BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY 1929–1939

BY

EMMA MERTINS THOM

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BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY
1929–1939

By EMMA MERTINS THOM

INTRODUCTION

The bibliography of North American geology, including paleontology, petrology, and mineralogy, for the years 1929–1939, lists publications on the geology of the Continent of North America and adjacent islands and on Panama, the Hawaiian Islands, and the Island of Guam. It includes textbooks and papers of a general character by American authors, but not papers by foreign authors, except those that appear in American publications.

The papers, with full title and medium of publication, are listed under the names of their authors, which are arranged in alphabetic order. The author list is followed by an index to the literature cited.

The bibliography of North American geology to the end of 1928 is contained in the following bulletins of the United States Geological Survey: 746 and 747 (1785–1918) and 823 (1919–28), by John M. Nickles. In this volume have been cumulated Bulletins 834 (1929–30) and 858 (1931–32), by John M. Nickles, and 869 (1933–34) and 892 (1935–36), by Emma Mertins Thom.

The bibliography for 1937, 1938, and 1939, which is included in the present bulletin, will not be published separately.

For valued help in preparing the matter for the press, the compiler is indebted to Miss Helen M. Duncan and Miss Barbara P. Gordon.
## ABBREVIATIONS

<p>| A. A. S. | American Association for the Advancement of Science |
| A. I. M. E. | American Institute of Mining and Metallurgical Engineers |
| Aardrijkskundig | Aardrijkskundig |
| aarg | aargang |
| Abh | Abhandlung |
| Abt | Abteilung |
| Acad | Academy, etc. |
| Accad | Accademia |
| Adm | Administration |
| ads | advertisements |
| Adv | Advancement |
| AfD | Afdeeling, Afdeling |
| AfV | Aflevering |
| Agr | Agricultural, Agriculture |
| Akad | Akademie |
| allg | allgemeine |
| Am | American |
| Anal | Analytic, etc. |
| angew | angewandte |
| Ann | Annual |
| anorg | anorganisch, etc. |
| Anthropol | Anthropological, etc. |
| Anz | Anzeiger |
| App | Appendix |
| appl | applique |
| approx | approximately |
| Arb | Arbeiten |
| Årb | Årbok |
| Archeol | Archeological, etc. |
| Årg | Årgång |
| Årsskrift | Årsskrift |
| art | article |
| Assoc | Association |
| Astron | Astronomical, etc. |
| Auth | Authority |
| Av | Avancement |
| Avd | Avdelningen |
| Bd | Board |
| Beitr | Beitrag, etc. |
| Ber | Bericht, etc. |
| Bibl | Bibliographic, etc. |
| Bienn | Biennial |
| Biog | Biographic, etc. |
| Biol | Biologic, etc. |
| Bldg | Building |
| Bol | Boletin, Boletín |
| Boll | Bollettino |
| Bot | Botanic, etc. |
| Br | Branch |
| Bull | Bulletin |
| Bur | Bureau |
| Camb | Cambrian |
| Carb | Carboniferous |
| Cat | Catalog |
| cent | central |
| Centrbl | Centralltatt |
| cf | compare with |
| Chap | Chapter |
| Chem | Chemical, etc. |
| chim | chimique |
| Cienc | Ciencia, Ciencias |
| cient | científica |
| Circ | Circular |
| Cl | Classe |
| classn | classification |
| Co | Company, County |
| Coll | Collections |
| Comm | Committee |
| Commun | Communications |
| Comp | Comparative |
| consol | consolidated |
| Conf | Conference |
| Cong | Congress, etc. |
| conglom | conglomerate |
| Conserv | Conservation |
| Contr | Contributions |
| Coop | Cooperative |
| correl | correlation |
| Coun | Council |
| Cret | Cretaceous |
| Denkschr | Denkschrift |
| Dept | Department, etc. |
| Dev | Devonian |
| develope | development |
| diagr | diagram |
| Direc | Dirección |
| Dissert | Dissertation |
| distrib | distribution |
| Div | division |
| Doc | Doctoral, Document |
| Doc. Dissert | Doctoral Dissertation |
| dol | dolomite |
| E | east |
| Ecol | Ecological, etc. |
| Econ | Economic |
| ed | edition |
| Educ | Education, Educational |
| Elec | Electric, etc. |
| Eng | Engineering, Engineers |
| Entomol | Entomological, etc. |
| equiv | equivalent |</p>
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Foremost, Pakowki, Milk River fms.: Slipper, 1.

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Fairview Dam, Trinity River: Louderback, 4.
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Radioactivity measurements: Engel, 1.
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Clinoptilolite: Bramlett, 2.
Colemanite: Van Amringe, 8.
Collophane: Galliher, 2.
Crestmore area: Daly, J. W., 1; Kelley, V. C., 6.
Currituckite: Wright, F. E., 2.
Darwin silver-lead area: Kelley, 8, 10.
Darwin stock: Kelley, 9.
Diadochite: Rogers, 25.
Diatoms replaced by calcite: Schenck, 8.
Diopside, Crestmore: Merriam, R., 1.
Diorite with garnets: Schurmann, 4.
Dumortierite: Murphy, F. M., 1; Wolff, J. B., 2.
Fluorescent minerals: Melhase, 4, 24.
Fossil pearls: Russell, P. G., 1.
Fuller's earth: Kerr, P. F., 16.
Garnets: Melhase, 7; Pabst, 3; Schurmann, 4.
Gem minerals: Sperisen, 1.
General: Melhase, 8.
Gold, hydrothermal: Schroeter, 1.
Goose Lake meteorite: Leonard, 6, 7, 8; Watson, F. G., Jr., 3.
Heavy minerals, Yosemite: Pabst, 11.
Hedenbergite: Esselink, 1.
Howlite: Van Amringe, 11.
Hilberite: Gianella, 14.
Inyo Co. min. res.: Tucker, W. B., 2.
Iron magnetic sulphide: Wright, R., 2.
Iron titanite: Ladermill, 5.
Jasper: Bell, O. J., 1; Lewis, W. S., 6; Walcott, 4.
Jouquinite: Van Amringe, 7.
Kernite: Calvert, E. L., 2; Schaller, 20.
Krausite: Foshag, 7.
Kunzite: Buranek, 1.
Lapis lazuli: Rogers, 28.
Maghemite and ferric oxides: Newhouse, 14.
Magnetites: Moorhouse, 2.
Martinez white sand: Pullitz, F., 1.
Meteorites: Nininger, 48, 50.
Miargyrite: Marston, 13; Shannon, 2.
Minerals: Goudey, 1; Melhase, 16; Pabst, 8.
Monazite: Dykes, 2.
Montesite: Moehlman, 2; Rogers, 30; Schaller, 19.
Montmorillonite: Ladermill, 6.
Montroydite: Woodhouse, 1.
Mother Lode: Kneip, A., 1.
Museum collections: Symons, 3.
Nagystite: Esselink, 3.
Neptunite: Buttegenbach, 1; Van Amringe, 7.
New York, Providence Mts.: Van Amringe, 10.
Nodules, opal or agate-filled: Renton, 4.
Osidian: Wright, D. G., 1.
Opal: Lewis, W. S., 1; Swartzlow, 8.
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Paragenesis, Crestmore: Daly, J. W., 1.

Pegmatites: Donnelly, 4.

Periclase: Rogers, A. F., 2.

Peridotite minerals: Lewis, W. S., 2.

Phosphorite, sea floor: Dietz, R. S., 2.

Piedmontite: Mayo, 4, 5; Short, A. M., 1; Simonson, 1; Web, 10.

Pleauzite: Pabst, 9.

Plumas Co., min. res.: Averill, 7.

P(PDO): Eakle, 1; Foshag, 6.


Plumias Co., min. res.: Averill, 7.

Pseudomorphs: Murdoch, 2, 3.

Pumpellyte: Irving, J., 1.

Quartz: Kennard, T. G., 2.

Radium, Lassen lavas: Evans, R. D., 1.

Rare-earth min.: Melhase, 9.

Round Valley: Chapman, R. W., 4.

Rubidium, gallium, thallium: Kennard, T. G., 1.

Saline lake deposits: Melhase, 17.

Sanborulite: Bradley, 15; Melhase, 6; Rogers, 7.

San Diego Co., gem min.: Grieger, 2.

San Gabriel Mts.: Oakeshott, 1.

San Marcos gabbro: Miller, F. S., 2.


Schnürerite: Foshag, 5.

Serendibite: Richmond, 1.

Shasta Co.: Averill, 8.

Sodium bicarbonate: Foshag, 18.

Southern Cali.: Murdock, 7.


Spodumene: McIntosh, F. G., 1.

Strategic min.: Merrill, C. W., 2.

Sulphur, native: Raymond, L. C., 1.

Tectopedate Molluscs: Men-lam, C. W., 2.

Thunbergite: Whistler, 1.

Tilleyte: Rogers, 14.

Tonalite: Wilson, R. W., 13.

Tourmaline: Grieger, 3; Irving, E. M., 1; Tompkins, 1.

Ulexite: Murdock, 12.

Ungulans: Fitch, 1.

Umbonium: Vollmer, 1.


Vegetation: Looman, 1; Short, A. M., 2.

Veins: Johnston, W. D., Jr., 14.

Venin-filling: Johnston, W. D., Jr., 14.

Vesuvianite: Pabst, 5.

White Mts.: Kerr, P. F., 7.

Wollastonite: Melhase, 12; Peacock, 10; Woodhouse, 2.

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Atruroidea: Miller, A. H., 1.

Auk: Miller, L. H., 14.

Auroroid: Pabst, 3.

Avifauna: Howard, H., 15; Miller, A. H., 7; Miller, L. H., 15, 3, 17, 18, 21; Wetmore, 13.

Bison: Stock, 65.

Bolvina: Adams, B. C., 2.

Borophagus: VanderHoof, 1.

Brachiopoda: Nomura, 1.

Branta: Miller, L. H., 2.

Brittle-star Im: Mertlam, C. W., 2.

Bulliminia: Cushman, 1.


Campanile: Hanna, 36.

Cancer: Rathbun, 7.

Capay fm.: Mertlam, C. W., 10.

Capromeryx: Frick, 1.

Caracara: Howard, H., 14.

Cardiidae: Keen, 7.

Cardita: Quayle, 4.

Catopsis: Quayle, 4.

Cats, Rancho La Brea: Merriam, J. C., 6, 8.

Cedarville flora: LaMotte, 9.

Cedrus: Barghoorn, 1.

Cephalopoda: Schenck, 5; Vokes, 7.

Cereophillum: Brown, 24.


Cetothere: Kellogg, 3, 8.

Chelonia (?): Gilmore, 19.

Chenodonta: Miller, L. H., 16.

Ciconia: Miller, L. H., 16.

Ctenocephalus: Mertlam, C. W., 10.

Conrad’s Miocene species from “Ocoya” Creek: Clark, A., 4.

Coral: Faustino, 1; Webb, 12.

Cormorant: Fitch, 1.

Corylus: Mason, H. L., 5.

Cosmos: Hinton, 1; Wilson, R. W., 1.

Creodontia: Stock, 35.


Cretaceous Foraminifera: Cushman, 6.


Decapod crustaceans: Rathbun, 2.

Deep borings, Salinas Valley: Dorn, 1.

Dentalium: Greger, 5.

Desmostylus: Hanna, 22; VanderHoof, 11.

Devonian: Stauffer, C. R., 2.

Diatoms: Hanna, G. D., 1, 10, 16, 20, 29, 22-a; Hendy, 1; Laporte, 1; Lohman, K. E., 5; Schenck, 8.
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Dinosaur: Hesse, 11.
Discocyclina: Schenck, 1, 11.
Dolphin: Wilson, L. E., 2.
Dragon fly: Cockreller, 2.
Dysoechyus: Stock, 69.
Eagles, vultures: Howard, H., 5.
Echinoids: Grant, 14.
Echinoidea: Grant, 14.
Elephants, Channel Is.: Stock, 1, 48, 54.
Faunas: Dusenbury, 1; Merriam, C. W., 7; Vokes, 12.
Foraminifera: Cushman, 14, 30; Woodring, 5.
Mammals: Stock, 16, 19.
Santa Ynez Range: Woodring, 5, 10.
Eohaplomys: Stock, 40.
Eomellivora: Stock, 21.
Epitonium: Woodring, 9.
Eporeodon, Sespe: Stock, 36.
Eumysops: Wilson, R. W., 3.
Fagesia, Chico group: Anderson, F. M., 5.
Falcons, Pleist.: Miller, L. H., 4.
Eocene: Dusenbury, 1; Merriam, C. W., 7; Vokes, 12.
McKittrick: Stock, 74, 80.
Marine: Richey, 2.
Markeley fin.: Clark, 27.
Miocene: Richey, 2; Woodring, 18.
Paleocene: White, R. T., 2.
Pleistocene: Willett, 2.
Pliocene: Adams, B., 1; Johnson, F. L., 1.
Redding quad.: Popenoe, 5.
Felidae, Rancho La Brea: Merriam, J. C., 7; Stock, 15.
Fernando group: Pressler, 2; Waterfall, 1.
Fish: David, L. R., 1, 2; Hesse, 16.
Fossils, marine: Woodring, 15.
Fossil marks: Herold, C. L., 1.
Fringillids: Ribble, 1.
Gabb's type lamellibranchs: Stewart, R., 1.
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Moris, Tert.: Compton, 6; Howard, H., 11.

Mycteria, Quat.: Howard, H., 9.

Mytilus loelii: Grant, U. S., IV, 2.

Neptunea: Grant, U. S., IV, 6.


Nothrotherium: Hoodie, 11.

Oligocene Mammalia: Stock, 18.

Operculum: Woodring, 16.

Orbitoids: Nelson, R. N., 2.

Oreodonts: Stock, 5.

Osteoborus: Richey, K. A., 1.

Ostrea: Hertlein, 7; Tieje, 2; Vokes, 2.

Ostracodes: Stock, 5.

Pampas Verdes Hills: Woodring, 17.

Parapavo: Howard, H., 12.

Passerine birds: Miller, A. H., 2, 5.

Peccaries: Colbert, 6.

Petrology.


Analalite diabase: Talaferrro, N. L., 2.
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Andalusite in pegmatites: MacDonald, G. A., 2; Webb, 14.
Anorthosite: Miller, W. J., 4.
Balaklaila chonolith: Seager, 1.
Ben Lomond Mtn.: Fitch, 2.
Bentonite: Kerr, P. F., 4.
Bonsal tonalite: Hurlbut, 2.
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Conglomerates: Simonson, 2.
Cretaceous contact rocks: Dunham, 2.
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Flood gravel: Krumbein, 27.
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Granodiorite melted to obsidian: Larsen, 24.
Hat Creek lava flow: Anderson, C. A., 12.
Heavy minerals: Cogen, 2; Pabst, 11.
Inclusions, dislocated, gold-quartz veins: Farmin, 4; Wiebenga, 1.
Lassen Peak dacites: Williams, H., 7.
Lassen Volcanic Nat. Park: Williams, H., 4.
Lava Beds Nat. Monument: Swartzlow, 5-a.
Lava Beds Nat. Park: Williams, H., 4.
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Haywards fault: Louderback, 12.

Horizontal displacement, San Andreas fault: Wood, H. O., 1.

Hornblender, San Marcos gabbro: Miller, F. S., 3.

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Mt. Whitney: Matthes, 24.

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Buckskin Gulch stock: Singewald, Q. D., 6.
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Cretaceous: Anderson, F. M., 14; Stephenson, 23.

Crypto-volcanic structures, Mid-continent: Bucher, 15.

Cretaceous: Anderson, F. M., 14; Stephenson, 23.

Cryptic structures, mid-continent: Bucher, 15.

Cuban geologists: Parsons, 1, 2; Cook, T. A., 1; Crosby, 9; Denny, 1; Kinnine, 5; Longwell, 25; Lougee, 7; Meinzer, 2; Stewart, L., 1.

Cretaecous: Anderson, F. M., 14; Stephenson, 23.

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Cuba: Corral y Aleman, 3; Lewis, J. W., 1; Ortega y Ros, 1, 2; Rutten, M. G., 4, 6; Thaddeus, 3, 5; Verne, 4.

Curacao, West Indies: Molengraaf, G. J. H., 1-a; Pijpers, 2; Vermunt, 1, 2, 3.

Decorah fm., upper Mississippi Valley: Ball, 13.

Delaware Basin: Bascom, 3; Grimsley, 1; Stephenson, L. W., 6.

Devonian, upper Mississippi Valley: Tester, 14.

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Florida: Berger, P., 1; Boesch, C. E., 1; 2; Cooke, C. W., 1, 2; Falge, 2.

Galena fm., upper Mississippi Valley: Ball, 13.

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Kans. G. S., 1, 2, 3; Landes, K. K.,
1, 3; Moore, R. C., 9, 13, 33, 39;
Moss, 2; Newell 4; Norton, G. H., 2;
Ockermann, 3; Pierce, 4; Wing, 1;
Woodruff, E. R., 1; Anonymous, 61.

Kentucky: Bailey, W. F., 3; Briggs, 1;
Butts, 2; Chappars, 1; Crabb, 1;
Dunn, P. H., 2, 3, 4, 5, 6, 7; Eyl, 1;
Freeman, L., 1; Griffin, 2, 3; Hunt,
C. B., 3; Hunter, 1; Jillson, 4, 19,
81; Kentucky G. S., 1, 2, 6, 7, 10,
11; Mayfleld, 1, 2. 3; Meacham, 1;
Miller, A. M., 1; Miller, R., 1, 2, 3,
4, 5, 6, 7, 8, 9, 10; Roberts, J. K.,
5, 6, 7, 9, 10; Robinson, L. C., 1, 2,
Shideler, 1, 2, 3, 4, 8, 9, 10, 11;
Sutton, 2, 3; Thesis, 1; Thomas,
R. N., 1; Welch, 1; Weller, J. M.,
2; Weller, S., 1, 2; Wesley, 1, 3;
Withyers, F. S., 1, 2, 3; Button,
2; Theis, 1; Thomas,
R. N., 1; Welch, 1; Weller, J. M.,
2; Weller, S., 1, 2; Wesley, 1, 3;
Withyers, F. S., 1, 2, 3; Button,
2; Theis, 1; Thomas,
R. N., 1; Welch, 1; Weller, J. M.,
2; Weller, S., 1, 2; Wesley, 1, 3;
Withyers, F. S., 1, 2, 3; Button,
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R. N., 1; Welch, 1; Weller, J. M.,
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Withyers, F. S., 1, 2, 3; Button,
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R. N., 1; Welch, 1; Weller, J. M.,
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Withyers, F. S., 1, 2, 3; Button,
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R. N., 1; Welch, 1; Weller, J. M.,
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Withyers, F. S., 1, 2, 3; Button,
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Withyers, F. S., 1, 2, 3; Button,
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R. N., 1; Welch, 1; Weller, J. M.,
2; Weller, S., 1, 2; Wesley, 1, 3;
Withyers, F. S., 1, 2, 3; Button,
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R. N., 1; Welch, 1; Weller, J. M.,
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Withyers, F. S., 1, 2, 3; Button,
2; Theis, 1; Thomas,
R. N., 1; Welch, 1; Weller, J. M.,
2; Weller, S., 1, 2; Wesley, 1, 3;
Withyers, F. S., 1, 2, 3; Button,
2; Theis, 1; Thomas,
R. N., 1; Welch, 1; Weller, J. M.,
2; Weller, S., 1, 2; Wesley, 1, 3;
Withyers, F. S., 1, 2, 3; Button,
2; Theis, 1; Thomas,
R. N., 1; Welch, 1; Weller, J. M.,
2; Weller, S., 1, 2; Wesley, 1, 3;
Withyers, F. S., 1, 2, 3; Button,
2; Theis, 1; Thomas,
R. N., 1; Welch, 1; Weller, J. M.,
2; Weller, S., 1, 2; Wesley, 1, 3;
Withyers, F. S., 1, 2, 3; Button,
2; Theis, 1; Thomas,
R. N., 1; Welch, 1; Weller, J. M.,
2; Weller, S., 1, 2; Wesley, 1, 3;
Withyers, F. S., 1, 2, 3; Button,
2; Theis, 1; Thomas,
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New Brunswick: Alcock, 18; Caley, 2; Canada, G., 8.; Hayes, 7; Norman, 2; Shaw, E. W., 1; Wright, W. J., 3.

New England: Bryan, 28, 34; Chapman, V. J., 1; Longwell, 14; Wheeler, G., 1.

Newfoundland: Bain, 18; Betz, 1; Buddington, 18; Cooper, J. R., 1, 2; Benson, 1; Foley, F. C., 1; George, P. W., 2; Hayes, A. O., 3, 6, 8; Heyl, 1, 2; Jewell, 2; Ingersoll, 2; Snelgrove, 5, 8; Vbay, 1.

New Hampshire: Billings, 8, 9, 10, 13; Chamberlain, R. V., 1; Chapman, C. A., 1; Chapman, R. W., 1; Fowler-Lunn, 1; Hadley, J. B., 1; Quinn, 8; White, G. W., 13; Williams, C. R., 2.

New Jersey: Berkey, 12; Chrltcblow, 1; Grimsley, 1; Lasky, 6; Lewis, J. V., 2; Palache, 2; Renick, 3; Thompson, D. G., 9; Winchester, 1.

New Mexico: Blanchard, W. G., Jr., 1; Bryan, 31, 35; Cabot, F. S., 1; Dane, 8; Dunham, 3, 4, 5, 7; Bills, R. W., 6; Fiedler, 2; Harley, 1; Hunt, C. B., 2; Hunt, W. F., 2; Just, 3; Kansas G. Soc., 7; Keyes, 290; Lasky, 10, 11, 12, 14, 15; McCann, 1; Miller, J. C., 2; Morgan, A. M., 1; Paige, 1; Random, 3; Robinson, T. W., Jr., 6; Schmitt, 10; Sears, J. D., 3; Spencer, A. C., 1; Stock, 55; Stott, C. E., 1; Vanderwilt, 12; Waring, 3; Williams, H., 11; Winchester, 3, 5.

New York: Balk, 5, 11; Barth, 14; Berkey, 19; Bradley, 18, 19; Brigham, A. P., 1; Brown, J. S., 2; Buddington, 8, 11, 17, 23; Butler, C. B., 7, 20; Cannon, R. S., 1; Cole, 14; Colony, 1; Dave, N. C., 2, 5; Denny, 2; Goldring, 7, 11; Grimsley, 1; Hudson, G. H., 1; Kay, G. M., 19; Kaye, 1; Larrabee, 1; Longwell, 14; Megathlin, 3; Mencher, 2; Miller, W. J., 1; O'Connell, 1; Reed, R. D., 20; Rich, 17; Ruedemann, 7, 40; Smith, B., 4; Stragowsk, 2; Suter, 1; Swinnerton, 7; Thompson, 19; Wedel, 1; Wheeler, G., 2.

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North Dakota: Andrews, 6; Hard, H. A., 1; Voedisch, 1; Anonymous, 67.

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Nova Scotia: Bell, W. A., 1; Cameron, H. L., 1; Canada, G. S., 1; Douglas, 5; Fairbault, 1, 2; Imperial Oil Ltd., 1; Malcolm, 1; Miller, A. H., 8; Newhouse, 15; Norman, 5; Wilson, J. T., 4; Wright, W. J., 1.

Ohio: Bowacker, 1; Braun, 1; Bucher, 15; Bryan, 1; Cushing, 1; Grimsley, 1; Lamborn, 1, 4; Lowell, 25; Ley, 5; Melnor, 10; Rogers, J. K., 2; White, G. W., 11, 17.

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Oklahoma: Bass, 6, 12; Boyd, W. B., 1; Boyle, J. P., 1; Bullard, 1; Bunn, 1; Cloud, 4; Cram, 2, 7; Davis, 6, 12; Decker, 4, 25; Harlton, 9; Hendricks, 9, 10; Hoffman, M. G., 1; Hyatt, 1; Ireland, 2; Kansas G. Soc., 7; Knechtel, 1, 5; Lucas, E. L., 2; McClellan, 1; Merritt, 7; Ross, C. S., 1; Sawyer, 1; Scharbenbeck, 1; Sheerar, 1; Six, 1, 2; Stone, J. A., 1; Stovall, 17; Suffel, 1; Swigart, 1; Tarr, R. S., 3; Tomlinson, C. W., 4; Travis, 1; U. S. G. S., 7, 8, 9, 10, 11, 14, 15; Weatherby, 2; Weldman, 2; Wilson, J. W., Jr., 13.

Ontario: Bartley, 1, 2; Bateman, J. D., 2; Bell, L. V., 2; Bruce, E. L., 1, 8, 16, 21, 22; Burrows, 2, 3; Burwash, E. M. J., 1, 4, 9, 8; Canada, G. S., 1; Coleman, 5, 9; Collins, W. H., 3, 4, 7; Cooke, H. C., 25; Derry, 5, 6, 10; Dyer, 1, 18, 20, 21; Emmons, R. C., 1; Fairbairn, 5, 11, 15; Flabery, 2; Freeman, B. C., 4; Furse, 2, 3; Goudge, 6; Graham, A. R., 3, 4, 5, 6; Greer, L., 1; Harcourt, 4; Harding, W. D., 2, 3, 4, 5; Harkness, 6, 11; Hawley, 2, 3; Horwood, 9, 10, 11, 12; Hurst, 4, 5, 11, 12; Kay, G. M., 19, 22; Keith, M. L., 4; Kindel, L. F., 2, 3; Laird, H. C., 2, 3, 4, 5, 7, 8, 9, 10; Langford, 1, 4; Macdonald, 1; Maynard, J. E., 1; Merritt, P. L., 2;
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Moorehouse, 3; Osborne, 3; Per¬
due, 1; Pettijohn, 5, 7, 9, 15; Phenz¬
ister, 1, 3; Quirk, 4, 5; Rickaby, 1,
3, 4, 6; Ringslieben, 1; Ritten¬
house, 2; Robson, 1; Satterly, 2,
3, 4; Savage, W. S., 1; Spearman,
3; Suffel, 2; Tanton, 1, 4, 7; Thom¬
son, James E., 2, 3, 4, 5, 6, 7, 8,
9, 11, 12, 14, 15, 16; Thomson, J.
Ellis, 1; Thomson, R., 1, 4; Watson,
R. J., 2; Wright, W. L., 1; Yates, 1.

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Hodge, 5; MacGinitie, 1; Mackay,
1; Moore, B. N., 8; Piper, A. M., 4,
17; Reed, J. C., 1; Renick, 2;
Shenon, 3, 5, 6; Smith, W. D., 11;
Stearns, H. T., 3, 7; Thayer, T. P.,
2, 3, 5; Wells, F. G., 7, 11; Wil¬
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Ozark Mts. area: Schottenloher, 2.


Patrician glaciation: Johnston, W. A.,
13; Keyes, 235; Martin, L., 3; Tyrr¬
ell, J. B., 1.

Pennsylvania: Ashley, 8, 15, 31; Bailey,
E. B., 1; Bascom, 1, 3, 6; Behre, 9;
Berkeley, 12; Butts, 10, 13; Cathcart,
9, 12; Cleaves, 8; DeWolf, 1;
Fettke, 4, 6, 7, 10; Foose, 1; Fraser,
9, 12; Graeber, 1; Grimsley, 1;
Hall, G. M., 5; Hickok, 5; Hills,
J. M., 1; Hughes, H. H., 1; Itter,
1; Johnson, M. R., 1; Knopf, E. F.
B., 3; Leggette, 9; Leighton, H., 6;
Lohman, S. W., 6, 10; Mackin, 4;
McLaughlin, E. B., 3; Miller, B. L.,
15; Miller, R. L., 1; Moyer, 1;
Piper, 7; Reeves, J. R., 2; Richard¬
son, G. B., 2, 3, 4; Shaffner, 2;
Sherrill, 5; Slier, 1; Smith, L. L.,
1; Stone, 5, 8; Stose, G. W., 1, 11,
12, 15, 17, 18, 20, 21; Swartz, F.
M., 10; Taylor, 13; Wagner, N. S.,
1; Ward, F., 5; Watson, E. H., 6;
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Quebec : Ambrose, 4; Auger, 1, 2; Back¬
mann, 1; Bannerman, 4; Bell, A. M.,
1; Bell, L. V., 1, 3, 4, 7, 10, 11, 12,
14, 15, 16; Bruce, 7, Burton, F. R.,
1; Canada G. S., 1; Clark, T. H.,
5, 6, 7, 11; Conolly, H. J., 1;
Cooke, H. E., 3, 19, 21, 22; DeMille,
2; Denis, 1, 2, 3, 4, 6, 7, 8, 9, Derry,
11; Douglas, 4; Faessler, 1, 2, 4, 5,
6, 7, 13, 18, 22; Flaherty, 3; Free¬
ming, 3; Gilbert, 5; Gun¬ning, 15, 16, 18, 23, 24; Gus¬
sow, 2; Hawley, 7, 10, 11; Hender¬
son, J. F., 1, 2; James, W. F., 1, 2;
Jones, L. W., 1, 2, 3, 4, 6, 8, 11, 12,
13, 14; Kindred, H., 3; Laverdiere,
1, 4, 6; Longley, 1, 2, 3, 4; Lown¬	her, 1; McGerrigle, 4, 8, 9; MacKenzie,
1, 3, 4; Malouf, 1; Mawdsley, 6;
Norman, 6, 7, 8, 9, 9-a, 10, 11, 12;
Northrop, 10; O'Neill, J. J., 2, 4, 5;
Osborne, 14, 19, 21, 22, 24, 29;
Parks, W. A., 1, 3, 4; Price, P., 3;
Retty, 1, 2, 3, 4, 5, 6, Ross, S. H., 1;
Shaw, G., 1; Sproule, 1-a; Tolman,
12, Weeks, L. J., 5-a, 6, 7, 8; Wil¬
son, H. S., 1; Wilson, J. T., 5, 6, 7;
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C. H., 3.

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Saskatchewan: Acock, 14, 18, 19;
Canada G. S., 1; Cooke, H. C., 24;
Fraser, F. J., 6; Hume, 23; Kelth,
M. L., 3; McMurphy, R. C., 1, 2;
Sproule, 2, 3, 5; Stockwell, 1;
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South Carolina : Cooke, C. W., 17; Kelth,
A. R., 2; Kosler, 1; Taber, 18.

South Dakota: Clark, J., 3; Cummings,
J. B., 2; Hess, F. L., 14; Kirby,
M. E., 1; Moxon, 2; Pugsley, 1;
Rothrock, E. P., 4, 8, 10, 13, 16;
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Texas: Adkins, 4; Albritton, 8, 9; Baker, 21; Bell, O. M., 2; Brucks, 1; Bullard, 2, 3, 4; Cheney, M. G., 2; Cooper, H. H., 2; Cunningham, W. A., 2; DeFord, 4; Denison, A. R., 2; Deussen, 1, 6, 13; Easton, 8; Eckel, E. B., 7, 11; Ferguson, W. B., 1; Fledler, 4; Foster, M. D., 2; Getzendaner, F. M., 1; Hamner, 1; Heath, 2; Jones, C. T., 1; Kansas G. Soc., 7; King, P. B., 5, 29; Kramer, 5; Lee, W., 1, 2; Levorsen, 3; Lidle, 3; Livings, P. P., 1, 2; Lonsdale, 7, 10; McLellan, 1; Mansfield, G. R., 20; Martyn, 1; Michaux, 1; Mills, 3; Oil and Gas Jour., 1; Patton, L. T., 1; Plummer, 17; Price, W. A., 12; Raleigh, 1; Reed, L. C., 2; Renick, 5; Rogatz, 2; Ross, C. S., 1; Sayre, 2, 4, 6; Scott, G., 6; Searlids, 27, 28-a, 30, 39; Stenzel, 9, 10, 17; Stephenson, 16; Tex. Univ. Bur. Econ. Geology, 1; Trowbridge, 6; Turner, S. F., 3; Weeks, A. J., 2, 3, 4; Wendlandt, 1, 2; White, W. N., 4.


Toroweap-Kaibab fms., Ariz.–Utah: McLean, 1; Mansfield, G. R., 20; McFerrin, 1; McKeen, 3; McReynolds, 1; Mc子女, 1; Mills, 3; Oil and Gas Jour., 1; Patton, L. T., 1; Plummer, 17; Price, W. A., 12; Raleigh, 1; Reed, L. C., 2; Renick, 5; Rogatz, 2; Ross, C. S., 1; Sayre, 2, 4, 6; Scott, G., 6; Searlids, 27, 28-a, 30, 39; Stenzel, 9, 10, 17; Stephenson, 16; Tex. Univ. Bur. Econ. Geology, 1; Trowbridge, 6; Turner, S. F., 3; Weeks, A. J., 2, 3, 4; Wendlandt, 1, 2; White, W. N., 4.

United States: Albright, 8, 9; Baker, 21; Bell, O. M., 2; Brucks, 1; Bullard, 2, 3, 4; Cheney, M. G., 2; Cooper, H. H., 2; Cunningham, W. A., 2; DeFord, 4; Denison, A. R., 2; Deussen, 1, 6, 13; Easton, 8; Eckel, E. B., 7, 11; Ferguson, W. B., 1; Fledler, 4; Foster, M. D., 2; Getzendaner, F. M., 1; Hamner, 1; Heath, 2; Jones, C. T., 1; Kansas G. Soc., 7; King, P. B., 5, 29; Kramer, 5; Lee, W., 1, 2; Levorsen, 3; Lidle, 3; Livings, P. P., 1, 2; Lonsdale, 7, 10; McLellan, 1; Mansfield, G. R., 20; Martyn, 1; Michaux, 1; Mills, 3; Oil and Gas Jour., 1; Patton, L. T., 1; Plummer, 17; Price, W. A., 12; Raleigh, 1; Reed, L. C., 2; Renick, 5; Rogatz, 2; Ross, C. S., 1; Sayre, 2, 4, 6; Scott, G., 6; Searlids, 27, 28-a, 30, 39; Stenzel, 9, 10, 17; Stephenson, 16; Tex. Univ. Bur. Econ. Geology, 1; Trowbridge, 6; Turner, S. F., 3; Weeks, A. J., 2, 3, 4; Wendlandt, 1, 2; White, W. N., 4.

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Washington: Coombs, 3; Culver, 1, 4, 6; Flets, W. M., 4; Plint, 17, 18, 20; Houghland, 3; Irwin, W. H., 1; Keyes, 242; Page, B. M., 2; Park, 9; Verhoogen, 1; Waters, 4, 11, 12; Weaver, 7.

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- Banner dist.: Anderson, A. L., 16.
- Batholith: Clapp, C. H., 5; Ross, C. P., 14, 29.
- Belt series: Fenton, 54; Gibson, 6.
- Boise basin: Ross, C. P., 18.
- Carboniferous: Williams, J. S., 8.
- Casto quad.: Ross, C. P., 22.
- Coeur d'Alene mining dist.: Dickey, F. H., 1.
- Copper districts: Ross, C. P., 23.
- Correlations by heavy minerals: Ross, C. P., 20.
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- Gem minerals: Olson, B. H., 1.
- Gold: Anderson, A. L., 18; Austin, R. B., 1; Bell, R. N., 2; Finch, J. W., 2; Hite, 1, 3, 4; Lorain, 2; Reed, J. C., 2; Ross, C. P., 7.
- Iron: Hodge, 16.
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- Metal mining history: Ross, C. P., 3.
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- Warren mining dist.: Reed, J. C., 14.
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- Banner dist.: Anderson, A. L., 16.
- Batholith: Clapp, C. H., 5; Ross, C. P., 14, 29.
- Belt series: Fenton, 54; Gibson, 6.
- Boise basin: Ross, C. P., 18.
- Carboniferous: Williams, J. S., 8.
- Casto quad.: Ross, C. P., 22.
- Coeur d'Alene mining dist.: Dickey, F. H., 1.
- Copper districts: Ross, C. P., 23.
- Correlations by heavy minerals: Ross, C. P., 20.
- Correlations, Tert. fms.: Carpenter, J. T., 1.
- Dixie placer dist.: Capps, 14.
- Dome mining dist.: Ross, C. P., 17.
- Edwardsburg-Thunder Mtn. area: Shenon, 16.
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- Flora, Tert.: Dorf, 6.
- Florence mining dist.: Reed, J. C., 19.
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Dixie placer dist.: Capps, 14.

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Florence mining dist.: Reed, J. C., 19.

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Mud Lake area: Stearns, 27.

Palouse Hills topog.: Kirkham, 8.

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Pollen analysis of bog: Hansen, H. P., 3.

Salmon River canyon: Shenon, 14.

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Belt ser.: Fenton, 54.

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British Columbia: Armstrong, J. E., 1; Bancroft, 1; Bostock, 1; Brock, B. B., 1; Brock, R. W., 1; Carter, 5, 15, 17; Campbell, C. D., 1, 6; Cockfield, 11, 14; Davis, C. D., 1; Davis, R. E., 1; Gray, J. G., 1; Gunning, 3, 11; Hansen, 1; James, H. T., 1; Johnston, W. A., 11; Kersh, F. A., 9, 11; Kindle, E. D., 3, 4; Lang, A. H., 1; Mathew, W. H., 1; Rice, H. M. A., 1, 4, 6; Sharpstone, David C., 1; Stevenson, J. S., 5; Stevenson, L. S., 1; Walker, J. F., 4, 5.

California: Anderson, C. A., 2, 3, 5, 6; Andrews, P., 2; Averill, 1, 7; Calkins, 1; Chapman, R. W., 4; Clark, 19; Dudley, 1; Eckels, 1; Erwin, 1; Evans, R. D., 1; Ferguson, H. G., 2, 4; Finch, R. H., 4; Fitch, 2, 3, 4; Fraser, D. M., 1; Gilbert, C. M., 1; Herold, S.; Hertlein, 11; Hewett, 16; Hinds, 11, 16, 18, 19; Hoff, 3; Kelley, 10; Knopf, A. J., 1; Knopf, E. C., 1; Longley, 3; MacDonald, G. A., 1; Mayo, 2; Miller, F. S., 3; Miller, W. J., 4, 6, 11, 12, 17, 21; Morse, R. R., 1; Murphy, F. M., 3; Noble, L. F., 4; Oakeshott, 1; Osborne, E. F., 1; Peacock, 2; Powers, H. A., 7; Rand, W. W., 1; Reck, 2; Schroeter, 2; Schumman, 4; Swartzlow, 5-8; Taff, 3; Williams, H., 1, 4; Wilson, R. W., 13; Woodford, 8.

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Colorado: Barnes, F. F., 2; Behre, 22; Boos, M. E., 5; 0; Burbank, W. S., 2, 8, 4; Butler, B. S., 5; Chapman, E. F., 2; Conn., 1; Eckel, E. E., 6; Goddard, E. N., 1, 2, 3; Gra-
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Costa Rica: Schaufelberger, 7.

Crystalline schists, Pa.-Md.: Jonas, 12.

Cuba: Lewis, J. W., 1; Ortega y Ros, 1, 2; Palmer, R. H., 5; Rutten, L. M. R., 4; Taber, 7, 13; Thiadens, 5; Vermunt, 4.

Curagao, West Indies: Molengraaff, G. J. H., 1-a, 2; Fijpers, 2; Vermunt, 1, 2.

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Nevada: Calkins, 4; Callaghan, 6, 8, 13; Cameron, E. N., 2; Campbell, D. F., 1; Ferguson, 10; Gianella, 9; Gillison, 1; Hewett, 4; Kerr, P. F., 14, 20; Muller, 14; Nolan, 2, 8, 9; Sharp, 4, 5; Westgate, 6.

New Brunswick: Caley, 2; Flaherty, 1; Gesner, 1.

Newfoundland: Cooper, J. R., 1, 2; Espenshade, 1; Foley, F. C., 1; Heyl, 1; Ingerson, 2; Jewell, 2; Snelgrove, 2, 4.

New Hampshire: Billings, 9; Chapman, A. P., Jr., 1; Hadley, J. B., 1; Kaiser, E. P., 2; Kingsley, 1; Model!, 3; White, G. W., 12; Williams, C. R., 2.

New Jersey: Butler, J. W., Jr., 1, 3; Moldenke, 1.

New Mexico: Church, F. S., 1; Hunt, C. B., 1, 4, 4-a; Just, 3; Lasky, 12, 14; Nichols, 7; Parker, R. H., 2; Renick, 3; Schmitt, 6, 10; Spencer, A. C., 1; Stott, C. E., 1; Vanderwilt, 12; Williams, H., 11; Winchester, 3.

New York: Alling, 6; Balk, 2, 5, 11; Bell, G. K., Jr., 1; Brown, J. S., 2; Buddington, 3, 8, 17, 23; Cannon, R. S., 1; Dale, N. C., 2, 5; Gallagher, 1; Reed, J. C. 5; Rodgers, 3; Whitcomb, 11-a.

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### New Mexico—Continued.

**Underground water—Continued.**

- Pecos River Valley: Robinson, T. W., Jr., 6.
- Portales Valley: Thels, 9.
- Rio Grande depression: Bryan, 36; Thels, 7, 13.
- Roswell artesian basin: Brown, R. H., 1; Piedler, 1, 2; Morgan, A. M., 1.
- Sandoval Co.: Renick, 3.
- Underground water inv.: Piper, 8.

### New York—Continued.

**Economic geology—Continued.**

- Petroleum devel.: Brewer, C., Jr., 1; Lawrence, A. A., 1; Newland, 7.
- Piscataqua Lake quad.: Cannon, R. S., 1.
- Potsdam quad.: Reed, J. C., 6.
- Salt: Brown, J. S., 1, 7; Hartnagel, 2.
- Sand and gravel: Nevin, 3.
- Siderite: Ruedemann, 12.
- Slate: Larrabee, 1.
- Zinc mine, Balmat: Brown, J. S., 2.

**Historical geology.**

- Adirondacks: Alling, 3; Bald; 2; Budge-ington, 3, 5, 11, 22, 23; Kay, G. M., 1, 5; Longwell, 14; Miller, W. J., 13; Rodgers, 3.
- Allegany State Park: Thwaites, 8.
- Allegeny ques: Dale, 4.
- Antwerp quad.: Budge-ington, 8; Gilluly, 13.
- Appalachian orogeny: Pepper, 1.
- Baltimore & Ohio.oute: Grimsley, 1.
- Black River group: Goldring, 11.
- Bradford oil field: Fettke, 9, 11; Newby, 1.
- Devonian sh.-Oriskany sand drilling: Bennett, J., 1.
- Emery deposits: Butler, J. W., Jr., 2; Gillson, 8; Zodac, 25.
- Felspar: Shaub, 1.
- Gold prospects: Newland, 10.
- Golden granite, Pekskill: Flurbir, 3.
- Gravel: Nevin, 3.
- Gypsum: Brown, J. S., 1, 7; Newland, 2.
- Hammond quad.: Budge-ington, 8.
- Iron ores: Miller, W. J., 20; Ruedemann, 12; Stratton, 1.
- Limonites: Newland, 13; Ruedemann, 12.
- Lowville quad.: Budge-ington, 8.
- Magnetic study, iron deposits: Stratton, 1.
- Magnetics: Bald, 14; Dale, N. C., 1; Gardaghe, 1.
- Medina fm.: Hartnagel, 3.
- Mining-quarry industries, 1927-33: Newland, 6, 14.

**Natural gas: Bradley, 13; Brewer, C., Jr., 1; Brown, J. S., 1, 7; Garrett, S. G., 1; Lucke, 1; Newland, 7, 8, 15, 20; Robinson, J. F., 3, 4; Torrey, P. D., 1, 3, 4, 8.
- Oil fields: Brewer, C., Jr., 1; Cathcart, 11; Fettke, 9, 11; Newby, 1.
- Oriskany gas and oil poss.: Bennett, J., 1; Bradley, 10; Fettke, 12; Garrett, S. G., 1.
- Oswegatchie quad.: Dale, 5.
New York—Continued.  
**Historical geology—Continued.**  
Grenville ser.: Bain, 20; Dale, 3.  
Hamilton correls.: Willard, 45.  
Hamilton group: Chadwick, 16; Cooper, G. A., 2, 7, 13, 15, 19; Reeves, J. R., 3; Willard, 21, 45.  
Hammond quad.: Buddington, 8; Gilluly, 13.  
Hounsfield metamabontonite: Kay, G. M., 7.  
Hutchinson Valley: Fluhr, 1.  
Ithaca area: Caster, 2.  
Kings Co.: Sanford, J. H., 1.  
Lowville quad.: Buddington, 8; Gilluly, 13; Ruedemann, 25.  
Medina fm.: Hartnagel, 3.  
Mohawk Valley, Megathlin, 3.  
Natural gas fields: Lucke, 1; Newland, 20; Torrey, P. D., 3, 8.  
New York City area: Fluhr, 4; Kaye, C. A., 1; Manchester, 1; Strzygowski, 2.  
Niagara area: Reimann, 12.  
Oneonta fade-out: Chadwick, 25; Sanford, J. T., 3.  
Oriskany ss.: Bradley, 19.  
Oscillations, Appalachians: Ruedemann, 5.  
Oswegatchie quad.: Dale, 5.  
Paleozoics: Newland, 9; Rodgers, 5; Ruedemann, 26.  
Penn-York embayment: Caster, 16.  
Phosphatic nodules, origin: Seiwell, 1.  
Piseco Lake quad.: Balk, 14; Cannon, R. S., 1.  
Port Huron moraines, correls.: Taylor, 13.  
Portage sedimentation: Sheldon, P. G., 1.  
Potsdam quad.: Reed, J. C., 5.  
Pre-Cambrian fms.: Newland, 18.  
Pre-Cambrian, names: Chadwick, 5.  
Rensselaer graywacke: Vaughan, H., 1.  
Rensselaer grit: Ruedemann, 38.  
Russell quad.: Dale, N. C., 2.  
Santa Clara quad.: Balk, 14; Buddington, 17.  
Saratoga area: Colony, 1.  
Sedimentary rocks, mapping: Goldring, 19.  
Shales, Mohawk Valley: Ruedemann, R., 1, 20.  
Shawangunk conglom.: Swartz, C. K., 2.  
Shawangunk Mts.: Heusser, 1.  
Silverian: Chadwick, 4; Fettkie, 2; Ruedemann, 1; Ruedemann, R., 1; Sanford, J. T., 3; Swartz, C. K., 3.  
Skaneateles quad.: Smith, B., 4.  
Slate, colored: Larrabee, 1.  

New York—Continued.  
**Historical geology—Continued.**  
South-central: Berry, G. W., 1.  
Taconic orogeny: Pepper, 1.  
Taconic subj.: Prindle, 1.  
Thirteenth Lake quad.: Balk, 14.  
Thorold ss.: Chadwick, 25; Sanford, J. T., 3.  
Ticonderoga area: Swinnerton, 7.  
Trenton group: Kay, G. M., 10, 19.  
Tully lms. fm.: Cooper, 18; Trainer, 3.  
Western N. Y.: Reimann, 2.  
Willsboro quad.: Whitcomb, 11-a.  
Zinc mine, Balmat: Brown, J. S., 2.  

**Mineralogy.**  
Bertrandite: Pough, 4.  
Calcium carbonates: Apfel, 3.  
Carbon dioxide: Germann, F. E. E., 1.  
Catskill facies: Mencher, 2.  
Celestite: Thibault, 1, 2.  
Chloritoid: Barth, 10.  
Cryptolite analysis: Muench, 1, 5.  
Dutchess Co.: Barth, 14.  
Epistilbite: Pough, 4.  
Feldspars: Alling, 4; Barth, 2; Singlewald, J. T., Jr., 2.  
Fluorescence, quartz: Berndelmer, 1.  
Fluorescent, phosphorescent minerals: Zodac, 8.  
Garnets: Miller, W. J., 18; Rowley, E. B., 3.  
Hematite in muscovite: Frondel, 12.  
Ileomite: Zodac, 5.  
Inclusions, muscovite: Frondel, 12.  
Kaolinite: Gruner, 13; Kerr, P. F., 1, 5.  
Lead, supergene, Balmat: Dyson, 1-a.  
Limonites: Newland, 13.  
Magnetics: Alling, 11; Frondel, 12; Gallagher, 1.  
Malachite: Fluhr, 2.  
Mineral locs.: McElroy, 1.  
Mineral waters: Whittell, 3.  
Mountain leather: Zodac, 27.  
Muscovite: Frondel, 12.  
New York City area: Manchester, 1.  
Northeastern N. Y.: Zodac, 16.  
Pitchblende: Zodac, 29.  
Pseudotillite: Warthin, 3.  
Quartz crystals: Hollister, J. S., 1; Newland, 16; Zodac, 19.  
Radioactivity, Saratoga: Baudisch, 2.  
Rock crystal near Napanoch: Zodac, 20.  
Selinite: Zodac, 7.  
Serendibite: Larsen, 8.  
Sphalerite: Brown, J. S., 4.  
Sulfur: Roedder, 1.  
Supergene minerals: Brown, J. S., 4; Dyson, 1-a.  
Tilly Foster mine: Trainer, J. N., 1.
New York—Continued.

Mineralogy—Continued.

Tourmaline: Butler, S. B., 1; Zodac. 6.
White face Mtn.: Newland, 12.
White Plains quarry: Zodac. 4.
Zinc, Balmat mine: Brown, J. S., 2; Dyson, 1-a.

Paleontology.

Algal barrier reefs: Goldring, 17.
Archeopterix maculenta: Arnold, 20.
Archeopteris sphenophyllifolia: Arnold, 20.
Armstrongia cf. Titusvillia: Caster, 13.
Aulocaulis: Fenton, M. A., 10.
Bellinurus: Eller, 12.
Berne quad.: Goldring, 11.
Bertie fm.: Monahan, 1.
Blastoids: Reimann, 8.
Brachiopoda: Ulrich, 27.
Bryozoa: McNair, 4, 5.
Calamopitys: Thomas, D. E., 1.
Callixylon: Arnold, 2, 3.
Catskill facies: Mencher, 2.
Cephalopoda: Flower, 1, 2, 6; Foerste, 9.
Conchopeltis: Knight, J. B., 13.
Conodonts: Branson, E. B., 17.
Corals: Chadwick, 29; Fenton, 42.
Crinoidea: Goldring, 9, 12, 13, 14, 18.
Cryptozoon: Goldring, 15.
Cystiphyllum: Fenton, 61.
Devonian faunal differentiation: Chadwick, 22.
Devonian plant-bearing fms.: Arnold, 25.
Devono-Carboniferous, southwest N. Y.: Caster, 1.
Diatoms: Lohman, K. E., 6.
Dipleura, young stages: Cooper, 17.
Echinocaris: Eller, 7, 11.
Erie Co.: Reimann, 5.
Eurypterids: Kjellesvig, 1, 2; Ruedemann, 22; Sanford, J. T., 2; Sharpe, C. F. S., 1.
Fauna of Chemung fm.: Curry, H. D., 1.
Fish: Bryant, 1, 6; Reimann, 14; Wells, J. W., 11.
Flora, Catskill delta: Arnold, 34.
Foraminifera: Kjellesvig, 3; Shupack, 1.
Forest, Gilboa Petrified: Goldring, 1, 3, 5, 10.
Fossil exhibits, N. Y. State Mus.: Ruedemann, 15.
Fraxinus nigra: West, G. F., 1.
Genesee country: Payne, T. G., 1.
Gilboa Petrified Forest: Goldring, 1, 3, 5, 10.

New York—Continued.

Paleontology—Continued.

Graptoites: Flower, 10.
Hamilton group: Cooper, G. A., 7.
Handbook of paleontology: Goldring, 2, 6.
Heliophyllium: Fenton, 61; Wells, J. W., 10.
Holopha: Knight, J. B., 7.
Idrales: Eller, 9.
Ithaca fauna: Chadwick, 14.
Konicckcidaris: Sanford, 9.
Lepidechnoides: Cooper, G. A., 4.
Mammalia: Smith, B., 1.
Molinia Valley: Happ, 3.
Nautiloidia: Flower, 5.
Oddest fossil forest: Goldring, 4.
Oldhamia: Ruedemann, R., 3.
Ostracoda: Swartz, F. M., 9-a.
Paleocyclidae: Basaller, 25.
Painurid: Rathbun, 6.
Pelecypoda: Caster, 10, 11.
Plankton and radiolarian ooze: Ruedemann, 42.
Plants, Dev.: Arnold, 14.
Pseudohydinocones: Reimann, 7.
Pseudodrilloceratidae: Flower, 9.
Plesiophytales: Read, 12.
Ptterygotus: Ruedemann, 28.
Quaternary Mammalia: Smith, B., 1.
Radiolaria: Ruedemann, 40, 42.
Radiolarian ooze: Ruedemann, 42.
Rust quarry, Trenton Falls: Delo, 4.
Scolecodonts: Johnson, Helgt, 4.
Silurian shs.: Ruedemann, R., 1.
Spongidae: Caster, 12.
Study of fossils: Ruedemann, 10.
Terataspis: Reimann, 10.
Teredo ignis: Fox, J. T., 1.
Triassic fossils: Hollick, 7.
Tuffi fm.: Cooper, 18.

Petrology.

Adirondack anorthosite: Alling, 6.
Baik, 1, 2, 3; Buddington, 5; Miller, W. J., 1.
Adirondacks, Ig. rocks: Buddington, 3, 23.
Augen gneiss: Barbour, G. P., 1; Zodiac, 23.
Calcium carbonate: Apfel, 3.
Catskill facies: Mencher, 2.
Dolomite in serpentinite: Pough, 9.
Dust fall, 11/13/33: Alexander, A. E., 2.
Dutchess Co.: Baik, 11; Barth, 14.
Granite phacoliths: Buddington, 3.
Greenvale Inclus.: Cushing, 2.
Lamprophyre dike: Blank, H. R., 1.
Limonites: Newland, 13.
Magnetites: Alling, 11; Gallagher, 1.
Niagara Gorge sediments: Alling, 9; Sanford, 10.
Nodular granite: Brugger, 1.
New York—Continued.

**Petrology—Continued.**

Onondaga ins. fm.: Alexander, A. E., 7; Schwartz, F. W., 1.
Oriskany ss.: Stow, 3, 11.
Poundridge granite: Bell, G. K., Jr., 5.
Santa Clara quad.: Buddington, 17.
Sedimentary rocks, Niagara Gorge: Alling, 9; Sanford, 10.
Slates, colored: Larrabee, 1.

**Physical geology.**

Adirondack ig. rocks : Buddington, 23.
Adirondack Mn. areas: Rodgers, 3.
Adirondacks, gravity stratification: Buddington, 11.
Black sh. deposition: Hard, E. W., 1.
Bouquet River landslide: Newland, 9, 11.
Bradford oil field: Fettke, 9, 11.
Caves, Hudson Valley: Zodac, 30.
Champlain Valley: Hudson, G. H., 2; Rodgers, 2.
Dikes: Filmer, 1; Hudson, G. H., 2, 3; Smith, B., 3.
Dutchess Co.: Balk, 6.
Earthquakes: Lynch, W. A., 1; Neumann, 5; Newland, 11.
Faulting and faults: Bradley, 19; Hudson, G. H., 1; Megathlin, 2, 3; Quinn, A. W., 1.
Garnet deposits, origin: Miller, W. J., 18.
Genesee country: Payne, T. G., 1.
Glacial pebbles, faceted and striated types: Engeln, von, 2.
Grenville incl.: Cushing, 2.
Guns of Seneca Lake: DeVarigny, 1; Fairchild, 14; Ingalls, 1.
Hudson gorge: Thompson, H. D., 1.
Lagoon deposits: Lucke, 3.
Lake Champlain area: Quinn, A. W., 1.
Landslip scars: Whitcomb, 11.
Magnetites: Alling, 11; Gallagher, 1.
Metamorphic rocks: Balk, 6.
Metamorphism, Franklin: Milton, 1.
Niagara Gorge, age: Kirk, 10.
Niagara rock slide: Anonymous, 58.
Orovoician, Adirondack arch: Kar, G. M., 18.
Oriskany ss.: Bradley, 19.
Osgoodgate quad.: Dale, 5.
Peridotite: Newland, 9.
Potashd quad.: Reed, J. C., 5.
Pyramidal jointing: Sheldon, P. G., 2.
Sands, Long Is. beaches, origin: Colony, 3.
Santa Clara quad.: Buddington, 17.
Sea level studies: Johnson, D. W., 4.
Selsomorphic sensitivity to tilt: Delaney, 1.
Genesee country: Payne, T. G., 1.
Genesee River: Fairchild, 19.
Genesee Valley: Fairchild, 5, 18.
Glacial advances, Allegany Co.: Eaton, H. N., 3.
Glacial drift: Engeln, von, 10.
Glacial pebbles, faceted, striated: Engeln, von, 2.
Glacial problems: Brigham, A. P., 2.
Glaciation: Apfel, 1; Fairchild, 11.
Great lake stages: Baker, M. B., 1.
Great Lakes, origin: Shub, 14.
Supergene lead, zinc, Balmat mine: Dyson, J. L., 1-a.

New York—Continued.

**Physical geology—Continued.**

Ticonderoga area: Swinnerton, A. C., 7.
Tilt measurements: Delaney, 1, 2, 3.
Waterfall-crest lines: Conant, 3.
Willboro quad.: Whitcomb, 11-a.

**Physiographic geology.**

Adirondack master streams: Ruedemann, 1, 2.
Antwerp quad.: Buddington, 8.
Bar changes, Long Is.: Howard, A. D., 12.
Bene quad.: Cook, J. H., 2; Goldring, 11.
Black Rock forest: Denny, 2.
Boulders, Hudson River fm.: Warthin, 1.
Boulder trains, Allegany Co.: Chadwick, 26.
Capital dist.: Cook, J. H., 1.
Catskill: Mencher, 2; Rich, 17; Ruedemann, 14.
Cayuga Valley lake history: Fairchild, 15.
Cazenovia glacial lobe: Apfel, 2.
Chittenango Falls, glacial history: Holmes, C. D., 1.
Closing stage glacial history: Fairchild, 9.
Correlations: Leverett, 24; McClinton, 11.
Deltas, Pleist.: Happ, 4.
Drumlins: Fairchild, 3; Slater, 1.
Erosion surfaces: Cole, 14; Fridley, 1.
Eskers: Chadwick, 6.
Finger Lakes area: Koenig, 1.
Genesee country: Payne, T. G., 1.
Genesee River: Fairchild, 19.
Genesee Valley: Fairchild, 5, 18.
Glacial advances, Allegany Co.: Eaton, H. N., 3.
Glacial drift: Engeln, von, 10.
Glacial pebbles, faceted, striated: Engeln, von, 2.
Glacial problems: Brigham, A. P., 2.
Glacial lobe: Apfel, 1; Fairchild, 11.
Gorge near Seneca Lake: Engeln, von, 4.
Gettiglacial broadmapping: De Geer, G. J., 3.
Hammond quad.: Buddington, 8.
Hudson-Delaware-Susquehanna drainage: Mackin, 1.
Hudson Gorge: Thompson, H. D., 1.
Hudson River valley: Morris, 6; Sharp, H. S., 3.
Interglacial deposit, cent. N. Y.: Engeln, von, 1.
Interglacial valley, upper Hudson: Stoller, 2.
Intrenched meanders: Cole, W. S., 4.
Katterskill piracy: Cressey, 1.

New York—Continued.

**Petrology—Continued.**

Onondaga ins. fm.: Alexander, A. E., 7; Schwartz, F. W., 1.
Oriskany ss.: Stow, 3, 11.
Poundridge granite: Bell, G. K., Jr., 5.
Santa Clara quad.: Buddington, 17.
Sedimentary rocks, Niagara Gorge: Alling, 9; Sanford, 10.
Slates, colored: Larrabee, 1.

**Physical geology.**

Adirondack ig. rocks : Buddington, 23.
Adirondack Mtn. areas: Rodgers, 3.
Adirondacks, gravity stratification: Buddington, 11.
Black sh. deposition: Hard, E. W., 1.
Bouquet River landslide: Newland, 9, 11.
Bradford oil field: Fettke, 9, 11.
Caves, Hudson Valley: Zodac, 30.
Champlain Valley: Hudson, G. H., 2; Rodgers, 2.
Dikes: Filmer, 1; Hudson, G. H., 2, 3; Smith, B., 3.
Dutchess Co.: Balk, 6.
Earthquakes: Lynch, W. A., 1; Neumann, 5; Newland, 11.
Faulting and faults: Bradley, 19; Hudson, G. H., 1; Megathlin, 2, 3; Quinn, A. W., 1.
Garnet deposits, origin: Miller, W. J., 18.
Genesee country: Payne, T. G., 1.
Glacial pebbles, faceted and striated types: Engeln, von, 2.
Grenville incl.: Cushing, 2.
Guns of Seneca Lake: DeVarigny, 1; Fairchild, 14; Ingalls, 1.
Hudson gorge: Thompson, H. D., 1.
Lagoon deposits: Lucke, 3.
Lake Champlain area: Quinn, A. W., 1.
Landslip scars: Whitcomb, 11.
Magnetites: Alling, 11; Gallagher, 1.
Metamorphic rocks: Balk, 6.
Metamorphism, Franklin: Milton, 1.
Niagara Gorge, age: Kirk, 10.
Niagara rock slide: Anonymous, 58.
Orovoician, Adirondack arch: Kar, G. M., 18.
Oriskany ss.: Bradley, 19.
Osgoodgate quad.: Dale, 5.
Peridotite: Newland, 9.
Potashd quad.: Reed, J. C., 5.
Pyramidal jointing: Sheldon, P. G., 2.
Sands, Long Is. beaches, origin: Colony, 3.
Santa Clara quad.: Buddington, 17.
Sea level studies: Johnson, D. W., 4.
Selsomorphic sensitivity to tilt: Delaney, 1.
Genesee country: Payne, T. G., 1.
Genesee River: Fairchild, 19.
Genesee Valley: Fairchild, 5, 18.
Glacial advances, Allegany Co.: Eaton, H. N., 3.
Glacial drift: Engeln, von, 10.
Glacial pebbles, faceted, striated: Engeln, von, 2.
Glacial problems: Brigham, A. P., 2.
Glacial lobe: Apfel, 1; Fairchild, 11.
Gorge near Seneca Lake: Engeln, von, 4.
Gettiglacial broadmapping: De Geer, G. J., 3.
Hammond quad.: Buddington, 8.
Hudson-Delaware-Susquehanna drainage: Mackin, 1.
Hudson Gorge: Thompson, H. D., 1.
Hudson River valley: Morris, 6; Sharp, H. S., 3.
Interglacial deposit, cent. N. Y.: Engeln, von, 1.
Interglacial valley, upper Hudson: Stoller, 2.
Intrenched meanders: Cole, W. S., 4.
Katterskill piracy: Cressey, 1.
New York—Continued.

Physiographic geology—Continued.
Kings County: Sanford, J. H., 1.
Lagoon deposits, Long Is.: Lucke, 3.
Landslip scars, Bouquet River: Whitcomb, 11.
Linden monocline: Chadwick, 11.
Long Island area: Fleming, W. L. S., 1; Knight, J. B., 10; Lucke, 3.
Louville quad.: Baudisch, 1, 2; Colony, 1; Ruedemann, 43; Whitnall, 3.
Suffolk County: Leggette, 10.

New World dist., Mont.: Lovering, 1.

Physiographic geology.
General: Marshall, W. C., 1.

Historical geology.
General: Sapper, 5.
Southern Nicaragua: Wegemann, 1.
Volcanism, Tert., Quat.: Burri, 4.

Petroleum.
Volcanic rocks: Burri, 2, 3, 4.
Volcanism, Tert., Quat.: Burri, 3, 4.

Physical geology.
Pumaroles, Masaya: Schönberg, 1.
Volcanic rocks: Burri, 2, 3, 4.
Volcanism, Tert., Quat.: Burri, 4.

Nickel.
Alaska: Reed, J. C., 15, 17.
British Columbia: Bostock, 1; Cockfield, 13; Horwood, 3, 4, 8.
Canada: Collins, 12; Robinson, A. H. A., 6.
Connecticut: Agar, 3.
Development and use: Stanley, R. C., 1.
Dominican Republic: Lengwiler, 1.
General: D'Arcy, 1; Moore, E. S., 12.
Manitoba: Hunter, C. E., 4; Pawel, 1.
Northwest Territories: Drybrough, 1.
Ontario: Bartley, 2; Burrows, 3; Coleman, 1; Collins, W. H., 1, 7; Dawson, 3; Freeman, B. C., 1; Halferdahl, 1; Moore, E. S., 6, 10; Phemister, 3; Tanton, 6; Thomson, J. Ellis, 18, 19; Thomson, R., 1; Walker, 15; Watson, R. J., 2; Yates, 1; Anonymous, 149.
Saskatchewan: Cooke, H. C., 24.

Quarries, nickel-cobalt-native silver type: Bastin, 18.

Quebec: Dresser, 6.

Sudbury nickel area: Burrows, 3; Coleman, 1; Collins, W. H., 1, 7; Dawson, 3; Freeman, B. C., 1; Halferdahl, 1; Moore, E. S., 6, 10; Phemister, 3; Tanton, 6; Thomson, J. Ellis, 18, 19; Thomson, R., 1; Walker, T. L., 15; Yates, 1; Anonymous, 149.

Tennessee Valley area: Eckel, E. C., 8.

Volcanism, Tert., Quat.: Burri, 4.


Till fabric.

Underground water.
Allegany State Park ground water: Thwaites, 8.
Artisan water, Genesee Valley: Fairchild, 18.
Artesian wells, Long Is.: Leggette, 12.
Balma Mine area: Dyson, 1–a.
Brine from Potsdam: Trainer, 4.
Croton Valley ground water: Jacob, C. E., 1.
Fluctuations, water levels: Cullings, 1.
Genesee Valley: Fairchild, 18.
Ground water, Monroe Co.: Leggette, 6.
Kings County: Leggette, 10; Sanford, J. H., 1.
Long Island: Leane, 1; Leggette, 8, 13; N. Y. State Dept. Conserv., 1; Norwich, 1; Suter, 1, 2, 3; Thompson, 11, 12, 15, 16.
Mineral Waters: Baudisch, 1, 2; Ruedemann, 43; Whitnall, 3.
Nassau County: Leggette, 10.
Queens County: Leggette, 10; Sanford, J. H., 1.
Radioactivity, Saratoga area: Baudisch, 1, 2.
Nitrate.
California: Noble, L. F., 1.
United States: Mansfield, G. R., 12.
Nitrogen: Johnson, B. L., 2.
Nodules, Oregon: Benton, 4.
Nomenclature.
Aechmochristina crenulata for A. serrata: Stewart, 10.
Agraunus gibbus for A. convexus: Howell, 38.
Agua for Chiquito: Keys, 453.
Algonkian: Hinds, 24.
Aquila antiqua and ferox, types: Wetmore, 32.
Archimedes lms.: Keys, 451.
Argyrotheca gardnerae: Cooke, C. W., 14.
Arroyos and barrancos: Grant, 9.
Arsenoferrite, non-existence: Buerger, 13.
Atchison sh. vs. Wabaunsee in Iowa: Keys, 393.
Aubrey, terranal title: Keys, 293.
Authority citations: Janssen, 1.
Babylon 1ms., Mo.: Keys, 483.
Barrancos and arroyos: Grant, 9.
Barrellian ser., Calif.: Keys, 91.
Beloit sh., Mo., Iowa, Wis.: Keys, 348, 500.
Benton Cret.: Keys, 304.
Benton fm., Mont.: Keys, 313.
Berms: Bascom, 2.
Biostratigraphic terms: Fenton, C. W., 9.
Bromo and barrancos: Grant, 9.
Breviarca haddonfleldensis for Trigonaria saffordi: Stephenson, 10.
Bythocithes boucki for B. minuta: Teichert, 17.
Callaway for Hutchinson lms.: Keys, 477.
Cambrid fossil: Resser, 9, 22.
Cambrian, redefinitions: Delius, 7; Keys, 299, 467, 481; Raasch, 3; 
Sardeson, 32.
Cambrotrichophora for Eostrophia: Ulrich, 30.
Camerina petri is Nummulites striatoreticulatus: Barker, 5.
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<td>Natural gas: Harkness, 1, 2, 4, 5, 6.</td>
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<td>Nepheline syenites: Davis, N. B., 1.</td>
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<td>Niccolite-chalcopyrite intergrowth: Love, 3.</td>
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<td>Nickel: Bastin, 18; Coleman, 1; Collins, W. H., 5; Lee, 6; Moore, E. S., 10; Phemister, 1; Watson, R. J., 2; Yates, 1.</td>
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Burwash River: Thomson, R., 4.
Chert, Lockport, Quodanga fm.: Laird,
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Clair River syncline: Fairbairn, 5.
Diorite: Freeman, B. C., 2.
Dore ser.: Cooke, H. C., 25.
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Favorable Lake area: Bateman, J. D., 3.
Felspar twinning: Chapman, W. M., 1.
French River area: Quirke, 2.
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Birch-Springpole Lakes area: Harding, 2.

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Burntbush River area: Thomson, R., 4.

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Casummit Lake area: Horwood, 12.

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Claire River syncline: Fairbairn, 5.

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Opepeeeway Lake area: Laird, 7.


Pagwachuan Lake area: MacDonald, R. D., 1.

Pickle Crow mine: Bothwell, 1; Thomson, James E., 13.

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Savant Lake area: Rittenhouse, 3.

Schreiber area: Bartley, 2; Harcourt, 4.

South Onaman area: Moorhouse, 3.

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Stull Lake area: Satterly, 3.

Sturgeon River area: Tanton, 5.

Sturgeon River-Beardmore area: Laird, 10.

Sudbury nickel dist.: Burrows, 3; Collins, 7; Cooke, H. C., 27; Fenner, 12; Phemister, 1; Reynolds, D. L., 1; Thomson, R., 1; Yates, 1; Anonymous, 149.

Tashota-Sturgeon River dist.: Flaherty, 2.

Thunder Lake area: Pettijohn, 15.

Uchi Lake area: Thomson, James E., 10.

Vem fn., Porcupine: Hurst, 10; Reid, J. A., 3.

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Little Long Lac area: Bruce, 16.
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North Spirit Lake area: Bateman, J. D., 2.
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Oysters: Hertlein, 4, 7.
Palaeeocene fauna: White, R. T., 2.
Palos Verdes Hills: Woodring, 17.
Pecten: Hertlein, 1, 7.
Peratherium: Stock, 50.
Perissodactyla: Stock, 27, 51.
Phalacrocorax: Howard, H., 1.
Pinnotherids: Rathbun, 9.
Plants in auriferous gravels: Chaney, 14; Mitchell, R. L., 1.
Plesiopus: Schultz, J. R., 2.
Pliocene faunas: Grant, U. S., IV, 3; Woodring, 6.
Pliocene faunas: Grant, U. S., IV, 3; Richein, 2.
Pliocene floras: Dorf, 1.
Pliohippus: VanderHoof, 2.
Pliumphsa: Miller, 20.
Pliomastodon: Matthew, 8.
Point Loma Pleist.: Webb, 5.
Porpoise: Kellogg, 6.
Poway conglom. fauna: Dusenbury, 1.
Protanopos: Stock, 60.
Protohippus: Stock, 44.
Radiolarian earths: Clark, 29.
Rodents: Hall, E. R., 3; Wilson, R. W., 5, 19, 20.
Salinans Valley: Dorn, 1.
San Miguel Is.: Bremner, 2.
San Pablo Bora: Axelrod, 2.
Santa Cruz Is.: Bremner, 1.
Santa Ynez Range: Woodring, 10.
Simi Valley: Woodring, 6.
Simimeryx: Stock, 37.
Storks: Miller, L. H., 13.
Strix brens: Howard, H., 7.
Syngnathus: Hanna, 15.
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**Tertiary—Continued.**

Curacao, West Indies.
- Foraminifera: Koch, R., 1, 2.
- Seros de Cuba lms.: Rutten, M. G., 1.
- Cytheridea shell structure: Stephenson, M. B., 2.
- Cytheropteron, Ala.-La.-Tex.: Martin, J. L., 1.
- Desmetystyle, sirenian: VanderHoof, 11.
- Dictyocoeli: Davies, L. M., 1; Vaughan, 15.
- Dogs, origin: Colbert, 11.
- Dominican Republic.
  - Cupraeidae: Ingram, W. M., 3.
  - Spondylidae: Palmer, K. E. V. H., 4.
- East Indian-equatorial Am. faunas, Eocene: Berry, E. Willard, 3.
- Faunas: Croneis, 28; Dunbar, 13.
- Fernando group, Calif.: Waterfall, 1.
- Fidicidae-Cassididae, relationships: Gardner, 10.
- Fish, Mex.-W. Indies-Trinidad: Leriche, 2.
- Floras, eastern N. Am.: Berry, 57.
  - Nomenclature: Graham, 4.
  - Western N. Am., correl.: Axelrod, 4.
- Florida.
  - Acline fossils: Tucker, H. I., 4.
  - Aphelops: Colbert, 1.
  - Attalea: Berry, E. W., 27.
  - Aves: Wetmore, 15.
  - Bees, mining, larval chambers: Brown, R. W., 7.
  - Caloosahatchee: Tucker, H. I., 3.
  - Chocotawhatchee fm.: Cushman, 7; Mansfield, W. C., 3, 8.
  - Crassatellites (Hybolophus?): Mansfield, W. C., 13.
  - Cypraeas: Ingram, W. M., 2.
  - Faunas, Oligocene: Mansfield, W. C., 21, 23.
  - Fish, teleost: Gregory, W. W., 6.
  - Foraminifera: Cole, W. S., 5, 6, 8; Cushman, 7, 22.
  - Gastropoda: Mansfield, W. C., 11.
  - Illyasissa: Tucker, H. I., 2.
- Georgia, Ostrea: Howe, 27.
- Ginko: Seward, 5.
- Glossary, mammal-bearing fms.: Simpson, 22.
- Glyptostrobus in America: Brown, R. W., 12.
- Greenland: Ravn, 1; Høeg, 1; Mathiesen, 1, 2.
- Green River floras, plant-animal, time discrepancies: Sahnl, 1.
- Geology, mammal-bearing fms.: Simpson, 22.
- Gabb's lamellibranch types: Stewart, R., 1.
- Georges Bank, Foraminifera: Cushman, 28.
- Georgia, Ostrea: Howe, 27.
- Ginko: Seward, 5.
- Glossary, mammal-bearing fms.: Simpson, 22.
- Gulf Coast.
  - Amnillida: Gardner, 16.
  - Archaeoceti: Kellogg, 9.
  - Cytheridea: Stephenson, M. B., 3.
  - Foraminifera: Garrett, J. B., Jr., 3.
  - Gastropoda: Gardner, 16.
  - Marginulina: Garrett, J. B., Jr., 2.
  - Venericardia planicosta group: Gardner, 14.
- High Plains floras: Chaney, 27.
- Hipparion, Pliocene indicator: Stirton, 22.
- Honduras, Mammalia: Olson, 4.
- Idaho.
  - Aves: Wetmore, 28.
  - Blarina, shrew: Gazin, 5.
  - Ceratomeryx: Gazin, 15.
  - Erethizon: Wilson, R. W., 10.
  - Felids: Gazin, 7.
  - Fish: Scheld, 2.
- Floras: Ashlee, 1; Berry, E. W., 32, 43; Brooks, B. P. W., 2; Brown, R. W., 8; Dorf, 6; Gillette, N. J., 2; Olson, B. H., 2; Smith, H. V., 1, 2, 4.
- Fruits: Brown, R. W., 8.

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Tertiary—Continued.

Florida—Continued.
- Tortoise: Wark, 1.
- Turritellidae: Sutton, 12.
- Foraminifera.
  - Georges Bank: Cushman, 28.
  - Haiti: Hanzawa, 1.
  - Jamaica: Hanzawa, 1.
  - Orbitoid: Vaughan, 24.
  - Tennessee: Hanzawa, 1.
  - Texas: Hanzawa, 1.
  - Trinidad: Hanzawa, 1.
  - United States, SE.: Cushman, 26.
- Fossils, plant-animal, time discrepancies: Sahnl, 1.
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Tertiary—Continued.

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Hares: Gazin, 9.
Hog Creek flora: Smith, H. V., 1, 2, 4.
Horses: Gazin, 18.
Idaho fm.: Kirkham, 9.
Mustelids: Gazin, 11, 21.
Payette fm.: Kirkham, 9.
Pecary: Gazin, 22.
Plesippus: Gidley, 5.
Quercinium: Boeshore, 2.
Sloths: Brown, R. W., 8.
Snake River Valley: Rice, H. B., 1.
Sucker Creek flora: Smith, H. V., 2.
Strombus: Rutsch, 1.
Turtle: Gilmore, 12.

Idaho-Oregon, Sucker Creek flora: Smith, H. V., 2.
Insecta, Kans.-Utal-Colo.: Carpenter, 22.
Isoetales, Wyo.-Mont.: Brown, 22.
Jackson Eocene fossils: Conrad, 1.
Kansas.
Aves: Wetmore, 38.
Cranes: Wetmore, 10.
Fauna, Pliocene: Hibbard, 5, 9, 12.
Feldiae: Hibbard, C. W., 3.
Grasses: Elias, 10.
Gnathobelodon: Barbour, 16.
Grebe: Wetmore, 38.
Grus, cranes: Wetmore, 10.
Kansasimys: Woodworth, 2.
Mammalia: Kellogg, 7.
Saccophius: Taylor, E. H., 1.
Sunsfish: Hibbard, 4.
Kentucky: Roberts, 14.
Louisiana.
Blitubulogenlerina: Howe, 12.
Caldwell Parish: Shreveport G. Soc., 2.
Catahoula Parish: Shreveport G. Soc., 2.
Calvert Cliffs Mammalia: Kellogg, 7.
Clam in barnacle shell: Buck, J. B., 1.
Crassatellites: Mansfield, W. C., 18.
Delphinodon: Barwick, 2.
Diatomaceae: Deflandre, 2.
Fellchthys: Lynn, 3.
Fish, albulid: Myers, G. S., 1.
Kummelia: Stephenson, 17.
Mammalia, Calvert Cliffs: Kellogg, 7.
Ophiucoelida: Berry, C. T., 3, 11.
Pearl: Berry, C. T., 7.
Pinus: Berry, E. W., 54.
Siphonocetus: Barwick, 1.
Sula: Wetmore, 43.
Tomarctus: Berry, C. T., 10.
Vertebrata: Gilley, 9.
Walnut: Berry, 48.
Whale: Helm, 1.
Xenohelix: Dryden, 6.
Massachusetts.
Cape Cod: Woodworth, 2.
Gay Head: Sanford, S. N. F., 1.
Mustodon, trilophodont-tetrabelodont: Frick, 4.
Merycolodontidae: Thorpe, 7, 8, 9, 10.
Metacodon: Clark, J., 5.
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Aturias: Miller, 36.
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Badger: Drescher, A. B., 1.
Brachiopoda: Cole, W. S., 2.
Crustacea, decapod: Rathbun, 3.
Diatomite: Hertlein, 6.
Discocyclina: Vaughan, T. W., 1.
Echinodermata: Israelsky, 3; Jackson, R. T., 3.
Elephant: Miiellerried, 17.
Foraminifera: Barker, 1; Cole, W. S., 3; Nuttall, 1; Thalmann, 11.
Hautkenina: Thalmann, 2.
Lepidocyclina: Thalmann, 6.
Miogypsina: Nuttall, 3; Thalmann, 1.
Notolagus: Wilson, R. W., 17.
San Carlos Mts.: Kellum, 13.
Triplalepidina: Vaughan, 38.
Utah: Chamberlain, R. V., 2.
Venericardia planicostata group: Rutsch, 3.

**Montana.**

Amphicyon: McGrew, 8.
Ardomyomys: Burke, 9.
Bear Creek fauna: Dorf, 14.
Coals, paleobotanic exam.: Miner, 4.
Desmatolagus: Burke, 9.
Fort Union flora: Dorf, 14.
Lizards: Gilmore, 22.
Melosoma: Berry, 64.
Proterozoic: Wetmore, 39.
Multituberculata: Simpson, 45.

**Nebraska.**

Antelopes: Furlong, 7.
Ardomyomys: Burke, 9.
Artiodactyla: Barbour, 28; Cook, 14.
Aves: Compton, 4; Wetmore, 7, 12, 18, 22, 23, 29, 35.
Bassaricus: Hibbard, 1.
Bathornis: Wetmore, 23.
Buteo: Wetmore, 7.
Camels: Brown, B., 1.
Cynarctoides: McGrew, 7.
Cynodesmus: McGrew, 2.
Cyttomyx: Wetmore, 29.
Desmatolagus: Burke, 9.
Diplolophus: Barbour, 37.
Dogs: Loomis, 10.
Eotodonta: Loomis, 5.
Equidae: Lewis, G. E., 1.
Faunus, Miocene, Pliocene: McGrew, 6.
Pfeldt Ranch Fauna: Hesse, 6.
Grasses: Elias, 10.
Hawks: Wetmore, 7, 35.
Mammalia: Barbour, 35; Colbert, E.
H., 2; Davis, P. B., 1; McGrew, 5; Matthew, 1, 14; Stirton, 12.
Marsupials: McGrew, 3.
Mastodont: Hesse, 5.
Mesocyon: Barbour, 18.
Mollusca: Cook, 13.
Mammals: McGrew, 10.
Palaeanthus: Dice, 3.
Pteropod, American: Collins, R. E.

**Mississippi.**

Amphipholrura: Berry, C. T., 10.
Bitubulogenerina: Howe, H. V., 12.
Bolvinella: Howe, H. V., 1.
Brissopsis: Grant, 13.
Cephalopoda: Miller, A. K., 10.
Clarke Co.: Shreveport G. Soc., 3.
Combretum: Berry, E. W., 42.
Crustacea, decapod: Stenzel, 7.
Eogorgia: Hickson, 1.
Eucythere: Howe, 20.
Foraminifera: Ellis, A. D., 1; Gravell, 2; Hadley, 2; Howe, H. V., 2.
Jackson Eocene: Fisk, 8; Monsour, 1.
Mollusca: Stephenson, 26; Gardner, 15.
Mammalia: Barbour, 35; Colbert, E.
H., 2; Davis, P. B., 1; McGrew, 5; Matthew, 1, 14; Stirton, 12.
Marsupials: McGrew, 3.
Mniasterodon: Hesse, 5.
Mesocyon: Barbour, 18.
Mollusca: Cook, 13.
Mammals: McGrew, 10.
Palaeanthus: Dice, 3.
Pteropod, American: Collins, R. E.

**Missouri.**

Amphipholrura: Berry, C. T., 10.
Bitubulogenerina: Howe, H. V., 12.
Bolvinella: Howe, H. V., 1.
Brissopsis: Grant, 13.
Cephalopoda: Miller, A. K., 10.
Clarke Co.: Shreveport G. Soc., 3.
Combretum: Berry, E. W., 42.
Crustacea, decapod: Stenzel, 7.
Eogorgia: Hickson, 1.
Eucythere: Howe, 20.
Foraminifera: Ellis, A. D., 1; Gravell, 2; Hadley, 2; Howe, H. V., 2.
Jackson Eocene: Fisk, 8; Monsour, 1.
Mollusca: Stephenson, 26; Gardner, 15.
Mammalia: Barbour, 35; Colbert, E.
H., 2; Davis, P. B., 1; McGrew, 5; Matthew, 1, 14; Stirton, 12.
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**Nebraska—Continued.**

- Scotts bluff Nat. Monument: Effinger, 1.
- Stenomyllus, gazelle-camels: Burke, 12.
- Titanotherium: Barbour, 15.
- Torgonobolodon: Barbour, 11.
- Vertebrata: Cook, 11; Hesse, 6.
- Woodpecker: Wetmore, 18.

**Nevada.**

- Artiodactyla: Stirton, 2.
- Camel: Cockerell, 14.
- Cupidinus: Chaffee, 1.
- Decapoda: Van Straelen, 3.
- Hedgehog: Matthew, 2.
- Merycodonts: Furlong, 6.
- Otter: Furlong, 3.
- Pliomastodon: Stock, 57.
- Pseudaelurus: Stock, 38.
- Rodents: Hall, E. R., 2; Wilson, R. W., 12.

**New Jersey.**

- Aturoidea: Miller, A. K., 19.
- Aves: Wetmore, 11.
- Balanus: Pilsbry, 2.
- Bryozoa: Canu, 1.
- Kummelia: Stephenson, 17.
- Microfauna, Monmouth, Rancocas groups: Jennings, P. H., 1.
- Mollusca: Pilsbry, 6.
- Myliobatis: Chaffee, 2.

**New Mexico.**

- Insect borings, fossil wood: Bruos, 2.
- Paleocene faunas: Matthew, 17.
- Turkey: Needham, 5.
- Vertebrata: Needham, 5.
- Noetinea: MacNeil, 7.

**North America.**

- Anadara pelecypods: Schenck, 32.
- Brachiopoda: Hatai, 1; Nomura, 1.
- Camel-like ruminants: Scott, W. B., 9.
- Epitonidae: Durham, 2.
- Foraminifera: Cushman, 1.
- Horned ruminants: Frick, 5.
- Nonionidae: Cushman, 38.
- Plants, Cenozoic: Chaney, 31.
- Pelecypods, Anadara: Schenck, 32.
- Snakes: Gilmore, 23.
- Turritellidae, Coastal Plain: Bowles, E. O., 1.

**North Carolina.**

- Aturia: Stenzel, 8.
- Coastal Plain: McCampbell, 1.
- Comatulids: Gillien, 1.
- Cypraea: Ingram, W. M., 1.
- Diatomis: Henbest, 11.
- Encrassatella: McNell, 4.
- Fauna, Elizabeth City: Henbest, 11.

**Oregon.**

- Anuklet: Miller, Alden H., 3.
- Blue Mts. flora: Oliver, 1.
- Briaster: Clark, H. L., 5, 6.
- Carnivora: Stock, 6.
- Cedrela: Arnold, 23.
- Colitis: Berry, 31.
- Cetotheres: Packard, 5.
- Cyca: Chaney, 31.
- Deschutes flora: Chaney, 34.
- Diatome: Lohnan, K. E., 3.
- Dipoides: Wilson, R. W., 7.
- Forests: Sanborn, E. I., 3.
- Franklin Butte floral: Sanborn, E. I., 5.
- Fruits, seeds, leaves: Brown, R. W., 8.
- Goschen flora: Chaney, 16.
- Legumes, Oligocene: Brown, R. W., 16.
- Mammalia: Gazin, 4; Scharf, 1.
- Mollusca: Henderson, J., 9; Turner, F. E., 5.
- Pseudotsuga: Arnold, 18.
- Raninidae: Rathbun, 8.
- Seeds, fruits, leaves: Brown, R. W., 8.
- Sphnophalos: Furlong, 2.
- Sucker Creek flora: Smith, H. V., 3.
- Tilia: LaMotte, 5.
- Trout Creek flora: Arnold, 27; MacGinitie, 1.
- Ostrea, Georgia: Howe, 27.
- Pacific Coast Peccaries: Colbert, 6.
- Palms, fossil: Noé, 14.

**Panama.**

- Aturia: Miller, 42.
- Cattia: Coryell, 16.
- Crabs: Rathbun, 13.
- Cypraela: Ingram, W. M., 3.
- Foraminifera: Coryell, 15.
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Panama—Continued.

Lepidocyclina: David, E., 1.
Mollusca: Li, 1.
Pectinidae: Davenport, 1; Mansfield, W. C., 12; Rowland, 1; Tucker, H. L., 1, 8.

Pelecypods, Pacific slope not Arcidae: Reinhart, 4.

Prohoscidia: Osborn, 36, 38.
Puerto Rico, corals: Coryell, 1.
Raphidioidea, revision: Carpenter, 15.

Rocky Mts. fms., Charophyta: Peck, 10, 15.

Ostracoda: Peck, 10, 15.


St. Kitts, Brimstone Hill: Trechmann, 8.

Sapindus oregonianus, climatic indications: La Motte, 4.

Saskatchewan.


Trapa?: Brown, 21.

Turtles: Russell, L. S., 22.

South Carolina, Mollusca: Mansfield, W. C., 16.

South Dakota.

Allognathosuchus: Patterson, B., 1.

Aturia: Stenzel, 8.

Basslerina: Moore, R. C., 4.

Borophagus: VanderHoof, 10.

Bysmachelys: Johnston, C. S., 7.

Canidae: VanderHoof, 13.

Canis: Johnston, C. S., 9.

Carnivora: Stirton, 27.

Claihorne, Cole, W. S., 1.

Claihorne foraminiferal zones: Israeli, 6.

Coastal Plain, W. of Brazos River: Deussen, 1.


Corals: Vaughan, 27; Wells, J. W., 7.

Crustacea, decapod: Stenzel, 5, 7.

Decapod Crustacea: Stenzel, 5, 7.

Eocene floras: Ball, O. M., 2, 5; Kirn, 2.

Epistominoides: Plummer, H. J., 8.

Equidae: Matthew, 9.

Foraminifera: Plummer, H. J., 8.

Hemphill Co.: Reed, L. C., 2.

Index fossils, oil fields: Harris, 10; Quesenbery, 1.

Jackson group foraminiferal zones: Ellisor, 3.

Lepidocyclina: Gravell, 4.


Midway group: Gardner, 8.

Mollusca: MacNeil, 3; Marshall, W. B., 1.

Mustelids: Gazin, 21.

Myodons, Eocene: Ball, O. M., 2.

Nannipus: Johnston, C. S., 8.

Osteoborus: Johnston, C. S., 10, 11.

Ostracoda: Alexander, 11; Moore, R. C., 4; Sutton, 16.

Ostrea: Harris, 8.

Paleobotany, Eocene: Ball, O. M., 2.

Plienuemys: Miller, L. H., 19.

Plant dis., Boxer Co.: Parks, H. B., 1.

Pliohippus: Stirton, 23.


Synthetoceras: Stirton, 6.

Teleoceras: Johnston, C. S., 3.

Textularia: Davis, F. E., 1.

Tracks, Pliocene: Johnston, C. S., 9.

Tree ferns: Atkinson, W. E., 1.

Turricula: Stenzel, 16.

Vertebrata: Hesse, 16-a.; Sollards, 40; Wood, H. E., 2d, 12.

Wilcox, cent. Tex.: Claypool, 1.

Titanotheres: Pavlova, 1.
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Cypraecea: Schilder, 1.
Echinoids: Joanneit, 1.
Foraminifera: Cushman, 1; Geyn, van de, 1; Vaughan, 38.
Forest clay flora: Berry, 55, 56.
Helicolepidina: Barker, 1.
Heteropods: Rutsch, 3.
Lepidocyclina: David, E., 1.
Mollusca: Yokes, 10.
Nautiloids: Miller, 32.
Ophioderma: Berry, C. T., 5.
Pteropods: Rutsch, 3.
Rudistids: Hodson, 1; Rutsch, 2.
Soldado Rock: Kugler, 4; Rutsch, 5.
Suggrunda: Hoffmeister, W. S., 1.
Terebratulina: Rutsch, 5.
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Rutsch, 4.

United States.

Floras, western: Brown, R. W., 14, 17.
Loxoconcha, southern: Murray, 3.
Mollusca, Claiborne: Palmer, K. E. V. H., 2.
Pectinidae: Tucker-Rowland, 1.
Pseudocreodi, western: Denison, R. H., 1.

Utah.
Agriochoerids (Diplobunops): Peterson, 6.
Anostelrid: Clark, J., 2.
Aptaelurus: Scott, W. B., 6, 8.
Creodont: Scott, W. B., 7.
Eonessa: Wetmore, 45.
Fish: Tanner, V. M., 1.
Mammalia: Burke, 4; Gazin, 24, 25, 26; Peterson, 8.
Mesonychids: Peterson, 5.
Micad: Clark, J., 7.
Miopterus: Burke, 4.
Rodents: Burke, 8, 7.
Scluravus: Burke, 10.
Stagnicola: Chamberlain, R. V., 1.
Teleodus: Peterson, 4.
Titanothere: Peterson, 9.
Turtle: Clark, J., 1.
Vertebrata: Peterson, 7.
Valentine: Johnson, F. W., 1.
Valvulinidae: Cushman, 29, 32.
Venericardia planecostata: Chavan, 1.
Verneuilinidae: Cushman, 29.

Virginia.
Amyda: Lynn, 1.
Ficus: Berry, E. W., 53.
Peritreusus: Berry, C. T., 6.
Phylodus: Glidersleeve, 6.
Pinus: Berry, E. W., 46.
Prunus: Berry, E. W., 54.
Snake: Lynn, 2.
Syllomus: Berry, C. T., 10.
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Tertiary—Continued.

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Larval chambers, mining bees: Brown, B. W., 7.
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Meniscotherium: Thorpe, 4.
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Miotapis: Schlaikjer, 6.
Mollusca: Russell, L. S., 9, 34.
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Mammalia: Denison, R. H., 1; Simpson, 46; Schlaikjer, 3.
Meniscotherium: Thorpe, 4.
Metacheiromys: Simpson, 15.
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Metacheiromys: Simpson, 15.
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Miotapis: Schlaikjer, 6.
Mollusca: Russell, L. S., 9, 34.
Mammalia: Denison, R. H., 1; Simpson, 46; Schlaikjer, 3.
Meniscotherium: Thorpe, 4.
Metacheiromys: Simpson, 15.
Microfossils, Eocene coal: Wilson, L. R., 10.
Miotapis: Schlaikjer, 6.
Mollusca: Russell, L. S., 9, 34.
Mammalia: Denison, R. H., 1; Simpson, 46; Schlaikjer, 3.
Meniscotherium: Thorpe, 4.
Metacheiromys: Simpson, 15.
Microfossils, Eocene coal: Wilson, L. R., 10.
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Mature lands: Johnson, 42.
Montana, Beartooth Mts.: Hughes, R. V., 3; Sharp, 11.
New England: Tarr, R. S., 1.
New Hampshire: White, G. W., 12.
New Mexico, Jemez Mts.: Church, F. S., 1.
New York: Cannon, R. S., 1; Fridley, 1.
Ohio: Cole, W. S., 10, 11; Desjardines, 1-a; Ver Steeg, 6.
Oregon, Neocene: Buwald, 5.
Pennsylvania.
Appalachian area: Anonymous, 186.
Bellefonte quad.: Butts, 10.
Chambersburg (Harrisburg): Campbell, M. R., 11.
General: Meyerhoff, 7; Stose, 2.
Harrisburg (Chambersburg): Campbell, M. R., 11.
Kittatinny (Schoolley): Ver Steeg, 14.
Schoolley (Kittatinny): Ver Steeg, 14.
South-cent.: Hickok, 4.
State College area: Detrick, 2.
Tyrone quad.: Butts, 13.
Planes of lateral corrosion: Johnson, D. W., 9.
Stages, developmental: Keyes, 323.
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Theoretic basis: Keyes, 382.
Vermont: Jacobs, 4; Pond, A. M., 1.
West Virginia: Cole, 11; Fridley, 7; Lucke, 12.
Wind gaps, water gaps: Ver Steeg, 2, 22.
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Cuesta vs. peneplain: Martin, L., 4.
Driftless area: Bates, R. E., 2; Martin, L., 4.
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Medicine Bow Range: Atwood, W. W., Jr., 5.
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Peneplain or penoplane: Johnson, D. W., 34.
Pennsylvania.
Field Conf.: Whitcomb, 8.
Geological Survey ann. rept.: Ashley, 4.
Syllabus of geology: Ashley, 5.

Areas described.
Adams Co.: Stone, G. W., 8.
Covatesville-West Chester quad.: Bascom, 3.
Delaware Water Gap area: Willard, 50.
Fairfield quad.: Stone, G. W., 1.
Freeport quad.: Hughes, H. H., 1.
Gettysburg quad.: Stone, G. W., 1.
Greene Co.: Stone, 8.
Hillards quad. oil and gas fields: Sherill, 5.
Lancaster quad.: Jonas, 2.
Lehigh Valley: Miller, B. L., 13.
McCalla Ferry-Quarryville dist.: Knopf, E. F., 3.
Middletown quad.: Stose, 12.
New Castle quad.: DoWolf, 1.
New Kensington quad. : Richardson, G. B., 2.
Northampton Co.: Miller, B. L., 15.
Pittsburgh quad.: Johnson, M. E., 1.
Quakertown-Daylesontown dist.: Bascom, 1.
Reading area: Willard, 58.
Schuykill Valley: Willard, 57.
Somerset quad.: Richardson, G. B., 3.
Southeastern Pa.: Hall, G. M., 5.
Tyrone quad.: Butts, 13.
Windber quad.: Richardson, G. B., 3.
York Co.: Stone, 21.

Economic geology.
Anthracite: Ashley, 31; Austin, A. C., 1; LeVan, 1; Thomas, J. P., 1; Turner, H. G., 1.
Appalachian oil and gas fields: Ashley, 28.
Bellefonte quad.: Butts, 10.
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Economic geology—Continued.

Bentonite: Bonine, 1, 2; Rosenkrans, 2.
Whitcomb, 7.
Bituminous coal fields: Sisler, 6.
Bradford oil field: Cathcart, 11; Fettke, 3, 9, 10, 11; Newby, 1; Waldo, 4.
Building stones: Stone, 11; Anonymous, 150.
Butler quad.: Richardson, G. B., 4.
Clay: Leighton, H., 2, 3, 5.
Coal: Ashley, 32; Linton, 1; Robinson, J. F., 2; Sisler, 1; Stadnichenko, 4; Thiessen, 3.
Correlation, oil and gas sands: Sisler, 2.
Deep sand, oil and gas: Cathcart, 10; Fettke, 4, 5, 6, 7.
Devonian sh., Oriskany sand drilling: Bennett, J., 1.
Early iron works: Billinger, 1.
Farmington gas field: Sanders, T. P., 2.
Feldspar: Stone, R. W., 5.
Fire clays: Leighton, H., 2.
Friedensville zinc mines: Blank, E. W., 1.
General: Ashley, 5.
Glass sand: Krynine, 11.
Gravel: Pennsylvania G. S., 1.
Hebron gas field: Reeves, J. R., 2.
Henry Shaler Williams camp area: Rogers, R. D., Jr., 1.
Hillsdale quad. oil and gas fields: Sherrill, 2.
Honeybrook quad.: Bascom, 6.
Iron: Billinger, 1; Callahan, 1; Hitchok, 2, 5; Smith, L. L., 1; Staples, J. M., 1; Yakhish, 1.
Lehigh Valley: Miller, B. L., 13.
Limestones: Miller, B. L., 4.
Magnetite: Callahan, 1; Smith, L. L., 1.
Map, oil and gas fields: Sisler, 7.
Metamorphism, Kittanning coal beds: Stadnichenko, 4.
Mineral res.: Ashley, 14; Berkey, 12; Pennsylvania G. S., 1; Anonymous, 140.
Mineral zoning, Tris.: Newhouse, 8.
Mining for oil: Torrey, F. D., 2.
Monongahela coals, microstructure: Thiessen, 3.
Natural gas.
Cameron Co.: Cathcart, 7.
Correlations: Sisler, 2.
Deep-sand poss.: Fettke, 4, 5, 6.
Elk Co.: Cathcart, 7.
Farmington field: Sanders, T. P., 2.
Fayette Co.: Gibbs, 1.
Gas and oil fields: Sherrill, 5; Simmons, A. C., 1.
General: Lucke, 1; Torrey, 6, 8.
Hebron gas field, Potter Co.: Reeves, J. R., 2.
Horizons, gas and oil: Claus, 1.
McKean Co.: Cathcart, 8.
Northern Pa.: Cathcart, 5.
Northwest Pa.: Fettke, 4, 5, 6.
Pennsylvania—Continued.

Economic geology—Continued.

Natural gas—Continued.

Oriskany gas fields: Cathcart, 2.
9, 9; Fettke, 12; Garrett, S. G., 1; Hamilton, S. H., 2.
Possibility of deep production: Fettke, 4, 5, 6, 7.
Potter Co.: Cathcart, 2, 3; Reeves, J. R., 2.
Sands, gas: Anonymous, 175.
Scenery Hill field: Robinson, J. F., 1.
Somerset Co.: Gibbs, 1.
Tideout quad.: Cathcart, 12.
Tioga region: Ashley, 8, 10; Cathcart, 1, 4; Giddess, 1; Robinson, J. F., 3, 4.
Western Pa.: Sisler, 7, 8.
Natural gas and oil fields: Cathcart, 12.
Claus, 1; Sherrill, 5; Simmons, A. C., 1; Sisler, 2, 7, 8; Anonymous, 175.
Nonmetallic mineral resources: Stone, 7.
Northampton Co.: Miller, B. L., 15, 18.
Oil and gas fields: Fettke, 4, 5, 6, 7.
Gibbs, 1; Sisler, 1, 8.
Correlation of sands: Sisler, 1.
Well records: Montgomery, J. G., Jr., 1.
Oriskany sands: Fettke, 12; Hamilton, S. H., 2; Ruggles, 1.
Petroleum: Anonymous, 158.
Correlations: Sisler, 2.
Deep sand poss.: Fettke, 4, 5, 6, 7.
Fayette Co.: Gibbs, 1.
Horizons, oil and gas: Claus, 1.
Industry, history: Lawrence, A. A., 1.
Mining for oil: Dickey, P. A., 1; Torrey, F. D., 2.
Northern Pa.: Cathcart, 5.
Northwest Pa.: Fettke, 4, 5, 6.
Oriskany sands: Ruggles, 1.
Pittsburgh area: Leighton, H., 6; Linton, 1.
Porosity, oil sands: Barb, 1; Honess, 3.
Possibilities, oil mining: Dickey, P. A., 1; Torrey, F. D., 2.
Oil and gas: Gibbs, 1.
Recovery by water flooding pressure: Clapp, F. G., 5.
Sands, oil: Anonymous, 175.
Somerset Co.: Gibbs, 1.
Tideout oil field: Cathcart, 12.
Western Pa.: Sisler, 7, 8.
Petroleum and nat. gas: Simmons, A. C., 1; Torrey, F. D., 6.
Pittsburgh area: Leighton, H., 6.
Pittsburgh coal bed: Eavenson, 3.
Potter Co.: Cathcart, 2, 3; Reeves, J. R., 2.
Recovery of oil by water pressure: Clapp, F. G., 5.
Rock salt: Stone, 12.
Sand: Pennsylvania G. S., 1.
Shale: Leighton, H., 3.
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Economic geology—Continued.

Somerset quad.: Richardson, G. B., 3.
Tyrone quad.: Butts, 13.
Western Pa., oil and gas: Sisler, 7, 8.
Windber quad.: Richardson, G. B., 3.
Wyoming-Lackawanna area: Itter, 1.
York Co.: Stose, 21.
Zinc: Blank, E. W., 2.

Historical geology.

Age of drift sheets: Ashley, 27.
Anthracite area: Barton, 11; Thomas, J. P., 1.
Reserves and geology: Ashley, 31.
Appalachian area: Jonas, 9; Anonymous, 186.
Atlantic Coastal Plain: Jonas, 4.
Avondale-Doe Run area: Bailey, E. B., 1.
Baltimore & Ohio routes: Grimsley, 1.
Basic rocks, E. highlands: Fraser, 11.
Bellefonte quad.: Butts, 10.
Bentonite areas: Bonine, 2; Rosenkrans, 2; Whitcomb, 7.
Blue Ridge: Stose, 13.
Bradford field: Fettke, 9, 10, 11.
Bradfordian ser., discontinued: Caster, 9.
Brazier sh.: Butts, 9.
Brooklyn quad.: Graeber, 1.
Brunswick fm. (Newark): McLaughlin, D. B., 2.
Butler quad.: Richardson, G. B., 4.
Cameron Co.: Cathcart, 6.
Carlin-Lowell Pais., hiatus: Butts, 8.
Chemung fm.: Butts, 9; Willard, 18, 24.
Clinton Co. Ord.: Whitcomb, 3.
Coal fields: Ashley, 32; Linton, 1.
Correlations.

Oil and gas sands: Sisler, 2.
Crystalline schists, Pa.-Md.: Jonas, 12.
Cycles, Penn.: Ashley, 6.
Dauphin-Sunbury area: Willard, 56.
Deep-sand oil and gas fields: Fettke, 4.
Delaware Valley below water gap: Ward, P., 5.
Delaware Water Gap area: Willard, 2, 50.
Devonian: Burroughs, 4; Caster, 8; Fettke, 2, 8; Laird, W. M., 2; Willard, 26, 36, 40, 41, 44, 59, 62.
Devonian-Miss. relations: Caster, 8; Laird, W. M., 2.
Eastern region: Miller, B. L. 7.
Elk Co.: Cathcart, 7.
Fayette Co.: Moyer, 1.
General: Ashley, 5; Willard, 30; Anonymous, 95, 172.
Geologic map: Stose, 7.
Glenarm ser.: Mackin, 4; Miller, B. L., 8.

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Historical geology—Continued.

Ground water: Leggette, 9; Lohman, S. W., 4, 10.
Hamilton correl.: Willard, 45.
Hamilton group: Reeves, J. R., 3; Willard, 21, 31, 35, 45.
Hardyton fm.: Miller, B. L., 16.
Harriaburg axis: Willard, 61.
Heavy minerals, age indicators: Dryden, 13.
Hebron gas field: Reeves, J. R., 2.
Heiderberg group: Swartz, F. M., 1, 10.
Henry Shaler Williams camp area: Rogers, R. D., Jr., 1.
Hillards quad. oil and gas fields: Sherrell, 5.
Honeybrook quad.: Bascom, 6.
Honeybrook uplift, structure: Stose, 17.
Igneous rocks, pre-Camb.: Bascom, 6.
Jacksonburg fm.: Miller, B. L., 2, 4.
Keyser lms.: Swartz, F. M., 10.
Kittatinny Mts.: Foose, 1; Willard, 53.
Lehigh-Northampton area: Breh, 9.
Lehigh Valley: Miller, B. L., 13.
Little Mtn.: Foose, 1.
Lowville-Carlim lms., hiatus: Butts, 8.
McKeen Co.: Cathcart, 7.
McKenzie shale: Swartz, F. M., 3.
Marcellus, Stroudsburg: Willard, 17.
Marle overthrust: Mackin, 4; Miller, B. L., 8.
Martinsburg fm.: Miller, B. L., 17.
Martinsburg lms.: Miller, R. L., 1; Stose, 18.
Martinsburg sh.: Gorman, J. P., 1.
MauohChunk fm.: Stone, 13.
Medina ss.: Chadwick, 12; Stose, 3.
Minnisink Valley: Happ, 3.
Mississippian-Dev. relations: Caster, 8; Laird, W. M., 2.
Monongabela ser.: Ashley, 1.
Natural gas fields: Lucke, 1; Torrey, 5.
Newark ser.: McLaughlin, D. B., 1.
New Bloomfield quad.: Cleaves, 1.
Northampton Co. : Miller, B. L., 15, 18.
Northern Pa.: Cathcart, 5; Torrey, 5.
Northwestern Pa.: Caster, 3, 5; Fettke, 6.
Oil and gas fields: Sisler, 8.
Correlations: Sisler, 2.
Horizons: Claus, 1.
Onondaga fm.: Willard, 41.
Ordovician: Stose, 5; Whitcomb, 3; Willard, 51, 54, 60.
Correlations: Willard, 51.
Ordovician-Sil. relations: Stose, 5; Willard, 60.
Oriskany group: Cathcart, 9; Cleaves, 4, 6, 8; Fettke, 1; Swartz, C. K., 6; Willard, 10.
Oriskany, supposed, is Mid. Dev.: Swartz, C. K., 6.
Paleogeography, glacial clay: Krynine, 10.
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**Historical geology—Continued.**

Paleozoic: Fraser, 15; Willard, 49.
Panther Valley: LeVan, 1.
Pennsylvanian cycles: Ashley, 6.
Pennsylvanian sec., Somerset Co.: Stone, 20.
Penn-York embayment: Caster, 16.
Pensauken fin.: Strock, 1.
Petroleum and gas horizons: Claus, 1.
Philadelphia area: Ehrenfeld, 2; Watson, E. D., 6.
Phoenixville quad.: Bascom, 6.
Piedmont prov.: Jonas, 4.
Pittsburgh area: Leighton, H., 6; Linton, 1.
Pleistocene, Philadelphia area: Ehrenfeld, 2.
Pocono: Ashley, 20; Chadwick, 24; Wagner, N. S., 1; White, C. D., 20.
Portage group: Willard, 34.
Possibility, deep oil and gas: Fettke, 7.
Pre-Camb.: Fraser, 15.
Reading Hills area: Fraser, 12; Stose, 15, 22; Willard, 58.
Reading overthrust: Stose, 15.
Sands, petroleum and gas: Anonymous, 175.
Schuylkill Valley: Willard, 57.
Selingsgrove Junction sec.: Willard, 16.
Silurian: Fettke, 2, 8; Swartz, C. K., 3; Swartz, F. M., 6, 7, 8; Willard, 69.
Silurian-Ord. relations: Willard, 60.
Smicksburg quad.: Shaffner, 2.
Southern Appalachian area: Butts, 4.
Southern Pa.: Stose, 11.
Southwestern Pa.: Piper, 7; Robinson, J. F., 2.
Spitzenberg conglomer.: Whitcomb, 4.
State College area: Detrick, 2.
Summary: Detrick, 1.
Taconic disturbance: Willard, 3.
Tidioute quad. oil and gas fields: Cathcart, 12.
Tioga region: Ashley, 8; Cathcart, 4; Willard, 11.
Trassic ser.: McLaughlin, D. B., 2.
Tully fm.: Cooper, 25.
Tully lms. and fauna: Willard, 22, 47.
Tunnels, South Penn turnpike: Cleaves, 5.
Tyrolean quad.: Butts, 13.
Volcanics, S. Appalachians: Jonas, 10.
**Mineralogy.**

Aragonite, caves: Faux, 1.
Barium: Meier, 3.
Bellfonte quad.: Butts, 10.

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**Mineralogy—Continued.**

Bentonite: Bonine, 2.
Carnotite: Myers, R. E., 1.
Clarion Co. meteorite (?): Stone, 14.
Copper: Butler, R. D., 3.
Corunum: Tomlinson, W. D., 2, 3.
Cornwall mine minerals: Ulke, 8.
Dickite: Hopes, 4.
Feldspar: Meier, 3.
Fluorite: Whittlock, 4.
Halite: Miller, B. L., 9.
Halotrichite: Shrader, 1.
Hardyston quartzite: Fraser, 14.
Harmatome: Meier, 1, 2.
Heavy minerals, age indicators: Dryden, 13.
Iron works, early: Billinger, 1.
Jasper: Fraser, 10; Myers, P. B., 1.
Manganese glass sand: Krynine, 11.
Meteorites: Smithsonian Inst., 2; Stone, 8, 15; Anonymous, 99.
Millerite: Hawkins, 5; Northup, 2, 4.
Minerals, Serpentine Range: Gehman, 1.
Montmorillonite: Tomlinson, W. H., 1.
Northampton Co.: Miller, B. L., 15.
Pennsylvanites: Fraser, D. M., 9; Meier, 4.
Prehnite: Fraser, D. M., 13.
Pyromorphite: Lewis, T. J., 1.
Rock crystal: Zodiace, 22.
Rock desert varnish: Miller, B. L., 12.
Sericitization: Fraser, D. M., 7.
Spessartite: Strock, 2.
Sphalerite: Butler, R. D., 1.
Thorianite: Wells, R. C., 6.
West Pittston area: Northup, 1.
York Co.: Stose, 21.
Zinc: Fraser, D. M., 6.

**Paleontology.**

Algae, calcareous: Fenton, 46.
Aorocrinus: Goldring, 15-a.
Appalachians, Olenellus zone: Resser, 20.
Archaeopteris: Arnold, 17, 20, 35.
Armstrongia cf. Titusvillia: Caster, 13.
Bothrideles slab: Chadwick, 10.
Brachiopoda: Benson, F. M., 1.
Branchiosaurus: Romer, 24.
Bryozoa: McNair, 4.
Camptostroma: Ruedemann, 18.
Cephalopoda: Flower, 1; Miller, 34.
Cheung tracks and trails: Willard, 28.
Coal flora: Durand, 3, 4.
Conifer: Wherry, 4.
Coral reef: Willard, 38.
Dalmanella: Barnacle, 1.
Dolocrinus: Burke, 1.
Devonian faunas: Willard, 12.
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Devonian-Miss. fms. with plants: Arnold, 25.
Devono-Carboniferous, N. W. Pa.: Caster, 1.
Dimerocrinus: Witmer, 1.
Dinosaur tracks: Hickok, 3; Willard, 23; Anonymous, 142.
Eurypterids: Eilers, 4.
Faunas, ancient: Anonymous, 173.
Marcellus: Willard, 17.
Martinburg: Secrist, 4.
Olenellus zone, Appalachians: Resser, 20.
Onondaga paint-ore: Willard, 52.
Tully lms.: Willard, 37.
Fish: Bryant, 5.
Floras, Catskill delta: Arnold, 34.
Devonian red-beds: Butler, R. D., 3.
Pittsburgh area: Darrah, 10.
Pocono: Arnold, 8, 10; Jongmans, 10.
Fossil collecting: Seaman, 8.
General: Willard, 42.
Helderberg group: Swartz, F. M., 10.
Homalonotus: Whitcomb, 1.
Insecta: Carpenter, 10.
Keyser lms.: Swartz, F. M., 10.
Lagenospermum: Arnold, 33.
Lehigh Valley: Miller, B. L., 13.
Lepidesthes: Cooper, G. A., 6.
Lepidostrobus: Arnold, 13.
Linguloids: Girty, 10.
Mastodons: Price, P. H., 4; Robinson, C. W., 1; Will, 1.
Mississippian plant beds: Arnold, 25.
Neuropteris: Jongmans, 6.
Northwest Pa.: Caster, 5.
Olenellus zone faunas, Appalachians: Resser, 20.
Ophiomorpha: Berry, C. T., 14.
Oriskany group: Cleaves, 2.
Ostracoda: Holland, W. C., 1; Swartz, F. M., 4, 5, 9.
Paleozoic: Stow, 3, 11.
Paramphibius tracks: Caster, 9; Anonymous, 69.
Pelecypoda: Caster, 10, 11.
Pittsburgh area: Darrah, 1; Leighton, H., 6.
Protothyra: Eller, 14.
Pseudospheroceratids: Flower, 9.
Pteridosperms, Card.: Darrah, 12.
Salonia: Cooper, G. A., 14.
Sauripterus: Gregory, 16.
Schizodiscus: Whites, 2.
Schuykill Valley: Willard, 57.
Scolithus: Cloud, P. E., 1; Miller, B. L., 14.
Siliceous sponges: Caster, 12.

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Spirifer: Willard, 39.
Sporodoceras: Miller, A. K., 27.
Strebodus: Arnold, 10.
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Terebratulina: Darrah, 7.
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Tentaculites: Vokes, 9.
Tetrapoda: Burke, 5.
Tully lms. and fauna: Willard, 37, 47.
Tyrone quad.: Butts, 13.
Walchia: Darrah, 7.

Petrology.

Albite trends, Piedmont: Ingerson, 4.
Basic rocks, E. highlands: Fraser, 11.
Bradford sand: Fettke, 3; Waldo, 4.
Coal: Fieldner, 9, 10.
Dauphin-Sunbury area: Willard, 56.
Gabbro alteration: Watson, E. D., 7.
Glass sand: Krynine, 11.
Gneiss-hornblende alteration: Postel, 2.
Hardyston quartzite: Fraser, 14.
Harmotome: Meier, 1, 2.
Heavy minerals, age indicators: Dryden, 13.
Helderberg group: Swartz, F. M., 10.
Jacksonburg fm.: Miller, R. L., 4.
Jacksonburg lms.: Miller, R. L., 2.
Jasper replacing Hardyston quartzite: Fraser, 10.
Keyser lms.: Swartz, F. M., 10.
Mica peridotite dike: Honess, 1.
Northampton Co.: Miller, B. L., 15.
Oriskany group: Cleaves, 8.
Oriskany ss.: Stow, 3, 11.
Paleozoic: Fraser, 15.
Pegmatites: Fraser, 9.
Pre-Cambrian: Fraser, 15.
Prehnite: Fraser, 15.
Reading Hills area: Fraser, 12; Willard, 58.
Ringing, trap rocks: Anonymous, 126.
Rock desert varnish: Miller, B. L., 12.
Sedimentation, Highlands: Fraser, D. M., 7.
Serpentine: Prouty, 1.
Shales, clays with coals: Grim, 5.
Zinc: Fraser, D. M., 6.

Physical geology.

Appalachian area: Anonymous, 186.
Appalachian-Piedmont deformation: Campbell, M. R., 1.
Anthracite Basin: Darton, 11.
Avondale-Doe Run area: Bailey, E. B., 1.
Bradford oil field: Fettke, 9, 11.
Brookville quad.: Graeber, 1.
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**Physical geology—Continued.**

**Caves:** Gorman, J. M., 1; Miller, B. L., 11; Stone, R. W., 2, 3, 10, 12.

Clove Creek earthquake 7/15/38: Landsberg, 12.
Dauphin-Sunbury area: Willard, 56.
Delaware Water Gap area: Willard, 50.
Drainage changes: Anonymous, 143.
Durham Hills shearing: Fraser, D. M., 8.
Earthquakes and seismology: Landsberg, 9, 12.
Eastern region: Miller, B. L., 7.
Farmington gas field: Sanders, T. P., 2.
Faulting, Conemaugh fm.: Ross, R. B., 1.
Garnets in conglomerates: Stose, 20.
Gneiss, hornblende, alteration: Postal, 2.
Granite intrusions. Phila.: Watson, 8.
Harrisburg axis: Willard, 61.
Helderberg group: Swartz, F. M., 10.
Henry Shaler Williams camp area: Rogers, R. D., Jr., 1.
Highway geology, Philadelphia-Pittsburgh: Willard, 55.
Honeybrook quad.: Bascom, 6.
Honeybrook uplift: Stone, 17.
Igneous assimilation, Macungie: Fraser, D. M., 5.
Iron deposit, Cornwall: Yaklish, 1.
Keyser lms.: Swartz, F. M., 10.
Kittatinny Mt.: Foose, 1.
Lehigh Valley: Miller, B. L., 13.
Lehigh Valley magnetic survey: Ewing, 8.
Little Mt.: Foose, 1.
Metamorphic belt, cent. Appalachians: Jonas, 1.
Mountains, origin: Ashley, 35.
New Bloomfield quad.: Cleaves, 1.
Northampton Co.: Miller, B. L., 15.
Phoenixville quad.: Bascom, 6.
Poleogeography, glacial clay: Krynine, 10.
Pre-Cambrian: Fraser, D. M., 12.
Reading Hills area: Fraser, D. M., 8, 12; Stose, 22; Willard, 58.
Schuylkill Valley: Willard, 57.
Shearing, Durham, Reading Hills: Fraser, D. M., 8.
Smicksburg quad.: Shaffner, 2.
State College area: Detrick, 2.
Wyoming-Lackawanna area: Itter, 1.
York County: Stose, 21.

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**Age of drift sheets:** Ashley, 27.
Appalachian drainage: Johnson, D. W., 12.
Appalachian Mts. sculpture: Ashley, 21.
Appalachian penepelaps: Ashley, 3; Ver Steeg, 3.
Appalachian plateaus, erosion surfaces: Cole, 12; Ver Steeg, 13.

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Appalachian region: Johnson, D. W., 8.
Asymmetric drainage, SW. Pa.: Stone, R. W., 1.
Bellefonte quad.: Butts, 10.
Brookville quad.: Graeber, 1.
Catoctin belt: Ver Steeg, 32.
Chambersburg (Harrisburg) peneplain: Campbell, M. R., 11.
Correlation, erosion surfaces: Ver Steeg, 31.
Dauphin-Sunbury area: Willard, 56.
Delaware Valley below Gap: Ward, F., 5.
Devonian ice: Willard, 32.
Eastern Pa.: Miller, B. L., 7.
Elk Hills glaciation: Filmer, 2.
Erosion surfaces, S-cent.: Hickok, 4.
Fayette Co.: Moyer, 1.
General: Ashley, 9; Anonymous, 92.
Glacial deposits outside Wisconsin mo-raine: Leverett, 16.
Glacial Lake Cowanesque: Willard, 15.
Glacial potholes, NE.: Davis, R. N., 1.
Glaciation: Filmer, 2; Anonymous, 156.
Ground water: Leggette, 9; Lohman, S. W., 4.
Harrisburg (Chambersburg) peneplain: Campbell, M. R., 11.
Hillards quad. oil and gas fields: Sherrill, 5.
Illinoian till, Delaware Valley: Leverett, 5.
Kittatinny Mt. gaps: Willard, 53.
Kittatinny (Schoolboy) penepelaps map: Ver Steeg, 14.
Lehigh Valley: Miller, B. L., 13.
Map, Schoolboy (Kittatinny) penepelaps: Ver Steeg, 14.
Meanders, Baystown Br., Juniata River: Stone, 16.
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Desmelozes area: Bell, L. V., 1.
Foch area: Bell, L. V., 10.
Gaboury Tp. area: Retty, 2.
Gaspé Peninsula: Jones, I. W., 11, 12, 13; Parks, 4.
Granada gold mine area: Hawley, 7.
Grevet (Kamshigama) Lake area: Longley, 1.
Lacente area: Osborne, 29.
Lake Ayler area: Burton, F. R., 1.
Lake Oostabong map area: Retty, 3.
Launay Tp.: Retty, 2.
Lower Laflame River: Auger, 2; Longley, 4.
McKenzie Township: Retty, 1.
Marsoui area: Jones, I. W., 6.
Mingan Is: Twenbofel, 4.
Mt. Alexander area: Jones, I. W., 14.
New Quebec (Ungava): Anonymous, 3.
North shore, St. Lawrence: Fassler, 23.
Ouilet (Mud) Lake area: Henderson, J. F., 2.
Guillet Township: Bannerman, 4.
Guillet-Tremblay area: Fassler, 16.
Guillet (Madawaska) Lake area: Fassler, 16.
Lac St. John area: Mawdsley, 6.
Ste. Anne River area: Laverde, 1.
Senterre area: Bell, L. V., 11.
Simard (Expanse) Lake area: Denis, 7.
Siscoe gold deposit: Hawley, 8.
Southern Quebec: Clark, T. H., 2.
Suzzor-Letondal area: Fassler, 16.
Taschereau map area: Lang, A. H., 3.
Thetford area: Cooke, H. C., 12.
Villebon-Denain area: Lowther, 1.
Waite-Ackerman-Montgomery property! Gill, 3.
Waswanipi Lake area: Lang, A. H., 4.
York River area: Jones, I. W., 11, 13.

Economic geology.
Abana mines: Mawdsley, 3, 4.
Abitibi area: Dresser, 6.
Aldermac ore, origin: Cooke, H. C., 5.

Quebec—Continued.

Economic geology—Continued.
Amber: Wilson, M. E., 18.
Amulet mine: Cooke, H. C., 6, 8.
Arnfield-Aldermac mines: Bruce, 7.
Asbestos: Cooke, H. C., 15, 20; Denis, 1; Palge, 3; Starks-Field, 1.
Assup River area: Bell, A. M., 1.
Bell River area: Bell, L. V., 7.
Bosquet-Cadillac area: Bell, L. V., 1.
Bosquet Tp.: Gunning, 23.
Cadillac area: Gunning, 13, 15, 22.
Cadillac-Malartic area: Gunning, 22.
Canadian Malartic gold mine: Berry, 11.
Canton Destor: Bannerman, 6.
Canton Vauquelin: Talman, 15.
Cape Smith sulfide deposits: Arth, 1.
Chibougamau Lake area: Mawdsley, 8; Norma, 6, 9.
Chromite: Denis, 2, 5.
Chrysothile veins: Taber, 1.
Copper: Cooke, H. C., 1; Goodwin, W. M., 1; Hawley, 5.
Desmelozes area: Mawdsley, 1.
Disraeli quad.: Bain, 21; Cooke, H. C., 15, 22.
Ditté gold placers: Goodwin, W. M., 5.
Dubuisson area: Bell, L. V., 16.
Eutis copper mine: Goodwin, W. M., 2.
Gaspé: Jones, I. W., 5, 7, 12, 15.
Geology In prosp.: Bell, L. V., 15.
Gold: Bain, G. W., 2; Bell, L. V., 6, 8, 13; Cooke, H. C., 1; Goodwin, W. M., 5; Hawley, 5, 7; McGerrigle, 5; Malouf, 1; Robinson, B., 1; Spearman, 3.
Granada gold mine: Hawley, 7; Robinson, B., 1.
Granites: Burton, F. R., 2; Osborne, 14, 20.
Graphite: Bain, G. W., 1.
Gravela: McGerrigle, 6; Plcher, 3, 4, 5.
Grenville series: Goodwin, W. M., 1.
Grevet (Kamshigama) Lake area: Longley, 1.
Guillet Township: Denis, 6.
Haltiwell mine area: MacKenzie, 5.
Horne Mine, Noranda: Butterfield, 1; Newhouse, 11; Price, P. 1, 2; Price W., 4; Suffel, 2.
Ilmenite: Gillson, 7; Keys, 2.
Intrusives, Rouyn-Bell River area: Gillson, 1.
Josselin-Delestre area: Bannerman, 4.
Labelle-L'Annonciation area: Osborne, 29.
Lachute lowland: McGerrigle, 8; Osborne, 29.
Lake Etchemin area: Talman, 12.
Quebec—Continued.

Economic geology—Continued.

Lamaque-Sigma mine areas: Bell, L. V., 12; Wilson, H. S., 1.
Late gold: Mawdsley, 8.
Limestones: Gouge, 5.
McWatters mine gold belt: Hawley, 10.
Madeline Lake gold: MacKenzie, 2.
Malartic gold mine area: O'Neil, 6.
Marbleton area: Laverdiere, 4.
Megiscane River area: Faessler, 13.
Mica: Wilson, M. E., 18.
Mineral prosp': Goodwill, W. L., 2.
Mineral resources: Gill, 7.
Mineralization, metamorphism, Eustis mine: Stevenson, 12.
Mining operations: Dufresne, 1, 2.
Mistawak area: Wilson, J. T., 6.
Molybdenite: Hawley, 6.
MONTAUBAN MINERALIZED ZONE: Osborne, 30.
Mt. Alexander area: Jones, I. W., 14.
Morganville area: Bell, L. V., 9.
Petroleum poss.: Spearman, 1.
Petroleum and gas res.: Parks, W. A., 1.
Prospecting, western: Bell, L. V., 15.
Recent mining devel.: Fairbairn, H. W., 1.
Risborough-Marlow area: Faessler, 22.
Road materials: Pecher, 3, 4, 5.
Roselake dist.: MacKenzie, 3.
Rouyn, Aldermac mine: Alderson, 1.
Rouyn-Bell River area: Lang, A. H., 5.
Simard (Expanse) Lake area: Denis, 7.
Siscoe gold mine: Backman, 1, 2; Hawley, 8.
Stangellite: Archambault, 1.
Suzor-Lewis Lakes area: Shaw, G. 1.
Témiscaming area: Norman, 10, 11.
Palmboard area: Lang, A. H., 3.
Pascalis-Lounivercourt area: Bell, L. V., 9.
Petrolium poss.: Spearman, 1.
Petrolium and gas res.: Parks, W. A., 1.
Prospecting, western: Bell, L. V., 15.
Recent mining devel.: Fairbairn, H. W., 1.
Risborough-Marlow area: Faessler, 22.
Road materials: Pecher, 3, 4, 5.
Roselake dist.: MacKenzie, 3.
Rouyn, Aldermac mine: Alderson, 1.
Rouyn-Bell River area: Lang, A. H., 5.
Simard (Expanse) Lake area: Denis, 7.
Siscoe gold mine: Backman, 1, 2; Hawley, 8.
Stangellite: Archambault, 1.
Suzor-Lewis Lakes area: Shaw, G. 1.
Témiscaming area: Norman, 10, 11.
Palmboard area: Lang, A. H., 3.
Pascalis-Lounivercourt area: Bell, L. V., 9.
Petrolium poss.: Spearman, 1.
Petrolium and gas res.: Parks, W. A., 1.
Prospecting, western: Bell, L. V., 15.
Recent mining devel.: Fairbairn, H. W., 1.
Risborough-Marlow area: Faessler, 22.
Road materials: Pecher, 3, 4, 5.
Roselake dist.: MacKenzie, 3.
Rouyn, Aldermac mine: Alderson, 1.
Rouyn-Bell River area: Lang, A. H., 5.
Simard (Expanse) Lake area: Denis, 7.
Siscoe gold mine: Backman, 1, 2; Hawley, 8.
Stangellite: Archambault, 1.
Suzor-Lewis Lakes area: Shaw, G. 1.
Témiscaming area: Norman, 10, 11.
Palmboard area: Lang, A. H., 3.
Pascalis-Lounivercourt area: Bell, L. V., 9.
Petrolium poss.: Spearman, 1.
Petrolium and gas res.: Parks, W. A., 1.
Prospecting, western: Bell, L. V., 15.
Recent mining devel.: Fairbairn, H. W., 1.
Risborough-Marlow area: Faessler, 22.
Road materials: Pecher, 3, 4, 5.
Roselake dist.: MacKenzie, 3.
Rouyn, Aldermac mine: Alderson, 1.
Rouyn-Bell River area: Lang, A. H., 5.
Simard (Expanse) Lake area: Denis, 7.
Siscoe gold mine: Backman, 1, 2; Hawley, 8.
Stangellite: Archambault, 1.
Suzor-Lewis Lakes area: Shaw, G. 1.
Témiscaming area: Norman, 10, 11.
Palmboard area: Lang, A. H., 3.
Pascalis-Lounivercourt area: Bell, L. V., 9.
Petrolium poss.: Spearman, 1.
Petrolium and gas res.: Parks, W. A., 1.
Prospecting, western: Bell, L. V., 15.
Recent mining devel.: Fairbairn, H. W., 1.
Risborough-Marlow area: Faessler, 22.
Road materials: Pecher, 3, 4, 5.
Roselake dist.: MacKenzie, 3.
Rouyn, Aldermac mine: Alderson, 1.
Rouyn-Bell River area: Lang, A. H., 5.
Simard (Expanse) Lake area: Denis, 7.
Siscoe gold mine: Backman, 1, 2; Hawley, 8.
Stangellite: Archambault, 1.
Suzor-Lewis Lakes area: Shaw, G. 1.
Témiscaming area: Norman, 10, 11.
Palmboard area: Lang, A. H., 3.
Pascalis-Lounivercourt area: Bell, L. V., 9.
Petrolium poss.: Spearman, 1.
Petrolium and gas res.: Parks, W. A., 1.
Prospecting, western: Bell, L. V., 15.
Recent mining devel.: Fairbairn, H. W., 1.
Risborough-Marlow area: Faessler, 22.
Road materials: Pecher, 3, 4, 5.
Roselake dist.: MacKenzie, 3.
Rouyn, Aldermac mine: Alderson, 1.
Rouyn-Bell River area: Lang, A. H., 5.
Simard (Expanse) Lake area: Denis, 7.
Siscoe gold mine: Backman, 1, 2; Hawley, 8.
Stangellite: Archambault, 1.
Suzor-Lewis Lakes area: Shaw, G. 1.
Témiscaming area: Norman, 10, 11.
Palmboard area: Lang, A. H., 3.
Pascalis-Lounivercourt area: Bell, L. V., 9.
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Historical geology—Continued.

Gravel areas: McGerrigle, 6.
Grenville, Côte Nord area: Faessler, 12.
Grevet (Kamshigama) Lake area: Longley, 1.
Guillet (Mud) Lake area: Canada G. S., 1; Henderson, J. F., 1.
Haillwell mine area: MacKenzie, 5.
Horne mine, Noranda: Price, F., 2.
Intrusives, Laurentian complex: Osborne, 26.
Josselin-Delestre area: Bannerman, 4.
Keewatin volcanics: Wilson, M. E., 19, 22.
Lake Memphremagog area: Clark, T. H., 4.
Lamaque mine area: Wilson, H. S., 1.
Lamaque-Sigma mines area: Bell, L. V., 12.
Lamaque-Sigma mines area: Bell, L. V., 12.
Lamaque mine area: Wilson, H. S., 1.
Lamaque-Sigma mines area: Bell, L. V., 12.
La Pause area map: Ambrose, 4.
Lac St. Jean area: Denis, 3.
Lake Etchemin area: Canada G. S., 1; Tolman, 12.
Lakeazzo matica: Longley, 3.
Lake Memphremagog area: Clark, T. H., 4.
Lamache area: McGerrigle, 8; Osborne, 29.
Lacolle cong. : Clark, T. H., 6.
Lava field, Canadian Shield: Wilson, M. E., 12.
Levis area: Laverdiere, 3.
Limestones: Goudge, 5.
Lower Laflamme River: Auger, 2; Longley, 4.
Macamic area: Canada G. S., 1.
McWatters mine gold belt: Hawley, 10.
Malartic area: Gunning, 16; O'Neil, 6.
Marbleton area: Laverdiere, 4.
Matapedia Valley: Crickmay, G. W., 1.
Megantic area: Canada G. S., 1.
Megantic River area: Faessler, 13.
Mogisac River area: Faessler, 13.
Mingan Islands: Twenhofel, 31.
Mistawak area: Wilson, J. T., 6, 7.
Moulage, age: Muench, 4.
Mount gay area: Weeks, 8.
Mt. Alexander area: Jones, I. W., 14.
Newbec area: Canada G. S., 1.
Opasatika area: Cooke, H. C., 3.
Opjawica-Lewis Lake area: Shaw, G., 1.
Opémiska area: Canada G. S., 1; Norman, 10, 11; Tolman, C., 6.
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Mineralogy.

Apatite: Alfani, 1.
Anorthosite: Faessler, 10.
Brucite: Berman, 4.
Cadillac area: Gunning, 15.
Canadian Malartic gold mine: Derry, 11.
Chibougamau-Wassanipi area: Norman, 8.
Chromite: Denis, 5; Poitevin, 1.
Dalmatianite: Walker, T. L., 2.
Garnet: Parsons, 15.
General: Faessler, 11.
Intrusives, acid: Gussow, 1.
Mica: Meen, 7.
Mineral resources: Gill, 7.
Mineralization, metamorphism, Eustis mine: Stevenson, J. S., 2.
Monazite, analysis, age: Muench, 4; Spence, 14.
Montauban mineralized zone: Osborne, 30.
Mt. Alexander area: Jones, I. W., 14.
Natrolite crystals: Poitevin, 5.
Pegmatite minerals: Spence, 5.
Pseudomorphs after spinel: Osborne, 28.
Pyrrhotite in chalcopyrite: Stevenson, J. S., 1.
Pyroxene: Parsons, A. L., 3.
Rare earths: Joashim, 1.
Replacement shells around batholiths: Freeman, B. C., 5.
Scapolite: Parsons, A. L., 3.
Silica: Cole, 7.
Suzorite stock: Faessler, 18.
Telluride ores, Eureka mine: Thomson, J. Ellis, 13.
Tungsten: Faessler, 17.
Uraninite: Ellsworth, H. V., 2; Muench, 7.

Paleontology.

Amulet mine: Cooke, H. C., 6; Wilson, M. E., 17.
Anorthosite: Faessler, 10.
Bell River complex: Freeman, B. C., 7.
Caldwell quartzites: Cooke, H. C., 9.
Chatham-Grenville stock: Osborne, 16.
Disraeli area: Cooke, H. C., 22.
Heavy minerals, Ord. ss.: Fraser, F. J., 4.
Intrusives, Rouyn-Bell River area: Gussow, 1.
Kee watin lavas: Wilson, M. E., 19.
Lachine area: McGerrigle, 8; Osborne, 29.
Lacolle conglomerate: Clark, T. H., 6.
Lake Dufault laccolith: Cooke, H. C., 5.
Lake Etchemin area: Tolman, 12.
Launay Township: Ross, S. H., 1.
Metabasalts: Fairbairn, H. W., 2.
Mineralization, metamorphism, Eustis mine: Stevenson, J. S., 2.
Mount Johnson dikes: Osborne, 15.
Mount Megantic: McGerrigle, 4.
Mount Royal: Finley, 1.
Opemiska intrusive: Tolman, 7.
Panache dist. dikes: Quirk, 18–d.
PetroTECTONICS: Osborne, 24.
Pierre River massifs: Osborne, 18.
Quartz: Fairbairn, 10.
Replacement shells around batholiths: Freeman, B. C., 5.
Risborough-Marlow area: Faessler, 22.
Shawinigan Falls area: Osborne, 22, 24.
Silurian, Gaspe: Northrop, 10.
Suzorite stock: Faessler, 18.
Thetford area: Cooke, H. C., 22.
Ville-Marie, Guillet (Mud) Lake areas: Henderson, J. F., 1.
Warwick area: Cooke, H. C., 22.
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Appalachians: Keith, 10.
Asbestos deposits, Thetford: Cooke, H. C., 21; Paige, 8.
Beattie-Galatea area: O'Neill, 4.
Beachastel Tp.: Malouf, 1.
Bell River complex: Freeman, B. C., 7.
Bic area: Rousseau, 2.
Bigniba area: Auger, 1.
Bousquet Tp.: Gunning, 23.
Breccia, St. Helen Is.: Osborne, 23.
Beauchastel Tp.: Malouf, 1.
Bic area: Rousseau, 2.
Bigniba area: Auger, 1.
Bousquet Tp.: Gunning, 23.
Breccia, St. Helen Is.: Osborne, 23.
Beauchastel Tp.: Malouf, 1.
Bic area: Rousseau, 2.
Bigniba area: Auger, 1.
Bousquet Tp.: Gunning, 23.
Breccia, St. Helen Is.: Osborne, 23.
Beauchastel Tp.: Malouf, 1.
Bic area: Rousseau, 2.
Bigniba area: Auger, 1.
Bousquet Tp.: Gunning, 23.

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Risborough-Marlow area: Faessler, 22.
St. Agathe, St. Jovite area: Osborne, 21.
St. Lawrence lowlands: Clark, T. H., 11.
Silurian, Gaspe: Northrop, 10.
Simard (Expense) Lake area: Denis, 7.
Silurian gold mine area: Backman, 1.
Suzor-Letondal area: Faessler, 16.
Taconic revolution: Keith, 11.
Thetford area: Cooke, H. C., 22.
Timiskaming earthquake data: Hodgson, 15.
Villebon-Domoin area: Lowther, 1.
Ville Marie and Guillet (Mud) Lake area: Henderson, J. F., 1.
Walte-Ackerman-Montgomery area: Wilson, M. E., 16.
Warwick area: Cooke, H. C., 22.
Wauwuilapt area: Norman, 9-a; Sproule, 1-a.
York River area: Jones, I. W., 13.

**Physiographic geology.**

Akpatok Is.: Cox, I. H., 1.
Bench cusps, Lake Olga: Butler, J. W., 4.
Beattie-Galatea area: O'Neill, 4.
Bigniba area: Auger, 1.
Chaleur Bay area: Alcock, 13.
Chateauguay Valley: McGerrigle, 8-a.
Clay rhizocrystallizations, St. Lawrence River: Rousseau, 1.
Disraeli area: Cooke, H. C., 22.
Gaspé: Jones, I. W., 12; Morin, 2.
Glacial boulders, Thetford: Cooke, H. C., 22.
Glacial geology, northwestern: Wilson, J. T., 5.
Glacial lakes: Gill, J. E., 1.
Glacial remnants, Côte-Nord: Faessler, 8.
Lower Lachaine River: Auger, 2; Longley, 4.
McWatters gold belt: Hawley, 10.
Mingan Islands: Twenhofel, 31.
Montreal Island: Evangeline, 1.
Opémiska area: Norman, 11.
Opémiska Lake area: Conolly, H. J., 1.
Panache dist.: Quirke, 18-d.
Peridotites, eastern: Cooke, H. C., 19.
Peridotites: Osismo, 24.
Philogipite-apatite deposits: Landes, 25.
Pre-Cambrian structures, tectonics: Norman, 8.

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Akpatok Is.: Cox, I. H., 1.
Bench cusps, Lake Olga: Butler, J. W., 4.
Beattie-Galatea area: O'Neill, 4.
Bigniba area: Auger, 1.
Chaleur Bay area: Alcock, 13.
Cheantequy Valley: McGerrigle, 8-a.
Clay rhizoconcretions, St. Lawrence River: Rousseau, 1.
Disraeli area: Cooke, H. C., 22.
Gaspé: Jones, I. W., 12; Morin, 2.
Glacial boulders, Thetford: Cooke, H. C., 22.
Glacial geology, northwestern: Wilson, J. T., 5.
Glacial lakes: Gill, J. E., 1.
Glacial remnants, Côte-Nord: Faessler, 8.
Gillet Tp.: Denis, 6.
Ice, northward moving: Clark, T. H., 8.
Josselin-Delestre area: Rannier, 4.
Laas-Fraser area: Longley, 2.
Lambert-L'Annonciation area: Osborne, 19.
Lachute area: McGerrigle, 8; Osborne, 29.
Lake Etchemin area: Tolman, 12.
Lake Mattagami area: Longley, 3.
Lamporte-Sigma mines area: Bell, L. V., 12.
Lower Laflamme River: Auger, 2; Longley, 4.
McWatters gold belt: Hawley, 10.
Mingan Islands: Twenhofel, 31.
Montreal Island: Evangeline, 1.
Opémiska area: Norman, 11.
Opémiska Lake area: Conolly, H. J., 1.
Panache dist.: Quirke, 18-d.
Peridotites, eastern: Cooke, H. C., 19.
Peridotites: Osismo, 24.
Philogipite-apatite deposits: Landes, 25.
Pre-Cambrian structures, tectonics: Norman, 8.
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Moraines, washboard: Mawdley, 7.  


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Risborough-Marlow area: Faessler, 22.  

Saguenay-Lake St. John area: Blanchard, 1.  


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St. Maurice Valley, drainage changes: Crosby, 3, 4.  


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Suzor-Letondal area: Faessler, 16.  

Tabletop area, Gaspe: Jones, I. W., 4.  

Talus slopes, Gaspe: Miner, N. A., 1.  

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Thetford area: Cooke, H. C., 22.  

Villebon-Demain area: Lowther, 1.  

York River area: Jones, I. W., 13.  

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Arkansas: Branner, 10; Hansell, 1; Reed, J. C., 6, 7, 8, 10; Solberg, 1, 2; Stearns, 7, 8, 11.  


California: Anderson, C. A., 5; Baum, 2; Franke, H. A., 2; Maxson, 5; Schuette, C. N., 4; Warner, T. 1.  

Cinnabar, spectographic study: Dreyer, R. M., 3.  

General: Ross, C. P., 34; Schuette, C. N., 2.  


Mexico: Franks, 1; Santillan, 14; Vappell, 1.  

Nevada: Dreyer, R. M., 2; Schuette, C. N.  


Occurrence of ore bodies: Schuette, C. N., 1.  

Oregon: Lewellen, 3; Oregon Dept. Geology, 1; Schuette, C. N., 5; Smith, W. D., 11; Wells, F G., 7.  

Texas: Duncan, F. 1; Lonsdale, 2; Ross, C. P., 19, 26, 27; Schoffelmayer, 1.  

Utah: Crawford, A. L., 2.  

Washington, cinnabar: Ott, 1.  

Western States: Ross, C. P., 13.  

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Radioactive elements: Wells, R. C., 10.  

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Age of matter by potassium, rubidium: Brewer, A. K., 2.  

Ages, astron., geol.: Urry, 4.  

Arkansas, Hot Springs water: Schlundt, 1.  

Astenolith theory: Willis, 16.  

Earth, age: Whitney, 6.  

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Gamma-ray well logging: Howell, L. G., 1.  

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And age of earth: Gries, 4.  


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Meteorites, iron, age by: Evans, R. D., 4.  

Methods of prosp.: Helland, 23.  

Minerals, Quincy granite: Keevil, 4.  

New Hampshire, Grafton: Shortle, 1.  

New York, Saratoga Springs water: Baudisch, 2.  

Northwest Territories, silver-pitchblende deposits: Furnival, 5; Marble, J. F., 2, 5; Spence, 13.  

Nova Scotia, ocean-bottom cores: Piggot, 9.  

Petroleum core testing: Landsberg, 10.  

Photography in study of: Wilkins, 1.  

Pitchblende area, Great Bear Lake: Marble, J. P., 2, 5; Spence, 13.  

Potassium, and geol. time: Brewer, A. K., 1.  

Protactinium, terrestrial and meteoritic: Evans, R. D., 6.  

Rocks and minerals: Kovarik, 1.  

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Granites: Piggot, 1.
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Baudisch, 2.
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Nova Scotia, ocean-bottom core: Piggot, 9.
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Ontario, Wilberforce: Spence, 2, 4.
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Ralstonite, Greenland: Gordon, S. G., 3; Pabst, 15.
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Comanche, pre-Comanche fms.: Hazzard, R. T., 3.
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Devonian: Darton, N. H., 1; King, 10.
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Edwards fms.: Jones, R. A., 2; Livingston, P. P., 1.
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- **Phosphoria fm.**: Branson, C. C., 1; Thomas, H. D., 6.
- **Popo Agi fm.**: Branson, E. B., 35.
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Schroeckingerite same as dakeite:
Nováček, 1.
Selenium in soils: Beath, 1, 3, 4.
Shorite: Fabry, 1.
South Pass-Atlantic City area: Abbott, 1.

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Absaroka volcanics dated by fossils:
Jepsen, 10.
Algae: Fenton, 56, 57.
Rest-forming: Wieland, 6.
Amphibia: Branson, E. B., 2.
Ancylocidaris: Miller, A. K., 1.
Apterododus: Schlaikjer, 3, 4.
Araeodon: Simpson, 44.
Beartooth Butte fauna: Dorf, 4, 5.
Flora: Dorf, 3, 4, 5.
Big Horn Basin: Jepsen, 2; Troxell, 3.
Birds: Wetmore, 24, 25.
Brachyhyops: Colbert, 5, 10.
Bridger Basin: Gilmore, 7.
Cats, sabre-tooth: Jepsen, 6.
Cephalopoda: Foerste, 21; Miller, A. K., 5, 14, 17, 30.
Cercidiphyllum: Brown, 24.
Charophyta: Peck, R. E., 3, 8, 9.
Colorado group, Cret.: Sidwell, 1.
Conodonts: Branson, C. C., 3; Branson, E. B., 38.
Corosaurus: Case, 20.
Crocodilus: Mook, 7.
Diatryma, Troxell, 4, 7-a.
Dinosaurs: Brown, B., 11; Frison, 1; Gilmore, 6, 8; Moodie, 5; Russell, L. S., 4; Swann, 2; Anonymous, 31, 56.
Eocene: Brown, R. W., 14.
Fossil forest: Avery, P. P., 1.
Frontier fm.: Berry, E. W., 7.
Gastroliths: Kemp, 1.
Gentilocamelus: Loomis, 11.
Goshen hole: Mammalia: Schlaikjer, 3.
Heptodon: Seton, 1.
Horses, 3-toed: Walker, M. V., 1.
Invertebrata, Morrison fauna: Branson, C. C., 9, 11.
Isoetales: Brown, 22.
Jurassic: Crickmay, 26.
Knowltonella: Berry, 41.
Lamdoceratidae: Bouillas, 1, 2.
Larval chambers of bees: Brown, R. W., 7.
Liquidambar: Brown, R. W., 4.
Lizards: Gilmore, 22; Walker, M. V., 4.
Lower Medicine Bow fm.: Dorf, 10.
Mammalia: Dentison, R. H., 1; Granger, 1; Schlaikjer, 3; Simpson, G. G., 4, 46; Wood, A. E., 14.
Medicine Bow fm.: Dorf, 10.
Meniscatherium: Thorpe, 4.
Metachelomyx and Edentata: Simpson, 15.
Microfossils, Eocene coal: Wilson, L. R., 10.
Miotapirus: Schlaikjer, 6.
Mollusca: Henderson, J., 8; Reeside, 9; Russell, L. S., 9, 34.
Morrison invertebrate fauna: Branson, C. C., 9, 11.
Multituberculata: Granger, 1.
Myopterygius: Nace, 3.
Nothosaurus: Case, 19.
Orodonts: Schlaikjer, 5.
Ostracoda: Morey, P. S., 1.
Palaeolagus: Dice, 2.
Palaeolophus: Schlaikjer, 5.
Phosphoria faunas from Embarr red beds:
Thomas, H. D., 5.
Phosphoria, from Embarr red beds:
Thomas, H. D., 5.
Fish: Branson, C. C., 6; Branson, E. B., 8; Bryant, 3, 4, 7; Haase, 17; Thorpe, 16.
Floras, Absaroka Mts.: Dorf, 12.
Aspen shale: Brown, R. W., 3.
Colgate mbr. Fox Hills fm.: Brown, 23.
Corson Ranch: Dorf, 7.

Wyoming—Continued.

Paleontology—Continued.

Eocene: Brown, R. W., 14.
Fossil forest: Avery, P. P., 1.
Frontier fm.: Berry, E. W., 7.
Gastroliths: Kemp, 1.
Gentilocamelus: Loomis, 11.
Goshen hole: Mammalia: Schlaikjer, 3.
Heptodon: Seton, 1.
Horses, 3-toed: Walker, M. V., 1.
Invertebrata, Morrison fauna: Branson, C. C., 9, 11.
Isoetales: Brown, 22.
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Lower Medicine Bow fm.: Dorf, 10.
Mammalia: Dentison, R. H., 1; Granger, 1; Schlaikjer, 3; Simpson, G. G., 4, 46; Wood, A. E., 14.
Medicine Bow fm.: Dorf, 10.
Meniscatherium: Thorpe, 4.
Metachelomyx and Edentata: Simpson, 15.
Microfossils, Eocene coal: Wilson, L. R., 10.
Miotapirus: Schlaikjer, 6.
Mollusca: Henderson, J., 8; Reeside, 9; Russell, L. S., 9, 34.
Morrison invertebrate fauna: Branson, C. C., 9, 11.
Multituberculata: Granger, 1.
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Nothosaurus: Case, 19.
Orodonts: Schlaikjer, 5.
Ostracoda: Morey, P. S., 1.
Palaeolagus: Dice, 2.
Palaeolophus: Schlaikjer, 5.
Phosphoria faunas from Embarr red beds:
Thomas, H. D., 5.
Wyoming—Continued.

**Paleontology—Continued.**

- *Pseudocreodi*: Denison, R. H., 2.
- *Rails*: Wetmore, 16.
- *Sharks, Perm.*: Branson, C. C., 7.
- *Sinc'air dinosaur expedition*: Brown, B., 11.
- *Tubiilodon*: Jepsen, 5.
- *Uinta Co.*: Veatch, 1.
- *Vertebrates*: Gilmore, 11; Jepsen, 1; Schlaikjer, 3; Troxell, E. L., 2.
- *Collecting*: Gilmore, 11.

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- *Agates*: Buddhue, 29.
- *Breccia, intrusive*: Pierce, 10.
- *Casper fm.*: Knight, S. H., 2.
- *Casper ss., cross-lamination*: Knight, S. H., 4, 5.
- *Chromite deposits*: Beckwith, 5.
- *Conglomerates, Green and Crook's Mts.*: Knight, S. H., 11.
- *Dreikanter*: Delo, 2.
- *Pennsylvanian*: Branson, C. C., 18.
- *Sunlight area volcanic centers*: Parsons, W. H., 2.
- *Tensleep fault*: Wilson, C. W., Jr., 14, 18.
- *Tensleep ss., cross-lamination*: Knight, S. H., 5.
- *Tuffs, volcanic deposits, Yellowstone*: Fenner, 18.

**Physical geology—Continued.**

- *Brecia, intrusive, Absaroka Mts.*: Pierce, 10.
- *Casper fm.*: Knight, S. H., 2.
- *Casper ss., cross-lamination*: Knight, S. H., 4, 5.
- *Chromite deposits*: Beckwith, 5.
- *Conglomerates, Green and Crook's Mts.*: Knight, S. H., 11.
- *Dreikanter*: Delo, 2.
- *Sunlight area volcanic centers*: Parsons, W. H., 2.
- *Tensleep fault*: Wilson, C. W., Jr., 14, 18.
- *Tensleep ss., cross-lamination*: Knight, S. H., 5.
- *Tuffs, volcanic deposits, Yellowstone*: Fenner, 18.
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Volcanic explosions, overthrusts: Bucher, 12.

Wasatch-Great Basin area: Eardley, 12.

Wind River Canyon: Fanshawe, 1; Jones, C. T., 2; Gwynne, 6.

Wind River Mts.: Baker, 26, 27.

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Woods-Jelm area thrust faults: Knight, S. H., 7.

Yellowstone Valley-Bighorn Basin area: Stow, 12; Thom, 23; Tomlinson, 10; Anonymous, 117.

Physiographic geology.


Bighorn Basin: Johnson, D. W., 33.

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Erosional history: Lucke, 7; Mackin, 7.

Dinwoody glaciers, Wind River Mts.: Wentworth, 10.

Glacial boulders, migrating, Teton glacier: Fryxell, 5.

Glacial geology, Jackson Hole: Fryxell, 2.

Medicine Bow Range: Atwood, W. W., Jr., 5.

Park Range: Atwood, W. W., Jr., 5.

Glacial tables, Tetons Nat. Pk.: Fryxell, 3.

Glaciers, Grand Teton Nat. Pk.: Fryxell, 7.

Dinwoody, Wind River Mts.: Wentworth, 10.

Medicine Bow Range, Pleist.: Atwood, W. W., Jr., 10.

Greybull River, stream capture: Mackin, 5.

Jackson Hole: Fryxell, 1.

Glacial geology: Fryxell, 2.


Laramie Basin structure: Beckwith, 4.

Medicine Bow Range, glacial geology: Atwood, W. W., Jr., 5, 10.

Warped peneplain: Atwood, W. W., Jr., 5.

Parallel drainage and log concretions: Wegemann, 2.

Park Co. valley area: Rouse, 3.

Park Range, glacial geology: Atwood, W. W., Jr., 5, 10.

Warped peneplain: Atwood, W. W., Jr., 5.

Red Desert: Nace, 2.

Sheep Mtn. area: Stevens, E. H., 2.

Sherman peneplain, Laramie Mts.: Hares, 3.

Soil drifting, Great Plains: Leighton, 29.

Stream capture, Abaroika Range: Mackin, 3.

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Sunlight area: Parsons, W. H., 3.

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Teton Mts.: Fryxell, 6, 9.

Teton Pass area: Horberg, 1.

Tunnels, natural, Dinwoody Creek: Wentworth, 23.

Valley area, Park Co.: Rouse, 3.

Wind River Basin: Bauer, C. M., 4.


Erosional history: Atwood, W. W., Jr., 7.

Yellowstone Park and Bighorn Basin: Johnson, D. W., 32.

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Alcova Dam site: Bradley, W. H., 11.

Hydrothermal activity: Kemp, 2.

Intermittent spring, Swift Creek: Stearns, N. D., 1.

Salt Creek-Teapot Dome uplift: Stabler, 1.

Snake River Valley: Debler, 1.

Xenohelix: Dryden, 6; Mansfield, W. C., 4.

Xenoliths.

Colville batholith, Wash.: Newcomb, 1.

Carnocopia, Oreg.: Goodspeed, 2.

Organ batholith, N. Mex.: Dunham, 4.

Xiphosura, Dev., N. Am.: Ruedemann, 51.

X-ray analysis of sediments: Mehlman, 1.

X-ray crystal analysis and petroleum geology: Reynolds, D. H., 1.

X-ray identification, antlerite: Waldo, 2.

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X-ray method for estimating quartz: Clark, G. L., 2.

X-ray powder camera: Buerger, 12.

X-raying the earth: Daly, 4.

X-rays in mineralogy: Peacock, 18.

Yardangs, Mojave Desert: Blackwelder, 33.

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Radioactivity, waters, gases, deposits: Schlundt, 2.

Historical geology.

Cambrian type fms., revision: Deiss, 7.


Geology: Stearns, 10.

Grand Canyon of the Yellowstone: Penhallow, 9; Howard, A. D., 6; Jones, O. T., 1.

Heart Mtn. overthrust-Yellowstone volcanics, ages: Hares, 1.

Mount Everts sec.; Wilson, C. W., Jr., 2.

Structural type, space, time relations, Yellowstone-Beartooth-Bighorn region: Thom, 13.

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Bore-hole inv.: Fenner, 14.

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Lamar Valley, age: Read, C. B., 3.
Insect borings in fossil wood: Brues, 2.
Petrified forest: Chapman, W., 1.

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Bore-hole Inv.: Fenner, 14.
Discharge, hot springs: Allen, E. T., 1.
Lava cliffs: Brouwer, 1.
Layering in rhyolite: Howard, A. D., 14.
Rhyolite-basalt contact, Gardiner River:
Fenner, 18; Wilcox, R. E., 3.
Rhyolites, shear control of structure:
Brouwer, 3.
Structure: Brouwer, 2.

Physical geology.

Drilling for geophys. data: Powers, 7.
General: Howard, A. D., 6, 8.
Grand Canyon of Yellowstone: Howard,
A. D., 6.
Heart Mtn. overthrust-Yellowstone volcanics, ages: Hares, 1.
Hot springs: Allen, E. T., 1, 5; Behre, 20; Day, 8.
Hydrothermal metamorphism, geyser
basins: Fenner, 10.
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Layering in rhyolites: Howard, A. D., 14.
Old Faithful geyser: Bauer, C. M., 6.
Rhyolite-Basalt contact, Gardiner River:
Fenner, 11, 18; Wilcox, R. E., 3.
Rhyolites, shear-control, of structure:
Brouwer, 3.
Structure: Brouwer, 2.
Volcanoes in Nat. Parks: Waesche, 3.

Physiographic geology.

Autophracy, Tower Creek: Howard, A.
D., 11.
Glaciation, multiple: Miner, 2.
Grand Canyon of Yellowstone: Fenne-
man, 9; Howard, A. D., 4, 6.
Hayden Valley lacustrine deposits: How-
ard, A. D., 4.
Physiographic history: Field, 5.

Underground water.

Bore-hole Inv.: Fenner, 14.
Geyser basins and ig. emanations: Allen,
E. T., 6.
Geyser: Bauer, C. M., 5.
Hot springs: Allen, E. T., 1, 2, 6-a;
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Hydrothermal activity: Kemp, 2.
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Yellowstone through the ages: Blackwelder, 44.
Yosemite Valley, geol. history: Matthes, 5.
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ston, J. R., 2.
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8, 9, 10, 12; Cockfield, 2, 5.
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Bostock, 8.

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Carmacks dist.: Bostock, 6; Canada
G. S., 1.
Freegold Mtn., Carmacks dist.: John-
ston, J. R., 2.
Laberge area: Bostock, 11; Canada
G. S., 1.
Marine Triassic, S. Yukon: Cockfield, 4.
Ozilvie area: Canada G. S., 1.
Pelly River area: Johnston, J. R., 1.
Pre-Cambrian: Mertie, 2.
Teslin-Quit Lake area: Canada G. S., 1;
Lees, E. J., 2.
Teslin-Quit Lake-Big Salmon area:
Bostock, 8.

Mineralogy.

Mineral reconnaissance: Karpiniski, 1.

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Petroleum.

Pelly River area: Johnston, J. R., 1.
Teslin-Quit Lake area: Lees, E. J., 2.

Physical geology.

Carmacks dist.: Bostock, 6.
Glaciation, depth of frost and ice veins,
Keno Hill: Wernette, 1.
Laberge area: Bostock, 11.
Pelly River area: Johnston, J. R., 1.
Teslin-Quit Lake area: Lees, E. J., 2.

Physiographic geology.

Carmacks dist.: Bostock, 6.
Glaciers: Washburn, 3.
Laberge area: Bostock, 11.
Pelly River area: Johnston, J. R., 1.
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Teslin-Quit Lake area: Lees, E. J., 2.

Zeballos River area, Vancouver Is., British
Columbia: Gunning, 11.

Zoology.

Manitoba: Brownell, G. M., 3.
Minnesota: Hanley, 1.
New Mexico: Needham, 8.

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Arizona: Fowler, 14; Hornon, 1.
Arkansas: McKnight, 2; Miser, 11;
Anonymous, 39.
Boulder Dam area: Lee, 7.
British Columbia: Armstrong, J. E., 1,
2; Calcares, 12, 13, 14, 17; Evans,
C. S., 4; Goranson, E. A., 3; Gun-
ing, H. C., 1; Hanson, 1, 11;
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Kindle, E. D., 2, 3, 4; Lay, 4;
O'Grady, 1; Sargent, H., 1, 2.
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California: Farrel, 1; Kelley, V. C., 10; Webb, R. W., 3.
Canada: Alcock, 3, 10.
Colorado: Behre, 32; Burbank, W. S., 3, 4; Chapman, E. P., 2; Cross, C. W., 2; Loughlin, 11, 12; Lover- ing, 15, 17; Rohling, 1; Vander- wilt, 11.

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Europe-N. Am. correlations: Behre, 33.

General: Jackson, C. F., 1.

Hydrothermal exper.: Kristofferson, 1.

Idaho: Anderson, A. L., 1, 23; Dickey, F. H., 1; McConnel, 1; Ross, C. F., 4, 31; Shenon, 17.

Kansas: Landes, 34.

Lead and zinc, upper Mississippi Valley: Banfield, 1.

Lowlands, S.-cent. and Ouachita provs.: Ruedemann, P., 3.

Mackenzie, Great Slave Lake Pint Pt. deposits: Bell, J. M., 2, 3.

Manitoba: Brownell, G. M., 2; Bruce, E. L., 2; Wright, J. F., 1, 2.

Meso-thermal deposits: McKnight, 1.

Mexico: Donald, R. T., 1; Edelen, 1; Fosburg, 12; Hayward, M. W., 1; Inlay, 10; Santillán, 14.

Mississippi Valley area: Bastin, 20; Graton, 7; Newhouse, 9.

Missouri: Duke, C. L., 1; Gleason, 3; Tarr, 21.

Montana: Dickey, F. H., 2; Lovering, 1; Purdee, 4; Sahinen, 4; Schafer, 1; Spirou, 3.

Nevada: Ferguson, H. G., 1, 5; Hewett, 4; Vanderburg, 3; Westrate, 6.

Newfoundland: George, P. W., 2; Snellgrove, 8.

New Jersey: Bowen, W. C., 1; Opp, 1; Palache, 28; Tarr, W. A. 3.

New Mexico: Dunham, 3; Krieger, P., 2; Lusky, 16; Ransom, F. L., 3; Schmitt, 10; Spencer, A. C., 1; Stott, 1.

New York: Brown, J. S., 2; Dyson, J. L., 1-1.

North America: Smirnov, 1.

Nova Scotia: Messervyee, 10.

Oklahoma: Fowlor, 6; Speer, 1; Tarr, 11; Weidman, 2.

Ontario: Bannerman, 1, 2; Burrows, 2; Freeman, B. C., 4; Hawley, 3; Hurst, 2; Moorhouse, 3; Osborne, 3, 31; Phemister, 3; Tuck, 2.

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Oregon: Callaghan, 10; Smith, W. D. 11.

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Pebble and ruby jack, fm. temperature, Mo.: Smith, W. S. T., 6.

Pennsylvania: Blank, E. W., 1; Butler, R. D., 1; Butts, 13.

Quebec: Bell, L. V., 14; Jones, I. W., 1, 5, 7; Osborne, 30; Wilson, M. E., 14.

Saskatchewan: Cameron, A. E., 3.

South Dakota: Tuills, 6.

Tennessee: Currier, 3; Newman, M. H., 1, 2.

Tri-State district: Fowler, G. M., 1, 2, 4, 5, 7, 8, 10, 13; Harbaugh, 2; Kansas G. Soc., 10; Leith, 5; Rama Rao, B., 1; Rice, 1; Tarr, 15.

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Utah: Green, J., 1; Nolan, 6; Staples, L W., 3.

Virginia: Currier, 2, 3.


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Zircon crystals in pegmatite, Wis.: Wilcox, R. E., 2.

Zolarite, Nev.: O'Brien, J. D., 1.