ramírez, M.  
Zimapán mining district, Hidalgo, Jurassic-Recent: Simons, F. S.
- Mississippi, Panola County, Tertiary-Quaternary: Vestal, F. E.
- Mississippi embayment, upper, Cretaceous-Eocene deposition cycle: Stearns, R. G.
- Montana, central, tectonic: Staggs, J. O., 1.  
Georgetown thrust area: Poulter, G. J.  
Townsend Valley: Lorenz, H. W.
- Mountain-building theory: Spieker, E. M.
- Nebraska, geomorphology and sedimentation, Tertiary: Lugin, A. L.
- Nevada, Cenozoic: Van Houten, F. B., 2.  
Fallon-Stillwater area, structural: Slemmons, D. B.  
Ivanpah quadrangle: Hewett, D. F., 1.  
Sierra Nevada, Cenozoic: Hinds, N. E. A.
- New England, Connecticut Valley area, Triassic-Pleistocene: Burke, M.
- New Hampshire: Billings, M. P.
- New Jersey, Franklin-Sterling area, Precambrian-post-Cambrian: Hague, J. M.
- New Mexico, Central basin platform: Mason, M. L., Jr.  
Manzano Mts., southern: Stark, J. T., 1.  
Matador arch: Schmitt, G. T.  
Questa molybdenum mine area: Schilling, J. H., 1.  
Raton basin, Cretaceous-Tertiary: Johnson, Ross B.  
Late Paleozoic: Shaw, G. L., 2.
- New York, Loon Lake quadrangle, Precambrian, Quaternary: Postel, A. W., 2.
- North Carolina, Spruce Pine district, Precambrian-Triassic, metamorphism: Kulp, J. L., 4.
- North Dakota: Hainer, J. L.  
Hettinger area, Cretaceous-Quaternary: Robinove, C. J.

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- North Dakota—Continued  
 Northeastern : Laird, W. M., 1.  
 Theodore Roosevelt Park, north unit :  
 Laird, W. M., 2.
- Northwest Territories, Baffin Island,  
 southernmost, Pleistocene :  
 Mercer, J. H., 2.
- Oklahoma, Beaver County, Mississippian  
 and Pennsylvanian : Barby, B.  
 G.
- Mannsville-Madill-Aylesworth anti-  
 cline : Godfrey, J. M.
- Ramsey oil pool, structural : Umpleby,  
 S. S.
- Ontario, Cochrane area, late Pleistocene  
 chronology : Karlstrom, T. N.  
 V., 1.
- Pacific Ocean, Mid-Pacific Mts. guyots :  
 Hamilton, E. L., 1.
- Popular and elementary : Irving, R.
- Quebec, Quebec area, Cambrian-Ordovi-  
 cian : Osborne, F. F., 3.
- Quebec area, evolution of interpreta-  
 tion : Osborne, F. F., 4.
- South Dakota, Black Hills : Gries, J. P.
- Texas, Central basin platform : Mason,  
 M. L., Jr.
- Fort Worth basin : Weaver, O. D., Jr.  
 Matador arch : Schmitt, G. T.
- Palo Duro basin : Nicholson, J. H., 1.
- Time boundaries, nonexistence : Spieker,  
 E. M.
- Time scale, nature : Spieker, E. M.
- United States, eastern, peneplains, res-  
 urrected : Sharp, H. S., 1.
- Great Basin, eastern, lower and mid-  
 dle Paleozoic : McFarlane, J. J.
- Great Plains, Pliocene-Pleistocene,  
 ecological interpretations :  
 Frye, J. C., 2.
- Lake Michigan basin, late Wisconsin  
 chronology : Zumberge, J. H.,  
 3.
- Uinta Mts. region, Cretaceous-  
 Miocene : Ritzma, H. R.
- Utah, Boulter Mts. area : Dearden,  
 M. O.
- Dry Mtn. area : Demars, L. C.
- North Canyon area, Wasatch Mts. :  
 Smith, C. V.
- Onaqui Mts., northern : Croft, M. G.
- Promontory Range : Olson, R. H.
- Raft River Range, eastern : Felix,  
 C. E.
- West Canyon area : McFarland, C. R.
- Virgin Islands, British : Martin-Kaye,  
 P. H. A., 1.
- Washington, Columbia River basin,  
 Miocene - Pleistocene : Camp-  
 bell, C. D., 1.
- Cowlitz River-Willapa Hills area,  
 Eocene-Miocene : Henriksen,  
 D. A.
- West Indies : Butterlin, J. A.
- Jurassic-Recent : Beckmann, J. P.
- West Virginia, Ohio River valley : Cross,  
 A. T., 1.

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- Williston basin, cf. other oil-producing  
 basins : Sloss, L. L.
- Wyoming, Black Hills : Gries, J. P.
- Gros Ventre Buttes : Scopel, L. J.
- Hoback basin, post-Cretaceous : Dorr,  
 J. A., Jr., 1.
- Northern, Pennsylvanian-Permian-  
 Triassic sequence, new inter-  
 pretation : Munyan, A. C.
- Northwestern, and adjoining areas,  
 Devonian : Andrichuk, J. M.,  
 1.
- Owl Creek Mts. : Masursky, H., 2.
- Pre-Niobrara formations, Cambrian-  
 Cretaceous : Wyo. Geol. Assoc.  
 Nomenclature Comm.
- Teton County, Cretaceous-Quater-  
 nary : Love, J. D., 2.
- Geologic mapping. *See also* Cartography ;  
 Technique, *Mapping*.
- Aerial radioactivity surveys : Kellogg,  
 W. C.
- Aeromagnetic, reconnaissance-detail pro-  
 gram : Hinrichs, F. W.
- Field and mine, abbreviations, lists :  
 Chace, F. M.
- Northwest Territories, use of helicop-  
 ters : Wright, G. M.
- Photogeologic, color photographs : Lay-  
 lander, P. A.
- Photogeologic procedures : Ray, R. G.,  
 3.
- Geologic maps. *See also* subheading *Geo-  
 logic maps* under the various  
 states and countries.
- Alabama, Wilcox County : LaMoreaux,  
 P. E.
- Alaska, Adak Island, northern : Coats,  
 R. R., 2.
- Aleutian Islands, western, reconnais-  
 sance : Coats, R. R., 4.
- Hyder district : Byers, F. M., Jr.
- Index : Cobb, E. H.
- Kanaga Island, northern : Coats,  
 R. R., 3.
- Kenai area, diatomaceous earth de-  
 posits : Plafker, G., 1.
- Knik Arm area : Moxham, R. M.
- Pribilof Islands : Barth, T. F. W.
- Shaktolik River area, Cretaceous :  
 Patton, W. W., Jr.
- Tuxedni Bay, Triassic-Jurassic,  
 sketch : Grantz, A., 1.
- Wishbone Hill district, Matanuska  
 coal field : Barnes, F. F.
- Alberta, Beiseker area, surficial : Stal-  
 ker, A. M., 1.
- George Creek area : Douglas, R. J.  
 W., 2.
- Lake Athabasca region : Blake, D. A.  
 W., 2.
- Nordegg area : Douglas, R. J. W., 1.
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 Petroleum Geologists, 2.
- Appalachian basin, Bedford shale and  
 Berea sandstone, Mississip-  
 pian : Pepper, J. F., 1.

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- Arizona, Carrizo Mts. area: Strobell, J. D., Jr.  
 Central, asbestos region: Stewart, L. A.  
 Chuska Mts. area, generalized: Wright, H. E., Jr., 5.  
 Cochise County, west-central: Gilluly, J.  
 Coyote Mts., Pima County, sketch: Wargo, J. G.  
 Dinnehotso quadrangles: Witkind, I. J., 2-5.  
 Meteor Crater, sketch: Hager, D., 1.  
 Monument Valley, Permian-Jurassic: Witkind, I. J., 1.  
 Navajo country: Kiersch, G. A.  
 San Carlos Indian Reservation: Bromfield, C. S.  
 Silver Bell district, Pima County: Richard, K. E.  
 Sonsela Buttes area: Kiersch, G. A.  
 Arkansas, Drew County, Eocene-Recent, sketch: Onellion, F. E., 1.  
 Magnet Cove igneous area: Erickson, R. L.; Kans. Geol. Soc., 2.  
 British Columbia, generalized: Chapman, J. D.  
 Granduc area: Bacon, W. R., 1.  
 Pacific Nickel mines: Aho, A. E.  
 Vancouver area, surficial: Armstrong, J. E., 1.  
 California, Alleghany area: Carlson, D. W.  
 Alturas pumice area: Chesterman, C. W., 1.  
 Big Pine quadrangle: Bateman, P. C.  
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 Black Rock tungsten mine: Rinehart, C. D.  
 Blind Spring Valley—Yellowjacket Spring pumice area: Chesterman, C. W., 1.  
 Casa Diablo Mtn. quadrangle: Rinehart, C. D.  
 Coso pumice area: Chesterman, C. W., 1.  
 Devils Den district, Tertiary: Smith, H. P.  
 Flagstaff Hill area, sketch: Clark, W. B.  
 Hayward quadrangle: Robinson, G. D.  
 Hornbrook area, Triassic-Tertiary, sketch: Peck, D. L.  
 Huntington Lake area: Hamilton, W. B., 1.  
 Ivanpah quadrangle: Hewett, D. F., 1.  
 Last Chance Canyon area: Chesterman, C. W., 1.  
 Long Beach—Santa Ana area, coastal zone: Poland, J. F., 1.  
 Medicine Lake area: Chesterman, C. W., 1.  
 Mendocino County, ground-water basins: Calif. Dept. Public Works Div. Water Res., 4.

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- California—Continued  
 Mono Craters pumice area: Chesterman, C. W., 1.  
 Mt. Goddard quadrangle: Bateman, P. C.  
 Mt. Tom quadrangle: Bateman, P. C.  
 Napa pumice area: Chesterman, C. W., 1.  
 Northwestern ground-water basins: Olmsted, F. H.  
 Olancha uranium area: Davis, D. L.  
 Ono area, Lower Cretaceous: Murphy, M. A.  
 Pittsburg pumice area: Chesterman, C. W., 1.  
 Sacramento Valley, ground-water conditions: Calif. Dept. Public Works Div. Water Res., 2.  
 Sacramento—San Joaquin delta: Water Proj. Authority Calif.  
 San Francisco Bay, areal and engineering geology: Calif. Dept. Public Works Div. Water Res., 1.  
 San Gabriel Mts., western: Calif. Dept. Nat. Res. Div. Mines, 2.  
 Santa Margarita River watershed: Calif. Dept. Public Works Div. Water Res., 5.  
 Ubehebe Peak quadrangle: McAllister, J. F.  
 Ventura County: Calif. State Water Res. Bd.  
 West Shasta copper-zinc district: Kinkel, A. R., Jr., 2.  
 Canada, Maritime area, sketch: Cameron, H. L.  
 Colorado, Beulah area: Rocky Mtn. Assoc. Geologists.  
 Bonanza-Dragon oil-shale area: Cashion, W. B., Jr.  
 Canon City embayment: Frederickson, E. A., 2.  
 Denver basin, post-Laramie: Reichert, S. O.  
 Elkhorn thrust fault, South Park: Merwin, S. S.  
 Freeland-Lamartine district: Harrison, J. E.  
 Golden Gate Canyon area: Adams, J. W.  
 Gulnare—Cuchara Pass—Stonewall area: Wood, G. H., Jr., 1.  
 Huerfano Park: Briggs, L. I., Jr.  
 Placerville quadrangle, Permian-Quaternary: Bush, A. L., 2.  
 Powderhorn district, generalized: Wallace, S. R., 1.  
 Thorium deposits: Olson, J. C., 1.  
 Roc Creek quadrangle: Shoemaker, E. M., 3.  
 Sangre de Cristo Range, northern: Litsey, L. R.  
 San Juan region: Larsen, E. S., Jr., 2.  
 Tennessee Pass area: Tweto, O. L.  
 Trinidad—Aguilar areas: Harbour, R. L.

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- Colorado Plateau, Grand Wash trough :  
Hunt, C. B., 1.
- Morrison formation uranium deposits,  
structural relations: Dodd,  
P. H.
- Sinbad Valley—Fisher Valley salt  
plugs: Shoemaker, E. M., 2.
- Connecticut, pre-Triassic—T r i a s s i c :  
Rodgers, J., 5.
- Costa Rica: Quirós Amador, T.
- Cuba, Sierra de los Organos: Leh-  
mann, H.
- Dominican Republic: Guerra Peña, F.
- El Salvador, Apastepeque volcanic field,  
sketch: Meyer-Abich, H., 3.
- Camalapa River area: Weyl, R., 1.
- Florida, De Soto and Hardee Counties:  
Bergendahl, M. H.
- Georgia, east-central: LeGrand, H. E., 1.
- Fairmount area, Upper Cambrian:  
Stuart, A. W., 1.
- Highland, sketch: Furcron, A. S., 1.
- Greenland, Blyklippen mine area: Gross,  
W. H.
- Dronning Louise Land, sketch: Pea-  
cock, J. D., 1.
- Eastern, latitude 74°–78° N.: Haller,  
J., 2.
- Nunatakker region: Haller, J., 1.
- Peary Land, sketch: Troelsen, J. C., 1.
- Red Rock Creek area, sketch: Gregory,  
J. E.
- Sketch: Ignat'ev, G. M.; Troelsen,  
J. C., 2.
- Guam, reconnaissance: Cloud, P. E., Jr.,  
1.
- Gulf Coastal Plain, Quaternary: Doer-  
ing, J. A.
- Haiti, sketch: Beckmann, J. P.
- Idaho, Eagle Rock area: Stearns, H. T.,  
1.
- Goose Creek district: Mapel, W. J., 2.
- Johnson Creek quadrangle: Gulbrand-  
sen, R. A.
- Murray area: Hosterman, J. W.
- Nez Perce County: Hubbard, C. R., 2.
- Nutmeg Mtn. area: Ross, C. P., 2.
- Preston quadrangle, southeastern:  
Coulter, H. W., 2.
- Salmon quadrangle: Anderson, A. L.
- Twin Falls—Pocatello area: Cros-  
thwaite, E. G., 2.
- Illinois, Crawford and Lawrence Coun-  
ties, Pennsylvanian, paleogeo-  
logic: Potter, P. E., 1.
- East Dubuque quadrangle, areal:  
Bradbury, J. C.
- East St. Louis area, surficial: Berg-  
strom, R. E., 2.
- Kinderhook series, Mississippian, pale-  
ogeologic: Workman, L. E.
- Shelbyville area, Pleistocene: Hack-  
ett, J. E., 2.
- Jamaica, sketch: Beckmann, J. P.
- White Limestone areas: Sweeting,  
M. M.

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- Kansas, eastern, pre-Chattanooga,  
sketch: Merriam, D. F., 4.
- Rawlins County: Walters, K. L.
- Reno County: Bayne, C. K., 2.
- Salina basin area, pre-Chattanooga,  
areal: Lee, W.
- Pre-Pennsylvanian, areal: Lee, W.
- Sheridan County: Bayne, C. K., 1.
- Kentucky, Hopkinsville quadrangle,  
Mississippian: Walker, E. H.,  
1.
- Prestonsburg quadrangle: Price, Wil-  
liam E., Jr.
- Western fluorspar district: Warren,  
J. R.
- Lake Superior region, western: Thiel,  
E.
- Louisiana, southwestern: Jones, P. H.,  
2.
- Manitoba, Booster Lake area, Precam-  
brian: Davies, J. F., 1.
- Chippewyan Lake—Herb Lake area:  
Quinn, H. A., 3.
- Deloraine area, Cretaceous and Quat-  
ernary, surficial: Elson, J. A.
- Interlake area: Stearn, C. W., 2.
- Knee Lake area, Precambrian: Quinn,  
H. A., 1.
- MacBride Lake area: Kilburn, L. C.
- Pas—Grand Rapids area: Stearn, C.  
W., 2.
- Maryland, Allegany County, Ordovician-  
Pennsylvanian: Berryhill, H.  
L., Jr.
- Central, sketch: Hoy, R. B.
- Massachusetts, Bernardston quadrangle:  
Balk, R., 1.
- Colrain quadrangle: Segerstrom, K., 1.
- Hudson and Maynard quadrangles,  
bedrock and surficial: Hansen,  
W. R., 1.
- Millers Falls quadrangle: Balk, R., 3.
- Northfield quadrangle: Balk, R., 2.
- Shelburne Falls quadrangle: Seger-  
strom, K., 2.
- Williamsburg quadrangle: Willard,  
M. E., 1.
- Mexico: González Reyna, J., 5; Sán-  
chez Mejorada, S. H.
- Baja California, southern: Internat.  
Geol. Cong. Mexico, 5.
- Caborca area, Sonora, sketch: Arel-  
lano, A. R. V.
- Cananea mineral district, Sonora:  
Velasco, J. R.
- Chiapas: Internat. Geol. Cong. Mex-  
ico, 13.
- Ciudad Juárez, Chihuahua, to México,  
D. F.: Internat. Geol. Cong.  
Mexico, 2.
- Ciudad Juárez, Chihuahua, to Monter-  
rey, Nuevo León: Internat.  
Geol. Cong. Mexico, 8.
- Concepción del Oro district, Zaca-  
tecas: Rogers, C. L.

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- Guadalajara area, Jalisco: Carreño, A. de la O.
- Guanajuato district: Edwards, J. D.
- Lucifer manganese mine, Baja California: Wilson, I. F., 2.
- México, D. F., to Huauchinango, Puebla, and Huayacocotla, Veracruz: Internat. Geol. Cong. Mexico, 12.
- México, D. F., to Parícutin, Michoacán: Internat. Geol. Cong. Mexico, 10.
- México, D. F., to Taxco, Guerrero: Fries, C., Jr.
- México, D. F., to Tlaxiaco, Oaxaca: Internat. Geol. Cong. Mexico, 7.
- México, D. F., to Zimapán, Hidalgo: Internat. Geol. Cong. Mexico, 3.
- Michoacán, Tierra Caliente, Triassic (?)—Quaternary: Foshag, W. F., 1.
- Oaxaca, Oaxaca, to México, D. F.: López Rubio, J. M.
- Pachuca area, Hidalgo: Geyne, A. R.
- Parral area, Chihuahua: Lowther, G. K., 1.
- Puebla, southern: Internat. Geol. Cong. Mexico, 6.
- Reynosa, Tamaulipas, to México, D. F.: Internat. Geol. Cong. Mexico, 9.
- San Francisco del Oro and Santa Bárbara mining areas, Chihuahua: Koch, G. S., Jr., 1.
- San Juan Raya region, Puebla: Calderón García, A., 1.
- Santa Rosalía area, Baja California: Wilson, I. F., 1.
- Sierra Madre Oriental, Torreón to Monterrey: Cserna, Z. de, 2.
- Tampico-Misantla basin: Internat. Geol. Cong. Mexico, 15.
- Tampico-Tuxpan basin: Benavides García, L.
- Taxco district: Edwards, J. D.
- Tuxtla Gutiérrez, Chiapas, to México, D. F.: Internat. Geol. Cong. Mexico, 14.
- Veracruz basin: Benavides García, L.
- Zimapán mining district, Hidalgo: Simons, F. S.

Michigan, Chassell quadrangle: White, W. S., 1.

Development: Martin, H. M. M.

Flint River basin: Mich. Water Res. Comm.

Hancock quadrangle, Precambrian-Cambrian (?): Cornwall, H. R., 1.

Kiernan quadrangle: Gair, J. E.

Laurium quadrangle, Precambrian-Cambrian (?): Cornwall, H. R., 2.

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- Palmer area, Precambrian: Vickers, R. C., 1.
- South Range quadrangle, Precambrian-Cambrian (?): White, W. S., 2.
- Minnesota, Anoka sand plain, Pleistocene: Farnham, R. S.
- Duluth area, Precambrian outcrops: Goldich, S. S., 1; Taylor, R. B.
- Mesabi range, strip: Geol. Soc. America.
- Minnesota River valley, Franklin area, Precambrian: Lund, E. H.
- Granite Falls area, Precambrian: Lund, E. H.
- Randall area, sketch: Friends Pleistocene Midwest, 1.
- Southeastern: Minn. Univ. Dept. Geology.
- Vermilion range: Reid, I. L., 1.
- Mississippi, Benton County: Lusk, T. W.
- Panola County: Vestal, F. E.
- Mississippi Valley, upper Precambrian-Devonian: Geol. Soc. America.
- Montana, Big Sandy quadrangle: Lindvall, R. M., 2.
- Bitterroot Valley, eastern: McMurtrey, R. G.
- Boulder batholith region, sketch: Everhart, D. L., 2.
- Cartersville and Hathaway quadrangles: Smith, J. F., Jr.
- Central: Billings Geol. Soc.
- Carboniferous, paleogeologic: Mundt, P. A., 3.
- Fort Peck Indian Reservation area: Colton, R. B., 1.
- Georgetown thrust area: Poulter, G. J.
- Hardin bentonite district: Knechtel, M. M., 1.
- Igneous outcrops, Precambrian, Cretaceous-Tertiary: Vine, J. D., 4.
- Iron deposits, sketch: DeMunck, V. C., 2.
- Judith Mts., Alpine Gulch stock: Wallace, S. R., 2.
- Kenilworth quadrangle: Lindvall, R. M., 1.
- Mineral County: Wallace, R. E., 2.
- Musselshell-Golden Valley Counties: Zimmerman, E. A.
- Stanford-Hobson area: Vine, J. D., 3.
- Townsend Valley: Lorenz, H. W.
- Uraniferous lignite areas: Denson, N. M., 1.
- Yellowstone River valley, Glendive to Sidney: Torrey, A. E.



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- Nebraska, Niobrara River basin, upper: Bradley, E., 1.  
 Sioux County, southern: Bradley, E., 2.
- Nevada, Austin area, intrusive contact: Thurlow, E. E., 1.  
 Coal Valley area: Axelrod, D. I.  
 Desert Peak area: Axelrod, D. I.  
 Eureka area, Cambrian-Ordovician, sketch: Nolan, T. B.  
 Fallon-Stillwater area, sketch: Slemmons, D. B.  
 Gabbs magnesite and brucite deposits: Vitallano, C. J.  
 Ivanpah quadrangle: Hewett, D. F., 1.  
 Kings River area, Humboldt County: Sharp, B. J.  
 Middlegate area: Axelrod, D. I.  
 Red Mtn. area: Axelrod, D. I.  
 Silver Queen group, Tonopah mining district: Davis, D. L.  
 Virginia City quadrangle: Thompson, G. A.
- New Brunswick, Coldstream area: Anderson, F. D.  
 Moncton basin, Carboniferous: Alberta Soc. Petroleum Geologists, 1.  
 Tetagouche Lakes area: Skinner, R.
- New Hampshire, bedrock: Billings, M. P.
- New Jersey, Franklin-Sterling area: Hague, J. M.  
 Lightweight aggregate materials: Lodding, W.
- New Mexico, Ambrosia Lake area, surface: Young, R. G., 1.  
 Black Hawk district: Gillerman, E.  
 Bluewater area: U. S. Atomic Energy Comm., 4.  
 Capitan coal field: Bodine, M. W., Jr., 1.  
 Carrizo Mts. area: Strobell, J. D., Jr.  
 Chuska Mts. area, generalized: Wright, H. E., Jr., 5.  
 Gallup area: U. S. Atomic Energy Comm., 3.  
 Hillsboro Peak quadrangle: Kuellmer, F. J., 1.  
 La Ventana area, Cretaceous: Cannon, H. L., 2.  
 Luis Lopez manganese district, Cenozoic: Miesch, A. T.  
 Manzano Mts., southern: Stark, J. T., 1.  
 Mesa del Oro area: Jicha, H. L., Jr., 2.  
 Questa molybdenum mine area: Schilling, J. H., 1.  
 San Juan Basin, Cretaceous, sketch: Beaumont, E. C.  
 Todilto limestone, Jurassic: Gabelman, J. W., 1.  
 Southeastern, basement rocks, Precambrian: Flawn, P. T., 2.

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- New York, Balmat-Edwards district, Precambrian: Brown, J. S.  
 Brewster magnetite district, bedrock: Prucha, J. J., 1.  
 Chateaugay quadrangle, Precambrian-Ordovician: Nelson, A. E.  
 Eden quadrangle, Devonian: de Witt, W., Jr.  
 Hamburg quadrangle, Devonian: Colton, G. W.  
 Loon Lake quadrangle: Postel, A. W., 2.  
 Malone quadrangle, Precambrian-Ordovician: Postel, A. W., 1.  
 Poundridge area: Scotford, D. M.  
 West Point quadrangle, southwestern: Paige, S., 1.  
 Western and west-central, West Falls formation, Devonian: Pepper, J. F., 2.
- Newfoundland: Newfoundland Dept. Mines and Res. Mines Br.  
 Argentia area: McCartney, W. D.  
 Comfort Cove: Patrick, T. O. H.  
 Index: Baird, D. M., 1.  
 Oderin and adjacent islands, Placentia Bay: Williamson, D. H.  
 Tilt Cove area, sketch: Baird, D. M., 2.
- Nicaragua, sketch: Zoppis de Sena, R.
- North Carolina, Bakersville-Plumtree area: Kulp, J. L., 1.
- North Dakota: Hainer, J. L.; Hansen, M., 1.  
 Chalky Buttes area: Moore, G. W., 1.  
 Grassy Butte area: Meldahl, E. G.  
 Pipestem Creek area, Stutsman County: Kresl, R. J.  
 Southwestern, sketch: Bergstrom, J. R.  
 Uraniferous lignite areas: Denson, N. M., 1.
- Northwest Territories, Baffin Island, Admiralty Inlet: Blackadar, R. G., 1.  
 Courageous Lake area: Moore, J. C. G.  
 Hill Island Lake area, east half: Taylor, F. C.  
 West half: Mulligan, R.  
 Matthews Lake area: Moore, J. C. G.  
 Prince Patrick - Eglinton - Melville Islands: Tozer, E. T., 1.  
 Ross Lake-Redout Lake area: Hutchinson, R. W.
- Nova Scotia, Cape North, Cape Breton Island: Neale, E. R. W., 2.  
 Cape St. Lawrence, Cape Breton Island: Neale, E. R. W., 1.  
 Chêticamp River area: MacLaren, A. S., 2.  
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 Wood Buffalo River area, 356 : Canada G. S., 5.  
 Canada, index : Canada G. S., 4.  
 Maine, Berwick quadrangle : Bromery, R. W., 2.  
 New Hampshire, Alton quadrangle : Bromery, R. W., 1.  
 Berwick quadrangle : Bromery, R. W., 2.  
 Newfoundland, Corner Brook area, 272 : Canada G. S., 5.  
 Flat Bay area, 318 : Canada G. S., 5.  
 Harrys River area, 269 : Canada G. S., 5.  
 Howley Lake area, 249 : Canada G. S., 5.  
 Little Friars Cove area, 317 : Canada G. S., 5.  
 Little Grand Lake area, 271 : Canada G. S., 5.  
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 Puddle Pond area, 250 : Canada G. S., 5.  
 Rainy Lake area, 273 : Canada G. S., 5.  
 St. Fintans area, 316 : Canada G. S., 5.  
 Serpentine area, 275 : Canada G. S., 5.  
 Star Lake area, 270 : Canada G. S., 5.  
 Northwest Territories, Allen Lake area, 365 : Canada G. S., 5.  
 Anaunethad Lake area, 390 : Canada G. S., 5.  
 Andrecyk Lake area, 393 : Canada G. S., 5.  
 Arnot Lake area, 370 : Canada G. S., 5.  
 Atkinson Lake area, 387 : Canada G. S., 5.

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- Bertran Lake area, 381: Canada G. S., 5.  
 Bouskill Lake area, 375: Canada G. S., 5.  
 Broad Lake area, 399: Canada G. S., 5.  
 Brule Point area, 108: Canada G. S., 5.  
 Bull Lake area, 396: Canada G. S., 5.  
 Burslem Lake area, 379: Canada G. S., 5.  
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 Crawford Lake area, 374: Canada G. S., 5.  
 Crowe Lake area, 398: Canada G. S., 5.  
 Deering Island area, 359: Canada G. S., 5.  
 Dehoux Bay area, 362: Canada G. S., 5.  
 Deskenatlata Lake South area, 107: Canada G. S., 5.  
 Dolby Lake area, 369: Canada G. S., 5.  
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 Foster Lake area, 406: Canada G. S., 5.  
 Gozdz Lake area, 394: Canada G. S., 5.  
 Hinde Lake area, 368: Canada G. S., 5.  
 Innes Island area, 383: Canada G. S., 5.  
 Jarvis Lake area, 400: Canada G. S., 5.  
 Knowles Lake area, 401: Canada G. S., 5.  
 Landry Creek area, 106: Canada G. S., 5.  
 Lone Lake area, 364: Canada G. S., 5.  
 Meyrick Lake area, 361: Canada G. S., 5.  
 Millar Lake area, 391: Canada G. S., 5.  
 Mountain Lake area, 388: Canada G. S., 5.  
 Nicol Lake area, 371: Canada G. S., 5.  
 Nixon Lake area, 372: Canada G. S., 5.  
 Pointe Ennuyeuse area, 105: Canada G. S., 5.  
 Ridgers Lake area, 367: Canada G. S., 5.  
 Rutledge Lake area, 386: Canada G. S., 5.  
 Sammon Lake area, 404: Canada G. S., 5.  
 Sanderson Lake area, 397: Canada G. S., 5.

Maps (excluding Geologic maps)—Continued  
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## Northwest Territories—Continued

- Sherwood Lake area, 366: Canada G. S., 5.  
 Sinclair Lake area, 405: Canada G. S., 5.  
 Southby Lake area, 385: Canada G. S., 5.  
 Striding River area, 360: Canada G. S., 5.  
 Suggitt Lake area, 363: Canada G. S., 5.  
 Thomas Lake area, 377: Canada G. S., 5.  
 Turner Lake area, 376: Canada G. S., 5.  
 Veira Lake area, 392: Canada G. S., 5.  
 Vermette Lake area, 395: Canada G. S., 5.  
 Wignes Lake area, 378: Canada G. S., 5.  
 Wright Lake area, 384: Canada G. S., 5.  
 Ontario, Bingle area, 303: Canada G. S., 5.  
 Charlton area, 288: Canada G. S., 5.  
 Crawfish Lakes area, 301: Canada G. S., 5.  
 Dana Lake area, 292: Canada G. S., 5.  
 Elk Lake area, 283: Canada G. S., 5.  
 Gowganda area, 284: Canada G. S., 5.  
 Iroquois Falls area, 302: Canada G. S., 5.  
 Kamiskotia Lake area, 299: Canada G. S., 5.  
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 Lipsett Lake area, 294: Canada G. S., 5.  
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 Pamour area, 298: Canada G. S., 5.  
 Porquis Junction area, 297: Canada G. S., 5.  
 Radisson Lake area, 290: Canada G. S., 5.  
 Ramore area, 295: Canada G. S., 5.  
 Smoothwater Lake area, 281: Canada G. S., 5.  
 Solace Lake area, 278: Canada G. S., 5.  
 Thorburn Creek area, 300: Canada G. S., 5.  
 Timmins area, 293: Canada G. S., 5.  
 Saskatchewan, Beartooth Island area, 425: Canada G. S., 5.  
 Cantara Bay area, 423: Canada G. S., 5.

## Maps (excluding Geologic maps)—Continued

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## Saskatchewan—Continued

- Crackingstone area, 430: Canada G. S., 5.  
 Easter Head area, 426: Canada G. S., 5.  
 Forget Lake area, 432: Canada G. S., 5.  
 Goldfields area, 436: Canada G. S., 5.  
 Harper Lake area, 435: Canada G. S., 5.  
 Maurice Bay area, 431: Canada G. S., 5.  
 Thluicho Lake area, 434: Canada G. S., 5.  
 Uranium City area, 433: Canada G. S., 5.  
 William Point area, 424: Canada G. S., 5.

*Coal.*

- Colorado, Raton basin, areal: Carter, D. A.  
 Indiana, Clay County: Hutchison, H. C.  
 Gibson County: Friedman, S. A., 1.  
 Vanderburgh County: Friedman, S. A., 2.  
 New Mexico, Raton basin, areal: Carter, D. A.  
 Pennsylvania, Clarion County: Blaylock, D. W.  
 Tennessee, Bledsoe County: Williams, L., 2.  
 Campbell County: Williams, L., 3.  
 Claiborne County: Hershey, R. E., 2.  
 Fentress County: Lowe, R. W.  
 Hamilton County: Hershey, R. E., 3.  
 Morgan County: Williams, L., 4.  
 Scott County: Williams, L., 1.  
 Van Buren County: Hershey, R. E., 1.  
 West Virginia, Logan County: Tavenner, W. H.  
 Marion County: Provost, J. M.  
 Marshall County: Dowd, J. J.  
 Monongalia County: Travis, R. G.  
 Wyoming: Fisk, H. G.

*Geophysical.*

- Kansas, southeastern: Cook, K. L., 2.  
 Kentucky, western fluorspar district, magnetic anomalies in dikes: Warren, J. R.  
 Lake Superior region, western, gravity: Thiel, E.  
 Mexico, gravity anomalies: Woollard, G. P., 1.  
 Vizcaino basin, Baja California, Bouguer anomalies: Mina Uthman, F., 1.  
 Michigan, Kiernan quadrangle, magnetic: Gair, J. E.  
 Upper Peninsula, central: Frantti, G. E.  
 North Dakota, Tioga area, magnetic: Hansen, M., 2.  
 Ohio, gravity survey: Heiskanen, W. A., 1.  
 Oklahoma, northeastern: Cook, K. L., 2.

## Maps (excluding Geologic maps)—Continued

*Geophysical*—Continued

- Ontario, Ottawa area, gravity: Saxov, S.  
 Puerto Rico, Bouguer anomalies: Shurbet, G. L., 1.  
 Saskatchewan, northern, gravity: Sawatzky, H. B., 2.  
 Southern, gravity: Sawatzky, H. B., 3.  
 Seismic: Sawatzky, H. B., 1.  
 South Dakota and Wyoming, resistivity: Denson, M. E., Jr.  
 Texas, Block 12 area, seismic: Deming, J. H.  
*Ground water.*  
 California, Long Beach—Santa Ana area, coastal zone: Poland, J. F., 1.  
 Sacramento—San Joaquin delta: Water Proj. Authority Calif.  
 Sacramento Valley: Calif. Dept. Public Works Div. Water Res., 2.  
 Santa Margarita River watershed: Calif. Dept. Public Works Div. Water Res., 5.  
 Georgia, east-central: LeGrand, H. E., 1.  
 Idaho, Minidoka County, southern: Crosthwaite, E. G., 1.  
 Illinois, Lee-Whiteside Counties: Foster, J. W.  
 Northwestern, aquifers: Hackett, J. E., 1.  
 Western: Bergstrom, R. E., 1.  
 White County, aquifers, fresh-water possibilities: Pryor, W. A., 2.  
 Kansas, Reno County: Bayne, C. K., 2.  
 Sheridan County: Bayne, C. K., 1.  
 Wichita well field, Equus beds area: Stramel, G. J.  
 Kentucky, Henderson area: Harvey, E. J.  
 Hopkinsville quadrangle: Walker, E. H., 1.  
 Jefferson County: MacCary, L. M.  
 Louisiana, southwestern, reservoirs, piezometric: Jones, P. H., 2.  
 Mexico, Guadalajara area, Jalisco: Carreño, A. de la O.  
 Mississippi, aquifers: Miss. Water Res. Policy Comm.  
 Montana, Bitterroot Valley, eastern part: McMurtrey, R. G.  
 Nebraska, Sioux County, southern: Bradley, E., 2.  
 North Dakota, Pipestem Creek area, Stutsman County, piezometric: Kresl, R. J.  
 Rhode Island, East Greenwich quadrangle: Allen, W. B.  
 Kingston quadrangle: Bierschenk, W. H.  
 Texas, Chambers County: Doyel, W. W.  
 Crane County, sandhills area: Shafer, G. H.  
 El Paso area, Hueco bolson: Knowles, D. B., 1.  
 Medina County, piezometric: Holt, C. L. R., Jr., 1.  
 Saline-water aquifers: Winslow, A. G.  
 San Antonio area: Pettit, B. M., Jr.

Maps (excluding Geologic maps)—Continued  
*Isopach.*

- Alabama, Lookout Mtn., Mississippian :  
Shotts, R. Q., 2.
- Alberta, Wabamun group, Devonian,  
Stettler area : Wonfor, J. S.
- Canada, Bakken formation : Mapel, W.  
J., 1.
- Prairie Provinces, southern : Borden,  
    R. L., 1.
- Southern, Jurassic-Cretaceous : Bor-  
    den, R. L., 2.
- Colorado, Canon City embayment : Fred-  
erickson, E. A., 2.
- Raton basin : Johnson, Ross B.
- Illinois, Kinderhook series, formations,  
Mississippian : Workman, L. E.
- White County, Pennsylvanian sand-  
    stones : Pryor, W. A., 2.
- Indiana, Wisconsin drift : Wayne, W. J.,  
2.
- Kansas, Hugoton embayment of Ana-  
darko basin, Cambrian-Cretace-  
ous : Merriam, D. F., 1.
- Salina basin area : Lee, W.
- Kentucky, Smith Mills North and Geneva  
oil pools, Mississippian : Fu-  
gate, G. W., Jr.
- Manitoba, Jurassic : Stott, D. F., 1.
- Mississippian : Zaborniak, H. M.
- Montana, Bighorn Basin, Tensleep sand-  
stone : Zapp, A. D.
- Central : Staggs, J. O., 1.
- Upper Jurassic formations : Rayl,  
    R. L.
- Montana and adjacent North and South  
Dakota, Heath and Otter for-  
mations : Mapel, W. J., 1.
- Nevada, eastern, Middle Ordovician  
quartzites : Webb, G. W.
- New Mexico, Matador arch, pre-Penn-  
sylvanian-Pennsylvanian :  
Schmitt, G. T.
- Raton basin : Johnson, Ross B.
- North Dakota, Bottineau County, Spear-  
fish formation, Triassic(?) :  
Anderson, S. B.
- Oklahoma, east-central, Simpson group,  
Ordovician : Cronenwett, C. E.
- Garfield County, western : Caylor, J.  
    W.
- Mansville - Madill - Aylesworth anti-  
    cline, Hunton group : Godfrey,  
    J. M.
- Panhandle : Totten, R. B.
- Ontario, Welland County, drift : San-  
ford, B. V., 2.
- Pennsylvania, Sheffield quadrangle, Up-  
per Devonian : Ingham, A. I.
- Saskatchewan, Mississippian forma-  
tions : MacDonald, G. H.
- Texas, Fort Worth basin, Pennsylvan-  
ian : Ohlen, H. R.
- Horseshoe atoll : Myers, D. A.
- Matador arch, pre-Pennsylvanian-  
    Pennsylvanian : Schmitt, G. T.
- Midland basin, northern : Myers, D.  
    A.
- Panhandle : Totten, R. B.

Maps (excluding Geologic maps)—Continued  
*Isopach*—Continued

- United States, Great Basin, Laketown  
dolomite : McFarlane, J. J.
- Jurassic intervals : McKee, E. D., 2.
- Pennsylvanian : Wanless, H. R., 2.
- Western, Phosphoria formation : Mc-  
    Kelvey, V. E., 5.
- Utah, western, Middle Ordovician  
quartzites : Webb, G. W.
- West Virginia, Greenbrier series, Missis-  
sippian : Flowers, R. R.
- Williston basin, Devonian : Baillie, A.  
D., 1.
- Jurassic formations : Francis, D. R.
- Permian (?) - Jurassic (?) red beds :  
    Ziegler, D. L.
- Triassic-Jurassic red beds : Francis,  
    D. R.
- Wyoming, Bighorn Basin, Tensleep sand-  
stone : Zapp, A. D.
- Western, and adjacent areas, Missis-  
    sippian : Strickland, J. W., 1.
- Wind River basin area : Thompson,  
    Raymond M.

*Mineral.*

- Alabama, important deposits : Pallister,  
H. D.
- Alaska, Horseshoe Bay pyrite deposits,  
Latouche Island : Stejer, F. A.
- Wishbone Hill district, Matanuska  
    coal field : Barnes, F. F.
- Arizona, San Carlos Indian Reservation :  
Bromfield, C. S.
- Uranium : Stuler, J. E.
- Arkansas, Batesville manganese dis-  
trict : Kilne, H. D.
- California, Bishop tungsten district,  
mines : Bateman, P. C.
- Clay : Wisser, E. H.
- El Dorado County : Clark, W. B.
- Gold : Calif. Dept. Nat. Res. Div.  
    Mines, 9.
- Peat : Calif. Dept. Nat. Res. Div.  
    Mines, 11.
- Pumice, pumicite, and volcanic cin-  
    ders : Chesterman, C. W., 1.
- San Gabriel Mts., western, titanium :  
    Calif. Dept. Nat. Res. Div.  
    Mines, 2.
- Southern, tungsten : Calif. Dept. Nat.  
    Res. Div. Mines, 4.
- West Shasta copper-zinc district,  
    mines : Kinkel, A. R., Jr., 2.
- Canada : Canada Dept. Mines and Tech.  
Surveys Mines Br.
- Colorado, Raton basin area, refractory  
clays : Turner, D. S., 1.
- Colorado Plateau, uranium : Minerals  
Map Co.
- Uranium-vanadium : Chew, R. T.,  
    3d, 2.
- Uravan belt, uranium-vanadium re-  
    serves : Bush, A. L., 1.
- Idaho, Weiser area, mercury : Ross, C.  
P., 2.

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*Mineral*—Continued

- Massachusetts, deposits, exclusive of clay, sand, gravel, and peat: Pearre, N. C.
- Mexico, Chihuahua, metallic: González Reyna, J., 4.
- Concepción del Oro district, Zacatecas, phosphate rock: Rogers, C. L.
- Manganese: Mapes Vázquez, E., 1.
- Mineral seams: González Reyna, J., 5.
- Michigan, Chassell quadrangle, copper: White, W. S., 1.
- Minnesota, resources: Schwartz, G. M., 2.
- Montana, iron deposits: DeMunck, V. C., 2.
- New Hampshire, mines and prospects: Meyers, T. R.
- Newfoundland, locations: Newfoundland Dept. Mines and Res. Mines Br.
- Nicaragua: Zoppis de Sena, R.
- North Dakota, southwestern, uranium: Bergstrom, J. R.
- Ohio: Smith, Robert W.
- Ontario, Lount Township, south-central: Satterly, J.
- Rhode Island, deposits, exclusive of clay, sand, gravel, and peat: Pearre, N. C.
- Rocky Mtn. region, uranium: Everhart, D. L., 2.
- South Dakota, Slim Buttes area, uranium distribution in ground water: Denson, N. M., 2.
- United States, Pacific Northwest, ceramic materials: Kelly, H. J., 1.
- Perlite: Jaster, M. C.
- Uranium provinces: Crawford, J. E.
- Utah, Nokai dome area, uranium: Grandbouche, G. R.
- Washington, metallic minerals: Huntington, M. T.
- Wyoming areas, uranium distribution in ground water: Denson, N. M., 2.

*Miscellaneous*.

- Alteration, Utah, Marysvale district: Kerr, P. F., 1.
- Clastic ratios, Pennsylvanian, Kansas-Oklahoma, facies study: Krumbain, W. C., 3.
- Facies, Oklahoma, West Brock area, study methods applied: Krumbain, W. C., 3.
- Geochemical, Yukon, Galena Hill—Mt. Haldane area, streams and springs, heavy metal content: Boyle, R. W., 1.
- Geologic structure, Appalachian Valley: Bridge, J.
- Arizona, Navajo country: Kiersch, G. A.
- Greenland, Nunatakker region: Halter, J., 1.

## Maps (excluding Geologic maps)—Continued

*Miscellaneous*—Continued

## Geologic structure—Continued

- Louisiana, Nodosaria embayment, fault trend—facies: Grigg, R. P., Jr.
- New Jersey, Franklin—Sterling area: Hague, J. M.
- New Mexico, southeastern: Stipp, T. F.
- Utah, east-central: Intermountain Assoc. Petroleum Geologists.
- Vermont, Mt. Mansfield State Forest: Christman, R. A., 2.
- Wyoming, Phelps Lake—Buck Mtn. area: Bradley, C. C., 1.
- Is och ore, Texas, Jackson-Wharton Counties, upper Frio sand: Grayshon, J. E.
- Isopach and lithofacies, Gulf Coastal Plain, Trinity group: Forgyson, J. M., Jr.
- Linear features, Alaska, Prince of Wales Island, Hollis area: Pillmore, C. L., 10.
- Alaska, Prince of Wales Island, Salt Chuck area: Pillmore, C. L., 9.
- Lithofacies, Texas, Fort Worth basin, Pennsylvanian: Ohlen, H. R.
- United States, Jurassic intervals: McKee, E. D., 2.
- Utah, central, Victoria quartzite and Gullmette formation, Devonian: Petersen, M. S.
- Cottonwood Wash area, Morrison formation: Pitman, R. K.
- Williston basin, Jurassic formations: Francis, D. R.
- Paleotopographic, Oklahoma, northeastern, Precambrian: Dillé, A. C. F.
- Porosity, North Dakota, Bottineau County, upper Mississippian: Anderson, S. B.
- Radioactivity, Nevada, Silver Queen group, Tonopah mining district: Davis, D. L.
- Sediment transport direction, Colorado Plateau, Triassic: Poole, F. G.
- Till-pebble isopleth, North Dakota, northwestern, and Montana, northeastern: Howard, A. D., 3.
- Transmissivity, Colorado, Mesa County, carnottite sediments: Phoenix, D. A.
- Colorado Plateau, uranium sediments: Jobin, D. A.
- Oil and gas.*
- Alberta: Oil and Gas Jour., 2.
- Fields and discoveries: Canada G. S., 1.
- Sturgeon Lake oil fields: Sproule, J. C., 2.
- British Columbia, northeastern, fields and discoveries: Canada G. S., 1.

Maps (excluding Geologic maps)—Continued  
*Oil and gas*—Continued

- California, fields and drilled areas: Jennings, C. W., 1.  
 Canada, western: World Oil.  
 Colorado Plateau, fields: Oil News and Uranium Digest.  
 Gulf of Mexico and Caribbean: Locke, E. R.  
 Kentucky, Smith Mills North and Geneva pools: Fugate, G. W., Jr.  
 Louisiana, fields: Coignet, G. O.  
 Southeastern, fields: Troutman, A., 2.  
 Manitoba, western, fields and discoveries: Canada G. S., 2.  
 Mexico: Garcia Rojas, A.  
 Montana: Vine, J. D., 4.  
 Central: Billings Geol. Soc.  
 Nebraska, fields: Finch, W. C.  
 New Mexico, Lea County: Phifer, R. L., 1.  
 Southeastern: Stipp, T. F.  
 Ohio, Tuscarawas County: Lamborn, R. E.  
 Oklahoma, Panhandle: Totten, R. B.  
 Southern, oil fields: Ardmore Geol. Soc., 2.  
 Pennsylvania, Sheffield quadrangle: Ingham, A. I.  
 Saskatchewan: Oil and Gas Jour., 2.  
 Fields and discoveries: Canada G. S., 2.  
 Texas, Horseshoe atoll: Myers, D. A.  
 Panhandle: Totten, R. B.  
 Rio Grande valley, fields: Troutman, A., 3.  
 Virginia, southwestern, fields and test wells: Huddle, J. W.  
 West Virginia, Monongalia-Marion-Taylor Counties: Haight, O. L., 2.  
 Wyoming, Wind River basin region: Thompson, Raymond M.

*Paleogeographic.*

- Appalachian basin, Bedford and Berea time, Mississippian: Pepper, J. F., 1.  
 Colorado Plateau, Cenozoic: Hunt, C. B., 1.  
 Costa Rica, Pennsylvanian-Pleistocene: Quirós Amador, T.  
 Mexico, northeastern, Upper Jurassic, tectonic-geomorphologic provinces: Humphrey, W. E., 2.  
 North America, Jurassic: Arkell, W. J., 1.  
 United States, Cordilleran region, Silurian: McFarlane, J. J.  
 Far West, Miocene-Pliocene: Axelrod, D. I.  
 Jurassic time units: McKee, E. D., 2.

*Photogeologic.*

- Arizona, Emmett Wash NE quadrangle: Detterman, J. S., 9.  
 Emmett Wash NW quadrangle: Minard, J. P., 3.

Maps (excluding Geologic maps)—Continued  
*Photogeologic*—Continued

Arizona—Continued

- Fredonia NW quadrangle: Hemphill, W. R., 2.  
 Fredonia SW quadrangle: Marshall, C. H., 12.  
 Heaton Knolls NW quadrangle: Marshall, C. H., 4.  
 House Rock Spring NE quadrangle: Minard, J. P., 5.  
 House Rock Spring SE quadrangle: McQueen, K., 2.  
 Jacob Lake NE quadrangle: Marshall, C. H., 16.  
 Lees Ferry SE quadrangle: McQueen, K., 1.  
 Lees Ferry SW quadrangle: Detterman, J. S., 8.  
 Lost Spring Mtn. quadrangles: Marshall, C. H., 5-7.  
 Paria Plateau quadrangles: McQueen, K., 3; Marshall, C. H., 15; Minard, J. P., 1, 2.  
 Shinarump NW quadrangle: Morris, R. H.  
 Short Creek quadrangles: Marshall, C. H., 2, 3, 10; Pillmore, C. L., 5.  
 Tanner Wash NW quadrangle: Minard, J. P., 4.  
 Colorado, Los Ochos uranium mine: Derzay, R. C.  
 Mt. Peale-1 quadrangle: Hackman, R. J., 4.  
 Mt. Peale-8 quadrangle: Hackman, R. J., 7.  
 Mt. Peale-9 quadrangle: Hackman, R. J., 1.  
 Mt. Peale-16 quadrangle: Hackman, R. J., 8.  
 Utah, Bluff-3 quadrangle: Marshall, C. H., 14.  
 Carlisle-1 quadrangle: Tolbert, G. E.  
 Castle Dale-16 quadrangle: Detterman, J. S., 1.  
 Desert Lake-13-16 quadrangles: Hemphill, W. R., 1; Kent, B. H.; Marshall, C. H., 1, 11.  
 Elk Ridge-3-5 quadrangles: Detterman, J. S., 6; Pillmore, C. L., 1; Sable, V. H., 2.  
 Elk Ridge-8-9 quadrangles: Miller, C. F., 1, 2.  
 Emery-1 quadrangle: Orkild, P. P., 4.  
 Emery-8 quadrangle: Condon, W. H.  
 Johnson SW quadrangle: Detterman, J. S., 7.  
 Kaiparowits Peak-1-2 quadrangles: Detterman, J. S., 2, 3.  
 Kaiparowits Peak-7 quadrangle: Detterman, J. S., 4.  
 Kanab SE quadrangle: Detterman, J. S., 5.



## Maps (excluding Geologic maps)—Continued

*Photogeologic*—Continued

## Utah—Continued

Kanab SW quadrangle: Pillmore, C. L., 4.

Lisbon Valley anticline: Lekas, M. A.

Lisbon Valley anticline and vicinity: U. S. Atomic Energy Comm., 5.

Moab-15 quadrangle: Sable, V. H., 1.

Mt. Peale-1 quadrangle: Hackman, R. J., 4.

Mt. Peale-4 quadrangle: Hackman, R. J., 5.

Mt. Peale-6-11 quadrangles: Hackman, R. J., 1-3, 6, 7, 9.

Mt. Peale-16 quadrangle: Hackman, R. J., 8.

Navajo Mtn.-1 quadrangle: Olson, A. B., 3.

Navajo Mtn.-13 quadrangle: Hackman, R. J., 10.

Navajo Mtn.-15 quadrangle: Hackman, R. J., 11.

Orange Cliffs-11 quadrangle: Ray, R. G., 2.

Orange Cliffs-13 quadrangle: Ray, R. G., 1.

Orderville Canyon NW quadrangle: Pillmore, C. L., 8.

Springdale quadrangles: Pillmore, C. L., 2, 3, 6.

Tidwell-2 quadrangle: Sable, V. H., 3.

Tidwell-10-11 quadrangles: Olson, A. B., 1, 2.

Uinta Basin, western, Eocene: Ray, R. G., 4.

Virgin quadrangles: Marshall, C. H., 8, 9, 13; Pillmore, C. L., 7.

White Canyon-3-4 quadrangles: Orkild, P. P., 5, 6.

White Canyon-7-8 quadrangles: Orkild, P. P., 2, 3.

Woodside-13 quadrangle: Orkild, P. P., 1.

*Physiographic.*

Alberta, Alliance-Kinsella area, stream-trench systems, Pleistocene: Gravenor, C. P., 4.

Castor district, glacial: Gravenor, C. P., 2.

Arizona, Benson quadrangle: Gilluly, J.

British Columbia, landforms and glacial geology: Chapman, J. D.

California, Point Reyes Beach, cut and fill, 1953-56: Trask, P. D., 3.

Canada, regions: Watson, J. W.

Colorado, southeastern: Rocky Mtn. Assoc. Geologists.

Colorado Plateau: Hunt, C. B., 1.

Cuba, Sierra de los Organos, tectonics: Lehmann, H.

Gulf Coastal Plain: Doering, J. A.

Illinois: Bier, J. A.

Indiana, glacial and bedrock: Wayne, W. J., 2.

## Maps (excluding Geologic maps)—Continued

*Physiographic*—Continued

Labrador, Goose Bay area: Blake, W., Jr.

Montana, central: Billings Geol. Soc.

North Dakota: Robinove, C. J.

Diagram: Hainer, J. L.

Northwest Territories, north-central Keewatin, glacial: Taylor, R. S.

Quebec, New Quebec Crater: Millman, P. M.

Saskatchewan, Moose Mtn. area, glacial: Christiansen, E. A.

Slope maps: Strahler, A. N., 2.

Washington, eastern, channeled scabland, glacial: Bretz, J. H., 2.

West Indies: Butterlin, J. A.

Wyoming, Jackson Hole area: Wyo. Geol. Assoc.

*Structure contour.*

Alaska, Oumalik anticline: Robinson, F. M.

Alberta, southern, plains area: Gallup, W. B., 1.

Arizona, Dinnehotso quadrangles: Witkind, I. J., 2-5.

California, Edison oil field areas: White, James L.

McKittrick oil field, Olig and Tulare sands: Zulberti, J. L.

Pyramid Hills oil field: Curtin, G.

Round Mtn. oil field, Vedder sand: Albright, M. B., Jr.

Colorado, Badito Alamo area: Creely, R. S., 2.

Bonanza-Dragon oil-shale area: Cashion, W. B., Jr.

Garcia anticline: Clair, J. R., 1.

Model anticline: Clair, J. R., 2.

Tercio anticline: Terry, B. E.

Colorado-New Mexico, Raton basin: Rocky Mtn. Assoc. Geologists.

Colorado Plateau: Hunt, C. B., 1.

Gulf Coastal Plain, Upper Cretaceous beds, Mississippi area: Hughes, W.

Illinois, Crawford and Lawrence Counties, Pennsylvanian: Potter, P. E., 1.

Northwestern, lead-zinc district: Bradbury, J. C.

White County, Pennsylvanian sandstones and bedrock surface: Pryor, W. A., 2.

Kentucky, Seitz quadrangle, Pennsylvanian: Bergin, M. J.

Smith Mills North and Geneva oil pools, Mississippian - Pennsylvanian: Fugate, G. W., Jr.

Louisiana, southwestern: Troutman, A. 1.

Manitoba, Jurassic: Stott, D. F., 1.

Mississippian: Zaborniak, H. M.

North Virden-Virden Roselea and Maples fields: Fleming, O. J.

Minnesota, southeastern: Minn. Univ. Dept. Geology.

Maps (excluding Geologic maps)—Continued  
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Mississippi, Benton County, lower Eocene: Lusk, T. W.

Montana, Bighorn Basin, Tensleep sandstone: Zapp, A. D.  
 Central: Billings Geol. Soc.; Staggs, J. O., 1.  
 Fort Peck Indian Reservation area: Colton, R. B., 1.

Nebraska, Buffalo County and vicinity, Cretaceous-Tertiary: Schreurs, R. L.  
 Pennsylvanian, Cretaceous: Finch, W. C.

New Mexico, Lea County, oil and gas fields: Phifer, R. L., 1.  
 Southeastern: Stipp, T. F.  
 Basement rocks: Flawn, P. T., 2.

North Dakota, Bottineau County, Mississippian: Anderson, S. B.  
 Bottineau County, Paleozoic erosional surface: Anderson, S. B.  
 Grassy Butte area, Paleocene: Meldahl, E. G.

Oklahoma, Beaver County: Barby, B. G.  
 Brushy Mtn. structure, Morrow formation: White, J. M., Jr.  
 Garfield County, western: Caylor, J. W.  
 Lincoln County, east-central: Cole, J. A.  
 Panhandle: Totten, R. B.  
 Prague-Aden area, Ordovician and Pennsylvanian: Blumenthal, M. B.  
 Ramsey oil pool: Umpleby, S. S.  
 Southern, oil fields: Ardmore Geol. Soc., 2.  
 Turner Turnpike area, Lincoln County: Busch, D. A., 1.

Ontario, Welland County, bedrock surface: Sanford, B. V., 2.

Pennsylvania, Sheffield quadrangle, Devonian-Mississippian: Ingham, A. I.  
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 Seymour oil fields: Haerberle, F. R.  
 Ward County, oil and gas fields: Phifer, R. L., 2.  
 Winkler County, oil and gas fields: Phifer, R. L., 3.

Maps (excluding Geologic maps)—Continued  
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Utah, Henry Mts.: Hunt, C. B., 1.  
 North Salt Valley-Cisco area, Cretaceous: Walton, P. T.  
 San Rafael Swell, Chinle formation: Isachsen, Y. W., 1.  
 West Virginia, Monongalia-Marion-Taylor Counties: Haight, O. L., 2.

Wyoming, Bighorn Basin, Tensleep sandstone: Zapp, A. D.  
 Powder River basin, Precambrian: Osterwald, F. W.  
 Ramshorn anticline: Zebal, G. P., 1.  
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 Sohare Creek anticline: Grace, R. M.  
 Spread Creek anticline: Strickland, J. W., 2.

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Arizona, Black Mesa area: Carithers, L. W.  
 Cochise County, west-central: Gilluly, J.  
 California, Ivanpah quadrangle, fault classification: Hewett, D. F., 1.

Canada, Maritime area: Cameron, H. L.  
 Prairie Provinces, southern, Cambrian-Jurassic: Borden, R. L., 3.

Colorado, Front Range: Warner, L. A.  
 Raton basin region: Gabelman, J. W., 3.  
 Uncompahgre Range: Holmes, C. N., 1.  
 Colorado Plateau: Kelley, V. C., 2.  
 Paradox basin: Elias, G. K.  
 San Juan Basin and Rio Grande depression: Hunt, C. B., 1.  
 Structural units and lineaments: Kelley, V. C., 1.  
 Uranium distribution, sketch: Shoemaker, E. M., 2.

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Florida peninsula, northern, fracture patterns: Murray, G. E., 2.

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Montana, central: Sonnenberg, F. P.

Nevada, Ivanpah quadrangle, fault classification: Hewett, D. F., 1.

- Maps (excluding Geologic maps)—Continued
- Tectonic*—Continued
- New Mexico, Raton basin region : Gabelman, J. W., 3.
- Southeastern, basement rocks : Flawn, P. T., 2.
- New York, Poundridge area : Scotford, D. M.
- North America, eastern, geological and geomorphological lineaments related to Appalachians : Murray, G. E., 2.
- Oklahoma : Arbenz, J. K., 1.
- Eastern, faults and folds : White, J. M., Jr.
- Mississippian-Pennsylvanian : Bennison, A. P.
- Northeastern, sketch : Cook, K. L., 2.
- Panhandle : Totten, R. B.
- Rocky Mts. : Blackstone, D. L., Jr.
- Rocky Mtn. region : Everhart, D. L., 2.
- South Dakota, Black Hills : Gries, J. P.
- Texas, Austin West quadrangle, joint trends : Muehlberger, W. R.
- Basement rocks : Flawn, P. T., 2.
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- South-central, major structural features : Fowler, P. T.
- Travis County, Austin outcrop belt, fractures : Muehlberger, W. R.
- United States, Cordilleran foreland : Osterwald, F. W.
- Cordilleran region : Mallory, W. W.
- Jurassic, paleotectonic : McKee, E. D., 2.
- Northeastern, lineaments extending into Canada : Murray, G. E., 2.
- Southern, fracture pattern : Murray, G. E., 2.
- Vermont, Bennington area : MacFadyen, J. A., Jr.
- Lyndonville quadrangle : Dennis, J. G.
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- Wyoming, Black Hills : Gries, J. P.
- Central : Bell, W. G.
- Northwestern : Bengtson, C. A.
- Teton County : Love, J. D., 2.
- Wind River basin : Sharkey, H. H. R.
- Wind River basin and adjacent areas : Murphy, J. F., 1.
- Wind River basin region : Thompson, Raymond M.
- Marble.
- Bending of headstones, petrofabrics : Drewes, H. D.
- New Jersey, Franklin-Sterling area, Precambrian : Hague, J. M.
- New York, Poundridge area : Scotford, D. M.
- Yule marble, petrofabrics : Turner, F. J.
- Marl.
- Alaska, Knik Arm area : Moxham, R. M.
- Saskatchewan, Sturgeon Lake : Kupsch, W. O., 2.
- Marl—Continued
- Wisconsin, Mendota, Wingra, and Trout Lakes, bottom sediments : Murray, R. C., 2.
- Mars.
- Geologic processes, interpretation of surface : McLaughlin, D. B., 3.
- Heat balance, relation to radioactive elements in meteorites : Urey, H. C., 1.
- Maryland.
- Engineering geology, Chesapeake Bay Bridge : Supp, C. W. A.
- Jones Point bridge foundations, Rosalie Island area : Deuterman, M.
- Geologic maps.*
- Allegheny County, Ordovician-Pennsylvanian : Berryhill, H. L., Jr.
- Central, sketch : Hoy, R. B.
- Ground water.*
- Baltimore-Harford Counties, Piedmont, statistical analyses : Dingman, R. J.
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- Baltimore-Harford Counties, Piedmont, aquifers : Dingman, R. J.
- Frederick area, Cambrian-Ordovician : Hoy, R. B.
- Washington County, Lower Ordovician nomenclature : Sando, W. J.
- Mineralogy.*
- Frostburg fire clay mine, mineral collecting : Levy, H. D.
- Rockville quarry, collecting : Griesbach, J. O.
- Paleontology.*
- Cephalopods, Washington County, Early Ordovician : Flower, R. H., 1.
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- Brandywine gravel, cobbles, interpretation, extreme-value technique : Krumbeln, W. C., 1.
- Physical geology.*
- Frederick area, fault : Hoy, R. B.
- Massachusetts.
- Engineering geology, Boston Harbor, tunnel : Linehan, D., 2.
- Field manual, Tufts University : Nichols, R. L.
- Gravity survey, western : Diment, W. H.
- Seismic survey, Boston Harbor : Linehan, D., 2.
- Economic geology.*
- Construction materials, Connecticut Valley : Mathias, W. F., Jr.
- Hudson and Maynard quadrangles : Hansen, W. R., 1.
- Metallic minerals, Connecticut Valley, old iron and lead mines : LaFreniere, G. F.
- Mineral deposits, exclusive of clay, sand, gravel, and peat : Pearre, N. C.

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*Economic geology*—Continued

Mineral resources, Bernardston quadrangle: Balk, R., 1.

*Geologic maps.*

Bernardston quadrangle: Balk, R., 1.  
Colrain quadrangle: Segerstrom, K., 1.  
Hudson and Maynard quadrangles, bedrock and surficial: Hansen, W. R., 1.  
Millers Falls quadrangle: Balk, R., 3.  
Northfield quadrangle: Balk, R., 2.  
Shelburne Falls quadrangle: Segerstrom, K., 2.  
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*Historical geology.*

Bernardston quadrangle. Ordovician-Devonian, Triassic: Balk, R., 1.  
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Connecticut Valley area, Cambrian-Triassic, boundary uplands: White, S. M.  
Paleozoic: Downs, R. A.  
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Triassic, arkoses: Heald, M. T., 3.  
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Arkoses: Heald, M. T., 3.  
Zircon, radiation damage: Fairbairn, H. W.

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Dinosaurs, Connecticut Valley, Triassic: Mizula, J. W.  
Fishes, Connecticut Valley, Triassic, list: Anton, R. E.

*Petrology.*

Arkoses, cementation: Heald, M. T., 3.  
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Connecticut Valley area, Paleozoic: Downs, R. A.  
Granites, age by lead ratios in zircon, eastern: Webber, G. R., 1.  
Hudson and Maynard quadrangles: Hansen, W. R., 1.  
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Northfield quadrangle: Balk, R., 2.  
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*Physical geology.*

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Connecticut Valley area, boundary uplands, orogenies, tectonics: White, S. M.  
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Northfield quadrangle: Balk, R., 2.  
Shelburne Falls quadrangle: Segerstrom, K., 2.  
Williamsburg quadrangle: Willard, M. E., 1.

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Connecticut Valley area, boundary uplands: White, S. M.  
Hudson and Maynard quadrangles, glacial: Hansen, W. R., 1.  
Narragansett basin and Blackstone River valley, glacial water levels: Parmenter, G. N.  
Tophet Chasm, Lake Nashua outlet: Lougee, R. J., 2.

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Formation and characteristics: Russell, R. J., 1.  
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Idaho, Weiser area: Ross, C. P., 2.  
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Alaska, northern, Colville River region: Gryc, G., 1.  
California, Ivanpah quadrangle: Hewett, D. F., 1.  
Mexico, Chiapas: Internat. Geol. Cong. Mexico, 13.  
Ciudad Juárez, Chihuahua, to Monterrey, Nuevo León: Internat. Geol. Cong. Mexico, 8.  
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Arizona, Navajo country: Kiersch, G. A.  
British Columbia, Aiken Lake area: Roots, E. F.  
Deposits: British Columbia Dept. Mines.  
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El Salvador, Metapán area, vein deposits: Dürr, F., 3.  
Ferromagnetic, Bitter figures: McGirk, L. S., Jr.  
Idaho, Nez Perce County: Hubbard, C. R., 2.  
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Mexico: Gonzáles Reyna, J., 5.  
Chihuahua: González Reyna, J., 4.  
Esmeralda mine, Parral, Chihuahua: Lowther, G. K., 2.

## Metallic minerals—Continued

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- Fresnillo district, Zacatecas: Stone, J. B.
- Frisco and Clarines mines, Chihuahua: Koch, G. S., Jr., 2.
- La Prieta mine, Parral, Chihuahua: Marlow, G. C.
- Naica mining district, Chihuahua, silver-lead-zinc: Wilson, I. F., 3.
- Parral area, Chihuahua, veins: Lowther, G. K., 1.
- San Martín district, Zacatecas: Kohls, A.
- Santa Bárbara area, Chihuahua: Kierans, M. D.
- Santa Eulalia mining district, Chihuahua: Horcasitas, A. S.
- Taxco district, Guerrero, silver-lead-zinc: Osborne, T. C.
- Zacatecas district: Mapes Vázquez, E., 3.
- Montana, Mineral County: Wallace, R. E., 2.
- Nevada, Ivanpah quadrangle: Hewett, D. F., 1.
- Nicaragua: Zoppis de Sena, R.
- Northwest Territories, prospecting possibilities: McGlynn, J. C.
- Ontario, Kenora area, base metals: Carlson, H. D.
- Polarization, interfacial effect on electrical conductivity of rocks: Hallof, P. G.
- Quebec, Obalski Township: Graham, R. B., 1.
- Washington: Huntting, M. T.
- Yukon, base metals, exploration: Chisholm, E. O.

## Metals.

- Columbium, sources, properties: Lomas, J.
- Natural compounds in hypogene deposits: Butler, B. S.

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- Accessory minerals, associations, paragenesis: Moorhouse, W. W., 2.
- Arizona, Cochise County, west-central: Gilluly, J.
- California, Franciscan metagraywackes: Bloxam, T. W.
- Glaucophane schists and eclogites, Healdsburg area: Borg, I. Y., 3.
- Ubehepe Peak quadrangle: McAllister, J. F.
- West Shasta copper-zinc district: Kinkel, A. R., Jr., 2.
- Colorado, San Juan region: Larsen, E. S., Jr., 2.
- Colorado Plateau, north-central, Precambrian: Shoemaker, E. M., 4.
- General, elementary: Berenson, B., 2.
- Georgia, east-central: LeGrand, H. E., 1.
- Greenland, Britannia So area, Dronning Louise Land: Peacock, J. D., 2.
- Dronning Louise Land, Precambrian: Peacock, J. D., 1.

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- Frederikshaab district, gabbro-anorthosites, retrograde: Bondam, J., 2.
- Nunatakker region, Caledonian complex: Haller, J., 1.
- Halogen geochemistry: Correns, C. W.
- Labrador, southwestern, Wabush Lake iron formation: Knowles, D. M.
- Manitoba, MacBride Lake area, Precambrian: Kilburn, L. C.
- Maryland, Baltimore-Harford Counties, Piedmont, aquifers: Dingman, R. J.
- Massachusetts, Bernardston quadrangle: Balk, R., 1.
- Hudson and Maynard quadrangles: Hansen, W. R., 1.
- Millers Falls quadrangle: Balk, R., 3.
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- Michigan, Kiernan quadrangle, Precambrian: Gair, J. E.
- Minnesota, Minnesota River valley, New Ulm to Ortonville, Precambrian: Lund, E. H.
- Nevada, Virginia City quadrangle: Thompson, G. A.
- New Hampshire: Billings, M. P.
- New Jersey, Franklin-Sterling area, Precambrian: Hague, J. M.
- New Mexico, Black Hawk district: Gillerman, E.
- Manzano Mts., southern, Precambrian: Stark, J. T., 1.
- Questa molybdenum mine area: Schilling, J. H., 1.
- Southeastern, basement rocks, Precambrian: Flawn, P. T., 2.
- New York, Grenville metasediments, pyrite concentration: Prucha, J. J., 2.
- Grenville series, Balmat-Edwards district: Brown, J. S.
- Loon Lake quadrangle: Postel, A. W., 2.
- Poundridge area: Scotford, D. M.
- Southeastern, stratigraphic relations: Prucha, J. J., 3.
- Newfoundland, Oderin and adjacent islands, Placentia Bay, Precambrian-Cambrian: Williamson, D. H.
- North Carolina, Bakersville-Plumtree area: Kulp, J. L., 1.
- Spruce Pine area, Cranberry and Henderson gneisses: Eckelmann, F. D., 1.
- Spruce Pine district: Kulp, J. L., 4.
- Northwest Territories, Courageous-Matthews Lakes area, Precambrian: Moore, J. C. G.

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- Ontario, Clare River syncline, Precambrian: Ambrose, J. W.
- Dungannon and Mayo Townships, Precambrian: Hewitt, D. F., 1.
- Emo area, origin: Irvine, T. N.
- Faraday uranium mine area: Morris, H. R.
- Grenville region, Precambrian: Hewitt, D. F., 2.
- Lount Township, Precambrian: Satterly, J.
- Pennsylvania, eastern, pinite-schist, Precambrian-Cambrian contact: Virgin, W. W., Jr.
- Kintnersville area, hornfels, Brunswick shale-diabase contact: Montgomery, A., 1.
- Wissahickon formation, Delaware County, calcareous sandstone: Tomlinson, W. H.
- Popular account: Pearl, R. M.; Shuttlesworth, D. E.
- Quebec, Calumet Island, Grenville series: Gittins, J.
- Grenville series, Precambrian, criteria: Osborne, F. F., 1.
- Labrador trough, eastern border, Fort Chimo area, New Quebec: Romer, H. S. de.
- McGill area: Aubert de la Rüe, E., 2.
- Montauban-les-Mines area, Precambrian: Smith, J. R., 1.
- Mt. Wright area, taconite, magnetite-specularite relations: Douglas, G. V., 1.
- Surprise Lake area, Timiskaming-Grenville boundary, Precambrian: Deland, A. N., 2.
- Rhode Island, Narragansett Pier quadrangle: Nichols, David R.
- Saskatchewan, Beaverlodge Lake area, Precambrian: Hill, P. A.
- Goldfields region, radioactive deposits, wall rocks: Dawson, K. R.
- Kisseynew gneiss group, Precambrian, Mari Lake area: Cheesman, R. L.
- Oldman River area, Precambrian: Blake, D. A. W., 1.
- Reindeer River area, Precambrian: Budding, A. J., 1.
- Texas, basement rocks, Precambrian: Flawn, P. T., 2.
- Enchanted Rock batholith: Hutchinson, R. M., 1.
- Southwestern, pre-Mesozoic: Flawn, P. T., 1.
- United States, southeastern, Piedmont and Coastal Plain, monazite belts: Overstreet, W. C., 1.
- Western, uranium in contact zones: Thurlow, E. E., 1.
- Utah, Raft River Range, eastern: Felix, C. E.

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- Vermont, Bennington area: MacFadyen, J. A., Jr.
- Lyndonville area: Dennis, J. G.
- Montpellier quadrangle: Cady, W. M., 1.
- Mt. Mansfield State Forest: Christman, R. A., 2.
- Virginia, paragneisses: Mertie, J. B., Jr.
- Southeastern Piedmont, phyllites: Pegau, A. A., 2.
- Yukon, Keno Hill-Sourdough Hill area: Boyle, R. W., 2.
- St. Elias Mts., central, amphibolite facies: Sharp, R. P., 1.
- Metamorphism.
- California, eclogites and glaucophane schists, Healdsburg area, retrograde: Borg, I. Y., 3.
- West Shasta copper-zinc district: Kinkeel, A. R., Jr., 2.
- Carbonate rocks, siliceous, equilibrium relations, thermochemistry: Weeks, W. F., 1.
- Connecticut, Middle Haddam area, gneiss domes: Rosenfeld, J. L., 2.
- Idaho, Boehls Butte quadrangle: Hietanen, A. M., 1.
- Illinois, coal, by igneous intrusions: Clegg, K. E.
- Mexico, Zimapán mining district, Hidalgo: Simons, F. S.
- Minerals, CaO-MgO-SiO<sub>2</sub>-H<sub>2</sub>O system, heats of formation: Weeks, W. F., 2.
- Montana, Button Butte dome: DeKalb, H. L.
- New Hampshire: Billings, M. P.
- New Jersey, Franklin-Sterling area: Hague, J. M.
- New York, Cortlandt complex, origin of emery: Friedman, G. M., 1.
- Poundridge area: Scotford, D. M.
- West Point quadrangle, southwestern: Paige, S., 1.
- North Carolina, Spruce Pine district: Kulp, J. L., 4.
- Ontario, Grenville region, Precambrian: Hewitt, D. F., 2.
- Ore deposition: Hawley, J. E., 2.
- Pelitic rocks: Shaw, Denis M.
- Pennsylvania, Kintnersville area, red beds by diabase sill: Montgomery, A., 1.
- Quebec, Surprise Lake area, Timiskaming-Grenville boundary, Precambrian: Deland, A. N., 2.
- Rhode Island, Narragansett Pier quadrangle: Nichols, David R.
- Saskatchewan, central, Precambrian area, regional: Budding, A. J., 2.
- Goldfields region, radioactive deposits, wall-rock alteration: Dawson, K. R.
- Oldman River area, Precambrian: Blake, D. A. W., 1.

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- Texas, south-central, relation to faulting and folding: Fowler, P. T.  
 Vermont, Bennington area: MacFadyen, J. A., Jr.  
     Lyndonville area: Dennis, J. G.  
     Montpelier quadrangle: Cady, W. M., 1.  
 Virginia, Blue Ridge, Harpers Ferry to Purcellville: Nickelsen, R. P.  
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 Mexico, Calera mining district, Chihuahua, contact: Jacob, L., Jr.  
 New York, Poundridge area: Scotford, D. M.  
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     Western, Devonian carbonate rocks, by evaporites: Walker, C. T.  
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 Age, rubidium-strontium method: Schumacher, E.  
     Time scale of universe: Öpik, E. J.  
     Uranium-lead method, cf. earth's age: Patterson, C. C., 1.  
 Arizona, Canyon Diablo: Nininger, H. H.  
 Arkansas, Cabin Creek: Henderson, Edward P., 3.  
 Australites, bearing on tektite problem: Cassidy, W. A.  
 Chondrites, gallium content: Onishi, H.  
     Isotope abundances: Ahrens, L. H., 4.  
     Rubidium and strontium abundances, age: Herzog, L. F., 2d, 2.  
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- Arizona, Black Mesa area, uranium:  
Carithers, L. W.
- Christmas mine, copper, origin: Peterson, N. P.
- Chrysotile asbestos: Stewart, L. A.
- Navajo-Hopi Reservations, uranium in diatremes: Shoemaker, E. M., 1.
- Seth-la-kai diatreme, Hopi Buttes, uranium: Lowell, J. D.
- Shinarump conglomerate, Monument Valley, uranium in channels: Witkind, I. J., 1.
- Silver Bell district, copper: Richard, K. E.
- Asbestos, exploration: Conn, H. M. K.
- British Columbia, Boundary district, copper: Seraphim, R. H.
- Highland Valley, copper: White, W. Harrison.
- Manganese, origin: Sargent, T. E. H.
- Metallic: British Columbia Dept. Mines.
- Distribution: Riley, C.
- Pacific Nickel mines, nickel-copper, origin: Aho, A. E.
- Rexspar property, Birch Island area, uranium: Joubin, F. R., 4.
- California, Alleghany-Downleville area, gold: Carlson, D. W.
- Bishop tungsten district, origin: Bateman, P. C.
- El Dorado County: Clark, W. B.
- Gold: Calif. Dept. Nat. Res. Div. Mines, 9.
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- West Shasta district, copper-zinc, origin: Kinkel, A. R., Jr., 1, 2.
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- Columbium: Rowe, R. B., 2.
- Eastern, epigenetic ores, origin: Hawley, J. E., 2.
- Iron, types: Harrison, J. M.
- Colorado, central, tungsten: Belser, C., 2.
- Central City district, pitchblende, origin: Sims, P. K., 1, 3.
- Climax mine, molybdenum, origin: Vanderwilt, J. W.

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- Colorado—Continued
- Freeland-Lamartine district, sulfides, origin, radioactivity: Harrison, J. E.
- Front Range, uranium: Merwin, S. S.; Sims, P. K., 2.
- Golden Gate Canyon, pitchblende, wall-rock control: Adams, J. W.
- Leadville limestone, copper-lead-zinc sulfides, origin, relation to hydrothermal dolomite: Engel, A. E. J., 2.
- Los Ochos mine, Saguache County, uranium: Derzay, R. C.
- Northern, Tertiary clastic rocks, uranium: Grutt, E. W., Jr.
- Powderhorn district, thorium: Wallace, S. R., 1.
- Thorium and rare earths: Olson, J. C., 1.
- Ralston Creek mine, uranium, origin: Bird, A. G.
- Roc Creek quadrangle, uranium-vanadium and copper-silver, origin: Shoemaker, E. M., 3.
- San Juan area, tungsten: Belser, C., 1.
- Southeastern, "Red Bed" copper: Soulé, J. H.
- Wet Mts., thorium: Singewald, Q. D.
- Colorado Plateau, central, uranium related to structures: Shoemaker, E. M., 2.
- Morrison formation, uranium: Dodd, P. H.
- Roll ore bodies, uranium-vanadium, origin: Shawe, D. R., 1.
- Shinarump and Chinle formations, uranium: Isachsen, Y. W., 1.
- Shoreline sandstones, uranium: Carithers, L. W.
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- El Salvador, El Dorado mine, gold: Dürr, F., 4.
- Metapán area, metallic mineral veins: Dürr, F., 3.
- Evaluation methods: Swanson, C. O.
- Florida, Alachua County, phosphate pebbles: Pirkle, E. C., Jr., 3.
- Land-pebble phosphate district, uranium: Cathcart, J. B., 1.

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Georgia, kaolin, origin: Kesler, T. L., 2. Stewart and Quitman Counties, Clayton formation, iron: Furcron, A. S., 2.

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## Mineral deposits—Continued

## Mexico—Continued

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Calera mining district, Chihuahua, copper-lead-zinc, origin: Jacob, L., Jr.

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Fresnillo district, Zacatecas: Stone, J. B.

Frisco mine, Chihuahua, veins: Koch, G. S., Jr., 3.

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## Mineral deposits—Continued

## Mexico—Continued

- Talamantes district, Chihuahua, manganese: Wilson, I. F., 7.
- Taxco district, Guerrero, silver-lead-zinc: Osborne, T. C.
- Terrenates region, Chihuahua, manganese: Jiménez V., S.
- Topia district, silver-lead-zinc, origin: Lemish, J., 1.
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- Zimapán district, Hidalgo, silver-lead-zinc, origin: Simons, F. S.
- Michigan, northern, uranium, origin: Vickers, R. C., 3.
- Minnesota, Auburn mine, iron: Holway, W.
- Ely area, copper-nickel: Anderson, Gerald E.
- Ely district, iron: Reid, I. L., 2.
- Hull-Rust-Mahoning mine, iron: Plummer, W. L., 2.
- Judson mine, Cretaceous, iron: Everett, J. V.
- Mesabi range, iron, origin: Gruner, J. W., 2.
- Iron enrichment: Stephenson, T. E.
- Monroe-Tener mine, iron: Plummer, W. L., 1.
- Soudan mine, iron: Klinger, F. L.
- Iron replacement and alteration, origin: Schwartz, G. M., 1.
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- Molybdenum, origin: Sales, R. H.
- Hardin district, bentonite: Knechtel, M. M., 1.
- Iron, types and occurrence: DeMunck, V. C., 2.
- Mineral County, metallic: Wallace, R. E., 2.
- Pryor Mtn. area, uranium: Hauptman, C. M.
- Uranium: Sahinen, U. M., 4.
- Western, geochemical prospecting by soil analyses: Robertson, F. S., 1.

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- Gabbs area, magnesite: Martin, C., 1.
- Magnesite and brucite: Vitaliano, C. J.
- Ivanpah quadrangle, Laramide origin: Hewett, D. F., 1.
- Kings River area, uranium: Sharp, B. J.
- Paradise Range, magnesite, origin: Martin, C., 2.
- Virginia City quadrangle: Thompson, G. A.
- New Brunswick, Bathurst area, sulfides, origin: Holyk, W. K.
- Pyrrhotite, origin: Houston, R. S., 3.
- New Jersey, Franklin-Sterling area, zinc: Hague, J. M.
- New Mexico, Ambrosia Lake area, uranium, origin: Ealy, G. K.; Gabelman, J. W., 4.
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- Gallup-Laguna area, Morrison sandstone, uranium, guides: Hilpert, L. S.
- Luis Lopez district, manganese: Miesch, A. T.
- Manganese, origin: Jicha, H. L., Jr., 1.
- Navajo-Hopi Reservations, uranium in diatremes: Shoemaker, E. M., 1.
- Prince mine, uraniferous magnetite-hematite, origin: Walker, G. W., 3.
- Questa mine area, molybdenum: Schilling, J. H., 1.
- Radioactive minerals: Lovering, T. G.
- "Red Bed" copper: Soulé, J. H.
- San Juan Basin, Dakota black shales and sandstone lenses, uranium, origin: Gabelman, J. W., 2.
- Zuni-Mt. Taylor area, structural control, uranium: Gabelman, J. W., 6.
- New York, Brewster district, magnetite, origin: Prucha, J. J., 1.
- Cortlandt area, spinel-emery, origin: Friedman, G. M., 1.
- Lake Sanford district, titaniferous magnetite, origin: Gillson, J. L., 1.
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- St. Lawrence and Jefferson Counties, pyrite, origin: Prucha, J. J., 2.
- Newfoundland, Buchans-Notre Dame area, base metals: Baird, D. M., 2.
- Exploration and possibilities: Corlett, A. V.
- Nicaragua: Zoppis de Sena, R.



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- North Carolina, tin-spodumene belt, lithium: Broadhurst, S. D.
- North Dakota, southwestern, uranium: Bergstrom, J. R.
- Northwest Territories, metallic prospects: McGlynn, J. C.
- Port Radium, Great Bear Lake area, pitchblende: Donald, K. G.
- Ross Lake area, pegmatites, rare-element: Hutchinson, R. W.
- Yellowknife area, gold, geochemistry and origin: Boyle, R. W., 3.
- Oklahoma, western, Permian red beds, uranium: Beroni, E. P.
- Ontario, Algoma district, uranium: Joubin, F. R., 1, 2.
- Bicroft mines pegmatite dikes, uranium: Kelly, L.
- Dungannon and Mayo Townships: Hewitt, D. F., 1.
- Faraday Township, carbonate lens in Grenville paragneiss, origin: Giblin, P. E.
- Gowganda area, Miller Lake portion, silver-cobalt, origin: Moore, E. S.
- Hardy mine, Sudbury district, nickel-copper: Mitchell, G. P.
- Kenora area, base metals: Carlson, H. D.
- Montreal River area, uranium: Nuffield, E. W.
- Northwestern, lithium: Pye, E. G.
- Steep Rock Lake, iron ores, origin: Jolliffe, A. W., 1.
- Sudbury basin, Falconbridge ore body: Lochhead, D. R.
- Ore, modern definition: Brown, B. W., 1.
- Ore bodies, long dimension, determination: Clark, A. R.
- Oregon, John Day area, chromite: Hundhausen, R. J., 2.
- Salem Hills, ferruginous bauxite: Corcoran, R. E., 1.
- Origin, chemistry: Holland, H. D., 4.
- Relation to geosynclines: Wells, F. G., 2.
- Review: Mutch, A. D.
- Pegmatites, radioactive: Heinrich, E. W., 2.
- Phosphates, types, uraniferous: McKelvey, V. E., 2.
- Precambrian banded iron ores, origin: Alexandrov, E. A.
- Quebec, Chibougamau area, metallic, types: Graham, R. B., 2.
- Copper Mtn. and Needle Mtn., Gaspé Peninsula, copper: Bell, A. M.
- Descriptions of properties: Bourret, P. E.
- Montauban-les-Mines area, lead-zinc: Smith, J. R., 1.
- Mt. Wright area, taconite, magnetite-specularite relations: Douglas, G. V., 1.

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- Quebec—Continued
- Obalski Township, metallic, origin: Graham, R. B., 1.
- Potton Township, talc: Morgan, J. H.
- Radioactive minerals, world: Nininger, R. D., 1.
- Research: U. S. Natl. Sci. Found.
- Rhode Island, exclusive of clay, sand, gravel, and peat: Pearre, N. C.
- Rock-alteration effects, uranium: Kerr, P. F., 1.
- Sampling design and grade estimation: Jewett, G. A.
- Saskatchewan, Beaverlodge area, uranium: Macdonald, B. C., 2.
- Gunnar "A" ore body, Lake Athabasca region, uranium: Jolliffe, A. W., 2.
- Hanson Lake area, sulfides: Clark, L. A.
- Stony Rapids area, Athabasca sandstone, uranium: Kermeen, J. S.
- South Carolina, kaolin, origin: Kesler, T. L., 2.
- South Dakota, Black Hills, gold, age: Kulp, J. L., 5.
- Black Hills, uranium: King, J. W., 2; Schnabel, R. W.
- Uranium, controls: Bell, H., 3d.
- Uranium in sandstone, carbonate-cementation relation: Gott, G. B., 1.
- Harding County, uranium in lignites, origin: King, J. W., 1.
- Syngenetic and epigenetic, distinction: Douglas, G. V., 2.
- Texas, Blanco-Burnet-Gillespie Counties, lead-zinc: Barnes, V. E., 4.
- Gulf Coastal Plain, uranium: Steinhäuser, S. R.
- Hueco Mts. area, uranium: Eargle, D. H.
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- Manganese, types and origin: Hewett, D. F., 2.
- Pacific Northwest, ceramic materials: Kelly, H. J., 1.
- Phosphate, types, distribution, origin: McKelvey, V. E., 1.
- Southeastern, monazite: Overstreet, W. C., 1.
- Terrestrial sedimentary rocks, uranium, except Colorado Plateau: Finch, W. I.
- Thorium: Twenhofel, W. S.
- Uranium: U. S. G. S.
- Types and distribution: Butler, A. P., Jr.
- Uranium and thorium: Page, L. R., 1.

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- Uranium-bearing veins, origin: Everhart, D. L., 1.
- Uranium in limestone: Gabelman, J. W., 1.
- Western, asphalt-bearing rocks, uranium: Hail, W. J., Jr., 1.
- Fluorite, origin: Peters, W. C.
- Mercury, petrographic and mineralogical studies: Dickson, F. W., 1.
- Uranium, black ores, comparison, New Mexico-Utah-Wyoming, paragenesis: Gruner, J. W., 1.
- Diverse types, hypotheses of origin: McKelvey, V. E., 4.
- Origin, multiple migration-accretion theory: Gruner, J. W., 4.
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- Dry Mtn., metallic, origin: Demars, L. C.
- Lisbon Valley anticline, uranium, origin: Lekas, M. A.
- Marysville area, pitchblende and secondary uranium: Walker, G. W., 1.
- Uranium: Sharp, B. J.
- Mi Vida mine, uranium, origin: Gross, E. B.
- Navajo-Hopi Reservations, uranium in diatremes: Shoemaker, E. M., 1.
- Nokai dome area, uranium, origin: Grandbouche, G. R.
- Park City district, sulfides: Kildale, M. B.
- Rainy Day, uranium: Davidson, E. S.
- San Rafael River district, uranium: Clark, E. L., 2.
- Scranton mine area, lead-zinc: Renzetti, B. L.
- Sunnyside area, bituminous sandstone: Holmes, C. N., 2.
- Temple Mtn. area, uranium, relation to collapse features: Keys, W. S.
- Thomas Range, uranium in fluorite: Staatz, M. H.
- White Canyon area, uranium: Trites, A. F., Jr., 1.
- Virginia, copper-lead-zinc, sulfide ores: Young, Robert S., 1.
- Shenandoah Valley, Timberville area, lead-zinc sulfides: Herbert, P., Jr.
- Washington, metallic: Huntting, M. T.
- Spokane Indian Reservation, uranium: Thurlow, E. E., 1.
- Wisconsin, southwestern, geochemical investigations, lead-zinc: Kennedy, V. C.

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- Wyoming, Black Hills, uranium: King, J. W., 2.
- Crooks Gap area, uranium: Whalen, J. F.
- Lost Creek, schroëckingerite: Wyant, D. G.
- Pumpkin Buttes area, uranium: Sharp, W. N.
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- Yukon, base metals, exploration: Chisholm, E. O.
- Keno Hill-Sourdough Hill area, silver-lead-zinc: Boyle, R. W., 2.
- Zinc, silicates and oxide, origin: Roy, D. M., 1.
- Mineral descriptions. *See also* Mineralogy.
- Abernathyite, Utah, new: Thompson, M. E., 1.
- Actinolite, Missouri: Allen, V. T., 2.
- Allevardite, double-layer mica: Brindley, G. W., 2.
- Alunite, Texas: Renfro, R. F.
- Ammonioborate: Clark, J. R., 2.
- Andalusite, Georgia: Hurst, V. J., 2.
- Bakerite, California: Kramer, H.
- Bastnaesite, Rhode Island: Smith, W. Lee, 1.
- Beyrichite, discredited species: Milton, C.
- Bøggildite, Greenland: Pauly, H.
- Boltwoodite, Utah: Frondel, C., 6.
- Brushite, Virginia: Murray, J. W.
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- Cerite, California: Glass, J. J.
- Chalcedony: Pelto, C. R.
- Chevkinite, New Hampshire: Jaffe, H. W., 1.
- Clarkeite: Frondel, C., 3.
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- Coffinite, new: Stieff, L. R., 2.
- Cordierite, Colorado, porphyroblasts: Travis, R. B.
- Dickite, crystal structure: Newnham, R. E.
- Duttonite, Colorado: Thompson, M. E., 3.
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- Eucolite, Wisconsin: Stobbe, H. R.
- Gerstleyite, California: Frondel, C., 7.
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 292, Dana Lake area: Canada G. S., 5.  
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1.  
Nautiloid, Beaver Bend limestone :  
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Crane, M. J.  
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 Idaho, fusulinids, Sublett Range :  
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 land, H. A.  
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- Mid-Pacific Mts. guyots, paleontology, rocks, geomorphology: Hamilton, E. L., 1.
- Radioelements, transport and deposition: Holland, H. D., 1.
- Radium and ionium removal from oceans: Holland, H. D., 2.
- Research, Lamont Geological Observatory: Ewing, W. M., 2.
- Unda environment: Gabriel, V. G.
- West Indies: Butterlin, J. A.
- Subsidence. *See also* Changes of level.
- California, central, ground-water withdrawal: Poland, J. F., 2.
- Tulare-Wasco area and Los Banos-Kettleman City area: Poland, J. F., 3.
- Gulf Coastal Plain: Bornhauser, M.
- New Mexico, Canjilon Hill, Bernalillo area, cauldron sink: Mutschler, F. E.
- Texas, Galveston Bay region, Quaternary: Henry, V. J.
- Utah, Temple Mtn. collapse area, deep-core rock alteration: Keys, W. S.
- Sulfides.
- Base-metal, uranium concentration, exploration tool: Wright, H. D.
- British Columbia, Pacific Nickel mines, origin: Aho, A. E.
- Hydrothermal, isotopic variation, crustal origin: Kulp, J. L., 7.
- Illinois, Coal Measures: McClure, S. M.
- New Brunswick, Bathurst area: Holyk, W. K.

## Sulfides—Continued

- Quebec, Chibougamau area: Graham, R. B., 2.  
 Pegma Lake area, New Quebec, mineralization: Gleeson, C. F.  
 Sulfur isotope abundances: Kulp, J. L., 3.  
 Virginia, Shenandoah Valley, Timberville area: Herbert, P., Jr.

## Sulfur.

- Gulf Coastal Plain, salt-dome cap rock: Boissevain, H.  
 Salt-dome exploration: Eby, J. B.  
 Isotopes, origin of ore-forming fluids: Kulp, J. L., 6.  
 Isotopic abundances, galenas, Mississippi Valley: Kulp, J. L., 2.  
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 Louisiana, salt domes, biological origin: Jones, G. E.  
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 Virginia, Fluvanna County, in galena molds in quartz: Dietrich, R. V., 4.

## Surveys.

- New Jersey, Engineering Soil Survey, methods: Rogers, F. C.  
 Ohio Geological Survey, stratigraphic sections, filing: Brant, Russell A., 2.  
 State geological surveys, highway engineering: Singewald, J. T., Jr., 1.  
 Terrestrial Magnetism Department, Carnegie Institute of Washington: Scott, W. E.  
 U. S. Geological Survey, Geochemical Exploration Section: Lovering, T. S., 1.  
 Geophysical exploration: Balsley, J. R., Jr., 2.  
 Photogeology: Ray, R. G., 5.  
 Photogrammetric training course for geologists: Landen, D.  
 Reports and maps in open file: Wilmoth, B. M., Jr.

## Symposiums.

- Cambrian: Rodgers, J., 1, 2.  
 Canada, ocean floors: Canadian Comm. Oceanography.  
 Clays and clay minerals, conference: Swineford, A., 1.  
 Finding ancient shorelines: Hough, J. L., 1.  
 Geology applied to highway engineering: Johns Hopkins Univ. Dept. Civil Eng.; N. C. State Coll.  
 Grenville problem, Canada—United States: Thomson, J. E.  
 Manganese, general: González Reyna, J., 1.  
 North America: González Reyna, J., 2.  
 Mineralogy teaching: Montgomery, A., 2.  
 Natural gas in Texas: Texas Petroleum Research Comm.

## Symposiums—Continued

- Nebraska, oil and gas fields: Finch, W. C.  
 Nuclear processes in geologic settings: Natl. Research Council Comm. Nuclear Sci.  
 Oil and gas: Guzmán Jiménez, E. J., 1.  
 Oklahoma, southern, petroleum geology: Ardmore Geol. Soc., 2.  
 Rock mechanics: Colo. School Mines Dept. Min. Eng.  
 Rocky Mts., tectonics: Am. Assoc. Petroleum Geologists Rocky Mtn. Sec.  
 Texas, Fort Worth basin: Soc. Econ. Paleontologists and Mineralogists, Permian Basin Sec.  
 Uranium and thorium, international conference: Page, L. R., 1; United Nations.  
 Williston basin: N. Dak. Geol. Soc.  
 Synclines.  
 Ontario, Clare River syncline, Precambrian: Ambrose, J. W.  
 Vermont, Bennington area: MacFadyen, J. A., Jr.  
 Synthetic minerals. *See* Artificial minerals.  
 Systems.  
 Anorthite-akermanite: de Wÿs, E. C., 1.  
 $\text{BaTiO}_3\text{-SiO}_2$ : Rase, D. E.  
 $\text{CaCO}_3\text{-FeCO}_3$ , subsolidus phase relations: Rosenberg P. E.  
 Calcite-aragonite, transformation by grinding: Burns, J. H.  
 Calcium-uranyl-phosphate-water: Ross, V. F.  
 $\text{CaO-Al}_2\text{O}_3\text{-H}_2\text{O}$ : Majumdar, A. J., 1.  
 $\text{CaO-Cr}_2\text{O}_3\text{-SiO}_2$ : Glasser, F. P.  
 $\text{CaO-MgO-SiO}_2\text{-CO}_2$ : Harker, R. I., 1, 2.  
 $\text{CaO-MgO-SiO}_2\text{-H}_2\text{O}$ , metamorphic minerals: Weeks, W. F., 2.  
 $\text{CaO-SiO}_2\text{-H}_2\text{O}$ : Roy, D. M., 2.  
 Diopside-anorthite-akermanite: de Wÿs, E. C., 2.  
 $\text{HgS-Na}_2\text{S-H}_2\text{O}$ : Dickson, F. W., 1.  
 $\text{HgS-Na}_2\text{S-Na}_2\text{O-H}_2\text{O}$ : Dickson, F. W., 1.  
 Iron oxide- $\text{Al}_2\text{O}_3$ : Muan, A., 2.  
 Iron oxide- $\text{Al}_2\text{O}_3\text{-SiO}_2$ : Muan, A., 3.  
 Lead-uranyl-phosphate-water: Ross, V. F.  
 $\text{Li}_2\text{O-MgO-Al}_2\text{O}_3\text{-SiO}_2$ : Prokopowicz, T. I.  
 $\text{MgO-FeO-Fe}_2\text{O}_3\text{-SiO}_2$ : Muan, A., 1.  
 $\text{MgO-SiO}_2\text{-H}_2\text{O}$ , in magmas: Bennington, K. O.  
 $\text{Mg}_2\text{SiO}_4\text{-Mg}_2\text{GeO}_4$ : Dachtler, F.; Ringwood, A. E., 2.  
 Mn-O-OH: Klingsberg, C.  
 $\text{Na}_2\text{O-Al}_2\text{O}_3\text{-SiO}_2$ : Schairer, J. F.  
 $\text{Na}_2\text{O-Nb}_2\text{O}_5$ : Shafer, M. W.  
 Pyrrhotite-pyrite, subsolidus relations: Arnold, R. G.  
 Silica-structure phases: Shafer, E. C.  
 Thermodynamic problems: Yoder, H. S., Jr., 1.

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- Tholeiite basalt-water: Yoder, H. S., Jr., 2.  
 ZnO-SiO<sub>2</sub>-H<sub>2</sub>O: Roy, D. M., 1.
- Talc.  
 California: Calif. Dept. Nat. Res. Div. Mines, 10.  
 Ceramic: Stafford, R.  
 Magmatic differentiation, relation to structure: Bennington, K. O.  
 Montana, ceramic: Stafford, R.  
 Quebec, Pottou Township: Morgan, J. H.
- Taxonomy, procedure: Schenk, E. T.

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## Apparatus.

- Bays earth-resistivity instrument: Stoley, A. K.  
 Chevenard Thermobalance, modified control: Woodroffe, H. M.  
 Continuous dipmeter: Prescott, B. O.  
 Coring rig for lake-bottom samples: Murray, R. C., 2.  
 Creep measurement in igneous rocks, torsion device: Lomnitz, C., 1.  
 Deep-sea camera: Shipek, C. J.  
 Deep-sea piston corer, modified Kullenberg: Ericson, D. B., 1.  
 Durimet microhardness tester: Nakhla, F. M.  
 Electromagnetic exploration equipment: Heinrichs, W. E., Jr.  
 Glacier exploration, crevasse detector: Cook, J. C.  
 Graphical template, dip determination, aerial vertical photographs: Threet, R. L., 2.  
 Gyrotory vibrating sieve: Cummings, R. H., 3.  
 Hand auger for boring sediments: Morgan, J. P.  
 High pressure and temperature experiments: Griggs, D. T.  
 Hydrothermal experiment on sediment grains: Cameron, R. A.  
 Hydrothermal investigations: Roy, R., 1.  
 Mass spectrometer for potassium-argon dating: Reynolds, J. H.  
 Micro-research-card library: Chronic, B. J., Jr.  
 Mineral heats of solution, calorimetric determination: Moore, T. H.  
 Nuclear magnetometer, airborne adaptation: Packard, M. E.  
 Nuclear precession magnetometer: Hunter, K. E.  
 Photogrammetric: Ray, R. G., 3.  
 Piston coring device, manual, shallow-water use: Ginsburg, R. N., 1.  
 Porosity volumeter, incoherent sands: Ludwick, J. C., 1.  
 Radioactivity detection, instrumentation: Milmo, J. O.  
 Radioactivity measurement in field: Stead, F. W.  
 Ramsonde, glacial-firn density investigations: Bull, C. B. B., 2.

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## Apparatus—Continued

- Sample holder for clay minerals, Norelco rotating-specimen device: McAtee, J. L., Jr., 2.  
 Sand analysis, multiple-cone sample splitter: Kellagher, R. C.  
 Silicate-rock analysis, rapid: Shapiro, L.  
 Spectrographic laboratory, truck-mounted for geochemical exploration: Myers, A. T.  
 Stereoscope, pocket-size, to accept prescription lenses: Lattman, L. H.  
 Turbiditymeter, suspended solids in sea water, measurement: Bradley, J. S., 1.  
 Uranium exploration, popular: Dake, H. C., 2.  
 Worden gravimeter: Heiskanen, W. A., 1.  
 X-ray patterns, high hydrostatic pressure: Jamieson, J. C.

## Geochemical.

- Analysis, systems HgS-Na<sub>2</sub>S-H<sub>2</sub>O and HgS-Na<sub>2</sub>S-Na<sub>2</sub>O-H<sub>2</sub>O: Dickson, F. W., 1.  
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 Bismuth, trace determination, colorimetric: Ward, F. N.  
 Black shale sampling, statistical analysis of radioactivity: Krumbain, W. C., 2.  
 Carbonaceous rocks, separation of organic matter, colloidal method: Deul M., 2.  
 Carbonate-content determination, deep-sea cores, rapid: Turekian, K. K., 1.  
 Copper, traces in leached outcrops, rubenic acid spot test: Sawyer, G. L.  
 Dispersion patterns, detection: Douglass, W. B., Jr.  
 Flame photometric, Li, Rb, Cs in silicate rocks: Horstman, E. L., 1.  
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 Hydrothermal investigations: Roy, R., 1.  
 Hydrothermal synthesis, dolomite and protodolomite: Graf, D. L.  
 Lead isolation and isotopic analysis, meteorites and rocks: Edwards, G.  
 Lead-zinc exploration, Wisconsin, southwestern: Kennedy, V. C.  
 Nickel in sea water, marine organisms, and sediments, analysis: Laevastu, T.



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*Geochemical—Continued*

- Phase equilibrium, preparation of mixtures: Roy, R., 3.
- Potassium-argon dating, argon loss during sample crushing: Stevens, J. R.
- Prospecting, field recovery of reagents: Mukherjee, N. R.
- Radiometric measurement, gamma-ray scintillation spectrometer, uranium and thorium: Hurley, P. M., 2.
- Rock and soil analysis, mobile spectrographic laboratory: Myers, A. T.
- Silicate-rock analysis, rapid: Shapiro, L.
- Soil analyses in prospecting: Robertson, F. S., 1.
- Soils in prospecting: Warren, H. V., 2.
- Spectrochemical analysis, silicate and carbonate rocks and iron ores: Hawley, J. E., 3.
- Spectrographic, hafnium-zirconium ratio in zircon: Waring, C. L., 2.
- Silica in rocks, germanium standard: Anthony, J. William.
- Spectrophotometric, thorium in monazite: Grimaldi, F. S., 2.
- Trace elements in limestone and dolomite, sampling problems: Lamar, J. E., 2.
- U. S. Geological Survey, exploration: Lovering, T. S., 1.
- Uranium prospecting: Denson, M. E., Jr.; Lovering, T. S., 2.
- Botanical, Colorado Plateau: Cannon, H. L., 1.
- Water analyses in zinc prospecting, eastern Tennessee: Bloss, F. D.
- X-ray emission spectrography, geologic materials: Webber, G. R., 2.
- Geologic-age determination.*
- Chondrites, rubidium-strontium analysis: Herzog, L. F., 2d, 2.
- Discrepancies, skeptic's view: Hunt, C. B., 3.
- Lead-alpha method, accessory minerals: Gottfried, D., 2.
- Lepidolites,  $\text{Sr}^{87}/\text{Rb}^{87}$  determinations, methods compared: Aldrich, L. T., 4.
- Meteorites,  $\text{Rb}^{87}\text{-Sr}^{87}$  method: Schumacher, E.
- Meteorites and earth, methods: Patterson, C. C., 1.
- Methods, important, evaluation: Patterson, C. C., 2.
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- Potassium-argon method: Carr, D. R.; Reynolds, J. H.
- Cordilleran orogenies, igneous cf. sedimentary minerals: Beveridge, A. J.

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*Geologic-age determination—Continued*

- Radioactive: Aldrich, L. T., 1.
- Pegmatite and granite minerals, validity: Aldrich, L. T., 2.
- Radioactive methods: Ahrens, L. H., 3.
- Geologic and biologic: Hahn, O.
- Radiocarbon method, applications: Suess, H. E., 3.
- Evaluation: Broecker, W. S., 1.
- Uranium minerals, lead-210 method: Hogg, J. E.
- Uranium ores, lead-uranium and lead-lead discrepancies: Stieff, L. R., 1.
- Zircon, radiation damage: Holland, H. D., 3.
- Zircon-lead ratios, granites, eastern Massachusetts: Webber, G. R., 1.
- Geophysical.*
- Aerial radioactivity surveys: Kellogg, W. C.
- Aeromagnetic, nuclear precession magnetometer: Hunter, K. E.
- Aeromagnetic interpretation, 3-dimensional structures, model studies: Zietz, I., 1.
- Aeromagnetic surveys, geological interpretation: Affleck, J.
- Airborne gamma-ray spectrometer, energy levels: Lundberg, H. T. F.
- Black shale sampling, statistical analysis of radioactivity: Krumbain, W. C., 2.
- Data correlation, geological and geophysical: Skeels, D. C.
- Earth-resistivity mapping, graphical scales: Roman, I.
- Earth-resistivity measurements, Iowa: Dixon, Howard R.
- Earth-resistivity test, highway engineering: Mobley, A. B.
- Electrical resistivity, Bays instrument, use in glacial outwash: Stoley, A. K.
- Depth determination: Mooney, H. M., 1.
- Electromagnetic surveys, airborne: Anonymous, 3.
- Equilibrium studies of earth's crust, apparatus: Griggs, D. T.
- Exploration: Read, V.
- Developments: Dobrin, M. B.
- Limestone reefs: Agnich, F. J.
- Fault depth, determination by magnetic-field intensity: Nuttli, O. W., 1.
- Glacier exploration, crevasse detector: Cook, J. C.
- Gravitational interpretation, subsurface: Ball, G. M.
- Gravity data, surface-density variations, Bouguer corrections: Vajk, R.
- Gravity effect in orogenesis, model studies: Bucher, W. H., 2.
- Gravity methods, iron prospecting: Chapman, R. H.

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*Geophysical—Continued*

- Gravity surveys, oil and gas traps: Pohly, R. A., 2.
- Ground-water hydrology, subsurface methods: Jones, P. H., 1.
- Ground-water prospecting, induced electrical polarization: Vacquier, V.
- Heat conductivity, sedimentary rocks, cores: Zierfuss, H.
- Heat-flow measurement, ocean floor: Bullard, E. C.
- Icecap measurements, Greenland: Bourgoin, J.-P.
- Inductive electromagnetic method, iron exploration: Ward, S. H.
- Magnetic gradiometer, airborne, uses: Glicken, M.
- Methods: Hopkins, H. R., 1.
- Near-surface velocities, load factor: Baillie, W.
- Nuclear magnetometer, airborne adaptation: Packard, M. E.
- Polarization phenomena of water-bearing rocks, electrical transients: Keller, G. V.
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- Stream gravels: Chew, R. T., 3d, 1.
- Refraction seismograph, Alberta foothills, Mississippian faults: Blundun, G. J.
- Resistivity, cyclothemetic sediments: McCullough, E. J., Jr.
- Resistivity data, variable surface layer effect: Mooney, H. M., 2.
- Resistivity prospecting, tri-potential method: Carpenter, E. W.
- Sediments, acoustic-properties measurements, resonant chamber method: Shumway, G. A.
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- Seismic prospecting, shear waves: Jolly R. N.
- Seismic surveying, California, Yosemite Valley floor: Gutenberg, B., 3.
- Weight-drop method: Waldie, A. D.
- Seismic velocity, geophysical and geological data, coordination: Hale, J. D.
- Seismic-magnetic data processing: Dunlap, R. C., Jr., 2.
- Seismograph correlation, Texas, Permian reef line with basin-type section: Daly, J. W.
- Underwater volcanic acoustics: Snodgrass, J. M.
- U. S. Geological Survey, exploration: Balsley, J. R., Jr., 2.
- Uranium prospecting: Denson, M. E., Jr.
- Colorado Plateau: Black, R. A.
- Velocity log interpretation, formation porosity and fluid content: Denton, E. R.

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*Mapping.*

- Aerial radioactivity surveys: Kellogg, W. C.
- Buried shorelines, compass diagrams of sedimentary features: Tanner, W. F., Jr., 4.
- Dip determination, aerial vertical photographs, graphical template: Threet, R. L., 2.
- Earth resistivity, graphical scales: Roman, I.
- Engineering soil survey, airphoto use: Smith, Preston C.
- New Jersey: Rogers, F. C.
- Photogeologic: Ray, R. G., 3.
- Subsurface structure, mineral-alteration studies: Lasky, B. H.
- Transfer of detail from airphotos to base map: Lovejoy, D. W.

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- Airborne radioactivity surveying, relation to uranium source: Sakakura, A. Y.
- Asbestos: Conn, H. M. K.
- Asphalt-bearing rocks, uranium content: Hail, W. J., Jr., 1.
- Bismuth, trace determination, colorimetric method: Ward, F. N.
- Drill-hole electrical surveys: Swanson, E. A.
- Geochemical, Wisconsin, southwestern, lead-zinc area: Kennedy, V. C.
- Geophysical advances: Dobrin, M. B.
- Geophysical methods: Hopkins, H. R., 1.
- Gravity meter, underground prospecting: Allen, W., Jr.
- Heavy minerals: Overstreet, W. C., 2.
- Induced polarization: Hallof, P. G.
- Iron, boulder-train tracing, Ontario, Steep Rock Lake area: Dreimants, A.
- Gravity methods: Chapman, R. H.
- Inductive electromagnetic: Ward, S. H.
- Lead-zinc, Mississippi Valley, upper, geologic: Agnew, A. F., 1.
- Magnetic gradiometer, airborne: Glicken, M.
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- Ore reserves, evaluation: Swanson, C. O.
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- Reconnaissance, Wisconsin: Vickers, R. C., 2.
- Stream gravels: Chew, R. T., 3d, 1.
- Resistivity, cyclothemetic sediments: McCullough, E. J., Jr.
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*Mineral exploration*—Continued

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 Airborne scintillometer: Rizzi, T. M.  
 Alpha radioactivity in plants: Anderson, R. Y.  
 Arizona, buried channels and related swales: Witkind, I. J., 1.  
 Base-metal sulfide concentration: Wright, H. D.  
 Botanical prospecting, Colorado Plateau: Cannon, H. L., 1.  
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- Brucite-periclase equilibrium: Kennedy, G. C., 1.  
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 Ceramic materials, density determination: Dziemlanowicz, T.  
 Cerium minerals, identification, nonopaque: Murata, K. J.  
 Chlorite species, X-ray identification: Brindley, G. W., 3.  
 Cinnabar-metacinnabar inversion temperature determination: Dickson, F. W., 2.  
 Clay-mineral dehydroxylation, X-ray diffraction: Weiss, E. J., 1.  
 Clay-mineral research: Aukland, M. F.  
 Crystal-structure analysis, Patterson projections, pectolite: Buerger, M. J., 4.  
 Crystal structures, Fourier synthesis: Buerger, M. J., 3.  
 Crystal-system determination, cleavage use: Riley, C. M., 1.  
 Crystallography, X-ray rotation diagram, tilted-axis method: Brindley, G. W., 4.  
 Crystals, transparent, point-group symmetry determination: Davison, J. W.  
 Fluorescent X-ray spectrographic analyses: Salmon, M. L., 2.

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*Mineralogic*—Continued

- Fluorescent X-ray spectroscopy, without internal standard: Claisse, F.  
 High pressure and temperature experiments, apparatus: Griggs, D. T.  
 Hydrofluoric acid, cleaning specimens: Sinkakas, J., 1.  
 Identification, minerals with narrow absorption bands, new method: Bastron, H.  
 Lead in igneous minerals, trace amounts: Maynes, A. D.  
 Magnetite determination in chrysotile: Shell, H. R.  
 Microphotometric scanning of spectrograms: Waring, C. L., 1.  
 Optic-axial angles, determination, stereographic construction: Parker, Robert L.  
 Perovskite-type compounds, classification: Roth, R. S.  
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 Quantitative determination, X-ray diffraction: Hurst, V. J., 1.  
 Single crystal lattice constants, precision determination, Weissenberg camera: Christ, C. L., 1.  
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 Structure analysis, nuclear magnetic resonance: Gutowsky, H. S.  
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 Thin sections, micrometric analysis: Mandarino, J. A.  
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 Continuous dipmeter: Prescott, B. O.  
 Engineering geology, dam-site exploration, recording and presenting data: O'Neill, A. L.  
 Highway location and foundations, tools for soils study: Bickel, J. O.

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*Miscellaneous*—Continued

- Engineering soil survey, New Jersey: Rogers, F. C.
- Facies-map study, regional and local components: Krumbein, W. C., 3.
- Firn density in glaciers, use of Rammsonde: Bull, C. B. B., 2.
- Geological data, integration on seismic sections: Ivanhoe, L. F., Jr.
- Geomorphology, quantitative, dimension space application: Strahler, A. N., 4.
- Glaciers, cirque bergschrund, temperature measurements: Thompson, H. R.
- Ground-water resources, aquifer test: Knowles, D. B., 2.
- Mineragraphic, ferromagnetic minerals: McGirk, L. S., Jr.
- Mineral deposits, sampling design and grade estimation: Jewett, G. A.
- Piston coring device, manual, shallow-water use: Ginsburg, R. N., 1.
- Plastic spray in laboratory and field: Conkin, J. E., 1.
- Sampling methods, beaches, efficiency: Krumbein, W. C., 4.
- Clays and shales: Phillips, J. G., 1.
- Sedimentation environments, trend surface computation: Miller, Robert L., 1.
- Slopes, statistical analysis, point-sampling methods: Strahler, A. N., 2.
- Statistics, two-dimensional orientation variates, vector and arithmetic operations: Pincus, H. J.
- Turbidimeter, suspended solids in sea water, measurement: Bradley, J. S., 1.

*Paleobotanic.*

- Palynological slides, multigrain: Mädlar, K. A.
- Peat, structural-classification systems: Radforth, N. W., 1.
- Pollen study, temporary mounts: Brush, G. S.
- Spores and pollen, separation from siliceous rocks: Norem, W. L., 1.
- Stratigraphy: Radforth, N. W., 2.

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- Barnacles, sessile, identification by figures in shell: Cornwall, I. E.
- Biometrical methods, invertebrate study: Imbrie, J., 1.
- Bone tissues, histological study: Enlow, D. H.
- Conversion of calcite to fluorite: Grayson, J. F.
- Foraminifera revision, textulariid, late Paleozoic: Cummings, R. H., 2.
- Gyratory vibrating sieve: Cummings, R. H., 3.

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*Paleontologic*—Continued

- Microfossils, composite studies, preparation: Wilson, L. R., 2.
- Preparation for photography: Cummings, R. H., 4.
- Staining by food coloring: Artusy, R. L.
- Micropaleontology, methods, summary: Hiltermann, H., 2.
- Ostracodes, Paleozoic, thin-section identification: Levinson, S. A., 2.
- Translucent calcium fluoride replacement: Sohn, I. G., 2.
- Paleotemperatures, oxygen isotopic analyses: Emiliani, C., 2.
- Photography, microfossils: Fournier, G.
- Small fossils: Whittington, H. B., 4.
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- White Canyon area, San Juan County, Shinarump conglomerate: Trites, A. F., Jr., 1.
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