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BIBLIOGRAPHY

OF

NORTH AMERICAN GEOLOGY

FOR

1909

WITH SUBJECT INDEX

BY

JOHN M. NICKLES

WASHINGTON
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INTRODUCTION.

The bibliography of North American geology, including paleontology, petrology, and mineralogy, for the year 1909 follows the plan and arrangement of its immediate predecessors, the bibliographies for 1906–7 and 1908 (Bulletins 372 and 409 of the U. S. Geological Survey). It includes publications bearing on the geology of the continent of North America and adjoining islands, also Panama and the Hawaiian Islands. Papers by American writers on the geology of other parts of the world are not included. Text-books and papers general in character by American authors are included; those by foreign authors are excluded unless they appear in American publications.

As heretofore, the papers, with full title and medium of publication and explanatory note when the title is not fully self-explanatory, are listed under the authors arranged in alphabetic order. The author list is followed by an index to the literature listed. In this index the entries, in one alphabet, are of three kinds—first, subject, with various subdivisions, to enable the specialist to ascertain readily all the papers bearing on a particular subject or area; second, titles of papers, many of them abbreviated or inverted, under their leading words; and third, cross references, which have been freely used to avoid too much repetition. The subjects have been printed in black-faced type, the titles of papers and cross references in ordinary type. As it may not be always obvious which subject headings have been adopted, a classified scheme of those used immediately precedes the index.

The bibliography of North American geology is comprised in the following bulletins of the U. S. Geological Survey: No. 127 (1732–1892); Nos. 188 and 189 (1892–1900); No. 301 (1901–1905); No. 372 (1906–7); and No. 409 (1908).
SERIALS EXAMINED.

American Mining Congress: Papers and Addresses, 11th Annual Session; 12th Annual Session.
California, University of, Department of Geology: Bulletin, vol. 5, nos. 18–23. Berkeley, Cal.
Canada, Department of Mines, Mines Branch: Miscellaneous publications. Ottawa, Ont.
Canadian Institute: Transactions, vol. 8, pt. 3. Toronto, Ont.
BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY, 1909.

Centralblatt für Mineralogie, Geologie und Paleontologie, Jahrgang 1909. Stuttgart, Germany.
Deutsche geologische Gesellschaft: Zeitschrift, Bd. 61; Monatsberichte, nos. 1-12. Berlin, Germany.
Indiana Academy of Science: Proceedings for 1908. Indianapolis, Ind.
Indiana, Department of Geology and Natural Resources: 33d Annual Report. Indianapolis, Ind.
Mexico, Instituto geológico: Parergones, t. 2, nos. 8-10, t. 3, nos. 1-3. Mexico, D. F.
Mining Science, vols. 57-60. Denver, Colo.
Missouri Bureau of Geology and Mines: Biennial Report State Geologist for 1907-1908;
vol. 9, pts. 1, 2. Jefferson City, Mo.
Neues Jahrbuch für Mineralogie, etc., 1909: Beilage Band, 27, 28. Stuttgart, Germany.
New Brunswick Natural History Society: Bulletin, no. 27 (vol. 6, pt. 2). St. John, N. B.
New York.
North Carolina Geological and Economic Survey: Biennial Report, 1907-8; Bulletin,
no. 18. Chapel Hill, N. C.
12, pt. 1. Halifax, N. S.
Ohio Naturalist, vol. 9, nos. 3-8, vol. 10, nos. 1-2. Columbus, Ohio.
Ontario, Bureau of Mines: Report, vol. 18, pts. 1, 2; General Index to Vols. I-XVI.
Toronto, Ont.
Philadelphia Academy of Natural Science: Proceedings, vol. 61; Journal, 2d ser.,
St. Louis Academy of Science: Transactions, vol. 18, nos. 2-5. St. Louis, Mo.
Smithsonian Institution: Annual Report for 1908; Miscellaneous Collections, vol.
52, 54, pp. 1-329.
Sociedad científica “Antonio Alzate:” Memorias y revista, t. 25, nos. 5-12. Mexico, D. F.
Sociedad geológica mexicana: Boletín, t. 5, 6, pt. 1. Mexico, D. F.
Tschermaks Mineralogische und petrographische Mitteilungen, N. F., Bd. 27, 28. Vienna, Austria.


Zeitschrift für Kristallographie, Bd. 46, 47, H. 1–2. Leipzig, Germany.

Zeitschrift für praktische Geologie, Jg. 17. Berlin, Germany.
BIBLIOGRAPHY.

Adams, Frank Dawson.
   Outlines briefly the progress of the investigation and some of the results obtained.
Adams, Frank D., and Barlow, Alfred E.
   Describes the distribution, geologic relations, general petrographic character, mineralogical composition, and the several occurrences.
Adams, W. J.
   Gives a definition for the term “ore.”
Agraz, Juan S.
   Describes the composition of a meteorite from the Rancho de Los Arenales, near Cordon de la Pastora, State of Durango, Mexico.
Aguilera, José G.
   A list of earthquakes felt in Mexico from 1904 to 1908.
   Gives a list of fossils, including a new genus and 15 new species, without descriptions, from the Cretaceous of Mexico.
   Describes iron deposits of Mexico. Includes analyses of igneous rocks.
   Describes the general geology of the coal fields of Coahuila, Mexico, the occurrence, character, and relations of Cretaceous coal-bearing strata, and the character and occurrence of the coal beds.
   Describes the origin and work of the Geological Survey of Mexico.
Alden, William C.


The discussion is based upon the character of the drift in southern Wisconsin and northern Illinois.


Alderson, Matt. W.


Describes ore deposits produced by thermal waters.

Aldrich, Thomas H., jr.


Allen, R. C.


Describes the geology and structure of the range and the occurrence, character, and relations of the iron ores, the igneous origin of which is discussed.

Allen, Roy Hutchins.


Includes notes on the geology and the occurrence of the copper ores.


Includes notes on the local geology and the occurrence and character of the copper ores.

Allen, Eugene T., and White, W. P.


Ames, Mary Lesley.


Ami, Henry M.


Anderson, Glenn.


Anderson, Robert.

Anderson, Robert—Continued.
Describes the general geology, the volcanic rocks, the occurrence, character, relations, and origin of Tertiary sedimentary rocks, and prospecting for oil.
Includes notes upon the geology.

Anderson, Tempest.

Anonymous papers. See page 111.

Anrep, S. A.
Investigation of the peat bogs and peat industry of Canada during the season 1908–9.—See Nyström and Anrep, no. 903.

Arkansas Diamond Company.
29. A brief account of the discovery and investigation and the official reports of geologist and mining engineer on the occurrence of diamonds in Pike County, Arkansas. Little Rock, 1908. 38 pp.
Includes reports by John T. Fuller and Henry S. Washington.

Arnold, Ralph.
Describes the general geology and the characters of sedimentary, metamorphosed sedimentary, and igneous rocks.

Describes the stratigraphy of the region, comprising Mesozoic and Cenozoic formations, with lists of fossils showing distribution, and gives systematic descriptions of species.

Discusses the correlation of Tertiary formations of the Pacific coast States.

Description of the Santa Cruz quadrangle, California.—See Branner and others, no. 138.

Arnold, Ralph, and Johnson, H. R.

Ashley, George Hall.
Ashley, Harrison Everett.


Aston, James.


Atwood, Wallace W.


Babb, Percy Andrus.


Describes the geology, occurrence, and character of quicksilver deposits in the State of San Luis Potosí, Mexico.

44. The Magistral copper district, Mexico.—Eng. and Min. Jour., vol. 88, pp. 1215–1216, 2 figs., December 18, 1909.

Includes notes on the local geology and occurrence of copper ores near Ameco, State of Jalisco, Mexico.

Bagg, Rufus Mather, jr.


Bain, Harry Foster.


Bain, Harry Foster, and others.


Baker, F. C.


Baker, M. B.


Describes the geology of the area, and the occurrence of gold and iron.


Gives an account of the clays of Ontario.


Discusses the nomenclature and source of clays in Ontario.
Balarezo, Manuel.
Gives a summarized account of the silver and copper deposits of Mexico, with regard to geographic distribution, geologic occurrence, and types of deposits.

Gives a brief account of ore-bearing deposits at El Dorado, Territory of Tepic, Mexico.

Ball, Max W.
Describes the geography, stratigraphy, and structure of the field and the physical properties and composition of the coals.

Ball, S. Mays.

Ball, W. G.
The lead-silver deposits at Newburyport, Massachusetts, and their accompanying contact zones.—See Clapp and Ball, no. 229.

Bancroft, George J.

Barbour, Percy E.
Includes notes on the occurrence of petroleum in the Los Angeles field, California.

Barlow, Alfred E.
Describes the geology of the district and the occurrence of the silver ores.
The nepheline and associated alkali syenites of eastern Ontario.—See Adams and Barlow, no. 4.

Barnett, V. H.
The stratigraphic and faunal relations of the Waldron fauna in southern Indiana.—See Kindle and Barnett, no. 670.

Baron, H. J.
Includes notes on the occurrence of the silver ores.
Includes notes on the local geology and the occurrence and character of the copper ores.
Barrell, Joseph.

Barry, John G.
Describes the occurrence of natural gas in Bottineau County and prospecting in the field.

Barry, John G., and Melsted, V. J.

Bartow, Edward.
71. Classification of waters according to physical and chemical properties.—Illinois State Geol. Survey, Bull. no. 10, pp. 22–55, 8 figs., 1909.

Bartow, Edward, and others.

Bascom, Florence.
Describes the occurrence and relations of the several pre-Cambrian gneisses.

Bascom, Florence, and others.
Describes the general physical features, the general geology and geologic structure, the distribution, character, and relations of pre-Cambrian, Cambrian, Ordovician, Triassic, Cretaceous, Tertiary, and Quaternary formations, and pre-Cambrian and Triassic igneous rocks, the geologic and physiographic history, and the mineral resources.

Describes the geography and topography, the occurrence, character, and relations of pre-Cambrian, Cambrian, Triassic, Cretaceous, Tertiary, and Quaternary formations, and of igneous rocks, the structural features, the geologic history, and the economic resources.

Baskerville, Charles.
Describes the characters and occurrence of minerals containing the rare metals titanium, tungsten, uranium, vanadium, zirconium.

Includes notes on the geology of oil-bearing shales of New Brunswick.

Bassler, Ray S.
78. The cement resources of Virginia west of the Blue Ridge.—Virginia Geol. Survey, Bull. no. 2A, 309 pp., 30 pls., 30 figs., 1909.
Describes the general geology of northwestern, western, and southwestern Virginia, the distribution, characters, and relations of Cambrian, Ordovician, and later Paleozoic formations with particular reference to cement materials, and the geology and cement materials of individual counties. Includes illustrations of characteristic fossils.
BASSLER, Ray S.—Continued.


   Includes notes on the stratigraphy of Louisville, Ky., and vicinity, a brief biography of Henry Nettleroth (with portrait), and a list of the types obtained from the Nettleroth collection.

   Describes a slab containing Uintacrinus socialis from Kansas and other paleontologic accessions.

BASTIN, Edson S.

   Mineral resources of the United States, 1908: Graphite; quartz and feldspar.—See no. 1170.

BASTIN, Edson S., and DAVIS, Charles A.


BATHER, F. A.

   Describes the Miocene beds at Florissant, Colo., and the conditions under which they were deposited, and gives a list of papers relating to the Florissant fossils, published after 1905.

BAUMHAUER, H.

   Describes measurements of the crystals of benitoite.

BAYLEY, William Shirley.

   Describes the occurrence and relations of pre-Cambrian sedimentary and gneissic rocks, structural features of the Highland area, and the magnetite deposits.


BECKE, F.

   A note upon uranium ore and associated minerals from Bald Mountain, Colorado.

BECKER, George F.

89. Relations between local magnetic disturbances and the genesis of petroleum.—U. S. Geol. Survey, Bull. 401, 24 pp., 1 pl., 1909.

BEEDE, Joshua W.

   Describes the occurrence, characters, and relations of the formations in Kansas and adjacent parts of Oklahoma.

56693°—Bull. 444—10——2
Beede, Joshua W.—Continued.
91. The bearing of the stratigraphic history and invertebrate fossils on the age of the anthracolithic rocks of Kansas and Oklahoma.—Jour. Geology, vol. 17, no. 8, pp. 710–729, 1 fig., 1909.


Beede, Joshua W., and Rogers, Austin F.

Discusses the nomenclature, the correlation value of species, the faunal distribution by horizons, including a chart, and the faunal characteristics of the various stages into which the coal measures are divided.

Bennett, John.

History of geological fieldwork in Kansas.—See Haworth and Bennett, no. 517.
General stratigraphy of Kansas.—See Haworth and Bennett, no. 518.

Berg, G.


Describes crystalline slates in Las Animas Canyon south of Silverton, Colo.

Bergeat, Alfred.


Describes the geologic relations and the petrographic-chemical properties of a granodiorite mass in the State of Zacatecas, Mexico, and the contact phenomena.


Describes nontronite from Conception del Oro, Mexico, produced by the action of iron sulphate in solution upon wollastonite.

Berkey, Charles P.


The paper in full has been published in the American Geologist, vol. 29, pp. 171–177, 1902.


Gives characters by which the formations can be discriminated and notes upon their distribution.
Berry, Edward W.


Describes and renames Cretaceous plants from the Raritan formation of New Jersey.


Gives notes upon the distribution, in Pleistocene times and later, of various plants, and upon the occurrence of Pleistocene swamp deposits, and remarks upon several additions to the known Pleistocene flora of Virginia.


Beyer, Samuel Walker.


Bibbins, Arthur Barneveld.


Bigot, Raoul.


Describes prospecting for copper in the State of Michoacan, Mexico.

Birge, E. A.


An administrative report.

Blackwelder, Eliot.


Describes the physical characteristics of the formation and the character and distribution of the sediments of which it is formed.

Blake, William P.


Blake, William P.—Continued.

Blatchley, Raymond S.
Includes data in regard to the Illinois oil pools.

Bogdanovich, K.
123. Earthquakes of Messina and San Francisco. [In Russian]. St. Petersburg, 1909. 160 pp., 84 figs.

Böggild, O. B.
Describes the occurrence and crystallographic characters.

Bordeaux, Albert F. J.
A review of the silver deposits of Mexico in their geologic relations.

Böse, Emilio.
A preliminary notice of a Pliocene fauna from Tuxtepec, Oaxaca, Mexico, describing occurrence and character of fauna and giving a list of species identified.

Discusses the origin and structure of the so-called central plateau of Mexico.

Discusses the origin of fault-zones through volcanic forces with particular reference to the valley of Mexico.

Botsford, C. W.
Gives a general account of the geology and notes on the ore deposits.

Gives an account of the geology of the district and its relations to that of Guanajuato and other localities in Mexico.

Bowles, O.

Bowmocker, John Adams.
132. Geology as applied to the formations in which natural gas is found in the Appalachian regions.—Progressive Age, vol. 27, pp. 541–544, July 1, 1909.
Bradford, A. H., and Curtis, Roy P.
Includes notes on the local geology and the occurrence of placer gold.

Bradford, Robert H.

Bradley, W. M.

Branner, John C.


Branner, John C., and others.
Describes the geography, the general character of the rocks, the distribution, character, and relations of Jurassic, Cretaceous, Tertiary, and Quaternary formations, and of igneous rocks, the geologic structure, the geologic history, and the mineral resources.

Branson, E. B.

Describes new species of Pelecypoda, Gastropoda, and Trilobita from early Ordovician strata.


Brigham, William T.
141. The volcanoes of Kilauea and Mauna Loa.—Bernice Pauahi Bishop Mus., Mem., vol. 2, no. 4, 222 pp., 28 pls., 143 figs., 1909.

gives the recorded history of these volcanoes to 1909.

Brinsmade, Robert B.


British Columbia.
Annual report of the minister of mines for the year ending 31st December, 1908, being an account of mining operations for gold, coal, etc., in the Province of British Columbia. Victoria, B. C., 1909.—See Robertson, no. 1007.

Brook, Reginald Walter.

Outlines the administrative work and field investigations carried on in 1908. Includes brief reports by various members of the staff.
Brock, Reginald Walter—Continued.

Gives a sketch of his life and a list of his writings on geology.

Brooks, Alfred Hulse.

Brooks, Alfred H., and others.

Brooks, E. W.

Describes the occurrence and character of copper ores in the Banner mining district, Gila County, Ariz.

Brooks, William Keith.

Includes a list of his writings.

Brown, E. Percy.

Gives notes on the local geology of the Upper Seal Harbour gold district, Guysborough County, Nova Scotia.

Brown, Robert M.

Gives a brief account of the ninth annual intercollegiate geologic excursion. Includes notes upon various geologic features of the region traversed.

Brown, Thomas Clachar.

Brumell, H. P. H.

Buckley, Ernest Robertson.

Buckley, Ernest Robertson—Continued.

160. Lead and zinc mining in the Central States in 1907.—Econ. Geology, vol. 4, no. 2, pp. 175-177, 1909.
Discuss the occurrence of lead and zinc ores in Missouri.


Buehler, H. A.
An administrative report, but includes a chapter on the mineral resources of Missouri.

Burchard, Ernest F.


Mineral resources of the United States, 1908: Fluorspar and cryolite; gypsum; barytes and strontium; mineral paints.—See no. 1170.

Burckhardt, Carlos, and Villarello, J. D.
166. Estudio geológico de los alrededores de una parte del Río Nazas en relación con el proyecto de una presa en el cañón de Fernández.—Mexico, Inst. Geol., Parerg., t. 3, no. 2, pp. 117, 135, 9 pls., 1909.
Describes the geology along the river Nazas, in the State of Durango, Mexico.

Burgess, J. A.

Burling, Leander D.

Burrows, A. G.
Describes the geology of the area and the mining operations.


Burrows, R. H.

Bustamante, Miguel.
Discusses climate in geologic time and the division into eras.

Butler, Bert S.

Reviews occurrences previously reported, describes an occurrence in Shasta County, Cal., and the evidence for its primary origin.

Mineral resources of the United States, 1908: Copper.—See no. 1170.
The Yakutat Bay region, Alaska.—See Tarr and Butler, no. 1137.
The Yakutat Bay region, Alaska; areal geology.—See Tarr and Butler, no. 1138.

Butler, G. Montague.

Butts, Charles.
Describes the geologic occurrence and relations, methods of exploitation and manufacture, and qualities of the products.

Caine, Thomas A., and others.

Cairnes, D. D.
Includes notes on the general geology and the occurrence and character of coal deposits and copper and other ores.

Caldwell, M. M.

Calkins, Frank Cathcart.
Describes the physiographic features of the region, the occurrence, character, and relations of Algonkian and igneous rocks, and the geologic structure.


Calvert, W. R.
Describes the topography, stratigraphy, and structure of the field, the occurrence and character of the coal beds, the character of the coal, and the mining development.

Describes the geography and geologic structure of the field, the occurrence, character, and relations of Carboniferous, Jurassic, Cretaceous, and Quaternary formations, the distribution and character of the coal beds, and the quality of the coal.
Calvin, Samuel.

186. Geology and revelation. An address delivered before the members of the Okoboji Lakeside Laboratory on Sunday, the Fourth of July, 1909. Privately printed for the students of the Lakeside Laboratory, 1909. 27 pp., 1 pl. (port. of the author).


Describes the various drift sheets and interglacial deposits, and their relations.


An administrative report. The map shows the progress of detailed mapping in 1908.

Campbell, Marius R.


Outlines the work in 1907 of the United States Geological Survey in the Investigation of the coal areas of the United States.

Campbell, Marius R., and Parker, Edward W.


Campbell, William.


Camsell, Charles.


Gives notes upon the geology and describes the mining developments.

Canada, Department of Mines, Mines Branch.


Canada, Geological Survey.


Summary report of the Geological Survey Branch of the Department of Mines for the calendar year 1908.—See Brock, R. W., no. 144.

Capps, Stephen R., jr.


Describes the occurrence and character of rock glaciers and distinguishes them from true glaciers.

Carman, J. Ernest.


Gives an account of the bed-rock geology with particular reference to the development of existing physiographic features, and describes these features and their origin.
Carney, Frank.

An historical review of contributions to the subject of glacial erosion made by various writers.


Carpenter, M. H.

Carpenter, Philip P.

Carr, Henry C.

Includes notes on the local geology and the character and occurrence of the ores in the Salmon River Mountains, Lemhi County, Idaho.

Carter, Oscar C. S.

Case, Ermine C.

Discusses the stratigraphy and mode of deposition of the red beds.


Castro, Carlos.

Describes an analysis of kaolin in coal from Villafuente, State of Coahuila, Mexico, and explains its origin.

Chamberlin, Rollin Thomas.
Chamberlin, Thomas Chrowder.


Chamberlin, T. C., and others.


Chambers, R. E., and Chambers, A. R.


Includes notes on the geologic occurrence of the iron ores and a geological section of the ore-bearing strata of Wabana, Newfoundland.

Chance, H. M.


Chase, Edwin E.


Chase, Thorington.


Includes notes on the geology of the district and the occurrence of the ores.


Cirkel, Fritz.

223. Report on the iron-ore deposits along the Ottawa (Quebec side) and Gatineau rivers.—Canada, Dept. Mines, Mines Branch, 147 pp., 5 pls., 15 figs., 2 maps, 1909.


Discusses the geologic occurrence of the mineral in Canada and other countries, the shape and structure of the ore bodies, the composition of the ores, and their properties and metallurgy.

225. The Opasatika Lake district, Province of Quebec.—Eng. and Min. Jour., vol. 87, pp. 455–456, 2 figs., February 27, 1909.

Gives notes upon the geology of the district and the occurrence of copper ores.

Cist, Jacob.


"From Silliman's American Journal of Science, vol. 4, 1832," pp. 1-16. Includes sections showing the position and relations of anthracite coal seams.

Clapp, Charles H.


Describes the general geology and the mineral occurrences.

Clapp, Charles H., and Ball, W. G.


Describes the history of the discovery and development, the general geology, and the mineralogy of the deposits.

Clapp, Frederick G.


A preliminary report on the geology of Florida with special reference to the stratigraphy.—See Matson and Clapp, no. 829.

Clark, B. W.

Laboratory manual in physical geography.—See Hopkins and Clark, no. 590.

Clark, George Archibald.

The Bogoslofs.—See Jordan and Clark, no. 639.

Clark, William Bullock.


An administrative report.


An administrative report.


An administrative report.


Description of the Philadelphia district.—See Bascom and others, no. 74.

Description of the Trenton quadrangle, New Jersey-Pennsylvania.—See Bascom and others, no. 75.

Clark, Wm. Bullock, and Twitchell, M. W.

Clarke, Frank Wigglesworth.  

Clarke, John Mason.  
240. Fifth report of the Director of the science division, including the 62d report of the State Museum, the 28th report of the State geologist, and the report of the State paleontologist for 1908. Director's report for 1908.—New York State Mus., Bull. 133, pp. 5-114, 17 pls., 2 figs., 1909.  
Outlines the progress of geologic and paleontologic investigation in New York. Includes various data upon the geology and paleontology of the State.

Cleland, Herdman F.  
Includes a short account of the geology of the island.


Cockerell, Theodore Dru Alison.  
Includes a description of Protomelecta brevipennis n. sp. from the Miocene shales of Florissant, Colo.

Describes insects from the Miocene shales of Florissant, Colo.

Describes Hirameleva occitator n. sp. from the Miocene shales of Florissant, Colo.

Describes Philorites johannseni n. gen. and n. sp. from the Eocene near Rifle, Colo.

Describes new Diptera from the Miocene shales of Florissant, Colo., and the Eocene near Rifle, Colo.


Describes new genera and species of Orthoptera and Diptera from the Miocene shales of Florissant, Colo.


Describes briefly Glossina osborni n. sp. from the Miocene shales of Florissant, Colo.


Describes Pelandrena n. gen., P. reduta n. sp., and Haliictus miocenicus n. sp., from the Miocene shales of Florissant, Colo.
Cockerell, Theodore Dru Alison—Continued.


Describes insects from Eocene shales near Rifle, Colo., and from the Miocene shales of Florissant, Colo.


Describes fossil insects, *Paleochrysa concinnula* n. sp. and *P. ferruginea* n. sp., from the Miocene shales of Florissant, Colo.


Includes a description of *Melitta willardi* n. sp., from the Miocene shales of Florissant, Colo.


Describes a fruit *Firmanites aterrimus* new gen. and sp., and an insect *Syntomostylus? fortis* new sp.


262. Fossil Euphorbiaceae, with a note on Saururaceae.—Torreya, vol. 9, no. 6, pp. 117-119, 2 figs., June, 1909.

Describes *Acalypha myricina* n. sp. and *Croton t durcatulum* n. sp. from the Miocene shales of Florissant, Colo., and *Tithymalus willistoni* n. sp. from the Loup Fork beds of Kansas.


Gives notes upon fossil plants from the Cretaceous of Marshall, Boulder County, Colo., and the occurrence of amber and describes *Phragmites laramianus* n. sp.

264. Two new fossil plants from Florissant, Colorado.—Torreya, vol. 9, no. 9, pp. 184-185, 2 figs., September, 1909.

Describes *Hylolepis coloradensis* n. sp. and *Bauhinia pseudocotyledon* n. sp. from the Miocene shales of Florissant, Colo.

Coffey, George N.


Describes the formation of clay dunes in southern Texas.

Coleman, Arthur P.


Gives notes upon the geology of the district, and the occurrence and character of iron deposits.


Gives an account of the geology of the district, and the occurrence and character of iron deposits.


Coleman, Arthur P.—Continued.


Discusses the nomenclature and source of the clays of Ontario.


Discusses the evidence for the glacial origin of the Lower Huronian conglomerate.

Collier, Arthur J.


Collier, Arthur J., and Smith, Carl D.


Describes the stratigraphy and structure of the field, the occurrence, character, and relations of the coal beds, the character of the coal, and the mining developments.

Collins, W. F.


Collins, W. H.


Describes the general features of the region, the occurrence and relations of pre-Cambrian formations and glacial deposits, and the mineral deposits, particularly silver.

277. A geological reconnaissance of the region traversed by the National Transcontinental Railway between Lake Nipigon and Clay Lake, Ontario.—Canada, Geol. Survey Branch, 67 pp., 2 pls., 1 fig., 2 maps, 1909.


Describes the general geology, the areal distribution of formations, and the occurrence of silver, iron ore, and asbestos.

Condit, D. Dale.

280. The Conemaugh formation in southern Ohio.—Ohio Naturalist, vol. 9, no. 6, pp. 482–488, April, 1909.

Describes the stratigraphy of the formation and gives lists of fossils from the Ames and Cambridge limestones and notes on their occurrence.

Conrad, Timothy A.


Conrad, Timothy A.—Continued.


Cook, C. W.
Iodyrite from Tonopah, Nevada, and Broken Hill, New South Wales.—See Kraus and Cook, no. 681.

Cook, Harold James.
Describes briefly a specimen from the lower Harrison beds, near Agate, Sioux County, Nebr., for which the name Ozydactylus campestris n. sp. is proposed.

Describes Gomphotherium conodon n. sp.

A Pliocene fauna from western Nebraska.—See Matthew and Cook, no. 840.

Cook, John H.

Cooledge, C. W., and Overspeck, L. S.

Cooper, W. F.
Describes the character, occurrence, and relations of Carboniferous formations, and the geologic relations and character of the coal seams.

Corss, Frederic.
Describes a rock showing glacial striæ.
Coste, Eugene.

Cox, G. H.

Crawford, R. D.
The Hahns Peak region, Routt County, Colorado.—See George and Crawford, no. 446.

Croasdale, Stuart.
Arranges in tabular form the characteristics of igneous rocks to aid in their determination.

Crosby, William O.
293. A study of the geology of the Charles River estuary and the formation of Boston Harbor.—Massachusetts, Report of the Committee on Charles River dam, Boston, 1903; Appendix no. 7, pp. 345-369, 2 pls., 1903.

Cross, Whitman.
Discusses the application of the term Laramie group and proposes the term Shoshone group for the deposits resting unconformably upon the Laramie as restricted.


Curtis, Roy P.
Dredging at Breckenridge, Colorado.—See Bradford and Curtis, no. 133.

Dale, T. Nelson.

Dall, William Healey.
Includes a list of his writings.

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Dall, William Healey—Continued.


Discusses the stratigraphic position of the beds and gives systematic descriptions of the invertebrates. Appendixes contain reprints of rare papers by Conrad, Dana, Shumard, and Carpenter pertaining to the investigation.


Dalton, Leonard V.


Daly, Reginald A.


Discusses the calcium and magnesium content of the ocean in pre-Cambrian and later time and presents data from analyses of river waters for determining this.

Dana, Edward S., and Ford, William E.


Dana, James D.


Daneš, Jiří V.


Notes the absence of evidences of glacial action in the Coast Ranges and Sierra Nevada of southern California.

Darton, Nelson Horatio.


Gives an account of the general geology and the occurrence and quality of various structural materials.


Discusses briefly the stratigraphic position of the Whitewood limestone in which the fossils were found.

311. The stream robbery on which the Belle Fourche reclamation project is based.—Abstract: Science, new ser., vol. 29, pp. 556-557, April 2, 1909.

Description of the Philadelphia district.—See Bascom and others, no. 74.

Description of the Trenton quadrangle, New Jersey-Pennsylvania.—See Bascom and others, no. 75.
BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY, 1909.

Darton, N. H., and O'Harra, C. C.

Describes the geography, the stratigraphy, including Carboniferous, Triassic, Jurassic, Cretaceous, and Quaternary formations, the geologic structure, the geologic history, the mineral resources, and the underground water conditions.

Darton, N. H., and Siebenthal, C. E.

Describes the geography and general geology, the occurrence, character, and relations of Carboniferous, Triassic, Jurassic, Cretaceous, and Tertiary formations, the geologic structure, the mineral resources, including coal, gypsum, bentonite, and others, and the underground waters.

Davis, Charles A.


Peat deposits of Maine.—See Bastin and Davis, no. 83.
Mineral resources of the United States, 1908: Peat.—See no. 1170.

Davis, William Morris.

Includes essays on physiographic subjects reprinted from various journals.


Describes the physiographic features and history of the great canyon of the Colorado River in northern Arizona.


Describes the history of the canyon.


Day, Arthur L.
Day, David T.


Dean, Bashford.


De Kalb, Courteneay.


DeWolf, Frank W.

Dickinson, H. P.

Diller, Joseph Silas.

Diller, Joseph Silas, and Kay, G. F.
340. Mineral resources of the Grants Pass quadrangle and bordering districts, Oregon.—U. S. Geol. Survey, Bull. 380, pp. 48-79, 1 pl. (map), 1909. Describes the general geology, the occurrence, character, and relations of Paleozoic, Jurassic, Cretaceous, Tertiary, and igneous rocks, the geologic structure, the mineral resources, chiefly quartz- and placer-gold and copper, and the mining developments.
BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY, 1909.

Dinsmore, Chas. A.
   Includes notes on the local geology and the occurrence and character of the copper ores.
   Includes notes on the geology of the region and the occurrence of tin ore on Mount Franklin, near El Paso, Tex.

Dole, Richard B., and Stabler, H.
   Presents estimates as to the rate of denudation.

Douglass, Earl.

Dowling, D. B.
350. The coal fields of Manitoba, Saskatchewan, Alberta, and eastern British Columbia.—Canada, Geol. Survey, 111 pp., 11 pls., 2 figs., 1 map, 1909.

Dresser, John A.
357. A geological reconnaissance along the National Transcontinental Railway from the St. Lawrence River to the interprovincial boundary between Quebec and New Brunswick.—Canada, Geol. Survey, Summ. Rept., 1908, pp. 124–128, 1909.
359. On the asbestos deposits of the eastern townships of Quebec.—Econ. Geology, vol. 4, no. 2, pp. 130–140, 4 figs., 1909.
BIBLIOGRAPHY

Dresser, John A.—Continued.

360. The asbestos industry of eastern Quebec.—Min. World, vol. 30, pp. 593–595, 4 figs., March 27, 1909.

Describes the geology of the district, the character, relations, and origin of the veins, and the character and occurrence of the asbestos.


Describes the general geology and the occurrence of asbestos, chromite, talc, copper, antimony, and nickel deposits.

Dulieux, E.


Includes an account of the geology and the mineral resources of the region.

Dumble, E. T.


Discusses the stratigraphic position of certain beds.

Duncanson, H. B.


Eastman, Charles R.


Describes Helodus comptus n. sp. from the Meadville upper limestone (base of the Waverly) at Meadville, Pa.


Discusses the position of the palatal dental plates in the Mylostomatidae.

Eaton, H. N.


Eberle, Frank.


Eckel, Edwin C.

Mineral resources of the United States, 1908: Cement industry in the United States in 1908.—See no. 1170.

Ekeley, John B.


Ellis, E. E.


Ells, R. W.

Eells, R. W.—Continued.


Discusses the age and correlation of various beds in the vicinity of St. John, New Brunswick.


Emmons, Newton W.


Includes notes on the occurrence of ores.

Emmons, Samuel Franklin.


Reviews the progress in the geological investigation of the mineral resources of the United States.


Emmons, William H.


Discusses the occurrence and genesis of copper deposits of the “segregated vein” type in eastern North America from Quebec to Georgia and Tennessee, and more particularly in Maine and New Hampshire.


Estes, A. W.


Evans, A. W.


Includes a short account of the geology of the field and the occurrence and character of the coal.

Evans, Horace F.


Eyerly, T. L.

383. The geology of Hemphill County [Texas]. With a brief description of its topography, water supply, and soils. [1907.] 16 pp., 2 pls. [Private publication?]

Fairbanks, Harold W.


Fairchild, Herman Le Roy.


Fairchild, Herman Le Roy—Continued.


Faribault, E. Rodolphe.


Describes the geologic structure of the area, and the occurrence and relations of gold-bearing rocks and tungsten deposits.

Fay, Albert H.


Includes notes on the occurrence of copper ores in Orange County, Vt.

Fenneman, N. M.


Ferguson, Edw. G. W.


Finch, J. W.


Discusses the definition of the terms vein, apex, vein matter, and ore.

Fisher, Cassius A.


Describes the topography, the occurrence, relations, and character of Carboniferous, Jurassic, Cretaceous, and Tertiary formations, the occurrence and character of coal beds, and the character of the coal.


Describes the topography and structure of the field, the geologic occurrence of the coal, the distribution, relations, and character of the coal beds, and the quality and composition of the coals.

Fleck, Herman.


Includes notes on the occurrence of uranium and vanadium.


Fleming, W. L.
Includes notes on the occurrence of the gold ores.

Fletcher, Hugh.
Gives various notes on the geology of the area examined.

Flores, Teodoro.
Describes the physiographic features and general geology of the vicinity of Teotecala, State of Morelos, and explains a sinking of the earth which took place suddenly at the locality.

Gives data regarding the physiographic features and geology of the State of Oaxaca, Mexico.

Gives a brief account of deposits of Mexican onyx near Tequisistlan in the State of Oaxaca, Mexico.

Geologic study of the Sierra of Guanajuato.—See Villarello, Flores, and Robles, no. 1192.

Foerste, August F.
Gives notes upon the stratigraphy of lower Mississippian formations in Kentucky and Ohio, and the faunas, and descriptions of fossils from the Bedford-Berea rocks of Kentucky.

The systematic descriptions of fossils are preceded by a discussion upon the correlation and distribution of upper Ordovician formations and horizons.

The Waverly formations of east central Kentucky.—See Morse and Foerste, no. 887.
Fohs, F. Julius.

Ford, William E.
Describes the occurrence and crystallographic characters.

Second appendix to the sixth edition of Dana's System of Mineralogy.—See Dana and Ford, no. 304.

Ford, W. E., and Pogue, J. L.


Ford, W. E., and Tillotson, E. W.


Forstner, William.


Fraas, Eberhard.
Describes a footprint supposed to have been made by a small dinosaur and a vertebra of Ophthalmosaurus (Baptanodon) from the Jurassic of Jameson Land, Greenland.

424. In den Bad Lands von Süd-Dakota.—Aus der Natur, Jg. 2, Heft 17, pp. 513-521, Heft 18, pp. 552-559, 10 figs., 1906.
A general account of the Bad Lands of South Dakota and the noteworthy fossils found in them.

Compares the Jurassic deposits of Württemberg, Germany, with those of the Great Plains.

Frecheville, William, and Marriott, Hugh F.
Free, E. E.
Calls attention to eolian action in transporting material to the sea.


Freeman, John R.

Presents various data to show that Boston, Mass., is slowly sinking into the sea and the harbor bottom tends to slowly become deeper.

Freudenberg, Wilhelm.

Gives observations upon the physiography and geology of the Sierra Nevada Mountains of Mexico.

Fuller, John T.

Fuller, Myron L.

Gale, Hoyt S.

Describes the general stratigraphy and structure of the region, the occurrence, character, and relations of the coal-bearing formations, and the distribution and character of the coals.

Gannett, Henry.

Ganong, W. F.

Gardner, James H.
436. The coal field between Gallina and Raton Spring, New Mexico, in the San Juan coal region.—U. S. Geol. Survey, Bull. 341, pp. 335-351, 1 pl. (map), 1909.

Describes the geography, topography, and stratigraphy of the field and the occurrence relations, and character of the coal beds.


Describes the stratigraphy and structure of the field, the occurrence, character, and relations of the coal beds, and the composition of the coals.


Describes the topography and geology of the field and the occurrence, character, and relations of the coal beds.
Garrison, F. Lynwood.

Geddes, Charles Walter.
Includes a brief account of the local geology and of the occurrence of the gold ores.

Gehrman, Charles A.

George, R. D.
Describes the general geology of the region, the lithology, the character and occurrence of tungsten ores, and the relations and origin of the ore bodies.


445. The main tungsten area of Boulder County, Colorado, with notes on the intrusive rocks by R. D. Crawford.—Colorado Geol. Survey, 1st Rept., 1908, pp. 7–103, 11 pls., 1909.
Describes the general geology and character of the rocks of the area, the occurrence and characters of tungsten minerals, and the occurrence, relations, and mining of tungsten ores in Boulder County, Colo.

George, R. D., and Crawford, R. D.
Describes the general features of the region, the occurrence, character, and relations of pre-Cambrian, Carboniferous, Triassic, Cretaceous, and Tertiary formations, and igneous rocks, and the economic geology.

Gibson, Thomas W.

Gidley, James Williams.

Gilbert, Grove Karl.

Explains the convexity of hilltops as due to the action of creep.

Gill, H. V.
Gilmore, Charles W.


Describes *Opisthias rarus* n. gen. and n. sp. from Como Bluff, Albany County, Wyo., and gives a list of vertebrate fossils from the same locality and notes upon some of them.

Girty, George H.


Discusses the relations of upper Carboniferous faunas and the correlations of Carboniferous and so-called Permian formations.


Discusses the correlation and stratigraphic position of the beds containing the Guadalupian fauna.


Discusses the stratigraphic relations of the Caney shale and gives systematic descriptions and figures of the invertebrate fauna.


Goldschmidt, V., and Mauritz, B.


Describes the crystallography of calomel from Terlingua, Tex.

Goldthwait, James Walter.


Goldthwait, J. W., and Jacobson, R. C.


Gordon, C. E.


Discusses the age, relations, and occurrence of metamorphosed pre-Cambrian and Cambrian sediments in New York and adjoining States.

Gordon, Charles H.


Discusses the occurrence of chalk beds, to which the formation name Annona chalk has been given, in northeast Texas, and considers them to be the equivalent of the upper part of the Austin chalk of central Texas.

BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY, 1909.

Gould, Charles N.


Grabau, Amadeus W.


Discusses the age and mode of formation of Ordovician and Silurian formations in Pennsylvania.

Nomenclature and subdivision of the upper Siluric strata of Michigan, Ohio, and western New York.—See Lane and others, no. 733.

New upper Siluric fauna from southern Michigan.—See Sherzer and Grabau, no. 1658.

Grabau, Amadeus W., and Shimer, Hervey Woodburn.


Gives brief descriptions, usually with figures, and geologic horizon and distribution of characteristic fossils. Includes keys to the genera and species and references to the more important literature.

Graham, Richard P. D.


Describes the occurrence, crystallography and optical properties, and the composition.


Grandin, M. V.


Describes the general geology of the South Cheticamp mining district and the occurrence, relations, and character of copper and other ores.
Granger, Walter.


Gives an historical review of previous work on the Washakie formations and the views entertained as to its age, relations, and deposition, describes the topography and geology with sections, and indicates the faunal horizons.

Grant, Ulysses Sherman.


Grasy, J. S.

The character and structural relations of the limestones of the Piedmont in Maryland and Virginia.—See Mathews and Grasty, no. 825.

Gratacap, Louis P.


Gray, F. W.


Includes notes on the geologic relations and occurrence of the coal deposits of Cape Breton Island, Nova Scotia.

Greene, F. C.


Greger, Darling K.


Describes the distribution and gives lists of fossils from the two formations represented.

Gregory, Herbert E.


A sketch of his life and a list of his writings.


Gives a general account of the physiographic features and descriptive geology and, in more detail, of the occurrence, character, and recovery of the underground waters.

Gregory, J. W.


Includes notes and figures of American forms from various horizons and descriptions of some species from the Cretaceous of New Jersey.
Griggs, Robert F.
Explain the formation by ice action of narrow ridges dividing lakes.

Grimsley, G. P.

Grosspietsch, Oskar.
Describes the crystallography of albite from Greenland.

Grout, Frank F.

Gulliver, F. P.
Gives an account of the meeting at Baltimore, December, 1908, and abstracts of papers presented.

Gunter, Herman.
The fuller's earth deposits of Gadsden County, Florida.—See Sellards and Gunter, no. 1050.

Guppy, R. J. Lechmere.
Discusses evidence for the pre-Miocene distribution of land in the Caribbean sea.

Haley, D. F.
Includes notes on the local geology and the occurrence of the ores.

Hall, Edward Hagaman.

Hamilton, S. Harbert.
Includes notes on the geology and the occurrence of iron, copper, and other ores and minerals.

Hannibal, Harold.


Hantzsch, Bernhard.


A description of northeastern Labrador. Includes notes on the geology and physiographic features.

Harder, Edmund Cecil.


Describes the local geology and the structure of the ore deposits.


Describes the character, composition, geographic distribution, and geologic relations of the various types of iron ore found in Virginia.


Mineral resources of the United States, 1908: Iron ores, pig iron, and steel; manganese ores; chromic iron ore.—See no. 1170.

Harris, Gilbert Dennison.

512. The geological occurrence of rock salt in Louisiana and east Texas.—Econ. Geology, vol. 4, no. 1, pp. 12-34, 2 pls., 7 figs., 1909.


Calls attention to the fact that the peridotite eruptives about Murfreesboro, Ark., are magnetic, and to the practical bearing of this fact.

Harris, G. D., Perrine, I., and Hopper, W. E.

514. Oil and gas in northwestern Louisiana with special reference to the Caddo field.—Louisiana Geol. Survey, Bull. no. 8, 52 pp., 6 figs., 1909.

Harrison, Alfred C., and others.


A sketch of his life.

Hastings, John B.


Haworth, Erasmus, and Bennett, John.


Discusses the nomenclature, synonymy, areal distribution, characters, and relations of the Carboniferous formations of Kansas.

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Haworth, Erasmus, and others.

519. Special report on oil and gas.—Kansas, Univ. Geol. Survey, vol. 9, 586 pp., 107 pls., 2 maps, 8 figs., 1908.

Includes chapters on discoveries of oil and gas, geographical and historical, detailed geology of oil and gas, life of oil wells and gas wells, commercial conditions of oil and gas, chemical composition of gas, and chemical composition of petroleum.

Hay, Oliver Perry.


Gives various notes upon fossil turtles.


Hayes, Charles Willard.


The first edition bearing title, Handbook for field geologists in the United States Geological Survey, 159 pp., 11 figs., was issued by the Survey in 1908 for official use.


Contributions to economic geology, 1908. Part I. Metals and nonmetals, except fuels.—See no. 1169.


Outlines the progress of investigations by the United States Geological Survey during the year 1908 and gives a list of publications issued in 1908 on nonmetallic mineral resources and iron ores.


Hayes, C. W., and Lindgren, Waldemar.


Hayford, John F.


Headden, William P.


Gives analyses and descriptive notes upon springs in Platte Canyon and in Delta County, Colo.

Hedburg, Edward.


Includes notes on the local geology and the occurrence of gold ores.

Henderson, Junius.


Describes the general geologic structure and the distribution and relations of pre-Carboniferous, Carboniferous, Permo-Triassic?, Jurassic, and Cretaceous formations.

Hennen, Ray V.


Describes the history, physiography, and geology of the Marshall-Wetzel-Tyler area of West Virginia, and the mineral resources, including petroleum, natural gas, coal, clays, road materials, and building stones.

Henning, Karl L.

538. Streifzüge in den Rocky Mountains.—Globus, Bd. 92, pp. 25–29, 46–49, 101–107, 10 figs., 1907; Bd. 93, pp. 312–318, 5 figs., 1908.

Describes excursions in the Rocky Mountains in Colorado. Includes notes on physiographic features and the geology.


Describes the region around Morrison, Colo., the red beds and the Morrison formation.

Henshaw, Fred F.


Describes gold deposits and the occurrence of coal.

Hermann, A.


Herrick, R. L.


Includes notes upon the geology of the ore body.


Includes an account of the local geology and the occurrence and character of the gold and silver ores.


Includes notes on the geology, character, and occurrence of the ores.
Herrick, R. L.—Continued.

Includes an account of the geology of the vicinity of Globe, Ariz., and the occurrence and character of the copper deposits.

Hershey, Oscar H.

Includes notes on the local geology of a prospect in Del Norte County, Cal.

Herzig, C. S.

Hess, Frank L.

Describes the occurrence and character.


Describes the general geology and the occurrence, character, and origin of the graphite.


Mineral resources of the United States, 1908: Antimony; bismuth; selenium, tellurium; tungsten, nickel, cobalt, vanadium, etc.; tin; arsenic.—See no. 1170.

Hice, Richard R.

Higgins, D. E., jr.
Copper mining and prospecting on Prince William Sound, Alaska.—See Grant and Higgins, no. 485.

Notes on the geology and mineral prospects in the vicinity of Seward, Kenai Peninsula, Alaska.—See Grant and Higgins, no. 486.

Higgins, Edwin.

Includes notes on the geology and the occurrence and character of the iron ores.

Includes a brief account of the geology of the district and of the occurrence and character of the silver deposits.

Higgins, Will C.

Includes a short account of the local geology and the character and occurrence of the gold ores.
Higgins, Will C.—Continued.
   Includes notes on the local geology and the ore deposits producing copper, gold, and silver.

   Includes notes on the local geology and the occurrence of the gold ore.

Hijar y Haro, Luis.
   Describes pyritiferous deposits yielding chiefly iron, with small amounts of lead, copper, silver, and gold.

Hill, J. M.
   Describes the general features, the stratigraphy and geologic structure, and the mineral resources, chiefly gold and silver, and mining developments.

Hill, Robert T.

Hille, F.

Hillebrand, W. F., and Schaller, W. T.
   Describes the occurrence and associations of the minerals and their physical properties, composition, and crystallography.

Hills, B. W.

Hills, Victor G.
   Discusses the definition of this term.

   Includes notes on the occurrence of tungsten ores in Colorado.

Hind, Henry Youle.

Hindry, W. E.
   Includes notes on the geology and occurrence of the gold ores.
Hinds, Henry.


Hitchcock, Charles H.


Describes briefly the history of the volcano Kilauea and its recent activity.

Hixon, Hiram W.


Hixon, A. W.

Analyses of Iowa coals.—See Lees and Hixon, no. 754.

Hlawatsch, C.


Gives observations upon benitoite.


Describes the crystallography of benitoite from California.


Observations upon the class of crystals to which benitoite belongs.


Gives notes upon natrolite and neptunite from San Benito, Calif.

Hobbs, William Herbert.


Discusses the causes of earthquakes and the possibilities of prognostication.

583. Apparatus for instruction in geography and structural geology.—School Science and Mathematics, vol. 8, pp. 566-570, 662-668, 10 figs., 1908; vol. 9, pp. 644-653, 8 figs., 1909.


Holland, W. J.

BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY, 1909. 55

Hollick, Arthur.


Proposes the new generic name *Fagopsis* for the *Planera longifolia* Lesq., from the Miocene shales of Florissant, Colo.

Hollick, Arthur, and Jeffrey, Edward Charles.


Holway, R. S., and Linsley, Earle G.


Hopkins, T. C., and Clark, B. W.


Hopper, W. E.

Oil and gas in northwestern Louisiana with special reference to the Caddo field.—See Harris, Perrine, and Hopper, no. 514.

Hore, R. E.


Includes notes on the occurrence of the copper ores.

Hovey, Edmund Otis.


The discussion and illustrations relate to effects produced by the eruptions of Mont Pelé in Martinique and the Soufrière in St. Vincent in 1902 and 1903.


595. Proceedings of the twentieth annual meeting of the Geological Society of America, held at Albuquerque, New Mexico, December 30 and 31, including the proceedings of the ninth annual meeting of the Cordilleran section, held at the same place and time.—Geol. Soc. America, Bull., vol. 19, pp. 513–617, 9 pls., 1909.

Includes abstracts of papers and obituary notices.


Gives an account of the twenty-first annual meeting at Baltimore, December, 1908, and abstracts of papers presented.


Records the discovery and describes the surface features and composition of this siderite to which the name Guffey is given.

Hovey, Edmund Otis—Continued.
   Includes notes on the physiographic features of the island.


Howe, Ernest.
603. Landslides in the San Juan Mountains, Colorado, including a consideration of their causes and their classification.—U. S. Geol. Survey, Prof. Paper 67, 58 pp., 20 pls., 4 figs., 1909.

Howley, James P.

605. Geology and mineral resources of Newfoundland.—Min. World, vol. 31, pp. 701-704, 1 fig. [geol. map], October 2, 1909.

Hudson, George H.
606. Some items concerning a new and an old coast line of Lake Champlain.—New York State Mus., Bull. 133, pp. 159-163, 8 pls., 1909.
   Proposes the term cup holes for shore-line excavations and discusses the position of shore lines of Lake Champlain.

Huene, F. v.
   Gives a classification and phylogeny of the Dinosauria. Includes American forms.

Humphreys, Edwin W.

Hussakof, L.

Iddings, Joseph P.


Ihne, F. W.

Illinois State Geological Survey.
   The several papers in this report have been listed under the individual authors.

Ingall, E. D.

The mineral wealth of the Cordilleras.—See Raymond and Ingalls, no. 986.
The mineral wealth of America.—See Raymond and Ingalls, no. 987.

Describes some of the volcanoes of Mexico.

Preliminary report on measurements of altitude of the Algonquin and Nipissing shorelines in Ontario.—See Goldthwait and Jacobson, no. 463.


Describes Araucariopitys americana from Cretaceous deposits of Staten Island, New York.

Studies of Cretaceous coniferous remains from Kreisherville, New York.—See Hollick and Jeffrey, no. 588.


Describes the location where found, the general characters, and the fall.

Describes the Quinn Canyon, Nevada, meteorite, and a meteor from which the fall may have been derived.

Discusses the geology of the district and the deposition of the ores.

Describes the geology of the district and the character and geologic relations of the ore bodies.
Jennings, E. P.


Jensen, Adolf Severin

Discusses climatic changes in Greenland in Quaternary time as evidenced by the distribution of certain mollusks.

Johnson, Alexander T.

Includes a brief account of the geology and occurrence of the ores.

Johnson, Douglas Wilson.

Describes physiographic features and faulting in the Grand Canyon region.


Discusses the origin of hanging valleys with reference to glacial erosion.

Johnson, H. R.

Describes the stratigraphic formations and the geologic structure of the area.

The earthquake rift in eastern San Luis Obispo County, California.—See Arnold and Johnson, no. 33.

Sodium sulphate in Soda Lake, Carriso Plain, San Luis Obispo County, California.—See Arnold and Johnson, no. 34.

Johnston, Robt. A. A.

Johnston, W. A.

Discusses the correlation of the Ordovician formations of the area.

Jones, Charles Colcock.
634. An iron deposit in the California desert region.—Eng. and Min. Jour., vol. 87, pp. 785-788, 6 figs., April 17, 1909.


Includes notes on the geology of the district and the occurrence and character of the ore deposits and placer gravels.

Jones, Fayette A.

Describes the geology and physiography of the Little Hatchet Mountains in Grant County, N. Mex., and the character and occurrence of the gold ores.


Describes the occurrence of turquoise in New Mexico.
JONES, S. P.

JORDAN, David Starr, and CLARK, George Archibald.

JUDSON, John N.

KATZ, F. J.
The Fairbanks gold placer region, Alaska.—See Prindle and Katz, no. 970.

KAY, G. F.

KEELE, Joseph.

KEITH, Arthur.

KELLY, William.

KEMP, James Furman.


646. Our knowledge of the filled channel of the Hudson in the Highlands and the submerged gorge on the continental shelf.—Abstract: Science, new ser., vol. 29, p. 279, February 12, 1909.


KEMPTON, C. W.


KEYES, Charles Rollin.
Keyes, Charles Rollin—Continued.


The paper is devoted chiefly to a description of the occurrence and origin of the deposits of borax in the desert regions of southeastern California. The geologic structure of the region is discussed.


Discusses the occurrence of the lead and zinc deposits of the Ozark region of Missouri.


Describes the occurrence of borate minerals in the Tertiary clays of southern California and the lithology of the Tertiary terranes.


Kindle, Edward M.


Discusses the stratigraphic relations of the Ouray limestone of Colorado and New Mexico and the faunas contained therein and gives systematic descriptions and figures of the Devonian forms.


Kindle, Edward M.—Continued.


Describes the general geologic relations of the rocks in the vicinity of Cape Thompson, the occurrence and character of Carboniferous and Mesozoic strata. Includes lists of fossils identified and remarks upon their age by David White, G. H. Girty, and T. W. Stanton.

Description of the Watkins Glen-Catatonk district, New York.—See Williams, Tarr, and Kindle, no. 1255.

Kindle, E. M., and Barnett, V. H.


Kirk, Morris P.


Includes notes on the occurrence and nature of the ore.

Klautzsch, A.


Describes the San Francisco earthquake with particular reference to its cause in the geologic structure of California.

Knapp, G. N.

Description of the Philadelphia district.—See Bascom and others, no. 74.

Knight, Cyril W.


Includes abstracts of papers relating to the geology of North America.


Discusses the evidences for the glacial origin of the Lower Huronian conglomerate.

Grenville-Hastings unconformity.—See Miller and Knight, no. 866.

Knirk, Carl F.


Knopf, Adolph.


Describes the occurrence, character, geology, and mineralogic associations of tin deposits in Seward Peninsula.


Mineral resources of the Nabesna-White River district, Alaska.—See Moffit and Knopf, no. 874.

Knowlton, Frank Hall.


Concludes that the beds named should be referred to the Fort Union formation and are Eocene in age.
Koeberlin, F. R.


Kolderup, C. F.


An account of the San Francisco earthquake extracted from the report of the California State Earthquake Commission report.

Kraus, E. H., and Cook, C. W.


Describes the occurrence, composition, and crystallography.

Kümmel, Henry B.


Includes notes on the occurrence of the ores.


Description of the Philadelphia district.—See Bascom and others, no. 74.

Description of the Trenton quadrangle, New Jersey-Pennsylvania.—See Bascom and others, no. 75.

Kunz, George F., and Washington, Henry S.


Lafayette, C.


Gives a general account of the physiography, geology, and mineral deposits of the Notre Dame and Shickshock Mountains, Quebec.


Gives a general account of the physiography and geology of the Laurentian Highlands.

La Forge, Laurence.


Notes on the crystallography of leadhillite.—See Palache and La Forge, no. 930.

Laguerenne, Teodoro L.


Describes the general geology of the mining district of Pregones, State of Guerrero, Mexico, the vein system, the deposits of lead and silver, and the mines.
Lahee, Fred. II.


Lakes, Arthur.


695. The general geology of Summit County, Colorado, with special reference to Breckenridge and vicinity.—Min. Science, vol. 57, pp. 243-244, 289-291, 6 figs., March 5 and 12, 1908.


697. Evolution of knowledge of veins and ore deposits.—Min. Science, vol. 58, pp. 5-6, 3 figs., July 2, 1908.


BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY, 1909.

**Lakes, Arthur—Continued.**


**Lambe, Lawrence M.**


Includes a description of **Ethonichthys elisi** n. sp.


**Lane, Alfred C.**


Discusses the application to magmas of facts and conclusions in the paper cited.


729. The decomposition of a boulder in the Calumet and Hecla conglomerate, and its bearing on the distribution of copper in the Lake Superior copper lodes as indicating the trend and characters of the waters forming the chute.—Econ. Geology, vol. 4, no. 2, pp. 158-173, 1 fig., 1909.


Gives a general account of the geology of the iron regions of Michigan and discusses the origin of the iron ores and analyses of waters from the mines.


**Lane, A. C., and others.**


**Lane, Louis.**


Includes notes on the local geology.
Laney, Francis Baker.


Gives a general description of the rocks and structure of the district, and of the occurrence, character, and relations of the gold-copper ores.

Laney, Francis Baker, and Wood, Katharine Hill.

736. Bibliography of North Carolina geology, mineralogy, and geography, with a list of maps.—North Carolina Geol. and Econ. Survey, Bull. no. 18, 428 pp., 1909.

Langford, D. B.


Includes various notes upon the economic geology of Nova Scotia, New Brunswick Quebec, Ontario, Alberta, and British Columbia.

Larsen, Esper S.

Quartz as a geologic thermometer.—See Wright and Larsen, no. 1292.

Larsh, W. S.


Describes the local geology and the occurrence and relations of silver, copper, and lead deposits.

Lawson, Andrew C.


Lawton, N. Oliver.


Describes the location, extent, and character of sulphur deposits on Unalaska Island.

Leach, W. W.


Includes an account of the geology and occurrence of coal and other mineral resources.

Lee, Willis Thomas.


Describes the general surface features, stratigraphy and structure of the field, the geographic distribution and character of the coal beds, and the composition of the coals.


Describes the rock formations of the region and presents and discusses the evidences of an unconformity previously unknown, the extent of the erosion interval, and the correlations of the formations between which the unconformity exists.


56693°—Bull. 444—10—5
Lee, Willis Thomas—Continued.


Presents evidence bearing upon the correlation of coal-bearing rocks in the Grand Mesa coal field of Colorado and the Raton coal field of New Mexico.


Lee, Willis T., and Nickles, John M.


Lees, James H.


Lees, James H., and Hixson, A. W.


Leighton, Henry.


Reviews the progress in geological mapping and gives a chronologic list of geologic maps of the State of New York.

Leith, Charles Kenneth.

Pre-Cambrian geology of North America.—See Van Hise and Leith, no. 1178.

Lenher, Victor.

756. Some observations on the tellurides.—Econ. Geology, vol. 4, no. 6, pp. 544-564, 1909.

Leonard, A. G.


Leonard, A. G., and others.


Leonard, A. G., and Smith, Carl D.


Describes the stratigraphy and structure of the field; the occurrence, character, and relations of the lignite beds; the character and uses of the lignite; and the mining operations.
LeRoy, Osmond E.


Describes the general geology and the occurrence, character, and relations of the gold-silver-copper ores, and the mining developments.

Leverett, Frank.


Discusses the erosion and weathering to which the drift sheets have been subjected as criteria for distinguishing them and determining their chronology and correlation with the drift sheets of Europe.

Levison, Wallace Goold.


Lewington, Guy A. R.


Lewis, J. Volney.


Describes the characters and occurrence of alunite.

Lincoln, Francis Church.


Describes the general geology, the character of the ore deposit, and the paragenesis of the minerals.

Lindgren, Waldemar.


—Gives a list of publications relating to deposits of metalliferous ores in the United States, issued by the United States Geological Survey in 1908, and outlines briefly the progress of investigation and the preparation of reports.


Describes the general features and geology, and the occurrence, character, and relations of the zinc and lead ores.


Summarizes the facts known regarding the distribution of ore deposits in the various geologic ages in the continent of North America.
Lindgren, Waldemar—Continued.

Mineral resources of the United States, 1908: Gold and silver.—See no. 1170.
Contributions to economic geology, 1908. Part I. Metals and nonmetals, except fuels.—See no. 1169.

Linsley, Earle G.
A syllabus for the study of the physiographic provinces of California.—See Holway and Linsley, no. 589.

Linton, Robert.


Loftus, J. P.

Includes notes on the local geology and the occurrence of the gold ores.

Logan, William E.


Logan, William N.

778. The pottery clays of Mississippi.—Mississippi State Geol. Survey, Bull. no. 6, 228 pp., 45 pls. and figs., 1909.

Loomis, F. B.

Describes Testudo arenivaga, Hay, Testudo breviseterna n. sp., and Testudo undabuna n. sp.


Louderback, George Davis.

Describes the general geologic surroundings and mode of occurrence in San Benito County, Cal., the conditions under which the mineral was formed, the general relations of the minerals in the veins, and the crystallography and other features of benitoite, neptunite, natrolite, and other associated minerals.


Loughlin, G. F.


Ludlow, Edwin.

784. The coal industry in Mexico.—Eng. and Min. Jour., vol. 88, pp. 661-664, 1 fig., October 2, 1909.
Includes notes on the occurrence and composition of coals in the State of Coahulla, Mexico.
Lull, Richard Swan.


Luther, D. Dana.

Describes the occurrence, character, relations, and fossil content of Silurian and Devonian formations.

Lyman, Benjamin Smith.


Lyon, Edward West.

Includes notes on the geologic occurrence and mineralogic character of the ore bodies.

MacAlister, D. A.
The geology of ore deposits.—See Thomas and MacAlister, no. 1144.

McCallie, S. W.


Gives a description, with analysis, of a stone-iron meteorite from Pickens County, Ga.

McCaskey, H. D.
Mineral resources of the United States, 1908: Gold and silver; quicksilver.—See no. 1170.

McConnell, R. G.

A report on the geology and mineral resources of the Whitehorse district.

Describes the general geology and the mineral deposits, producing chiefly copper, gold, and iron.

McCormick, Clinton P.

Includes notes on the occurrence and character of copper ores.

McCourt, W. E.


McDermott, Walter.

Describes the occurrence and geologic relations of silver ore mined on Silver Islet, Lake Superior.
McDermott, Walter—Continued.
Describes the character and occurrence of the ore deposits.

MacDonald, Bernard.

MacDonald, Donald Francis.
Gives notes upon the geology, the character, relations, and mineralization of the veins, and the gold mines.

Macdougal, D. T.

McEvoy, James.

MacFarland, Ira.

MacFarlane, James.
Includes notes on the local geology and the occurrence of the copper ores.

MacFarren, H. W.
Includes notes on the geology and occurrence of the ores.

McInnes, William.
Includes notes on the geology of the region examined.

Maddren, A. G.
Mineral resources of the Kotsina-Chitina region, Alaska.—See Moffit and Maddren, no. 875.
Maine State Survey Commission.

   An administrative report upon the progress of topographic, geologic, and hydrographic work.

Malloch, G.

   Describes the general geology and occurrence and character of the coal.

Mansfield, George Rogers.


Marbut, Curtis F.


Marriott, Hugh E.

A visit to the mineral districts of Canada.—See Frecheville and Marriott, no. 426.

Marrs, G. O.


Martin, Al. H.

   Includes notes on the occurrence of gold ores.

   Includes notes on the local geology, and the occurrence and character of the gold deposits.

   Includes notes on the local geology and the occurrence of gold ores.

Martin, George Curtis.

   Describes the general geology of the foothills belt of northern Colorado, and the occurrence, character, and composition of limestones and shales.

Martin, Lawrence.


   Apparatus for topographic field work on models in the laboratory.—See Mead and Martin, no. 843.

Marvin, C. F.

   Discusses the Kingston earthquake as recorded in Washington, D. C.

Mather, Kirtley F.

   Discusses the time and cause of drainage changes in this region.
Mathews, Edward B., and Grasty, J. S.

Mathez, Auguste.
Includes notes on the geologic relations of the ore deposits.

Matson, George Charlton.
Includes an account of the stratigraphy of the region.

Describes the location, geologic horizon, and composition.

Matson, George Charlton, and Clapp, Frederick G.

Matthes, François E.


Matthew, George F.
Outlines the geologic history of the region known as Acadia, citing the various evidences from which this has been determined and discussing the stratigraphic position and correlation of the geologic formations.


Matthew, William Diller.


Gives some account of reptilian remains collected in the Permian of Texas.

Gives an account of the meeting and abstracts of the papers read.

Matthew, W. D., and Cook, Harold J.


Describes mammalian fossils from Sioux County, Nebr., and discusses their stratigraphic position.

Mauritz, B.

Ueber Kalomel.—See Goldschmidt and Mauritz, no. 459.

Maury, Carlotta J.


Describes Levisanus fulguriparens n. sp., from the Eocene at Montgomery, La.

Mead, Walter J.

842. Relation of density to the specific volume of ore. A graphic method for the determination of the specific volume of ore from its porosity and included moisture.—Min. Science, vol. 58, pp. 89–91, 1 fig., July 30, 1908.

Mead, W. J., and Martin, Lawrence.


Melsted, V. J.

The geology of northeastern North Dakota with special reference to cement materials.—See Barry and Melsted, no. 70.

Mendenhall, Walter Curran.

844. A phase of ground water problems in the West.—Econ. Geology, vol. 4, no. 1, pp. 35–45, 2 figs., 1909.


Describes physical features and water supply of the region.


Describes the geography, the general geologic features, the character of the deposits, and the water resources.


Describes the occurrence, character, and value of the coal.

 Merriam, John C.


Describes Felis atrox var. bebbi from the Quaternary of Rancho La Brea, near Los Angeles, Cal.


Describes Ungoceros alexandri n. gen. and n. sp., and Sphenophalos nevadanus n. gen. and n. sp., from late Tertiary beds near Thousand Creek in northern Humboldt County, Nev.
Merrill, F. J. H.
Includes notes on the local geology and the occurrence of the silver ores.

Merrill, George P.

Merwin, H. E.
Alamosite, a new lead silicate from Mexico.—See Palache and Merwin, no. 931.
On connellite and chalcopyllllite from Bisbee, Arizona.—See Palache and Merwin, no. 932.

Mexico, Instituto Geologico.
A list of earthquakes and seismic shocks registered at the seismological station at Tacuba, D. F., Mexico, during the first half of 1909.
Catálogo de los temblores (macroseismos) sentidos en la Republica Mexicana durante los años de 1904 a 1908.—See Aguilera, no. 7.

Millar, Austin Q.

Miller, Arthur M.
859. Evidence that the Appalachian and central coal fields were once connected across central Kentucky.—Abstract: Science, new ser., vol. 29, p. 624, April 16, 1909.
Describes the occurrence of coal measure conglomerate in central Kentucky.

Miller, Benjamin L.
Description of the Philadelphia district.—See Bascom and others, no. 74.
Description of the Trenton quadrangle, New Jersey-Pennsylvania.—See Bascom and others, no. 75.

Miller, G. W.
862. The De LaMar mines, Lincoln County, Nevada.—Min. Science, vol. 58, pp. 347-348, 3 figs., October 29, 1908.
Describes the character and occurrence of the gold deposits and the local geology.
Miller, Loye Holmes.


Describes *Teratornis merriami* n. gen. and n. sp., from the Quaternary asphalt beds of Rancho La Brea in southern California.

Miller, Willet G.

Miller, Willet G., and Knight, Cyril W.

Miller, William J.
867. Geology of the Remsen quadrangle, including Trenton Falls and vicinity in Oneida and Herkimer counties.—New York State Mus., Mus. Bull. 126, 51 pp., 11 pls., 4 figs., 1 geol. map (in pocket), 1909.

Describes the general geologic features, the occurrence, character, and relations of pre-Cambrian and Ordovician strata, the structural features, and the glacial geology.


Millward, William.

Gives lists of Paleozoic fossils found in limestone and chert pebbles of the Wisconsin drift and in bedded rocks of Carboniferous age and discusses the correlation of the formations of the latter.

Mining and Scientific Press.


Moffit, Fred H.


Includes an account of the general geology.

Moffit, Fred H., and Maddren, A. G.

Describes the general geology, the occurrence and relations of Triassic and other rocks of undetermined or doubtful age, and the mineral resources, chiefly copper and placer gold.
Moodie, Roy L.


Gives various notes upon the forms mentioned.


Discusses the occurrence, characters, and classification of Carboniferous Amphibia.


Moore, Elwood S.


Gives an account of the geology of the region and the occurrence and character of iron deposits.


Gives an account of the geology and physiographic features of the region and of the distribution and character of bog iron deposits.


Describes the geology of the area, the petrography of the rocks, and the occurrence, character, relations, and origin of the iron deposits.


Moore, Phil. II.


Includes notes on the local geology and the occurrence and character of the gold ores.

Moore, Richard B.

Radioactivity of the thermal waters of Yellowstone National Park.—See Schlundt and Moore, no. 1033.

Morsack, Cajetan.


Includes notes on the character and occurrence of the deposits.

Morse, William Clifford, and Foerste, August F.

Munn, Malcolm J.


The discussion is based mainly upon structural and stratigraphic features of oil pools in the Sewickley quadrangle, Pennsylvania.

889. The anticlinal and hydraulic theories of oil and gas accumulation.—Econ. Geology, vol. 4, no. 6, pp. 509-529, 3 figs., 1909.

Nason, Frank L.


Describes folds in the Sierra Madre Oriental Mountains in Nuevo Leon, Mexico, and explains their production and relations to ore-bearing fissures.

Nelson, Gaylord.


Newland, David H.


Describes the distribution of the Clinton formation, the general structure of the beds, the occurrence of the iron ores, and their origin.


Newsom, J. F.

Description of the Santa Cruz quadrangle, California.—See Branner and others, no. 138.

Nicholas, Francis C.


Nickles, John M.


Classified list of papers dealing with coal, coke, lignite, and peat contained in publications of the U. S. Geological Survey, except those on Alaska.—See Lee and Nickles, no. 749.

Nicol, John M.


Includes notes on the local geology and the occurrence of placer gold.

Nicolas, Frank J.


Nordenskjöld, Otto.


Describes the occurrence, character, and relations of Archean and post-Archean eruptive rocks and of Paleozoic, Triassic, Jurassic, and Tertiary deposits.
Northwest Mining Journal.

Nylander, Olof O.

Nyström, Erik, and Anrep, S. A.

Obalski, J.
904. Mining operations in the Province of Quebec for the year 1908.—Quebec, Dept. of Colonization, Mines and Fisheries, 85 pp., 19 pls., 1909.
Includes notes on the occurrence of various mineral deposits.

Odendall, Leonhard.
Describes the occurrence and characters of the principal copper deposits of the United States, Mexico, and Canada, and discusses the various types of deposits.

O'Harra, Cleophas C.
Description of the Belle Fourche quadrangle, South Dakota.—See Darton and O'Harra, no. 312.

Ohio Geological Survey.
906. A geological map of Ohio. J. A. Bownocker, state geologist. Based on preceding maps by Newberry and Orton. Richmond-Lorraine boundary by Foerste and Morse; glacial boundary and shore of glacial Lake Erie (Lake Maumee) after Leverett. Scale, 8 miles to 1 inch, 1909.

Olcott, Theodore F.

Oldham, Richard Dixon.

Ontario, Bureau of Mines.
909. Visit [of the British Association for the Advancement of Science, Winnipeg Meeting, 1909] to Cobalt and Sudbury, August 17th to August 20th. Toronto, 1909. 31 pp., illus.
Describes the Cobalt and Sudbury (Ontario) mineral areas, giving data upon the geology, the occurrence, relations, and genesis of the ores.

Ordóñez, Ezequiel.
Gives a general account of the physiography and geology of Mexico and the general mode of occurrence of ore deposits.

Describes the physiographic features and the kinds and disposition of volcanic rocks forming its surface.
Orton, Edward, jr.

Osborn, Henry Fairfield.
Describes the general geology and climatic history of the Tertiary and Pleistocene of western North America and the character, origin, distribution, and relations of the various mammalian faunas and discusses their homotaxial relations and correlation.

Describes a specimen of Trachodon annectens from Converse County, Wyo., preserving part of the epidermal covering.


Discusses the habits and restorations.

Osborn, Henry Fairfield, and Matthew, W. D.
Explains the organization of the committee, the method of procedure, and the progress of correlation work.

Osgood, Samuel W.
Includes notes on the occurrence of the zinc ores.

O’Sullivan, Owen.
Includes notes on geologic features of the country traversed.

Outerbridge, Alexander E., jr.


Overspeck, L. S.
The iron deposits of the Black Hills, South Dakota.—See Cooledge and Overspeck, no. 284.

Pack, R. W.
Packard, George A.
   Includes notes on the local geology.
   Includes notes on the geology, occurrence, character, and genesis of the copper ores of Shasta County, Cal.

Paige, Sidney.
   Describes the geography and topography of the Hanover iron-ore district, the general geology, the occurrence, character, and relations of sedimentary and igneous rocks, the metamorphism produced by intrusions, and the distribution, character, and genesis of iron ores.
   Describes the general geology, the stratigraphy, and the geologic structure, metamorphism in the region, and the occurrence and character of marble.
   Describes sandstone dikes at this locality and discusses their origin.

Palache, Charles.

Palache, C., and La Forge, L.

Palache, C., and Merwin, H. E.
   Describes the occurrence, crystallographic characters, and chemical composition.

Palache, Charles, and Wood, H. O.

Palmer, Chase.
   Describes the characters, crystallography, and composition of the mineral obtained from a pegmatite dike near Hackberry, Ariz.

Palmer, George Thomas.

Palmer, William.
   Describes Psephophorus calvertensis n. sp.
Pardee, J. T.
  Describes the general features, the stratigraphy, the geologic structure, and the vein system, particularly its faulting.

Paredes, Trinidad.
  Describes the geology, occurrence, and relations of a copper deposit at Cerro Secco, in the State of Guerrero, Mexico.

  Describes the hydrology of the region stated. Includes an account of the geology.

  Describes the physiographic features, general geology, the Cretaceous and Tertiary formations, the geologic history, and the hydrology of the Valley of Ixmiquilpan, State of Hidalgo, Mexico.

Parker, Edward W.
  Coal fields of the United States.—See Campbell and Parker, no. 191.

Parks, William Arthur.
  Discusses the characters of the genus, and the generic position of various species referred to it and describes Protaster whiteavesiavus n. sp., from the Trenton of Ontario.


Patton, Horace B.
943. The Montezuma mining district of Summit County, Colorado.—Colorado Geol. Survey, 1st Report, 1908, pp. 105-144, 4 pls., 1 fig., 1909.
  Describes the general geology and the rocks of the area, the vein systems, and the occurrence and relations of gold, silver, lead, zinc, and iron ores.

Peale, A. C.

Peet, C. A.
945. Green River oil fields in Wayne County, Utah.—Salt Lake Min. Rev., vol. 11, no. 18, pp. 19-21, 6 figs., December 30, 1909.

Penck, Albrecht F. K.

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Pepperberg, Leon J.

Describes the geology of the district and the occurrence and composition of limestone and shale.


Describes the topography and geography, the stratigraphy and structure of the field, the character and distribution of the coal beds, and the properties and composition of the coal.

Peragallo, Oreste.

Includes notes on the local geology and the occurrence, character, and origin of the silver-lead-zinc ores.

Perrine, I.

Oil and gas in northwestern Louisiana, with special reference to the Caddo field.—See Harris, Perrine, and Hopper, no. 514.

Peterson, O. A.

Includes an account of the Agate Spring fossil quarries in western Nebraska.


Proposes the name *Daphaxodon* for the material described as *Amphicyon superbus*.

Phalen, William Clifton.

Mineral resources of the United States, 1908: Bauxite and aluminum; abrasive materials; salt and bromine; sulphur and pyrite.—See no. 1170.

Phillips, William B.

Includes a brief account of the geology of the district and the occurrence of the silver ore.


Includes notes on the occurrence of the ore.


Platt, James M.


Includes notes on the occurrence and character of the silver ores of the Zacualpan district, State of Mexico, Mexico.

Pogue, Joseph E.

Pogue, Joseph E.—Continued.


Describes the general geology of the region, the lithology, structural features, and geologic history.

Pogue, J. L.

Calcite crystals from Kellys Island, Lake Erie.—See Ford and Pogue, no. 417.

Crystals of datolite from Bergen Hill, New Jersey.—See Ford and Pogue, no. 418.

Poole, Henry S.


Pratt, Joseph Hyde.


964. The mining industry in North Carolina during 1907, with special report on the mineral waters.—North Carolina Geol. and Econ. Survey, Econ. Paper no. 15, 176 pp., 13 pls., 4 figs., 1908.

965. Biennial report of the state geologist, 1907-1908.—North Carolina Geol. Survey, 60 pp., 1908 [1909?].


Pratt, Joseph Hyde, and Sterrett, Douglas B.


Prindle, Louis M.


Describes the general physical and geologic features, the occurrence, character, and relations of pre-Ordovician, Devonian, Carboniferous, Tertiary, and Quaternary formations, and the gold deposits.

Prindle, L. M., and Katz, F. J.


Prosser, Charles S.

Nomenclature and subdivision of the upper Siluric strata of Michigan, Ohio, and western New York.—See Lane and others, no. 733.

Prouty, William F.

Purdue, A. H.
972. The slates of Arkansas.—Arkansas, Geol. Survey, pp. 1-95, 7 pls., 1909.
973. Structure and stratigraphy of the Ouachita Ordovician area, Arkansas.—

Quackenbush, L. S.
Includes notes on the occurrence of various mammals.

Ramsay, J. D.
975. The Maple Mountain mining district [Montreal River mining division] of
Ontario.—Canadian Min. Jour., vol. 30, pp. 526-527, 3 figs., September 1,
1909.
Includes notes on the geology of the district and the occurrence of the silver ores.

Rankin, G. S.
The binary systems of alumina with silica, lime, and magnesia.—See Shepherd and Rankin, no. 1056.

Ransome, Frederick Leslie.
976. The geology and ore deposits of Goldfield, Nevada.—U. S. Geol. Survey,
Prof. Paper 66, 258 pp., 35 pls., 34 figs., 1909.
Describes the occurrence and relations of pre-Tertiary sedimentary rocks and Tertiary
igneous rocks and sedimentary deposits, the geologic structure and history, the mineralogy,
and the distribution, geologic relations, and genesis of the ore bodies, and gives a detailed
account of the mines.
977. The Hornsilver district, Nevada.—U. S. Geol. Survey, Bull. 380, pp. 41-43,
1909.
Gives notes upon the local geology and the gold and silver ores.
1909.
Describes briefly the general geology, the occurrence and character of the ores, yielding
primarily gold, and the mining developments.
99-119, 2 figs., 1909.
Describes the general geology, the occurrence, character, and relations of pre-Tertiary
and Tertiary rocks, the mines and prospects, and the character of the copper deposits.
980. Notes on some mining districts in Humboldt County, Nevada.—U. S. Geol.
Survey, Bull. 414, 75 pp., 1 pl. (map), 7 figs., 1909.
Describes the mining developments of the Humboldt region, the general geology and
petrology of the mining districts, the occurrence, relations, and character of the ore deposits,
mainly gold, silver, copper, antimony, nickel, and cobalt, and the mineralogy of the ore
deposits.
981. Characteristics of some ore deposits of southern Humboldt County, Ne-
vada.—Abstract: Science, new ser., vol. 30, pp. 972-973, December 31,
1909.
[Petrography of the Newark group in the Trenton quadrangle.]—See Bascom
and others, no. 74.

Raymond, Percy E.
982. The fauna of the upper Devonian in Montana. Part I. The fossils of the
red shales.—Carnegie Mus., Annals, vol. 5, pp. 141-158, 6 pls., 5 figs.,
1909.
983. Some sections of the Conemaugh series between Pittsburgh and Latrobe,
984. Notice of two new horizons for marine fossils in western Pennsylvania.—
Raymond, Rossiter W.


Raymond, R. W., and Ingalls, W. R.


Raymond, R. W., and others.


Discusses the application of these terms to the position of ore bodies.

Reagan, Albert B.


Reed, W. J.

The Madill oil pool, Oklahoma.—See Taff and Reed, no. 1132.

Reid, Harry Fielding.


Discusses the nomenclature and classification of faults, the nature of the observations necessary to determine completely the movement at a fault, and how this movement can be worked out from the observations.


Discusses conditions preceding and leading to tectonic earthquakes, and some characteristics of seismologic instruments; and suggests establishing a National Seismological Bureau.


Reynoso, José J.


Gives notes upon the geology and the lead and iron deposits of Naica, State of Chihuahua, Mexico.

Richards, Ralph W.


Describes the general features of the field, the stratigraphy and the structure, the character and distribution of the coal beds, and the qualities and composition of the coal.
Richardson, George Burr.


Describes the geography, the occurrence, character, and relations of pre-Cambrian, Cambrian, Ordovician, Silurian, Carboniferous, Cretaceous, and Quaternary formations, and of igneous rocks, the geologic structure, the geologic history, and the mineral resources.


Describes the location and topography, the stratigraphy and structure of the field, the occurrence and character of the coal beds, and the quality and composition of the coals.


Describes the topography, stratigraphy, including Cretaceous and Tertiary formations, and structure of the field, and the occurrence, character, and development of the coal beds and quality of the coal.

Rickard, Forbes.


Includes notes on the local geology.

Rickard, T. A.


Describes gold mining and the occurrence of placer gold in Alaska.

Ries, Heinrich.


Riggs, Elmer S.


Ritter, Etienne A.


Describes the geology of the district, the veins, and the character and structure of the silver ores.

Roberts, Milnor.


Describes features of Mount Rainier National Park, Washington.

Robertson, William Fleet.


Includes notes on the geology and occurrence of various ores in British Columbia.

Robles, R.

Geologic study of the Sierra of Guanajuato.—See Villarello, Flores, and Robles, no. 1192.
BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY, 1909.

Roddy, H. Justin.
Notes the discovery of lower Cambrian fossils.

Roe, A. D.

Rogers, Austin F.
Coal measures faunal studies: faunal divisions of the Kansas coal measures.—See Beede and Rogers, no. 95.

Rogers, A. P.

Rogers, R. V.

Rohwer, S. A.

Root, W. A.
Includes notes on the occurrence and character of the ore deposits.

Rowe, Jesse Perry.
Includes notes on the occurrence and character of the coals.

Ruedemann, Rudolf.
Discusses the definition of inlier, and describes various types and their mode of formation with especial reference to occurrences in New York.


Ruhl, Otto.
Includes notes on the geology and the occurrence of the lead ores.
Includes notes on the local geology and occurrence of the ores.

Description of the Philadelphia district.—See Bascom and others, no. 71.
Description of the Trenton quadrangle, New Jersey-Pennsylvania.—See Bascom and others, no. 75.

Mineral resources of the United States, 1908: Mineral waters.—See no. 1170.

Describes physiographic features of Alaska.


Notes the discovery of ophiuroids in the “upper clay” near Rockland, Me.

The mercury minerals from Terlingua, Texas.—See Hillebrand and Schaller, no. 565.


Considers that drainage changes may have been caused by tilting of the land in preglacial time rather than by the advance of glaciers.


Describes the physiographic features and general geology, the occurrence of the ores, gold, silver, lead, copper, and zinc, and the mining developments.
Schubert, E. A.

Schuchert, Charles.
The Silurian section at Arisaig, Nova Scotia: Correlation.—See Twenhofel, no. 1158.

Schultz, A. R.
Describes the topographic features, stratigraphy, and geologic structure of the field, the quality and composition of the coals, and the mining developments.

Schwarz, E. H. L.

Scott, J. G.
Notes the discovery of bituminous coal in northern Alberta.

Scott, W. A.
Includes notes on the occurrence of the copper ores.
Includes notes on the local geology and the occurrence of placer gold.

See, T. J. J.

Sellards, E. H.
Describes fossil plants from the coal measures and Permian formations of Kansas.

Sellards, E. H., and Gunter, Herman.
Shaler, Nathaniel Southgate.

1051. The autobiography of Nathaniel Southgate Shaler, with a supplementary memoir by his wife. Boston, Houghton Mifflin Company, 1909. 481 pp., illus.

Includes a list of his writings.

Shannon, C. W.


Shattuck, George B.


Shaw, E. Wesley.


Describes the topography and stratigraphy of the field, and the occurrence, character, and mining of the coals.

Shaw, S. F.


Includes notes on the geology and occurrence of gold and silver ores.

Shepherd, E. S., and Rankin, G. S.


Discusses the relations and correlations of various Silurian formations and gives lists of fossils from different beds.

Shideler, William.


Describes exposures of Richmond strata near Oxford, Ohio, and gives a list of the fossils collected.

Shimek, B.


Shimer, Hervey Woodburn.

BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY, 1909.

Shumard, B. F.


Shurick, A. T.


Includes a brief account of the geology and the character of the coal.

Sibley, R. Roy.


Includes notes on the occurrence of the copper deposits.

Siebenthal, Claude E.

Mineral resources of the United States, 1908: Lead, zinc, cadmium.—See no. 1170.

Geology and mineral resources of the Laramie Basin, Wyoming.—See Darton and Siebenthal, no. 313.

Simmons, Jesse.


Includes notes upon the geology and occurrence of the tin ores.


Gives notes on the occurrence of the ore deposits.

Sinclair, W. J.


Describes the materials composing the Washakie formation of southern Wyoming and shows that they differ from those of the Bridger formation; and concludes that the two formations are not contemporaneous.

Singewald, Joseph T., jr.


Sivyer, Leonard D.


Sloan, Earle.

1068. A summary of the mineral resources of South Carolina. Issued by [South Carolina], Dept. Agriculture, Commerce, and Immigration. Columbia, S. C., 1907. 66 pp., illus.


Slocum, Arthur Ware.

Smith, Arthur L.


Discusses the form and mode of formation of several experimental deltas, and the necessary and modifying conditions of delta formation.

Smith, Burnett.


Describes fish remains from the Marcellus shale in the vicinity of Syracuse, N. Y., identified with Dinichthys halmodeus (Clarke).


Records the discovery of two dikes, which are briefly described, at a locality 12 miles southwest of Syracuse, N. Y.

Smith, Carl D.


Describes the general features of the field, the various exposures of lignite beds, and the character of the lignite.


Describes the general features of the field, the stratigraphy and structure, the distribution of the lignite, and its character and uses.


Describes the topography and stratigraphy of the field, and the character and distribution of the lignite beds.

The Miles City coal field, Montana.—See Collier and Smith, no. 274.
The Sentinel Butte lignite field, North Dakota and Montana.—See Leonard and Smith, no. 761.

Smith, E. Eggleston.


Describes the general features of the field and the stratigraphy and structure, the occurrence and character of the coal beds, and the quantity and composition of the coals.

Smith, Ethel M.


Describes the physiographic history of extinct volcanoes of the United States.

Smith, F. C.


Presents a definition of the term "ore."

Smith, George L.


Describes the coal measures stratigraphy of southwestern Iowa and gives notes upon the range of certain fossils.
BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY, 1909.

Smith, George Otis.

1081. Scapolite. Geology of the Kennebec River basin [Maine].—U. S. Geol. Survey, Water-
Supply and Irrig. Paper no. 198, pp. 4–9, 1907.


A summary of the work of the year, by branches and divisions, with notes on special features, brief descriptions of the publications, and maps showing areas covered by geologic and topographic surveys.


Smith, James Perrin.


Outlines the geologic history of California from the Cambrian to the present. Includes a synopsis of Quaternary history in tabular form.

Smith, Philip S.


Describes development of placer and lode gold deposits. Includes notes on the geology of the region.


Describes the general geology, the gravels, and the placer and lode gold deposits.

Snider, L. C.


Spalding, W. A.


Spencer, Arthur Coe.


Describes the mining developments, the constitution of the ore, and the characteristics, relations, and origin of the deposits.

Springer, Frank.


Spurr, Josiah Edward.


Questions the correctness of his former determination of scapolite rocks in Alaska.


Squire, George Hull.


Describes the deposits and discusses their origin and mode of formation.
Stabler, H.

Stauffer, Clinton R.

Stearns, Jane.
1097. A physiography laboratory.—Jour. Geography, vol. 8, no. 4, pp. 84–89, 7 figs., December, 1909.

Stephenson, L. W.

Sternberg, Charles H.

Stevens, Blamey.
Stevenson, John James.
A sketch of his life and a list of his writings.

Stewart, C. A.

Stieglitz, Julius.

Stoek, H. H.
Includes notes on the geology, occurrence, and character of the iron ores of the Marquette Range, Michigan.

Stone, C. A.

Stone, Ralph W.
Describes the geography, the general geology, and the structure of the area examined, the occurrence, character, and relations of the coal beds, and the quality of the coal.

Storrs, William H.
Includes notes on the local geology.

Stose, George W.
Describes the topographic features, the general geology, the occurrence, character, and relations of pre-Cambrian volcanic rocks, and of Cambrian, Ordovician, Silurian, and Devonian formations, the geologic structure, the geologic history, and the economic resources.

Stow, Audley H.
Stutzer, O.


Describes the contact-metamorphic copper-ore deposits of Whitehorse, Yukon Territory.

Surr, Gordon.


Describes composition, characters, probable origin, etc., of granite.

Swartz, Charles K.


Symons, Brenton.


Taff, Joseph A.


Describes briefly the general features of the field and the stratigraphy of the coal-bearing rocks, and in more detail the occurrence, character, and mining of the coals.


Mineral resources of the United States, 1908: Asphalt, related bitumens, and bituminous rock.—See no. 1170.

Taff, J. A., and Reed, W. J.


Describes the stratigraphy and the structure of the field, and the physical properties, occurrence development, and source of the oil.

Tallman, Clay.


Includes an account of the geology of the district.

Tarr, R. P.

BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY, 1909.

97

Tarr, Ralph S.


1136. The Yakutat Bay region, Alaska; physiography and glacial geology.—U. S. Geol. Survey, Prof. Paper 64, pp. 11-144, 36 pls., 10 figs., 1909.
Description of the Watkins Glen-Catatonk district, New York.—See Williams, Tarr, and Kindle, no. 1255.

Tarr, Ralph S., and Butler, Bert S.


Taylor, Arthur E.


Taylor, Frank Bursley.


Tays, E. A. H.

Includes notes on the geology of the region.

1143. San José de Gracia, a great Mexican gold camp.—Eng. and Min. Jour., vol. 88, pp. 640-645, 5 figs., October 2, 1909.
Includes notes on the local geology and the occurrence of the gold ores in the San José de Gracia district in the State of Sinaloa, Mexico.

Thomas, H. H., and MacAlister, D. A.


Thomas, Kirby.

Includes a short account of the local geology and the occurrence of gold and silver ores.

Tillotson, E. W.

Orthoklaszwillinge von ungewöhnlicher Ausbildung.—See Ford and Tillotson.

Todd, James E.

Describes the geography, the general geology, the occurrence and relations of pre-Cambrian and Cretaceous strata and Quaternary deposits, the geologic history, and the economic resources, particularly the underground waters.

Discusses the probable margin of the Kansas ice sheet in the State of Kansas, the line of the master drainage stream, and the extent of erosion in Pleistocene and more recent times.

56693°—Bull. 444—10——7
Tolman, C. F.

1148. The geology of the vicinity of the Tumamoc Hills, Arizona.—In Spalding, Distribution and Movements of Desert Plants (Carnegie Inst., Washington, Publ. no. 113), pp. 67-82, 3 pls. (incl. maps), 1 fig., 1909.


Describes the geology, and the occurrence and character of the copper ores.


Describes the geologic relations, character, and occurrence of the copper ores.


Describes the general geology of the district, and the occurrence, character, geologic relations, and genesis of the copper-ore deposits.


Describes the geology of the district, and the relations and characters of the copper-ore bodies.

True, Frederick W.


Truesdell, William H.


Describes the geology of the district, and the occurrence and character of the copper ores.

Turner, H. W.


Describes the geographic features, the occurrence, relations, and petrologic characters of pre-Cambrian, Cambrian, Ordovician, Tertiary, and Quaternary deposits, and of igneous and volcanic rocks, and structural features.


Includes notes on the local geology and the occurrence of the gold ores.

Twenhofel, W. H.


Reviews previous work on the section describes the location, structure, petrology, mode of deposition, and subdivisions, and gives a detailed account of the various horizons, with lists of fossils.

Twitchell, M. W.

The geological distribution of the Mesozoic and Cenozoic Echinodermata of the United States.—See Clark and Twitchell, no. 238.

Tyrrell, J. B.

Tyssowski, John.


Udden, Johan August.


Discusses the occurrence of underground waters with respect to their geologic horizon.


Describes the stratigraphy and the coal beds, and the structure, pointing out the possible occurrence of oil.


Describes the stratigraphy and geologic structure of the region, and the occurrence, altitude, and character of the coal beds.

Uhlig, Johannes.


Describes rocks collected in northeastern Labrador (see Hantisch, no. 308).

Ulrich, Edward Oscar.


Discusses the criteria to be used in paleogeography.


Gives a classification of erosion channels and describes examples from Ordovician and later Paleozoic deposits.

United States Geological Survey.


The papers in this bulletin have been entered under the individual authors. Inter-spersed are lists of the Survey publications on various economic products.


Contains the following papers, mainly statistical in character, relating to the production, condition of the industry, etc., but also in some cases including notes on the geology and occurrence of the products treated:

Part I.

Summary of mineral production in the United States in 1908, compiled by W. T. Thom, pp. 7-59.
Iron ores, pig iron, and steel, by E. C. Harder, pp. 61-134.
Manganese ores, by E. C. Harder, pp. 135-156.
Copper, by B. S. Butler, pp. 185-226.
United States Geological Survey—Continued.

Zinc, by C. E. Siebenthal, pp. 245-273.
Gold, silver, copper, lead, and zinc in the United States, pp. 275-276.
Gold, silver, copper, lead, and zinc in the Western States, pp. 277-586.
Silver, copper, lead, and zinc in the Central States, pp. 587-643.
Antimony, by Frank L. Hess, pp. 709-711.
Bismuth, by Frank L. Hess, pp. 713-714.
Tungsten, nickel, cobalt, vanadium, etc., by Frank L. Hess, pp. 721-749.
Cadmium iron ore, by E. C. Harder, pp. 751-770.
Tin, by Frank L. Hess, pp. 771-779.
Cadmium, by C. E. Siebenthal, pp. 793-803.

Part II.

Fuels.

Coal, by E. W. Parker, pp. 5-211.
Coal, briquetting, by E. W. Parker, pp. 213-221.
Coke, by E. W. Parker, pp. 223-283.
Gas, coke, tar, and ammonia, by E. W. Parker, pp. 285-316.
Natural gas, by B. Hill, pp. 317-341.

Structural Materials.

Glass sand, other sand, and gravel, by A. T. Coons, pp. 505-510.
Sand-lime brick, pp. 517-519.

Abrasives.


Chemical Materials.

Borax, by C. G. Yale, pp. 603-605.
Fluorspar and cryolite, by E. F. Burchard, pp. 607-620.
Gypsum, by E. F. Burchard, pp. 621-628.
Phosphate rock, by F. B. Van Horn, pp. 629-642.
Salt and bromine, by W. C. Phalen, pp. 643-657.
Sulphur and pyrite, by W. C. Phalen, pp. 659-668.

Pigments.

Barytes and strontium, by E. F. Burchard, pp. 669-673.

Miscellaneous.

Asbestos, by J. S. Diller, pp. 697-706.
Graphite, by E. S. Bastin, pp. 717-738.
Magnesite, by C. G. Yale, pp. 739-741.
Mica, by D. B. Sterrett, pp. 743-755.
Monazite and zircon, by D. B. Sterrett, pp. 791-794.
Peat, by Charles A. Davis, pp. 785-804.
Precious stones, by D. B. Sterrett, pp. 805-859.
Quartz and feldspar, by E. S. Bastin, pp. 861-868.
Talc and soapstone, by J. S. Diller, pp. 869-878.
Upham, Warren.


Urbina, Fernando.
Describes physical features of the State of Yucatan, Mexico. Includes notes on the geology.

Describes a cavern situated near Cacahuamilpa, District of Alarcon, State of Guerrero, Mexico.

1175. Nota acerca de unos supuestos yacimientos de cobre y de yeso en el partido de Champoton (Estado de Campeche).—Soc. Geol. Mexicana, Bol., t. 6, pp. viii, 15-16, 1 pl., 1909.
A brief note regarding supposed deposits of copper and of gypsum near Champoton, State of Campeche, Mexico.

Valiquette, J. H.
Includes an account of the geology and mineral resources of the region visited.

Van Hise, Charles Richard.

Gives a general account of the pre-Cambrian rocks of North America and a summary of the literature relating to them, and a detailed account of their occurrence, relations, and characters in the several areas in which they are found.

Van Horn, F. B.
Mineral resources of the United States, 1908: Phosphate rock.—See no. 1170.

Van Horn, Frank R.

Van Ingen, Gilbert.
The so-called Clinton ores are considered to be of Salina age.
BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY, 1909.

Vaughan, T. Wayland.


Gives notes upon the character of the deposits forming the Keys.


Veatch, Otto.


Villarello, Juan D.


Describes the physiographic features, the geology, and the underground waters in the vicinity of Montenegro, State of Queretaro, Mexico.


Describes the granites quarried in the Leahy and Red Stone quarries near Conway, New Hampshire, and the Bienvenue quarry on Deer Island, Maine.


Describes the underground water resources of the vicinity of Patzcuaro, Michoacan. Includes a brief account of the geology of the region.


Describes the petroleum well of Dos Bocas, State of Vera Cruz, Mexico.


Villarello, J. D., Flores, T., and Robles, R.


Includes an account of the ore deposits of Guanajuato district, in the State of Guanajuato, Mexico.

Villars, J. R.


Wade, W. Rogers.


Describes the occurrence and geologic relations of tourmaline.

Wadsworth, M. Edward.


Wainewright, Wilfrid B.

Waitz, Pablo.
1197. Principios de clasificacion y comparacion de rocas macizas (igneas).—Soc. Geol. Mexicana, Bol., t. 6, pp. xi-xii, 17-36, 3 pls., 1909.
Discusses the classification of igneous rocks.

Walcott, Charles D.

Walker, T. L.

Ward, Freeman.
Describes the character and extent of the formation, and its petrographic characters and structure.
Calamine crystals from the Organ Mountains, Donna Anna County, New Mexico.—See Ford and Ward, no. 419.

Waring, Gerald A.

Warren, C. H.

Washburne, Chester W.
Describes the general features of the field, the stratigraphy of the coal beds, and the distribution, relations, and character of the coals.
Describes the general geology, stratigraphy, and structure of the field, the mode of occurrence and character of the oil, and the development and production of the field.

Washington, Henry S.
Diamonds in Arkansas.—See Kunz and Washington.

Watson, C. B.

Watson, Thomas Leonard.
Watson, Thomas Leonard—Continued.

Weaver, Charles E.
Reviews previous work on the San Pablo formation, describes its geographic distribution, stratigraphic relations, and correlation, and gives a list of species occurring in it by horizons. Considers the San Pablo to be lower Pliocene.

Weeks, Fred B., and Nickles, John M.

Wegemann, Carroll H.
Gives a detailed account of geologic and physiographic features of the vicinity of Danville, Ill., and discusses the development of the drainage of the area.
Describes the topography and geology of the field, and the distribution and character of the coal beds.

Welch, R. Kemp.
Includes notes upon the occurrence and source of placer gold in North Carolina.

Weld, C. M.

Weller, Stuart.
Describes fossils from the Fern Glen formation in Missouri and Illinois, and discusses the correlation of the Fern Glen formation and its fauna.

West, H. E.
Includes notes on the occurrence and geologic relations of the silver ores in the Gowganda district.
Describes the local geology and the occurrence and geologic relations of gold and silver bearing manganese deposits in the Matagalpa district of Nicaragua.
Wheeler, H. A.


Wheeler, H. E.


Includes notes on the occurrence of fossils in the Eocene deposits of this locality.

Wheeler, Joseph T.


Wherry, Edgar T.


Gives an account of the meeting and abstracts of the papers presented.


Characterizes the formations of Cambrian and Ordovician age.

White, David.


1231. The upper Paleozoic floras, their succession and range.—Jour. Geology, vol. 17, no. 4, pp. 320-341, 2 figs., 1909.


Includes notes on the correlation of the coal beds.


White, Douglas.


Describes briefly the geologic occurrence of the zinc ores.

White, I. C.


Discusses the distribution of workable beds, the method of deposition of the coal, and the duration of the field under present methods of mining and use.


White, W. P.

Diopside and its relations to calcium and magnesium metasilicates.—See Allen and White, no. 20.
Whiteaves, J. F.

Whitlock, H. P.

Whitney, Milton.

Whitney, Milton, and others.
Contains soil surveys of the following areas:
Marion County, pp. 381–400.
Tallahassee County, pp. 401–436.
Arkansas, Conway County, pp. 753–771.
California, Colusa area, pp. 927–972.
Redding area, pp. 973–999.
Siskiyous County, Butte Valley, pp. 1001–1014.
Florida, Jefferson County, pp. 345–379.
Idaho, Minidoka area, pp. 909–926.
Indiana, Marion County, pp. 793–812.
Maryland, Easton area, pp. 121–163.
Mississippi, Jasper County, pp. 525–556.
Oktibbeha County, pp. 467–502.
Prentiss County, pp. 503–523.
Nebraska, North Platte area, pp. 813–836.
New York, Dutchess County, pp. 31–79.
North Carolina, Edgecombe County, pp. 249–260.
Henderson County, pp. 227–247.
North Dakota, McKenzie area, pp. 859–879.
Morton area, pp. 837–858.
Pennsylvania, Johnston area, pp. 81–120.
South Carolina, Lee County, pp. 323–343.
Oconee County, pp. 271–298.
Sumter County, pp. 299–321.
South Dakota, Bellefourche area, pp. 881–906.
Tennessee, Giles County, pp. 773–791.
Texas, Bastrop County, pp. 663–704.
Brownsville area, pp. 705–732.
Cooper area, pp. 733–752.
Robertson County, pp. 591–640.
Wilson County, pp. 641–662.
West Virginia, Middlebourne area, pp. 165–192.

Whytock, P. R.
Describes the occurrence of the gold ores.
Wiard, Edward S.

Includes notes on the geology of the region and the character and occurrence of the silver-lead ores.

Wickham, H. F.


Wiechert, E.


Wieland, G. R.


Describes Hierosaurus sternbergii from the Niobrara chalk of western Kansas.

Describes the occurrence of cycads of Triassic or Jurassic age in Oaxaca, Mexico, and gives notes upon the fossils.

Wilder, F. A.


Willard, Daniel E.

Describes the general features, the Cretaceous and Quaternary deposits, the geologic history, the water supply, and the soils.

Williams, Henry S.


Williams, H. S., Tarr, R. S., and Kindle, E. M.

Describes the topographic features, the occurrence, character, relations, faunal characteristics, boundaries, and correlations of Devonian formations, the occurrence and character of igneous rocks, geologic structures in the Devonian rocks, the Quaternary deposits, the geologic history and physiographic record, and the economic resources.

Willis, Bailey.

Gives paleogeographic maps of North America in lower Cambrian, late middle and upper Cambrian, middle Ordovician, Silurian, Middle Devonian, Mississippian, Pennsylvanian, latest Paleozoic, Triassic, late Jurassic, Lower Cretaceous, Upper Cretaceous, Eocene-Oligocene, Miocene, and Quaternary time.

Winchell, Alexander N.

Elements of optical mineralogy.—See Winchell and Winchell, no. 1273.

Winchell, Newton Horatio.


Describes the megascopic characters of specimens taken from a drilling in the Mesabi Range, Minnesota.
BIBLIOGRAPHY OF NORTH AMERICAN GEOLOGY, 1909. 109

Winchell, N. H., and Winchell, Alexander N.
1273. Elements of optical mineralogy: an introduction to microscopic petrography, with description of all minerals whose optical elements are known and tables arranged for their determination microscopically. New York, D. Van Nostrand Company, 1909. 502 pp., 4 pls., 350 figs.

Winston, W. B.
Includes notes on the geologic occurrence of the gold ores.

Wisconsin Geological and Natural History Survey.
1275. Sixth biennial report of the commissioners of the Geological and Natural History Survey covering the period from July 1, 1906, to June 30, 1908. Madison, Wisconsin, 1908. 45 pp.
An administrative report.

Wittich, Ernesto.
1276. Contribuciones a la geologia de la region meridional de la Baja California.—Soc. Geol. Mexicana, t. 6, pp. xii-xiii, 5-14, 1 pl., 1909.
Describes the general features of the southern part of Lower California, the occurrence, character, and relations of igneous rocks, and Tertiary, Quaternary, and recent deposits and the geologic structure.

Wolcott, G. E.
Describes the local geology and the occurrence of gold ores.

Wolff, J. Fred.
Includes notes on the geologic occurrence of the iron ores.

Wolff, John E.

Wood, Elvira.

Wood, George McLane.
States the practice of the Survey in the preparation of its publications. Includes definitions of geologic terms.

Wood, H. O.
Crystallographic notes on minerals from Chester, Mass.—See Palache and Wood, no. 933.

Wood, Katharine Hill.
Bibliography of North Carolina geology, mineralogy, and geography, with a list of maps.—See Laney and Wood, no. 736.

Woodman, J. Edmund.
Woodruff, Elmer Grant.
   Describes the surface features, the stratigraphy and structure of the field, the occurrence and character of the coal beds, and the character of the coal.

   Describes the stratigraphy and structure of the field and the geologic occurrence, mining, and character of the coals.

   Describes the location, geologic relations and structure, and the occurrence and origin of the sulphur ore.

Woodward, A. Smith.
1286. Address of the president to the geological section of the British Association for the Advancement of Science.—Science, new ser., vol. 30, pp. 321-331, September 10, 1909.
   Discusses evolution among the vertebrates and the problems which this study has raised.

Woodworth, Jay B.

Woolsey, Lester H.
   Describes the general geology, the occurrence and character of the coal beds, the character of the coal, and the development.

Wright, C. T.
1289. The laboratories for physical geography in two California high schools.—Jour. Geography, vol. 8, no. 1, pp. 10-14, 3 figs., September, 1909.

Wright, Charles W.
   Includes notes on the geology of Kasaan Peninsula and other districts of southeastern Alaska.

Wright, Fred. Eugene.
   Gives optical measurements of clinoenstatite crystals and calls attention to distinctions between enstatite and clinoenstatite.

The binary systems of alumina with silica, lime, and magnesia; optical study.—See Shepherd and Rankin, no. 1056.

Wright, Fred. Eugene, and Larsen, Esper S.

Wright, George Frederick.
Wright, J. W.
Includes notes on the local geology and the occurrence of the ores yielding gold, silver, and copper.

Yates, J. A.

Yeandle, W. H.

Young, George A.
Describes the general geology and the occurrence and relations of an iron-ore deposit, and gives general notes on the Tobique country.

Zalinski, Edward R.
Describes the gem material, and its geological occurrence in Tooele County, Utah.


Zambonini, F.
A discussion in regard to the distinctions between enstatite and clinoenstatite.

Zehring, W. S.
Includes notes on the geology and occurrence of the copper ores.

Anonymous.

Describes the geologic conditions and occurrence of the ores in the Liberty Bell mine, at Telluride, Colorado.

CLASSIFIED SCHEME OF SUBJECT HEADINGS.

1. GENERAL.

Associations, meetings; Addresses; History; Philosophy; Biography; Bibliography; Educational; Text-books.
Classification; Nomenclature; Cartography; Technique; Fieldwork; Surveys; Borings.
Geochemistry; Chemical analyses (list); Atmosphere.
Miscellaneous.

2. REGIONAL.

The States of the Union, Alabama, etc.; the Provinces of Canada, Alberta, etc.; Greenland; Mexico; the countries of Central America; the West Indies, and the single islands; the Hawaiian Islands.

3. ECONOMIC.

Ore deposits, origin; Contact phenomena.
Gold; Placers; Black sands; Silver; Quicksilver; Nickel; Cobalt; Copper; Lead; Zinc; Iron; Magnetite; Manganese; Tin; Aluminum; Bauxite; Antimony; Bismuth; Tungsten; Wolframite; Vanadium; Uranium; Carnotite ores; Molybdenum; Molybdenite; Titanium; Rutile; Platinum; Monazite; Rare earths; Tantalum; Selenium; Tellurium; Zircon.
Coal; Anthracite; Coke; Peat; Lignite; Bituminous rock; Natural gas; Petroleum; Oil shales; Asphalt; Albertite; Gilsonite; Grahamite; Ozokerite.
Stone; Building stone; Granite; Bluestone; Limestone; Lime; Marble; Onyx; Sandstone; Clay; Kaolin; Bentonite; Fire clay; Ganiester; Slate; Shale; Marl; Sand; Glass sand; Sand-lime brick; Gravel; Cement and cement materials; Concrete materials; Road materials; Trap; Steatite; Soapstone; Talc.
Precious stones; Diamonds; Sapphires; Turquoise; Tourmaline.
Abrasive materials; Corundum; Emery; Garnet; Diatomaceous earth; Tripoli; Volcanic ash; Millstones; Novaculite.
Asbestos; Feldspar; Mica; Quartz; Gypsum; Graphite; Fuller's earth; Infusorial earth; Magnesite; Mineral paint; Chromium; Chromite; Chromic iron ore; Fluorspar; Barite; Barytes; Strontium; Arsenic; Pyrite; Sulphur; Sulphate of soda; Cryolite; Phosphorus; Phosphate; Apatite; Glauconite; Borax; Bromine; Salt; Natron deposits.

4. DYNAMIC AND STRUCTURAL.

Earth, genesis of; Earth, age of; Earth, interior of; Earth, temperature of. Volcanoes; Earthquakes; Seismographs. Isostasy; Orogeny; Changes of level. Magmas; Intrusions; Dikes; Laccoliths; Metamorphism; Contact phenomena. Deformation; Folding; Faulting; Unconformities. Conglomerates; Concretions; Stalactites; Jointing; Cleavage. Sedimentation; Denudation; Erosion; Caves; Sink holes; Erratic bowlders; Weathering; Wind work; Dunes; Loess; Landslides. Glaciers; Glacial erosion; Eskers; Kames; Moraines; Kettle holes. Drainage changes.
5. PHYSIOGRAPHIC.

Geomorphy; Relief maps.
Valleys; Cirques; Deserts; Dunes; Deltas; Alluvial fans; Eskers; Kames; Mounds, natural; Natural bridges; Sink holes; Karsts.
Lakes; Swamps; Marshes; Everglades; Terraces; Shore lines; Rivers; Meanders; Falls; Springs.

6. HISTORICAL OR STRATIGRAPHIC.

Geologic history; Geologic time; Paleogeography; Paleogeographic maps; Paleoclimatography.
Geologic maps; Geologic formations described (list).
Pre-Cambrian; Cambrian; Ordovician; Silurian; Devonian; Carboniferous; Triassic; Jurassic; Cretaceous; Tertiary; Quaternary; Recent; Glacial geology; Glaciation; Glacial lakes; Ice ages.

7. PALEONTOLOGY.

Geographic distribution.
Vertebrata; Man, fossil; Mammalia; Aves; Reptilia; Amphibia; Pisces; Footprints, fossil.
Invertebrata; Arthropoda; Trilobita; Ostracoda; Insecta; Arachnida; Myriapoda.
Mollusca; Cephalopoda; Gastropoda; Pelecypoda.
Molluscoidea; Brachiopoda; Bryozoa; Vermes.
Echinodermata; Echinoidea; Asteroidea; Crinoidea; Crystoidea.
Coelenterata; Anthozoa; Hydrozoa; Graptolites.
Protozoa; Spongida; Foraminifera.
Paleobotany; Diatoms.
Problematica.

8. PETROLOGY.

Rocks, origin; Rocks described (list); Igneous and volcanic rocks; Rock-forming minerals.

9. MINERALOGY.

Minerals described (list); Crystallography; Pseudomorphism; Paragenesis of minerals; Rock-forming minerals; Meteorites.

10. UNDERGROUND WATER.

Mine waters; Thermal waters; Geysers; Springs; Mineral waters.

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Maryland Geological Survey reports: Clark, 234-236.
Michigan, state geologist's report, tenth: Lane, 727.
United States Geological Survey, thirtieth annual report of the Director: Smith, 1082.
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Wisconsin, report of director, 1906-08: Birge, 115.
sixth biennial report: Wis. G. N. H. S., 1275.

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Englishtown sand, Cretaceous, New Jersey: Bascom et al., 74, 75; Kümml, 682.

Enterprise shales, Carboniferous, Kansas: Beede, 90.

Erian, Devonian, New York: Luther, 786.

Eskridge shales, Carboniferous, Kansas: Haworth and Bennett, 518.

Esmeralda formation, Tertiary, Nevada: Turner, 1156.

Esopus grit, Devonian, New Jersey: Kümml, 682.

Espina breccia, Tertiary, Nevada: Ransom, 976.

Estill clay, Silurian, Kentucky: Foerste, 409.

Etchequoin formation, Miocene, California: Arnold, 30.

Etchequoin-Jacalitos formation, California: Johnson, 631.

Etcheminian, Cambrian, North America: Grabau, 472.

Eutaw formation, Cretaceous, Georgia: Veatch, 1184.

Everglades limestone, Pleistocene, Florida: Matson and Clapp, 829.

Fern Glen formation, Devonian, Missouri: Buckley, 158.

Fern Glen formation, Mississippian, Missouri and Illinois: Weller, 1218, 1221.

Fern Glen shale, Mississippian, Illinois and Missouri: Fenneman, 392.

Fernie shale, Jurassic, British Columbia: Dowling, 350.

Fernvale limestone, Ordovician, Illinois: Savage, 1027.
Fish Creek beds, Cretaceous, Montana: Douglass, 348.
Fish Creek sandstone, Carboniferous, West Virginia: Hennen, 537.
Fishkill limestone, Cambro-Ordovician, New York: Clarke, 240.
Flat Rock dolomite, Silurian, Michigan and adjacent: Sherzer and Grabau, 1058.
Flat Rock dolomites, Silurian, Michigan: Lane et al., 733.
Fleming Inlet series, Triassic, Greenland: Nordenstjeld, 900.
Florena shales, Carboniferous, Kansas: Haworth and Bennett, 518.
Florence flint, Carboniferous, Kansas: Haworth and Bennett, 518.
Floridan group, Pliocene, Florida: Matson and Clapp, 829.
Floyd shales, Carboniferous, Georgia: Veatch, 1184.
Forelle limestone, Carboniferous, Wyoming: Dakota and Siebenthal, 313.
Fork Mountain slate, Arkansas: Purdue, 972.
Fort Ancient division, Ordovician, Ohio: Foerste, 413.
Fort Benton formation, Cretaceous, Montana: Douglass, 348.
Fort Payne chert, Carboniferous, Georgia: Veatch, 1184.
Fort Riley limestone, Carboniferous, Kansas: Haworth and Bennett, 518.
Fort Scott limestone, Carboniferous, Kansas: Haworth and Bennett, 518.
Fort Union beds, Cretaceous, Montana: Douglass, 348.
Fort Union formation, Eocene, Montana: Stanton, 1094.
Fort Union formation, Eocene, North Dakota: Leonard, 758.
Fort Union formation, Eocene, North Dakota and Montana: Leonard and Smith, 761.
Fort Union formation, Eocene, Wyoming, North and South Dakota, and Montana: Knowlton, 678.
Fort Union formation, Tertiary, Wyoming: Shaw, 1054; Washburne, 1284; Woodruff, 1283, 1284.
Fort Union formation, Tertiary, Montana: Pepperberg, 949; Smith, 1076; Stone, 1164.
Fountain formation, Pennsylvanian, Colorado: Henderson, 536.
Fountain formation, Triassic, Colorado: Martin, 819.
Fox Hills formation, Cretaceous, Colorado: Henderson, 536; Martin, 819.
Fox Hills formation, Cretaceous, Montana: Douglass, 348.
Fox Hills formation, Cretaceous, North Dakota: Leonard, 758.
Fox Hills sandstone, Cretaceous, South Dakota: Dakota, 307; Dakota and O'Hara, 312.
Fox Hills (?) sandstone, Cretaceous?, Montana: Smith, 1076.
Fox Hills substage, Cretaceous, Mexico: Aguillera, 10.
Franciscan formation, Jurassic?, California: Arnold, 30, 31; Branner et al., 138.
Franklin limestone, pre-Cambrian, New Jersey: Kimmel, 682.
Franklin limestone formation, pre-Cambrian, New Jersey: Bayley, 86.
Franklin limestone, pre-Cambrian, Pennsylvania: Bascom et al., 75.
Fulton green shale, Carboniferous, West Virginia: Hennen, 537.
Fusion formation, Cretaceous, South Dakota: Dakota, 307; Dakota and O'Hara, 312.
Fusselman limestone, Silurian, Texas: Richardson, 986.
Galesburg shales, Carboniferous, Kansas: Haworth and Bennett, 518.
Garrard sandstone, Ordovician, Kentucky: Foerste, 413.
Garrison formation, Carboniferous, Kansas: Haworth and Bennett, 518.
Gasconade formation, Cambrian, Missouri: Buckley, 158.
Gaspé sandstone, Devonian, Canada: Williams, 1254.
Genesea shale, Devonian, New York: Luther, 786; Williams, 1541.
Genundewa limestone, Devonian, New York: Luther, 786.
Gila conglomerate, Quaternary, Arizona: Truesdell, 1155.
Gilboy sandstone, Carboniferous, West Virginia: Hennen, 537.
Gilmore sandstone, Carboniferous, West Virginia: Hennen, 537.
Girardeau limestone, Silurian, Illinois and Missouri: Savage, 1027.
Glendale granite, Tertiary, Colorado: Crawford, 290.
Glen Park formation, Devonian, Missouri: Buckley, 158.
Glen Rose formation, Cretaceous, Texas: Hess, 551.
Globe limestone, Devonian-Carboniferous, Arizona: Truesdell, 1155.
Goldland limestone, Cretaceous, Oklahoma: Taff and Reed, 1132.
Gower limestone, Silurian, Illinois and Iowa: Carman, 198.
Grand Rapids group, Carboniferous, Michigan: Cooper, 283.
Grand Tower, Devonian, Missouri: Buckley, 158.
Granger formation, Devonian, Virginia: Bassler, 78.
Greenbrier limestone, Mississippian, Virginia: Bassler, 78.
Greendale bed, Ordovician, Kentucky: Foerste, 413.
Greenfield dolomite, Silurian, Ohio: Lane et al., 733; Sherzer and Grabau, 1058.
Greenhorn limestone, Cretaceous, South Dakota: Dakota, 307; Dakota and O'Hara, 312.

Green Pond conglomerate, Silurian, New Jersey: Kümmler, 682.

Green River formation, Tertiary, Colorado: Gale, 433; Lee, 743.

Green River formation, Tertiary, Wyoming, Schultz, 1039.


Grimes sandstone, Devonian, New York: Luther, 786.

Guanaquito conglomerate, Mexico: Botsford, 129.

Gunnnison formation, Jurassic?, Colorado: Lee, 743.

Gunnnison formation, Juratrics, Colorado: Spurr, 1091.

Hampton shale, Cambrian, Virginia: Bassler, 78.

Hancock limestone, Devonian, Virginia: Bassler, 78.

Hannibal formation, Mississippian, Missouri: Buckley, 158.

Harpers schist, Cambrian, Pennsylvania: Stose, 1119.

Harpers shale, Cambrian, Virginia: Bassler, 78.

Hardyston quartzite, Cambrian, New Jersey: Kümmler, 682.

Hatch shale and flags, Devonian, New York: Luther, 786.

Hawthorne formation, Oligocene, Florida: Matson and Clapp, 829.

Helderberg limestone, Silurian, Pennsylvania: Stote, 1119.

Hell Creek beds, Cretaceous, Montana: Stanton, 1094.

Hell Creek beds, Eocene, Montana: Knowlton, 678.

Herculean shale member, Tertiary, California: Weaver, 1212.

Herington limestone, Carboniferous, Kansas: Beebe, 90.

Highb ridge limestone, Ordovician, Kentucky: Matson, 827.

High Falls formation, Silurian, New Jersey: Kümmler, 682.

High Point sandstone, Devonian, New York: Luther, 786.


Holston marble, Ordovician, Virginia: Bassler, 78.

Honaker limestone, Cambrian, Virginia: Bassler, 78.

Hopkinton limestone, Silurian, Illinois and Iowa: Carman, 198.

Hornerstown marl, Cretaceous, New Jersey: Bearcom et al., 74, 75; Kümmler, 682.

Howard limestone, Carboniferous, Kansas: Hawthorne and Bennett, 518.

Hudson River (Thebes), Ordovician, Missouri: Buckley, 158.

Hueco limestone, Pennsylvanian, Texas: Richardson, 998.

Hundred sandstone, Carboniferous, West Virginia: Hennen, 537.

Hurionian, pre-Cambrian, Ontario: Collins, 276.

Hurry Inlet series, Triassic, Greenland: Nordenskjöld, 900.

Hygiene sandstone, Cretaceous, Colorado: Hendersson, 536.

Hygiene sandstone member, Cretaceous, Colorado: Martin, 819.

Idaho Springs formation, Colorado: Patton, 943.

Illinoian drift, Pleistocene, Iowa: Calvin, 187.

Illinoian epoch, Quaternary, Illinois and Missouri: Fenneman, 392.

Illinoian glacial epoch, Quaternary, Illinois and Iowa: Carman, 198.

Illinoian till, Pleistocene, Ontario: Coleman, 269.

Indian Fields member, Silurian, Kentucky: Foerste, 409.

Inwood limestone, New York: Berkey, 101, 103; Koeberlin, 679.

Iola limestone, Carboniferous, Kansas: Haworth and Bennett, 518.

Iowan drift, Pleistocene, Iowa: Calvin, 187.

Iowan glacial epoch, Quaternary, Illinois and Iowa: Carman, 198.

Iowan till, Pleistocene, Ontario: Coleman, 269.

Iroquois clay, Pleistocene, Ontario: Coleman, 269.

Irvine formation, Tertiary, Kentucky: Matson, 827.

Ithaca shale member, Devonian, New York: Williams, 1254.

Jacaltios formation, Miocene, California: Arnold, 50.

Jackfork sandstone, Carboniferous, Oklahoma: Tauf, 1130.

Jackson stage, Eocene, Louisiana and Texas: Harris, 512.

Jacksonburg limestone, Ordovician, New Jersey: Kümmler, 682.

Jacksonville formation, Miocene, Florida: Matson and Clapp, 829.

Jefferson City formation, Cambrian, Missouri: Buckley, 158.

Jeffersonville limestone, Devonian, Kentucky: Bassler, 80.

Jossifin formation, Ordovician, Missouri: Buckley, 158.


Jolliettown sandstone, Carboniferous, West Virginia: Hennen, 537.

Judith River beds, Cretaceous, Montana: Douglass, 348.

Judith River formation, Cretaceous, Montana: Pepperberg, 948, 949; Stone, 1114.


Junitala formation, Ordovician, Pennsylvania: Stote, 1119.

Junitala red beds, Ordovician, Pennsylvania: Graban, 476.

Kanouse sandstone, Devonian, New Jersey: Kümmler, 682.

Kansan drift, Pleistocene, Iowa: Calvin, 187.

Kansan epoch, Quaternary, Illinois and Missouri: Fenneman, 392.

Kansan glacial epoch, Quaternary, Illinois and Iowa: Carman, 198.

Kansan or pre-Kansan drift, Pleistocene, New Jersey: Kümmler, 682.

Kanwaka shales, Carboniferous, Kansas: Haworth and Bennett, 518.

Keewatin, pre-Cambrian, Ontario: Collins, 276.

Kendall tuff, Tertiary, Nevada: Ransome, 976.
Kenneott formation, Jurassic or Cretaceous, Alaska: Moffit and Maddren, 675.
Keeuk formation, Mississippian, Missouri: Buck-ley, 158.
Key Largo limestone, Pleistocene, Florida: Sanford, 1025.
Key West oolite, Pleistocene, Florida: Sanford, 1025.
Kibbey sandstone, Carboniferous, Montana: Fisher, 396.
Kickapoo limestone, Carboniferous, Kansas: Ha-worth and Bennett, 518.
Kiger stage, Carboniferous, Kansas: Haworth and Bennett, 518.
Kimmick formation, Ordovician, Missouri: Buck-ley, 158.
Kimmick limestone, Ordovician, Illinois: Sav-age, 1027.
Kimmick limestone, Ordovician, Missouri: Wel-ler, 1218.
Kinderhook formation, Mississippian, Illinois and Missouri: Fenneman, 392.
Kingsbury conglomerate, Eocene, Wyoming: Knowlton, 678.
Kingston or Port Ewen beds, Devonian, New Jer-sey: Kümmler, 682.
Kirkwood formation, Tertiary, New Jersey: Bas-com et al., 74, 73; Kümmler, 682.
Kittatinny limestone, Cambrian, New Jersey: Kümmler, 682.
Knob (Riverside) sandstone, Mississippian, Ken-tucky: Bassler, 80.
Knobstone group, Mississippian, Kentucky: Bass-ler, 80.
Knox dolomite, Cambro-Ordovician, Virginia: Bas-sler, 78.
Knox dolomite, Ordovician, Georgia: Veatch, 1184.
Knoxville formation, Cretaceous, California: Ar-nold, 31; Bramer et al., 138.
Knoxville-Chicoo rocks, Cretaceous, California: Ar-nold, 30; Johnson, 631.
Kootanie, Cretaceous, Canada: Dowling, 350.
Kootanie formation, Cretaceous, Alberta: Dowling, 352.
Kootenai formation, Cretaceous, Montana: Calvert, 185; Fisher, 396; Stone, 1114.
Kolbette shales, Carboniferous, Kansas: Haworth and Bennett, 518.
Ladore shales, Carboniferous, Kansas: Haworth and Bennett, 518.
Lafayette formation, Pliocene, Florida: Matson and Clapp, 829.
Lafayette formation, Tertiary, Georgia: Veatch, 1184.
Lafayette formation, Tertiary, New Jersey: Bas-com et al., 74.
Lafayette gravels, Tertiary, Missouri: Buckley, 158.
Lake Valley beds, Mississippian: Weller, 1218.
Lakota sandstone, Cretaceous, South Dakota: Darton, 307; Darton and O'Harr, 312.
La Luz schists, Mexico: Botsford, 129.
Launeotte formation, Cambrian, Missouri: Buckley, 158.
Lance Creek beds, Cretaceous, Wyoming: Stanton, 1094.
Lance Creek beds, Eocene, Wyoming: Knowlton, 678.
Lane shales, Carboniferous, Kansas: Haworth and Bennett, 518.
Lanoria quartzite, pre-Cambrian, Texas: Richard-son, 998.
Laramie formation, Colorado: George and Craw-ford, 446.
Laramie formation, Cretaceous, Colorado: Gale, 433; Henderson, 536; Martin, 819.
Laramie formation, Cretaceous, Great Plains and Rocky Mountain region: Cross, 291.
Laramie, Cretaceous, Montana: Douglass, 348; Stone, 1114.
Laramie, Cretaceous, Mexico: Aguilero, 10.
Laramie formation, Cretaceous, New Mexico: Gard-ner, 436.
Laramie formation, Cretaceous, Wyoming: Ball, 57; Schultz, 1039; Smith, 1077; Washburne, 1204; Woodruff, 1284.
Las Vegas formation, Mexico: Burrows, 171.
Laurentian, pre-Cambrian, Ontario: Collins, 276.
Lawrence shales, Carboniferous, Kansas: Haworth and Bennett, 518; Yates, 1295.
Leclaire limestone, Silurian, Illinois and Iowa: Carman, 198.
Lecompton shales, Carboniferous, Kansas: Ha-worth and Bennett, 518.
Leda clay, Pleistocene, Ontario: Coleman, 269.
Lehighsville formation, Cambrian, Pennsylvania: Wherry, 1229.
Le Roy shales, Carboniferous, Kansas: Haworth and Bennett, 518.
Levyville formation, Oligocene, Florida: Matson and Clapp, 829.
Lewis shale, Cretaceous, Colorado: Gale, 433.
Lewis shale, Cretaceous, New Mexico: Gardner, 436.
Lewis shale, Cretaceous, Wyoming: Ball, 57; Schultz, 1039; Stanton, 1084.
Lewiston limestone, Silurian-Devonian, Virginia: Bassler, 78.
Lexington limestone, Ordovician, Kentucky: Matson, 827.
Liberty Hall formation, Ordovician, Virginia: Bass-ler, 78.
Linnetta clays, Mississippian, Kentucky: Morse and Foerste, 887.
Livingston formation, Tertiary, Montana: Stone 1114.
Lockatong beds, Triassic, New Jersey: Kümmler, 682.
Lockatong formation, Triassic, Pennsylvania: Bas-com et al., 74, 75.
Logan formation, Carboniferous, Ohio: Carney, 200.
Logan formation, Mississippian, Ohio and Ken- tucky: Morse and Foerste, 887.
Lone Tree white layer, Eocene, Wyoming: Mat-thew, 834.
Longwood shale, Silurian, New Jersey: Kümmel, 682.
Lookout sandstone, Carboniferous, Georgia: Veatch, 1184.
Lorraine beds, Ordovician, New York: Miller, 867.
Looe gneiss, New Jersey: Bayley, 86.
Looe gneiss, pre-Cambrian, New Jersey: Kümmel, 682.
Lostmans River limestone, Pleistocene, Florida: Matson and Clapp, 829; Sanford, 1025.
Loudon formation, Cambrian, Virginia: Bassler, 78.
Louisiana formation. Mississippian, Missouri: Buckley, 158.
Louisville formation, Silurian, Kentucky: Bassler, 80.
Louisville limestone, Silurian, Indiana: Kindle and Barnett, 670.
Lowville, Ordovician, New York: Grabau, 472.
Lowville limestone, Ordovician, New York: Miller, 867.
Lucas dolomite, Silurian, Michigan and Ohio: Sherzer and Grabau, 1058.
Lucas dolomite, Silurian, Ohio: Lane et al., 733.
Ludlow ville shale, Devonian, New York: Luther, 786.
Luta limestone, Carboniferous, Kansas: Beebe, 90.
Lykins formation, Triassic, Colorado: Martin, 819.
Lyons formation, Pennsylvanian, Colorado: Henderson, 536.
Lyons sandstone, Triassic, Colorado: Martin, 819.
McAdam formation, Silurian, Nova Scotia: Twenhofel, 1158.
Madera limestone, Pennsylvanian, New Mexico: Lee, 745.
Madison limestone, Carboniferous, Montana: Fisher, 396, 397.
Madison limestone, Mississippian, Montana: Calvert, 185.
Magdalena group, Pennsylvanian, New Mexico: Lee, 745.
Magothy formation, Cretaceous, Atlantic coastal plain: Bibbins, 113.
Magothy formation, Cretaceous, New Jersey: Bascom et al., 74, 75; Kümmel, 682.
Mahoning sandstone, Carboniferous, Pennsylvania: Raymond, 983.
Malpais basalt, Tertiary, Nevada: Ransome, 976.
Manasquan formation, Cretaceous, New Jersey: Bascom et al., 75.
Manasquan marl, Cretaceous, New Jersey: Kümmel, 682.
Manatee River marl, Oligocene, Florida: Matson and Clapp, 829.
Mancos shale, Cretaceous, Colorado: Gall, 433; George and Crawford, 446; Lee, 743.
Mancos shale, Cretaceous, Colorado and Utah: Richardson, 1000.
Mancos shale, Cretaceous, New Mexico: Gardner, 436.
Manitoba series, Devonian, Manitoba: Dowling, 350.
Manlius limestone, Silurian, New Jersey: Kümmel, 682.
Manlius limestone, Silurian, New York: Luther, 786.
Mannington sandstone, Carboniferous, West Virginia: Hennen, 537.
Manzano group, Pennsylvanian, New Mexico: Lee, 745.
Maquoketa shale, Ordovician, Illinois and Iowa: Carman, 198.
Marcellus shale, Devonian, New Jersey: Kümmel, 682.
Marcellus shale, Devonian, New York: Luther, 786.
Marietta sandstones, Carboniferous, West Virginia: Hennen, 537.
Marianna limestone, Oligocene, Florida: Matson and Clapp, 829.
Marion limestone, Carboniferous, Kansas: Haworth and Bennett, 518.
Marion stage, Carboniferous, Kansas: Beebe, 90.
Maroon formation, upper Carboniferous, Colorado: Spurr, 1091.
Marmon stage, Carboniferous, Kansas: Haworth and Bennett, 518.
Marshalltown clay-marl, Cretaceous, New Jersey: Kümmel, 682.
Marshalltown formation, Cretaceous, New Jersey: Bascom et al., 74, 75.
Martinsburg shale, Ordovician, New Jersey: Kümmel, 682.
Martinsburg shale, Ordovician, Pennsylvania: Stose, 1119.
Martinsburg shale, Ordovician, Virginia: Bassler, 78.
Maryville limestone, Cambrian, Virginia: Bassler, 78.
Massanutten sandstone, Ordovician, Virginia: Bassler, 78.
Matanaw group, Cretaceous, New Jersey: Bascom et al., 74, 75.
Matfield shales, Carboniferous, Kansas: Haworth and Bennett, 518.
Maysville formation, Ordovician, Kentucky: Matson, 827.
Meda rhyolite, Tertiary, Nevada: Ransome, 976.
Medora group of lignite beds, Eocene, North Dakota: Leonard and Smith, 761.
Merced formation, Pliocene, California: Branner et al., 138.
Merchantville clay, Cretaceous, New Jersey: Bascom et al., 74, 75; Kümmel, 682.
Mesaverde formation, Cretaceous, Colorado: Gale, 433; Lee, 743.
Mesaverde formation, Cretaceous, Colorado and Utah: Richardson, 1000.
Mesaverde formation, Cretaceous, New Mexico: Gardner, 430.
Mesaverde formation, Cretaceous, Wyoming: Ball, 57; Schultz, 1039; Smith, 1077; Stanton, 1094.
Miami oolite, Pleistocene, Florida: Matson and Clapp, 829; Sanford, 1025.
Midway formation, Eocene, Louisiana: Harris, 512.
Midway formation, Tertiary, Georgia: Veatch, 1184.
Million bed, Ordovician, Kentucky: Foerste, 413.
Milltown andesite, Tertiary, Nevada: Ransome, 976.
LISTS.

Minnekahta limestone, Carboniferous, South Dakota: Darton, 307; Darton and O’Harra, 312.

Minnekahta limestone, Carboniferous, Wyoming and South Dakota: Darton, 306.

Minnelusa sandstone, Carboniferous, South Dakota: Darton, 307; Darton and O’Harra, 312.


Mira basalt, Tertiary, Nevada: Ransome, 976.

Missouri Mountain formation, Ordovician, Arkansas: Purdue, 973.

Missouri Mountain slate, Arkansas: Purdue, 972.

Moccasin limestone, Ordovician, Virginia: Bassler, 78.

Monmouth group, Cretaceous, New Jersey: Bascom et al., 74, 75.

Monongahela series, Carboniferous, West Virginia: Hennen, 537.

Monroan, Silurian, Michigan, Ohio, and Canada: Grabau, 472.

Monroe formation, Silurian, Michigan and adjacent: Sherzer and Grabau, 1058.

Monroe formation, Silurian, Michigan, Ohio, and New York: Lane et al., 733.

Montalto quartzite member, Cambrian, Pennsylvania: Stose, 1119.

Montana formation, Cretaceous, Wyoming: Shaw, 1054.


Montana group, Cretaceous, Montana: Calvert, 153; Fisher, 397; Pepperberg, 949; Stone, 1114.

Montana group, Cretaceous, South Dakota: Todd, 1146.

Montana group, Cretaceous, Wyoming: Darton and Sibleth, 313; Woodruff, 1284.

Montana stage, Cretaceous, Mexico: Aguilera, 10.

Monterey shale, Miocene, California: Branner et al., 138.

Monterey shales, Miocene, California: Johnson, 631.

Montezuma granite, Colorado: Patton, 943.

Montoya limestone, Ordovician, Texas: Richardson, 998.

Mora sandstones, New Mexico: Keyes, 604.

Morena rhyolite, Tertiary, Nevada: Ransome, 976.

Morrison formation, Cretaceous, Colorado: Hennen, 538.

Morrison formation, Cretaceous, Wyoming: Darton and Sibleth, 313.


Morrison formation, Jurassic, Colorado: Henderson, 540.

Morrison formation, Jurassic, Montana: Calvert, 185; Fisher, 397.

Morrison formation, Jurassic or Cretaceous, Colorado: Martin, 819.

Morrison shale, Cretaceous, South Dakota: Darton, 307; Darton and O’Harra, 312.

Morrison shale, Jurassic 7, Montana: Fisher, 396.

Moscow shale, Devonian, New York: Luther, 786.

Mound Valley limestone, Carboniferous, Kansas: Haworth and Bennett, 518.

Mount Laurel sand, Cretaceous, New Jersey: Bascom et al., 74, 75; Kümmel, 682.

Mount Morris limestone, Carboniferous, West Virginia: Hennen, 537.

Mount Sicker series, Mesozoic, British Columbia: Clapp, 228.


Moydart formation, Silurian, Nova Scotia: Twenhofel, 1158.

Murat limestone, Ordovician, Virginia: Bassler, 78.

Nashua marl, Pliocene, Florida: Matson and Clapp, 829.

Nastapoka group, Canada: Young, 1297.

Nation River formation, Carboniferous, Alaska: Prindle, 690.

Natural Bridge limestone, Cambro-Ordovician, Virginia: Bassler, 78.


Navesink marl, Cretaceous, New Jersey: Bascom et al., 74, 75; Kümmel, 682.

Nazareth cement rock, Ordovician, Pennsylvania: Wherry, 1229.

Nebraskan drift sheet, Pleistocene, Iowa: Shimek, 1000.

Neosho member, Carboniferous, Kansas: Haworth and Bennett, 518.

Neva limestone, Carboniferous, Kansas: Haworth and Bennett, 518.

New Albany shale, Devonian, Kentucky: Bassler, 80.

Newark group, Triassic, Pennsylvania: Bascom et al., 74, 75.

Newland formation, Algonkian, Idaho and Montana: Calkins, 181.

Newman limestone, Mississippian, Virginia: Bassler, 78.

New Providence shale, Mississippian, Indiana and Kentucky: Weller, 1218.

New Providence shale, Mississippian, Kentucky: Bassler, 80.

New Scotland beds, Devonian, New Jersey: Kümmer, 682.

Niagara limestone, Silurian, Illinois and Iowa: Carman, 198.

Niagara (Bainbridge), Silurian, Missouri: Buckley, 158.

Niagaran, Silurian: Grabau, 472.

Niagaran limestone, Silurian, Kentucky: Bassler, 80.

Nicholas bed, Ordovician, Kentucky: Foerste, 413.

Nicholas beds, Ordovician, Kentucky and Ohio: Foerste, 412.

Nikolai greenstone, Alaska: Moffit and Maddren, 875.

Nineveh sandstone, Carboniferous, West Virginia: Hennen, 537.

Niobrara, Cretaceous, Canada: Dowling, 350.

Niobrara, Cretaceous, North Dakota: Barry and Melsted, 70.


Niobrara limestone, Cretaceous, Colorado: Martin, 819.

Niobrara formation, Cretaceous, South Dakota: Darton, 307; Darton and O’Harra, 312; Todd, 1146.

Niobrara formation, Cretaceous, Wyoming: Darton and Sibleth, 313.
Nipissing clay, Pleistocene, Ontario: Coleman, 269.
Niskay formation, Ordovician, Pennsylvania: Wherry, 1229.
Nolichucky shale, Cambrian, Virginia: Bassler, 78.
Oak Grove sand member, Oligocene, Florida: Matson and Clapp, 829.
Ocala limestone, Oligocene, Florida: Matson and Clapp, 829.
Ocehese beds, Oligocene, Florida: Matson and Clapp, 829.
Octoraro schist, Ordovician, Pennsylvania: Bascom et al., 74, 75.
Ogalalal formation, Pliocene, Nebraska: Matthew and Cook, 840.
Ohio shale, Devonian, Kentucky: Matson, 827.
Ohio shale, Devonian and Mississippian, Kentucky: Morse and Foerste, 887.
Ohio Creek formation, Tertiary, Colorado: Lee, 743.
Ojinaga formation, Mexico: Burrows, 171.
Oldham limestone, Silurian, Kentucky: Foerste, 499.
Olen tangy shale, Devonian, Ohio: Stauffer, 1096.
Onondaga limestone, Devonian, New Jersey: Küm mel, 682.
Onondaga limestone, Devonian, New York: Luther, 786.
Opechee formation, Carboniferous, South Dakota: Darton, 307; Darton and O’Harra, 312.
Opechee formation, Carboniferous, Wyoming and South Dakota: Darton, 306.
Orchard Creek shale, Ordovician, Illinois: Savage, 1027.
Oread limestone, Carboniferous, Kansas: Haworth and Bennett, 518.
Oriskany formation, Devonian, New Jersey: Küm mel, 682.
Oriskany formation, Devonian, Pennsylvania: Stose, 1119.
Oriskany sandstone, Devonian, New York: Luther, 786.
Osage formation, Mississippian, Missouri: Buckley, 158.
Osage limestone, Mississippian, Illinois and Missouri: Fenneman, 392.
Otter shale, Carboniferous, Montana: Fisher, 396.
Ouachita shale, Ordovician: Purdue, 972.
Ouray limestone, Devonian, Colorado: Kindle, 666.
Paint Lick bed, Ordovician, Kentucky: Foerste, 413.
Palm Beach limestone, Pleistocene, Florida: San ford, 1025.
Pamela (Stones River) formation, Ordovician, New York and Canada: Clarke, 240.
Panola formation, Silurian and Devonian, Kentucky: Matson, 827.
Parting quartztite series, Devonian, Colorado: Spurr, 1091.

Paskapoo, Tertiary, Canada: Dowling, 356.
Paskapoo formation, Tertiary, Alberta: Dowling, 352.
Patapeco formation, Cretaceous, New Jersey: Bascom et al., 74.
Patriot limestone, Carboniferous, Ohio: Condit, 280.
Pawnee limestone, Carboniferous, Kansas: Haworth and Bennett, 518.
Peace Creek bone bed, Pliocene, Florida: Matson and Clapp, 829.
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