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UNITED STATES GEOLOGICAL SURVEY
J. W. POWELL, DIRECTOR

RECORD

OF

NORTH AMERICAN GEOLOGY FOR 1887 TO 1889 INCLUSIVE

BY

NELSON HORATIO DARTON

WASHINGTON
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1891

LETTER OF TRANSMITTAL.

DEPARTMENT OF THE INTERIOR,
UNITED STATES GEOLOGICAL SURVEY,
POTOMAC DIVISION OF GEOLOGY,
Washington, D. C., June 1, 1890.

SIR: I have the honor to forward herewith a Record of North American Geology for the years 1887 to 1889, inclusive, which is submitted for publication as a bulletin of the Survey.

Very respectfully, your obedient servant,

N. H. DARTON,
Assistant Geologist.

Hon. J. W. POWELL,
Director.

RECORD OF NORTH AMERICAN GEOLOGY FOR 1887 TO 1889.

By Nelson Horatio Darton.

INTRODUCTORY.

The literary scope of this record includes geologic publications printed in North America and publications on North American geology wherever printed. Chronologically it includes publications issued during the years 1887, 1888, and 1889. The List of Publications Examined, page 9, indicates the range of the sources of information.

The entries are comprised in the three following classes, all being arranged in a single alphabetic sequence:

I. *Principal entries.*—Consisting of full titles of separate contributions classified by authors, with subarrangement by dates, together with as much of the usual bibliographic information as appears necessary in a work of this kind. The descriptive note relates only to the geologic contents of the contribution. The size of volume is given only when other than octavo. The extent of papers less than a page in length is indicated thus: $\frac{1}{8}$ p., $\frac{1}{4}$ col., 3 lines.

II. *Titles of containing publications.*—Entered as headings, under which authors' names and short titles of the contained papers are listed in their order of precedence.

III. *Subject references.*—Geographic, stratigraphic, and miscellaneous geologic headings under which abbreviated titles of papers are classified for cross reference to principal entries. A key to these subject references is given on page 8.

KEY TO THE SUBJECT REFERENCES.

Geographic:

- Alabama.
- Alaska, and the other States and Territories.
- Asia.
- Bermudas.
- Canada, comprising all British possessions in North America.
- Central America.
- Europe.
- Hawaiian Islands.
- Mexico.
- New Zealand.
- South America.

Stratigraphic:

- Pleistocene.
- Tertiary.
- Cretaceous, including Laramie and Potomac.
- Jurassic-Triassic.
- Carboniferous, including Permian.
- Devonian.
- Silurian, Upper.
- Silurian, Lower.
- Cambrian.
- Archean, comprising all pre-Cambrian formations.

Miscellaneous:

- Geologic history.
- Geologic philosophy.
- Petrography.

LIST OF PUBLICATIONS EXAMINED.

American Academy of Arts and Sciences, Proceedings, vol. 22; vol. 23, part 1.
American Anthropologist, vols. 1, 2. Washington.
American Association for the Advancement of Science, Proceedings, vols. 36, 37. Salem, Mass.
American Geographical Society, Bulletin, vols. 19–21. New York.
American Geologist, vols. 1–4. Minneapolis, Minn.
American Institute of Mining Engineers, Transactions, vol. 15, p. 536 to end; vols. 16, 17. New York.
American Journal of Science, vols. 33–38. New Haven, Conn.
American Museum of Natural History, Bulletin, vol. 2, Nos. 1–2. New York.
American Naturalist, vols. 21, 22; vol. 23, January to September. Philadelphia.
American Philosophical Society, Proceedings, vols. 24, 25, Nos. 124–130. Philadelphia.
——— Transactions, vol. 16, new series, part 2. Philadelphia.
Appalachia, vol. 4, No. 4; vol. 5. Boston.
Arkansas Geological Survey, Report for 1888, vols. 1–3. Little Rock.
Boston Society of Natural History, Memoirs, vol. 4, Nos. 1–6. Boston.
Boston Society of Natural History, Proceedings, vol. 23, p. 257, to vol. 24, p. 288. Boston.
British Association for the Advancement of Science, Report of fifty-sixth, fifty-seventh, and fifty-eighth meetings. London.
California Academy of Sciences, Bulletin, vol. 2, Nos. 6-8. San Francisco.
California Academy of Sciences, Proceedings, 2d series, vol. 1, parts 1, 2.
California State Mining Bureau. Seventh and Eighth Annual Reports of the State Mineralogist, William Irelan, jr. Sacramento.
Canada, Geological and Natural History Survey, Annual Report, vol. 2, 1886–'88. Montreal.
Canada, Royal Society, Transactions, vols. 4–6. Montreal.
Canadian Institute, Proceedings, vol. 4, No. 2, to vol. 6, No. 2. Toronto.
Canadian Record of Science, vol. 2, No. 5, to vol. 3, No. 6. Montreal.
Cincinnati Society of Natural History, Journal, vol. 10 to vol. 12, No. 3. Cincinnati, Ohio.
Colorado State School of Mines, Field work and Analyses. Golden, Colorado, 1886.
——— Biennial Report, 1886; Annual Report, 1887.
Colorado Scientific Society, Proceedings, vol. 2, parts 2, 3; vol. 3, part 1. Denver.
Connecticut Academy of Arts and Sciences, Transactions, vol. 7, part 2. New Haven.
Cornwall, Royal Geological Society, Transactions, vol. 11, parts 2, 3. Penzance.
Dakota School of Mines, Preliminary Report upon the Geology and Mineral Resources of the Black Hills of Dakota. Rapid City.
Davenport Academy of Sciences, Proceedings, vol. 4; vol. 5, part, 1. Davenport, Iowa.
Dennison University, Scientific Laboratories, Bulletin, vol. 2; vol. 3, part 1; vol. 4, parts 1, 2. Granville, Ohio.
Deutschen geologischen Gesellschaft, Zeitschrift, vol. 39; vol. 40, parts 1–3. Berlin.

Edinburgh Geological Society, Transactions, vol. 5, parts 2–4. Edinburgh.
Elisha Mitchell Scientific Society, Journal, 1887–'89. Raleigh, North Carolina.
Engineering and Mining Journal, vols. 43–48. New York.
Essex Institute, Bulletin, vols. 19, 20; vol. 21, Nos. 1–6. Salem, Massachusetts.
Forum, 1888. New York.
Franklin Institute, Journal, vols. 123–127. Philadelphia.
Geologists' Association, Proceedings, vol. 10; vol. 11, Nos. 1–5. London.
Geological Society, Quarterly Journal, vols. 43–45. London.
Geological Magazine, Third decade, vols. 4–6. London.
Geological and Scientific Bulletin, vol. 1, Nos. 2–7 and 9–12. Austin, Texas.
Glasgow Geological Society, Transactions, vol. 8, parts 1, 2.
Harvard College, Museum of Comparative Zoölogy, Bulletin, vol. 16, Nos. 1–4, vol. 17, Nos. 1, 2, 5, 6, vol. 18, Cambridge, Massachusetts.
——— Memoirs, vol. 16, Nos. 1–3. Cambridge, Massachusetts.
Hamilton Association, Journal, vols. 2, 3.
International Congress of Geologists, American Committee, Reports, 1888.
Iowa Historical Record, vols. 3, 4. Des Moines, Iowa.
Iowa State University, Laboratories of Natural History, Bulletin, vol. 1, No. 1. Iowa City.
Ireland, Royal Geological Society, Journal, vol. 17, part 2; vol. 18, part 2. Dublin.
Johns Hopkins University, Circulars, Nos. 53–57. Baltimore.
Kansas Academy of Science, Transactions, 1885–'86, vols. 10, 11. Topeka.
Kansas Board of Agriculture, 5th Report Topeka.
Kentucky Geological Survey, Reports on Jackson purchase, Kentucky River, Round Gap region, and Letcher, Harlan, Leslie, Perry, Breathitt, Spencer, Nelson, Garrard, Henry, Shelby, Oldham, Mason, Marion, Bath, and Fleming counties, and Rocks of central Kentucky.
Lackawanna Institute of History and Science, Proceedings, vol. 1. Scranton, Pennsylvania.
Liverpool Geological Association, Transactions, vols. 7, 8. Liverpool.
Liverpool Geological Society, Proceedings, vol. 5, parts 3, 4. Liverpool.
Louisville and Nashville Railroad. Mineral resources of upper Cumberland Valley, by A. S. McCreath and E. V. d'Invilliers. Louisville.
Manchester Geological Society, Transactions, vol. 19; vol. 20, parts 1–8. Manchester.
Maryland Academy of Sciences, Transactions, 1888, pp. 1–68. Baltimore.
Massachusetts, Gazetteer of Hampshire County, 1854–'87, by W. B. Gay. Syracuse, New York.
Meriden Scientific Association, Transactions, vols. 2, 3. Meriden, Connecticut.
Minnesota Geological and Natural History Survey, Geology of Minnesota, Final report, vol. 2, by N. H. Winchell and Warren Upham.
Minnesota Geological and Natural History Survey, Sixteenth and Seventeenth Annual Reports. St. Paul.
——— Bulletin, No. 5.
Minnesota Academy of Natural Sciences, Bulletin, vol. 3, No. 1. Minneapolis.
National Academy of Sciences, Memoirs, vol. 3, part 2; vol. 4, part 1. Washington.
National Geographic Magazine, vol. 1. Washington.
Nature, 1887–'89.
Neues Jahrbuch für Mineralogie, Geologie, und Palaeontologie, 1887–'89. Stuttgart.
New Brunswick Natural History Society, Bulletins Nos. 6–8. St. John.
New Jersey Geological Survey, Reports of State Geologist for 1886, 1887, and 1888. Trenton.
New Orleans Academy of Sciences, Papers, vol. 1, No. 2.
New York Academy of Sciences, Annals, vol. 4, Nos. 1–11. New York.
——— Transactions, vols. 4–8.

New York State Museum of Natural History, Bulletins, Nos. 1–6. Albany.
——— Fortieth Annual Report, for year 1886. Albany.
Nova Scotian Institute of Natural Science, Proceedings and Transactions, vol. 7, parts 1–3. Halifax.
Ohio Geological Survey, Report, vol. 6, Economic Geology. Columbus.
Ottawa Naturalist, vols. 1, 2; vol. 3, Nos. 1–3. Ottawa.
Pennsylvania Geological Survey, Annual Report for 1886, parts 3 and 4. Harrisburg, 1887.
——— Atlases, HH–HHH, and AA, parts 2–5.
Peoria Scientific Association, Bulletin, vol. 1. Peoria, Illinois.
Philadelphia Academy of Natural Sciences, Journal, 2d series, vol. 9, part 2. Philadelphia.
——— Proceedings 1887–'88; 1889, parts 1, 2. Philadelphia.
Popular Science Monthly, 1887–'89. New York.
Royal Geographical Society, Proceedings, vol. 11. London.
St. Louis Academy of Sciences, Transactions, vol. 5, Nos. 1, 2. St. Louis.
School of Mines Quarterly, vol. 8, No. 3, to vol. 11, No. 1. New York.
Science, vols. 9–14. New York.
Scientific American Supplement, vols. 24–28. New York.
Scottish Geographical Magazine, vols. 3–5. Edinburgh.
Smithsonian Institution, Reports for 1885–'86.
Société géologique de France, Bulletin, vols. 15, 16. Paris.
Société géologique du Nord, Annales, vol. 15, Nos. 1–6. Lille.
Staten Island Natural Science Association, Proceedings, 1887–'89. New Brighton, New York.
Stockholm, Geologiska Föreningen, Förhandlinger, vols. 8–10; vol. 11, Nos. 1–4. Stockholm.
Texas, University of, School of Geology, Circular No. 1. Austin, Texas.
——— Paleontology of the Cretaceous, part 1.
Texas Geological and Mineralogical Survey, First Report of Progress, 1888. Austin.
Trenton Natural History Society, Journal, vol. 1. Trenton, New Jersey.
U. S. Geological Survey, Bulletins Nos. 34–54. Washington.
——— Mineral Resources, 1887.
——— Monographs vols. XIII and XIV.
——— Seventh Report, 1885–'86. Washington.
U. S. National Museum, Proceedings, vols. 9–11. Washington.
United States, Reports on the iron regions of northern Louisiana and eastern Texas. Washington.
Vienna, K.-k. geologische Reichsanstalt, Verhandlungen, 1888, Nos. 1–7. Vienna.
Vassar Brothers' Institute, Proceedings, vol. 4. Poughkeepsie, New York.
Washburn College Laboratory, Bulletin, vol. 2, Nos. 9, 10. Topeka, Kansas.
Washington Philosophical Society, Bulletin, vols. 9, 10; vol. 11 to page 172. Washington.
Wisconsin Academy of Sciences, Transactions, vol. 7. Madison.
Wyoming, Report of the Territorial Geologist for 1887. Cheyenne.
Wyoming Historical and Geological Society, Publications, vol. 3. Wyoming, Pennsylvania.
Yorkshire Geological and Polytechnic Society, Transactions, vol. 9, part 2; vol. 11, part 1. Yorkshire.

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ABBOTT, Charles C. On the antiquity of man in the valley of the Delaware.

Boston Soc Nat. Hist., Proc., vol. 23, pp. 424–426. 1888.

Includes references to the genesis and relation of the Trenton gravels.

ADAMS, Frank D. On the coal-bearing rocks of Canada.

British Assoc. Adv. Sci., Report of 56th Meeting, 1886, pp. 639–641. 1887.

General description of the Carboniferous coal measures of Nova Scotia and New Brunswick, the lignites and anthracites of the Northwest Territory, and the bituminous coal of Vancouver's Island.

—— The anorthosite rocks of Canada.

British Assoc. Adv. Sci., Report of 56th Meeting, 1886, pp. 666–667. 1887.

Describes the mineralogic constituents and variations of the Upper Laurentian or Norian series occurring in detached areas in the great Laurentian region.

—— [Analyses—Shell marl from Anticosti and Carbonaceous schist from Lake of the Woods.]

Canada Geol. and Nat. Hist. Survey, Report, 1886, part I, p. 41, ½ p. 1887.

—— On the microscopical character of the ore of the Treadwell mine, Alaska.

Am. Geologist, vol. 4, pp. 88–93, 1889.

Abstract Am. Naturalist, vol. 23, p. 721, 6 lines. 1889.

Includes petrographic description of associated rock.

—— and **LAWSON**, Andrew C. On some Canadian rocks containing scapolite, with a few notes on some rocks associated with the apatite deposits.

Canadian Record Science, vol. 3, pp. 185–201, 1888.

Abstract, Am. Naturalist, vol. 23, pp. 169–170, p. (February No.), 1890.

Petrographic description of apatite-bearing pyroxenites from Portland West, the McLaurian mine, Star Hill mine, and Blessington mine, amphibolites from Arnprior, and scapolite-bearing rocks from near Arnprior, in Frontenac and Addington counties, and the Perry Sound region. Discussion of associations and history of some of the contained minerals.

ADAMS, Frank D., and **LAWSON**, Andrew C.—Continued.

AGASSIZ, Alexander. The coral reefs of the Hawaiian Islands.

Harvard College, Mus. Comp. Zool., Bull., vol. 17, pp. 121–170, pls. I–XII. 1889.

Review of theories of the origin of coral reefs, and an account of recent observations on the relations of the coral formations of the Hawaiian Islands.

ALDRICH, T. H. [On the absence of separable Oligocene in the Gulf Tertiary region.]

International Congress of Geologists, Am. Committee, Reports, 1888, F., p. 7, 8 lines. Am. Geologist, vol. 2, p. 273. 1888.
Statement of opinion.

ALLEN, Joseph H. Western Kentucky Coals and cokes.

Am. Inst. Mining Engineers, Trans., vol. 16, pp. 581–593. 1888.
Generalized section. Discusses identity of some of the beds at different localities.

American Anthropologist, vol. 2.

Geologic antecedents of man in the Potomac Valley, McGEE.

American Association for the Advancement of Science, Proceedings, vol. 36.

Work of International Congress of Geologists, GILBERT.
Devonian system in North America, WILLIAMS, H. S.
Lower Devonian and Upper Silurian in well in central New York, PROSSER.
Upper Hamilton of Chenango and Otsego Counties, New York, PROSSER.
Section of southwestern Ohio, JAMES.
Granite and quartzite contact, Ironwood, Michigan, WINCHELL, N. H.
Lower Silurian and Cambrian in well near Utica, New York, WALCOTT.
Fossils in Lower Taconic of Emmons, WALCOTT.
Berea grit in northeastern Ohio, CUSHING.
Texas section of American Cretaceous, HILL, R. T.
Geology of Florida, JOHNSON, L. C.
Upper Eocene lacustrine formations of the United States, SCOTT.
"Lake Cuyahoga," CLAYPOLE.
Glacial erosion in Norway, SPENCER.
Theory of glacier motion, SPENCER.
Sand bowlders in drift of Missouri, SPENCER.
Columbia formation, McGEE.
Genesis of the Hawaiian Islands, HITCHCOCK.
Serpentines of southeastern Pennsylvania, CHESTER.
Dynamic metamorphism of eruptives of south shore of Lake Superior, WILLIAMS, G. H.

American Association for the Advancement of Science, Proceedings, vol. 36—Continued.

Four great sandstones of Pennsylvania. CLAYPOLE.

—— vol. 37.

Address on International Geological Congress, COOK.
Sporocarps in Ohio shale, ORTON.
Oil and gas horizons, Mississippi Valley, ORTON.
Forest bed beneath inter-morainic drift, LEVERETT.
Rock salt in Kansas, HAY.
Oil fields of Colorado, NEWBERRY.
Mesozoic of Sergipe-Alagôas Basin, BRANNER.
Age of Arkansas crystallines, BRANNER.
Peridotites of Pike County, Arkansas, BRANNER and BRACKETT.
Granites of Northwest, distribution and lithology, HALL, C. W.
Ancient Ohio channel at Cincinnati, JAMES.
Great Lakes of North America, SPENCER.
Lake Cheyenne, TODD.
Terraces of the Missouri, TODD.
Archean of the Northwest, WINCHELL, A.
Use of fossils in determining age, WILLIAMS, H. S.
Woods and lignites of Potomac formation, KNOWLTON.
Glacial boundary in southeastern Dakota, WRIGHT.
Eruptive rocks of Minnesota and in general, WINCHELL, N. H.

American Geographical Society, Bulletin, vol. 19.

Physical geography of Labrador, PACKARD.

—— vol. 20.

Summer cruise to northern Labrador, PACKARD.
Philosophy of glacier motion, ROGER.

AMERICAN GEOLOGIST, Irving and Chamberlin on the Lake Superior sandstones.

American Geologist, vol. 1, pp. 44–57. 1888.
Review of "Observations on the junction between the eastern sandstone and the Keweenaw series on Keweenaw Point, Lake

AMERICAN GEOLOGIST—Cont'd.

Superior, by R. D. Irving and T. C. Chamberlin, U. S. Geological Survey, Bull. No. 23.

—— Murray's theory of the formation of barrier reefs and coral islands.

Am. Geologist, vol. 1, pp. 113–116. 1888.
Statement of Darwin's and Murray's theories.

—— On the chert of the Upper Coal Measures in Montgomery County, Iowa.

Am. Geologist, vol. 1, pp. 116–117. 1888.
Discussion of nature and origin.

—— Black marl from Cheyenne County, Nebraska.

Am. Geologist, vol. 1, p. 137, 3 lines. 1888.
Notice of occurrence.

—— Later Cretaceous in Iowa.

Am. Geologist, vol. 1, p. 337, ½ p. 1888.
Reference to a number of localities in different parts of the State and in Minnesota.

—— The antiquity of man; some incidental results of the discussion.

Am. Geologist, vol. 2, pp. 51–54. 1888.
Includes references to the remoteness and duration of the glacial epochs.

—— Formation of coal seams.

Am. Geologist, vol. 2, pp. 331–336. 1888.
Review of W. S. Gresley and discussions of conditions of carbonaceous accumulation.

—— [Fossil bone in well at Lincoln, Nebraska.]

Am. Geologist, vol. 2, p. 439, ½ p. 1888.
Gives section through drift in Dakota sandstone.

—— A new glacial theory.

Am. Geologist, vol. 3, pp, 138–139. 1889.
Notice of Carpenter's theory and discussion of cause of glacial cold and ice.

—— [Notice and review of E. Danzig "Ueber die eruptive Natur gewissen Gneisse sowie des Granulits im sächsischen Mittelgebirge."]

Am. Geologist, vol. 3, pp. 150–152. 1889.
Points out the bearings of some of the conclusions.

—— Unconformity at the falls of the Montmorenci.

Am. Geologist, vol. 3, pp. 333–334. 1889.
Reproduces Emmons's illustration of the locality and reviews the opinions of Emmons and others in regard to the relations.

—— Very striking examples of glacial action * * * on eastern flanks of the higher ranges of the Sierra Nevada Mountains.

Am. Geologist, vol. 3, pp. 340–341, ⅔ p. 1889.
Notice of some glacial planings.

AMERICAN GEOLOGIST—Cont'd.

—— Some recent speculations on the origin of petroleum.

Am. Geologist, vol. 4, pp. 371–376. 1889.
Abstract, Sci. Am. Supt., vol. 29, pp. 11765–11766, 2 cols., 4°, 1890.
Review of Mendeléef. Discusses original sources of bituminous material and means of its transfer and accumulation as petroleum.

American Geologist, vol. 1.

History of International Congress of Geologists, FRAZER.

Animikie black slates and Ogishke conglomerate of Minnesota, WINCHELL, N. H.

Unconformities of Animikie in Minnesota, WINCHELL, A.

Well at Washington, Iowa, CALVIN.

Irving and Chamberlin on Lake Superior sandstones, AM. GEOLOGIST.

Ice age in North America, WRIGHT.

Flora of coast islands of California, LE CONTE.

Range of fossils of Hamilton period in western Ontario, CALVIN.

Correlation of Lower Silurian, ULRICH.

Murray's theory of formation of coral islands, AM. GEOLOGIST.

Chert of upper coal measures of Iowa, AM. GEOLOGIST.

Brown hematite in Allamakee County, Iowa, ORR.

Crystalline rock in Pawnee County, Nebraska, RUSSELL, F. W.

Salt well at Lincoln, Nebraska, RUSSELL, F. W.

Trenton limestone as an oil formation, ORTON.

Diatomaceous earth on North Loup River, Nebraska, HICKS.

Well hole on south side of Long Island, BRYSON.

Clay from Pine and Cherry counties, Nebraska, REED.

Peat bed in Loup County, Nebraska, RUSSELL, F. W.

Black marl from Cheyenne County, Nebraska, AM. GEOLOGIST.

Effect of pressure of a continental glacier, WINCHELL, A.

River-lake system of western Michigan, WOOLBRIDGE.

Objections to the term Taconic considered, WINCHELL, N. H.

American Geologist, vol. 1—Continued.

A great primordial quartzite, WINCHELL, N. H.
Anthracite coal in valley of Bow River, Canada, DODGE.
Subterranean commotion near Akron, Ohio, CLAYPOLE.
Diabase dikes of Rainy Lake, LAWSON.
Cretaceous deposits in Iowa, WHITE, C. A.
Taconic system as established by Emmons, MILLER.
On sceptropora, ULRICH.
Niagara shales of western New York, RINGUEBERG.
Pittsburgh coal bed and its disturbances, WASMUTH.
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Archean geology of Missouri, HAWORTH.
The reef-builders, HICKS.
Geology in our preparatory schools, TAYLOR.
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Later Cretaceous in Iowa, AM. GEOLOGIST.
Some American norytes and gabbros, HERRICH, CLARKE and DEMING.
Taconic question, WINCHELL, A.
Condition of interior of the earth, CLAYPOLE.

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Psammichnites [etc.] of Cambrian of eastern Canada, MATTHEW.
"Principles" of the adversaries of the Taconic, MARCOU.
Fossils from lower coal measures at Des Moines, Iowa, KEYES.
Post-glacial geology of Ann Arbor, Michigan, WOOLBRIDGE.
Geology as a means of culture, WINCHELL.
Antiquity of man, AM. GEOLOGIST.
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Lake beaches at Ann Arbor, SPENCER.
Volcanic dust from Nebraska and Kansas, HICKS.
Beaches along south side of Long Island, BRYSON.
Knowledge of North American Eastern Tertiary, MEYER.
Geology of the Montmorenci, EMMONS, E.

American Geologist, vol. 2—Continued.

Marcou on Taconic of Georgia [etc.], SELWYN.
Taconic at Boston, HYATT.
Peculiarities of superficial deposits of northeastern Iowa, MCGEE.
Carboniferous of western Texas, CUMMINS.
Report of subcommittee on Archean, FRAZER.
Report of subcommittee on Lower Paleozoic, WINCHELL.
Use of term Taconic, DANA. WINCHELL, A. SELWYN. WILLIAMS, G. H. EMERSON. DAWSON, J. W. LE CONTE. IRVING. HAGUE. BLAKE. MACFARLANE. EMMONS, S. F. DUTTON.
Nomenclature of Lower Paleozoic, FORD. HALL. HITCHCOCK. NEWBERRY.
Taconic system of Emmons, WALCOTT.
Report of subcommittee on Upper Paleozoic (Devonic), WILLIAMS, H. S.
Report of subcommittee on Upper Paleozoic (Carbonic), STEVENSON.
Report of subcommittee on Mesozoic, COOK.
Mesozoic realm, COPE.
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White limestone of Gulf region, JOHNSON.
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Oligocene in Florida, JOHNSON.
Classification of Tertiary deposits, HEILPRIN.
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St. Lawrence basin and the Great Lakes, SPENCER.

Quartzite between Niobrara and O'Neil, Nebraska, HICKS.

Some forgotten Taconic literature, VOGDES.

Geology of vicinity of Quebec City, MARCOU.

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Rejoinder to C. D. Walcott on fossils from Mount Stephen, Canada, ROMINGER.

Huronian system of Canada, BELL.

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H. C. Lewis and his work in glacial geology, UPHAM.

Coal Measures of central Iowa, KEYES.

Keokuk group at Crawfordsville, Indiana, BEACHLER.

Section at Todd's Fork, Ohio, FOERSTE.

Glacial erosion in Norway, Spencer [review], AM. GEOLOGIST.

Mitchell County, Texas, BROADHEAD.

Literature of geyserite, MERRILL, G. P.

Fossil bone in well, Lincoln, Nebraska, AM. GEOLOGIST.

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Glacial origin of cliffs, DAVIS.

Diabase with jaspilyte of Minnesota, WINCHELL, H. V.

Mount Stephen, B. C., MCCONNELL.

Soils of Nebraska, HICKS.

Green quartzite from Nebraska, TODD.

H. S. Williams's report on Devonic, MARCOU.

An unjust attack, FRAZER.

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Woods and lignites of Potomac formation, KNOWLTON.

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Notice and review of Lehmann, AM. GEOLOGIST.

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Original locality of Gryphæa Pitcheri. MARCOU.

Old channel of Niagara River, SCOVELL.

Iron ores of Penokee-Gogebic, VAN HISE.

Great Lake basins of St. Lawrence, DRUMMOND.

Notes on geology of Black Hills, CARPENTER.

Glacial erosion, SPENCER.

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Artesian well, Woodhaven, Long Island, BRYSON.

Nickel-bearing rock in Kansas, SNOW.

Relations of Devonian faunæ of Iowa, WILLIAMS, H. S.

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Foliation and sedimentation, LAWSON.

Geologic story of Colorado River, Texas, HILL, R. T.

Carboniferous glaciations, WHITE, C. D.

Unconformity at falls of Montmorenci, AM. GEOLOGIST.

"Two systems confounded in the Huronian," SELWYN.

Glacial action on flanks of higher Sierra Nevada, AM. GEOLOGIST.

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Description of the characteristics of the unaltered and the metamorphosed sediments and the massive rocks and synopsis and discussion of the stratigraphy, general geologic relations, taxonomy and geologic history of California formations, especially in the Coast Ranges; detailed descriptions and discussions of the relations in each of the principal quicksilver districts in California and at Steamboat Springs, Nevada, and references to various other American and foreign localities. Discussion of history, date, results, and conditions affecting metamorphism in the region; origin of serpentines, the nodules in the sandstones, and the massive rocks; relations of the volcanics in general and in the several districts; the geologic relations, associations, and genesis of the ores, and the nature and nomenclature of ore veins, and the genesis of ores in general. Accompanied by colored geologic maps.

—— Report, California division of geology.

U. S. Geol. Survey, Seventh Report, J. W. Powell, 1885–'86, pp. 93–97. 1888.

References to the diabase pebbles in the conglomerate and the relative ages of the andesites at Steamboat Springs, Nevada; the occurrence of a dike of rhyolite at New Almaden and Guadaloupe; reexamination of Washoe diabase, andesites, and quartz porphyry; the relations of the early and the late Cretaceous of the Coast Ranges, the identity of the older strata of the Coast Ranges with the fossiliferous rocks at the southern end of the gold belt in the Sierra Nevada, and the age and history of the Chico and Téjon series; the Cretaceous metamorphics; the shape of volcanic cones; mechanical conditions of faulting, and the age and

BECKER, George F.—Continued.

contemporaneity of the lava on the west side of Clear Lake with that of Mount Shasta.

BEECHER, Charles E. A spiral bivalve shell from the Waverly group of Pennsylvania.

New York, Thirty-ninth Report State Museum of Nat. Hist., 1885, pp. 161–163, plate. 1886.

Describes the Waverly rocks of northwestern Pennsylvania, where they are greatly attenuated and present evidence of near shore deposition.

[—— and **HALL**, C. E.?]. Field notes on the geology of the Mohawk Valley.

New York, Fifth Report of the State Geologist, 1885, pp. 8–10, map. 1887.

Describes a series of faults and the relations of the crystalline to the overlying rocks. Accompanied by a folded, partly colored geologic map.

[—**HALL**, J. W. and **HALL**, C. E.?]. Note on the Oneonta sandstone in the vicinity of Oxford, Chenango County, New York.

New York, Fifth Report of the State Geologist, 1885, p. 11. 1887.

Describe occurrence of fossils and discuss the horizon of the sandstones.

BELL, Robert. Marble Island and the northwest coast of Hudson's Bay.

Canadian Inst., Proc., 3d series, vol. 4, pp. 192–204, 2 plates. 1887.

Abstract. Scottish Geog. Mag., vol. 3, p. 321, ½ p. 1887.

Describes supposed Huronian quartzite, glaciation, and ancient beaches on the island and in its vicinity, and a series of rock specimens, supposed to be Huronian, from the coast of the bay. Discusses the direction of glacial flow in the Hudson's Bay region.

—— On some points in reference to ice phenomena.

Canada, Royal Soc., Trans., vol. 4, section III, pp. 85–91. 4°. 1887.

Discusses the transportation of débris by icebergs, field ice, and anchor ice; the formation of bowlder rings around ponds, and the occurrence of dikes of bowlders and shingle on the shores of islands and points.

—— Rock specimens from Cumberland Sound, Baffin Land.

Science, vol. 10, p. 287. 1887.

Gneisses, limestone, graphite, and quartz, which are considered representatives of Laurentian, similar to that on the north side of Hudson Strait and the lower Ottawa Valley.

—— The silver mines of Thunder Bay, Lake Superior.

BELL, Robert—Continued.

Eng. and Mining Jour., vol. 43, pp. 23, 42. 1887.

Statement of geologic relations.

—— The Huronian system of Canada.

Am. Geologist, vol. 2, p. 361, ½ p. 1888.

Abstract of paper read to Royal Society of Canada. 1888.

Discussion of the indivisibility of the Huronian.

—— Report on an exploration of portions of the At-ta-wa-pish-kat and Albany Rivers, Lonely Lake to James' Bay.

Canada, Geol. and Nat. Hist. Survey, Report 1886, part G, p. 38, plates. 1887.

Abstracts, *ibid.*, part A, pp. 22–26. Geol. Magazine, III, vol. 6, p. 134, ½ p. 1889.

Includes references to distribution, characters, and relations of crystalline rocks; fossiliferous Devonian, Silurian, and drifts; list of directions of glacial striæ; brief discussion of extent of Paleozoic rocks, the absence of Carboniferous, and the source of the drift.

—— The petroleum field of Ontario.

Canada, Roy. Soc., Trans, vol. 5, section IV, pp. 101–113, 4°. 1888.

Discussion of the conditions affecting the occurrence of petroleum, the extension of the Cincinnati anticlinal in Canada and its history, and the structure of the Ontario region.

—— The origin of some geographical features in Canada.

Canadian Record Sci., vol. 3, pp. 163–165. 1888.

Abstract, Popular Science Monthly, vol. 35, pp. 422, 423, ½ p. 1889.

Reviewed by A. T. Drummond, Canadian Record of Science, vol. 3, pp. 142–147. 1888

Abstract of paper read to Royal Society of Canada.

Discussion of the origin of the lake basins, large and small, and of certain river channels.

—— Presidential address: The Huronian system in Canada.

Canada, Royal Soc., Trans., vol. 6, section IV, pp. 3–13. 1889.

A general discussion of the characteristics, relations, stratigraphy, distribution, and classification of the Huronian.

—— On the Archean. See **FRAZER**. Report on Archean.

Bermudas, origin of present form, FEWKES. HEILPRIN.

BIDDLE, H. J. Notes on the surface geology of southern Oregon.

Am. Jour. Sci., 3d series, vol. 35, pp. 475–483. 1888.

BIDDLE, H. J.—Continued.

Includes descriptions of ancient lake beaches and deposits, including a volcanic ash bed, and discussion of the Quaternary history of the lakes of the region.

BISHOP, Irving P. Salt wells of western New York.

New York, Fifth Report of the State Geologist, 1885, pp. 12–47. 1887.

Gives a series of well records; discusses the extent, horizon, and origin of the salt deposits.

BLAKE, William P. Iron ore deposits of southern Utah.

Am. Inst. Mining Engineers, Trans., vol. 14, pp. 809–811. 1886.

Brief reference to nature of associated formations.

—— The rainbow lode, Butte City, Montana.

Am. Inst. Mining Engineers, Trans., vol. 16, pp. 65–80. 1887.

Describes the granite and its constituents, the trachyte or porphyry outburst of the "Butte," and the character, course, faults, variations, and minerals of the lode; discusses vein formation and rock decomposition.

[——] [On the use of the term "Taconic."]

International Congress of Geologists, Am. Committee Report, 1888, B, p. 17, 2 lines.

Am. Geologist, vol. 2, p. 207. 1888.

Suggestion in regard to its application.

—— The copper deposits of the Copper Basin, Arizona, and their origin.

Am. Inst. Mining Engineers, Trans., vol. 17, pp. 479–485. 1889.

Includes a brief description of the geologic relations.

—— On the Archean. See **FRAZER**, Report on Archean.

BLAUVELT, Harrington. The Reymert manganiferous lode, Arizona, and its formations.

Eng. and Mining Jour., vol. 47, pp. 139–140. 1889.

Prefaced by a brief description of geologic relations.

BOAS, Franz. The geography and geology of Baffin Land.

Canada, Royal Soc., Trans., vol. 5, section IV, pp. 75–78, 4°. 1888.

Brief reference to geologic formations and evidences of glaciation.

BOLTON, H. C. Notes on the great salt deposits of Petite Anse, Louisiana. [Abstract.]

BOLTON, H. C.—Continued.

New York Acad. Sci., Trans., vol. 7, pp. 122–127. 1888.

Sci. Am. Supt., vol. 26, pp. 10475, 10476, No. 656. 1888.

Brief description of deposit and workings; quotes analyses and Hilgard and Goessmann on the age and origin, and discusses relations of underlying sandstones and lignites.

BONNEY, T. G. Notes on a part of the Huronian series in the neighborhood of Sudbury (Canada).

Geol. Soc., Quart. Jour., vol. 44, pp. 32–44. 1888.

Review by Alexander Winchell, Am. Geologist, vol. 3, pp. 212–214. 1889.

Petrographic description, mainly, and discussion of their nature, origin, history, age, and relations to the Laurentian. Reference to some structural relations.

——See also **SPENCER**, James.

Boston Society of Natural History, Memoirs, vol. 4.

Taconic of Georgia and report on geology of Vermont, MARCOU.

——— **Proceedings, vol. 23.**

Origin of divisions between layers of stratified rocks, SHALER.

Antiquity of man in valley of the Delaware, ABBOTT.

Age of Ohio gravel beds, WRIGHT.

Recession of ice sheet in Minnesota, UPHAM.

Geology of outer islands of Boston Harbor, CROSBY.

Geology of the Black Hills of Dakota, CROSBY.

Origin of present form of the Bermudas, FEWKES.

Dikes at Paradise, CROSBY and BARTON.

Origin of Trias monoclinals, DAVIS, W. H.

Use of name Taconic, MARCOU.

——— **vol. 24.**

Evolution of faunas of the Lower Lias, HYATT.

Date of report on geology of Vermont, HITCHCOCK, MARCOU.

Geology of Nahant, LANE.

Marine shells in till near Boston, UPHAM.

Early man in Delaware Valley, CRESSON.

Chipped implement in drift, Jackson County, Indiana, CRESSON.

Boston Society of Natural History, Proceedings, vol. 24—Continued.

Age of Philadelphia red gravel, WRIGHT.

Canadian geologic classification for Quebec, MARCOU.

Pot holes at Cohasset, BOUVÉ, UPHAM.

Structure of drumlins, UPHAM.

Horizon of limestone at Nahant, FOERSTE.

Clinton fossils from Indiana, Tennessee, and Georgia, FOERSTE.

BOUVÉ, T. T. Indian pot holes or giants' kettles of foreign writers.

Boston Soc. Nat. Hist., Proc., vol. 24, pp. 218–226. 1889.

Description and figures of pot holes on the coast at Cohasset and discussion of their origin.

BOWERS, Stephen. Ventura County.

California, Eighth Report of State Mineralogist, pp. 679–690. 1888.

Includes references to geologic relations and history, age of formations, fossils, and structure at various points.

BOWMAN, Amos. Mining developments on the northwestern Pacific coast and their wider bearing.

Am. Inst. Mining Engineers, Trans., vol. 15, pp. 707–717. 1887.

Some references to the coal-bearing formations. Briefly describes the geologic relations of the auriferous slates, series of the Caribou region, and discusses their age, origin, and mode of impregnation with gold. Considers the origin of some placer deposits and drainage features.

—— [Preliminary report on the Caribou gold-bearing district, British Columbia.]

Canada, Geol. and Nat. Hist. Survey, Report, 1886, part A, pp. 5–7. 1887.

Includes announcement of the discovery of Paleozoic fossils in the auriferous schists and reference to their equivalency.

—— Testimony of Ottawa clays and gravels to the expansion of the Gulf of St. Lawrence and Canadian lakes within the human period.

Ottawa Naturalist, vol. 1, pp. 149–161. 1888.

Description of the superficial deposits and terraces.

BRACKETT, Richard N. A microscopic study of the peridotite of Pike County, Arkansas.

Am. Jour. Sci., 3d series, vol. 38, pp. 56–59. 1889.

BRACKETT, Richard N.—Continued.

Abstract, Am. Naturalist, vol 23, p. 721, ⅓ p. 1889.

Petrographic description of the several rocks from the locality.

—— See, also, **BRANNER**, John C. and

BRAINERD, Alfred F. A new discovery of carbonate iron ores at Enterprise, Mississippi.

Am. Inst. Mining Engineers, Trans., vol. 16, pp. 146–149. 1887.

Reference to mode of occurrence, thickness, etc. Analyses.

—— Notes on the iron ores, fuel, and improved blast-furnace practice of the Birmingham district.

Am. Inst. Mining Engineers, Trans., vol. 17, pp. 151–155. 1889.

Includes analyses of limestones and Clinton iron ores.

BRAINERD, Ezra and **SEELY**, H. M. The original Chazy rocks.

Am. Geologist vol. 2, pp. 323–330. 1888.

Detailed description of stratigraphy and structure in Chazy, New York, accompanied by map and cross sections. Discussion of possibility of fault separating the Chazy from the Potsdam and cutting off the Calciferous beds.

BRANNER, John C. Annual Report of the Geological Survey of Arkansas for 1887, pp. 15, 8°. Little Rock, 1887.

Administrative report.

—— Glaciation: its relations to the Lackawanna-Wyoming region.

Lackawanna Inst. Hist. and Science, Pubs., vol. 1, pp. 3–18, 4 plates. 1887.

Sketch of the glacial history of the region, and discussion of glacial theories, origin of drifts, causes of glacial cold, etc.

—— Notes upon the glacial striæ observed in the Wyoming-Lackawanna region.

Lackawanna Inst. Hist. and Science, Pubs., vol. 1, pp. 19–27. 1887.

List of striæ, in some instances with suggestions in regard to the significance of their direction.

—— Introduction to the report upon western central Arkansas.

Arkansas, Geol. Survey, Report for 1888, vol. 1, pp. XXIX–XXXI. 1888.

Incidentally discusses the extent and relations of the axes of the flexures.

—— On the manufacture of Portland cement.

Arkansas, Geol. Survey, Report for 1888, vol. 2, pp. 291–302. 1888.

BRANNER, John C.—Continued.

Includes tables of analyses of Arkansas chalks and clays.

—— The Geology of Fernando de Noronha, part I.

Am. Jour. Sci., 3d series, vol. 37, pp. 145-161, pl. v. 1889.

Topography, distribution, structure, and relations of the several volcanic rocks and account of calcareous sandstones at various points along the coast.

—— The age and correlation of the Mesozoic rocks of the Sergipe-Alagôas basin of Brazil.

Am. Assoc. Adv. Science, Proc., vol. 37, pp. 187–188, ½ p. 1889.

Paleontologic characteristics of the several zones of the series and age of adjoining formations.

—— The age of the crystalline rocks of Arkansas.

Am. Assoc. Adv. Science, Proc., vol. 37, p. 188, ¼ p. 1889.

Evidence of their intrusive nature and age.

—— The peridotite of Pike County, Arkansas.

Am. Jour. Sci., 3d series, vol. 38, pp. 50–56, plate. 1889.

Local geology, illustrated by colored map; relations and date of intrusion of peridotite and sketch of geologic history of the region.

—— and **BRACKETT**, R. N. The peridotites of Pike County, Arkansas.

Am. Assoc. Adv. Science, Proc., vol. 37, pp. 188–189, ½ p. 1889.

Abstract, Popular Science Monthly, vol. 36, p. 431, ¼ col.

Announcement of their occurrence, general relations, and petrographic characteristics.

BRENT, Charles. The Beaver mine, Ontario, Canada.

Eng. and Mining Jour., vol. 45, p. 123, ¾ col., 4°. 1888.

Reference to geologic relations of Animikie slates and traps.

BRINTON, D. G. On an ancient human footprint from Nicaragua.

Am. Phil. Soc., Proc., vol. 24, pp. 437–444, pl. No. 126. 1888.

Includes a description by Dr. Earl Flint of the geologic relations of the region and deposit in which the footprint was found.

British Assoc. Adv. Science, Report of Fifty-sixth Meeting.

Anorthosite rocks of Canada, ADAMS.

Canadian Rocky Mountains, DAWSON, G. M.

Coal-bearing rocks of Canada, ADAMS.

British Assoc. Adv. Science, Report of Fifty-sixth Meeting—Continued.

Glaciation of North America, Great Britain, and Ireland, LEWIS.

Relations of geology of Arctic and Atlantic basins, DAWSON, J. W.

—— **Report of Fifty-seventh Meeting.**

Extra-morainal lakes in England, North America, and elsewhere, LEWIS, H. C.

Places of interest on banks of Saskatchewan, PANTON.

—— **Report of Fifty-eighth Meeting.**

Bowlder in Halifax coal, SPENCER and BONNEY.

BRITTON, N. L. Report for 1886.

Geol. Survey of New Jersey, Report of the Geologist for 1886, pp. 74–112, 2 plates. 1887.

Review, Science, vol. 9, pp. 595–596. 1887.

Presents additional information in regard to the stratigraphy, structural features, succession, and distribution of the three groups of the highland Archean, which appears to constitute one conformable system representing the Laurentian of Canada; dicusses the equivalency of the groups to similar formation elsewhere, and the relations of the Westchester County—New York Island—Trenton belt; describes the occurrence, relations, and lithology of a collection, including granites, quartz-syenites, diorites, diabases, kersantites, and porphyrites. Accompanied by colored geologic maps of areas near Boonton and Franklin Furnace.

—— [Remarks on origin of serpentines in the vicinity of New York.]

New York Acad. Sci., Trans., vol. 4, p. 29, ½ p. 1887.

States his opinion that they are altered stratified Archean rocks, mainly limestones and tremolitic schists.

—— Notes on glacial and preglacial drifts of New Jersey and Staten Island.

New York Acad. Sci., Trans., vol. 4, pp. 26–33. 1887.

Describes the extent of the yellow gravel and preglacial drift in the eastern United States, its characteristics, thickness, outcrops in contact with overlying drifts, its exposures and relations on Staten Island and its flora in Cumberland County, New Jersey. Discusses the origin of the preglacial drift and its relation to later deposits.

—— Geological notes in western Virginia, North Carolina, and eastern Tennessee.

New York Acad. Sci., Trans., vol. 5, pp. 215–223. 1887.

BRITTON, N. L.—Continued.

Some statements in regard to the slates and limestones of the Great Valley. Notes on rocks and structure about Luray, Natural Bridge, and Balcony Falls, Virginia; the contact of crystlalines and clastics in Doe River Gorge, Tennessee; Cranberry iron mine, Roan Mountain, and Warm Springs to Asheville, North Carolina.

—— Additional notes on the geology of Staten Island.

New York Acad. Sci., Trans., vol. 6, pp. 12–18. 1887.

Abstract, Popular Science Monthly, vol. 37, pp. 132–143, ½ col. 1890.

Discussion of the origin and relations of the serpentines and the structural features which give rise to the several outcrops in the vicinity of New York; reference to the southward extension of the crystalline rocks of Staten Island, outcrop of preglacial drift near Woodrow, relations of drifts at Tompkinsville, and to the driftless areas north and west of the terminal moraine.

—— On recent field work in the Archean areas of northern New Jersey and southeastern New York.

School of Mines Quarterly, vol. 9, pp. 33–39. 1887.

Describes the several members of the crystalline series of the Highlands and of the Philadelphia-Westchester County region, the altered Paleozoic rocks at the junction of the two areas near Peekskill, and some other Paleozoic contacts. Discusses the subdivision of Archean and the relations of the groups to each other and to the Laurentian series of Canada.

—— [Boring through drift and Cretaceous sediments on Staten Island.]

New York Acad. Sci., Trans., vol. 7, p. 39; ⅒ p. 1888.

Six hundred feet to crystalline schists.

—— On an Archean plant from the white crystalline limestone of Sussex County, New Jersey.

New York Acad. Sci., Annals, vol. 4, pp. 123–124; pl. VII. 1888.

Canadian Record of Science, vol. 3, p. 184. 1888.

Includes reference to the distinctive features of the limestone belts in the highlands.

—— Notes on the modified drift.

Staten Island Nat. Sci. Assoc., Proc., Jan. 14, 1888; ½ p.

Describes sections exposed in ditch through plain of modified drift on Staten Island.

—— [Notice of outcrop of Cretaceous clay on Eltingville road, Staten Island.]

Staten Island Nat. Sci. Assoc., Proc., April, 1889, 2 lines.

BRITTON, N. L.—Continued.

Am. Naturalist, vol. 23, p. 1037. 1889.

—— [Outcrops of Cretaceous clay and of Triassic shales.]

Staten Island Nat. Sci. Assoc., Proc., Oct., 1889; 12 lines.

Notice of new localities.

—— [Notice of a new exposure of Cretaceous near Grassmere Station, Staten Island.]

Staten Island Nat. Sci. Assoc., Proc., March, 1889.

Am. Naturalist, vol. 23, p. 553; ⅛ p. 1889.

New York Acad. Sci., Trans., vol. 8, p. 31; 5 lines. 1889.

Includes reference to its relations to the drifts.

—— [Remarks on the yellow gravel formation.]

Staten Island Nat. Sci. Assoc., Proc., April, 1889, 1 page.

Am. Naturalist, vol. 33, pp. 1032–1033. 1889.

Discussion of its origin.

—— [Remarks on the relations of the crystalline rock series in the New York-New Jersey region.]

New York Acad. Sci., Trans., vol. 8, pp. 52–53. 1889.

Age and equivalency, especially in the Westchester County and Peekskill region.

—— [Remarks on recent discoveries in local Cretaceous and Quaternary geology.

New York Acad. Sci., Trans., vol. 8, p. 177. 1889.

Description of the occurrence of fossil-bearing concretions in the plastic clay series on Staten Island and on the Raritan River, New Jersey; an outcrop of kaolin and of Cretaceous gravels containing Paleozoic fossils at Prince's Bay, and an exposure of bowlder clay at Arrochar, Staten Island; discusses the origin and history of the fossiliferous pebbles in the Cretaceous and the yellow gravel deposits, and the relations and age of the ferruginous quartz and "jasperoid rock" overlying the serpentines of Hoboken and Staten Island.

—— Geologic surveys, New Jersey Archean. See [**COOK**, G. H.].

BROADHEAD, G. C. Mitchell County, Texas.

Am. Geologist, vol. 2, pp. 433–436. 1888.

References to Red beds, Cretaceous and structure, and the occurrence of salt beds in the Permian in Texas and Kansas.

—— The geological history of the Ozark uplift,

BROADHEAD, G. C.—Continued.

Am. Geologist, vol. 3, pp. 6–13. 1889.

Sketch of the distribution, relations, and stratigraphy of the various formations from Cambrian to lower Carboniferous, and the general structure and history of the Ozark region.

—— The Missouri River.

Am. Geologist, vol. 4, pp. 148–155. 1889.

Description of its physiography and sketch of its geologic history.

BROWN, Amos P. Modes of occurrence of pyrite in bituminous coal.

Am. Inst. Mining Engineers, Trans., vol. 16, pp. 539–546. 1888.

Description of pyritiferous beds in Pennsylvania; discusses origin of the pyrite.

BROWN, C. Newton. The Pittsburgh coal seam in Jefferson, Belmont, and Guernsey Counties.

Ohio, Geol. Survey Report, vol. 6, Economic Geology, pp. 595–626; map. 1888.

Description of outcrops and associated strata.

BROWN, R. T. Hancock County.

Indiana, Department of Geol. and Nat. Hist., Fifteenth Report, 1886, pp. 187–197. 1886.

Description of its glacial drift and till deposits and suggestions in regard to age and dip of the underlying formations.

BROWNE, David H. The distribution of phosphorous in the Ludington mine, Iron Mountain, Michigan.

Am. Inst. Mining Engineers, Trans., vol. 17, pp. 616–632. 1889.

Am. Jour. Sci., 3d series, vol. 37, pp. 299–310; pls. VIII–XIII. 1889.

Includes a brief description of the relations of the ore masses, and discussion of the genesis of iron ores in various parts of the Lake Superior region.

BRUNTON, D. W. Aspen Mountain. Its ores and their mode of occurrence.

BRUNTON, D. W.—Continued.

Eng. and Mining Jour., vol. 46, pp. 22–23, 42–45, 4°. 1888.

Description of geologic relations, faults, evidence of recent movements, evidences of glacial action, results of underground erosion and dolomitization of the lower Carboniferous limestone. Discussion of the origin of the ores and their relations to the faults.

BRYAN, Oliver N. The Cretaceous formation of southwestern Maryland.

Am. Naturalist, vol. 23, pp. 712, 713. 1889.

Gives general account of its relations and distribution.

BRYSON, John. [On the beaches along the southern side of Long Island.]

Am. Geologist, vol. 2, pp. 64–65. 1888.

Discussion of their origin.

—— [Notes on well hole on the south side of Long Island.]

Am. Geologist, vol. 2, pp. 136–137, ½ p. 1888.

List of beds penetrated and suggestion in regard to their origin.

—— Artesian well, Woodhaven, Long Island, New York.

Am. Geologist, vol. 3, pp. 214–215. 1889.

Record of 556-foot well down to rock. Comments on possible representation of Cretaceous in the record, the nature of the beds pierced, the absence of shells, and the finding of rock in another well.

—— The terminal moraine near Louisville.

Am. Geologist, vol. 4, pp. 125–126. 1889.

Describes glacial phenomena of the region and discusses their significance.

BURKE, M. D. Drift. Its distribution and character in the vicinity of Cincinnati, when considered as a probable source of water supply.

Cincinnati Soc. Nat. Hist., Jour., vol. 11, pp. 69–75. 1888.

Sketch of the geologic history of the region and of its drainage during the glacial epochs.

C.

CADELL, H. M. The Colorado River of the West.

Scottish Geographical Mag., vol. 3, pp. 441–460, 2 plates, map. 1887.

From Dutton's Tertiary History of the Grand Cañon district.

California, auriferous slates, BECKER, DILLER. IRELAN. WHITE, C. A.
building stones, HANKS. JACKSON.
bored wells, Kern County, HAGGIN.

California—Continued.
catalogue of fossils, COOPER.
cements, IRELAN.
Chico and Téjon groups, BECKER. WHITE, C. A.
coal, ASHBURNER. GOODYEAR.
Cretaceous of Mendocino County, BECKER. WHITE, C. A.
drift mining, DUNN.
dry lakes, JENNEY.

CALLAWAY (Ch.). On parallel structure in rocks as indicating a sedimentary origin.

Geol. Mag., 3d decade, vol. 4, pp. 351–354. 1887.

Reviews the conclusions in Dana's paper on the Cortlandt rocks entitled "On a case in which various massive crystalline rocks * * * were made through metamorphic agencies in one metamorphic process," and after discussing laminated structure in eruptive masses, suggests, from the evidence presented, that the rocks in question are probably eruptive in their nature.

—— Parallel structure in igneous rocks.

Geol. Mag., 3d decade, vol. 4, p. 479, ⅓ p. 1887.

States his obligation to Harker for directing his attention to the modified views of Dana on the nature of some of the Cortlandt rocks.

CALVIN, S. Notes on the formations passed through in boring the deep well at Washington, Iowa.

CANNON, George L., jr. The Quatenary of the Denver Basin.

Colorado Sci. Soc., Proc., vol. 3, pp. 48–70. 1889.

Description of a series of post-Tertiary deposits and erosions, and discussion of their history.

—— On the Tertiary Dinosauria found in Denver beds.

Colorado Sci. Soc., Proc., vol. 3, pp. 140–147. 1889.

Includes references to the general geologic relations of the region, and presents evidence to prove that the bones were found in place.

CHAMBERLIN, T. C.—Continued.

U. S Geol. Survey, Sixth Report, J. W. Powell, 1884–'85, pp. 33–40. 1885.

Describes the results of his own studies and those of his assistants, as follows: 1. J. E. Todd, on the glacial lake of the Bijou Hills region; the terraces of the Missouri and Big Sioux Rivers; the outer moraine from Kimball to Wall Lake, and the second moraine, from Canistoga to Mitchell; the relation of the loess to the glacial drift and evidence of post-glacial deformation of the loess surface, and the discovery of Pliocene beds at Frankfort, Nebraska, Niobrara chalkstone near Canton and north of Mitchell, beds of siliceous flour under drift on Bazile River, coal in upper Dakota beds at Ponca, and several Dakota sandstone outcrops. 2. R. D. Salisbury, on the driftless area of the Upper Mississippi valley. 3. G. F. Wright, on the southern boundary of drift in Illinois. 4. G. H. Stone, on eskers and glaciation in Maine. 5. W. M. Davis, on drumlins of Massachusetts, and glaciation of Mount Monadnock. 6. I. M. Buell, on bowlder trains of central Wisconsin. 7. D. W. Mead, on glacial flood-plains and the terrace systems of the Chippewa Valley of Wisconsin. And his own work, consisting of a reconnaissance along the Chicago, Milwaukee, St. Paul and Omaha Railroad in northwestern Wisconsin; a study of the southeastern border of the driftless area; and a trip through southern Iowa, western Missouri, northeastern Kansas, and westward, and through a portion of the Orange sand region. In a summary of the results of this trip there are discussed the non-morainal character of the drift border in Nebraska, Kansas, and Missouri; the non-glacial derivation of the Orange sand, the pre-Champlain age of the loess of the Lower Mississippi, and the post-Quaternary orographic movements indicated by the distribution of the loess and the relations of some drainage features.

—— Note respecting the term Agnotozoic.

Am. Jour. Sci., 3d series, vol. 35, pp. 254–255. 1888.

Does not wish name retained simply because first proposed by him. Accredits the term Keweenawan to Brooks or Brooks and Pumpelly.

—— Report—division of glacial geology.

U. S. Geol. Survey, Seventh Report, J. W. Powell, 1885–'86, pp. 76–85. 1888.

A general account of the various investigations and their progress, including references to the drift limit and products of local glaciation in the upper Missouri region; glacial features, old lake terraces and drainage relations in Montana and Idaho; observations of J. E. Todd on limits of drift moraines, striæ, terraces, old lake beds, and various glacial features in southern Dakota, position of drift border in east central Nebraska, relations of bowlder clay near Berks, Nebraska, and the relations of volcanic ash deposits in Seward County, Nebraska; studies of Warren Upham on the altitude of the beaches of Lake Agassiz; work of George H. Stone on the gravel deposits and osar of Maine; observations of N. S. Shaler on the glacial train from Cumberland, Rhode Island, origin of Kames, and the course of the ice flow on the coast of Maine and southeastern Massachusetts, and G. K. Gilbert's studies on the beaches of Lake Ontario.

CHAMBERLIN, T. C.—Continued.

—— The rock scorings of the great ice invasions.

U. S. Geol Survey, Seventh Report, J. W. Powell, 1885–'86, pp. 147–248, Pl. 8. 1888.

Geographic distribution, topographic relations, topography as affecting the distribution of striæ and condition of glacial flowage, cross striation, conditions affecting scoring action and the scorings, method of determining the point of motion, accompanied by map of northern United States, showing distribution of glacial drifts and striæ.

—— and **SALISBURY**, R. D. Preliminary paper on the driftless area of the Upper Mississipi valley.

U. S. Geol Survey, Sixth Report, J. W. Powell, 1884–'85, pp. 199–322, pls. 23–29. 1885.

Abstract, Science, vol. 10, pp. 306–307. 1887.

Am. Geologist, vol. 1, pp. 122–125. 1888.

Describes the togography, geology, erosion, drainage, surface deposits, and circumjacent glacial phenomena, the morainic, the attenuated till and bowlder and attenuated drift borders. Discusses the light which the driftless area throws upon the glacial history of the adjoining region and the sequence and character of events of the glacial periods; the origin and relations of the topographic and drainage features; erosion; nature, origin, and relations of the loess and residuary products, and the origin of the border deposits. In a general résumé, sketches the apparent history of the region, and reviews the causes to which the driftless area is due.

CHAPIN, J. H. The Hanging Hills.

Meriden Sci. Assoc., Trans., vol. 2, pp. 23–28. 1887.

Describes topographic features and extent of ridges of which the Hanging Hills are a a part, and calls attention to some contacts of trap and sandstone. Discusses the nature and relative ages of the trap sheets, presenting some evidence which is thought to indicate intrusion.

—— The trap ridges at Meriden again.

Meriden Sci. Assoc., Trans., vol. 3, pp. 34–36. 1888.

Reference to their extrusive nature and the relations and significance of the associated ash bed.

CHAPMAN, W. H. Geology of Peoria County.

Peoria Sci. Assoc., Bull., vol. 1, pp. 14–21. 1887.

Not seen.

China, Kaiping coal mine, KWONG YUNG KWANG.

CHATARD, Thomas M. The gneiss dunyte contacts of Corundum Hill, North Carolina, in relation to the origin of corundum.

U. S. Geol. Survey, Bull., vol. 7, pp. 45–63, No. 42. 1887.

Abstract Eng. and Mining Jour., vol. 46, p. 46, ⅛ col., 4°. 1888.

Includes a description and analyses of the rocks and a discussion of their chemic relations and the origin of the dunyte.

—— The peridotite of Elliott County, Kentucky.

U. S. Geol. Survey, Bull., vol. 7, pp 136–137, No. 42. 1887.

Analyses of dike and associated rocks.

—— Yellowish brown, kaolinized, decomposed trap from four miles west of Sanford, North Carolina.

U. S. Geol. Survey, Bull., vol. 7, p. 138, ⅛ p., No. 42. 1887.

Analysis.

—— Mica andesite from a cañon on the east side of San Mateo Mountain, New Mexico.

U. S. Geol. Survey, Bull., vol. 7, p. 139, ⅛ p., No. 42. 1887.

Analysis.

—— Hypersthene andesite from San Francisco Mountains, Arizona.

U. S. Geol. Survey, Bull., vol. 7, p. 139, ⅛ p. No. 42. 1887.

Analysis.

—— Basalt from six miles northeast of Grant, New Mexico.

U. S. Geol. Survey, Bull., vol. 7, p. 140, ⅛ p., No. 42. 1887.

Analysis.

—— Yellow sandstone from the Armejo quarry, Colorado.

U. S. Geol. Survey, Bull., vol. 7, p. 141, ⅛ p No. 42. 1887.

Analyses.

CHAUVENET, Regis. Preliminary notes on the iron resources of Colorado.

Colorado School of Mines, Report of field work and analyses, 1886, pp. 5–16. 1888.

Includes very brief descriptions of iron-ore beds in Cretaceous, Carboniferous, Silurian, and crystalline formations.

CHESTER, Frederick D. The State line serpentines and associated rocks; a preliminary notice of the serpentines of southeastern Pennsylvania. [Abstract.]

Am. Assoc. Adv. Science, Proc., vol. 36, p. 224. 1888.

Petrographic characteristics and relations of various areas.

CHICKERING, J. W., jr. The Muir glacier, Alaska.

Sci. Am. Supt., vol. 26, pp. 10789–10790, No. 675, ½ p., folio. 1888.

[Read to Washington Philosophical Society May, 1887.]

Reference to evidences of glacial action on the shores of Glacier Bay.

CHISM, Richard E. The drainage of the valley of Mexico.

Eng. and Mining Jour., vol. 46, pp. 478–480, 500–501, 522–524. 4°. 1888.

Includes a brief geologic sketch on page 479; reference to volcanic rocks, metamorphic Mesozoic limestones, and emergence of the valley.

—— The Catorce mining district.

Eng. and Mining Jour., vol. 48, pp. 340–342, 388–389, 476–478. 1889.

Includes a brief general description of the geology.

—— Sierra Mojada, Mexico.

Am. Inst. Mining Engineers, Trans., vol. 15, pp. 542–587, map. 1887.

Describes very briefly the relations and structure of the supposed Cretaceous limestones, and (p. 37) states his opinion in regard to the formations on the eastern slope of the Sierra Madre.

CHISOLM, Frederic F. The Elk Head anthracite coal field of Routt County, Colorado.

Colorado Sci. Soc., Proc., vol. 2, pt. 2, pp. 147–149. 1887.

Describes coal beds in Fox Hill rocks baked into anthracite in places by a flow of "nepheline tephrite," which covers the adjacent country.

Cincinnati Society of Natural History, Journal, vol. 10.

Well at Oxford, Ohio, JAMES.

—— **vol. 11.**

Drift in vicinity of Cincinnati, BURKE.

Ancient channel of the Ohio at Cincinnati, JAMES.

Ivorydale well in Mill Creek valley, JAMES.

Cincinnati Society of Natural History, Journal, vol. 12—Continued.

Sedimentation in Cincinnati group, JAMES.

Devonian plants from Ohio, NEWBERRY.

CLAGHORN, Clarence R. Notes on the Bernice anthracite coal basin, Sullivan County, Pennsylvania.

Am. Inst. Mining Engineers, Trans., vol. 17, pp. 606–616. 1889.

Reference to geologic relations and structure.

CLARK, E. S. Some norytes and gabbros. See **HERRICK**, C. L., and **DEMING**, J. L.

CLARK, William B. A new ammonite which throws additional light upon the geological position of the Alpine Rhætic.

Am. Jour. Sci., 3d series, vol. 35, pp. 118–119. 1888.

References to Tyrolean formations and discussion of position of Rhætic beds.

—— On three geological excursions made during the months of October and November, 1887, into the southern counties of Maryland.

Johns Hopkins Univ., Circulars, vol. 7, pp. 65–67, No. 63, 4°. 1888.

Stratigraphic description and lists of fossils of Miocene and Eocene.

—— Discovery of fossil-bearing Cretaceous strata in Anne Arundel and Prince George counties, Maryland.

Johns Hopkins Univ., Circulars, vol. 8, No. 69, pp. 20–21, 4°. 1889.

Description of a number of localities in the banks and vicinity of the Severn River south of Bowie, and at Fort Washington on the Potomac. Lists of fossils and expression of opinion in regard to equivalency of the beds.

CLARKE, F. W. Fulgurite from Whiteside County, Illinois.

U. S. Geol. Survey, Bull., vol. 7, p. 140, ½ p., No. 42. 1887.

Analyses.

—— Blue and buff limestones from quarries of the Hoosier Stone Company, Bedford, Indiana.

U. S. Geol. Survey, Bull., vol. 7, pp. 140–141, ½ p., No. 42. 1887.

Analyses.

—— Volcanic dust.

U. S. Geol. Survey, Bull., vol. 7, pp. 141, 142, ½ p., No. 42. 1887.

Analyses: From Gallatin Valley, Montana, and mouth of Bazile Creek, Nebraska.

CLARKE, F. W.—Continued.

—— Three coals from Gulf, North Carolina.

U. S. Geol. Survey, Bull., vol. 7, p. 146, ¼ p., No. 42. 1887.

Analyses.

—— Some nickel ores from Oregon.

Am. Jour. Sci., 3d series, vol. 35, pp. 483–488. 1888.

Includes an analysis of the associated peridotite and a report on its mineralogic constitutents by J. S. Diller. Also a reference to the peridotite of Webster, North Carolina, by J. S. Diller.

CLARKE, J. M. [Sink holes at Attica, Wyoming County.]

New York, Sixth Report of the Geologist, 1886, pp. 34–35. 1887.

Describes two sink holes in one of which mastodon remains were found.

CLAYPOLE, E. W. The lake age in Ohio, or some episodes in the retreat of the North American glacier.

Edinburgh Geol. Soc., Trans., vol 5, pp. 421–458, 4 plates. 1887.

Abstracts, American Nat., vol. 22, p. 152, ½ p. 1888. Am. Geologist, vol. 1, pp. 63–64. 1888.

Popular Science Monthly, vol. 33, pp. 428–429. 1888.

Points out the consequences of a glacial dam across the Ohio and the probable size, outlet, duration, dissolution, and deposits of the "Lake Ohio" to which it gave rise. Follows the retreat of the glacier to the borders of Lake Erie and describes a series of lakes which must then have extended from the glacier front southward to the divide and emptied into affluents of the Ohio. Discusses the relation of these lakes to each other at their several stages, and to the adjacent and subsequent drainage and topography. Considers the extent and history of the successive drainage channels of the glacial Lake "Erie-Ontario."

—— The materials of the Appalachians.

Am. Naturalist, vol. 21, pp. 955–962, 1054–1060. 1887.

Discusses the amount, thinning, character, and origin of the Paleozoic sediments in Pennsylvania, calling attention to the present small areas of pre-Paleozoic rocks and discussing its probable former extent and the prominent presence of the quartzose rocks which supplied materials for the conglomerates and sandstones. Describes the extent, variations in thickness and coarseness of materials in the several sandstone series, and advances a hypothesis of successive uplifts of quartzose "Archean" rocks at the beginning of the deposition of each of these series. Discusses the position and character of these uplifts and the mode of deposition of the sediments.

CLAYPOLE, E. W.—Continued.

—— "Lake Cuyahoga," a study in glacial geology.

Am. Assoc. Adv. Science, Proc., vol. 36, p. 218. 1888.

Abstract. Paper in full in Edinburgh Geol. Soc., Trans., 1887, as described above.

—— The four great sandstones of Pennsylvania. [Abstract.]

Am. Assoc. Adv. Science, Proc., vol. 36, p. 227, ½ p. 1888.

Discusses the origin and mode of deposition of the materials and the location of the land from which they were derived.

—— Singular subterranean commotion near Akron, Ohio.

Am. Geologist, vol. 1, pp. 190–192. 1888.

Includes reference to pre-glacial valley now occupied by the Tuscaroras.

—— On some investigations regarding the condition of the interior of the earth.

Am. Geologist, vol. 1, pp. 382–386, vol. 2, pp. 28–35. 1888.

Abstract, British Assoc. Adv. Sci., Report of fifty-eighth meeting, pp. 669–670. 1889.

Exposition and discussion of a paper by Mr. Davison.

—— The eccentricity theory of glacial cold versus the facts.

Edinburgh Geol. Soc., Trans., vol. 5, pp. 534–548. 1888.

Includes discussion of the rate of recession of Niagara Falls, the falls of St. Anthony, and various minor falls in New York and Ohio, as bearing on the date of the last period of glacial cold. Also discusses the history of the Niagara-St. Lawrence drainage and the Upper Mississippi.

—— Glaciers and glacial radiants in the ice age.

Am. Geologist, vol. 3, pp. 73–94. 1889.

A general discussion of the conditions, extent, and results of glaciation in North America and elsewhere.

—— The story of the Mississippi-Missouri.

Am. Geologist, vol. 3, pp. 361–377. 1889.

A general sketch of the geologic history of North America with especial reference to the Mississippi-Missouri region.

—— Falls of rock at Niagara.

Nature, vol. 39, p. 367, ½ col. 1889.

Cites newspaper accounts of the fall of great masses from the edge of the shelf over which Niagara falls, and expresses opinion in regard to the mean rate of recession.

CLAYTON, Joshua E. The Drumlummon group of veins and their mode of formation.

CLAYTON, Joshua E.—Continued.

Eng. and Mining Jour., vol. 46, pp. 85–86, 106–108, 4°. 1888.

Extract from report to Montana Company of London.

Description of geologic relations at contact of granite and metamorphic beds. Discussion of the origin and history of the mineralization.

—— The Cœur d'Alene silver-lead mines.

Eng. and Mining Jour., vol. 45, pp. 108–109, 4°. 1888.

Description of geology of region and discussion of structural relations.

[**CLERC**, F. L.] The lead and zinc ores of southwest Missouri.

Eng. and Mining Jour., vol. 43, pp. 397–398. 1887.

(From a pamphlet not seen.)

Discusses age and origin of slate beds in depressions in surface of Carboniferous limestones and the erosion of the region.

CLIFFORD, William. Richmond coal field, Virginia.

Manchester Geol. Soc., Trans., vol. 19, pp. 326–353, pls. 1–5, pp. 431–433. 1888.

Review by F. H. Newell, Geol. Magazine, III, vol. 6, pp. 137–139. 1889.

General description of the structure and stratigraphy of the field, including numerous quotations from previous writers. Discussion of the origin and extent of the coal and coke, and relation of the coal measures to adjoining formations, accompanied by maps and sections at Clover Hill, Midlothian, Black Heath, and Deep Run.

COLEMAN, A. P. Microscopic petrography of the drift of central Ontario.

Canada, Royal Soc., Trans., vol. 5, section III, pp. 45–59, pls. 1, 2, 4°. 1888.

Abstract, Canadian Record Science, vol. 2, p. 435, ½ p. 1887.

Preceded by a brief general description of the drift in which the described rocks occur.

COLLINS, J. H. On the Sudbury copper deposits.

Geol. Soc., Quart. Jour., vol. 44, pp. 834–838. 1888.

Includes brief description of geologic relations. Discusses origin of the deposits and their relations to the igneous rocks.

Colorado, age of Denver formation, COPE.

analyses of Leadville rocks and ores, HILLEBRAND.

Aspen Mountain, BRUNTON. HERRICK. LAKES.

Aspen ore deposits, SIVER.

Boulder County veins, VAN DIEST.

COOK, George H.—Continued.

Reviewed, Science, vol. 9, pp. 595–596. 1887.

Reviews Roger's theory of inclined deposition and Russell's theory of continuity in deposition of the New Jersey and Connecticut Valley areas. Discusses the occurrence and effects of faults, the relations of the igneous rocks in opposition to the theory of extrusion, and the structural relations of the New Jersey and Connecticut Valley areas. Postulates some working hypotheses for the study of the formation.

[——] Surface geology.

Geol. Survey of New Jersey, Report of the Geologist for 1886, pp. 127–129. 1887.

Introductory to Merrill's report on the yellow gravel; describes its distribution, character, and relations to associated formations.

[——] Mining.

Geol. Survey of New Jersey, Report of the Geologist for 1886, pp. 135–154. 1887.

Describes some geologic features in several magnetite mines, and at the hematite mine on Marble Mountain, Warren County.

[——] Greensand marls.

Geol. Survey of New Jersey, Report of the Geologist for 1886, pp. 154–210. 1887.

Reprinted from the report of the State Geologist to the State Board of Agriculture in 1876. Statements in regard to geographic extent, geologic structure, thickness, age, composition, clay marls, red sand bed, and use, and detailed descriptions of openings in the middle and upper marl beds.

[——] Geologic surveys.

Geol. Survey of New Jersey, Report of Geologist for 1887, pp. 20–23. 1887.

General description of the subdivisions and structure of the Archean, with an abstract of Britton's report on field work of 1887. Reference to the extension of the Cretaceous members locally known as the sand hills.

—— Artesian wells.

Geol. Survey of New Jersey, Report of Geologist for 1887, pp. 25–27. 1887.

Includes reference to wells in red sandstone near Hoboken, and through clay to gneiss at Sayreville.

—— Report of the subcommittee on Mesozoic.

International Congress of Geologists, Am. Committee Reports, 1888, E, pp. 3–7.

Am. Geologist, vol. 2, pp. 257–261. 1888.

Reference to position and characteristics of the Trias and Cretaceous of the Eastern United States, absence of separable Jurassic, and use of terms group and series. Includes tables of opinions in regard to equivalency of Trias of New Jersey, Virginia, and North Carolina, and the Cretaceous and its subdivisions in New Jersey, Alabama, Mississippi, Texas, interior North America, and the Canadian Rocky Mountains.

COOK, George H.—Continued.

—— On the International Geologic Congress and our part in it as American geologists.

Am. Assoc. Adv. Science, Proc., vol. 37, pp. 159–177. 1889.

Abstract, Science, vol. 12, pp. 92–93. 1888.

Includes a brief general review of American geology, and a discussion of the principles of geologic classification and nomenclature.

—— Geological map of New Jersey, from original surveys. Scale, 5 miles to an inch. 1889. Atlas sheet No. 20. 34 by 25 inches.

Colored map with two cross-sections. Differs from map published with 1882 report as follows: Wider extension of the larger coastal alluvial areas, outlying area of Cretaceous (Potomac?) near Monmouth Junction, Hudson River slates area, and alteration in Triassic boundary near Clinton and Brookville, additional small volcanic areas near Beemerville, and in the Triassic region, several small crystalline limestone areas near Danville, northward extension of the First Watchung trap area, and many slight local corrections of boundary lines.

[——] On the Triassic or red sandstone rocks.

Geol. Survey of New Jersey, Report for 1888, pp. 11–15. 1889.

Statement of general characteristics of the formation, discussion of the occurrence of faults and expression of opinion in regard to the nature of the trap rocks.

[——] Artesian wells.

Geol. Survey of New Jersey, Report for 1888, pp. 72–77. 1889.

Gives records of 1,150-foot well at Atlantic City, 380-foot well at Sea Island City, 155-foot well near Marlton, and a 450-foot well in Jersey City.

COOPER, J. G. Catalogue California fossils.

California, Seventh Report of the State Mineralogist, pp. 223–308. 1888.

Compilation. References to stratigraphic positions.

COPE, E. D. The formations of the Belly River of Canada.

Am. Naturalist, vol. 21, pp. 171–172. 1887.

Abstract (with comments) of paper by George M. Dawson described in the bibliography for 1886.

—— The Mesozoic and Cenozoic realms of the interior of North America.

Am. Naturalist, vol. 21, pp. 445–462. 1887.

COPE, E. D.—Continued.

General review of the distribution, characteristics and equivalency of the several groups and their subdivisions and discussion of their paleontologic and stratigraphic relations. Reviews Gilbert on glacial age of the Montana equus beds.

—— Mr. Hill on the Cretaceous of Texas.

Am. Naturalist, vol. 21, pp. 469–470. 1887.

Objects to the new nomenclature and discusses the probable equivalency of some of the groups and subdivisions.

[——?] [The International Congress of Geologists.]

Am. Naturalist, vol. 21, pp. 643–645. 1887.

Discusses the desirability of a uniform system of colors and nomenclature, and the probable general synchronism of the wider geologic subdivisions. Quotes Powell's letter on the subject and advances some objections to its recommendations.

—— Synopsis of the vertebrate fauna of the Puerco series.

Am. Phil. Soc., Trans., new series, vol. 16. pp. 298–361, pls. IV, V. 4°. 1888.

Prefatory remarks, Am. Naturalist, vol. 22, pp. 161–163. 1888.

Preceded by a brief description of the extent and general relations of the series.

—— Mesozoic realm.

International Congress of Geologists, Am. Committee Report, 1888, E, pp. 7–15.

Am. Geologist, vol. 2, pp. 261–268. 1888.

Résumé of distribution, general relations, and characteristics of the several formations, and discussions of age and equivalency.

—— Report of the subcommittee on the Cenozoic (Interior).

International Congress of Geologists, Am. Committee Reports, 1888, G, p. 20.

Am. Geologist, vol. 2, pp. 285–299. 1888.

Résumé of paleontologic and geologic characteristics of the members of the Cenozoic, and a discussion of their age, range, and equivalency.

—— Vertebrate fauna of the Puerco series. [Abstract.]

Science, vol. 11, p. 198, ½ p. 1888.

Read to National Academy of Sciences.

Incidentally refers to position of Puerco beds.

—— Sketches of the Cascade Mountains of Oregon.

Am. Naturalist, vol. 22, pp. 996–1005. 1888.

Scientific Am. Supt., vol. 27, pp. 10981–10982, (No. 687,) 4°. 1889.

Includes sketches of volcanic history of the region and description of some geologic features in the vicinity of Crater Lake and in the cañon of the Des Chutes.

COPE, E. D.—Continued.

—— The age of the Denver formation.

Science, vol. 13, p. 290, ⅔ col. 1889.

Discussion of the bearing of its mammalian remains.

—— The vertebrate fauna of the Equus beds.

Am. Naturalist, vol. 23, pp. 161–165. (February number.) 1889.

List of species, description of new species from Washington, and brief discussion of age of Equus beds.

—— An intermediate Pliocene fauna.

Am. Naturalist, vol. 23, pp. 253–254. 1889.

Notices of occurrence of mammalian remains from Oregon and discussion of their age; also refers to age of some Floridian remains.

Cornwall, Royal Geological Society, Transactions, vol. 11.

Copper mining at the Cove, Newfoundland, GARLAND.

COSTE, E. [Preliminary report on sheet 113, Ontario.]

Canada, Geol. and Nat. Hist. Survey, Report, 1886, part A, pp. 20–22. 1887.

Includes some general statements in regard to relations of igneous rocks penetrating the Archean.

COURTIS, W. M. The Animikie rocks and their vein phenomena as shown at Duncan Mine, Lake Superior.

Am. Inst. Mining Engineers, Trans., vol. 15, pp. 671–677, plate. 1887.

Describes the eruptive and clastic rocks passed through in a 994-foot drill hole. Gives partial analyses of some of the rocks and a section showing the structural relations.

COWLAM, George B. The extent and value of East Tennessee minerals.

Eng. and Mining Journ., vol. 45, pp. 19–21, 4°. 1888.

General description of the coal field and fossil ore belt.

COX, E. T. [Salt deposits in Kansas, etc., and their relation to those of Petite Anse.]

New York Acad. Sci., Trans., vol. 7, p. 127, ⅛ p. 1888.

Reference to thickness and position of the Kansas deposit, and statement of opinion in regard to its age and the age of the Petite Anse beds.

CRAGIN, F. W. Geological notes on the region south of the great bend of the Arkansas.

Washburn Coll. Lab., Bull., vol. 2, pp. 33–37. 1889.

CRAGIN, F. W.—Continued.

Description of Mesozoics and discussion of of the stratigraphic range and relation of the Permian-Triassic transition series.

—— Contributions to the paleontology of the Plains. No. 1.

Washburn Coll. Lab., Bull., vol. 2, pp. 65–68. 1889.

Contains an incidental reference to the equivalency of a Kansas formation, for which the term "Cheyenne sandstone" is suggested.

CRAIG, W. Contributions to the geology and paleontology of the townships of Russell and Cambridge in Russell, Ontario. Physiography and general geology.

Ottawa Naturalist, vol. 2, pp. 136–139. 1889.

An account of the drifts and of the relations of Ordovician formations.

CRANDALL, A. R. Report on the geology of Elliott County.

Geol. Survey of Kentucky, Report on Geology of Elliott County, by Crandall, pp. 5–16, 7 plates, 2 maps. [1887?].

Describes topographic features of the conglomerate, the exposures of peridotite and the occurrence and variations of the coal strata. Accompanied by geologic maps and columnar sections.

—— Notes on the Elliott County dike, eastern Kentucky.

Geol. Survey of Kentucky, Report on Geology of Elliott County, pp. 17–19, map. [1887?].

Briefly describes the localities and discusses the relations of the intrusions to the structure of the region.

—— Report on the Pound Gap region.

Geol. Survey of Kentucky, Reports on the southeastern Kentucky coal field, 1887, pp. 1–29, maps, plates.

Describes structure of Pine Mountain and iron ores and coal-measures of Pound Gap region. Gives table of thicknesses of beds from upper Silurian to coal-measures in Pine Mountain and in western Kentucky, discusses the age of the Pine Mountain fault and its relations to topography and drainage, and reviews the stratigraphy and geologic history of Kentucky and of the Pine Mountain region. Accompanied by map of the Appalachian coal field.

CRESSON, Hilborne T. Early man in the Delaware valley.

Boston Soc. Nat. Hist., Proc., vol. 24, pp. 141–150. 1889.

Includes references to the relations of the drift deposits in the valley of the lower Delaware.

CRESSON, Hilborne T.—Continued.

—— Remarks upon a chipped implement found in modified drift on the east fork of the White River, Jackson County, Indiana.

Boston Soc. Nat. Hist., Proc., vol. 24, pp. 150–152. 1889.

Includes a brief discussion of the nature and history of the deposit by G. F. Wright.

Cretaceous (including Potomac formation).

Alabama, Tuscaloosa formation, McGEE.

Tuscaloosa, Tombigbee, and Alabama rivers, SMITH and JOHNSON. McGEE.

Arkansas, northern limits of Cretaceous, HAY, O. P.

events in North American Cretaceous history, HILL, R. T.

Jura, Neocomian, and chalk, MARCOU.

Pike County, BRANNER.

events in Cretaceous history, HILL, R. T.

Portland cement, BRANNER.

relations of southern to eastern Cretaceous, HILL, R. T.

southwestern Arkansas, HILL, R. T.

Trinity formation, HILL, R. T.

west central, COMSTOCK.

Brazil, Sergipe-Alagoâs region, BRANNER.

California, BECKER. BOWERS. DUTTON. GOODYEAR. LE CONTE. IRELAN. JACKSON. WEBER. WHITE, C. A. WHITING.

catalogue of fossils, COOPER.

petrographic description, SCHUSTER.

Canada, branches of Saskatchewan, PANTON.

Belly River region, COPE.

borings in Manitoba, DAWSON, G. M.

Caribou gold district, BOWMAN.

Cascade anthracite basin, DAWSON, G. M.

coal in valley of Bow River, DODGE.

earlier Cretaceous of the Northwest, DAWSON, G. M.

floras of the Northwest, DAWSON, J. W.

fossils from coast of British Columbia, WHITEAVES.

Laramie plants, DAWSON, J. W.

Mount Stephen, McCONNELL. WALCOTT.

northern Alberta, etc., TYRRELL.

CROSBY, W. O.—Continued.

Boston Soc. Nat. Hist., Proc., vol. 23, pp. 450–457. 1888.

Description of the relations of diabase sheets and dikes to slates, and discussion of structure, relations of the diabase, evidence of a fault, and cause of relative position and trend of the islands. Reference to drifts.

—— Geology of the Black Hills, Dakota.

Boston Soc. Nat. Hist., Proc., vol. 23, pp 488–517, vol. 24, p. 11, ¼ p. 1888.

Abstract, Am. Journ. Sci., 3d series, vol. 36, p. 153, ¼ p. 1888.

Sketch of geology and description of various features of the several formations. Discussion of relative ages of the crystalline rocks; the relation of the metamorphic conglomerate and the deformation of its pebbles; the cor. relations of the Archean rocks with those elsewhere; evidence of the existence of limestone in the Archean; origin, extent, relations, and age of the granites, volcanic rocks, mineral deposits, and superficial formations; conditions of deposition and formations in the West between the Cambrian and Carboniferous, relations of Paleozoic and Mesozoic; age, history, and relations of Black Hills uplift, and of the red beds and subsequent formations.

—— Quartzites and siliceous concretions.

Sci. Am. Supt., vol. 26, pp. 10466–10468, folio, No. 655. 1888.

From Technology Quarterly.

Description of relations of Potsdam sediments in the Black Hills and discussion of the nature and origin of the included quartzite masses and on silicification in general.

—— and **BARTON**, G. H. On the great dikes at Paradise, near Newport.

Boston Soc. Nat. Hist., Proc., vol. 23, pp. 325-330. 1887.

Gives an account of the geologic features of the region, the relations of which are found to be much simpler than formerly supposed; the "hornblende schist" of Dale proving on examination by Merrill to be an intrusive rock, probably an altered diorite.

CROSS, Whitman. Petrography.

Geology and Mining Industry of Leadville, Colorado, by S. F. Emmons, U. S. Geol. Survey, Mon., vol. 12, pp. 319–362, 2 plates. 1886.

Abstract, Am. Naturalist, vol. 22, p. 62, ¼ p. 1887.

Describes the eruptives of the Leadville region, and the Henry Mountain laccolites. Discusses age, succession, composition, and character of the rocks.

—— On the occurrence of topaz and garnet in lithophyses of rhyolite.

Colorado Sci. Soc., Proc., vol. 2, part 2, pp. 61–70. 1887.

CROSS, Whitman—Continued.

Published in 1886, Am. Jour. Sci., 3d series, vol. 31, pp. 432–438.

—— The Cimarron landslide, July, 1886.

Colorado Sci. Soc., Proc., vol. 2, part 2, pp. 116–126. 1887.

Describes geologic features of the vicinity and topographic changes due to the slide. Discusses its cause and similarity to other slides.

—— Note on phonolite from Colorado [El Paso County].

Colorado Sci. Soc., Proc., vol. 2, pp. 167–170. 1888.

Abstract, Am. Naturalist, vol. 23, pp. 171–172, ⅛ p. (February No.). 1889.

Petrographic description and analyses.

—— [Observations in regard to the paramorphic origin of certain minerals.]

Colorado Sci. Soc., Proc., vol. 2, pp. 182–183. 1888.

Refers to instances observed in Custer County, Colorado.

—— On some eruptive rocks from Custer County, Colorado.

Colorado Sci. Soc., Proc., vol. 2, pp. 228–250. 1888.

Abstract, Am. Naturalist, vol. 23, p. 171, ¼ p. (February No.). 1889.

Description of petrography and occurrence of rhyolites, trachytes, syenite, peridotite, augite-diorite, and sanadine-bearing andesite. Definition of lithologic terms.

—— The Denver Tertiary formation.

Am. Jour. Sci., 3d series, vol. 37, pp. 261–279. 1889.

Abstract, Colorado Sci. Soc., Proc., vol. 3, pp. 119–133. 1889.

Description of distribution, stratigraphy, composition, and general relations of the formation, and discussion of stratigraphic and paleontologic evidence of its age and history.

CUMMINS, W. T. The Carboniferous of western Texas and its relation to the Cretaceous.

Am. Geologist, vol. 2, p. 138, ½ p. 1888.

Reference to its barrenness in coal and to its conformable overlap by the Cretaceous.

—— Mining districts in El Paso County [Texas].

Geol. and Sci. Bull., vol. 1, No. 2, ⅝ col., 4°. 1888.

Geologic relations of granites and porphyries to Cretaceous and Carboniferous limestones.

—— The Carboniferous formation in Texas.

Geol. and Sci. Bull., vol. 1, No. 3, 1¼ col., 4°. 1888.

CUMMINS, W. T.—Continued.

Reference to extent, relations, and stratigraphic range.

—— Report of Geologist for northern Texas.

Texas, Geol. and Mineralogical Survey, First Report, 1888, pp. 45–53. 1889.

Abstract, Geol. and Sci. Bull., vol. 1, Nov., 1888, ¼ col.; Jan., 1889, ¼ col., 4°.

Notes on Carboniferous coals and stratigraphy in northern central Texas.

CURTICE, Cooper. Oriskany drift near Washington, District of Columbia.

CURTICE. Cooper—Continued.

Am. Geologist, vol. 3, pp. 223–225. 1889.

Calls attention to occurrence of fossiliferous pebbles in the Potomac formation at Mount Vernon and near Alexandria.

CUSHING, H. P. Notes on the Berea grit in northeastern Ohio.

Am. Assoc. Adv. Science, Proc., vol. 36, pp. 213–215. 1888.

Gives stratigraphic sections at several localities. Description of extent and relations and discussion of equivalency of the beds, especially of the sandstone north of Warren.

D.

Dakota School of Mines, Report on Black Hills.

Geology of the Black Hills, CARPENTER.

Mineral resources of the Black Hills, CARPENTER.

Dakota, beaches of glacial Lake Agassiz, UPHAM.

coal, ASHBURNER.

continuance of Lake Cheyenne, TODD.

Cretaceous, UPHAM. WARD. HILL, R. T.

fossil plants and prairies, LEIBERG.

geology of Black Hills, CARPENTER. CROSBY.

glacial boundary in southeast Dakota, WRIGHT.

glacial geology, CHAMBERLIN.

granites, HALL, C. W.

great primordial quartzite, WINCHELL, N. H.

green quartzite, TODD.

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ore deposits of Black Hills, CARPENTER.

Quaternary of southern Dakota, CHAMBERLIN.

Missouri River, BROADHEAD.

quartzite and siliceous concretions, Black Hills, CROSBY.

Tertiary, COPE.

terraces of the Missouri, TODD.

DALL, William H. Notes on the geology of Florida.

Am. Jour. Sci., 3d series, vol. 34, pp. 161–170. 1887.

DALL, William H.—Continued.

Describes the extent of the several superficial and Tertiary formations and discusses their faunal distribution and equivalency, and the synchronism of post-Cretaceous formations in general. Calls attention to many rock outcrops and new fossiliferous localities, and to a series of meridional flexures crossing the Caloosahatchee River.

—— [On the faunal relations of the formations of the Tertiary.]

International Congress of Geologists, Am. Committee Reports, 1888, F., p. 16, ½ p.

Am. Geologist, vol. 2, p. 282. 1888.

Discussion of basis on which Tertiary should be subdivided.

DANA, Edward S. Contributions to the petrography of the Sandwich Islands.

Am. Jour. Sci., 3d series, vol. 37, pp. 441–467, pl. XIV. 1889.

Abstracts, Am. Naturalist, vol. 23, pp. 522–533, ¾ p. 1889. Nature, vol. 40, p. 189, 11 lines. 1889.

Petrographic descriptions of lavas. Includes an account of volcanic stalactites and discussion of their origin.

DANA, James D. Volcanic action.

Am. Jour. Sci., 3d series, vol. 33, pp. 102–115. 1887.

Discusses causes and results of volcanic action and a résumé and discussion of the phenomena of Kilauea, Vesuvius, the recent New Zealand eruptions, and other instances.

[——?] The origin of mountain ranges considered experimentally, structurally, dynamically, and in relation to their geological history, by T. Mellard Reade [etc.].

Am. Jour. Sci., 3d series, vol. 33, pp. 240–242. 1887.

DANA, James D.—Continued.

A brief statement of the theory and a review of its application to continental uplift and the Appalachian trough.

—— On Taconic rocks and stratigraphy, with a geological map of the Taconic region; part 2, the middle and northern part.

Am. Jour. Sci., 3d series, vol. 33, pp. 270–276 392–419, pl. 11. 1887.

[Continued from vol. 29, p. 443, 1885.]

Describes the rocks and a series of sections across the region, and discusses the structural and stratigraphic relations, distribution, and equivalency of the limestones, schists, and quartzites. In a supplement entitled "The views of Prof. Emmons on the Taconic system," reviews Hunt's "The Taconic question restated," pp. 412–419.

[——?] Report on the geology of New Jersey for 1886.

Am. Jour. Sci., 3d series, vol. 34, p. 71, ⅔ p. 1887.

Abstract of Britton's report on the Archean and discussion of the use of the term Huronian.

[——] Geology of Long Island.

Am. Jour. Sci., 3d series, vol. 34, pp. 153–155. 1887.

Abstract and review of F. J. H. Merrill's paper described in the bibliography for 1886. Discusses the character of the drift ridges, the identification of the Cretaceous and Tertiary, the uplift of the preglacial formations by the advancing edge of the ice sheet, and the cause of the deep bays in the north shore of the island.

[——?] A pot-hole of remarkable size in Archbald, Pennsylvania.

Am. Jour. Sci., 3d series, vol. 34, p. 489. 1887.

Description, and discussion of its origin.

—— History of the changes in the Mount Loa craters; part I, Kilauea.

Am. Jour. Sci., 3d series, vol. 35, pp. 15–34, pp. 213–228, 282–289, pls. I, IV, V. 1888.

Abstract, Nature, vol. 37, p. 358, 17 lines. 1888.

Includes discussion of the causes and relations of the changes, the mobility of the lavas, the eruptive and crater characteristics of a basalt volcano, size of the Kilauea conduit, and the conditions involved in the various phenomena occurring between the eruptions.

[——] Gradual variation in intensity of metamorphism.

Am. Jour. Sci., 3d series, vol. 35, pp. 82–83, ⅔ p. 1888.

Refers to illustrative localities west of New Haven, and discusses the occurrence and origin of included masses of granite in that region.

DANA, James D.—Continued.

[——] Fossils of Littleton, New Hampshire.

Am. Jour. Sci., 3d series, vol. 35, p. 255, ⅒ p. 1888.

Notice of their reference to the Niagara group by Hitchcock in 1884.

—— History of changes in the Mount Loa craters, part III, eruptives of Kilauea and Mount Loa.

Am. Jour. Sci., 3d series, vol. 36, pp. 90–112, 167, 175. 1888.

Discussion of the characteristics and causes of eruption, metamorphism as an effect of volcanic conditions, the origin of the form of Mount Loa, relations of Kilauea to Mount Loa, and the contrast between volcanoes of the Mount Loa and Vesuvius types.

—— History of the changes in the Mount Loa craters, part II, Mokuaweoweo.

Am. Jour. Sci., 3d series, vol. 36, pp. 14–32, pl. I, 81–90. 1888.

History of eruptions, etc., and discussion of times and time intervals, and the nature and causes of the ordinary activity within the summit crater.

—— Brief history of Taconic ideas.

Am. Jour. Sci., 3d series, vol. 36, pp. 410–427. 1888.

And résumé of present knowledge of the relations in the Taconic region.

—— [On the use of the term "Taconic."]

International Congress of Geologists, Am. Committee Reports, 1888, B, pp. 8–9.

Am. Geologist, vol. 2, pp. 198–199. 1888.

Discussion, of its applicability to lower Paleozoic formations.

—— [On the subdivisions, nomenclature, distinctive features, and origin of some members of the Archean, origin of Serpentine, and the use of terms "Taconic," "Ordovician," and "Cambrian."]

International Congress of Geologists, Am. Committee Reports, 1888, A, pp. 53–55.

—— Recent observations of Mr. Frank S. Dodge, of the Hawaiian Government Survey, on Halema'uma'u and its débris cone.

Am. Jour. Sci., 3d series, vol. 37, pp. 48–50. 1889.

Evidence of recent elevation of the cone and some other minor changes in the crater.

—— Points in the geological history of the islands Maui and Oahu.

DANA, James D.—Continued.

Am. Jour. Sci., 3d series, vol. 37, pp. 81–103, pls. III, IV. 1889.

Description and discussion of topographic and geologic relations, discussion of geologic history, volcanism and evidence of subsidence. Statement of opinion in regard to Darwin's theory of coral island formation.

—— On the origin of the deep troughs of the Oceanic depression. Are any of volcanic origin?

Am. Jour. Sci., 3d series, vol. 37, pp. 192–202, pl. VII. 1889.

Review of distribution and relations of the deep Oceanic troughs. Accompanied by a bathymetric map.

—— The name Silurian in geology.

Popular Science Monthly, vol. 36, p. 276, ⅔ p. 1889.

Discussion of nomenclature of the Silurian and Ordovician, and suggestion of term "Ordovician" for the "upper Silurian."

DARTON, Nelson H. Bibliography of North American geology for 1886.

U. S. Geol. Survey, Bull., vol. 7, pp. 343–377, No. 44. 1887.

—— On the great lava flows and intrusive trap-sheets of the Newark system in New Jersey.

Am. Jour. Sci., 3d series, vol. 30, pp. 134–139. 1889.

Discussion of characteristics of extrusive and intrusive masses, and an account of the nature and relations of the traps of the New Jersey region.

—— North American geology for 1886.

Smithsonian Institution, Report, 1886-'87, Part 1, pp. 189–229. 1889.

Classified abstracts of papers.

DARWIN, Charles. The structure and distribution of coral reefs, 3d edition, with an appendix by T. G. Bonney, p. 344. New York. 1889.

Davenport Academy of Natural Sciences, Proceedings, vol. 5, part 1.

A defense of our local geology, BARRIS.

Rockfort shales of Iowa, WEBSTER.

DAVIS, Charles H. S. The Catopterus gracilis.

Meriden Sci. Assoc., Trans., vol. 2, pp. 19–22. 1887.

Remarks on the occurrence of fish remains in the Trias, and a description of the locality at Little Falls, Connecticut.

DAVIS, William Morris. Instruction in geological investigation.

DAVIS, William Morris—Continued.

Am. Naturalist, vol. 21, pp. 810–825. 1887.

In discussing some experiences with his field classes, describes dike contacts in the quarry at Somerville, Massachusetts, and evidences of a former higher level of the sea about Boston.

—— [Results of a study of the mechanical origin of the Triassic monoclinal in the Connecticut valley.]

Boston Soc. Nat. Hist., Proc., vol. 23, pp. 339–341. 1887.

Reviews the various theories and advances a hypothesis to account for the monoclinal attitude. This paper antedates the one on the same subject described in the 1886 bibliography.

[——] The origin of mountain ranges, considered experimentally, structurally, dynamically, and in relation to their geological history. By T. Mellard Reade. London.

Science, vol. 10, p. 139. 1887.

States condition of present opinions on the subject, and briefly relates and reviews the author's theory.

—— The classification of lakes.

Science, vol. 10, pp. 142–143. 1887.

Discusses the formation of lakes in the development of drainage systems, and the effects of lava flows and glacial incursions.

—— The ash bed at Meriden and its structural relations.

Meriden Sci. Assoc., Trans., vol. 3, pp. 23–30. 1888.

Brief notice of the occurrence of the ash-bed; description of contacts of trap with overlying sediments in Lamentation Mountain and of West Rock range, New Haven, and the structural relations in the Meriden region, and sketch of the history of volcanic extrusion, and the mechanism of the uplift and faulting of the Newark formation of the Connecticut valley.

[——] Geographic methods in geologic investigation.

National Geogr. Mag., vol. 1, pp. 11–26. 1888.

Discussion of the status of geographic science and the genetic relations of topographic features. Includes references to structure of the Newark formation of the Connecticut valley, base levels in New Jersey and in eastern Pennsylvania, the relations of topography and drainage to structure and uplift in the Appalachian region and elsewhere, and conditions affecting waterfalls, instanced by some in northeastern Pennsylvania.

DAVIS, William Morris—Continued.

[——] The topographic map of New Jersey.

Science, vol. 12, pp. 206–207. 1888.

Calls attention to topographic features expressing geologic relations or suggesting geologic problems: Submerged mouths of streams along coast, course and termination of ridges in the Newark region, fracture separating Archean highlands from lowlands of softer sediments, and some relations of the preglacial Passaic drainage.

—— The structure of the Triassic formation of the Connecticut valley.

U. S. Geol. Survey, Seventh Report, J. W. Powell, 1885-'86, pp. 455–490, pl. 52. 1887.

Abstract, Am. Geologist, vol. 4, pp. 112–113. 1889.

Description and discussion of stratigraphy and the structural relations and characteristics of the igneous members, and a discussion of the mechanical origin of the Triassic monocline, with its faults and flexures.

—— The faults in the Triassic formation near Meriden, Connecticut.

Harvard College, Mus. Comp. Zool. Bull., vol. 16, pp. 61–87, pls. 1–5. 1889.

Detailed description of the relations of traps and sandstones, and structural relations in the Meriden-New Britain region. Illustrated by sketch maps and cross-sections.

—— Topographic development of the Triassic formation of the Connecticut valley.

Am. Jour. Sci., 3d series, vol. 37, pp. 423–434. 1889.

Abstract, Popular Science Monthly, vol. 36, p. 573, ⅔ col. 1890.

Description of structural features in the Meriden region, discussion of the cause and significance of the eastward deflection of the lower Connecticut, and the orographic relations and topographic history of the Connecticut valley region, and comparison of some of its stages with topography of fault systems in the Great Basin and in China.

—— The glacial origin of cliffs.

Am. Geologist, vol. 3, pp. 14–18. 1889.

Discussion of the relations of cliff and talus slopes and their modification by glaciation, instancing those of the Newark regions of New Jersey and the Connecticut valley.

—— Methods and models in geographic teaching.

Am. Naturalist, vol. 23, pp. 566–583. 1889.

Abstract, Johns Hopkins Univ., Circulars, vol. 8, p. 62, ⅔ p, 4°. 1889.

Includes a general discussion of various types and stages of topographic development.

[——] A river pirate.

DAVIS, William Morris—Continued.

Science, vol. 13, pp. 108–109. 1889.

Describes the topographic relations of some drainage features in the southeastern corner of Pennsylvania and discusses their history.

[——] The ice age in North America and its bearing upon the antiquity of man. [By G. F. Wright.]

Science, vol. 14, pp. 118–119. 1889.

A general review of the work.

—— The contoured map of Massachusetts.

Science, vol. 14, pp. 422–423, ¾ p. 1889.

A general review of the more characteristic topographic features of the State and some suggestions in regard to their geologic history.

—— The rivers and valleys of Pennsylvania.

National Geogr. Mag., vol. 1, pp. 183–253. 1889.

Abstract, Am. Geolgist, vol. 5, pp. 60–61, ½ p. 1891.

General description of salient topographic and geologic features, sketch of geologic history, exposition of conceptions of stages of development of drainage systems in general, and discussion of the genesis, history, and relations of the drainage of Pennsylvania.

—— and **WHITTLE**, Charles Livy. The intrusive and extrusive Triassic trap sheets of the Connecticut valley.

Harvard College, Mus. Comp. Zool., Bull., vol. 16, pp. 99–138, pl. 5. 1889.

Abstract, Am. Naturalist, vol. 24, p. 769, 6 lines. 1890.

An account of the general features of intrusive and extrusive sheets in Connecticut and the palisade sheet in New Jersey, and detailed description of the more important localities. Illustrated by maps and sections.

DAWSON, George M. Report on a geological examination of the northern part of Vancouver Island and adjacent coasts.

Canada, Geol. and Nat. Hist. Survey, Report, 1886, part B, pp. 1–107, plates. 1887. Map No. 1 in atlas.

Abstract, Geol. Magazine, III, vol. 6, pp. 130–133. 1889.

Description of Cretaceous, Triassic, volcanics, granites, and drifts, and discussion of their distribution, relations, equivalency, geologic history, the contact relations of the granites and the existence of Carboniferous and Permian. Accompained by a colored geologic map.

—— Notes to accompany a geological map of the northern portion of the Dominion of Canada east of the Rocky Mountains.

DAVIS, William Morris—Continued.

Canada, Geol. and Nat. Hist. Survey, Report, 1886, part R, pp. 62, colored map. 1887.

Abstract, Geol. Magazine, III, vol. 6, pp. 137–138. 1889.

Includes a discussion of the characteristics, equivalency, age, range, structure, distribution, and relations of the various formations and areas, and of the direction of ice movement in the glacial period.

—— On the Canadian Rocky Mountains, with special reference to that part of the Range between the 49th parallel and the headwaters of the Red Deer River.

Canadian Record of Science, vol. 2, pp. 586–300. 1887.

Abstract, without geology, British Assoc. Adv. Sci., Report of the 56th meeting, 1886, pp. 638–639.

General sketch of topographic and geologic features, constituting an abstract of his paper in the Canadian Geol. Survey Report, vol. 1, new series, and described in the 1886 bibliography.

—— On certain borings in Manitoba and the Northwest Territory.

Canada, Royal Soc., Trans., vol. 4, Section IV, pp. 85–99. 1887.

Abstract, Geol. Magazine, 3d decade, vol. 4, pp. 278–289. 1887.

Description of beds passed through at Rosenfield Station, Rat Creek, Solsgirth, Grenfel Station, McLean Station, Regina, Belle Plain Station, Langevin Station, Cassills, and Gleishen Station, and discussion of the equivalency of some of the strata, the thinning of some of the Paleozoic formations toward the region, the relation of the drift deposits, and the stratigraphy of the Cretaceous at the Langevin hole.

—— Note on the Cascade Anthracite basin, Rocky Mountains.

Am. Geologist, vol. 1, pp. 332–333. 1888.

General description of the trough and reference to the horizon and thickness of the Cretaceous in that region.

—— The geological observations of the Yukon expedition, 1887.

Science, vol. 11, pp. 185–186. 1888.

Description of the geology of the Coast Ranges and of the region eastward, to, and including the Rocky Mountains, in west central British Columbia. Includes references to rock series from granites to Miocene, relations of superficial deposits and evidence of glacial action, terraces, striation, and great volcanic ash deposit.

—— Recent observations on the glaciation of British Columbia and adjacent regions.

DAVIS, William Morris—Continued.

Geol. Magazine, 3d decade, vol. 5, pp. 347–350, 1888.

Am. Geologist, vol. 3, pp. 279–253. 1889.

Describes and discusses evidence bearing on the extent and directions of movements of the great ice mass. Includes a brief reference to the occurrence of bowlder clay deposits and to the general terracing of the region.

—— Notes on the ore deposit of the Treadwell mine, Alaska.

Am. Geologist, vol. 4, pp. 84–83. 1889.

Discussion of genesis and geologic relations.

—— On the earlier Cretaceous rocks of the northwestern portion of the Dominion of Canada.

Am. Jour. Sci., 3d series, vol. 38, pp. 120–127. 1889.

Abstract, Nature, vol. 40, p. 404, 11 lines. 1889. Am. Naturalist, vol. 24, p. 769, ¼ p. 1890.

Discusses correlation, extent, and geologic history of Kootanie, Queen Charlotte, and other earlier Cretaceous formations in western Canada, relations of overlying conglomeritic series, and Canadian equivalents of the Comanche formation of the Texas region.

—— Glaciation of high points in the southern interior of British Columbia.

Geol. Magazine, decade III, vol. 6, pp. 350–352. 1889.

Abstracts, Ottawa Naturalist, vol. 3, pp. 112–113, ⅛ p. 1889. Am. Naturalist, vol. 24, p, 771, 4 lines. 1890.

List of some glaciated high summits and remarks on their bearing on the conditions of the glaciation of the region.

—— On the Archean, see **FRAZER**. Report on Archean.

—— See, also, **Dawson, J. W.**, and **Dawson, G. M.**, on Cretaceous plants from Port McNeill, Vancouver Island.

DAWSON, J. William. On the correlation of the geological structure of the Maritime Provinces of Canada with that of western Europe. (Abstract.)

Canadian Record of Science, vol. 2, pp. 404–406. 1887.

Science, vol. 9, pp. 589–590. 1887.

Discusses the differences between the formations of eastern Canada and those farther west, and points out their close similarity to the formations of western Europe.

—— Notes on fossil woods from the western territories of Canada.

Canadian Record of Science, vol. 2, pp. 499–502. 1887.

Nature, vol. 36, pp. 274–275. 1887.

DAWSON, J. William—Continued.

Discusses the age of the Laramie group and questions of climate and contemporaneity of the lower Eocene flora of different regions.

—— On the relation of the geology of the Arctic and Atlantic basins.

British Assoc. Adv. Science, Report of Fifty-sixth Meeting, 1886, p. 638, ½ p. 1887.

Points out the intimate relations of the Arctic formations to those of eastern North America.

—— Some points in which American geological science is indebted to Canada.

Canada, Royal Soc., Trans., vol. 4, section IV, pp. 1–8. 4°. 1887.

Résumé of the history of geologic research in Canada, especially by Logan. Briefly discusses the subdivisions of the pre-Cambrian of Canada; the relations and equivalency of the "Quebec" group, the position of the "so-called Jurassic of the western territories of the United States," and continental glaciation.

—— On the fossil plants of the Laramie formation of Canada.

Canada, Royal Soc., Trans., vol. 4, section IV, pp. 19–34, pls. 1–2, 4°. 1887.

Describes the extent and stratigraphy of the formation and discusses its equivalency and floral relations.

—— Cretaceous floras of the northwest territories of Canada.

Am. Naturalist, vol. 22, pp. 953–959. 1888.

Abstract of paper read to Royal Society of Canada. 1888.

Discussion of stratigraphic positions, the value of fossil plants in indicating geologic horizons, and the physical conditions and climate indicated by the faunas.

—— Preliminary note on new species of sponges from the Quebec group at Little Metis.

Canadian Record of Science, vol. 3, pp. 49, 59, plate. 1888.

Discussion of the geologic horizon of the beds.

—— Eozoon canadense.

Canadian Record of Science, vol. 3, pp. 201–226. 1888.

Extracts from publications of the Peter Redpath Museum, September, 1888.

In part as "On new facts relating to Eozoon canadense," Geol. Magazine, decade 3, vol. 5, pp. 49–54, plate. 1888.

Review of paragraph 9, on upper Laurentian, by A. R. C. Selwyn, Science, vol. 11, p. 146, ⅛ col. 1888.

Includes incidental references to containing beds at several localities, beds of fragmental Eozoon, the relations of the limestones of the middle Laurentian, the aqueous origin of the greater part of the upper Laurentian, the equivalency of some of the crystalline rocks west of Lake Superior with the upper Laurentian of St. Jerome, and some instances of rock lamination.

DAVIS, William Morris—Continued.

—— Notes on fossil woods and other plant remains from the Cretaceous and Laramie formations of the western territories of Canada.

Canada, Royal Soc., Trans., vol. 5, section IV, pp. 31–37, 4°. 1888.

Abstract, Am. Geologist, vol. 1, pp. 195–197. 1888.

Includes references to localities, climatic conditions in later Cretaceous and early Tertiary times, the position of the Laramie of the Northwest, and the distinction between the lower and upper Laramie.

—— On the Eozoic and Paleozoic rocks of the Atlantic coast of Canada in comparison with those of western Europe and the interior of America.

Geol. Soc., Quart. Jour., vol. 44, pp. 797–817. 1888.

Abstracts, Geol. Magazine, 3d decade, vol. 5, pp. 331–332, 1888; Canadian Record Science, vol. 3, pp. 182–183, 230–231, 1888; Nature, vol. 38, p. 142, ⅛ col., 1888; Popular Science Monthly, vol. 36, p. 287, ⅓ p., 1889.

Subdivisions, relations, history, extent, and equivalency of Laurentian, Huronian, Cambrian, Ordovician, Silurian, Devonian, and Carboniferous systems.

—— [On nomenclature, subdivisions, characteristics, evidence of life and origin of some members of the Archean, origin of serpentines, classification of Archean eruptives, nomenclature of lower Paleozoic.]

International Congress of Geologists, Am. Committee Reports, 1888, A, p. 71, ½ p.

—— [On use of term "Taconic."]

International Congress of Geologists, Am. Committee Reports, 1888, B, p. 17, 1 line.

Am. Geologist, vol. 2, p. 207.

Expression of opinion.

—— On Nematophyton and allied forms from the Devonian (Erian) of Gaspé and Bay des Chaleurs. Introductory geological note.

Canada, Royal Soc., Trans., vol. 6, Section IV, pp. 27–36. 1889.

Includes a sketch of the stratigraphy of the region and table showing the equivalency of the Devonian beds with those of other localities.

DAWSON, J. William—Continued.

—— Supplemental note to a paper on the rocks of the Atlantic coast of Canada.

Geol. Soc., Quart. Jour., vol. 45, p. 80, ½ p. 1889.

Reference to the position of the *Olenellus* fauna and to the bearing of new evidence on this point on the geologic conditions during Lower Cambrian and late pre-Cambrian times.

—— Note on Balanus Hameri in the Pleistocene at Rivière Beaudette, and on the occurrence of peculiar varieties of Mya arenaria and M. truncata in the modern sea and in the Pleistocene.

Canadian Record Science, vol. 3, pp. 287-292. 1889.

Brief reference to nature and equivalency of the containing beds.

—— Handbook of geology for the use of Canadian students, p. 250, Montreal. 1889.

—— and **DAWSON**, G. M. On Cretaceous plants from Port McNeill, Vancouver Island.

Canada, Royal Soc., Trans., vol. 6, Section IV, pp. 71-72.

Abstract, Canadian Record of Science, vol. 3, p. 167, ½ p. 1888.

Includes a description of the relations of the plant-bearing beds and statement in regard to their equivalency and age.

[**DAY**, David T.] Infusorial earth.

U. S. Geol. Survey, Mining Resources, 1887, p. 554, ½ p. 1888.

Notice of occurrence at Pope's Creek, Maryland, and Linkville, Klamath County, Oregon. Analyses of former by P. de P. Ricketts.

Delaware, Sand dunes of Lewes, ROTHROCK.

DEMING, J. L. See **HERRICK**, C. L. and **CLARKE**, E. S.

Denison University, Scientific Laboratories, Bulletin, vol. 2.

Clinton group of Ohio, FOERSTE.

Geological history of Licking County, HERRICK.

Geology of Michipiciton Bay, HERRICK, TIGHT and JONES.

—— **vol. 3.**

Clinton group of Ohio, FOERSTE.

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Reference to occurrence of beds indicating position of shore line.

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Am. Jour. Sci., 3d series, vol. 37, pp. 109-113. 1889.

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Am. Inst. Mining Engineers, Trans., vol. 17, pp. 636–637. 1889.

Includes brief reference to geologic relations of beds in which it occurs.

DILLER, J. S. Notes on the geology of northern California (abstract).

Washington, Phil. Soc., Bull., vol. 9, pp. 4–5 (additional note on p. 8). 1887.

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Am. Geologist, vol. 1, pp. 125–126, ½ p. 1888.

Popular Science Monthly, vol. 32, p. 419, 10 lines. 1888.

Abstract of U. S. Geol. Survey, Bulletin No. 33, described in the 1886 bibliography.

—— The latest volcanic eruption in northern California and its peculiar lava.

Am. Jour. Sci., 3d series, vol. 33, pp. 45–50. 1887.

Abstract, Am. Geologist, vol. 1, p. 126, ¼ p. 1888.

Describes beds of volcanic ash, in places inclosing the stumps of more or less decayed trees, and in part overlain by a peculiar "quartz basalt," the nature, origin, and occurrence of which is discussed at length.

—— Peridotite of Elliott County, Kentucky.

U. S. Geol. Survey, Bull., vol. 6, pp. 357–385, No. 38. 1887.

Abstracts, Am. Geologist, vol. 1, p. 125, ⅛ p. 1888. Popular Science Monthly, vol. 32, p. 420, ¼ col. 1888.

(By Geo. H. Williams), Neues Jahrbuch, 1887, vol. 2, pp. 475–476.

Describes its occurrence, micro-petrography, structure, and alteration. Discusses its nature, origin, and relations to the associated Carboniferous sandstones. Quotes Crandall's description of the region.

—— Supplementary note on the peridotite of Elliott County, Kentucky.

Am. Jour. Sci., 3d series, vol. 37, pp. 219–220. 1889.

Entirely petrographic.

—— [Report on petrography of peridotite from Douglas County, Oregon, and Webster, North Carolina.] See **CLARKE**, F. W., on nickel ores from Oregon.

—— and **KUNZ**, George F. Is there a diamond field in Kentucky?

Science, vol. 10, pp. 140-142. 1887.

Describe and figure the peridotite outcrops, call attention to an exposure of contact with the Carboniferous shales, and discuss the possibilities of the occurrence of diamonds.

DODGE, James A. Anthracite coal in the valley of the Bow River, Northwest Territory of Canada.

DODGE, James A.—Continued.

Am. Geologist, vol. 1, pp. 172–173. 1888.

Analyses and letter from A. Pugh on number of beds and dip.

DRUMMOND, A. T. The distribution and physical and past geological relations of British North American plants.

Canadian Record of Science, vol. 2, pp. 412–423, 457–469. 1887. Vol. 3, pp. 1–21. 1888.

Discusses probability of a Tertiary land connection between Asia and North America, and post-Tertiary changes in North American physiography which would impede the eastward extension of plants. Advances botanical evidence in opposition to the idea of regional glaciation in Canada, and argues in favor of local glaciation. Incidentally refers to climatic conditions in later Cretaceous and Eocene times indicated by the flora.

—— The prairies of Manitoba.

Canadian Record Science, vol. 3, pp. 39–43. 1888.

Description of superficial deposits and discussion of the origin of the prairies.

—— The great lake basins of Canada.

Canadian Record Science, vol. 3, pp. 142–147. 1888.

Abstract, Popular Science Monthly, vol 35, pp. 422–423, ½ p. 1889.

Objections to the theory of continental glaciation in America. Discussion of origin of the basins and the relations of land and water in northern North America during the glacial epochs.

—— The great lake basins of the St. Lawrence.

Canadian Record Science, vol. 3, pp. 247–287. 1889.

Abstracts, Science, vol. 13, p. 32, ⅔ col. 1889. Am. Geologist, vol. 3, pp. 197-199, ½ p. 8. 1889.

A discussion of their origin, history, associated superficial deposits, relations to geologic structure of the region and conditions during glacial period.

DUMBLE, E. T. The Nacogdoches oil field.

Geol. and Sci. Bull., vol. 1, March, 1888, ⅔ col.

References to the lower Eocene horizon of the oil-bearing beds.

DUNN, Russell L. Drift mining in California.

California, Eighth Report of State Mineralogist, pp. 736–770. 1888.

Includes references to the ancient drainage systems to which the gold-bearing gravels belong. Discusses relations, sequence, and extent of some of the lava flows by which this drainage system was displaced.

DUTTON, Clarence E. Mount Taylor and the Zuñi Plateau.

U. S. Geol. Survey, Sixth Report, J. W. Powell, 1884'-85, pp. 106-198, pls. 11-22. 1885.

Abstracts, Am. Jour. Sci., 3d series, vol. 34, pp. 155-198, pls. 11-12; Science, vol. 10, pp. 317-318. 1887.

Describes the High Plateau country as a whole, the formations of northwestern New Mexico, extending from upper Carboniferous to Wahsatch sandstone, the uplift or "swell" of the Zuñi Plateau, the Zuñi uplift, Mount Taylor and vicinity with its great middle Tertiary lava flows and old vents, the newer lavas of the San José valley region and their source, and the areal geologic features in general. Discusses questions of synchronism and stratigraphy, especially in regard to the Jura and Trias, the mechanism of the faults on the southwest side of the Zuñi Plateau, the relations of the Archean to the adjacent Carboniferous rocks along the axis of the Zuñi Plateau, and the age, extent, and mode of extrusion of the lavas of Mount Taylor and vicinity, and of the more recent flows. Chapter v consists of a general discussion of the geologic history of the High Plateau and adjoining regions.

—— The submerged trees of the Columbia River.

Science, vol. 9, pp. 82-84. 1887.

Describes evidence of a slight post-glacial transverse anticlinal as the cause of damming.

—— [On geologic nomenclature in general, and the classification, nomenclature, and distinctive characteristics of the pre-Cambrian formations, and the origin of serpentines.]

International Congress of Geologists, Am. Committee Reports, 1888, A, pp. 71-73.

[——] [On the use of the term Taconic.]

International Congress of Geologists, Am. Committee Reports, 1888, B., p. 17, 1 line.

Am. Geologist, vol. 2, p. 207. 1888.

Statement of opinion.

—— Report—Division of volcanic geology.

U. S. Geol. Survey, Seventh Report, J. W. Powell, 1885-'86, pp. 97-103. 1888.

Includes a general description of the geology of the region between the Cascade Ranges and the Sierra Nevada, the southern part of the Cascade Ranges, and the region westward, including the Coast Ranges in western Oregon and northwestern California.

—— On some of the greater problems of physical geology.

Washington Phil. Soc., Bull., vol. 11, pp. 51-64. 1889.

DUTTON, Clarence E.—Continued.

Discussion of earth crust deformation.

DWIGHT, William B. Palæontological observations on the Taconic limestones of Canaan, Columbia County, New York. (Abstract.)

American Naturalist, vol. 21, pp. 270-271. 1887.

Describes Trenton and Calciferous fossiliferous limestone exposures.

—— Primordial rocks of the Wappinger Valley limestones.

Vassar Brothers' Inst., Trans., vol. 4, pp. 130-141, Pl. 1. 1887.

Republication of a paper entitled "Discovery of fossiliferous Potsdam strata at Poughkeepsie, New York," in Am. Jour. Sci., 3d series, vol. 31, pp. 125-133, pl. 6, and described in the bibliography for 1886.

—— Primordial rocks of the Wappinger Valley limestones and associated strata.

Vassar Brothers' Inst., Trans., vol. 4, pp. 206-214. 1887. See, also, Am. Jour. Sci., 3d series, vol. 34, pp. 27-32. 1887.

Calls attention to several new localities of fossiliferous Potsdam and discusses the relations of the several belts of this formation to each other and to the associated limestones. Announces the discovery by himself and Walcott of middle Cambrian remains in the quartzites and limestone on the flanks of Stissing Mountain and its vicinity, and describes the structure of the region. Gives a general résumé of the formations occurring in Dutchess County, New York.

—— [Remarks on crustal plication in continental elevation.]

Vassar Brothers' Inst., Trans., vol. 4, pp. 271-273. 1887.

Discusses Warring's address on the evolution of continents.

—— Recent explorations in the Wappinger Valley limestone of Dutchess County, New York. No. 6. Discovery of additional fossiliferous Potsdam strata and pre-Potsdam strata of the Olenellus group, near Poughkeepsie, New York.

Am. Jour. Sci., 3d series, vol. 34, pp. 27-32. 1887.

Essentially similar to "Primordial rocks of the Wappinger Valley limestones and associate strata," which antedates it.

—— Recent explorations in the Wappinger Valley limestones and other formations of Dutchess County, New York. No. 7. Fossiliferous strata of the paradoxides zone at Stissing. No. 8. Dis-

DWIGHT, William B.—Continued.

covery of Calciferous fossils in the Millerton-Fishkill limestone belt; also in a belt near Rhinebeck.

Am. Jour. Sci., 3d series, vol. 38, pp. 139–153, pl. 6. 1889.

No. 7. Description of relations of Olenellus-Ordovician in the vicinity of Stissing Mountain and Pine Plains. Descriptions of fossils.

No. 8. Announcement of discovery of fossils and brief discussion of relations of limestones and schists in the vicinity of Millerton; also announces fossils from near Rhinebeck.

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Edinburgh Geological Society, Transactions, vol. 5.

Canadian and Scottish glacial geology, RICHARDSON.

Geology of Winnipeg district, McCHARLES.

Lake age in Ohio, CLAYPOLE.

Terraces of American lakes and roads of Glenroy, KINAHAN.

Eccentricity theory of glacial cold, CLAYPOLE.

ELDRIDGE, George H. Some suggestions upon the method of grouping the formations of the middle Cretaceous and the employment of an additional term in its nomenclature.

Am. Jour. Sci., 3d series, vol. 38, pp. 313–321. 1889.

Abstract, Am. Naturalist, vol. 24, p. 769, ½ p. 1890.

A discussion of the classification of the middle Cretaceous in the West and Northwest, including a general description of the characteristics of its several members.

—— On some stratigraphical and structural features of the country about Denver, Colorado.

Colorado Sci. Soc., Proc., vol. 3, pp. 86–118, 1889.

Description of the Archean and Triassic to Tertiary formations, coals, unconformities, faults, flexures, and topographic characteristics, discussion of various questions of equivalency and classification, and sketch of geologic history of the region.

Elisha Mitchell Scientific Society Journal, 1888, part 2.

Mica mining in North Carolina, PHILLIPS.

ELLS, R. W. Report on the geology of a portion of the eastern townships, relating more especially to the counties of Compton, Stanstead, Beauce, Richmond, and Wolfe.

Canada, Geol. and Nat. Hist. Survey, Report, 1886, part J, pp. 70, plates, map 5 in atlas. 1887.

ELLS, R. W.—Continued.

Abstracts, Ibid., part A, pp. 28–36. Geol. Magazine, III, vol. 6, pp. 134–135. 1889.

Description of Silurian, Cambro-Silurian, Cambrian, pre-Cambrian, granites, diorites, serpentines, drifts and structure, and discussion of the age, history, equivalency, and structural relations of the several formations, and the nature of glaciation in the region. List of glacial striæ. Accompanied by a colored geologic map.

—— Elementary lecture on geology.

Ottawa Naturalist, vol. 2, pp. 117–134. 1889.

An account of the history of geologic science and sketch of geologic history of Canada, in which are included brief discussions of the nature and relations of the pre-Cambrian crystallines and of the conditions during the Quaternary.

—— Notes on the geological relations and mode of occurrence of some of the more important economic minerals of eastern Quebec.

Ottawa Naturalist, vol. 3, pp. 45–57. 1889.

Includes a brief general account of the geology of the region, incidental references to geologic features, and allusions to age of the gold-bearing series and to occurrence and relations of the serpentines.

EMERSON, B. K. The Connecticut Lake of the Champlain period, north of Holyoke.

Am. Jour. Sci., 3d series, vol. 34, pp. 404–405, ½ p. 1887.

Abstract of paper on Hampshire County, Massachusetts. Describes the outline of the lake and its deposits. Discusses the duration of the lake and the remoteness of the glacial period.

—— [On the use of the term "Taconic."]

International Congress of Geologists, Am. Com. Reports, 1888, B, p. 17, 2 lines.

Am. Geologist, vol. 2, p. 207. 1888.

Expression of opinion.

—— Topography — geological features [etc.].

Massachusetts, Hampshire County Gazetteer, 1654–1887, by W. B. Gay, Syracuse, N. Y., pp. 10–22. 1888.

EMERSON, B. K.—Continued.

Crystalline rocks, Triassic formation and glacial features, and a brief sketch of the geologic history of the region.

—— On the Archean. See **FRAZER**. Report on Archean.

EMMONS, Ebenezer. Geology of the Montmorenci.

Am. Geologist, vol. 2, pp. 94–100. 1888.
From the Am. Magazine, November, 1841.

EMMONS, S. F. Report * * * Rocky Mountain division.

U. S. Geol. Survey, Sixth Report, 1884–'85, pp. 62–67. 1885.

Outlines evidence in the Gunnison district and elsewhere, indicating a Jurassic and a Carboniferous unconformity in the Rocky Mountain region. Describes the age and extent of the uplifts.

—— [On the use of the term "Taconic."]

International Congress of Geologists, Am. Committee Report, 1888, B, p. 17, 2 lines.
Am. Geologist, vol. 2, p. 207. 1888.
Expression of opinion.

—— Geology and mining industry of Leadville, Colorado. U. S. Geol. Survey, Monographs. No. 12, 2 vols. 4°: vol. 1, pp. xxix, 1–362, pls. 1–21; vol. 2, pp. 363–770, pls. 22–45, and folio atlas of 35 plates. Washington, 1886.

Abstracts, Science, vol. 11, pp. 18–19, 1889; Am. Geologist, vol. 1, pp. 194–195, 1888; Nature, vol. 39, pp. 484–485, 1889; Scottish Geogr. Mag., vol. 5, pp. 198–202, 1889.

Detailed description of the geology of the Mosquito Range and of Leadville and vicinity. Discusses geologic history; stratigraphy and structural relations; origin of dolomites; occurrence of serpentine in Silurian rocks and elsewhere; the relations of the faults and flexures and their development; the structure of the Rocky Mountains and Basin Ranges; the succession, age, extent, texture, and composition of the eruptive rocks, the mechanism and extent of intrusion, the distribution of intrusives in the Rocky Mountains, the occurrence of laccolites in the Henry Mountains and elsewhere; contact, metamorphism, classification of ore deposits in general, and the relations, composition, and genesis of the Leadville deposits. Accompanied by maps, plans, and sections, and includes: Appendix A, Petrography, by Whitman Cross; B, Chemistry, by W. F. Hillebrand, and C, Metallurgy, by Antony Guyard.

—— Notes on some Colorado ore deposits.

Colorado Sci. Soc., Proc., vol. 2, part 2, pp. 85–105. 1887.

Considers the relation of faults to ore deposits, describing some features of the Leadville, Carbonate Hill, and San Juan regions.

EMMONS, S. F.—Continued.

Discusses some metamorphic changes in the San Juan region and secondary alteration of ore deposits in general, and as observed at Red Cliff and Leadville.

—— Notes on the geology of Butte, Montana.

Am. Inst. Mining Engineers, Trans., vol. 16, pp. 49–62. 1887.

Describes the topography, mineral deposits and characteristics, and distribution of the rocks. Discusses the origin of the depression in which Butte is situated, the history of its ores, and the relations of the fissures. The genesis of the ores is also discussed by R. W. Raymond, pp. 11–14.

—— The submerged trees of the Columbia River.

Science, vol. 9, pp. 156–157. 1887.

Discusses the cause of the damming of the Columbia River, restating an explanation previously published, and opposing Dutton's theory of a transverse anticlinal.

—— Structural relations of ore deposits.

Am. Inst. Mining Engineers, Trans., vol. 16, pp. 804–839. 1888.

Discussion of causes, nature, and relations of structural and physical conditions affecting the transportation and deposition of mineral matter. References to relations of faults and mineral deposits in various parts of Colorado and at the Ontario mine, Utah.

—— On the origin of fissure veins.

Colorado Sci. Soc., Proc., vol. 2, pp. 189–208. 1888.

Discussion of the physical and structural conditions affecting the transportation and deposition of mineral matters and the origin and relations of fissures and planes produced by dynamic movements.

—— On glaciers in the Rocky Mountains.

Colorado Sci. Soc., Proc., vol. 2, pp. 211–227. 1888.

Consists mainly of a discussion of distinctions between glaciers and névé and an account of the existence of glaciers in the Rocky Mountains and the Sierra Nevada. Refers also to the results of former glaciation in the same regions.

—— Preliminary notes on Aspen, Colorado.

Colorado Sci. Soc., Proc., vol. 2, pp. 251–277. 1888.

Account of geologic relations of the region and discussion of the structure of Aspen Mountain, the dolomitization of the limestones, and evidence bearing on the sequence of porphyry intrusions, faulting, and ore deposition. Reference to evidences of glaciation.

—— [On subdivisions, nomenclature, origin of some members, and characteris-

EMMONS, S. F.—Continued.
tics of the Archean, classification of eruptives, and origin of serpentines.]

International Congress of Geologists, Am. Committee Reports, 1888, A, pp. 58–61.

—— [On the use of the Term "Taconic."

International Congress of Geologists, Am. Committee Report, 1888, B, p. 17, 2 lines.

ENDLICH, F. M. The origin of the gold deposits near Ouray, Colorado.

Eng. and Mining Jour., vol. 48, p. 335, ⅓ p. 4°. 1889.

Includes a general description of the geologic features of the region.

ENGINEERING AND MINING JOURNAL. Gogebic iron mines.

Eng. and Mining Jour., vol. 43, p. 182, 4°. 1887.

Description of nature and structure of ore beds and associated strata.

—— The "Dauntless" core drill.

Eng. and Mining Jour., vol. 46, p. 193. 4°. 1888.

Gives columnar section of coal measures in drill-hole at Saybrook, Illinois.

—— The Sylvanite mine, Colorado.

Eng. and Mining Jour., vol. 46, pp. 499–500. 4°. 1888.

Brief reference to presence of associated diorite and highly altered sediments.

—— Zinc mining in Arkansas.

Eng. and Mining Jour., vol. 47, p. 431, ⅓ p. 4°. 1889.

Includes a brief general sketch of geology of zinc region in Marion County.

Engineering and Mining Journal, vols. 43 and 44.

American chemical industries, salt, WYATT.
Battle Mountain mining district, OLCOTT.
Chapin iron mine, Lake Superior, LARSSON.
Copper deposits, Morenci, Arizona, HENRICH.
Copper ores of Southwest, WENDT.
Earthquake phenomena, FREEMAN.
Elements of primary geology, HUNT.
Fossil fuels of Illinois, COMSTOCK.
Geologic map of Europe, RAYMOND.
Geologic survey of New Jersey, Report, RAYMOND.
Gogebic iron mines, ENG. AND MINING JOURNAL.
Lead and copper of Missouri, CLERC.
Mineral resources of Kentucky, PROCTOR.

Engineering and Mining Journal, vols. 43 and 44—Continued.
Natural gas in United States, ASHBURNER.
Phœnix mine, Arizona, RICKETTS.
San Pedro copper mine, New Mexico, HENRICH.
Silver mines, Thunder Bay, BELL.
Tin in North Carolina, VAN NESS.

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Western iron belt of Tennessee, KILLEBREW.
East Tennessee minerals, COWLAM.
Mineral resources of Tennessee, PROCTOR.
Cœur d'Alene silver-lead mines, CLAYTON.
Beaver mine, Ontario, Canada, BRENT.
Formation of coal seams, NATHURST.
Geology of Aspen, Colorado, ore deposits, SIVER.
Geology and mining industry of Leadville, Emmons [Review], RAYMOND.
Mica mining in North Carolina, PHILLIPS.
Formation of coal seams, GRESLEY.
Formation of coal beds, WARDROPER.

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Aspen Mountain ores, BRUNTON.
Drumlummon group of veins, CLAYTON.
Ore deposits of Red Mountain district, Colorado, KEDZIE.
"Dauntless" core drill, ENGINEERING AND MINING JOURNAL.
Michigan gold fields, PARKER.
Coal measures of Kansas, WOOSTER.
Petite Anse salt mine, POMEROY.
Life history of Niagara Falls, POHLMAN.
Ore deposits in limestones, HENRICH.
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Metamorphism in rocks, HENRICH.
Drainage of the valley of Mexico, CHISM.
Colorado oil fields, NEWBERRY.
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Coal field of southwest Virginia, KILLEBREW.
Reymert lode, Arizona, BLAUVELT.
Zinc mining in Arkansas, ENG. AND MINING JOURNAL.

EVANS, F. Johnston. Among the ancient glaciers of North Wales.

Am. Naturalist, vol. 23, pp. 8–17. 1889.
Description of evidences of glaciation.

F.

FARIBAULT, E. R. Report on the lower Cambrian rocks of Guysborough and Halifax counties, Nova Scotia.

Canada, Geol. and Nat. Hist. Survey, Report, 1886, part P, pp. 129–163. 1887.
Abstract, Ibid., part A, pp. 43–45.
Description of the distribution, characteristics, and contact relations of the granites and the Cambrian beds, and the faults and flexures traversing them.

FARNSWORTH, P. J. Pockets containing fire-clay and carbonaceous materials in the Niagara limestone at Clinton, Iowa.

Am. Geologist, vol. 2, pp. 331–334. 1888.
Description and discussion of mode of origin and equivalency with other similar deposits.

FAUR, Faber du. The sulphur deposits of southern Utah.

Am. Inst. Mining Engineers, Trans., vol. 16, pp. 33–35. 1887.
Describes decomposed andesites, trachyte, and limestone with sulphur impregnations.

FELIX, Johannes. Ueber einen besuch des Jorullo in Mexico.

Deutsche Geol. Gesell., Zeit., vol. 40, pp. 355–357. 1888.

FELIX, Johannes—Continued.
Includes references to the nature and relations of the lavas, and the character of the crater.

FEWKES, J. Walter. On the origin of the present form of the Bermudas.

Boston Soc. Nat. Hist., Proc., vol. 23, pp. 518–522. 1888.
Discussion of erosive agents and extent of erosion.

—— Across the Santa Barbara Channel.

Am. Naturalist, vol. 23, pp. 211–217, 387–394. 1889.
Includes references to some geologic features and history of Santa Cruz Island, and the origin of some sandstone bowlders near Santa Barbara.

FINCH, W. W. Infusorial earth at Santa Barbara, California.

Santa Barbara Soc. Nat. Hist., Bull. No. 1, pp. 8–11. 1887.
Not seen.

FISCHER, Moritz. Natural gas in Kentucky.

U. S. Geol. Survey, Mineral Resources, 1887, pp. 489–492. 1888.
Abstract from Am. Manufacturer, Natural gas supplement. 1886.

FLEMING, H. S. General description of the ores used in the Chattanooga district.

Am. Inst. Mining Engineers, Trans., vol. 15, pp. 757–761. 1887.

Analyses of some Alabama and East Tennessee Clinton iron ores.

FLETCHER, Hugh. Report on geological surveys and explorations in the counties of Guysborough, Antigonish, and Pictou, Nova Scotia, from 1882 to 1886.

Canada, Geol. and Nat. Hist. Survey, Report, 1886, part P, pp. 5–128. 1887.

Abstract, Ibid., part A, pp. 42–45.

Geol. Magazine, III, vol. 6, pp. 136–137, ⅔ p. 1889.

Description of formations from pre-Cambrian to Permian, superficial deposits, volcanic and metamorphic rocks, structural relations and overlaps, and discussion of equivalency, age, history, and distribution of the formations at various localities. Soils.

Florida, deposits of phosphate of lime, PENROSE.

geology of, DALL. JOHNSON.

Geologic Survey Report, KOST.

Miocene, LANGDON.

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well at St. Augustine, KENNISH.

intermediate Pleistocene fauna, COPE.

FOERSTE, A. F. The Clinton group of Ohio, part 2.

Denison Univ. Bull., vol. 2, pp. 89–110, pl.; pp. 148–176, pls. x, XV–XVII. 1887.

Paleontologic.

—— Notes on a geological section at Todd's Fork, Ohio.

Am. Geologist, vol. 2, pp. 412–419. 1888.

Description of Cincinnati blue clay, marking the period of disturbance between lower and upper Silurian. Discussion of equivalency, paleonotologic relations, and history of the several members.

—— The Clinton group of Ohio, part IV.

Denison Univ., Sci. Laboratories, Bull., vol. 3, pp. 3–12. 1888.

Lithologic characteristics; analyses; occurrences of fossils; discussion of subdivisions and their equivalency, relations to adjoining formations, extent and faunal relations.

—— The paleontological horizon of the limestone at Nahant, Massachusetts.

Boston Soc. Nat. Hist., Proc., vol. 24, pp. 261–263. 1889.

Abstract, Am. Jour. Sci., 3d series, vol. 39 p. 11, ½ p. 1890.

FOERSTE, A. F.—Continued.

Discussion of the relations and equivalency of the Nahant limestones and of the Cambrian rocks of eastern Massachusetts.

—— Notes on Clinton group fossils, with special reference to collections from Indiana, Tennessee, and Georgia.

Boston Soc. Nat. Hist., Proc., vol. 24, pp. 263–355, pls. 5–9. 1889.

Abstract, Am. Jour. Sci., 3d series, vol. 40, pp. 252–254. 1890.

Includes brief description of the stratigraphy of the Silurian formations at Hanover, Indiana, and at a locality in northwestern Georgia.

—— Fence-wall geology.

Am. Geologist, vol. 4, pp. 367–371. 1889.

Sci. Am. Supt., vol. 29, pp. 11748–11749, 1½ cols., 4°, No. 735. 1890.

Hints on the study of areal geology in drift-covered areas.

FORD, S. W. [On the nomenclature of the American lower Paleozoic.]

International Congress of Geologists, Am. Committee Reports, 1888, B, pp. 9–10.

Am. Geologist, vol. 2, pp. 199–200. 1888.

Reference to the equivalency of the "Quebec group," use of term Cambrian, position of base of Silurian, and the application of the term "primordial fauna."

—— Notes on certain fossils discovered within the city limits of Quebec.

New York Acad. Science, Trans., vol. 7, pp. 2–5. 1888.

Review of Charles Lapworth, 1886. Discussion of the age and faunal relations of the containing beds, and of the stratigraphic position and relations of the Norman's Kill graptolitic slates in central eastern New York.

Forum, 1888, Changes of level of the Great Lakes, GILBERT.

Franklin Institute, Journal, vols. 123, 124.

International Congress of Geologists, FRAZER.

Stratification of anthracite of Pennsylvania, WASMUTH.

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Southern anthracite coal field of Pennsylvania, WASMUTH.

FRAZER, Persifor, jr. A card to American geologists.

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Announcement of time of meeting of American Committee of the International Congress, and request for statements of views in regard to classification, nomenclature, coloring, etc.

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Describes the occurrence and literature of the belt of serpentines on New York Island, giving an account of their micropetrography and discussing the origin of their constituent minerals. Evidence is presented which is thought to indicate the probable inorganic character of the eozoonal structure.

—— [Notice of occurrence of bowlder of Oriskany sandstone on Staten Island.]

Staten Island, Nat. Sci. Assoc., Proc., March, 1889.

Am. Naturalist, vol. 23, pp. 549–550, ¾ p. 1889.

Includes a list of the twenty species of fossils which it contained.

GREGG, A. Economic minerals of San Saba County.

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Royal Geog. Soc., Proc., vol. 11, pp. 153–169. 1889.

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Discusses method of accumulation of materials.

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California, Sixth Annual Report of the Mineralogist, part I, pp. 56–57. 1886.

Through gravels, sands, and clays to 650 feet in one well and 472 feet in the other.

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U. S. Geol. Survey, Sixth Annual Report, 1884-85, pp. 54–59. 1885.

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—— Geological history of the Yellowstone National Park.

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Abstract, Popular Science Monthly, vol. 36, pp. 282–283, ½ p. 1889.

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—— [On the Archean and its subdivisions.]

International Congress of Geologists, Am. Committee Reports, 1888, A, pp. 66–67.

Discusses the distinctness of the Archean as a system, separateness of the Huronian, and the subdivision and classification of eruptives in the Archean.

[——] [On the use of the term "Taconic."]

International Congress of Geologists, Am. Committee Reports, 1888, B, p. 17, 2 lines.

Am. Geologist, vol. 2, p. 207. 1888.

Suggestion in regard to its application.

—— Notes on the occurrence of a leucite rock in the Absaroka range, Wyoming Territory.

Am. Jour. Sci., 3d series, vol. 38, pp. 43–47. 1889.

Abstract, Am. Naturalist, vol. 23, p. 811, ½ p. 1889.

Account of a bowlder of leucite rock, and discussion of its petrography, composition, and origin. Includes a petrographic description by J. P. Iddings, an analysis by J. E. Whitfield, and a list of localities of leucite-bearing rocks in various parts of the world.

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Prefaced by an account of the Keweenawan formation, and brief discussion of its extent in Minnesota.

HALL, C. W.—Continued.

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Minnesota, Acad. Sci., Bull., vol. 3, part 1, pp. 111–124, pl. 1. 1889.

Detailed description of Trenton and the underlying St. Peters sandstone in the vicinity of the city. Analyses. Well record. Reference to glacial striæ and thickness of drift.

—— The geological conditions which control artesian well borings in southeastern Minnesota.

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—— The distribution of the granites of the Northwestern States and their general lithologic characters. [Abstract.]

Am. Assoc. Adv. Science, Proc., vol. 37, pp. 189–190. 1889.

List of localities, summary of petrographic characteristics, and reference to age.

—— Field notes on the geology of the Mohawk valley. See [**Beecher**, C. E., and **Hall**, C. E.?]

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Description of some of the gneisses, granites, and marbles of New York and New England and the limestones and sandstones of New York. Discusses the qualities, selection, and causes of decay in building stones.

—— Report of the State Geologist.

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—— [On the nomenclature of the American lower Paleozoic.]

International Congress of Geologists, Am. Committee Reports, 1888, B, p. 10, ⅔ p.

Am. Geologist, vol. 2, p. 200. 1888.

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California, Sixth Annual Report of the Mineralogist, part 1, pp. 16–34. 1886.

Description of well known building stones and of California localities. Gives partial analyses of a dunyte from San Diego County and a sandstone from Santa Barbara.

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California, Sixth Annual Report of the Mineralogist, part 1, pp. 78–79, 2 plates. 1886.

Description of outcrop of columnar basalt. Considers the mountain an old volcano, but finds no evidence of a crater.

[——] San Diego County.

California, Sixth Annual Report of the Mineralogist, part 1, pp. 80–90, map. 1886.

Incidental geologic and mineralogic notes. Describes fold in slates in mine at Banner. Accompanied by a colored geologic map of the county, provisionally illustrating the distribution of Quaternary, Tertiary, Permo-Carboniferous, and Archean.

[——] California minerals.

California, Sixth Annual Report of the Mineralogist, part 1, pp. 91–141. 1886.

Includes descriptions of some localities of lignite, various kinds of quartz, limestones, and serpentines.

—— On the occurrence of hanksite in California.

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HARKER, Alfred. The Cortlandt rocks.

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Brief references to outcrops and characteristics.

Harvard, Museum Comparative Zoölogy, Bulletin, vol. 16.

Dike of diabase in Boston basin, HOBBS.

Cambrian district of Bristol County, Massachusetts, SHALER.

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Fossil plants from Golden, Colorado, LESQUEREUX.

Faults in Trias near Meriden, Connecticut, DAVIS.

Triassic trap sheets of Connecticut valley, DAVIS and WHITTLE.

—— **vol. 17.**

Coral reefs of Hawaiian Islands, AGASSIZ.

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Halema'una'u and its débris cone, DANA, J. D.

Mount Loa craters, BAKER. DANA, J. D. MERRITT.

Petrography, DANA, E. S.

HAWORTH, Erasmus. A contribution to the Archean geology of Missouri.

Am. Geologist, vol. 11, pp. 280–297, 363–382, part 1. 1888.

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General description of relations of the massive rocks to each other and to the stratified rocks, and petrographic description of granites, porphyries, and diabases.

HAY, O. P. On the manner of deposit of the glacial drift.

Am. Jour. Sci., 3d series, vol. 34, pp. 52–58. 1887.

Statement of the views of Dana, the Geikies, Newberry, and N. H. Winchell. Discusses the action of the glacier on its bed, in general and under varying circumstances, and the mode of accumulation of drift-material at its base and in the terminal moraine.

—— The northern limit of the Mesozoic rocks in Arkansas.

Arkansas, Geol. Survey, Report for 1888, vol. 2, pp. 261–290. 1888.

Descriptions of outcrops, and relations of the Cretaceous in the vicinity of the Mesozoic-Paleozoic boundary line.

—— A geological section in Wilson County, Kansas.

Kansas Acad. Sci., Trans., vol. 10, pp. 6–8, plate. 1888.

Discussion of rate of dip, evidence of a fault, and equivalency of the Dun limestone with the Humboldt limestone.

HAY, O. P.—Continued.

—— Report on geology.

Kansas Acad. Sci., Trans., vol. 10, pp. 21–22. 1888.

Discussion of the eastern extension of the Tertiary in southern Kansas, and the equivalency and boundary of the red rocks and gypsum in the region extending from Comanche County to Medicine Lodge.

—— Natural gas in eastern Kansas.

Kansas Acad. Sci , Trans., vol. 10, pp. 57–62, plate. 1888.

Abstract from Fifth Report of State Board of Agriculture.

Reference to geologic position of gas-yielding beds. Gives sections at Fort Scott, and refers to the stratigraphic and structural relations in that vicinity. Partial section from Fort Scott, Kansas, to Nevada, Missouri, on plate.

—— Note on a remarkable fossil.

Kansas Acad. Sci., Trans., vol. 10, pp. 128–129, ⅔ p., plate. 1888.

Includes brief discussion of the derivation of the enclosing concretion in its bearing on the location of the former eastern boundary of the Cretaceous.

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—— Lecture. The geology of Kansas.

Kansas Acad. Sci., Trans., vol. 11, pp. 35–37. 1889.

References to distribution and relations of the Jura-Trias, Cretaceous, and Tertiary.

—— The Triassic rocks of Kansas. [Abstract.]

Kansas Acad. Sci., Trans., vol. 11, pp. 38–39, ½ p. 1889.

Abstract, Am. Geologist, vol. 5, p. 250, 3 lines. 1890.

References to their relations to the Permo-Carboniferous and absence of unconformity at their base.

—— Recent discoveries of rock salt in Kansas. [Abstract.]

Am. Assoc. Adv. Science, Proc., vol. 37, pp. 184–185. 1889.

Statements in regard to its stratigraphic position and relations, and brief sketch of the Permian-"Dacotah" history of the region.

—— and **THOMPSON**, A. H. Historical sketch of geological work in the State of Kansas.

HAY, O. P.—Continued.

Kansas Acad. Sci., Trans., vol. 10, pp. 45–52. 1888.

Statements of the conclusions of each observer, and description of some unpublished papers in which information is given in regard to the eastern dip of the strata in the eastern part of the State, and the now known order of Kansas formations.

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U. S. Geol. Survey, Sixth Report, J. W. Powell, 1884-'85, pp. 48–53. 1885.

Statement of results of studies in the region between the Bridger or East Gallatin range and the three forks of the Missouri Briefly describes the structure and stratigraphy of the several formations—including the newly discovered Devonian—the lake deposits of the Gallatin valley, and the drift.

—— Report . . . . . Montana division of geology.

U. S. Geol. Survey, Seventh Report, J. W. Powell, 1885-'86, pp. 85–87. 1888.

Reference to relations of formations from Cambrian to Carboniferous and coals, and evidence of glacial action in the Gallatir range region, and to the volcanic constituents, age, origin, and relations of the lake beds of Gallatin valley.

HEADDEN, William P. [Notice of a thin bed of infusorial earth in west Denver.]

Colorado Sci. Soc., Proc., vol. 2, p. 183, ⅛ p. 1888.

HEILPRIN, Angelo. Explorations on the west coast of Florida and in the Okeechobee wilderness, with special reference to the geology and zoölogy of the Floridian peninsula.

Wagner Inst., Trans., vol. 1, pp i–viii, 1–134, pls. II, 1–19. 1887.

Abstracts, Am. Jour. Sci., 3d series, vol. 34, pp, 230–232. 1887. Popular Science Monthly, vol. 33, p. 418, ⅓ p. 1887.

Describes outcrops and occurrence of fossils. Summarizes observations on rocks of Homosassa, Cheeshowiska, Pithlachascootie, Manatee, and Caloosahatchee rivers, Tampa Bay, Hillsboro, and Sarasota Bay. Discusses literature, extent, equivalency, and paleontology of the subdivisions of the Tertiary; the coral-reef theory, and the general geologic history of the peninsula. Gives a table showing the relations of the "Atlantic and Gulf coast Tertiaries of the United States."

—— [On the classification of the Tertiary deposits.]

International Congress of Geologists, Am. Committee Reports, 1888, F, pp. 12–14.

HEILPRIN, Angelo —Continued.

Am. Geologist, vol. 2, pp. 278–280. 1888.

Discussion of upper limit of Tertiary and nomenclature.

[——] [Remarks on P. R. Uhler's paper on the Alburipean and associated formations in Maryland.]

Am. Phil. Soc., Proc., vol. 25, p. 54, ½ p. No. 127. 1888.

Expression of opinion that part of the "Alburipean" is Paleozoic, and in regard to the age of the Potomac formation.

—— The Miocene mollusca of the State of New Jersey.

Philadelphia Acad. Sci., Proc., 1887, p. 397.

Lists of fossils, notes on new and old species, and expression of opinion regarding age and equivalency of the Miocene members at Shiloh and in the Atlantic City well.

[——] Determination of the age of rock deposits.

Philadelphia Acad. Sci., Proc., 1887, p. 395.

Discussion of rates of deposition.

—— The classification of the post-Cretaceous deposits.

Philadelphia Acad. Sci., Proc., 1888, pp. 314–322.

Review of faunal relations and equivalency of the Tertiary formations mainly in the United States; and discussion of the value of the faunal element in geologic chronology.

—— The Bermuda Islands; a contribution to the physical history and zoölogy of the Somers Archipelago, with an examination of the structure of coral reefs, pp. 231, pls. 17. Philadelphia. 1889.

Includes an account of their geology and physiography, a discussion of the coral-reef problem, and a review of recent literature on coral reefs.

—— On Archean. See **FRAZER**. Report on the Archean.

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Eng. and Mining Jour., vol. 43, p. 183. 4°. 1887.

Statement of character and dip of containing limestones.

—— The copper ore deposits near Morenci, Arizona.

Eng. and Mining Jour., vol. 43, pp. 202–203, 219–220. 4°. 1887.

Description of geologic relations of containing formations.

HENRICH, Carl—Continued.

—— Some forms of ore deposits in lime stone.

Eng. and Mining Jour., vol. 46, pp. 368–369. 4°. 1888.

Reference to attitude and evidences of internal erosion of limestones inclosing lead ores in Morgan County, Missouri, and Beaverhead County, Montana.

—— The United and Champion copper mines of New Zealand.

Eng. and Mining Jour., vol. 46, pp. 414–416. 4°. 1888.

Description of geologic relations of great "Serpentine" dikes in which the ores occur.

—— Metamorphism in rocks.

Eng. and Mining Jour., vol. 46, p. 461, ½ p. 4°. 1888.

Discusses the agency of highly heated underground waters under great pressure.

—— Notes on the geology and on some of the mines of Aspen Mountain, Pitkin County, Colorado.

Am. Inst. Mining Engineers, Trans., vol. 17, pp. 156–206. 1889.

Stratigraphy of beds from Cambrian to Carboniferous, structural relations, faults, intrusives, and ore deposits. Mainly a discussion of structural relations.

—— The Slaybach lode—a peculiar kind of fissure vein.

Eng. and Mining Jour., vol. 48, p. 27, ⅔ p. 4°. 1889.

Includes some statements in regard to relations of associated volcanic rocks, and dikes.

—— Is a faulted fissure always the oldest? A study of faults.

Eng. and Mining Jour., vol. 48, p. 159, ⅔ p. 4°. 1889.

Discussion of mechanism of crossed faults.

HERRICK, C. L. A sketch of the geological history of Licking County, accompanying an illustrated catalogue of Carboniferous fossils from Flint Ridge, Ohio.

Denison Univ., Bull., vol. 2, pp. 5–68, pls. I–VI, pp. 144–148. 1887.

Detailed description of the geologic relations, the outcrops, structure, and characteristics of the Waverly and immediately overlying rocks. Discusses the mode and rate of deposition of the formations, the origin of their materials, and their paleontologic relations. Gives structural and columnar sections.

—— The geology of Licking County, Ohio, part III.

HERRICK, C. L.—Continued.

Denison Univ., Bull., vol. 3, pp. 13–110, pls. I–XII. 1888.

Abstracts, Am. Jour. Sci., vol. 37, pp. 317–318, ½ p., 1889; Am Geologist, vol. 3, p. 50, ½ p. 1889.

Discussion of the stratigraphic position and range of the Waverly and description of its stratigraphy, paleontology, and inclination, and of evidence of local unconformity in the sub-Carboniferous at some points. List of fossils, pp. 27–37.

—— Geology of Licking County, part IV.

Denison University, Bull., vol. 4, pp. 11–60, 97–123. pls. I–XI. 1888.

Abstracts, Am. Jour. Sci., 3d series, vol. 37, pp. 317–318, ½ p., 1889; Am. Geologist, vol. 3, p. 50, ½ p. 1889.

Pages 11–60 and 114–123, descriptions and lists of fossils.

Pages 97–114, discussion of stratigraphy of Waverly and associated series.

—— Notes on the Waverly group in Ohio.

Am. Geologist, vol. 3, pp. 94–99, pls. I–IV. 1889.

Discussion of the equivalency, taxonomy, and paleontologic relations of the Waverly members.

—— **CLARKE**, E. S. and **DEMING**, J. L. Some American norytes and gabbros.

Am. Geologist, vol. 1, pp. 339–346, pl. 1888.

Discussion of the modifications induced in basic eruptives by the interpenetrated rocks and description of occurrence and petrography of olivine noryte and adjacent rocks near Marshall, North Carolina, the Duluth gabbros and the garnetiferous gabbros from Granite Falls, Minnesota. Review of Wadsworth on the origin of diorites.

—— **TIGHT**, W. G. and **JONES**, H. L. Geology and lithology of Michipicoten Bay.

Denison Univ., Bull., vol. 2, pp. 119–143, pls. 10–13. 1887.

Abstracts, Am. Jour. Sci., 3d series, vol. 34, p. 12, ½ p. 1887; Am. Naturalist, vol. 21, pp. 654–655, pls. 22–23, 1887, (by Herrick?)

After reviewing the work of previous observers, especially McFarlan, describe the geologic features of the region and the micro-petrography and mode of occurrence of a series of rock specimens. Discuss the nature, relative positions, stratigraphic and structural relations, variations and equivalency of the Laurentian, Huronian, and Keweenawan series. Illustrated by maps and structural and micro-rock sections.

HEWETT, G. C. The northwestern Colorado coal region.

Am. Inst. Mining Engineers, Trans., vol. 17, pp. 375–380. 1889.

HEWETT, G. C.—Continued.

Statement in regard to geologic horizon and distribution of the coals and the general stratigraphy of the region. Notice of very recent lava flows.

HICKS, Henry. The Cambrian rocks of North America.

Geol. Mag., 3d decade, vol. 4, pp. 155–158. 1887.

Summarization of Walcott's views on the use of the term Cambrian and the faunal, and stratigraphic relations and equivalency of the subdivisions of the formation.

—— [Remark on equivalency of the Huronian with the Pebidian.]

Geol. Soc., Quart. Jour., vol. 44, p. 817, ¼ p. 1888.

HICKS, Lewis E. [Diatomaceous earth on North Loup River, Nebraska.]

Am. Geologist, vol. 1, p. 136. 1/10 p. 1888.

Notice of its occurrence and thickness.

—— Geyserite in Nebraska.

Am. Geologist, vol. 1, pp. 277–280, vol. 2, p. 437. 1888.

Reference to occurrences of volcanic dust in Nebraska, and extracts from "Physical geography and geology of Nebraska," 1880, by Samuel Aughey on polishing powders and supposed infusorial earth and geyser flocula.

—— The reef-builders.

Am. Geologist, vol. 1, pp. 297–305. 1888.

Discussion of the theories of Darwin and Murray.

—— [Volcanic dusts from Krakatoa, and from Nebraska and Kansas.]

Am. Geologist, vol. 2, p. 64, ½ p. 1888.

Reference to evidence of their volcanic nature.

—— [Quartzite between Niobrara and O'Neil, Nebraska, and its relation to the Valentine quartzite.]

Am. Geologist, vol. 2, pp. 351–352, ½ p. 1888.

Reference to occurrence of quartzite on road from Niobrara to O'Neil, Nebraska, and discussion of its age and equivalency with the Tertiary quartzite at Valentine, Nebraska.

—— Diatomaceous earth in Nebraska.

Am. Jour. Sci., 3d series, vol. 35, p. 86, ¼ p. 1888.

List of species. Brief reference to mode of occurrence.

—— Soils of Nebraska as related to geological formations.

Am. Geologist, vol. 3, pp. 36–45. 1889.

Includes a preliminary geologic map and sketch of the geology of the State.

HILGARD, E. W. The equivalence in time of American marine and intra-continental Tertiaries.

Science, vol. 9, pp. 525–536. 1887.

Calls attention to the opportunities afforded for the determination of the relations of interior and gulf Tertiaries, in the region between and adjacent to the Red and Arkansas rivers. Discusses the correlation of some of the members of the two series.

—— [On the use of the term "Oligocene" in the gulf region.]

International Congress of Geologists, Am. Committee Reports, 1888, F, p. 7, 6 lines.

Am. Geologist, vol. 2, p. 273. 1888.

Opinion in regard to its inapplicability.

—— [On the relations of the Grand Gulf series.]

International Congress of Geologists, Am. Committee Reports, 1888, F, pp. 8–9.

Am. Geologist, vol. 2, pp. 274–275. 1888.

To associated and correlated formations.

—— [On the inclusion of "Quaternary" in the Tertiary.]

International Congress of Geologists, Am. Committee Reports, 1888, F, pp. 14–15, ⅓ p.

Am. Geologist, vol. 2, pp. 280–281. 1888.

Statement of opinion.

—— Agriculture and late Quaternary geology.

Science, vol. 11, pp. 241–242, ¾ p. 1888.

Descriptions of evidence of an ancient drainage system in the upper San Joaquin valley, California.

HILL, Frank A. Geology and mining in the northern coal-field of Pennsylvania.

Am. Inst. Mining Engineers, Trans., vol. 15, pp. 699–707. 1887.

General description of the geologic features.

—— Report on the Anthracite region.

Pennsylvania, Report of Geol. Survey, 1886, part 3, pp. 919–1329, 4 plates, 7 sheets in atlas. 1887.

Description of northern and western-middle coal-fields and discussion of structural and stratigraphic relations in some parts of the areas, pp. 925–1007. Sections in northern and eastern and western-middle fields.

—— Lehigh River section continued from Lock 11, southward to the Blue Mountain.

Pennsylvania, Report of Geol. Survey, 1886, part 4, pp. 1372–1385. 1887.

Detailed description of the stratigraphy of beds from Pocono to top of Loraine slate, and of the structural relations of the region. Reference to glacial drift and striæ.

HILL, Frank A.—Continued.

—— Report on the metallic paint ores along the Lehigh River.

Pennsylvania, Report of Geol. Survey, 1886, part 4, pp, 1386–1408, sheet 6 in atlas. 1887.

Description of geologic relations, structure of paint beds, and sections in mines.

—— Atlas southern anthracite field, part 2. Pennsylvania Geol. Survey, AA. 13 sheets. Harrisburg. 1889.

Colored geologic maps.

—— Atlas eastern middle anthracite field, part 3. Pennsylvania Geol. Survey, AA. 13 sheets. Harrisburg, 1889.

Colored geologic maps, and columnar and cross sections.

—— Atlas northern anthracite field, part 4. Pennsylvania Geol. Survey, AA. 8 sheets. Harrisburg, 1889.

Colored geologic maps, with marginal columnar sections.

—— Atlas northern anthracite field, part 5. Pennsylvania Geol. Survey, AA. 7 sheets. Harrisburg, 1889.

Cross and columnar sections in coal-measures.

HILL, Robert T. A partial report on the geology of western Texas.

Am. Jour. Sci., 3d series, vol. 33, pp. 73–75. 1887.

Notice of G. G. Shumard's posthumous report. Describes the work of the Shumards, and points out the erroneousness of their opinion in regard to the stratigraphic relations of the subdivisions of the Cretaceous to each other, and to the Tertiary.

—— The topography and geology of the Cross-Timbers and surrounding regions in northern Texas.

Am. Jour. Sci., 3d series, vol. 33, pp. 291–303, plate 6. 1887.

Abstract, Am. Naturalist, vol. 21, p. 172, ½ p. 1887.

Describes the general topographic and geologic features of Texas, and the relations of the Cretaceous. Points out the cause of the cross-timbers, and discusses their extent and geologic relations. Gives a table showing the history, position, equivalency, stratigraphy, paleontology, and occurrence of the subdivisions of the Cretaceous of northern Texas. Accompanied by a hypsometric map.

—— The Texas section of the American Cretaceous.

Am. Jour. Sci., 3d series, vol. 34, pp. 287–309. 1887.

Describes the subdivisions of the Texas

HILL, Robert T.—Continued.

Cretaceous, and discusses their faunal and stratigraphic relations, extent, and equivalency with the Cretaceous of other parts of North America and of Europe. Reviews the literature and paleontology and the equivalency and horizons of the subdivisions of the American Cretaceous.

—— The present condition of knowledge of the geology of Texas.

U. S. Geol. Survey, Bull., vol. 7, pp. 381–473, No. 45. 1887.

Historic sketch of geologic investigation, and summary and review of the results.

—— Notes upon the Texas section of the American Cretaceous. [Abstract.]

Am. Assoc. Adv. Science, Proc., vol. 36, p. 216, ⅔ p. 1888.

Refers to relations and equivalency of a new group lying below the Dakota sandstone, and the general relations of the Cretaceous members in Texas.

[——] Notes on the geology of Western Texas.

Geol. and Sci. Bull., vol. 1, No. 6, ⅔ p., 4°. 1888.

Abstract, Am. Geologist, vol. 3, pp. 51–52, ½ p. 1889.

References to extent and inclination of Carboniferous, divisibility of "red beds" into Permian and Jura Trias, relations of Cretaceous, Quaternary or late Tertiary of plains west of the Sweetwater, evidence of Quaternary lakes in the mountain region west of the Pecos, the terraces of the Rio Grande near El Paso, the lower Cretaceous or possible Jurassic of the southwestern region, and the Quaternary and post-Quaternary history especially of the Llano Estacado region.

—— The Trinity formation of Arkansas, Indian Territory, and Texas.

Science, vol. 11, p. 21, ⅓ p. 1888.

Describes the characteristics, extent, and general relations of a pre-Cretaceous Mesozoic series to which the term Trinity formation is applied.

—— University of Texas. School of Geology—circular No. 1. 1 page. 1888.

References to Permian of western Texas; occurrence of Laramie along the Texas side of the lower Rio Grande; origin of the Texas Cretaceous; occurrence of Mesozoic igneous area in central Texas; the Jurassic age of the Tucumcarri section in northwest Texas, and the existence of an extensive marine Jurassic formation in southwest Texas and adjacent parts of Mexico.

—— Neozoic geology of southwestern Arkansas.

Arkansas Geol. Survey, Report for 1888, vol. 2, pp. 1–260. Map. 1888.

HILL, Robert T.—Continued.

Review by Jules Marcou, Am. Geologist, vol. 4, pp. 357–367. 1889. Abstracts. Popular Science Monthly, vol. 36, p. 129, ½ p. 1889. Am. Geologist, vol. 4, pp. 243–246. 1889. Am. Jour. Sci., 3d series, vol. 38, pp. 413–414, ⅔ p. 1889.

Systematic description of the several formations, discussions of equivalency, geologic history, extent and relations in adjoining and correlated regions, and paleontologic descriptions. Part 2 is an account of economic geology, in which the origin, classification, geologic relations, and improvement of soils are considered.

—— Events in North American Cretaceous history illustrated in the Arkansas-Texas division of the southwestern region of the United States.

Am. Jour. Sci., 3d series, vol. 37, pp. 282–290. 1889.

Includes descriptions of stratigraphic and structural characteristics, discussions of equivalency, taxonomy, and paleontologic relations of some of the Cretaceous members, and brief reference to pre-Cretacic and post-Cretacic conditions in the Arkansas-Texas region.

—— Ueber eine durch die Häufigkeit Hippuritenartiger Chamiden ausgezeichnete Fauna der oberturonen Kreide von Texas, von Ferdinand Roemer in Breslau. 1888.

Am. Jour. Sci., 3d series, vol. 37, pp. 318–319, ½ p. 1889.

Review in which the stratigraphy is discussed.

—— [Remarks on occurrence of Macraster Texanus].

Am. Naturalist, vol. 23, p. 168, ¼ p. (February No.) 1889.

Reference to its associates and stratigraphic position. Review of Roemer, Neues Jahrbuch, 1888, vol. 1, pp. 191–195, pl.

—— [On the validity of some new species from the Cretaceous of Texas].

Am. Naturalist, vol. 23, p. 169, ⅓ p. (February No.) 1889.

Review of Shüter "Ueber die regulären Echinodermata der Kreide Nord Amerikas," and Ueber Inoceramus und Cephalopoden der texanischen Kreide. Includes references to equivalency of Austin Cretaceous beds.

—— A portion of the geologic story of the Colorado River of Texas.

Am. Geologist, vol. 3, pp. 287–299. 1889.

Abstracts, Popular Science Monthly, vol. 36, p. 573, ⅔ col. 1890. Am. Naturalist, vol. 24, p. 956, ⅛ p. 1890.

Descriptions of stratigraphy, structure, and

HILL, Robert T.—Continued.

overlaps, and sketch of geologic history from Cambrian to Quaternary in Travis, Burnet, and parts of adjoining counties.

—— The foraminiferal origin of certain Cretaceous limestones, and the sequence of sediments in North American Cretaceous.

Am. Geologist, vol. 4, pp. 174–177. 1889.

Discusses the nature of the lower Cretaceous limestones, and summarizes the history of deposition of the Cretaceous of the Texas region.

—— Paleontology of the Cretaceous formation of Texas. Part I. University of Texas school of geology, pp. 5, pls. 3, Austin. 1889.

Abstract, Popular Science Monthly, vol. 36, pp. 424–425, ½ col. 1890.

Includes a reference to the relations of the Vola limestone of the Comanche series near Austin.

—— The Permian rocks of Texas.

Science, vol. 13, p. 92, ½ col. 1889.

Calls attention to the presence of a Permian-Triassic? series, and suggests their extension to the Kanab Valley section in Utah.

—— and **PENROSE**, R. A. F., jr. Relation of the uppermost Cretaceous beds of the eastern and southern United States, and the Tertiary-Cretaceous parting of Arkansas and Texas.

Am. Jour. Sci., 3d series, vol. 38, pp. 468–473. 1889. Abstract, **Am. Naturalist**, vol. 24, p. 769, ½ p. 1800.

Description of the characteristics and relations of the uppermost Cretaceous members in the Texas-Arkansas region, presentation of evidence of their equivalency with the lower marls of the New Jersey region, and an account of the relations and history of the unconformity at the base of the Tertiary. Prefaced by a summary account snd table of the Cretaceous members in the Arkansas-Texas region, and concluded by some suggestions in regard to Cretaceous taxonomy.

HILLEBRAND, W. F. Chemistry.

Geology and Mining Industry of Leadville, Colorado, by S. F. Emmons, U. S. Geol. Survey, Mon., vol. 12, pp. 585–608. 1886.

Analyses of eruptives, limestones, ores, vein materials, etc.

HILLS, R. C. Notes on the recent discovery of natural gas in Pitkin County, Colorado.

Colorado Sci Soc., Proc., vol. 2, part 2, pp. 106–107. 1887.

Discussion of the horizon from which the gas is derived.

HILLS, R. C.—Continued.

—— Circulation of water through the strata of the upper Cretaceous coal measures of Gunnison County, Colorado.

Colorado Sci. Soc., Proc., vol. 2, part 2, pp. 127–133. 1887.

Account of the strata penetrated by boreholes and general sketch of the geology of the region, illustrated by a geologic map.

—— Preliminary notes on the eruptions of the Spanish Peaks region.

Colorado Sci. Soc., Proc., vol. 3, pp. 24–34, pl. 1889.

Describes structural relations of the dikes and laccolites, and discusses the history of their intrusion.

—— The recently discovered Tertiary beds of the Huerfano River basin, Colorado.

Colorado Sci. Soc., Proc., vol. 3, pp. 148–164, pl. 1889.

Description of their stratigraphy, structure, distribution, volcanic contents, and relations to the Laramie, and discussion of their history, extent, and taxonomy.

—— Address—The field for original work in the Rocky Mountains.

Colorado Sci. Soc., Proc., vol. 3, pp. 168–184. 1889.

General review of the present condition of knowledge of Colorado geology and summary of discoveries made since the Hayden survey. Refers to occurrence of supposed Cambrian near Ouray, the extent and stratigraphy of the Laramie, and of the Trias in the San Juan region; evidences of glaciation in the White River plateau, the occurrence of supposed Tertiary conglomerate near Ouray and Telluride, the genesis of ores, and the existence of more recent volcanic formations in various parts of the State.

HINMAN, Russell. The laws of corrasion.

Science, vol. 12, pp. 119–120, ½ p. 1888.

Reference to Powell's contributions to the subject, and suggests some exceptional conditions.

HITCHCOCK, C. H. Genesis of the Hawaiian Islands.

Am. Assoc. Adv. Science, Proc., vol. 36, pp. 222–223. 1888.

Discusses evidence of uplift, in review of Dutton.

—— [On the nomenclature of the American lower Paleozoic.]

International Congress of Geologists, Am. Committee Reports, 1888, B, pp. 11–12.

Am. Geologist, vol. 2, pp. 201–202. 1888.

HITCHCOCK, C. H.—Continued.

Reference to the position of the "Taconic" rocks, the use of the term "Taconic," the use of the smaller American terms like "Niagara," and to a dual nomenclature, paleontologic and stratigraphic.

—— Report of the subcommittee on the Quaternary and Recent.

International Congress of Geologists, Am Committee Reports, 1888, H, pp. 12.

Am. Geologist, vol. 2, pp. 300–306. 1888.

Review of occurrence, characteristics, and relations of the members of the Quaternary and résumé of opinion in regard to their equivalency and correlation, and the sequence of events in Quaternary time.

—— Conglomerates in New England gneisses [a letter addressed to Alexander Winchell.]

Am. Geologist, vol. 3, pp, 253–256. 1889.

Discusses the age and relations of pebble and fragment-bearing crystalline rocks in Rhode Island, New Hampshire, Vermont, and Massachusetts.

—— Date of the publication of the report upon the geology of Vermont.

Boston Soc. Nat. Hist., Proc., vol. 24, pp. 33–37. 1889.

Includes a historic account and definition of the application of the term "Georgia slate," and references to the results of Walcott's studies in western Vermont.

—— On the Archean. See **FRAZER**, Report on Archean.

HOBBS, William H. On the petrographical characters of a dike of diabase in the Boston basin.

Harv., Mus. Comp. Zool., Bull., vol. 16, pp. 1–12, pl. No. 1. 1888.

Also describes occurrence, textural relations in its different parts, and some features of the inclosing strata. Analyses.

—— On the rocks occurring in the neighborhood of Ilchester, Howard County, Maryland: Being a detailed study of the area comprised in sheet No. 16 of the Johns Hopkins University map.

Johns Hopkins Univ., Circulars, vol. 7, pp. 69–70, 4°, No. 65. 1888.

Abstract, Am. Naturalist, vol. 22, p. 527, 1888.

Mainly petrographic. References to sequence of the various eruptives and the relations at several localities.

—— On the paragenesis of allanite and epidote as rock-forming minerals.

Am. Jour. Sci., 3d series, vol. 38, pp. 223–228. 1889.

HOBBS, William H.—Continued.

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Includes a petrographic description and analysis of the granite from Ilchester, near Baltimore.

HODGE, J. M. Preliminary report on the geology of parts of Letcher, Harlan, Leslie, Perry, and Breathitt counties.

Kentucky. Geol. Survey, John R. Proctor, Director, Reports on the southeastern Kentucky coal-field, pp. 35–52, maps, plates. 1887.

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—— Preliminary report on the geology of the lower north fork, middle and south forks, Kentucky River.

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Am. Inst. Mining Engineers, Trans., vol. 16, pp. 729–753. 1888.

Includes a description of Cretaceous and Jurassic formations, and the occurrence and petrography of the andesites, and a sketch of the geologic history of the region.

HOLLICK, Arthur. [Well at Clifton, Staten Island.]

Staten Island Nat. Sci. Assoc., Proc., Oct. 8, 1887.

Nine hundred feet in depth in mica schists.

—— [Leaf impressions in Cretaceous (?) sandstone in drift near Arrochar station.]

Staten Island Nat. Sci. Assoc., Proc., Dec. 8, 1888. ⅛ col.

Am. Naturalist, vol. 23, p. 459, ¼ p, p. 548, ¼ p. 1889.

Notice of occurrence of drift masses containing fossil leaves, and a fine exposure of modified drift overlain by bowlder drift.

—— [Remarks on fossiliferous sandstones in Cretaceous clays on Staten Island.]

Staten Island Nat. Sci. Assoc., Proc., April, 1889, ⅛ p.

Am. Naturalist, vol. 23, p. 1036. 1889.

Brief reference to their occurrence on beach at Tottenville and Perth Amboy, and in a new clay outcrop at Prince's Bay.

—— [Triassic shale outcrops on Staten Island.]

HOLLICK, Arthur—Continued.

Staten Island Nat. Sci. Assoc., Proc., April, 1889, ⅜ p.

Am. Naturalist, vol. 23, pp. 1033–1344, 1037. 1889.

Brief references to outcrops at Mariner's Harbor, and near Erastina and Arlington stations.

HOLLISTER, O. J. Gold and silver mining in Utah.

Am. Inst. Mining Engineers, Trans., vol. 16, pp. 3–18. 1887.

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Nova Scotian Inst., Proc., vol. 7, pp. 7–12. 1888.

References to the bowlders, glacial striæ and drifts, terraces, Silurian, Cambrian, and Triassic outcrops, and occurrences of granites, amygdaloids, and diorites.

—— Notes of examination by Prof. James Hall of the Silurian collection of the Provincial Museum.

Nova Scotian Inst., Proc., vol. 7, pp. 14–17. 1888.

Statement of paleontologic evidence of the equivalency of the subdivisions of the Arisaig group, the beds at Wentworth, and the Silurian beds on Cape Breton.

—— Geology of Halifax and Colchester counties. Part II.

Nova Scotian Inst., Proc., vol. 7, pp. 36–47. 1888.

References to lower Cambrian, lower Carboniferous, granites, evidences of glaciation, contacts of lower Carboniferous and lower Cambrian, and the date of metamorphism of the gold-bearing rocks.

—— Glacial geology of Nova Scotia.

Nova Scotian Inst., Proc., vol. 7, pp. 73–85. 1888.

Description of bowlder deposits at various localities, and discussion of their origin. Reference to striæ, terraces, and glacial history of the region.

—— Nova Scotian superficial geology, with map, systematized and illustrated.

Nova Scotian Inst., Proc., vol. 7, pp. 131–141. 1888.

Reference to the occurrence, relations, and history of the several superficial formations.

—— A geological recreation in Massachusetts centre, U. S. A.

Nova Scotian Inst., Trans., vol. 7, pp. 197–201. 1889.

Includes incidental references to the characteristics of the crystalline rocks of the region, and discusses their age.

HONEYMAN, D.—Continued.

—— Glacial bowlders of our fisheries, and invertebrates, attached and detached.

Nova Scotian Inst., Trans., vol. 7, pp. 205–213. 1889.

Account of bowlders from the fishing banks, and expression of opinion in regard to formation underlying the region.

HOVEY, Edmund Otis. Observations on some of the trap ridges of the East Haven-Branford region.

Am. Jour. Sci., 3d series, vol. 38, pp. 361–383, pl. IX. 1889.

Descriptions and discussions of contact phenomena, amygdular surfaces, breccias, faults, and flexures, and discussion of their bearing on the origin of the traps.

HOWLEY, James P. The Taconic of eastern Newfoundland.

Am. Geologist, vol. 4, pp. 121–125. 1889.

Statements in regard to the relations of Cambrian and Ordovician members at various localities.

HUBBARD, O. P. [Great bowlder in Woodbridge, Connecticut.]

New York Acad. Sci., Trans., vol. 4, p. 25, ⅛ p. 1887.

Statement of size and elevation, and suggestion in regard to its origin and history.

HUGHES, N. C. Genesis and geology: the harmony of the scriptural and geological records, pp. 142. 12°. Chocowinity, North Carolina, 1887.

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HUMPHREYS, A. N. Mining methods practiced by the Westmoreland Coal Company, Irwin, Pennsylvania.

Pennsylvania, Geol. Survey., Report for 1886, part 1, pp. 411–456, 7 plates. 1887.

Pages 446–454; section of the bed, dips, clay and slack veins, faults.

HUNT, T. Sterry. Elements of primary geology.

Geol. Mag., 3d decade, vol. 4, pp. 493–500. 1887.

Abstracts, Eng. and Mining Jour., vol. 44, p. 219. 4°. 1887. Nature, vol, 36, pp. 574–576. 1887. British Assoc. Adv. Science, Report, 1887, pp. 704–705. 1888.

Contains a résumé of the characteristics, equivalency, and distribution of the subdivisions of the Archean, and a brief discussion of the extent of the Taconian in Eastern North America, the equivalency of the Animikie, and the relations of the Keeweenawan and Cambrian.

HUNT, T. Sterry—Continued.

—— Gastaldi on Italian geology and the crystalline rocks.

Geol. Magazine., 3d decade, vol. 4, pp. 531–540. 1887.

Abstract, British Assoc. Adv. Science, Report, 1887, pp. 703–704. 1888.

Refers to the unaltered nature of the Montreal granitoid chrysolitic dolerite, and to the magnesian chrysolites in the crystalline limestones of eastern Massachusetts. Briefly discusses the petrography of the Taconian and its separateness from the Huronian and upper Taconic.

—— The genetic history of crystalline rocks.

Canada, Royal Soc., Trans., vol. 4, section III, pp. 7–37. 1887.

An examination of the crenitic "hypothesis in some of its aspects to show how far the conception of a single consolidated igneous mass under the combined action of heat and water may be made to explain satisfactorily the various facts in the history of the Earth's crystalline crust." Discusses the relations of stratified and massive crystalline rocks; foliation; variations and sources of igneous rocks; texture, composition, and minerals of vein stones, and the nature of the crystalline limestones of eastern Massachusetts and New York, and the apatite-bearing veins of Canada.

—— The Taconic question restated.

Am. Naturalist, vol. 21, pp. 114–125, 238–250, 312–320. 1887.

Reviewed by J. D. Dana, Am. Jour. Sci., 3d ser., vol. 33, pp. 412–419. 1887.

Reviews the stages of opinion which have been held in regard to the "Taconic" and related formations. Calls attention to Emmons's modified views in regard to the age of the "upper Taconic." Discusses the history, use, and application of the term "Taconic," the relations of the pre-Potsdam strata in America, and the significance of the discoveries of Dana, Dwight, Ford, Walcott, and others, in the Taconic-Hudson River region, and Rominger and others in the Lake Superior region. Defines the term "Taconian" as applied by him, and considers the use of the word "Cambrian."

—— [On subdivisions, unconformities, characteristics, origin of some members, nomenclature and life of the Archean, origin of serpentine, classification of eruptives, nomenclature of the lower Palezoic formations.]

International Congress of Geologists, Am. Committee Reports, 1888, A, pp. 68-69, ⅔ p.

—— On crystalline shists.

Nature, vol. 38, pp. 519–522. 1888.

HUNT, T. Sterry—Continued.

From Les schistes crystallins, published by the International Geological Congress in London. 1888.

Includes a discussion of the subdivision of the pre-Cambrian rocks of North America, and the age, extent, characteristics, and relations of the members of the "Taconian" and Taconic.

HYATT, Alpheus.

The Taconic at Boston.

Am. Geologist, vol. 2, p. 137, ½ p. 1888.

On the nomenclature proposed by Winchell for the Cambrian rocks.

—— Evolution of the faunas of the lower Lias.

Boston Soc. Nat. Hist., Proc., vol. 24, pp. 17–31. 1888.

Includes references to the extent and relations of the basins in which the lower Lias of Europe was deposited, and the equivalency of some of its members.

Idaho, [Caribou Mountain,] VAN DIEST.
Cœur d'Alene mines, CLAYTON.
deep well at Nampa, WRIGHT.
geology of, THOMPSON.
graphitic anthracite, JENNEY.
glacial geology, CHAMBERLIN.
volcanic dusts, analysis, WHITFIELD, J. E.

IDDINGS, Joseph P. The nature and origin of lithophysæ, and the lamination of acid lavas.

Am. Jour. Sci, 3d series, vol. 33, pp. 36–45. 1887.

Abstract of a memoir to appear in the Seventh Report of the U. S. Geol. Survey. Describes the micro-strcture and lithology of the spherulites and lithophysæ, and the finely laminated structure of the rhyolite of Obsidian Cliff, Yellowstone Park; and discusses the origin of these structural phenomena.

—— On the origin of primary quartz in basalt.

Am. Jour. Sci., vol. 36, pp. 208-221. 1888.

Abstracts, Am. Naturalist, vol. 22, p. 1021, ½ p. 1888. Am. Geologist, vol. 3, p. 52, $\frac{9}{16}$ p. 1889.

Petrographic description of quartz-bearing basalts from the Tewan Mountains, Arizona; references to other similar occurrences in California, Colorado, and Nevada, and discussion of the origin of the quartz, and the conditions involved in the solidification of eruptive masses.

—— Obsidian Cliff, Yellowstone National Park.

U. S. Geol. Survey, Seventh Report, J. W. Powell, 1885–'86, pp. 249–295, pls. 9–18. 1888.

IDDINGS, Joseph P.—Continued.

Abstracts, Am. Geologist, vol. 4, pp. 103–104. 1889. Am. Naturalist, vol. 24, pp. 70–71, ¾ p. 1890. Am. Jour. Sci., 3d series, vol. 33, pp. 36–45. 1887.

Description of occurrence, lithologic structure, and petrographic characteristics; discussion of the origin, relation, and history of development of the various structures in the obsidian, and references to literature of lithophysæ, and to occurrences of obsidian at other localities.

—— On the crystallization of igneous rocks.

Washington, Phil. Soc., Bull., vol. 11, pp. 65–113. 1889.

Abstracts, Am. Naturalist, vol. 23, p. 718, ¾ p. 1889, vol. 24, pp. 360–361, ½ p. 1890.

Systematic discussion of the philosophy of the crystallization of igneous rocks.

—— Leucite rock, Wyoming. See **HAGUE**, Arnold.

IHLSENG, M. C. Review of the mining interests of the San Juan region.

Colorado School of Mines, Report of field-work and analyses, 1886, pp. 19–63. Map. 1888.

Includes description of the geology of the region, and discussion of geologic history, and of the age and origin of the mineral deposits.

—— Report on oil fields of Fremont County.

Colorado School of Mines, Report of field work and analyses, 1886, pp. 67–80, pl. 1888.

Includes a description of the geology of the region, with a sketch of its geologic history.

—— Notes on Leadville.

Colorado School of Mines, Annual Report, 1887, pp. 29–45.

Includes a brief general discussion of the geology of the region.

Illinois, Carboniferous echinodermata, KEYES.

coal, ASHBURNER.

"Dauntless" core drill, ENG. and MINING JOUR.

driftless area, CHAMBERLIN, T. C. CHAMBERLIN and SALISBURY.

forest bed beneath intra-morainal drift, LEVERETT.

fossil fuels, COMSTOCK.

fulgerite from Whiteside County, analysis, CLARKE, F. W.

glacial phenomena in northeastern Illinois, LEVERETT.

loess and clays, analyses, RIGGS.

lower Silurian sceptopora, ULRICH.

moraines, CHAMBERLIN, T. C.

Illinois—Continued.

Paleozoic border adjoining Jackson purchase, Kentucky, LOUGHRIDGE.

Peoria County, CHAPMAN.

raised beaches of Lake Michigan, LEVERETT.

types of Devonian system in North America, WILLIAMS, H. S.

Indiana, Benton, Tippecanoe, and Washington counties, GORBY.

Brown County, GORBY and LEE.

building stones, chalk beds, clays, glacial deposits, gas, THOMPSON, M.

caves and cave life, KINGSLEY.

chipped implement in drift of Jackson County, CRESSON.

Clinton fossils, FOERSTE.

Clinton, Marshall, and Starke counties, THOMPSON, M.

coals, ASHBURNER.

compendium of geology, THOMPSON, M.

correlations of lower Silurian, ULRICH.

crinoids from the Niagara at St. Paul, BEECHLER.

diameter of Silurian island about Cincinnati, DENNIS.

erosion, SCOVILL.

glacial phenomena in northern Indiana, LEVERETT.

Hancock County, BROWN.

Henry and adjoining counties, PHINNEY.

Keokuk group at Crawfordsville, BEECHLER.

limestone from Bedford, analysis, CLARKE, F. W.

Maxinkuckee, THOMPSON and LEE.

natural gas, PHINNEY.

origin of loess, CAMPBELL.

terminal moraine in central Indiana, THOMPSON, M.

Trenton limestone, Orton.

types of Devonian system in North America, WILLIAMS, H. S.

Wabash arch, GORBY. THOMPSON, M.

Indiana, Department of Geology and Natural History, Fifteenth Report, 1886.

Benton County, GORBY.

Boone County, GORBY and LEE.

Building stones, THOMPSON, M.

Chalk beds, THOMPSON, M.

Clays, THOMPSON, M.

INGALL, E. D. [Preliminary report on mining districts in the Thunder Bay region.]

Canada, Geol. and Nat. Hist. Survey, Report, 1886, part A, pp. 14–19. 1887.

Includes a brief description of the characteristics and relations of the Animikie rocks.

d'INVILLIERS, E. V. The Pittsburgh coal region.

Pennsylvania, Geol. Survey, Report for 1886, part 1, pp. 1–372, 3 pls., map in pocket, 1887.

Includes descriptions of the structural and stratigraphic relations and a detailed account of the geologic features of the southwestern counties of Pennsylvania. Accompanied by a folded, colored geologic map.

—— Geological map of southwest Pennsylvania, giving the geological outcrops and tidal elevations as a basis for estimating the depths to the oil and gas sands, to illustrate Mr. Carll's report on the oil and gas regions . . . . . scale, 2 miles to 1 inch. June, 1887.

Pennsylvania, Geol. Survey, Annual Report for 1886, part 2, two sheets in pocket. 1887.

The same as the sheet in part 1, with addition of columnar sections and notes by Carll.

—— Report on the iron mines and limestone quarries of the Cumberland-Lebanon valley. 1886.

Pennsylvania, Geol. Survey, Report for 1886, part 4, pp. 1409–1567, maps, sheets 7–11 in atlas. 1887.

Description of structure and stratigraphy of the valley region, the mines, and the quarries of limestone and of Mesozoic sandstone. Brief discussion of the structure in the Dillsburg and Hummelstown regions, and relations of the Newark sandstone.

—— and **McCREATH**, Andrew. The New River-Cripple Creek mineral region of Virginia, pp. 171, 4 plates, and map in pocket. Harrisburg. 1887.

Includes a description of the stratigraphy, distribution, and structure of the several formations in southern Wythe and Pulaski counties, in general and in connection with the ore deposits. Describes the Draper Mountain region in considerable detail, and discusses and figures its complicated structural relations. The report is accompanied by a colored geologic map on which topography and structure are indicated.

IRVING, Roland D.—Continued.

bers, the upper of which, and also the Animikie, being of Huronian age. Gives an account of recent field work in the Huronian region and in the district north of Lake Superior, describing the uncrystalline nature of the original Huronian rocks, and outcrops exhibiting the relations of their basal conglomerates to the underlying schists and granites. Discusses the relations of the Huronian, iron-bearing, Animikie, and Keeweenaw rocks and their structure, origin, and stratigraphy; the extent of the Huronian in America; the uncertainty of age of some so-called Huronian areas in Canada, and the use of the term "group." Proposes the use of Chamberlin's term "Agnotozoic" for the great system of formations between the Paleozoic (Cambrian) and Archean.

[——] [On the use of the term "Taconic."]

International Congress of Geologists, Am. Committee, Reports, 1888, B, p. 17, 1 line.
Am. Geologist, vol. 2, p. 207. 1888.
Expression of opinion.

—— [On subdivisions, nomenclature, origin of some members, and characteristics of Archean rocks, classification of eruptives, origin of serpentines, and use of term "Taconic."]

International Congress of Geologists, Am. Committee, Reports, 1888, A, pp. 61–65.

—— Report — Lake Superior division of geology.

U. S. Geol. Survey, Seventh Report, J. W Powell, 1885–'86, pp. 68–76. 1888.
In résumé of results refers to the origin of the ferruginous schists and their iron ores, the divisibility of the Archean, the origin of chloritic schists exposed at the falls of the Menominee River, and the origin of the upper mica schists of the iron-bearing series.

—— On the classification of the early Cambrian and pre-Cambrian formations. A brief discussion of principles, illustrated by examples drawn mainly from the Lake Superior region.

U. S. Geol. Survey, Seventh Report, J. W. Powell, 1885–'86, pp. 365–454, pls. 30–51. 1888.
Abstract, Am. Geologist, vol. 4, pp. 111–112, ⅘ p. 1889.
Paleontologic and lithologic characteristics, and unconformities and overlaps of various kinds. Discussion of geologic relations and equivalency of rock group in the Lake Superior region, and taxonomy of the lower part of the geologic column. Accompanied by colored geologic maps.

IVES, James T. B. Geology in the public schools.

Canadian Inst., Proc., 3d series, vol. 5, pp. 125–128. 1887.
Describes a device for illustrating the simpler geologic relations.

—— Iron and other ores in Ontario.

Canadian Inst., Proc., 3d series, vol. 5, pp. 185–192. 1888.
Includes a brief discussion of the horizon of some of the ores.

—— [Remarks on ancient shore-line near Toronto.]

Canadian Inst., Proc., 3d series, vol. 6, pp. 4–5, 1888.
Remarks on the observations of previous writers, and statement in regard to evidence of terraces near Toronto.

JACKSON, A. Wendell. [Report on some California building stones.]

California, Seventh Report of the State Mineralogist, pp. 206–213. 1888.
Macroscopic and microscopic descriptions of Santa Susanna sandstone, Henley sandstone, Campo Seco tufa, and Colton marble.

—— Building stones.

California, Eighth Report of State Mineralogist, pp. 885–894. 1888.
Describes petrography of Angel Island sandstone, Sespe brownstone, San José sandstone, Altamont sandstone, Penryn granite, Rocklin granite, and Mount Raymond granite.

JAMES, Joseph F. Account of a well drilled for oil or gas at Oxford, Ohio, May and June, 1887.

Cincinnati, Soc. Nat. Hist., Jour., vol. 10, pp. 70–77. 1887.
Abstract geological section of southwestern Ohio. Am. Assoc. Adv. Science, Proc., vol. 36, p. 211, ½ p. 1888.
Abstract by author, Science, vol. 9, p. 623. 1887.
Description of 1,365 feet of strata passed through, from the Cincinnati group to white arenaceous limestones thought to be equivalent to the Calciferous sandrock.

—— The geology of Cincinnati.

Cincinnati, Soc. Nat. Hist., Jour., vol. 9, pp. 20–21, 136–141. 1886.
Abstract, "The glacial lake and island of Cincinnati," Popular Science Monthly, vol. 31, pp. 423–424.
Abstract of paper described in bibliography for 1886.

—— An ancient channel of the Ohio River at Cincinnati.

Cincinnati, Soc. Nat. Hist., Jour., vol. 11, pp. 96–101. 1888.
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—— The geology of the Montmorenci. A correction in a date.

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—— [On the equivalency and members of the White limestone formation in the gulf Tertiary region.]

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—— On the Rosetown extension of the Cortlandt series.

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Abstract, Am. Naturalist, vol. 22, p. 1020, ½ p. 1888.

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—— The geology of Manhattan Island.

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—— On certain porphyrite bosses in northwestern New Jersey.

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Letcher, Harlan, Leslie, Perry, and Breathitt counties, HODGE.

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Am. Jour. Sci., 3d series, vol. 33, pp. 276–278. 1887.

Review of H. C. Lewis on Irish Eskers. Points out the distinction between true Eskers and certain drift ridges, and discusses some of the phenomena of drift deposition.

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—— The coal-field of Crested Butte, Gunnison County, Colorado.

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—— The geology of Nahant. [Abstract.]

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LANE, Alfred C.—Continued.

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LANG, Herbert. Transcontinental railroads.

Science, vol. 11, pp. 73–74. 1888.

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Am. Jour. Sci., 3d series, vol. 38, pp. 322–324. 1889.

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—— Preliminary report on some graptolites from the lower Paleozoic rocks on the south side of the St. Lawrence from Cape Rosier to Tartigo River, from the north shore of the Island of Orleans, one mile above Cap Rouge, and from the Cove Fields, Quebec.

Canada, Royal Soc., Trans., vol. 4, section IV, pp. 167–184. 1887.

Considers the equivalency of the graptolite-bearing beds with English zones from middle Ordovician down. Reviews the evidence in regard to the horizon of the Norman's Kill beds near Albany, New York. Gives a résumé of the supposed stratigraphic relations of the strata of the south side of the St. Lawrence from Cape Gaspé to Tartigo River, and discusses their equivalency, extension, and structure.

—— Note on graptolites from Dease River, British Columbia.

Canadian Record of Sci., vol. 3, pp. 141–142. 1888.

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Am. Inst. Mining Engineers, Trans., vol. 16, pp. 119–128; plate. 1887.

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Briefly describes the porphyry, and its relations to the associated Weber quartzites.

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Am. Jour. Sci., 3d series, vol. 33, pp. 473–480. 1887.

Subdivides the rocks into five series; an intrusive group provisionally termed Laurentian; the Contchiching, overlain conformably and overlapped by the very different Kewatin, together with which it is penetrated by "Huronian" granites, diabases, and gabbros, and unconformably overlain by the Keweenawan "(Nipogon)."

—— Some recent developments in Archean geology, particularly in the Lake Superior region, as tend to modify commonly accepted notions of rock metamorphism.

Canadian Record of Science, vol. 2, pp. 430–431. 1887.

Brief abstract of paper read at sixth meeting of the Royal Society of Canada. Discusses the application of the term "metamorphism;" the correlation of the Huronian and Animikie and its equivalents, on the south shore of Lake Superior, their unconformity to the older rocks, and the separation of Huronian from the Archean.

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Canada, Geol. and Nat. Hist. Survey, Report, 1886, part A, pp. 11–14. 1887.

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—— The diabase dikes of Rainy Lake.

Canadian Inst., Proc., 3d series, vol. 5, pp. 173–185. 1888.

Am. Geologist, vol. 1, pp. 199–211. 1888.

Abstract, Am. Naturalist, vol. 22, pp, 348–349, ½ p. 1888.

Petrographic description of several dikes; mineralogic, structural, and textural variations from center to sides, age, history, and relations to enclosing rocks.

LAWSON, Andrew C.—Continued.

—— Foliation and sedimentation. A reply to Prof. Alexander Winchell.

Am. Geologist, vol. 3, pp. 169–178. 1889.

Discusses evidence of igneous nature, and history of foliation of some of the crystalline rocks of the Northwest.

—— Foliation and sedimentation.

Am. Geologist, vol. 3, pp. 276–279. 1889.

Definition of his views in regard to the history and relations of the Archean rocks of the Northwest and discussion of the nature of the so-called conglomerates in the gneisses.

—— Scapolite bearing rocks of Canada, etc. See **ADAMS**, Frank D., and.

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Am. Geologist, vol. 1, pp. 76–81. 1888.

Abstract, Nature, vol. 37, p. 358, 9 lines 1887.

A discussion of the post Tertiary physical changes of the coast region of California as indicated by the flora and fauna of the outlying islands.

—— [Nomenclature, subdivision, characteristics, classification of eruptives, origin of some members, and evidences of life of the Archean, and on the nomenclature of the lower Paleozoic.]

International Congress of Geologists, Am. Committee, Reports, 1888, A, pp. 55–57.

—— [On the use of the term "Taconic."]

International Congress of Geologists, Am. Committee, Reports, 1888, B, p. 17, 3 lines.

Am. Geologist, vol. 2, p. 207. 1888.

—— [On nomenclature of Cenozoic formations.]

International Congress of Geologists, Am. Committee, Reports, 1888, F, pp. 17–18, ⅔ p.

Am. Geologists, vol. 2, pp. 283–284. 1888.

Discussion of a designation for the present time, reference to the nomenclature of the Tertiary, and the position of Cenozoic unconformity in California.

—— On the origin of normal faults and of the structure of the basin region.

Am. Jour. Sci., 3d series, vol. 38, pp. 257–263. 1889.

Abstract, Nature, vol. 40, pp. 46–47, 16 lines. 1889.

Discussion of the origin and mechanism of faults, especially of the class to which "Great

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—— Maxinkuchee. See **THOMPSON**, W. H., and.

LEGGETT, Thomas H. Notes on the Rosario mine at San Juancito, Honduras, Central America.

Am. Inst. Mining Engineers, Trans., vol. 17, pp. 432–449. 1889.

Includes a description of the geologic features of the region and a discussion of the origin of its ores.

LEIBERG, John B. Some notes upon the more recent fossil flora of North Dakota and an inquiry into the causes that have led to the development of the treeless areas of the Northwest.

Minnesota, Acad. Sci., Bull., vol. 3, part 1, pp. 145–151. 1889.

Discusses evidence of various kinds indicating continuous slow elevation of the country.

LESLEY, J. P. A dictionary of the fossils of Pennsylvania and neighboring States named in the reports and catalogues of the Survey. Pennsylvania Geol. Survey Report, P4, pages xiv, 438, xxxi. Harrisburg. 1889.

Contains incidental references to geologic formations in which some of the species occur.

—— Revision and correction of the semi-bituminous coal section at Wellersburg in Somerset County, Pennsylvania.

Pennsylvania, Geol. Survey, Atlas to Reports, H H and H H H, pp. 349–360. 1889.

An account of the components and relations of the coal measures at that locality.

LESQUEREUX, Leo. On the character and distribution of Paleozoic plants.

Pennsylvania, Geol. Survey Report for 1886, part 1, pp. 457–522. 1887.

Includes a discussion of geologic distribution of floral remains, the genesis of coal, the evidence afforded by paleobotany of the conditions of deposition of some of the formations, and the equivalency of different members and portions of the lower Carboniferous of the United States.

—— Prof. L. F. Ward's synopsis of the flora of the Laramie group.

Am. Jour. Sci., 3d series, vol. 34, pp. 487–488. 1887.

Review of some stratigraphic relations of the Laramie flora.

LESQUEREUX, Leo—Continued.

—— fossil plants collected at Golden, Colorado.

Harv., Mus. Comp. Zoöl., Bull., vol. 16, pp. 43–59. No. 3. 1888.

In summary, pp. 57–59, discusses stratigraphic position of the plants, and floral relations of Fort Union and Laramie groups.

—— Fossil plants of the coal measures of Rhode Island.

Am. Jour. Sci., 3d series, vol. 37, pp. 229–230. 1889.

List of species and statement of opinion in regard to their age.

LEVERETT, Frank. Glacial phenomena of northern Indiana and northeastern Illinois.

Am. Naturalist, vol. 23, p. 808, ½ p. 1889.

Nature, vol. 40, pp. 557–558, ½ col. 1889.

Abstract of paper read to American Association. 1889.

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—— On the occurrence of the "forest bed" beneath intra-morainic drift. [Abstract.]

Am. Assoc. Adv. Science, Proc., vol. 37, pp. 183–184, ⅔ p. 1889.

Account of its geographic and stratigraphic distribution in northeastern Illinois.

—— Raised beaches of Lake Michigan.

Wisconsin Acad. Sci., Trans., vol. 7, pp. 177–192. 1889.

Description of their physiography and deposits, with incidental suggestions in regard to some details of their history.

LEWIS, Elias, jr. Woodham artesian well, on Long Island, 2 miles east of East New York, on the line of the Long Island Railroad.

Am. Jour. Sci., 3d series, vol. 37, p. 233, ½ p. 1889.

Five hundred and seventy-seven feet through drift to gneiss.

LEWIS, H. Carvill. Comparative studies upon the glaciation of North America, Great Britain, and Ireland.

Rept. Fifty-sixth Meeting, British Assoc. Adv. Sci., 1886, pp. 632–635. 1887.

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—— On some important extra-morainal lakes in central England, North America, and elsewhere during the period of maximum glaciation, and on the origin of extra-morainal bowlder-clays.

Nature, vol. 36, p. 573, ½ p. 1887.

LEWIS, H. Carvill—Continued.

Geol. Magazine, 3d decade, vol. 4, pp. 515–517. 1887.

British Assoc. Adv. Science, Proc., Report, 1887, pp. 692–693. 1888.

Points out the relations of extra-morainic clay deposits in America and in general, and discusses the location and extent of extra-morainal lakes indicated by deposits of bowlder-clay in England, and the nature of the glaciation of England.

—— [Remarks on P. H. Uhler's paper on the Albirupean formation in eastern Maryland.]

Am. Phil. Soc., Proc., vol. 25, pp. 53–54. No. 127. 1888.

Objections to the term "Albirupean," and suggestion that its sandstone members are in part Paleozoic.

LINDAHL, Joshua. Dr. N. O. Holst's studies in glacial geology.

Am. Naturalist, vol. 22, pp. 589–598, 705–713. 1888.

Condensed translation of "Om de glaciala rullstensåsarne," and "Berättelse om en i geologiskt syfte företagen resa till Grönland."

LINDGREN, Waldemar. The silver mines of Calico, California.

Am. Inst. Mining Engineers, Trans., vol. 15, pp. 717–734, plate. 1887.

Description and sections of the region, and discussion of the lithologic, stratigraphic, and structural features of the "Tertiary" sandstones, tuff deposits, "liparite," and andesite, and their relations to the ore deposits.

—— Notes on the geology of Baja, California, Mexico.

California Acad. Sci., Proc., 2d series, vol. 1, pp. 173–196, pls. 1–5. 1889.

Description of Pleistocene, Tertiary, Cretaceous, eruptives, basal granites, and structural features. Illustrated by plates of cross-sections and colored geologic map.

LINNEY, W. M. Report on the geology of Clark County.

Kentucky, Geol. Survey, John R. Proctor, Director, Report on the Geology of Clark and Montgomery Counties, pp. 1–43. Map. [1887?]

Description of stratigraphy of beds from Chazy limestone to lower coal measures. Accompanied by a colored geologic map with cross-section.

—— Geological Survey of Kentucky, John R. Proctor, Director. Reports on the geology of Bath [and Fleming counties], 86 pages. Map. [Date?]

Description of formations from Carboniferous to Ordivician; considers silicification and alteration in texture in some of the limestones; gives an account of the flexures of the region. Illustrated by a colored geologic map.

LINNEY, W. M.—Continued.

—— Geological Survey of Kentucky, John R. Proctor, Director. Report on the geology of Garrard County, pp. 31. Map. [1888?]

Description of beds from Chazy limestone to upper sub-Carboniferous. List of fossils. Accompanied by a colored geologic map.

—— Geological survey of Kentucky, John R. Proctor, Director. Reports on the geology of Henry, Shelby, and Oldham counties, 70 pages. Map. [Date?]

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—— Geological Survey of Kentucky, John R. Proctor, Director. Report on the geology of Lincoln County, 37 pages. Map. [1887?]

Description of beds from Trenton limestone to sub-Carboniferous, and structural relations. Accompanied by a colored geologic map.

—— Geological Survey of Kentucky, John R. Proctor, Director. Report of the geology of Mason County, 31 pages. Map. [Date?]

Description of formations from Niagara to lower Hudson, and alluvial. List of fossils. Illustrated by colored geologic map.

—— Geological Survey of Kentucky, John R. Proctor, Director. Report on the geology of Mercer County, 29 pages. Map. [1887?]

Description of beds from Chazy limestone to sub-Carboniferous. Brief references to flexures. Accompanied by a colored geologic map.

—— Report on the geology of Montgomery County.

Kentucky, Geol. Survey, John R. Proctor, Director, Report on the Geology of Clark and Montgomery Counties, pp. 45–75. Map. [1887?]

Description of stratigraphy of beds from Trenton limestone to lower coal measures and of structural relation and fault in Clark and Montgomery counties. Discussion of conditions under which some of the formations were deposited, evidence of erosional unconformities between some of the beds, and the extent and relations of the fault.

—— Report on the geology of Nelson County.

LINNEY, W. M.—Continued.

Kentucky, Geol. Survey, John R. Proctor, Director, Report on Spencer and Nelson Counties, pp. 21–58. Map. [1888?]

Description of beds from lower Hudson to upper sub-Carboniferous. Reference to position and relations of uplift. Accompanied by a colored geologic map.

—— Report on the geology of Spencer County.

Kentucky, Geol. Survey, John R. Proctor, Director, Report on Spencer and Nelson Counties, pp. 1–19. Map. [1888?]

Description of beds of the Hudson River group, accompanied by a colored geologic map.

—— Geological Survey of Kentucky, John R. Proctor, Director. Report on the Geology of Washington County, 24 pages. Map. [1887?]

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Abstract [in regard to fault], Am. Jour. Sci., 3d series, vol. 37, p. 232, 11 lines. 1889.

Includes descriptions of formations from Cretaceous to recent and sub-Carboniferous and of the deep well and fault at Paducah. Discussion of equivalency, correlation, origin, extent, and relations of some of the formations and geologic history of the region at various stages. Analyses. Reference to relations and extent of Paleozoic border rocks in Missouri, Illinois, and Kentucky; agricultural features, distribution, composition, and characteristics of soils and clays. Descriptions of geology by counties. Accompanied by colored geologic map, map showing thickness of gravels, and a soil map.

Louisiana, iron ores, analyses, RIGGS.

iron regions, JOHNSON.

Petite Anse salt, BOLTON. COX. POMEROY.

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Tertiary, HEILPRIN. HILGARD.

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Abstract, Ibid., part A, pp. 26–28.

Includes pp. 17–18, notes of distribution and character of Laurentian, Huronian, lower Paleozoic limestone and drift. Reference to glacial striæ.

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M.

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—— The foot-steps of time in the Red River Valley, with special reference to the salt springs and flowing wells to be found in it.

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—— Note on the geology of Mount Stephen, British Columbia.

Am. Geologist, vol. 3. pp. 22–25. 1889.

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McCREATH, A. S., and D'INVILLIERS, E. V. Comparison of some Southern cokes and iron ores.

Am. Inst. Mining Engineers, Trans., vol. 15, pp. 734–753. 1887.

Brief statement in regard to geologic relations at Birmingham, Alabama.

—— Mineral resources of the upper Cumberland valley of southeastern Kentucky and southwestern Virginia tributary to the proposed Cumberland valley extension of the Louisville and Nashville railroad, 152 pages, map. Louisville, 1888.

Brief prefatory sketch of the general geology and structure, and detailed description of the coal measures.

—— The New River—Cripple Creek mineral region of Virginia. See **D'INVILLIERS, E. V., and.**

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U. S. Geol. Survey, Sixth Report, J. W. Powell, 1884–'85, pp. 25–32. 1885.

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—— Some features of the recent earthquake.

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Abstract, Am. Geologist, vol. 1, pp. 126–127, ⅓ p. 1887.

Discusses the climatic conditions of the loess period as indicated by its fauna; the relations of the loess to the drift in Iowa and adjacent regions; the early Quaternary submergence of the middle Atlantic slope, and the attendant climatic conditions; the extent of refrigeration in glacial times, and the position of the strata yielding the Ovibos remains at New Madrid and Fort Gibson.

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—— The geology of the head of Chesapeake Bay.

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Abstract, Am. Geologist, vol. 4, pp. 113–115. 1889.

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McGEE, W J—Continued.

of the middle Atlantic slope; brief references to Archean (?) alluvial, Appomattox, and Sassafras River greensand; discussion of evidence of a displacement bounding the coastal plain on the west, its position, extent, amount, influence on drainage, and topography, date, history, rate, and cause; the genetic relations of topographic forms in general, and the Quaternary history recorded in the Columbia formation; and prognostication in regard to the occurrence of artesian waters in the region. Accompanied by a stereogram of the middle Atlantic slope.

—— Report —— Potomac Division of Geology.

U. S. Geol. Survey, Seventh Report, J. W. Powell, 1885-'86, pp. 104–111. 1888.

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—— Three formations of the Middle Atlantic Slope.

Am. Jour. Sci., 3d series, vol. 35, pp. 120–143, 328–330, 367–388, 448-466, pls. II, VI, VII. 1888.

Abstract. Nature, vol. 38, p. 91, 15 lines, p. 190, 11 lines. 1888. Am. Geologist, vol. 2, pp. 129–131. 1888.

Description of character, distribution, and relations of the Potomac and Columbia formations, and of a new later Tertiary formation, designated the "Appomattox," from North Carolina to New Jersey. Discussion of stratigraphic relations, origin of materials, conditions of deposition, taxonomy, and bearing on geologic history, especially on the Quaternary. Synopsis of literature of the Columbia formation and of the glacial history of the United States. Accompanied by a stereogram of the middle Atlantic slope.

—— The classification of geographic forms by genesis.

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Definition and classification of geologic phenomena and discussion of their relation to the genesis of geographic features.

—— The Columbia formation.

Am. Assoc. Adv. Science, Proc., vol. 36, pp. 221–222. 1888.

General notice. Discussion of origin and mode of deposition of its materials and climatic conditions indicated by its stratigraphy and relations.

—— Paleolithic man in America: his antiquity and environment.

Popular Science Monthly, vol. 34, pp. 20–36. 1888.

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—— [On some peculiarities of the superficial deposits of northeastern Iowa.]

Am. Geologist, vol. 2, pp. 137–138, ½ p. 1888.

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—— Notes on the geology of Macon County, Missouri.

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—— Topographic types of northeastern Iowa.

Am. Naturalist, vol. 23, p. 808, ½ p. 1889.

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—— Geological antecedents of man in the Potomac valley.

Am. Anthropologist, vol. 2, pp. 227-244. 1889.

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McINNES, W. Portions of counties of New Brunswick. See **BAILEY, L. W., and.**

McKELLAR, Peter. The correlation of the Animikie and Huronian rocks of Lake Superior.

Canada, Royal Soc., Trans., vol. 5, section IV, pp. 63–73. 4°. 1888.

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Canadian Inst., Proc., vol. 6 (new series), pp. 338–341. 1889.

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[MacFARLANE, Thomas.] [On the use of the term "Taconic."]

International Congress of Geologists, Am. Committee, Report, 1888, B, p, 17, 3 lines.
Am. Geologist, vol. 2, p. 207. 1888.
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—— On the Archean. See **FRAZER**, Report on Archean.

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enlargements of augites in peridotites from Little Deer Island, MERRILL, G. P.
Farmingham clay, ROBINSON.
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Paleozoic and volcanic series near Eastport, SHALER.
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terminal moraines, STONE.

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Richmond coal-field, Virginia, CLIFFORD.

Manitoba, Historical and Scientific Society, Transactions, No. 27.
Red River Valley geology, McCHARLES.

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Boston Soc. Nat. Hist., Proc., vol. 23, pp. 343–355. 1887.
A plea for the retention of "Taconic" as a group name for the primordial, and the relegation of Cambrian to the rocks of the second fauna instead of "Ordovician." Discusses the history of "Taconic," and gives a table showing the classification of the lower Paleozoic according to Sedgwick, Murchison, Emmons, Barrande, Marcou, Lapworth, and Walcott, and a list of papers on the subject.

—— Paleontologic and stratigraphic "principles" of the adversaries of the Taconic.

Am. Geologist, vol. 2, pp. 10–23, 67–88. 1888.
Discussion of paleontologic, stratigraphic, and structural relations of the Taconic system, especially in review of C. D. Walcott's paper, "The Taconic system of Emmons, and the use of the name Taconic in geologic nomenclature."

MARCOU, Jules—Continued.

—— Geology of the vicinity of Quebec city.

Am. Geologist, vol. 2, pp. 355–356. 1888.
References to horizon, and relations of slates unconformably underlying the Trenton at Quebec and Montmorenci falls.

—— The Taconic of Georgia, and the report on the geology of Vermont.

Boston Soc. Nat. Hist., Memoirs, vol. 4, pp. 105–131, pl. 13. 4°. 1888.
*Abstract, Am. Geologist, vol. 1, pp. 328–329, ½ p. 1888.
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—— Some remarks on Prof. Henry S. Williams's report of the subcommittee on the upper Paleozoic (Devonic) in the American Geologist for October, p. 226.

Am. Geologist, vol. 3, pp. 60–61. 1889.
Discussion of some points in the history of the nomenclature of the New York Devonian.

—— Barrande and the Taconic system.

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Historic and controversial.

—— The original locality of the Gryphæa Pitcheri, MORTON.

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Includes a discussion of the absence of Neocomian in New Mexico and reference to the extent of the Jurassic formation of the Tucumcari area of Texas.

—— The Mesozoic series of New Mexico.

Am. Geologist, vol. 4, pp. 155–165, 216–229. 1889.
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—— Jura Neocomian and chalk of Arkansas.

Am. Geologist, vol. 4, pp. 357–367. 1889.
Review of R. T. Hill on the "Neozoic Geology of Southwestern Arkansas." Discusses the general stratigraphic statements concerning the Mesozoic formations, and reviews the paleontology and equivalency of the Trinity and Cretaceous.

—— On some dates of the "Report on the Geology of Vermont."

MARCOU, Jules—Continued.

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MARGARIE, Emm. de. Presentation d'un relief en plâtre de la Pennsylvanie au nom de M. J. P. Lesley et observations sur les plissements des terrains paléozoïques.

Soc. Géol. de France, Bull., 3d series, tome 15, pp. 356–357. 1887.

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Am. Jour. Sci., 3d series, vol. 35, pp. 88–94. 1888.

Abstract, Am. Geologist, vol. 1, p. 136, ½ p. 1888.

Includes a brief reference to the uncertainties in regard to the age indicated by these fossils.

—— Restoration of Brontops robustus, from the Miocene of America.

Am. Jour. Sci., 3d series, vol. 37, pp. 163–165, pl. VI. 1889.

Includes very brief reference to subdivisibility of Brontotherium beds of the eastern flanks of the Rocky Mountains.

—— The skull of the gigantic Ceratopsidæ.

Am. Jour. Sci., vol. 38, pp. 501–506, plate XII. 1889.

Includes a reference to the geologic horizon of the "Ceratops bed" and its persistence for many hundred miles along the east flank of the Rocky Mountains.

MARSTERS, V. F. On certain camptonite dikes near Whitehall, Washington County, New York. See **KEMP**, J. F., and.

MARTIN, D. S. The "Field of rocks" [11 miles west of Philadelphia].

New York Acad. Sci., Trans., vol. 7, pp. 16–18. 1888.

Description of isolated bowlder-covered areas, and suggestion in regard to the origin of the bowlders.

—— [Remarks on the distinctness of the New York gneiss from the crystalline rocks of the Highlands.]

New York Acad. Sci., Trans., vol. 7, p. 64, ½ p. 1888.

MARTIN, D. S.—Continued.

—— Geological map of New York City and vicinity, 2 miles to 1 inch. New York, 1888. Accompanied by an explanatory text, pp. 14.

A colored wall-map, showing areal distribution of geologic formations within a radius of 40 miles from New York. The accompanying pamphlet gives a brief general account of geologic relations of the region.

Maryland Academy of Sciences, Transactions, vol. 1.

Cretaceous and Eocene of Maryland, UHLER.

Maryland, age of Potomac formation, WARD.

Antecedents of man in the Potomac valley, MCGEE.

Albirupean and associated formations, HEILPRIN. LEWIS, H. C. UHLER.

Archean geology, WILLIAMS, G. H.

Baltimore gabbros, WILLIAMS, G. H.

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Cretaceous in Ann Arundel and Prince George counties, CLARK.

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Potomac woods and lignites, KNOWLTON.

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rocks from near Ilchester, Howard County, HOBBS.

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Massachusetts, Hampshire County Gazetteer, 1654–1887.

Topography—geological features, EMERSON.

MATTHEW, G. F.—Continued.

Brunswick, and review of the relations and equivalency of the Olenellus faunas of the Pacific slope in the western Territories of the United States.

—— On some remarkable organism of the Silurian and Devonian rocks in southern New Brunswick.

Canada, Royal Soc., Trans., vol. 6, section IV, pp. 49–54, pl. 4. 1889.

Includes a brief account of the stratigraphy of the formations and statements in regard to their general relations and to their equivalents elsewhere.

—— How is the Cambrian divided? * * * A plea for the classification of Salter and Hicks.

Am. Geologist, vol. 4, pp. 139–148. 1889.

A general discussion of the paleontologic relations and classification of the Cambrian.

MEADS, A. D. The Stillwater, Minnesota, deep well.

Am. Geologist, vol. 3, pp. 341–342, ½ p. 1889.
Science, vol. 13, p. 401. 1889.

General description of its record (3,400 feet). Calls attention to the positive evidence presented in regard to the stratigraphic position of the Keweenawan.

Meriden Scientific Association, Transactions, vol. 2.

Catopterus gracilis, DAVIS, C. H. S.
Hanging Hills, CHAPIN.

—— **vol. 3.**

Ash bed at Meriden, DAVIS, W. M.
Trap ridge at Meriden, CHAPIN.

MERRILL, F. J. H. Note on the Green Pond Mountain group of New Jersey.

New York Acad. Sci., Trans., vol. 6, p. 59, ⅛ p. 1887.

Statement in regard to age and general relations.

—— Geological structure and age of the deposits at Gay Head, Massachusetts. [Abstract.]

New York Acad. Sci., Trans., vol. 4, pp. 78–79. 1887. Two lines, as follows:

Expression of opinion in regard to age of beds.

—— Index of current literature relating to American geology.

School of Mines Quarterly, vol. 8, pp. 285, 375, vol. 9, pp. 85–87. 1887.

Arranged by subjects: geology, mineralogy, paleontology, topography, etc.

—— Green Pond Mountain group.

MERRILL, F. J. H.—Continued.

New Jersey, Geol. Survey, Report of the Geologist for 1886, pp. 112–122. 1887.

Abstract, Science, vol. 9, pp. 595–596, ⅛ p. 1887.

Describes some structural and stratigraphic relations near Newfoundland, New Jersey, which indicate that at least a portion of the group is equivalent to the Oneida, the associated fossiliferous limestones, Lower Helderberg, and the slates, Hamilton. Announces the discovery of Corniferous and Oriskany fossils in quartzite near Newfoundland and Longwood. Gives a résumé of the stratigraphy of the region.

—— Yellow gravel.

New Jersey, Geol. Survey, Report of the Geologist for 1886, pp. 129–134. 1887.

Describes the distribution, character, and relations, and discusses its age and the origin of its materials.

MERRILL, George H. Great dike at Paradise, Newport, R. I. See **CROSBY**, W. O., and **BARTON**, G. H.

MERRILL, George P. The literature of geyserite.

Am. Geologist, vol. 2, pp. 436–437, ¾ p. 1888.

Calls attention to announcements of volcanic origin of some supposed geyserite formations and to the confirmatory results of a reexamination of some deposits in Montana and Nebraska.

—— Note on the secondary enlargement of augites in a peridotite from Little Deer Isle, Maine.

Am. Jour. Sci., 3d series, vol. 35, pp. 488–490. 1888.

Abstract, Am. Naturalist, vol. 23, pp. 1006–1007, 7 lines. 1890.

Petrographic.

—— Concerning the Montville serpentine.

Science, vol. 11, p. 302, ⅔ p. 1888.

Refers to its occurrence in the crystalline limestone, and discusses the evidence and bearing of its metasomatic origin.

[——] [Examination of rock with which nickel occurs in Nickel Mountain, Oregon.]

U. S. Geol. Survey, Mineral Resources of the U. S., 1887, p. 128, ½ p. 1888.

Statement of its constituent minerals.

—— On the ophiolite of Thurman, Warren County, New York, with remarks on the Eozoon Canadense.

Am. Jour. Sci., 3d series, vol. 37, pp. 189–191. 1889.

MERRILL, George P.—Continued.

Discussion of its origin and the nature of the original rock.

—— On the serpentine of Montville, New Jersey.

U. S. National Museum, Proc., vol. 11, pp. 105–111, pls. XXXI, XXXII. 1889.

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—— On a peridotite from Little Deer Island in Penobscot Bay, Maine.

U. S. National Museum, Proc., vol. 11, pp. 191–195, pl. XXXIV. 1889.

Description of its relations, micropetrography, and composition.

—— Among the Pennsylvania slate quarries.

Sci. Am., Supt., vol. 27, pp. 10874–10875 (No. 681). 1889.

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Am. Jour. Sci., 3d series, vol. 37, pp. 51–52. 1889.

An account of condition and topography of the crater.

MERRITT, William Hamilton. The minerals of Ontario, and their development.

Am. Inst. Mining Engineers, Trans., vol. 17, pp. 293–300. 1889.

Includes statements in regard to the relation of the Animikie and Huronian in the Port Arthur district.

Mexico, age of coal in Rio Grande region, WHITE, C. A.

Baja California, LINDGREN.

Catorce mining district, CHISM.

drainage of the Valley of Mexico, CHISM.

geologic observations, VOM RATH.

Jorullo, FELIX.

Jurassic, HILL, R. T.

Lower California copper mines, WENDT.

lower Cretaceous, WHITE, C. A.

relations of Laramie, WHITE, C. A.

metamorphism in Sonora coal field, NEWBERRY.

Sierra Mojada, CHISM.

Sonora earthquake, GOODFELLOW.

MEYER, Julius. Floods in the lower Missouri.

Science, vol. 12, pp. 167–168, ⅓ p. 1888.

Discussion of the conditions affecting corrasion.

MEYER, Otto. Beitrag zur Kenntniss des Alttertiärs von Mississippi und Alabama.

Frankfurt-Senckenbergische Naturf. Gesell., Bericht, s. 3, taf. I-II. 1887.

Paleontologic.

—— Some remarks on the present state of our knowledge of the North American eastern Tertiary.

Am. Geologist, vol. 2, pp. 88–94. 1888.

Discussion of the paleontologic, stratigraphic, and structural relations, equivalency and relative positions of the several members.

Michigan, Archean rocks of the Northwest, WINCHELL, A.

Chapin iron mine, LARSSON.

classification of Cambrian and pre-Cambrian, IRVING.

coal, ASHBURNER.

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Gogebic iron region, ENG. AND MINING JOURNAL.

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granite of the Northwest, HALL, C. W.

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Huronian group, IRVING.

iron ores of Menonomie range, FULTON.

Irving and Chamberlin on Lake Superior sandstone, AM. GEOLOGIST.

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[Marquette and Gogebic regions], WINCHELL, A. WINCHELL, N. H.

metamorphism of eruptives on south shore of Lake Superior, WILLIAMS, G. H.

Penokee-Gogebic iron ores, VAN HISE.

post-glacial geology of Ann Arbor, WOOLBRIDGE.

phosphate in Ludington mine, BROWNE.

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N.

NEWBERRY, John S.—Continued.

New York Acad. Sci., Trans., vol. 6, p. 138, $\frac{1}{12}$ p. 1887.

Statement of opinion in regard to the status of Emmons's generalization.

—— Fossil fishes and fossil plants of the Triassic rocks of New Jersey and the Connecticut valley.

U. S. Geol. Survey, Monograph, No. 14, XIV, 122 pages, 26 plates. 4°. Washington, 1888.

Abstracts, New York Acad. Sci., Trans., vol. 6, pp. 124–128, 1887; Am. Naturalist, vol. 22, p. 639, $\frac{3}{4}$ p., 1888; Am. Jour. Sci., 3d series, vol. 38, pp. 77–78, 1889; Am. Geologist, vol. 4, pp. 187-188, $\frac{3}{4}$ p., 1889; Popular Science Monthly, vol. 36, pp. 562–563, $\frac{1}{2}$ p. 1890.

Includes (pp. 3-15) geologic sketch of the characteristic features of the containing rocks; reference to conditions under which they were deposited, and to the origin of their materials; and a discussion of their structure, former extent, and equivalency. Also, reference to the age, history, and relations of the Jura and Trias of western United States.

—— Rhetic plants from Honduras.

Am. Jour. Sci., 3d series, vol. 36, pp. 342–351, pl. VIII. 1888.

Includes a brief reference to the relations of the plant-bearing beds.

Statements in regard to stratigraphic position of oil-bearing strata, and disscussion of the origin of gas and oil.

—— [On the nomenclature of the American lower Paleozoic.]

International Congress of Geologists, Am. Committee, Reports, 1888, B, pp. 13–17.

Am. Geologist, vol. 2, pp. 203–207. 1888.

—— [On nomenclature of the Tertiary formations, and on the inclusion of the "Quaternary" in the Tertiary.]

International Congress of Geologists, Am. Committee, Reports, 1888, F, p. 15, $\frac{1}{2}$ p.

Am. Geologist, vol. 2, p. 281. 1888.

[——] [Significance of overlap of Cretaceous on Archean on Staten Island.]

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—— The geology of Crow Wing and Morrison counties.

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—— [Beaches of Lake Agassiz.] See **CHAMBERLIN**, Division of glacial geology.

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fossils from San Pete region, WHITE, C. A.
gilsonite, Uinta County, RAYMOND.
gold and silver mining, HOLLISTER.
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obsidian, IDDINGS.
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Describes the gneisses, granites, felsite dikes, and their contained minerals. On accompanying map indicates boundary of metamorphic and sedimentary rocks.

—— Address of the retiring president.

Colorado Sci. Soc., Proc., vol. 2, pp. 278–285. 1888.

Refers to geologic features of Caribou Mountains, and at the Wilson mine, Idaho, in connection with the occurrence of gold at these localities.

—— Colorado volcanic craters.

Colorado Sci. Soc., Proc., vol. 3, pp. 19–24. 1889.

VAN DIEST, P. H.—Continued.

Describes some features of craters and lava flows in Rio Grande County, and refers to reports of craters at other points in Colorado.

VAN HISE, C. R. Notes on the enlargement of hornblendes and augites in fragmental and eruptive rocks.

Am. Jour. Sci., 3d series, vol. 33, pp. 385–388. 1887.

Abstract, Am. Naturalist, vol. 22, p. 168, ½ p. 1888.

Calls attention to Becke's discovery of the fact in 1883, and describes some Penokee-Gogebic altered diabases exhibiting secondary hornblendic enlargements on augite grains.

—— The iron ores of the Penokee-Gogebic series of Michigan and Wisconsin.

W.

WADSWORTH, M. E. Preliminary description of the peridotytes, gabbros, diabases, and andesytes of Minnesota.

Geol. and Nat. Hist. Survey of Minnesota, Bull. No. 2, pp. 9–159, 12 plates. 8°. St. Paul, 1887.

Abstract, Am. Naturalist, vol. 22, pp. 452–453, ½ p. 1888.

Description and discussion of the micro-petrography of a large collection in greater part from the northeastern part of the State. Colored plates of micro rock sections.

Also includes a discussion of classification, history, and relations of basic crystalline rocks.

—— The Keweenawan system.

Science, vol. 10, p. 166, ½ p. 1887.

Describes a locality on the Hungarian River; a graduation of the eastern sandstone into the Keweenaw rocks is exhibited without intervening fault. Discusses the copper-bearing rocks and relative position of the sandstones.

—— [On subdivisions, unconformities, characteristics, origin of some members, nomenclature, and life of the Archean, and origin of serpentine.]

International Congress of Geologists, Am. Committee Reports, 1888, A, pp. 69–70.

Wagner Free Institute, Transactions, vol. 1.

Explorations on west coast of Florida, etc., HEILPRIN.

WALCOTT, Charles D. Report * * * Division of Paleozoic Invertebrates.

U. S. Geol. Survey, Sixth Annual Report, 1884-'85, pp. 74–78. 1885.

Notice of Paleozoic rocks of central Texas and Devonian fossils from northern Montana.

—— The Taconic system.

Am. Jour. Sci., 3d series, vol. 33, pp. 153–154. 1887.

Announces results of recent field work in Taconic region which indicates: 1. That the granular quartz is the shore deposit of the shales, sandstones, and limestones of the "upper Taconic and is Middle Cambrian in age," and 2. That the Potsdam is represented by the base of the limestone on the eastern side and by hydromica shales on the west side of the range; the limestones and overlying slates of the Taconic range representing the calciferous and Hudson River groups, as shown by Dana.

—— Fauna of the "upper Taconic" of Emmons, in Washington County, New York.

WALCOTT, Charles D.—Continued.

Am. Jour. Sci., 3d series, vol. 34, pp. 187–199, plate 1. 1887.

Statement of stratigraphic position and account of mode of occurrence.

—— Section of lower Silurian (Ordovician) and Cambrian strata in central New York, as shown by a deep well near Utica. [Abstract.]

Am. Assoc. Adv. Science, Proc., vol. 36, pp. 211–212, ¾ p. 1888.

Description of drill-hole 2,250 feet in depth.

—— Discovery of fossils in the lower Taconic of Emmons. [Abstract.]

Am. Assoc. Adv. Science, Proc., vol. 36, pp. 212–213. 1888.

Describes occurrences of middle Cambrian species in the quartzites and Trenton-Chazy species in the limestones of southwestern Vermont, and calls attention to their bearing on the question of the age of the Taconic system.

—— The Taconic system of Emmons, and the use of the name Taconic in geologic nomenclature.

Am. Jour. Sci., 3d series, vol. 35, pp. 229–242, pl. III, pp. 307–327, 394–401. 1888.

Abstract, Nature, vol. 37, p. 500, 14 lines; p. 623, 11 lines. 1888.

Review by Jules Marcou, Am. Geologist, vol. 2, pp. 10–23, 67–88. 1888.

Review of Emmons and others, description and discussion of relations in the Taconic region, announcement of discovery of fossils and structural features throwing new light on the relative position, equivalency, and relations of the various members of the Taconic system, discussion of nomenclature and classification of the Cambrian formations. Accompanied by a colored geologic map.

—— Cambrian fossils from Mount Stephen, Northwest Territory of Canada.

Am. Jour. Sci., 3d series, vol. 36, pp. 161–166, September number. 1888.

Read to Biological Society of Washington, 1888.

Review of some of the species described by Rominger, and discussion of the paleontologic evidence on the stratigraphic position of the Cambrian of Mount Stephen.

—— [On the nomenclature and origin of the Archean and the use of the term Taconic.]

International Congress of Geologists, Am. Committee Reports, 1888, A, pp. 57–58.

—— Synopsis of conclusions on the "Taconic system" of Emmons.

WALCOTT, Charles D.—Continued.

International Congress of Geologists, Am. Committee Reports, 1888, B, pp. 25–29.

Am. Geologist, vol. 2, pp. 215–219. 1888.

Extracts from paper in American Journal of Science, 1888, with additional notes.

—— Report—Paleozoic division of invertebrate paleontology.

U. S. Geol. Survey, Seventh Report, J. W. Powell, 1885-'86, pp. 113–117. 1888.

Reference to the formations constituting the Paleozoic in central Nevada, especially to the discovery of Devonian and lower Carboniferous; the thickness and horizon of the Wahsatch Cambrian; to studies by H. S. Williams on the stratigraphy and faunal relations of the Devonian of southern New York; and collection of Cambrian fossils in the southern Appalachian by Cooper Curtice.

—— Stratigraphic position of the Olenellus faunæ of North America and Europe.

Am. Jour. Sci., 3d series, vol. 37, pp. 374–392, vol. 38, pp. 29–42. 1889.

Abstracts, Nature, vol. 40, pp. 68, 310–311, 24 lines, 1889. New York Acad. Sci., Trans., vol. 8, p. 176, ½ p. 1889.

Review and discussion of paleontologic and stratigraphic relations of the lower Cambrian to the middle Cambrian, and of the stratigraphic position, geographic distribution, zoology and stratigraphic characteristics of the Olenellus zone in America and Europe. Includes a description of the Cambrian of Newfoundland based on recent examinations, and a general review and tabulation of Cambrian taxonomy.

—— A simple method of measuring the thickness of inclined strata.

U. S. National Museum, Proc., vol. 11, pp. 447–448. 1889.

WALKER, J. B. Notes on the geology of Burnet County.

Geol. and Sci., Bull., vol. 1, February, 1889. 4°.

Statements in regard to characteristics, relations, and distribution of the Cretaceous and Carboniferous.

WARD, Lester F. Synopsis of the flora of the Laramie group.

U. S. Geol. Survey, Sixth Report, J. W. Powell, 1884-'85, pp. 399–557, pls. III–LXV. 1885.

Abstracts, Am. Naturalist, vol. 21, pp. 1011–1012; Am. Geologist, vol. 2, pp. 56–58, 1888.

Review, Science, vol. 10, pp. 150–151. 1887.

Reviews the opinions which have been held in regard to the age and position of the Laramie and equivalent formations. Describes the nature, extent, and vegetation of the group and discusses its age, history, distribution, and floral relations, the equivalency of groups near its horizon, and the stratigraphic and geographic range of the flora of the Laramie, Senonian, and Eocene. Gives a brief account of observation on the lower Tertiary or upper Cretaceous at several points in Colorado and Wyoming, and along the Missouri from Fort Benton to Bismarck.

WARD, Lester F.—Continued.

—— Evidence of the fossil plants as to the age of the Potomac formation.

Am. Jour. Sci., 3d series, vol. 36, pp. 119–131. 1888.

Abstract, Nature, vol. 38, p. 462, 9 lines. 1888.

Read to National Academy of Sciences, 1888.

—— Report—Division of paleobotany.

U. S. Geol. Survey, Seventh Report, J. W. Powell, 1885-'86, pp. 123–126. 1888.

Includes a brief reference to the occurrence of outcrops of younger Mesozoic from Richmond southward, and at Weldon, North Carolina.

WARDROPER, D. Lee. The formation of coal beds.

Eng. and Mining Jour., vol. 45, p. 473, ½ col., 4°. 1888.

Describes occurrence of small lenticular coal masses in sandstone over coal beds in northwestern Georgia.

WARRING, Charles B. The cutting at Croton Point, New York.

Vassar Brothers' Inst., Trans., vol. 4, pp. 274–278. 1887.

Describes and figures beds of sand and cobbles unconformably overlain by two layers of very fine material conformable to the surface of the ground, on Hudson River just north of the mouth of the Croton River.

—— The evolution of continents.

Vassar Brothers' Inst., Trans., vol. 4, pp. 256–271, 273–274. 1887.

General discussion of the relations of continental masses; the theories of continental formation and the solidification of the earth's crust. Advances the hypothesis that the continents originally constituted a great triangular clot of solidified matter floating on a molten surface, and by breaking apart near the central line at the present Atlantic Ocean, separated into continents which were thence solidified into their present positions.

Washburn College Laboratory, Bulletin, vol. 2.

Paleontology of the Plains, CRAGIN.

Region south of great bend of the Arkansas, CRAGIN.

Washington, analysis of soil, SCHNEIDER.

WEBSTER, Clement L.—Continued.

Iowa, and the effects upon the faunal relations.

—— A general preliminary description of the Devonian rocks of Iowa, which constitute a typical section of the Devonian formation of the interior continental area of North America.

Am. Naturalist, vol. 23, pp. 229–243. 1889.

Description of the characteristics, distribution, and relations, and discussion of equivalency, stratigraphic range, and paleontologic relations of the several members.

—— A description of the Rockford shales of Iowa.

Davenport, Acad. Sci., Proc., vol. 5, part 1, pp. 100–109. 1889.

Description of stratigraphy, and lists of fossils.

WEED, Walter Harvey. On the formation of siliceous sinter by the vegetation of thermal springs.

Am. Jour. Sci., 3d series, vol. 37, pp. 351–359. 1889.

Describes the formation of siliceous deposits by algæ and mosses in the geyser waters in the Yellowstone Park; discusses their rate of growth; gives analyses of Yellowstone Park and New Zealand sinters, and discusses the nature of the latter. Preceded by a general discussion of the deposition of silica by geyser waters.

WENDT, Arthur F. The copper ores of the southwest.

Am. Inst. Mining Engineers, Trans., vol. 15, pp. 25–77, plate. 1887.

Abstract, Eng. and Mining Jour., vol. 43, pp, 94–96, 112–114, 133–134, 150–152, 183–185. 1887.

Describes the occurrence of ores in Carboniferous limestones, and associated eruptives at Santa Rita, New Mexico, Clifton, Bisbee, and Black Range districts, Arizona, and in recent formations at Moleje, Lower California. Includes notes on micropetrography, by A. A. Julien.

West Virginia, coal, ASHBURNER.

coal from Jefferson County; analysis, WHITFIELD, J. E.

WHITE, Charles A. Report . . . . . Division of Mesozoic Invertebrates.

U. S. Geol. Survey, 6th Annual Report, J. W. Powell, 1884–'85, pp. 72–74. 1885.

Announces his conclusions in regard to the position of the Chico and Téjon groups, and the auriferous slate series of California Calls attention to the occurrence of a Cretaceous formation in Mendocino County, California, to which the provisional name of Wallala group is given.

WHITE, Charles A.—Continued.

—— On the age of the coal found in the region traversed by the Rio Grande.

Am. Jour. Sci., 3d series, vol. 33, pp. 18–20. 1887.

Refers it either to the Laramie or Fox Hills formation, or to both, and describes the extension of these formations southward into Mexico.

—— On the inter-relation of contemporaneous fossil faunas and floras.

Am. Jour. Sci., 3d series, vol. 33, pp. 364–374. 1887.

Discusses the faunal and floral relations and contemporaneity of deposition of the Laramie, and the equivalents of the Bridger, and the stratigraphic position of these groups.

—— On the relation of the Laramie molluscan fauna to that of the succeeding fresh-water Eocene and other groups.

U. S. Geol. Survey, Bull., vol. 5, pp. 391–442, 5 plates. No. 34. 1887.

Abstracts, Science, vol. 10, pp. 126–127. 1888; Popular Science Monthly, vol. 33, p. 420, ½ col. 1888.

Describes Wasatch fossils from San Pete Valley and adjacent portions of Wasatch Mountains, and discusses the faunal and stratigraphic relations of these beds, and of the Bear River Laramie, Wasatch, Laramie, Puerco, and Fort Union groups. (The abstract in Science is a very complete one.)

—— On the Cretaceous formations of Texas, and their relation to those of other portions of North America.

Philadelphia, Acad. Sci., Proc., 1887, part 1, pp. 39–47.

Describes results of studies by R. T. Hill, from which is given a descriptive table of the strata of the eastern half of Texas, and their supposed equivalents in the Mississippi and upper Missouri River sections. Discusses the equivalency, distribution, subdivisions, and relations to associated formations.

—— On the occurrence of later Cretaceous deposits in Iowa.

Am. Geologist, vol. 1, pp. 221–227. 1888.

References to localities and occurrence of fossils, and discussion of their stratigraphic position in the Cretaceous, the position of Cretaceous shore line, and original thickness and extent of the Cretaceous in Iowa.

—— On the relation of the Laramie group to earlier and later formations.

Am. Jour. Sci., 3d series, vol. 35, pp. 432–438. 1888.

Abstract, Nature, vol. 38, p. 189, 7 lines. 1888.

Description of the relations of the Laramie in the lower Rio Grande region in Texas and

WHITE, Charles A.—Continued.

Mexico, references to the relations of the Belly River series, and discussion of the history of the late Cretaceous and early Tertiary in western America, and the Cretaceous age of the greater part of the Laramie.

—— On the Puget group of Washington Territory.

Am. Jour. Sci., 3d series, vol. 36, pp. 443–450. 1888.

Abstract, Nature, vol. 39, p. 189, 16 lines. 1888.

Statement of general relations and discussion of genesis, history, biologic relations, and correlation with Laramie and Chico-Téjon groups.

—— Mountain upthrusts.

Am. Naturalist, vol. 22, pp. 399–408. 1888.

Sections and descriptions of the Uinta fold, and the Junction and Yampa mountain upthrusts, and discussion of their history and the philosophy of their uplift.

—— [On the fauna of the Permian of Baylor, Archer and Wichita counties, Texas.]

Am. Naturalist, vol. 22, p. 926, ½ p. 1888.

Statement of his opinion in regard to the Permian age of the formations.

—— On Hindeastræa, a new generic form of Cretaceous Astrædæ.

Geol. Magazine, 3d decade, vol. 5, pp. 362–364. 1888.

Incidentally refers to stratigraphic position of Ripley group.

—— Remarks on the genus Aucella, with special reference to its occurrence in California.

U. S. Geol. Survey, Monograph, No. 13, Quicksilver deposits of the Pacific slope. By G. F. Becker, pp. 226–232, plates III, IV. 1888.

Includes a statement in regard to the age of the containing series indicated by its occurrence.

—— Report—Mesozoic division of invertebrate paleontology.

U. S. Geol. Survey, Seventh Report, J. W. Powell, 1885-'86, pp. 117–120. 1888.

References to thickness, age, and fauna of coal-bearing series in hills south of San Pete valley, Utah, their faunal relation to the Laramie and their equivalency with the coal-bearing beds near Evanston, Wyoming; the occurrence of coal in the Laramie in Cottonwood Cañon, the equivalency of the coal series in Pleasant valley and Coalville, Utah, and the marine origin of the containing strata; the faunal relations of the Laramie and Wasatch, and extent of land area during the latter part of the Jurassic period.

WHITE, Charles A.—Continued.

—— The lower Cretaceous of the Southwest and its relation to the underlying and overlying formations.

Am. Jour. Sci., 3d series, vol. 38, pp. 440–445. 1889.

An account of its characteristics and relations in various districts in Texas and northern Mexico, and discussion of its stratigraphic range, equivalency, history, and extent.

—— On the Permian formation of Texas.

Am. Naturalist, vol. 23, pp. 109–128, pl. (February, 1889).

Discussion of faunal and stratigraphic relations and range; brief description of its several members, estimates of thickness, dip, and extent, characteristics and relations of associated formations, and review of evidence and opinions bearing on the identity and equivalency of the Permian in North America.

—— On invertebrate fossils from the Pacific coast.

U. S. Geol. Survey, Bull., vol. 8, pp. 433–532, pls. I–XIV. No. 51. 1889.

Abstract. Am. Geologist, vol. 5, pp. 109–110, ⅝ p. 1890.

The paper consists of five parts: I. New fossil mollusca from the Chico-Téjon series of California, which includes a discussion of the stratigraphic and faunal relation of the series. II. Equivalents of the Chico-Téjon series in Oregon and Washington; a description of a number of new or little-known localities. III. Cretaceous fossils from Vancouver Island region, including some remarks on the faunal relations of the Vancouver group. IV. Molluscan fauna of the Puget group; includes some general remarks on the geology of the group, its history, extent, and faunal and floral relations. V. Mesozoic mollusca from the southern coast of the Alaskan peninsula, including some remarks on the horizon of the containing beds.

—— The North American Mesozoic.

Science, vol. 14, pp. 160–166. 1889.

Nature, vol. 40, p. 557, 12 lines. 1889.

Abstracts of address to Am. Assoc. Adv. Science, 1889.

WHITE, C. D. Carboniferous glaciation in the southern and eastern hemispheres, with some notes on the Glossopteris flora.

Am. Geologist, vol. 3, pp. 299–330. 1889.

Sets forth a summary of the evidence of an early Carboniferous glacial epoch in the region bordering the Indian Ocean in Asia Africa, and Australia, and reviews the discussions of its date and extent, the correlation of the terranes by which it is represented in different regions, the origin and history of the Glossopteris flora, and the evidence of an Africa-India-Australian continent.

WHITE, I. C. Rounded bowlders at high altitudes along some Appalachian rivers.

Am. Jour. Sci., 3d series, vol. 34, pp. 374–381. 1887.

A discussion of the history recorded in the bowlder deposits and terraces, especially in connection with the existence of a glacial ice dam in the Ohio. Discusses the relations and significance of bowlder deposits along the upper Ohio, the Kanawha, the Pittsburg regions, the Potomac, and the James; the bowlder and clay-covered divides of the Teazes valley near Charleston and Pittsburg and McKeesport, Pennsylvania; the terraces of the Monongahela and Youghiogheny, the variations in altitude of these bowlder and terrace deposits, and the origin of the high-level deposits along the Cheat River of West Virginia.

WHITEAVES, J. F. Notes on some Mesozoic fossils from various localities on the coast of British Columbia, for the most part collected by Dr. G. M. Dawson in the summer of 1886.

Canada, Geol. and Nat. Hist. Survey, Report, 1886, part B, pp. 108–114. Appendix 1. 1887.

Includes mention of localities and some suggestions in regard to horizons indicated by the fossils.

WHITFIELD, J. Edward. [Analyses of volcanic dusts.]

U. S. Geol. Survey, Bull., vol. 7, p. 141, ½ p. No. 42. 1887.

From Marsh Creek valley, Idaho, Little Sage Creek, Montana, and Devil's pathway, Montana.

—— Coal from Jefferson County, West Virginia.

U. S. Geol. Survey, Bull., vol. 7, p. 146, ¼ p. No. 42. 1887.

Analysis.

—— Coal from Walnut Cove, Stokes County, North Carolina.

U. S. Geol. Survey, Bull., vol. 7, p. 146, ¼ p. No. 42. 1887.

Analysis.

WHITFIELD, R. P. New Jersey Cretaceous.

Am. Naturalist, vol. 21, pp. 66–69. 1887.

General review of stratigraphy and faunal relations of the Cretaceous and Eocene, and discussion of the equivalency of the former with members in the upper Missouri section.

—— [On the use of the term "Quaternary."]

International Congress of Geologists, Am. Committee Reports, 1888, F, pp. 15–16, ⅛ p.

WHITFIELD, R. P.—Continued.

Am. Geologist, vol. 2, pp. 281–282. 1888.

Consideration of its taxonomic value.

—— Observations on some imperfectly known fossils from the Calciferous sandrock of Lake Champlain, and descriptions of several new forms.

Am. Museum Nat. Hist., Bull., vol. 2, pp. 41–63, plates VII–X. 1889.

Preceded by a brief description of the relations near Plattsburg, New York.

—— Note on the faunal resemblance between the Cretaceous formations of New Jersey and those of the Gulf States.

Am. Museum Nat. Hist., Bull., vol. 2, pp. 113–116. 1889.

Parallel lists of species from Alabama, Mississippi, Texas, and Dakota, and comments on the faunal relations.

WHITING, H. A. Mono County.

California, Eighth Report of State Mineralogists, pp. 352–401. 1888.

Includes incidental references to geologic relations at various localities and to petrographic features of some of the rocks.

WHITTLE, Charles Livy. The intrusive and extrusive Triassic trap sheets of the Connecticut valley. See **DAVIS**, William Morris, and.

WILLIAMS, George H. On a plan proposed for future work upon the geological map of the Baltimore region.

Johns Hopkins Univ. Circular, No. 59, pp. 122–123. 1887.

Statement of scope.

—— Rutil nach Ilmenit in verändertem Diabas. Pleonast (Hercyint) in Norit von Hudson-Fluss. Perowskit in Serpentin (Peridotit) von Syracuse, New York.

Neues Jahrbuch, 1887, Band 2, ss. 263–267.

Describes micropetrography of diabase from Big Quinnesec Falls, Menominee River; the norite of the Cortlandt series, and the serpentine of Syracuse, the origin of which is also briefly discussed.

—— The norites of the "Cortlandt series" on the Hudson River near Peekskill, New York.

Am. Jour. Sci., 3d series, vol. 33, pp. 135–144, 191–199. 1887.

Abstract, Neues Jahrbuch, 1887, Band 2, ss. 316–317.

After a review of the distribution of hypersthene rocks in general, describes and discusses the micropetrography, occurrence

WILLIAMS, George H.—Continued.

and some structural relations of the "norite proper," "hornblende norite," "mica norite," "hyperite," or "augite norite," "pyroxenite" and their graduations.

—— Holocrystalline granitic structure in eruptive rocks of Tertiary age.

Am. Jour. Sci., 3d series, vol. 33, pp. 315–316, 1887.

Notice of some of Stelzner conclusions in his memoir on "The Geology of the Argentine Republic." Incidentally refers to the nature of the "Nevadite" of von Richthofen and discusses the relations of structure in rock masses to the conditions under which they solidify.

—— On the serpentine (peridotite) occurring in the Onondaga salt group at Syracuse, New York.

Am. Jour. Sci., 3d series, vol. 34, pp, 137–145. 1887.

Abstracts by author. Science, vol. 9, pp. 137–145, 1887; Neues Jahrbuch, 1888, Band 1, ss. 80–81.

Describes the occurrence of the rock and its chemic and mineralogic constituents. Discusses its alteration from peridotite and its close resemblance to the dikes of Elliott County, Kentucky.

—— The gabbros and associated hornblende rocks occurring in the neighborhood of Baltimore, Maryland. U. S. Geological Survey, Bull. No. 28.

Abstract, Geol. Mag., 3d decade, vol. 4, pp. 87–88. 1887.

—— Some examples of the dynamic metamorphism of the ancient eruptive rocks on the south shore of Lake Superior. [Abstract.]

Am. Assoc. Adv. Science, Proc., vol. 36, pp. 225–226. 1888.

Description of certain modifications which rocks undergo when subjected to the action of mountain-making forces.

—— The gabbros and diorites of the "Cortlandt series" on the Hudson River near Peekskill, New York.

Am. Jour. Sci., 3d series, vol. 35, pp. 438–448. 1888.

Abstract, Am. Naturalist, vol. 22, p. 929, ⅛ p. 1888.

References to occurrence and relation to each other, and petrographic description.

—— The contact metamorphism produced in the adjoining mica schists and limestones by the massive rocks of the "Cortlandt series" near Peekskill, New York.

WILLIAMS, George H.—Continued.

Am. Jour. Sci., 3d series, vol. 36, pp. 254–269. pl. VI. 1888.

Abstracts, Johns Hopkins Univ. Circulars, vol. 7, pp. 63–65, No. 65, 1888; Am. Naturalist, vol. 22, pp. 1020–1021, ½ p., 1888.

Mainly petrographic. Describes contact relations at Cruger's Station and on the southern end of Verplanck's Point. Résumé of evidence of the eruptive nature of the massive members of the Cortlandt series and references to conditions of solidification, and location of the center of eruptive action.

—— [Subdivision of Archean, nature of oldest crystalline schists, origin of serpentine, and use of term "Taconic."]

International Congress of Geologists, Am. Committee Reports, 1888, A, pp. 67–68.

—— On the use of the term "Taconic."

International Congress of Geologists, Am. Committee Reports, 1888, B, p. 17, 3 lines.

Am. Geologist, vol. 2, p. 207. 1888.

Expression of opinion.

—— Geology of the Baltimore region.

Johns Hopkins Univ. Circulars, vol. 7, p. 73, ¼ col. No. 65. 1888.

Refers to the sequence of the eruptives.

—— Progress of the work on the Archean geology of Maryland.

Johns Hopkins Univ. Circulars, vol. 7, pp. 61–63. No. 65. 1888.

General sketch of Maryland geology and description of the relations of the gneisses and various eruptives in the Baltimore region and northward to the Pennsylvania line.

—— Geology of Fernando de Noronha, Part II, petrography.

Am. Jour. Sci., 3d series, vol. 37, pp. 178–189. 1889.

Abstract, Am. Naturalist, vol. 23, p. 522, ½ p. 1889.

Petrographic description of specimens of phonolites, trachytes, and andesites.

—— Contributions to the mineralogy of Maryland.

Johns Hopkins Univ. Circulars, vol. 8, pp. 99–100. No. 75. 1889.

Includes reference to the occurrence and composition of an ottrelite rock in Frederick County.

WILLIAMS, H. S. Methods of instruction in general geology.

Am. Naturalist, vol. 21, pp. 616–626. 1887.

—— On the fossil faunas of the upper Devonian. The Genesee section, New York.

U. S. Geol. Survey, Bull., vol. 6, pp. 481–603, pls. I–IV. No. 41. 1887.

WILLIAMS, H. S.—Continued.

Discussion of the paleontologic and stratigraphic relations, equivalency, and range of the members of the upper Devonian and base of the lower Carboniferous in southern New York, northern Pennsylvania, and Ohio. Detailed description of stratigraphy and fauna at various localities from Genesee County, New York, to McKean County, Pennsylvania.

—— On the different types of the Devonian system in North America.

Am. Jour. Sci., 3d series, vol. 35, pp. 51–59. 1888.

Abstracts, Nature, vol. 37, p. 358, 11 lines, 1888; Am. Assoc. Adv. Science, Proc., vol. 36, pp. 207–208, ⅔ p. 1888.

Résumé of the more prominent features and discussion of the paleontologic and stratigraphic relations of the Devonian formations in the several areas.

—— Report of the subcommittee on the upper Paleozoic (Devonic).

International Congress of Geologists, Am. Committee Reports, 1888, C, pp. 31.

Am. Geologist, vol. 2, pp. 225–239. 1888.

Review by Jules Marcou, Am. Geologist, vol. 3, pp. 60–61, ⅔ p. 1889.

A general review of the distribution, taxonomy, and nomenclature of the Devonian members of North America.

—— On the relation of the Devonian faunæ of Iowa.

Am. Geologist, vol. 3, pp. 230–233. 1889.

Discussion of the faunal relations, and stratigraphy and equivalency of the Iowa Devonian.

—— The use of fossils in determining the age of geologic terranes. [Abstract.]

Am. Assoc. Adv. Science, Proc., vol. 37, p. 206, ⅔ p. 1889.

Discusses the value and limitation of paleontologic correlations.

—— [Comparision of cis- with trans-Atlantic formations.]

Nature, vol. 40, p. 557, ½ col. 1888.

Abstract of paper read to American Association, 1889.

Faunal relations of Devonian of England and America.

WILLIAMS, S. G. Note on the lower Helderberg rocks of Cayuga Lake.

New York, Sixth Report of the State Geologist, 1886, pp. 10–12. 1887.

Notice of additional discoveries of fossils. Repeats his opinion that the "Salina and lower Helderberg are merely different phases of one geological period, deposited under very different conditions indeed, but to a great extent contemporaneously."

WILLIAMS, S. G.—Continued.

—— The Tully limestone, its distribution, and its known fossils.

New York, Sixth Report of the Geologist, 1886, pp. 13–29. Map. 1887.

Describes its line of outcrop, constituents, thickness, structure, and fossils. Accompanied by a map of its outcrop.

WILLIS, Bailey. Changes in river courses in Washington Territory due to glaciation.

U. S. Geol. Survey, Bull., vol. 6, pp. 473–480, 4 plates. No. 40. 1887.

Discussion of the agency of lava flows and glaciers in diverting a portion of the course of the Columbia River, Accompanied by a geologic map indicating the formations along a line of reconnaissance, and hachured maps showing preglacial channel of the Similkameen River, the lower valley of the Okinakane River, and Columbia River from the latter to Lake Chelan.

—— Topography and structure in the Bays Mountains, Tennessee.

School of Mines Quarterly, vol. 8, pp. 242–252. 1887.

Describes their structure, topography, and drainage, and discusses the relations of drainage and topography to structure, and the time and extent of Appalachian uplift.

[——] [Absence of Sierra Nevada structure in northern Washington Territory.]

Washington, Phil. Soc., Bull., vol. 9, p. 8, ⅛ p. 1887.

States that the eastern face of the Cascade Range is not determined by a great fault.

—— The marble of Hawkins County, Tennessee.

School of Mines Quarterly, vol. 9, pp. 112–123. 1888.

Description of a bed of Trenton marble, and the great fault by which it is cut off from the adjoining Cambrian rocks.

—— Mount Rainier and its glaciers.

Washington, Phil. Soc., Bull., vol. 10, p. 10, ⅛ p. 1888.

Brief mention of the paper, and statement in regard to the relations of Mounts Rainier and Shasta as points of volcanic activity.

—— Round about Asheville.

National Geogr. Mag., vol. 1, pp. 291–300. Map. 1889.

Classification of the topographic characteristics of the western North Carolina-East Tennessee region, and discussion of evidence and history of successive stages of elevation and base leveling.

WINCHELL, Alexander. Report of geological observations made in north-

WINCHELL, Alexander.—Continued.

eastern Minnesota during the season of 1886.

Geol. and Nat. Hist. Survey of Minn., 15th Report, 1886, pp. 7-206. Map. 1887.

Field notes of work in region north of the western part of Lake Superior. Describes and figures many details of structure, rock texture, and distribution, volcanism, vein stones, etc., in the crystalline and metamorphic series. In a summary of observations (p. 172) gives a general description of the region, and discusses the structural and stratigraphic relations, extent, equivalency, modifications, variations, origin, and geologic history of the formations. Reviews Lawson on the Keewatin series, and on gneissic foliation. Notices some glacial phenomena in the region. Accompanied by a folded colored geologic map, in part, by N. H. Winchell.

—— Unconformability between the Animikie and the Vermilion series.

Am. Jour. Sci., 3d series, vol. 34, p. 314. 1887.

"The Animikie flint schists dipping, 5° S. have been traced by me to within seven feet of sericitic argillites of the Vermilion series dipping about 67° NE."

—— The unconformities of the Animikie in Minnesota.

Am. Geologist, vol. 1, pp. 14–24. 1888.

Reference to characteristics, relations, distribution, and equivalency of the Animikie, and description and discussion of relations in northern Minnesota and some adjacent portions of Canada.

—— Some effects of pressure of a continental glacier.

Am. Geologist, vol. 1, pp. 139–143. 1888.

Discussion of relations of crustal deformation to the great lava outflows of the far West, and to post-glacial uplift of shore lines in the Atlantic coast region.

—— The Taconic question.

Am. Geologist, vol. 1, pp. 347–363. 1888.

Review of literature, and discussion of the grounds of the opponents of the Taconic system, and the nomenclature of the lower Paleozoic.

—— Geology as a means of culture.

Am. Geologist, vol. 2, pp. 44–51, 100–114. 1888.

—— [On the use of the term "Taconic."]

International Congress of Geologists, Am. Committee Reports, 1888, B, pp. 12–13.

Am. Geologist, vol. 2, pp. 202–203. 1888.

Discussion of its applicability.

—— [On the nomenclature of the Tertiary, and the faunal relations, and designation of the Quaternary.]

WINCHELL, Alexander.—Continued.

International Congress of Geologists, Am. Committee Reports, 1888, F, pp. 16–17, ⅔ p.

Am. Geologist, vol. 2, pp. 282–283. 1888.

Discusses the taxonomic value of the Lyellian divisions, and the term "Quaternary."

—— Report of a geological survey in Minnesota during the season of 1887, embracing comparative observations in some other regions.

Minnesota, Geol. and Nat. Hist. Survey, 16th Report, pp. 133–391. 1888.

Description and discussion of relations in northeastern Minnesota, preceded by an account and discussion of observations in the original Huronian in Canada, and in Northern Michigan, and Wisconsin.

—— Systematic results of a field study of the Archean rocks of the northwest. [Abstract.]

Am. Assoc. Adv. Science, vol. 37, pp. 205–206, ½ p. 1889.

Abstract, Science, vol. 12, p. 100, 12 lines. 1888.

Summary statement of stratigraphic succession and equivalency of the crystalline series of the Northwest.

—— Conglomerates enclosed in gneissic terranes.

Am. Geologist, vol. 3, pp. 153–165. 1889.

Describes pebble-bearing gneisses in the region northwest of Lake Superior, discusses the bearing of their occurrence on the origin and history of the gneiss, and cites other instances of conglomeritic crystalline rocks in New England and in Europe.

[——] Rejoinder to Dr. Lawson [on rock foliation and sedimentation].

Am. Geologist, vol. 3, pp. 193–195. 1889.

Discussion of some conditions of metamorphism, and citation of English investigations bearing on the question.

—— Two systems confounded in the Huronian.

Am. Geologist, vol. 3, pp. 212–214. 1889.

Review of Bonney. "Notes on a part of the Huronian series in the vicinity of Sudbury, Canada." Discusses the age and equivalency of the beds described by Bonney, and the correlation of the post-Laurentian series in the Sudbury region with the Huronian and associated series in the Lake Superior district.

—— Conglomerates enclosed in gneissic terranes.

Am. Geologist, vol. 3, pp. 256–261. 1889.

Discusses the bearing of the occurrence of pebbles in crystalline rocks of various ages, including the Laurentian, on the clastic origin of some of the Laurentian members.

WINCHELL, Alexander—Continued.

—— On the Archean. See **FRAZER**, Report on Archean.

WINCHELL, H. V. Partial report of observations made by.

Minnesota, Geol. and Nat. Hist. Survey, Fifteenth Report, 1886, pp. 403–419. 1887.

On crystalline rocks of a portion of northeastern Minnesota.

—— Report of observations made during the summer of 1887.

Minnesota, Geol. and Nat. Hist. Survey, Sixteenth Report, pp. 395–478, map. 1888.

Description of relations and characteristics of crystalline rocks along various routes in northwest Minnesota. References to Cretaceous outliers.

—— The diabasic schists containing the jaspilyte beds of northeastern Minnesota.

Am. Geologist, vol. 3, pp. 18–22. 1889.

Description and discussion of relations of the massive and of schistose basic series and their siliceous and ferruginous associates.

—— Report of field observations made during the season of 1888 in the iron regions of Minnesota.

Minnesota, Geol. and Nat. Hist. Survey, Seventeenth Report, pp. 77–145. 1889.

Notes on region east of Tower. Discussion of the relations of the several formations, pages 128–135.

—— [Professor Irving and the Keewatin series, and the origin and horizon of the iron ores of the Vermilion Lake series.] See **WINCHELL**, N. H. and H. V.

—— On a possible chemical origin of the iron ores of the Keewatin in Minnesota. See **WINCHELL**, N. H., and H. V.

WINCHELL, N. H. Geological report.

Minnesota, Geol. and Nat. Hist. Survey, Fifteenth Report, 1886, pp. 211–399, map. 1887.

Detailed description of Vermilion Lake iron region and vicinity, and discussion of the structural relations, stratigraphy, equivalency, age, extent, origin, etc., of the several formations and of the "jaspilyte rock." Gives list of some glacial striæ. Describes some features of the Mayhew Lake titaniferous iron-ore district. Accompanied by a folded, colored, geologic map.

—— Notes on the classification and nomenclature for the American Committee of the International Geological Congress, March, 1887.

WINCHELL, N. H.—Continued.

American Naturalist, vol. 21, pp. 693–700. 1887.

After stating the present condition of the Taconic question, discusses the history, application, and equivalency of the terms "Taconic," "Primordial," and "Cambrian," showing that "Taconic" was prior to "Cambrian" under the same conditions of application, and was originally applied with equal error. It is urged that "Taconic" should be retained for the first fauna and "Cambrian" for the second, in accordance with the purpose of their authors. Discusses the subdivisions of the Archean and the use of the term.

—— The granite and quartzite contact of the Aurora mine, Gogebic iron range, at Ironwood, Michigan. [Abstract.]

Am. Assoc. Adv. Science, Proc., vol. 36, p. 211, ½ p. 1888.

Discusses the nature and origin of the granite, and refers it to the Huronian.

—— The Animikie black slates and quartzites, and the Ogishke conglomerate of Minnesota, the equivalent of the "original Huronian."

Am. Geologist, vol. 1, pp. 11–14. 1888.

Includes a review of the characteristics of the original Huronian, and a table suggesting the equivalency of the several members with similar rocks in Minnesota and Wisconsin.

—— Some objections to the term Taconic considered.

Am. Geologist, vol. 1, pp. 162–173. 1888.

Discussion of the status of the term and discussion of the objections advanced against its adoption.

—— A great primordial quartzite.

Am. Geologist, vol. 1, pp. 173–178. 1888.

Correlation of Cambrian quartzites of the Taconic region, the Potsdam sandstone of New York, the Huronian quartzites of Minnesota and Wisconsin, the "Potsdam" sandstone of the Black Hills of Dakota, and the eastern sandstones of Michigan.

[——] Note [on small outliers of Cretaceous in Minnesota].

Am. Geologist, vol. 2, p. 334, ¼ p. 1888.

References to localities and characteristics.

—— Report of the subcommittee on the lower Paleozoic.

International Congress of Geologists, Am. Committee Reports, 1888, B, pp. 37.

Am. Geologist, vol. 2, pp. 193–224. 1888.

Discussion of nomenclature, especially in regard to the use of the terms "Taconic" and "St. Croix." Includes extracts of letters from J. D. Dana, S. W. Ford, James Hall, C. H. Hitchcock, Alexander Winchell, J. S. Newberry, G. H. Williams, J. W. Dawson, A. R. C.

WINCHELL, N. H.—Continued.

Selwyn, B. K. Emerson, Joseph Le Conte, James Macfarlane, S. F. Emmons, A. Hague, W. P. Blake, and C. E. Dutton, and synopsis of conclusions by C. D. Walcott on the "Taconic system of Emmons," which is also reviewed.

—— Preface.

Minnesota, Geology of, Final Report, vol. 2, pp. 13–24. 1888.

Discussion of some of the stratigraphic relations and equivalency of members of the Cambrian in the Minnesota and Mississippi valleys. Reference to Cretaceous areas and glacial history.

—— The geology of Wabasha County.

Minnesota, Geology of, Final Report, vol. 2, pp. 1–19, map. 1888.

Description of Cambrian and Trenton areas and the drifts and terraces. Reference to the probable occurrence of Cretaceous. Discussion of the history of some drainage and topographic features. Accompanied by a colored geologic map.

—— The geology of Goodhue County.

Minnesota, Geology of, Final Report, vol. 2, pp. 20–61, map. 1888.

Description of Cambrian, Trenton, Cretaceous, drifts and terraces. List of fossils. Discussion of relation of some drainage features, ancient and modern, extent of Cretaceous, origin of some topographic features, and history of some of the drifts. Accompanied by a colored geologic map.

—— The geology of Dakota County.

Minnesota, Geology of, Final Report, vol. 2, pp. 62–101, map. 1888.

Description of lower Silurian and Cambrian areas, drifts, faults, terraces, gravel plains, remains of ancient drainage systems, Cretaceous outcrops, and the glacial history of the region. Accompanied by a colored geologic map.

—— The geology of Hennepin County.

Minnesota, Geology of, Final Report, vol. 2, pp. 264–344, map, pls. A[1], M–Z. 1888.

Descriptions of Trenton limestone, St. Peter sandstone, and Cretaceous outcrops, and the drifts and terraces. Records of artesian wells. Review of descriptions of St. Anthony's Falls, and discussion of their history and rate of recession. Accompanied by a colored geologic map.

—— The geology of Ramsey County.

Minnesota, Geology of, Final Report, vol. 2, pp. 345–374, map. 1888.

Description of Trenton and St. Peter sandstone and the drifts. Discussion of origin of certain topographic features, the extent and stratigraphic relations of some of the members of the rock formations, and the equivalency of some of the beds met with in the artesian wells. Accompanied by a colored geologic map.

WINCHELL, N. H.—Continued.

—— The geology of Washington County.

Minnesota, Geology of, Final Report, vol. 2, pp. 375–398, map. 1888.

Description of Trenton limestone, St. Peter sandstone, and lower magnesian limestone areas, the drifts, terraces, an anticlinal and faults in the Cambrian, and an unconformity between the lower magnesian and the St. Peter sandstone. Accompanied by a colored geologic map.

—— Report [original Huronian, iron-bearing rocks in Marquette and Gogebic region, and northeastern Minnesota].

Minnesota, Geol. and Nat. Hist. Survey, Sixteenth Report, pp. 13–129. 1888.

Description of various localities, and discussion of structural relations, stratigraphy, genesis, and equivalency of the several pre-Cambrian members. List of directions of glacial striæ.

—— Natural gas in Minnesota.

Minnesota, Geol. and Nat. Hist. Survey, Bull. No. 5, pp. 39. St. Paul, 1889.

Includes records of deep borings near Freeborn, Albert Lea, Mankato, Stillwater, Moorhead, and Duluth, and some comments on the geologic horizon and relations of the beds pierced.

—— The crystalline rocks of Minnesota. General report of progress made in the study of their field relations. Statement of problems yet to be solved.

Minnesota, Geol. and Nat. Hist. Survey, Seventeenth Report, pp. 5–74. 1889.

Review by J. D. Dana, Am. Jour. Sci., 3d series, vol. 39, pp. 67–68, ⅝ p. 1890.

Abstract, Am. Geologist, vol. 5, pp. 59–60. 1890.

A general review and discussion of the stratigraphy, history, and relations of formations from the Laurentian to the St. Croix sandstone.

[——] List of American publications between 1872 and 1889 that have some relation to the crystalline rocks of the Northwest.

Minnesota, Geol. and Nat. Hist. Survey, Seventeenth Report, pp. 233–265. 1889.

—— Notice of the discovery of Lingula and Paradoxides in the red quartzite of Minnesota.

Minnesota, Acad. Sci., Bull., vol. 3, part 1, pp. 103–105. 1889.

Description of the remains, and brief reference to the relations and age of the formation, and its representatives elsewhere.

WINCHELL, N. H.—Continued.

—— Some thoughts on eruptive rocks, with special reference to those of Minnesota.

Am. Assoc. Adv. Sci., Proc., vol. 37, pp. 212–221. 1889.

Reviews classification and relations of eruptive rocks in general, advances hypothesis as to the genesis of acid and of basic eruptives, and gives a résumé of the stratigraphic relations and eruptive contents of the several crystalline rock series of the Northwest.

—— Methods of stratigraphy in studying the Huronian.

Am. Geologist, vol. 4, pp. 342–357. 1889.

Reviews the Huronian system, and discusses its taxonomy, relations to Laurentian, correlation outside of the type area, stratigraphic range and characteristics, and past and present methods of research in this connection.

—— On the Archean. See **FRAZER**. Report on Archean.

—— and **WINCHELL**, H. V. [Professor Irving and the Keewatin series, and the origin and horizon of the iron ores of the Vermilion Lake series.]

Am. Geologist, vol. 4, pp. 383–386. 1889.

Review of Irving's writings in this connection, including references to the distribution, equivalency, and sideritic contents of iron-bearing series of Minnesota.

—— —— On a possible chemical origin of the iron ores of the Keewatin in Minnesota.

Am. Geologist, vol. 4, pp. 291–300. 1889.

Point out the differences in characteristics and relations of the Keewatin and Huronian ores. Discuss the history of the Keewatin formation and advance a hypothesis as to the genesis of its siliceous and ferruginous members.

WINSLOW, Arthur. The Lehigh River cross-section, measured, mapped, and described in detail. Edited by J. P. Lesley.

Pennsylvania, Report of Geol. Survey, 1886, part 4, pp. 1331–1371, sheets 1–5, in atlas. 1887.

Detailed descriptions of stratigraphy and structure. Discussion of the stratigraphic range of some of the members of Nos. IX and X. Accompanied by maps and cross and columnar sections.

—— A preliminary report on a portion of the coal regions of Arkansas.

Arkansas, Geol. Survey, Report for 1888 vol. 3, pp. 1–92, map. 1888.

WINSLOW, Arthur—Continued.

General account of distribution, stratigraphy, and structure. Descripiton of prominent localities. Analyses. Economic. Geologic map.

Wisconsin, Animikie slates and quartzites, WINCHELL, N. H.

Archean rocks of the Northwest, WINCHELL, A.

bowlder trains of central Wisconsin, CHAMBERLIN, T. C.

classification of Cambrian and pre-Cambrian, IRVING.

driftless area, CHAMBERLIN, T. C. CHAMBERLIN and SALISBURY.

granites of the Northwest, HALL, C. W.

Huronian, IRVING.

Gogebic iron region, ENG. AND MINING JOUR. IRVING.

great primordial quartzite, WINCHELL, N. H.

Great Lake basins of St. Lawrence, DRUMMOND.

iron ores of Penokee-Gogebic, VAN HISE.

Irving and Chamberlin on Lake Superior sandstones, AM. GEOLOGIST.

loess and clays, analyses, RIGGS.

Penokee Gap region, WINCHELL, A.

Quaternary of northwestern Wisconsin, CHAMBERLIN.

raised beaches of Lake Michigan, LEVERETT.

Report—Lake Superior division, U. S. Geol. Survey, IRVING.

Report—Glacial division, U. S. Geol. Survey, CHAMBERLIN.

rock from Penokee iron ranges, analysis, RIGGS.

Taconic system, MILLER.

Wisconsin Academy of Sciences, Arts, and Letters, Transactions, vol. 7.

Raised beaches of Lake Michigan, LEVERETT.

WOODWARD, Henry. On the discovery of *Turrilepas* in the Utica formation (Ordovician) of Ottawa, Canada.

Geol. Magazine, decade III, vol. 6, pp. 271–275. 1889.

Includes stratigraphic section of the beds at Rifle Range, near Ottawa, by H. M. Ami.

WOODWARD, R. S. On the form and position of the sea level with special reference to its dependence on superficial masses symetrically disposed about a normal of the earth's surface.

U. S. Geol. Survey, Bull., vol. 8, pp. 87–172, No. 48. 1888.

Incidentally considers certain geologic causes of earth-crust deformation.

WOOLBRIDGE, C. W. The river-lake system of western Michigan.

Am. Geologist, vol. 1, pp. 143–146. 1888.

Description of relations and discussion of origin and history.

—— The post-glacial geology of Ann Arbor, Michigan.

Am. Geologist, vol. 2, pp. 35–39. 1888.

Description of delta deposits and shore lines, and discussion of their history.

WOOLMAN, Lewis. Geological result of the boring of an artesian well at Atlantic City, New Jersey.

Philadelphia, Acad. Sci., Proc., 1887, pp. 339–342

Description of 1,121-foot record, lists of fossils and statement in regard to horizons of the Tertiary beds passed through.

—— [Fossiliferous Cretaceous limestone from near Clementon, New Jersey.]

Am. Naturalist, vol. 23, p. 544, 3 lines. 1889.

Notice of occurrence and fossils.

WOOSTER, L. C. The coal measures of Kansas.

Science, vol. 12, p. 119, ⅓ col. 1888.

Eng. and Mining Jour., vol. 46, p. 240, ¼ col. 4°. 1888.

Describes 2,000-foot bore-hole entirely in coal measures and discusses the conditions under which the coal measures were deposited.

—— The limit of drift [Kansas].

Science, vol. 12, p. 132, ⅓p. 1888.

Calls attention to some glaciated bowlders and briefly discusses their mode of transportation.

WRIGHT, G. Frederick. Notes on the glaciation of the Pacific coast.

Am. Naturalist, vol. 21, pp. 250–256. 1887.

Describes results of glaciation along Northern Pacific Railroad west from Bismarck, in the region about Puget Sound, and glaciers and evidence of glacial action up the coast. Discusses the glacial history of the Puget Sound region.

—— The Muir glacier.

Am. Jour. Sci., 3d series, vol. 33, pp. 1–18. 1887.

WRIGHT, G. Frederick—Continued.

Sci. Am., Supt., vol. 23, pp. 9252–9254. No. 579. 1887.

Description of the glacier, its moraines, its motion, evidence of its retreat, associated drift and rock formations, striæ, and buried forest and other glaciers in its vicinity.

—— ["The ice age in North America."]

Am. Geologist, vol. 1, p. 68, ½ p. 1838.

Notice of lecture to Lowell Institute. Reference to nature of evidence indicative of two glacial epochs.

—— On the age of the Ohio gravel beds.

Boston Soc. Nat. Hist., Proc., vol. 23, pp. 427–436. 1888.

Extract, "Preglacial man in Ohio," Ohio Arch. and Hist. Quart. December, 1887.

Describes the relations of the Trenton gravels and of deposits of similar origin in the valley of the Little Miami in Ohio, and discusses the date of their deposition in glacial times.

—— The ice age in North America, and its bearings upon the antiquity of man. 640 pages, maps. New York, 1889.

Abstract, Popular Science Monthly, vol. 35, pp. 557–560. 1889.

Review, W. M. Davis, Science, vol. 14, pp. 118–119. 1889; Appalachia, vol. 6, pp. 72–73. 1890.

I. What is a glacier? II. Existing glaciers on the Pacific coast. III A month with the Muir glacier. IV. Glaciers of Greenland. V. Glaciers in other parts of the world. VI. Signs of glaciation. VII. Boundary of the glaciated area in North America. VIII. Depth of ice during the glacial period. IX. Terminal moraines. X. Glacial erosion and transportation. XI. Drumlins. XII. Preglacial drainage. XIII. Drainage during the glacial period. XIV. Kames. XV. Glacial dams, lakes, and waterfalls. XVI. The loess. XVII. Flight of plants and animals during the glacial period. XVIII. Europe during the glacial period. XIX. The cause of the glacial period. XX. The date of the glacial period. XXI–XXII. Man and the glacial period. Appendix: A. Probable causes of glaciation. B. Chalmers on the glaciation of eastern Canada.

—— The age of the Philadelphia red gravel.

Boston Soc. Nat. Hist., Proc., vol. 24, pp. 152–157. 1889.

Discussion of the age and condition of deposition of the Columbia formation, and incidentally considers the origin of some high-level Columbia gravels in the Susquehanna valley.

—— [Image from deep well at Nampa, Idaho.]

Am. Geologist, vol. 4, pp. 387–388. 1889.

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