

UC-NRLF



B 3 794 983

7 1507

BERKELEY
LIBRARY
UNIVERSITY OF
CALIFORNIA

EARTH
SCIENCES
LIBRARY

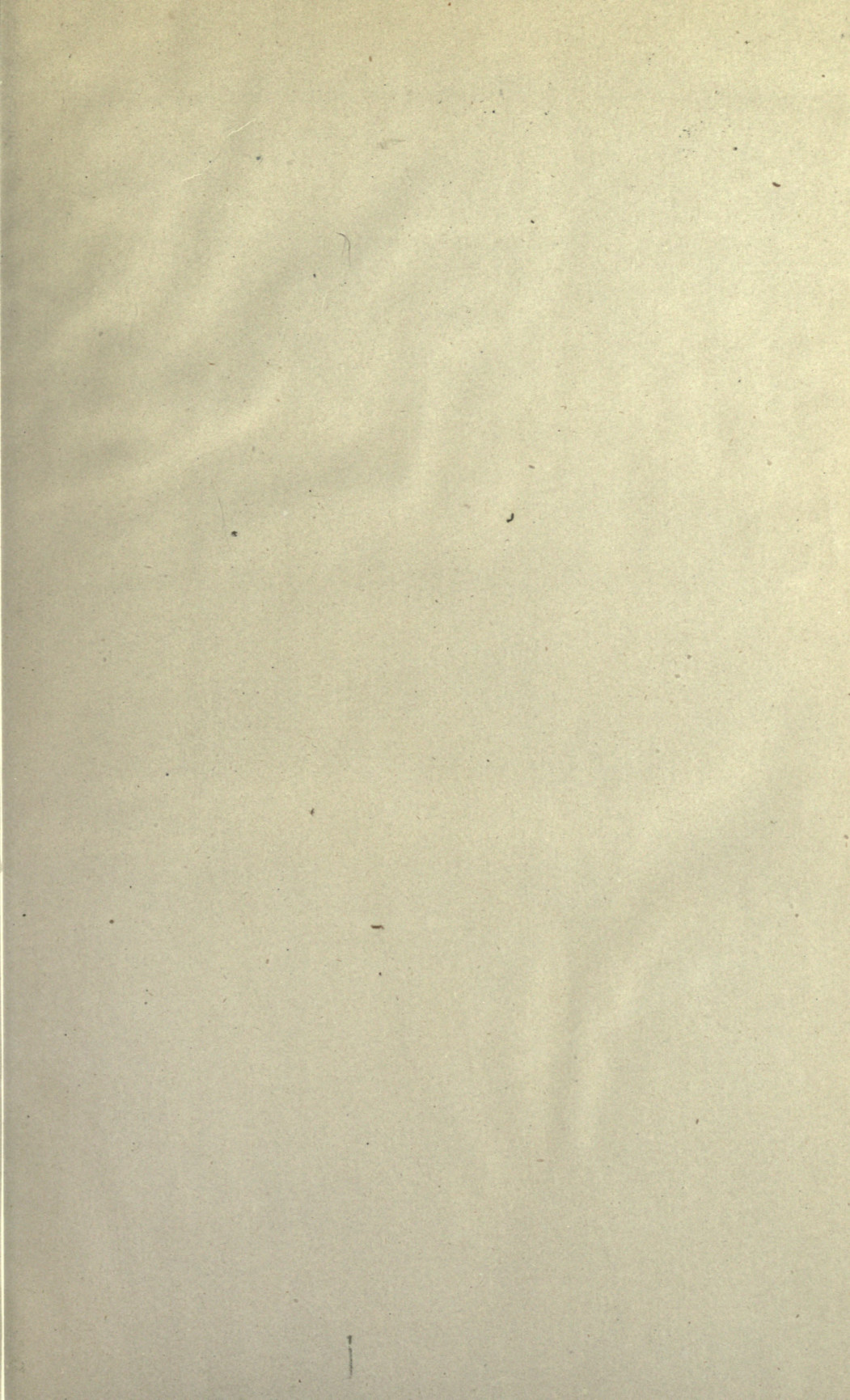
LIBRARY
OF THE
UNIVERSITY OF CALIFORNIA

GIFT OF

Ohio Geol survey.

Class

03 15



GEOLOGICAL SURVEY OF OHIO

EDWARD ORTON, JR., State Geologist.

A BIBLIOGRAPHY OF OHIO GEOLOGY

PART ONE.

A Subject Index of the Publications of the Geological Survey
of Ohio, from its Inception to and including Bulletin
Eight of the Fourth Series

BY

ALICE GREENWOOD DERBY, B. PH., B. A.



PART TWO.

A Bibliography of the publications relating to the Geology of
Ohio, other than those of the State
Geological Survey.

BY

MARY WILSON PROSSER.

Published by authority of the Legislature of Ohio, under the supervision
of the State Geologist.

COLUMBUS, OHIO, AUGUST, 1906.

QE151
A7
no6

EARTH
SCIENCES
LIBRARY

Printed by the Springfield Publishing Company,
Springfield, Ohio.



LETTER OF TRANSMITTAL.

To His Excellency ANDREW L. HARRIS, *Governor of Ohio.*

SIR:—I have the honor to present to you, herewith, the Sixth Bulletin of the fourth series of the publications of the Geological Survey of Ohio. The subject is A Bibliography of Ohio Geology. It is in two parts, the first of which gives an exhaustive analysis of the publications of the Geological Survey of Ohio, from its earliest organization down to the eighth Bulletin of the Fourth Series, published in August, 1906, and which has been prepared by Miss Alice Greenwood Derby, B.Ph., B.A. The second part is an equally painstaking list of all references to Ohio Geology appearing in other publications than the official publications of the Geological Survey of Ohio, and has been prepared by Mary Wilson Prosser (Mrs. C. S. Prosser). The two lists are mutually complementary. I submit this work to you with confidence that it will greatly improve the accessibility, and hence the value, of the studies thus far made in the field of Ohio geology.

I have the honor to be,

Yours very respectfully,

EDWARD ORTON, Jr., E. M.

State Geologist.

OFFICERS OF THE SURVEY.

EDWARD ORTON, JR., E. M. State Geologist

CHARLES SMITH PROSSER, M. Sc. Assistant Geologist
Areal and Stratigraphical Geology.

JOHN ADAMS BOWNOCKER, D. Sc. Assistant Geologist
Economic Geology.

NATHANIEL WRIGHT LORD, E. M. Consulting Chemist
Constitution and Utilization of Coals.

MRS. M. R. McCLELLAND Stenographer and Clerk

ANNOUNCEMENTS BY THE STATE GEOLOGIST.

BULLETIN SIX.

This Bulletin aims to present to the public a thorough analytical statement of what has been done by the various individuals and organizations which have represented the Geological Survey of Ohio since the State first took up this branch of its duties, or who have written on the subject of the Geology of Ohio in any of its numerous phases. It is, of course, realized that no such work is ever entirely complete, and in the nature of the case cannot be made so, but it is believed that the present work covers in its two branches all of the most important contributions in this field.

The purposes served by a bibliography are in general well known, but it is probably not realized by the average reader how exceedingly important this branch has become in all lines of scientific, historical or literary research. The constant and increasing subdivision of knowledge, the enormous increases in book-making and book circulation and the unparalleled number of persons entering into research, make improvement in our systems of classification and storing knowledge one of the vital necessities of our day. While a library is of the greatest value as a storehouse or receptacle of knowledge, yet it is well nigh valueless unless it is well indexed. Further, the indices must be several, from different systems of classifications—subjects, titles, authors, etc. Indices are to a library what the ledger is to a commercial company. Without their assistance, the investment would be well nigh worthless and certainly unprofitable.

Besides the general reasons in favor of the making of bibliographies, as a means of extending knowledge, there are special reasons why this work should be done in Ohio by the Geological Survey. As is well known, the early volumes of the Survey were published in large numbers, and distributed through the General Assembly. But, in all this lavish expenditure of expensive printing, there was no systematic effort made to see that copies of the reports were placed in the libraries of the cities and towns of Ohio, or in the libraries of Ohio schools and colleges; still less was done in the way of securing systematic exchange with the Surveys of other states and foreign countries. As a result, some large and well endowed libraries have complete sets of our publications, which they have secured chiefly by purchase from private owners; smaller and unendowed libraries more often have broken sets, secured by donation, but which they have not been able to complete; while

the vast majority of small libraries, both in Ohio and over the country generally, especially those of recent establishment, have only odd volumes of our publications or none at all.

It is now too late to remedy the damage done by the wasteful system of free distribution of these reports; the total known supply now held for sale among second-hand book-dealers and collectors is very small; reprinting would be too costly to be seriously considered.

But one thing remains to be done—if the old reports cannot be furnished to the libraries, we can at least furnish a complete statement of what they contained, so that scholars who desire to search the literature of our Survey can at least find in advance whether it contains any articles or references to the points they are looking up. The modern system of library exchanges, by which one library can borrow from another a volume for temporary use, thus enables a scholar to obtain a copy of whichever one of our publications he may need, and to refer to it with precision and certainty, while without this bibliography he could only become aware of this fact by obtaining access to a set of our publications and himself studying out their contents.

The bibliography may then be regarded as an up-to-date feature of Geological Survey literature, which is well worth having on its own account, but which owing to the peculiar situation of the Geological Survey of Ohio in regard to its literature is for us doubly necessary and important. In fact, it is the one and indispensable thing which can be done to remedy a bad situation so far as it may be remedied.

This Bulletin has been prepared in view of these considerations, and with a view to making it an aid to the geologist, the student, the practical man who may need to consult the work of this Survey. It is a source of regret, that there cannot be published at the same time and place a list of the places in Ohio where access to full sets of the reports may be had, but this information is not at hand and would be difficult to obtain.

PUBLICATIONS OF THE SURVEY.

Since this volume is itself the most careful list ever prepared on this subject, the usual abbreviated notice published in the other volumes of this series is omitted.

DISTRIBUTION OF REPORTS.

First Geological Survey.—These volumes are out of print and rare. They can only be procured from dealers in second-hand libraries and are difficult to obtain even there.

Second Geological Survey.—These volumes were all distributed at the time of their issue. The State retained no stock for meeting future demands, so that no copies of any of these volumes can be obtained from the office of the State Geologist. They can be bought in many second-hand book stores, and from dealers in old libraries, at prices ranging from a few cents to two or three dollars per volume, according to rarity and demand. Volumes V and VI are the rarest and most sought for.

Third Geological Survey.—These volumes were all distributed at the time of issue, except volume VII, of which 1,500 were put in the hands of the Secretary of State, for sale at the cost of publication. Of these, a few remain at the date of the publication of this volume. The price is \$1.50. To obtain copies, send postal or money order to the Secretary of State, State House, Columbus, Ohio. No other volumes can be obtained from this source.

The other volumes of this series can be procured only from second-hand book and library dealers.

Fourth Geological Survey.—Under the law, copies of these Bulletins can be bought at the office of the State Geologist at the cost of publication. Postal orders, money orders, checks, drafts, or currency must accompany orders. Stamps will not be received.

Bulletin 1—Oil and Gas	\$ 0.65
Bulletin 2—Uses of Hydraulic Cements.....	0.30
Bulletin 3—Manufacture of Hydraulic Cements— Issue exhausted.	
Bulletin 4—Lime Resources and Lime Industries— In press.	
Bulletin 5—Sand-Lime Brick Industry—In press.	
Bulletin 6—Bibliography of Ohio Geology.....
Bulletin 7—Revised Nomenclature of the Ohio Geo- logical Formations.....	0.06
Bulletin 8—Salt Deposits and the Salt Industry in Ohio	0.06

LAWS UNDER WHICH THE SURVEY OPERATES.

For the information of the public, the law under which the work of the Survey is prosecuted is herewith published:

Laws of Ohio, 1889, Vol. 86, p. 262.

(Senate Bill 409.)

AN ACT

To Provide for the Extension of the Geological Survey of the State.

Section 1. Be it enacted by the General Assembly of the State of Ohio, That the governor is hereby authorized to appoint a state geologist, whose duty it shall be to continue and extend the investigations already made into the geological structure and resources of the state. Said state geologist shall be appointed for a term of two years, but he may be removed for cause at any time, and a successor appointed in his stead; and the governor is authorized to fill any vacancy which may occur from any cause, at any time. The compensation of said state geologist shall be at the rate of three hundred dollars per month, for the time actually employed; and said geologist shall have power to employ such assistants as he may need; but in no event shall the salary of the geologist, pay of assistants, and expense of the department, exceed the amount of the expenditure authorized by the general assembly.

Section 2. It shall be the duty of said geologist to study, and determine as nearly as possible, the number and extent of the various formations of the state; to represent the same, from time to time, upon properly constructed maps and diagrams; to study the modes of occurrence and the distribution of the useful minerals and products of these formations; to determine the chemical composition and structure of the same; to investigate the soils and water supply of the state; and to give attention to the discoveries of coal, building stone, natural cement, petroleum, gas and other natural substances of use and value to the state. He may also collect and describe the fossils of the various geological formations of the state; but no expenditure shall be incurred under this head that is not expressly ordered and provided for by the general assembly.

Section 3. The said geologist shall make, on or before the first day in February of each year, a report to the governor, covering the work of the preceding year, and the report shall be transmitted to the general assembly, to be printed in the same manner as other public documents, or as shall be otherwise ordered.

Section 4. The salaries of the state geologist, and the assistants employed by him, together with the traveling and incidental expenses, shall be paid monthly, on presentation of properly itemized vouchers, signed by the governor, out of the state treasury, from the appropriation made for such purpose.

Section 5. There is hereby appropriated from the general revenue fund the sum of one thousand dollars annually, for the purpose above named.

Section 6. This act shall take effect and be in force from and after its passage.

NOAH H. ALBAUGH.

Speaker pro tem. of the House of Representatives.

THEODORE F. DAVIS,

President pro tem. of the Senate.

Passed April 12, 1889.

From the terms of the law, it was evidently intended to provide for the creation of a bureau of geology to which only a portion of the time of the State Geologist should be applied, as the annual appropriation made was much too small to provide the salary of a State Geologist contin-

uously, without making any provisions for office expenses, assistance, etc. It was thought at that time that a few months' work per year would be sufficient to maintain the Survey abreast of geological developments.

The powers and duties of the State Geologist under this act were made so broad and general as to permit carrying on almost any work, so that no new legal provision was thought necessary in connection with reopening the work of the Survey under the Fourth organization. The sum designated in Section 5 is not made a limiting condition of the law so that the Legislature may appropriate any other amount, at its discretion, for carrying on the work.

Acting under this law, the Legislature has made the following appropriations for geological work:

Designation of Legislature.	Year.	Amount Appropriated.
Seventy-Fourth	1900	\$2,500 00
Seventy-Fourth	1901	\$3,500 00
Seventy-Fifth.....	1902	\$5,000 00
Seventy-Fifth.....	1903	\$3,000 00
Seventy-Sixth.....	1904	\$2,800 00
Seventy-Sixth.....	1905	\$2,900 00
Seventy-Seventh.....	1906	\$3,850 00*
Seventy-Seventh.....	1907	\$5,100 00

*And balance and receipts.

The law providing for the publication and distribution of reports is as follows:

Laws of Ohio, 1902, Vol. 95, p. 593.

(House Bill 800.)

AN ACT

To Provide for the Publication and Distribution of the Reports of the State Geologist.

Section 1. Be it enacted by the General Assembly of the State of Ohio, That whenever the state geologist shall have completed a bulletin upon any of the subjects upon which he is authorized to conduct investigation, he shall notify the state printing

commission of this fact, and it shall be the duty of this commission to determine the number of copies which shall be printed, and the grade of paper, the kind of binding, and any other details incident to its proper publication.

Section 2. It shall be the duty of said commission to provide for the publication of said bulletin as soon as possible after the completion of the same. The issue shall consist of a minimum number of three thousand copies.

Of these, one thousand copies, after deducting 200 for the State Library, shall be distributed pro rata among the general assembly.

One thousand shall be distributed free by the state geologist in exchange with other surveys, and with individuals whose services have been used in the collection or preparation of the matter for the bulletins. Of this number not more than four hundred may be distributed during the first year after publication, and not more than fifty in any subsequent year.

One thousand copies shall be set aside for binding along with other bulletins from time to time. When a sufficient number of such bulletins have accumulated to make collectively a volume of from 800 to 1,000 pages, they shall be bound, lettered and numbered, to take their place in the series of volumes already published by the survey.

The distribution of the bound volume of the survey shall be in the hands of the state geologist; but the state library shall receive ten copies, each member of the general assembly one copy, with privilege to draw not to exceed two other copies on application, and public libraries in the state shall be supplied with one copy each. The volumes remaining after these demands have been met, may be distributed among the geological surveys and geological societies of the United States and of foreign countries in exchange for their publications.

Section 3. The board may, at its discretion, order the publication of extra copies in addition to the three thousand already provided for. These extra copies shall be placed in the hands of the state geologist. From these members of the general assembly may, on application, draw up to fifty (50) copies each. Those remaining shall be placed on sale at a price equal to the net cost of printing and binding, which price is to be established by the state supervisor of public printing. The proceeds of such sales shall be accounted for and paid into the state treasury, and the state geologist shall be required by the commission to give suitable bond for the security of the funds thus passing through his hands. The proceeds of such sales shall be credited to the account of the geological survey, and shall be used for the prosecution of the further work of the survey without distinction from other funds which the general assembly from time to time appropriates for the survey.

Section 4. The cost of printing, illustrating, electrotyping, binding, et cetera, of said bulletins and said volumes, shall be paid from the general appropriation for state printing.

Section 5. This act shall take effect from and after its passage.

W. S. MCKINNON,
Speaker of the House of Representatives.

F. B. ARCHER,
President of the Senate.

Passed May 12, 1902.

THE SURVEY IN ITS RELATIONS TO THE PUBLIC.

The usefulness of the Survey is not limited to the preparation of formal reports on important topics. There is a constant and insistent desire on the part of the people to use it as a technical bureau for free advice in all matters affecting the geology or mineral industries of the

State. A very considerable correspondence comes in, increasing rather than decreasing in amount, and asking specific and particular questions on points in local geology.

The volume of this correspondence has made it necessary to adopt a uniform method of dealing with these requests. Not all of them can be granted, but some can and should be answered. There is a certain element of justice in the people demanding such information, from the fact that the geological reports issued in former years were not so distributed as to make them accessible to the average man or community today. The cases commonly covered by correspondence may be classified as follows:

1st. Requests for information covered by previous publications.—This is furnished where the time required for copying the answer is not too large. Where the portion desired cannot be copied, the enquirer is told in what volume and page it occurs and advised how to proceed to get access to a copy of the report.

2d. Requests for identification of minerals and fossils.—This is done, where possible. As a rule, the minerals and fossils are simple and familiar forms, which can be answered at once. In occasional cases, a critical knowledge is required and time for investigation is necessary. Each assistant is expected to co-operate with the State Geologist in answering inquiries concerning his field.

3d. Requests from private individuals for analyses of minerals and ores, and tests to establish their commercial value.—Such requests are frequent. They cannot be granted, however, except in rare instances. Such work should be sent to a commercial chemical laboratory. The position has been taken that the Geological Survey is in no sense a chemical laboratory and testing station, to which the people may turn for free analytical work. Whatever work of this sort is done, is done on the initiative of the Survey and not at the solicitation of an interested party.

The greatest misapprehension in the public mind regarding the Survey is on this point. Requests for State aid in determining the value of private mineral resources, ranging from an assay worth a dollar, up to drilling a test well costing several thousand dollars, represent extreme cases. At present there is no warrant for the Survey making private tests, even where the applicant is entirely willing to pay for the service. In many cases individuals would prefer the report of a State chemist or State geologist to that of any private expert, at equal cost, because of the prestige which such a report would carry. But it is a matter of doubt whether it will ever be the function of the Survey to enter into commercial work of this character; it certainly will not be unless explicit legal provisions for it are made.

4th. *Requests from a number of persons representing a diversity of interests, who jointly ask the Survey to examine into and publicly report upon some matter of local public concern.*—Such cases are not common. It is not always easy to determine whether such propositions are really actuated by public interest or not. Each case must be judged on its merits. The Survey will often be prevented from taking up such investigations by the lack of available funds, while otherwise the work would be attempted.

The reputed discovery of gold is one of the most prolific sources of such calls for State examination. It usually seems wise and proper to spend a small sum in preventing an unfounded rumor from gaining acceptance in the public mind, before it leads to large losses, and unnecessary excitement. The duty of dispelling illusions of this sort cannot be considered an agreeable part of the work of the Survey, but it is nevertheless of very direct benefit to the people of the State.

BULLETIN NUMBER SIX.

PART ONE.

A SUBJECT INDEX OF THE PUBLICATIONS OF THE GEOLOGICAL
SURVEY OF OHIO, FROM ITS INCEPTION TO AND
INCLUDING BULLETIN NUMBER EIGHT,
SERIES FOUR.

BY

ALICE GREENWOOD DERBY, B. PH., B. A.

LETTER OF TRANSMITTAL.

Professor Edward Orton, Jr., State Geologist.

DEAR SIR:—I take pleasure in submitting to you the results of my study of the publications of the Geological Survey. I have gone outside of the actual publications of the Survey itself in a few cases, to include State documents obviously bearing on this work but not published under its auspices. I only did so from the feeling that the work would be incomplete without it.

Regarding the general scheme of classification used, I would say that while it would be possible to make it much more detailed, the present seemed about the desirable mean between a too condensed and too expanded system. It will undoubtedly make the task of consulting the literature of the Survey much easier in future than ever before.

Very respectfully submitted

ALICE G. DERBY.

Ohio State University, Columbus, July 1906.



**PUBLICATIONS OF THE GEOLOGICAL SURVEY OF OHIO,
AND PUBLIC DOCUMENTS RELATING THERETO,
WITH TOPICAL ANALYSIS OF EACH VOLUME.**

Ohio Executive Documents 1836. Report No. 1. Report of the Committee on a Geological Survey of the State. By S. P. Hildreth, chairman of the committee.

Report of Professor Hildreth, pp. 65-79.

Analysis of the limestone of Cincinnati and Dayton, by John Locke. p. 77-78.

Appendix A. On the application of the hot blast, in the manufacture of cast iron, by Thomas Clark (from Amer. Jour. Sci. for Oct., 1836.) pp. 78-79.

Ohio Executive Documents 1836. pt. 1. Report No. 60. Report of John L. Riddell, M. D., one of the special committee appointed by the last legislature to report on the method of obtaining a complete geological survey of this state.

34p. Contents; Letter of transmittal of Gov. Vance, p. 3.

Report of Mr. Riddell, pp. 3-34, with two plates of sections.

Ohio General Assembly. House of Representatives. Document No. 76. Catalogue of the Geological Specimens collected, on the late survey of the state of Ohio, by W. W. Mather, state geologist. Feb. 25, 1842.

Contents: Letter of transmittal of the governor, Thos. Corwin, to the House, p. 3. Letter of W. W. Mather to the Governor in connection with the report, pp. 5-7. Catalogue of the geological specimens, consisting of 11 sheets on which the report is arranged in tabulated form.

OHIO GEOLOGICAL SURVEY, FIRST ORGANIZATION 1837-38.

First Annual Report || on the || Geological Survey || of the || State of Ohio.

By W. W. Mather, principal geologist, and the several assistants. || Columbus. || Samuel Medary, printer to the state. 1838.

134 pp. 1 plate. 8vo. Bound in black cloth, binder's title, "Ohio Geological Survey. Mather" in gilt on the back. 5,000 copies of this report were printed.

Contents: Title page as above; verso blank; letter of transmittal of Gov. Joseph Vance to the General Assembly; verso blank; plate representing a geological section of the state.

Report of W. W. Mather, principal geologist, pp. 5-23.
 Report of Dr. S. P. Hildreth, 1st assistant geologist, pp. 25-63.
 Report of Dr. Kirkland, 2d assistant geologist, p. 98.
 Report of Mr. Whittlesey, topographer of the Survey, pp. 99-109.
 Geological queries, pp. 111-21; glossary of some geological terms used in these reports from Lyell's geology and other sources pp. 123-29; table of contents pp. 130-134.

Ohio General Assembly. Legislative Doc's. Document No. 26.

First Annual Report on the Geological Survey of the State of Ohio. By W. W. Mather, principal geologist, and several assistants. 5,000 copies were ordered printed for distribution among the members.

Second Annual Report || on the || Geological Survey || of the || State of Ohio. By W. W. Mather, || principal geologist, and several assistants. Columbus. || Samuel Medary, printer to the State. || 1838.

1+286 p. illus. 15 plates. 1 folded map. Bound in black cloth, binder's title, "Ohio Geological Survey. Mather." 5,000 copies of this report were printed.

Contents: Title as above; verso blank; letter of transmittal of Gov. Shannon to the General Assembly; verso blank.

Report of W. W. Mather, pp. 5-39.

Report of Mr. Whittlesey, pp. 41-71, with two plates illustrating topography.

Report of Mr. Foster, pp. 73-107, with plate representing geological section.

Report of Mr. Briggs, pp. 109-154, with geological sections.

Report on the Zoology of Ohio, by Prof. J. P. Kirkland, p. 157-200.

Report of Dr. John Locke, pp. 203-286, with sections and a folded map of Ohio.

Ohio General Assembly. Legislative Documents. Document No. 22.

Second annual report on the Geological Survey of the State of Ohio. By W. W. Mather, principal geologist, and the several assistants.

Copies were ordered printed for distribution among the members.

OHIO GEOLOGICAL SURVEY, SECOND ORGANIZATION 1869-88.

Report of Progress, 1869. Title page reads as follows: Geological Survey of Ohio. || Part 1. || Report of Progress in 1869, || by J. S. Newberry, chief geologist. || Part 2. || Report of Progress in the second district, || by E. B. Andrews, || Assistant Geologist. || Part 3. Report on geology of Montgomery county, || by Edward Orton, || assistant geologist. || Columbus. || Columbus Printing Company, state printers. || 1870.

164 p. Illus. Colored maps, 2. 1 chart. 8vo. Bound in cloth, binder's title, Ohio || Geological Survey || 1869. || in gilt on the side. 14,500 copies were printed.

Contents: Preliminary geological map of Ohio, col.; title page as above; verso, letter of transmittal of chief geologist to Gov. Hayes; part 1, Rept. of Progress, by J. S. Newberry, pp. 3-51; errata; chart of Geological History; part 2. Report of progress in the second district, by Prof. E. B. Andrews, assistant geologist, pp. 55-135; part 3, Report on geology of Montgomery County, by Edward Orton, assistant geologist, pp. 139-161; map of grouped sections with explanations, pp. 163-64.

Report of Progress, 1870. Geological Survey of Ohio. || Report of Progress in 1870. || By J. S. Newberry, chief geologist, || including reports by || E. B. Andrews, Edward Orton, J. H. Klippart, assistant geologists. || T. G. Wormley, chemist. G. K. Gilbert, M. C. Read, Henry Newton, W. B. Potter, || local assistants. || Columbus || Nevins and Myers, state printers. || 1871.

568 p. Illus. 6 plates, 1 colored, 1 folded. Svo. Bound in cloth, binder's title, "Geological || Survey || 1870 || Ohio. 14,500 copies of this report were printed.

Contents: Title page as above; verso, letter of transmittal to the Gov. Secondary title, Part 1. Report of Progress of the Geological Survey in 1870. Sketch of the structure of the lower coal measures in northeastern Ohio, by J. S. Newberry, chief geologist; verso blank; Report, pp. 5-53.

Part 2. Report of labors in the second Geological District during the year 1870, by E. B. Andrews; pp. 57-251.

Part 3. Geology of Highland County, by Edward Orton, assistant geologist. Letter of transmittal; colored map of Highland County. Report on Highland County, pp. 255-309. Geological series of Highland County. 6 p.

Part 4. Agricultural Survey, by John H. Klippart, assistant geologist, pp. 313-400.

Part 5. Report of Chemical Department, by T. G. Wormley. Letter of transmittal; Report, pp. 403-462.

Part 6. Sketches of the geology of Geauga and Holmes Counties, by M. C. Read. Letter of transmittal; Report, pp. 465-84.

Part 7. Report on the geology of Williams, Fulton, and Lucas counties, by G. K. Gilbert. Letter of transmittal. Report, pp. 488-99.

Part 8. Sketch of the present state of the iron manufacture in Great Britain. By W. B. Potter, E. M. Letter of transmittal. Report, pp. 503-26.

Part 9. A sketch of the present state of the steel industry. by Henry Newton, E. M. Letter of transmittal. Report, pp. 529-55. Errata.

Index, pp. 557-68.

Part 2 is accompanied by a collection of 5 maps, showing the grouped sections of the Second Geological District.

These are published in a separate envelope.

Report of Progress. 1871. Geological Survey || of Ohio || Report of progress for 1871. || Printed by order of the General Assembly. 12 pp. 8vo. Unbound.

Contents: Title page as above; letter of transmittal of the Governor to the General Assembly; report of progress of the Geological Survey of Ohio for the year 1871, pp. 3-9; report on the 2d geological district by E. B. Andrews, pp. 11-12.

Geology of Ohio. Report on the Geological Survey of Ohio. Columbus, Ohio. 1873-1894.

7v. in 9. Illus. plates, maps, charts. 8vo. and 4to. Bound in black cloth, with "Geological Survey of Ohio;" volume title, and volume number on the back, in gilt. The earlier volumes had the seal of the Survey on side, in gilt.

Geology of Ohio. Report || of the || Geological Survey of Ohio. || Volume 1. || Geology and Palaeontology. || Part 1 Geology. || Officers of the Survey. J. S. Newberry, chief geologist; Edward Orton, assistant geologist; E. B. Andrews, assistant geologist; T. G. Wormley, chemist; F. B. Meek, Palaeontologist. || Published by authority of the Legislature of Ohio. || Columbus, Ohio. || Nevins and Myers, state printers. || 1873. 5+3+680 p. Illus. 2 plates. Chart 13 maps, 9 colored, 2 folded (col.), 2 black and white. 8vo. Bound in cloth, binder's title, "Geological Survey of Ohio Geology Vol. 1," in gilt on back. Seal of Survey on side in gilt.

Contents: Title page as above; verso, members of the Geological board; Geological Corps, 1689-72. Local and volunteer assistants with complete list of their names. Table of Contents: Part 1—Geology. Section 1—General geology, by J. S. Newberry, pp. 1-167. Section 2—Local geology, pp. 171-645.

Geology of Cuyahoga County. J. S. Newberry. pp. 171-200.

Geology of Summit County. J. S. Newberry. pp. 201-22.

Geology of Gallia County. E. B. Andrews. pp. 25-46.

Geology of Meigs County. E. B. Andrews. pp. 247-60.

Geology of Athens County. E. B. Andrews. pp. 261-93.

Geology of Morgan County. E. B. Andrews. pp. 294-313.

Geology of Muskingum County. E. B. Andrews. pp. 314-64.

Geology of the Cincinnati group. Edward Orton. pp. 365-418.

Geology of Hamilton County. Edward Orton. pp. 419-34.

Geology of Clermont County. Edward Orton. pp. 435-49.

Geology of Clark County. Edward Orton. pp. 450-80.

Geology of Ashtabula County. M. C. Read. pp. 481-92.

Geology of Trumbull County. M. C. Read. pp. 493-509.

- Geology of Lake County. M. C. Read. pp. 510-19.
 Geology of Geauga County. M. C. Read. pp. 520-33.
 Surface geology of the Maumee Valley. G. K. Gilbert. pp. 535-56.
 Geology of Williams County. G. K. Gilbert. pp. 557-66.
 Geology of Fulton County. G. K. Gilbert. pp. 567-72.
 Geology of Lucas County. G. K. Gilbert. pp. 573-87.
 Geology of West Sister Island. G. K. Gilbert. pp. 588-90.
 Geology of Sandusky County. N. H. Winchell. pp. 593-610.
 Geology of Seneca County. N. H. Winchell. pp. 611-24.
 Geology of Wyandot County. N. H. Winchell. pp. 625-39.
 Geology of Marion County. N. H. Winchell. pp. 640-45.
 List of illustrations of part 1.
 Secondary title, Geological Survey of Ohio. Vol. 1, Part 1.
 Section 1. The general geological relations and structure of Ohio.
 Table of errata.
 Reports.
 Appendix A. Tables of temperature and rainfall. pp. 650-65.
 Appendix B. Profiles of railroads and canals. pp. 666-72.
 Index to Vol. 1, Part 1. pp. 673-80.

Accompanying this volume is a portfolio of maps, five in number, representing geological sections of the state. This volume is also printed in German.

Geology of Ohio. Vol. 1. Part. 2. Report of the Geological Survey of Ohio. Volume 1. Geology and Palaeontology. Part 2. Palaeontology. Officers of the Survey; J. S. Newberry, chief geologist; Edward Orton, assistant geologist; E. B. Andrews, assistant geologist; T. G. Wormley, chemist; F. B. Meek, palaeontologist. Published by the Legislature of Ohio. Columbus, Nevins & Myers, state printers. 1873.

13+2+399+3 pages and 48 plates. Illus. 4to. Bound in cloth, binder's title, "Geological Survey of Ohio. Palaeontology. Vol. 1," in gilt on the back. Seal of the Survey in gilt on the side. 20,000 copies printed.

Contents: Title page as above; verso blank; Members of the Geological Board; Geological Corps; and local and volunteer assistants; verso blank; Table of contents; verso blank.

Preface, by J. S. Newberry, pref. pp. vii-xiii.

Secondary title, Geological Survey of Ohio. Vol. 1. Part 2. Palaeontology.

Section 1. Descriptions of invertebrate fossils of the Silurian and Devonian systems, by F. B. Meek. Letter of transmittal; Report, pp. 1-243.

Section 2. Descriptions of fossil fishes, by J. S. Newberry. pp. 247-355.

Section 3. Descriptions of fossil plants, by J. S. Newberry.
pp. 359-85.

Index, pp. 387-99.

Errata.

Diagrams of Crinoids, 3 pp.

Plates.

This volume was also printed in German.

Geology of Ohio. Vol. 2. Part 1. Report || of the || Geological Survey of Ohio. || Volume 2. || Geology and Palaeontology. || Part 1. Geology. || Officers of the Survey. J. S. Newberry, chief geologist; E. B. Andrews, assistant geologist; Edward Orton, assistant geologist; T. G. Wormley, chemist; F. B. Meek, palaeontologist. || Published by authority of the state of Ohio. || Columbus, Ohio. || Nevins & Myers, state printers. || 1874.

15+701 pp. Illus. Plates, maps, col. and plain. 8vo. Bound in cloth, binder's title, "Geological Survey of Ohio. Geology. Vol. ii," in gilt, on the back. Seal of the Survey on the side, in gilt. 20,000 copies printed.

Contents: Plate of glacial markings, frontispiece; title page as above; verso blank; table of contents, pp. v-vii; preface, by J. S. Newberry, pp. ix-xv.

Section 1. General geology. Surface geology, by J. S. Newberry, pp. 1-80.

The Carboniferous system, by J. S. Newberry pp. 81-180.

Section 2. Local geology. pp. 183-696.

Geology of Erie County and the Islands. J. S. Newberry. pp. 183-205.

Geology of Lorain County. J. S. Newberry. pp. 206-24.

Geology of Ottawa County. N. H. Winchell. pp. 227-35.

Geology of Crawford County. N. H. Winchell. pp. 236-52.

Geology of Morrow County. N. H. Winchell. pp. 253-71.

Geology of Delaware County. N. H. Winchell. pp. 272-313.

Geology of Van Wert County. N. H. Winchell. pp. 314-23.

Geology of Union County. N. H. Winchell. pp. 324-34.

Geology of Paulding County. N. H. Winchell. pp. 335-51.

Geology of Hardin County. N. H. Winchell. pp. 352-57.

Geology of Hancock County. N. H. Winchell. pp. 358-67.

Geology of Wood County. N. H. Winchell. pp. 368-86.

Geology of Putnam County. N. H. Winchell. pp. 387-96.

Geology of Allen County. N. H. Winchell. pp. 397-403.

Geology of Auglaize County. N. H. Winchell. pp. 404-09.

Geology of Mercer County. N. H. Winchell. pp. 410-14.

Geology of Henry County. N. H. Winchell. pp. 415-21.

Geology of Defiance County. N. H. Winchell. pp. 422-38.

- Surface geology of southeastern Ohio. E. B. Andrews. pp. 441-52.
- Geology of Washington County. E. B. Andrews. pp. 453-508.
- Geology of Noble County. E. B. Andrews. pp. 509-28.
- Geology of Guernsey County (southern half). E. B. Andrews. pp. 529-42.
- Geology of Belmont County (southern half). E. B. Andrews. pp. 543-69.
- Geology of Monroe County. E. B. Andrews. pp. 570-87.
- Geology of Pickaway and Fairfield Counties. E. B. Andrews. pp. 588-608.
- Geology of Pike County. Edward Orton. pp. 611-41.
- Geology of Ross County. Edward Orton. pp. 642-58.
- Geology of Greene County. Edward Orton. pp. 659-96.
- Index pp. 697-701.

Accompanying this volume is a collection of 4 maps, representing geological sections of local geology; 4 charts representing geological structure of large divisions of Ohio; 2 charts of palaeontological specimens.

This volume is also found in the German edition, contents being similar to the English edition.

Geology of Ohio. Vol. 2. Part 2. Report || of the || Geological Survey of Ohio. || Volume II || Geology and Palaeontology || Part II. Palaeontology. || Officers of the Survey; J. S. Newberry, chief geologist; E. B. Andrews, assistant geologist, Edward Orton, assistant geologist; T. G. Wormley, chemist; F. B. Meek, palaeontologist. || Published by authority of the Legislature of Ohio. || Columbus; || Nevins & Myers, state printers, || 1875. ||

8+435 pp. + 59 plates. Illus. 4to. Bound in cloth, binder's title, "Geological Survey of Ohio. Palaeontology. Vol. II." in gilt, on the back; seal of the Survey on the side. 20,000 copies of this volume were printed.

Contents: Title page as above; members of the Geological Board, Geological Corps, and local and special assistants; table of contents; verso blank.

Preface, by J. S. Newberry, pp. v-viii;

Descriptions of fossil fishes, by J. S. Newberry, pp. 1-64.

Descriptions of Silurian fossils, by James Hall and R. P. Whitfield, pp. 65-161.

Descriptions of Crinoidea from the Waverly Group, by James Hall and R. P. Whitfield, pp. 162-179.

Descriptions of the Corals of the Silurian and Devonian Systems, by H. H. Alleyne Nicholson, pp. 181-286.

Descriptions of Invertebrate Fossils from the Carboniferous System, by F. B. Meek, pp. 269-347.

Synopsis of the Extinct Batrachia from the Coal Measures
by E. D. Cope, pp. 349-411.

Descriptions of Fossil Plants from Lower Carboniferous strata,
by E. B. Andrews, p. 413-426.

Index pp. 427-35.

59 illustrative plates.

This volume is also found in the German edition. The contents are similar to the English edition.

Geology of Ohio, Volume 3. Report of the Geological Survey of Ohio. Volume III. Geology and Palaeontology.

Part 1, Geology. Officers of the Survey: J. S. Newberry, chief geologist; E. B. Andrews, assistant geologist; Edward Orton, assistant geologist; T. G. Wormley, chemist; F. B. Meek, palaeontologist. Published by the authority of the Legislature of Ohio. Columbus; Nevins & Myers, state printers, 1878.

i+958 p. illus. plates, maps, col., 8vo. Bound in cloth, binder's title, "Geological Survey of Ohio. Geology. Vol. III," in gilt on the back. Seal of the Survey on the side. 20,000 copies of this report were printed.

Contents: Title page as above; members of the Geological Board, Corps, and local and special assistants; Table of Contents, p. iii-v; Preface, by J. S. Newberry, p. vii-viii. Part i, Geology. Section 1, General Geology. Review of Geological structure of Ohio, by J. S. Newberry, pp. 1-51. Section 2, Local Geology, pp. 52-944.

Geology of Tuscarawas County. J. S. Newberry. pp. 52-89.

Geology of Columbiana County. J. S. Newberry. pp. 90-132.

Geology of Portage County. J. S. Newberry. pp. 133-50.

Geology of Stark County. J. S. Newberry. pp. 151-76.

Geology of Carroll County. J. J. Stevenson. pp. 177-99.

Geology of Harrison County. J. J. Stevenson. pp. 200-18.

Geology of Guernsey County. J. J. Stevenson. pp. 219-36.

Geology of Muskingum County. J. J. Stevenson. pp. 237-60.

Geology of Belmont County. J. J. Stevenson. pp. 261-87.

Geology of Huron County. M. C. Read. pp. 289-309.

Geology of Richland County. M. C. Read. pp. 310-24.

Geology of Knox County. M. C. Read. pp. 325-47.

Geology of Licking County. M. C. Read. pp. 348-61.

Geology of Medina County. A. W. Wheat. pp. 362-80.

Geology of Warren County. Edward Orton. pp. 381-91.

Geology of Butler County. Edward Orton. pp. 392-403.

Geology of Preble County. Edward Orton. pp. 404-19.

Geology of Madison County. Edward Orton. pp. 420-28.

Geology of Clinton and Fayette Counties. J. Hussey. pp. 429-47.

- Geology of Shelby County. J. Hussey. pp. 448-67.
 Geology of Miami County. J. Hussey. pp. 468-81.
 Geology of Logan County. F. C. Hill. pp. 482-90.
 Geology of Champaign County. F. C. Hill. pp. 491-95.
 Geology of Darke County. A. C. Lindemuth. pp. 496-518.
 Geology of Ashland County. M. C. Read. pp. 519-28.
 Geology of Wayne County. M. C. Read. pp. 529-39.
 Geology of Holmes County. M. C. Read. pp. 540-61.
 Geology of Coshocton County. J. T. Hodge. pp. 562-95.
 Geology of Franklin County. Edward Orton. pp. 596-646.
 Geology of Hocking Valley Coal Field. M. C. Read. pp. 647-715.
 Geology of Jefferson County. J. S. Newberry. pp. 716-80.
 Geology of Mahoning County. J. S. Newberry. pp. 781-814.
 Supplemental Report on Perry County and Portions of Hocking
 and Athens Counties. E. B. Andrews. pp. 815-82.
 Supplemental Report on the Hanging Rock District. Edward
 Orton. pp. 883-941.
 Geology of Brown County. H. Herzer. pp. 942-44.
 Index, pp. 944-54.
 Illustrations of volume 3, Geology, pp. 955-56.
 Errata, pp. 957-58.

This volume is accompanied by geological atlas.

Volume 3, part 1, is printed in the German edition, the contents being similar to the English edition.

Geological Atlas of Ohio, to accompany Vol. 3. 1879.

Geological Survey of Ohio. Geological atlas of the state of Ohio prepared by J. S. Newberry, chief geologist. Published by authority of the legislature of Ohio, 1879.

Contents: Geological map of the state in sections.

Volume 4. Chart No. 2. Sections of shafts and slopes in the Mahoning Valley coal field, is sometimes bound with the Geological atlas.

Geology of Ohio. Vol. 4. Part I. Report of the Geological Survey of Ohio. Volume 4. Zoology and Botany. Part 1 Zoology. Officers of the Survey: J. S. Newberry, chief geologist; Edward Orton, assistant geologist; E. B. Andrews, assistant geologist; T. G. Wormley, chemist; F. B. Meek, palaeontologist; special assistants in Zoology and Botany: J. M. Wheaton, A. W. Brayton, H. C. Beardlee, D. S. Jordan, W. H. Smith, R. M. Byrnes. Published by the authority of the legislature of Ohio. Columbus, Nevins & Myers, state printers. 1882.

viii+1020 p. 8vo. Bound in black cloth, binder's title, "Geological Survey of Ohio. Zoology and Botany. Volume iv," in gilt on the back. 20,000 copies of this report were printed.

Contents: Title page as above; verso blank; table of contents; Part 1—Zoology, verso blank; preface, pp. v–viii.

Section 1. Report on the Mammalia of Ohio, by A. W. Brayton, p. 1–185.

Section 2. Report on the Birds of Ohio, by J. M. Wheaton, M. D., pp. 187–628.

Section 3. Report on the Reptiles and Amphibians of Ohio, by W. H. Smith, M. D., Ph. D., pp. 629–734.

Section 4. Report on the Fishes of Ohio, by David S. Jordan, M. D., pp. 735–1002.

Index pp. 1003–1020.

A German edition of this volume was printed, 1883, the contents being similar with the addition of "Vorrede des Uebersetzers zur deutschen Ausgabe."

Geology of Ohio. Vol. 5. Report of the Geological Survey of Ohio. Volume V. Economic Geology. Published by authority of the legislature of Ohio under the supervision of the state geologist. Columbus. G. J. Brand & Co., state printers. 1884.

16+1124 pp. Illus. Plates, tables, maps, 8vo. Bound in cloth, binder's title, "Geological Survey of Ohio. Economic Geology Volume V," in gilt on the back. Accompanying this volume is a collection of 8 maps representing the coal fields and counties of the state.

Contents: Title page as above; verso blank; officers of the Survey; Edward Orton, state geologist; N. W. Lord, chemist; assistants, J. N. Bradford, Mech. Eng., C. Newton Brown, Edward C. Downer, John J. Dun, E. M., Frederick Keffer, E. M., Ellis Lovejoy, Emerson McMillin, Edward Orton, Jr., E. M., Willis J. Root, Hon. Andrew Roy, Frederick W. Sperr, E. M., Prof. Albert A. Wright, Prof. G. Frederick Wright; verso blank; Preface by Edward Orton, pp. v–xi; table of contents, pp. xii–xiii; list of illustrations, pp. xiv–xvi;

Chap. 1. The stratigraphical order of the lower coal measures of Ohio, by Edward Orton, pp. 1–128.

Chap. 2. The coal seams of the lower coal measures of Ohio, in part, by Edward Orton, pp. 129–168.

Chap. 3. Chapter 2 cont. pp. 169–300.

Chap. 4. Coal Mining in Ohio, by Andrew Roy, State Inspector of Mines, pp. 301–370.

Chap. 5. The iron ores of Ohio, by Edward Orton, pp. 371–435.

Chap. 6. Iron manufacture of Ohio, by N. W. Lord, pp. 438–554

Chap. 7. The manufacture of coke, by Henry Newton, pp. 555–76.

Chap. 7. Building stones of Ohio, from notes of Prof. Orton, pp. 578–642.

- Chap. 8. The clays of Ohio, and the industries founded upon them, by Edward Orton, Jr., pp. 643-721.
- Chap. 10. The gas coals of Ohio, by Emerson McMillin, pp. 722-49.
- Chap. 11. The glacial boundary in Ohio, by Prof. G. Fred. Wright, pp. 750-72.
- Chap. 12-18. The coal seams of the lower coal measures of Ohio (cont.) by Edward Orton and Albert A. Wright, pp. 773-1058.
- Chap. 19. The Meigs Creek coal seam in Morgan, Muskingum, Guernsey and Noble Counties, by C. Newton Brown, pp. 1059-1087.
- Chap. 29. Report of the chemical department, by N. W. Lord, pp. 1087-98.
- Tables of analysis, pp. 1099-1113.
- Index, pp. 1115-24.

Preliminary report on petroleum, 1886. Geological Survey of Ohio || Preliminary report || upon || Petroleum and inflammable gas || by || Edward Orton, state geologist. || Published by authority of the legislature. || Columbus, Ohio. || The Westbote Co., state printers. || 1886.

76+3 pp. Illus. 2 folded maps. Bound in cloth. 2,500 copies of this report were printed.

Contents: Title page as above;

Report, pp. 3-76.

Index, 3 pp.

(2) Geological Survey of Ohio. || Preliminary report upon petroleum and inflammable gas, || by Edward Orton, state geologist. || Reprinted for the author || with a supplement || Col. O. || A.H.Smythe, || 1887.

200 pp. Illus. 2 folded maps. Bound in cloth, binder's title, "Preliminary Report || Petroleum and Gas || Orton" || in gilt on the side.

Contents: Title as above; Copyright by Edward Orton.

Preface, pp. 3-4.

Report, pp. 5-110.

Secondary title; Supplement to Preliminary report published in 1888 on petroleum and inflammable gas by Edward Orton, state geologist. April, 1887.

Contents: Report, pp. 115-93.

Index to preliminary report pp. 195-97.

Index to supplementary report pp. 198-200.

Geology of Ohio. Vol. VI. Report || of the || Geological Survey || of Ohio. || Volume VI. || Economic Geology. || Published by the authority of the legislature of Ohio || Under the supervision of the state geologist. || Columbus. || The Westbote Co., state printers. || 1888. ||

10+831 pp. Illus. plates, maps. 8vo. Bound in cloth, binder's title, "Geological Survey of Ohio. Economic Geology, Volume VI." in gilt, on the back. 2,500 copies of this report were printed.

Contents: Title page as above; verso blank; officers of the Survey. Edward Orton, state geologist; N. W. Lord, chemist; assistants, F. W. Minshall, F. H. Newell, Emerson McMillin, C. Newton Brown, S. W. Robinson, Ellis Lovejoy, Willis J. Root, M. R. Campbell, draughtsman; verso blank; preface, pp. v-viii; table of contents, p. ix; list of illustrations and maps, p. x.

Chap. 1. The geology of Ohio considered in its relation to petroleum and natural gas, by Edward Orton, p. 1-59.

Chap. 2. The origin and accumulation of petroleum and natural gas by Edward Orton, pp. 60-100.

Chap. 3. The Trenton limestone as a source of oil and gas in Ohio, by Edward Orton, pp. 101-310.

Chap. 4. Berea grit as a source of oil and gas in Ohio, by Edward Orton, pp. 311-409.

Chap. 5. The Ohio shale as a source of oil and gas in Ohio, by Edward Orton, pp. 410-42.

Chap. 6. The history and development of the Macksburg oil field, by F. W. Minshall, pp. 443-75.

Chap. 7. The drilling and care of oil wells, by Fred H. Newell, pp. 476-515.

Chap. 8. The transportation, uses and modes of using natural gas, by Emerson McMillin, pp. 516-46.

Chap. 9. Measurement of gas wells, and other gas streams, and the piping of natural gas, by Prof. S. W. Robinson, pp. 548-94.

Chap. 10. The Pittsburg coal seam in Jefferson, Belmont, and Guernsey Counties, by Prof. C. Newton Brown, pp. 595-626.

Chap. 11. The Pomeroy and Federal Creek coal field, by Ellis Lovejoy, pp. 627-652.

Chap. 12. The manufacture of salt and bromine, by W. J. Root, pp. 653-70.

Chap. 13. Natural and artificial cements, by N. W. Lord, pp. 671-95.

Chap. 14. Gypsum or land plaster in Ohio, by Edward Orton, pp. 696-702.

Chap. 15. The production of lime in Ohio, by Edward Orton, pp. 703-72.

Chap. 16. The drift deposits of Ohio, by Edward Orton, pp. 772-82.

Chap. 17. Supplemental report on the new gas fields and oil of Ohio, by Edward Orton, pp. 783-92.

Appendix. Table of elevations in Ohio, pp. 793-820.
Index pp. 821-31.

Accompanying this volume is a collection of 4 maps, consisting of a geological map of Ohio, oil and gas fields of certain counties, and certain geological structure of the state. Title is "Maps. Geology of Ohio—Volume 6. Edward Orton, state geologist, 1888."

OHIO GEOLOGICAL SURVEY, THIRD ORGANIZATION 1889-93.

First Annual Report || of the || **Geological Survey of Ohio** || (Third Organization) By Edward Orton, state geologist || Published by authority of the legislature. || Columbus, Ohio. || The Westbote Co., state printers. || 1890.

6+(2)+323 pp. Plates. Bound in cloth, binder's title, "Geological Survey of Ohio, 1890. Orton," in gilt on the back.

Contents: Title page as above; verso blank; officers of the Survey; verso blank; preface, pp. v-vi; table of contents; list of illustrations and maps; secondary title, Geological Survey of Ohio Annual report, 1890.

Introduction, pp. 1-8.

Chap. 1. Geological scale and geological structure in Ohio, pp. 9-54.

Chap. 2. Origin and accumulation of petroleum and natural gas, pp. 55-104.

Chap. 3. The Trenton limestone as a source of oil and gas, pp. 105-226.

Chap. 4. The Clinton limestone as a source of oil and gas, pp. 227-47.

Chap. 5. Remaining sources of oil and gas in Ohio, pp. 248-58.

Chap. 6. The utilization of oil and gas in Ohio, pp. 259-80.

Chap. 7. The measurement of natural gas, by S. W. Robinson, pp. 281-395.

Chap. 8. The Wood County oil field, pp. 306-315.

Index pp. 316-23.

With this volume are two maps of the oil and gas fields of certain specified counties of Ohio.

Geology of Ohio. Vol. VII. Report || of the || **Geological Survey** || of Ohio || Volume VII. || **Economic Geology.** || **Archaeology.** || **Botany.** || **Palaeontology.** || Published by authority of the legislature of Ohio. || Norwalk, Ohio. || The Laning Co., state printers. || 1893-4.

16+290+700 pp.+56 plates. Illus. plates, map. Bound in cloth, binder's title, "Geological Survey of Ohio. Geology. Vol. VII," in gilt, on the back. 7,500 copies of this report were printed. This is the complete Volume VII, containing both parts 1 and 2.

Contents: Frontispiece, geological map of Ohio; title page as above; verso blank; officers of the Survey; verso blank; preface by Edward Orton, pp. v-xvi; contents, list of illustrations and maps.

Part 1. Economic.

Chap. 1. Geological scale and geological structure of Ohio, by Prof. Edward Orton, pp. 3-41.

Chap. 2. The clays of Ohio, their origin, composition, and variety, by Prof. Edward Orton, pp. 45-68.

Chap. 3. The clay working industries of Ohio, by Edward Orton, Jr., pp. 69-254.

Chap. 4. The coal fields of Ohio, by Prof. Edward Orton, pp. 255-290.

Part 2. General.

Chap. 1. The archaeology of Ohio, by Gerard Fowke, pp. 3-55.

Chap. 2. The botany of Ohio, Prof. W. A. Kellerman and W. C. Werner, pp. 56-406.

Chap. 3. Contributions to the palaeontology of Ohio. Prof. R. T. Whitfield, pp. 407-94.

Chap. 4. Observations on the so-called Waverly group of Ohio. Prof. C. L. Herrick, pp. 495-515.

Chap. 5. Fossils of the Clinton group in Ohio and Indiana. Aug. F. Foerste, pp. 516-601.

Chap. 6. The fossil fishes of Ohio. Profs. E. W. Claypole and A. A. Wright, pp. 602-26.

Chap. 7. New and little known Lamellibranchiata from the Lower Silurian rocks of Ohio and adjacent states. E. O. Ulrich, pp. 627-93.

General index, pp. 695-97.

Palaeontological index, pp. 698-700.

Palaeontological plates, 56.

Accompanied by a collection of 10 maps representing "Outcrop boundaries of principal coal seams." Title, "1893. Geology of Ohio. Vol. VII. Edward Orton, state geologist." Belongs to Vol. VII. Part 1, only.

OHIO GEOLOGICAL SURVEY—FOURTH SERIES. 1903.

Report of Petroleum and Natural Gas in Ohio. Geological Survey of Ohio || Edward Orton, Jr., State Geologist. || Fourth Series, Bulletin No. 1. || The || Occurrence and exploitation || of || Petroleum and Natural Gas || in Ohio, || by John Adams Bownocker, D. Sc., || Professor of Inorganic Geology Ohio State University. || Published under the authority of the legislature of Ohio, under the || supervision of the State Geologist. || Columbus, Ohio, December, 1903.

xxii + 325 pp. Plates, maps. Bound in cloth, binder's title, "Geological || Survey || of || Ohio || Fourth series || Bulletin 1 || Oil || and || Gas || Bownocker || 1903."

Contents: Title page as above; verso, printer's notice; letter of transmittal to the Governor; list of officers of the Survey.

The organization and work of the Geological Survey of Ohio, by Prof. Edward Orton, Jr., State Geologist, pp. i-xxii.

Secondary title page; letter of transmittal of Professor Bownocker to the state geologist; contents of the report; list of illustrations.

Report on the oil and gas producing rocks of Ohio, by J. A. Bownocker, pp. 17-320.

Index, pp. 321-325.

Report on uses of Hydraulic cement. Geological Survey of Ohio, || Edward Orton, Jr., State Geologist. || Fourth Series, Bulletin No. 2. || The || Uses of Hydraulic Cement || by Frank Harvey Eno, C. E. || Associate Professor of Civil Engineering, Ohio State University. || Published by authority of the legislature of Ohio, under the supervision of the state geologist. || Columbus, Ohio, September, 1904.

16+260 pp. Illus. Bound in cloth, binder's title, "Geological Survey of Ohio, Fourth Series, Bulletin No. 2. Uses of Hydraulic cement, Eno, 1904."

Contents: Title page as above; verso, printer's notice; letter of transmittal to the Governor; list of officers of the Survey. Announcements by the state geologist, pp. viii-xvi. Secondary title page; verso blank; letter of transmittal of Professor Eno, to state geologist; table of contents; pp. 5-7; tables, p. 8; list of illustrations, pp. 9-12; Author's introduction, pp. 13-15.

Report, pp. 17-248.

Chap. 1. Brief history of cement, pp. 17-22.

Chap. 2. Uses of cement in mortars, pp. 23-62.

Chap. 3. Uses of cement in concrete, pp. 63-123.

Chap. 4. Uses of cement in reinforced concrete, pp. 124-88

Chap. 5. Specifications for concrete materials, pp. 189-222.

Chap. 6. Machinery and tools, pp. 223-48.

Index, pp. 249-60.

Manufacture of Cements. Geological Survey of Ohio. || Edward Orton, Jr., State Geologist. || Fourth series, Bulletin No. 3. || The || Manufacture || of || Hydraulic Cements, || by || Albert Victor Bleining, B. Sc., || Instructor in Ceramics, Ohio State University. || Published by authority of the legislature of Ohio, under the || supervision of the state geologist. || Columbus, Ohio, December, 1904.

14+(2)+391 pp. Illus. 2 pl.

Contents: Title page as above; verso, printer's notice; letter of transmittal to the Governor; verso blank; list of officers of the Survey; announcements by the state geologist; pp. vii-xiv; secondary title page; verso blank; letter of transmittal of Mr. Bleining

to state geologist; table of contents, pp. 13-19; illustrations, pp. 19-21; Author's preface, pp. 23-24; Report on the manufacture of cements, pp. 25-378.

Chap. 1. General considerations on the hydraulic cements, pp. 25-40.

Chap. 2. Raw materials of the cement industry, pp. 41-101.

Chap. 3. Chemical and Physical examination of cement materials, pp. 102-57.

Chap. 4. Manufacture of Pozzuolane and natural cements, pp. 158-96.

Chap. 5. On the nature of Portland cement, pp. 197-222.

Chap. 6. The compounding of Portland cement mixtures, pp. 223-47.

Chap. 7. Winning and preparation of the raw materials, pp. 248-87.

Chap. 8. The Burning of Portland cement—The grinding of the clinker and general arrangement of plants, pp. 288-335.

Chap. 9. The properties of Portland cement and the testing of cement, pp. 336-78.

Index, pp. 381-91.

Geology of Ohio, Volume VIII. Geological Survey of Ohio. Economic Geology. Volume VIII. 1906.

Report of the Geological Survey of Ohio. Volume VIII.

Comprising reports on various mineral industries. Published by authority of the legislature of Ohio, under the supervision of Edward Orton, Jr., state geologist. Columbus, Ohio, January, 1906. Binding similar to rest of set.

Contents: Title page as above; Letter of transmittal from state geologist to Governor; Organization and work of state geologist.

Bulletin 1. The occurrence and exploitation of petroleum and natural gas in Ohio, by John Adams Bownocker, D. Sc.

Bulletin 2. Uses of hydraulic cements, by Frank Harvey Eno, C. E.

Bulletin 3. The manufacture of hydraulic cements, by Albert Victor Bleininger, B. Sc.

Limestones and Lime Industry of Ohio. Geological Survey of Ohio. Edward Orton, State Geologist. Fourth series, Bulletin No. 4. The Limestones and Lime Industry of Ohio, by Edward Orton, Jr., and S. V. Peppel. Published by authority of the legislature of Ohio, by state geologist. Columbus, Ohio, July, 1906.

365 pp. Illus. Bound in cloth, with Bulletin No. 5. 4,000 copies printed.

Contents: Title page as above; verso, printer's notice; letter of transmittal to the Governor; officers of the Survey; announcements by state geologist, p. vii; Letter of transmittal, p. 3; table of contents, p. 5; table of illustrations, p. 11; preface, p. 13; Report, p. 17-365.

Introduction. Limestones and the lime industry of Ohio. Edward Orton, Jr., pp. 17-19.

Chap. 1. The occurrence, extent and economic classification of the limestones of Ohio. Edward Orton, Jr. and S. V. Peppel, pp. 20-25.

Chap. 2. Methods employed in sampling and testing limestones. Edward Orton, Jr. and S. V. Peppel, pp. 25-30.

Chap. 3. The composition of the limestones of Ohio, with special reference to their fitness for portland cement manufacture. Edward Orton, Jr., pp. 31-136.

Chap. 4. The composition, physical character, and uses of the limestones of Ohio, considered by geological formations. Edward Orton, Jr., and S. V. Peppel, pp. 137-211.

Chap. 5. The uses of limestone in Ohio. S. V. Peppel, pp. 212-248.

Chap. 6. Technology of the lime industry. S. V. Peppel, pp. 250-341.

Appendix. Description and drawings of some of the typical lime manufacturing plants in Ohio, by S. V. Peppel. pp. 342-365.

Manufacture of Artificial Sandstone or Sand-lime Brick. Geological Survey of Ohio. || Edward Orton, Jr., State Geologist. || Fourth series, Bulletin No. 5. || The Manufacture || of || Artificial Sandstone || or || Sand-lime Brick, || by || Samuel Vernon Peppel, B. Sc. || Springfield, Ohio. || The Springfield Publishing Company, || state printers. || 1905. || 79 p. Illus. Bound in cloth, with Bulletin No. 4. 4,000 copies printed.

Contents: Title page as above; letter of transmittal of Mr. Peppel to the state geologist; verso blank; table of contents; list of illustrations; preface by state geologist, pp. 9-11; verso blank; preface by author, p. 13; verso blank; introduction, pp. 15-16; report, pp. 17-79.

Chap. 1. History and description of the industry, pp. 17-23.

Chap. 2. The raw materials, their impurities and their preparation, pp. 24-41.

Chap. 3. The pressing and hardening, pp. 42-47.

Chap. 4. Testing, pp. 48-52.

Chap. 5. Properties of the product, pp. 53-60.

Chap. 6. Mechanical equipment for manufacture, pp. 61-70.

Chap. 7. Processes and patents, pp. 71-79.

Bibliography of Ohio Geology. Geological Survey of Ohio || Edward Orton, Jr., State Geologist || Fourth Series, Bulletin No. 6. || A Bibliography of Ohio Geology || Part One || A Subject Index of the Publications of the Geological Survey || of Ohio, from its Inception to and including Bulletin || Eight of the Fourth Series || By || Alice Greenwood Derby, B. Ph., B. A. || Part Two || A Bibliography of the publications relating to the Geology of || Ohio, other than those of the State || Geological survey. || By || Mary Wilson Prosser. || Published by authority of the Legislature of Ohio, under the supervision || of the State Geologist || Columbus, Ohio, August, 1906. ||

332 pages. Bound in cloth. 3,500 copies printed.

Contents: Title page as above; verso, printers' notice; letter of transmittal to the Governor; officers of the Survey; announcements by the State Geologist, pp. 7-14; title page, Part One; letter of transmittal from Miss Derby to State Geologist, p. 17. Topical analysis of each volume of the publications of the Geological Survey of Ohio and public documents relating thereto, pp. 19-37; Subject Index, p. 38.

Part Two; Title page, p. 235; letter of transmittal from Mrs. Prosser to State Geologist, p. 237; author's introduction, p. 239; list of references, p. 241-332.

Revised Nomenclature of Ohio Geological Formations. Geologica, Survey of Ohio. || Edward Orton, Jr., State Geologist. || Fourth series || Bulletin No. 7. || Revised Nomenclature of the Ohio || Geological Formations || by || Charles S. Prosser, M. Sc., || Professor of Geology, Ohio State University. || Published by authority of the legislature of Ohio, under the supervision of || the state geologist. || Columbus, Ohio, November, 1905. ||

16+36 p. Bound in paper; printer's title. 3,500 copies printed.

Contents: Title page as above; letter of transmittal of state geologist to the Governor; p. iii; verso blank; officers of the Survey; announcements by the state geologist, pp. vii-viii; report of state geologist, pp. ix-xv. Report on the revised nomenclature of the Ohio geological formations, pp. 1-36.

Salt Deposits and the Salt Industry in Ohio. Geological Survey of Ohio. || Edward Orton, Jr., State Geologist. || Fourth series, Bulletin No. 8. || Salt deposits and the salt industry in Ohio, || by || John Adams Bownocker, D. Sc., || Professor of Geology, Ohio State University. || Published by authority of the legislature of Ohio, under the supervision of the state geologist. || Columbus, Ohio, June, 1906. ||

16+42 p. Illus. Map.

Contents: Title page as above; printer's notice; letter of transmittal of state geologist to the Governor; blank page; officers of the Survey; blank; preface by the state geologist, pp. vii-viii; announcements by state geologist, pp. ix-xvi; secondary title page; letter of transmittal of Professor Bownocker to state geologist, p. 3; table of contents, p. 5; table of illustrations, p. 7; map of eastern Ohio showing salt works. p. 8.

Report, pp. 9-41.

Appendix, pp. 41-42.

ABREVIATIONS USED IN THE TEXT.

- | | |
|--|---|
| Annual Report, Mather. Volume 1, 1838. | Ann. rep. v. 1. |
| Annual Report, Mather. Volume 2, 1838. | Ann. rep. v. 2. |
| Report of Progress, 1869, Newberry. | Rep. Prog. 1869. |
| Report of Progress, 1870, Newberry. | Rep. Prog. 1870. |
| Report of Progress, 1871, Newberry. | Rep. Prog. 1871. |
| Geology of Ohio. Newberry, Orton. | Geol. of O., v. 1-8. |
| First Annual Report (3rd organization.)
Orton, 1890. | Rep. 1890. |
| Preliminary Report on Petroleum and Inflammable Gas, Orton, 1886-1887. | Prelim. rep. on petrol.
and inflam. gas. |
| Bulletin 1. Occurrence and Exploitation of Petroleum and Natural Gas in Ohio. Bownocker, 1903. | O. Geol. Sur. Bull. 1. |
| Bulletin 2. The uses of Hydraulic Cement, Eno, 1904. | O. Geol. Sur. Bull. 2. |
| Bulletin 3. The Manufacture of Hydraulic Cements. Bleininger, 1904. | O. Geol. Sur. Bull. 3. |
| Bulletin 4. Limestones and Lime Industry of Ohio. Orton, Jr., and Peppel, 1906. | O. Geol. Sur. Bull. 4. |
| Bulletin 5. Manufacture of Artificial Sandstone or Sand-lime Brick. Peppel, 1905. | O. Geol. Sur. Bull. 5. |
| Bulletin 6. Bibliography. 1906. | |
| Part 1. Subject index of the publications of geological survey. Alice G. Derby. | |
| Part 2. Bibliography of Ohio geology. Mary Wilson Prosser. | O. Geol. Sur. Bull. 6. |
| Bulletin 7. Revised Nomenclature of Ohio Geological Formations. Prosser, 1905. | O. Geol. Sur. Bull. 7. |
| Bulletin 8. Salt Deposits and the Salt Industry in Ohio. Bownocker, 1906. | O. Geol. Sur. Bull. 8. |

SUBJECT INDEX.

- Aborigines.** Earthworks in Lucas County. Geol. of O. v. 1, pt. 1, pp. 586-87.
- Fowke. Archaeology of Ohio, embodying the principal results of explorations and discoveries. Geol. of O., v. 7, pt. 2, pp. 1-55.
- Fowke. Relics of aboriginal inhabitants of Ohio. Geol. of O., v. 7, pt. 2, pp. 46-54.
- Hill. Archaeological remains in Logan county. Geol. of O., v. 3, pp. 488-90.
- Hodge. Indian mounds in Coshocton county. Geol. of O., v. 3, p. 568.
- Hussey. Remains of extinct peoples in Shelby county. Geol. of O., v. 3, pp. 462-64.
- Locke. Ancient work in Highland county. Ann. Rep. 2, v. 2, 1838, pp. 267-69. Plate, Showing Fort-Hill, in Highland county.
- Newberry. Aboriginal inscriptions in Columbiana county. Geol. of O., v. 3, p. 116.
- Newberry. Ancient earthworks in Lorain county. Geol. of O., v. 2, pt. 1, pp. 223-24.
- Orton. Ancient remains in Warren county. Geol. of O., v. 3, pp. 390-91.
- Read. Archaeological remains in Licking county. Geol. of O., v. 3, p. 361.
- Wheat. Ancient mounds in Medina county. Geol. of O., v. 3, pp. 369-71, 374-75, 375-76.
- Whittlesey. Ancient works in region between the Scioto and Hockhocking rivers. Ann. rep., v. 1, 1837, pp. 104-6.
- See also Indians.*
- Absorption.** Peppel. Absorption in sand-lime brick. O. Geol. Sur., Bull. 5, p. 59.
- Abutments.** Eno. Use of concrete in abutments. O. Geol. Sur., Bull. 2, pp. 66-68.
- Acid Slaking Process.** Peppel. Acid slaking process in manufacture of sand-lime brick. O. Geol. Sur., Bull. 5, pp. 21-22.
- Adams County.** Locke. Geology. Ann. Rep., v. 2, 1838, pp. 238-56. 266. Geological map of Adams county, 39x35.5 cm.
- Orton. Cliff limestone of. Rep. Prog., 1870, p. 295-308.

- Adams County.** Orton, Jr. Composition of limestones with reference to their fitness for portland cement manufacture. *O. Geol. Sur., Bull. 4*, pp. 32-36.
- Agriculture.** Hill. Agricultural resources of Champaign county. *Geol. of O.*, v. 3, pp. 494-95.
- Klippart. Agricultural survey of Ohio. *Rep. Prog. 1870*, pp. 313-400.
- Winchell. Agricultural products of Crawford county. *Geol. of O.*, v. 2, pt. 1, pp. 249-50.
- Air-Slaked Lime.** Peppel. Discussion of uses of air-slaked lime. *O. Geol. Sur., Bull. 4*, pp. 313-315.
- Algae.** Kellerman & Werner. Index to Genera. *Geol. of O.*, v. 7, pt. 2, p. 396.
- List of Algae of Ohio. *Geol. of O.*, v. 7, pt. 2, pp. 385-95.
- Allegheny Formation.** Prosser. Correlation of this formation in Ohio with coal formations of West Virginia. *O. Geol. Sur., Bull. 7*, pp. 8-11.
- Allen County.** Bownocker. *Geology. O. Geol. Sur., Bull. 1*, pp. 82-5.
- Oil Production. *O. Geol. Sur., Bull. 1*, pp. 78-85. Geologic map of Allen and other counties, showing oil and gas territories. 20.7x21 cm. opp. 80. Amanda Township, p. 81. Auglaize township, p. 80. Bath township, p. 80. German township, p. 81. Jackson township, pp. 79-80. Marion township, p. 81. Monroe township, p. 80. Ottawa township, pp. 78-9. Perry township, p. 80. Richland township, p. 79. Shawnee township, pp. 80-1. Spencer township, pp. 81-2.
- Orton. Oil wells. *Rep. 1890*, pp. 215-18.
- Orton, Jr., and Peppel. Composition of limestones with reference to fitness for portland cement. *O. Geol. Sur., Bull. 4*, pp. 36-37.
- Winchell. *Geology. Geol. of O.*, v. 2, pt. 1, pp. 397-403.
- Winchell. *Topography. Geol. of O.*, v. 2, pt. 1, pp. 397-98.
- Alluvial Deposits.** Foster. Alluvium in Muskingum, Licking and Franklin counties. *Ann. rep.*, v. 2, 1838, pp. 76-77.
See also Drift.
- Altitudes.** Table giving elevations above sea level in the several counties of Ohio. *Geol. of O.*, v. 6, pp. 793-820.
- Alumina.** Bleininger. Alumina in hydraulic cements. *O. Geol. Sur., Bull. No. 3*, pp. 32-33.
- Amanda.** Orton. Deep wells, explorations for natural gas in Clinton Limestone. *Rep. 1890*, pp. 243-44.

- Ames Limestone.** Orton. Ames limestone of Hanging Rock district. Geol. of O., v. 3, p. 997.
- Orton and Peppel. Crinoidal or Ames Limestone Available for Cement Making. O. Geol. Sur., Bull. No. 3, p. 94.
- Ammonia Manufacture.** Peppel. Use of hydrated lime in manufacture of ammonia and potassium bi-chromate. O. Geol. Sur., Bull. No. 4, p. 245.
- Amorphozoa.** Nicholson. Amorphozoa from silurian and devonian formations. Geol. of O., v. 2, pt. 2, pp. 245-55.
- Amphibia, see Batrachia.*
- Analysis. For analysis of any substance, see its name, Clay analysis; Coal analysis; etc.*
- Andrews, E. B.** Administrative report on second geological district. Rep. Prog. 1871, pp. 11-12.
- Annual report of the second geological district. O. Geol. Sur. Rep. Prog. 1869, pp. 55-135. Rep. Prog. 1870, pp. 57-251.
- Descriptions of Fossil Plants from the Coal-measures of Ohio. Geol. of O., v. 2, pt. 2, pp. 415-26.
- Geology of Belmont county (south half). Geol. of O., v. 2, pt. 1, pp. 543-69.
- Geology of Guernsey county (south half). Geol. of O., v. 2, pt. 1, pp. 529-42.
- Geology of Monroe County. Geol. of O., v.2, pt.1,pp.570-87.
- Geology of Noble County. Geol. of O., v. 2, pt. 1, pp. 509-28.
- Geology of Perry county, and Portions of Hocking and Athens counties. Geol. of O., v. 3, pp. 815-84.
- Geology of Pickaway and Fairfield counties. Geol. of O., v. 2, pt. 1, pp. 588-94.
- Geology of Washington county. Geol. of O., v. 2, pt. 1, pp. 453-508.
- Report on the second geological district. Geol. of O., v. 1, pt. 1, pp. 225-364.
- Report on the second geological district. Geol. of O., v. 2, pt. 1, pp. 441-608.
- Angiosperms.** Kellerman and Werner. Index to the flowering plants. Geol. of O., v. 7, pt. 2, pp. 235-43.
- List of Angiosperms in Ohio. Geol. of O., v. 7, pt. 2, pp. 81-234.
- Annelida (Paleozoic), see Paleontology.*
- Anthozoa (Paleozoic), see Paleontology.*

- Anticlines.** Orton. Anticlines of Ohio. Geol. of O., v. 7, pp. 40-44.
- Apple River Dam.** Eno. Use of concrete in this dam. O. Geol. Sur., Bull. No. 2, p. 102.
- Archaeology, see Aborigines; Indians; Mound Builders; Mounds; Trench Enclosures.*
- Archer's Fork Pool.** Bownocker. Wells in Independence township, Washington county. O. Geol. Sur., Bull. No. 1, p. 185.
- Arches.** Orton. Arches and folds in Ohio. Geol. of O., v. 6, pp. 54-59.
 —Orton. Arches as part of the Geological structure of Ohio. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 43-44.
 Rep. 1886, pp. 29-30.
- Artesian Wells.** Gilbert. Wells of Lucas County. Geol. of O., v. 1, pt. 1, pp. 583-84.
 —Gilbert. Artesian wells in Williams county. Rep. Prog. 1870, pp. 488-89.
 —Gilbert. Water in Williams county. Geol. of O., v. 1, pt. 1, pp. 562-4.
 —Winchell. Wells and springs of Ottawa county. Geol. of O., v. 2, pt. 1, pp. 233-34.
- Articula, see Crustacea; Paleontology.*
- Ashland County.** Read. Geology. Geol. of O., v. 3, pp. 519-528.
 Geologic map, Richland, Ashland, etc., 31. 7x42 cm. Topography. pp. 519-20.
- Ashpits.** Eno. Use of steel concrete in turntables and ashpits. O. Geol. Sur., Bull. No. 2, p. 178
- Ashtabula County.** Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 302-04.
 —Orton. Shale gas. Geol. of O., v. 6, pp. 422-27.
 —Read. Geology. Geol. of O., v. 1, pt. 1, pp. 483-92. Geologic map of Ashtabula, Trumbull, Lake and Geauga counties, 26.3x32 cm.
- Athens County.** Andrews. Geology. Geol. of O., v. 1, pt. 1, pp. 261-93. Alexander township, pp. 289-90. Ames township, pp. 270-71. Athens township, pp. 277-82. Berne township, pp. 271-77. Canaan township, p. 283. Carthage township, pp. 291-92. Dover township, pp. 263-4. Lee township, pp. 290-91. Lodi township, pp. 287-89. Rome township, pp. 283-87. Trimble township, pp. 265-70. Troy township, p. 292. Waterloo township, pp. 262-3. York Township, pp. 262-3.

- Athens County.** Andrews. Geology. Rep. Prog. 1870, pp. 80-97.
 Waterloo township, pp. 89-91. York township, pp. 86-89.
- Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 269-74. Alexander township, p. 272. Athens township, pp. 269-70. Canaan township, pp. 272-73. Dover township, p. 273. Lee township, p. 272. Lodi township, p. 273. Rome township, p. 273. Troy township, p. 273. Waterloo township, pp. 270-72. York township, p. 272.
- Briggs. Geology. Ann. Rep., v. 1, 1837, pp. 71-98.
- Briggs. Geology of Hocking and Athens counties. Ann. Rep. v. 2, 1838, pp. 130-45.
- Hildreth. Geology. Ann. Rep., v. 1, 1837, pp. 25-54.
- Orton. Deep Wells, Drilling for Oil and Gas. Geol. of O., v. 6, p. 398.
- Orton, Jr., and Peppel. Composition of limestones with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 37-40.
- Auglaize County.** Bownocker. Geology. O. Geol. Sur., Bull. No. 1, pp. 88-89.
- Oil production. O. Geol. Sur., Bull. No. 1, p. 85-9. Geologic map, Auglaize and other counties, showing oil and gas territories, 20.7x21 cm., opp. p. 80. Duchouquet township, p. 85. German township, p. 87. Jackson township, p. 87. Logan township, pp. 85-6. Moulton township, p. 86. Noble township, p. 86. St. Marys township, pp. 86-7. Salem township, p. 86. Washington township, p. 86.
- Orton. Oil and gas wells. Geol. of O., v. 6, pp. 254-58.
- Orton. Gas wells. Rep. 1890, pp. 156-61.
- Orton. Oil wells. Rep. 1890, pp. 812-15.
- Orton, Jr., and Peppel. Lime formations of, important for lime industries. O. Geol. Sur., Bull. No. 4, p. 134.
- Winchell. Geology. Geol. of O., v. 2, pt. 1, pp. 404-09.
- Winchell. Topography. Geol. of O., v. 2, pt. 1, pp. 404-06.
- Austin Rock Crusher.** Eno. Section of Austin portable crusher. O. Geol. Sur., Bull. No. 2, p. 226.
- Ball Mill.** Bleining. Machines used in cement manufacture. O. Geol. Sur., Bull. No. 3, pp. 270-73.
- Baltimore Fire.** Eno. Effect of fire on steel concrete as shown in Baltimore Fire. O. Geol. Sur., Bull. No. 2, p. 188.

- Barnesville Oil and Gas Field.** Bownocker. Wells of Belmont county. O. Geol. Sur., Bull. No. 1, pp. 214-216.
- Barometrical Observations.** Locke. Record of barometrical observations in Adams county. Ann. Rep. v. 2, 1838, pp. 275-86.
- Base-boards.** Eno. Use of cement for mouldings and base-boards. O. Geol. Sur., Bull. No. 2, pp. 49-50.
- Batrachia.** Cope. Synopsis of extinct batrachia from the coal-measures. Geol. of O., v. 2, pt. 2, pp. 351-411.
- Genera and Species. Geol. of O., v. 4.
- Batrachia. Anoura, pp. 701-02.
- Bufonidæ. Bufo. Lentiginosus, pp. 702-04. Hylidæ. Acris Gryllus (Crepitans), p. 705. Chorophlus triseriatus, pp. 704-05. Hyla Pickeringii, p. 707. Hyla Versicolor, pp. 706-07.
- Ranidæ. Rana catesbyana, pp. 712-13. Rana clamitans, pp. 711-12. Rana halecina, pp. 708-09. Rana palustris, p. 709. Rana Temporaria cantabrigensis, p. 710. Rana temporaria sylvatica, pp. 710-11.
- Urodela. Perennibranchiata. Proteidæ. Menobranchus, pp. 714-15.
- Caducibranchiata. Menopomidæ. Menopoma alleghaniensis, pp. 716-17.
- Salamandridæ. Amblystoma, pp. 717-18. Amblystoma, Jeffersonianum p. 721. Amblystoma microstomum, 722. Amblystoma opacum, pp. 719-20. Amblystoma punctatum, p. 719. Amblystoma Tigrinum, pp. 720-21. Amblystoma xiphias, pp. 722-23. Notophthalmus Viridescens, pp. 730-31. Plethodon, pp. 723-34. Plethodon erythronotus, pp. 724-25. Plethodon fuscus, p. 726. Plethodon glutinosus, pp. 725-26. Spelerpes bilineatus, pp. 727-28. Spelerpes longicaudus, p. 728. Spelerpes porphyriticus, pp. 729-30. Spelernes ruber, pp. 728-29.
- Smith. Report on the reptiles and amphibians of Ohio. Geol. of O., v. 4, pp. 700-734.
- Smith. Tabular List of the Reptilia and Amphibia of Ohio. Geol. of O., v. 4, pp. 732-34.
- Beaches.** Gilbert. Raised beaches in Maumee valley. Geol. of O., v. 1, pt. 1, pp. 549-56. Geologic map showing moraines and raised beaches of Maumee valley, opp. p. 541, 21.5x17 cm. Geologic Map Showing Raised Beaches North of Maumee river, opp. p. 549, 21.3x13.9 cm. Geologic map, same. Geol. of O., v. 2, pt. 1, opp. p. 55, 56.
- Newberry. Terraces and raised beaches in Ohio. Geol. of O., v. 2, pt. 1, pp. 50-65.



- Beaches.** Newberry. Geologic map showing moraines and raised beaches of Maumee valley, opp. p. 50.
- Newberry. Geologic map showing raised beaches north of the Maumee river, opp. p. 56.
- Bedford Shale.** Herrick. Bedford shale and its fossils in Ohio. Geol. of O., v. 7, pt. 2, pp. 506-08.
- Newberry. Bedford shale in Cuyahoga county. Geol. of O., v. 1, pt. 1, pp. 188-9.
- Newberry. In Erie County. Geol. of O., v. 2, pt. 1, p. 188.
- Newberry. In Lorain County. Geol. of O., v. 2, pt. 1, pp. 212-13.
- Newberry. In Ohio. Geol. of O., v. 2, pt. 1, pp. 90-2.
- Newberry. In Summit County. Geol. of O., v. 1, pt. 1, p. 209.
- Newberry. Fossils. Geol. of O., v. 2, pt. 1, pp. 91-2.
- Orton. Bedford shale of Ohio. Geol. of O., v. 6, pp. 33-35. Same, in part, Rep. 1890, pp. 34-5.
- Orton. Bedford shale in Ohio. Geol. of O., v. 7, pp. 27-28.
- Prosser. Discussion of name of this formation to be retained in the revised geological scale of Ohio. O. Geol. Sur., Bull. No. 7, pp. 19-20.
- Read. Bedford shale in Ashtabula county. Geol. of O., v. 1, pt. 1, p. 485.
- Read. Bedford Shale in Geauga County. Geol. of O., v. 1, pt. 1, p. 525.
- Read. Bedford shale in Huron county. Geol. of O., v. 3, p. 305.
- Read. Bedford shale in Lake county. Geol. of O., v. 1, pt. 1, p. 514.
- Read. Bedford shale in Trumbull county. Geol. of O., v. 1, pt. 1, p. 508.
- Winchell. Bedford shale in Morrow county. Geol. of O., v. 2, pt. 1, p. 263.
- Belfast Bed.** Prosser. Explanation of the use of this name by writers on geology of Ohio. O. Geol. Sur., Bull. No. 7, p. 29.
- Belmont County.** Andrews. Geology. Geol. of O., v. 2, pt. 1, pp. 543-69. Local Geology. Goshen township, pp. 551-55. Mead township, pp. 564-65. Pultney township, pp. 560-64. Richland township, pp. 559-60. Smith township, pp. 555-58. Somerton township, pp. 550-51. Warren township, pp. 545-50. Washington township, pp. 567-69. Wayne township, p. 569. York township, pp. 565-67.

- Belmont County.** Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 214-21. Geologic map showing oil and gas territories in Belmont county, 22x17.6 cm., opp. p. 214.
- Bownocker. Oil and gas wells. O. Geol. Sur., Bull. No. 1, pp. 214-21. Goshen township, p. 218. Kirkwood township, p. 219. Pease township, pp. 219-20. Pultney township, p. 219. Richland township, p. 219. Smith township, p. 219. Washington township, pp. 220-21. Wayne township, p. 218. Wheeling township, p. 221. York township, p. 221.
- Brown. Pittsburg Coal Seam. Geol. of O., v. 6, pp. 605-23. Colerain township, pp. 608-09. Flushing township, pp. 611-12. Goshen township, p. 622. Kirkwood township, pp. 612-13. Mead Township, p. 620. Pease township, pp. 605-08. Pultney township, pp. 615-20. Richland township, pp. 614-15. Somerset township, p. 623. Union township, p. 614. Warren township, pp. 622-23. Washington township, pp. 621-22. Wheeling township, pp. 609-11. York township, pp. 620-21.
- Orton, Jr., and Peppel. Composition of limestones, with reference to their fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 40-47.
- Read. Local geology. Geol. of O., v. 3, p. 271-85, Colerain township, pp. 278-80. Flushing township, pp. 275-76. Goshen township, pp. 271-72. Kirkwood township, pp. 272-73. Pease township, pp. 280-85. Pultney township, p. 285. Union township, p. 274. Warren township, pp. 268-71. Wheeling township, pp. 276-78.
- Stevenson. Geology. Geol. of O., v. 3, pp. 261-87.
- Stevenson. Topography and Resources. Geol. of O., v. 3, p. 261.
- Benching.** Orton, Jr., and Peppel. Methods of winning Ferriferous limestone in Ohio. O. Geol. Sur., Bull. No. 4, pp. 183-85.
- Berea Grit.** Building stones of Ohio. Geol. of O., v. 5, pp. 578-90, 594-95.
- Bownocker. Oil and gas producing rocks in Ohio. O. Geol. Sur. Bull. No. 1, pp. 22-23.
- Herrick. Berea grit and its fossils in Ohio. Geol. of O., v. 7, pt. 2, p. 508.
- Newberry. Berea grit in Cuyahoga county. Geol. of O., v. 1, pt. 1, pp. 186-88.
- Newberry. Berea grit in Lorain county. Geol. of O., v. 2, pt. 1, pp. 211-12.
- Newberry. Berea grit in Ohio. Geol. of O., v. 2, pt. 1, pp. 88-90.
- Newberry. Berea grit in Summit county. Geol. of O., v. 1, pt. 1, pp. 209-10.

- Berea Grit.** Newberry. Fossils. Geol. of O., v. 2, pt. 1, p. 90.
- Orton. Berea grit and Ohio shale as sources of gas. Prelim. Rep. on petroleum and inflammable gas, 1887. pp. 76-78.
- Orton. Berea grit as a source of gas and oil in Ohio. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 79-90. Edition 1886, pp. 54-62.
- Orton. Berea grit as a source of oil and gas in Ohio. Geol. of O. v. 6, pp. 311-409. Rep. 1890, pp. 249-58.
- Orton. Berea grit in Ohio. Geol. of O., v. 6, pp. 35-6. Rep. 1890, pp. 35-67; Geol. of O., v. 7, pp. 28-30.
- Read. Berea grit in Ashtabula county. Geol. of O., v. 1, pt. 1. pp. 483-85.
- Read. Berea grit in Geauga county. Rep. Prog. 1870, pp. 468-69. Geol. of O., v. 1, pt. 1, pp. 523-25.
- Read. Berea grit in Huron county. Geol. of O., v. 3, pp. 301-05.
- Read. Berea grit in Lake county. Geol. of O., v. 1, pt. 1, pp. 512-14.
- Read. Berea grit in Trumbull county. Geol. of O., v. 1, pt. 1, pp. 504-08.
- Winchell. Berea grit in Morrow county. Geol. of O., v. 2, pt. 1, pp. 259-63.
- Berea Sandstone.** Bownocker. Oil sand of Corning field, Perry county. O. Geol. Sur., Bull. No. 1, p. 262.
- Berea Shale.** Herrick. Berea shale and its fossils. Geol. of O., v. 7, pt. 2, p. 508.
- Orton. Berea shale in Ohio. Geol. of O., v. 6, pp. 36-7. Same, in part, Rep. 1890, p. 37.
- Berea shale or Waverly black shale in Ohio. Geol. of O., v. 7, p. 30.
- Prosser. Berea shale equals Sunbury shale in the revised geological scale of Ohio. O. Geol. Sur., Bull. No. 7, p. 19.
Berea Shale, see also Sunbury Shale.
- Birds.** Check List of Ohio Birds, with Dates of their Occurrence. Geol. of O., v. 4, pp. 570-84
- Genera and Species. *Accipiter cooperei*, pp. 421-22. *Accipiter Fuscus*, pp. 420-21. *Actiturus bartramius*, pp. 489-90. *Aegillitis meloda*, pp. 459-60. *Aegillitis semipalmata*, pp. 458-59. *Aegillitis vocifera*, pp. 457-58. *Aegiothus linaria*, pp. 319-20. *Agelæus Phœniceus*, pp. 355-56. *Aix sponsa*, pp. 528-29. *Alauda arvensis*, p. 234-35. *Ampelis cedrorum*, pp. 296-97. *Ampelis garrulus*, pp. 294-96. *Anas boschas*, pp. 522-23. *Anas obscura*, pp. 523

Birds. -24. *Anorthura troglodites*, pp. 231-32. *Anser albifrons* (gambeli), pp. 517-18. *Anser cœrulescens*, pp. 519-20. *Anser hyperboreus*, pp. 520-21. *Anthus ludovicianus*, pp. 236-37. *Antostimulus vociferus*, pp. 382-83. *Aquila chryseatus*, pp. 432-33. *Archibuteo lagopus*, pp. 430-31. *Ardea candidissima*, pp. 502-03. *Ardea egretta*, p. 501. *Ardea herodias*, pp. 500-01. *Ardea virescens*, p. 504. *Astur atricappilus*, pp. 422-23. *Ardetta exilis*, pp. 505-06.

Bonasa umbellus, pp. 446-47. *Botaurus minor*, pp. 504-05. *Branta bernicla*, pp. 520-21. *Branta canadensis*, p. 521. *Branta canadensis hutchinsii*, p. 522. *Brachyotus palustris*, pp. 410-11. *Bubo virginianus*, p. 407. *Bucephale albeola*, pp. 533-34. *Bucephale clangula*, p. 533. *Buteo aquilinus*, pp. 427-28. *Buteo lineatus*, pp. 428-29. *Buteo pennsylvanicus*, pp. 429-30.

Calidris arenaria, pp. 478-79. *Cardinalis virginianus*, pp. 348-50. *Carpodacus purpureus*, pp. 315-16. *Cathartes atratus*, pp. 439-40. *Cathartes aura*, pp. 437-39. *Centurus carolinus*, pp. 399-400. *Certhia familiaris*, pp. 226-27. *Ceryle alcyon*, pp. 389-90. *Chætura pelagica*, pp. 385-87. *Charadrius fulvus* (virginicus), pp. 456-57. *Chaulelasmus streperus*, pp. 524-25. *Chondestes grammacus*, pp. 339-41. *Chordeiles virginianus*, pp. 383-85. *Chrysomitris pinus*, pp. 320-22. *Chrysomitris tristis*, p. 322. *Circus cyaneus* (hudsonius), pp. 417-18. *Cistothorus stellaris*, pp. 233-34. *Coccyzus americanus*, pp. 392-93. *Coccyzus erythrophthalmus*, pp. 390-92. *Colaptes auratus*, pp. 401-02. *Colymbus Arcticus*, p. 565. *Colymbus septentrionalis*, p. 565. *Colymbus torquatus*, pp. 564-65. *Contopus borealis*, pp. 371-72. *Contopus virens*, pp. 372-73. *Conurus carolinensis*, pp. 403-05. *Corvus americanus*, pp. 364-65. *Corvus corax*, pp. 363-64. *Coturnicus henslovii*, p. 328. *Coturnicus passerinus*, pp. 327-28. *Cotyle riparia*, pp. 290-91. *Cupidonia cupido*, pp. 445-46. *Cyanospiza Cyanea*, pp. 347-48. *Cyanurus cristatus*, pp. 365-66. *Cygnus americanus*, pp. 516-17. *Cygnus buccinape*, p. 516.

Dalfilia Asuta, p. 524. *Dendrœca aestiva*, pp. 246-47. *Dendrœca blackburniæ*, pp. 252-53. *Dendrœca cœrulea*, pp. 249-51. *Dendrœca castanea*, pp. 254-55. *Dendrœca coronata*, pp. 251-52. *Dendrœca discolor*, pp. 259-60. *Dendrœca* (albilora), dominica pp. 260-62. *Dendrœca kirklandii*, pp. 263-65. *Dendrœca* (albilora) Maculosa, pp. 257-58. *Dendrœca palmarum*, pp. 265-66. *Dendrœca pennsylvanica*, pp. 256-57. *Dendrœca pinus*, pp. 266-67. *Dendrœca striata*, pp. 253-54. *Dendrœca tigrina*, pp. 258-59. *Dendrœca virens*, pp. 247-48. *Dolichonyx oryzivorus*, pp. 351-53.

Birds. *Ectopistes macrura*, pp. 440-42. *Elanoides forficatus*, pp. 418-19. *Epidonax acadicus*, pp. 373-75. *Epidonax flaviventis*, pp. 380-81. *Epidonax minimus*, p. 379. *Epidonax traill*, pp. 375-79. *Eremophila alpestris*, pp. 235-36. *Ereunetes pusillus*, p. 472. *Erismatura rubida*, p. 539. *Euspiza americana*, pp. 343-45.

Falco Communis, pp. 423-24. *Falco columbaris*, p. p. 424-25. *Falco sparverius*, pp. 425-27. *Fulcia americana*, p. 515. *Fuligula affinis*, p. 530. *Fuligula collaris*, pp. 530-31. *Fuligula ferina*, p. 531. *Fuligula marila*, pp. 529-30. *Fuligula vallisneria*, p. 532. *Gallinula galeata*, pp. 512-13. *Gallinago wilsoni*, pp. 469-70. *Geothlypis philadelphia*, p. 276. *Geothlypis triachus*, pp. 275-76. *Goniaphea ludoviciana*, pp. 346-47. *Graculus dilophus*, pp. 543-44. *Graculus dilophus (floridanus)*, pp. 544-45. *Grus americana*, pp. 507-08. *Grus canadensis*, p. 508.

Haliaetus leucocephalus, pp. 434-36. *Harporhynchus rufus*, pp. 211-12. *Heralda glacialis*, pp. 534-35. *Hesperiphona vespertina*, pp. 313-14. *Himantopus nigricollis*, pp. 463-65. *Hirundo erythrogastra*, pp. 286-87. *Hyloptomus pileatus*, pp. 394-95. *Icteria virens*, pp. 277-79. *Icterus baltimore*, pp. 359-60. *Icterus spurius*, pp. 358-59.

Junco hyemalis, pp. 332-33.

Lanius borealis, pp. 306-09. *Lanius ludovicianus*, var. *ludovicianus*, pp. 309-10. *Lanius ludovicianus*, var. *excubitorides* pp. 310-313. *Larus argentatus*, pp. 548-49. *Larus delawarensis*, p. 549. *Larus marinus*, p. 547. *Larus leucopterus*, pp. 546-47. *Larus philadelphia*, pp. 550-52. *Larus tridactylus*, pp. 549-50. *Limosa fedoa*, pp. 479-81. *Limosa haemastica*, p. 481. *Lobipes hyperboreus*, pp. 466-67. *Lophophanes bicolor*, pp. 221-22. *Loxia curvirostra*, pp. 316-18. *Loxia leucoptera*, pp. 318-9.

Melægris gallopavo (Americana), pp. 443-44. *Melanerpes erythrocephalus*, pp. 400-01. *Melospiza lincolni*, p. 329. *Melospiza melodia*, pp. 330-32. *Melospiza palustris*, pp. 329-30. *Meraca americana*, pp. 525-26. *Mergus cucullatus*, pp. 541-42. *Mergus merganser*, p. 540. *Mergus serrator*, p. 541. *Micropalma himantopus*, p. 471. *Microrhamphus griseus*, pp. 470-71. *Mimus carolinensis*, pp. 210-11. *Mimus polyglottus*, pp. 209-10. *Molothrus ater*, pp. 353-55. *Myiarchus crinitus*, pp. 368-69. *Myiiodictes canadensis*, pp. 281-82. *Myiiodictes mitratus*, pp. 279-80. *Myiiodictes pusillus*, p. 281.

Numenius borealis, pp. 493-95. *Numenius hudsonicus*, pp. 492-93. *Numenius longirostris*, pp. 491-92. *Nyctale acadica*, pp. 415-17. *Nyctea scandiaca*, pp. 412-14. *Nyctiardea grisea (nævia)*, p. 504.

Birds. *Oedemia americana*, pp. 537-38. *Oedemia fusca*, pp. 538-39. *Oporornis agilis*, pp. 272-73. *Oporornis formosus*, pp. 273-75. *Ortyx virginianus*, pp. 448-55. *Otus vulgaris*, pp. 409-10.

Pandion haliaetus, pp. 431-32. *Passer domesticus*, pp. 341-42. *Passerculus savanna*, pp. 325-26. *Passerella iliaca*, pp. 342-43. *Parus atricapillus*, pp. 222-23. *Parus carolinensis*, pp. 223-24. *Pelgadis falcinellus*, pp. 497-99. *Pelicanus trachyrhynchus*, pp. 542-43. *Petrochelidon lunifrons*, pp. 288-90. *Phalaropus fulicarius*, pp. 467-68. *Philchela minor*, pp. 468-69. *Philomachus pugnax*, pp. 488-89. *Picoides arcticus*, p. 397. *Picus pubescens*, p. 396. *Picus villosus*, pp. 395-96. *Pinicola enuncleatos*, pp. 314-15. *Pipilo erythrophthalmus*, pp. 350-55. *Plectrophanes lapponicus*, pp. 324-25. *Plectrophanes nivalis*, pp. 323-24. *Podiceps cornutus*, pp. 567-68. *Podiceps griseigena*, pp. 566-67. *Podilymbus podiceps*, pp. 568-69. *Pœcetes gramineus*, pp. 326-27. *Polioptila cœrulea*, pp. 217-20. *Porphyrio martinica*, p. 514. *Porzana carolina*, pp. 510-11. *Porzana noveboracensis*, pp. 511-12. *Progne subis*, pp. 292-94. *Pyrranga aestiva*, pp. 284-85. *Pyrranga rubra*, p. 284.

Querquedula carolinensis, p. 526. *Querquedula discors*, p. 527. *Quiscalis purpureus*, pp. 361-63.

Rallus elegans, p. 509. *Rallus virginianus*, pp. 509-10. *Recurvirostra americana*, pp. 461-62. *Regulus calendula*, pp. 214-15. *Regulus satrapa*, pp. 215-16.

Sayornis fuscus, pp. 369-71. *Scolecophagus perrugineus*, pp. 360-61. *Scops asio*, pp. 408-09. *Setophaga ruticilla*, pp. 282-83. *Sialia sialis*, pp. 212-14. *Sitta canadensis*, pp. 225-26. *Sitta carolinensis*, pp. 224-25. *Sitta pusilla*, p. 226. *Siurus auricapillus*, pp. 267-68. *Siurus motacilla*, pp. 269-71. *Siurus nævius*, pp. 268-69. *Somateria spectabilis*, pp. 535-37. *Spatula clypeata*, pp. 527-28. *Sphyrapicus varius*, pp. 397-99. *Spizella monticola*, pp. 333-34. *Spizella pusilla*, pp. 335-36. *Spizella socialis*, pp. 334-35. *Squatarola helvitica*, pp. 455-56. *Steganopus wilsoni*, pp. 464-66. *Sterna anglica*, pp. 552-53. *Sterna antillarum*, p. 562. *Sterna dougalli*, pp. 561-62. *Sterna fluviatilis*, pp. 553-60. *Sterna fosteri*, pp. 560-61. *Sterna hydrochelidon lariformis*, pp. 562-64. *Strepsilas interpres*, pp. 460-61. *Stelgidopteryx serripennis*, pp. 291-92. *Strix flamma*, pp. 406-07. *Sturnella magna*, pp. 357-58. *Sturnia ulula*, pp. 414-15. *Syrnium cinereum*, pp. 411-12. *Syrnium nebulosum*, p. 412.

Tachycineta bicolor, pp. 287-88. *Tantalus loculator*, pp. 495-97. *Telmatodyes palustris*, pp. 232-33. *Thryothorus ludovicianus*,

Birds. pp. 228-30. *Totanus flavipes*, pp. 484-85. *Totanus melaneleucus*, pp. 483-84. *Totanus semipalmatus*, pp. 482-83. *Totanus solitarius*, pp. 485-87. *Tringa alpina (americana)*, pp. 477-78. *Tringa bairdii*, pp. 473-75. *Tringa canutus*, p. 478. *Tringa fuscicollis*, pp. 475-76. *Tringa maculata*, p. 475. *Tringa maritima*, pp. 476-77. *Tringa minutilla*, p. 473. *Tringoides macularius*, pp. 487-88. *Trochilus colubris*, pp. 387-88. *Troglodytes domesticus*, pp. 230-31. *Tryngites rufescens*, pp. 491. *Turdus fuscescens*, pp. 208-09. *Turdus migratorius*, pp. 204-05. *Turdus mustelinus*, pp. 205-06. *Turdus pallasi*, pp. 206-07. *Turdus swainsoni*, pp. 207-08. *Turdus swainsoni aliclæ*, p. 208. *Tyrannus carolinensis*, pp. 367-68.

Vireo flavifrons, pp. 302-03. *Vireo gilvus*, pp. 301-02. *Vireo novaboracensis*, pp. 304-06. *Vireo olivaceus*, pp. 298-99. *Vireo philadelphicus*, pp. 299-301. *Vireo solitarius*, pp. 303-04.

Xanthocephalus icterocephalus, pp. 356-57. *Xema sabinei*, p. 553.

Zenædura carolinensis, pp. 442-43. *Zonotrichia albicollis*, pp. 336-37. *Zonotrichia leucophrys*, pp. 337-38.

———Kirtland. Catalogue of the mammalia, birds, reptiles, etc., in Ohio. Ann. Rep., v. 2, 1838, pp. 161-67.

———Kirtland. Notes and Observations. Ann. Rep., v. 2, 1838, pp. 177-87.

———Wheaton. Additions, additional references and corrections to list of Ohio birds. Geol. of O., v. 4, pp. 588-94.

———Wheaton. Bibliography of Ohio ornithology. Geol. of O., v. 4, pt. 594-612.

———Wheaton. Glossary of technical terms used in the descriptions of Ohio birds. Geol. of O., v. 4, pp. 620-28.

———Wheaton. List of birds observed in my garden. Geol. of O., v. 4, pp. 585-87.

———Wheaton. On the relation between latitude and the pattern of coloration in Ohio birds. Geol. of O., v. 4, pp. 613-19.

———Wheaton. Report on the birds of Ohio. Geol. of O., v. 4, pp. 189-628. Bibliography, pp. 594-612; Glossary, pp. 620-28.

Blackband Ore. Orton. Blackband ore in Hocking valley. Geol. of O., v. 5, pp. 406-12.

———Blackband in Holmes county. Geol. of O., v. 5, pp. 399-402.

———Blackband and mountain ores in Stark, Carroll and Tuscarawas counties. Geol. of O., v. 5, pp. 386-98.

- Blackband Ore Analysis.** Lord. Blackband ores in Stark, Carroll and Tuscarawas counties. Geol. of O., v. 5, pp. 388-389-396.
- Wormley and Andrews. Ore in Holmes county. Geol. of O., v. 5, pp. 401-02.
- Wormley and Andrews. Ore in Mahoning valley district. Geol. of O., v. 5, p. 460.
- Wormley and Andrews. Ore in Tuscarawas Region. Geol. of O., v. 5, p. 465.
- Black Hand Formation.** Prosser. The Black Hand formation in the revised Ohio geological scale. O. Geol. Sur., Bull. No. 7, pp. 17-18.
- Black Kidney Ore.** Orton. Black kidney ore in Hanging Rock district. Geol. of O., v. 5, p. 432.
- Bleininger, Albert Victor.** Manufacture of hydraulic cements. O. Geol. Sur., Bull. No. 3, 1904.
- Block Coal.** Orton. Block coal in Mahoning valley. Geol. of O., v. 5, pp. 156, 169, 171, 172, 176, 177, 178.
- Block Machines.** Eno. Machines for making concrete building blocks. O. Geol. Sur., Bull. No. 2, pp. 237-45.
- Block Ores.** Lord. Block ores in Hanging Rock district. Geol. of O., v. 5, pp. 488-89.
- Orton. Block ores in Hanging Rock district. Geol. of O., v. 5, pp. 423-26.
- Orton. Block ore in Hocking valley. Geol. of O., v. 5, pp. 412-16.
- Orton. Block ores of Stark, Carroll and Tuscarawas counties. Geol. of O., v. 5, p. 399.
- Bloomdale Gas Well.** Orton. Bloomdale gas well. Prelim. Rep. on petroleum and inflammable gas. 1887, pp. 67-68. Edition 1886, pp. 46-47.
- Bloomville Gas Field.** Orton. Development. Prelim. Rep. on Petroleum and inflammable gas, 1887, pp. 136-38.
- Blue Clay, see Shales.*
- Boggs Ore.** Orton. Boggs ore in the Hanging Rock district. Geol. of O., v. 5, pp. 421-23.
- Analysis,—Brown. Boggs ore in Hanging Rock district. Geol. of O., v. 5, p. 422.
- Bog Iron Ore, see Limonite.*

- Borax Company's Building.** Eno. Effect of fire on steel concrete as shown by this company's building. O. Geol. Sur., Bull. No. 2, pp. 185-88.
- Botany.** Kellerman. Recent changes in nomenclature of plants. Geol. of O., v. 7, pt. 2, pp. 80a-80d.
- Kellerman and Werner. Bibliography of Ohio plants. Geol. of O., v. 7, pt. 2, pp. 58-79.
- Kellerman and Werner. Catalogue of Ohio plants. Geol. of O., v. 7, pt. 2, pp. 56-406.
- Kirtland. Report on specimens of botany and zoology collected in Ohio. Ann. Rep., v. 1, 1837, pp. 65-69.
- Boulders.** Newberry. Boulders in blackband Ore and coal in Mahoning county. Geol. of O., v. 3, pp. 791-93.
- Wheat. Boulders in Medina county. Geol. of O., v. 3, pp. 368-69.
- See also, Drift, Pleistocene.*
- Bowerston Oil Pool.** Bownocker. Wells in Harrison county. O. Geol. Sur., Bull. No. 1, pp. 240-41.
- Bowling Green Gas Field.** Orton. Development. Prelim. Rep. on petroleum and inflammable gas. 1886, pp. 39-41; 1887, pp. 57-60; 138-39.
- Bownocker, John Adams.** Occurrence and exploitation of petroleum and natural gas. O. Geol. Sur., Bull. No. 1, pp. 17-325.
- Salt deposits and the salt industry in Ohio. O. Geol. Sur., Bull. No. 8.
- Brachiopoda.** Meek. Brachiopoda of the Cincinnati group. Geol. of O., v. 1, pt. 2, pp. 70-130.
- Brachiopoda of the Corniferous group. Geol. of O., v. 1, pt. 2, pp. 196-97.
- Brachiopoda of Niagara and Clinton groups. Geol. of O., v. 1, pt. 2, pp. 176-85.
- Orton. Brachiopods of the Cincinnati group. Geol. of O., v. 1, pt. 1, pp. 392-97.
- See also Paleontology Genera and Species.*
- Brayton, A. M.** Report on the mammals in Ohio. Geol. of O., v. 4, pp. 3-185.
- Breakwaters.** Eno. Concrete used for breakwaters. O. Geol. Sur., Bull. No. 2, pp. 84-90.

- Bricker Pool.** Bownocker. Wells in Harrison county. O. Geol. Sur., Bull. No. 1, pp. 229-30.
- Brick Color.** Peppel. Color of sand-lime brick. O. Geol. Sur., Bull. No. 5, p. 58.
- Bricklaying.** Peppel. Preference for dolomite lime in brick laying and plastering. O. Geol. Sur., Bull. No. 4, pp. 255-56.
- Bricks and Brick Manufacture.** Mather. Brick manufacture. Ann. rep., v. 2, (for 1838), pp. 24-28.
- Mather. Same, Exec. Docs. 1838, No. 22, pp. 24-28.
- Orton. Natural gas as fuel for manufacture of bricks. Rep. 1890, pp. 275-76.
- Orton, Jr. Brick manufacture of Ohio. Geol. of O., v. 5, pp. 704-05.
- Orton, Jr. Manufacture of bricks in Ohio. Geol. of O., v. 7, pp. 233-39.
- Winchell. Brick and pottery works in Crawford county. Geol. of O., v. 2, pt. 1, p. 252.
- Winchell. Brick manufacture in Auglaize county. Geol. of O., v. 2, pt. 1, p. 408.
- Winchell. Brick-making in Hancock county. Geol. of O., v. 2, pt. 1, p. 365.
- Winchell. Brick-making in Wood county. Geol. of O., v. 2, pt. 1, p. 386.
- Bricks and Brick Manufacture, see also Sand Lime Brick.*
- Bridge Metal Protector.** Eno. Cement mortar as bridge metal protector. O. Geol. Sur., Bull. No. 2, pp. 59-60.
- Bridges.** Eno. Use of concrete in bridge building. O. Geol. Sur. Bull. No. 2, pp. 78-80.
- Eno. Use of steel concrete in constructing bridges and culverts. O. Geol. Sur., Bull. No. 2, pp. 158-64.
- Briggs, C.** Report on Scioto, Lawrence, Gallia, Athens, Hocking and Jackson counties. Ann. Rep., v. 1, 1837, pp. 71-98.
- Briggs, C. Geological report on Wood, Crawford, Athens, Hocking and Tuscarawas counties. Ann. Rep., v. 2, 1838, pp. 109-54.
- Brine Springs, see Salt.*
- Bromine.** Bownocker. By-product of salt manufacture in Meigs county. O. Geol. Sur., Bull. No. 8, pp. 18-20.
- Bownocker. Manufacture of bromine at salt works near Pomeroy. O. Geol. Sur., Bull. No. 8, p. 24.

- Bromine.** Newberry. Bromine in Tuscarawas county. Geol. of O., v. 3, pp. 84-5.
- Root. Manufacture in Ohio. Geol. of O., v. 6, pp. 667-70.
- Brookville Coal (No. 4).** Orton. Brookville in Jackson county. Geol. of O., v. 5, pp. 1031-32.
- Orton. Characteristics of Ohio coal. Geol. of O., v. 5, pp. 160-62.
- Orton. Brookville coal in Scioto and Jackson counties. Geol. of O., v. 5, pp. 1040-41.
- Orton. Brookville Coal in Tuscarawas county. Geol. of O., v. 5, pp. 259-60.
- Orton. Brookville Coal in Vinton county. Geol. of O., v. 5, pp. 999-1001.
- Orton, Jr. Brookville Coal in Coshocton county. Geol. of O., v. 5, pp. 852-54.
- Wright. Brookville Coal in Holmes county. Geol. of O., v. 5, p. 828.
- Brown, C. Newton.** Meigs creek coal seam in Morgan, Muskingum, Guernsey and Noble counties. Geol. of O., v. 5, pp. 1059-85.
- C. Newton. The Pittsburg coal seam in Jefferson, Belmont and Guernsey counties. Geol. of O., v. 6, pp. 595-626.
- Brown County.** Herzer. Geology. Geol. of O., v. 3, pp. 942-44.
- Orton. Oil and gas wells. Geol. of O., v. 6, pp. 301-02.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to their fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 47-48.
- Bryan.** Orton. Oil and gas production. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 162-63.
- Bryozoa, see Paleontology—Genera and Species.*
- Buck Run Oil Field.** Bownocker. Oil and gas in Morgan county. O. Geol. Sur., Bull. No. 1, pp. 139-44.
- Buckeye Salt Company.** Bownocker. Existing furnaces in Meigs county. O. Geol. Sur., Bull. No. 8, p. 20.
- Bownocker. Method of salt manufacture in use. O. Geol. Sur., Bull. No. 8, pp. 22-23.
- Buena Vista Stone.** Dawes. Building stone of Ohio. Geol. of O., v. 5, pp. 601-02.
- Buhr Stone.** Foster. Buhr in Muskingum, Licking and Franklin counties. Ann. rep., v. 2, 1838, pp. 90-2.
- Hildreth. Buhr-stone rock. Ann. rep., v. 1, 1837, pp. 28-35.

- Building Stone.** Building stone of Ohio. Geol. of O., v. 5, pp. 578-641.
- Andrews. Building stone of Fairfield county. Geol. of O., v. 2, pt. 1, p. 594.
- Gilbert. Building stone in Lucas county. Rep. Prog. 1870, p. 497.
- Gilbert. Building stone in Lucas county. Geol. of O., v. 1, pt. 1, pp. 580-81.
- Newberry. Building stone in Erie county. Geol. of O., v. 2, pt. 1, p. 195.
- Newberry. Building stone in Lorain county. Geol. of O., v. 2, pt. 1, pp. 216-19.
- Newberry. Building stone in Tuscarawas county. Geol. of O., v. 3, pp. 83-4.
- Orton. Building rock in Montgomery county. Rep. Prog. 1869, pp. 146-48.
- Orton. Building stone in Pike county. Geol. of O., v. 2, pt. 1, pp. 626-27.
- Orton. Corniferous limestone as building stone in Franklin county. Geol. of O., v. 3, pp. 629-30.
- Orton. Springfield limestone in Clark county. Geol. of O., v. 1, pt. 1, pp. 467-70.
- Orton, Jr., and Peppel. Use of Corniferous limestones for building material. O. Geol. Sur., Bull. No. 4, p. 166.
- Orton, Jr., and Peppel. Use of Maxville limestone for building. O. Geol. Sur., Bull. No. 4, p. 172.
- Orton, Jr., and Peppel. Uses of Niagara limestones. O. Geol. Sur., Bull. No. 4, p. 154.
- Peppel. Use of limestone as building stone in Ohio. O. Geol. Sur., Bull. No. 4, pp. 212-216.
- Read. Building stone in Richland county. Geol. of O., v. 3, p. 323.
- Stevenson. Building materials in Harrison county. Geol. of O., v. 3, p. 218.
- Winchell. Building stone in Defiance county. Geol. of O., v. 2, pt. 1, pp. 437-38.
- Winchell. Building stone in Delaware county. Geol. of O., v. 2, pt. 1, pp. 309-10, 313.
- Winchell. Building stone in Putnam county. Geol. of O., v. 2, pt. 1, p. 393.
- Winchell. Building stone in Seneca county. Geol. of O., v. 1, pt. 1, p. 623.

- Building Stone.** Winchell. Building stone in Wood county. Geol. of O., v. 2, pt. 1, p. 386.
- Bulletins.** Bulletins of Ohio Geological Survey. For list and analysis, see analysis of Survey publications at the beginning of this index.
- Burial Vaults.** Eno. Concrete used for burial vaults. O. Geol. Sur., Bull. 2, p. 120.
- Burlington Group.** Herrick. Burlington group and its fossils. Geol. of O., v. 7, pt. 2, pp. 514-15.
- Butler County.** Locke. Geological reconnoissance in Butler county. Ann. rep., v. 2, 1838, pp. 216-23.
- Orton. Geology. Geol. of O., v. 3, pp. 392-403. Geologic map, 13x10.2 cm.
- Orton. Oil and gas wells. Geol. of O., v. 6, pp. 292-95.
- Orton. Topography. Geol. of O., v. 3, pp. 392-94.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to their fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 48-50.
- Cadiz Oil Pool.** Bownocker. Wells in Harrison county. O. Geol. Sur., Bull. No. 1, pp. 226-29.
- Calcareous Limestone.** Orton, Jr., and Peppel. Composition of an impure limestone in Tuscarawas county with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, p. 127.
- Calcareous Materials.** Bleininger. Exact methods of analysis for their determination. O. Geol. Sur., Bull. No. 3, pp. 130-33.
- Bleininger. Limestone and calcareous materials for Portland cement. O. Geol. Sur., Bull. No. 3, pp. 226-31.
- Bleininger. Rapid or factory methods of analysis for their determination. O. Geol. Sur., Bull. No. 3, pp. 133-40.
- Calciferous Sandrock.** Hildreth. Calcarious rocks. Exec. Docs., 1836, Rep. No. 1, p. 75.
- Newberry. Calciferous sandrock in Ohio. Geol. of O., v. 1, pt. 1, p. 59.
- Newberry. Potsdam and Calciferous groups. Geol. of O., v. 1, pt. 1, pp. 112-16.
- Calcimines.** Peppel. Use of hydrated lime for calcimines and white-washes. O. Geol. Sur., Bull. No. 4, p. 241.
- Calcium Chloride.** Bownocker. By-products of salt manufacture in Meigs county. O. Geol. Sur., Bull. No. 8, p. 18.

- Calcium Chloride.** Bownocker. Manufacture of calcium chloride at salt works in Meigs county. O. Geol. Sur., Bull. No. 8, p. 24.
- Cambridge Limestone.** Orton. Cambridge limestone in Hanging Rock district. Geol. of O., v. 3, pp. 895-97.
- Orton and Peppel. Cambridge stone available for cement making. O. Geol. Sur., Bull. No. 3, pp. 93-94.
- Orton, Jr., and Peppel. Composition of, in Guernsey county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 69-70; in Lawrence county, pp. 87-88.
- Campbell Mixer.** Eno. Campbell concrete mixing machine. With illustration. O. Geol. Sur., Bull. No. 2, pp. 232-33.
- Cannel Coal.** Orton. Cannel coal in Milton and Jackson townships. Geol. of O., v. 5, pp. 1032-33.
- Orton. Flint Ridge cannel in Licking county. Geol. of O., v. 5, pp. 908-11.
- Orton, Jr. Bedford cannel coal of Coshocton county. Geol. of O., v. 5, pp. 845-52.
- Carboniferous Conglomerate.** Dawes. Conglomerate as building stone in Ohio. Geol. of O., v. 5, pp. 602-07.
- Carboniferous Group.** Hodge. Carboniferous in Coshocton county. Geol. of O., v. 3, pp. 565-68.
- Carboniferous Limestone.** Hawes. Carboniferous as building stone in Ohio. Geol. of O., v. 5, pp. 638-39.
- Orton. Lime production. Geol. of O., v. 6, p. 707.
- Orton, Jr., and Peppel. Composition of, in Licking county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, p. 88.
- Orton, Jr., and Peppel. Limestones of the Eastern or coal measures groups for commercial use. O. Geol. Sur., Bull. No. 4, pp. 22-23.
- Peppel. Use of carboniferous as building stone in Ohio. O. Geol. Sur., Bull. No. 4, p. 212.
- Carboniferous System.** Andrews. Coal-measures of 2d geol. dist. Rep. Prog. 1870, pp. 71-9, 235.
- Andrews. General discussion of Lower Coal-measures in 2d geol. dist. Rep. Prog. 1870, pp. 314-33.
- Bownocker. Carboniferous as a source of oil and gas. O. Geol. Sur., Bull. No. 1, pp. 126-306.
- Bownocker. Oil and gas producing rocks in Ohio. O. Geol. Sur., Bull. No. 1, pp. 22-30.

- Carboniferous System.** Newberry. Carboniferous system. Rep. Prog. 1869, pp. 20-23.
- Newberry. Carboniferous in Cuyahoga county. Geol. of O., v. 1, pt. 1, pp. 184-90.
- Newberry. Carboniferous in Ohio. Geol. of O., v. 1, pt. 1, pp. 72-8.
- Newberry. Carboniferous system of Ohio. Geol. of O., v. 2, pt. 1, pp. 81-180.
- Newberry. Carboniferous in Ohio. Geol. of O., v. 3, pp. 18-27.
- Newberry. Descriptions of fishes. Geol. of O., v. 1, pt. 2, pp. 276-78, 325-55.
- Newberry. Fishes of the Coal-measures. Geol. of O., v. 1, pt. 2, pp. 283-88.
- Newberry. Fishes. Geol. of O., v. 2, pt. 2, pp. 41-64.
- Newberry. Fishes of the Sub-Carboniferous limestone. Geol. of O., v. 1, pt. 2, pp. 282-283.
- Newberry. Fossil plants from the Coal-measures of Ohio. Geol. of O., v. 1, pt. 2, pp. 359-385.
- Newberry. Lower Carboniferous limestone. Geol. of O., v. 2, pt. 1, pp. 99-103.
- Newberry. Lower Carboniferous limestone. Geol. of O., v. 3, pp. 23-25.
- Newberry. Lower Carboniferous of Cin. arch. Geol. of O., v. 1, pt. 1, pp. 108-10.
- Newberry. Sections of the Lower Coal-measures. Rep. Prog. 1870, pp. 19-25.
- Newberry. Structure of the Lower Coal-measures in northeastern Ohio. Rep. Prog. 1870, p. 14-44.
- Orton. Stratigraphical order of the Lower Coal-measures of Ohio. Geol. of O., v. 5, pp. 1-128.
- Prosser. Line of separation between Devonian and Carboniferous in revised geological scale of Ohio. O. Geol. Sur., Bull. No. 7, pp. 20-21.
- Prosser. Table of formations included in this system in revised geological scale of Ohio. O. Geol. Sur., Bull. No. 7, p. 2.
- Read. Coal-measures of Geauga county. Rep. Prog. 1870, pp. 466-67.
- Carey Gas Wells.** Orton. Carey Gas wells. Prelim. Rep. on petroleum and inflammable gas. 1886, p. 47; 1887, pp. 68-9.
- Orton. Development of Carey field. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 139-40.

- Carroll County.** Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 292-95. Augusta township, p. 293. Brown township, p. 295. Center township, p. 294. Fox township, p. 295. Harrison township, p. 295. Lee township, p. 294. Loudon township, pp. 294-95. Monroe township, p. 295. Orange township, p. 293. Perry township, p. 295. Rose township, pp. 293-94. Union township, p. 294. Washington township, p. 293.
- Orton. Coal mines. Geol. of O., v. 5, pp. 244-56.
- Orton. Iron ores. Geol. of O., v. 5, pp. 386-99.
- Orton, Jr., and Peppel. Limestone resources of, slight importance. O. Geol. Sur., Bull. No. 4, p. 136.
- Stevenson. Geology. Geol. of O., v. 3, pp. 177-99.
- Stevenson. Topography and resources. Geol. of O., v. 3, pp. 177-79.
- Casparis Stone Company.** Peppel. Descriptive account. O. Geol. Sur., Bull. No. 4, pp. 220-222.
- Cassells, J. L.** Analyses of iron ores from Collingwood, Yellow Creek. Rep. Prog. 1870, p. 49.
- Catskill Group.** Newberry. Catskill group in Ohio. Geol. of O., v. 1, pt. 1, pp. 71-2.
- Newberry. Fossil fishes. Geol. of O., v. 1, pt. 2, pp. 271-76.
- Caves.** Hildreth. Grottoes and caverns. Ann. Rep., v. 1, 1837, p. 52.
- Cedarville Limestone.** Orton. Cedarville limestone in Greene county. Geol. of O., v. 2, pt. 1, pp. 673-79.
- Orton, Jr., and Peppel. Composition, physical character and uses of, in Ohio. O. Geol. Sur., Bull. No. 4, p. 194.
- Cement.** Andrews. Cement limestone of Belmont county. Geol. of O., v. 2, pt. 1, pp. 548-49, 556, 558, 561, 563, 565, 569.
- Bleining. Analysis to determine insoluble residue in raw cement mixtures and burnt cement. O. Geol. Sur., Bull. No. 3, pp. 140-41.
- Bleining. Analytical analysis of natural cements. O. Geol. Sur., Bull. No. 3, pp. 115-17.
- Bleining. General discussion on hydraulic cements. O. Geol. Sur., Bull. No. 3, pp. 25-41.
- Bleining. Manufacture of hydraulic cements. O. Geol. Sur., Bull. No. 3, 1904.
- Bleining. Manufacture of pozzuolane and natural cements. O. Geol. Sur., Bull. No. 3, pp. 158-96.

- Cement.** Bleining. Mechanical analysis of raw mixtures and cements. O. Geol. Sur., Bull. No. 3, pp. 146-57.
- Bleining. Physical and chemical examination of cement materials. O. Geol. Sur., Bull. No. 3, pp. 102-57.
- Bleining. Raw materials of the cement industry. O. Geol. Sur., Bull. No. 3, pp. 41-101.
- Bleining. Winning and preparation of raw materials in cement manufacture. O. Geol. Sur., Bull. No. 3, pp. 248-87.
- Eno. Historical sketch. O. Geol. Sur., Bull. No. 2, pp. 17-22.
- Eno. Specifications for Portland and natural cement as adopted by American R. R. Engineering and Maintenance of Way Association. O. Geol. Sur., Bull. No. 2, pp. 192-97.
- Eno. Uses of hydraulic cements. O. Geol. Sur., Bull. No. 2, pp. 17-246.
- Lord. Natural and artificial cements. Geol. of O., v. 6, pp. 670-95.
- Newberry. Hydraulic cement. Rep. Prog. 1870, pp. 51-3.
- Newberry. Production of hydraulic cement in Columbiana county. Geol. of O., v. 3, p. 109.
- Orton, Jr., and Peppel. Probable use of Maxville limestone for manufacture of cement. O. Geol. Sur., Bull. No. 4, p. 172.
- Stevenson. Manufacture of cement in Belmont county. Geol. of O., v. 3, pp. 269, 286.
- Winchell. Cement of Defiance county. Geol. of O., v. 2, pt. 1, p. 438.
- Wormley. Analyses of cement limestones in 2d geol. dist. Geol. of O., v. 2, pt. 1, p. 607.
- See also Portland Cement; Roman Cement; Waterlime.*

Cement Grinding. Bleining. Machinery used in preparation of raw materials. O. Geol. Sur., Bull. No. 3, pp. 252-87.


Cement Plants. Bleining. Mechanical equipment. O. Geol. Sur., Bull. No. 3, pp. 322-331.

Cement Specifications. Eno. Requirements for cement. O. Geol. Sur., Bull. No. 2, pp. 189.

Central Ohio Natural Gas Field. Bownocker. Gas reservoirs in Ohio. O. Geol. Sur., Bull. No. 1, pp. 101-25. Geologic map showing position of central Ohio natural gas field, 12.7x20.8 cm., opp. p. 102.

——Bownocker. Geology. O. Geol. Sur., Bull. No. 1, pp. 117-25.

- Cephalopoda.** Meek. Cephalopoda of Cincinnati group. Geol. of O., v. 1, pt. 2, pp. 155-58.
- Meek. Cephalopoda of the Corniferous group. Geol. of O., v. 1, pt. 2, pp. 229-33.
- Meek. Cephalopoda of the Niagara and Clinton groups. Geol. of O., v. 1, pt. 2, pp. 186-87.
- See also Paleontology.*
- Ceramic Mixtures.** Peppel. Use of hydrated lime in ceramic mixtures. O. Geol. Sur., Bull. No. 4, pp. 245-246.
- Ceramics, see Pottery.*
- Chagrin Formation.** Prosser. Chagrin formation, formerly Erie shale, in the Ohio geological scale. O. Geol. Sur., Bull. No. 7, pp. 21-22.
- Chagrin River Valley.** Newberry. Strata exposed. Geol. of O., v. 1, pt. 1, pp. 198-200.
- Champaign County.** Hill. Geology. Geol. of O., v. 3, pp. 491-95.
- Hill. Geologic map Logan and Champaign counties, p. 49, 14x17.9 cm.
- Hill. Topography. Geol. of O., v. 3, pp. 491-92.
- Orton. Oil and gas wells. Geol. of O., v. 6, pp. 274-77.
- Riddell. Geology. O. Exec. Docs. 1836, Rep. No. 60, p. 13.
- Chatellerault Bridge, France.** Eno. Use of steel concrete in bridge building. O. Geol. Sur., Bull. No. 2, pp. 163-64.
- Chemical Department.** Lord. Report of chief chemist. Geol. of O., v. 5, pp. 1087-1113.
- Chemical Manufactures.** Peppel. Use of hydrated lime in manufacture of chemicals. O. Geol. Sur., Bull. No. 4, pp. 243-44.
- Chemung group.** Hall and Whitfield. Crinoids of Genessee slate and Chemung group. Geol. of O., v. 2, pt. 2, pp. 158-61.
- Newberry. Fossil fishes. Geol. of O., v. 1, pt. 2, pp. 270-71.
- Newberry. Portage and Chemung groups in Ohio. Geol. of O., v. 1, pt. 1, pp. 69-71.
- Chester Hill Oil Field.** Bownocker. Geology. O. Geol. Sur., Bull. No. 1, pp. 132-39.
- Bownocker. Oil and gas in Morgan county. O. Geol. Sur., Bull. No. 1, pp. 126-39.
- Chimneys.** Eno. Use of steel concrete for chimneys. O. Geol. Sur. Bull. No. 2, pp. 152-53.
- China, see Pottery.*

- Cincinnati Arch.** Newberry. Structure of the Cincinnati arch south of the Ohio. Geol. of O., v. 1, pt. 1, pp. 93-6.
- Newberry. Structure of the Cincinnati anticlinal north of the Ohio. Geol. of O., v. 1, pt. 1, pp. 97-101.
- Newberry. Structure of Cincinnati arch. Geol. of O., v. 3, p. 1-2.
- Cincinnati Anticlinal.** Orton. Physical history. Geol. of O., v. 1, pt. 1, pp. 411-18. Map showing lines of juncture of Cincinnati group and Clinton limestone, 27.5x21 cm.
- Orton. Cincinnati anticlinal as a part of the geological structure of Ohio. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 41-43, 124-28. Rep. 1886, pp. 28-29.
- Orton. Cincinnati anticlinal in geological structure of Ohio. Geol. of O., v. 6, pp. 46-54. Cincinnati anticlinal Rep. 1890, pp. 46-49.
- Orton. Cincinnati axis. Geol. of O., v. 7, pp. 40-41.
- Cincinnati Group.** Hawes. Building stones in Ohio. Geol. of O., v. 5, pp. 608-10.
- Herzer. Cincinnati group in Brown county. Geol. of O., v. 3, p. 942. Fossils, pp. 942-43.
- Hussey. Boundary line of Cincinnati group in Fayette and Clinton counties. Geol. of O., v. 3, p. 441.
- Meek. Fossils. Geol. of O., v. 1, pt. 2, pp. 1-176.
- Meek. List of fossils as reported in description of invertebrate fossils of Devonian-Silurian systems. Geol. of O., v. 1, pt. 2, pp. 237-41.
- Newberry. Cincinnati group in Ohio. Rep. Prog. 1869, p. 14.
- Newberry. Cincinnati group. Geol. of O., v. 1, pt. 1, pp. 103, 116-26; v. 3, pp. 2-4.
- Newberry. Fossils. Geol. of O., v. 1, pt. 1, pp. 121-26.
- Nicholson. Corals. Geol. of O., v. 2, pt. 2, pp. 183-223.
- Orton. Blue limestone of Highland county. Rep. Prog. 1870, pp. 267-68.
- Orton. Cincinnati group in Butler county. Geol. of O., v. 3, pp. 399-401.
- Orton. Cincinnati group in Clark county. Geol. of O., v. 1, pt. 1, pp. 462-63. 
- Orton. Cincinnati group in geological series of Ohio. Prelim. Rep. on petroleum and inflammable gas, 1887, p. 29. Rep. 1886, pp. 19-20.
- Orton. Cincinnati group in Greene county. Geol. of O., v. 2, pt. 1, pp. 662-64.

- Cincinnati Group.** Orton. Cincinnati group in Preble county. Geol. of O., v. 3, p. 406.
- Orton. Cincinnati group in Warren county. Geol. of O., v. 3, pp. 382-84.
- Orton. Divisions of. Geol. of O., v. 1, pt. 1, pp. 370-73.
- Orton. Fossils of, in Warren county. Geol. of O., v. 3, pp. 383-84.
- Orton. Geology. Geol. of O., v. 1, pt. 1, pp. 367-418.
- Orton. Geological position and equivalents. Geol. of O., v. 1, pt. 1, pp. 368-69.
- Orton. Origin of the Cincinnati group. Geol. of O., v. 1, pt. 1, pp. 380-84.
- Cincinnati (or blue) Limestone.** Locke. Blue limestone of southwest Ohio. Ann. Rep., v. 2, 1838, pp. 206-11.
- Orton. Blue limestone in Montgomery county. Rep. Prog. 1869, pp. 141-42.
- Orton, Jr., and Peppel. Composition of, in Hamilton county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 71-73.
- Riddell. Blue limestone district of Ohio. Ohio Exec. Docs. 1836, pt. 1, Rep. No. 60, pp. 4-8.
- Cisterns.** Eno. Use of concrete in cistern linings. O. Geol. Sur., Bull. No. 2, pp. 96-7.
- Clarion Coal No. 4.** Orton. Characteristics of Ohio coal. Geol. of O., v. 5, p. 162.
- Orton. Clarion in Jackson county. Geol. of O., v. 5, pp. 1030-31.
- Orton. Clarion (upper) coal in Scioto and Lawrence counties. Geol. of O., v. 5, pp. 1041-42.
- Wright. Clarion coal in Holmes county. Geol. of O., v. 5, p. 828.
- Clark, Thomas.** Application of the hot blast in manufacture of cast iron. Exec. Docs. 1836. Rep. No. 1, pp. 78-9 (from Amer. Jour. Sci. for Oct., 1836).
- Clark County.** Orton. Lime production. Geol. of O., v. 6, pp. 715-19.
- Orton. Oil and gas wells. Geol. of O., v. 6, pp. 278-80.
- Orton. Geology. Geol. of O., v. 1, pt. 1, pp. 450-80. Geologic map of Clark county (colored), 21.1x12.3 cm.
- Orton. Topography. Geol. of O., v. 1, pt. 1, pp. 450-55.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to their fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 50-52.

- Clark County.** Riddell. Geology. O. Exec. Docs. 1836, Rep. No. 60, p. 13.
- Clay Analyses.** Alluvial clays. O. Geol. Sur., Bull. No. 3, pp. 81-2.
 ————Analyses of glacial drift clays. O. Geol. Sur., Bull. No. 3, pp. 83-4.
 ————Clays from Columbiana county. Geol. of O., v. 3, pp. 127-28.
 ————Clays used in Ohio potteries. Geol. of O., v. 5, pp. 671-72, 674-75, 680-81.
 ————Newberry. Analyses of Erie clay. Geol. of O., v. 1, pt. 1, p. 177.
 ————Orton, Jr. Fire clay analyses. O. Geol. Sur., Bull. No. 3; pp. 71-2.
 ————Orton, Jr. Fire clays of Ohio. Geol. of O., v. 7, p. 222.
 ————Orton, Jr. Flint clays of Ohio. Geol. of O., v. 7, p. 220.
 ————Orton, Jr. Shale clays used in manufacture of paving brick and sewer pipe. Geol. of O., v. 7, p. 133.
 ————Orton, Jr. Stoneware clays. Geol. of O., v. 7, pp. 94-6.
 ————Orton, Jr. Stoneware slip clays. Geol. of O., v. 7, pp. 105-06.
 ————Wormley. Fire clay analyses. Rep. Prog. 1870, pp. 445-47.
- Clays.** Andrews. Clays of 2d geological district. Rep. Prog. 1869, pp. 131-32.
 ————Andrews. Fire clay in Scioto county. Rep. Prog. 1870, pp. 166, 168-9.
 ————Bleining. Alluvial clays for cement making. O. Geol. Sur., Bull. No. 3, pp. 79-82.
 ————Bleining. Alterative influences to which clays are subjected. O. Geol. Sur., Bull. No. 3, pp. 59-63.
 ————Bleining. Classification. O. Geol. Sur., Bull. No. 3, p. 68.
 ————Bleining. Clays suitable for Portland cement. O. Geol. Sur., Bull. No. 3, pp. 223-26.
 ————Bleining. Complete analysis. O. Geol. Sur., Bull. No. 3, pp. 117-18.
 ————Bleining. Methods of winning clays for cement making. O. Geol. Sur., Bull. No. 3, pp. 248-49.
 ————Bleining. Mineral analysis. O. Geol. Sur., Bull. No. 3, pp. 118-19.
 ————Bleining. Mineral analysis by heating with calcium carbonate. O. Geol. Sur., Bull. No. 3, pp. 120-30.
 ————Bleining. Origin. O. Geol. Sur., Bull. No. 3, pp. 56-9.
 ————Bleining. Use of clays in Portland cement industry. O. Geol. Sur., Bull. No. 3, pp. 56-83.
 ————Mather. Clays in Ohio. Ann. Rep., v. 1, 1837, p. 10.

- Clays.** Newberry. Erie clay of Cuyahoga county. Geol. of O., v. 1, pt. 1, pp. 174-77.
- Newberry. Fire clays. Rep. Prog. 1870, pp. 50-1.
- Newberry. Fire clay in Summit county. Geol. of O., v. 1, pt. 1, pp. 220-21.
- Orton. Brick draining tile and pottery clay in Montgomery county. Rep. Prog. 1869, pp. 148-49.
- Orton. Clays in Clermont county. Geol. of O., v. 1, pt. 1, pp. 440-46.
- Orton. Clays in Ohio, their origin, composition and varieties. Geol. of O., v. 7, pp. 45-68.
- Orton, Jr. Clay deposits in Ohio. Geol. of O., v. 5, pp. 656-67. Bedded clays, 658-67. Drift clays, pp. 656-58.
- Orton, Jr. Clays of Ohio, and industries established upon them. Geol. of O., v. 5, pp. 643-721.
- Orton, Jr. Clay working industries of Ohio. Geol. of O., v. 5, pp. 668-721.
- Orton, Jr. Clay working industries of Ohio. Geol. of O., v. 7, pp. 69-254.
- Orton, Jr. Method of analysis. Geol. of O., v. 5, pp. 649-50.
- Orton, Jr. Origin, composition, analysis and properties of clay. Geol. of O., v. 5, pp. 643-55.
- Orton, Jr. Table of clay-working temperatures. Geol. of O., v. 7, p. 253.
- Peppel. Effect of clay as an impurity in the manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 30-33.
- Peppel. Tables showing effect of clay or kaolin in manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 31-32.
- Read. Fire clays in the Hocking Valley. Geol. of O., v. 3, p. 713.
- Read. Fire clays in Holmes county. Rep. Prog. 1870, pp. 482-83.
- Winchell. Brick clays in Wood county. Geol. of O., v. 2, pt. 1, p. 386.
- Winchell. Clay in Seneca county. Geol. of O., v. 1, pt. 1, pp. 623-24.
- Winchell. Pottery clay in Hancock county. Geol. of O., v. 2, pt. 1, p. 366.
- Clay Band Ore.** Orton. Clay band ore in Hocking valley. Geol. of O., v. 5, pp. 409-12.

- Clay Products.** Orton, Jr. Details of absorption tests. Geol. of O., v. 7, pp. 241-46.
- Orton, Jr. Details of crushing tests. Geol. of O., v. 7, pp. 249-52.
- Orton, Jr. Table of details of rattling tests. Geol. of O., v. 7, pp. 247-48.
- Claypole, E. W.** Fossil fishes in Ohio. Geol. of O., v. 7, pt. 2; pp. 602-26.
- Clermont County.** Orton. Geology. Geol. of O., v. 1, pt. 1, pp. 435-49.
- Orton. Oil and gas wells. Geol. of O., v. 6, pp. 300-01.
- Orton. Topography. Geol. of O., v. 1, pt. 1, pp. 435-37.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. 4, pp. 52-53.
- Cleveland Salt Company.** Bownocker. Methods of manufacture in use. O. Geol. Sur., Bull. No. 8, pp. 36-37.
- Cleveland Shale.** Newberry. Cleveland shale in Cuyahoga county. Geol. of O., v. 1, pt. 1, pp. 189-90.
- Newberry. Cleveland shale in Erie county. Geol. of O., v. 2, pt. 1, p. 188.
- Newberry. Cleveland shale in Lorain county. Geol. of O., v. 2, pt. 1, p. 213.
- Newberry. Cleveland shale in Ohio. Geol. of O., v. 2, pt. 1, pp. 92-5.
- Newberry. Cleveland shale in Summit county. Geol. of O., v. 1, pt. 1, pp. 208-9.
- Newberry. Fossils. Geol. of O., v. 2, pt. 1, pp. 94-5.
- Orton. Cleveland shale in Franklin county. Geol. of O., v. 3, pp. 642-43.
- Orton. Cleveland shale in Ohio. Geol. of O., v. 5, pp. 25-28. Same, Rep. 1890, pp. 28-31.
- Orton. Cleveland shale in Pike county. Geol. of O., v. 2, pt. 1, pp. 624-26.
- Read. Cleveland shale in Ashtabula county. Geol. of O., v. 1, pt. 1, p. 486.
- Read. Cleveland shales in Geauga county. Geol. of O., v. 1, pt. 1, pp. 525-26.
- Read. Cleveland shale in Huron county. Geol. of O., v. 3, p. 306.
- Read. Cleveland shale in Lake county. Geol. of O., v. 1, pt. 1, pp. 514-15.

- Cleveland Shale.** Winchell. Cleveland shale in Crawford county. Geol. of O., v. 2, pt. 1, p. 242.
- Winchell. Cleveland shale in Deaware county. Geol. of O., v. 2, pt. 1, p. 282.
- Winchell. Cleveland shale in Morrow county. Geol. of O., v. 2, pt. 1, pp. 263-64.
- Cliff Limestone.** Locke. Cliff limestone in southwest Ohio. Ann. Rep., v. 2, 1838, pp. 211-13.
- Cliff Oil Pool.** Bownocker. Wells in Monroe county. O. Geol. Sur., Bull. No. 1, p. 208.
- Climate, see Meteorology.*
- Clinker.** Bleining. Grinding of clinker in cement manufacture. O. Geol. Sur., Bull. No. 3, pp. 317-22.
- Clinton County.** Hussey. Geology of Clinton and Fayette counties. Geol. of O., v. 3, pp. 429-47.
- Hussey. Topography of Clinton and Fayette counties. Geol. of O., v. 3, pp. 429-30.
- Orton. Oil and gas wells. Geol. of O., v. 6, pp. 296-97.
- Orton, Jr. and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 53-56.
- Riddell. Geology of Clinton and Highland counties. O. Exec. Docs. 1836, Rep. No. 60, p. 11.
- Clinton Group.** Bownocker. Clinton formation as a source of oil and gas. O. Geol. Sur., Bull. No. 1, pp. 101-25.
- Bownocker. Gas producing rocks of. O. Geol. Sur., Bull. No. 1, pp. 20-21.
- Første. Fossils in Ohio and Indiana. Geol. of O., v. 7, pt. 2, pp. 516-601.
- Første. List of trilobites, mollusks and brachiopods of Clinton group in Ohio and Indiana. Geol. of O., v. 7, pt. 2, pp. 595-97.
- Hall and Whitfield. Fossils. Geol. of O., v. 2, pt. 2, pp. 111-20.
- Hussey. Clinton group in Clinton and Fayette counties. Geol. of O., v. 3, pp. 441-43.
- Hussey. Clinton in Miami county. Geol. of O., v. 3, pp. 479-80.
- Hussey. Clinton in Shelby county. Geol. of O., v. 3, pp. 464-65.
- Meek. Fossils. Geol. of O., v. 1, pt. 2, pp. 176-93.
- Meek. List of fossils. Geol. of O., v. 1, pt. 2, pp. 241-42.
- Newberry. Clinton and Niagara groups. Rep. Prog. 1869, pp. 14-15.

- Clinton Group.** Newberry. Clinton group in Ohio. Geol. of O., v. 1, pt. 1, p. 62.
- Newberry. Clinton in Ohio. Geol. of O., v. 3, pp. 5-8.
- Newberry. Fossils. Geol. of O., v. 1, pt. 1, p. 128.
- Newberry. Medina and Clinton groups. Geol. of O., v. 1, pt. 1, pp. 103, 126-28.
- Nicholson. Corals. Geol. of O., v. 2, pt. 2, pp. 224-28.
- Orton. Clinton group in geological series of Ohio. Prelim. Rep. on petroleum and inflammable gas. 1887, pp. 30-31, 119. Rep. 1886, pp. 20-21.
- Orton. Clinton limestone of Highland county. Rep. Prog. 1870, pp. 268-70.
- Orton. Clinton group in Montgomery county. Rep. Prog. 1869, pp. 142-143.
- Orton. Clinton in Clark county. Geol. of O., v. 1, pt. 1, pp. 463-64.
- Orton. Clinton limestone in Greene county. Geol. of O., v. 2, pt. 1, pp. 664-67.
- Orton. Clinton limestone in Highland county. Rep. Prog. 1870, pp. 271-72.
- Orton. Clinton limestone in Ohio. Geol. of O., v. 6, pp. 11-13. Rep. 1890, pp. 17-18; v. 7, pp. 10-11.
- Orton. Clinton limestone in Preble county. Geol. of O., v. 3, pp. 406-08.
- Orton. Clinton limestone in Warren county. Geol. of O., v. 3, pp. 384-86.
- Orton. Clinton limestone as a source of oil and gas. Rep. 1890, pp. 227-47.
- Orton. Fossils of, in southern Ohio. Geol. of O., v. 3, pp. 415-16.
- Orton. Gas in, at Lancaster. Geol. of O., v. 6, pp. 783-84.
- Orton. Lime production. Geol. of O., v. 6, p. 705.
- Orton, Jr., and Peppel. Clinton for Portland cement making. O. Geol. Sur., Bull. No. 3, pp. 89-90.
- Orton, Jr., and Peppel. Composition of, in Adams county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, p. 33; in Clark county, pp. 51-52; in Clinton county, pp. 53-56; in Greene county, pp. 67-69; in Miami county, pp. 96-98; in Montgomery county, pp. 100-102; in Preble county, pp. 116, 118-19.
- Orton, Jr., and Peppel. Composition, physical character and uses of Clinton limestones in Ohio. O. Geol. Sur., Bull. No. 4, pp. 143-147.

- Clinton Group.** Prosser. Correlation of this limestone with Clinton of New York. O. Geol. Sur., Bull. No. 7, p. 29.
- Clinton Shale.** Orton. Clinton, Medina, Hudson river and Utica shale. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 96-99. Edition 1886, pp. 66-68.
- Clyde Hydrator.** Peppel. Illustrations and description of the Clyde hydrator. O. Geol. Sur., Bull. No. 4, pp. 328-330.
- Coal.** Andrews. Coal in Belmont county. Geol. of O., v. 2, pt. 1, pp. 544-69.
- Andrews. Coal in Guernsey county, south half. Geol. of O., v. 2, pt. 1, pp. 529-42.
- Andrews. Coal in the Hocking Valley. Geol. of O., v. 3, pp. 822-57.
- Andrews. Coal in Meigs county. Geol. of O., v. 1, pt. 1, pp. 248-59.
- Andrews. Coal in Monroe county. Geol. of O., v. 2, pt. 1, pp. 570-87.
- Andrews. Coal seams in Muskingum county. Geol. of O., v. 1, pt. 1, pp. 314-44.
- Andrews. Coal in Noble county. Geol. of O., v. 2, pt. 1, pp. 510-28.
- Andrews. Coal in Vinton county. Rep. Prog. 1870, pp. 92-126.
- Andrews. Coal in Washington county. Geol. of O., v. 2, pt. 1, pp. 461-508.
- Andrews. Nelsonville or Straitsville coal. Rep. Prog. 1869, pp. 96-113.
- Andrews. Origin and formation of coal. Geol. of O., v. 1, pt. 1, pp. 345-64.
- Andrews. Production of 2d geological district. Rep. Prog. 1869, pp. 130-31.
- Andrews. Strata above the Nelsonville seam. Rep. Prog. 1869, pp. 113-16.
- Andrews. Upper Coal-measures in Washington county. Geol. of O., v. 2, pt. 1, pp. 457-59.
- Bleininger. Coal used in burning Portland cement. O. Geol. Sur., Bull. No. 3, pp. 294-96.
- Briggs. Coal in Jackson, Scioto and Lawrence counties. Ann. Rep., v. 1, 1837, pp. 86-87.
- Briggs. Coal in the Hocking Valley. Ann. Rep., v. 1, 1837, pp. 84-86.
- Briggs. Coal in Hocking and Athens counties. Ann. Rep., v. 2, 1838, pp. 138-41.

- Coal.** Briggs. Coal in Tuscarawas county. Ann. Rep., v. 2, 1838, pp. 149-51.
- Foster. Coal-measures in Muskingum, Licking and Franklin counties. Ann. Rep., v. 2, 1838, pp. 83-87.
- Hildreth. Bituminous coal in Ohio. Exec. Docs. 1836, Rep.No. 1, pp. 73-74.
- Hildreth. Geology of the Coal-measures in Ohio. Ann. Rep., v. 1, 1837, pp. 25-54.
- Hildreth. Pomeroy coal seam. Ann. Rep., v. 1, 1837, pp. 40-46.
- Hodge. Coal in Coshocton county. Geol. of O., v. 3, pp. 565-66, 568-94.
- Mendenhall. Heating power of some Ohio coal. Rep. Prog. 1870, pp. 236-42.
- Newberry. Altitudes of Coal No. 1. Rep. Prog. 1870, pp. 29-30. Coal No. 3, p. 34. Coal No. 6, pp. 42-43.
- Newberry. Coal in Columbiana county. Geol. of O., v. 3, pp. 92-126.
- Newberry. Coal-measures in Jefferson county. Geol. of O., v. 3, pp. 718-79.
- Newberry. Coal in Mahoning county. Geol. of O., v. 3, pp. 792-814.
- Newberry. Coal in Ohio. Rep. Prog. 1869, pp. 32-38.
- Newberry. Coal in Portage county. Geol. of O., v. 3, pp. 138-49.
- Newberry. Coal-measures in Summit county. Geol. of O., v. 1, pt. 1, pp. 214-18, 219-20.
- Newberry. Coal-measures in Tuscarawas county. Geol. of O., v. 3, pp. 54-84.
- Orton. Classification of Ohio coals. Geol. of O., v. 5, pp. 144-46.
- Orton. Coal seams in Hanging Rock District. Geol. of O., v. 3, pp. 911-21.
- Orton. Coal seams of the Lower Coal-measures of Ohio. Geol. of O., v. 5, pp. 128-68.
- Orton. Coal seams in Pike county. Geol. of O., v. 2, pt. 1, pp. 631-34.
- Orton. Dip or inclination of Coal-measures. Geol. of O., v. 5, pp. 138-40.
- Orton. Lowest coals in northern Perry county. Geol. of O., v. 5, pp. 885-87.
- Orton. Massillon coal. Geol. of O., v. 5, pp. 773-815.
- Orton. Methods of designating coal seams. Geol. of O., v. 5, pp. 129-34.

- Coal.** Orton. Ohio coal field. Geol. of O. v. 5, pp. 134-38.
- Orton. Preparation of coal for the market. Geol. of O., v. 5, pp. 153-55.
- Orton. Proportion of coal lost in mining. Geol. of O., v. 5, p. 155.
- Orton. Stratigraphical order of the Lower Coal-measures in Ohio. Geol. of O., v. 5, pp. 28-128.
- Orton. Uses of Ohio coal. Geol. of O., v. 5, pp. 150-53.
- Peppel. Use of coal as a fuel in burning lime in Ohio. O. Geol. Sur., Bull. No. 4, pp. 273-76.
- Read. Coal-measures in Geauga county. Geol. of O., v. 1, pt. 1, pp. 521-22.
- Read. Coal in Holmes county. Rep. Prog. 1870, pp. 476-82; Geol. of O., v. 3, pp. 548-61.
- Read. Coal in Knox county. Geol. of O., v. 3, p. 336.
- Read. Coal in Licking county. Geol. of O., v. 3, pp. 355-58.
- Read. Coal-measures in Trumbull county. Geol. of O., v. 1, pt. 1, pp. 495-502.
- Read. Coal in Wayne county. Geol. of O., v. 3, pp. 530-38.
- Stevenson. Coal in Belmont county. Geol. of O., v. 3, pp. 261-86.
- Stevenson. Coal in Guernsey county. Geol. of O., v. 3, pp. 220-36.
- Stevenson. Coal in Harrison county. Geol. of O., v. 3, pp. 203-18.
- Stevenson. Coal-measures in Muskingum county. Geol. of O., v. 3, pp. 238-59.
- Wheat. Coal-measures in Medina county. Geol. of O., v. 3, pp. 363, 365, 376, 377-78.
- Coal No. 1.** Hodge. Coal No. 1 in Coshocton county. Geol. of O., v. 3 pp. 568-70, 576, 580.
- Newberry. Coal No. 1, or Briar Hill coal. Rep. Prog. 1870, pp. 26-30.
- Newberry. Geol. of O., v. 2, pt. 1, pp. 133-35.
- Newberry. Coal No. 1 in Mahoning county. Geol. of O., v. 3, pp. 784-90.
- Newberry. Coal No. 1 in Portage county. Geol. of O., v. 3, pp. 138-41.
- Newberry. Coal No. 1 in Stark county. Geol. of O., v. 3, pp. 156-67.

- Coal No. 1.** Newberry. Coal No. 1 in Tuscarawas county. Geol. of O., v. 3, pp. 54-59.
- Orton. Sharon, or Coal No. 1. Geol. of O., v. 5, pp. 156-57.
- Read. Coal No. 1 in Holmes county. Geol. of O., v. 3, pp. 548-50.
- Read. Coal No. 1 in Licking county. Geol. of O., v. 3, p. 357.
- Read. Coal No. 1 in Wayne county. Geol. of O., v. 3, pp. 536-38.
- Stevenson. Coal No. 1 in Muskingum county. Geol. of O., v. 3, p. 241.
- Coal No. 2.** Newberry. Coal No. 2 in Mahoning county. Geol. of O., v. 3, pp. 793-94.
- Newberry. Coal No. 2. Rep. Prog. 1870, pp. 30-31; Geol. of O., v. 2, pt. 1, pp. 135-6.
- Orton. Coal No. 2, or Quakertown coal. Geol. of O., v. 5, pp. 157-58.
- Read. Coal No. 2 in Holmes county. Geol. of O., v. 3, pp. 550-51.
- Coal No. 3.** Hodge. Coal No. 3 in Coshocton county. Geol. of O., v. 3 pp. 581-83, 590.
- Newberry. Coal No. 3. Rep. Prog. 1870, pp. 31-34. Geol. of O., v. 2, pt. 1, pp. 137-38.
- Newberry. Coal No. 3 in Mahoning county. Geol. of O., v. 3, pp. 794-95, 799, 804-6, 810.
- Newberry. Coals No. 3 and 4 in Portage county. Geol. of O., v. 3, pp. 141-49.
- Newberry. Coals No. 3 and 4 in Stark county. Geol. of O., v. 3 pp. 167-70.
- Newberry. Coal No. 3 in Tuscarawas county. Geol. of O., v. 3, pp. 59-60.
- Orton. Coal No. 3 in Hanging Rock district. Geol. of O., v. 3 pp. 912-18.
- Orton. Coal No. 3, or Lower Mercer coal. Geol. of O., v. 5, pp. 158-59.
- Read. Coal No. 3 in Holmes county. Geol. of O., v. 3, pp. 551-54.
- Read. Coal No. 3 in Wayne county. Geol. of O., v. 3, pp. 535-36.
- Stevenson. Coal No. 3 in Guernsey county. Geol. of O., v. 3, pp. 224-25.

- Coal No. 3.** Stevenson. Coal No. 3 in Muskingum county. Geol. of O., v. 3, p. 241.
- Coal No. 3a.** Coal No. 3a, or Upper Mercer coal. Geol. of O., v. 5, pp. 159-60.
- Coal No. 3b.** Orton. Tionesta or Coal No. 3b. Geol. of O., v. 5, p. 160.
- Coal No. 4.** Hodge. Coal No. 4 in Coshocton county. Geol. of O., v. 3, pp. 579-80, 573-74.
- Newberry. Coal No. 4. Rep. Prog. 1870, pp. 34-36. Geol. of O., v. 2, pt. 1, pp. 139-43.
- Newberry. Coal No. 4 in Mahoning county. Geol. of O., v. 3, pp. 795-96, 806-11.
- Newberry. Coals No. 3 and 4 in Portage county. Geol. of O., v. 3, pp. 141-49.
- Newberry. Coals No. 3 and 4 in Stark county. Geol. of O., v. 3, pp. 167-70.
- Newberry. Coal No. 4 in Tuscarawas county. Geol. of O. v. 3, pp. 60-62.
- Orton. Brookville, or Coal No. 4. Geol. of O., v. 5, pp. 160-62.
- Orton. Clarion or Coal No. 4a. Geol. of O., v. 5, p. 163.
- Orton. Coal No. 4 in Hanging Rock district. Geol. of O., v. 3, pp. 915-16.
- Read. Coal No. 4 in Holmes county. Geol. of O., v. 3, pp. 554-55.
- Stevenson. Coal No. 4 in Carroll county. Geol. of O., v. 3, pp. 193-94.
- Stevenson. Coal No. 4 in Guernsey county. Geol. of O., v. 3, pp. 224-36.
- Stevenson. Coal No. 4 in Muskingum county. Geol. of O., v. 3, p. 241.
- Coal No. 5.** Newberry. Rep. Prog. 1870, pp. 36-38.
- Newberry. Geol. of O., v. 2, pt. 1, pp. 143-46.
- Newberry. Coal No. 5 in Jefferson county. Geol. of O., v. 3, pp. 727-28, 541, 743-44, 757-60.
- Newberry. Coal No. 5 in Mahoning county. Geol. of O., v. 3, pp. 796-97.
- Newberry. Coal No. 5 in Stark county. Geol. of O., v. 3, pp. 170-74.
- Newberry. Coal No. 5 in Tuscarawas county. Geol. of O., v. 3, pp. 64-66.

- Coal No. 5.** Orton. Coal No. 5 in Hanging Rock district. Geol. of O., v. 3, p. 916.
- Orton. Lower Freeport, or Coal No. 5. Geol. of O., v. 5, p. 166.
- Orton. Lower Kittanning, or Coal No. 5. Geol. of O., v. 5, pp. 163-64.
- Read. Coal No. 5 in Holmes county. Geol. of O., v. 3, p. 555.
- Stevenson. Coal No. 5 in Carroll county. Geol. of O., v. 3, pp. 191-92.
- Stevenson. Coal No. 5 in Muskingum county. Geol. of O., v. 3, p. 241.
- Coal No. 6.** Andrews. Coal No. 6 in the Hocking valley. Geol. of O. v. 3, pp. 826-50.
- Hodge. Coal No. 6 in Coshocton County. Geol. of O., v. 3, pp. 569-71, 573-74, 578-79, 583-85, 588-93.
- Newberry. Coal No. 6. Rep. Prog. 1870, pp. 38-41.
- Newberry. Coal No. 6. Geol. of O., v. 2, pt. 1, pp. 146-49, 151.
- Newberry. Coal No. 6 in Mahoning county. Geol. of O., v. 3, pp. 798-99.
- Newberry. Coal No. 6 in Jefferson county. Geol. of O., v. 3, pp. 727, 733, 736-37, 756-57, 760.
- Newberry. Coal No. 6 in Stark county. Geol. of O., v. 3, pp. 174-75.
- Newberry. Coal No. 6 in Tuscarawas county. Geol. of O., v. 3, pp. 67-72.
- Orton. Coal No. 6 in Hanging Rock district. Geol. of O., v. 3, pp. 916-20.
- Orton. Middle Kittanning, or Coal No. 6. Geol. of O., v. 5, pp. 165-66.
- Read. Coal No. 6 in the Hocking Valley. Geol. of O., v. 3, pp. 648-52, 661-71.
- Read. Coal No. 6 in Holmes county. Geol. of O., v. 3, pp. 555-57.
- Read. Coal No. 6 in Wayne county. Geol. of O., v. 3, pp. 534-35.
- Stevenson. Coal No. 6 in Carroll county. Geol. of O., v. 3, pp. 187-191, 196-97.
- Stevenson. Coal No. 6 in Guernsey county. Geol. of O., v. 3, pp. 224, 232, 234, 236.
- Stevenson. Coal No. 6 in Muskingum county. Geol. of O., v. 3, pp. 240-41.

Coal No. 6a. Andrews. Coal No. 6a in Hocking valley. Geol. of O., v. 3, pp. 850-54.

———Read. Coal No. 6a in the Hocking valley. Geol. of O., v. 3, pp. 667, 671-73, 706.

Coal No. 7. Andrews. Coal No. 7 in Hocking valley. Geol. of O., v. 3, pp. 854-57.

———Newberry. Coal No. 7. Rep. Prog. 1870, pp. 43-44.

———Newberry. Coal No. 7. Geol. of O., v. 2, pt. 1, pp. 151-54.

———Newberry. Coal No. 7 in Jefferson county. Geol. of O., v. 3, pp. 726-27, 736, 745, 749-50.

———Newberry. Coal No. 7 in Stark county. Geol. of O., v. 3, p. 175.

———Newberry. Coal No. 7 in Tuscarawas county. Geol. of O., v. 3, pp. 72-74.

———Orton. Coal No. 7 in Hanging Rock district. Geol. of O., v. 3, pp. 920-21.

———Orton. Upper Freeport, or Coal No. 7. Geol. of O., v. 5, pp. 167-68.

———Read. Coal No. 7 in Hocking valley. Geol. of O., v. 3, pp. 673-74, 684-86, 706.

———Read. Coal No. 7 in Holmes county. Geol. of O., v. 3, pp. 557-58.

———Read. Coal No. 7 in Wayne county. Geol. of O., v. 3, p. 534.

———Stevenson. Coal No. 7 in Carroll county. Geol. of O., v. 3, pp. 182-87.

———Stevenson. Coal No. 7 in Guernsey county. Geol. of O., v. 3, pp. 223-24, 227-30, 234-35.

———Stevenson. Coal in Muskingum county. Geol. of O., v. 3, p. 240.

———Stevenson. Coal No. 7 in Harrison county. Geol. of O., v. 3, pp. 203-08.

Coal No. 8. Newberry. Geol. of O., v. 2, pt. 1, pp. 158-61.

———Newberry. Coal No. 8 in Jefferson county. Geol. of O., v. 3, pp. 721-22, 750, 762-78.

———Stevenson. Coal No. 8 in Belmont county. Geol. of O., v. 3, pp. 266-69, 272-73, 275-80, 282-83, 285-86.

———Stevenson. Coal No. 8 in Guernsey county. Geol. of O., v. 3, pp. 221-22, 225-27, 233-35.

———Stevenson. Coal No. 8 in Harrison County. Geol. of O., v. 3, pp. 209-15.

Coal No. 9. Newberry. Geol. of O., v. 2, pt. 1, p. 161.

Coal No. 9. Stevenson. Coal No. 9 in Belmont county. Geol. of O., v. 3, pp. 264, 276.

——Stevenson. Coal No. 9 in Harrison county. Geol. of O., v. 3, p. 216.

Coal No. 10. Newberry. Geol. of O., v. 2, pt. 1, pp. 161–62.

——Stevenson. Coal No. 10 in Belmont county. Geol. of O., v. 3, pp. 264, 269–71, 274–75, 285–86.

——Stevenson. Coal No. 10 in Harrison county. Geol. of O., v. 3, pp. 216–17.

Coal No. 11. Newberry. Geol. of O., v. 2, pt. 1, pp. 162–63.

——Prosser. Correlation of Coal No. 11 and Waynesburg coal. O. Geol. Sur., Bull. No. 7, p. 7.

——Stevenson. Coal No. 11 in Belmont county. Geol. of O., v. 3, pp. 264, 280, 286.

——Stevenson. Coal No. 11 in Harrison county. Geol. of O., v. 3, p. 217.

Coal No. 12. Newberry. Geol. of O., v. 2, pt. 1, p. 163.

——Stevenson. Coal No. 12 in Belmont county. Geol. of O., v. 3, pp. 264, 277, 280.

Coal No. 13. Newberry. Geol. of O., v. 2, pt. 1, p. 163.

——Stevenson. Coal No. 13 in Belmont county. Geol. of O., v. 3, p. 264.

Coal Analyses. Coal from Carroll county. Geol. of O., v. 3, pp. 191–94.

——Coal No. 7 from Carroll county. Geol. of O., v. 3, pp. 183–86.

——Coal from Columbiana county. Geol. of O., v. 3, pp. 127–28.

——Coal from Federal Creek field. Geol. of O., v. 6, pp. 648, 650–52.

——Coal from Harrison county. Geol. of O., v. 3, pp. 211–12, 215.

——Coal from Hocking valley. Geol. of O., v. 5, p. 480.

——Coal from Long Run division of Pomeroy and Federal creek coal field. Geol. of O., v. 6, p. 647.

——Meigsville and Bristol coal. Meigs creek seam. Geol. of O., v. 5, pp. 1067–68.

——Coal from Tuscarawas county. Geol. of O., v. 3, p. 87.

——Andrews. Coal No. 6 from the Hocking valley. Geol. of O., v. 3, pp. 827–30, 833–35, 937, 842–44.

——Andrews. Coal No. 7 from Hocking valley. Geol. of O., v. 3, pp. 855–56.

——Andrews. Analyses of Nelsonville coal. Rep. Prog. 1869, pp. 104–05.

- Coal Analyses. Andrews. Analyses of Nelsonville coal. O. Geol. Sur., Rep. Prog. 1869, pp. 104-05.
- Bleininger. Determination of carbon and coal in cement materials. O. Geol. Sur., Bull. No. 3, p. 142.
- Howard. Coal from Hanging Rock district. Geol. of O., v. 3, pp. 939-40.
- Lord. Akron furnace mine, Longstreth's mine. Geol. of O., v. 5, p. 967.
- Lord. Bedford cannel coal of Coshocton county. Geol. of O., v. 5, p. 851.
- Lord. Bloom township coal, Meigs creek seam. Geol. of O., v. 5, p. 1064.
- Lord. Brookfield coal, Meigs creek seam. Geol. of O., v. 5, p. 1074.
- Lord. Brooks mine, Nelsonville district. Geol. of O., v. 5, p. 973.
- Lord. Brush creek coal, Dell Roy field, Carroll county. Geol. of O., v. 5, p. 248.
- Lord. Burnet mine, Massillon field. Geol. of O., v. 5, p. 785.
- Lord. Cambridge coal, Guernsey county. Geol. of O., v. 5, pp. 292-95.
- Lord. Camp creek hard coal, Massillon field. Geol. of O., v. 5, p. 812.
- Lord. Cannel coal of Milton township, Jackson county. Geol. of O., v. 5, p. 1032.
- Lord. Carbondale coal, Nelsonville district. Geol. of O., v. 5, p. 981.
- Lord. Coal from Carbon Hill mine, Monday creek. Geol. of O., v. 5, p. 965.
- Lord. Center township coal, Meigs creek seam. Geol. of O., v. 5, p. 1070.
- Lord. Coals described in v. 5, Geol. of O. Geol. of O., v. 5, pp. 1099-1110.
- Lord. Coshocton from Coshocton county. Geol. of O., v. 5, pp. 863, 965-66.
- Lord. Dennison mine, Massillon field. Geol. of O., v. 5, p. 784.
- Lord. Diamond coal works, Massillon field. Geol. of O., v. 5, p. 787.
- Lord. Coal from Diamond seam. Geol. of O., v. 5, p. 214.
- Lord. Elm Run mine, Massillon field. Geol. of O., v. 5, p. 814.

- Coal Analyses. Lord. Enoch township coal, Meigs creek seam. Geol. of O., v. 5, p. 1078.
- Lord. Evansdale limestone coal. Geol. of O., v. 5, p. 235.
- Lord. Excelsior slope, Massillon field. Geol. of O., v. 5, p. 786.
- Lord. Finley coal in Jefferson county. Geol. of O., v. 5, p. 215.
- Lord. Flushing coal, Meigs creek seam. Geol. of O., v. 5, p. 1084.
- Lord. Fox Lake mine, Massillon field. Geol. of O., v. 5, pp. 792-93.
- Lord. Gilliland or Canter coal from Jackson county. Geol. of O., v. 5, p. 1011.
- Lord. Greentown limestone coal. Geol. of O., v. 5, p. 233.
- Lord. Happy Hollow, Upper Freeport of Nelsonville district, Geol. of O., v. 5, p. 985.
- Lord. Jackson shaft coal. Geol. of O., v. 5, p. 1015.
- Lord. Lake View mine, Massillon field. Geol. of O., v. 5, p. 782.
- Lord. Lawrence mine, Massillon field. Geol. of O., v. 5, p. 802.
- Lord. Coal from Lawrence township, Stark county. Geol. of O., v. 5, p. 799.
- Lord. Lower Freeport coal, Jefferson county. Geol. of O., v. 5, p. 223.
- Lord. Lower Kittanning, Guernsey county. Geol. of O., v. 5, p. 284.
- Lord. Lower Kittanning of Holmes county. Geol. of O., v. 5, p. 829.
- Lord. Lower Kittanning in north Perry county. Geol. of O., v. 5, p. 897.
- Lord. Lower Kittanning, Sandy township, Stark county. Geol. of O., v. 5, p. 241.
- Lord. Lower Kittanning, Tuscarawas county. Geol. of O., v. 5, p. 262.
- Lord. Lower Mercer in Holmes county. Geol. of O., v. 5, p. 824.
- Lord. Marion township coal, Meigs creek seam. Geol. of O., v. 5, p. 1061.
- Lord. Meigs creek coal. Geol. of O., v. 5, pp. 1060-61, 1064-65, 1067-68, 1070, 1072, 1074, 1078, 1080, 1083, 1084.
- Lord. Middlebury shaft coal, Massillon field. Geol. of O., v. 5, p. 780.
- Lord. Middle Kittanning from Buckingham mine 19, Sunday creek district. Geol. of O., v. 5, p. 939.

- Coal Analyses.** Lord. Middle Kittanning coal at Chestnut Grove mine, Stark county. Geol. of O., v. 5, p. 237.
- Lord. Middle Kittanning in Holmes county. Geol. of O., v. 5, pp. 830-32, 933-35.
- Lord. Middle Kittanning in north Perry county. Geol. of O., v. 5, pp. 887-88, 903.
- Lord. Middle Kittanning, Osnaburg mine, Stark county. Geol. of O., v. 5, p. 240.
- Lord. Middle Kittanning, Pike township, Stark county. Geol. of O., v. 5, p. 238.
- Lord. Middle Kittanning, Tuscarawas county. Geol. of O., v. 5, pp. 267, 279.
- Lord. Mine No. 9, Straitsville district. Geol. of O., v. 5, p. 957.
- Lord. Morgan township, Meigs creek seam. Geol. of O., v. 5, p. 1065.
- Lord. Nelsonville coal. Geol. of O., v. 5, pp. 975, 977.
- Lord. New Castle coal of Lawrence county. Geol. of O., v. 5, p. 1045.
- Lord. New Chippewa mine, Massillon field. Geol. of O., v. 5, p. 791.
- Lord. Pittsburg coal from Belmont county. Geol. of O., v. 6, pp. 607-09, 611-12, 616-17, 622.
- Lord. Pittsburg coal from Guernsey county. Geol. of O., v. 6, p. 626.
- Lord. Pittsburg coal from Jefferson county. Geol. of O., v. 6, p. 599.
- Lord. Coal from Pomeroy field. Geol. of O., v. 6, pp. 637-39, 642.
- Lord. Rixville coal, Meigs creek seam. Geol. of O., v. 5, p. 1072.
- Lord. Sharon coal, Holmes county. Geol. of O., v. 5, p. 821.
- Lord. Sharon coal, Portage county. Geol. of O., v. 5, p. 228.
- Lord. Coal from mines in Shawnee district. Geol. of O., v. 5, pp. 949-50, 952.
- Lord. Silver Creek, shaft 2, Massillon field. Geol. of O., v. 5, p. 788.
- Lord. Sippo mine, Massillon field. Geol. of O., v. 5, p. 808.
- Lord. Coal from State Line mine. Geol. of O., v. 5, p. 198.
- Lord. Steubenville shaft coal. Geol. of O., v. 5, p. 219.
- Lord. Straitsville Central mine. Geol. of O., v. 5, p. 955.
- Lord. Talmadge coal, Massillon field. Geol. of O., v. 5, p. 780.

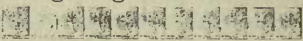

- Coal Analyses.** Lord. Tionesta coal of Tuscarawas county. Geol. of O., v. 5, p 259.
- Lord. Upper Barnesville coal. Geol. of O., v. 5, p. 1083.
- Lord. Upper Freeport of Carroll county. Geol. of O., v. 5, pp. 250-51.
- Lord. Upper Freeport of Nelsonville district. Geol. of O., v. 5, p. 985.
- Lord. Upper Freeport coal of Salineville. Geol. of O., v. 5, pp. 202-03.
- Lord. Upper Freeport of Sunday creek district. Geol. of O., v. 5, pp. 941-42.
- Lord. Upper Mercer of Holmes county. Geol. of O., v. 5, p. 826.
- Lord. Upper Sunday creek coal. Geol. of O., v. 5, p. 933.
- Lord. Waterloo coal of Gallia county. Geol. of O., v. 5, p. 1058.
- Lord. Wellston, or Coalton coal of Jackson county. Geol. of O., v. 5, p. 1021.
- Lord and Wormley. Block coal of Trumbull county. Geol. of O., v. 5, pp. 170-72.
- Lord and Wormley. Leetonia coal and coke. Geol. of O., v. 5, pp. 190, 192.
- Newberry. Coal from Mahoning county. Geol. of O., v. 3, pp. 813-14.
- Newberry. Analyses of Coal No. 1. Rep. Prog. 1870, p. 27. Coal No. 2, p. 31; Coal No. 3, p. 33; Coal No. 4, p. 36; Coal No. 5, p. 38; Coal No. 6, pp. 39-42.
- Orton. Coal in Pike county. Geol. of O., v. 2, pt. 1, pp. 632-33.
- Orton. Coal in Shade creek division of Pomeroy and Federal creek field. Geol. of O., v. 6, p. 644.
- Read. Coal in the Hocking valley. Geol. of O., v. 3, pp. 650-51, 671, 673, 682-83, 685, 701-02.
- Wormley. Analyses of coal from Athens county. Geol. of O, v. 1, pt. 1, pp. 264, 266-67, 275-76, 285.
- Wormley. Coal in Belmont county. Geol. of O., v. 2, pt. 1, p. 559.
- Wormley. Elk township, Vinton county coal. Rep. Prog. 1870, pp. 112-13.
- Wormley. Analyses of coal from Gallia county. Geol. of O., v. 1, pt. 1, pp. 227, 229-30, 240.
- Wormley. Coal in Guernsey county. Geol. of O., v. 2, pt. 1, pp. 533, 540-41, 535.

- Coal Analyses.** Wormley. Coal in Harrison township, Scioto county. Rep. Prog. 1870, p. 164.
- Wormley. Coal in Holmes county. Geol. of O., v. 3, p. 559
- Wormley. Coal in Jackson county. Rep. Prog. 1870, pp. 129-30, 133, 140-41, 145-46, 149-50, 157-58.
- Wormley. Coal in Jefferson county. Geol. of O., v. 3, p. 779.
- Wormley. Coal in Lawrence county. Rep. Prog. 1870, pp. 195-96, 207.
- Wormley. Madison township, Vinton county coal. Rep. Prog. 1870, p. 115.
- Wormley. Methods of analysis. Rep. Prog. 1870, pp. 403-13, 421-24, 426-27.
- Wormley. Coal in Noble county. Geol. of O., v. 2, pt. 1, pp. 511, 525-27.
- Wormley. Richland township, Vinton county coal. Rep. Prog. 1870, pp. 100-02.
- Wormley. Coal of the 2d geological district. Geol. of O., v. 2, pt. 1, p. 608.
- Wormley. Stokely coal. Rep. Prog. 1870, p. 99.
- Wormley. Coal in Summit county. Geol. of O., v. 1, pt. 1, p. 222.
- Wormley. Tables of coal analyses of 2d geological district. Rep. Prog. 1870, pp. 223-33.
- Wormley. Tables. Rep. Prog. 1870, pp. 414-20, 425, 428-29.
- Wormley. Coal in Washington county. Geol. of O., v. 2, pt. 1, pp. 481, 483-84, 490.
- Wormley. Willow bank coal of Tuscarawas region. Geol. of O., v. 5, p. 467.
- Wormley. Wolfe coal. Rep. Prog. 1870, p. 106.
- Wormley and others. Coal No. 6 in Hocking Valley. Geol. of O., v. 3, pp. 827-30, 833-35, 937, 842-44, 848.
- Coal Composition.** Orton. Composition of Ohio coals. Geol. of O., v. 5, pp. 146-50.
- Coal Equivalents.** Orton. Equivalent names and number of coals of Ohio. Geol. of O., v. 5, pp. 49, 66-68, 73, 75-77, 80-81, 85, 98-99, 100-01, 103-05, 108, 110, 121, 124-25, 127, 132-33, 156-68, 185, 193, 207, 211, 229-30, 239, 244, 273, 277, 299, 405, 431, 843-44, 869, 994, 1025, 1037.
- Coal Fields.** Orton. Cambridge coal field. Geol. of O., v. 5, pp. 289-97.
- Orton. Coal fields in Ohio. Geol. of O., v. 7, pp. 255-90.

- Coal Fields.** Orton. Dell Roy field. Geol. of O., v. 5, pp. 245-52.
- Orton. East Palestine and State Line coal fields. Geol. of O., v. 5, pp. 196-200.
- Orton. Hocking valley coal field. Geol. of O., v. 5, pp. 912-91.
- Orton. Leetonia coal field. Geol. of O., v. 5, pp. 187-96.
- Orton. Massillon coal field. Geol. of O., v. 5, pp. 773-815.
- Orton. Nebo coal field. Geol. of O., v. 5, pp. 222-25.
- Orton. Post Boy borings. Geol. of O., v. 5, pp. 297-300.
- Orton. Salineville coal fields. Geol. of O., v. 5, pp. 201-07.
- Orton. Shawnee and Straitsville district of Hocking valley. Geol. of O., v. 5, pp. 944-58.
- Orton. Steubenville field. Geol. of O., v. 5, pp. 215-22.
- Orton. Waterloo coal field of Gallia and Lawrence counties. Geol. of O., v. 5, pp. 1052-58.
- Read. Report on the Hocking Valley coal field. Geol. of O., v. 3, pp. 647-715.
- Roy. Coalton or Wellston coal field. Geol. of O., v. 5, pp. 1015-1021.
- Coal-measures.** Andrews. Fossil plants of. Geol. of O., v. 2, pt. 2, pp. 415-26.
- Bownocker. Oil and gas producing rocks in Ohio. O. Geol. Sur., Bull. No. 1, pp. 25-30.
- Lord. Coal area of Ohio. Geol. of O., v. 5, pp. 443-47.
- Meek. Fossils. Geol. of O., v. 2, pt. 2, pp. 326-47.
- Newberry. Coal-measures in Ohio. Geol. of O., v. 2, pt. 1, pp. 113-63.
- Newberry. Coal-measures in Ohio. Geol. of O., v. 3, pp. 26-27.
- Newberry. Fauna and flora. Geol. of O., v. 2, pt. 1, pp. 175-80.
- Newberry. Limestones of Upper Coal-measures. Geol. of O., v. 2, pt. 1, pp. 163-65.
- Newberry. Lower Coal-measures in Ohio. Geol. of O., v. 2, pt. 1, pp. 130-57. Coal No. 1, pp. 133-35. Coal No. 2, pp. 135-36. Coal No. 3, pp. 137-38. Coal No. 4, pp. 139-43. Coal No. 5, pp. 143-46. Coal No. 6, pp. 146-49. Coal No. 6a, p. 151. Coal No. 7, pp. 151-57.
- Newberry. Upper Coal-measures in Ohio. Geol. of O., v. 2, pt. 1, pp. 157-65. Coal No. 8, pp. 158-61. Coal No. 9-13, pp. 161-63.
- Orton. Coal-measures in geological series of Ohio. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 39-40. Rep. 1886, pp. 26-27.

- Coal-measures.** Orton. Coal-measures in Ohio. Geol. of O., v. 6, pp. 43-44. Same, Rep. 1890, p. 44.
- Orton. Lime production. Geol. of O., v. 6, pp. 707-08.
- Orton. Lower Coal-measures in Ohio. Geol. of O., v. 7, pp. 36-37.
- Orton. Stratigraphical order of the Lower Coal-measures in Ohio. Geol. of O., v. 5, pp. 1-128.
- Orton and Wright. Coal seams of the Lower Coal-measures in Ohio. Geol. of O., v. 5, pt. 1, pp. 1-282, 773-1058.
- Orton Jr. and Peppel. Limestones of the Eastern or Coal-measure groups for commercial use. O. Geol. Sur., Bull. No. 4, pp. 22-23.
- Read. Dip of the Coal-measures. Geol. of O., v. 3, pp. 560-61.
- Whitfield. Fossils in Ohio. Geol. of O., v. 7, pt. 2, pp. 482-93.
- Coal Mines.** Orton. Diamond coal mine. Geol. of O., v. 5, pp. 210-15.
- Orton. Coal mines in Scioto and Lawrence counties and western part of Gallia county. Geol. of O., v. 5, pp. 1034-58.
- Orton. Mines in Trumbull, Mahoning, Columbiana, Jefferson, Portage, Stark, Carroll, Tuscarawas and Guernsey counties. Geol. of O., v. 5, pp. 168-300.
- Orton. Coal mines in Vinton and Jackson counties. Geol. of O., v. 5, pp. 992-1034.
- Coal Mining.** Roy. Coal mining in Ohio. Geol. of O., v. 5, pp. 301-70.
- Roy. Conditions of coal mining in Ohio. Geol. of O., v. 5, pp. 325-28.
- Roy. Development of coal mining in Ohio. Geol. of O., v. 5, pp. 318-24.
- Roy. Early coal mining in England. Geol. of O., v. 5, pp. 301-16.
- Roy. Labor-saving machinery in mines. Geol. of O., v. 5, pp. 339-44.
- Roy. Manner of mining coal in Ohio. Geol. of O., v. 5, pp. 328-39, 346-58.
- Roy. Systems of British mining. Geol. of O., v. 5, pp. 305-16.
- Roy. Ventilation of coal mines. Geol. of O., v. 5, pp. 359-70.
- Coal Ridge Furnaces.** Bownocker. Existing salt furnaces in Meigs county. O. Geol. Sur., Bull. No. 8, p. 20.
- Coal Seams.** Newberry. Extent of coal seams. Geol. of O., v. 2, pt. 1, pp. 165-69.
- Newberry. Parallelism of coal seams. Geol. of O., v. 2, pt. 1, pp. 169-72.

- Coal Seams.** Newberry. Troubles in. Geol. of O., v. 2, pt. 1, pp. 172-75.
- Orton. Coal seams of the Big Sandy creek valley. Geol. of O., v. 5, pp. 63-91.
- Orton. Coal seams in the lower Tuscarawas and Muskingum valleys. Geol. of O., v. 5, pp. 91-127.
- Coal Tests.** Tests of coal used in gas making. Geol. of O., v. 5, pp. 713-17.
- Coalton Coal.** Roy. Coalton or Wellston coal in Jackson county. Geol. of O., v. 5, pp. 1015-1021.
- Coelenterata, see Paleontology, Genera and Species.*
- Coke Analyses.** Coke from Tuscarawas county. Geol. of O., v. 3, pp. 89, 131.
- Analyses of coke from U. S. and Europe. Geol. of O., v. 5, p. 559.
- Coke.** Newton. Manufacture of. Geol. of O., v. 5, pp. 555-576.
- Coke Ovens.** Newton. Ovens for manufacture of coke. Geol. of O., v. 5, pp. 567-76.
- Cold-water Paints.** Peppel. Use of hydrated lime in cold-water paints. O. Geol. Sur., Bull. No. 4, p. 241.
- Colerain Oil Field.** Bownocker. Wells in Belmont county. O. Geol. Sur., Bull. No. 1, pp. 217-18.
- Colonial Salt Company.** Bownocker. Methods of manufacture. O. Geol. Sur., Bull. No. 8, pp. 37-38.
- Columbian System.** Eno. Columbian system of reinforced concrete. O. Geol. Sur., Bull. No. 2, p. 137.
- Columbiana County.** Bownocker. Early history of salt industry in this county. O. Geol. Sur., Bull. No. 8, p. 13.
- Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 250-57. Center township, pp. 254-55. Elk Run township, p. 254. Fairfield township, p. 256. Hanover township, p. 257. Knox township, pp. 256-57. Madison township, pp. 252-53. Middleton township, p. 256. St. Clair township, p. 254. Unity township, pp. 255-56. Washington township, p. 257. Wayne township, p. 256. West township, p. 257. Yellow Creek township, pp. 251-52.
- Newberry. Geology. Geol. of O., v. 3, pp. 90-132.
- Newberry. Topography. Geol. of O., v. 3, pp. 90-91.
- Orton. Coal mines. Geol. of O., v. 5, pp. 184-207.

- Columbiana County.** Orton. Deep wells, drilling for oil and gas. Geol. of O., v. 6, pp. 403-04.
- Orton. Iron ores. Geol. of O., v. 5, pp. 384-86.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to their fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 56-58.
- Root. Salt manufacture. Geol. of O., v. 6, p. 654.
- Columbus Limestone.** Orton, Jr., and Peppel. Composition of, in Franklin county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 63-65.
- Orton, Jr., and Peppel. Composition, physical character and uses of, in Ohio. O. Geol. Sur., Bull. No. 4, pp. 159-68.
- Prosser. Propriety of retaining this name for certain of the Devonian limestones of the revised Ohio geological scale. O. Geol. Sur., Bull. No. 7, pp. 24-25. 
- Columns.** Eno. Use of reinforced concrete for columns and pillars. O. Geol. Sur., Bull. No. 2, pp. 147-48. 
- Compression.** Peppel. Compression shown by lime-sand brick in pressing. O. Geol. Sur., Bull. No. 5, p. 45.
- Conchology, see Mollusca; Paleontology, Genera and Species.*
- Concrete.** Eno. Adhesion of concrete to metal. O. Geol. Sur., Bull. No. 2, p. 129.
- Eno. Coefficient of expansion of concrete. O. Geol. Sur., Bull. No. 2, pp. 121-22.
- Eno. Specifications for concrete used in concrete construction. O. Geol. Sur., Bull. No. 2, p. 191.
- Eno. Specifications for heavy concrete as practiced by U. S. engineer. O. Geol. Sur., Bull. No. 2, pp. 208-10.
- Eno. Tables showing cost of concrete work in various parts of U. S. O. Geol. Sur., Bull. No. 2, pp. 122-23.
- Eno. Uses of cement in concrete. O. Geol. Sur., Bull. No. 2, pp. 63-123.
- Concrete Blocks.** Eno. Use of concrete blocks in building houses. O. Geol. Sur., Bull. No. 2, pp. 74-78.
- Concrete Construction.** Eno. Specifications for concrete sidewalks and paving as used in Columbus, Ohio. O. Geol. Sur., Bull. No. 2, pp. 201-03.
- Eno. Specifications for concrete sidewalks as used in Peoria, Ill. O. Geol. Sur., Bull. No. 2, pp. 204-07.

- Concrete Curb.** Eno. Specifications for concrete curb in use in Peoria, Ill. O. Geol. Sur., Bull. No. 2, pp. 221-22.
- Concrete Mixers.** Eno. Machines used for mixing concrete. O. Geol. Sur., Bull. No. 2, pp. 225, 230-37.
- Concrete Sidewalks.** Eno. Sample specification form for sidewalk construction. O. Geol. Sur., Bull. No. 2, pp. 198-99.
- Eno. Specification for concrete walks as used in Chicago, Ill. O. Geol. Sur., Bull. No. 2, p. 200.
- Concrete Specifications.** Eno. Specifications for concrete work. O. Geol. Sur., Bull. No. 2, pp. 189-222.
- Conemaugh Formation.** Prosser. Name and position of this formation in the revised geological scale of Ohio. O. Geol. Sur., Bull. No. 7, pp. 7-8.
- Conglomerate.** Andrews. Conglomerate of the Coal-measures. Rep. Prog. 1870, pp. 66-71.
- Briggs. Conglomerate in Hocking and Athens counties. Ann. Rep., v. 2, 1838, pp. 131-32.
- Foster. Conglomerate in Muskingum, Licking and Franklin counties. Ann. Rep., v. 2, 1838, pp. 99-103.
- Newberry. Carboniferous conglomerates in Cuyahoga county. Geol. of O., v. 1, pt. 1, pp. 184-85.
- Newberry. Conglomerate in Mahoning county. Geol. of O., v. 3, p. 784.
- Newberry. Conglomerate in Ohio. Geol. of O., v. 2, pt. 1, pp. 103-13; v. 3, pp. 25-26.
- Newberry. Conglomerate in Summit county. Geol. of O., v. 1, pt. 1, pp. 212-14.
- Newberry. Fossils. Geol. of O., v. 2, pt. 1, pp. 110-11.
- Orton. Conglomerate in Pike county. Geol. of O., v. 2, pt. 1, pp. 630-31.
- Read. Carboniferous conglomerate in Licking county. Geol. of O., v. 3, pp. 358-59.
- Read. Conglomerate in Geauga county. Rep. Prog. 1870, p. 467-68.
- Read. Conglomerate in Geauga county. Geol. of O., v. 1, pt. 1, pp. 522-23.
- Read. Conglomerate in Holmes county. Rep. Prog. 1870, pp. 475-76.
- Read. Conglomerate in Holmes county. Geol. of O., v. 3, pp. 545-48.

- Conglomerate.** Read. Conglomerate in Trumbull county. Geol. of O., v. 1, pt. 1, pp. 502-03.
- Read. Sub-carboniferous conglomerate in Wayne county. Geol. of O., v. 3, p. 538.
- Read. Waverly conglomerate in Knox county. Geol. of O., v. 3, pp. 337-40.
- Read. Waverly conglomerate in Licking county. Geol. of O., v. 3, pp. 360-61.
- Read. Conglomerate in Richland county. Geol. of O., v. 3, pp. 316-23.
- Wheat. Carboniferous conglomerate in Medina county. Geol. of O., v. 3, pp. 363-67, 375-76, 378-79.
- Conglomerate Group.** Orton. Conglomerate group in Ohio. Geol. of O., v. 6, p. 43; v. 7, p. 36. Same, Rep. 1890, pp. 43-44.
- Conveying Devices.** Peppel. Conveying machinery used in the manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, p. 62.
- Cope, Edward D.** Synopsis of the extinct batrachia from the Coal-measures. Geol. of O., v. 2, pt. 2, pp. 351-411.
- Corals.** Nicholson. Description of the corals of the Silurian and Devonian systems. Geol. of O., v. 2, pt. 2, pp. 183-242.
- Orton. Corals of the Cincinnati group. Geol. of O., v. 1, pt. 1, pp. 387-88.
- See also Paleontology—Genera and Species.*
- Corniferous Group.** Gilbert. Corniferous group in Lucas county. Rep. Prog. 1870, pp. 493-94.
- Meek. Fossils. Geol. of O., v. 1, pt. 2, pp. 194-236.
- Meek. List of fossils. Geol. of O., v. 1, pt. 2, pp. 242-43.
- Corniferous limestone.** Andrews. Corniferous limestone in Pickaway county. Geol. of O., v. 2, pt. 1, pp. 591-92.
- Gilbert. Corniferous group in Lucas county. Geol. of O., v. 1, pt. 1, pp. 575-77. Fossils, p. 577.
- Hawes. Building stone in Ohio. Geol. of O., v. 5, pp. 629-37.
- Hill. Corniferous limestone in Logan county. Geol. of O., v. 3, pp. 485-87.
- Newberry. Corniferous limestone. Geol. of O., v. 1, pt. 1, pp. 142-49. Fossils, pp. 144-47.
- Newberry. Corniferous limestone of the Cincinnati arch. Geol. of O., v. 1, pt. 1, pp. 105-07.

- Corniferous limestone.** Newberry. Corniferous limestone in Erie county. Geol. of O., v. 2, pt. 1, pp. 190-93.
- Newberry. Limestone of Kelly's Island. Geol. of O., v. 2, pt. 1, pp. 200-01.
- Newberry. Corniferous limestone in Ohio. Rep. Prog. 1869, pp. 17-18; Geol. of O., v. 1, pt. 1, pp. 67-68; v. 3, pp. 10-11.
- Newberry. Fishes. Geol. of O., v. 1, pt. 2, pp. 264-68.
- Newberry. Fossils. Geol. of O., v. 2, pt. 1, pp. 191-93.
- Nicholson. Corals. Geol. of O., v. 2, pt. 2, pp. 230-42.
- Orton. Corniferous limestone in Franklin county. Geol. of O., v. 3, pp. 603-632.
- Orton. Corniferous limestone in geological series of Ohio. Prelim. Rep. on petroleum and inflammable gas, 1887, p. 34. Rep. 1886, p. 23.
- Orton. Corniferous limestone in Madison county. Geol. of O., v. 3, pp. 421-23.
- Orton. Fossils. Geol. of O., v. 3, pp. 618-29.
- Orton, Jr., and Peppel. Composition of, in Crawford county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, p. 58; in Defiance county, pp. 59-60; in Delaware county, pp. 60-61; in Erie county, pp. 61-62; in Franklin county, pp. 63-65; in Henry county, p. 134; in Logan county, p. 89; in Lucas county, pp. 90-92; in Marion county, pp. 93-96; in Ottawa county, pp. 108-111; in Paulding county, p. 135; in Pickaway county, p. 135; in Sandusky county, pp. 120-21; in Seneca county, pp. 124-25; in Union county, p. 135; in Wood county, pp. 132-34; in Wyandot county, p. 135.
- Orton Jr. and Peppel. Corniferous for Portland cement making. O. Geol. Sur., Bull. No. 3, p. 90.
- Orton, Jr., and Peppel. Composition, physical character and uses in Ohio. O. Geol. Sur., Bull. No. 4, pp. 158-68.
- Peppel. Use of Corniferous as building stone in Ohio. O. Geol. Sur., Bull. No. 4, p. 212.
- Peppel. Use of, for crushed stone in Ohio. O. Geol. Sur., Bull. No. 4, pp. 216-222.
- Read. Corniferous limestone in Huron county. Geol. of O., v. 3 p. 309.
- Winchell. Corniferous limestone in Crawford county. Geol. of O., v. 2, pt. 1, pp. 243-246.
- Winchell. Corniferous group in Delaware county. Geol. of O., v. 2, pt. 1, pp. 289-301.

Corniferous limestone. Winchell. Corniferous limestone in Marion county. Geol. of O., v. 1, pt. 1, pp. 642-43.

———Winchell. Corniferous in Paulding county. Geol. of O., v. 2, pt. 1, pp. 339-40.

———Winchell. Corniferous limestone in Sandusky county. Geol. of O., v. 1, pt. 1, pp. 603-06.

———Winchell. Corniferous limestone in Seneca county. Geol. of O., v. 1, pt. 1, pp. 619-22. Eden, Bloom township, p. 619. Scipio, Eden township, p. 620. Thompson township, pp. 620-21. Bloom township, pp. 621-22.

———Winchell. Corniferous limestone in Wyandot county. Geol. of O., v. 1, pt. 1, pp. 636-37.

———Winchell. Lower Corniferous in Hardin county. Geol. of O., v. 2, pt. 1, p. 356.

———Winchell. Lower Corniferous in Union county. Geol. of O., v. 2, pt. 1, p. 328.

———Winchell. Lower Corniferous in Wood county. Geol. of O., v. 2, pt. 1, p. 383.

See also Upper Helderberg Group, Columbus limestone; Delaware limestone.

Corning Oil and Gas Field. Bownocker. Wells in Perry county. O. Geol. Sur., Bull. No. 1, pp. 257-65.

Corrosion. Eno. Dangers of corrosion in steel and iron bars used in reinforced concrete construction. O. Geol. Sur., Bull. No. 2, pp. 126-29.

Coshocton. Orton. Deep wells, explorations for natural gas in Clinton limestone. Rep. 1890, pp. 245-46.

Coshocton County. Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 291-92. Adams township, p. 292. Franklin township, p. 292. Jefferson township, p. 292. Lafayette township, p. 292. Linton township, p. 292. Tuscarawas township, pp. 291-92. White Eyes township, p. 292.

———Hodge. Geology. Geol. of O., v. 3, pp. 562-95. Geologic map, Coshocton and other counties, 31.7x42 cm.

———Hodge. Topography. Geol. of O., v. 3, pp. 562-63.

———Hodge. Local geology. Geol. of O., v. 3, pp. 569-94. Adams township, pp. 579-80. Bedford township, pp. 581-83. Bethlehem township, pp. 577-78. Clarke township, pp. 569-72. Crawford township, p. 574. Franklin township, pp. 591-92. Jackson township, pp. 583-85. Jefferson township, pp. 576-77. Keene

Coshocton County. Hodge.—(Continued.)

township, pp. 578-79. Lafayette township, p. 588. Linton township, pp. 592-94. Newcastle township, pp. 574-76. Mill Creek township, pp. 572-74. Monroe township, p. 569. Oxford township, p. 588. Perry township, pp. 580-81. Pike township, pp. 588-89. Tiverton township, pp. 568-69. Tuscarawas township, pp. 585-87. Virginia township, pp. 590-91. Washington township, pp. 589-90. White Eyes township, p. 579.

——Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 368-69.

——Orton, Jr. Coal mines. Geol. of O., v. 5, pp. 843-67.

——Orton, Jr., and Peppel. Limestone resources of, small. O. Geol. Sur., Bull. No. 4, p. 136.

——Riddell. Geology of Holmes, Coshocton and Muskingum counties. Exec. Docs. 1836, Rep. No. 60, pp. 27-30.

Cow Run Oil Field. Bownocker. Geology. O. Geol. Sur., Bull. No. 1, pp. 167-70.

——Bownocker. Oil and gas in Washington county. O. Geol. Sur., Bull. No. 1, pp. 150-54; 164-72.

Cracks. Eno. Hair cracks or sun cracks in cement surfaces. O. Geol. Sur., Bull. No. 2, pp. 37-41.

Crawford County. Briggs. Geology. Ann. Rep., v. 2, 1838, pp. 118-129.

——Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 363-64.

——Orton, Jr., and Peppel. Composition of lieestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, p. 58.

——Riddell. Geological formation. Ohio Exec. Docs. 1836, pt. 1, pp. 15-18.

——Winchell. Geology. Geol. of O., v. 2, pt. 1, pp. 236-52. Geologic map, 10.8x10.5 cm.

——Winchell. Topography. Geol. of O., v. 2, pt. 1, pp. 236-39.

Creaceous System. Newberry. Geol. of O., v. 1, pt. 1, pp. 82-83.

Crinoidea, see Echinoderma (Palaeozoic); Palaeontology, Genera and Species

Crops. Klippart. Tables of, from Maumee valley. Rep. Prog. 1870, pp. 382-92.

Crushed Stone. Orton, Jr., and Peppel. Use of Corniferous limestone for crushed stone and ballast. O. Geol. Sur., Bull. No. 4, p. 166.

- Crushed Stone.** Orton, Jr. and Peppel. Use of Niagara limestones for crushed stone in Ohio. O. Geol. Sur., Bull. No. 4, p. 154.
- Peppel. Use of limestone for crushed stone in Ohio. O. Geol. Sur., Bull. No. 4, pp. 216–222.
- Crushing Machines.** Bleininger. Machines used for crushing test of Portland cement. O. Geol. Sur., Bull. No. 3, pp. 342–49.
- Bleininger. Rough crushing machinery for preparation of cement. O. Geol. Sur., Bull. No. 3, pp. 254–59.
- Crushing Strength.** Peppel. Mechanical test to determine crushing strength of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 48–49.
- Crustacea.** Locke. *Isoletus maximus* found in Adams county. Ann. Rep., v. 2, 1838, pp. 247–49. Plates showing drawings of this trilobite.
- Meek. Crustacea of Cincinnati group. Geol. of O., v. 1, pt. 2, pp. 158–75.
- Meek. Crustacea of the Corniferous group. Geol. of O., v. 1, pt. 2, pp. 233–36.
- Meek. Crustacea of the Niagara and Clinton groups. Geol. of O., v. 1, pt. 2, pp. 187–93.
- See also Paleontology—Genera and Species.*
- Orton. Trilobites of Cincinnati group. Geol. of O., v. 1, pt. 1, pp. 398–99.
- Cryptograms.** Kellerman and Werner. Vascular cryptograms of Ohio. Geol. of O., v. 7, pt. 2, pp. 246–51.
- Cubical Mixers.** Eno. Cubical concrete mixing machines, with illustration. O. Geol. Sur., Bull. No. 2, pp. 232–34.
- Culverts.** Eno. Use of concrete in culverts. O. Geol. Sur., Bull. No. 2, p. 68.
- Cumberland Coal.** Andrews. Cumberland coal in Morgan county. Geol. of O., v. 1, pt. 1, pp. 294–313.
- Cummings' System.** Eno. Cummings' system of reinforced concrete construction. O. Geol. Sur., Bull. No. 2, p. 137.
- Curbs.** Eno. Use of concrete for curbs and gutters. O. Geol. Sur., Bull. No. 2, pp. 116–17.
- Cuyahoga County.** Newberry. Geology. Geol. of O., v. 1, pt. 1, pp. 171–200. Geological map of the county (colored), 12.3x21.2 cm.
- Newberry. Soil of. Geol. of O., v. 1, pt. 1, pp. 173–74.
- Newberry. Topography. Geol. of O., v. 1, pt. 1, pp. 171–73.

- Cuyahoga County.** Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 351-56.
- Orton. Shale gas. Geol. of O., v. 6, pp. 428-36.
- Cuyahoga Formation.** Prosser. Position of the Cuyahoga formation in the revised Ohio geological scale. O. Geol. Sur., Bull. No. 7, pp. 18-19.
- Cuyahoga Shale.** Herrick. Cuyahoga shale and its fossils. Geol. of O., v. 7, pt. 2, pp. 508-12.
- Newberry. Cuyahoga shale in Lorain county. Geol. of O., v. 2, pt. 1, pp. 210-11.
- Newberry. Cuyahoga shale in Ohio. Geol. of O., v. 2, pt. 1, pp. 87-88. * Fossils, p. 88.
- Newberry. Cuyahoga shale in Summit county. Geol. of O., v. 1, pt. 1, pp. 210-12.
- Orton. Cuyahoga shale in Ohio. Geol. of O., v. 6, pp. 37-39. Same, Rep. 1890, pp. 37-39.
- Orton. Cuyahoga shale in Ohio. Geol. of O., v. 7, pp. 31-32.
- Read. Cuyahoga shales in Geauga county. Geol. of O., v. 1, pt. 1, p. 525.
- Read. Cuyahoga shales in Huron county. Geol. of O., v. 3, pp. 299-300.
- Read. Cuyahoga shale in Trumbull county. Geol. of O., v. 1, pt. 1, pp. 503-14.
- Wheat. Cuyahoga shale in Medina county. Geol. of O., v. 3, pp. 363-65, 367-68, 373-75.
- Winchell. Cuyahoga shales and sandstones in Delaware county. Geol. of O., v. 2, pt. 1, pp. 276-282.
- Winchell. Cuyahoga shale and sandstone in Morrow county. Geol. of, v. 2, pt. 1, pp. 257-59.
- Cystoidea, see Echinoderma; Paleontology—Genera and Species.*
- Dams.** Eno. Specifications for concrete dam in Scioto river, Columbus, Ohio. O. Geol. Sur., Bull. No. 2, pp. 211-14.
- Use of Concrete in construction of Dams. O. Geol. Sur., Bull. No. 2, pp. 99-104.
- Use of steel concrete for dams. O. Geol. Sur., Bull. No. 2, pp. 179-82.
- Darke County.** Bownocker. Oil production. O. Geol. Sur., Bull. No. 1, p. 99.
- Geologic map, Darke and other counties, showing oil and gas territories. 20.7x21 cm. opp. p.80.

- Darke County.** Lindemuth. Geology. Geol. of O., v. 3, pp. 496-518.
Topography. Geol. of O., v. 3, pp. 496-99.
- Orton. Lime Production. Geol. of O., v. 6, pp. 726-27.
Oil and gas wells. Geol. of O., v. 6, pp. 271-73.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 58-59.
- Dayton Limestone.** Locke and Wormley. Analysis. Geol. of O., v. 5, pp. 115.
- Orton. Occurrence of, in Green county. Geol. of O., v. 2, pt. 1, pp. 668-69.
- Orton, Jr., and Peppel. Composition, character and uses of, in Ohio. O. Geol. Sur., Bull. No. 4, p. 148.
- Orton, Jr., and Peppel. Composition of, in Greene county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 67-68.
- Decatur Township, Lawrence County.** Orton, Jr., and Peppel. Ferrous limestone in Ohio. O. Geol. Sur., Bull. No. 4, p. 178.
- Decorative Tile.** Orton, Jr. Manufacture of encaustic tiling in Ohio. Geol. of O., v. 5, pp. 717-19.
- Defiance County.** Orton, Jr., and Peppel. Composition of limestones of, with reference to their fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 59-60.
- Winchell. Geology. Geol. of O., v. 2, pt. 1, pp. 422-38. Geologic map, 15.8x9.7 cm.
Topography. Geol. of O., v. 2, pt. 1, pp. 422-23.
- Delaware County.** Orton. Lime production. Geol. of O., v. 6, pp. 762-65.
- Orton, Jr., and Peppel. Compositions of limestones of, with reference to their fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 60-61.
- Winchell. Geology. Geol. of O., v. 2, pt. 1, pp. 272-311. Geologic map, 13.8x10.5 cm.
Topography. Geol. of O., v. 2, pt. 1, pp. 272-73.
- Delaware Limestone.** Orton, Jr., and Peppel. Composition of, in Delaware county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 60-62; in Franklin county, pp. 63-65.
- Orton, Jr., and Peppel. Composition, physical character and uses, in Ohio. O. Geol. Sur., Bull. No. 4, pp. 159-168.

- Delaware Limestone.** Prosser. Notes on propriety of applying this name to certain of the Devonian limestones of revised Ohio geological scale. O. Geol. Sur., Bull. No. 7, p. 24.
- DeMan's System.** Eno. De Man's system of reinforced concrete construction. O. Geol. Sur., Bull. No. 2, p. 139.
- Devonian Limestones.** Orton, Jr., and Peppel. Composition, physical character and uses of, in Ohio. O. Geol. Sur., Bull. No. 4, pp. 158-68.
- Devonian System.** Bownocker. Oil and gas producing rocks in Ohio. O. Geol. Sur. Bull. No. 1, pp. 21-22.
- Meek. Description of invertebrate fossils of Devonian and Silurian systems. Geol. of O., v. 1, pt. 2, pp. 1-243.
- Newberry. Devonian in Cuyahoga county. Geol. of O., v. 1, pt. 1, pp. 190-200.
- Devonian System in Ohio. Geol. of O., v. 1, pt. 1, pp. 65-72, v. 3, pp. 9-18.
- Fishes of. Geol. of O., v. 1, pt. 2, pp. 263; v. 2, pt. 3, p. 3-40.
- Nicholson. Amorphozoa. Geol. of O., v. 2, pt. 2, pp. 245-55.
- Prosser. The division line between Devonian and Carboniferous in revised geological scale of Ohio. O. Geol. Sur., Bull. No. 7, pp. 20-21.
- Prosser. Table showing formations included in this system in revised nomenclature of Ohio geological series. O. Geol. Sur., Bull. No. 7, p. 3.
- See also Ohio series; Paleontology-Genera and species.*
- Dip.** Orton. Strata dip in Ross county. Geol. of O., v. 2, pt. 1, pp. 656-58.
- Diluvium, see Drift.*
- Dip of Strata.** Orton. Effects of disturbances of strata upon accumulation of oil and gas. Geol. of O., v. 6, pp. 89-96; Rep. 1890, pp. 89-92.
- Whittlesey. Geological Report. Ann. Rep., v. 2 (1838), pp. 41-43.
- Disinfectant.** Peppel. Use of hydrated lime as a disinfectant and anti-septic. O. Geol. Sur., Bull. No. 4, p. 244.
- Disintegrators.** Bleininger. Machines used in cement grinding. O. Geol. Sur., Bull. No. 3, pp. 266-67.
- Dolomite.** Bleininger. Dolomite as constituent of hydraulic cement. O. Geol. Sur., Bull. No. 3, pp. 37-38.

- Dolomite.** Orton, Jr. and Peppel. Dolomitic limestone in the western area of Ohio, and its commercial uses. O. Geol. Sur., Bull. No. 4, pp. 23-24.
- Dolomite Lime.** Peppel. Definition, uses and manufacture. O. Geol. Sur., Bull. No. 4, pp. 251-59.
- Peppel. Dolomite lime in lime industry of Ohio. O. Geol. Sur., Bull. No. 4, pp. 222-30.
- Peppel. Method of slaking dolomite lime. O. Geol. Sur., Bull. No. 4, pp. 258-59.
- Draft.** Peppel. Importance of the draft in burning lime. O. Geol. Sur., Bull. No. 4, p. 310.
- Drainage.** Klippart. Drainage in Maumee valley. Rep. Prog., 1870. pp. 329-39.
- Drain-Tile.** Orton, Jr. Manufacture in Ohio. Geol. of O., v. 5, pp. 709-11.
- Drawing.** Peppel. Drawing of lime after burning. O. Geol. Sur., Bull. No. 4, pp. 315-16.
- Dresden.** Orton. Deep wells, explorations for natural gas in Clinton Limestone. Sep., 1890, pp. 246.
- Drift.** Andrews. Drift in Fairfield county. Geol. of O., v. 2, pt. 1, p. 593.
- Andrews. Drift in Second geological district. Rep. Prog., 1869, pp. 58-61.
- Andrews. Surface drift in Second geological district. Rep. Prog., 1870, pp. 57-8.
- Andrews. Drift in the Second geological district. Geol. of O., v. 2, pt. 1, pp. 441-52.
- Bleininger. Glacial clays suitable for cement making. O. Geol. Sur., Bull. No. 3, pp. 82-83.
- Briggs. Superficial materials in Crawford county. Ann. Rep., v. 2, 1838, pp. 122-29.
- Briggs. Superficial materials resting on the limestone in Wood county. Ann. Rep., v. 2, 1838, pp. 114-18.
- Gilbert. Drift in Williams county. Rep. Prog., 1870, pp. 487-88.
- Gilbert. Superficial deposits in Lucas county. Rep. Prog., 1870, pp. 495-96.
- Gilbert. Surface geology in Maumee valley. Geol. of O., v. 1, pt. 1, pp. 537-56.

- Drift.** Herzer. Drift in Brown county. Geol. of O., v. 3, p. 943.
- Hill. Drift in Champaign county. Geol. of O., v. 3, pp. 493-94.
- Hussey. Drift in Fayette and Clinton counties. Geol. of O., v. 3, pp. 436-40.
- Hussey. Drift in Miami county. Geol. of O., v. 3, pp. 473-77.
- Hussey. Shelby county. Geol. of O., v. 3, pp. 458-64.
- Lindemuth. Drift in Darke county. Geol. of O., v. 3, pp. 499-509.
- Newberry. Deposits of Portage county. Geol. of O., v. 3, pp. 133-36. In Cuyahoga county. Geol. of O., v. 1, pt. 1, pp. 174-84. In Lorain county. Geol. of O., v. 2, pt. 1, pp. 208-210. Drift in Ohio. Rep. Prog., 1869, pp. 23-32. Drift in Ohio. Geol. of O., v. 1, pt. 1, pp. 85-8; v. 2, pt. 1, pp. 1-80. Drift deposits in Summit county. Geol. of O., v. 1, pt. 1, pp. 205-6.
- Orton. Drift beds in Butler county. Geol. of O., v. 3, pp. 394-99.
- Orton. Drift deposits in Clermont county. Geol. of O., v. 1, pt. 1, pp. 438-46.
- Orton. Drift deposits in Hamilton county. Geol. of O., v. 1, pt. 1, pp. 425-34.
- Orton. Drift deposits in Ohio. Geol. of O., v. 6, pp. 772-82.
- Orton. Drift in Clark county. Geol. of O., v. 1, pt. 1, pp. 455-62.
- Orton. Drift in Franklin county. Geol. of O., v. 3, pp. 643-46.
- Orton. Drift in Greene county. Geol. of O., v. 2, pt. 1, pp. 679-81.
- Orton. Drift in Highland county. Rep. Prog., 1870, pp. 264-67.
- Orton. Drift in Madison county. Geol. of O., v. 3, pp. 423-27.
- Orton. Drift in Montgomery county. Rep. Prog., 1869, pp. 144-58.
- Orton. Drift in Pike county. Geol. of O., v. 2, pt. 1, pp. 634-36.
- Orton. Drift in Preble county. Geol. of O., v. 3, pp. 411-15.
- Orton. Drift in Ross county. Geol. of O., v. 2, pt. 1, pp. 651-55.
- Orton. Drift in Warren county. Geol. of O., v. 3, pp. 386-91.
- Orton. Glacial drift as a source of natural gas. Preliminary report on petroleum and inflammable gas. 1886, pp. 68-70; 1887, pp. 99-101.
- Orton. Glacial drift in geological series of Ohio. Prelim. Rep. on petroleum and inflammable gas. 1886, pp. 27-28; Rep. 1887, pp. 40-41.
- Orton. Glacial drift in Ohio. Geol. of O., v. 6, p. 44; same Rep., 1890, p. 45; Geol. of O., v. 7, pp. 37-39.

- Drift.** Orton. Lime production. Geol of O., v. 6, p. 708.
- Read. Drift in Geauga county. Rep. Prog., 1870, p. 470.
- Read. Drift in Holmes county. Rep. Prog., 1870, p. 474; Geol. of O., v. 3, p. 541.
- Read. Drift in Knox county. Geol. of O., v. 3, pp. 325-33.
- Read. Drift in Licking county. Geol. of O., v. 3, pp. 349-52.
- Read. Drift in Richland county. Geol. of O., v. 3, pp. 312-14.
- Read. Soil, drift and lake ridges of Lake county. Geol. of O., v. 1, pt. 1, pp. 516-19.
- Read. Drift of Ashland county. Geol. of O., v. 3, pp. 520-22.
- Read. Surface deposits in Geauga county. Geol. of O., v. 1, pt. 1, pp. 527-28.
- Read. Surface deposits in Huron county. Geol. of O., v. 3, pp. 289-99.
- Winchell. Drift in Allen county. Geol. of O., v. 2, pt. 1 p. 401.
- Winchell. Drift in Auglaize county. Geol. of O., v. 2, pt. 1, pp. 407-08.
- Winchell. Drift in Crawford county. Geol. of O., v. 2, pt. 1, pp. 46-48.
- Winchell. Drift in Defiance county. Geol. of O., v. 2, pt. 1, pp. 428-34.
- Winchell. Drift in Delaware county. Geol. of O., v. 2, pt. 1, pp. 302-06.
- Winchell. Drift in Hancock county. Geol. of O., v. 2, pt. 1, pp. 364-65.
- Winchell. Drift in Hardin county. Geol. of O., v. 2, pt. 1, pp. 356-57.
- Winchell. Drift in Henry county. Geol. of O., v. 2, pt. 1, pp. 418-21.
- Winchell. Drift in Marion county. Geol. of O., v. 1, pt. 1, p. 644.
- Winchell. Drift in Mercer county. Geol. of O., v. 2, pt. 1, 413.
- Winchell. Drift in Morrow county. Geol. of O., v. 2, pt. 1, pp. 265-67.
- Winchell. Drift in Paulding county. Geol. of O., v. 2, pt. 1, p. 345.
- Winchell. Drift in Putnam county. Geol. of O., v. 2, pt. 1, pp. 391-92.
- Winchell. Drift in Sandusky county. Geol. of O., v. 1, pt. 1, p. 606.

- Drift.** Winchell. Drift in Seneca county. Geol. of O., v. 1, pt. 1, pp. 622-23.
- Winchell. Drift in Union county. Geol. of O., v. 2, pt. 1, pp. 329-32.
- Winchell. Drift in Van Wert county. Geol. of O., v. 2, pt. 1, pp. 318-21.
- Winchell. Drift in Wyandot county. Geol. of O., v. 1, pt. 1, pp. 637-39.
- Winchell. Drift in Wood county. Geol. of O., v. 2, pt. 1, pp. 383-85.

See also Pleistocene.

- Dromedary Mixer.** Eno. Dromedary concrete mixing machine. With illustration. O. Geol. Sur., Bull. No. 2, pp. 232, 236-237.
- Drum Mixer.** Eno. Ransome drum mixer for concrete making. O. Geol. Sur., Bull. No. 2, pp. 225, 230-231.
- Dry Slaking Process.** Peppel. The dry slaking process in manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 20-21.
- Dunkard Formation.** Prosser. Location of Dunkard formation in Ohio geological scale. O. Geol. Sur., Bull. No. 7, p. 7.
- Dykema Block Machine.** Eno. Dykema machine for concrete blocks. O. Geol. Sur., Bull. No. 2, pp. 240-45.

Earthenware, see Pottery.

- Eastern Ohio Region.** Lord. Iron manufacture. Geol. of O., v. 5, pp. 468-73.
- East Liverpool Gas Wells.** Orton. Berea grit as source of East Liverpool gas wells. Prelim. Rep., on petroleum and inflammable Gas. 1886, pp. 55-56; 1887, pp. 81-82.
- Orton. Productive oil and gas fields of Ohio. Geol. of O., v. 6, pp. 333-36.
- Echinoderma.** Meek. Asteroidea, in the Cincinnati group. Geol. of O., v. 1, pt. 2, pp. 58-68.
- Meek. Crinoidea of the Cincinnati group. Geol. of O., v. 1, pt. 2, pp. 1-39.
- Meek. Cystoidea of the Cincinnati group. Geol. of O. v. 1, pt. 2, pp. 39-58.
- Meek. Ophiuroidea of the Cincinnati group. Geol. of O., v. 1, pt. 2, pp. 68-9.
- Orton. Crinoidea of the Cincinnati group. Geol. of O., v. 1, pt. 1, pp. 388-90.

See also Palaeontology-Genera and Species.

- Economic Geology.** Lindemuth. Economic geology of Darke county. Geol. of O., v. 3, pp. 516-18.
- Eden Shale.** Prosser. Arguments advanced by geologists in support of use of this name in revised Ohio geological scale. O. Geol. Sur., Bull. No. 7, pp. 34-35.
- Elasmobranchii.** Newberry. Elasmobranchii of the carboniferous. Geol. of O., v. 1, pt. 2, pp. 325-37.
- Elasmobranchii of the Devonian. Geol. of O., v. 1, pt. 2, pp. 302-24.
- Elasticity.** Peppel. Elastic property of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 59-60.
- Peppel. Elasticity shown by sand-lime brick in pressing. O. Geol. Sur., Bull. No. 5, p. 45.
- Eldred Lime-burning System.** Peppel. Description of Eldred system for burning lime. O. Geol. Sur., Bull. No. 4, pp. 282-83.
- Electric Fountains.** Eno. Use of steel concrete for electric fountains. O. Geol. Sur., Bull. No. 2, pp. 178.
- Electrical Resistance.** Peppel. Tests showing electrical resisting strength of sand-lime brick. O. Geol. Sur., Bull. No. 5, p. 58.
- Elephant, see Mastodon.*
- Elevated Railroads.** Eno. Use of steel concrete on elevated railroads. O. Geol. Sur., Bull. 2, pp. 174.
- Elevations.** Orton. Table giving elevations above sea level in Northern Indiana. Prelim. Rep., on petroleum and inflammable gas. 1887, pp. 191-93.
- Table of elevations above sea level in western counties of Ohio. Prelim. Rep., on Petroleum and inflammable gas. 1887, pp. 178-90.
- Elevators.** Eno. Use of concrete for tanks, silos and elevators. O. Geol. Sur., Bull., No. 2, pp. 153-58.
- Elizabeth Township, Lawrence County.** Orton, Jr., and Peppel. Ferriferous limestone in. O. Geol. Sur., Bull. No. 4, pp. 176-78.
- Elk Pool Run.** Bownocker. Wells of Independence township, Washington county. O. Geol. Sur., Bull. No. 1, pp. 185-87.
- England.** Eno. Early use of cements in England. O. Geol. Sur., Bull. No. 2, pp. 19-20.
- Eno, Frank Harvey.** Uses of hydraulic cements. O. Geol. Sur., Bull. No. 2.

- Eozoic System.** Newberry. Eozoic system in Ohio. Geol. of O., v. 1, pt. 1, pp. 56-7.
- Erie Clay.** Gilbert. Erie clay of the Maumee valley. Geol. of O., v. 1, pt. 1, pp. 544-49.
- Newberry. Erie clay in Ohio. Geol. of O., v. 2, pt. 1, pp. 21-30. v. 3, pp. 32-38.
- Erie County.** Newberry. Geology. Geol. of O., v. 2, pt. 1, pp. 183-96. Geologic map of Erie county and islands, 20x12.4 cm.
- Surface features and deposits. Geol. of O., v. 2, pt. 1, pp. 183-86.
- Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 346-47.
- Orton. Shale gas. Geol. of O., v. 6, pp. 439-40.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to their fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 61-63.
- Erie, Lake.** Mather. Rise and fall of lake Erie. Ann. Rep., v. 2, 1838, pp. 23-24. Same, Exec. Docs., 1838, Rep., 22 pp. 23-24.
- Mather. Degradation of the Lake coast. Ann. Rep., v. 1, 1837, pp. 15-18.
- Newberry. Islands of. Geol. of O., v. 1, pt. 1, pp. 110-11; v. 2, pt. 1, pp. 197-205.
- Newberry. Soil and vegetation. Geol. of O., v. 2, pt. 1, pp. 199-200.
- Whittlesey. Encroachments upon the shore. Ann. Rep., v. 2, 1838, pp. 53-54.
- Whittlesey. Height of water in Lake Erie. Ann. Rep., v. 2, 1838, pp. 50-52.
- Erie Shale.** Newberry. Erie shale in Erie county. Geol. of O., v. 2, pt. 1, pp. 188.
- Newberry. Erie shale in Lorain county. Geol. of O. v. 2, pt. 1, p. 213.
- Newberry. Erie shale in Summit county. Geol. of O., v. 1, pt. 1, p. 208.
- Newberry. Erie shale in Ohio. Geol. of O., v. 3, pp. 18-19.
- Orton. Erie shale in Hamilton county. Geol. of O., v. 1 pt. 1, pp. 423-24.
- Read. Erie shale of Ashtabula county. Geol. of O., v. 1, pt. 1, pp. 486-88.
- Read. Erie shales in Huron county. Geol. of O., v. 3, pp. 306-07.
- Whitfield. Fossils. Geol. of O., v. 7, pt. 2, pp. 452-64.

- Erie Shale.** Winchell. Erie shale of Crawford county. Geol. of O., v. 2, pt. 1, pp. 242-43.
- Winchell. Erie shale in Morrow county. Geol. of O., v. 2, pt. 1, p. 264.
- See also Chagrin Formation.*
- Expanded Metal System.** Eno. Expanded metal system of reinforced concrete construction. O., Geol. Sur., Bull. No. 2, p. 133.
- Facings.** Eno. Cement mortar in facing concrete work. O. Geol. Sur., Bull. No. 2, pp. 57-59.
- Fairfield County.** Andrews. Geology. Geol. of O., v. 2, pt. 1, pp. 592-94.
- Andrews. Topography. Geol. of O., v. 2, pt. 1, p. 592.
- Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 382-88.
- Fall Creek Bridges, Indianapolis.** Eno. Use of steel concrete in building bridges. O. Geol. Sur., Bull. No. 2, pp. 160-62.
- Farrel Rock Crusher.** Eno. Illustration and section of Farrel crusher. O. Geol. Sur., Bull. No. 2, pp. 227-28.
- Fayette County.** Hussey. Geology of Clinton and Fayette counties. Geol. of O., v. 3, pp. 429-47.
- Hussey. Topography of Clinton and Fayette counties. Geol. of O., v. 3, pp. 429-30.
- Orton. Oil and gas wells. Geol. of O., v. 6, p. 291.
- Orton, Jr., and Poppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, p. 63.
- Federal Creek Coal Field.** Lovejoy. Pomeroy and Federal creek coal field. Geol. of O., v. 6, pp. 627-52. Geologic map showing area of this field in Ohio. Opp. p. 632.
- Feldspar.** Bleininger. Feldspar as component mineral of clays. O. Geol. Sur., Bull. No. 3, pp. 64-66.
- Poppel. Effect of feldspar on sand used in manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 33-35.
- Fences.** Eno. Concrete for fences and posts. O. Geol. Sur. Bull. No. 2, pp. 117-18.
- Ferric Oxide.** Bleininger. Ferric oxide in hydraulic cement. O. Geol. Sur., Bull. No. 3, pp. 33-34.

- Ferriferous Limestone.** Orton, Jr., and Peppel. Composition of, in Gallia county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, p. 66; in Holmes county, pp. 81-82; in Jackson county, pp. 82-84; in Lawrence county, pp. 85-87; in Mahoning county, pp. 92-93; in Scioto county, pp. 122-23.
- Orton, Jr. and Peppel. Composition, physical character, and uses of, in Ohio. O. Geol. Sur., Bull. No. 4, pp. 174-191.
- Orton, Jr. and Peppel. Ferriferous limestone available for cement making. O. Geol. Sur., Bull. No. 3, p. 92.
- Ferriferous Limestones.** Orton. Ferriferous limestones of lower coal measures of Ohio. Geol. of O., v. 5, pp. 16-21.
- Fertilizer.** Peppel. Use of hydrated lime and lime for agricultural purposes. O. Geol. Sur., Bull. No. 4, pp. 234-37.
- Fielding System of Dam Construction.** Eno. Steel concrete in hollow dam construction. O. Geol. Sur., Bull. No. 2, p. 179.
- Fillers.** Eno. Cement mortar as filler. O. Geol. Sur., Bull. No. 2, pp. 50.
- Filter Beds.** Eno. Concrete in filter beds. O. Geol. Surv., Bull. No. 2, pp. 97-9.
- Findlay Gas Field.** Bownocker. Natural gas in northwestern Ohio. O. Geol. Sur., Bull. No. 1, pp. 32-47.
- Orton. Development. Prelim. Rep., on petroleum and inflammable gas. 1886, pp. 31-39; Rep. 1887, pp. 46-57, 129-36.
- Findlay Oil Field.** Orton. Development of the field. Prelim. rep. on petrol and inflammable gas, 1887, p. 157.
- Fineness of Sand.** Peppel. Fineness of sand employed in sand-lime brick manufacture. O. Geol. Sur., Bull. No. 5, p. 27.
- Fire Brick.** Andrews. Fire clay of Scioto county. Rep. Prog. 1870, pp. 166, 168-9.
- Newberry. Fire clays. Rep. Prog. 1870, pp. 50-1.
- Newberry. Manufacture of fire brick in Columbiana County. Geol. of O., v. 3, p. 108.
- Orton, Jr. Manufacture of fire brick in Ohio. Geol. of O., v. 5, pp. 687-700.
- Orton, Jr. Manufacture of fire brick in Ohio. Geol. of O., v. 7, pp. 217-31.
- Fire Clays.** Composition of European fire clays. Rep. Prog. 1870, pp. 170-71.

- Fire Clays.** Bleininger. Fire-clays for cement making purposes. O. Geol. Sur., Bull. No. 3, pp. 69-74.
- Newberry. Fire-clay in Portage county. Geol. of O., v. 3, pp. 149-50.
- Newberry. Fire clay in Tuscarawas county. Geol. of O., v. 3, pp. 64, 66, 83.
- Stevenson. Fire clay in Carroll county. Geol. of O. v. 3, pp. 198.
- Fire Clays. Analyses.** From Columbiana county. Geol. of O., v. 3, pp. 131.
- Lord. Fire clays described in Geol. of O., v. 5. Geol. of O., v. 5, pp. 1110-1113.
- Lord. Method of analyses. Geol. of O., v. 5, pp. 1096-98.
- Orton, Jr. Fire clays used in paving brick and sewer pipe in Ohio. Geol. of O., v. 7, pp. 136, 139, 140.
- Wormley. Fire clays in Jefferson county. Geol. of O., v. 3, p. 780.
- Wormley. Fire clay in Portage county. Geol. of O., v. 3, p. 150.
- Fire Proof Concrete.** Eno. Fire proof qualities of concrete and steel concrete. O. Geol. Sur., Bull. No. 2, pp. 183-88.
- Fire-Proofing.** Orton, Jr. Fire-proofing manufacture of Ohio. Geol. of O., v. 5, pp. 708-09.
- Fire Resistance.** Peppel. Tests showing fire resistance of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 57-58
- Firestones.** Orton. Firestone of Montgomery county. Rep. Prog. 1869, p. 149.
- Fishes.** List of Ohio genera and species. Geol. of O., v. 4, pp. 766-1,000. *Acipenser maculosus*, p. 768. *Acipenser rubicundus*, pp. 766-68. *Alosa sapidissima*, pp. 872-73. *Alvordius*, p. 971. *Alvordius*, aspro, pp. 972-73. *Alvordius*, evides, p. 974. *Alvordius*, macrocephalus, p. 972. *Alvordius*, phoxocephalus, p. 972. *Alvordius*, variatus, pp. 973-74. *Ambloplites*, p. 940. *Ambloplites rupestres*, pp. 941-42. *Amblyopsis spelaeus*, pp. 900-01. *Amia calva*, pp. 776-79. *Amiurus*, pp. 788-89. *Amiurus catus*, pp. 793-96. *Amiurus marmoratus*, p. 792. *Amiurus melas*, p. 793. *Amirus natalis*, pp. 790-91. *Amiurus nigricans*, pp. 789-90. *Amiurius vulgaris*, pp. 791-92. *Amiurus xanthocephalus*, p. 796. *Ammacoetes niger*, pp. 756-57. *Ammocrypta*, p. 964. *Ammocrypta pellucida*, p. 965. *Anguilla vulgaris*, European synonymy, p. 781. *Anguilla vulgaris*, American synonymy, pp. 781-83. *Aphredoderus sayanus*, pp. 920-21.

Fishes. *Boleosoma*, p. 965. *Boleosoma nigrum*, pp. 966-67. *Boleosoma olmstedii*, p. 967. *Bubalichthys*, p. 806. *Bubalichthys Bubalis*, pp. 807-08. *Bubalichthys urus* p. 807.

Campostoma anomalum, pp. 835-37. *Carassius auratus*, p. 868. *Carpiodes*, pp. 808-09. *Carpiodes bison*, pp. 811-12. *Carpiodes carpio*, pp. 809-10. *Carpiodes cutisanserinus*, pp. 812-13. *Carpiodes cyprinos*, pp. 810-11. *Carpiodes difformis*, p. 813. *Carpiodes thompsoni*, p. 811. *Carpiodes velifer*, p. 812. *Catostomus*, pp. 815-16. *Catostomus longirostris*, pp. 816-17. *Catostomus nigricans*, pp. 819-20. *Catostomus teres*, pp. 817-19. *Chaenobryttus antistius*, pp. 939-40. *Centrarchus macropterus*, pp. 926-27. *Ceraticthys*, pp. 859-60. *Ceraticthys amblyops*, p. 860. *Ceraticthys biguttatus*, pp. 861-62.

Chologaster agassiz, pp. 901-02. *Chriope heterodon*, pp. 846-47. *Chrosomus erythrogaster*, pp. 837-38. *Coregonus*, p. 877. *Coregonus artedi*, pp. 882-84. *Coregonus elupeiformis*, pp. 879-80. *Coregonus hoyi*, pp. 881-82. *Coregonus labradoricus*, p. 881. *Coregonus nigripinnis*, pp. 884-85. *Coregonus quadrilateralis*, p. 878. *Coregonus tullibee*, p. 885. *Cottogaster copelandi*, pp. 969-70. *Couesius prosthemi*, pp. 862-63. *Cristivomer namayeush*, pp. 893-96. *Cycleptis*, pp. 813-14. *Cycleptis elongatus*, pp. 814-15. *Cyprinus carpio*, pp. 868-69.

Diplesium blennioides, pp. 967-68. *Dorosoma*, p. 869. *Dorosoma cepedianum*, pp. 870-71.

Ericymba, p. 854. *Ericymba buccata*, p. 855. *Erimystax*, p. 858. *Erimystax dissimilis*, p. 859. *Erimyzon*, pp. 820-21. *Erimyzon sucetta*, pp. 821-23. *Esox*, p. 913. *Esox lucius*, pp. 915-17. *Esox nobilior*, pp. 917-18. *Esox salmoneus*, pp. 914-15. *Etheostoma flabellare*, pp. 977-78. *Etheostoma squamiceps*, p. 978. *Eucalia*, p. 997. *Eucalia inconstans*, 998-99. *Eupomotis*, p. 927. *Eupomotis gibbosus*, pp. 928-31. *Eupomotis notatus*, 931. *Exoglossum maxillilingua*, pp. 841-42.

Fundulus, p. 902. *Fundulus diaphanus*, p. 903.

Hudsonius, pp. 842-43. *Hudsonius analostanus*, 845-46. *Hudsonius fretensis*, pp. 844-45. *Hudsonius haematurus*, p. 845. *Hudsonius storerianus*, p. 843. *Hudsonius stramineus*, p. 844. *Hudsonius volucellus*, pp. 843-44. *Hybognathus nuchalis*, pp. 838-39. *Hyborhynchus notatus*, pp. 840-41. *Hyodon*, p. 874. *Hyodon alosoides*, pp. 875-76. *Hyodon tergisus*, p. 875.

Ichthaelurus, pp. 784-85. *Ichthaelurus furcatus*, pp. 785-86. *Ichthaelurus punctatus*, pp. 786-88. *Ichthaelurus robustus*, p. 786. *Ichthyobus*, pp. 894-95. *Ichthyobus bubalis*, pp. 805-06. *Imostoma shumardi*, pp. 968-69.

Fishes. *Labidesthes*, p. 918. *Labidesthes sicculus*, 919. *Lepomis*, pp. 931-32. *Lepomis cyanellus*, 938-39. *Lepomis humilis*, pp. 934-35. *Lepomis macrochirus*, pp. 935-36. *Lepomis megalotis*, pp. 933-34. *Lepomis pallidus*, pp. 936-37. *Lepidosteus osseus*, pp. 770-73. *Lepidosteus platystomus*, pp. 773-74. *Litholepis spatula*, pp. 774-76. *Lota maculosa*, pp. 995-96. *Luxilus*, p. 852. *Luxilus cornutus*, pp. 853-54. *Lythrurus diploemius*, pp. 851-52.

Micropterus, pp. 942-48. *Micropterus dolomieu*, pp. 948-52. *Micropterus salmoides*, pp. 952-53. *Microperca punctulate*, p. 981. *Minnilus ariommus*, p. 850. *Minnilus dinemis*, pp. 848-49. *Minnilus photogenis*, pp. 849-50. *Minnilus rubifrons*, pp. 847-48. *Minnilus scabriceps*, pp. 850-51. *Minytrema*, pp. 823-24. *Minytrema melanops*, pp. 824-25. *Myxostoma*, pp. 825-26. *Myxostoma anisurum*, p. 827. *Myxostoma aureolum*, p. 828. *Myxostoma carpio*, pp. 830-31. *Myxostoma macrolepidotum*, pp. 828-30. *Myxostoma velatum*, pp. 826-27.

Nannostoma tessellatum, p. 975. *Nannostoma zonale*, pp. 974-75. *Notemigonus*, pp. 866-67. *Notemigonus chrysoleucus*, pp. 867-68. *Nothonotus*, p. 975. *Nothonotus camirus*, pp. 976-77. *Nothonotus maculatus*, pp. 976-77. *Noturus*, pp. 798-99. *Noturus exilis*, p. 800. *Noturus flavus*, 799-800. *Noturus miurus*, pp. 800-801. *Noturus sialis*, p. 801.

Oncorhynchus chouicha, pp. 886-91.

Pelodichthys olivaris, pp. 797-98. *Perca americana*, pp. 958-59. *Percina caprodes*, pp. 970-71. *Percina manitou*, p. 971. *Percopsis guttatus*, pp. 899-900. *Phenacobius teretulus*, pp. 855-56. *Phoxinus neogaeus*, p. 866. *Pimephales promelas*, pp. 839-40. *Placopharynx carinatus*, pp. 831-32. *Poeciliichthys coeruleus*, pp. 979-80. *Poeciliichthys eos*, pp. 980-81. *Poeciliichthys spectabilis*, p. 980. *Poeciliichthys virgatus*, p. 979. *Polyodon folium*, pp. 764-66. *Pomolobus chrysochloris*, pp. 873-74. *Pomoxys*, p. 923. *Pomoxys annularis*, p. 924. *Pomoxys sparoides*, pp. 925-26. *Pygosteus*, p. 999. *Pygosteus pungitius*, pp. 999-1000.

Quassilabia lacerata, p. 832-33.

Rhinichthys atronasmus, pp. 857-58. *Rhinichthys cataractae*, pp. 856-57. *Roccus*, p. 954. *Roccus chrysops*, p. 955. *Roccus interruptus*, p. 956.

- Fishes.** *Salmo salar*, pp. 892-93. *Salvelinus fontinalis*, pp. 897-99. *Scaphirrhynchops platyrhynchops*, pp. 768-69. *Scolecisma argenteus*, pp. 757-58. *Semotilus corporalis*, pp. 863-64. *Stizostedium*, p. 960. *Stizostedium canadense*, pp. 961-62. *Stizostedium vitreum*, p. 962. *Stizostedium salmoneum*, pp. 963-64.
- Telestes elongatus*, p. 865. *Trigloopsis*, p. 985. *Trigloopsis thompsonii*, p. 986. *Typhlichthys subterraneus*, p. 901. *Umbra limi*, pp. 912-13. *Uranidea*, pp. 986-87. *Uranidea franklini*, p. 988. *Uranidea gracilis*, pp. 988-89. *Uranidea hoyi*, pp. 978-88. *Uranidea richardsoni*, pp. 989-93. *Uranidea spilota*, pp. 993-94.
- Zygonectes*, pp. 903-09. *Zygonectes dispar*, pp. 910-11. *Zygonectes notatus*, p. 910.
- Jordan and others. Four lists of Ohio fishes. *Geol. of O.*, v. 4, pp. 744-49.
- Jordan. Report on the fishes of Ohio. *Geol. of O.*, v. 4, pp. 737-1002.
- Kirtland. Catalogue of mammals, birds, reptiles, etc., in Ohio. *Ann. Rep.*, v. 2, 1838, pp. 168-70.
- Kirtland. Notes and observations. *Ann. Rep.*, v. 2, 1838, pp. 190-97.
- Fishes, Fossil.** Genera and species. *Cocosteus Cuyahogae*, *Geol. of O.*, v. 7, pt. 2, pp. 615-16. *Dinichthys*, *Geol. of O.*, v. 7, pt. 2, pp. 606-08, 620-26. *Gorgonichthys, Clarki*, *Geol. of O.*, v. 7, pt. 2, pp. 614-15. *Titanichthys*, *Geol.*, of *O.*, v. 7, pt. 2, pp. 608-12. *Titanichthys attenuatus*, *Geol. of O.*, v. 7, pt. 2, pp. 612-14.
- Claypole. Fossil fishes of Ohio. *Geol. of O.*, v. 7, pt. 2, pp. 602-26.
- Foerste. Sharks of the Cleveland shale. *Geol. of O.*, v. 7, pt. 2, pp. 616-19.
- Newberry. Descriptions of fossil fishes. *Geol. of O.*, v. 1, pt. 2, pp. 247-355.
- Newberry. Descriptions of fossil fishes of Ohio. *Geol. of O.*, v. 2, pt. 2, pp. 3-64.
- Newberry. Fossil fishes of Huron shale in Lorain county. *Geol. of O.*, v. 2, pt. 1, pp. 214-15.
- Newberry. Origin of our Ichthyc fauna. *Geol. of O.*, v. 1, pt. 2, pp. 288-89.
- Flint's Mills Oil Pool.** Bownocker. Wells in Ludlow township, Washington county. *O. Geol. Sur., Bull. No. 1*, pp. 189-90.

Floors. Orton. Floors of Ohio coal seams. Geol. of O., v. 5, pp. 142-43.
 ————Eno. Use of steel concrete flooring in fire proof buildings. O. Geol. Sur., Bull. No. 2, pp. 143-45.

Foerste, Augustus F. Fossils of the Clinton group in Ohio and Indiana. Geol. of O., v. 7, pt. 2, pp. 516-601.

Forests. Gilbert. Timber of Fulton county. Rep. Prog., 1870, pp. 491-92.

———Gilbert. Vegetation of Fulton county. Geol. of O., v. 1, pt. 1, p. 572.

———Gilbert. Vegetation of Williams county. Geol. of O., v. 1, pt. 1, pp. 565-66.

———Klippart. Forests of Maumee valley. Rep. Prog. 1870, pp. 347-53.

———Orton. Timber of Pike county. Geol. of O., v. 2, pt. 1, p. 638.

———Read. Native forests of Geauga county. Rep. Prog. 1870, pp. 470-71; Geol. of O., v. 1, pt. 1, p. 528.

———Read. Timber of Knox County. Geol. of O., v. 3, p. 334.

———Winchell. Timber of Crawford county. Geol. of O., v. 2, pt. 1, p. 239.

———Winchell. Timber of Defiance county. Geol. of O., v. 2, pt. 1, pp. 423-24.

———Winchell. Timber of Delaware county. Geol. of O., v. 2, pt. 1, pp. 274-76.

———Winchel. Timber of Morrow county. Geol. of O., v. 2, pt. 1, pp. 255-56.

———Winchell. Timber of Paulding county. Geol. of O., v. 2, pt. 1, pp. 336-37.

———Winchell. Timber of Union county. Geol. of O., v. 2, pt. 1, pp. 326-27.

———Winchell. Timber of Van Wert County. Geol. of O., v. 2, pt. 1, pp. 315-16.

———Winchell. Forest of Wood county. Geol. of O., v. 2, pt. 1, pp. 385-86.

Fortifications. Eno. Government use of concrete in fortifications. O. Geol. Sur., Bull. No. 2; pp. 73-74.

Fossil fishes, see Fishes (fossil).

Fossil plants, see Paleobotany.

Fossils, see Paleontology.

Foster, John W. Geological report on Muskingum county and parts of Licking and Franklin counties. Ann. Rep., v. 2, 1838, pp. 73-107.

- Foundations.** Eno. Use of cement in concrete foundations. O. Geol. Sur., Bull. No. 2, pp. 63-4.
- Fowke, Gerard.** Archaeology of Ohio, an abstract embodying the principal results of explorations and discoveries. Geol. of O., v. 7, pt. 2, pp. 1-55.
- France.** Eno. Use of cements. O. Geol. Sur., Bull. No. 2, p. 20.
- Franklin County.** Foster. Physical geography. Ann. Rep., v. 2, 1838, p. 75.
- Orton. Geology. Geol. of O., v. 3, pp. 596-646.
- Orton. Lime production. Geol. of O., v. 6, pp. 762-65.
- Orton. Oil and gas wells. Geol. of O., v. 6, pp. 281-83.
- Orton. Topography. Geol. of O., v. 3, pp. 596-99.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness, for portland cement. O. Geol. Sur., Bull. No. 4, pp. 63-65.
- Fremont Wells.** Orton. Drilling of wells at Fremont. Prelim. Rep. on petrol and inflammable gas, 1887, pp. 141-42.
- Orton. Fremont gas wells. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 69-71; edition 1886, pp. 48-9.
- Freeport Clays and Shale.** Orton. Clays in Ohio. Geol. of O., v. 7, p. 67.
- Freeport Coal.** Orton. Freeport coals in Tuscarawas county. Geol. of O., v. 5, pp. 280-82.
- Wright. Lower Freeport coal in Holmes county. Geol. of O., v. 5, p. 836.
- Freeport Limestones.** Orton. Freeport limestones of lower coal measures of Ohio. Geol. of O., v. 5, pp. 21-23.
- Orton, Jr., and Peppel. Composition of, in Athens county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 37-38.
- Freeport Oil Field.** Orton. Wood county oil field. Rep. 1890, pp. 312-14.
- Freezing Cement.** Eno. Effect of freezing on cement mortar. O., Geol. Sur., Bull. No. 2, pp. 61-62.
- Freezing Test.** Peppel. Freezing test to determine strength of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 49-50.
- Fuel.** Bownocker. Coal as fuel in salt works in Meigs county. O. Geol. Sur., Bull. No. 8, pp. 24-25.

Fuel. Peppel. Fuels used in Ohio for lime burning. O. Geol. Sur., Bull. No. 4, pp. 271-93.

———Peppel. Quantity and cost of fuel for lime burning. O. Geol. Sur., Bull. No. 4, pp. 290-93.

Fulton County. Gilbert. Economic geology. Rep. Prog. 1870, p. 492.

———Gilbert. Geology. Geol. of O., v. 1, pt. 1, pp. 567-72.

———Gilbert. Surface geology. Rep. Prog. 1870, pp. 490-91.

———Gilbert. Topography. Geol. of O., v. 1, pt. 1, p. 567. Geological structure, pp. 567-69. Surface geology and soils, pp. 569-70. Economic geology, pp. 570-72. Vegetation, p. 572.

Fungi. Kellerman and Werner. Alphabetic list of hostplants of the parasitic fungi. Geol. of O., v. 7, pt. 2, pp. 376-81.

———Kellerman and Werner. Fungi of Ohio. Geol. of O., v. 7, pt. 2, pp. 300-75.

———Kellerman and Werner. Index to genera. Geol. of O., v. 7 pt. 2, pp. 382-84.

See also Paleobotany.

Furnaces. Lord. Iron smelting furnaces in Ohio. Geol. of O., v. 5, pp. 503-54.

———Lord. List of abandoned blast furnaces in Ohio. Geol. of O., v. 5 p. 450.

———Lord. Table of active furnaces in Ohio. Geol. of O., v. 5; pp. 456-58. Hanging Rock district, p. 458. Hocking valley, p. 457. Mahoning valley, p. 456.

Furniture. Eno. Concrete used to construct certain kinds of furniture. O. Geol. Sur., Bull. No. 2, pp. 120-21.

Gallia County. Andrews. Geology of Gallia county. Rep. Prog. 1870, pp. 178-80.

———Andrews. Coal. Rep. Prog. 1870, pp. 179-81. Huntington township, p. 179. Walnut township, pp. 179-80.

———Andrews. Local Geology. Geol. of O., v. 1, pt. 1, pp. 225-46. Greenfield township, pp. 226-28. Walnut township, pp. 228-39. Perry township, pp. 231-32. Raccoon township, pp. 232-33. Huntington township, pp. 233-34. Morgan township, pp. 234-35.

———Andrews. Iron ore. Rep. Prog. 1870, pp. 178-81.

———Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1 pp. 279-81.

———Briggs. Geology. An. Rep. v. 1, 1837, pp. 71-98.


- Gallia County.** Newberry. Geology. Geol. of O., v. 1, pt. 1, pp. 225-46.
Addison township, pp. 242-43. Cheshire township, pp. 243-44.
Clay township, pp. 240-41. Gallipolis township, pp. 241-42.
Green township, p. 236. Guyan township, pp. 237-39. Harrison
township, p. 237. Ohio township, p. 239. Springfield township,
pp. 235-36.
- Orton. Coal mines. Geol. of O., v, 5. pp. 1046-58.
- Orton. Deep wells, drilling for oil and gas. Geol. of O., v. 6,
p. 398.
- Orton, Jr., and Peppel. Composition of limestones of, with ref-
erence to fitness for portland cement. Geol. Sur., Bull. No. 4,
p. 66.
- Orton, Jr., and Peppel. Occurrence of ferriferous limestone in.
O. Geol. Sur., Bull. No. 4, p. 180.
- Galveston Sea Wall.** Eno. Concrete for sea wall. O. Geol. Sur., Bull.
No. 2, pp. 83-84.
- Ganoidei.** Newberry. Ganoidei of the Carboniferous. Geol. of O., v.
1, pt. 2, pp. 337-55.
- Newberry. Ganoidei of the Devonian. Geol. of O., v. 1, pt. 2,
pp. 290-302.
- Gases.** Bleininger. Analysis of kiln gases in cement making. O. Geol.
Sur., Bull. No. 3, pp. 142-46.
- Gas Analyses.** Howard. Gas from the Thurston field. O. Geol. Sur.,
Bull. No. 1, p. 125.
- Howard. Composition of Findlay gas. Prelim. Rep. on petro-
leum and inflammable gas, 1886, p. 36. Rep. 1887, p. 53.
- Phillips. Shale gas of Fredonia, N. Y. Geol. of O., v. 6, p. 409.
- Gas Coals.** McMillin. Gas coals of Ohio. Geol. of O., v. 5, pp. 722-49.
- Gas Fields.** Bownocker. Central Ohio natural gas fields. O. Geol.
Sur., Bull. No. 1, pp. 101-25.
- Orton. Barnesville gas field. Rep. 1890, pp. 254-55.
- Orton. Cambridge gas field. Rep. 1890, pp. 255-57.
- Orton. Lancaster gas field. Rep. 1890, pp. 234-40.
- Orton. Thurston gas field. Rep. 1890, pp. 240-42.
- Gas Manufacture.** McMillin. Gas coals of Ohio. Geol. of O., v. 5,
pp. 721-49.
- Gas Wells.** Orton. Berea grit as a source of East Liverpool gas wells.
Prelim. Rep. petroleum and inflammable gas, 1886, pp. 55-56.
Edition 1887, pp. 81-82.

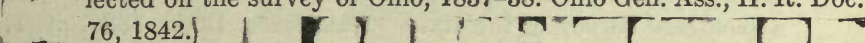
- Gas Wells.** Orton. Berea grit as a source of Neff gas wells. Prelim. Rep. on petroleum and inflammable gas, 1886, p. 57. Edition 1887, pp. 82-83.
- Orton. Bloomdale gas wells. Prelim. Rep. on petroleum and inflammable gas, 1886, pp. 46-47. Edition 1887, pp. 67-68.
- Orton. Carey gas wells, Wyandot county. Prelim. Rep. on petroleum and inflammable gas, 1886, p. 47. Edition 1887, pp. 68-9.
- Orton. Development of Carey gas field. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 139-40.
- Orton. Drilling for gas in Fremont. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 141-42.
- Orton. Drilling of wells at Oak Harbor, Ottawa county. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 140-41.
- Orton. Fremont gas wells. Prelim. Rep. on petroleum and inflammable gas, 1886, pp. 48-9. Edition 1887, pp. 69-71.
- Orton. Measurement of the flow of gas wells. Prelim. Rep. on petroleum and inflammable gas, 1886, pp. 72-6. Edition 1887, pp. 107-10.
- Orton. Gas wells of Mercer county. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 142-45.
- Orton. Production of gas wells. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 146-50.
- Gas Wells and Springs, see also Petroleum.*
- Gasteropoda.** Meek. Gasteropoda of the Corniferous group. Geol. of O., v. 1, pt. 2, pp. 210-229.
- Meek. Fossils of the Niagara and Clinton groups. Geol. of O., v. 1, pt. 2 pp. 185-86.
- See also Paleontology—Genera and Species.*
- Gates' Revolving Screen.** Eno. Illustration. O. Geol. Sur., Bull. No. 2, p. 229.
- Gates' Rock Crusher.** Eno. Illustration and section. O. Geol. Sur., Bull. No. 2, pp. 223-24.
- Geauga County.** Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 304-05.
- Read. Geology. Rep. Prog., 1870, pp. 465-73.
- Read. Geology. Geol. of O., v. 1, pt. 1, pp. 520-33.
- Geologic map of Ashtabula, Trumbull, Lake and Geauga counties, 26.3x32 cm.
- Read. Topography. Geol. of O., v. 1, pt. 1, pp. 520-21.

- Genessee Slate.** Hall and Whitfield. Fossils. Geol. of O., v. 2, pt. 2, pp. 158-61.
- Geologic Map.** Andrews. Grouped sections of 2d Geol. Dist To accompany Rep. Prog., 1870. No. 1, Hocking, Athens, Vinton counties. No. 2, Vinton and Jackson counties. No. 3, Jackson county. No. 4, Jackson, Gallia, Scioto and Lawrence counties. No. 5, Scioto and Lawrence counties. 66.5x87.5 cm.
- Andrews. Explanation of maps of grouped sections of 2d Geol. Dist., Rep. Prog., 1870, pp. 241-51.
- Andrews. Map of Lower coal measures in part of Athens, Hocking, Perry, Licking and Muskingum counties. 74.5x66.55 cm. scale 10 ft. (vertical) to $\frac{3}{4}$ in. Rep. Prog., 1869, facing p. 164.
- Bownocker. Maps showing areas of oil and gas territory in Ohio. No. 1, Lucas, Ottawa, Wood, Sandusky, Seneca, Hancock and Wyandot counties. No. 2, Van Wert, Putnam, Allen, Auglaize, Mercer, Shelby and Darke counties. No. 3, Knox, Licking, Fairfield and Hocking counties. No. 4, Western Washington and adjacent parts of Morgan and Athens counties. No. 5, Eastern Washington county. No. 6, Monroe county. No. 7, Belmont county. No. 8, Harrison county. No. 9, Jefferson county. O. Geol. Sur.. Bull. No. 1, 1902.
- Newberry. Preliminary geological map of Ohio, 1870, 34.5x28 cm. Rep. Prog., 1869 (frontispiece).
- Orton. Map showing topography of the Trenton limestone of western Ohio. Prelim. Rep. on petroleum and inflammable gas, 1887, p. 127.
- Maps to accompany Geology of Ohio, v. 1, pt. 1, 1873. Separate envelope. Map No. 6, grouped sections, Gallia county. Map No. 7, grouped sections, Meigs county. Map No. 8, grouped sections, Athens county. Map No. 9, grouped sections, Morgan county. Map No. 10, grouped sections, Muskingum county, south of central Ohio R. R.
- Maps to accompany geology of Ohio, v. 2, 1874. Separate envelope. Chart No. 1, sections of the coal measures in western Pennsylvania and northern Ohio. Chart No. 2, sections of the lower coal-measures of northern and central Ohio. Chart No. 3, sections of the coal-measures on the Ohio river between Smith's Ferry and Browns Station. Chart No. 4, Sections of the coal-measures on the Ohio river between Browns Station and Moundsville. Chart No. 5, *Dinichthys terrelli*. Chart No. 6, *Dinichthys terrelli*, bones of ventral shields. Map No. 11, grouped sections of Washington county. Map No. 12, grouped sections of Noble and south half of Guernsey county. Map No. 13, grouped sections of Monroe county. Map No. 14, grouped sections of south half of Belmont county.

- Geologic Map.** Geologic map of Ohio. Counties. Geol. of O., v. 2, pt. 1, Putnam county, opp. p. 387. Henry county, opp. p. 416. Defiance county opp. p. 422. Highland, Ross and Pike counties, opp. p. 611. Green county, opp. p. 659. Erie county and islands, opp. p. 183. Ottawa county, opp. p. 227. Crawford county, opp. p. 237. Morrow county, opp. p. 253. Delaware county, opp. p. 272. Van Wert county, opp. p. 314. Union county opp. p. 324. Hardin, opp. p. 354. Hancock county, opp. p. 358. Wood, county, opp. p. 368.
- Geol. of O., v. 3. Ashland county, opp. p. 529. Butler county, opp. p. 399. Champaign county, opp. p. 491. Coshocton county, opp. p. 529. Holmes county, opp. p. 529. Huron county, opp. p. 299. Knox county, opp. p. 529. Licking county, opp. p. 529. Medina county, opp. p. 363. Portage county, opp. p. 133. Preble county, opp. p. 404. Richland county, opp. p. 529. Tuscarawas county, opp. p. 52. Warren county, opp. p. 382. Wayne county, opp. p. 529.
- Maps to accompany geology of Ohio, v. 5, 1884. Separate envelope. Map No. 1, Mahoning Valley coal field. Map No. 2, Massillon coal field. Map No. 3, sections from Massillon coal field. Map No. 4, Holmes, Coshocton and Tuscarawas counties. Map No. 5, Muskingum and northern Perry counties. Map No. 6, Hocking Valley coal field. Map No. 7, Vinton and Jackson counties. Map No. 8, Lawrence, Gallia and Scioto counties. Explanation of map of Vinton and Jackson counties. Geol. of O., v. 5, pp. 992-93.
- Geological map of Ohio, showing areas and sources of natural gas at present time. Prelim. Rep. on petroleum and inflammable gas, 1887, opposite title page. Edition of 1886, in back of book.
- Map of northwestern Ohio showing areas of Trenton limestone, 500 feet below sea level in oil and gas region. Prelim. Rep. on petroleum and inflammable gas, 1887, opp. p. 76. Edition of 1886, opp. p. 52.
- Maps to accompany geology of Ohio, v. 6, 1888. Separate envelope. Map No. 1, geologic map of Ohio. Map No. 2, gas fields and oil fields of Hancock and Wood counties. Map No. 3, oil fields and gas fields of Allen, Auglaize, and Mercer counties. Map No. 4, territory of Berea grit in Ohio.
- Maps to accompany geology of Ohio, v. 7, 1893. Separate envelope. Maps showing outcrop boundaries of principal coal seams. Map. No 1, Lawrence, Gallia and Jackson counties (in part). Map No. 2, Jackson, Vinton, Meigs and Vinton, counties (in part). Map No. 3, Hocking, Perry, Athens and

Geologic Map. Maps to accompany geology of Ohio, v. 7, 1893.—(Cont.) Vinton counties (in part). Map No. 4, Muskingum, Licking, Perry and Morgan counties (in part). Map No. 5, Coshocton and Holmes counties. Map No. 6, Tuscarawas, Harrison and Carroll counties (in part). Map No. 7, Columbiana, Jefferson and Carroll counties (in part). Map No. 8, Guernsey and Stark counties (in part). Map No. 9, Pittsburgh and Meigs creek coal seams. Map No. 10, coal fields of Ohio.

—Maps to accompany geology of Ohio, Annual Report of 1890. Map No. 1, oil fields and gas fields of Hancock, Wood, Sandusky and Wyandot counties. Map No. 2, oil fields and gas fields of Allen, Auglaize and Mercer counties. 

Geologic Specimens. Mather. Catalogue of the geological specimens collected on the survey of Ohio, 1837-38. Ohio Gen. Ass., H. R. Doc. 76, 1842. 

Geological Scale. Orton. Geological scale of Ohio. Prelim. Rep. on petroleum and inflammable gas. 1887, pp. 116-24.

—Orton. Geological scale of Ohio in connection with oil and gas supply. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 23-41. Rep., 1886, pp. 15-28.

—Prosser. Revised nomenclature of the Ohio geological formations. O. Geol. Sur., Bull. No. 7, pp. 1-36.

—Prosser. Table of old and new stratigraphical names in geological scale of Ohio. O. Geol. Sur., Bull. No. 4, pp. 21-22.

—Prosser. Table showing equivalent names for geological formations of Ohio. O. Geol. Sur., Bull. No. 7, p. 4.

—Prosser. Table showing the geological scale of Ohio. O. Geol. Sur., Bull. No. 7, pp. 2-3.

Geological Structure. Bownocker. Discussion of salt producing area in northeastern Ohio. - O. Geol. Sur., Bull. No. 8, pp. 39-40.

—Bownocker. Geological considerations of salt wells near Pomeroy, with sections. O. Geol. Sur., Bull. No. 8, pp. 25-26.

—Bownocker. Record of well of Cleveland Salt Company. O. Geol. Sur., Bull. No. 8, p. 36.

—Bownocker. Record of wells of Colonial Salt Company, Summit county. O. Geol. Sur., Bull. No. 8, p. 37.

—Bownocker. Skeleton record of wells of Ohio Salt Company, in Wayne county. O. Geol. Sur., Bull. No. 8, p. 32.

—Bownocker. Record of wells of Union Salt Company, near Cleveland. O. Geol. Sur., Bull. No. 8, pp. 34-35.

—Orton. Geological structure of Ohio. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 41-44, pp. 124-8. Rep., 1886, pp. 28-30.

- Geological Structure.** Orton. Structure of eastern Ohio. Rep., 1890, pp. 49-51.
- Orton. Structure of northeastern Ohio. Rep., 1890, pp. 51-4.
- Geological Survey.** Hildreth. Establishment of survey recommended. Exec. Docs., 1836, Rep. No. 1, pp. 76-7.
- Hildreth. Report of committee on a geological survey of the state. Exec. Docs., 1836. Rep. No. 1, pp. 65-78.
- Joint resolution on geological survey by Ohio, Indiana and Kentucky from legislature of Indiana. Exec. Docs., 1836, Rep. No. 1, p. 80.
- Newberry. Historical sketch. Geol. of O., v. 1, pt. 1, p. 1-15.
- Riddell. Report of one of the special committee appointed by the legislature to make geological observations and estimates for a geological survey of the state. Ohio Exec. Docs., 1836, pt. 1, Rept. No. 60.
- Wormley. Report of the chemical department. Rep. Prog., 1870, pp. 403-62.
- Geological Survey of Ohio.** Newberry. Geology of O., v. 1 to 4, 1872-82.
- Geological Survey, 2nd District.** Andrews. Annual Report of 2d geological district. Rep. Prog., 1869, pp. 55-135. Rep. Prog., 1870, pp. 57-251.
- Andrews. Report of work in 1871. Rep. Prog., 1871, pp. 11-12.
- Andrews. Geology. Geol. of O., v. 1, pt. 1, pp. 225-364.
- Andrews. Geology. Geol. of O., v. 2, pt. 1, pp. 441-608.
- Geological Survey, 3rd District.** Orton. Geology. Geol. of O., v. 1, pt. 1, pp. 367-480.
- Orton. Geology. Geology of O., v. 2, pt. 1, pp. 611-96.
- Geological Survey, 4th District.** Gilbert. Geology. Geol. of O., v. 1, pt. 1, pp. 537-90.
- Geological Survey, First Organization.** Mather. Annual report on the geological survey of the state of Ohio. Ann. Rep. (for 1837) 1838, 2 v. Same, Ohio Gen. Assem. H. R. Doc., 22; doc. 26, 1838.
- Mather. Organization, duties, etc. Ann. Rep., v. 1, 1837, pp. 19-23.
- Geological Survey, Second Organization.** Newberry. Historical sketch of the geological survey of Ohio. Rep. Prog., 1869, pp. 3-11.
- Newberry. Report of progress for 1869-71. Columbus. 1870-71. 3v. illus. pl., maps, charts. 8vo.

- Geological Survey, Second Organization.** Newberry. Administrative report on work in 1871. Rep. Prog., 1871, pp. 3-9.
- Geological Survey, Third Organization.** Orton. First annual report. Ann. Rep., 1890, 6+3+323 pp.
——Orton. Historical sketch. Rep., 1890, pp. 1-8.
- Geological Survey, Fourth Organization.** Orton, Jr. Bulletins Nos. 1 to 8.
——Orton, Jr. Organization and work of the geological survey of Ohio. Bull. No. 1, pp. i-xxi.
——Announcement by state geologist. Bull. No. 3, pp. vii-xiv; Bull. Nos. 4 and 5, pp. vii-xvi; Bull. No. 6, pp. 7-14; Bull. No. 7, pp. vii-xv; Bull. No. 8, pp. ix-xvi.
- Geology.** Lapham. Miscellaneous observations on the geology of Ohio. Exec. Docs., 1836, Rep. No. 60, pp. 31-4.
——Mather. Geological queries. Ann. Rep. v. 1, 1837, pp. 111-21.
——Mather. Glossary of geological terms. Ann. Rep. v. 1, 1837, pp. 123-29.
- Geology of Ohio.** Order of publication of the final report. Rep. Prog., 1870, pp. 12-3.
- Gerhard Limekiln.** Peppel. Description of Gerhard kiln and system of operation. O. Geol. Sur., Bull. No. 4, pp. 284-88.
- Germantown Oil Pools.** Bownocker. Wells of Liberty township. Washington county. O. Geol. Sur., Bull. No. 1, p. 192.
- Germany.** Eno. Use of cements. O. Geol. Sur., Bull. No. 3, p. 20.
- Gilbert, G. K.** Geology of Williams, Fulton and Lucas counties. Rep. Prog., 1870, pp. 488-99.
——Report on the 4th geological district. Geol. of O., v. 1, pt. 1 pp. 537-90.
- Glacial Geology.** Gilbert. Glacial markings in Maumee valley. Geol. of O., v. 1, pt. 1, pp. 537-40.
——Newberry. Glacier action in Ohio. Geol. of O., v. 3, pp. 30-51.
——Newberry. Glacial erosion in Ohio. Geol. of O., v. 3, pp. 30-32.
——Read. Glacial markings of Geauga county. Rep. Prog., 1870, pp. 471-72. Geol. of O., v. 1, pt. 1, pp. 529-31.
——Whittlesey. Abstract of bearings of glacial striae and grooves of Ohio. Geol. of O., v. 5, pp. 770-72.
——Wright. Glacial boundary in Ohio. Geol. of O., v. 5, pp. 750-69.
- Glass Manufacture.** Peppel. Use of hydrated lime in the glass industry. O. Geol. Sur., Bull. No. 4, pp. 242-43.

- Glass-Pots.** Orton, Jr. Manufacture of glass-pots in Ohio. Geol. of O., v. 5, pp. 701-02.
- Glass-sand.** Gilbert. Glass-sand of Lucas county. Geol. of O., v. 1, pt. 1, p. 582.
- Glendale Limestones.** Orton, Jr., and Peppel. Composition of, in Hamilton county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 72-73.
- Goat Island Bridge, Niagara.** Eno. Use of steel concrete in building this bridge. O. Geol. Sur., Bull. No. 2, pp. 162-63.
- Gold.** Newberry. Drift gold. Geol. of O., v. 2, pt. 1, pp. 70-72.
———Read. Gold in Geauga county. Rep. Prog., 1870, pp. 472-73. Geol. of O., v. 1, pt. 1, pp. 531-33.
———Read. Gold in Richland county. Geol. of O., v. 3, pp. 314-15.
- Goose Run Oil Pool.** Bownocker. Wells of Marietta township, Washington county. O. Geol. Sur., Bull. No. 1, pp. 178-79.
- Gould Oil Field.** Bownocker. Wells of Jefferson county. O. Geol. Sur., Bull. No. 1, p. 244.
- Gravel.** Orton. Gravel in Montgomery county. Rep. Prog., 1869, pp. 154-55.
———Orton. Sand and gravel banks of Greene county. Geol. of O., v. 2, pt. 1, pp. 680-81.
See also Drift, Pleistocene.
- Gravity Concrete Mixer.** Eno. Gravity concrete mixing machines, with illustration. O. Geol. Sur., Bulletin No. 2, pp. 232-235.
- Graysville Oil Pool.** Bownocker. Geology of the field. O. Geol. Sur., Bull. No. 1, pp. 203-04.
———Bownocker. Wells of Monroe county. O. Geol. Sur., Bull. No. 1, pp. 202-05.
- Greene County.** Orton. Geology. Geol. of O., v. 2, pt. 1, pp. 659-96. Geologic map, 12.5x10.2 cm.
———Orton. Lime production. Geol. of O., v. 6, pp. 719-21.
———Orton. Oil and gas wells. Geol. of O., v. 6, pp. 289-91.
———Orton. Topography. Geol. of O., v. 2, pt. 1, pp. 659-62.
———Orton, Jr., and Peppel. Compositions of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 66-69.
- Griffin Mill.** Bleininger. Grinding machines for cement manufacture. O. Geol. Sur., Bull. No. 3, pp. 276-79.

- Grinding Machines.** Bleininger. Fine grinding machines for cement manufacture. O. Geol. Sur., Bull. No. 3, pp. 273-79.
- Bleininger. Intermediate grinding machines for cement preparation. O. Geol. Sur., Bull. No. 3, pp. 259-73.
- Ground Lime.** Peppel. Commercial uses of ground lime. O. Geol. Sur., Bull. No. 4, p. 319.
- Grouting.** Eno. Use of cement in grouting. O. Geol. Sur., Bull. No. 2, pp. 51-2.
- Guelph Formation.** Gilbert. Guelph group in Lucas county. Geol. of O., v. 1, pt. 1, p. 574.
- Lindemuth. Fossils of, in Darke county. Geol. of O., v. 3, pp. 514-15.
- Lindemuth. Guelph limestone in Darke county. Geol. of O., v. 3, pp. 512-16.
- Orton. Guelph or Cedarville limestone in Highland county. Rep. Prog., 1870, pp. 277-82.
- Guernsey County.** Andrews. Geology. Geol. of O., v. 2, pt. 1, pp. 529-42.
- Andrews. Adams township, pp. 529-31. Cambridge township, pp. 531-33. Center township, pp. 533-35. Westland township, pp. 535-36. Spencer township, pp. 536-37. Jackson township, pp. 537-38. Valley township, pp. 538-39. Richland township, pp. 539-40. Wills township, pp. 540-41. Willwood township, pp. 541-42.
- Bownocker. Early history of the salt industry. O. Geol. Sur., Bull. No. 8, p. 15.
- Bownocker. Oil and gas productions. O. Geol. Sur., Bull. No. 1, pp. 221-23. Jackson township, p. 223. Kimbolton township, p. 224. Londonderry township, p. 223. Quaker City, p. 223. Senecaville, p. 223.
- Brown. Meigs creek, coal in. Geol. of O., v. 5, pp. 1059-85.
- Brown. Pittsburgh coal seam. Geol. of O., v. 6, pp. 623-26. Londonderry township, p. 625. Millwood township, pp. 623-24. Oxford township, pp. 624-25. Spencer township, p. 625. Richland township, p. 625. Wells township, p. 625.
- Orton. Coal mines. Geol. of O., v. 5, pp. 282-300.
- Orton. Deep wells, explorations for oil and gas. Geol. of O. v. 6, pp. 376-82.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 69-71.

- Guernsey County.** Root. Salt manufacture. Geol. of O., v. 6, pp. 68
654-55.
- Stevenson. Geology. Geol. of O., v. 3, pp. 219-36.
- Stevenson. Local geology. Geol. of O., v. 3. Adams township,
p. 234. Cambridge township, pp. 233-34. Center township, pp.
229-30. Jefferson township, pp. 230-31. Knox township, p.
234. Liberty township, pp. 231-33. Londonderry township,
p. 227. Madison township, pp. 228-29. Millwood township, p.
225. Monroe township, pp. 227-28. Oxford township, pp.
226-27. Washington township, p. 227. Wills township, pp.
225-26.
- Stevenson. Topography. Geol. of O., v. 3, pp. 219-20.
- Gutters.** Eno. Concrete for curbs and sidewalks. O. Geol. Sur., Bull.
No. 2, pp. 116-17.
- Gymnosperms.** Kellerman and Werner. Gymnosperms of Ohio. Geol.
of O., v. 7, pt. 2, p. 244.
- Kellerman and Werner. Index to genera of gymnosperms.
Geol. of O., v. 7, pt. 2, p. 245.
- Gypsum.** Orton. Gypsum or land-plaster in Ohio. Geol. of O., v. 6,
pp. 696-702.
- Gypsum Analyses.** Lord. Product of gypsum beds in Ohio. Geol. of
O., v. 6, pp. 700-701.
- Hall, James, and Whitfield, R. B.** Descriptions of invertebrate fossils
mainly from the Silurian system. Geol. of O., v. 2, pt. 2, pp.
67-268.
- Hallelujah Ore.** Orton. Hallelujah ore of Hanging Rock district. Geol.
of O., v. 5, pp. 434-35.
- Hamilton County.** Orton. Geology. Geol. of O., v. 1, pt. 1, pp. 419-34.
Geologic map of Hamilton county (colored), 21x12 cm.
- Orton. Topography. Geol. of O., v. 1, pt. 1, pp. 419-23.
- Orton. Oil and gas wells. Geol. of O., v. 6, pp. 298-300.
- Orton, Jr., and Peppel. Composition of limestones of, with refer-
ence to fitness for portland cement. O. Geol. Sur., Bull. No. 4,
pp. 71-73.
- Hamilton Group.** Newberry. Fishes. Geol. of O., v. 1, pt. 2, p. 268.
- Newberry. Hamilton in Erie county. Geol. of O., v. 2, pt. 1,
pp. 189-90.

- Hamilton Group.** Newberry. Hamilton group in Ohio. Geol. Sur., Rep. Prog., 1869, p. 18. First use of the term in Ohio.
- Newberry. Hamilton group in Ohio. Geol. of O., v. 1, pt. 1, pp. 149-52. Fossils, p. 152.
- Newberry. Hamilton group in Ohio. Geol. of O., v. 3, pp. 11-13.
- Read. Hamilton group in Huron county. Geol. of O., v. 3, p. 309.
- Whitfield. Note on marcellus shale and other members of Hamilton group in Ohio, as determined from paleontological evidence. Geol. of O., v. 7, pt. 2, pp. 432-33.
- Winchell. Hamilton group in Defiance county. Geol. of O., v. 2, pt. 1, pp. 427-28.
- Winchell. Hamilton group in Delaware county. Geol. of O., v. 2, pt. 1, pp. 289-96.
- Winchell. Hamilton group in Marion county. Geol. of O., v. 1, pt. 1, pp. 643.
- Winchell. Hamilton group in Paulding County. Geol. of O., v. 2, pt. 1, pp. 338-39.
- Winchell. Hamilton group in Union county. Geol. of O., v. 2, pt. 1, p. 328.
- Hamilton Shale.** Orton. Hamilton shale in geological series of Ohio. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 34-35. Rep., 1886, p. 23.
- Orton. Hamilton shale in Ohio. Geol. of O., v. 6, pp. 22-23. Same, Rep., 1890, pp. 26-27.
- Hancock County.** Bownocker. Geology. O. Geol. Sur., Bull. No. 1, pp. 69-71.
- Bownocker. Oil production. O. Geol. Sur., Bull. No. 1, pp. 65-71.
- Bownocker. Geological map, Lucas, Ottawa, Wood, Sandusky Seneca, Hancock and Wyandot counties, showing oil and gas territories. 18x26.5 cm. opp. p. 56.
- Bownocker. Oil production. O. Geol. Sur., Bull. No. 1, pp. 65-71. Allen township, pp. 65-66. Amanda township, p. 68. Big Lick township, p. 68. Cass township, p. 67. Delaware township, p. 68. Eagle township, p. 67. Jackson township, p. 68. Liberty township, p. 66. Marion township, pp. 67-68. Orange township, p. 67. Portage township, p. 66. Union township, p. 67.
- Orton. Gas wells. Rep., 1890, pp. 112-33. Allen township, pp. 123-30. Cass township, p. 131. Marion township, pp. 131-32. Washington township, pp. 132-33.

- Hancock County.** Orton. Lime production. Geol. of O., v. 6, pp. 743-45.
- Orton. Oil wells. Rep., 1890, pp. 218-20.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 73-74.
- Riddell. Geology of Hancock and Seneca counties. O. Exec. Docs., 1836, Rep. No. 60, pp. 18-19.
- Winchell. Geology. Geol. of O., v. 2, pt. 1, pp. 358-67. Geologic map, 12.5x12.8 cm.
- Winchell. Topography. Geol. of O., v. 2, pt. 1, pp. 358-59.
- Hanging Rock District.** Lord. Iron manufacture. Geol. of O., v. 5, pp. 482-97.
- Orton. Geology. Geol. of O., v. 3, pp. 885-941.
- Orton. Iron ores. Geol. of O., v. 5, pp. 416-35.
- Hanging Rock Limestone.** Orton. Hanging Rock limestone of Hanging Rock district. Geol. of O., v. 3, pp. 892-95.
- Hardening.** Peppel. Experiments to show length of exposure and steam pressure in hardening sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 46-47.
- Peppel. Modes of procedure in hardening process in manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, p. 23.
- Hardening Cylinders.** Peppel. Hardening boilers in use in manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 62-64.
- Hardin County.** Orton. Gas wells. Rep., 1890, pp. 182-86.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to their fitness for portland cement. O. Geol. Sur., Bull. No. 4, p. 74.
- Riddell. Geology. O. Exec. Docs. 1836, Rep. No. 60, pp. pp. 14-15.
- Winchell. Geology. Geol. of O., v. 2, pt. 1, pp. 352-57. Geologic map, 12.7x11.5 cm.
- Winchell. Topography. Geol. of O., v. 2, pt. 1, pp. 352-54.
- Harrison County.** Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 226-43. Geologic map, showing oil and gas territories, 21x15.6 cm. opp. p. 226.
- Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 226-43. Archer township, p. 242. Athens township, p. 243. Cadiz township, pp. 242-43. Franklin township, p. 242. Free-

Harrison County. Bownocker.—(Continued.)

port township, p. 243. German township, p. 242. Monroe township, p. 241. Moorfield township, p. 243. North township, p. 240. Nottingham township, p. 243. Short Creek township, p. 243. Stock township, p. 242. Washington township, p. 243.

——Orton, Jr., and Peppel. Limestone resources of. O. Geol. Sur., Bull. No. 4, p. 136.

——Stevenson. Geology. Geol. of O., v. 3, pp. 200–218.

——Stevenson. Topography and resources. Geol. of O., v. 3, pp. 200–01.

Hayden Block Machine. Eno. Hayden machine for making concrete blocks. O. Geol. Sur., Bull. No. 2, p. 245.

Heat. Eno. Effect of heat on cement mortar. O. Geol. Sur., Bull. No. 2, p. 62.

Helderberg Group. Newberry. Helderberg of the Cincinnati group. Geol. of O., v. 1, pt. 1, pp. 104–5.

——Newberry. Salina and Lower Helderberg formations in Ohio. Rep. Prog., 1869, pp. 15–6.

Helderberg Limestones. Newberry. Helderberg group in Ohio. Geol. of O., v. 1, pt. 1, pp. 63–4.

——Orton. Greenfield stone of Pike county. Geol. of O., v. 2, pt. 1, pp. 614–16.

——Orton. Helderberg system in Highland county. Rep. Prog., 1870, pp. 287–94.

——Orton. Helderberg limestones in Madison county. Geol. of O., v. 3, p. 421.

See also Helderberg; Lower Helderberg; Monroe Formation.

Hendershot Oil Pool. Bownocker. Wells of Marietta township, Washington county. O. Geol. Sur., Bull. No. 1, pp. 179–80.

Hennebique System. Eno. Hennebique system of reinforced concrete construction. O. Geol. Sur., Bull. No. 2, p. 135.

Hennebique Armored Piles. Eno. Use of Hennebique armored piles in construction. O. Geol. Sur., Bull. No. 2, pp. 173–74.

Henry County. Orton, Jr., and Peppel. Lime formations of, important for lime industries. O. Geol. Sur., Bull. No. 4, p. 134.

——Winchell. Geology. Geol. of O., v. 2, pt. 1, pp. 415–21. Geologic map, 12.6x11.9 cm.

——Winchell. Topography. Geol. of O., v. 2, pt. 1, pp. 415–16.

- Hepaticae.** Kellerman and Werner. Hepaticae of Ohio. Geol. of O., v. 7, pt. 2, pp. 278-84.
- Herrick, C. L.** Observations upon the so-called Waverly group of Ohio. Geol. of O., v. 7, pt. 2, pp. 495-515.
- Kellerman and Werner. Index to genera of Hepaticae. Geol. of O., v. 7, pt. 2, p. 285.
- Herzer, H.** Geology of Brown county. Geol. of O., v. 3, pp. 942-44.
- High-calcium Lime.** Peppel. Method of slaking high-calcium or hot limes. O. Geol. Sur., Bull. No. 4, p. 259.
- Peppel. Lime industry of Ohio. O. Geol. Sur., Bull. No. 4, pp. 222-30.
- Peppel. Definition, uses and manufacture. O. Geol. Sur., Bull. No. 4, pp. 251-59.
- Highland County.** Locke. Geology. Ann. Rep., v. 2, 1838, pp. 267-270.
- Orton. Cliff limestone. Rep. Prog., 1870, pp. 295-308.
- Orton. Geology. Rep. Prog., 1870, pp. 255-309. Geological map.
- Orton. Lime production. Geol. of O., v. 6, pp. 729-31.
- Orton. Oil and gas wells. Geol. of O., v. 6, p. 297.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 74-79.
- Riddell. Geology of Clinton and Highland counties. O. Exec. Docs., 1836. Rep. No. 60, p. 11,
- Hildreth, S. P.** Geological report on the coal measures in southeastern and northeastern Ohio. Ann. Rep., v. 1, 1837, pp. 25-63.
- Report of committee on geological survey of the state. Exec. Docs., 1836, Rep. No. 1, pp. 65-78.
- Hill, Franklin C.** Geology of Logan and Champaign counties. Geol. of O., v. 3, pp. 482-95.
- Hocking County.** Andrews. Geology. Rep. Prog., 1870, pp. 80-6. Benton township, pp. 82-3. Falls township, p. 80. Laurel township, p. 83. Starr township, pp. 83-6. Washington township, p. 80.
- Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 274-75.
- Briggs. Geology. Ann. Rep., v. 1, 1837, pp. 71-98.
- Briggs. Geology of Hocking and Athens counties. Ann. Rep., v. 2, 1838, pp. 130-45.

- Hocking County.** Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 391-94.
- Orton and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 79-81.
- Hocking Valley.** Bownocker. Early history of salt industry in this region. O. Geol. Sur., Bull. No. 8, p. 15.
- Briggs. Coal of the Hocking valley. Ann. Rep., v. 1, 1837, pp. 84-6.
- Lord. Iron manufacture. Geol. of O., v. 5, pp. 473-81.
- Orton. Iron ores. Geol. of O., v. 5, pp. 405-16.
- Orton. Structure and composition of coal. Geol. of O., v. 5, pp. 921-26.
- Hocking Valley Coal Field.** Orton. Explanation of map. Geol. of O., v. 5, pp. 913-15.
- Orton. Extent. Geol. of O., v. 5, pp. 917-18.
- Orton. Geological reports on. Geol. of O., v. 5, pp. 915-17.
- Hodge, J. T.** Geology of Coshocton county. Geol. of O., v. 3, pp. 562-95.
- Hohman Oil Pool.** Bownocker. Wells of Ludlow township, Washington county. O. Geol. Sur., Bull. No. 1, p. 188.
- Holmes County.** Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 286-88. Hardy township, p. 288. Kilbuck township, pp. 287-88. Richland township, p. 287. Washington township, p. 287.
- Orton. Blackband ore. Geol. of O., v. 5, pp. 399-402.
- Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 367-68.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to their fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 81-82.
- Read. Geology. Rep. Prog., 1870, pp. 473-84.
- Read. Geology. Geol. of O., v. 3, pp. 540-61. Geologic map, Holmes and other counties, 31.7x42 cm.
- Read. Topography. Geol. of O., v. 3, p. 540.
- Riddell. Geology of Holmes, Coshocton and Muskingum counties. Exec. Docs., 1836. Rep. No. 60, pp. 27-30.
- Wright. Coal mines. Geol. of O., v. 5, pp. 816-24.

Homer Gas Field. Bownocker. Homer gas field. O. Geol. Sur., Bull. No. 1, pp. 116-17.

Howard, C. C. Analyses of minerals of Hanging Rock district. Geol. of O., v. 3, pp. 934-40.

Hudson River Group. Hall and Whitfield. Fossils. Geol. of O., v. 2, pt. 2, pp. 67-110.

———Newberry. Hudson River group in Ohio. Geol. of O., v. 1, pt. 1, pp. 60-61.

———Orton. Hudson River group in Ohio. Geol. of O., v. 6, pp. 9-10. Same, Rep., 1890, pp. 15-16.

———Orton. Hudson River group in Ohio. Geol. of O., v. 7, pp. 8-9.

———Orton. Lime production. Geol. of O., v. 6, p. 704.

———Orton, Jr., and Peppel. Composition of, in Adams county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 32-33; in Belmont county, pp. 47-48; in Butler county, pp. 48-50; in Clark county, pp. 50-52; in Clermont county, pp. 52-53; in Clinton county, pp. 53-56; in Hamilton county, pp. 71-73; in Montgomery county, pp. 100-101; in Preble county, pp. 117-18; in Warren county, pp. 128-29;

———Orton, Jr., and Peppel. Composition, physical character and uses of its limestone. O. Geol. Sur., Bull. No. 4, pp. 137-43.

See also Eden Shale; Lorraine Formation; Richmond Formation.

Hudson River Shale. Orton. Clinton, Medina, Hudson River and Utica shales as sources of gas. Prelim. Rep. on petroleum and inflammable gas, 1886, pp. 66-69. Edition 1887 pp. 96-99.

Huron County. Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 350-51.

———Orton. Oil and gas wells. Geol. of O., v. 6, pp. 302-03.

———Orton. Shale gas. Geol. of O., v. 6, pp. 440-441.

———Read. Geology. Geol. of O., v. 3, pp. 289-309. Geologic map of Huron county, 14.1x10.6 cm.

———Read. Topography. Geol. of O., v. 3, pp. 289-90.

———Riddell. Geology. Exec. Docs., 1836. Rep. No. 60, pp. 23-5.

Huron Shale. Andrews. Huron shale in Pickaway county. Geol. of O., v. 2, pt. 1, pp. 589-91.

———Hill. Huron shale in Logan county. Geol. of O., v. 3, p. 484.

———Newberry. Fossil fishes of. Geol. of O., v. 1, pt. 2, pp. 268-70.

———Newberry. Huron shale in Cuyahoga county. Geol. of O., v. 1, pt. 1, p. 191.

- Huron Shale.** Newberry. Huron shale in Erie county. Geol. of O., v. 2, pt. 1, pp. 188-89.
- Newberry. Huron shale in Lorain county. Geol. of O., v. 2, pt. 1, pp. 213-16.
- Newberry. Huron shale in Ohio. Geol. of O., v. 3, pp. 13-18.
- Orton. Fossils. Geol. of O., v. 3, pp. 635-637.
- Orton. Huron shale in Franklin county. Geol. of O., v. 3, pp. 632-38.
- Orton. Huron shale in Ohio. Geol. of O., v. 6, pp. 25-26. Same, in part, Rep., 1890, pp. 28-9.
- Orton. Huron shale in Pike county. Geol. of O., v. 2, pt. 1, pp. 616-18.
- Orton. Huron shale in Ross county. Geol. of O., v. 2, pt. 1, pp. 646-47.
- Prosser. Discussion on the propriety of the name for this formation in the revised Ohio geological scale. O. Geol. Sur., Bull. No. 7, pp. 22-24.
- Read. Huron shale in Huron county. Geol. of O., v. 3, pp. 307-08.
- Read. Huron shale in Lake county. Geol. of O., v. 1, pt. 1, pp. 515.
- Winchell. Huron shale in Crawford county. Geol. of O., v. 2, pt. 1, p. 243.
- Winchell. Huron shale in Defiance county. Geol. of O., v. 2, pt. 1, pp. 425-26.
- Winchell. Huron shale in Delaware county. Geol. of O., v. 2, pt. 1, pp. 282-87.
- Winchell. Huron shale in Marion county. Geol. of O., v. 1, pt. 1, p. 643.
- Winchell. Huron shale in Morrow county. Geol. of O., v. 2, pt. 1, pp. 264-65.
- Hussey, John.** Geology of Clinton, Fayette, Shelby and Miami counties. Geol. of O., v. 3, pp. 429-81.
- Hydrated Lime.** Peppel. Manufacture and uses of hydrated lime in Ohio. O. Geol. Sur., Bull. No. 4, pp. 233-46.
- Peppel. Processes of manufacture, mechanical equipment and commercial uses of hydrated lime. O. Geol. Sur., Bull. No. 4, pp. 319-41.
- Peppel. Properties of hydrated lime. O. Geol. Sur., Bull. No. 4, pp. 335-41.

Hydration. Bleininger. Hydration of Portland cement. O. Geol. Sur., Bull. No. 3, pp. 336-38.

Hydraulic Cement, see Cement.

Hydraulic Limestone, see Waterlime.

Ice, see Glacial Geology; Pleistocene.

Indiana. Orton. Table giving elevations above sea level in northern Indiana. Prelim. Rep., on petroleum and inflammable gas, 1887, pp. 191-93.

——Orton. Trenton limestone in northeastern Indiana as a source of gas and oil. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 170-76.

Indians. Fowke. Indians and mound builders. Geol. of O., v. 7, pt. 2, pp. 45-6.

Iron Manufacture. Briggs. Iron manufacture in Lawrence and Scioto counties. Ann. Rep. v. 1, 1837, pp. 89-92.

——Clark. Application of the hot blast, in manufacture of cast iron. Exec. Docs., 1836. Rep. No. 1, pp. 78-9. (from Amer. Jour. Sci. for Oct., 1836.)

——Hildreth. Furnaces in Scioto and Lawrence counties. Exec. Docs., 1836. Rep. No. 1, p. 70.

——Lord. Fuels used. Geol. of O., v. 5, pp. 443-44.

——Lord. General conditions. Geol. of O., v. 5, pp. 438-41.

——Lord. Historical sketch. Geol. of O., v. 5, pp. 447-55.

——Lord. Iron manufacture in Ohio. Geol. of O., v. 5, pp. 438-554.

——Lord. Metallurgy of Iron in Ohio. Geol. of O., v. 5, pp. 497-554.

——Lord. Transportation. Geol. of O., v. 5, pp. 441-43.

——Newberry. Manufacture of iron. Rep. Prog., 1869, pp. 41-9.

——Orton. Natural gas as fuel for iron mills. Rep. 1890, pp. 273-75.

——Potter. Present state of the iron manufacture in Great Britain. Rep. Prog., 1870, pp. 503-526.

——Winchell. Furnaces of Paulding county. Geol. of O., v. 2, pt. 1, pp. 350-51.

Iron Ores. Andrews. Analysis of iron ore from Belmont county. Geol. of O., v. 2, pt. 1, p. 580.

——Andrews. Iron ores of the Hocking valley. Geol. of O., v. 3, pp. 857-82.

——Andrews. Iron ores of the 2d geol. district. Rep. Prog., 1869, pp. 116-23. Rep. Prog., 1870, pp. 214-23.

- Iron Ores.** Andrews. Iron ore of Vinton county. Rep. prog., 1870, pp. 92-126.
- Andrews. Iron ore of Washington county. Geol. of O., v. 2, pt. 1, pp. 489-90.
- Briggs. Iron ores of Athens county. Ann. Rep., v. 2, 1838, pp. 143-45.
- Briggs. Iron ores of Hocking county. Ann. Rep., v. 2, 1838, pp. 142-43.
- Briggs. Iron ores of Jackson county. Ann. Rep., v. 1, 1837, pp. 92-93.
- Briggs. Iron ores of Lawrence and Scioto counties. Ann. Rep., v. 1, 1837, pp. 88-89.
- Briggs. Iron ores of Tuscarawas county. Ann. Rep., v. 2, 1838, pp. 151-53.
- Foster. Iron ores of Muskingum, Licking and Franklin counties. Ann. Rep., v. 2, 1838, pp. 88-90.
- Hildreth. Iron ore deposits. Exec. Docs., 1836. Rep. No. 1, pp. 66-72.
- Hildreth. Iron ore in southeastern and northeastern Ohio. Ann. Rep., v. 1, 1837, pp. 36-44.
- Lord. Method of analyses. Geol. of O., v. 5, pp. 1091-93.
- Mather. Iron ores of Ohio. Ann. Rep., v. 1, 1837, pp. 7-9.
- Newberry. Blackband iron ore of Mahoning county. Geol. of O., v. 3, pp. 790-91.
- Newberry. Blackband iron ore of Stark county. Geol. of O., v. 3, pp. 175-6.
- Newberry. Iron deposits in Ohio. Rep. Prog., 1869; pp. 38-41.
- Newberry. Iron ores in Ohio. Rep. Prog., 1870, pp. 44-9.
- Newberry. Iron ore of Tuscarawas county. Geol. of O., v. 3, pp. 63-4.
- Newberry. Iron ore of Tuscarawas county. Geol. of O., v. 3, pp. 74-80.
- Orton. Classification of ores of lower coal-measures. Geol. of O., v. 5, pp. 375-78.
- Orton. Iron ores of Hanging Rock district. Geol. of O., v. 3, pp. 899-911.
- Orton. Ores of the Hocking valley. Geol. of O., v. 5, pp. 405-16.
- Orton. Iron ores of Ohio, geological order and geographical distribution. Geol. of O., v. 5, pp. 371-435.
- Orton. Ores from the sub-carboniferous limestone to the Mercer group in Hanging Rock district. Geol. of O., v. 5, pp. 418-21.



- Iron Ores.** Read. Iron ores of the Hocking Valley. Geol. of O., v. 3, pp. 654-61, 674-77, 686-93, 707-13, 714-15.
- Read. Iron ore of Holmes county. Rep. Prog., 1870, pp. 482-83.
- Read. Iron ore of Richland county. Geol. of O., v. 3, pp. 315-16.
- Stevenson. Iron ore in Carroll county. Geol. of O., v. 3, pp. 197-98.
- See also Limonite.*
- Wormley. Analyses. Geol. of O., v. 2, pt. 1, pp. 604-06.
- Wormley. Analyses. Iron ore analyses, from Carroll county, Geol. of O., v. 3, pp. 186-87. From Columbiana county, Geol. of O., v. 3, pp. 127-28, 130. From Hanging Rock district, Geol. of O., v. 5, p. 496. From Hocking valley, Geol. of O., v. 5, pp. 475-76. From Tuscarawas county, Geol. of O., v. 3, p. 88.
- Andrews. Analyses by L. G. Wormley. Rep. Prog., 1869, p. 123.
- Andrews. From Lawrence county. Rep. Prog., 1870, pp. 183, 185, 193 and 200.
- Cassells. From Collingwood, Yellow Creek valley. Rep. Prog., 1870, p. 49.
- Howard. From Hanging Rock district. Geol. of O., v. 3, pp. 937-939.
- Lord. Ores described in Geol. of O., v. 5. Geol. of O., v. 5, pp. 1110-1111, 1112-13.
- Newberry. Blackband ore. Rep. Prog., 1870, p. 48.
- Newberry. Ore from Holmes, Tuscarawas and Columbiana counties. Rep. Prog., 1870, pp. 46-7.
- Newberry. Iron ores from Mahoning county. Geol. of O., v. 3, p. 813.
- Read. Iron ore from Hocking Valley. Geol. of O., v. 3, pp. 660, 677, 692, 693, 711.
- Read. Iron ore from Holmes county. Geol. of O., v. 3, p. 558.
- Wormley. Iron ore from Guernsey county. Geol. of O., v. 2, pt. 1, p. 530.
- Wormley. Iron ore from Jefferson county. Geol. of O., v. 3, p. 780.
- Wormley. Iron ore from Muskingum county. Geol. of O., v. 1, pt. 1, pp. 324-25.
- Wormley. Iron ore from Noble County. Geol. of O., v. 2, pt. 1, p. 516.
- Wormley. Iron ore from Scioto county, Harrison township. Rep. Prog., 1870, p. 165.

- Iron Ores.** Wormley. Iron ore from Vinton county. Rep. Prog., 1870, pp. 119, 120-21, 122.
- Wormley. Iron ore from Washington county. Geol. of O., v. 2, pt. 1, pp. 465-489.
- Wormley. Method of analysis. Rep. Prog., 1870, pp. 429-37.
- Wormley. Table of iron ore analyses from 2d geol. dist. Rep. Prog., 1870, pp. 219-23.
- Wormley. Tables. Rep. Prog., 1870, pp. 438-44.
- Wormley and others. Iron ore from the Hocking Valley. Geol. of O., v. 3, pp. 859, 860, 861, 862-63, 865, 866, 867, 868, 870, 871, 872, 873, 876, 877, 878, 879, 880.
- Irrigation Ditches.** Eno. Use of concrete for irrigation ditches. O. Geol. Sur., Bull. No. 2, pp. 94-6.
- Island Creek Oil Field.** Bownocker. Wells of Jefferson county. O. Geol. Sur., Bull. No. 1, pp. 244-45.
- Ithaca Dam.** Eno. Use of steel concrete in dam construction. O. Geol. Sur., Bull. No. 2, pp. 180-82.
- Jackson County.** Andrews. Coal measures. Rep. Prog., 1870, pp. 127-62. Jefferson township, pp. 159-60. Madison township, p. 161.
- Andrews. Coal-measures. Rep. Prog., 1870, pp. 127-62. Hamilton township, pp. 156-9. Liberty township, Scioto township, Franklin township, Bloomfield township, p. 154. Lick township, pp. 138-47. Milton township, pp. 132-38. Washington township, pp. 127-32.
- Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 275-76. Jackson township, p. 275. Liberty township, p. 275. Lick township, p. 275. Scioto township, p. 275. Washington township, p. 275. Wellston township, p. 275.
- Briggs. Coal. Ann. Rep., v. 1, 1837, pp. 86-7.
- Briggs. Geology. Ann. Rep., v. 1, 1837, pp. 71-98.
- Briggs. Iron ores. Ann. Rep., v. 1, 1837, pp. 92-3.
- Orton. Coal mines, Geol. of O., v. 5, pp. 1008-1034.
- Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 394-95.
- Orton. Mines above the horizon of Wellston coal. Geol. of O., v. 5, pp. 1024-34.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 82-84.

- Jackson County.** Orton, Jr., and Peppel. Occurrence of ferriferous limestone in. O. Geol. Sur., Bull. No. 4, pp. 180-82.
- Roy. Manner of mining in. Geol. of O., v. 5, pp. 1021-24.
- Jackson Ridge Oil Pool.** Bownocker. Geology of the field. O. Geol. Sur., Bull. No. 1, p. 201.
- Bownocker. Wells of Monroe county. O. Geol. Sur., Bull. No. 1, pp. 200-02.
- Jackson Shaft Coal.** Orton. Jackson shaft coal in Vinton county. Geol. of O., v. 5, p. 995.
- Roy. Jackson shaft coal in Jackson county. Geol. of O., v. 5, pp. 1011-1015.
- Jaw Crusher.** Bleininger. Machines used in cement grinding. O. Geol. Sur., Bull. No. 3, pp. 254-55.
- Jeffers Coal.** Andrews. Jeffers coal in Gallia county. Geol. of O., v. 1, pt. 1, pp. 225-45.
- Jefferson County.** Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 243-50. Brush Creek township, p. 247. Mt. Pleasant township, p. 249. Moss township, pp. 247-48. Salem township, p. 248. Smithfield township, pp. 248-49. Springfield township, p. 248. Warren township, p. 250. Wells township, pp. 249-50.
- Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 243-50. Geologic map showing oil and gas territories. 16x25.3 cm. opp. p. 244.
- Brown. Pittsburgh coal. Geol. of O., v. 6, pp. 596-604. Cross Creek township, pp. 597-98. Island Creek township, p. 597. Knox township, p. 596. Mt. Pleasant township, pp. 602-03. Ross township, p. 596. Salem township, pp. 596-97. Smithfield township, pp. 600-02. Springfield township, p. 596. Steubenville township, p. 598. Warren township, pp. 603-04. Wayne township, p. 597. Wells township, pp. 599-600.
- Newberry. Geology. Geol. of O., v. 3, pp. 716-80.
- Newberry. Topography. Geol. of O., v. 3, pp. 716-18.
- Orton. Coal mines. Geol. of O., v. 5, pp. 297-99.
- Orton. Deep wells, drilling for oil and gas. Geol. of O., v. 6, pp. 404-06.
- Orton, Jr., and Peppel. Composition of limestone of, with reference to their fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 84-85.

- Jewett Oil Pool.** Bownocker. Wells of Harrison county. O. Geol. Sur., Bull. No. 1, pp. 232-33.
- Joints.** Orton. Joints of the Ohio coal seams. Geol. of O., v. 5, pp. 143-44.
- Jordan, David S.** Report on the fishes of Ohio. Geol. of O., v. 4, pp. 737-1002.
- Jurassic System.** Newberry. Geol. of O., v. 1, pt. 1, pp. 81-2.
- Kahl Press.** Peppel. Presses in use for hardening in sand-lime brick manufacture. O. Geol. Sur., Bull. No. 5, p. 68.
- Kahn's System.** Eno. Kahn's system of reinforced concrete.. O. Geol. Sur., Bull. No. 2, p. 137.
- Kames.** Lindemuth. Kames of Darke county. Geol. of O., v. 3, pp. 503-06.
———Newberry. Kames in Ohio. Geol. of O., v. 2, pt. 1, pp. 41-6.
———Newberry. Kames in Ohio. Geol. of O., v. 3, pp. 40-42.
———Orton. Kames in Franklin county. Geol. of O., v. 3, p. 646.
- Kaolin.** Orton. Properties of kaolin. Geol. of O., v. 7, pp. 48-50.
———Peppel. Dehydrated kaolin employed in the manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, p. 35.
- Kaolinite.** Bleining. Kaolinite as component mineral of Portland cement clay. O. Geol. Sur., Bull. No. 3, pp. 63-64.
See also Clays.
- Kellerman, W. A.** Catalogue of Ohio plants. Geol. of O., v. 7, pt. 2, pp. 56-406.
- Kelly's Island.** Orton. Lime production. Geol. of O., v. 6, pp. 750-62.
- Kent Mill.** Bleining. Machines used in cement manufacture. O. Geol. Sur., Bull. No. 3, pp. 267-70.
- Keokuk Group.** Herrick. Keokuk group and its fossils in Ohio. Geol. of O., v. 7, pt. 2, pp. 514-15.
- Kidney Ores.** Orton. Kidney ores of Stark, Carroll and Tuscarawas county. Geol. of O., v. 5, pp. 398-99.
- Kiln Capacities.** Peppel. Consideration of kiln capacities in lime burning. O. Geol. Sur., Bull. No. 4, pp. 289-90.
- Kiln Lining.** Bleining. Refractory lining for cement burning kilns. O. Geol. Sur., Bull. No. 3, pp. 309-314.

- Kilns.** Bleining. Varieties of kilns used in cement burning. O. Geol. Sur., Bull. No. 3, pp. 187-89.
- Peppel. Varieties of kilns for burning of lime in use in Ohio. O. Geol. Sur., Bull. No. 4, pp. 267-71.
- Kinderhook Group.** Herrick. Kinderhook group and its fossils in Ohio. Geol. of O., v. 7, pt. 2, pp. 512-14.
- Kirtland, Jared P.** Report on specimens of botany and zoology collected in Ohio. Ann. Rep., v. 1, 1837, pp. 65-69.
- Report on the zoology of Ohio. Ann. Rep., v. 2, 1838, pp. 157-200.
- Kittanning Clays and Shales.** Orton. Kittanning clays in Ohio. Geol. of O., v. 7, pp. 65-66.
- Klippart, John H.** Agricultural survey of Ohio. Rep. Prog., 1870, pp. 313-400.
- Knox County.** Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 283-85.
- Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 366-67.
- Read. Geology. Geol. of O., v. 3, pp. 325-47.
- Read. Topography. Geol. of O., v. 3, pp. 325-333.
- Knoxville Oil and Gas Field.** Bownocker. Wells of Jefferson county. O. Geol. Sur., Bull. No. 1, pp. 246-47.
- Koehler's Excelsior Salt Works.** Bownocker. Existing salt furnaces in Meigs county. O. Geol. Sur., Bull. No. 8, pp. 18-22.
- Komnick Press.** Peppel. Presses for use in sand-lime brick manufacture. O. Geol. Sur., Bull. No. 5, pp. 69-70.
- Lake County.** Orton. Shale gas. Geol. of O., v. 6, pp. 427-428.
- Read. Geology. Geol. of O., v. 1, pt. 1, pp. 510-19. Geologic map of Ashtabula, Trumbull, Lake and Geauga counties, 26.3x32 cm.
- Read. Topography. Geol. of O., v. 1, pt. 1, pp. 510-12.
- Lake Ridges.** Newberry. Lake ridges of Cuyahoga county. Geol. of O., v. 1, pt. 1, pp. 178-81.
- Newberry. Lake ridges of Lorain county. Geol. of O., v. 2, pt. 1, pp. 207-08.
- Newberry. Lake ridges of Ohio. Geol. of O., v. 3, pp. 44-45.
- Newberry. Lake ridges of Ohio. Geol. of O., v. 2, pt. 1, pp. 56-65.

- Lake Ridges.** Read. Lake ridges and terraces of Ashtabula county. Geol. of O., v. 1, pt. 1, pp. 488-92.
- Read. Soil drift and lake ridges of Lake county. Geol. of O., v. 1, pt. 1, pp. 516-19.
- Lakes.** Newberry. Origin of the basins of the lakes. Geol. of O., v. 3, pp. 45-51.
- Newberry. Origin of the great lakes. Geol. of O., v. 2, pt. 1, pp. 72-80.
- Newberry. Lakes of Summit county. Geol. of O., v. 1, pt. 1, p. 206.
- Lamellibranchiata (Paleozoic).** Meek. Lamellibranchiata of the Cincinnati group. Geol. of O., v. 1, pt. 2, pp. 130-155.
- Meek. Lamellibranchiata of the Corniferous group. Geol. of O., v. 1, pt. 2, pp. 157-209.
- Ulrich. New and little known species from Lower Silurian rocks of Ohio and adjacent states. Geol. of O., v. 7, pt. 2, pp. 626-93.
See also Paleontology; Genera and Species.
- Lancaster.** Orton. Oil and gas production. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 163-65.
- Lancaster Gas Field.** Orton. Lancaster gas field. Rep., 1890, pp. 234-40.
- Lapham, I. A.** Miscellaneous observations on the geology of Ohio. Exec. Docs., 1836. Rep. No. 60, pp. 31-4.
- Las Ninfas Dam.** Eno. Use of concrete in its construction. O. Geol. Sur., Bull. No. 2, pp. 101-02.
- Lawrence County.** Andrews. Local Geology. Rep. Prog., 1870, pp. 181-213. Aid township, pp. 194-95. Decatur township, pp. 186-89. Elizabeth township, pp. 190-94. Fayette township, p. 208. Hamilton township, p. 197. Lawrence township, p. 201. Mason township, p. 196. Perry township, pp. 203-7. Rome township, pp. 202-3. Symmes township, p. 189. Union township, pp. 208-9. Upper township, pp. 197-200. Windsor township, pp. 201-2. Washington township, pp. 182-86.
- Briggs. Coal. Ann. Rep., v. 1, 1837, pp. 86-7.
- Briggs. Geology. Ann. Rep., v. 1, 1837, pp. 71-98.
- Briggs. Iron manufacture. Ann. Rep., v. 1, 1837, pp. 89-92.
- Briggs. Iron ores. Ann. Rep., v. 1, 1837, pp. 88-89.
- Orton. Coal mines. Geol. of O., v. 5, pp. 1034-46.

- Lawrence County.** Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, p. 396.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to their fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 85-88.
- Orton, Jr., and Peppel. Occurrence of ferriferous limestone in. O. Geol. Sur., Bull. No. 4, pp. 175-79.
- Lead.** Read. Lead of Holmes county. Rep. Prog., 1870, p. 483.
- Levees.** Eno. Concrete in levee walls. O. Geol. Sur., Bull. No. 2, pp. 72-73.
- Lichens.** Kellerman and Werner. Index to genera. Geol. of O., v. 7, pt. 2, p. 299.
- Kellerman and Werner. List of lichens of Ohio. Geol. of O., v. 7, pt. 2, pp. 286-98.
- Licking County.** Foster. Physical geography. Ann. Rep., v. 2, 1838, p. 75.
- Orton. Coal mines. Geol. of O., v. 5, pp. 908-11.
- Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 370-72.
- Orton. Iron ores. Geol. of O., v. 5, pp. 402-04.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to their fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 88-89.
- Read. Geology. Geol. of O., v. 3, pp. 348-361.
- Read. Topography. Geol. of O., v. 3, pp. 348-349.
- Lima Oil Field.** Orton. Development of the Lima oil field. Prelim. Rep. on petroleum and inflammable gas. 1886, pp. 41-6. Edition 1887, pp. 60-7.
- Orton. Lima field as a source of Trenton limestone oil. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 152-57.
- Lime.** Bleining. Lime as a constituent of hydraulic cements. O. Geol. Sur., Bull. No. 3, pp. 34-37.
- Bleining. Lime materials in cement making. O. Geol. Sur., Bull. No. 3, pp. 85-87.
- Bleining. Methods of winning lime materials. O. Geol. Sur. Bull. No. 3, pp. 249-50.
- Eno. Lime in cement mortar. O. Geol. Sur., Bull. No. 2, pp. 41-46.

- Lime.** Gilbert. Lime of Lucas county. Geol. of O., v. 1, pt. 1, pp. 581-82.
- Orton. Lime burning in Clark county. Geol. of O., v. 1, pt. 1, pp. 473-79.
- Orton. Manufacture of lime from Corniferous limestone in Franklin county. Geol. of O., v. 3, pp. 631-632.
- Orton. Lime burning in Greene county. Geol. of O., v. 2, pt. 1, pp. 676-77.
- Orton. Production in Ohio. Geol. of O., v. 6, pp. 703-771.
- Orton. Use of natural gas in lime burning. Rep., 1890, pp. 276-77.
- Orton, Jr., and Peppel. Use of corniferous limestone for lime in Ohio. O. Geol. Sur., Bull. No. 4, p. 166.
- Orton, Jr., and Peppel. Use of Lower Helderberg limestones for lime, in Ohio. O. Geol. Sur., Bull. No. 4, p. 158.
- Orton, Jr., and Peppel. Use of Niagara limestones for, in Ohio. O. Geol. Sur., Bull. No. 4, p. 154.
- Peppel. Commercial uses of ground lime. O. Geol. Sur., Bull. No. 4, p. 319; of lump lime, p. 319.
- Peppel. Definition of lime. O. Geol. Sur., Bull. No. 4, pp. 249-251.
- Peppel. Preparation of lime used in manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 39-41.
- Peppel. Processes of manufacture, equipment, and commercial uses of hydrated lime. O. Geol. Sur., Bull. No. 4, pp. 319-41.
- Peppel. Production in Ohio. O. Geol. Sur., Bull. No. 4, pp. 229-33.
- Peppel. Quantity and kind of lime used in manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 35-38.
- Peppel. Technology of the lime industry. O. Geol. Sur., Bull. No. 4, pp. 249-341.
- Peppel. Use of limestones for manufacture of lime in Ohio. O. Geol. Sur., Bull. No. 4, pp. 222-33.
- Winchell. Lime burning in Allen county. Geol. of O., v. 2, pt. 1, pp. 401-02.
- Winchell. Lime of Delaware county. Geol. of O., v. 2, pt. 1, pp. 296-99.
- Winchell. Lime of Ottawa county. Geol. of O., v. 2, pt. 1, p. 235.
- Winchell. Lime of Sandusky county. Geol. of O., v. 1, pt. 1, pp. 606-07.

- Lime.** Winchell. Limekilns of Van Wert county. Geol. of O., v. 2, pt. 1, p. 323.
- Winchell. Lime burning in Wood county. Geol. of O., v. 2, pt. 1, pp. 376-378.
- Winchell. Quicklime of Delaware county. Geol. of O., v. 2, pt. 1, pp. 309-12.
See also Gypsum.
- Lime Burning.** Peppel. Discussion and experimental investigations of temperature for burning lime. O. Geol. Sur., Bull. No. 4, pp. 293-311.
- Peppel. Processes and machinery of lime burning. O. Geol. Sur., Bull. No. 4, pp. 265-310.
- Lime Cooling.** Peppel. Methods employed in cooling burned lime. O. Geol. Sur., Bull. No. 4, pp. 311-13.
- Lime Classification.** Peppel. Classification and definition of limes. O. Geol. Sur., Bull. No. 4, pp. 251-54.
- Lime Industry.** Peppel. Distribution of lime industry in Ohio. O. Geol. Sur., Bull. No. 4, pp. 225-227.
- Peppel. Recent history of the industry in Ohio. O. Geol. Sur., Bull. No. 4, pp. 227-29.
- Peppel. Technology of the lime industry. O. Geol. Sur., Bull. No. 4, pp. 249-341.
- Lime Manufacture.** Peppel. Description and plans of typical lime manufacturing establishments in Ohio. O. Geol. Sur., Bull. No. 4, pp. 343-365.
- Peppel. Processes in manufacture of lime. O. Geol. Sur., Bull. No. 4, pp. 260-341.
- Limestones.** Andrews. Fossiliferous limestones of Athens county. Geol. of O., v. 1, pt. 1, pp. 262-90.
- Andrews. Limestones of Morgan county. Geol. of O., v. 1, pt. 1, pp. 294-313.
- Andrews. Limestones of Muskingum county. Geol. of O., v. 1, pt. 1, pp. 314-44.
- Andrews. Limestones of Noble county. Geol. of O., v. 2, pt. 1, pp. 513-25.
- Andrews. Limestones of Washington county. Geol. of O., v. 2, pt. 1, pp. 461-508.
- Bleining. Limestone and calcareous materials in Portland cement. O. Geol. Sur., Bull. No. 3, pp. 226-31.

- Limestones.** Briggs. Limestones in Crawford county. Ann. Rep., v. 2, 1838, pp. 120-21.
- Briggs. Limestones in Hocking and Athens counties. Ann. Rep., v. 2, 1838, pp. 135-37.
- Briggs. Limestones in region between Scioto and Hoekhocking rivers. Ann. Rep., v. 1, 1837, pp. 82-83, 76.
- Briggs. Limestones in Tuscarawas county. Ann. Rep., v. 2, 1838, pp. 147-48.
- Briggs. Limestone in Wood county. Ann. Rep., v. 2, 1838, pp. 112-14.
- Foster. Limestone in Muskingum, Licking and Franklin counties. Ann. Rep., v. 2, pp. 838-93.
- Hawes. Building stone of Ohio. Geol. of O., v. 5, pp. 608-41.
- Hawes. Quarries in Ohio. Geol. of O., v. 5, pp. 608-41.
- Hildreth. Limestone in Morgan, Athens, Meigs, etc., counties. Ann. Rep., v. 1, 1837, pp. 38-9, 46, 47-8.
- Hodge. Limestones in Coshocton county. Geol. of O., v. 3, pp. 566-67.
- Hussey. Quarries in Miami county. Geol. of O., v. 3, pp. 478-80.
- Lindemuth. Fossils in Guelph in Darke county. Geol. of O. v. 3, pp. 514-15.
- Lindemuth. Quarries in Darke county. Geol. of O., v. 3, pp. 512-14.
- Locke. Limestones in southwestern Ohio. Ann. Rep., v. 2, 1838, pp. 203-7.
- Locke. Limestone in Adams county. Ann. Rep., v. 2, 1838, pp. 243-46.
- Locke. Quarries in Preble and Montgomery counties. Ann. Rep., v. 2, 1838, pp. 227-32.
- Lovejoy. Limestones of the Pomeroy and Federal Creek coal field. Geol. of O., v. 6, pp. 629-30. 632-33.
- Mather. Limestone in Ohio. Ann. Rep., v. 1, 1837, p. 9.
- Newberry. Corniferous limestones in Erie county. Geol. of O., v. 2, pt. 1, pp. 190-93.
- Newberry. Limestones in Tuscarawas county. Geol. of O., v. 3, pp. 62-3.
- Newberry. Quarries in Lorain county. Geol. of O., v. 2, pt. 1, pp. 216-19.
- Newberry. White limestone in Mahoning county. Geol. of O., v. 3, pp. 797-98.

- Limestones.** Orton. Cedarville limestone in Clark county. Geol. of O., v. 1, pt. 1, pp. 471-73.
- Orton. Cliff and Blue cliff limestone in Highland county. Rep. Prog., 1870, pp. 274-77.
- Orton. Cliff limestone in Highland and Adams counties. Rep. Prog., 1870, pp. 295-308.
- Orton. Fossils in Ross county limestone. Geol. of O., v. 2, pt. 1, pp. 644-45.
- Orton. Fossils in Springfield limestone of Clark county. Geol. of O., v. 1, pt. 1, p. 470.
- Orton. Hill-quarry series in Hamilton county. Geol. of O., v. 1, pt. 1, pp. 424-25.
- Orton. Limestone in the Cincinnati group. Geol. of O., v. 1, pt. 1, pp. 373-79.
- Orton. Limestone in the Hanging Rock district. Geol. of O., v. 3, pp. 888-99.
- Orton. Limestone in Montgomery county. Rep. Prog., 1869, pp. 149-53.
- Orton. Limestone as reservoirs for petroleum and natural gas. Geol. of O., v. 6, pp. 86-7.
- Orton. Limestone in Ross county. Geol. of O., v. 2, pt. 1, pp. 643-46.
- Orton. Limestones of the lower coal-measures of Ohio. Geol. of O., v. 5, pp. 13-27.
- Orton. Point Pleasant beds in Clermont county. Geol. of O., v. 1, pt. 1, pp. 437-38.
- Orton. Quarries in Franklin county. Geol. of O., v. 3, pp. 607-614.
- Orton. Quarries of Springfield limestone in Clark county. Geol. of O., v. 1, pt. 1, pp. 467-70.
- Orton. Thickness of Devonian and Upper Silurian limestones in geological scale of Ohio. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 122-23.
- Orton, Jr., and Peppel. Composition of limestones, in Belmont county, with reference to their fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 40-47.
- Orton, Jr., and Peppel. Composition, physical character and uses of the limestones of Ohio, considered by geological formations. O. Geol. Sur., Bull. No. 4, pp. 137-211.
- Orton, Jr., and Peppel. Limestones and lime industry in Ohio. O. Geol. Sur., Bull. No. 4.

- Limestones.** Orton, Jr., and Peppel. List of counties in Ohio, practically devoid of limestone resources. O. Geol. Sur., Bull. No. 4, p. 136.
- Orton, Jr. and Peppel. Occurrence, extent, and economic classification of the limestones of Ohio. O. Geol. Sur., Bull. No. 4, pp. 20-24.
- Orton, Jr. and Peppel. Limestone resources of Ohio for cement making. O. Geol. Sur., Bull. No. 3, pp. 89-95.
- Orton, Jr. and Peppel. Lower Kittanning available for cement making. O. Geol. Sur., Bull. No. 3, pp. 92-3.
- Peppel. Uses of limestone in Ohio. O. Geol. Sur., Bull. No. 4, pp. 212-248.
- Read. Fossiliferous limestone in Ashland county. Geol. of O., v. 3, p. 525.
- Read. Limestones in the Hocking Valley. Geol. of O., v. 3, pp. 711-12.
- Riddell. Yellow limestone district of Ohio. Ohio Exec. Docs., 1836. Rep. No. 60, pp. 8-30.
- Stevenson. Crinoidal limestones in Carroll county. Geol. of O., v. 3, p. 180.
- Stevenson. Crinoidal limestone in Guernsey county. Geol. of O., v. 3, pp. 222-23.
- Winchell. Quarries in Allen county. Geol. of O., v. 2, pt. 1, pp. 398-401.
- Winchell. Quarries in Crawford county. Geol. of O., v. 2, pt. 1, pp. 251-52.
- Winchell. Quarries in Defiance county. Geol. of O., v. 2, pt. 1, pp. 427-28.
- Winchell. Quarries in Delaware county. Geol. of O., v. 2, pt. 1, pp. 290-96.
- Winchell. Quarries in Hancock county. Geol. of O., v. 2, pt. 1, pp. 359-64.
- Winchell. Quarries in Mercer county. Geol. of O., v. 2, pt. 1, pp. 411-13.
- Winchell. Quarries in Paulding county. Geol. of O., v. 2, pt. 1, pp. 338-39.
- Winchell. Quarries in Van Wert county. Geol. of O., v. 2, pt. 1, pp. 317-18.
- Winchell. Quarries in Wood county. Geol. of O., v. 2, pt. 1, pp. 373-74, 377-79.
- Winchell. Quarries in Wyandot county. Geol. of O., v. 1, pt. 1, pp. 629-30, 632.

Limestones. *See also Carboniferous system; Waterline; also names of formations.*

- Limestone Analyses. By Formations or Localities.** Cambridge stone of Ohio. O. Geol. Sur., Bull. No. 3, pp. 93-94.
- Clinton limestone in Ohio. O. Geol. Sur., Bull. No. 3, pp. 98-9.
- Clinton formation in Ohio. O. Geol. Sur., Bull. No. 4, pp. 144-45.
- Corniferous limestones. O. Geol. Sur., Bull. No. 3, pp. 100-101.
- Corniferous limestone in Crawford county. O. Geol. Sur., Bull. No. 4, p. 58.
- Corniferous or Devonian limestones in Ohio. O. Geol. Sur., Bull. No. 4, pp. 160-63.
- Crinoidal or Ames limestone. O. Geol. Sur., Bull. No. 3, p. 94.
- Delaware limestone from Delaware county. O. Geol. Sur., Bull. No. 4, p. 61.
- Ferriferous limestone from Lawrence county. O. Geol. Sur., Bull. No. 4, pp. 86-87.
- Limestones from Hocking valley. Geol. of O., v. 5, pp. 477-478.
- Limestones from Tuscarawas county. Geol. of O., v. 3, p. 89.
- Lower Carboniferous formation. O. Geol. Sur., Bull. No. 3, pp. 100-101.
- Lower Helderberg limestones. O. Geol. Sur., Bull. No. 4, pp. 156-57; from Van Wert county, p. 128; from Ottawa county, p. 108; Lower Kittanning from Columbiana county, Ohio. O. Geol. Sur., Bull. No. 4, p. 191.
- Lower Kittanning in Ohio. O. Geol. Sur., Bull. No. 3, p. 93.
- Lower Silurian or Hudson river formation. O. Geol. Sur., Bull. No. 3, pp. 98-99.
- Lower Silurian or Hudson river group limestones. O. Geol. Sur., Bull. No. 4, pp. 140-41.
- Maxville and Ames limestone from Muskingum county. O. Geol. Sur., Bull. No. 4, p. 104.
- Maxville limestone of Ohio. O. Geol. Sur., Bull. No. 4, pp. 170-71.
- Meigs creek limestones in Ohio. O. Geol. Sur., Bull. No. 4, pp. 208-09.
- Mercer limestones in Ohio. O. Geol. Sur., Bull. No. 3, p. 91; Bull. No. 4, p. 173.
- Middle Kittanning from Columbiana county, Ohio. O. Geol. Sur., Bull. No. 4, p. 191.
- Middle Kittanning in Ohio. O. Geol. Sur., Bull. No. 3, p. 93.
- Niagara limestones in Ohio. O. Geol. Sur., Bull. No. 4, pp. 150-53.

Limestone Analyses. By Formations or Localities. Pittsburg limestones in Ohio. O. Geol. Sur., Bull. No. 4, pp. 206-07.

- Putnam Hill limestone from Stark county, Ohio. O. Geol. Sur., Bull. No. 4, p. 174.
- Putnam Hill limestone in Ohio. O. Geol. Sur., Bull. No. 3, p. 92.
- Subcarboniferous limestones. O. Geol. Sur., Bull. No. 3, pp. 100-101.
- Trenton limestone in northwest Ohio. Geol. of O., v. 6, pp. 186, 193, 218, 222, 250.
- Upper Carboniferous formation. O. Geol. Sur., Bull. No. 3, pp. 100-101.

Limestone Analyses. By Authors or Analysts.

- Howard. Limestones from Hanging Rock district. Geol. of O. v. 3, pp. 934-36.
- Hooker, Holbrook, Lord, Peppel. Ferriferous limestones from Mahoning county. O. Geol. Sur., Bull. No. 4, p. 92.
- Locke. Analysis of limestone from Cincinnati and Dayton. Exec. Docs., 1836. Rep. No. 1, pp. 77-8.
- Locke, Lord, Wormley. Niagara group from Montgomery county. O. Geol. Sur., Bull. No. 4, p. 101.
- Locke, Wormley. Cincinnati limestone of Hamilton county. O. Geol. Sur., Bull. No. 4, p. 71.
- Lord. Ames limestone from Perry county. O. Geol. Sur., Bull. No. 4, p. 112.
- Lord. Columbus formation from Marion county. O. Geol. Sur. Bull. No. 4, p. 93.
- Lord. Corniferous limestone from Erie county. O. Geol. Sur., Bull. No. 4, p. 61.
- Lord. Limestones used in cement making. Geol. of O., v. 6, pp. 673, 674, 676, 682, 683; in Cuyahoga county, p. 354; in Franklin and Delaware counties, pp. 763, 764; in Greene county, pp. 720, 721; from Kelly's Island quarries, p. 707; in Marion county, pp. 767, 769; in Miami county, pp. 723, 724; in Montgomery county, p. 722; in northern Ohio, pp. 747, 748, 753, 755, 756, 758, 761; from Ottawa county, pp. 734, 736; in Preble county, pp. 725, 726; in the production of gypsum in Ohio, pp. 698, 699; in Sandusky county, pp. 737, 738; in Seneca county, p. 739; in Wood county, pp. 740, 741 and 742.

Limestone Analyses. By Authors or Analysts.—(Continued.)

- Lord. Lower Freeport from Columbiana county. O. Geol. Sur., Bull. No. 4, p. 57; Lucas limestone, water lime or Lower Helderberg in Allen county, p. 37; Niagara limestones from Fostoria, Seneca county, p. 124; Niagara (Springfield) limestones from Ottawa county, p. 108; Owens limestones from Marion county, p. 94; Woodville (Niagara) from Sandusky county, p. 120.
- Lord, Meek. Columbus limestone from Franklin county. O. Geol. Sur., Bull. No. 4, p. 64.
- Lord and others. Trenton limestone in Ohio. Geol. of O., v. 6, pp. 103, 104, 105.
- Lord, Peppel. Lower Helderberg at Fremont, Sandusky county. O. Geol. Sur., Bull. No. 4, p. 120; Maxville limestone from Hocking county, p. 80; Maxville limestone from Perry county, p. 113; Waterlime from Hancock county, p. 73.
- Lord, Peppel, Wormley. Niagara limestone in Greene county. O. Geol. Sur., Bull. No. 4, p. 66.
- Lord, Wormley. Clinton limestone of Clark county. O. Geol. Sur., Bull. No. 4, p. 51; Clinton limestone from Greene county, p. 67; Clinton limestone from Miami county, p. 97; Corniferous limestones of Ottawa county, Hartshorn, p. 109; Niagara from Miami county, p. 97; Springfield limestones of Clark county, pp. 50-51.
- Lord. Method of analysis. Geol. of O., v. 5, pp. 1093-94.
- Nauss, Peppel, Wormley. Ferriferous limestone from Jackson county. O. Geol. Sur., Bull. No. 4, p. 83.
- Newberry. Limestones from Mahoning county. Geol. of O., v. 3, p. 814.
- Orton. Limestone from Franklin county. Geol. of O., v. 3, pp. 616-18.
- Orton. Limestone from Lancaster, Fairfield county. Geol. of O. v. 6, pp. 383-384.
- Orton. Limestone from Montgomery county. Rep. Prog., 1869, pp. 151-53.
- Orton. Trenton limestone. O. Geol. Sur., Bull. No. 1, p. 18.
- Orton. Niagara limestone from Wood county. O. Geol. Sur., Bull. No. 4, p. 133; Springfield limestone from Preble county, p. 116.
- Orton, Jr. Trenton limestone of southwest Ohio. Geol. of O., v. 6, pp. 262, 266, 268, 271, 272, 273, 279, 282, 287, 288, 297, 303.
- Orton, Wormley, Peppel. Niagara formation in Darke county, O. Geol. Sur., Bull. No. 4, p. 59.

Limestone Analyses. By Authors or Analysts—(Continued.)

- Peppel. Belmont county limestones. O. Geol. Sur., Bull. No. 4, pp. 43, 44, 46, 47; Cambridge limestone from Lawrence county, p. 88; Cincinnati limestones of Hamilton county, p. 72; Clinton and Niagara limestone of Greene county, p. 69; Clinton limestone of Clark county, p. 51; Clinton limestone from Clinton county, p. 55; Clinton limestone from Montgomery county, p. 102; Clinton limestone from Piqua, Miami county, p. 98; Clinton limestone from Preble county, pp. 118, 119; Columbus and Delaware limestones from Franklin county, p. 65; Corniferous limestone of Defiance county, p. 60; Corniferous limestones at Marblehead, Ottawa county, p. 110; Corniferous from Seneca county, p. 125; Corniferous from Wood county, p. 133; a crinoidal limestone from Columbiana county, p. 57; Ferriferous limestone from Scioto county, p. 123; Freeport limestone from Athens county, p. 37; Glendale limestones from Hamilton county, p. 72; Highland county limestones, p. 78; Hudson river group in Adams county, p. 33; Hudson river group in Brown county, p. 48; Hudson river group in Butler county, p. 49; Hudson river group in Clermont county, pp. 52, 53; Hudson river group in Warren county, p. 128; Impure limestone from Tuscarawas county, p. 127; Lower Helderberg in Logan county, p. 90; Lower Mercer from Howard Furnace, Scioto county, p. 122; Lower Mercer in Perry county, p. 112; Lower Niagara in Preble county, p. 119; Lucas limestone, waterlime or Lower Helderberg in Allen county, p. 36; Maxville limestones from northwestern Perry county, p. 114; Meigs creek limestone from Monroe county, p. 100; Meigs creek limestone from Morgan county, p. 103; Meigs creek limestone from Noble county, p. 107; Meigs creek and Pittsburg limestones from Guernsey county, p. 70; Mercer limestones from Licking county, p. 88; Niagara group in Adams county, p. 34; Niagara formation in Mercer county, p. 96; Niagara formation from Piqua, Miami county, p. 98; Owens limestones from Marion county, p. 95; Pittsburg limestone from Athens county, p. 40; Putnam Hill stone from Stark county, p. 126; Upper coal-measures limestone in Jefferson county, p. 85; Waterlime from Bellevue, Sandusky county, p. 121; Waterlime formation in Hardin county, p. 74.
- Peppel, Nauss. Maxville limestone from Muskingum county. O. Geol. Sur., Bull. No. 4, p. 106.
- Wormley. Analyses. Rep. Prog., 1870, pp. 448-51.
- Wormley. Cambridge limestone from Guernsey county. O. Geol. Sur., Bull. No. 4, p. 70.
- Wormley. Cement limestone from Belmont county. Geol. of O., v. 2, pt. 1, pp. 548-49, 557, 558, 568, 563, 565.

Limestone Analyses. By Authors or Analysts.

- Wormley. Clinton limestone. Geol. of O., v. 6, p. 705.
- Wormley. Eaton limestones (Clinton and Niagara) in Preble county. O. Geol. Sur., Bull. No. 4, p. 116.
- Wormley. Helderberg limestones of Highland and Pike counties. Geol. of O., v. 6, p. 730.
- Wormley. Hudson river group in Clermont county. O. Geol. Sur., Bull. No. 4, p. 52.
- Wormley. Limestone from Greene county. Geol. of O., v. 2, pt. 1, p. 678.
- Wormley. Limestone of Darke and Shelby counties. Geol. of O., v. 6, p. 727.
- Wormley. Limestone from Hocking county, Starr township. Rep. Prog., 1870, p. 84.
- Wormley. Limestone of the Hudson river group. Geol. of O., v. 6, p. 704.
- Wormley. Limestone from Jefferson county. Geol. of O. v. 3, p. 780.
- Wormley. Lower Mercer in Hocking county. O. Geol. Sur., Bull. No. 4, p. 81; Niagara in Shelby county, p. 126; Niagara and Waterlime in Highland county, p. 75.
- Wormley. Niagara limestones used for lime production. Geol. of O., v. 6, p. 705.
- Wormley. Waterlime formation in Fayette county. O. Geol. Sur., Bull. No. 4, p. 63.
- Wormley, Locke, Lord. Clinton limestone from Montgomery county. O. Geol. Sur., Bull. No. 4, p. 101.
- Wormley and Lord. Clinton Limestones. Geol. of O., v. 6, pp. 728, 729.
- Wormley, Lord. Ferriferous limestone from Holmes county. O. Geol. Sur., Bull. No. 4, p. 81.
- Wormley and Lord. Lime of Clark county. Geol. of O., v. 6, pp. 716, 717, 718, 719.
- Wormley, Peppel. Corniferous and Waterlime in Lucas county. O. Geol. Sur., Bull. No. 4, p. 91; Meigs Creek coal strata in Washington county, pp. 129, 131, 132.

Limestone Coal. Orton. Limestone coal in Vinton county. Geol. of O., v. 5, pp. 1001-1003.

Limestone Ore. Lord. Limestone ore of Hanging Rock district. Geol. of O., v. 5, pp. 486-88.

———Orton. Group of limestone ores from Hanging Rock district. Geol. of O., v. 5, pp. 426-35.

- Limestone Ore.** Orton. Limestone kidney ore of Hanging Rock district. Geol. of O., v. 5, pp. 427-28.
- Orton. Limestone ore of Hanging Rock district. Geol. of O., v. 5, pp. 428-30.
- Limestone Production.** Peppel. Table of approximate production of limestone by counties of Ohio in 1902. O. Geol. Sur., Bull. No. 4, p. 247-48.
- Limestone Sampling.** Orton and Peppel. Methods employed in sampling and testing limestones. O. Geol. Sur., Bull. No. 4, pp. 25-28.
- Limestone Testing.** Orton and Peppel. Methods employed in sampling and testing limestones. O. Geol. Sur., Bull. No. 4, pp. 28-30.
- Limonite.** Winchell. Bog ore in Hancock county. Geol. of O., v. 2, pt. 1, p. 366.
- Winchell. Bog iron ore in Morrow county. Geol. of O., v. 2, pt. 1, p. 270.
- Wormley. Analysis of limonite from Muskingum county. Geol. of O., v. 1, pt. 1, pp. 319, 323, 327.
- Winchell. Bog iron ore in Putnam county. Geol. of O., v. 2, pt. 1, p. 394.
- Winchell. Bog iron ore in Seneca county. Geol. of O., v. 1, pt. 1, p. 624.
- Lindemuth, A. C.** Geology of Darke county. Geol. of O., v. 3, pp. 496-518.
- Lizards, see Reptiles.*
- Locke, John.** Analysis of limestone from Cincinnati and Dayton. Exec. Docs., 1836. Rep. No. 1, pp. 77-78.
- Geological report on southwestern Ohio. Ann. Rep., v. 2, 1838, pp. 203-86.
- Logan County.** Hill. Geology. Geol. of O., v. 3, pp. 482-90. Geologic map, Logan and Champaign counties, p. 491, 14x17.9 cm.
- Hill. Topography. Geol. of O., v. 3, pp. 482-483.
- Orton. Oil and gas wells. Geol. of O., v. 6, pp. 266-69.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to their fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 89-90.
- Riddell. Geology. O. Exec. Docs., 1836. Rep. No. 60, p. 14.
- Logan Group.** Bownocker. Oil and gas producing rocks in Ohio. O. Geol. Sur., Bull. No. 1, pp. 23-25.
- Orton. Logan group in Ohio. Geol. of O., v. 6, pp. 39-42. Same, Rep., 1890, pp. 39-42. Same, Geol. of O., v. 7, p. 35.

- Logan Group.** Prosser. The Logan formation in the revised Ohio geological scale. O. Geol. Sur., Bull. No. 7, p. 17.
- Long Run Field.** Lovejoy. Long Run division of Pomeroy and Federal creek coal fields. Geol. of O., v. 6, pp. 645-47.
- Lorain County.** Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, p. 305.
- Newberry. Geology. Geol. of O., v. 2, pt. 1, pp. 206-24.
- Newberry. Topography. Geol. of O., v. 2, pt. 1, pp. 206-10.
- Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 347-50.
- Orton. Shale gas. Geol. of O., v. 6, pp. 436-439.
- Lord, N. W.** Iron manufacture in Ohio. Geol. of O., v. 5, pp. 438-554.
- Lord. Natural and artificial cements. Geol. of O., v. 6, pp. 671-95.
- Lord. Report of the chemical department. Geol. of O., v. 5, pp. 1086-1113.
- Lorraine Formation.** Prosser. Probability of renaming this formation in the revised geological scale of Ohio. O. Geol. Sur., Bull. No. 7, p. 34.
- Lovejoy, Ellis.** The Pomeroy and Federal creek coal field. Geol. of O., v. 6, pp. 627-52.
- Lower Clarion Coal.** Orton. Lower Clarion or Brookville coal in Ohio. Geol. of O., v. 7, p. 277.
- Lower Freeport Coal.** Orton. Characteristics of Ohio coal. Geol. of O., v. 5, p. 166.
- Orton. Lower Freeport in Guernsey county. Geol. of O., v. 5, p. 286.
- Orton. Lower Freeport in Lawrence and Gallia counties. Geol. of O., v. 5, p. 1052.
- Orton. Lower Freeport (Coal No. 6 a) in Ohio. Geol. of O., v. 7, pp. 279-81.
- Orton. Lower Freeport in Vinton county. Geol. of O., v. 5, p. 1007.
- Lower Freeport Limestone.** Orton, Jr., and Peppel. Composition of, in Columbiana county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 56-57.
- Lower Helderberg.** Bownocker. Gas and oil producing rocks. O. Geol. Sur., Bull. No. 1, p. 21.

- Lower Helderberg.** Hawes. Lower Helderberg as building stone. Geol. of O., v. 5, pp. 621-29.
- Hawes. Quarries. Geol. of O., v. 5, pp. 622-29.
- Orton. Lower Helderberg or waterlime formation of Ohio. Geol. of O., v. 6, pp. 16-20. Same Rep. 1890, pp. 21-44.
- Whitfield. Description of fossils. Geol. of O., v. 7, pt. 2, pp. 410-19.
- Orton, Jr., and Peppel. Composition, in Allen county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 36-37; in Ottawa county, p. 108; in Sandusky county, p. 120; in Van Wert county, pp. 127-28.
- Lower Helderberg Formation.** Orton, Jr., and Peppel. Composition, physical character and uses of limestones in Ohio. O. Geol. Sur., Bull. No. 4, pp. 155-58; in Madison county, pp. 134-35; in Putnam county, p. 135; in Union county, p. 135; in Wyandot county, p. 135.
- See also Helderberg Groups; Helderberg Limestone; Monroe Formation.*
- Lower Kittanning Coal (No. 5).** Orton. Characteristics of Ohio coal. Geol. of O., v. 5, pp. 163-64.
- Orton. Lower Kittanning of Jackson county. Geol. of O., v. 5, pp. 1029-1030.
- Orton. Lower Kittanning coal of Muskingum county. Geol. of O., v. 5, pp. 871-73.
- Orton. Lower Kittanning coal of north Perry county. Geol. of O., v. 5, pp. 889-908 (scattered ref.).
- Orton. Lower Kittanning coal of Scioto and Lawrence counties. Geol. of O., v. 5, pp. 1042-45.
- Orton. Lower Kittanning coal of Ohio. Geol. of O., v. 7, p. 278.
- Orton. Lower Kittanning coal of Tuscarawas county. Geol. of O., v. 5, pp. 260-64.
- Orton. Lower Kittanning coal of Vinton county. Geol. of O., v. 5, p. 1003.
- Orton, Jr. Lower Kittanning coal of Coshocton county. Geol. of O., v. 5, p. 855.
- Wright. Lower Kittanning coal in Holmes county. Geol. of O., v. 5, pp. 828-30.
- Lower Kittanning Limestone.** Orton, Jr., and Peppel. Occurrence of, in Ohio. O. Geol. Sur., Bull. No. 4, p. 191.
- Lower Mercer Clay and Shale.** Orton. Lower Mercer clay and shale in clay industries. Geol. of O., v. 7, p. 61.

- Lower Mercer Coal (No. 3).** Orton. Characteristics of Ohio coal seams. Geol. of O., v. 5, pp. 158-59.
- Orton. Lower Mercer in Nelsonville district. Geol. of O., v. 5, pp. 989-91.
- Orton. Lower Mercer coal in Ohio. Geol. of O., v. 7, pp. 274-75.
- Orton. Lower Mercer coal in Vinton county. Geol. of O., v. 5, pp. 995-96.
- Wright. Lower Mercer coal in Holmes county. Geol. of O., v. 5, pp. 823-25.
- Lower Mercer Limestone.** Orton, Jr., and Peppel. Composition of, in Hocking county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 80-81; in Lawrence county, p. 85; in Scioto county, p. 122.
- Orton and Peppel. Composition, physical character and uses of, in Ohio. O. Geol. Sur., Bull. No. 4, pp. 172-73.
- Lower Silurian.** Newberry. Lower Silurian system of Ohio. Geol. of O., v. 3, pp. 1-4.
- Orton. Lower Silurian in Preble county. Geol. of O., v. 3, p. 406.
- Orton, Jr., and Peppel. Composition, physical character and uses of its limestone. O. Geol. Sur., Bull. No. 4, pp. 137-43.
- Orton and Peppel. Limestones for Portland cement. O. Geol. Sur., Bull. No. 3, p. 89.
- Prosser. Line of separation between Upper and Lower Silurian in revised geological scale of Ohio. O. Geol. Sur., Bull. No. 7, pp. 29-30.
- Prosser. Preference for this name over that of Ordovician for the system, with reasons. O. Geol. Sur., Bull. No. 7, pp. 30-31.
- Prosser. Table showing formations included in revised geological scale of Ohio. O. Geol. Sur., Bull. No. 7, p. 3.
- Ulrich. New and little known Lamellibranchiata from the Lower Silurian rocks of Ohio and Indiana. Geol. of O., v. 7, pt. 2, pp. 626-93.
- See also names of sub-divisions; Paleontology—genera and species.*
- Lucas County.** Bownocker. Géology. O. Geol. Sur., Bull. No. 1, pp. 93-94.
- Bownocker. Oil production. O. Geol. Sur., Bull. No. 1, pp. 92-94. Jerusalem township, p. 93. Monclova township, p. 92. Oregon township, pp. 92-93.
- Gilbert. Geology. Rep. Prog., 1870, pp. 492-99.
- Gilbert. Geology. Geol. of O., v. 1, pt. 1, pp. 573-87. Geologic map of Lucas county (colored), 20.8x12.3 cm.

- Lucas County.** Gilbert. Topography. Geol. of O., v. 1, pt. 1, pp. 573-74.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 90-92.
- Riddell. Geology of Sandusky, Wood and Lucas counties. Exec. Docs., 1836, Rep. No. 60, pp. 19-23.
- Lucas Limestone.** Orton, Jr., and Peppel. Composition, in Allen county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 36-37.
- Prosser. Propriety of this name for the upper member of the Monroe formation in revised Ohio geological scale. O. Geol. Sur., Bull. No. 7, pp. 27-28.
- Lump Lime.** Peppel. Commercial uses of lump lime. O. Geol. Sur., Bull. No. 4, p. 319.
- Luten's System.** Eno. Luten's system of reinforced concrete construction. O. Geol. Sur., Bull. No. 2, p. 139.
- Lake Beaches.** Gilbert. Lake beaches of Williams county. Rep. Prog., 1870, p. 488.
- McConnellsville Gas Field.** Bownocker. Gas in Morgan county. O. Geol. Sur., Bull. No. 1, pp. 144-48.
- McMahon Co., Building.** Eno. Effect of fire on steel concrete as shown by this company's building. O. Geol. Sur., Bull. No. 2, p. 185.
- McMillin, Emerson.** Gas coals of Ohio. Geol. of O., v. 5, pp. 722-49. Transportation, uses and modes of using natural gas. Geol. of O., v. 6, pp. 516-46.
- Machine-Mixed Mortars.** Peppel. Preference for machine-mixed mortars for commercial use. O. Geol. Sur., Bull. No. 4, pp. 256-58.
- Machinery.** Eno. Machinery and tools used in making concrete and mortar work. O. Geol. Sur., Bull. No. 2, pp. 223-248.
- Peppel. Mechanical equipment necessary for manufacture of hydrated lime. O. Geol. Sur., Bull. No. 4, pp. 327-335.
- Peppel. Mechanical equipment for manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 61-70.
- Peppel. Patented processes and appliances for manufacture of lime. O. Geol. Sur., Bull. No. 4, pp. 318-19.
- Macksburg Oil Field.** Bownocker. Geology. O. Geol. Sur., Bull. No. 1, pp. 160-64.

- Macksburg Oil Field.** Bownocker. Oil and gas in Washington county. O. Geol. Sur., Bull. No. 1, pp. 149-50, 154-64.
- Minshall. History and development. Geol. of O., v. 6, pp. 443-75.
- Orton. Berea grit as a source of oil. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 83-85. Edition 1886, pp. 57-58.
- Madison County.** Orton. Geology. Geol. of O., v. 3, pp. 420-28.
- Orton. Oil and gas wells. Geol. of O., v. 6, pp. 280-81.
- Orton. Topography. Geol. of O., v. 3, pp. 420-21.
- Orton, Jr., and Peppel. Limestone formations of, important for lime industries. O. Geol. Sur., Bull. No. 4, pp. 134-35.
- Magnesia.** Bleining. Magnesia as a constituent of hydraulic cement. O. Geol. Sur., Bull. No. 3, pp. 38-40.
- Magnetic Needle.** Whittlesey. Variation of the needle. Ann. Rep., v. 2, 1838, pp. 44-50.
- Mahoning County.** Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 299-300.
- Newberry. Geology. Geol. of O., v. 3, pp. 781-814.
- Newberry. Local geology. Geol. of O., v. 3, pp. 799-811. Austintown township, pp. 800-802. Beaver township, pp. 807-09. Berlin township, pp. 810-11. Boardman township, p. 809. Canfield township, pp. 809-10. Coitsville township, p. 803. Ellsworth township, p. 810. Goshen township, p. 811. Green township, pp. 811-12. Jackson township, pp. 799-800. Milton township, p. 799. Poland township, pp. 803-06. Smith township, p. 811. Springfield township, pp. 806-07. Youngstown pp. 802-03.
- Newberry. Surface features. Geol. of O., v. 3, pp. 781-83.
- Orton. Coal mines. Geol. of O., v. 5, pp. 175-84.
- Orton. Deep wells, drilling for oil and gas. Geol. of O., v. 6, pp. 402-03.
- Orton. Iron ores. Geol. of O., v. 5, pp. 382-83.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to their fitness for portland cement. O. Geol. Sur., Bull., No. 4, pp. 92-93.
- Mahoning Valley District.** Lord. Iron manufacture. Geol. of O., v. 5, pp. 459-64.
- Mammals.** Brayton. Report on the mammals of Ohio. Geol. of O. v. 3, pp. 3-185.

Mammals. Brayton. Genera and species. Geol. of O., v. 4, p. 6 to 185. *Arctomys monax*, pp. 122-24. *Arvicola*, pp. 141-42. *Arvicola* (*myonomys*) *riparius*, 145-48. *Arvicola* (*pedomys*) *austerus*, pp. 142-45. *Arvicola pitymus pinetorum*, pp. 148-50. *Atalpa*, pp. 85-86. *Atalpa* (*lasiurus*) *cinerus*, pp. 88-89. *Atalpa* (*lasiurus*) *noveboracensis*, pp. 86-87.

Bison americanus, pp. 68-77. *Blarina*, pp. 95-96. *Blarina brevicauda*, pp. 96-98. *Blarina soriciscus parva*, pp. 98-100. *Canis*, pp. 12-13. *Canis lupus occidentalis*, pp. 14-15. *Cariacus virginianus*, pp. 78-79. *Castor fiber*, pp. 126-29. *Cervus canadensis*, pp. 79-80. *Condylura cristata*, pp. 176-80. *Didelphys*, pp. 162-63. *Didelphys virginiana*, pp. 163-70. *Erethizon dorsatus*, pp. 154-56. *Felis concolor*, pp. 6-8. *Fiber zibethicus*, pp. 150-53. *Hesperomys* (*oryzomys*), p. 140. *Hesperomys palustris*, pp. 140-41. *Hesperomys* (*vesperimus*), pp. 136-37. *Hesperomys leucopus*, pp. 137-40.

Lepus americanus, pp. 159-61. *Lepus sylvaticus*, pp. 156-59. *Lutra*, p. 56. *Lutra canadensis*, pp. 56-63. *Lynx canadensis*, pp. 9-10. *Lynx rufus*, pp. 10-12. *Mephitis*, pp. 47-48. *Mephitis mephitis*, pp. 48-55. *Mustela*, p. 24. *Mustela penanti*, pp. 24-27. *Neotoma*, pp. 134-35. *Neotoma floridana*, pp. 135-36. *Procyon*, pp. 65-66. *Procyon lotor*, pp. 66-67. *Putorius*, p. 28. *Putorius* (*gale*) *ermineus*, 28-35. *Putorius* (*lutreola*) *vison*, pp. 35-40. *Putorius vulgaris*, pp. 171-75.

Scalops, pp. 89-90. *Scalops aquaticus*, pp. 90-91. *Scapans*, pp. 92-93. *Scapans breweri*, p. 93. *Sciuropterus volucella*, pp. 101-05. *Sciurus carolinensis*, pp. 108-12. *Sciurus hudsonius*, pp. 105-08. *Sciurus niger*, pp. 112-15. *Spermophilus*, pp. 118-19. *Spermophilus franklini*, pp. 119-20. *Spermophilus tridecemlineatus*, pp. 181-84. *Tamias striatus*, pp. 115-19. *Taxidea*, pp. 40-41. *Taxidea americana*, pp. 41-7. *Urocyon cinero-argenteus*, pp. 19-21. *Ursus*, pp. 63-64. *Ursus americanus*, pp. 64-65. *Vespertilio*, pp. 82-3. *Vespertilio noctivagus*, p. 84. *Vespertilio subulatus*, p. 83. *Vespertilio* (*vesperus*) *fuscus*, pp. 84-5. *Vulpus vulgaris pennsylvanicus*, pp. 416-19. *Zapus hudsonius*, pp. 130-33.

———Kirtland. Catalogue of the mammalia, birds, reptiles, etc., in Ohio. Ann. Rep., v. 2, 1838, pp. 160-61.

———Kirtland. Notes and observations. Ann. Rep., v. 2, 1838, pp. 175-77.

See also Mastodon.

Mansfield. Orton. Deep wells, explorations for natural gas in Clinton limestone. Rep., 1890, p. 245.

Manufacturing Processes. Peppel. Processes and patents in Manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 71-79.

Maps, see Geologic maps; names of counties.

Marcellus Shale. Whitfield. Note on marcellus shale and other members of the Hamilton group in Ohio, as determined from paleontological evidence. Geol. of O., v. 7, pt. 2, pp. 432-33.

——— Whitfield. Recognized species from the Marcellus shales of Ohio. Geol. of O., v. 7, pt. 2, pp. 441-46.

Marion County. Orton. Lime production. Geol. of O., v. 6, pp. 765-70.

——— Orton, Jr., and Peppel. Composition of limestone of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 93-96.

——— Winchell. Geology. Geol. of O., v. 1, pt. 1, pp. 640-45. Geologic map (colored), 15.4x9.9 cm.

——— Winchell. Topography. Geol. of O., v. 1, pt. 1, pp. 640-41.

Marl. Mather. Marls of Ohio. Ann. Rep., v. 1, 1837, pp. 13-14.

——— Newberry. Shell marl in Summit county. Geol. of O., v. 1, pt. 1, pp. 207-8.

——— Orton, Jr., and Peppel. Composition of, in Erie county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 62-63.

——— Orton, Jr., and Peppel. Marl resources for cement making. O. Geol. Sur., Bull. No. 3, pp. 95-97.

——— Peppel. Calcareous deposits in Adams county and their fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 35-36.

Marl Analysis. Klippart. Marl of Erie county. O. Geol. Sur., Bull. No. 4, p. 62.

Massillon Coal Field. Mines of. Geol. of O., v. 5, pp. 779-815. Akron district, Springfield and Coventry township, pp. 780-83. Bethlehem township, pp. 814-15. Franklin township, p. 797. Jackson township, pp. 804-06. Lawrence township, pp. 797-804. Norton township, pp. 783-96. Sugarcreek township, pp. 810-14. Tallmadge township, pp. 779-80. Tuscarawas township, pp. 807-10.

Mastodon. Andrews. Bones of mammoth found in Washington county. Geol. of O., v. 2, pt. 1, pp. 471-72.

——— Briggs. Bones of the mastodon found in Crawford county. Ann. Rep., v. 2, 1838, pp. 127-29.

——— Lindemuth. Bones of mammoth found in Darke county. Geol. of O., v. 3, pp. 508-09.

- Mastodon.** Read. Bones of mastodon found at Montville, Geauga county. Geol. of O., v. 1, pt. 1, pp. 526-27.
- Winchell. Fossil remains found in Putnam county. Geol. of O., v. 2, pt. 1, pp. 393-94.
- Mather, William Williams.** Annual report of the geological survey of Ohio. Ann. Rep., v. 1, 1837, v. 2, 1838. Ohio H. R. Doc. 26, 1838, 1839, Doc. 22.
- Mather. Catalogue of the geological specimens collected on the late survey of Ohio, Feb., 25, 1842. Ohio Gen. Ass. H. R., 1842, Doc. 76, 7 p. and 11 sheets.
- Maumee Valley.** Gilbert. Surface geology. Geol. of O., v. 1, pt. 1, pp. 537-56.
- Klippart. Agricultural report. Rep. Prog., 1870, pp. 320-400.
- Maxville Limestone.** Andrews. Maxville limestone. Rep. Prog., 1869, pp. 80-96.
- Andrews. Maxville limestone in the Hocking Valley. Geol. of O., v. 3, pp. 817-22.
- Andrews. Maxville limestone in the 2d Geol. Dist. Rep. Prog., 1870, pp. 63-6.
- Orton. Maxville or white limestone in Hanging Rock district. Geol. of O., v. 3, pp. 890-91.
- Orton, Jr., and Peppel. Composition of, in Hocking county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 79-81; in Muskingum county, pp. 104-106; in Perry county, pp. 112-15.
- Orton, Jr., and Peppel. Composition, physical character and uses of, in Ohio. O. Geol. Sur., Bull. No. 4, pp. 168-72.
- Orton, Jr., and Peppel. Maxville for portland cement making. O. Geol. Sur., Bull. No. 3, p. 90.
- Prosser. Position and identification of this formation in the revised geological scale of Ohio. O. Geol. Sur., Bull. No. 7, pp. 16-17.
- Maxwell Oil Pool.** Bownocker. Wells of Harrison county. O. Geol. Sur., Bull. No. 1, p. 232.
- Mecca Oil Field.** Orton. Productive oil and gas fields of Ohio. Geol. of O., v. 6, pp. 328-32.
- Medina County.** Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 305-06.
- Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 360-61.

- Medina County.** Riddell. Geology of Richland, Wayne and Medina counties. Exec. Docs., 1836. Rep. No. 60, pp. 25-7.
- Wheat. Geology. Geol. of O., v. 3, pp. 362-380.
- Wheat. Local geology. Geol. of O., v. 3. Brunswick township, p. 364. Chatham township, p. 365. Granger township, p. 365. Guilford township, pp. 365-66. Harrisville township, pp. 367-71. Hinckley township, pp. 366-67. Homer township, p. 367. Lafayette township, p. 373. Litchfield township, p. 371. Liverpool township, pp. 371-72. Medina township, pp. 373-74. Montville township, pp. 375-76. Sharon township, p. 376. Spencer township, p. 376. Wadsworth township, pp. 377-80. Westfield township, p. 377. York township, p. 380.
- Wheat. Topography. Geol. of O., v. 3, pp. 362-63.
- Medina Group.** Newberry. Medina and Clinton groups. Geol. of O., v. 1, pt. 1, p. 103.
- Newberry. Medina group in Ohio. Geol. of O., v. 3, pp. 4-5.
- Medina Shale.** Orton. Clinton, Medina, Hudson river and Utica shales as sources of gas. Prelim. Rep. on petroleum and inflammable gas, 1886, pp. 66-68. Edition 1887, pp. 96-99.
- Orton. Medina shale in geological series of Ohio. Prelim. Rep. on petroleum and inflammable gas, 1886, p. 20. Rep., 1887, pp. 29-30, 118-19
- Orton. Medina shale in Ohio. Geol. of O., v. 6, p. 11. Same, Rep., 1890, pp. 16-17. Geol. of O., v. 7, pp. 9-10.
- Prosser. Position of this formation in the revised Ohio geological scale. O. Geol. Sur., Bull. No. 7, p. 29.
- Meek, F. B.** Descriptions of invertebrate fossils of the Silurian and Devonian systems. Geol. of O., v. 1, pt. 2, pp. 1-243.
- Meek. Report on some of the invertebrate fossils of the Waverly group and coal measures of Ohio. Geol. of O., v. 2, pt. 2, pp. 273-347.
- Meigs County.** Andrews. Geology. Geol. of O., v. 1, pt. 1, pp. 247-60. Bedford township, pp. 256-57. Chester township, p. 259. Columbia township, pp. 249-50. Lebanon township, pp. 258-59. Letart township, p. 258. Olive township, p. 259. Orange township, p. 259. Rutland township, pp. 251-53. Salem township, pp. 248-49. Salisbury township, pp. 253-54. Scipio township, pp. 250-51. Sutton township, pp. 257-58.
- Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 282-83.
- Bownocker. Salt industry in Meigs county. O. Geol. Sur., Bull. No. 8, pp. 15-28.

- Meigs County.** Hildreth. Geology. Ann. Rep., v. 1, 1837, pp. 25-54.
- Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 396-97.
- Orton, Jr., and Peppel. Limestone resources of, slight importance. O. Geol. Sur., Bull. No. 4, p. 136.
- Root. Salt manufacture. Geol. of O., v. 6, pp. 657-58.
- Meigs Creek Coal.** Orton. Meigs creek coal in Ohio. Geol. of O., v. 7, pp. 288-90.
- Meigs Creek Limestone.** Orton, Jr., and Peppel. Composition of, in Guernsey county, with reference to use for portland cement. O. Geol. Sur., Bull. No. 4, pp. 70-71; in Monroe county, pp. 98-100; in Morgan county, pp. 102-104; in Noble county, pp. 106-107; in Washington county, pp. 129-32.
- Orton, Jr., and Peppel. Occurrence of, in Ohio. O. Geol. Sur., Bull. No. 4, pp. 203-04.
- Melan System.** Eno. Melan system of reinforced metal construction. O. Geol. Sur., Bull. No. 2, pp. 133-34.
- Mendenhall, T. C.** Discussion of the heating power of some Ohio coals. Rep. Prog., 1870, pp. 236-42.
- Mercer County.** Bownocker. Geology. O. Geol. Sur., Bull. No. 1, pp. 90-92.
- Bownocker. Oil production. O. Geol. Sur., Bull. No. 1, pp. 89-92. Geologic map of Mercer and other counties, showing oil and gas territories. 20.7x21 cm. opp. p. 80. Black Creek township, p. 90. Center township, p. 89. Dublin township, p. 90. Franklin township, p. 90. Jefferson township, p. 89. Union township, p. 89.
- Orton. Gas and oil wells of Mercer county. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 142-45. Geol. of O., v. 6, pp. 258-64. Rep., 1890, pp. 161-72, p. 212.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to their fitness for portland cement. O. Geol. Sur., Bull. No. 4, p. 96.
- Winchell. Geology. Geol. of O., v. 2, pt. 1, pp. 410-14.
- Winchell. Topography. Geol. of O., v. 2, pt. 1, pp. 410-11.
- Mercer Limestones.** Orton. Mercer limestones in Ohio. Geol. of O., v. 5, pp. 13-16.
- Orton, Jr., and Peppel. Composition of, in Licking county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 88-89.

- Mercer Limestones.** Orton, Jr., and Peppel. Mercer limestones available for cement making. O. Geol. Sur., Bull. No. 3, pp. 90-91.
- Metalloid Sidewalks.** Eno. Use of steel concrete in sidewalk building. O. Geol. Sur., Bull. No. 2, p. 183.
- Meteorology.** Tables of temperature and rainfall. Geol. of O., v. 1, pt. 1, pp. 650-65.
- Klippart. Meteorology of Maumee valley. Rep. Prog., 1870, pp. 353-60.
- Newberry. Causes of the Arctic climate of the ice period. Geol. of O., v. 2, pt. 1, pp. 65-9.
- Newberry. Climate of Ohio. Geol. of O., v. 1, pt. 1, pp. 16-25.
- Miami County.** Hussey. Geology. Geol. of O., v. 3, pp. 468-481.
- Hussey. Topography. Geol. of O., v. 3, pp. 468-73.
- Orton. Lime production. Geol. of O., v. 6, pp. 722-24.
- Orton. Oil and gas wells. Geol. of O., v. 6, pp. 273-74.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 96-98.
- Mica.** Bleining. Micaceous minerals found in clays. O. Geol. Sur. Bull. No. 3, pp. 66-67.
- Middle Kittanning (No. 6) Coal.** Orton. Middle Kittanning in Guernsey county. Geol. of O., v. 5, pp. 284-85.
- Orton. Middle Kittanning in Hocking valley. Geol. of O., v. 5, pp. 944-83.
- Orton. Middle Kittanning in Jackson county. Geol. of O., v. 5, pp. 1027-1029.
- Orton. Middle Kittanning in Muskingum county. Geol. of O., v. 5, pp. 874-78.
- Orton. Middle Kittanning in north Perry county. Geol. of O., v. 5, pp. 887-89, 889-908 (scattered ref.).
- Orton. Middle Kittanning in Ohio. Geol. of O., v. 7, pp. 278-79.
- Orton. Middle Kittanning in Scioto and Lawrence counties. Geol. of O., v. 5, pp. 1045-46.
- Orton. Middle Kittanning in Sunday Creek valley, Monroe township. Geol. of O., v. 5, pp. 931-40.
- Orton. Middle Kittanning in Tuscarawas county. Geol. of O., v. 5, pp. 264-80.
- Orton. Middle Kittanning in Vinton county. Geol. of O., v. 5, pp. 1003-1007.

- Middle Kittanning (No. 6) Coal.** Orton, Jr. Middle Kittanning in Coshocton county. Geol. of O., v. 5, pp. 855-67.
- Wright. Middle Kittanning coal in Holmes county. Geol. of O., v. 5, pp. 830-36.
- Middle Kittanning Limestone.** Orton, Jr., and Peppel. Middle Kittanning available for cement making. O. Geol. Sur., Bull. No. 3, p. 93.
- Orton, Jr., and Peppel. Occurrence of, in Ohio. O. Geol. Sur., Bull. No. 4, p. 191.
- Mineral Paints.** Orton. Mineral paints in Montgomery county. Rep. Prog., 1869, p. 154.
- Winchell. Mineral paint in Auglaize county. Geol. of O., v. 2, pt. 1, p. 409.
- Mineral Springs.** Briggs. Mineral springs in Crawford county. Ann. Rep., v. 2, 1838, pp. 125-27.
- Briggs. Mineral springs in Tuscarawas county. Ann. Rep., v. 2, 1838, pp. 153-54.
- Gilbert. Stryker mineral water in Williams county. Geol. of O., v. 1, pt. 1, pp. 564-65.
- Mather. Mineral springs of Ohio. An. Rep., v. 1, 1837, p. 14.
- Riddell. Yellow Springs, Greene county. O. Exec. Docs., 1863. Rep. No. 60, pp. 11-13.
- Winchell. Springs in Allen county. Geol. of O., v. 2, pt. 1, p. 402.
- See also Salt; Sulphur Springs.*
- Mining.** Orton, Jr., and Peppel. Methods of winning Ferriferous limestone in Ohio. O. Geol. Sur., Bull. No. 4, pp. 185-191.
- Roy. Coal mining in Ohio. Geol. of O., v. 5, pp. 301-70.
- Minshall, E. W.** History and development of the Macksburg oil-field. Geol. of O., v. 6, pp. 443-75.
- Mitchell Oil Pool.** Bownocker. Wells of Marietta township, Washington county. O. Geol. Sur., Bull. No. 1, p. 179.
- Mixing Machinery.** Peppel. Machines used in mixing materials for sand-lime brick. O. Geol. Sur., Bull. No. 5, p. 62.
- Peppel. Mixing devices in use in sand-lime brick manufacture. O. Geol. Sur., Bull. No. 5, p. 23.
- Moldings.** Eno. Use of cement for moldings and base-boards. O. Geol. Sur., Bull. No. 2, pp. 49-50.

- Molds.** Eno. Forms of molds used in concrete building. O. Geol. Sur., Bull. No. 2, P. 237.
- Mollusca.** Kirtland. Catalogue of mammals, birds, reptiles, etc., in Ohio. Ann. Rep., v. 2, 1838, pp. 170-75.
- Kirtland. Notes and observations. Ann. Rep., v. 2, 1838, pp. 197-200.
- Meek. Polyzoa of the Cincinnati group. Geol. of O., v. 1, pt. 2, pp. 69-70.
- Meek. Polyzoa of the Corniferous group. Geol. of O., v. 1, pt. 2, pp. 194-95.
- Orton. Mollusks of Cincinnati group. Geol. of O., v. 1, pt. 1, pp. 390-92.
- Orton. Fossils of Pentamerus limestone. Rep. Prog., 1870, pp. 280-82.
See also Brachiopoda; Cephalopoda; Ganoidii; Lamellibranchiata; Paleontology—Genera and Species.
- Monday Creek District.** Orton. Coal mines. Geol. of O., v. 5, pp. 958-69.
- Monier System.** Eno. Monier system of reinforced concrete. O. Geol. Sur., Bull. No. 2, p. 131.
- Monoliths.** Eno. Use of concrete for building blocks. O. Geol. Sur., Bull. No. 2, p. 74.
- Monongahela Formation.** Orton, Jr., and Peppel. Limestones of Monongahela formation in Ohio. O. Geol. Sur., Bull. No. 4, pp. 192-211.
- Monongahela Limestones.** Orton, Jr., and Peppel. Uses of this formation in Ohio. O. Geol. Sur., Bull. No. 4, pp. 210-11.
- Monroe County.** Andrews. Geology. Geol. of O., v. 2, pt. 1, pp. 570-87. Local geology of Adams township, pp. 581-2. Benton township, p. 576. Bethel township, p. 575. Center township, pp. 578-81. Franklin township, pp. 571-2. Green township, p. 586. Jackson township, pp. 577-8. Malaga township, p. 573. Ohio township, pp. 586-7. Perry township, pp. 576-77. Salem township, pp. 583-5. Seneca township, pp. 572-3. Summit township, pp. 573-4. Sunbury township, pp. 582-3. Switzerland township, pp. 585-6. Washington township, pp. 575-6. Wayne township, p. 574.
- Bownocker. Oil and gas wells. O. Geol. Sur., Bull. No. 1, pp. 193-214.
Geologic map, showing oil and gas territories, 22.5x18.6 cm. opp. p. 194.

- Monroe County.** Bownocker. Oil and gas wells. O. Geol. Sur., Bull. No. 1, pp. 193-214. Adams township, pp. 210-11. Benton township, p. 199. Bethel township, p. 208. Center township, p. 202. Franklin township, p. 209. Green township, pp. 209-10. Jackson township, pp. 199-200. Malaga township, pp. 213-14. Perry township, p. 200. Salem township, p. 211. Summit township, pp. 211-13.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 98-100.
- Monroe Formation.** Orton, Jr., and Peppel. Composition of, character and uses of limestones of, in Ohio. O. Geol. Sur., Bull. No. 4, pp. 155-58.
- Prosser. Discussion of reasons for use of this name in revised nomenclature of Ohio geological scale. O. Geol. Sur., Bull. No. 7, pp. 25-27.
- Montgomery County.** Locke. Geology of Preble and Montgomery counties. Ann. Rep., v. 2, 1838, pp. 223-236.
- Orton. Geology. O. Geol. Sur., Rep. Prog., 1869, pp. 140-64.
- Orton. Lime production. Geol. of O., v. 6, pp. 721-22.
- Orton. Oil and gas wells. Geol. of O., v. 6, pp. 285-89.
- Orton. Sections and explanations. Rep. Prog., 1869, pp. 159-61.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 100-02.
- Moore's Junction Oil field.** Bownocker. Oil wells in eastern Washington county. O. Geol. Sur., Bull. No. 1, pp. 172-76.
- Moose Ridge Oil Pool.** Bownocker. Wells of Monroe county. O. Geol. Sur., Bull. No. 1, pp. 205-07.
- Moraines.** Gilbert. Moraines of the Maumee valley. Geol. of O., v. 1, pt. 1, pp. 540-44.
- Wright. Moraines of Ohio. Geol. of O., v. 5, pp. 751-58.
- Morgan County.** Andrews. Geology. Geol. of O., v. 1, pt. 1, pp. 294-313. Bloom township, pp. 304-6. Bristol township, pp. 307-8. Centre township, pp. 311-2. Deerfield township, p. 296. Homer township, pp. 298-300. Malta township, pp. 302-4. Manchester township, p. 312. Marion township, pp. 300-2. Meigsville township, pp. 308-9. Morgan township, pp. 306-7. Penn township, p. 302. Union township, p. 302. Windsor township, pp. 309-11. York township, pp. 295-6.

- Morgan County.** Bownocker. Early history of salt industry. O. Geol. Sur., Bull. No. 8, pp. 13-14.
- Bownocker. Oil and gas. O. Geol. Sur., Bull. No. 1, pp. 126-48. Geologic map, Morgan, Athens and western Washington counties, showing oil and gas territories. 37.2x20.2 cm. opp. p. 128.
- Brown. Meigs creek coal. Geol. of O., v. 5, pp. 1059-85.
- Hildreth. Geology. An. Rep., v. 1, 1837, pp. 25-54.
- Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 389-90.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 102-04.
- Root. Salt manufacture, Geol. of O., v. 6, p. 655.
- Morrow County.** Orton. Oil and gas wells. Geol. of O., v. 6, pp. 283-84.
- Winchell. Geology. Geol. of O., v. 2, pt. 1, pp. 253-71. Geologic map, 10.8x13 cm.
- Winchell. Topography. Geol. of O., v. 2, pt. 1, pp. 253-56.
- Mortar.** Eno. Uses of cement in mortars. O. Geol. Sur., Bull. No. 2, pp. 23-62.
- Peppel. Use of hydrated lime in mortars. O. Geol. Sur., Bull. No. 4, pp. 237-41.
- Mosaic.** Eno. Use of cement in mosaic work. O. Geol. Sur., Bull. Bull. No. 2, p. 55.
- Mosses.** Kellerman and Werner. Index to mosses of Ohio. Geol. of O., v. 7, pt. 2, pp. 275-77.
- Kellerman and Werner. Mosses of Ohio. Geol. of O., v. 7, pt. 2, pp. 252-74.
- Mound Builders.** Fowke. Mound builders. Geol. of O., v. 7, pt. 2, pp. 28-45.
See also Aborigines.
- Mounds.** Fowke. Mounds of Ohio. Geol. of O., v. 7, pt. 2, pp. 16-28. Plates illustrating most important mounds in Ohio. opp. p. 16.
- Mountain Ore.** Orton. Mountain ore of Stark, Carroll and Tuscarawas county. Geol. of O., v. 5, pp. 386-98.
- Mt. Vernon.** Orton. Deep wells, explorations for natural gas in Clinton limestone. Rep. 1890, pp. 244-45.
- Mushrooms, see Fungi.*

- Muskingum County.** Andrews. Geology of the part south of the Central Ohio R. R. Geol. of O., v. 1, pt. 1, pp. 314-44. Blue Rock township, pp. 341-2. Brush Creek township, p. 329. Clay township, pp. 328-29. Falls township, pp. 320-23. Hope-well township, p. 318-20. Meigs township, pp. 342-3. New-ton township, p. 328. Perry township, pp. 333-35. Rich Hill township, pp. 339-41. Salt Creek township, pp. 338-9. Spring-field township, pp. 327-28. Union township, pp. 335-6. Wash-ington township, pp. 329-31. Wayne township, pp. 331-2. Zanesville corporation, pp. 324-26.
- Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 265-69. Blue Rock township, pp. 266-67. Brush Creek township, p. 267. Cass township, p. 268. Harrison township, p. 268. Jackson township, p. 269. Licking township, p. 269. Meigs township, p. 268. Newton township, p. 268. Perry town-ship, p. 268. Rich Hill township, p. 268. Salem township, p. 269. Salt Creek township, p. 268. Zanesville, pp. 265-66.
- Brown. Meigs Creek coal. Geol. of O., v. 5, pp. 1059-85.
- Foster. Physical geography. Ann. Rep., v. 2, 1838, p. 75.
- Hildreth. Geology. An. Rep., v. 1, 1837, pp. 25-54.
- Orton. Coal mines. Geol. of O., v. 5, pp. 868-84.
- Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 372-76.
- Orton. Iron ores. Geol. of O. v. 5, pp. 402-04.
- Orton, Jr., and Peppel. Composition of limestones of, with refer-ence to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 104-106.
- Riddell. Geology of Holmes, Coshocton and Muskingum counties. Exec. Docs., 1836, Rep. No. 60, pp. 27-30.
- Stevenson. Geology. Geol. of O., v. 3, pp. 236-60.
- Stevenson. Topography. Geol. of O., v. 3, pp. 236-37.
- Myxomycetes.** Kellerman and Werner. Index to slime mould. Geol. of O., v. 7, pt. 2, p. 404.
- Kellerman and Werner. List of slime moulds of Ohio. Geol. of O., v. 7, pt. 2, pp. 397-403.
- Nassau County Court House.** Eno. Use of steel concrete in buildings as seen in this structure. O. Geol. Sur., Bull. No. 2, pp. 148-51.
- Natural Gas.** Bownocker. Clinton formation as a source of oil and gas. O. Geol. Sur., Bull. No. 1, pp. 101-25.
- Bownocker. Gas wells of Perry county. O. Geol. Sur., Bull. No. 1, pp. 263-65.

- Natural Gas.** Bownocker. Geological conditions under which oil and gas are found. O. Geol. Sur., Bull. No. 1, pp. 318-20.
- Bownocker. Occurrence and exploitation of petroleum and natural gas. O. Geol. Sur., Bull. No. 1, pp. 17-325.
- Bownocker. Origin of oil and gas. O. Geol. Sur., Bull. No. 1, pp. 307-18.
- Bownocker. Wells of Central Ohio natural gas field. O. Geol. Sur., Bull. No. 1, pp. 122-25.
- McMillin. Transportation, uses, and modes of using. Geol. of O. v. 6, pp. 516-46.
- Orton. Berea grit and Ohio shale as sources of gas. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 176-78.
- Orton. Berea grit as a source of oil and gas. Prelim. Rep. on petroleum and inflammable gas, 1886, pp. 54-62. Edition 1887, pp. 79-90. Geol. of O., v. 6, pp. 311-409. Rep., 1890, pp. 249-58.
- Orton. Bowling Green field. Geol. of O., v. 6, pp. 156-165.
- Orton. Clinton limestone as a source of oil and gas. Rep., 1890, pp. 227-47.
- Orton. Clinton, Medina, Hudson river and Utica shale. Prelim. Rep., on petroleum and inflammable gas, 1886, pp. 66-68. Edition 1887, pp. 96-99.
- Orton. Drift as a source of oil and gas. Geol. of O., v. 6, pp. 772-75.
- Orton. Effects of rock-pressure. Geol. of O., v. 6, pp. 96-100. Rep., 1890, pp. 92-104.
- Orton. Findlay oil and gas field. Geol. of O., v. 6, pp. 109-56. Rep., 1890, pp. 112-23.
- Orton. Gas and oil wells of northwestern Ohio. Geol. of O., v. 6, pp. 182-254.
- Orton. Gas-wells in Findlay field. Geol. of O., v. 6, p. 146.
- Orton. Geology of Ohio, considered in its relations to petroleum and natural gas. Geol. of O., v. 6, pp. 1-59.
- Orton. Ohio shale as a source of oil and gas. Prelim. Rep. on petroleum and inflammable gas. 1886, pp. 62-66. Edition 1887, pp. 90-96. Geol. of O., v. 6, pp. 410-42. Rep., 1890, pp. 248-49.
- Orton. Oil and gas in central and southwest Ohio. Geol. of O., v. 6, pp. 254-310.
- Orton. Report on petroleum and gas in Ohio. Prelim. Rep. on, petroleum and inflammable gas, 1886, pp. 6-73. Rep., 1887. pp. 5-179.

- Natural Gas.** Orton. Theories as to the origin of petroleum and natural gas. Geol. of O., v. 6, pp. 61-83. Rep., 1890, pp. 54-104.
- Orton. Trenton limestone as source of petroleum and high pressure gas. Prelim. Rep. on petroleum and inflammable gas, 1886, pp. 30-54. Rep., 1887, pp. 45-79. Geol. of O., v. 6, pp. 101-310. Rep., 1890, pp. 105-226.
- Orton. Utilization of natural gas in Ohio. Rep., 1890, pp. 259-80.
- Peppel. Use of natural gas as fuel in burning lime in Ohio. O. Geol. Sur., Bull. No. 4, p. 272.
- Robinson. Measurement of gas-wells and other gas streams and the piping of gas. Geol. of O., v. 6, pp. 548-94. Rep., 1890, pp. 281-305.
- Natural Gas analyses.** Findlay gas. Geol. of O., v. 6, pp. 136-37.
- Morley. Shale gas. Geol. of O., v. 6, p. 416.
See also Petroleum; names of gas and oil fields.
Natural Cement, see Roman Cement.
- Neff Gas Wells.** Orton. Berea grit as source for Neff gas wells. Prelim. Rep. on petroleum and inflammable gas, 1886, p. 57. Edition 1887, pp. 82-3. Geol. of O., v. 6, pp. 340-43.
- Nelsonville Coal.** Andrews. Nelsonville coal in Athens county. Geol. of O., v. 1, pt. 1, pp. 267-69.
- Andrews. Quality of the coal. O. Geol. Sur., Rep. Prog., 1869, pp. 103-13.
- Andrews. Thickness of the coal seam. O. Geol. Sur., Rep. Prog., 1869, pp. 97-103.
- Nelsonville District.** Orton. Coal mines. Geol. of O., v. 5, pp. 969-91.
- New Lisbon Kidney Ore.** Analysis. Mahoning valley district. Geol. of O., v. 5, pp. 459-460.
- New York Fire Tests.** Eno. Tests to show fire proof qualities of concrete. O. Geol. Sur., Bull. No. 2, pp. 183-85.
- Newark Gas Fields.** Bownocker. O. Geol. Sur., Bull. No. 1, pp. 106-07.
- Newberry, John Strong.** Carboniferous system of Ohio. Geol. of O., v. 2, pt. 1, pp. 81-180.
- Descriptions of fossil fishes. Geol. of O., v. 1, pt. 2, pp. 247-355.
- Descriptions of fossil fishes. Geol. of O., v. 2, pt. 2, pp. 3-64.
- Descriptions of fossil plants of the coal measures of Ohio. Geol. of O., v. 1, pt. 2, pp. 359-85.

- Newberry, John Strong.** General geological relations and structure of Ohio. Geol. of O., v. 1, pt. 1, pp. 1-167.
- Geology of Cuyahoga and Summit counties. Geol. of O., v. 1, pt. 1, pp. 171-222.
- Geology of Erie county and the Islands. Geol. of O., v. 2, pt. 1, pp. 183-205.
- Geology of Jefferson county. Geol. of O., v. 3, pp. 716-780.
- Geology of Jefferson and Mahoning counties. Geol. of O., v. 3, pp. 716-814.
- Geology of Lorain county. Geol. of O., v. 2, pt. 1, pp. 206-24.
- Geology of Ohio, 1872-82, v. 1-4 in 6. Il. pl., maps, charts. 8vo and 4to.
- Geology of Tuscarawas, Columbiana, Portage and Stark counties. Geol. of O., v. 3, pp. 52-176.
- Report of progress of Geological Survey, 1869-71. Columbus. 1870-71, 3 v. Illus. pl., maps, charts. 8vo.
- Report of progress in 1869. Rep. Prog., 1869, pp. 3-51.
- Report of progress of the Survey for 1870. Rep. Prog., 1870, pp. 5-14.
- Review of the geological structure of Ohio. Geol. of O., v. 3, pp. 1-51.
- Surface geology of Ohio. Geol. of O., v. 2, pt. 1, pp. 1-80.
- Newell, Fred H.** Drilling and care of oil wells. Geol. of O., v. 6, pp. 476-515.
- Newell's Run Oil Pool.** Bownocker. Wells of Newport township, Washington county. O. Geol. Sur., Bull. No. 1, pp. 181-85.
- Newland Coal.** Orton. Newland coal of Vinton county. Geol. of O., v. 5, pp. 996-99.
- Newton, Henry.** Manufacture of coke. Geol. of O., v. 5, pp. 555-76.
- Sketch of the present state of the steel industry, the chemical and physical character of steel, and the methods of its manufacture. Rep. Prog., 1870, pp. 529-55.
- Niagara Group.** Hall and Whitfield. Fossils. Geol. of O., v. 2, pt. 2, pp. 121-57.
- Hawes. Building stone of Ohio. Geol. of O., v. 5, pp. 611-21.
- Hussey. Niagara group in Clinton and Fayette counties. Geol. of O., v. 3, pp. 443-44.
- Hussey. Niagara in Miami county. Geol. of O., v. 3, pp. 477-79.
- Hussey. Niagara in Shelby county. Geol. of O., v. 3, pp. 465-67.

- Niagara Group.** Meek. Fossils. Geol. of O., v. 1, pt. 2, pp. 176-93.
- Meek. List of fossils. Geol. of O., v. 1, pt. 2, pp. 241-43.
- Newberry. Clinton and Niagara groups. O. Geol. Sur., Rep. Prog., 1869, pp. 14-5.
- Newberry. Niagara in the Cin. arch. Geol. of O., v. 1, pt. 1, p. 104.
- Newberry. Niagara group of the Cin. arch. Geol. of O., v. 1, pt. 1, pp. 128-33.
- Newberry. Niagara group in Ohio. Geol. of O., v. 1, pt. 1, p. 62.
- Newberry. Niagara in Ohio. Geol. of O., v. 3, p. 7-8.
- Nicholson. Corals. Geol. of O., v. 2, pt. 2, p. 229.
- Orton. Fossils of, in southern Ohio. Geol. of O., v. 3, pp. 416-19.
- Orton. Niagara group in geological series of Ohio. Prelim. Rep. on petroleum and inflammable gas, 1886, pp. 21-2. Rep. 1887, pp. 31-3.
- Orton. Niagara group in Greene county. Geol. of O., v. 2, pt. 1, pp. 667-79.
- Orton. Niagara group in Highland county. Rep. Prog., 1870, pp. 270-87.
- Orton. Niagara group in Montgomery county. Rep. Prog., 1869, pp. 143-44.
- Orton. Niagara group in Ohio. Geol. of O., v. 6, pp. 13-16. Same, Rep., 1890, pp. 17-21.
- Orton. Niagara group in Ohio. Geol. of O., v. 7, pp. 11-13.
- Orton. Niagara group in Ohio geological scale. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 119-20.
- Orton. Niagara group in Preble county. Geol. of O., v. 3, pp. 408-11.
- Orton. Niagara group in Clark county. Geol. of O., v. 1, pt. 1, pp. 464-73.
- Orton. Niagara group in Preble county. Geol. of O., v. 3, pp. 408-11.
- Orton. Niagara group in Warren county. Geol. of O., v. 3, p. 386.
- Orton, Jr., and Peppel. Composition, physical character and uses of its limestones in Ohio. O. Geol. Sur., Bull. No. 4, pp. 147-55.
- Prosser. Desirability of retaining this name for the known group of rocks in revised Ohio geological scale. O. Geol. Sur., Bull. No. 7, p. 28.

- Niagara Group.** Winchell. Niagara group in Allen county. Geol. of O., v. 2, pt. 1, pp. 398-99.
- Winchell. Niagara group in Hancock county. Geol. of O., v. 2, pt. 1, pp. 359-61.
- Winchell. Niagara group in Hardin county. Geol. of O., v. 2, pt. 1, pp. 354-55.
- Winchell. Niagara group in Marion county. Geol. of O., v. 1, pt. 1, pp. 641-42.
- Winchell. Niagara group in Mercer county. Geol. of O., v. 2, pt. 1, pp. 411-13.
- Winchell. Niagara group in Ottawa county. Geol. of O., v. 2, pt. 1, pp. 229-30.
- Winchell. Niagara group in Sandusky county. Geol. of O., v. 1, pt. 1, pp. 596-99.
- Winchell. Niagara group in Sandusky county. Geol. of O., v. 1, pt. 1, pp. 596-99. Ballville township, p. 597. Jackson township, p. 598. Madison township, p. 597. Scott township, p. 598. Washington township, p. 597. Woodville township, p. 597.
- Winchell. Niagara group in Seneca county. Geol. of O., v. 1, pt. 1, pp. 513-17. Jackson township, pp. 613-14. Liberty, Pleasant and Hopewell townships, p. 614.
- Winchell. Niagara limestone in Van Wert county. Geol. of O., v. 2, pt. 1, pp. 316-17.
- Winchell. Niagara group in Wood county. Geol. of O., v. 2, pt. 1, pp. 370-74.
- Winchell. Niagara group in Wyandot county. Geol. of O., v. 1, pt. 1, pp. 627-32.
- See also Guelph Formation.*

- Niagara Limestone.** Orton. Lime production. Geol. of O., v. 6, pp. 705-06.
- Orton, Jr., and Peppel. Composition of, in Adams county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 33-35; in Clark county, pp. 50-52; in Clinton county, pp. 53-56; in Darke county, pp. 58-59; in Greene county, pp. 66-69; in Hancock county, pp. 73-74; in Highland county, pp. 75-79; in Mercer county, p. 96; in Miami county, pp. 96-98; in Montgomery county, pp. 100-102; in Ottawa county, pp. 107-108; in Sandusky county, p. 120; in Seneca county, p. 124; in Shelby county, pp. 125-26; in Van Wert county, pp. 127-28; in Wood county, pp. 132-33; in Wyandot county, p. 135.

- Niagara Shale.** Orton. Niagara shale in Greene county. Geol. of O. v. 2, pt. 1, pp. 669-70.

- Niagara Shale.** Orton. Niagara shale in Highland county. Rep. Prog., 1870, pp. 272-73.
- Nicholson, H. Alleyne.** Descriptions of amorphoza from the Silurian and Devonian systems. Geol. of O., v. 2, pt. 2, pp. 245-55.
- Descriptions of the corals of the Silurian and Devonian systems. Geol. of O., v. 2, pt. 2, pp. 183-242.
- Polyzoa from the Silurian. Geol. of O., v. 2, pt. 2, pp. 259-68.
- Noble County.** Andrews. Geology. Geol. of O., v. 2, pt. 1, pp. 509-28. Local geology of Beaver township, pp. 520-2. Brookfield township, pp. 509-11. Buffalo townshp, pp. 517-8. Center township, p. 522. Elk township, pp. 526-8. Enoch township, pp. 523-4. Jackson township, pp. 511-2. Jefferson township, pp. 528. Marion township, pp. 522-3. Olive township, p. 512. Noble township, pp. 515-7. Sharon township, p. 511. Seneca township, pp. 518-20. Stock township, pp. 524-6. Wayne township, p. 520.
- Andrews. Geology of part of Noble and Washington counties. Rep. Prog., 1869, pp. 123-27.
- Andrews. Topography. Geol. of O., v. 2, pt. 1, p. 509.
- Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 224-25.
- Brown. Meigs creek coal. Geol. of O. O., v. 5, pp. 1059-85.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 106-07.
- Normandin Block Machine.** Eno. Normandin machine for concrete blocks. O. Geol. Sur., Bull. No. 2, p. 239.
- North Baltimore Oil field.** Orton. Oil production. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 157-58.
- Orton. Wood county oil field. Rep., 1890, pp. 308-12.
- Northeastern Ohio.** Bownocker. Salt industry in this portion of Ohio. O. Geol. Sur., Bull. No. 8, pp. 28-40.
- Ohio Formations.** Prosser. Revised nomenclature of the Ohio geological formations. O. Geol. Sur., Bull. No. 7, pp. 1-36.
Ohio Geological Survey, see Geological Survey of Ohio.
- Oak Harbor Wells.** Orton. Development of Oak Harbor gas field. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 140-41.
- Ohio River.** Whittlesey. Encroachment of the Ohio river at Portsmouth. Ann. Rep., v. 2, 1838, pp. 70-71.

- Ohio Salt Company.** Bownocker. Methods of manufacture in use by this company. O. Geol. Sur., Bull. No. 8, pp. 32-34.
- Ohio Series.** Orton. Geol. scale of Ohio. Geol. of O., v. 6, pp. 3-4. Same, Rep., 1890, pp. 10-11. Geological of O., v. 7, pp. 1-44.
- Orton. Stratigraphical relations of Berea grit in Ohio. Geol. of O., v. 6, pp. 311-24.
- Ohio Shale.** Orton. Berea grit and Ohio shale, as sources of gas. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 176-78.
- Orton. Ohio shale. Geol. of O., v. 6, pp. 23-4. Same, Rep., 1890, pp. 27-28.
- Orton. Ohio shale as a source of oil and gas. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 90-96. Edition 1886, pp. 62-66. Rep., 1890, pp. 248-9. Geol. of O., v. 6, pp. 410-42.
- Orton. Ohio shale in geological series of Ohio. Prelim. Rep. on petroleum and inflammable gas, 1886, pp. 23-4. Rep., 1887, pp. 35-6, pp. 123-4.
- Orton. Shale of Ohio. Geol. of O., v. 7, pp. 21-26.
- Prosser. The Ohio shale in the revised Ohio geological scale. O. Geol. Sur., Bull. No. 7, p. 21.
- Oil, see Petroleum.*
- Oil Fields, See names of fields.*
- Olean Conglomerate.** Prosser. Discussion as to identity of Sharon and Olean conglomerates in revised Ohio geological scale. O. Geol. Sur., Bull. No. 7, pp. 13-16.
- Olentangy Shale.** Winchell. Olentangy shale in Crawford county. Geol. of O., v. 2, pt. 1, p. 243.
- Winchell. Olentangy shale in Delaware county. Geol. of O., v. 2, pt. 1, pp. 287-89.
- Onondaga Salt Group.** Gilbert. Onondaga in Lucas county. Geol. of O., v. 1, pt. 1, pp. 574-75.
- Ordovician.** Bownocker. Ordovician system in Ohio. O. Geol. Sur., Bull. No. 1, pp. 18-19.
- Prosser. Discussion of propriety of use of this name to replace Lower Silurian in geological nomenclature. O. Geol. Sur., Bull. No. 7, pp. 30-31.
- Oriskany Sandstone.** Newberry. Oriskany sandstone. Geol. of O., v. 1, pt. 1, pp. 149-41.
- Newberry. Oriskany in Erie county. Geol. of O., v. 2, pt. 1, p. 193.

- Oriskany Sandstone.** Newberry. Oriskany sandstone in Ohio. Rep. Prog., 1869, p. 16. First use of the term in Ohio.
- Newberry. Oriskany sandstone in Ohio. Geol. of O., v. 1, pt. 1, p. 67.
- Newberry. Oriskany of Ohio. Geol. of O., v. 3, pp. 9-10 p. 67.
- Winchell. Oriskany sandstone in Delaware county. Geol. of O., v. 2, pt. 1, p. 301.
- Winchell. Oriskany sandstone in Paulding county. Geol. of O., v. 2, pt. 1, pp. 340-41.
- Winchell. Oriskany sandstone in Sandusky county. Geol. of O., v. 1, pt. 1, p. 603.
- Winchell. Oriskany in Wood county. Geol. of O., v. 2, pt. 1, pp. 379-83.
- Ornamental Cement Work.** Eno. Use of cement for ornamental work, ceilings, monuments, etc. O. Geol. Sur., Bull. No. 2, pp. 52-55. *Ornithology, see Birds.*
- Orton, Edward.** Annual report as state geologist. Rep., 1890. 6+3+323 pp.
- Berea grit as a source of oil and gas in Ohio. Geol. of O., v. 6, pp. 311-409.
- Clays of Ohio, their origin, composition and varieties. Geol. of O., v. 7, pp. 45-68.
- Coal fields of Ohio. Geol. of O., v. 7, pp. 255-90.
- Coal mines of Vinton and Jackson counties. Geol. of O., v. 5 pp. 992-1034.
- Drift deposits of Ohio. Geol. of O., v. 6, pp. 772-82.
- Geological scale and geological structure of Ohio. Geol. of O., v. 7, pp. 1-44.
- Geology of Franklin county. Geol. of O., v. 3, pp. 596-646.
- Geology of Highland county. Rep. Prog., 1870, pp. 255-309.
- Geology of Montgomery county. Rep. Prog., 1869, pp. 140-64.
- Geology of Ohio, in its relations to petroleum and natural gas. Geol. of O., v. 6, pp. 1-59.
- Geology of Pike, Ross and Greene counties. Geol. of O., v. 2, pt. 1, pp. 611-96.
- Report on the geology of the 3rd geological district. Geol. of O., v. 1, pt. 1, pp. 367-480.
- Geology of the 3rd geological district. Geol. of O., v. 2, pt. 1, pp. 611-696.

- Orton, Edward.** Report on the geology of Warren, Preble, Butler and Madison counties. Geol. of O., v. 3, pp. 381-428.
- Gypsum or land-plaster in Ohio. Geol. of O., v. 6, pp. 696-702.
- Hocking valley coal field. Geol. of O., v. 5, pp. 912-91.
- Iron ores of Ohio, considered with reference to their geological order and geographical distribution. Geol. of O., v. 5, pp. 371-435.
- Lower coal-measures in Ohio. Geol. of O., v. 5, pp. 1-282, 773-815, 868-1058.
- Mines in Muskingum, Licking and Perry (northern part) counties. Geol. of O., v. 5, pp. 868-911.
- Mines in Scioto and Lawrence counties, and western part of Gallia county. Geol. of O., v. 5, pp. 1035-1058.
- Ohio shale as a source of oil and gas in Ohio. Geol. of O., v. 6, pp. 410-42. Map of territory in which low pressure gas in Ohio shale is due, opp. p. 410.
- Origin and accumulation of petroleum and natural gas. Geol. of O., v. 6, pp. 60-100.
- Preliminary report upon petroleum and inflammable gas. Reprinted for the author with a supplement. A. H. Smythe. Col., O., 1887. 200 pp., maps, plates.
- Production of lime in Ohio. Geol. of O., v. 6, pp. 703-71.
- Remaining sources of oil and gas in Ohio. Rep., 1890, pp. 248-58.
- Report on the geology of Ohio. Geol. of O., v. 5-7.
- Supplemental report on the Hanging Rock district. Geol. of O., v. 3, pp. 885-941.
- Supplemental report on the new gas fields and oil fields in Ohio. Geol. of O., v. 6, pp. 783-92.
- Utilization of natural gas in Ohio. Rep., 1890, pp. 259-80.
- Orton, Edward, Jr.** Clays of Ohio, and industries established upon them. Geol. of O., v. 5, pp. 643-721.
- Clay working industries in Ohio. Geol. of O., v. 7, pp. 69-254.
- Geological Survey of Ohio, Bulletins No. 1-8.
- Geology of Ohio, v. viii.
- Mines of Coshocton county. Geol. of O., v. 5, pp. 843-67.
- Orton, Edward, Jr., and Peppel, S. V.** Lime resources in Ohio available for Portland cement manufacture. O. Geol. Sur., Bull. No. 3 pp. 88-97.
- Limestones and lime industry of Ohio. O. Geol. Sur., Bull. No. 4.
- Osgood Beds.** Prosser. Basis for use of this name in revised nomenclature of Ohio geological scale. O. Geol. Sur., Bull. No. 7, pp. 28-29.

- Ottawa County.** Bownocker. Oil production. O. Geol. Sur., Bull. No. 1, pp. 94-95.
- Orton. Gas wells. Rep., 1890, pp. 172-73.
- Orton. Lime production. Geol. of O., v. 6, pp. 732-36.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 107-11.
- Winchell. Geology. Geol. of O., v. 2, pt. 1, pp. 227-35. Geologic map, 20.3x12.3 cm.
- Winchell. Topography. Geol. of O., v. 2, pt. 1, pp. 227-28.
- Otay Dam.** Eno. Concrete used in Otay dam. O. Geol. Sur., Bull. No. 2, pp. 100-01.
- Packing.** Peppel. Preparation of hydrated lime for market. O. Geol. Sur., Bull. No. 4, pp. 334-35.
- Paleobotany.** Andrews. Descriptions of fossil plants from the coal-measures of Ohio. Geol. of O., v. 2, pt. 2, pp. 415-26.
- Newberry. Descriptions of fossil plants of the coal-measures of Ohio. Geol. of O., v. 1, pt. 2, pp. 359-85.
- Orton. Fossil plants of the Cincinnati group. Geol. of O., v. 1, pt. 1, pp. 386-87.
- Paleobotany.** Genera and species. Alethopteris, Geol. of O., v. 2, pt. 2, pp. 420-21. Alethopteris bunburyi, p. 421. Alethopteris maxima, pp. 421-22. Alethopteris grandiflora, Geol. of O., v. 1, pt. 2, pp. 384-85. Alethopteris macrophylla, pp. 383-84. Antholithes priscus, Geol. of O., v. 1, pt. 2, p. 363. Archaeopteris stricta, Geol. of O., v. 2, pt. 2, p. 418. Asterophyllites erectifolius, Geol. of O., v. 2, pt. 2, p. 425. Asterophyllites minutus, pp. 424-25.
- Cardiocarpon newberryi, Geol. of O., v. 2, pt. 2, pp. 425-26. Cardiocarpon, Geol. of O., v. 1, pt. 2, pp. 370-72. Cardiocarpon annulatum, p. 374. Cardiocarpon bicuspidatum, p. 373. Cardiocarpon elongatum, p. 373. Cardiocarpon latum, p. 372. Cardiocarpon marginatum, p. 373. Cardiocarpon minus, p. 372. Cardiocarpon orbiculare, p. 374. Cardiocarpon retusum, p. 374. Cardiocarpon samaraeforme, p. 375.
- Eremopteris marginata, Geol. of O., v. 2, pt. 2, pp. 422-23. Hymenophyllites, Geol. of O., v. 2, pt. 2, p. 422. Lepidodendron rushvillense, Geol. of O., v. 2, pt. 2, pp. 423-24. Lepidophlois lesquereuxii, Geol. of O., v. 2, pt. 2, p. 423. Megalopteris, Geol. of O., v. 2, pt. 2, pp. 416-17. Megalopteris harttii p. 416. Megalopteris lata, pp. 417-18. Megalopteris minima, pp. 416-17. Megalopteris ovata, p. 417.

Paleobotany. *Neriopteris lanceolata*, Geol. of O., v. 1, pt. 2, p. 381. *Odonopteris neuropteroides*, Geol. of O., v. 1, pt. 2, pp. 381-82. *Odonopteris gracillima*, pp. 382-83. *Polysporia mirabilis*, Geol. of O., v. 1, pt. 2, p. 362. *Rhabdocarpus*, Geol. of O., v. 1, pt. 2, pp. 375-76. *Rhabdocarpus acuminatus*, p. 378. *Rhabdocarpus apiculatus*, pp. 377-78. *Rhabdocarpus carinatus*, p. 376. *Rhabdocarpus costatus*, p. 378. *Rhabdocarpus danai*, pp. 376-77. *Rhabdocarpus laevis*, p. 377. *Roots*, Geol. of O., v. 2, pt. 2, p. 424.

Trigonocarpon; Geol. of O., v. 1, pt. 2, pp. 364-67. *Trigonocarpon bertholletiforme*, p. 369. *Trigonocarpon carpolithus fragarioides*, p. 370. *Trigonocarpon magnum*, p. 369. *Trigonocarpon multicarinatum*, p. 369. *Trigonocarpon ornatum*, p. 368. *Trigonocarpon tricuspdatum*, p. 368. *Trigonocarpon triloculare*, pp. 367-68.

Paleontology. Andrews. Fossils of the Waverly group. Rep. Prog., 1869, pp. 71-72.

———Briggs. Fossil bones in the region between the Scioto and Hocking rivers. An. Rep., v. 1, 1837, pp. 96-8.

———Cope. Synopsis of the extinct batrachia from the coal-measures. Geol. of O., v. 2, pt. 2, pp. 351-411.

———Hall, James and Whitfield. Descriptions of invertebrate fossils, mainly from the Silurian system. Geol. of O., v. 2, pt. 2, pp. 67-268.

———Hildreth. Fossils, fresh water shell. An. Rep., v. 1, 1837, p. 50.

———Hildreth. Fossils in the Pomeroy coal seam. An. Rep., v. 1, 1837, pp. 42-44.

———Hildreth. List of species from below the "Bonebed" of Ohio. Geol. of O., v. 7, pt. 2, pp. 434-49.

———Meek. Descriptions of invertebrate fossils of the Silurian and Devonian systems. Geol. of O., v. 1, pt. 2, pp. 1-243.

———Meek. Invertebrate fossils of the Waverly group and coal-measures of Ohio. Geol. of O., v. 2, pt. 2, pp. 273-347.

———Meek. List of fossils described in description of invertebrate fossils of the Devonian and Silurian systems. Geol. of O., v. 1, pt. 2, pp. 237-43.

———Newberry. Descriptions of fossil fishes. Geol. of O., v. 1, pt. 2, pp. 247-355.

———Newberry. Fossil fishes of Huron shale in Lorain county. Geol. of O., v. 2, pt. 1, pp. 214-15.

———Newberry. Report on the paleontology of Ohio. Geol. of O., v. 1, pt. 2; v. 2, pt. 2.

- Paleontology.** Nicholson. Descriptions of corals of the Silurian and Devonian systems. Geol. of O., v. 2, pt. 2, pp. 183-242.
- Orton. Catalogue of described fossils of Cincinnati group in southwest Ohio. Geol. of O., v. 1, pt. 1, pp. 400-11.
- Orton. Fossils of the Cincinnati group. Geol. of O., v. 1, pt. 1, pp. 384-99.
- Orton. Fossils of the Corniferous limestone. Geol. of O., v. 3, pp. 618-29.
- Orton. List of fossils of Clinton and Niagara groups in southern Ohio. Geol. of O., v. 3, pp. 415-19.
- Plates illustrating report on the paleontology of Ohio. Geol. of O., v. 1, pt. 2.
- Plates illustrating fossils described in paleontology of Ohio. Geol. of O., v. 2, pt. 2, 59, pl.
- Plates illustrating genera and species described in v. 7, Geol. of O. Geol. of O., v. 7, pt. 2, fol. p. 700.
- Read. Fossils in Geauga county. Rep. Prog., 1870, pp. 469-70.
- Whitfield. Contributions to the paleontology of Ohio. Geol. of O., v. 7, pt. 2, pp. 407-94.

Paleontology. Genera and species described. *Acanthaspis*, Geol. of O., v. 2, pt. 2, pp. 36-7. *Acanthaspis armatus*, pp. 37-38. *Acantholepis*, Geol. of O., v. 2, pt. 2, p. 38. *Acantholepis pustulosus*, pp. 38-40. *Acervularia clintonensis*, Geol. of O., v. 2, pt. 2, pp. 227-28. *Acervularia davidsoni*, pp. 240-41. *Acervularia profunda*, p. 240. *Acidaspis ceralepta*, Geol. of O., v. 1, pt. 2, pp. 169-70. *Acidaspis cincinnatiensis*, pp. 167-69. *Acidaspis crosotus*, pp. 165-67. *Acidaspis ortonii*, Geol. of O., v. 7, pt. 2, p. 522. *Acidaspis brevispinosa*, pp. 522-23. *Actinocrinus daphne*, Geol. of O., v. 2, pt. 2, pp. 162-63. *Actinocrinus eris*, pp. 164-65. *Actinocrinus helice*, pp. 163-64. *Actinocrinus viminalis*, pp. 165-66. *Actinodesma subrecta*, Geol. of O., v. 7, pt. 2, p. 450. *Actinomya*, Geol. of O., v. 7, pt. 2, pp. 656-58. *Actinomya kentonsensis*, pp. 658-59.

Agelacrinites (lepidodiscus) cincinnatiensis, Geol. of O., v. 1, pt. 2, pp. 55-6. *Agelacrinites pileus*, pp. 56-57. *Agelacrinites vorticellata*, pp. 57-58. *Alecto auloporoides*, Geol. of O., v. 2, pt. 2, p. 267. *Alecto confusa*, pp. 267-68. *Alecto frondosa*, pp. 266-67. *Allonychia*, Geol. of O., v. 7, pt. 2, pp. 640-41. *Allonychia ovata*, p. 641. *Allonychia subrotunda*, p. 642. *Allorisma andrewsi*, Geol. of O., v. 7, pt. 2, p. 475. *Allorisma maxvillensis*, pp. 475-76. *Allorisma costata*, Geol. of O., v. 2, pt. 2, pp. 344-45. *Allorisma (cereomyopsis) pleuropistha*, Geol. of O., v. 2, pt. 2, pp. 309-11. *Allorisma ventricosa*, pp. 312-13. *Allorisma winchelli*, pp. 311-12.

Paleontology. *Ambonychia alata*, Geol. of O., v. 1, pt. 2, pp. 131-32. *Ambonychia casei*, p. 133. *Ambonychia costata*, pp. 130-31. *Ambonychia radiata*, Geol. of O., v. 2, pt. 2, pp. 79-81. *Amphicoelia* (*leptodomus*) *costata*, Geol. of O., v. 2, pt. 2, pp. 140-41. *Anodontopsis milleri*, Geol. of O., v. 1, pt. 2, pp. 140-41. *Anodontopsis* (*modiolopsis*) *unionoides*, pp. 141-42. *Anomalocrinus incurvus*, Geol. of O., v. 1, pt. 2, pp. 17-20. *Anomalocystites* (*ateleocystites*) *balanoides*, Geol. of O., v. 1, pt. 2, pp. 41-44. *Anomalodonta*, Geol. of O., v. 7, pt. 2, pp. 636-37. *Anomalodonta alata*, p. 638. *Anomalodonta plicata*, pp. 638-39. *Anoptera*, Geol. of O., v. 7, pt. 2, pp. 649-50. *Anoptera miseneri*, p. 650. *Anthracopupa ohioensis*, Geol. of O., v. 7, pt. 2, pp. 491-92. *Archaeocaris vermiformis*, Geol. of O., v. 2, pt. 2, pp. 321-22. *Aristozoa canadensis*, Geol. of O., v. 7, pt. 2, p. 462.

Asaphus isotelus, *megistos*, Geol. of O., v. 1, pt. 2, pp. 159-60. *Aspidichthys*, Geol. of O., v. 2, pt. 2, pp. 322-23. *Aspidichthys clavatus*, p. 323. *Astartella newberryi*, Geol. of O., v. 2, pt. 2, pp. 340-41. *Astartella varica*, p. 341. *Astartella*, pp. 341-42. *Asterosteus*, Geol. of O., v. 2, pt. 2, p. 35. *Asterosteus stenocephalus*, p. 36.

Athyris lamellosa, Geol. of O., v. 2, pt. 2, pp. 283-85. *Athyris subtilitia*, Geol. of O., v. 7, pt. 2, p. 488. *Atrypa lati-corrugata*, Geol. of O., v. 7, pt. 2, pp. 591-92. *Atrypa marginalis*, p. 591. *Atrypa nodostriata*, Geol. of O., v. 2, pt. 2, pp. 133-34.

Aulopora arachonidea, Geol. of O., v. 2, pt. 2, pp. 216-17. *Avicula Whitfieldi*, Geol. of O., v. 7, pt. 2, pp. 558-59. *Aviculopecten crenistriatus*, Geol. of O., v. 2, pt. 2, pp. 295-96. *Aviculopecten winchelli*, pp. 296-98. *Aviculopecten equilatera*, Geol. of O., v. 7, pt. 2, p. 445. *Aviculopecten interlineatus*, Geol. of O., v. 7, pt. 2, p. 489. *Aviculopecten parillis*, Geol. of O., v. 1, pt. 2, pp. 197-99. *Aviculopecten* (*streblopteria*) *hertzeri*, Geol. of O., v. 2, pt. 2, pp. 330-31.

Bellerophon alternodosus, Geol. of O., v. 7, pt. 2, p. 479. *Bellerophon sublevis*, p. 479. *Bellerophon* (*Bucania*) *exiguus*, Geol. of O., v. 7, pt. 2, p. 548. *Bellerophon opertus*, pp. 548-49. *Bellerophon trilobatus*, p. 549. *Bellerophon fiscoello-striatus*, p. 548. *Bellerophon newberryi*, Geol. of O., v. 1, pt. 2, pp. 222-25. *Bellerophon propinquus*, p. 226. *Beyrichia chambersi*, Geol. of O., v. 2, pt. 2, pp. 103-05. *Beyrichia oculifera*, p. 103. *Beyrichia quadrilirata*, p. 105. *Beyrichia tumifrons*, pp. 102-03. *Brachydectes*, Geol. of O., v. 2, pt. 2, p. 388. *Brachydectes newberryi*, pp. 388-89. *Byssonychia acutirostris*, Geol. of O., v. 7, pt. 2, pp. 634-35. *Byssonychia alveolata*, p. 631. *Byssonychia bynesi*, pp. 635-36. *Byssonychia cultrata*, p. 632. *Byssonychia grandis*, pp. 631-32. *Byssonychia imbricata*, p. 635. *Byssonychia obesa*, p. 630. *Byssonychia praeursora*, pp. 633-34. *Byssonychia richmondensis*, pp. 632-33. *Byssonychia subrecta*, pp. 634-35. *Byssonychia vera*, pp. 629-30.

- Paleontology.** *Calymene senaria*, Geol. of O., v. 1, pt. 2, pp. 173-75. *Calymene christyi*, Geol. of O., v. 2, pt. 2, pp. 107-08. *Calymene niagarensis*, Geol. of O., v. 2, pt. 2, pp. 153-54. *Calymene vogdesi*, Geol. of O., v. 7, pt. 2, pp. 526-27. *Cardiomorpha obliquata*, Geol. of O., v. 1, pt. 2, pp. 146-47. *Cardiomorpha subglobosa*, Geol. of O., v. 2, pt. 2, pp. 304-05. *Ceramopora ohioensis*, Geol. of O., v. 2, pt. 2, pp. 265-66. *Ceraterpeton*, Geol. of O., v. 2, pt. 2, p. 370. *Ceraterpeton lennicorne*, pp. 372-73. *Ceraterpeton lineopunctatum*, p. 372. *Ceratiocaris colpocaris*, Geol. of O., v. 2, pt. 2, pp. 317-18. *Ceratiocaris colpocaris bradleyi*, pp. 318-19. *Ceratiocaris colpocaris elytroides*, pp. 319-20. *Ceratiocaris solenocaris*, pp. 320-21. *Ceratiocaris solenocaris strigata*, p. 321. *Ceraurus icarus*, Geol. of O., v. 1, pt. 2, pp. 162-65. *Ceraurus (pseudosphærexochus) clintoni*, Geol. of O., v. 7, pt. 2, pp. 527-28.
- Chætetes*, Geol. of O., v. 2, pt. 2, pp. 188-92. *Chætetes approximatus*, pp. 193-94. *Chætetes attritus*, p. 194. *Chætetes briareus*, pp. 202-03. *Chætetes clathratulus*, p. 209. *Chætetes corticans*, pp. 210-11. *Chætetes dalei*, p. 192. *Chætetes delicatulus*, pp. 199-200. *Chætetes discoideus*, p. 206. *Chætetes filiasa*, pp. 206-07. *Chætetes fletcheri*, pp. 197-98. *Chætetes frondosus*, pp. 208-09. *Chætetes gracilis*, pp. 198-99. *Chætetes jamesi*, pp. 200-01. *Chætetes mammulatus*, pp. 207-08. *Chætetes newberryi*, pp. 212-13. *Chætetes nodulosus*, p. 200. *Chætetes ortonii*, pp. 211-12. *Chætetes papillatus*, p. 216. *Chætetes petropolitanus*, pp. 204-05. *Chætetes petechialis*, p. 213. *Chætetes pulchellus*, pp. 295-97. *Chætetes rhombicus*, pp. 201-02. *Chætetes rugosus*, p. 193. *Chætetes sigillarioides*, pp. 203-04.
- Chonetes reversa*, Geol. of O., v. 7, pt. 2, p. 443. *Chonetes scitula*, p. 443. *Cladodus acuminatus*, Geol. of O., v. 2, pt. 2, pp. 45-46. *Cladodus concinnus*, p. 48. *Cladodus hertzeri*, p. 46. *Cladodus parvulus*, pp. 48-49. *Cladodus pattersoni*, p. 47. *Cladodus romingeri*, pp. 49-50. *Cladodus subulatus*, pp. 47-48. *Clathropora clintoniensis*, Geol. of O., v. 2, pt. 2, pp. 113-14. *Clidophorus fabula*, Geol. of O., v. 1, pt. 2, pp. 138-39. *Clinopistha antiqua*, Geol. of O., v. 1, pt. 2, p. 208. *Clionychia*, Geol. of O., v. 7, pt. 2, pp. 650-51. *Clionychia excavata*, pp. 651-52. *Clionychia subundata*, p. 651.
- Coccosteus occidentalis*, Geol. of O., v. 2, pt. 2, pp. 32-34. *Cocytinus*, Geol. of O., v. 2, pt. 2, pp. 260-64. *Cocytinus gyrinoides*, pp. 364-65. *Coleolus clintonensi*, Geol. of O., v. 7, pt. 2, p. 547. *Colosteus*, Geol. of O., v. 2, pt. 2, pp. 405-06. *Colosteus foveatus*, p. 406. *Colosteus pauciradiatus*, p. 408. *Colpomya constricta*, Geol. of O., v. 7, pt. 2, pp. 659-60. *Columnopora*, Geol. of O., v. 2, pt. 2, pp. 186-87. *Columnopora cribriformis*, pp. 187-88. *Comsacanthus*, Geol. of O., v. 1, pt. 2, p. 331. *Comsacanthus lævis*, p. 332.

- Paleontology.** *Conocardium ohioense*, Geol. of O., v. 1, pt. 2, pp. 203-06. *Conocardium trigonale*, pp. 201-03. *Conodonts*, Geol. of O., v. 2, pt. 2, pp. 41-44. *Constellaria*, Geol. of O., v. 2, pt. 2, p. 214. *Constellaria antheloidea*, pp. 214-15. *Constellaria polystomella*, pp. 215-16. *Conularia bilineata*, Geol. of O., v. 2, pt. 2, p. 547. *Conularia niagarensis*, p. 547. *Conularia elegantula*, Geol. of O., v. 1, pt. 2, pp. 228-29. *Conularia micronema*, Geol. of O., v. 2, pt. 2, p. 316. *Conularia newberryi*, pp. 316-17.
- Corallidomus*, new genus, Geol. of O., v. 7, pt. 2, p. 493. *Cornulites distans*, Geol. of O., v. 7, pt. 2, pp. 532-33. *Crania carbonaria*, Geol. of O., v. 7, pt. 2, pp. 484-85. *Crania dubia*, Geol. of O., v. 7, pt. 2, p. 565. *Crania lœlia*, Geol. of O., v. 2, pt. 2, p. 75. *Crania scabiosa*, pp. 74-75. *Craniella clintonensis*, Geol. of O., v. 7, pt. 2, p. 565.
- Ctenacanthus*, Geol. of O., v. 1, pt. 2, pp. 325-26. *Ctenacanthus formosus*, pp. 328-29. *Ctenacanthus marshi*, pp. 326-28. *Ctenacanthus triangularis*, pp. 329-30. *Ctenacanthus vetustus*, p. 326. *Ctenacanthus formosus*, Geol. of O., v. 2, pt. 2, pp. 53-54. *Ctenacanthus furcicarinatus*, pp. 54-55. *Ctenacanthus parvulus*, p. 55. *Ctenodonta cingulata*, Geol. of O., v. 7, pt. 2, p. 680. *Ctenodonta perminuta*, p. 680. *Ctenodonta retrorsa*, pp. 678-80. *Ctenodus*, Geol. of O., v. 2, pt. 2, p. 410. *Ctenodus ohioensis*, pp. 410-11. *Ctenodus reticulatus*, Geol. of O., v. 2, pt. 2, pp. 60-61. *Ctenodus serratus*, pp. 59-60. *Ctenoptychius semicircularis*, Geol. of O., v. 2, pt. 2, p. 52.
- Cuneamya*, Geol. of O., v. 2, pt. 2, pp. 90-91. *Cuneamya miamiensis*, pp. 91-92. *Cuneamya scapha*, pp. 92-93. *Cyathocrinus somersi*, Geol. of O., v. 7, pt. 2, pp. 482-83. *Cycloconcha*, Geol. of O., v. 7, pt. 2, p. 686. *Cycloconcha mediocardinalis*, pp. 686-87. *Cycloconcha ovata*, pp. 687-88. *Cyclonema bilix*, Geol. of O., v. 1, pt. 2, pp. 151-52. *Cyclonema bilix*, Geol. of O., v. 7, pt. 2, pp. 551-52. *Cyclonema crenulata*, Geol. of O., v. 1, pt. 2, p. 213. *Cyclora alta*, Geol. of O., v. 7, pt. 2, p. 552. *Cyclora minuta*, Geol. of O., v. 1, pt. 2, pp. 152-53. *Cyclora parvula*, p. 154. *Cyclospira sparsi-plica*, Geol. of O., v. 7, pt. 2, pp. 593-94. *Cymatonota attenuata*, Geol. of O., v. 7, pt. 2, pp. 664-65. *Cymatonota cona stricta*, p. 664. *Cymatonota productifrons*, p. 665. *Cymatonot-recta*, pp. 662-63. *Cymatonota semistrata*, pp. 663-64. *Cymatonota typicalis*, p. 662.
- Cypricardina carbonaria*, Geol. of O., v. 2, pt. 2, pp. 342-43. *Cypricardites carinata*, Geol. of O., v. 1, pt. 2, pp. 135-36. *Cypricardites sterlingensis*, pp. 133-35. *Cypricardites caswelli*, Geol. of O., v. 7, pt. 2, p. 561. *Cypricardites ferrugineum*, Geol. of O., v. 2, pt. 2, pp. 116-17. *Cypricardina undulostriata*, Geol. of O., v. 7, pt. 2, pp. 561-62. *Cyrtacanthus*, Geol. of O., v. 1, pt. 2, pp. 306-07. *Cyrtacanthus dentatus*, p. 307.

Paleontology. *Cyrtoceras cretaceum*, Geol. of O., v. 7, pt. 2, pp. 429-30. *Cyrtoceras hertzeri*, Geol. of O., v. 2, pt. 2, pp. 150-51. *Cyrtoceras myrice*, pp. 149-50. *Cyrtoceras clintonense*, Geol. of O., v. 7, pt. 2, p. 534. *Cyrtoceras (glyptoceras) eatonense*, pp. 535-37. *Cyrtoceras (glyptoceras) subcompressum*, p. 535. *Cyrtoceratites ohioensis*, Geol. of O., v. 1, pt. 2, pp. 229-30. *Cyrtolites costatus*, Geol. of O., v. 1, pt. 2, p. 150. *Cyrtolites dyeri*, pp. 149-50. *Cyrtolites inornatus*, pp. 147-48. *Cyrtolites ornatus*, pp. 148-49. *Cyrtolites youngi*, Geol. of O., v. 7, pt. 2, p. 549. *Cystiphyllum ohioense*, Geol. of O., v. 2, pt. 2, pp. 234-35. *Cystiphyllum vesiculosum*, pp. 233-34. *Cythere cincinnatiensis*, Geol. of O., v. 1, pt. 2, pp. 158-59.

Dalmanitia breviceps, Geol. of O., v. 2, pt. 2, pp. 108-09. *Dalmanites carleyi*, Geol. of O., v. 1, pt. 2, pp. 170-73. *Dalmanites ohioensis*, pp. 234-36. *Dalmanites werthneri*, Geol. of O., v. 7, pt. 2, pp. 530-31. *Dentalium martini*, Geol. of O., v. 7, pt. 2, pp. 423-24. *Dictyostroma*, Geol. of O., v. 2, pt. 2, p. 254. *Dictyostroma undulata*, pp. 254-55. *Dinichthys*, Geol. of O., v. 1, pt. 2, pp. 313-16. *Dinichthys hertzeri*, pp. 316-22. *Dinichthys*, Geol. of O., v. 2, pt. 2, pp. 3-27. *Dinichthys terrelli*, pp. 27-32. *Dinichthys terrelli*, charts representing, Geol. of O., v. 2; separate envelope, charts 5 and 6. *Dinobolus conradi*, Geol. of O., v. 2, pt. 2, pp. 130-31.

Diplodus, Geol. of O., v. 1, pt. 2, pp. 334-35. *Diplodus compressus*, p. 335. *Diplodus gracilis*, pp. 335-36. *Diplodus latus*, p. 336. *Diplodus*, Geol. of O., v. 2, pt. 2, pp. 44-45. *Dipterus sherwoodi*, Geol. of O., v. 2, pt. 2, pp. 61-62. *Discina humilis*, Geol. of O., v. 7, pt. 2, pp. 452-53. *Discina lodensis*, Geol. of O., v. 7, pt. 2, p. 442. *Discina minuta*, p. 442. *Discina meekani*, pp. 483-84. *Discina meekana*, p. 488. *Discina (orbiculoidea) newberryi*, Geol. of O., v. 2, pt. 2, pp. 277-78. *Discina (orbiculoidea) pleurites*, pp. 278-79.

Echinocaris, Geol. of O., v. 7, pt. 2, pp. 455-56. *Echinocaris multinodosa*, pp. 458-59. *Echinocaris pustulosa*, p. 458. *Echinocaris sublevis*, pp. 457-58. *Edmondia tapesiformis*, Geol. of O., v. 2, pt. 2, p. 304. *Eichwaldia reticulata*, Geol. of O., v. 7, pt. 2, p. 594. *Elpe Ulrichi*, Geol. of O., v. 7, pt. 2, p. 532. *Enerinurus ornatus*, Geol. of O., v. 2, pt. 2, pp. 154-56. *Enerinurus punctatus*, Geol. of O., v. 7, pt. 2, pp. 531-32. *Entolium shumardianum*, Geol. of O., v. 2, pt. 2, pp. 292-94. *Eridonychia apicalis*, Geol. of O., v. 7, pt. 2, pp. 639-40. *Eridonychia crenata*, p. 640. *Eridonychia paucicostata*, p. 640. *Eridophyllum simcoense*, Geol. of O., v. 2, pt. 2, p. 228. *Eridophyllum strictum*, pp. 238-39. *Eridophyllum verneuianum*, p. 239.

- Paleontology.** *Eucalyptocrinus crassus*, Geol. of O., v. 2, pt. 2, p. 129. *Eucalyptocrinus splendidus*, pp. 128-29. *Euomphalus decewi*, Geol. of O., v. 1, pt. 2, pp. 220-21. *Eurylepis*, Geol. of O., v. 1, pt. 2, pp. 347-49. *Eurylepis corrugatus*, p. 350. *Eurylepis granulatus*, p. 352. *Eurylepis insculptus*, p. 351. *Eurylepis lineatus*, p. 353. *Eurylepis minimus*, pp. 353-54. *Eurylepis ornatissimus*, p. 352. *Eurylepis ovoideus*, p. 351. *Eurylepis striolatus*, p. 355. *Eurylepis tuberculatus*, p. 350. *Eurypterus eriensis*, Geol. of O., v. 7, pt. 2, pp. 416-17. *Eurythorax*, Geol. of O., v. 2, pt. 2, pp. 401-02. *Eurythorax sublævis*, p. 402.
- Favistella*, Geol. of O., v. 2, pt. 2, pp. 184-85. *Favistella stellata*, pp. 185-86. *Favosites aspera*, Geol. of O., v. 2, pt. 2, pp. 225-26. *Favosites gothlandica*, pp. 224-25. *Favosites venusta*, p. 226. *Favosites favosa*, p. 229. *Favosites*, p. 183. *Favosites gothlandica*, pp. 183-84. *Favosites invaginata*, pp. 232-33. *Favosites pleurodictyoides*, pp. 231-32. *Favosites polymorpha*, p. 231. *Favosites turbinata*, pp. 230-31. *Fenestella delicata*, Geol. of O., v. 2, pt. 2, pp. 273-74. *Fenestella multipora*, pp. 274-75. *Forbesiocrinus communis*, Geol. of O., v. 2, pt. 2, pp. 169-70. *Forbesiocrinus kelloggi*, pp. 171-72. *Forbesiocrinus tardus*, pp. 170-71.
- Gilbertsocrinus spinigerus*, Geol. of O., v. 7, pt. 2, pp. 447-48. *Glyptocrinus decadactylus*, Geol. of O., v. 1, pt. 2, pp. 30-32. *Glyptocrinus dyeri*, pp. 32-34. *Glyptocrinus dyeri sub-globosus*, p. 34. *Glyptocrinus nealli*, pp. 34-36. *Glyptocrinus parvus*, pp. 36-37. *Glyptocrinus baeri*, pp. 37-39. *Gomphoceras amphora*, Geol. of O., v. 7, pt. 2, p. 428. *Gomphoceras hyatti*, pp. 427-28. *Gomphoceras sciotense*, pp. 428-29. *Gomphoceras eos*, Geol. of O., v. 2, pt. 2, pp. 100-101. *Gomphoceras ortonii*, Geol. of O., v. 7, pt. 2, pp. 533-34.
- Goniophora dubia*, Geol. of O., v. 7, pt. 2, pp. 415-16. *Grammysia bisulcata*, Geol. of O., v. 7, pt. 2, pp. 451-52. *Grammysia hannibalensis*, Geol. of O., v. 2, pt. 2, pp. 300-01. *Grammysia rhomboides*, pp. 302-03. *Grammysia ventricosa*, p. 303. *Gyracanthus*, Geol. of O., v. 1, pt. 2, p. 330. *Gyracanthus alleni*, p. 331. *Gyracanthus compressus*, pp. 330-31. *Gyracanthus*, Geol. of O., v. 2, pt. 2, p. 57. *Gyroceras columbiense*, Geol. of O., v. 7, pt. 2, pp. 430-31. *Gyroceras seminodosum*, p. 431. *Gyroceratites (nautilus) inelegans*, Geol. of O., v. 1, pt. 2, pp. 232. *Gyroceratites (trochoceras) ohioensis*, pp. 230-31.
- Halysites catenularia*, Geol. of O., v. 2, pt. 2, p. 227. *Heliodus*, Geol. of O., v. 2, pt. 2, pp. 62-63. *Heliodus lesleyi*, p. 64. *Hemicystites stellatus*, Geol. of O., v. 1, pt. 2, pp. 52-54. *Hemicystites (cystaster) granulatus*, p. 54. *Hemipronites crenistria*, Geol. of

Paleontology.

O., v. 2, pt. 2, pp. 279-82. *Heterocrinus constrictus*, Geol. of O., v. 1, pt. 2, pp. 3-5. *Heterocrinus exilis*, pp. 5-7. *Heterocrinus simplex*, pp. 7-10. *Heterocrinus juvenis*, pp. 10-12. *Heterocrinus heterodactylus*, pp. 12-14. *Heterocrinus laxus*, pp. 14-15. *Hippochoa inflata*, Geol. of O., v. 2, pt. 2, p. 268. *Holopea newtonensis*, Geol. of O., v. 7, pt. 2, pp. 477-78. *Hyphasma*, Geol. of O., v. 2, pt. 2, p. 387. *Hyphasma lævis*, pp. 387-88.

Illænus ambiguus, Geol. of O., v. 7, pt. 2, p. 525. *Illænus daytonensis*, p. 525. *Illænus insignis*, pp. 525-26. *Illænus madisonianis*, p. 526. *Illænus (bumastus) insignis*, Geol. of O., v. 1, pt. 2, pp. 189-93. *Inocaulis bella*, Geol. of O., v. 2, pt. 2, p. 122. (*Ioeyinus*) *subcrassus*, Geol. of O., v. 1, pt. 2, pp. 15-17. *Ischyrodonta*, Geol. of O., v. 7, pt. 2, pp. 671-72. *Ischyrodonta decipiens*, pp. 673-74. *Ischyrodonta elongata*, p. 675. *Ischyrodonta miseneri*, pp. 675-76. *Ischyrodonta modioliformis*, pp. 676-77. *Ischyrodonta ovalis*, p. 674. *Ischyrodonta truncata*, pp. 672-73. *Ischyrodonta unionoides*, pp. 677-78.

Leiorhynchus limitaris, Geol. of O., v. 7, pt. 2, p. 444. *Leperditia alta*, Geol. of O., v. 1, pt. 2, pp. 187-88. *Leperditia alta*, Geol. of O., v. 7, pt. 2, pp. 417-18. *Leperditia angulifera*, pp. 418-19. *Leperditia (isochilina) cylindrica*, Geol. of O., v. 2, pt. 2, p. 101. *Leperditia (isochilina) minutissima*, p. 102. *Lepocrinites moorei*, Geol. of O., v. 1, pt. 2, pp. 39-41. *Leptæna rhomboidalis*, Geol. of O., v. 7, pt. 2, pp. 566-67. *Leptæna sericea*, Geol. of O., v. 1, pt. 2, pp. 70-72. *Leptobolus lepis*, Geol. of O., v. 2, pt. 2, p. 69. *Leptothractus*, Geol. of O., v. 2, pt. 2, pp. 399-400. *Leptothractus obsoletus*, pp. 400-01.

Lichas breviceps, Geol. of O., v. 2, pt. 2, pp. 156-57. *Lichas breviceps*, Geol. of O., v. 7, pt. 2, p. 529. *Lichenocrinus*, Geol. of O., v. 1, pt. 2, pp. 44-51. *Lichenocrinus dyeri*, p. 51. *Lichenocrinus crateriformis*, pp. 51-52. *Licina (paracyclas) ohioensis*, Geol. of O., v. 1, pt. 2, pp. 199-200. *Linguella (dignomia) cincinnatiensis*, Geol. of O., v. 2, pt. 2, pp. 67-69. *Lingula covingtonensis*, Geol. of O., v. 2, pt. 2, p. 67. *Lingula ligea*, Geol. of O., v. 7, pt. 2, pp. 441-42. *Lingula manni*, p. 441. *Lingula ligea*, pp. 462-63. *Lingula plumulites newberryi*, pp. 463-64. *Lingula (lingulella) membranacea*, Geol. of O., v. 2, pt. 2, p. 275. *Lingula melie*, p. 276. *Lingula scotica*, pp. 276-77. *Liognathus*, Geol. of O., v. 1, pt. 2, p. 306. *Liognathus spatulatus*, p. 306. *Listracanthus*, Geol. of O., v. 1, pt. 2, p. 336. *Listracanthus hildrethi*, Geol. of O., v. 2, pt. 2, p. 56. *Listracanthus hystrix*, Geol. of O., v. 1, pt. 2, p. 337; v. 2, p. 56. *Lituites ortonii*, Geol. of O., v. 1, pt. 2, pp. 186-87.

Paleontology. *Loxonema parvulum*, Geol. of O., v. 7, pt. 2, pp. 424-25. *Loxonema plicatum*, p. 486. *Loxonema?* (cf. *holopellm*) *subulata*, p. 556. *Lyrodesma cincinnatiensis*, Geol. of O., v. 2, pt. 2, 82-3. *Lyrodesma conradi*, Geol. of O., v. 7, pt. 2, p. 684. *Lyrodesma grande*, p. 683. *Lyrodesma inornatum*, pp. 682-83. *Lyrodesma subplanum*, pp. 683-84. *Machæracanthus*, Geol. of O., v. 1, pt. 2, pp. 302-04. *Machæracanthus major*, p. 304. *Machæracanthus peracutus*, p. 305. *Machæracanthus sulcatus*, p. 305. *Macrocheilus klipparti*, Geol. of O., v. 2, pt. 2, pp. 346-47. *Macrocheilus prisceus*, Geol. of O., v. 7, pt. 2, p. 424. *Macrocheilus regularis*, pp. 485-86. *Macrocheilus subcorpulentus*, p. 478. *Macrodon obsoletus*, Geol. of O., v. 2, pt. 2, pp. 334-35.

Macropetalichthys, Geol. of O., v. 1, pt. 2, pp. 290-94. *Macropetalichthys sullivanii*, pp. 294-96. *Megalichthys*, Geol. of O., v. 1, pt. 2, pp. 343-44. *Megambonia jamesi*, Geol. of O., v. 1, pt. 2, pp. 136-38. *Melocrinus* (*ctenocrinus*) *bainbridgensis*, Geol. of O., v. 2, pt. 2, pp. 158-60. *Meristella bella*, Geol. of O., v. 7, pt. 2, p. 412. *Meristella levis*, pp. 411-12. *Meristella* (*meristina*) *cylindrica*, Geol. of O., v. 1, pt. 2, pp. 180-82. *Meristella umbonata*, Geol. of O., v. 7, pt. 2, pp. 590-91. *Meristina maria*, Geol. of O., v. 2, pt. 2, pp. 132-33.

Modiolodon declivis, Geol. of O., v. 7, pt. 2, p. 654. *Modiolodon obtusus*, pp. 654-55. *Modiolodon oviformis*, pp. 652-53. *Modiolodon oviformis amplus*, p. 653. *Modiolodon subovalis*, pp. 655-56. *Modiolodon subrectus*, pp. 653-54. *Modiolopsis cincinnatiensis*, Geol. of O., v. 2, pt. 2, p. 88. *Modiolopsis concentrica*, pp. 86-87. *Modiolopsis modiolaris*, pp. 83-84. *Modiolopsis pholadiformis*, p. 85. *Modiolopsis truncatus*, p. 86. *Modiolopsis rhomboidea*, Geol. of O., v. 7, pt. 2, p. 560. *Modiolopsis subrhomboidea*, pp. 560-61. *Molgophis*, Geol. of O., v. 2, pt. 2, p. 368. *Molgophis brevicostatus*, p. 369. *Molgophis macrurous*, p. 368. *Molgophis wheatleyi*, pp. 369-70. *Monomerella newberryi*, Geol. of O., v. 2, pt. 2, pp. 131-32. *Mytilarca mytiliformis*, Geol. of O., v. 7, pt. 2, pp. 559-60. *Mytilarca percarinata*, Geol. of O., v. 7, pt. 2, pp. 422-23.

Naticopsis æquistriata, Geol. of O., v. 1, pt. 2, pp. 216-17. *Naticopsis* (*isomena*) *humilis*, pp. 214-15. *Naticopsis levis*, pp. 215-16. *Naticopsis ortonii*, Geol. of O., v. 7, pt. 2, p. 489. *Naticopsis ziezac*, p. 477. *Nautilus ortonii*, Geol. of O., v. 7, pt. 2, pp. 486-87. *Nautilus* (*gyroceras*) *subquadrangularis*, p. 487. *Nautilus* (*temnocheilus*) *spectabilis*, Geol. of O., v. 7, pt. 2, p. 480. *Nautilus pauper*, p. 481. *Nuculites* (*cleidophorus*) *ferrugineum*, Geol. of O., v. 7, pt. 2, p. 564. *Nucleospira rotundata*, Geol. of O., v. 7, pt. 2, p. 413. *Nyassa*, Geol. of O., v. 7, pt. 2, p. 451. *Nyassa arguta*, p. 451.

- Paleontology.** *Oestocephalus*, Geol. of O., v. 2, pt. 2, pp. 380-81. *Oestocephalus* *rectidens*, pp. 386-87. *Oestocephalus* *remex*, pp. 381-86. *Onychodus*, Geol. of O., v. 1, pt. 2, pp. 296-99. *Onychodus* *sigmoides*, pp. 299-302. *Opisthoptera*, Geol. of O., v. 7, pt. 2, pp. 642-43. *Opisthoptera* *alternata*, p. 644. *Opisthoptera* *ampla*, p. 647. *Opisthoptera* *casei*, p. 643. *Opisthoptera* *extenuata*, p. 645. *Opisthoptera* *fissicosta*, pp. 643-44. *Opisthoptera* *laticostala*, pp. 646-47. *Opisthoptera* *notabilis*, p. 648. *Opisthoptera* *obliqua*, p. 646.
- Ordus* *elegantulus*, Geol. of O., v. 2, pt. 2, pp. 51-52. *Ordus* *variabilis*, pp. 50-51. *Orthacanthus* *arcuatus*, Geol. of O., v. 1, pt. 2, pp. 332-34. *Orthigoniopteris*, Geol. of O., v. 2, pt. 2, pp. 418-19. *Orthigoniopteris* *clara*, pp. 419-20. *Orthigoniopteris* *gilberti*, p. 420.
- Orthis* *acutilirata*, Geol. of O., v. 1, pt. 2, pp. 119-21. *Orthis* *bellula*, pp. 103-04. *Orthis* *biforata*, pp. 112-14. *Orthis* *borealis*, pp. 101-03. *Orthis* *dentata*, pp. 117-19. *Orthis* *ella*, pp. 105-06. *Orthis* *emacerata*, pp. 109-11. *Orthis* *var. multisecta*, p. 112. *Orthis* *fissicosta*, pp. 106-07. *Orthis* *insculpta*, pp. 99-101. *Orthis* *laticosta*, pp. 116-17. *Orthis* *lynx*, pp. 114-16. *Orthis* *occidentalis*, pp. 96-99. *Orthis* *plicatella*, pp. 108-09. *Orthis* *retrorsa*, pp. 92-94. *Orthis* *subquadrata*, pp. 94-96. *Orthis* *clytie*, Geol. of O., v. 2, pt. 2, pp. 75-76. *Orthis* *ella*, pp. 76-77. *Orthis* *jamesi*, pp. 77-78. *Orthis* (*dalmanella*) *elegantula*, Geol. of O., v. 7, pt. 2, pp. 581-84. *Orthis* *fausta*, *squamosa*, pp. 574-75. *Orthis* (*herbertella*) *daytonensis*, pp. 575-78. *Orthis* (*herbertella*) *fausta*, pp. 573-74. *Orthis* (*orthis-dinorthis*) *calligramma*, pp. 570-73. *Orthis* (*platystrophia*) *biforata*, pp. 579-81. *Orthis* (*rhpidomella*) *hybrida*, pp. 584-85. *Orthis* *tioga*, p. 453.
- Orthoceras* (*actinoceras*) *clavatum*, Geol. of O., v. 7, pt. 2, p. 538. *Orthoceras* *daytonense*, p. 539. *Orthoceras* *lata-nummulatum*, p. 538. *Orthoceras* *turgido-nummulatum*, pp. 538-39. *Orthoceras* *youngi*, pp. 537-38. *Orthoceras* (*cycloceras*) *amycus*, p. 546. *Orthoceras* *inceptum*, pp. 543-45. *Orthoceras* *inceptum* *acceleratum*, p. 545. *Orthoceras* *annulatum*, Geol. of O., v. 2, pt. 2, pp. 147-48. *Orthoceras* *crebescens*, pp. 148-49. *Orthoceras* *strix*, p. 149. *Orthoceras* *carleyi*, pp. 98-100. *Orthoceras* *duseri*, pp. 97-98. *Orthoceras* *turbidum*, p. 100. *Orthoceras* (*cycloceras*) *nova-carlislense*, Geol. of O., v. 7, pt. 2, p. 545. *Orthoceras* (*discosorus*) *conoideum*, p. 546. *Orthoceras* (*eu-orthoceras*) _____, pp. 542-43. *Orthoceras* *erraticum*, pp. 541. *Orthoceras* *hanoverense*, p. 543. *Orthoceras* *ignotum*, pp. 539-00. *Orthoceras* *rectum*, p. 539. *Orthoceras* *virgulatum*, p. 543. *Orthoceras* (*kionoceras*) *crawfordi*, p. 546. *Orthoceras* (*spy-*

Paleontology.

roceras?) *jamesi*, p. 546. *Orthoceras spyroceroïdes*, pp. 545-46. *Orthoceras nuntium*, pp. 425-26. *Orthoceras ortonii*, Geol. of O., v. 1, pt. 2, pp. 155-56.

Orthodesma, Geol. of O., v. 2, pt. 2, pp. 93-94. *Orthodesma contracta*, pp. 96-97. *Orthodesma curvata*, pp. 95-96. *Orthodesma parallela*, p. 96. *Orthodesma recta*, pp. 94-95. *Orthodesma parvatum*, Geol. of O., v. 7, pt. 2, pp. 660-61. *Orthodesma subangulatum*, p. 660. *Orthonema newberryi*, Geol. of O., v. 1, pt. 2, pp. 217-18. *Ortonella*, Geol. of O., v. 7, pt. 2, pp. 669-70. *Ortonella hainesi*, p. 670. *Palæaster dyeri*, Geol. of O., v. 1, pt. 2, pp. 58-60.

Palæaster granulosus, pp. 60-61. *Palæaster incomptus*, pp. 64-65. *Palæaster jamesii*, pp. 62-64. *Palæaster shæfferi*, p. 66. *Palæoneilo bedfordensis*, Geol. of O., v. 2, pt. 2, p. 298. *Palæoneilo similis*, Geol. of O., v. 7, pt. 2, p. 453. *Palæopaleamon*, Geol. of O., v. 7, pt. 2, pp. 460-61. *Palæopaleamon newberryi*, pp. 461-62. *Palæophyllum*, Geol. of O. v. 2, pt. 2, p. 219. *Palæophyllum divaricans*, pp. 220-21. *Paleopupa abrupta*, Geol. of O., v. 7, pt. 2, pp. 556-57.

Pelion, Geol. of O., v. 2, pt. 2, pp. 389-90. *Pelion lyellii*, pp. 390-91. *Pentamerus pes-ovis*, Geol. of O., v. 7, pt. 2, pp. 414-15. *Pentamerus perigibbosus*, Geol. of O., v. 2, pt. 2, pp. 139-40. *Pentamerus (pentamerella) ventricosus*, pp. 138-39. *Pentamerus oblongus*, pp. 137-38. *Pentremites elegans*, Geol. of O., v. 7, pt. 2, pp. 466-67. *Pentremites sub-cylindrica*, Geol. of O., v. 2, pt. 2, pp. 129-30. *Peplorhina*, Geol. of O., v. 2, pt. 2, pp. 409-10. *Peplorhina anthracina*, p. 410. *Petalodus alleghaniensis*, Geol. of O., v. 2, pt. 2, pp. 52-53.

Phacops trisulcatus, Geol. of O., v. 7, pt. 2, pp. 529-30. *Phænopora (ptilodictya) expansa*, Geol. of O., v. 2, pt. 2, p. 114. *Phillipsastræa gigas*, Geol. of O., v. 2, pt. 2, pp. 241-42. *Phillipsia (griffithides) lodiensis*, Geol. of O., v. 2, pt. 2, pp. 323-25. *Phlegethontia*, Geol. of O., v. 2, pt. 2, pp. 366-67. *Phlegethontia linearis*, p. 367. *Phlegethontia serpens*, p. 367. *Pholodops cincinnatiensis*, Geol. of O., v. 1, pt. 2, p. 130. *Phragmoceras ellipticum*, Geol. of O., v. 2, pt. 2, p. 152. *Phragmoceras parvum*, pp. 151-52. *Physetomya*, Geol. of O., v. 7, pt. 2, p. 693. *Physetomya acuminata*, p. 693. *Pinna Maxvillensis*, Geol. of O., v. 7, pt. 2, p. 474.

Placunopsis recticardinalis, Geol. of O., v. 2, pt. 2, pp. 331-32. *Platyceras dumosus attenuatus*, Geol. of O., v. 1, pt. 2, pp. 212-13. *Platyceras multispinosum*, pp. 210-11. *Platyceras (niagarensis clintonense)*, Geol. of O., v. 7, pt. 2, p. 554. *Platyceras (platystoma) niagarensis*, pp. 553-54. *Platy-*

Paleontology.

ceras (orthonychia) *lodiense*, Geol. of O., v. 2, pt. 2, pp. 313-14. *Platyceras squalodens*, Geol. of O., v. 7, pt. 2, p. 423. *Platyceras tortum*, Geol. of O., v. 2, pt. 2, p. 345. *Platycrinus bedfordensis*, Geol. of O., v. 2, pt. 2, p. 161. *Platycrinus contritus*, Geol. of O., v. 2, pt. 2, p. 166. *Platycrinus graphicus*, pp. 166-67. *Platycrinus lodensis*, pp. 168-89. *Platycrinus richfieldensis*, pp. 167-68. *Platycrinus præmaturus*, Geol. of O., v. 2, pt. 2, pp. 124-25. *Platyodus*, Geol. of O., v. 2, pt. 2, p. 58. *Platyodus lineatus*, p. 58. *Platyostoma niagarensis trigonostoma*, Geol. of O., v. 1, pt. 2, pp. 185-86.

Plectambonites transversalis, Geol. of O., v. 7, pt. 2, p. 566. *Pleurophorus tropidophorus*, Geol. of O., v. 2, pt. 2, pp. 338-39. *Pleurotomaria filitexta*, Geol. of O., v. 7, pt. 2, p. 559. *Pleurotomaria inexpectans*, pp. 549-50. *Pleurotomaria inexpectans*, Geol. of O., v. 2, pt. 2, pp. 117-18. *Pleurotomaria lucina*, Geol. of O., v. 1, pt. 2, pp. 226-27. *Pleurotomaria occidentis*, Geol. of O., v. 2, pt. 2, pp. 142-43. *Pleurotomaria textiligeræ*, pp. 314-15. *Pleuroptyx*, Geol. of O., v. 2, pt. 2, p. 370. *Pleuroptyx clavatus*, pp. 370-71. *Plumulites*, Geol. of O., v. 2, pt. 2, p. 106. *Plumulites jamesi*, pp. 106-07.

Polyphemopsis melanoides, Geol. of O., v. 7, pt. 2, p. 478. *Polypora varsouviensis*, Geol. of O., v. 7, pt. 2, p. 467. *Polypora synocladia réctistyla*, pp. 467-68. *Polyrhizodus modestus*, Geol. of O., v. 2, pt. 2, p. 50. *Posidonomya fracta*, Geol. of O., v. 2, pt. 2, pp. 333-34. *Poteroocrinites caduceus*, Geol. of O., v. 1, pt. 2, pp. 26-27. *Poteroocrinites casei*, pp. 28-29. *Poteroocrinites dendrocrinus*, *cincinnatiensis*, pp. 20-22. *Poteroocrinites dyeri*, pp. 24-25. *Poteroocrinites polydactylus*, p. 22. *Poteroocrinites posticus*, pp. 22-23. *Poteroocrinus crineus*, Geol. of O., v. 2, pt. 2, pp. 172-73. *Poteroocrinus pleias*, p. 173. *Poteroocrinus (scaphio-crinus) corycia*, pp. 173-74.

Prochoceras bæri, Geol. of O., v. 1, pt. 2, pp. 157-58. *Productus*, Geol. of O., v. 2, pt. 2, pp. 282-83. *Productus elegans*, Geol. of O., v. 7, pt. 2, pp. 469-70. *Productus pileiformis*, p. 470. *Promacrus andrewsi*, Geol. of O., v. 2, pt. 2, pp. 308-09. *Protarea*, Geol. of O., v. 2, pt. 2, p. 221. *Prothyris meeki*, Geol. of O., v. 2, pt. 2, pp. 305-06. *Prætus determinatus*, Geol. of O., v. 7, pt. 2, pp. 523-24. *Prætus parviusculus*, Geol. of O., v. 2, pt. 2, pp. 109-110. *Prætus planimarginatus*, Geol. of O., v. 1, pt. 2, pp. 233-34. *Prætus spurlocki*, pp. 161-62. *Protaster granuliferus*, Geol. of O., v. 1, pt. 2, pp. 68-69.

Psiloconcha elliptica, Geol. of O., v. 7, pt. 2, p. 667. *Psiloconcha grandis*, pp. 665-67. *Psiloconcha inornata*, p. 667. *Psiloconcha*

Paleontology.

minima, p. 669. *Psilocoencha sinuata*, p. 668. *Psilocoencha subovalis*, p. 666. *Psilocoencha subrecta*, pp. 667-68. *Psilocoencha tenuistriata*, p. 668. *Psilonychia*, Geol. of O., v. 7, pt. 2, pp. 648-49. *Psilonychia perangulata*, p. 649.

Pterinea aviculoidea, Geol. of O., v. 7, pt. 2, p. 415. *Pterinea brisa*, pp. 557-58. *Pterinea demissa*, Geol. of O., v. 2, pt. 2, pp. 78-79. *Pterinea flabella*, Geol. of O., v. 7, pt. 2, pp. 449-50. *Pterinea similis*, Geol. of O., v. 7, pt. 2, pp. 445-46. *Ptilodictya arctipora*, Geol. of O., v. 2, pt. 2, pp. 263-64. *Ptilodictya emacerata*, p. 261. *Ptilodictya falciformis*, pp. 259-61. *Ptilodictya flagellum*, p. 262. *Ptilodictya fenestelliformis*, pp. 263-64. *Ptilodictya nervata*, p. 264. *Ptilodictya shafferi*, Geol. of O., v. 1, pt. 2, pp. 69-70. *Ptilodictya (stictopora) carbonaria*, Geol. of O., v. 2, pt. 2, p. 328. *Ptilodictya sereata*, pp. 327-28. *Ptilodictya (stictopora) gilberti*, Geol. of O., v. 1, pt. 2, pp. 194-95. *Ptyetodus calceolus*, Geol. of O., v. 2, pt. 2, p. 59. *Ptyonius*, Geol. of O., v. 2, pt. 2, pp. 373-74. *Ptyonius marshii*, pp. 375-76. *Ptyonius nummifer*, pp. 374-75. *Ptyonius pectinatus*, pp. 377-78. *Ptyonius serrula*, pp. 379-80. *Ptyonius vinehellianus*, pp. 376-77. *Pyrenomoeus*, Geol. of O., v. 7, pt. 2, p. 681. *Pyrenomoeus decipiens*, pp. 681-82. *Pyrenomoeus subcuneatus*, p. 682.

Raphistoma affine, Geol. of O., v. 7, pt. 2, pp. 550-51. *Receptaculites devonicus*, Geol. of O., v. 7, pt. 2, pp. 419-20. *Receptaculites ohioensis*, Geol. of O., v. 2, pt. 2, p. 123. *Retepora angulata*, Geol. of O., v. 2, pt. 2, p. 111. *Retzia formosa*, Geol. of O., v. 7, pt. 2, pp. 413-14. *Retzia granulifera*, Geol. of O., v. 1, pt. 2, pp. 128-29. *Rhinopora frondosa*, Geol. of O., v. 2, pt. 2, p. 112. *Rhizodus angustus*, Geol. of O., v. 1, pt. 2, pp. 342-43. *Rhizodus lancifer*, pp. 342-43. *Rhizodus quadratus*, p. 343.

Rhynchodus, Geol. of O., v. 2, pt. 2, pp. 58-59. *Rhynchodus*, Geol. of O., v. 1, pt. 2, pp. 307-10. *Rhynchodus crassus*, pp. 312-13. *Rhynchodus frangens*, pp. 311-12. *Rhynchodus secans*, pp. 310-11. *Rhynchonella acinus convexa*, Geol. of O., v. 7, pt. 2, p. 593. *Rhynchonella scobina*, pp. 592-93. *Rhynchonella carolina*, Geol. of O., v. 1, pt. 2, pp. 196-97. *Rhynchonella capax*, pp. 123-24. *Rhynchonella dentata*, pp. 121-22. *Rhynchonella hydraulica*, Geol. of O., v. 7, pt. 2, p. 414. *Rhynchonella neglecta*, Geol. of O., v. 1, pt. 2, pp. 179-80. *Rhynchonella neglecta*, Geol. of O., v. 2, pt. 2, p. 134. *Rhynchonella pisa* p. 135. *Rhynchonella tennesseensis*, p. 136. *Rhynchonella raricosta*, Geol. of O., v. 7, pt. 2, pp. 421-22. *Rhynchonella scobina*, Geol. of O., v. 2, pt. 2, p. 116. *Rhytimya*

Paleontology.

byrnesi, Geol. of O., v. 7, pt. 2, p. 689. *Rhytimya compressa*, p. 692. *Rhytimya convexa*, p. 691. *Rhytimya mickleboroughi*, pp. 690-91. *Rhytimya œhana*, pp. 698-90. *Rhytimya producta*, p. 688. *Rhytimya radiata*, p. 692.

Saccocrinus ornatus, Geol. of O., v. 2, pt. 2, pp. 126-27. *Saccocrinus tennesseeensis*, pp. 125-26. *Sanguinolites æolus*, Geol. of O., v. 2, pt. 2, pp. 307-08. *Sanguinolites obliquus*, pp. 306-07. *Sanguinolites sanduskyensis*, Geol. of O., v. 1, pt. 2, p. 209. *Sauropleura*, Geol. of O., v. 2, pt. 2, p. 402. *Sauropleura digitata*, pp. 403-04. *Sauropleura newberryi*, pp. 404-05. *Scaphioerinus (poteriocrinus) ægina*, Geol. of O., v. 2, pt. 2, pp. 174-75. *Scaphioerinus (poteriocrinus) lyrioipe*, pp. 175-76. *Scaphioerinus subcarinatus*, p. 176. *Scaphioerinus subtortuosus*, p. 177. *Schizocrania*, Geol. of O., v. 2, pt. 2, pp. 71-73. *Schizocrania filosa*, pp. 73-74. *Schizodus chesterensis*, Geol. of O., v. 7, pt. 2, p. 474. *Schizodus cuneatus*, Geol. of O., v. 2, pt. 2, pp. 336-37. *Schizodus (aviculopinna) americanus*, pp. 337-38. *Schizodus medinænsis*, pp. 299-300.

Sedgewickia compressa, Geol. of O., v. 1, pt. 2, pp. 144-45. *Sedgewickia fragilis*, pp. 143-44. *Sedgewickia neglecta*, pp. 142-43. *Sedgewickia divaricata*, Geol. of O., v. 2, pt. 2, pp. 89-90. *Solemya (janeia) vetusta*. Geol. of O., v. 1, pt. 2, pp. 206-07. *Solenomya anodontoides*, Geol. of O., v. 2, pt. 2, pp. 339-40.

Spærexochus pisum, Geol. of O., v. 7, p. 2, pp. 528-29. *Spirifer carteri*, Geol. of O., v. 2, pt. 2, pp. 285-88. *Spirifer (trigonotreta)* pp. 289-90. *Spirifer (trigonotreta) biplicatus*, pp. 290-92. *Spirifera maia*, Geol. of O., v. 7, pt. 2, p. 444. *Spirifera (matinia) contracta*, p. 471. *Spirifera rockymontana*, pp. 471-72. *Spirifera (martinia) lineata*, p. 488. *Spirifer (trigonotreta) opimus*, Geol. of O., v. 2, pt. 2, pp. 329-30. *Spirifera vanuxemi*, Geol. of O., v. 7, pt. 2, p. 411. *Spirifera ziezac*, p. 448. *Spirorbis anthracosia*, Geol. of O., v. 7, pt. 2, p. 492.

Stenaster grandis, Geol. of O., v. 1, pt. 2, pp. 66-67. *Stictopora magna*, Geol. of O., v. 2, pt. 2, pp. 112-13. *Straparollus niagarænsis*, Geol. of O., v. 2, pt. 2, pp. 144-45. *Straparollus* (cf. *oriotoma*) *incarinatum*, Geol. of O., v. 7, pt. 2, pp. 552-53. *Straparollus similis*, pp. 476-77. *Streptelasma*, Geol. of O., v. 2, pt. 2, pp. 217-18. *Streptelasma corniculum*, p. 218. *Streptorhynchus crassum*, Geol. of O., v. 7, pt. 2, pp. 468-69. *Streptorhynchus flabellum*, p. 421. *Streptorhynchus hydraulicum*, p. 410. *Striclandinia triplexiana*, Geol. of O., v. 7, pt. 2, p. 594.

Paleontology.

Stromatopora, Geol. of O., v. 2, pt. 2, pp. 245-46. *Stromatopora concentrica*, pp. 247-48. *Stromatopora nodulata*, pp. 249-51. *Stromatopora ponderosa*, pp. 246-47. *Stromatopora sub-striatella*, pp. 248-49. *Strophomena alternata*, Geol. of O., v. 1, pt. 2, pp. 88-91. *Strophomena flitexta*, pp. 83-85. *Strophomena plano-convexa*, pp. 82-83. *Strophomena sinuata*, pp. 87-88. *Strophomena sulcata*, pp. 85-86. *Strophomena (orthothetes) hanoverensis*, Geol. of O., v. 7, pt. 2, pp. 567-68. *Strophomena (orthothetes) tenuis*, pp. 568-69. *Strophomena (strophonella) patenta*, pp. 569-70. *Strophomena patenta*, Geol. of O., v. 2, pt. 2, p. 115. *Strophomena*, Geol. of O., v. 1, pt. 2, pp. 73-75. *Strophomena rhomboidalis*, pp. 75-77. *Strophomena hemipronites nutans*, pp. 77-79. *Strophomena hemipronites planum bona*, pp. 79-81. *Strophomena hemipronites plicata*, pp. 81-82.

Stylasteria anna, Geol. of O., v. 7, pt. 2, p. 420. *Subulites directus*, Geol. of O., v. 7, pt. 2, pp. 554-55. *Subulites (polyphemopsis) plani-lateralis*, pp. 555-56. *Subulites terebriformis*, Geol. of O., v. 2, pt. 2, pp. 141-42. *Synocladia biserialis*, Geol. of O., v. 2, pt. 2, pp. 326-27. *Syringopora maclurei*, Geol. of O., v. 2, pt. 2, p. 241. *Syringostroma*, Geol. of O., v. 2, pt. 2, p. 251. *Syringostroma columnaris*, p. 253. *Syringostroma densa*, pp. 251-52.

Technophorus punctostriatus, Geol. of O., v. 7, pt. 2, p. 685. *Technophorus yoldiiformis*, pp. 685-86. *Tellinomya eliptica*, Geol. of O., v. 7, pt. 2, p. 562. *Tellinomya (nucula?) clintonensis*, pp. 563-64. *Tellinomya minima*, p. 563. *Tellinomya socialis*, p. 563. *Tellinomya levata*, Geol. of O., v. 2, pt. 2, p. 82. *Tellinomya pectunculoides*, pp. 81-82. *Terebratula turgida*, Geol. of O., v. 7, pt. 2, p. 473. *Tetradium*, Geol. of O., v. 2, pt. 2, pp. 221-22. *Tetradium minus*, pp. 222-23. *Thyrsidium*, Geol. of O., v. 2, pt. 2, p. 365. *Thyrsidium fasciculare*, pp. 365-66.

Tremanotus alpheus, Geol. of O., v. 2, pt. 2, p. 145. *Tremanotus trigonostoma*, p. 146. *Trematis millepunctata*, Geol. of O., v. 2, pt. 2, p. 70. *Trematis punctostriata*, pp. 70-71. *Trematoceras*, Geol. of O., v. 7, pt. 2, pp. 426-27. *Trematoceras ohioense*, p. 427. *Trimerella grandis*, Geol. of O., v. 1, pt. 2, p. 182. *Trimerella ohioensis*, pp. 183-85. *Triplesia*, Geol. of O., v. 1, pt. 2, pp. 176-77. *Triplesia ortonii*, pp. 178-79. *Triplesia ortonii*, pp. 585-90.

Trochonema pauper, Geol. of O., v. 2, pt. 2, pp. 143-44. *Trochonema tricarinata* Geol. of O., v. 1, pt. 2, pp. 218-19. *Tuditanus*, Geol. of O., v. 2, pt. 2, pp. 391-92. *Tuditanus brevirostris*, pp. 393-94. *Tuditanus huxleyi*, pp. 397-98. *Tudi-*

Paleontology.

tanus longipes, pp. 398-99. Tuditanus mordax, pp. 395-96. Tuditanus obtusus, pp. 396-97. Tuditanus punctulatus, pp. 392-93. Tuditanus radiatus, pp. 394-95.

Whitella ohioensis, Geol. of O., v. 7, pt. 2, pp. 678-79. Xenophora (pseudophorus) antiqua, Geol. of O., v. 1, pt. 2, pp. 221-22. Yoldia (palæoneilo) carbonaria, Geol. of O., v. 2, pt. 2, p. 336. Yoldia stevensoni, p. 335. Zaphrentis edwardsi, Geol. of O., v. 2, pt. 2, p. 235. Zaphrentis multi-lamellata, pp. 236-37. Zaphrentis prolifica, pp. 237-38. Zaphrentis wortheni, pp. 235-36. Zaphrentis cliffordana, Geol. of O., v. 7, pt. 2, p. 465. Zaphrentis cyathocrinus maxvillensis, pp. 465-66. Zeacrinus merope, Geol. of O., v. 2, pt. 2, pp. 178-79. Zeacrinus paternus, pp. 177-78. Zeacrinus mooresi, Geol. of O., v. 7, pt. 2, p. 483. Zygospira cincinnatiensis, Geol. of O., v. 1, pt. 2, p. 126. Zygospira headi, pp. 127-28. Zygospira modesta, pp. 125-26.

See also Brachiopoda; Cephalopoda; Crustacea Echinoderma; Fishes; Gasteropoda Lamellibranchiata; names of rock formations.

Palmer Block Machine. Eno. Palmer block machine for concrete block. O. Geol. Sur., Bull. No. 2, pp. 239-40.

—Eno. Use of Palmer blocks in house construction. O. Geol. Sur., Bull. No. 2, pp. 74-78.

Partings. Orton. Partings of Ohio coal fields. Geol. of O., v. 5, pp. 140-41.

Patents. Peppel. Description and discussion of patents on lime-hydrating processes and apparatus. O. Geol. Sur., Bull. No. 4, pp. 322-27.

—Peppel. Patents for processes of manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 71-79.

Paulding County. Bownocker. Oil production. O. Geol. Sur., Bull. No. 1, p. 100.

—Orton, Jr., and Peppel. Limestone formations of, important for lime industries. O. Geol. Sur., Bull. No. 4, p. 135.

—Winchell. Geology. Geol. of O., v. 2, pt. 1, pp. 335-51. Geologic map, 12.6x9.9 cm.

—Winchell. Topography. Geol. of O., v. 2, pt. 1, pp. 335-36.

Paving Brick. Orton, Jr. Manufacture in Ohio. Geol. of O., v. 7, pp. 129-208.

—Orton, Jr. Tests of Ohio paving materials. Geol. of O., v. 7, pp. 192-206.

- Peat.** Hussey. Peat beds in Shelby county. Geol. of O., v. 3, pp. 453-55.
- Mather. Peat in Ohio. An. Rep., v. 1, 1837, pp. 10-11.
- Newberry. Peat bogs in Summit county. Geol. of O., v. 1, pt. 1, pp. 206-07.
- Read. Peat in Trumbull county. Geol. of O., v. 1, pt. 1, p. 509.
- Peekskill Tunnel.** Eno. Use of concrete for lining. O. Geol. Sur., Bull. No. 2, pp. 104-06.
- Pentamerus Limestone.** Orton. Fossils. Rep. Prog. 1870, pp. 279-82.
- Orton. Pentamerus limestone in Highland county. Rep. Prog. 1870, pp. 277-82.
- Peppel, Samuel Vernon.** The manufacture of artificial sandstone or sand-lime brick. O. Geol. Sur., Bull. No. 5, 79 p., Springfield Ohio, 1905.
- The uses of limestone in Ohio. O. Geol. Sur., Bull. No. 4, pp. 212-48.
- The technology of the lime industry. O. Geol. Sur., Bull. No. 4, pp. 249-365.
- Peppel, S. V., and Orton, Edward, Jr.** Lime resources of Ohio available for Portland cement manufacture. O. Geol. Sur., Bull. No. 3, pp. 88-97.
- Limestones and lime industry in Ohio. O. Geol. Sur., Bull. No. 4, 365 pp. Springfield, Ohio, 1906.
- Permian System.** Newberry. Geol. of O., v. 1, pt. 1, p. 80.
- Prosser. Discussion of the boundaries of the Permian in Ohio geological scale. O. Geol. Sur., Bull. No. 7, pp. 5-7.
- Perry County.** Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 257-65.
- Hildreth. Géology. Ann. Rep., v. 1, 1837, pp. 25-54.
- Orton. Coal mines in North and Central townships. Geol. of O., v. 5, pp. 884-908. Bearfield township, pp. 901-02. Clayton township, pp. 893-94. Harrison township, pp. 891-93. Jackson township, pp. 905-08. Madison township, pp. 889-91. Pike township, pp. 899-901. Pleasant township, pp. 902-05.
- Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 388-89.
- Orton. Geological structure. Geol. of O., v. 5, pp. 884-85.
- Orton. Iron ores. Geol. of O., v. 5, pp. 402-04.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to their fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 111-115.

- Peterson Ore.** Orton. Peterson ore in Hanging Rock district. Geol. of O., v. 5, pp. 433-34.
- Petroleum.** Andrews. Petroleum in Washington county. Geol. of O., v. 2, pt. 1, pp. 487-89.
- Bownocker. Discovery and development of oil fields in northwestern Ohio. O. Geol. Sur., Bull. No. 1, pp. 50-54.
- Bownocker. Geological conditions under which oil and gas are found. O. Geol. Sur., Bull. No. 1, pp. 318-20.
- Bownocker. Clinton formation as a source of oil and gas. O. Geol. Sur., No. 1, pp. 101-25.
- Bownocker. Occurrence and exploitation of petroleum and natural gas. O. Geol. Sur., Bull. No. 1, pp. 17-325.
- Bownocker. Oil wells in Allen county. O. Geol. Sur., Bull. No. 1, pp. 84-85; in Auglaize county, p. 88; of Buck Run field, Morgan county, pp. 143-44; in Hancock county, pp. 68, 70-71; in Mercer county, pp. 90-92; in Perry county, pp. 262-63; in Sandusky county, pp. 75-76; in Seneca county, p. 77; in Wood county, pp. 59, 64-65.
- Bownocker. Origin of oil and gas. O. Geol. Sur., Bull. No. 1, pp. 307-18.
- Gilbert. Petroleum in Williams county. Geol. of O., v. 1, pt. 1, pp. 561-62.
- Minshall. History and development of the Macksburg oil field. Geol. of O., v. 6, pp. 442-75.
- Newberry. Gas and oil wells in Columbiana county. Geol. of O., v. 3, p. 118.
- Newberry. Gas and oil in Cuyahoga county. Geol. of O., v. 1, pt. 1, pp. 192-94.
- Newberry. Oil shales in Erie county. Geol. of O., v. 2, pt. 1, pp. 195-96.
- Newberry. Petroleum in Lorain county. Geol. of O., v. 2, pt. 1, pp. 219-22.
- Newell. Drilling and care of oil wells. Geol. of O., v. 6, pp. 476-515.
- Orton. Berea grit as source of oil and gas in Ohio. Prelim. Rep. on petroleum and inflammable gas, 1886, pp. 54-62. Edition 1887, pp. 79-90. Geol. of O., v. 6, pp. 311-409. Rep. 1890, pp. 249-58.
- Orton. Clinton limestone as a source of oil and gas. Rep. 1890, pp. 227-47.
- Orton. Drift as a source of oil and gas. Geol. of O., v. 6, pp. 772-75.

- Petroleum.** Orton. Findlay oil field. Geol. of O., v. 6, pp. 150-54.
- Orton. Gas and oil wells in northwestern Ohio. Geol. of O., v. 6, pp. 182-254.
- Orton. Geology of Ohio considered in its relations to petroleum and natural gas. Geol. of O., v. 5, pp. 1-50.
- Orton. Lima oil field. Geol. of O., v. 6, pp. 165-182.
- Orton. Modes of accumulation of petroleum and natural gas, Geol. of O., v. 6, pp. 83-96. Rep. 1890, pp. 86-89.
- Orton. Ohio shale as source of oil and gas. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 90-96. Edition 1886, pp. 62-66. Geol. of O., v. 6, pp. 410-42. Rep. 1892, pp. 248-49.
- Orton. Oil and gas in central and southwestern Ohio. Geol. of O., v. 6, pp. 254-310.
- Orton. Oil production of the field in Trenton limestone. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 158-59.
- Orton. Oil production of the Trenton limestone, 1888-90. Rep. 1890, pp. 194-226, 305-15.
- Orton. Report on petroleum and natural gas. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 5-179. Rep. 1886, pp. 6-73.
- Orton. Supplemental report on the new gas fields and oil fields of Ohio. Geol. of O., v. 6, pp. 783-92.
- Orton. Theories of origin of petroleum and natural gas. Geol. of O., v. 6, pp. 61-83. Rep. 1890, pp. 54-104.
- Orton. Trenton limestone as a source of petroleum and high pressure gas. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 45-79. Rep. 1886, pp. 30-54.
- Orton. Trenton limestone as a source of oil and gas in Ohio. Geol. of O., v. 6, pp. 101-310. Rep. 1890, pp. 105-226.
- Orton. Wood county oil field. Rep. 1890, pp. 305-15.
- Read. Petroleum and gas in Knox county. Geol. of O., v. 3, pp. 340-47.
- Wheat. Petroleum and gas in Medina county. Geol. of O., v. 3, pp. 372-73.
- Winchell. Gas wells in Hancock county. Geol. of O., v. 2, pt. 1, pp. 366-67.
- See also names of oil and gas fields.*

Philadelphia Road Pool. Bownocker. Wells in Harrison county. O. Geol. Sur., Bull. No. 1, p. 240.

Phosphorus Ore—Hamden Furnace. Orton. Phosphorus ore in Hanging Rock district. Geol. of O., v. 5, pp. 431-32.

- Physical Geography.** Profiles of railroads and canals in Ohio. Geol. of O., v. 1, pt. 1, pp. 667-72.
- Klippart. Topography of the Maumee valley. Rep. Prog. 1870, pp. 321-29.
- Newberry. Physical geography of Ohio. Geol. of O., v. 1, pt. 1, pp. 16-49.
- Newberry. Surface geology of Ohio. Geol. of O., v. 3, pp. 27-51.
- Read. Topography of Geauga county. Rep. Prog. 1870, p. 465.
- Whittlesey. Topography of the region between the Scioto and Hockhocking rivers. Ann. Rep., v. 1, 1837, pp. 99-109.
- Pickaway County.** Andrews. Geology. Geol. of O., v. 2, pt. 1, pp. 588-92.*
- Andrews. Topography. Geol. of O., v. 2, pt. 1, pp. 588-89.
- Orton. Oil and gas wells. Geol. of O., v. 6, p. 292.
- Orton, Jr., and Peppel. Limestone formations of, important for lime industries. O. Geol. Sur., Bull. No. 4, p. 135.
- Pig Iron.** Lord. Method of analyses of. Geol. of O., v. 5, pp. 1094-96.
- Pike County.** Orton. Geology. Geol. of O., v. 2, pt. 1, pp. 611-641.
Geologic map of Pike, Highland and Ross counties. 37x20.2 cm.
- Orton. Lime production. Geol. of O., v. 6, pp. 729-31.
- Orton. Topography. Geol. of O., v. 2, pt. 1, pp. 611-14.
- Piles.** Eno. Use of steel concrete for piles. O. Geol. Sur., Bull. No. 2, pp. 173-74.
- Pillars.** Eno. Use of reinforced concrete for columns and pillars. O. Geol. Sur., Bull. No. 2, pp. 147-48.
- Pisces, see Fishes.*
- Pittsburg Coal.** Brown. Pittsburg coal seam in Jefferson, Belmont and Guernsey counties. Geol. of O., v. 6, pp. 595-626. Geologic map of area of this coal in the above counties. opp. p. 600.
- Orton. Pittsburg coal in Ohio. Geol. of O., v. 7, pp. 283-88.
- Pittsburg Limestone.** Orton, Jr., and Peppel. Composition of, in Athens county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 38-40; in Guernsey county, pp. 70-71.
- Orton, Jr., and Peppel. Occurrence of, in Ohio. O. Geol. Sur., Bull. No. 4, pp. 201-03.
- Orton and Peppel. Pittsburg stone available for cement making. O. Geol. Sur., Bull. No. 3, pp. 94-95.

- Plain City.** Orton. Deep wells, explorations for natural gas in Clinton limestone. Rep. 1890, p. 246.
- Plaster.** Eno. Cement mortar used for plastering. O. Geol. Sur., Bull. No. 2, pp. 46-48.
- Peppel. Preference for dolomite lime in brick laying and plastering. O. Geol. Sur., Bull. No. 4, pp. 255-56.
- Pleistocene.** Bleining. Glacial clays suitable for cement making. O. Geol. Sur., Bull. No. 3, pp. 82-83.
- Hill. Drift in Champaign county. Geol. of O., v. 3, pp. 493-94.
- Hussey. Drift in Miami county. Geol. of O., v. 3, pp. 473-77.
- Hussey. Drift in Shelby county. Geol. of O., v. 3, pp. 458-64.
- Lindemuth. Drift in Darke county. Geol. of O., v. 3, pp. 499-509.
- Newberry. Drift in Ohio. Geol. of O., v. 3, pp. 32-51.
- Newberry. Pleistocene geology of Ohio. Geol. of O., v. 2, pt. 1. p. 180.
- Orton. Drift beds in Butler county. Geol. of O., v. 3, pp. 394-99.
- Orton. Drift in Franklin county. Geol. of O., v. 3, pp. 643-46.
- Orton. Drift in Madison county. Geol. of O., v. 3, pp. 423-27.
- Orton. Drift deposits in Ohio. Geol. of O., v. 6, pp. 772-82.
- Orton. Drift in Preble county. Geol. of O., v. 3, pp. 411-15.
- Orton. Glacial drift in Ohio. Geol. of O., v. 6, p. 44. Same, Rep. 1890, p. 45.
- Read. Surface deposits in Ashland county. Geol. of O., v. 3, pp. 520-22.
- Read. Surface deposits in Huron county. Geol. of O., v. 3. pp. 290-99.
- Read. Surface deposits in Knox county. Geol. of O., v. 3, pp. 325-33.
- Read. Surface deposits in Licking county. Geol. of O., v. 3, pp. 349-52.
- Read. Surface deposits in Richland county. Geol. of O., v. 3. pp. 312-14.
- See also Drift; Glacial Geology; Marl; Peat; Quaternary System.*
- Plumb Run Oil Pool.** Bownocker. Wells in Harrison county. O. Geol. Sur., Bull. No. 1, p. 240.
- Polyzoa.** Nicholson. Polyzoa from the Silurian. Geol. of O., v. 2, pt. 2, pp. 259-68.

- Pomeroy Coal.** Andrews. Federal creek or Pomeroy coal in Athens county. Geol. of O., v. 1, pt. 1, pp. 270-89.
- Andrews. Pomeroy coal in Gallia county. Geol. of O., v. 1, pt. 1, pp. 225-45.
- Andrews. Pomeroy coal in Morgan county. Geol. of O., v. 1, pt. 1, pp. 294-312.
- Wormley. Analysis. Geol. of O., v. 1, pt. 1, pp. 254-55.
- Lovejoy. Pomeroy and Federal creek coal field. Geol. of O., v. 6, pp. 627-52. Geologic map showing area of coal field in Ohio, opp. p. 632.
- Pomeroy Salt Association.** Bownocker. Method of salt manufacture. O. Geol. Sur., Bull. No. 8, pp. 23-24.
- Pomeroy Salt Works.** Bownocker. Existing salt furnaces in Meigs county. O. Geol. Sur., Bull. No. 8, p. 20.
- Porcelain, see Pottery.*
- Portage County.** Newberry. Geology. Geol. of O., v. 3, pp. 133-50.
- Newberry. Topography. Geol. of O., v. 3, pp. 133-36.
- Whittlesey. Clays. Ann. Rep., v. 2, 1838, pp. 67-69.
- Whittlesey. Coke. Ann. Rep., v. 2, 1838, pp. 61-63.
- Whittlesey. Important beds of coal. Ann. Rep., v. 2, 1838, pp. 60-62.
- Whittlesey. Iron ores. Ann. Rep., v. 2, 1838, pp. 66-67.
- Whittlesey. Lake ridges. Ann. Rep., v. 2, 1838, p. 55.
- Whittlesey. Limestone. Ann. Rep., v. 2, 1838, pp. 62-65.
- Whittlesey. Mineral springs. Ann. Rep., v. 2, 1838, p. 65.
- Whittlesey. Order of strata. Ann. Rep., v. 2, 1838, pp. 56-58.
- Whittlesey. Outline of the coal region. Ann. Rep., v. 2, 1838, pp. 58-60.
- Whittlesey. Topography of the region. Ann. Rep., v. 2, 1838, pp. 54-55.
- Portage Group.** Newberry. Portage and Chemung groups in Ohio. Geol. of O., v. 1, pt. 1, pp. 69-71.
- Port Homer Oil Field.** Bownocker. Wells in Jefferson county. O. Geol. Sur., Bull. No. 1, p. 246.
- Portland Cement.** Bleining. Burning of portland cement. O. Geol. Sur., Bull. No. 3, pp. 288-331.
- Bleining. Calculation of portland cement mixtures. O. Geol. Sur., Bull. No. 3, pp. 231-42.

- Portland Cement.** Bleining. Compounding of portland cement. O. Geol. Sur., Bull. No. 3, pp. 223-47.
- Bleining. Constancy of volume. O. Geol. Sur., Bull. No. 3, pp. 351-56.
- Bleining. Corrections of the cement composition. O. Geol. Sur., Bull. No. 3, pp. 246-47.
- Bleining. Cost of manufacture. O. Geol. Sur., Bull. No. 3, pp. 327-31.
- Bleining. Definition of portland cement. O. Geol. Sur., Bull. No. 3, p. 26.
- Bleining. Effect of various reagents. O. Geol. Sur., Bull. No. 3, pp. 362-63.
- Bleining. Enduring qualities. O. Geol. Sur., Bull. No. 3, pp. 363-67.
- Bleining. Experimental apparatus for portland cement burning. O. Geol. Sur., Bull. No. 3, pp. 242-46.
- Bleining. Fineness of the grain. O. Geol. Sur., Bull. No. 3, p. 360.
- Bleining. Hydration of. O. Geol. Sur., Bull. No. 3, pp. 336-38.
- Bleining. Nature of portland cement. O. Geol. Sur., Bull. No. 3, pp. 197-222.
- Bleining. Ohio portland cement works. O. Geol. Sur., Bull. No. 3, pp. 331-35.
- Bleining. Properties of portland cement. O. Geol. Sur., Bull. No. 3, pp. 336-67.
- Bleining. Raw materials of the portland cement industry. O. Geol. Sur., Bull. No. 3, pp. 55-101.
- Bleining. Review of the investigations on the constitution of portland cement. O. Geol. Sur., Bull. No. 3, pp. 199-222.
- Bleining. Setting and hardening. O. Geol. Sur., Bull. No. 3, pp. 338-42.
- Bleining. Specific gravity. O. Geol. Sur., Bull. No. 3, pp. 356-60.
- Bleining. Tensile and crushing strength. O. Geol. Sur., Bull. No. 3, pp. 342-51.
- Eno. First portland cement in U. S. O. Geol. Sur., Bull. No. 2, pp. 21-22.
- Eno. Tests for portland cement used in concrete work. O. Geol. Sur., Bull. No. 2, p. 190.

See also Cement; Roman Cement.

Portland Cement Analysis. Lord. Portland cement. Geol. of O., v. 6. pp. 685, 786.

- Portland Cement Specifications.** Bleining. Rules proposed by Amer. Soc. Civil Engineers for testing of portland cement, 1903. O. Geol. Sur., Bull. No. 3, pp. 368-78.
- Eno. Specifications for portland and natural cements as adopted by Amer. R. R. Engineering and Maintenance of Way Assoc. O. Geol. Sur., Bull. No. 2, pp. 192-97.
- Posts.** Eno. Concrete used for fences and posts. O. Geol. Sur., Bull. No. 2, pp. 117-18.
- Eno. Use of steel concrete for posts. O. Geol. Sur., Bull. No. 2, pp. 271-73.
- Potsdam Group.** Newberry. Potsdam and Calciferous groups. Geol. of O., v. 1, pt. 1, pp. 112-16.
- Newberry. Potsdam in Ohio. Geol. of O., v. 1, pt. 1, pp. 58-59.
- Potter, W. B.** Sketch of the present state of the iron manufacture in Great Britain. Rep. Prog. 1870, pp. 503-526.
- Pottery.** Orton, Jr. Directory of manufacturers. Geol. of O., v. 7, pp. 126-28.
- Orton, Jr. Directory of stoneware manufacturers. Geol. of O., v. 7, p. 117.
- Orton, Jr. Manufacture of earthenware in Ohio. Geol. of O., v. 5, pp. 675-82.
- Orton, Jr. Pottery manufacture in Ohio. Geol. of O., v. 5, pp. 668-86.
- Orton, Jr. Manufacture of, in Ohio. Geol. of O., v. 7, pp. 89-129.
- Orton, Jr. Manufacture of white-ware or iron-stone china in Ohio. Geol. of O., v. 5, pp. 682-86.
- Orton, Jr. Stoneware manufacture in Ohio. Geol. of O., v. 5, pp. 669-75.
- Winchell. Brick and pottery works in Crawford county. Geol. of O., v. 2, pt. 1, p. 252.
- Pottsville Formation.** Prosser. Pottsville formation in the revised geological scale of Ohio. O. Geol. Sur., Bull. No. 7, pp. 11-12.
- Pozzuolane.** Bleining. Chemical examination. O. Geol. Sur., Bull. No. 3, pp. 111-13.
- Pozzuolane Cements.** Bleining. Pozzuolane cement. O. Geol. Sur., Bull. No. 3, p. 25.
- Bleining. Manufacture of pozzuolane and natural cements. O. Geol. Sur., Bull. No. 3, pp. 158-96.

- Pozzuolane Cements.** Bleininger. Raw materials for pozzuolane cement. O. Geol. Sur., Bull. No. 3, pp. 41-52.
- Pozzuolane Cement Analyses.** Composition of pozzuolane cement. O. Geol. Sur., Bull. No. 3, p. 42.
- Prairies.** Klippart. Prairies of Maumee valley. Rep. Prog. 1870, pp. 345-47.
- Newberry. Origin of prairies in Ohio. Geol. of O., v. 1, pt. 1, pp. 26-31.
- Preble County.** Locke. Geology of Preble and Montgomery counties. Ann. Rep., v. 2, 1838, pp. 223-36.
- Orton. Geology. Geol. of O., v. 3, pp. 404-419. Geologic map, 9.5x13.6 cm.
- Orton. Lime production. Geol. of O., v. 6, pp. 724-26.
- Orton. Oil and gas wells. Geol. of O., v. 6, pp. 284-85.
- Orton. Topography. Geol. of O., v. 3, pp. 404-05.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 115-19.
- Presses.** Peppel. Presses in use in manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 23, 64-70.
- Pressing.** Peppel. Pressing of the materials used in manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 42-46.
- Prison Cells.** Eno. Use of steel concrete for prison cells. O. Geol. Sur., Bull. No. 2, p. 179.
- Producer Gas.** Peppel. Use of producer gas in lime burning in Ohio. O. Geol. Sur., Bull. No. 4, pp. 276-289.
- Prosser, Charles S.** Revised nomenclature of the Ohio geological formations. O. Geol. Sur., Bull. No. 7, xvi+36 p. Springfield, Ohio, 1905.
- Pteropoda, see Paleontology—Genera and Species.*
- Purifying Agents.** Peppel. Use of hydrated lime as a purifying agent. O. Geol. Sur., Bull. No. 4, p. 244.
- Putnam County.** Bownocker. Oil production. O. Geol. Sur., Bull. No. 1, p. 100. Geologic map, Putnam and other counties, showing oil and gas territories, 30.7x21 cm., opp. p. 80.
- Orton. Gas wells. Rep. 1890, pp. 192-94.
- Orton, Jr., and Peppel. Limestone formations in, important for lime industries. O. Geol. Sur., Bull. No. 4, p. 135.

- Putnam County.** Winchell. Geology. Geol. of O., v. 2, pt. 1, pp. 387-96. Geologic map, 14x11.3 cm.
- Winchell. Topography. Geol. of O., v. 2, pt. 1, pp. 387-88.
- Putnam Hill Limestone.** Orton. Clay deposits in. Geol. of O., v. 7, pp. 63-65.
- Orton, Jr., and Peppel. Composition of, in Stark county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 126-27.
- Orton, Jr., and Peppel. Composition, physical character and uses of in Ohio. O. Geol. Sur., Bull. No. 4, pp. 173-74.
- Orton, Jr., and Peppel. Putnam Hill stone available for cement making. O. Geol. Sur., Bull. No. 3, pp. 91-92.
- Pyrometers.** Peppel. Descriptions of pyrometers for measurement of temperatures in kilns for lime burning. O. Geol. Sur., Bull. No. 4, pp. 301-04.
- Quakertown Clay and Shale.** Orton. Quakertown clay and shale in clay industries. Geol. of O., v. 7, pp. 60-61.
- Quakertown Coal.** Orton. Characteristics of Ohio coal seams. Geol. of O., v. 5, pp. 157-58.
- Orton. Quakertown coal in Ohio. Geol. of O., v. 7, p. 273.
- Wright. Quakertown coal in Holmes county. Geol. of O., v. 5, p. 823.
- Quarrying.** Peppel. Methods of winning limestone for building material. O. Geol. Sur., Bull. No. 4, pp. 213-16.
- Peppel. Methods of winning limestone for lime burning. O. Geol. Sur., Bull. No. 4, pp. 260-65.
- Quartz.** Bleining. Quartz in clays. O. Geol. Sur., Bull. No. 3, pp. 66-67.
- Quaternary System.** Newberry. Drift in Ohio. Geol. of O., v. 1, pt. 1, pp. 85-88.
- Prosser. Note on the thickness of this system in the Ohio geological scale. O. Geol. Sur., Bull. No. 7, p. 5.
See also Pleistocene.
- Quicklime Process.** Peppel. Quicklime process in manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, p. 22.
See also Pleistocene.
- Quicksand.** Eno. Use of cement in hardening quicksand. O. Geol. Sur., Bull. No. 2, pp. 60-61.

- Ransome System.** Eno. Ransome system of reinforced concrete construction. O. Geol. Sur., Bull. No. 2, p. 135.
- Raw Materials.** Peppel. Raw materials used in manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, p. 24.
- Raymond Pile.** Eno. Raymond pile in building. O. Geol. Sur., Bull. No. 2, p. 173.
- Read, M. C.** Geology of Ashland, Wayne and Holmes counties. Geol. of O., v. 3, pp. 519-61.
- Geology of Ashtabula, Trumbull, Lake and Geauga counties. Geol. of O., v. 1, pt. 1, pp. 483-533.
- Sketches of the geology of Geauga and Holmes counties. Rep. Prog. 1870, pp. 465-84.
- Geology of the Hocking valley coal field. Geol. of O., v. 3, pp. 647-715.
- Geology of Huron, Richland, Knox and Licking counties. Geol. of O., v. 3, pp. 289-361.
- Reaney Hydrator.** Peppel. Illustration and description of the Reaney hydrator. O. Geol. Sur., Bull. No. 4, pp. 331-32.
- Reinforced Concrete.** Eno. Early use. O. Geol. Sur., Bull. No. 2, pp. 124-25.
- Eno. Recent uses. O. Geol. Sur., Bull. No. 2, pp. 125-26.
- Eno. Use of cement in reinforced concrete construction. O. Geol. Sur., Bull. No. 2, pp. 124-88.
- Reinforced Concrete Systems.** Eno. Descriptions of different systems of reinforced concrete. O. Geol. Sur., Bull. No. 2, pp. 131-39.
- Reptiles.** Kirtland. Catalogue of mammals, birds, reptiles, etc. in Ohio. Ann. Rep., v. 2, 1838, pp. 167-68.
- Kirtland. Notes and observations. Ann. Rep., v. 2, 1838, pp. 188-90.
- Smith. Report on the reptiles and amphibia in Ohio. Geol. of O., v. 4, pp. 633-700.
- Smith. Tabular list of the reptilia and amphibia in Ohio. Geol. of O., v. 4, pp. 732-34.
- Reptiles.** Genera and species. Geol. of O., v. 4, pp. 650-99. *Amyda mutica*, pp. 667-68. *Ancistrodon contortrix*, pp. 675-76. *Aromochelys odoratus*, pp. 666-67. *Aspidonectes spinifer*, pp. 668-69. *Bascanion constrictor*, pp. 693-94. *Carphophis amœnus*, pp. 698-99. *Chelopus insculpus*, pp. 658-59. *Chelydra serpentina*, pp. 656-57. *Chrysemys marginata*, pp. 664-65. *Chrysemys picta*, pp. 663-

Reptiles. Genera and species.

64. *Cinosternum pennsylvanicum*, pp. 665-66. *Cistudo elausa*, pp. 655-56. *Coluber obsoletus*, pp. 691-92. *Crotalophorus tergeminus*, pp. 673-74. *Crotalophorus miliarius*, pp. 674-75. *Crotalus durissus*, pp. 671-73. *Cyclophis æstivus*, pp. 695-96.

Diadophis punctatus, pp. 696-97. *Elaps fulvius*, p. 676. *Emys meleagris*, pp. 659-60. *Eumeces quinquelineatus*, pp. 650-51. *Eutænia proxima*, p. 678. *Eutænia sirtalis*, pp. 679-81. *Eutænia saurita*, p. 679. *Graptemys geographica*, pp. 661-62. *Graptemis lesueurii* pp. 662-63. *Heterodon platyrhinus*, pp. 686-87. *Heterodon platyrhinus niger*, pp. 687-88. *Liopeltis vernalis*, p. 695. *Lygosoma laterale*, p. 651. *Nanemys guttatus*, pp. 660-61.

Ophibolus calligaster, p. 689. *Ophibolus doliatus*, p. 691. *Ophibolus triangulus*, pp. 689-91. *Pityophis melanoleucus*, p. 688. *Rigina leberis*, p. 682. *Rigina kirtlandii*, 682-83. *Sceloporus undulatus*, pp. 652-54. *Storeria dekayi*, pp. 697-98. *Storeria occipito-maculata*, p. 698. *Toxicophis piscivorus*, p. 676. *Tropidonotus erythrogaster*, p. 685. *Tropidonotus sipedon*, pp. 683-84. *Tropidonotus fasciatus*, p. 684. *Tropidonotus rhombifer*, p. 685.

Reservoirs. Eno. Use of concrete in reservoirs. O. Geol. Sur., Bull. No. 2, p. 96.

———Hussey. Loramie reservoir in Shelby county. Geol. of O., v. 3, pp. 456-58.

Retaining Walls. Eno. Concrete in retaining walls on railroads. O. Geol. Sur., Bull. No. 2, pp. 68-72.

Retorts. Orton, Jr. Manufacture of retorts in Ohio. Geol. of O., v. 5, pp. 700-01.

Richland County. Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 364-66.

———Orton. Oil and gas wells. Geol. of O., v. 6, pp. 303-06.

———Read. Geology. Geol. of O., v. 3, pp. 310-24.

———Read. Topography. Geol. of O., v. 3, pp. 310-11.

———Riddell. Geology of Richland, Wayne and Medina counties. Exec. Docs. 1836, Rep. No. 60, pp. 25-27.

Richmond Formation. Prosser. Propriety of this name to replace portions formerly considered under Hudson river group. O. Geol. Sur., Bull. No. 7, pp. 33-34.

Riddell, John L. Report of one of the special committee appointed by the legislature to make geological observations and estimates for a geological survey of the State. O. Exec. Docs. 1836, pt. 1. Rep. No. 60, 34 p., 2 pl.

- Ridges.** Winchell. Drift ridges in Defiance county. Geol. of O., v. 2, pt. 1, pp. 431-34.
- Road Foundations.** Eno. Specifications for concrete road foundations as used in Columbus, O. O. Geol. Sur., Bull. No. 2, pp. 215-16.
- Eno. Specifications for concrete road foundations in use in Peoria, Ill. O. Geol. Sur., Bull. No. 2, p. 220.
- Eno. Specifications for concrete road foundations in use in Washington, D. C. O. Geol. Sur., Bull. No. 2, pp. 217-19.
- Roads.** Eno. Concrete for road foundations. O. Geol. Sur., Bull. No. 2, pp. 110-11.
- Robinson, S. W.** Measurement of gas wells and other gas streams and the piping of natural gas. Geol. of O., v. 6, pp. 548-94.
- Measurements of natural gas, including gas wells, pipe lines, service pipes, etc. Rep. 1890, pp. 281-305.
- Rock-aggregate.** Bleininger. Light colored and ferruginous rock-aggregate as component of cement clays. O. Geol. Sur., Bull. No. 3, pp. 68-69.
- Rock Crushers.** Eno. Rock crushers used in making concrete and mortar. O. Geol. Sur., Bull. No. 2, pp. 223-25.
- Rocks.** Winchell. General section of rocks in Paulding and Defiance counties. Geol. of O., v. 2, pt. 1, pp. 341-45.
- Roebing's System.** Eno. Roebing's system of reinforced concrete. O. Geol. Sur., Bull. No. 2, pp. 131-33.
- Rolls.** Bleininger. Machinery used in cement grinding. O. Geol. Sur., Bull. No. 3, pp. 259-66.
- Roman Cement.** Bleininger. Investigations of the burning process in cement manufacture. O. Geol. Sur., Bull. No. 3, pp. 175-87.
- Bleininger. Manufacture of natural cement. O. Geol. Sur., Bull. No. 3, pp. 173-96.
- Bleininger. Raw materials of Roman cement. O. Geol. Sur., Bull. No. 3, pp. 52-55.
- Roman Cement Analyses.** Bleininger. Roman cements. O. Geol. Sur., Bull. No. 3, p. 54.
- Roman Cement Tests.** Bleininger. Standard test. O. Geol. Sur., Bull. No. 3, pp. 193-94.
- Roof.** Orton. Roof of Ohio coal seams. Geol. of O., v. 5, pp. 141-42.
- Roofs.** Eno. Use of steel concrete for roofs. O. Geol. Sur., Bull. No. 2, pp. 148-51.

- Roofing tile.** Orton, Jr. Manufacture of, in Ohio. Geol. of O., v. 5, pp. 706-08.
- Root, W. J.** Manufacture of salt and bromine. Geol. of O., v. 6, pp. 653-70.
- Ross County.** Orton. Geology. Geol. of O., v. 2, pt. 1, pp. 542-58.
·Geologic map, Highland, Ross and Pike counties, p. 611.
- Orton. Topography. Geol. of O., v. 2, pt. 1, pp. 642-43.
- Rotary Kiln.** Bleininger. Use of rotary kiln in burning of Portland cement. O. Geol. Sur., Bull. No. 3, pp. 288-309.
- Roy, Andrew.** Coal mining in Ohio. Geol. of O., v. 5, pp. 301-70.
- St. Marys Gas Field.** Bownocker. Gas and Oil in Trenton limestone. O. Geol. Sur., Bull. No. 1, pp. 47-50.
- Salina Group.** Newberry. Salina group of Cincinnati arch. Geol. of O., v. 1, pt. 1, pp. 132-35.
- Newberry. Salina group in Erie county. Geol. of O., v. 2, pt. 1, p. 194.
- Newberry. Salina group in Ohio. Rep. Prog. 1869, pp. 15-16.
- Newberry. Salina in Ohio. Geol. of O., v. 1, pt. 1, p. 63.
- Newberry. Salina in Ohio. Geol. of O., v. 3, pp. 8-9.
- Orton. Salina group in Ohio. Geol. of O., v. 7, pp. 13-14.
- Winchell. Salina shale in Ottawa county. Geol. of O., v. 2, pt. 1, p. 230.
- Winchell. Salina in Wood county. Geol. of O., v. 2, pt. 1, p. 374.
- Salines, see Salt.*
- Salt.** Andrews. Salt in the Duck Creek valley. Rep. Prog. 1869, pp. 127-28.
- Andrews. Salt in the 2d geological district. Rep. Prog. 1869, pp. 133-34.
- Andrews. Salt production in 2d geological district. Rep. Prog. 1870, pp. 234-35.
- Andrews. Salt in the 2d geological district. Geol. of O., v. 2, pt. 1, pp. 599-600.
- Andrews. Salt in Washington county. Geol. of O., v. 2, pt. 1 p. 487.
- Bownocker. Early history of salt and salt making in Ohio. O. Geol. Sur., Bull. No. 8, pp. 9-12; production of salt in Ohio from 1882, compared with that of United States, p. 17.
- Bownocker. Salt deposits and the salt industry in Ohio. O. Geol. Sur., Bull. No. 8. pp. xvi and 42.

- Salt.** Briggs. Salines in the region between the Scioto and Hockhocking rivers. Ann. Rep., v. 1, 1837, pp. 94-96.
- Foster. Salt springs and salt wells in Muskingum, Licking and Franklin counties. Ann. Rep., v. 2, 1838, pp. 94-99.
- Hildreth. Early history of salt manufacture. Ann. Rep., v. 1, 1837, pp. 54-55.
- Hildreth. Early legislation on. Ann. Rep. v. 1, 1837, p. 58.
- Hildreth. Delaware salines. Ann. Rep., v. 1, 1837, pp. 1-10.
- Hildreth. Gallipolis salines. Ann. Rep., v. 1, 1837, p. 59.
- Hildreth. Hockhocking valley salines. Ann. Rep., v. 1, 1837, pp. 60-61.
- Hildreth. Leading Creek salines. Ann. Rep., v. 1, 1837, pp. 59-60.
- Hildreth. Muskingum salines. Ann. Rep., v. 1, 1837, pp. 59, 61-62.
- Hildreth. Scioto salines. Ann. Rep., v. 1, 1837, p. 57.
- Hildreth. Salt producing rocks. Ann. Rep., v. 1, 1837, pp. 55-56.
- Hildreth. Salt springs in Ohio. Ann. Rep., v. 1, 1837, pp. 54-62.
- Hildreth. Salt water and salt. Exec. Docs. 1836, Rep. No. 1, pp. 75-76.
- Newberry. Salt wells in Columbiana county. Geol. of O., v. 3, pp. 116-18.
- Newberry. Salt in Tuscarawas county. Geol. of O., v. 3, p. 84.
- Read. Salt in Hocking Valley. Geol. of O., v. 3, pp. 713-14.
- Root. Manufacture in Ohio. Geol. of O., v. 6, pp. 653-667.
- Winchell. Salt wells in Morrow county. Geol. of O., v. 2, pt. 1, p. 270.
- Salt Analyses.** Salt in Ohio. Geol. of O., v. 6, pp. 662-63.
- Bownocker. Methods of analysis of salt and brines used in the report. O. Geol. Sur., Bull. No. 8, pp. 41-42.
- Foulk. Composition of salt made in northeastern Ohio. O. Geol. Sur., Bull. No. 8, p. 38; from Pomeroy region, Meigs county, pp. 27-28; samples of salt brine from Union Salt Company, Cleveland, p. 38.
- Lord. Salt seam at Newburg, Cuyahoga county. Geol. of O., v. 6, p. 353.
- Wormley. Table of Analyses of Salt. Geol. of O., v. 2, pt. 1, pp. 601-02.

- Salt Manufacture.** Bownocker. Methods of manufacture in use in Excelsior Works, Pomeroy, Ohio. O. Geol. Sur., Bull. No. 8, pp. 20-22; methods in use in northern Ohio, pp. 28-38; methods in use by Ohio Salt Company, Wayne county, pp. 32-34; methods in use at Wadsworth Salt Works, pp. 28-30.
- Saluda Bed.** Prosser. Discussion of position and name of this member in revised geological scale of Ohio. O. Geol. Sur., Bull. No. 7, pp. 31-33.
- Sand.** Bleininger. Sandstone and sand in cement making. O. Geol. Sur., Bull. No. 3, pp. 83-85.
- Eno. Effects of various sands upon mortar. O. Geol. Sur., Bull. No. 2, pp. 27-30.
- Eno. Specifications for sand used in concrete work. O. Geol. Sur., Bull. No. 2, p. 190.
- Newberry. Delta sand in Cuyahoga county. Geol. of O., v. 1, pt. 1, pp. 177-78.
- Peppel. Preparation of the sand used in manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 38-39.
- Peppel. Sand used in the manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 24-30.
- Tables showing effect of use of fine and coarse sand in experimental manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 26, 27, 29.
- See also Pleistocene.*
- Sand Hill Oil Pool.** Bownocker. Wells in Marietta township, Washington county. O. Geol. Sur., Bull. No. 1, pp. 180-81.
- Sand-Brick Filler.** Peppel. Sand-brick with exclusively carbonate filler. O. Geol. Sur., Bull. No. 5, p. 18; with hydro-silicate filler, pp. 19-22; with partly carbonate and partly silicate filler, pp. 18-19.
- Sand-lime Brick.** Peppel. Comparison of sand-lime brick with natural stone to show various properties. O. Geol. Sur., Bull. No. 5, pp. 59-60.
- Peppel. History and description of the industry. O. Geol. Sur., Bull. No. 5, pp. 17-23.
- Peppel. Manufacture of artificial sandstone or sand-lime brick. O. Geol. Sur., Bull. No. 5, p. 79.
- Peppel. Mechanical equipment for manufacture. O. Geol. Sur., Bull. No. 5, pp. 61-70.
- Peppel. Pressing and hardening product in manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 42-47.

- Sand-lime Brick.** Peppel. Processes and patents on manufacturing processes of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 71-79.
- Peppel. Properties of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 53-60.
- Peppel. Raw materials, their impurities and their preparation. O. Geol. Sur., Bull. No. 5, pp. 24-41.
- Peppel. Tables of tests showing properties of sand-lime brick which make them commercially valuable. O. Geol. Sur., Bull. No. 5, pp. 54-57.
- Sand-lime Reaction.** Peppel. Determination of soluble silica. O. Geol. Sur., Bull. No. 5, p. 26.
- Sandstone.** Quarries in Ohio. Geol. of O., v. 5, pp. 578-607.
- Andrews. Logan sandstone of the Hocking Valley. Geol. of O., v. 3, p. 816.
- Andrews. Quarries in Fairfield county. Geol. of O., v. 2, pt. 1, p. 594.
- Bleininger. Sandstone and sand in cement making. O. Geol. Sur., Bull. No. 3, pp. 83-85.
- Bownocker. Berea as gas sandstone in McConnellsville gas field. O. Geol. Sur., Bull. No. 1, p. 147; oil and gas producing sandstone in Ohio, pp. 26-30; oil sand in Buck Run oil field, p. 143; oil sands in Cow Run field, Washington county, p. 170; oil sandstones in Macksburg field, Washington county, pp. 157-59, 162-64; oil sand in Moore's Junction field, Washington county, pp. 175-76; oil sands in Moose Ridge pool, Monroe county, pp. 205-06; oil sandstone in Morgan county, pp. 137-38; oil sands in Newell's Run oil pool, pp. 184-85; oil sands in Sistersville pool field, Monroe county, pp. 197-99; oil sands in Whitacre pool, Monroe county, p. 207.
- Briggs. Sandstones in Hocking and Athens counties. Ann. Rep., v. 2, 1838, pp. 132-35.
- Briggs. Sandstones in Tuscarawas county. Ann. Rep., v. 2, 1838, pp. 146-47.
- Foster. Fine-grained sandstone in Muskingum, Licking and Franklin counties. Ann. Rep., v. 2, 1838, pp. 103-05.
- Foster. Sandstones in Muskingum, Licking and Franklin counties. Ann. Rep., v. 2, 1838, p. 94.
- Hildreth. Fine-grained sand rocks. Exec. Docs. 1836, Rep. No. 1, pp. 74-75.
- Hildreth. Sand rock in southeastern and northeastern Ohio. An. Rep., v. 1, 1837, pp. 36-37, 44-53.

- Sandstone.** Locke. Quarries in Scioto county. Ann. Rep., v. 2, 1838, pp. 263-66.
- Lovejoy. Sandstone in Pomeroy and Federal creek coal field. Geol. of O., v. 6, pp. 635-36.
- Mather. Sandstone in Ohio. Ann. Rep., v. 1, 1837, pp. 9-10.
- Orton. Hillsboro sandstone in Highland county. Rep. Prog. 1870, pp. 283-87.
- Orton. Quarries in Pike county. Geol. of O., v. 2, pt. 1, pp. 621-23.
- Orton. Sandstones as reservoirs for petroleum and natural gas. Geol. of O., v. 6, pp. 84-86.
- Orton. Sylvania sandstone. Geol. of O., v. 6, pp. 18-20. Same Rep. 1890, pp. 23-24.
- Peppel. Comparison of sand-lime brick with natural stone to show various properties. O. Geol. Sur., Bull. No. 5, pp. 59-60.
- Read. Quarries in Ashland county. Geol. of O., v. 3, pp. 526-27.
- Read. Quarries in Huron county. Geol. of O., v. 3, pp. 301-02, 304.
- Read. Sandstone in Richland county. Geol. of O., v. 3, pp. 321-22.
- Read. Waverly sandstone in Ashland county. Geol. of O., v. 3, pp. 525-27.
- Winchell. Quarries in Delaware county. Geol. of O., v. 2, pt. 1, pp. 276-82.
- Winchell. Quarries in Morrow county. Geol. of O., v. 2, pt. 1, pp. 257-63.
- See also Calciferous Sand Rock.*
- Sandstone, artificial, see Sand-Lime Brick.*
- Sandusky County.** Bownocker. Geology. O. Geol. Sur., Bull. No. 1, pp. 73-76.
- Bownocker. Oil production. O. Geol. Sur., Bull. No. 1, pp. 71-76. Geological map, Sandusky and other counties, showing oil and gas territories, 18x26.5 cm., opp. p. 56. Oil production, pp. 71-76. Jackson township, p. 73. Madison township, p. 72. Rice township, p. 73. Scott township, p. 72. Washington township, pp. 72-73. Woodville township, pp. 71-72.
- Orton. Gas wells. Rep. 1890, pp. 173-74.
- Orton. Lime production. Geol. of O., v. 6, pp. 737-38.
- Orton. Oil wells. Rep. 1890, pp. 223-26.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 119-21.

- Sandusky County.** Riddell. Geology of Sandusky, Wood and Lucas counties. O. Exec. Docs. 1836, Rep. No. 60, pp. 19-23.
- Winchell. Geology. Geol. of O., v. 1, pt. 1, pp. 593-610. Geological map (colored), 21.3x12.2 cm.
- Winchell. Topography. Geol. of O., v. 1, pt. 1, pp. 593-95.
- Scio Oil Pool.** Bownocker. Wells in Harrison county. O. Geol. Sur., Bull. No. 1, pp. 233-40.
- Scioto County.** Andrews. Geology. Rep. Prog. 1870, pp. 163-77. Bloom township, pp. 165-68. Clay township, pp. 172-73. Harrison township, pp. 163-65. Madison township, p. 163. Porter township, pp. 168-72. Vernon township, pp. 173-77.
- Briggs. Coal. Ann. Rep., v. 1, 1837, pp. 86-87.
- Briggs. Geology. Ann. Rep., v. 1, 1837, pp. 71-98.
- Briggs. Iron manufacture. Ann. Rep., v. 1, 1837, pp. 89-92.
- Briggs. Iron ores. Ann. Rep., v. 1, 1837, pp. 88-89.
- Locke. Geology. Ann. Rep., v. 2, 1838, pp. 256-66.
- Orton. Coal mines. Geol. of O., v. 5, pp. 1034-46.
- Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, p. 395.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 122-23.
- Orton, Jr., and Peppel. Occurrence of Ferriferous limestone in. O. Geol. Sur., Bull. No. 4, pp. 179-80.
- Scioto Lime and Stone Company.** Peppel. Description and plans of typical lime manufacturing establishments in Ohio. O. Geol. Sur., Bull. No. 4, pp. 351-54.
- Screens.** Eno. Screens for stone in concrete making. O. Geol. Sur., Bull. No. 2, p. 225.
- Sea Walls.** Eno. Concrete used for sea walls. O. Geol. Sur., Bull. No. 2, pp. 82-84.
- Seneca County.** Bownocker. Geology. O. Geol. Sur., Bull. No. 1, p. 78.
- Bownocker. Oil production. O. Geol. Sur., Bull. No. 1, pp. 76-78. Clinton township, pp. 76-77. Hopewell township, pp. 76-77. Jackson township, p. 77. Liberty township, p. 77. Geologic map, Seneca and other counties, showing oil and gas territories. 18x26.5 cm., opp. p. 56.
- Orton. Gas wells. Rep. 1890, pp. 186-192.

- Seneca County.** Orton. Oil wells. Rep. 1890, pp. 222-23.
- Orton. Lime production. Geol. of O., v. 6, pp. 738-39.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 124-125.
- Riddell. Geology of Hancock and Seneca counties. O. Exec. Docs. 1836, Rep. No. 60, pp. 18-19.
- Winchell. Geology. Geol. of O., v. 1, pt. 1, pp. 612-24. Geologic map (colored), 21.3x12.2 cm.
- Winchell. Topography. Geol. of O., v. 1, pt. 1, pp. 611-12.
- Seneca White Lime Company.** Peppel. Description and plans of typical lime manufacturing establishments in Ohio. O. Geol. Sur., Bull. No. 4, pp. 343-50.
- Serpents, see Reptiles.*
- Sewer Pipe.** Orton, Jr. List of factories. Geol. of O., v. 7, pp. 215-16.
- Orton, Jr. Manufacture of sewer pipe in Ohio. Geol. of O., v. 5, pp. 711-17; v. 7, pp. 209-17.
- Sewers.** Eno. Steel concrete in sewer construction. O. Geol. Sur., Bull. No. 2, pp. 167-69.
- Eno. Use of concrete for sewer construction. O. Geol. Sur., Bull. No. 2, pp. 90-93.
- Shade Creek Field.** Lovejoy. Shade creek division of Pomeroy and Federal creek coal field. Geol. of O., v. 6, pp. 642-45.
- Shales.** Andrews. Ohio black slate or Huron shale. Rep. Prog. 1870, pp. 58-59.
- Bleininger. Shales for cement making. O. Geol. Sur., Bull. No. 3, pp. 74-79.
- Briggs. Shales in Hocking and Athens counties. Ann. Rep., v. 2, 1838, pp. 137-38.
- Briggs. Shales in Scioto, Lawrence, Gallia, etc., counties, Ann. Rep., v. 1, 1837, pp. 77-79, 81.
- Briggs. Shales in Tuscarawas county. Ann. Rep., v. 2, 1838, pp. 148-49.
- Foster. Shales in Muskingum, Licking and Franklin counties. Ann. Rep., v. 2, 1838, pp. 105-06.
- Hildreth. Shale and slaty clay in southeast and northeast Ohio. Ann. Rep., v. 1, 1837, pp. 36-37, 39-40, 45-46, 48-53.
- Newberry. Cuyahoga shale. Geol. of O., v. 1, pt. 1, pp. 185-6.
- Newberry. Erie shale. Rep. Prog. 1869, p. 20.

- Shales.** Newberry. Erie shale in Ohio. Geol. of O., v. 1, pt. 1, pp. 163-67. Fossils, p. 164.
- Newberry. Huron shale. Rep. Prog. 1869, pp. 18-20.
- Newberry. Huron shale in Ohio. Geol. of O., v. 1, pt. 1, pp. 152-63, 197-98. Fossils, p. 157.
- Newberry. Shales in Erie county. Geol. of O., v. 2, pt. 1, pp. 188-89.
- Newberry. Shales in Lorain county. Geol. of O., v. 2, pt. 1, pp. 212-16.
- Orton. Fossils of Ohio shales. Geol. of O., v. 6, pp. 28-32. Same in part, Rep. 1890, pp. 31-33.
- Orton. Niagara shale in Clark county. Geol. of O., v. 1, pt. 1, pp. 465-67.
- Orton. Shales in Ohio. Geol. of O., v. 5, pp. 22-28, 35-39. Same, in part, Rep. 1890, pp. 25-31, 37-39.
- Orton. Shale, or blue clay of the Cincinnati group. Geol. of O., v. 1, pt. 1, pp. 373-79.
- Orton. Shales in Pike county. Geol. of O., v. 2, pt. 1, pp. 619-21, 624-26.
- Orton. Shales in Ross county. Geol. of O., v. 2, pt. 1, pp. 646-49.
- Read. Olive shales of the Waverly in Licking county. Geol. of O., v. 3, pp. 359-60.
- Read. Shales in Ashland county. Geol. of O., v. 3, pp. 522-25.
- Read. Shales in Ashtabula county. Geol. of O., v. 1, pt. 1, pp. 485-88.
- Read. Shales in Geauga county. Rep. Prog. 1870, p. 469.
- Read. Shales in Geauga county. Geol. of O., v. 1, pt. 1, pp. 525-26.
- Read. Shales in Huron county. Geol. of O., v. 3, pp. 305-08.
- Read. Shales in Knox county. Geol. of O., v. 3, pp. 337, 340.
- Read. Shales in Lake county. Geol. of O., v. 1, pt. 1, pp. 514-15.
- Read. Shales in Richland county. Geol. of O., v. 3, pp. 319-20.
- Winchell. Shales in Crawford county. Geol. of O., v. 2, pt. 1, pp. 242-43.
- Winchell. Shales in Delaware county. Geol. of O., v. 2, pt. 1, pp. 276-89.
- Winchell. Shales in Morrow county. Geol. of O., v. 2, pt. 1, pp. 263-65.
- Shale Analyses.** Orton. Black Huron shale. O. Geol. Sur., Bull. No. 3, p. 79.

- Shale Analyses.** Orton, Jr. Ferruginous shales available for cement making. O. Geol. Sur., Bull. No. 3, p. 77.
- Sharon Coal.** Orton. Characteristics of Ohio coal seams. Geol. of O., v. 5, pp. 156-57.
- Orton. Sharon coal in Ohio. Geol. of O., v. 7, pp. 272-73.
- Wright. Sharon coal in Holmes county. Geol. of O., v. 5, pp. 821-22.
- Sharon Conglomerate.** Prosser. Discussion as to identity of Sharon and Olean conglomerates in revised Ohio geological scale. O. Geol. Sur., Bull. No. 7, pp. 13-16.
- Prosser. Sharon conglomerate as a member of Pottsville formation in revised Ohio geological scale. O. Geol. Sur., Bull. No. 7, pp. 12-13.
- Sharon Shales.** Orton. Use of Sharon shales in clay industries. Geol. of O., v. 7, p. 60.
- Shawnee District.** Orton. Coal mines. Geol. of O., v. 5, pp. 946-52.
- Shawnee Limestone.** Orton. Shawnee limestone in Hanging Rock district. Geol. of O., v. 3, p. 895.
- Sheets Run Oil Pool.** Bownocker. Wells of Grand View township, Washington county. O. Geol. Sur., Bull. No. 1, p. 191.
- Shelby County.** Bownocker. Oil production. O. Geol. Sur., Bull. No. 1, p. 99. Geologic map, Shelby and other counties, showing oil and gas territory, 20.7x21 cm., p. 80.
- Hussey. Geology. Geol. of O., v. 3, pp. 448-467.
- Hussey. Topography. Geol. of O., v. 3, pp. 448-51.
- Orton. Lime production. Geol. of O., v. 6, pp. 726-27.
- Orton. Oil and gas wells. Geol. of O., v. 6, pp. 264-66.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 125-26.
- Shells, see Mollusca. Palentology, Genera and Species.*
- Sheridan Coal.** Andrews. Sheridan coal in Gallia county. Geol. of O., v. 1, pt. 1, pp. 225-44.
- Ship Linings.** Eno. Cement used in linings of warships. O. Geol. Sur., Bull. No. 2, p. 60.
- Siderite.** Andrews. Analysis of siderite from Zanesville. Geol. of O., v. 1, pt. 1, p. 326.

- Sidewalks.** Eno. Concrete used for sidewalks. O. Geol. Sur., Bull. No. 2, pp. 113-16.
- Silica.** Bleininger. Silica and its salts as constituents of hydraulic cements. O. Geol. Sur., Bull. No. 3, pp. 27-32.
- Silos.** Eno. Use of steel concrete for tanks, silos and elevators. O. Geol. Sur., Bull. No. 2, pp. 153-58.
- Silurian.** Bownocker. Silurian system in Ohio. O. Géol. Sur., Bull. No. 1, pp. 19-21.
- Meek. Descriptions of invertebrate fossils of the Devonian and Silurian systems. Geol. of O., v. 1, pt. 2, pp. 1-243.
- Newberry. Fishes. Geol. of O., v. 1, pt. 2, pp. 259-63.
- Newberry. Report on Silurian system in Ohio. Rep. Prog. 1869, pp. 12-20.
- Newberry. Silurian in Ohio. Geol. of O., v. 1, pt. 1, pp. 58-65.
- Nicholson. Amorphozoa. Geol. of O., v. 2, pt. 2, pp. 245-55.
See also names of subdivisions Upper Silurian Ohio series.
- Sisterville Oil Pool.** Bownocker. Wells of Monroe county. O. Geol. Sur. Bull. No. 1, pp. 194-99.
- Slag.** Bleininger. Slags in artificial pozzuolane cement. O. Geol. Sur., Bull. No. 3, pp. 43-52.
- Tetmayer's analysis of European furnace slags. O. Geol. Sur., Bull. No. 3, pp. 45-46.
- Lord. Methods of analyzing furnace slags. O. Geol. Sur., Bull. No. 3, pp. 114-15.
- Slag Cement.** Bleininger. Manufacture of slag cement. O. Geol. Sur., Bull. No. 3, pp. 159-73.
- Slaking Machines.** Peppel. Slaking machines used in the manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 61-62.
- Slate.** Andrews. Ohio black slate. O. Geol. Sur., Rep. Prog. 1869, pp. 62-65.
- Smith, W. H.** Report on the reptiles and amphibians of Ohio. Geol. of O., v. 4, pp. 633-734.
- Smith Mixer.** Smith concrete mixer, with illustration. O. Geol. Sur., Bull. No. 2, pp. 230-31.
- Snyder Oil Pool.** Bownocker. Wells in Harrison county. O. Geol. Sur., Bull. No. 1, pp. 230-32.
- Soap.** Peppel. Use of hydrated lime in manufacture of soap. O. Geol. Sur., Bull. No. 4, pp. 244-45.

- Soil.** Andrews. Soil of Pickaway county. Geol. of O., v. 2, pt. 1, p. 589.
- Andrews. Soil in Washington county. Geol. of O., v. 2, pt. 1, pp. 456-57.
- Andrews. Soil of the Waverly hills near the Ohio river. Rep. Prog. 1869, pp. 72-80.
- Gilbert. Soil and timber in Fulton county. Rep. Prog. 1870, pp. 491-92.
- Gilbert. Soil in Fulton county. Geol. of O., v. 1, pt. 1, pp. 569-70.
- Gilbert. Soil in Lucas county. Rep. Prog. 1870, p. 496.
- Gilbert. Soil in Lucas county. Geol. of O., v. 1, pt. 1, pp. 579-80.
- Gilbert. Soil in Williams county. Rep. Prog. 1870, pp. 489-90.
- Gilbert. Surface geology and soil of Williams county. Geol. of O., v. 1, pt. 1, pp. 559-60.
- Herzer. Soil in Brown county. Geol. of O., v. 3, pp. 943-44.
- Hill. Soil in Champaign county. Geol. of O., v. 3, pp. 492-93.
- Hill. Soil in Logan county. Geol. of O., v. 3, pp. 483-84.
- Hussey. Soil in Shelby county. Geol. of O., v. 3, pp. 451-55.
- Klippart. Agricultural value of, in Maumee valley. Rep. Prog. 1870, pp. 339-45, 361-81.
- Lindemuth. Soil in Darke county. Geol. of O., v. 3, pp. 509-12.
- Mather. Soils in Ohio. Ann. Rep., v. 1, 1837, pp. 11-12.
- Newberry. Soil and agriculture in Ohio. Geol. of O., v. 1, pt. 1 pp. 25-26.
- Orton. Soils in Butler county. Geol. of O., v. 3, pp. 398-99, 401-03.
- Orton. Soil in Clermont county. Geol. of O. v. 1, pt. 1, pp. 447-49.
- Orton. Soil in Greene county. Geol. of O., v. 2, pt. 1, pp. 681-90.
- Orton. Soil in Madison county. Geol. of O., v. 3, pp. 425-27.
- Orton. Soil in Montgomery county. O. Geol. Sur., Rep. Prog. 1869, pp. 155-56.
- Orton. Soil in Pike county. Geol. of O., v. 2, pt. 1, pp. 636-39.
- Orton. Soil in Ross county. Geol. of O., v. 2, pt. 1, p. 655.
- Read. Soil, drift and lake ridges in Lake county. Geol. of O., v. 1, pt. 1, pp. 516-19.
- Read. Soil in Geauga county. Rep. Prog. 1870, pp. 465-66.
- Read. Soil in Geauga county. Geol. of O., v. 1, pt. 1, p. 521.
- Read. Soil in Holmes county. Rep. Prog. 1870, pp. 473-74.
- Read. Soil in Holmes county. Geol. of O., v. 3, pp. 540-41.

- Soil.** Read. Soil in Richland county. Geol. of O., v. 3, pp. 311-12.
- Winchell. Soil in Allen county. Geol. of O., v. 2, pt. 1, pp. 397-98, 401.
- Winchell. Soil in Crawford county. Geol. of O., v. 2, pt. 1, pp. 238-39.
- Winchell. Soil in Defiance county. Geol. of O., v. 2, pt. 1, p. 423.
- Winchell. Soil in Delaware county. Geol. of O., v. 2, pt. 1, p. 274.
- Winchell. Soil in Mercer county. Geol. of O., v. 2, pt. 1, pp. 411, 413.
- Winchell. Soil and timber in Morrow county. Geol. of O., v. 2, pt. 1, pp. 255-56.
- Winchell. Soil and timber in Ottawa county. Geol. of O., v. 2, pt. 1, p. 228.
- Winchell. Soil in Paulding county. Geol. of O., v. 2, pt. 1, p. 336.
- Winchell. Soil and timber in Sandusky county. Geol. of O., v. 1, pt. 1, p. 595.
- Winchell. Soil and timber in Seneca county. Geol. of O., v. 1, pt. 1, pp. 612-13.
- Winchell. Soil in Wood county. Geol. of O., v. 2, pt. 1, p. 385.
- Winchell. Soil in Wyandot county. Geol. of O., v. 1, pt. 1, pp. 626-27.
- Wormley. Analyses. Rep. Prog. 1870, pp. 452-59.
- Wormley. Analysis of soil from Highland county. Rep. Prog. 1870, p. 262.
- Somerset.** Orton. Deep wells, explorations for natural gas in Clinton limestone. Rep. 1890, pp. 246-47.
- Spindle Crushers.** Bleining. Machinery used in cement grinding. O. Geol. Sur., Bull. No. 3, pp. 256-58.
- Springfield Limestone.** Hawes. Springfield stone as building stone. Geol. of O., v. 5, pp. 617-19.
- Orton. Springfield stone in Greene county. Geol. of O., v. 2, pt. 1, pp. 671-73.
- Lord, Wormley. Analyses of, from Clark county. O. Geol. Sur., Bull. No. 4, pp. 50-51.
- Orton, Jr., and Peppel. Composition, physical character and uses of, in Ohio. O. Geol. Sur., Bull. No. 4, pp. 148-48.

- Springs.** Mather. Mineral springs in Ohio. Ann. Rep. v. 1, 1837, p. 14.
- Orton. Springs in Greene county. Geol. of O., v. 2, pt. 1, pp. 691-94.
- Orton. Water supply of Pike county. Geol. of O., v. 2, pt. 1, pp. 639-41.
- Riddell. Yellow Springs, Greene county. O. Exec. Docs. 1836, Rep. No. 60, pp. 11-13.
- Winchell. Sulphur spring in Putnam county. Geol. of O., v. 2, pt. 1, pp. 395-96.
- Winchell. Wells and springs in Crawford county. Geol. of O., v. 2, pt. 1, pp. 248-49.
- Winchell. Wells and springs in Delaware county. Geol. of O. v. 2, pt. 1, pp. 306-08.
- Winchell. Wells and springs in Morrow county. Geol. of O., v. 2, pt. 1, pp. 267-68.
- Winchell. Wells and springs in Ottawa county. Geol. of O., v. 2, pt. 1, pp. 233-34.
- Winchell. Wells and springs in Paulding county. Geol. of O., v. 2, pt. 1, pp. 345-49.
- Winchell. Wells and springs in Sandusky county. Geol. of O., v. 1, pt. 1, pp. 609-10.
- Winchell. Wells and springs in Union county. Geol. of O., v. 2, pt. 1, pp. 332-33.
- Winchell. Wells and springs in Van Wert county. Geol. of O., v. 2, pt. 1, pp. 319-22.
- See also Mineral Springs.*

Stairways. Eno. Steel concrete used for stairways and elevator shafts. O. Geol. Sur., Bull. No. 2, pp. 145-47.

Standard Lime Company. Peppel. Description and plans of typical lime manufacturing establishments in Ohio. O. Geol. Sur., Bull. No. 4, pp. 360-65.

Star Fishes, see Paleontology.

- Stark County.** Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 296-99. Marlborough township, p. 299. Nimishillen township, p. 299. Osnaburg township, p. 299. Paris township, p. 299. Washington township, p. 299.
- Newberry. Geology. Geol. of O., v. 3, pp. 151-76.
- Newberry. Topography. Geol. of O., v. 3, pp. 151-55.
- Orton. Coal mines. Geol. of O., v. 5, pp. 229-44.

- Stark County.** Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 359-60.
- Orton. Iron ores of. Geol. of O., v. 5, pp. 386-99.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 126-27.
- Steam Pressure.** Peppel. Steam pressure to be employed in hardening sand-lime brick. O. Geol. Sur., Bull. No. 5, p. 46.
- Steel concrete.** Eno. Use of cement in steel concrete construction. O. Geol. Sur., Bull. No. 2, pp. 124-88.
- Eno. Steel concrete used for footings or foundations for skyscrapers. O. Geol. Sur., Bull. No. 2, pp. 139-43.
- Steubenville Shaft Coal.** Orton. Place in the coal series of Ohio. Geol. of O., v. 5, pp. 49-62.
- Stevenson, John J.** Reports on the geology of Carroll, Harrison, Guernsey, Muskingum and Belmont counties. Geol. of O., v. 3, pp. 177-287.
- Stone.** Eno. Specifications for stone used in concrete work. O. Geol. Sur., Bull. No. 2, p. 191.
See also Building Stone.
- Stoneware, see Pottery.*
- Stone Work.** Peppel. Preference of stone workers for high-calcium limes. O. Geol. Sur., Bull. No. 4, pp. 254-55.
- Straitsville District.** Orton. Coal mines. Geol. of O., v. 5, pp. 953-59.
- Street Paving.** Eno. Concrete used for street paving. O. Geol. Sur., Bull. No. 2, pp. 110-13.
- Stucco.** Eno. Cement stucco for walls. O. Geol. Sur., Bull. No. 2, pp. 48-49.
- Sub-carboniferous Limestone.** Orton. Sub-carboniferous limestone in Ohio. Geol. of O., v. 6, p. 42. Same, Rep. 1890, pp. 42-43.
- Orton. Sub-carboniferous in Ohio. Geol. of O., v. 7, pp. 35-36.
- Sub-carboniferous Sandstone.** Orton. Sub-carboniferous sandstones in Ohio. Geol. of O., v. 5, pp. 578-612.
- Sugar Grove Gas Field.** Bownocker. Sugar Grove gas field. O. Geol. Sur., Bull. No. 1, pp. 108-13.
- Sulphur.** Lord. Methods of determining sulphur in coal. Geol. of O., v. 5, pp. 1089-91.

- Summit County.** Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 295-96.
- Newberry. Geology. Geol. of O., v. 1, pt. 1, pp. 201-22. Geologic map of Summit county (colored), 12.4x21.3 cm.
- Newberry. Topography. Geol. of O., v. 1, pt. 1, pp. 201-05.
- Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 356-59.
- Sunbury Shale.** Prosser. Sunbury shale, formerly Berea shale, in the revised Ohio geological scale. O. Geol. Sur., Bull. No. 7, p. 19.
- Sunday Creek Valley.** Orton. Coal in Sunday Creek valley. Geol. of O., v. 5, pp. 926-44.
- Sycamore Oil Pool.** Bownocker. Wells in Monroe county. O. Geol. Sur., Bull. No. 1, p. 208.
- Tanks.** Eno. Use of steel concrete for tanks, silos and elevators. O. Geol. Sur., Bull. No. 2, pp. 153-58.
- Tanning.** Peppel. Use of hydrated lime in tanning processes. O. Geol. Sur., Bull. No. 4, p. 245.
- Telegraph Poles.** Eno. Concrete used for bases of telegraph poles. O. Geol. Sur., Bull. No. 2, pp. 118-20.
- Telephone Tunnels.** Eno. Concrete lining for Chicago telephone tunnel. O. Geol. Sur., Bull. No. 2, pp. 106-07.
- Temperanceville Oil Field.** Bownocker. Wells in Belmont county. O. Geol. Sur., Bull. No. 1, pp. 216-17.
- Temperature for Lime Burning.** Peppel. Discussion of amount of heat required for lime burning. O. Geol. Sur., Bull. No. 4, pp. 304-10.
- Terraces.** Newberry. Terraces in Cuyahoga county. Geol. of O., v. 1, pt. 1, pp. 181-83.
- Terra-cotta.** Orton, Jr. Manufacture of, in Ohio. Geol. of O., v. 5, pp. 719-21.
- Tertiary.** Foster. Tertiary of Muskingum, Licking and Franklin counties. Ann. Rep., v. 2, 1838, pp. 77-83.
- Newberry. Geol. of O., v. 1, pt. 1, pp. 84-85.
- Testing Methods.** Peppel. Methods of testing the product in the manufacture of lime. O. Geol. Sur., Bull. No. 4, pp. 316-18.
- Peppel. Methods of testing products of sand-lime brick manufacture. O. Geol. Sur., Bull. No. 5, pp. 48-52.
- Thacher System.** Eno. Thacher system of reinforced concrete. O. Geol. Sur., Bull. No. 2, pp. 134-35.

- Theresa Dam.** Eno. Use of steel concrete in dam construction. O. Geol. Sur., Bull. No. 2, p. 179.
- Thurston Gas Field.** Bownocker. Thurston gas field. O. Geol. Sur., Bull. No. 1, pp. 107-08.
- Orton. Thurston gas field. Rep. 1890, pp. 240-42.
- Ties.** Eno. Concrete for rail beds and ties. O. Geol. Sur., Bull. No. 2, pp. 108-10.
- Eno. Use of steel concrete for railroad ties. O. Geol. Sur., Bull. No. 2, pp. 174-78.
- Tile.** Orton, Jr. Tile manufacture in Ohio. Geol. of O., v. 7, pp. 239-40.
- Eno. Use of cement for tiling and figured work. O. Geol. Sur., Bull. No. 2, pp. 56-57.
- Winchell. Tile manufacture of Auglaize county. Geol. of O. v. 2, pt. 1, p. 408.
- See also Decorative Tile; Drain Tile; Floor Tile.*
- Tionesta Clay.** Orton. Tionesta clay in Ohio. Geol. of O., v. 7, p. 62.
- Tionesta Coal No. 3b.** Orton. Characteristics of Ohio coal. Geol. of O., v. 5, p. 160.
- Orton. Tionesta coal in Ohio. Geol. of O., v. 7, p. 276.
- Orton. Tionesta coal in Scioto and Lawrence counties. Geol. of O., v. 5, pp. 1039-40.
- Orton. Tionesta coal in Tuscarawas county. Geol. of O., v. 5, pp. 258-59.
- Wright. Tionesta coal in Holmes county. Geol. of O., v. 5, pp. 827-28.
- Tools.** Eno. Machinery and tools used in concrete and concrete mortar work. O. Geol. Sur., Bull. No. 2, pp. 223-248.
- Eno. Tools for cement work, with illustrations. O. Geol. Sur., Bull. No. 2, pp. 246-48.
- Topography, see Physical Geography.*
- Toronto Gas Field.** Bownocker. Wells in Jefferson county. O. Geol. Sur., Bull. No. 1, pp. 245-46.
- Tortoises, see Reptiles.*
- Tower Substructures.** Eno. Concrete bases for towers and monuments. O. Geol. Sur., Bull. No. 2, pp. 80-82.
- Travertine.** Orton, Jr., and Peppel. Travertine as source of portland cement material. O. Geol. Sur., Bull. No. 3, p. 97.

- Travertine.** Orton, Jr., and Peppel. Composition of, in Erie county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 62-63.
- Travertine Analysis.** Klippart. Travertine from Erie county. O. Geol. Sur., Bull. No. 4, p. 62.
- Trees, see Forests.*
- Trench Enclosures.** Fowke. Enclosures, roadways, etc., of aborigines in Ohio. Geol. of O., v. 7, pp. 5-16.
- Trenton Limestone.** Bownocker. Oil and gas producing rocks in Ohio. O. Geol. Sur., Bull. No. 1, pp. 18-19.
- Bownocker. Trenton in Sandusky county. O. Geol. Sur., Bull. No. 1, pp. 73-76.
- Bownocker. Trenton limestone as a source of oil and gas. O. Geol. Sur., Bull. No. 1, pp. 31-101.
- Bownocker. Trenton in Wood county. O. Geol. Sur., Bull. No. 1, pp. 59-65.
- Orton. Availability as a gas and oil rock in eastern Ohio. Prelim. Rep. on petroleum and inflammable gas. 1887, pp. 166-69.
- Orton. Trenton limestone as a source of petroleum and high pressure gas. Prelim. Rep. on petroleum and inflammable gas, Rep. 1886, pp. 30-54; 1887, pp. 45-79.
- Orton. Trenton limestone as a source of oil and gas in Ohio. Geol. of O., v. 6, pp. 101-310.
- Orton. Trenton limestone as a source of oil and gas in Ohio. Geol. of O., v. 6, pp. 784-92. Rep. 1890, pp. 105-226.
- Orton. Trenton limestone in geological series of Ohio. Prelim. Rep. on petroleum and inflammable gas, Rep. 1886, p. 18; 1887, pp. 25-28, 116-17.
- Orton. Trenton limestone in Ohio. Geol. of O., v. 5, pp. 4-7. Same, Rep. 1890, pp. 11-14. Geol. of O., v. 7, p. 416.
- Orton. Trenton limestone in northeastern Indiana as a source of gas and oil. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 170-76.
- Orton, Jr., and Peppel. Composition, physical character and uses in Ohio. O. Geol. Sur., Bull. No. 4, p. 138.
- Prosser. Reasons for retaining this name in revised geological scale of Ohio. O. Geol. Sur., Bull. No. 7, pp. 35-36.
- Trestle Bents.** Eno. Use of steel concrete in trestle bents. O. Geol. Sur., Bull. No. 2, p. 178.

- Triassic System.** Newberry. Geol. of O., v. 1, pt. 1, pp. 80-81.
- Trilobita, see Crustacea; Paleontology, Genera and Species,*
- Trumbull County.** Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 300-02.
- Orton. Coal mines. Geol. of O., v. 5, pp. 168-75. Brookfield township, p. 173. Hubbard township, p. 173. Liberty township p. 174. Vienna township, p. 173. Weathersfield township, pp. 174-75.
- Orton. Deep wells, drilling for oil and gas. Geol. of O., v. 6, p. 401.
- Orton. Iron ores. Geol. of O., v. 5, pp. 382-83.
- Read. Geology. Geol. of O., v. 1, pt. 1, pp. 493-509. Geologic map of Ashtabula, Trumbull, Lake and Geauga counties, 26.3x32 cm.
- Whittlesey. Clays. An. Rep., v. 2, 1838, pp. 67-69.
- Whittlesey. Coke. An. Rep., v. 2, 1838, pp. 61-63.
- Whittlesey. Important beds of coal. An. Rep., v. 2, 1838, pp. 60-62.
- Whittlesey. Iron ores. An. Rep., v. 2, 1838, pp. 66-67.
- Whittlesey. Lake ridges. An. Rep., v. 2, 1838, p. 55.
- Whittlesey. Limestone. An. Rep., v. 2, 1838, pp. 62-65.
- Whittlesey. Mineral springs. An. Rep., v. 2, 1838, p. 65.
- Whittlesey. Order of strata. An. Rep., v. 2, pp. 56-58.
- Whittlesey. Outline of the coal region. An. Rep., v. 2, 1838, pp. 58-60.
- Whittlesey. Topography. An. Rep., v. 2, 1838, pp. 54-55.
- Tube Mill.** Bleining. Grinding machines for cement manufacture. O. Geol. Sur., Bull. No. 3, pp. 273-76.
- Tully Limestone.** Winchell. Tully limestone in Defiance county. Geol. of O., v. 2, pt. 1, pp. 426-27.
- Tunnels.** Eno. Concrete in tunnel construction. O. Geol. Sur., Bull. No. 2, pp. 104-07.
- Eno. Use of steel concrete in tunnel lining. O. Geol. Sur., Bull. No. 2, p. 167.
- Turntables.** Eno. Use of steel concrete in turntables and ashpits. O. Geol. Sur., Bull. No. 2, p. 178.
- Turtles, see Reptiles.*

- Tuscarawas County.** Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 288-90. Lawrence township, p. 290. Mill township, p. 290. Oxford township, p. 289. Salem township, pp. 289-90. Warren township, p. 289. Warwick township, p. 290. Washington township, p. 289.
- Briggs. Geology. Ann. Rep., v. 2, 1838, pp. 145-54.
- Newberry. Geology. Geol. of O., v. 3, pp. 52-89. Geologic map (uncolored), 12.6x16.6 cm.
- Newberry. Topography. Geol. of O., v. 3, pp. 51-54.
- Orton. Coal mines. Geol. of O., v. 5, pp. 256-82.
- Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 369-70.
- Orton. Iron ores. Geol. of O., v. 5, pp. 386-99.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, p. 127.
- Root. Salt manufacture. Geol. of O., v. 6, p. 656.
- Tuscarawas Region.** Lord. Iron manufacture. Geol. of O., v. 5, pp. 464-68.
- Tuscarawas Valley.** Newberry. Geology. Geol. of O., v. 3, pp. 80-81.
- Ulrich, E. O.** New and little known lamellibranchiata from the Lower Silurian rocks of Ohio and adjacent states. Geol. of O., v. 7, pt. 2, pp. 6-93.
- Union County.** Orton. Oil and gas wells. Geol. of O., v. 6, pp. 269-70.
- Orton, Jr., and Peppel. Limestone formations of, important in lime industry. O. Geol. Sur., Bull. No. 4, p. 135.
- Winchell. Geology. Geol. of O., v. 2, pt. 1, pp. 324-34. Geologic map, 10.6x14 cm.
- Union Salt Company.** Bownocker. Methods of manufacture in use. O. Geol. Sur., Bull. No. 8, pp. 34-36.
- Winchell. Topography. Geol. of O., v. 2, pt. 1, pp. 324-26.
- United States.** Eno. Use of cements. O. Geol. Sur., Bull. No. 3, p. 21.
- Upper Clarion Coal.** Orton. Upper Clarion in Ohio. Geol. of O., v. 7, pp. 277-78.
- Upper Coal-measures.** Orton, Jr., and Peppel. Composition of limestones of, in Jefferson county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 84-85.

- Upper Freeport Coal (No. 7).** Orton. Characteristics of Ohio coal. Geol. of O., v. 5, pp. 167-68.
- Orton. Upper Freeport coal in Guernsey county. Geol. of O., v. 5, pp. 286-89.
- Orton. Upper Freeport in Jackson county. Geol. of O., v. 5, pp. 1026-27.
- Orton. Upper Freeport in Lawrence and Gallia county. Geol. of O., v. 5, pp. 1052-58.
- Orton. Upper Freeport in Muskingum county. Geol. of O., v. 5, pp. 878-84.
- Orton. Upper Freeport coal in Nelsonville district. Geol. of O. v. 5, pp. 984-87.
- Orton. Upper Freeport, or Coal No. 7, in Ohio. Geol. of O., v. 7, pp. 281-82.
- Orton. Upper Freeport in Sunday Creek valley. Geol. of O., v. 5, pp. 840-44.
- Orton. Upper Freeport in Vinton county. Geol. of O., v. 5, p. 1007.
- Upper Helderberg.** Orton. Lime production. Geol. of O., v. 6, pp. 706-07.
- Orton. Upper Helderberg in geological scale of Ohio. Prelim. Rep. on petroleum and inflammable gas, 1887, p. 121.
- Orton. Upper Helderberg in Ohio. Geol. of O., v. 6, pp. 20-22. Same, Rep. 1890, pp. 24-26.
- Orton. Upper Helderberg in Ohio. Geol. of O., v. 7, pp. 18-21.
- Whitfield. Species of fossils from the limestones. Geol. of O., v. 7, pt. 2, pp. 419-31.
- See also Corniferous Limestone.*
- Upper Kittanning Coal.** Orton. Upper Kittanning in Guernsey county. Geol. of O., v. 5, pp. 285-86.
- Upper Mercer Block Ore.** Analysis of ore from Muskingum county. Geol. of O., v. 5, p. 403.
- Upper Mercer Clay and Shale.** Orton. Upper Mercer clay and shale in clay industries. Geol. of O., v. 7, p. 62.
- Upper Mercer Coal.** Orton. Characteristics of Ohio coal seams. Geol. of O., v. 5, pp. 159-60.
- Orton. Upper Mercer in Lawrence and Scioto counties. Geol. of O., v. 5, pp. 1038-39.
- Orton. Upper Mercer in Nelsonville district. Geol. of O., v. 5, pp. 989-91.

- Upper Mercer Coal.** Orton. Upper Mercer coal in Ohio. Geol. of O., v. 7, pp. 275-76.
- Wright. Upper Mercer coal in Holmes county. Geol. of O., v. 5, pp. 825-27.
- Upper Mercer Limestone.** Orton, Jr., and Peppel. Composition, physical character and uses of, in Ohio. O. Geol. Sur., Bull. No. 4, pp. 172-73.
- Upper Silurian.** Newberry. Upper Silurian in Ohio. Geol. of O., v. 3, pp. 4-9.
- Orton. Upper Silurian in Butler county. Geol. of O., v. 3, pp. 399-401.
- Orton. Upper Silurian in Preble county. Geol. of O., v. 3, pp. 406-19.
- Prosser. Line of separation between Upper and Lower Silurian in revised geological scale of Ohio. O. Geol. Sur., Bull. No. 7, pp. 29-30.
- Prosser. Table showing formations included in this division in revised nomenclature of geological scale of Ohio. O. Geol. Sur., Bull. No. 7, p. 3.
- See also names of subdivisions; Paleontology.*
- Utica Shale.** Orton. Clinton, Medina, Hudson river and Utica shales as sources of gas. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 96-99. Edition 1886, pp. 66-68.
- Orton. Utica shale in geological series of Ohio. Prelim. Rep. on petroleum and inflammable gas, 1886, p. 19; 1887, pp. 28-29, 117-18.
- Orton. Utica shale in Ohio. Geol. of O., v. 6, pp. 7-9. Same, Rep. 1890, pp. 14-15.
- Orton. Utica shale in Ohio. Geol. of O., v. 7, pp. 6-8.
- Van Buren Gas Field.** Orton. Development. Prelim. Rep. on petroleum and inflammable gas, 1887, p. 136.
- Van Wert County.** Bownocker. Oil production. O. Geol. Sur., Bull. No. 1, pp. 96-99. Geologic map, Van Wert and other counties, showing oil and gas territories, 20.7x21 cm., opp. p. 80.
- Bownocker. Oil production. O. Geol. Sur., Bull. No. 1, pp. 96-99. Jennings township, p. 97. Liberty township, pp. 97-98. Ridge township, p. 97. York township, p. 97.
- Orton. Oil and gas wells. Geol. of O., v. 6, pp. 239-40.
- Orton, Jr., and Peppel. Composition of limestone of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 127-28.

- Van Wert County.** Winchell. Geology. Geol. of O., v. 2, pt. 1, pp. 314-23. Geologic map, 12.5x11.7 cm.
- Winchell. Topography. Geol. of O., v. 2, pt. 1, pp. 314-15.
- Vertebrata, see Batrachia; Birds; Fishes; Mammals; Reptiles.*
- Vinton County.** Andrews. Local Geology. Rep. Prog. 1870, pp. 92-126. Clinton township, pp. 118-23. Elk township, pp. 104-12. Jackson township, pp. 97-99. Madison township, pp. 95-96. Richland township, pp. 99-104. Swan township, pp. 96-97. Vinton township, pp. 117-18. Wilkesville township, pp. 123-25.
- Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 276-79. Brown township, p. 277. Clinton township, p. 279. Jackson township, pp. 277-78. Knox township, p. 278. Madison township, p. 277. Richland township, p. 277. Swan township, pp. 278-79. Vinton township, pp. 276-77.
- Orton. Coal mines. Geol. of O., v. 5, pp. 995-1011.
- Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, p. 394.
- Orton, Jr., and Peppel. Limestone resources of, small and unimportant. O. Geol. Sur., Bull. No. 4, p. 136.
- Orton, Jr., and Peppel. Occurrence of Ferriferous limestone in. O. Geol. Sur., Bull. No. 4, p. 182.
- Wadsworth Salt Company.** Bownocker. Discovery and process of manufacture of salt. O. Geol. Sur., Bull. No. 8, pp. 28-31.
- Walls.** Eno. Use of concrete in walls. O. Geol. Sur., Bull. No. 2, pp. 64-66.
- Eno. Use of steel concrete for walls. O. Geol. Sur., Bull. No. 2, p. 143.
- Eno. Use of concrete in retaining walls. O. Geol. Sur., Bull. No. 2, pp. 164-67.
- Wampum Ore.** Analysis. Geol. of O., v. 5, p. 459.
- Warren County.** Orton. Geology. Geol. of O., v. 3, pp. 381-91. Geologic map, 10.6x11.3 cm.
- Orton. Oil and gas wells. Geol. of O., v. 6, pp. 295-96.
- Orton. Topography. Geol. of O., v. 3, pp. 381-82.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 128-29.
- Washington County.** Andrews. Geology. Geol. of O., v. 2, pt. 1, pp. 453-508.

- Washington County.** Andrews. Geology of a part of Washington and Noble counties. Rep. Prog. 1869, pp. 123-27.
- Andrews. Local geology of. Geol. of O., v. 2, pt. 1, pp. 453-508. Adams township, pp. 474-77. Aurelius township, pp. 486-90. Barlow township, pp. 466-68. Belpre township, pp. 465-66. Decatur township, pp. 459-61. Dunham township, pp. 473-74. Fairfield township, pp. 461-62. Fearing township, pp. 490-92. Grand View township, pp. 507-08. Independence township, pp. 505-06. Jolly township, p. 508. Lawrence township, pp. 493-99. Liberty township, pp. 499-501. Ludlow township, pp. 506-07. Marietta township, pp. 492-93. Muskingum township, pp. 478-80. Newport township, pp. 501-05. Palmer township, pp. 463-64. Salem township, pp. 480-86. Union township, pp. 477-78. Warren township, pp. 472-73. Waterford township, pp. 469-72. Watertown township, pp. 468-69. Wesley township, pp. 462-63.
- Andrews. Topography. Geol. of O., v. 2, pt. 1, pp. 453-56.
- Bownocker. Oil and gas. O. Geol. Sur., Bull. No. 1, pp. 148-93. Geologic map, western half Washington county, showing oil and gas fields, 37.2x20.2 cm., opp. p. 128. Geologic map, eastern half Washington county, showing oil and gas fields, 29.8x22.5 cm., opp. p. 154.
- Bownocker. Wells in Lawrence township. O. Geol. Sur., Bull. No. 1, pp. 170-71.
- Bownocker. Wells in Salem township. O. Geol. Sur., Bull. No. 1, pp. 192-93.
- Hildreth. Geology. Ann. Rep., v. 1, 1837, pp. 25-54.
- Orton. Deep wells, drilling for oil and gas. Geol. of O., v. 6, pp. 398-401.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 129-32.
- Water.** Eno. Effect of water upon strength of mortar. O. Geol. Sur., Bull. No. 2, pp. 30-33.
- Orton. Water supply in Greene county. Geol. of O., v. 2, pt. 1, pp. 690-96.
- Orton. Water supply in Madison county. Geol. of O., v. 3, pp. 427-28.
- See also Mineral Springs; Springs.*
- Waterlime.** Gilbert. Waterlime group in Lucas county. Rep. Prog, 1870, p. 493. Geol. of O., v. 1, pt. 1, p. 575.
- Hill. Waterlime in Logan county. Geol. of O., v. 3, p. 487.

- Waterlime.** Hussey. Lower Helderberg, or waterlime, in Clinton and Fayette counties. Geol. of O., v. 3, pp. 444-447.
- Lord. Limestones for cement making. Geol. of O., v. 6, pp. 671-80.
- Newberry. Waterlime group of Cincinnati arch. Geol. of O., v. 1, pt. 1, pp. 135-39. Fossils, p. 136.
- Newberry. Waterlime in Erie county. Geol. of O., v. 2, pt. 1, p. 193.
- Newberry. Waterlime in Lake Erie islands. Geol. of O., v. 2, pt. 1, pp. 201-05.
- Newberry. Waterlime in Ohio. Geol. of O., v. 3, p. 9.
- Orton. Lime production. Geol. of O., v. 6, p. 706.
- Orton. Lower Helderberg, or waterlime, in Franklin county. Geol. of O., v. 3, pp. 600-03.
- Orton. Waterlime, or Lower Helderberg limestone, in geological series of Ohio. Prelim. Rep. on petroleum and inflammable gas 1886, pp. 22-23. Rep. 1887, pp. 33-34, 120-21.
- Orton. Lower Helderberg, or waterlime group. Geol. of O., v. 7, pp. 14-18.
- Orton, Jr., and Peppel. Composition of, in Clark county, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 50-52; in Fayette county, p. 63; in Hancock county, pp. 73-74; in Hardin county, p. 74; in Highland county, pp. 75-79; in Logan county, pp. 89-90; in Lucas county, pp. 90-91.
- Peppel. Use of, for crushed stone in Ohio. O. Geol. Sur., Bull. No. 4, pp. 216-22.
- Winchell. Waterlime in Allen county. Geol. of O., v. 2, pt. 1 pp. 399-401.
- Winchell. Waterlime in Delaware county. Geol. of O., v. 2, pt. 1, pp. 301-02.
- Winchell. Waterlime in Hancock county. Geol. of O., v. 2, pt. 1, pp. 361-64.
- Winchell. Waterlime in Hardin county. Geol. of O., v. 2, pt. 1, pp. 355-56.
- Winchell. Waterlime in Marion county. Geol. of O., v. 1, pt. 1, pp. 641-42.
- Winchell. Waterlime in Ottawa county. Geol. of O., v. 2, pt. 1, pp. 230-32.
- Winchell. Waterlime in Paulding county. Geol. of O., v. 2, pt. 1, p. 341.
- Winchell. Waterlime in Putnam county. Geol. of O., v. 2, pt. 1, pp. 388-91.

- Waterlime.** Winchell. Waterlime in Sandusky county. Geol. of O., v. 1, pt. 1, pp. 600-03. Woodville and Washington townships, p. 600. Jackson, Ballville and Sandusky townships, p. 601.
- Winchell. Waterlime quarries in Seneca county. Geol. of O., v. 1, pt. 1, pp. 617-19.
- Winchell. Waterlime in Union county. Geol. of O., v. 2, pt. 1, p. 329.
- Winchell. Waterlime in Van Wert county. Geol. of O., v. 2, pt. 1, pp. 317-18.
- Winchell. Waterlime in Wood county. Geol. of O., v. 2, pt. 1, pp. 374-79.
- Winchell. Waterlime in Wyandot county. Geol. of O., v. 1, pt. 1, pp. 632-36.
- See also Cement; Monroe formation.*
- Waterlime Analysis.** Waterlime from Columbiana county. Geol. of O., v. 3, p. 132.
- Newberry. Analysis of hydraulic limestone. Rep. Prog. 1870, pp. 52-53.
- Water Pipe.** Eno. Use of concrete for water pipes. O. Geol. Sur., Bull. No. 2, p. 94.
- Eno. Use of steel concrete for water pipes and conduits. O. Geol. Sur., Bull. No. 2, pp. 169-71.
- Water Supply.** Gilbert. Water supply in Lucas county. Rep. Prog. 1870, p. 498.
- Waverly Conglomerate.** Dawes. Building stones in Ohio. Geol. of O., v. 5, pp. 590-99.
- Waverly Group.** Andrews. Waverly in Fairfield county. Geol. of O., v. 2, pt. 1, pp. 593-94.
- Andrews. Waverly in the Hocking valley. Geol. of O., v. 3, pp. 816.
- Hall and Whitfield. Crinoidea. Geol. of O., v. 2, pt. 2, pp. 162-79.
- Herrick. Observations upon the so-called Waverly group in Ohio. Geol. of O., v. 7, pt. 2, pp. 495-515.
- Meek. Fossils. Geol. of O., v. 2, pt. 2, pp. 273-325.
- Newberry. Descriptions of fossil fishes. Geol. of O., v. 1, pt. 2, pp. 278-82.
- Newberry. List of fossils of the Waverly in Ohio. Geol. of O., v. 2, pt. 1, pp. 97-99.

- Waverly Group.** Newberry. Waverly group in Cuyahoga county. Geol. of O., v. 1, pt. 1, pp. 185-90.
- Newberry. Waverly in Lorain county. Geol. of O., v. 2, pt. 1, pp. 210-16.
- Newberry. Waverly in Mahoning county. Geol. of O., v. 3, pp. 783-84.
- Newberry. Waverly group in Ohio. Geol. of O., v. 3, pp. 19-23.
- Newberry. Waverly in Summit county. Geol. of O., v. 1, pt. 1, pp. 208-18.
- Orton. Waverly group in geological scale of Ohio. Geol. of O., v. 2, pt. 1, pp. 84-99. Prelim. Rep. on petroleum and inflammable gas, 1886, pp. 24-26; 1887, pp. 36-39. Geol. of O., v. 6, pp. 33-42. Rep. 1890, pp. 33-42. Geol. of O., v. 7, pp. 26-35.
- Orton. Waverly in Franklin county. Geol. of O., v. 3, pp. 638-43.
- Orton. Waverly in Pike county. Geol. of O., v. 2, pt. 1, pp. 618-30.
- Prosser. Discussion of formations of this series in the revised geological scale of Ohio. O. Geol. Sur., Bull. No. 7, pp. 18-22.
- Read. Waverly in Holmes county. Rep. Prog. 1870, pp. 474-75.
- Waverly Sandstone.** Andrews. Fossils of the Waverly. Rep. Prog. 1869, pp. 71-72.
- Andrews. Waverly sandstone group. Rep. Prog. 1870, pp. 59-62.
- Andrews. Waverly sandstone in Ohio. Rep. Prog. 1869, pp. 65-71. Section.
- Andrews. Waverly in Pickaway county. Geol. of O., v. 2, pt. 1, pp. 589-90.
- Briggs. Waverly sandstone series in Scioto, Lawrence, Gallia, etc., counties. Ann. Rep., v. 1, 1837, pp. 79-81.
- Orton. Waverly sandstone in Franklin county. Geol. of O., v. 3, pp. 639-42.
- Orton. Waverly sandstone in Pike county. Geol. of O., v. 2, pt. 1, pp. 621-24.
- Read. Waverly in Wayne county. Geol. of O., v. 3, pp. 538-39.
- Read. Waverly sandstone in Holmes county. Geol. of O., v. 3, pp. 544-45.
- Winchell. Waverly in Marion county. Geol. of O., v. 1, pt. 1, p. 643.

- Waverly Shales.** Orton. Waverly shales in Franklin county. Geol. of O., v. 3, p. 639.
- Orton. Waverly shales in Ross county. Geol. of O., v. 2, pt. 1, pp. 648-49.
- Wayne County.** Bownocker. Oil and gas production. O. Geol. Sur., Bull. No. 1, pp. 285-86.
- Orton. Deep wells, explorations for oil and gas. Geol. of O., v. 6, pp. 361-63.
- Read. Geology. Geol. of O., v. 3, pp. 529-42. Geologic map, Richland, Wayne, etc., counties, 31.7x42 cm.
- Read. Topography. Geol. of O., v. 3, pp. 529-530.
- Riddell. Geology of Richland, Wayne and Medina counties. Exec. Docs. 1836, Rep. No. 60, pp. 25-27.
- Waynesburg Coal.** Prosser. Correlation of Waynesburg, Pennsylvania, coal with coal No. 11 of Ohio. O. Geol. Sur., Bull. No. 7, p. 7.
- Weber System.** Eno. Weber system of reinforced concrete. O. Geol. Sur., Bull. No. 2, p. 137.
- Wells.** Winchell. Wells and springs in Allen county. Geol. of O., v. 2, pt. 1, pp. 402-03.
- Winchell. Wells and springs in Crawford county. Geol. of O., v. 2, pt. 1, pp. 248-49.
- Winchell. Wells and springs in Defiance county. Geol. of O., v. 2, pt. 1, pp. 434-37.
- Winchell. Wells and springs in Delaware county. Geol. of O., v. 2, pt. 1, pp. 306-08.
- Winchell. Wells and springs in Hancock county. Geol. of O., v. 2, pt. 1, p. 366.
- Winchell. Wells and springs in Henry county. Geol. of O., v. 2, pt. 1, p. 421.
- Winchell. Wells and springs in Morrow county. Geol. of O., v. 2, pt. 1, pp. 267-68.
- Winchell. Wells and springs in Paulding county. Geol. of O., v. 2, pt. 1, pp. 345-49.
- Winchell. Wells and springs in Putnam county. Geol. of O., v. 2, pt. 1, pp. 394-96.
- Winchell. Wells and springs in Union county. Geol. of O., v. 2, pt. 1, pp. 332-33.
- Winchell. Wells and springs in Van Wert county. Geol. of O., v. 2, pt. 1, pp. 319-22.

- Wellsburg Gas Field.** Orton. Berea grit as source of Wellsburg gas flow. Prelim. Rep. on petroleum and inflammable gas, 1887, pp. 85-86. Edition 1886, pp. 58-62.
- Wellsburg and Brilliant Gas Field.** Orton. Productive oil and gas fields in Ohio. Geol. of O., v. 6, pp. 337-40.
- Wellston Coal.** Orton. Wellston coal in Vinton county. Geol. of O., v. 5, p. 995.
- Orton. Wellston or Jackson Hill coal in Ohio. Geol. of O., v. 7, pp. 273-74.
- Werner, William C.** Catalogue of Ohio plants. Geol. of O., v. 7, pt. 2, pp. 56-406.
- West Sister Island.** Gilbert. Economic Geology. Geol. of O., v. 1, pt. 1, p. 590.
- Gilbert. Geological structure. Geol. of O., v. 1, pt. 1, pp. 588-91.
- Gilbert. Topography. Geol. of O., v. 1, pt. 1, p. 588.
- West Union Cliff Limestone.** Orton. West Union Cliff in Greene county. Geol. of O., v. 2, pt. 1, pp. 670-71.
- West Union Limestone.** Orton, Jr., and Peppel. Composition, physical character and uses of, in Ohio. O. Geol. Sur., Bull. No. 4, p. 148.
- Wet Slaking Process.** Peppel. Wet slaking process of manufacture of sand-lime brick. O. Geol. Sur., Bull. No. 5, pp. 19-20.
- Wheat, Alfred W.** Report on the geology of Medina county. Geol. of O., v. 3, pp. 362-80.
- Wheaton, J. M.** Report on the birds in Ohio. Geol. of O., v. 4, pp. 189-628.
- Whitacre Oil Pool.** Bownocker. Wells in Monroe county. O. Geol. Sur., Bull. No. 1, p. 207.
- Whitfield, R. P., and Hall, James.** Descriptions of invertebrate fossils mainly from the Silurian system. Geol. of O., v. 2, pt. 2, pp. 67-268.
- Whitfield, R. P.** Contributions to the Paleontology of Ohio. Geol. of O., v. 7, pt. 2, pp. 407-94.
- Whittlesey, Charles.** Geological report. An. Rep., v. 2, 1838, pp. 41-71.
- Topographical report on the region between the Scioto and Hocking rivers. An. Rep., v. 1, 1837, pp. 99-109.
- Williams County.** Gilbert. Geology. Rep. Prog. 1870, pp. 487-90.

- Williams County.** Gilbert. Geology. Geol. of O., v. 1, pt. 1, pp. 556-66.
- Gilbert. Topography. Geol. of O., v. 1, pt. 1, p. 557.
- Wilson Run Oil Pool.** Bownocker. Wells in Ludlow township, Washington county. O. Geol. Sur., Bull. No. 1, pp. 188-189.
- Winchell, N. H.** Geology of Sandusky, Seneca, Wyandot and Marion counties. Geol. of O., v. 1, pt. 1, pp. 593-645.
- Geology of Ottawa, Crawford, Morrow, Delaware, Van Wert, Union, Paulding, Hardin, Hancock, Putnam, Allen, Henry, Auglaize, and Defiance counties. Geol. of O., v. 2, pt. 1, pp. 227-438.
- Winget Block Machine.** Eno. Winget machine for making concrete blocks. O. Geol. Sur., Bull. No. 2, p. 239.
- Wingett P. O. Gas Wells.** Bownocker. Wells in Ludlow township, Washington county. O. Geol. Sur., Bull. No. 1, pp. 190-91.
- Wood.** Peppel. Use of wood as a fuel in burning lime in Ohio. O. Geol. Sur., Bull. No. 4, p. 272.
- Wood County.** Bownocker. Geology. O. Geol. Sur., Bull. No. 1, pp. 59-65.
- Bownocker. Oil production. O. Geol. Sur., Bull. No. 1, pp. 55-65. Geological map, Lucas, Ottawa, Wood, Sandusky, Seneca, Hancock and Wyandot counties to show oil and gas territories, 18x26.5 cm., opp. p. 56.
- Bownocker. Oil production. O. Geol. Sur., Bull. No. 1, pp. 55-65. Bloom township, p. 57. Freedom township, p. 58. Henry township, pp. 56-57. Liberty township, p. 56. Middleton township, pp. 55-56. Montgomery township, p. 58. Perry township, p. 58. Plain township, p. 56. Portage township, p. 57. Troy township, p. 58. Washington township, p. 56. Webster township, pp. 57-58.
- Briggs. Geology. Ann. Rep., v. 2, 1838, pp. 109-18.
- Orton. Gas and oil fields. Geol. of O., v. 6, pp. 223-39. Gas wells. Rep. 1890, pp. 133-56. Bloom township, pp. 133-38. Center and Plain townships, pp. 152-55. Henry township, pp. 140-51. Perry township, pp. 138-39. Portage township, pp. 151-52.
- Orton. Lime production. Geol. of O., v. 6, pp. 739-43.
- Orton. Oil field. Rep. 1890, pp. 306-15.
- Orton, Jr., and Peppel. Composition of limestones of, with reference to fitness for portland cement. O. Geol. Sur., Bull. No. 4, pp. 132-34.

- Wood County.** Riddell. Geology of Sandusky, Wood and Lucas counties. O. Exec. Docs. 1836, Rep. No. 60, pp. 19-23.
- Winchell. Geology. Geol. of O., v. 2, pt. 1, pp. 368-86. Geologic map, 12.6x16.5 cm.
- Winchell. Topography. Geol. of O., v. 2, pt. 1, pp. 368-70.
- Woodville White Lime Company.** Peppel. Description and plans of typical lime manufacturing establishments in Ohio. O. Geol. Sur., Bull. No. 4, pp. 355-59.
- Wormley, T. G.** Analysis of coal of 2d Geol. Dist. Rep. Prog. 1870, pp. 99, 100-02, 106, 112-13, 115, 195-96, 207, 223-33.
- Analyses of iron ores. Geol. of O., v. 2, pt. 1, pp. 604-06.
- Iron ore analyses from the 2d geological district. Rep. Prog. 1870, pp. 119-22, 165, 219-23.
- Analyses of minerals of 2d geological district. Geol. of O., v. 2 pt. 1, pp. 601-08.
- Report of the chemical department. Rep. Prog. 1870, pp. 403-62.
- Salt analyses. Geol. of O., v. 2, pt. 1, pp. 601-02.
- Wright, Albert A.** Mines in Holmes county. Geol. of O., v. 5, pp. 816-42.
- On the ventral armor of *Dinichthys*. Geol. of O., v. 7, pt. 2, pp. 620-26.
- Wright, G. Frederick.** Glacial boundary in Ohio. Geol. of O., v. 5, pp. 750-69.
- Wyandot County.** Bownocker. Geology. O. Geol. Sur., Bull. No. 1, p. 96.
- Bownocker. Oil production. O. Geol. Sur., Bull. No. 1, pp. 95-96. Crane township, p. 96. Crawford township, p. 95. Salem township, p. 95.
- Orton. Gas wells. Rep. 1890, pp. 174-82.
- Orton. Oil wells. Rep. 1890, pp. 220-22.
- Orton, Jr., and Peppel. Limestone resources of, important for lime industries. O. Geol. Sur., Bull. No. 4, p. 135.
- Winchell. Geology. Geol. of O., v. 1, pt. 1, pp. 625-39. Geologic map (colored), 2x10.8 cm.
- Winchell. Topography. Geol. of O., v. 1, pt. 1, pp. 625-26.
- Yellow Kidney Ore.** Orton. Yellow Kidney ore in Hanging Rock district. Geol. of O., v. 5, p. 433.

Zoar Limestone. Orton. Zoar limestone in Hanging Rock district. Geol. of O., v. 3, pp. 891-92.

Zoology. Kirtland. Report on collected specimens in botany and zoology in Ohio. Ann. Rep., v. 1, 1837, pp. 65-69.

———Kirtland. Zoology of Ohio. Ann. Rep., v. 2, 1838, pp. 157-200.

BULLETIN NUMBER SIX

PART TWO

A BIBLIOGRAPHY OF THE PUBLICATIONS RELATING TO THE
GEOLOGY OF OHIO OTHER THAN THOSE OF THE
STATE GEOLOGICAL SURVEY.

BY
MARY WILSON PROSSER.

LETTER OF TRANSMITTAL

PROF. EDWARD ORTON, JR., *State Geologist, Columbus, Ohio:*

SIR:—I have the honor to transmit herewith the manuscript for Part II, Bulletin Number Six, of the Geological Survey of Ohio, entitled "A Bibliography of the publications relating to the geology of Ohio other than those of the State Geological Survey."

Yours respectfully,

MARY WILSON PROSSER.



INTRODUCTION

Having on hand, for private use, some three hundred references to the geology of Ohio, I was requested by Professor Edward Orton, Jr., State Geologist, to complete the bibliography as a natural accompaniment to Part I, of this Bulletin. The work was undertaken, but must, on account of limited time, necessarily be regarded as little more than preliminary. In this connection I wish to state that I will be under great obligation if persons interested in this work will send in any further references to articles which have been overlooked.

I desire to take advantage of this opportunity to acknowledge my indebtedness to the Bibliographic Bulletins of the United States Geological Survey, to Mr. F. B. Weeks, Mr. Jesse E. Hyde and to all others who have kindly assisted me.

M. W. P.

A BIBLIOGRAPHY OF THE PUBLICATIONS RELATING TO
THE GEOLOGY OF OHIO, OTHER THAN THOSE OF
THE STATE GEOLOGICAL SURVEY.

Andrews, E. B. [Ebenezer Baldwin].

- Relation of the river terraces of southern Ohio to the drift and drift theories.
Proc. Am. Assoc. Adv. Sci., vol. XIII, 1860, pp. 319-321.
- Rock oil, its geological relations and distribution.
Am. Jour. Sci., 2d series, vol. XXXII, 1861, pp. 85-93, map and sections.
- Observations on a seam of coal.
Am. Jour. Sci., 2d series, vol. XXXVIII, 1864, pp. 194-199.
- Petroleum in its geological relations.
Am. Jour. Sci., 2d series, vol. XLII, 1866, pp. 33-43.
- Lower Carboniferous limestone in Ohio.
Am. Jour. Sci., 3d series, vol. I, 1871, pp. 91-92.
- [On peat bed under drift in Ohio.]
Am. Nat., vol. V, 1871, p. 522.
- Section along the Ohio from Adams to Lawrence counties.
Proc. Am. Phil. Soc., vol. XI, 1871, p. 245.
- Part II, Report of labors in the second geological district during the year 1870. [Coal-measure district.]
Abstract: Am. Nat., vol. VI, 1872, pp. 291-292.
Geol. Surv. Ohio Rept. Progress in 1870, pp. 55-251, 1871.
- Report on second geological district.
Abstract: Am. Jour. Sci., 3d series, vol. VI, 1873, p. 63.
Rept. Geol. Surv. Ohio, vol. I, 1873, pp. 225-364, maps.
- On the parallelism of coal seams.
Am. Jour. Sci., 3d series, vol. VIII, 1874, pp. 56-59.
Cincinnati Quart. Jour. Sci., vol. I, 1874, pp. 340-342.
- A comparison between the Ohio and West Virginia sides of the Alleghany coal fields.
Am. Jour. Sci., 3d series, vol. X, 1875, pp. 283-290.
Proc. Am. Assoc. Adv. Sci., vol. XXIV, pt. II, 1876, pp. 84-92.
- On the erosion of rocks.
Am. Jour. Sci., 3d series, vol. XII, 1876, pp. 304-305.
- Discovery of a new group of Lower Carboniferous rocks in southeastern Ohio.
Am. Jour. Sci., 3d series, vol. XVIII, 1879, p. 137.
- [Proposed corrections for a part of the geological atlas of Ohio.]
Am. Jour. Sci., 3d series, vol. XVIII, 1879, p. 410.

Anon.

Ten days in Ohio: from the diary of a naturalist.

Am. Jour. Sci., 1st series, vol. xxv, 1834, pp. 217-257.

—Miscellaneous observations made during a tour in May, 1835, to the falls of the Cuyahoga, near Lake Erie.

Am. Jour. Sci., 1st series, vol. xxxi, 1837, pp. 1-84, 20 figs.

—Prairies of Ohio.

Am. Jour. Sci., 1st series, vol. xxxiii, 1838, pp. 230-236.

From Western Monthly Magazine, Feb., 1836.

—New Trilobites.

Am. Jour. Sci., 1st series, vol. xxxiv, 1838, pp. 377-380, 3 figs.

—Notice of a geological map of the United States and the British provinces of North America by Jules Marcou, with explanatory text, geological sections and plates of fossils which characterize the formations.

Am. Jour. Sci., 2d series, vol. xvii, 1854, pp. 199-206.

—Discovery of the horns of an extinct species of ox in Ohio.

Am. Jour. Sci., 3d series, vol. x, 1875, p. 386.

—The paleontological labors of Prof. Joseph F. James.

Am. Geol., vol. i, 1888, pp. 323-327.

—The Columbian Exposition. Glacial drift and traces of Glacial man in Ohio.

Am. Geol., vol. xiii, 1894, pp. 112-114.

Anthony, J. G. [John Gould].

Fossil encrinure.

Am. Jour. Sci., 1st series, vol. xxxv, 1839, pp. 359-360.

—Description of a new fossil (*Calymene Bucklandii*).

Am. Jour. Sci., 1st series, vol. xxxvi, 1839, pp. 106-107, 2 figs.

—On an impression of the soft parts of an *Orthoceras*.

Quart. Jour. Geol. Soc., 1847, p. 256.

Abstract: Am. Jour. Sci., 2d series, vol. vi, 1848, pp. 132-133, 1 fig.

Armstrong, C. S.

Coal.

United States Geol. Surv., Min. Res. U. S. 1885, pp. 11-143. See p. 59.

Ashburner, C. A. [Charles Albert].

Geologic distribution of natural gas in the United States.

Eng. and Mining Jour., vol. xliii, 1887, pp. 38-39; 58-60; 76-77.

Trans. Am. Inst. Mining Eng., vol. xv, 1887, pp. 505-542, maps.

Ashburner, C. A. [Charles Albert.]

Coal.

United States Geol. Surv., Min. Res. U. S., 1887, pp. 224-377.

See p. 289.

—Coal.

United States Geol. Surv., Min. Res. U. S., pp. 168-382, 1888.

See p. 281.

Atwater, Caleb.

On the prairies and barrens of the west.

Am. Jour. Sci., 1st series, vol. i, 1818, pp. 116-125.

—Notice of the scenery, geology, botany, etc., of Belmont county, Ohio.

Am. Jour. Sci., 1st series, vol. i, 1818, pp. 226-230.

—On some ancient human bones, etc., with a notice of the bones of the Mastodon or Mammoth, and of various shells found in Ohio and the west.

Am. Jour. Sci., 1st series, vol. ii, 1820, pp. 242-246, 2 pls.

—Facts and remarks relating to the climate, diseases, geology and organized remains of parts of the state of Ohio, etc.

Am. Jour. Sci., 1st series, vol. xi, 1826, pp. 224-231.

Bancroft, T. B.

Coke manufactures in Ohio.

Ohio Min. Jour., vol. v, no. 2, 1887, pp. 30-38.

—Recent coal developments.

Ohio Min. Jour., vol. vi, no. 3, 1888, pp. 40-46.

Bannan, Benjamin, Daddow, S. H. [Samuel Harries] and.

Coal, iron and oil, or the practical American miner. Pottsville, 808 pp., maps, 1866.

Bascom, Florence.

A pre-Tertiary nepheline-bearing rock.

Jour. Geol., vol. iv, 1896, pp. 160-165.

—Classification of Ordovician strata in vicinity of Cincinnati, Ohio.

Proc. United States Nat. Mus., vol. xxx, No. 1442, 1906, pp. 1-66, pls. I-VII.

Bassler, R. S. [Ray Smith], **Harper, G. W.** and.

Catalogue of the fossils of the Trenton and Cincinnati periods occurring in the vicinity of Cincinnati, Ohio. Cincinnati, 34 pp., 1896.

Bassler, R. S., Nickles, J. M. and.

Synopsis of American fossil Bryozoa.

Bull. United States Geol. Surv., no. 173, 663 pp., 1900.

Baughman, A. G.

The Bellville gold region.

Ohio Arch. and Hist. Publications, 1904, pp. 83-87, 4 pls.

Bean, W. H.

Check and label list of Lower Silurian fossils found in the vicinity of Lebanon, Ohio.

Bell, T. J.

History of the water supply of the world. Geology Hamilton county. 134 pp., Cincinnati, 1882. See pp. 93-102.

Bendrat, T. A., Herrick, C. L. and.

Identification of an Ohio Coal-measures horizon in New Mexico. Am. Geol., vol. xxv, 1900, pp. 234-242.

Bigsby, J. J. [John Jeremiah].

[Strontianite bearing limestone on Lake Erie].

Am. Jour. Sci., 1st series, vol. iv, 1822, pp. 280-282.

Birkinbine, John.

The iron ores east of the Mississippi river.

United States Geol. Surv., Min. Res. U. S., 1887, pp. 39-103. See p. 56.

—The production of iron ores in various parts of the world.

United States Geol. Surv., 16th Ann. Rep., 1895, pt. III, Min. Res. U. S., pp. 21-218, 15 pls. See p. 40.

Blake, W. P. [William Phipps], Hitchcock, C. H. [Charles Henry], and.

Geological map of the United States. Statistics of mines and mining in the states and territories west of the Rocky mountains, 5th report, by R. W. Raymond, Washington, 1873.

Statistical atlas of the United States based on results of the 9th Census, 1870. Plates XIII, XIV, Washington, 1875.

Petermann's Mitteilungen, vol. XXI, 1875, pl. XVI.

Special report Smithsonian Institution for the Centennial, Washington, 1876.

Atlas of the United States and the world by Gray, Philadelphia, 1871.

Reproduced (probably) by F. Ratzel, "Die Vereinigten Staaten von Nord-Amerika," vol. I, München, 1878.

Bourne, Amos.

On the prairies and barrens of the west.

Am. Jour. Sci., 1st series, vol. II, 1820, pp. 30-34.

Bownocker, J. A. [John Adams.]

The paleontology and stratigraphy of the Corniferous rocks of Ohio.

Bull. Sci. Lab. Denison Univ., vol. XI, 1898, pp. 12-40, 7 pls.

Bownocker, J. A. [John Adams.]

- A deep pre-Glacial channel in western Ohio and eastern Indiana.
Am. Geol., vol. xxiii, 1899, pp. 178-182, 1 pl.
- History of the Little Miami river.
Ohio State Acad. Sci., Special Papers, No. 3, 1900, pp. 32-45,
map, 2 figs.
- The Corning oil and gas field.
Ohio Naturalist, vol. i, no. 4, 1901, pp. 49-59, 1 pl.
- The oil and gas producing rocks of Ohio.
Jour. Geol., vol. x, 1902, pp. 822-838. [Ohio State] Univ. Bull.,
series 7, no. 3, (Geol. series no. 4), 1902.
- The central Ohio natural gas fields.
Am. Geol., vol. xxxi, 1903, pp. 218-231, pl. xiv: [Ohio State]
Univ. Bull., series 7, no. 13, (Geol. series no. 5), 1903.
- The occurrence and exploitation of petroleum and natural gas in
Ohio.
Eng. and Mining Jour., vol. lxxviii, 1904, p. 268.
Am. Geol., vol. xxxiv, 1904, pp. 261-262.
Rept. Geol. Surv. Ohio, 4th series, Bull. no. 1, 320 pp., 6 pls.,
maps, 1903.
- Petroleum and gas producing rocks of Ohio.
United States Geol. Surv., Min. Res. U. S., 1904, pp. 635-718.
See p. 660.
- The salt deposits of northeastern Ohio.
Am. Geol., vol. xxxv, 1905, pp. 370-376, 1 pl.

Brainerd, Jehu.

- On quartz pebbles of the sandstone conglomerate, and reasons for
rejecting the theory of water detrition.
Proc. Am. Assoc. Adv. Sci., vol. v, 1851, p. 222.
Annals of Science, [Cleveland], vol. i, 1851, pp. 235-236.
- On some fossils of northern Ohio.
Proc. Am. Assoc. Adv. Sci., vol. vi, 1852, pp. 304-306.
- Fossil fishes, [Chagrin Falls, Ohio].
Annals of Science, [Cleveland], vol. i, 1853, pp. 18-19.
- Analysis of Berea sandstones.
Proc. Cleveland Acad. Sci., vol. i, 1874, pp. 144-146.

Burke, M. D. [Milo Darwin].

- Drift, its distribution and character in the vicinity of Cincinnati,
when considered as a probable source of water supply.
Jour. Cincinnati Soc. Nat. Hist., vol. xi, 1888-1889, pp. 69-75.

Byrem, Lawrence.

A concise description of the geological formations and mineral localities of the western states, designed as a key to the geological map of the same. 48 pp., Boston, 1843.

Campbell, M. R. [Marius Robison].

Huntington folio, West Virginia-Ohio.

United States Geol. Surv., Geol. Atlas U. S., folio no. 69, 1900.

Carll, J. F. [John Franklin].

Notes on the comparative geology of northeastern Ohio, northwestern Pennsylvania and western New York.

Second Geol. Surv. Pennsylvania, Rep. I, 127 pp., map, 1875.

See p. 57.

Abstract: Am. Jour. Sci., 3d series, vol. xi, 1876, p. 64.

—Second Geol. Surv., Pennsylvania.

Seventh Report on the oil and gas fields of western Pennsylvania, with additional unpublished well records, viii, 356 pp., 6 maps, sections, charts, Harrisburg, 1890. See Chapter XX.

Carr, E. P., Martin, J. O., and.

Soil survey of the Ashtabula area, Ohio.

United States Dept. Agr., Field Oper. Bur. Soils, 5th Rept., 1904, pp. 647-658, 1 fig.

Catlett, Charles.

Trenton limestone from Ohio and Indiana.

Bull. United States Geol. Surv., no. 60, 174 pp., 9 figs., 1890. See p. 161.

—[Trenton limestones from the natural gas belt.]

Bull. United States Geol. Surv., no. 168, 308 pp., 1900. See p. 261, and Bull. 148, p. 262.

Chamberlain, J. G.

The iron industries of Columbiana county.

Ohio Min. Jour., vol. 1, no. 2, 1883, pp. 74-82.

Chamberlin, T. C. [Thomas Chrowder].

The bearing of some recent determinations on the correlation of the eastern and western terminal moraines.

Am. Jour. Sci., 3d series, vol. xxiv, 1882, pp. 93-97.

—Report [on work on Quarternary geology].

United States Geol. Surv., 3d Ann. Rept., 1883, pp. 17-21.

Chamberlin, T. C. [Thomas Chrowder].

- Preliminary paper on the terminal moraine of the second Glacial epoch.
 United States Geol. Surv., 3d Ann. Rept., 1883, pp. 291-402. See p. 334.
 Abstracts: Am. Nat., vol. XIX, 1885, p. 153. Science, vol. IV, 1884, pp. 67-69.
 Petermann's Mitteilungen, vol. XXXI, 1885, pp. 90-91.
- Hillocks of angular gravel and disturbed stratification.
 Am. Jour. Sci., 3d series, vol. XXVII, 1884, pp. 378-390. See p. 380.
- The character of the outer border of the drift.
 Proc. Am. Assoc. Adv. Sci., vol. XXXII, 1884, p. 210.
- The rock-scorings of the great ice invasions.
 United States Geol. Surv., 7th Ann. Rept., 1888, pp. 155-248. See figs. 10, 11, 28, 29.
- Introduction. The glacial boundary in western Pennsylvania, Ohio, Kentucky, Indiana and Illinois, by G. F. Wright.
 Bull. United States Geol. Surv., no. 58, 1890, pp. 13-38.
- The altitude of the eastern and central portions of the United States during the Glacial period.
 Am. Geol., vol. VIII, 1891, pp. 233, 267-275. See p. 271. Discussed by W. Upham, *ibid*, p. 233.
- The diversity of the Glacial period.
 Am. Jour. Sci., 3d series, vol. XLV, 1893, pp. 171-200.
- The nature of the englacial drift of the Mississippi Basin.
 Jour. Geol., vol. I, 1893, pp. 47-60. See p. 54.
- The horizon of drumlin, osar and kame formation.
 Jour. Geol., vol. I, 1893, pp. 255-267, 1893. See p. 265.
 Abstract: Am. Geol., vol. XII, 1893, pp. 122-123.
- The glacial phenomena of North America.
 Geikie's Ice Age, 3d edit., 1894, pp. 724-775.
- [The age of the second terrace on the Ohio at Brilliant, Ohio].
 Jour. Geol., vol. IV, 1896, pp. 219-221.
- Supplementary hypothesis respecting the origin of the loess of the Mississippi valley.
 Jour. Geol., vol. V, 1897, pp. 795-802.

Chamberlin, T. C., and Leverett, Frank.

- Further studies of the drainage features of the Upper Ohio basin.
 Am. Jour. Sci., 3d series, vol. XLVII, 1894, pp. 247-283, 5 figs., 4 maps. Correction same vol., p. 483.
 Abstract: Am. Geol., vol. XIII, 1894, pp. 217-219.

Chamberlin, T. C., Leverett, Frank.

Outline of Glacial stages.

Dana's Manual, 4th edition, 1894, p. 969.

Chatard, T. M. [Thomas Mareau].

Blue Ohio sandstone.

Bull. United States Geol. Surv., no. 27, 80 pp., 1886. See p. 66.

—Sandstones from near Portsmouth. The "Peebles-Henley" or "Otway" building stone.

Bull. United States Geol. Surv., no. 64, 60 pp., 1890. See p. 45.

—Sandstones, cherts and sinters. Blue sandstone from near Cleveland.

Bull. United States Geol. Surv., no. 168, 308 pp., 1900. See p. 244, and Bull. no. 148, p. 247.

Christy, David.

Some views relating to North American geology, communicated in a letter from David Christy, Oxford, Ohio, to M de Verneuil, president of the Geological society of France, 12 pp. Oxford, Ohio, 1847.

—Letters on geology, being a series of communications originally addressed to Dr. John Locke, of Cincinnati, giving an outline of the geology of the west and southwest, together with an essay on the erratic rocks of [North America. 68 pp., 6 pls., Oxford, 1848.

—On the goniatite limestone of Rockford, Jackson county, Indiana. Proc. Am. Assoc. Adv. Sci., vol. v, 1851, pp. 76-80.

Claassen, Edward.

On erratic boulders in the valley of the Rocky river, Cuyahoga county.

Sixth Ann. Rept., Ohio State Acad. Sci., 1898, pp. 43-44.

Clapp, A.

Geological equivalents of the rocks of the Falls of the Ohio, and other strata in the western states.

Proc. Acad. Nat. Sci., Philadelphia, vol. i, 1841, pp. 18-19; 177-178.

Clarke, F. W. [Frank Wigglesworth].

Sandstone from Buena Vista.

Bull. United States Geol. Surv., no. 64, 60 pp., 1890. See p. 45.

—[Trenton limestone from Bryan, Kenton, and other localities].

Bull. United States Geol. Surv., no. 148, 306 pp., 1897. See p. 261, also Bull. no. 168, p. 260.

Clarke, F. W. [Frank Wigglesworth].

Analyses of rocks, laboratory of the United States Geological Survey, 1880-1889.

Bull. United States Geol. Surv., no. 168, 308 pp., 1900. See pp. 244, 259, 284.

—Analyses of rocks, laboratory of the United States Geological Survey, 1880-1903.

Bull. United States Geol. Surv., no. 228, 375 pp., 1904. See pp. 312, 344.

Clarke, F. W., and Hillebrand, W. F.

Analyses of rocks and analytical methods, United States Geological Survey, 1880-1896.

Bull. United States Geol. Surv., no. 148, 306 pp., 1897. See pp. 260, 261, 283.

Clarke, F. W., and Riggs, R. B.

Limestones from Ohio and Indiana.

Bull. United States Geol. Surv., no. 60, 174 pp., 9 figs., 1890.
See p. 161.

—Three samples of Utica shale from New Vienna.

Bull. United States Geol. Surv., no. 148, 306 pp., 1891. See p. 283, and Bull. no. 168, p. 284.

—Trenton limestone from New Vienna [and other localities].

Bull. United States Geol. Surv., no. 168, 308 pp., 1900. See p. 259 and Bull. no. 148, p. 260.

Clarke, J. M. [John Mason].

The Lower Silurian Trilobites of Minnesota.

Minnesota Geol. and Nat. Hist. Surv., Paleontology, vol. III, pt. II, 1897, pp. 695-759, 82 figs. See p. 710, figs. 14-16.

—The Oriskany fauna of Becraft mountain, Columbia county, New York.

Memoir New York State Mus., no. III, 128 pp., 9 pls., 1900.

New York State Mus., 53d Ann. Rept., vol. II, 128 pp., 9 pls., 1901. See pp. 8, 10.

—[Cincinnatian]: Classification of New York series of geologic formations.

New York State Mus., Handbook no. 19, 26 pp., 1903.

Clarke, J. M., and Hall, James.

Trilobites and other Crustacæ of the Oriskany, Upper Helderberg, Hamilton, Portage, Chemung and Catskill groups.

Paleontology New York, vol. VII, LXIV, 236 pp., 36 pls., 1888.

Clarke, J. M., and Hall, James.

An introduction to the study of the genera of Palæozoic Brachipoda, Part I.

Paleontology New York, vol. VIII, pt. I, XVI, 367 pp., 20 pls., 1892.

—Memoir on the Palæozoic reticulate sponges, constituting the family, Dietyospongiadæ.

Memoir New York State Mus., no. II, 350 pp., 70 pls., 45 figs., 1898. Fifteenth Ann. Rept., State Geol. [New York], 1898, vol. II, pp. 741-984, 47 pls.

New York State Mus., 49th Ann. Rep., 1898, vol. III, pp. 741-984, 47 pls.

—Memoir on the Palæozoic reticulate sponges, constituting the family, Dietyospongiadæ.

Memoir New York State Mus., no. II, 350 pp., 70 pls., 45 figs., 1898. Sixteenth Ann. Rept. State Geol. [New York], 1899, pp. 341-448, pls. 48-70.

New York State Mus., 50th Ann. Rept., 1899, vol. II, pp. 341-448, pls. 48-70.

Clarke, J. M., and Ruedemann, Rudolf.

The Guelph formation and fauna in the state of New York.

Memoir New York State Mus., no. V, 195 pp., 21 pls., 1903. See p. 131.

Clarke, J. M., and Schuchert, Charles.

The nomenclature of the New York series of geological formations [Cincinnatian].

Science, new series, vol. X, 1899, pp. 874-878.

Am. Geol., vol. XXV, 1900, pp. 114-120.

Clark, William.

Some new points on the fin attachment of *Dinichthys* and *Cladodus*.

Sixth Ann. Rept., Ohio State Acad. Sci., 1898, pp. 46-48, 3 figs.

Clark, W. B. [W. Blair].

Drainage Modifications in Knox, Licking and Coshocton counties.

Bull. Sci. Lab. Denison Univ., vol. XII, 1902, pp. 1-16, 3 pls.

Claypole, E. W. [Edward Waller].

On the pre-Glacial geography of the region of the Great Lakes.

Canadian Naturalist, vol. IX, 1877, pp. 187-206.

—On the occurrence of a tree-like fossil plant, *Glyptodendron*, in the Upper Silurian (Clinton) rocks of Ohio.

Am. Jour. Sci., 3d series, vol. XV, 1878, pp. 302-304.

—Pre-Glacial formation of the beds of the great American lakes.

Canadian Naturalist, vol. IX, new series, 1881, pp. 213-227.

Claypole, E. W. [Edward Waller].

- Evidence from the drift of Ohio, Indiana and Illinois in support of the pre-Glacial origin of the basins of Lakes Erie and Ontario. Proc. Am. Assoc. Adv. Sci., vol. xxx, 1882, pp. 147-159.
- On the occurrence of the genus *Dalmanites* in the Lower Carboniferous rocks of Ohio. Geol. Mag., new series, dec. III, vol. I, 1884, pp. 303-307.
- Preliminary note on some fossil wood from the Carboniferous rocks of Ohio. Proc. Am. Assoc. Adv. Sci., vol. xxxv, 1887, p. 219.
- The lake age in Ohio, or some episodes in the retreat of the North American glacier. Trans. Edinburgh Geol. Soc., vol. v, 1887, pp. 421-458, pls. Abstracts: Am. Nat., vol. xxii, 1887, p. 152. Am. Geol., vol. I, 1887, pp. 63-64. Pop. Sci. Monthly, vol. xxxiii, 1888, pp. 428-429. "Lake Cuyahoga; a study in Glacial geology." Proc. Am. Assoc. Adv. Sci., vol. xxxvi, 1888, p. 218.
- The future of natural gas. Am. Geol., vol. I, 1888, pp. 31-36.
- Singular subterranean commotion near Akron, Ohio. Am. Geol., vol. I, 1888, pp. 190-192.
- [Researches of Dr. William Clark, of Berea, Ohio]. Am. Geol., vol. II, 1888, pp. 62-64.
- Megalonyx in Holmes county, Ohio, 1890. Am. Geol., vol. VII, 1891, pp. 122-132; 149-153.
- On a deep boring near Akron, Ohio, and its significance. Am. Geol., vol. VIII, 1891, p. 239.
- Pre-Glacial drainage of Summit county. Bull. Geol. Soc. Am., vol. 2, 1891, p. 504.
- On a deep pre-Glacial river bed near Akron, Ohio. Proc. Am. Assoc. Adv. Sci., vol. XL, 1891, p. 259.
- A new gigantic placoderm from Ohio. Am. Geol., vol. X, 1892, pp. 1-4.
- The head of *Dinichthys*. Am. Geol., vol. X, 1892, pp. 199-207.
- A deep boring in the Pleistocene near Akron, Ohio. Bull. Geol. Soc. Am., vol. 3, 1892, pp. 150-151.
- An episode in the history of the Cuyahoga river. Proc. Am. Assoc. Adv. Sci., vol. XLI, 1892, p. 176.
- A new Coccosteian, *Coccosteus Cuyahogæ*. Am. Geol., vol. XI, 1893, pp. 167-171, 2 figs.

Claypole, E. W. [Edward Miller].

- The cladodont sharks of the Cleveland shale.
 Am. Geol., vol. XI, 1893, pp. 325-331, 2 pls.
 Abstract: Am. Nat., vol. XXVII, 1893, p. 1083.
- The three great fossil placoderms of Ohio.
 Am. Geol., vol. XII, 1893, pp. 89-99.
- On three new species of *Dinichthys*.
 Am. Geol., vol. XII, 1893, pp. 275-269, 1 pl., 3 figs.
- The Upper Devonian fishes of Ohio.
 Geol. Mag., dec. III, vol. x, 1893, pp. 443-448.
- Cladodus? magnificus*, a new Selachian.
 Am. Geol., vol. XIV, 1894, pp. 137-140, 1 pl.
- On a new placoderm, *Brontichtys Clarki*, from the Cleveland shale.
 Am. Geol., vol. XIV, 1894, pp. 379-380, 1 pl.
- On a new specimen of *Cladodus Clarki*.
 Am. Geol., vol. XV, 1895, pp. 1-7, 2 pls.
- Recent contributions to our knowledge of the cladodont sharks.
 Am. Geol., vol. XV, 1895, pp. 363-368.
- Actinophorus Clarki*, Newberry.
 Am. Geol., vol. XVI, 1895, pp. 20-25, 1 pl.
- The cladodonts of the Upper Devonian of Ohio.
 Rept. Brit. Assoc. Adv. Sci., 1895, p. 694.
- The great Devonian placoderms of Ohio, with specimens.
 Rept. Brit. Assoc. Adv. Sci., 1895, p. 695.
- On an unrecognized coal-horizon in northeastern Ohio.
 Third Ann. Rept., Ohio State Acad. Sci., 1895, pp. 9-12.
- On the Salina group in northeastern Ohio.
 Third Ann. Rept., Ohio State Acad. Sci., 1895, pp. 12-13.
- A new *Titanichthys*.
 Am. Geol., vol. XVII, 1896, pp. 166-169, 1 pl.
- The ancestry of the Upper Devonian placoderms of Ohio.
 Am. Geol., vol. XVII, 1896, pp. 349-360.
- Dinichthys Prentis-Clarki*.
 Am. Geol., vol. XVIII, 1896, pp. 199-201, 1 pl.
- Human relics in the drift of Ohio.
 Am. Geol., vol. XVIII, 1896, pp. 302-314.
- A new *Dinichthys*, *Dinichthys Kepleri*.
 Am. Geol., vol. XIX, 1897, pp. 322-324, 1 pl.
- A fossiliferous stalagmite in the Cuyahoga glen.
 Fifth Ann. Rept., Ohio State Acad. Sci., 1897, pp. 53-55.
- The Devonian era in the Ohio basin.
 Am. Geol., vol. XXXII, 1903, pp. 15-41, 7 pls.; pp. 79-105, 3 pls.;
 pp. 240-250; 312-322; 335-353.

Cobb, J. C. H.

The Hanging Rock iron district.

Ohio Min. Jour., vol. v, no. 4, 1887, pp. 112-116.

Coffey, G. N., Dorsey, C. W., and.

Soil survey of Montgomery county, Ohio.

United States Dept. Agr., Field Oper. Bur. Soils, 2d Rept., 1901
pp. 85-102, 3 pls., 4 figs.

Cohen, E.

Über das Meteoreisen von Cincinnati, Vereinigte Staaten.

Preus. Akad. d. Wissen. zu Berlin, Sitzungst., 1898, pp. 428-430.

Conrad, T. A. [Timothy Abbott].

Observations on the Silurian and Devonian systems of the United States, with description of new organic remains.

Jour. Philadelphia Acad. Sci., vol. VIII, 1842, pp. 228-235.

—Notes on American fossiliferous strata.

Am. Jour. Sci., 2d series, vol. XLVII, 1869, pp. 358-364.

Cooper, W. F. [William Funk].

Tabulated list of fossils known to occur in the Waverly of Ohio.

Bull. Sci. Lab. Denison Univ., vol. IV, 1888, pp. 123-130.

—The Waverly group.

Bull. Sci. Lab. Denison Univ., vol. V, 1890, pp. 24-32.

—Tabulated list of fossils known to occur in the Waverly of Ohio.

Bull. Sci. Lab. Denison Univ., vol. V, 1890, pp. 33-34.

—The Paleozoic formation.

Bull. Sci. Lab. Denison Univ., vol. IX, pt. I, 1895, pp. 1-10.

—Ohio correlations.

Geol. Surv. Michigan, vol. VII, pt. II, 1900, pp. 285-303.

Cooper, W. F., Lane, A. C., and.

Fossils of the Marshall and Coldwater.

Geol. Surv. Michigan, vol. VII, pt. II, 1900, pp. 252-284, 2 pls.

Cope, E. D. [Edward Drinker].

On some new Batrachia and fishes from the Coal-measures of Linton, Ohio.

Proc. Acad. Nat. Sci. Philadelphia, 1873, pp. 340-343.

—A continuation of researches among the Batrachia of the Coal-measures of Ohio.

Proc. Am. Phil. Soc., vol. XVI, 1877, pp. 573-578.

Paleontological Bull. no. 24.

- Cope, E. D.** [Edward Drinker].
 Second continuation among the Batrachia of the Coal-measures of Ohio.
 Paleontological Bull., no. 40.
- On new Paleozoic vertebrata from Illinois, Ohio and Pennsylvania.
 Proc. Am. Phil. Soc., vol. xxxv, 1897, pp. 71–91, 3 pls.
- Cummings, E. R.** [Edgar Roscoe].
 A section of the Upper Ordovician at Vevay, Indiana.
 Am. Geol., vol. xxviii, 1901, pp. 361–381, 2 pls. See p. 372.
- A revision of the Bryozoan genera *DeKayia DeKayella* and *Heterotrypa* of the Cincinnati group.
 Am. Geol., vol. xxix, 1902, pp. 197–217, 4 pls.
- The Morphogenesis of *Platystrophia*. A study of the evolution of a Paleozoic Brachiopod.
 Am. Jour. Sci., 4th series, vol. xv, 1903, pp. 1–48; 121–136, 27 figs., 1 map.
- Cummings, E. R., Prosser, C. S.**, assisted by.
 The Waverly formations of central Ohio.
 Am. Geol., vol. xxxiv, 1904, pp. 335–361, 3 pls.
- Cushing, H. P.** [Henry Platt].
 Notes on the Berea grit in northeastern Ohio.
 Proc. Am. Assoc. Adv. Sci., vol. xxxvi, 1888, pp. 213–215.
- Daddow, S. H.** [Samuel Harries], and **Bannan, Benjamin**.
 Coal, iron and oil, or the practical American miner. Pottsville, 808 pp., maps, 1866.
- Daly, R. A.** [Reginald Aldworth].
 The calcareous concretions of Kettle Point, Lambton county, Ontario.
 Jour. Geol., vol. viii, 1900, pp. 135–150, 7 figs.
- Dana, J. D.** [James Dwight].
 Note on a fossil *Echinoderm* from the blue limestone (Lower Silurian) of Cincinnati.
 Am. Jour. Sci., 2d series, vol. xxxv, 1863, p. 295.
- The surface geology of Ohio. J. S. Newberry.
 Abstract: Am. Jour. Sci., 3d series, vol. ix, 1875, pp. 468–469.
- Darton, N. H.** [Nelson Horatio].
 Bibliography of North American geology for 1886.
 Bull. United States Geol. Surv., no. 44, 35 pp., 1887.

Darton, N. H. [Nelson Horatio].

An account of the progress in North American geology in the year 1886.

Smithsonian Rept. for 1886-1887, pp. 189-229, 1889. [Reprint].

—Record of North American geology for 1887 to 1889, inclusive.

Bull. United States Geol. Surv., no. 75, 173 pp., 1891.

—Record of North American geology for 1890.

Bull. United States Geol. Surv., no. 91, 88 pp., 1891.

—Catalogue and index of contributions to North American geology 1732-1891.

Bull. United States Geol. Surv., no. 127, 1045 pp., 1896.

—Preliminary list of deep borings in the United States, pt. II.

United States Geol. Surv., Water-Supply and Irrigation Papers, no. 61, 67 pp., 1902.

Davis, H. J.

Modification in the Jonathan creek drainage basin.

Bull. Sci. Lab. Denison Univ., vol. xi, 1899, pp. 165-173, 2 pls.

Davis, W. M. [William Morris].

On the classification of lake basins.

Proc. Boston Soc. Nat. Hist., vol. xxi, 1883, pp. 315-381.

Abstracts: Am. Jour. Sci., 3d series, vol. xxiv, 1882, p. 230.

Am. Nat., vol. xvi, 1882, pp. 1028-1029.

—Gorges and waterfalls.

Am. Jour. Sci., 3d series, vol. xxviii, 1884, pp. 123-132

Dawson, J. W. [Sir John William].

On American Devonian.

Am. Jour. Sci., 2d series, vol. xxxv, 1863, pp. 309-311.

—On spore cases in coals.

Am. Jour. Sci., 3d series, vol. i, 1871, pp. 256-263.

Day, D. T. [David Talbot].

Bromine.

United States Geol. Surv., Min. Res. U. S., 1885, pp. 851-853.

—Gypsum and gypsum products.

United States Geol. Surv. Min. Res. U. S., 1904, pp. 1033-1045.

See p. 1036.

Day, W. C. [William Cathcart].

Stone.

United States Geol. Surv., Min. Res. U. S., 1892, pp. 373-440.

See p. 416.

—Stone.

United States Geol. Surv., 16th Ann. Rept., 1895, pt. iv, Min. Res. U. S., pp. 436-510, 4 pls. See p. 491.

Day, W. C. [William Cathcart].

Stone.

United States Geol. Surv., 17th Ann. Rept., 1896, pt. III, Min. Res. U. S., pp. 759-811, 2 pls. See p. 780.

—Stone.

United States Geol. Surv., 18th Ann. Rept., 1897, pt. v, Min. Res. U. S., pp. 949-1068. See p. 1025.

—Stone.

United States Geol. Surv., 19th Ann. Rept., 1898, pt. VI, Min. Res. U. S., pp. 205-309. See p. 302.

—Stone.

United States Geol. Surv., 20th Ann. Rept., 1899, pt. VI, Min. Res. U. S., pp. 269-464. See p. 429.

Dean, Bashford.

A new cladodont from the Ohio Waverly, *Cladoselache Newberryi* n. sp.

Trans. New York Acad. Sci., vol. XIII, 1894, pp. 115-118, 1 pl.

—On two new Arthrodiros from the Cleveland shale of Ohio.

Mem. New York Acad. Sci., vol. II, 1901, pp. 86-100, 5 pls., 2 figs.

—On the characters of *Mylostoma* Newberry.

Mem. New York Acad. Sci., vol. II, pt. III, 1901, pp. 101-109, 6 figs., 2 pls.

—The preservation of muscle fibres in sharks of the Cleveland shale.

Am. Geol., vol. XXX, 1902, pp. 273-278, 2 pls.

Dean, G. W.

Catalogue of the shell-bearing Mollusca of Portage county, Ohio. Am. Nat., vol. XXVI, 1892, pp. 11-23.

Delafield, James.

Notices of the sulphate of strontian of Lake Erie and Detroit river.

Am. Jour. Sci., 1st series, vol. IV, 1822, pp. 279-280.

Dennis, D. W.

The east-west diameter of the Silurian island about Cincinnati.

Am. Nat., vol. XXII, 1888, p. 94.

Desor, Edouard.

Des alluvions marines et lacustres et du terrain erratique de l'Amérique du Nord.

Bull. Soc. Géol. France, 2d series, vol. VII, 1850, pp. 623-631.

—[Note on the terraces of Lake Erie, etc. Letters from Whittlesey and Lapham].

Proc. Boston Soc. Nat. Hist., vol. III, 1851, pp. 291-292.

Desor, Edouard.

Note sur le terrain quaternaire de l'Amérique du Nord.

Bull. Soc. Géol. France, 2d series, vol. ix, 1852, pp. 281-285.

Annual of Sci. Discovery 1853, pp. 269-272.

Dorsey, C. W., and Coffey, G. N.

Soil survey of Montgomery county, Ohio.

United States Dept. Agr., Field Oper. Bur. Soils, 2d Rept., 1901,
pp. 85-102, 3 pls., 4 figs.

Drake, Daniel.

Geological account of the valley of the Ohio.

Trans. Am. Phil. Soc., vol. ii, new series, 1825, pp. 124-139.

Dutton, C. E. [Clarence Edward].

The Charleston earthquake of August 31st, 1886.

United States Geol. Surv., 9th Ann. Rept., 1889, pp. 341-344.

Eakins, L. G.

Sandstone from Berea.

Bull. United States Geol. Surv., no. 60, 174 pp., 9 figs., 1890. See
p. 158.

—Sandstones, cherts and sinters. Sandstone from Berea.

Bull. United States Geol. Surv., no. 168, 308 pp., 1900. See p.
244, and Bull. no. 148, p. 247.

Eastman, C. R. [Charles Rochester].

Preliminary note on the relations of certain body-plates in the
Dinichthyids.

Am. Jour. Sci., 4th series, vol. ii, 1896, pp. 46-50.

Eaton, Amos.

Geological text-book prepared for popular lectures on North Amer-
ican geology, with applications to agriculture and the arts,
vii, 63 pp., map, Albany, 1830. Second edition, 134 pp., with
separate geological map, Albany, 1832.

Eckel, E. C. [Edwin Clarence].

The American cement industry.

Bull. United States Geol. Surv., no. 260, Contributions to eco-
nomic geology, 1904, pp. 496-505. See pp. 498, 503.

—Cement materials and industry of the United States.

Bull. United States Geol. Surv., no. 243, 395 pp., 15 pls., 1905.
See pp., 269, 352, 1 pl.

Ede, J. A.

Development of No. 2, or Wellston coal.

Ohio Min. Jour., whole no. 23, 1895, pp. 68-73.

Evans, E. W.

On the action of oil wells.

Am. Jour. Sci., 2d series, vol. xxxviii, 1864, pp. 159-166.

Faber, C. L.

Remarks on some fossils of the Cincinnati group.

Jour. Cincinnati Soc. Nat. Hist., vol. ix, no. 1, 1886-1887, pp. 14-20, 1 pl.

Faber, C. L., Miller, S. A., and.

Description of some Subcarboniferous and Carboniferous Cephalopoda.

Jour. Cincinnati Soc. Nat. Hist., vol. xiv, 1891-1892, pp. 164-168, 1 pl.

—Some new species and new structural parts of fossils.

Jour. Cincinnati Soc. Nat. Hist., vol. xv, 1892-1893, pp. 79-87.

Abstract: Am. Geol., vol. x, 1892, pp. 316-317.

—New species of fossils from the Hudson River group, and remarks upon others.

Jour. Cincinnati Soc. Nat. Hist., vol. xvii, 1894-1895, pp. 22-33, 1 pl.

—Description of some Cincinnati fossils.

Jour. Cincinnati Soc. Nat. Hist., vol. xvii, 1894-1895, pp. 137-158.

Featherstonhaugh, G. W. [George William].

Report of a geological reconnaissance made in 1835 from the seat of government by the way of Green Bay and the Wisconsin territory to the Coteau du Prairie, an elevated ridge dividing the Missouri from the St. Peters river, 168 pp., 4 pls., Washington, 1836.

Flynn, B. H. [Benjamin Harrison], and Flynn, M. S.

The natural features and economic development of the Sandusky, Maumee, Muskingum and Miami drainage areas in Ohio.

United States Geol. Surv., Water-Supply and Irrigation Papers no. 91, 130 pp., 1904.

Flynn, M. S. [Margaret Sutherland], Flynn, B. H., and.

The natural features and economic development of the Sandusky Maumee, Muskingum and Miami drainage areas in Ohio.

United States Geol. Surv., Water Supply and Irrigation Papers no. 91, 130 pp., 1904.

Foerste, A. F.

The Clinton group of Ohio, [with descriptions of new species].

Bull. Sci. Lab. Denison Univ., vol. i, 1885, pp. 63-120, 2 pls., 3 figs.

Foerste, A. F.

Flint Ridge Bryozoa.

- Bull. Sci. Lab. Denison Univ., vol. II, 1887, pp. 71-88, 1 pl.
- The Clinton group of Ohio. Part II.
Bull. Sci. Lab. Denison Univ., vol. II, 1887, pp. 89-110, 1 pl.
- The Clinton group of Ohio. Part III.
Bull. Sci. Lab. Denison Univ., vol. II, 1887, pp. 149-176.
- Notes on a geological section at Todd's Fork, Ohio.
Am. Geol., vol. II, 1888, pp. 412-419, 5 figs.
- The Clinton group of Ohio. Part IV.
Bull. Sci. Lab. Denison Univ., vol. III, 1888, pp. 3-12.
- Notes on Paleozoic fossils. Cambrian.
Bull. Sci. Lab. Denison Univ., vol. III, 1888, pp. 117-137, 1 pl.
- The age of the Cincinnati anticlinal.
Am. Geol., vol. VII, 1891, pp. 97-109.
- On the Clinton oölitic iron ores.
Am. Jour. Sci., 3d series, vol. XLI, 1891, pp. 28-29.
- An examination of *Glyptodendron* Clappole, and of other so-called Silurian land plants from Ohio.
Am. Geol., vol. XII, 1893, pp. 133-141, 1 pl.
- Remarks on specific characters in *Orthoceras*.
Am. Geol., vol. XII, 1893, pp. 232-236, 7 figs.
- On Clinton conglomerates and wave marks in Ohio and Kentucky.
With a résumé of our knowledge of similar occurrences in other Silurian strata of these states, and their evidence upon probable land conditions.
Jour. Geol., vol. III, 1895, pp. 50-60, 169-197.
- An account of the Middle Silurian rocks of Ohio and Indiana, including the Niagara and Ohio Clinton and the bed at the top of the Lower Silurian strata, formerly considered the Medina.
Jour. Cincinnati Soc. Nat. Hist., vol. XVIII, 1895-1896, pp. 161-199.
- Age and development of the Cincinnati anticline.
Abstract: Science, new series, vol. X, 1899, p. 488.
- A general discussion of the middle Silurian rocks of the Cincinnati anticlinal region with their synonymy.
Indiana Dept. Geol. and Nat. Res., 24th Ann. Rept., 1900, pp. 41-80.
- Further studies on the history of the Cincinnati anticline.
Abstract: Science, new series, vol. XI, 1900, p. 145.
- The Cincinnati anticline in southern Kentucky.
Am. Geol., vol. XXX, 1902, pp. 359-369, 1 pl.

Foerste, A. F.

The Richmond group along the western side of the Cincinnati anticline in Indiana and Kentucky.

Am. Geol., vol. xxxi, 1903, pp. 333-361, 2 pls.

—The Cincinnati group in western Tennessee between the Tennessee river and the central basin.

Jour. Geol., vol. xi, 1903, pp. 29-45, 1 fig.

—Silurian and Devonian limestones of western Tennessee.

Jour. Geol., vol. xi, 1903, pp. 554-583, 6 figs.; pp. 679-715, 4 figs.

—Variation in thickness of the subdivisions of the Ordovician of Indiana. With notes on the range of certain fossils.

Am. Geol., vol. xxxiv, 1904, pp. 87-102, 1 pl.

—Notes on the distribution of Brachiopoda in the Arnheim and Waynesville beds.

Am. Geol., vol. xxxvi, 1905, pp. 244-250.

—The Ordovician-Silurian contact in the Ripley island area of southern Indiana, with notes on the age of the Cincinnati anticline.

Am. Jour. Sci., 4th series, vol. xviii, 1904, pp. 321-342, 1 pl.

Foshay, P. M. [P. Max.]

Pre-Glacial drainage and recent geological history of western Pennsylvania.

Am. Jour. Sci., 3d series, vol. xl, 1890, pp. 397-403.

Foster, J. W.

Head of the *Mastodon giganteum*.

Am. Jour. Sci., 1st series, vol. xxxvi, 1839, pp. 189-191, 2 figs.

—On the Mountain limestone of the eastern United States.

Bull. Soc. Géol. France, vol. xii, 1841, pp. 86-87.

—Immense coal beds in Perry county.

Am. Jour. Sci., 2d series, vol. xii, 1851, p. 282.

—On fossil fish in the coal rocks of Ohio.

Am. Jour. Sci., 2d series, vol. xii, 1851, pp. 282-283.

—[On the occurrence of mastodon remains in Ohio].

Proc. Boston Soc. Nat. Hist., vol. iii, 1851, pp. 111-113; 114-115; 116.

—On the alternations of marine and terrestrial organic remains in the Carboniferous series of Ohio.

Proc. Am. Assoc. Adv. Sci., vol. vi, 1852, pp. 301-304.

—On the geological position of the deposits in which occur the remains of the fossil elephant of North America.

Proc. Am. Assoc. Adv. Sci., vol. x, pt. ii, 1857, pp. 148-169.

Foster, J. W., and Whitney, J. D.

- Report on the geology of the Lake Superior land district. Part II.
The iron region together with the general geology.
United States Senate, Exec. Doc., no. 4, special sess., March,
1851, pp. v, 1-139; 190-202; 274-284. See p. 5.

Fowke, Gerard.

- A contribution to the knowledge of the pre-Glacial drainage of Ohio.
Part II. Pre-Glacial and recent drainage channels in Ross
county, Ohio.
Bull. Sci. Lab. Denison Univ., vol. ix, 1895, pp. 15-24, 1 pl.
—Pre-Glacial drainage in the vicinity of Cincinnati, Ohio; its relation
to the origin of the modern Ohio river, and its bearing upon
the question of the southern limits of the ice sheet.
Bull. Sci. Lab. Denison Univ., vol. xi, 1898, pp. 1-10, 1 pl.
—Pre-Glacial drainage conditions in the vicinity of Cincinnati.
Ohio State Acad. Sci., Special Papers, no. 3, 1900, pp. 68-75, 2
maps.

Fuller, M. L. [Myron Leslie].

- Evidences of caves of Put-in-Bay, Ohio, on question of land tilting.
Abstract: Science, new series, vol. xx, 1904, p. 761.
—Bibliographic review and index of papers relating to underground
waters, 1879-1904.
United States Geol. Surv., Water-Supply and Irrigation Papers,
no. 120, 128 pp., 1905.

Fuller, M. L., Lines, E. F., and Veatch, A. C.

- Record of deep well drilling for 1904.
Bull. United States Geol. Surv., no. 264, 103 pp., 1905. See pp.
60 and 91.

Gannett, Henry.

- A dictionary of altitudes in the United States.
Bull. United States Geol. Surv., no. 5, 325 pp., 1884.
—Boundaries of the United States and of the several states and ter-
ritories, with a historical sketch of the territorial changes.
Bull. United States Geol. Surv., no. 13, 135 pp., 1885. See p. 110.
—A dictionary of altitudes in the United States. Second edition.
Bull. United States Geol. Surv., no. 76, 393 pp., 1891.
—Magnetic declination in the United States.
United States Geol. Surv., 17th Ann. Rept., pt. 1, 1896, pp. 203-
440, 2 pls. See p. 261.
—A dictionary of altitudes in the United States.
Bull. United States Geol. Surv., no. 160, 775 pp., 1899.

Gannett, Henry.

Boundaries of the United States, states and territories, with outline of history of important changes. Second edition.

Bull. United States Geol. Surv., no. 171, 142 pp., 53 pls., 1900.
See p. 116 and pl. xxxix.

—Boundaries of the United States and of the several states and territories, with an outline of the history of all important changes of territory. Third edition.

Bull. United States Geol. Surv., no. 226, 145 pp., 1904. See p. 117.

Gazlay, Sayrs.

Notices of fossil wood in Ohio.

Am. Jour. Sci., 1st series, vol. xxv, 1834, pp. 104-107.

Geib, W. J., Rice, T. D., and.

Soil survey of Coshocton county.

United States Dept. Agr., [Advance sheets], Field Oper. Bur. Soils, 20 pp., 1 fig., 1 map, 1905.

Gilbert, G. K. [Grove Karl].

On certain Glacial and post-Glacial phenomena of the Maumee valley.

Am. Jour. Sci., 3d series, vol. i, 1871, pp. 339-345.

—Some facts in regard to the surface geology of the Maumee valley.
Proc. New York Lyceum Nat. Hist., vol. i, 1871, pp. 175-178.

—Report on the geology of Williams, Fulton, and Lucas counties.

Abstract: Am. Jour. Sci., 3d series, vol. iii, 1872, p. 220.

Geol. Surv. Ohio, Rept. progress 1870, pt. vii, 1871, pp. 485-499.

—The history of the Niagara river.

New York State Reservation at Niagara, 6th Rept., 1890, pp. 61-84, pls. 1-8.

—From the Ohio to the Mississippi river.

Congrès Géol. Internat., Compte rendu, 5me session, 1893, pp. 289-290.

—Recent earth movement in the Great Lakes region.

United States Geol. Surv., 18th Ann. Rept., pt. ii, 1897, pp. 620-624.

Girty, G. H. [George Herbert].

The Waverly group in northeastern Ohio.

Science, new series, vol. xiii, 1901, p. 664.

—Comparison of sections of upper Paleozoic rocks in Ohio and northeastern Pennsylvania.

Science, new series, vol. xix, 1904, pp. 24-25.

Girty, G. H. [George Herbert].

The relations of some Carboniferous faunas.

Proc. Washington Acad. Sci., vol. VII, 1905, pp. 1-26. See p. 5.

Gordon, C. H.

Geological report on Saranac county, Michigan.

Geol. Surv. Michigan, vol. VII, pt. III, 34 pp., 4 pls., 2 figs., map,
1900. See p. 9.

[**Grabau, Amadeus.**]

[Greenfield limestone].

Science, new series, vol. VIII, 1898, p. 800.

Granger, Ebenezer.

Notice of vegetable impressions on the rocks connected with the
coal formation of Zanesville, Ohio.

Am. Jour. Sci., 1st series, vol. III, 1821, pp. 5-7, 2 pls.

—Notice of a curious fluted rock at Sandusky bay, Ohio.

Am. Jour. Sci., 1st series, vol. VI, 1823, pp. 179-180.

Greene, G. K.

Contribution to Indiana Palæontology, vol. I, pt. X, 1902, pp. 85-
97, 3 pls.

Griggs, R. F. [Robert Fiske].

The thickness of the Columbus limestone.

The Ohio Naturalist, vol. IV, no. 3, 1904, pp. 67-69.

Grimsley, G. P. [George Perry].

Microscopical study of Ohio limestone.

Jour. Cincinnati Soc. Nat. Hist., vol. XV, 1892-1893, pp. 160-167.

—The gypsum of Michigan and the plaster industry.

Geol. Surv. Michigan, vol. IX, pt. II, 1904, pp. 25-26, 145, 228-229.

Grinnell, G. B. [George Bird].

Notice of a new genus of Annelids from the Lower Silurian.

Am. Jour. Sci., 3d series, vol. XIV, 1877, pp. 229, 230, 2 figs.

Griswold, W. T. [William Tudor].

The Berea Grit oil sand in the Cadiz quadrangle, Ohio.

Bull. United States Geol. Surv., no. 198, 43 pp., 1 pl., 1 fig., 1902.

—Structural work during 1901 and 1902 in the eastern Ohio oil fields.

Bull. United States Geol. Surv., no. 213, Contributions to economic
geology, 1903, pp. 336-344.

Haime, Jules, Milne-Edwards, Henri, and.

Monographie des polypiers fossiles des terrains palæozoïques, pré-
cédée d'un tableau général de la classification des polypes.

Extrait: Archives du Muséum d'histoire naturelle, tome V., 502
pp., 20 pls., 1851.

Hall, James.

Notes upon the geology of the western states.

Am. Jour. Sci., 1st series, vol. XLII, 1842, pp. 51-62.

—[On the geographical distribution of fossils in the older rocks of the United States.]

Am. Jour. Sci., 1st series, vol. XLV, 1843, pp. 157-165.

Geology of New York, Part 4, [fourth or western district], XXVII, 685 pp., 54 pls., geological map of middle and western states, Albany, 1843. See map.

—Notes explanatory of a section from Cleveland, Ohio, to the Mississippi river, in a southwest direction, with remarks upon the identity of the western formations with those of New York. Trans. Assoc. Am. Geologists and Naturalists, 1843, pp. 267-293, pl.

—Description of some microscopic shells from the decomposing marl slate of Cincinnati.

Am. Jour. Sci., 1st series, vol. XLVIII, 1845, pp. 292-295.

—Nature of the strata and geographical distribution of the organic remains in the older formations of the United States.

Boston Jour. Nat. Hist., vol. v, 1847, pp. 1-20.

—Descriptions of the organic remains of the lower division of the New York system.

Paleontology New York, vol. I, XXIII, 338 pp., 87 pls., 1847.

—On the parallelism of the Palæozoic deposits of North America with those of Europe; followed by a table of the species of fossils common to the two continents, with indication of the positions in which they occur, and terminated by a critical examination of each of these species.

Am. Jour. Sci., 2d series, vol. v, 1848, pp. 176-183; 359-370.

—On the parallelism of the Palæozoic deposits of North America with those of Europe; followed by a table of the species of fossils common to the two continents, with indication of the positions in which they occur, and terminated by a critical examination of each of these species.

Am. Jour. Sci., 2d series, vol. VII, 1849, pp. 45-51; 218-231.

—Parallelism of the Palæozoic deposits of the United States and Europe.

United States Senate, Exec. Doc., no. 4, special sess., March, 1851, chapter XVIII, pp. 285-318. See pp. 292, 296, 307.

—Catalogue of the species of fossils described in volumes I, II and III of the Paleontology of New York, with corrections in nomenclature.

New York State Mus., 12th Ann. Rept., 1859, pp. 63-87.

Hall, James.

- Paleontology [of New York], volume III, containing descriptions and figures of the organic remains of the lower Helderberg group and the Oriskany sandstone, XII, 523 pp., Albany, 1859. See pp. 43, 48.
- New species of fossils from the Hudson river group of Ohio and other western states.
New York State Mus., 13th Ann. Rept., 1860, pp. 119–121.
- Observations upon some new and other species of fossils from the rocks of the Hudson river group of Ohio and the western states, with descriptions.
New York State Mus., 14th Ann. Rept., 1861, pp. 89–92.
- On the Catskill group of New York.
Canadian Naturalist, vol. VII, 1862, pp. 377–381.
- Contributions to Paleontology.
Appendix D. Sixteenth Ann. Rept. of the Regents of the State of New York, April, 1863, pp. 17–226. See pp. 20, 24, 30, 34.
- Observations upon the genera *Uphantania* and *Dictyophyton*, with notices of some species from the Chemung group of New York and the Waverly sandstone of Ohio.
New York State Mus., 16th Ann. Rept., 1863, pp. 84–91, 4 pls.
- Preliminary notice of some species of Crinoidea from the Waverly sandstone series of Summit county, Ohio, supposed to be of the age of the Chemung group of New York.
New York State Mus., 17th Ann. Rept., 1864, pp. 50–60.
- Descriptions and figures of the fossil Brachiopoda of the Upper Helderberg, Hamilton, Portage and Chemung groups.
Paleontology New York, vol. IV, pt. I, XI, 428 pp., 63 pls., 1867.
- Description of new species of fossils from the Hudson river group in the vicinity of Cincinnati, Ohio.
New York State Mus., 24th Ann. Rept., 1872, pp. 225–232, 1 pl.
- On the relations of the Niagara and Lower Helderberg formations and their geographical distribution in the United States and Canada.
Proc. Am. Assoc. Adv. Sci., vol. XXII, pt. II, 1874, pp. 321–335.
Canadian Naturalist, new series, vol. VII, 1875, pp. 157–159.
- Geological survey of the state of New York, Paleontology, vol. V, pt. II, text, containing descriptions of the Gasteropoda, Pteropoda and Cephalopoda of the Upper Helderberg, Hamilton, Portage and Chemung groups, xv, 492 pp., Albany, 1879.
- The hydraulic beds and associated limestones at the Falls of the Ohio.
Trans. Albany Inst., vol. IX, 1879, pp. 169–180. See p. 179.

Hall, James.

Van Cleve's fossil Corals.

Indiana Dept. Geol. and Nat. Hist., 12th Ann. Rept., 1882, pp. 239-270, 14 pls.

—Contributions to the geological history of the American continent. Proc. Am. Assoc. Adv. Sci., vol. xxxi, 1883, pp. 29-69.

—Lamellibranchiata I. Descriptions and figures of the Monomyaria of the Upper Helderberg, Hamilton and Chemung groups. Paleontology New York, vol. v, pt. i, l. i, xviii, 268 pp., pls. xxxiii and lxxxix-xcii, 1884.

—Lamellibranchiata II. Descriptions and figures of the Dimyaria of the Upper Helderberg, Hamilton, Portage and Chemung groups. Paleontology New York, vol. v, pt. i, l. ii, lvii, 269-562 pp., pls. xxxiv-lxxx and xciii-xcvi, 5 figs., 1885.

Hall, James, and Clarke, J. M.

Trilobites and other Crustaceæ of the Oriskany, Upper Helderberg, Hamilton, Portage, Chemung and Catskill groups.

Paleontology New York, vol. vii, lxiv, 236 pp., 36 pls., 1888.

—An introduction to the study of the genera of Palæozoic Brachiopoda, Part I.

Paleontology New York, vol. viii, pt. i, xvi, 367 pp., 20 pls., 1892.

—Memoir on the Palæozoic reticulate sponges, constituting the family, Dictyospongiidæ.

Memoir New York State Mus., no. ii, 350 pp., 70 pls., 45 figs., 1898.

Fifteenth Ann. Rept. State Geol. [New York], 1898, vol. ii, pp. 741-984, 47 pls.

New York State Mus., 49th Ann. Rept., 1898, vol. iii, pp. 741-984, 47 pls.

—Memoir on the Palæozoic reticulate sponges, constituting the family, Dictyospongiidæ.

Memoir New York State Mus., no. ii, 350 pp., 70 pls., 45 figs., 1898.

Sixteenth Ann. Rept. State Geol. [New York], 1899, pp. 341-448, pls. 48-70.

New York State Mus., 50th Ann. Rept., 1899, vol. ii, pp. 341-448, pls. 48-70.

Hall, James, and Logan, W. E.,

Geological Map of Canada and parts of the United States from Hudson's Bay to Virginia, and from Missouri river to Newfoundland. Montreal, 1866; also on smaller scale in Atlas to geology of Canada, 1863.

- Hall, James, and Whitfield, R. P.,**
 Notice of three new species of fossil shells from the Devonian of Ohio.
 New York State Mus., 23d Ann. Rept., 1873, pp. 240-241.
- Handlirsch, Anton.**
 Revision of American Palaeozoic Insects, Proceedings U. S. Nat. Mus. vol. xxix, 1906, pp. 661-820.
- Harper, G. W., and Bassler, R. S.**
 Catalogue of the fossils of the Trenton and Cincinnati periods, occurring in the vicinity of Cincinnati, Ohio, 34 pp., Cincinnati, 1896.
- Hawes, G. W. [George Wesson], et. al.**
 Report on the building stones of the United States.
 Tenth Census United States, vol. x, 1884, pp. 1-399, 58 pls., figs. Chapter on Ohio, pp. 188-215, compiled mainly from notes of Prof. Orton.
- Hay, O. P. [Oliver Perry].**
 Bibliography and catalogue of the fossil vertebrata of North America.
 Bull. United States Geol. Surv., no. 179, 868 pp., 1902.
- Hayes, C. W. [Charles Willard].**
 Solution of silica under atmospheric conditions.
 Bull. Geol. Soc. Am., vol. 8, 1897, pp. 213-220, 3 pls. See p. 217.
- Hayes, C. W.**
 Coal fields of the United States.
 Bull. United States Geol. Surv., no. 213, Contributions to economic geology, 1903, pp. 257-269. See p. 258.
- Hayes, C. W., and Ulrich, E. O.**
 Columbia Folio. Tennessee.
 United States Geol. Surv., Geol. Atlas U. S., folio, no. 95, 1903.
- Hayes, Seth.**
 Another Miami valley skeleton.
 Jour. Cincinnati Soc. Nat. Hist., vol. xvii, 1894-1895, pp. 235-240, 2 pls.
- The Shaw Mastodon: an examination and description of Mastodon and accompanying mammalian remains found near Cincinnati, June, 1894.
 Jour. Cincinnati Soc. Nat. Hist., vol. xvii, 1894-1895, pp. 217-226.
 Ohio State Acad. Sci., 3d Ann. Rept., 1895, pp. 37-41, 1 pl.

Hazeltine, R. M.

Development of the mineral resources of the Mahoning valley and the surveying of mines.

Ohio Min. Jour., vol. i, no. 1, 1882, pp. 36-42.

—Horsebacks in the Lower Coal-measures and their origin.

Ohio Min. Jour., vol. i, no. 2, 1883, pp. 65-69.

—The Mahoning coal field.

Ohio Min. Jour., vol. iii, no. 2, 1885, pp. 24-26.

—Ohio's mineral display.

Ohio Min. Jour., whole no. 17, 1888, pp. 26-29.

—The bituminous coal field of Ohio.

United States Geol. Surv., 22d Ann. Rept., pt. iii, 1902, pp. 215-226, 1 pl.

Herrick, C. L. [Clarence Luther].

A sketch of the geological history of Licking county, accompanying an illustrated catalogue of Carboniferous fossils from Flint Ridge, Ohio.

Bull. Sci. Lab. Denison Univ., vol. ii, 1887, pp. 5-70, 6 pls., 2 figs.

Abstract: Am. Jour. Sci., 3d series, vol. xxxiv, 1887, p. 71.

—Sketch of the geological history of Licking county, no. 2. Additional fossils from Coal-measures at Flint Ridge.

Bull. Sci. Lab. Denison Univ., vol. ii, 1887, pp. 144-148, 1 pl.

—The geology of Licking county, Ohio. Part IV. The Subcarboniferous and Waverly groups.

Bull. Sci. Lab. Denison Univ., vol. iii, 1888, pp. 13-110, 12 pls.

Abstract: Am. Geol., vol. iii, 1889, p. 50.

—Geology of Licking county. Part IV. List of Waverly fossils continued.

Bull. Sci. Lab. Denison Univ., vol. iv, 1888, pp. 11-60; 97-123, 11 pls.

Am. Jour. Sci., 3d series, vol. xxxvii, 1889, pp. 317-318.

—Notes upon the Waverly group in Ohio.

Am. Geol., vol. iii, 1889, pp. 94-99, 4 pls.

—Additions and corrections to Miller's North American palæontology.

Am. Geol., vol. v, 1890, pp. 253-255.

—The Cuyahoga shale and the problem of the Ohio Waverly.

Bull. Geol. Soc. Am., vol. 2, 1891, pp. 31-48, 1 pl.

Abstract: Am. Nat., vol. xxv, 1890, p. 275.

Herrick, C. L., and Bendrat, T. A.

Identification of an Ohio Coal-measures horizon in New Mexico.

Am. Geol., vol. xxv, 1900, pp. 234-242.

Herzer, H.

- A new tree from the Carboniferous rocks of Monroe county, Ohio.
Am. Geol., vol. xi, 1893, pp. 285-286.
- A new fungus from the Coal-measures.
Am. Geol., vol. xi, 1893, pp. 365, 366, 1 pl.
- A new fungus from the Coal-measures.
Am. Geol., vol. xii, 1893, pp. 289-290, 1 pl.
- Psaronius*.
Fifth Ann. Rep., Ohio State Acad. Sci., 1897, pp. 55-58.
- Six new species, including two new genera of fossil plants.
Ninth Ann. Rep., Ohio State Acad. Sci., 1901, pp. 22-29, 2 figs.,
3 pls.
- A new fossil sponge from the Coal-measures.
Ninth Ann. Rep., Ohio State Acad. Sci., 1901, pp. 30-31, 1 pl.
- New fossil plants from the Carboniferous and Devonian.
Tenth Ann. Rep., Ohio State Acad. Sci., 1902, pp. 40-48, 3 figs.,
3 pls.
- New fossils from the Carboniferous, Hamilton and Medina series.
Tenth Ann. Rep., Ohio State Acad. Sci., 1902, pp. 49-66, 7 pls.,
3 figs.

Hice, R. R.

- The inner gorge terraces of the upper Ohio and Beaver rivers.
Am. Jour. Sci., 3d series, vol. XLIX, 1895, pp. 112-120.
- The clays of the upper Ohio and Beaver river region.
Trans. Am. Ceramic Soc., vol. VII, pt. II, 1905, pp. 1-14, 1 pl.

Hicks, L. E.

- Discovery of the Cleveland shale in Delaware county.
Am. Jour. Sci., 3d series, vol. XVI, 1878, pp. 70-71.
- The Waverly group in central Ohio.
Am. Jour. Sci., 3d series, vol. XVI, 1878, pp. 216-224.
- Bowlders in coal [in Perry county].
Am. Jour. Sci., 3d series, vol. XVII, 1879, pp. 68-69.

Hildreth, S. P. [Samuel Prescott].

- Facts relating to certain parts of the state of Ohio.
Am. Jour. Sci., 1st series, vol. x, 1826, pp. 1-8.
Abstract: West Virginia Geol. Surv., vol. I, 1899, pp. 136-138.
- Notice of fossil trees near Gallipolis.
Am. Jour. Sci., 1st series, vol. XII, 1827, pp. 205-206.
- Miscellaneous observations on the coal, diluvial, and other strata
of certain portions of the state of Ohio.
Am. Jour. Sci., 1st series, vol. XIII, 1828, pp. 38-40.

Hildreth, S. P. [Samuel Prescott].

Facts relating to Ohio and Mexico.

Am. Jour. Sci., 1st series, vol. xvi, 1829, pp. 154-159.

—Observations on the saliferous rock formation in the valley of the Ohio.

Am. Jour. Sci., 1st series, vol. xxiv, 1833, pp. 46-68.

—Observations on the bituminous coal deposits of the valley of the Ohio, and the accompanying rock strata; with notices of the fossil organic remains, and the relics of vegetable and animal bodies, illustrated by a geologic map, by numerous drawings of plants and shells, and by views of interesting scenery.

Am. Jour. Sci., 1st series, vol. xxix, 1836, pp. 1-148, 36 pls., 19 figs.

—Note on the Lias of the west.

Am. Jour. Sci., 1st series, vol. xxx, 1836, p. 395.

Hill, R. T. [Robert Thomas].

Clay materials of the United States.

United States Geol. Surv., Min. Res. U. S., 1893, pp. 474-528.

See p. 509.

Hillebrand, W. F. [William Francis], **Clarke, F. W.**, and.

Analyses of rocks and analytical methods, United States Geological Survey, 1880-1896.

Bull. United States Geol. Surv., no. 148, 306 pp., 1897. See pp. 260, 261, 283.

Hinde, G. J. [George Jennings].

On Conodonts from the Chazy and Cincinnati group of the Cambro-Silurian, and from the Hamilton and Genessee shale divisions of the Devonian, in Canada and the United States.

Quart. Jour. Geol. Soc., 1879, pp. 351-368, 3 pls.

Hitchcock, C. H. [Charles Henry].

The coal area of the United States of America.

Geol. Mag., vol. x, 1873, pp. 99-101.

—Map of the coal fields of the United States, compiled from state reports.

Statistical atlas of United States, based on results of 9th Census, pls. xi, xii, Washington, 1874.

—Geological map of the United States and part of Canada, compiled to illustrate the scheme of coloration and nomenclature recommended by the International Geological Congress.

Trans. Am. Inst. Mining Eng., map 17x27 inches; explanation, vol. xv, 1887, pp. 465-488.

Hitchcock, C. H., and Blake, W. P.

- Geological map of the United States. Statistics of mines and mining in the states and territories west of the Rocky mountains, 5th report by R. W. Raymond, Washington, 1873.
Statistical atlas of the United States based on results of the 9th Census. Plates XIII, XIV, Washington, 1875.
Atlas of the United States and the world, by Gray, Philadelphia, 1871.
Reproduced (probably) by F. Ratzel, "Die Vereinigten Staaten von Nord-Amerika," vol. I, München, 1878.
Petermann's Mitteilungen, vol. XXI, 1875, pl. xvi.
Special report Smithsonian Institution for the Centennial, Washington, 1876.

Hobbs, W. H. [William Herbert].

- Contributions from the mineralogical laboratory of the University of Wisconsin.
Am. Geol., vol. xxxvi, 1905, pp. 179-186, 1 pl.

Holmes, W. H. [William Henry].

- Traces of Glacial man in Ohio.
Jour. Geol., vol. I, 1893, pp. 147-163.]

Horton, R. E., Johnson, Edward, Jr., and Hoyt, J. C.

- Report of progress of stream measurements for the calendar year 1904. Part VI. Great Lakes and St. Lawrence river drainage.
United States Geol. Surv., Water-Supply and Irrigation Papers, no. 129, 150 pp., 1905. See p. 68.

Houston, Samuel.

- Peculiar faulting of a coal bed.
Science, vol. I, 1883, pp. 191-192.

Howells, A.

- Review of Andrew Roy's review of Prof. Orton's discussion of the Number One, or Sharon, coal seam.
Ohio Min. Jour., vol. III, no. 3, 1885, pp. 27-34.

Hoyt, J. C., Johnson, Edward, Jr., Horton, R. E., and.

- Report of progress of stream measurements for the calendar year 1904. Part VI. Great Lakes and St. Lawrence river drainage.
United States Geol. Surv., Water-Supply and Irrigation Papers, no. 129, 150 pp., 1905. See p. 68.

Hoyt, J. C., and Wood, B. D.

Index to the Hydrographic Progress reports of the United States Geological Survey, 1888 to 1903.

United States Geol. Surv., Water-Supply and Irrigation Papers, no. 119, 253 pp., 1905.

Hunt, T. S. [Thomas Sterry.]

Remarks on Prof. Newberry's paper on "Circles of deposition in American sedimentary rocks."

Proc. Am. Assoc. Adv. Sci., vol. xxii, 1874, pp. 196-198.

—The coals of the Hocking valley, Ohio.

Trans. Am. Inst. Mining Eng., vol. ii, 1874, pp. 273-278.

—The coal and iron of the Hocking valley, Ohio.

Trans., Am. Inst. Mining Eng., vol. vii, 1879, pp. 313-315.

Hyde, J. E. [Jesse Earl].

Changes in the drainage near Lancaster.

The Ohio Naturalist, vol. iv, no. 7, 1904, pp. 149-157, 4 figs.

James, J. F. [Joseph Francis].

Catalogue of the fossils of the Cincinnati group. 27 pp., Cincinnati, 1881.

—Fucoids of the Cincinnati group.

Jour. Cincinnati Soc. Nat. Hist., vol. vii, 1884-1885, pp. 124-132, 2 pls.; pp. 151-166, 2 pls.

—Evidences of beaches in the Cincinnati group.

Science, vol. v, 1885, pp. 231-233.

—Remarks on some markings on the rocks of the Cincinnati group described under the names of *Ormathichnus* and *Walcottia*.

Jour. Cincinnati Soc. Nat. Hist., vol. viii, 1885-1886, pp. 160-162.

—Cephalopoda of the Cincinnati group.

Jour. Cincinnati Soc. Nat. Hist., vol. viii, 1885-1886, pp. 235-253, 1 pl.

—Note on a recent synonym in the palæontology of the Cincinnati group.

Jour. Cincinnati Soc. Nat. Hist., vol. ix, 1886-1887, p. 39.

—Geology and topography of Cincinnati. [Part II, topography].

Jour. Cincinnati Soc. Nat. Hist., vol. ix, 1886-1887, pp. 136-141.

—Protozoa of the Cincinnati group.

Jour. Cincinnati Soc. Nat. Hist., vol. ix, 1886-1887, pp. 244-252.

—Geology of Cincinnati.

Jour. Cincinnati Soc. Nat. Hist., vol. ix, no. 2, 1886-1887, pp. 20-31.

Abstract: Pop. Sci. Monthly, vol. xxxi, 1887, pp. 423-424. The Glacial lake and island of Cincinnati.

James, J. F. [Joseph Francis].

- Account of a well drilled for oil or gas at Oxford, Ohio, 1887.
 Jour. Cincinnati Soc. Nat. Hist., vol. x, 1887, pp. 70-77.
 Proc. Am. Assoc. Adv. Sci., vol. xxxvi, 1888, p. 211.
 Abstract: Science, vol. ix, 1887, p. 623.
- Well drilled for gas at Oxford.
 Science, vol. ix, 1887, p. 623.
- Nomenclature of some Cincinnati group fossils.
 Am. Geol., vol. i, 1888, p. 333.
- *Monticulipora*, a coral and not a polyzoon.
 Am. Geol., vol. i, 1888, pp. 386-392.
- An ancient channel of the Ohio river at Cincinnati.
 Jour. Cincinnati Soc. Nat. Hist., vol. xi, 1888, pp. 96-101.
 Abstract: Proc. Am. Assoc. Adv. Sci., vol. xxxvii, 1889, p. 196.
- Geological section of southwestern Ohio.
 Abstract: Proc. Am. Assoc. Adv. Sci., vol. xxxvi, 1888, p. 211.
- The Ivorydale well at Mill Creek valley.
 Jour. Cincinnati Soc. Nat. Hist., vol. xi, 1888-1889, pp. 102-104.
- Remarks upon sedimentation in the Cincinnati group.
 Jour. Cincinnati Soc. Nat. Hist., vol. xii, 1889-1890, pp. 34-36.
- On the Maquoketa shales and their correlation with the Cincinnati group of southwestern Ohio.
 Am. Geol., vol. v, 1890, pp. 335-356, 394.
- A cave in the Clinton formation of Ohio.
 Jour. Cincinnati Soc. Nat. Hist., vol. xiii, 1890-1891, pp. 31-32.
- On the age of the Point Pleasant, Ohio, beds.
 Jour. Cincinnati Soc. Nat. Hist., vol. xiv, 1891, pp. 93-104, 2 pls.
 Abstracts: Science, new series, vol. xviii, 1891, p. 157.
 Proc. Am. Assoc. Adv. Sci., vol. xl, 1891, pp. 283-284.
- Manual of the paleontology of the Cincinnati group. Part II.
 Jour. Cincinnati Soc. Nat. Hist., vol. xiv, 1891, pp. 149-163.
- A brief history of the Ohio river.
 Pop. Sci. Monthly, vol. xxxviii, 1891, pp. 739-748.
- Manual of the paleontology of the Cincinnati group. Part I.
 Jour. Cincinnati Soc. Nat. Hist., vol. xiv, 1891-1892, pp. 45-72.
- Manual of the paleontology of the Cincinnati group. Part III.
 Jour. Cincinnati Soc. Nat. Hist., vol. xv, 1892-1893, pp. 88-100.
- Manual of the paleontology of the Cincinnati group. Part IV.
 Jour. Cincinnati Soc. Nat. Hist., vol. xv, 1892-1893, pp. 144-159.

James, J. F. [Joseph Francis].

The Cincinnati ice dam.

Am. Geol., vol. xi, 1893, pp. 199-202.

—Manual of the paleontology of the Cincinnati group. Part V.

Jour. Cincinnati Soc. Nat. Hist., vol. xvi, 1893-1894, pp. 178-208.

—Manual of the paleontology of the Cincinnati group. Part VI.

Jour. Cincinnati Soc. Nat. Hist., vol. xviii, 1895-1896, pp. 67-88.

—Manual of the paleontology of the Cincinnati group. Part VII.

Jour. Cincinnati Soc. Nat. Hist., vol. xviii, 1895-1896, pp. 115-140.

—Manual of the paleontology of the Cincinnati group. Part VIII.

Jour. Cincinnati Soc. Nat. Hist., vol. xix, 1896-1901, pp. 99-118.

James, J. F., James, U. P., and.

On the Monticuliporoid corals of the Cincinnati group, with a critical revision of the species.

Jour. Cincinnati Soc. Nat. Hist., vol. x, 1887-1888, pp. 118-141; 158-184.

Abstract: Proc. Am. Assoc. Adv. Sci., vol. xxxvi, 1888, p. 223.

James, U. P.

Catalogue of the Lower Silurian fossils, Cincinnati group, found at Cincinnati and vicinity—within a range of forty or fifty miles. 14 pp., 1871.

—On a new species of fossil from the Lower Silurian.

Am. Jour. Sci., 3d series, vol. iii, 1872, p. 26.

—Additions to catalogue of Lower Silurian fossils, Cincinnati group. 4 pp., 1873.

—Descriptions of new species of Brachiopoda, from the Lower Silurian rocks. Cincinnati group.

The Cincinnati Quart. Jour. Sci., vol. i, no. i, Jan., 1874, pp. 19-22.

—Descriptions of one new species of *Leptæna*, and two species of *Cyclonema* from the Lower Silurian rocks. Cincinnati group.

The Cincinnati Quart. Jour. Sci., vol. i, no. ii, April, 1874, pp. 151-154.

—Descriptions of new species of fossils from the Lower Silurian formation, Cincinnati group.

The Cincinnati Quart. Jour. Sci., vol. i, no. iii, July, 1874, pp. 239-242.

—Descriptions of new species of Brachiopoda from the Lower Silurian formation. Cincinnati group.

The Cincinnati Quart. Jour. Sci., vol. i, no. iv, Oct., 1874, pp. 333-335.

James, U. P.

- Catalogue of Lower Silurian fossils of the Cincinnati group, found at Cincinnati and vicinity, within a circuit of 40 or 50 miles. New edition with descriptions of some new species of Corals and Polyzoa. 8 pp., 1875.
- Descriptions of newly discovered species of fossils from the Lower Silurian formation. Cincinnati group.
The Paleontologist, Cincinnati, no. 1, July, 1878, pp. 1-8.
- Descriptions of newly discovered species of fossils and remarks on others, from the Lower and Upper Silurian rocks of Ohio.
The Paleontologist, Cincinnati, no. 2, Sept., 1878, pp. 9-15.
- Description of new species of fossils and remarks on some others, from the Lower and Upper Silurian rocks of Ohio.
The Paleontologist, Cincinnati, no. 3, January, 1879, pp. 17-24.
- Descriptions of newly discovered fossils.
The Paleontologist, Cincinnati, no. 4, July, 1879, pp. 25-26.
- Geological nomenclature. The Cincinnati Group—the "Hudson River Group."
The Paleontologist, Cincinnati, no. 4, July, 1879, pp. 27-28.
- Supplement to catalogue of Lower Silurian fossils of the Cincinnati group.
The Paleontologist, Cincinnati, no. 4, July, 1879, pp. 29-32.
- Supplement to the catalogue of Lower Silurian fossils of the Cincinnati group found at Cincinnati and within a radius of forty or fifty miles. 4 pp., July, 1879.
- Contributions to paleontology; fossils of the Lower Silurian formation, Ohio, Indiana and Kentucky.
The Paleontologist, Cincinnati, no. 5, June, 1881, pp. 33-44.
- Descriptions of ten new species of *Monticulipora* from the Cincinnati group, Ohio, index, etc.
The Paleontologist, Cincinnati, no. 6, Sept., 1882, pp. 45-56.
- Descriptions of fossils from the Cincinnati group.
Jour. Cincinnati Soc. Nat. Hist., vol. vi, 1883, pp. 235, 236, 1 pl.
- Descriptions of new species of fossils from the Cincinnati group, Ohio and Kentucky.
The Paleontologist, Cincinnati, no. 7, April, 1883, pp. 57-59, 2 pls.
- Description of three species of fossils.
Jour. Cincinnati Soc. Nat. Hist., vol. vii, 1884-1885, pp. 20-24, 15 figs.
- Descriptions of four new species of fossils from the Cincinnati group.
Jour. Cincinnati Soc. Nat. Hist., vol. vii, 1884-1885, pp. 137-140, 1 pl.

James, U. P.

On Conodonts and fossil Annelid jaws.

Jour. Cincinnati Soc. Nat. Hist., vol. VII, 1884-1885, pp. 143-149, 1 pl.

— *Agelocrinus Holbrookii*.

Jour. Cincinnati Soc. Nat. Hist., vol. X, 1887-1888, pp. 25, 26, 2 figs.

James, U. P., and James, J. F.

On the Monticuliporoid corals of the Cincinnati group, with a critical revision of the species.

Jour. Cincinnati Soc. Nat. Hist., vol. XI, 1888-1889, pp. 15-47.

Jennings, W. H.

Address of the President.

Ohio Min. Jour., whole no. 17, 1888, pp. 7-13.

— Wastage of coal.

Ohio Min. Jour., whole no. 26, 1899, pp. 103-106.

Johnson, Jr., E.

Report of progress of stream measurements for the calendar year 1904.

United States Geol. Surv., Water-Supply and Irrigation Papers, no. 128, 1905, 168 pp. See pp. 59, 63, 74, 77, 80.

Johnson, Jr., Edward, Hoyt, J. C., Horton, R. E., and.

Report of progress of stream measurements for the calendar year 1904. Part VI. Great Lakes and St. Lawrence river drainage.

United States Geol. Surv., Water-Supply and Irrigation Papers, no. 129, 150 pp., 1905. See p. 68.

Jones, H. L.

Geology of Licking county.

Bull. Sci. Lab. Denison Univ., vol. VII, 1892, pp. 5-6.

Kennedy, William.

Texas clays and their origin. [Chemical analyses of Ohio clays].
Science, vol. XXII, 1893, pp. 297-300.

Keyes, C. R. [Charles Rollin].

A bibliography of North American paleontology, 1888-1892.

Bull. United States Geol. Surv., no. 121, 251 pp., 1894.

Killebrew, J. B. [Joseph Buckner].

Report on the culture and curing of tobacco in the United States.

Tenth Census United States, vol. III, statistics of agriculture, X, 286 pp., Washington, 1883. See pp. 126, 141.

Kimball, J. P. [James Putnam].

Genesis of iron-ores by isomorphous and pseudomorphous replacement of limestone, etc.

Am. Geol., vol. VIII, 1891, pp. 352, 376.

King, A. T.

On the ancient alluvium of the Ohio river and its tributaries.

Proc. Acad. Nat. Sci. Philadelphia, vol. VI, 1856, pp. 4-8.

Klippart, J. H.

Discovery of *Dicotyles (Platygonus) compressus*, Le Conte.

The Cincinnati Quart. Jour. Sci., vol. II, no. I, Jan., 1875, pp. 1-6.

Proc. Am. Assoc. Adv. Sci., vol. XXIII, 1874, p. 1b.

—Mastodon remains in Ohio.

The Cincinnati Quart. Jour. Sci., vol. II, no. 2, April, 1875, pp. 151-155.

—Discovery of *Dicotyles (Platygonus) compressus*, LeConte.

Proc. Am. Assoc. Adv. Sci., vol. XXIII, 1875, pt. II, pp. 1-6.

Knowlton, F. H. [Frank Hall].

Note on a supposed new endogenous tree from the Carboniferous.

Science, vol. XXI, 1893, pp. 332-333.

Kraus, E. H. [Edward Henry].

On the origin of the caves of the island of Put-in-Bay, Lake Erie.

Am. Geol., vol. XXXV, 1905, pp. 167-171.

Bull. Geol. Soc. Amer., vol. 16, 1906, pp. 563-574.

—Hydration caves.

Science, new series, vol. XXII, 1905, pp. 502-503.

Kunz, G. F. [George Frederick].

Precious stones.

United States Geol. Surv., 21st Ann. Rep., 1901, pt. VI, Min.

Res. U. S., pp. 419-462. See p. 419.

Lamb, G. F.

Field geology in Ohio State University.

Am. Geol., vol. XXXVI, 1905, pp. 195-197.

Lane, A. C. [Alfred Church].

Geological report on Huron county, Michigan.

Geol. Surv., Michigan, vol. VII, 1900, pp. 1-329, 11 pls., 12 figs.

See p. 9.

—Coal of Michigan, its mode of occurrence and quality.

Geol. Surv. Michigan, vol. VIII, pt. II, 220 pp., 9 pls., 9 figs., 1902.

—Deep borings for oil and gas.

Rept. State Board Geol. Surv. Michigan for 1903, p. 342, 6 pls., 10 figs. See p. 287.

Lane, A. C., and Cooper, W. F.

Fossils of the Marshall and Coldwater.

Geol. Surv. Michigan, vol. VII, pt. II, 1900, pp. 252-284, 2 pls.

Langdon, F. W. [Frank Warren].

The Mammalia of the vicinity of Cincinnati—a list of species with notes.

Jour. Cincinnati Soc. Nat. Hist., vol. III, 1880-1881, pp. 311-313.

—The giant beaver (*Castoroides ohioensis*), Foster.

Jour. Cincinnati Soc. Nat. Hist., vol. VI, 1883, pp. 238-239.

Lapham, I. A., [Increase Allen].

Miscellaneous observations on the geology of Ohio. Rep. of Jn. L. Riddell, M. D., one of the special committee appointed by the last legislature to report on the method of obtaining a complete geological survey of the State, pp. 31-34, 1837.

Lapham, Darius, and Lapham, I. A.

Observations on the primitive and other bowlders of Ohio.

Am. Jour. Sci., 1st series, vol. XXII, 1832, pp. 300-303.

Lawton, J. E.

Ore and ore mining in Lawrence county.

Ohio Min. Jour., vol. III, no. 3, 1885, pp. 38-42.

Leeds, [Albert R.]

On an Asphaltic coal from the shale of Huron river, Ohio, containing seam of sulphate of baryta. Annals Lyceum Nat. Hist., New York, vol. XI, 1876, pp. 105-106.

Abstract: Am. Jour. Sci., 3d series, vol. X, 1875, p. 303.

Leighton, M. O. [Marshall Ora].

Normal and polluted waters in northeastern United States.

United States Geol. Surv., Water-Supply and Irrigation Papers, no. 79, 192 pp., 17 figs., 1903.

Lesley, J. P. [Joseph Peter].

Note on a map intended to illustrate five types of earth surface in the United States between Cincinnati and the Atlantic.

Trans. Am. Phil. Soc., new series, vol. XIII, 1869, pp. 305-312.

—[On former flow of the upper Ohio].

Proc. Am. Phil. Soc., vol. XIX, 1882, p. 353.

—Letter of transmittal.

Second Geol. Surv. Pennsylvania, Rep. Z, Report on the terminal moraine in Pennsylvania and western New York by H. C. Lewis, pp. v-XLIX, Harrisburg, 1884. See pp. VIII, XX, XXXVIII.

Abstract: Science, vol. IV, 1884, p. 560.

Lesley, [Joseph Peter].

Dr. Orton's Ohio gas and oil report.

Science, vol. VIII, 1886, pp. 233-235.

Lesquereux, Leo.

[Some observations on the Coal-measures of Ohio].

Proc. Boston Soc. Nat. Hist., vol. IV, 1854, pp. 175-179.

—Palæontological report of the fossil flora of the Coal-measures of the western Kentucky coal field.

3d Rep. Geol. Surv. Kentucky, 1857, pp. 536-555.

Abstract: Am. Jour. Sci., 2d series, vol. XXVI, 1858, pp. 110-112.

—The fossil plants of the Coal-measures of the United States with descriptions of the new species in the cabinet of the Pottsville Scientific Association, etc., 24 pp., 2 pls., Pottsville, Pa., including impressions of vegetable on coal by S. Lewis, p. 24.

Abstract: Am. Jour. Sci., 2d series, 1858, vol. XXVI, pp. 112-113.

—Mode of preservation of vegetable remains in our American Coal-measures.

Geol. Surv. Illinois, vol. VI, Geol. and Paleon., pp. 478-508, Chicago, 1870.

Abstract: Am. Nat., vol. V, 1871, pp. 340-353.

—On remains of land plants in the Lower Silurian.

Am. Jour. Sci., 3d series, 1874, vol. VII, pp. 31-34.

—Land plants recently discovered in the Silurian rocks of the United States.

Proc. Am. Phil. Soc., vol. XVII, 1877, pp. 163-173, 1 pl.

Abstract: Am. Jour. Sci., 3d series, vol. XV, 1878, p. 149.

—Atlas to the coal flora of Pennsylvania and of the Carboniferous formation throughout the United States.

Second Geol. Surv. Pennsylvania, Rep. P., 85 pls., 1879.

—Description of the coal flora of the Carboniferous formation in Pennsylvania and throughout the United States.

Second Geol. Surv. Pennsylvania, Rep. P., vols. I, II, LXIII, 694 pp., Harrisburg, 1880.

—Principles of Paleozoic botany.

Indiana Dept. Geol. and Nat. Hist., 13th Ann. Rep., 1883, pp. 1-106, 22 pls.

—Description of the coal flora of the Carboniferous formation in Pennsylvania and throughout the United States.

Second Geol. Surv. Pennsylvania, Rep. P., vol. II, pp. 695-977, pls. LXXXVIII-CXI, Harrisburg, 1884.

—A review of the fossil flora of North America.

United States geological and geographical survey of the Territories. F. V. Hayden in charge. Vol. I, 2d series, pp. 233-248, Washington, 1896.

Lesquereux, Leo.

Changes of climate indicated by interglacial beds and attendant oxidation and leaching.

Proc. Boston Soc. Nat. Hist., vol. xxiv, 1890, pp. 455-459.

Abstracts: Am. Geol., vol. v, 1891, p. 123.

Am. Nat., vol. xxv, 1891, p. 279.

Leverett, Frank.

Glacial studies bearing on the antiquity of man.

Abstract: Proc. Boston Soc. Nat. Hist., vol. xxiv, 1890, pp. 585-586.

—The Cincinnati ice dam.

Am. Geol., vol. viii, 1891, pp. 232-233.

Abstract: Proc. Am. Assoc. Adv. Sci., vol. xl, 1891, pp. 250-251.

—Pleistocene fluvial planes of western Pennsylvania.

Am. Jour. Sci., 3d series, vol. xlii, 1891, pp. 200-212.

—Relation of a Loveland, Ohio, implement bearing terrace to the moraines of the ice sheet.

Abstract: Proc. Am. Assoc. Adv. Sci., vol. xl, 1891, pp. 361-362.

—On the significance of the white clays of the Ohio region.

Am. Geol., vol. x, 1892, pp. 18-24.

Abstract: Am. Nat., vol. xxviii, 1893, p. 148.

—On the correlation of moraines with raised beaches of Lake Erie.

Am. Jour. Sci., 3d series, vol. xliii, 1892, pp. 281-301.

Proc. Wisconsin Acad. Sci. Arts and Letters, vol. viii, 1892, pp. 233-240.

Abstracts: Jour. Geol., vol. i, 1893, pp. 99-100.

Am. Nat., vol. xxvi, 1892, p. 412-414.

—Supposed Glacial man in southwestern Ohio.

Am. Geol., vol. xi, 1893, pp. 186-189.

—Relation of the attenuated drift border to the outer moraine in Ohio.

Am. Geol., vol. xi, 1893, pp. 215-216.

—The Glacial succession in Ohio.

Jour. Geol., vol. i, 1893, pp. 129-146, map.

Abstract: Am. Geol., vol. xi, 1893, pp. 413-415.

—Origin of the fringe.

Bull. Geol. Soc. Am., vol. 5, 1894, p. 17.

—On the correlation of New York moraines with raised beaches of Lake Erie.

Am. Jour. Sci., 3d series, vol. i, 1895, pp. 1-20.

Leverett, Frank.

Changes in drainage in southern Ohio.

Bull. Sci. Lab. Denison Univ., vol. ix, pt. II, 1897, pp. 18-21,
1 map.

—The water resources of Indiana and Ohio.

United States Geol. Surv., 18th Ann. Rep., pt. IV, 1897, pp. 419-
559, maps, section.

—Correlation of moraines with beaches on the border of Lake Erie.

Am. Geol., vol. XXI, 1898, pp. 195-199.

—Map of the glaciated area of North America.

Monograph United States Geol. Surv., vol. XXXVIII, pl. I, 1899.

—Glacial phenomena of central Ohio.

Abstract: Science, new series, vol. X, 1899, pp. 487-488.

—Glacial phenomena of central Ohio.

Abstract: Bull. Geol. Soc. Am., vol. 11, 1900, p. 2.

—Glacial formations and drainage features of the Erie and Ohio
basins.

Monograph United States Geol. Surv., vol. XLI, 802 pp., 26 pls.,
8 figs., 1902.

—Further studies of the drainage features of the upper Ohio basin.

Am. Jour. Sci., 3d series, vol. XLVII, 1894, pp. 247-283, 4 maps,
5 figs. Correction, same vol., p. 483.

Abstract: Am. Geol., vol. XIII, 1894, pp. 217-219.

Leverett, Frank, Chamberlain, T. C., and.

Outline of Glacial stages.

Dana's Manual, 4th edition, 1894, p. 969.

Lewis, H. C. [Henry Carvill].

Report on the terminal moraine across Pennsylvania and western
New York.

Second Geol. Surv. Pennsylvania, Rep. Z, 299 pp., map, Harris-
burg, 1884. See pp. 10, 11, 15, 49, 201, 203.

Abstracts: Am. Jour. Sci., 3d series, vol. XXVIII, 1884, pp. 231-
234.

Science, vol. IV, 1884, p. 560.

Lines, E. F., Veatch, A. C., Fuller, W. L., and.

Record of deep well drilling for 1904.

Bull. United States Geol. Surv., no. 264, 103 pp., 1905. See pp.
60 and 91.

Linney, W. M.

Notes on the rocks of central Kentucky.

Rep. Geol. Surv. Kentucky, 1882, pp. 1-19. See pp. 15, 18.

Locke, John.

[Report on southwestern Ohio].

Abstract: Am. Jour. Sci., 1st series, vol. XL, 1838, pp. 128-133.
Geol. Surv. Ohio, 2d Ann. Rep., 1838, pp. 201-274.

—[Glacial planing and boulders in Ohio].

Am. Jour. Sci., 1st series, vol. XLI, 1841, pp. 175-176.

Trans. Assoc. Am. Geologists and Naturalists, 1843, p. 28.

—On a new species of Trilobite of very large size. *Isotelus megistos*.

Am. Jour. Sci., 1st series, vol. XLII, 1842, pp. 366-368, 1 pl.

Trans. Assoc. Am. Geologists and Naturalists, 1843, pp. 221-224.

—Notice of a new Trilobite.

Am. Jour. Sci., 1st series, vol. XLIV, 1843, p. 346, 1 fig.

—Notice of a prostrate forest under the diluvium of Ohio.

Trans. Assoc. Am. Geologists and Naturalists, 1843, pp. 240-241.

—Observations made in the years 1838, 1839, 1840, 1841 and 1843 to determine the magnetical dip and intensity of the magnetical force in several parts of the United States.

Trans. Am. Phil. Soc., vol. IX, new series, 1846, pp. 283-328.

Logan, W. E. [Sir William Edmond], **Hall, James, and.**

Geological map of Canada and parts of the United States from Hudson's bay to Virginia, and from Missouri river to Newfoundland, Montreal, 1866; also on smaller scale in Atlas to geology of Canada, 1863.

Long, S. H.

Account of an expedition from Pittsburg to the Rocky mountains performed in years 1819-20; compiled by Edward James, vol. v, 503 pp.; vol. II, 442 pp. Atlas of 11 sheets, Philadelphia, 1823.

Lord, N. W. [Nathaniel Wright].

The Hanging Rock region.

Ohio Min. Jour., vol. III, no. 1, 1884, pp. 3-10.

—The chemical compositions of certain Ohio and Pennsylvania coals as compared with their evaporative performance in locomotive boilers.

Ohio Min. Jour., whole no. 21, 1892, pp. 60-68.

Lovejoy, Ellis.

The clays of Five Mile creek.

Ohio Min. Jour., whole no. 17, 1888, pp. 34-40.

Lyell, Jr., Charles.

- On the ridges, elevated beaches, inland cliffs, and boulder formation of the Canadian lakes and valley of the St. Lawrence.
Am. Jour. Sci., 1st series, vol. XLVI, 1844, pp. 314-317.
Geol. Soc. London, vol. IV, no. 92, 1844.
- On the geological position of the *Mastodon giganteum* and associated fossil remains at Bigbone Lick, Kentucky, and other localities in the United States and Canada.
Am. Jour. Sci., 1st series, vol. XLVI, 1844, pp. 320-322.
- Travels in North America 1841-1842, with geological observations on the United States, Canada and Nova Scotia; vol. I, VII, 251 pp.; vol. II, VI, 221 pp., 7 pls., map, New York, 1845.
Abstracts: Quart. Jour. Geol. Soc., vol. I, 1845, p. 389.
Am. Quart. Jour. Agr. and Sci., vol. II, 1845, p. 265. Another edition, vol. I, XII, 316 pp., 4 pls.; vol. II, VIII, 272 pp., 3 pls., London, 1845. Second English edition, London, 1855. German edition, Halle, 1846.
- A second visit to the United States of North America, 2 vols: vol. I, XII, 273 pp.; vol. II, XI, 287 pp.; New York, 1849. Another edition, vol. I, 268 pp.; vol. II, 385 pp.; London, 1855. Third edition, London, 1855.

Lyman, W. S., Caine, T. A., and.

Soil survey of the Wooster area.

United States Dept. Agr., [Advance sheets], Field Oper. Bur. Soils, 26 pp., 1 fig., 1 map, 1905.

Lyon, S. S.

Paleontological report. Description of new species of organic remains.

Geol. Surv. Kentucky, 3d Rep., 1857, pp. 488-492, 1 pl.

Mabery, C. F. [Charles Frederic].

A résumé of the composition and occurrence of petroleum.

Proc. Am. Phil. Soc., vol. XLII, 1903, pp. 36-54.

McCreery, J. M.

Notes on some of the causes of extinction of species.

Am. Geol., vol. V, 1890, pp. 100-104.

Macfarlane, James.

Coal regions of America, their topography, geology, and development. XVI, 676 pp., 25 maps, New York, 1873. Third edition. XVI, 697 pp., 33 figs., 29 maps, New York, 1877. See p. 306.

- An American geological railway guide, giving the geological formation at every railway station, with notes on interesting places on the routes, and a description of each of the formations. 216 pp., New York, 1879. See p. 109.

Macfarlane, James.

An American geological railway guide, giving the geological formation at every railway station, with altitudes above mean tide-water, notes on interesting places on the routes and a description of each of the formations. Second edition, 426 pp., New York, 1890. See p. 177.

McGee, W J

Map of the United States exhibiting the present status of knowledge relating to the areal distribution of geologic groups, (preliminary compilation), 17¼x28 inches.

United States Geol. Surv., 5th Ann. Rep., 1885.

—Map of the United States showing the distribution of the geologic systems as far as known, compiled from data in the possession of the United States Geological Survey.

United States Geol. Surv., 14th Ann. Rep., pt. II, 1893.

Maclure, William.

Map of the United States of America accompanying Observations on the geology, etc.

Trans. Am. Phil. Soc., vol. VI, 1809, pp. 411-428.

—Cartes des États-Unis de l'Amérique-Nord pour servir aux observations géologiques.

Jour. de Phys. de Chem. et d'Histoire Nat., vol. LXIX, 1811, pp. 204-213; vol. LXXII, 1811, pp. 137-165.

McMillin, Emerson.

The gas coals of Ohio.

Ohio Min. Jour., vol. III, no. I, 1884, pp. 16-24.

—Natural gas.

Ohio Min. Jour., vol. III, no. 3, 1885, pp. 8-27.

Marcou, J. B. [John Belknap].

Bibliography of North American paleontology in the year 1886.

Smithsonian Rep. for 1886-1887, no. 698, pp. 231-287, 1889.

[Reprint].

Marcou, Jules.

Ueber die Geologie der Vereinigten Staaten und der englischen Provinzen von Nord-America.

Petermann's Mitteilungen, vol. I, 1855, pp. 149-159, map.

—Geology of North America, with two reports on the prairies of Arkansas and Texas, the Rocky mountains of New Mexico, and the Sierra Nevada of California, originally made by the United States Government, 144 pp., 7 pls., 3 maps, Zurich, 1858.

Marcou, Jules.

Geological map of the United States and British provinces of North America (with explanatory text and geological sections, 92 pp., 8 pls.), Boston, 1853.

Bull. Soc. Géol. France, 2d series, vol. XII, 1841, pp. 813-936, map, plate, under title, Résumé explicatif d'une carte géologique des États-Unis, et des provinces anglaises de l'Amérique du Nord, avec un profil géologique allant de la Vallée du Mississippi aux côtes du Pacifique, et une planche de fossiles.

Map in atlas to "Voyage dans l'Amérique du Nord," par G. Lambert, Bruxelles, 1855.

Annales des Mines, vol. VII, p. 320, pl. IX.

Geology of North America, Zurich, 1858.

"La vie souterraine, ou les mines et les mineurs," par L. Simonin, pls. X, XI, XIV, Paris, 1867.

"Physicalische Karten, Geology," Vienna, 1872.

Marcou, Jules and Marcou, J. B.,

A catalogue of geological maps, relative to North and South America.

Bull. United States Geol. Surv., no. 7, 184 pp., 1884. See p. 77.

Marsh, O. C. [Othniel Charles].

Boulders in coal.

Am. Nat., vol. VI, 1872, p. 439.

Martin, J. O., and Carr, E. P.

Soil survey of the Ashtabula area, Ohio.

United States Dept. Agr., Field Oper. Bur. Soils, 5th Rep., 1904, pp. 647-658, 1 fig.

Mather, W. W. [William Williams].

First annual report on the geological survey of Ohio.

Abstract: Am. Jour. Sci., 1st series, vol. XXXIV, 1838, pp. 347-362, 2 figs.

Ohio Geol. Surv., First Ann. Rep., 1838, pp. 5-23.

—Remarks in addition to, and explanation of, the review of the report of the geological survey of Ohio [fossil bones and Waverly group].

Am. Jour. Sci., 1st series, vol. XXXIV, 1838, pp. 362-364.

—Geology of New York, part I, [first or southeastern district], XXXVII, 671 pp., 46 pls., Albany, 1843. See pp. 204, 224.

—On the alleged great coal bed of Perry county.

Am. Jour. Sci., 2d series, vol. XV, 1853, p. 450.

—Report of the statehouse artesian well, at Columbus, Ohio, 42 pp., 1859.

Abstract: Am. Jour. Sci., 2d series, vol. XXVII, 1859, p. 276.



Maw, George.

Geological history of the North American lake region.

Geol. Mag., vol. v, new series, 1878, pp. 455-456.

Abstracts: Am. Jour. Sci., 3d series, vol. xvi, 1878, pp. 394-395.

Gardener's Chronicle, 1878, pp. 169-170.

Mead, C. S. [Charles Searing].

[Report on] Field geology in Ohio State University.

Am. Geol., vol. xxxii, 1903, pp. 261-263.

Meek, F. B. [Fielding Bradford].

Remarks on the Carboniferous and Cretaceous rocks of eastern Kansas and Nebraska, and their relations to those of the adjacent states and other localities farther eastward, in connection with a review of a paper recently published on this subject by M. Jules Marcou in Bulletin de la Société Géologique de France.

Am. Jour. Sci., 2d series, vol. xxxix, 1865, pp. 157-174.

—On some new Silurian Crinoids and shells.

Am. Jour. Sci., 3d series, vol. ii, 1871, pp. 295-302.

—Remarks on the genus *Lichenocrinus*.

Am. Jour. Sci., 3d series, vol. ii, 1871, pp. 299-302.

—Supplementary note on the genus *Lichenocrinus*.

Am. Jour. Sci., 3d series, vol. iii, 1872, pp. 15-17; 261-262.

—Descriptions of two new star-fishes and a crinoid from the Cincinnati group of Ohio and Indiana.

Am. Jour. Sci., 3d series, vol. iii, 1872, pp. 257-261.

—Description of new species of fossils from the Cincinnati group of Ohio.

Am. Jour. Sci., 3d series, vol. iii, 1872, pp. 423-428.

—Descriptions of a few new species and one new genus of Silurian fossils from Ohio.

Am. Jour. Sci., 3d series, vol. iv, 1872, pp. 274-280.

Meek, F. B., and Worthen, A. H.

Introduction.

Geol. Surv. Illinois, vol. ii, Paleontology, pp. iii-xix, Chicago, 1866. See pp. x, xvii, xviii.

—Part II, Palaeontology. Geol. Surv. Illinois, vol. iii, Geology and Palaeontology, 574 pp. 20 pls., Chicago, 1869. See pp. 325, 327, 438, 443, 445, 457, 458 and pls. 4, 11, 12, 14.

Merrill, G. P. [George Perkins].

[Building stones].

Tenth Census United States. Report on building stones of the United States and statistics of the quarry industry, p. 357, bound as part of vol. x, but with separate pagination, Washington, 1884.

Merrill, G. P. [George Perkins].

The collection of building and ornamental stones in the United States National Museum, a handbook and catalogue.

Ann. Rep. Smithsonian Inst., pt. II, 1889, pp. 277-648, 9 pls.

See pp. 373, 404, 456.

—Stones for building and decoration. 453 pp., 21 pls., 18 figs., New York, 1891. See pp. 16, 145, 274.

Mickleborough, John, and Wetherby, A. G.

A classified list of Lower Silurian fossils, Cincinnati group.

Jour. Cincinnati Soc. Nat. Hist., vol. I, 1878-1879, pp. 61-86.

Miller, A. M.

The hypothesis of a Cincinnati Silurian island.

Am. Geol., vol. XXII, 1898, pp. 78-85.

—Hydrostatic vs. lithoplastic theory of gas well pressure.

Science, new series, vol. XI, 1900, pp. 192-193.

—Pre-glacial drainage in southwestern Ohio.

Science, new series, vol. XIV, 1901, pp. 534-535, 1 fig.

Miller, Jr., G. S. [Gerrit Smith].

A new fossil bear from Ohio.

Proc. Washington Biol. Soc., vol. XIII, 1899, pp. 53-56.

Miller, S. A. [Samuel Almond].

The column of *Heterocrinus heterodactylus*.

The Cincinnati Quart. Jour. Sci., vol. I, no. I, Jan., 1874, pp. 2-3.

—[Description of species.]

The Cincinnati Quart. Jour. Sci., vol. I, no. I, Jan., 1874, pp. 4-7, 3 figs.

—Remarks on the genus *Conchicolites* of Nicholson.

The Cincinnati Quart. Jour. Sci., vol. I, no. I, Jan., 1874, pp. 7-13.

—Genus *Ambonychia* (Hall).

The Cincinnati Quart. Jour. Sci., vol. I, no. I, Jan., 1874, pp. 14-16, 2 figs.

Palæontology New York, vol. I, 1847, p. 163.

—On remains of land plants in the Lower Silurian; by Leo Lesquereux.

The Cincinnati Quart. Jour. Sci., vol. I, no. I, Jan., 1874, pp. 43-45.

—The position of the Cincinnati group in the geological column of fossiliferous rocks of North America.

The Cincinnati Quart. Jour. Sci., vol. I, no. II, April, 1874, pp. 97-115.

Miller, S. A. [Samuel Almond].

Monograph of the Crustacea of the Cincinnati group.

The Cincinnati Quart. Jour. Sci., vol. I, no. II, April, 1874, pp. 115-147, 2 figs.

—*Streptorhynchus* (?) Hallie (S. A. Miller).

The Cincinnati Quart. Jour. Sci., vol. I, no. II, April, 1874, p. 148.

—*Modiolopsis modiolaris* (Conrad).

The Cincinnati Quart. Jour. Sci., vol. I, no. II, April, 1874, p. 149.

—Monograph of the Lamellibranchiata of the Cincinnati group.

The Cincinnati Quart. Jour. Sci., vol. I, no. III, July, 1874, pp. 211-232, 4 figs.

—[Description of species].

The Cincinnati Quart. Jour. Sci., vol. I, no. III, July, 1874, pp. 232-236, 6 figs.

—On the parallelism of coal-seams by J. S. Newberry.

The Cincinnati Quart. Jour. Sci., vol. I, no. IV, Oct., 1874, pp. 267-269.

—Monograph of the Gasteropoda of the Cincinnati group.

The Cincinnati Quart. Jour. Sci., vol. I, no. IV, Oct., 1874, pp. 302-321, 5 figs.

—On the so-called land plants from the Lower Silurian of Ohio by J. S. Newberry.

The Cincinnati Quart. Jour. Sci., vol. I, no. IV, Oct., 1874, pp. 335-338.

—On the parallelism of coal-seams by E. B. Andrews.

The Cincinnati Quart. Jour. Sci., vol. I, no. IV, Oct., 1874, pp. 340-342.

—[Description of species].

The Cincinnati Quart. Jour. Sci., vol. I, no. IV, Oct., 1874, pp. 343-351, 7 figs.

—Observations upon *Stenopora fibrosa* and the genus *Chaetetes*.

The Cincinnati Quart. Jour. Sci., vol. I, no. IV, Oct., 1874, pp. 368-375.

—Monograph of the class Brachiopoda of the Cincinnati group.

The Cincinnati Quart. Jour. Sci., vol. II, no. I, Jan., 1875, pp. 6-62.

—*Acidaspis O'Nealli*.

The Cincinnati Quart. Jour. Sci., vol. II, no. I, Jan., 1875, pp. 86-87.

—Class Cephalopoda, as represented in the Cincinnati group. The Cincinnati Quart. Jour. Sci., vol. II, no. II, April, 1875, pp. 121-134.

Miller, S. A. [Samuel Almond].

Review of the Glacial theory.

The Cincinnati Quart. Jour. Sci., vol. II, no. III, July, 1875, pp. 259-267.

—Some remarks on *Plumulites Jamesi* of Hall and Whitfield.

The Cincinnati Quart. Jour. Sci., vol. II, no. III, July, 1875, pp. 274-277.

—*Glyptocrinus Shafferi*.

The Cincinnati Quart. Jour. Sci., vol. II, no. III, July, 1875, pp. 277-279.

—*Heterocrinus isodactylus*.

The Cincinnati Quart. Jour. Sci., vol. II, no. III, July, 1875, p. 279.

—Some new species of fossils from the Cincinnati group and remarks upon some described forms.

The Cincinnati Quart. Jour. Sci., vol. II, no. IV, Oct., 1875, pp. 349-355.

—The American Palæozoic fossils: a catalogue of the genera and species with names of authors, dates, places of publication, groups of rocks in which found and the etymology and signification of the words, and an introduction devoted to the stratigraphical geology of the Palæozoic rocks. Cincinnati, 253 pp., 1877.

—Description of a new genus and eleven new species of fossils, with remarks upon others well known, from the Cincinnati group. Jour. Cincinnati Soc. Nat. Hist., vol. I, 1878-1879, pp. 100-108, 2 pls.

—Report of committee on geological nomenclature [Cincinnati group]. Jour. Cincinnati Soc. Nat. Hist., vol. I, 1878-1879, pp. 193-194. Am. Jour. Sci., 3d series, vol. XVII, 1879, pp. 484-485.

—Catalogue of fossils found in the Hudson River, Utica slate and Trenton groups, as exposed in the southeast part of Indiana, southwest part of Ohio and northern part of Kentucky. Indiana Dept. Geol. and Nat. Hist., 8th, 9th and 10th Ann. Repts., 1879, pp. 22-56.

—Description of twelve new fossil species and remarks upon others. Jour. Cincinnati Soc. Nat. Hist., vol. II, 1879-1880, pp. 104-118, 2 pls.

—Silurian *Ichnolites* with definitions of new genera and species.

Jour. Cincinnati Soc. Nat. Hist., vol. II, 1879-1880, pp. 217-222, 2 pls.

—Description of four new species of Silurian fossils.

Jour. Cincinnati Soc. Nat. Hist., vol. III, 1880-1881, pp. 140-144, 1 pl.

Miller, S. A. [Samuel Almond].

Description of four new species and a new variety of Silurian fossils and remarks upon others.

Jour. Cincinnati Soc. Nat. Hist., vol. III, 1880-1881, pp. 232-236, 1 pl.

—Description of five new species of Silurian fossils, and remarks upon an undetermined form.

Jour. Cincinnati Soc. Nat. Hist., vol. III, 1880-1881, pp. 314-317, 1 pl.

—Description of some new and remarkable Crinoids and other fossils of the Hudson River group, and notice of *Strolocrinus bloomfieldensis*.

Jour. Cincinnati Soc. Nat. Hist., vol. IV, 1881, pp. 69-77, 1 pl.

—North American Mesozoic and Cenozoic geology and paleontology.

Jour. Cincinnati Soc. Nat. Hist., vol. IV, 1881, pp. 183-234. Also issued 338 pp., Cincinnati, 1881.

—Description of new species of fossils from the Hudson River group and remarks upon others.

Jour. Cincinnati Soc. Nat. Hist., vol. IV, 1881, pp. 316-319, 1 pl.

—Notice of a work by Prof. Nicholson on the genus *Monticulipora*

Bull. Sci. Lab. Denison Univ., vol. V, 1882, pp. 25-33.

—Description of two new genera and eight new species of fossils from the Hudson River group, with remarks upon others.

Jour. Cincinnati Soc. Nat. Hist., vol. V, 1882, pp. 34-44, 2 pls.

—Description of three new species and remarks upon others.

Jour. Cincinnati Soc. Nat. Hist., vol. V, 1882, pp. 116-121, 1 pl.

—Description of three new orders and four new families, in the class Echinodermata, and eight new species from the Silurian and Devonian formations.

Jour. Cincinnati Soc. Nat. Hist., vol. V, 1882, p. 221-231, 1 pl.

—*Glyptocrinus* redefined and restricted, *Gaurocrinus*, *Pycnocrinus* and *Compsocrinus* established, and two new species described.

Jour. Cincinnati Soc. Nat. Hist., vol. VI, 1883, pp. 217-234.

—Description of a beautiful star-fish and other fossils.

Jour. Cincinnati Soc. Nat. Hist., vol. VII, 1884-1885, pp. 16-20, 1 pl.

—North American geology and paleontology for the use of amateurs, students and scientists. Third edition, 664 pp., 1st appendix, 1892; 2d appendix, 1897. Total, 793 pp., 1458 figs., Cincinnati, 1889.

—Palæontology.

Indiana Dept. Geol. and Nat. Hist., 18th Ann. Rep., 1893, pp. 251-333. See p. 331.

Miller, S. A., and Faber, C. L.

Description of some Subcarboniferous and Carboniferous Cephalopoda.

Jour. Cincinnati Soc. Nat. Hist., vol. xiv, 1891-1892, pp. 164-168, 1 pl.

—Some new species and new structural parts of fossils.

Jour. Cincinnati Soc. Nat. Hist., vol. xv, 1892-1893, pp. 79-87.
Abstract: Am. Geol., vol. x, 1892, pp. 316-317.

—New species of fossils from the Hudson River group, and remarks upon others.

Jour. Cincinnati Soc. Nat. Hist., vol. xvii, 1894-1895, pp. 22-33, 1 pl.

—Description of some Cincinnati fossils.

Jour. Cincinnati Soc. Nat. Hist., vol. xvii, 1894-1895, pp. 137-158.

Mills, W. C. and Wright, G. F.,

Discovery of a Palæolithic implement at Newcomerstown, Ohio.
Western Reserve Hist. Soc., Tract no. 75, 1890, pp. 1-14, 4 pls.

Milne-Edwards, Henri and Haimes, Jules.

Monographie des polypiers fossiles des terrains palæozoïques précédée d'un tableau général de la classification des polypes.
Extrait: Archives du Muséum d'histoire naturelle, tome V., 502 pp., 20 pls., 1851.

Minshall, F. W.

Oil interests [Ohio, West Virginia, Pennsylvania].

The Register [Marietta], (Industrial Edition), March, 1897, pp. 13, 14, section, p. 13.

Mitchell, S. L. [Samuel Latham].

Observations on the geology of North America illustrated by the description of various organic remains found in that part of the world. Cuvier's Essay on the theory of the earth, 1818, pp. 319-424, 3 pls., New York.

Moore, P. N.

Some notes upon the iron manufacture in the Kentucky division of the Hanging Rock iron district.

Geol. Surv., Kentucky, Reports of progress, vol. i, pt. v, 2d series, pp. 317-353, Frankfort, 1876.

[Morgan, H. J.]

Illustrations of polished rock surfaces.

Tenth Census United States. Rept. on building stones of the United States and statistics of quarry industry, 32 pls., Washington, 1884. Part of vol. x.

Morris, J. B.

The Black Band ore fields of Post Boy, Tuscarawas county.
Ohio Min. Jour., whole no. 19, 1890, pp. 91-93.

Moseley, E. L.

Attractions for a scientist in the vicinity of Sandusky.

Third Ann. Rept., Ohio State Acad. Sci., 1895, p. 5.

—Formation of Sandusky Bay and Cedar Point. President's address.
Thirteenth Ann. Rept., Ohio State Acad. Sci., vol. iv, pt. 5, 1904,
pp. 179-238, 9 maps.

Moses, T. F.

Report of the antiquities of Mad river valley.

Proc. Central Ohio Sci. Assoc., Urbana, vol. i, pt. 1, 1878, pp.
23-46.

Morton, S. G. [Samuel George].

Appendix. Being a notice and description of the organic remains
embraced in the preceding paper on the bituminous coal de-
posits of the valley of the Ohio by S. P. Hildreth.

Am. Jour. Sci., 1st series, vol. xxix, 1836, pp. 149-154, 36 pls.

Neff, Peter.

The Sylvania sand in Cuyahoga county, Ohio.

Bull. Geol. Soc. Am., vol. i, 1890, pp. 32-34.

Abstract: Am. Nat., vol. xxiv, 1890, p. 110.

Newberry, J. S. [John Strong].

Fossil plants from the Ohio coal basin.

Annals of Science [Cleveland], vol. i, 1853, pp. 2-3, 95-97, 106-
108, 164-165, 268-270.

—Fossil fishes of the cliff limestone of Ohio.

Annals of Science [Cleveland], vol. i, 1853, pp. 12-13, 2 figs., pp.
282-283.

—Catalogue of the fossil plants of Ohio.

Annals of Science [Cleveland], vol. i, 1853, pp. 95 and 106.

—New fossil plants from Ohio.

Annals of Science [Cleveland], vol. i, 1853, pp. 116, 128 and 153.

—On the Carboniferous flora of Ohio, with descriptions of fifty new
species of fossil plants.

Proc. Am. Assoc. Adv. Sci., vol. vii, 1853, pp. 163-166.

Annals of Science [Cleveland], vol. i, 1853, p. 280.

—Description of several new genera and species of fossil fishes from
the Carboniferous strata of Ohio.

Proc. Acad. Nat. Sci. Philadelphia, vol. viii, 1856, pp. 96-100.

Newberry, J. S. [John Strong].

- On the structure and affinities of certain fossil plants of the Carboniferous era.
 Proc. Am. Assoc. Adv. Sci., vol. VII, 1856, pp. 157-163, 9 figs.
- On the Carboniferous flora of Ohio, with descriptions of fifty new species of fossil plants.
 Proc. Am. Assoc. Adv. Sci., vol. VII, 1856, pp. 163-166.
- On the fossil fishes of the cliff limestone of Ohio.
 Proc. Am. Assoc. Adv. Sci., vol. VII, 1856, pp. 166-167.
- Fossil fishes of the Devonian rocks of Ohio.
 Bull. Nat. Inst., Washington, D. C., Jan., 1857.
- New fossil fishes from the Devonian rocks of Ohio.
 Proc. Nat. Inst., Washington, D. C., new series, vol. I, 1857, pp. 119-126, 1 fig.
- Abstract: Am. Jour. Sci., 2d series, vol. XXIV, 1857, pp. 147-149.
- Report on the economic geology of the route of the Ashtabula and New Lisbon railroad, 47 pp., map, Cleveland, 1857.
- The rock oils of Ohio.
 Ohio Agricultural Report, 1860, pp. 605, 618.
- The Statehouse well of Columbus, Ohio.
 Rept. of Supt. of Statehouse, 1860, and reprint.
- Notes on the surface geology of the basin of the Great Lakes.
 Proc. Boston Soc. Nat. Hist., vol. IX, 1862, pp. 42-46.
- Prospectus of Neff Petroleum Company, Knox county, Ohio, pp. 16-23; 40-43, Gambier, 1866.
- On some fossil reptiles and fishes from the Carboniferous strata of Ohio, Kentucky and Illinois.
 Abstract: Proc. Am. Assoc. Adv. Sci., vol. XVI, 1867, pp. 144-146.
- On some remarkable fossil fishes discovered by Rev. H. Herzer, in the black shale [Devonian] at Delaware, Ohio.
 Proc. Am. Assoc. Adv. Sci., vol. XVI, 1867, pp. 146-147, 2 figs.
- Geological map of Ohio.
 Stebbin's Atlas of Ohio, 1867.
- Sketch of the geology of Ohio.
 Walling's Atlas of Ohio with geological map, 1868.
- On the surface geology of the basin of the Great Lakes and the valley of the Mississippi.
 Annals New York Lyceum Nat. Hist., vol. IX, pp. 213-234, 1870.
 Am. Nat., vol. IV, 1871, pp. 193-218.
 Abstracts: Am. Jour. Sci., 2d series, vol. XLIX, 1869, pp. 111-114. 267-269.
 Am. Nat., vol. II, 1869, pp. 444-445.
 Neues Jahrbuch, 1870, p. 500.
 Nature, vol. II, p. 177.

Newberry, J. S. [John Strong].

The geological position of the remains of elephant and mastodon in North America.

Proc. New York Lyceum Nat. Hist., vol. I, 1870, pp. 77-83.

—Notes on some new genera and species of fossil fishes from the Devonian rocks of Ohio.

Proc. New York Lyceum Nat. Hist., vol. I, 1870, p. 152.

—The geological survey of Ohio, its progress in 1869; report of an address delivered to the legislature of Ohio, 60 pp., New York, 1870.

—Part I. Report of progress in 1869.

Abstract: Am. Jour. Sci., 3d series, vol. I, 1871, pp. 215-216.

Geol. Surv. Ohio, Rept. progress 1869, pp. 3-53, map, Columbus, 1870.

—On the gas wells of Ohio and Pennsylvania.

Trans. New York Lyceum Nat. Hist., vol. I, 1871, pp. 266-270.

—Part I. Sketch of the structure of the Lower Coal-measures in northeastern Ohio.

Abstracts: Am. Nat., vol. VI, 1872, p. 291.

Am. Jour. Sci., 3d series, vol. III, 1872, pp. 143-144.

Geol. Surv., Ohio Rept. progress 1870, pp. 14-53, Columbus, 1871.

—Geology of Ohio.

Gray and Walling's Atlas of Ohio, with geological map, 1872.

—On Ohio and other gas wells.

Am. Jour. Sci., 3d series, vol. V, 1873, pp. 225-228.

—The geological position of the mastodon and elephant.

Proc. New York Lyceum Nat. Hist., 2d series, 1873, p. 12.

Am. Nat., vol. V, 1871, pp. 729-731.

—On the parallelism of coal seams.

Am. Jour. Sci., 3d series, vol. VII, 1874, pp. 367-369.

Cincinnati Quart. Jour. Sci., vol. I, 1874, pp. 267-269.

—On the so-called land plants from the Lower Silurian of Ohio.

Am. Jour. Sci., 3d series, vol. VIII, 1874, pp. 110-113.

—Circles of deposition in American sedimentary rocks.

Proc. Am. Assoc. Adv. Sci., vol. XXII, pt. II, 1874, pp. 185-196.

Canadian Naturalist, new series, vol. VII, 1875, pp. 163-164.

—Fossil plants from the Ohio coal basin.

Proc. Cleveland Acad. Sci., vol. I, 1874, pp. 26-53, 8 figs.

—Note on the vegetation of the drift.

Proc. Cleveland Acad. Sci., vol. I, 1874, pp. 76-80.

—Analysis of Ohio coals.

Proc. Cleveland Acad. Sci., vol. I, 1874, pp. 80-82.

Newberry, J. S. [John Strong].

- On the structure and origin of the Great Lakes.
Proc. New York Lyceum Nat. Hist., 2d series, 1874, p. 135.
- Report of the Geological Survey Ohio, vol. II, Geology and Paleontology, pt. II, Paleontology, 436 pp., 60 pls., 1875.
Abstract: Am. Jour. Sci., 3d series, vol. XI, 1876, pp. 409-410.
- [Geology of oil regions of the United States].
Am. Nat., vol. X, 1876, pp. 316-317.
- [On an asphaltic coal from the shale of the Huron river, Ohio, containing sulphate of baryta].
Annals New York Lyceum Nat. Hist., vol. XI, 1876, pp. 105-106.
Am. Jour. Sci., 3d series, vol. X, 1875, p. 303.
- Review of geological structure of Ohio.
Abstract: Am. Jour. Sci., 3d series, vol. XVII, 1879, pp. 331-332.
Geol. Surv. Ohio, vol. III, Geology and Paleontology, pt. I, Geology, 51 pp., Columbus, 1878.
- Descriptions of new Palæozoic fishes. Annals New York Acad. Soc., vol. I, 1879, pp. 188-192.
- Ohio [geological formations].
Macfarlane's Am. Geol. Railway Guide, 1879, pp. 109-114.
- On the origin and drainage of the basins of the Great Lakes.
Proc. Am. Phil. Soc., vol. XX, 1881, pp. 91-95.
- The gas wells of Ohio.
Amer. Chemist. vol. I, 1882, p. 201.
- On the origin of carbonaceous matter in bituminous shales.
Annals New York Acad. Sci., vol. II, 1883, pp. 357-369.
- On the physical conditions under which coal was formed.
School of Mines Quart., vol. IV, 1883, pp. 169-173.
Science, vol. I, 1883, pp. 89-91.
Ohio Min. Jour., vol. I, 1883, pp. 168-172.
- Note on the origin of elongated coal seams at Massillon, Ohio.
Trans. New York Acad. Sci., vol. II, 1883, pp. 87-88.
- Fossil fishes from the Devonian rocks of Ohio.
Trans. New York Acad. Sci., vol. II, 1883, p. 145.
- The relations of *Dinichthys*, as shown by complete crania recently discovered by Mr. Jay Terrell in the Huron shale of Ohio.
Trans. New York Acad. Sci., vol. III, 1883-1884.
- The drift deposits of Indiana.
Indiana Dept. Geol. and Nat. Hist., 14th Ann. Rep., 1884, pp. 85-98. See p. 90.
- On cone-in-cone.
Geol. Mag., vol. II, 3d series, 1885, pp. 559-560.

Newberry, J. S. [John Strong].

Description of some gigantic Placoderm fishes recently discovered in the Devonian of Ohio.

Trans. New York Acad. Sci., vol. v, 1885, pp. 25-28.

—Description of a new species of *Titanichthys*.

Trans. New York Acad. Sci., vol. vi, 1887, pp. 164, 165.

—Descriptions of new fossil fishes.

Trans. New York Acad. Sci., vol. vi, 1887.

Abstract: Am. Jour. Sci., 3d series, vol. xxxv, 1887, p. 498.

—On the fossil fishes of the Erie shale of Ohio.

Abstract: Trans. New York Acad. Sci., vol. vii, 1888, pp. 178-180.

—The Palæozoic fishes of North America.

Monograph United States Geol. Surv., vol. xvi, 228 pp., 53 pls., 1889.

Abstract: Am. Jour. Sci., 3d series, vol. xl, 1890, pp. 355, 356.

—Devonian plants from Ohio.

Jour. Cincinnati Soc. Nat. Hist., vol. xii, 1889-1890, pp. 48-56, 3 pls.

Abstract: Am. Jour. Sci., 3d series, vol. xxxix, 1890, pp. 71, 72.

—The genus *Sphenophyllum*.

Jour. Cincinnati Soc. Nat. Hist., vol., xiii, 1890-1891, pp. 212-217, 1 pl.

Newberry, S. B. [Spencer Baird].

Natural and artificial cements.

United States Geol. Surv., Min. Res. U. S., 1893, pp. 739-747.

See p. 745.

—Portland cement.

United States Geol. Surv., 17th Ann. Rep., 1896, pt. iii, Min. Res. U. S., pp. 881-888. See p. 885.

—Portland cement.

United States Geol. Surv., 18th Ann. Rep., 1897, pt. v, Min. Res. U. S., pp. 1169-1177. See p. 1175.

—Portland cement.

United States Geol. Surv., 21st Ann. Rep., 1901, pt. v, Min. Res. U. S., pp. 393-406. See p. 402.

Newell, F. H. [Frederic Haynes].

Letter of transmittal: Hydrography.

United States Geol. Surv., 19th Ann. Rept., pt. iv, 1898, viii, 814 pp., 118 pls., maps. See pp. vii-viii.

Newell, F. H. [Frederic Haynes].

Report of progress of stream measurements for the calendar year 1898.

United States Geol. Surv., 20th Ann. Rept., pt. iv, 1900, pp. 1-562, 63 pls. See pp. 212 and 223.

—Report of progress of stream measurements for the calendar year 1900.

United States Geol. Surv., 22d Ann. Rept.; pt. iv, 1902, pp. 9-506, 36 pls., 226 figs. See p. 235 and figs. 97-102.

—Report of progress of stream measurements for calendar year 1901.

United States Geol. Surv., Water-Supply and Irrigation Papers No. 76, 246 pp., 13 pls., 1903.

Newton, Henry.

The ores of iron; their geographical distribution and relation to the great centers of the world's iron industries.

Trans. Am. Inst. Min. Eng., vol. III, 1875, pp. 360-391. See p. 386.

Nicholson, H. A. [H. Alleyne].

On *Ortonia*, a new genus of fossil tubicolar Annelides, with notes on the genus *Tentaculites*.

Geol. Mag., vol. ix, no. 10, 1872, (pp. 1-4, reprint).

—Letter to editor Cincinnati Quarterly Journal of Science.

The Cincinnati Quart. Jour. Sci., vol. I, no. III, July, 1874, pp. 236-238.

—Descriptions of species of *Chaetetes* from the Lower Silurian rocks of North America.

Quart. Jour. Geol. Soc., vol. xxx, 1874, pp. 499-515, 2 pls.

—Descriptions of species of *Hippothoa* and *Alecto* from the Lower Silurian rocks of Ohio, with a description of *Aulopora arachnoidea*.

Annals and Magazine Nat. Hist., [London], vol. xv, 1875, (pp. 1-5, reprint), 1 pl.

—Descriptions of new species of Polyzoa from the Lower and Upper Silurian rocks of North America.

Annals and Magazine Nat. Hist., [London], vol. xv, 1875, pp. 177-184, 1 pl.

—On the Guelph limestones of North America and their organic remains.

Geol. Mag., vol. II, new series, 1875, pp. 343-348.

—Tabulate corals of the Paleozoic period, 342 pp., 44 figs., 15 pls., 1879.

—The genus *Monticulipora* and its sub-genera, 235 pp., 50 figs., 6 pls., 1881.

Nickles, J. M. [John Milton].

The geology of Cincinnati.

Jour. Cincinnati Soc., Nat. Hist., vol. xxx, 1901-1902, pp. 49-100,
topographic map.

—Description of a new bryozoan, "*Homotrypa Bassleri*" n.sp., from
the Warren beds of the Lorraine group.

Jour. Cincinnati Soc. Nat. Hist., vol. xx, 1901-1902, pp. 103-
105, 1 fig.

—The Richmond group in Ohio and Indiana and its subdivisions,
with a note on the genus *Strophomena* and its type.

Am. Geol., vol. xxxii, 1903, pp. 202-218.

—Land-sculpturing displayed about Cincinnati.

The Teacher's Bull., series III, vol. I, no. 2, 18 pp., 3 pls., Cincin-
nati, 1905.

Nickles, J. M., and Bassler, R. S.

Synopsis of American fossil Bryozoa.

Bull. United States Geol. Surv., no. 173, 663 pp., 1900.

Niles, W. H.

Geological agency of lateral pressure exhibited by certain rock
movements.

Proc. Boston Soc. Nat. Hist., vol. xviii, 1877, pp. 272-278.

Oliphant, F. H. [Fideleo Hughes].

Petroleum.

United States Geol. Surv., 18th Ann. Rept., 1897, pt. v, Min. Res.
U. S., pp. 747-893. See p. 803.

—Natural gas.

United States Geol. Surv., 18th Ann. Rept., 1897, pt. v, Min. Res.
U. S., pp. 895-918. See p. 906.

—Petroleum.

United States Geol. Surv., 19th Ann. Rept., 1898, pt. vi, Min.
Res. U. S., pp. 1-166. See p. 59.

—Natural gas.

United States Geol. Surv., 19th Ann. Rept., 1898, pt. vi, Min. Res.
U. S., pp. 167-185. See p. 174.

—Petroleum.

United States Geol. Surv., 20th Ann. Rept., 1899, pt. vi, Min. Res.
U. S., pp. 1-202. See p. 67.

—Natural gas.

United States Geol. Surv., 20th Ann. Rept., 1899, pt. v, Min. Res.
U. S., pp. 203-224. See p. 211, 212.

—Petroleum.

United States Geol. Surv., 21st Ann. Rept., 1901, pt. vi, Min. Res.
U. S., pp. 1-292. See p. 88.

Oliphant, F. H. [Fideleo Hughes].

Natural gas.

United States Geol. Surv., 21st Ann. Rept., 1901, pt. vi, Min. Res. U. S., pp. 293-318. See pp. 296, 309, 310.

—Natural gas.

United States Geol. Surv., Min. Res. U. S., 1901, pp. 629-651. See p. 643.

—Natural gas.

United States Geol. Surv., Min. Res. U. S., 1904, pp. 631-655. See p. 645.

—Natural gas.

United States Geol. Surv., Min. Res. U. S., 1904, pp. 719-743. See p. 732.

—Natural gas.

United States Geol. Surv., Min. Res. U. S. 1905, pp. 761-788. See p. 775.

Orton, Edward.

On the occurrence of a peat bed beneath deposits of drift in southwestern Ohio.

Am. Jour. Sci., 2d series, vol. L, 1870, pp. 54-57.

—Part III—the geology of Highland county.

Abstract: Am. Jour. Sci., 3d series, vol. III, 1872, pp. 218-219.

Geol. Surv. Ohio, Report progress in 1870, pp. 255-310, Columbus, 1871.

—Note on the Lower Waverly strata of Ohio.

Am. Jour. Sci., 3d series, vol. XVIII, 1879, pp. 138-140.

—The Berea sandstone of Ohio, 9 pp., 1879.

—Review of the stratigraphical geology of eastern Ohio, 34 pp., 1 pl. Columbus, 1880.

Abstract: Am. Jour. Sci., 3d series, vol. XX, 1880, p. 333.

Ann. Rept. Sec. State Ohio, Exec. Docs. Gen. Assem., pt. III, 1880, pp. 933-967.

—A source of the bituminous matter in the Devonian and Subcarboniferous black shales of Ohio.

Am. Jour. Sci., 3d series, vol. XXIV, 1882, pp. 171-175.

—The growth and order of the Lower Coal-measures.

Ohio Min. Jour., vol. I, 1882, pp. 16-25.

—The Berea grit of Ohio.

Proc. Am. Assoc. Adv. Sci., vol. XXX, 1882, pp. 167-175.

—The Great Kanawha coal fields.

The Virginias, vol. III, 1882, p. 6.

—The Lower Coal-measures of Ohio.

Ohio Min. Jour., vol. I, 1883, pp. 97-108.

Orton, Edward.

Uses of Ohio coals.

Ohio Min. Jour., vol. II, 1883, pp. 18-23.

—The Ohio coal field.

Ohio Min. Jour., vol. II, 1883, pp. 43-46.

—A source of the bituminous matter of the black shales of Ohio.

Proc. Am. Assoc. Adv. Sci., vol. XXXI, 1883, pp. 373-384.

—The iron ores of Ohio.

Ohio Min. Jour., vol. II, 1884, pp. 105-113.

—The gas wells of Ohio.

Ohio Min. Jour., vol. II, 1884, pp. 185-193.

—The constitution of Ohio coals.

Ohio Min. Jour., vol. II, 1884, pp. 200-207.

—The Massillon coal field.

Ohio Min. Jour., vol. III, no. I, 1884, pp. 32-38.

—The horizons of petroleum and inflammable gas in Ohio.

Abstract: Proc. Am. Assoc. Adv. Sci., vol. XXXIII, 1885, pp. 397-398.

Science, vol. IV, 1884, pp. 325-326,

—The record of the deep well of the Cleveland Rolling Mill Company, Cleveland, Ohio.

Abstract: Proc. Am. Assoc. Adv. Sci., vol. XXXIV, 1885, pp. 220-222.

Am. Jour. Sci., 3d series, vol. XXX, 1885, p. 316.

—Salt and bromine production in Ohio.

Ohio Min. Jour., vol. III, no. 2, 1885, pp. 7-14.

—The correlation of the Lower Coal-measures of Ohio and eastern Kentucky.

Abstract: Proc. Am. Assoc. Adv. Sci., vol. XXXIII, 1885, pp. 398-399.

—[Problems in the study of coal with a sketch of recent progress in geology].

Proc. Am. Assoc. Adv. Sci., vol. XXXIV, 1885, pp. 173-197.

Abstract: Science, vol. VI, 1885, pp. 217-219.

—The recently discovered sources of natural gas and petroleum in northwestern Ohio.

Abstract: Proc. Am. Assoc. Adv. Sci., vol. XXXIV, 1885, pp. 202-204.

Science, vol. VI, 1885, p. 220.

—The natural gas wells of northwestern Ohio.

Science, vol. V, 1885, p. 474.

Orton, Edward.

- Geological survey of Ohio, preliminary report upon petroleum and inflammable gas, 76 pp., 2 maps, Columbus, 1886.
 Abstract: *Am. Jour. Sci.*, 3d series, vol. xxxii, 1886, p. 241.
- Natural gas in Ohio.
Amer. Manufr., Nat. gas supplement, April 30, 1886, p. 15.
United States Geol. Surv., Min. Res., 1888, pp. 479-484.
- Present production of petroleum and natural gas in Ohio.
 [Extracts from advance sheets of report on petroleum and inflammable gas].
Amer. Manufr., Aug. 6, p. 13; Aug. 20, p. 13, 1886.
- [A year's progress in geology]. Address of Vice-President American Association Advancement Science.
Proc. Am. Assoc. Adv. Sci., vol. xxxiv, 1886, pp. 173-197.
- Petroleum and natural gas as found in Ohio.
Science, vol. vii, 1886, pp. 560-564, 1 map.
- Characteristics of Ohio coals.
 Tenth Census United States, vol. xv, 1886, pp. 619-622. Report on mining industries (exclusive of precious metals).
- The Findlay field.
Am. Manufr., May 27, 1887, p. 13.
- The Trenton rock and gas supply.
Ohio Min. Jour., vol. v, 1887, pp. 85-89.
- Geological survey of Ohio, preliminary report upon petroleum and inflammable gas, reprinted for the author, with a supplement, 200 pp., pls., Columbus, 1887.
 Abstract: *Am. Geol.*, vol. i, 1888, pp. 62-63.
- The Trenton limestone as an oil formation.
Am. Geol., vol. i, 1888, p. 133.
- The geology of Ohio, considered in its relations to petroleum and natural gas.
 Abstracts: *Am. Geol.*, vol. ii, 1888, pp. 58-61.
Science, vol. xii, 1888, p. 175.
Geol. Mag., dec. iii, vol. vi, 1888, pp. 84-86.
Rept. Geol. Surv. Ohio, vol. vi, Economic Geology, 59 pp., 1888.
- The conditions of oil and gas production in northern Ohio and Indiana.
Ohio Min. Jour., vol. vi, no. 3, 1888, pp. 29-33.
- The drift deposits of Ohio.
 Abstract: *Science*, vol. xii, 1888, p. 176.
Rept. Geol. Surv. Ohio, vol. vi. Economic Geology, 1888, pp. 772-782.

Orton, Edward.

Gypsum or land-plaster in Ohio.

United States Geol. Surv., Min. Res. U. S., 1888, pp. 596-601.
 Rept. Geol. Surv. Ohio, vol. VI, Economic Geology, 1888, pp.
 696-702.

- Review of the westward extension of the Hocking valley coal field.
 Ohio Min. Jour., whole no. 18, 1889, pp. 7-21.
- Natural gas.
 Ohio Min. Jour., whole no. 18, 1889, pp. 28-30.
- Discovery of sporocarps in the Ohio shale.
 Abstract: Proc. Am. Assoc. Adv. Sci., vol. XXXVII, 1889, pp.
 179-181.
- The Trenton limestone as a source of petroleum and inflammable
 gas in Ohio and Indiana.
 United States Geol. Surv., 8th Ann. Rept., pt. II, 1889, pp. 475-
 662, 7 pls., map.
 Abstracts: Am. Nat., vol. XXIV, 1890, pp. 661-663.
 Am. Geol., vol. V, 1890, pp. 388-391.
- On the origin of the rock pressure of natural gas of the Trenton
 limestone of Ohio and Indiana.
 Am. Jour. Sci., 3d series, vol. XXXIX, 1890, pp. 225-229.
- Origin of the rock pressure of natural gas in the Trenton limestone
 of Ohio and Indiana.
 Bull. Geol. Soc. Am., vol. 1, 1890, pp. 87-94, 96.
 Smithsonian Institution, Ann. Rep., 1893, pp. 155-162.
 Abstracts: Am. Geol., vol. V, 1890, p. 119.
 Am. Nat., vol. XXIV, 1890, p. 955.
- Geological formations found in Ohio.
 Macfarlane's Am. Geol. Railway Guide, 2d edit., 1890, pp. 177-
 187.
- Professor Edward Orton's talk on the origin of the rock pressure
 of natural gas in the Trenton limestone of Ohio and Indiana.
 Ohio Min. Jour., whole no. 19, 1890, pp. 32-41.
- On the occurrence of *Megalonyx Jeffersoni* in central Ohio.
 Abstract: Bull. Geol. Soc. Am., vol. 2, 1891, p. 635.
- On the occurrence of a quartz boulder in the Sharon coal of north-
 eastern Ohio.
 Am. Jour. Sci., 3d series, vol. XLIV, 1892, pp. 62-63.
- From the Ohio river to Chicago. Itinerary of excursion of Inter-
 national Geological Congress.
 Congrès Géol. Internat., Compte rendu, 5me session, 1893, pp.
 291-298.

Orton, Edward.

Geological surveys of Ohio.

Jour. Geol., vol. II, 1894, pp. 502-516.

—The stored power of the World.

Ohio Min. Jour., whole no. 21, 1894, pp. 102-121, 1 pl.

—An approximate determination of the coal resources based on the recent maps of the geological survey.

Ohio Min. Jour., whole no. 23, 1894, pp. 96-113.

—Geological survey of Ohio, vol. VII.

Abstract: Jour. Geol., vol. III, 1895, pp. 353-357.

—Review of the uses that may be made of the geological maps accompanying volume VII, Geology of Ohio.

Ohio Min. Jour., whole no. 23, 1896, pp. 90-113.

—Geological probabilities as to petroleum. Annual address by the President.

Bull. Geol. Soc. Am., vol. 9, 1898, pp. 85-100.

—Geological structure of the Iola gas field.

Bull. Geol. Soc. Am., vol. 10, 1899, pp. 99-106, 1 pl.

—The wastage of our coal fields.

Ohio Min. Jour., whole no. 26, 1899, pp. 110-114.

—The rock waters of Ohio.

United States Geol. Surv., 19th Ann. Rept., pt. IV, 1899, pp. 633-717, 3 pls.

—The geography and geology of Ohio. [Preceded by a biography of the author].

Howe's Hist. Collections Ohio, vol. 1, 1904, pp. 59-89, 1 fig., 1 map.

Orton, Jr., Edward.

The Bedford cannel coal.

Ohio Min. Jour., vol. II, no. 2, 1884, pp. 80-88.

Eng. and Min. Jour., vol. XXXVII, 1884, p. 175.

Owen, D. D. [David Dale].

Review of the New York geological reports.

Am. Jour. Sci., 1st series, vol. XLVI, 1844, pp. 143-157.

—Review of the New York geological reports.

Am. Jour. Sci., 1st series, vol. XLVII, 1844, pp. 354-380.

—Review of the New York geological reports.

Am. Jour. Sci., 1st series, vol. XLVIII, 1845, pp. 296-316.

—Review of the New York geological reports.

Am. Jour. Sci., 2d series, vol. I, 1846, pp. 43-70.

Owen, D. D. [David Dale].

On the geology of the western states of North America.

Quart. Jour. Geol. Soc., vol. II, 1846, pp. 433-447, (with a geological chart of the Ohio valley). The map republished by Lawrence Byrem, 1843, "A geological map of the western United States."

—Review of the New York geological reports.

Am. Jour. Sci., 2d series, vol. III, 1847, pp. 164-171.

Parker, E. W. [Edward Wheeler].

Coal.

United States Geol. Surv., 16th Ann. Rept., 1895, pt. IV, Min. Res. U. S., pp. 1-217, See p. 156.

—Coal.

United States Geol. Surv., 17th Ann. Rept., 1896, pt. III, Min. Res. U. S., pp. 285-542, 4 pls. See p. 464.

—Coal.

United States Geol. Surv., 18th Ann. Rept., 1897, pt. V, Min. Res. U. S., pp. 351-632. See p. 562.

—Coke.

United States Geol. Surv., 18th Ann. Rept., 1897, pt. V, Min. Res. U. S., pp. 708, 659-746. See p. 708.

—Salt.

United States Geol. Surv., 18th Ann. Rept., 1897, pt. V, Min. Res. U. S., pp. 1273-1313. See p. 1301.

—Coal.

United States Geol. Surv., 20th Ann. Rept., 1899, pt. VI, Min. Res. U. S., pp. 295-507. See p. 448.

Peale, A. C. [Albert Charles].

Mineral Waters.

United States Geol. Surv., Min. Res. U. S., 1885, pp. 978-987. See p. 984.

—Lists and analyses of the mineral springs of the United States (a preliminary study).

Bull. United States Geol. Surv., no. 32, 235 pp., 1886. See p. 130.

—Natural mineral waters of the United States.

United States Geol. Surv., 14th Ann. Rept., pt. II, 1894, pp. 49-88. See p. 86.

—Mineral waters.

United States Geol. Surv., 17th Ann. Rept., 1896, pt. III, Min. Res. U. S., pp. 1025-1044. See p. 1037.

—Mineral waters.

United States Geol. Surv., 18th Ann. Rept., 1897, pt. V, Min. Res. U. S., pp. 1369-1389. See p. 1382.

- Peale, A. C.** [Albert Charles].
 Mineral waters.
 United States Geol. Surv., 20th Ann. Rept., 1899, pt. vi, Min. Res.
 U. S., pp. 747-769. See p. 762.
- Mineral waters.
 United States Geol. Surv., 21st Ann. Rept., 1901, pt. vi, Min. Res.
 U. S., pp. 597-622. See p. 614.
- Peckham, S. F.** [Stephen Farnum].
 Report on the production, technology and uses of petroleum and
 its products.
 Tenth Census United States, vol. x, 1884, pp. 1-301, 20 pls., 1
 map.
 Abstract: Am. Jour. Sci., 3d series, vol. xxviii, 1884, pp. 105-
 117.
- Peet, S. D.** [Stephen Denison].
 Natural and artificial terraces.
 Am. Geol., vol. vii, 1891, pp. 113-117.
- The flood plain and the mound builders.
 Am. Geol., vol. viii, 1891, pp. 44-51.
- Peppel, S. V.** [Samuel Vernon].
 Gypsum deposits in Ohio.
 Bull. United States Geol. Surv., no. 223, 1904, pp. 38-44, 3 pls.
- Perry, N. W.**
 The Cincinnati rocks; what has been their physical history?
 Am. Geol., vol. iv, pp. 326-336, 2 pls., 1889.
 Abstract: Am. Jour. Sci., 3d series, vol. xxxix, 1889, p. 70.
- Peter, Robert.**
 Chemical report of the soils, marls, clays, ores, coals, iron-furnace
 products, mineral waters, etc., of Kentucky.
 Geol. Surv. Kentucky, Reports of progress, vol. i, pt. iv, 2d series,
 180 pp., Frankfort, 1876. See pp. 146, 160, 292.
- Phinney, A. J.** [Arthur John].
 The natural gas field of Indiana.
 United States Geol. Surv., 11th Ann. Rept., pt. i, 1890, pp. 643-
 648.
- Pierce, S. J.**
 The pre-Glacial Cuyahoga valley.
 Am. Geol., vol. xx, 1897, pp. 176-181, 1 pl.
- The Cleveland water-supply tunnel.
 Am. Geol., vol. xxviii, 1901, pp. 380-385.

Porter, Dwight.

Report on the water power of the Ohio river Basin and the Ohio state canals.

Tenth Census United States, vol. xvii, 1886, pp. 429-504.

Powell, J. W. [John Wesley].

United States Irrigation Survey, 2d Ann. Rept., 1889-1890.

United States Geol. Surv., 11th Ann. Rept., pt. II, 395 pp., 1891.

See p. 263.

Pratt, J. H. [Joseph Hyde].

Abrasive materials.

United States Geol. Surv., Min. Res. U. S., 1902, pp. 781-809.

See p. 789.

—Strontium ores.

United States Geol. Surv., Min. Res. U. S., 1902, pp. 955-958.

See p. 956.

Price, E. K.

On the Glacial epochs.

Proc. Am. Phil. Soc., vol. xvi, 1877, pp. 241-276.

Prosser, C. S. [Charles Smith].

Names for the formations of the Ohio Coal-measures.

Am. Jour. Sci., 4th series, vol. xi, 1901, pp. 191-200; [Ohio State] Univ. Bull., series 5, No. 16, (Geol. series, No. 2), 1901.

—The classification of the Waverly series of central Ohio.

Jour. Geol., vol. ix, 1901, pp. 205-232, 4 figs.; [Ohio State] Univ. Bull., series 5, no. 16, (Geol. series no. 2), 1901.

Abstract: *Lethæa geognostica*, I. Theil. *Lethæa palæozoica*, 2, Bd. iv, Lief, 1902, p. 693.

—[On the Bedford shale and limestone of Ohio and Indiana].

Jour. Geol., vol. ix, 1901, pp. 270-273.

—The Sunbury shale of Ohio.

Jour. Geol., vol. x, 1902, pp. 262-313, 6 figs.; [Ohio State] Univ. Bull., series 6, no. 13, (Geol. series no. 3), 1902.

—The nomenclature of the Ohio geological formations.

Jour. Geol., vol. xi, 1903, pp. 519-546; [Ohio State] Univ. Bull., series 8, no. 3, (Geol. series no. 6), 1903.

Abstract: *Geologisches Centralblatt*, Bd. iv, 1904, pp. 591-593.

—The Delaware limestone.

Jour. Geol., vol. xiii, 1905, pp. 413-443, 3 figs.

—Stratigraphical Geology.

Ann. Rep., Ohio State Acad. Sci., for 1905.

- Prosser, C. S.**, assisted by **Cumings, E. R.**,
The Waverly formations of central Ohio.
Am. Geol., vol. xxxiv, 1904, pp. 335-361, 2 pls.
- Raborg, W. A.**
Abrasive materials. Grindstones.
United States Geol. Surv., Min. Res. U. S., 1887, pp. 581-594.
See p. 582.
- Salt.
United States Geol. Surv., Min. Res. U. S., 1888, pp. 611-625.
See p. 619.
- Rafter, G. W.**
Relation of rainfall to run-off.
United States Geol. Surv., Water-Supply and Irrigation Papers,
no. 80, 104 pp., 1903.
- Ramsay, G. S.**
The northeastern bituminous Coal-measures of the Appalachian
system.
Trans. Am. Inst. Mining Eng., vol. xxv, 1896, pp. 76-83.
- Redfield, W. C.**
[On cause of drift phenomena in Portage county].
Abstract: Am. Jour. Sci., 1st series, vol. XLVII, 1844, pp. 120-
121.
- Rice, T. D.**, and **Geib, W. J.**,
Soil survey of Coshocton county.
United States Dept. Agr., [Advance sheets], Field Oper. Bur.
Soils, 20 pp., 1 fig., 1 map, 1905.
- Riddell, J. L.**
Remarks on the geological features of Ohio, and some of the de-
siderata which might be supplied by a geological survey of the
state, 12 pp., Cincinnati, 1836.
- Ries, Heinrich.**
The pottery industry of the United States.
United States Geol. Surv., 17th Ann. Rept., 1896, pt. III, Min.
Res. U. S., pp. 842-880, 2 pls. See p. 866.
- The clay-working industry in 1896.
United States Geol. Surv., 18th Ann. Rept., 1897, pt. v, Min. Res.
U. S., pp. 1105-1168. See p. 1145.
- The kaolins and fire clays of Europe.
United States Geol. Surv., 19th Ann. Rept., 1898, pt. VI, Min.
Res. U. S., pp. 377-467. See p. 395.

Ries, Heinrich.

The clays of the United States east of the Mississippi river.

United States Geol. Surv., Professional Paper, no. 11, 298 pp.,
9 pls., 11 figs., 1903. See p. 190.

Riggs, R. B., [Robert Baird] Clarke, F. W., and.

Limestones from Ohio and Indiana.

Bull. United States Geol. Surv., no. 60, 174 pp., 9 figs., 1890. See
p. 160.

—Three samples of Utica shale from New Vienna.

Bull. United States Geol. Surv., no. 148, 306 pp., 1897. See p.
283 and Bull. no. 168, p. 284.

—Trenton limestone from New Vienna [and other localities].

Bull. United States Geol. Surv., no. 168, 308 pp., 1900. See p.
259, and Bull. no. 148, p. 260.

Rogers, H. D. [Henry Darwin].

An inquiry into the origin of the Appalachian coal strata, bitumi-
nous and anthracite.

Trans. Assoc. Am. Geologists and Naturalists, 1843, pp. 433-474.

—Introductory observations. New species of plants from the an-
thracite and bituminous coal fields of Pennsylvania, by Leo
Lesquereux.

Boston Jour. Nat. Hist., vol. vi, 1854, pp. 409-413.

—Sketch of the geology of the United States.

Geology of Pennsylvania, vol. II, 1858, pp. 741-775. See p. 752.

Rogers, H. D., and Rogers, W. B.

Observations on the geology of the western peninsula of Upper
Canada and the western part of Ohio.

Trans. Am. Phil. Soc., vol. VIII, new series, 1843, pp. 273-284.
Proc. Am. Phil. Soc., vol. II, 1842, pp. 120-125.

Rogers, W. B. [William Barton], and Rogers, H. D.

Observations on the geology of the western peninsula of Upper
Canada and the western part of Ohio.

Trans. Am. Phil. Soc., vol. VIII, new series, 1843, pp. 273-284.
Proc. Am. Phil. Soc., vol. II, 1842, pp. 120-125.

Rominger, Carl.

Helderberg group.

Geol. Surv. Michigan, vol. III, pt. I, 1876, pp. 23-37.

—Black shales of Ohio—Genessee shales of New York.

Geol. Surv. Michigan, vol. III, pt. I, 1876, pp. 65-68.

—Geological Survey of Michigan, Lower Peninsula, 1873-1876, ac-
companied by a geological map, vol. III; pt. II, Palæontology-
Corals, 161 pp., 55 pls., 1876.

Rosemond, F. L.

Address of welcome.

Ohio Min. Jour., whole no. 19, 1890, pp. 9-13.

Roy, Andrew.

The coal mines. 367 pp., Cleveland, Ohio, 1876.

—The Mahoning valley coal region.

Trans. Am. Inst. Mining Eng., vol. iv, 1876, pp. 188-190.

—Causes of wants or areas of barren ground in the coal beds of the state.

Ohio Min. Jour., vol. i, no. 1, 1882, pp. 32-36.

—The mineral resources of Jackson county.

Ohio Min. Jour., vol. i, no. 2, 1883, pp. 59-65.

—Notes on the coal field.

Ohio Min. Jour., vol. i, no. 2, 1883, pp. 82-86.

—Origin of coal and early mining.

Ohio Min. Jour., vol. i, no. 4, 1883, pp. 147-168.

—Coal mining in Ohio.

Ohio Min. Jour., vol. ii, no. 1, 1883, pp. 3-15.

—The Ohio coal field.

Ohio Min. Jour., vol. ii, no. 3, 1884, pp. 121-129.

—The Jackson shaft coal and the Wellston coal of Jackson county.

Ohio Min. Jour., vol. ii, no. 4, 1884, pp. 162-175.

—Sketch of the Glasgow-Port Washington works of Tuscarawas county.

Ohio Min. Jour., vol. iii, no. 1, 1884, pp. 10-15.

—Review of Prof. Orton's discussion of the lower Coal-measures of Ohio.

Ohio Min. Jour., vol. iii, no. 1, 1884, pp. 39-50.

—The lower two hundred feet of the Coal measures of Jackson county.

Ohio Min. Jour., vol. iii, no. 3, 1885, pp. 34-38.

—The identification of coal seams.

Ohio Min. Jour., vol. v, no. 2, 1887, pp. 14-17.

—Peculiarities of coal seams.

Ohio Min. Jour., vol. v, no. 3, 1887, pp. 89-93.

—Waving of the Coal-measures.

Ohio Min. Jour., vol. vi, no. 3, 1888, pp. 33-40.

—The coal seams of Jackson county.

Ohio Min. Jour., whole no. 21, 1894, pp. 12-16.

—Geology of the Jackson county coal in Ohio.

Mines and Minerals, vol. xix, 1899, pp. 254-255.

Abstract: Eng. and Mining Jour., vol. lxxv, 1898, p. 164.

Roy, Andrew.

Geology of Jackson shaft coal.

Ohio Min. Jour., whole no. 27, 1899, pp. 120-124.

—The mines and mining resources of Ohio.

Howe's Hist. Collections Ohio, vol. I, 1904, pp. 110-118.

Ruedemann, Rudolf, Clarke, J. M., and.

The Guelph formation and fauna in the state of New York.

Memoir New York State Mus., no. v, 195 pp., 21 pls., 1903. See p. 131.

Sardeson, F. W. [Frederick William].

The Galena and Maquoketa series. Part III.

Am. Geol., vol. XIX, 1897, pp. 91-111, 2 pls.

Sayler, N.

Geological map of Ohio, scale 5 miles to 1 inch, Cincinnati, 1865.

Schuchert, Charles.

A synopsis of American fossil Brachiopoda.

Bull. United States Geol. Surv., no. 87, 464 pp., 1897.

—The I. H. Harris collection of invertebrate fossils in the United States National Museum.

Am. Geol., vol. XXI, 1903, pp. 131-135.

—On the faunal provinces of the Middle Devonian of America and the Devonian Coral sub-provinces of Russia, with two Paleographic maps.

Am. Geol., vol. XXXII, 1903, pp. 137-162, 2 pls.

Schuchert, Charles, and Clarke, J. M.

—The nomenclature of the New York series of geological formations, [Cincinnatian].

Science, new series, vol. x, 1899, pp. 874-878.

Am. Geol., vol. XXV, 1900, pp. 114-120.

Schuchert, Charles, and Winchell, N. H.

The Lower Silurian Brachiopoda of Minnesota.

Minnesota Geol. and Nat. Hist. Surv., Paleontology, vol. III, pt. I, 1893, pp. 333-474, 6 pls.

—Sponges, Graptolites and Corals from the Lower Silurian of Minnesota.

Minnesota Geol. and Nat. Hist. Surv., Final Rept., vol. III, pt. I, 1895, pp. 55-95, 2 pls.

Abstract: Am. Geol., vol. XII, 1894, p. 331.

Scofield, W. H., and Ulrich, E. O.

The Lower Silurian Gastropoda of Minnesota.

Minnesota Geol. and Nat. Hist. Surv., Paleontology, vol. III, pt. II, 1897, pp. 813-1081, 12 pls.

Scoville, S. S.

A large boulder in southern Ohio.

Jour. Cincinnati Soc. Nat. Hist., vol. I, 1878-1879, p. 56.

Scudder, S. H. [Samuel Hubbard].

A classed and annotated bibliography of fossil insects.

Bull. United States Geol. Surv., no. 69, 101 pp., 1890.

—Index to the known fossil insects of the world, including Myriopods and Arachnids.

Bull. United States Geol. Surv., no. 71, 744 pp., 1891.

Abstract: Am. Jour. Sci., 3d series, vol. XLIII, 1892, pp. 244-245.

—Revision of the American fossil cockroaches with descriptions of new forms.

Bull. United States Geol. Surv., no. 124, 176 pp., 12 pls., 1895.

Selby, A. D.

Notes on the Barren measures.

Ohio Min. Jour., vol. v, no. 4, 1887, pp. 108-112.

Shaler, N. S. [Nathaniel Southgate].

[Source of boulders in Ohio, Kentucky, etc.].

Proc. Boston Soc. Nat. Hist., vol. xiv, 1872, p. 386.

—[On the geology of the region about Richmond, Virginia, etc.].

Proc. Am. Acad. Arts and Sciences, [Boston], vol. VIII, 1874, pp. 307-308.

—On the original connection of the eastern and western coal fields of the Ohio valley.

Memoirs Harvard Coll. Mus. Comp. Zool., vol. xvi, no. 2, 1887, pp. 3-11.

Sharpe, Daniel.

Report on the fossil remains of Mollusca from the Paleozoic formations of the United States, etc., with remarks on the comparison of the North American formations with those of Europe.

Quart. Jour. Geol. Soc., vol. iv, 1848, pp. 145-181.

Sherman, C. E. [Christopher Elias].

Preliminary report on the Ohio cooperative topographic survey, 228 pp., 1 map, 1904.

Sherzer, W. H. [Will Hittell].

Geological report on Monroe county, Michigan.

Geol. Surv. Michigan, vol. VII, pt. I, 240 pp., 7 pls., 1900.

Smith, H. P.

Bison latifrons—Leidy.

Jour. Cincinnati Soc. Nat. Hist., vol. x, 1887-1888, pp. 19-24, 1 pl.

Smith, J. P. [James Perrin.]

The Carboniferous Ammonoids of America.

Monograph United States Geol. Surv., vol. XLII, 211 pp., 29 pls., 1903. See p. 54.

Smith, W. G.

Soil survey of the Toledo area, Ohio.

United States Dept. Agr., Field Oper. Bur. Soils, 4th Rept., 1903, pp. 383-402, 3 pls., 1 fig.

Soil survey of the Columbus area, Ohio.

United States Dept. Agr., Field Oper. Bur. Soils, 4th Rept., 1903, pp. 403-423, 1 pl.

Smock, J. C.

The useful minerals of the United States—Ohio.

United States Geol. Surv., Min. Res. U. S., 1883, pp. 718-721.

Smurthwaite, William.

Coal mining at Steubenville.

Ohio Min. Jour., vol. I, no. II, 1883, pp. 53-59.

—Our mineral resources and their economic developments.

Ohio Min. Jour., vol. II, no. 2, 1884, pp. 68-73.

Spencer, J. W. [Joseph William Winthrop].

Discovery of the preglacial outlet of the basin of Lake Erie into that of Lake Ontario, with notes on the origin of our lower Great Lakes.

Proc. Am. Phil. Soc., vol. XIX, 1882, pp. 300-337, maps.

Second Geol. Surv. Pennsylvania, Rep. Q⁴, geology of Erie and Crawford counties by I. C. White, pp. 257-404, maps, Harrisburg, 1881.

Abstracts: Canadian Nat., vol. x, new series, 1883, pp. 65-79.

Am. Nat., vol. xv, 1881, pp. 408-410.

Am. Jour. Sci., 3d series, vol. XXII, 1881, pp. 151-152.

—A short study of the features of the region of the lower Great Lakes during the great river age, or notes on the origin of the Great Lakes of North America.

Proc. Am. Assoc. Adv. Sci., vol. XXX, 1882, pp. 131-146.

—The ancient Mississippi and its tributaries.

Kansas City Review, vol. VI, 1883, pp. 615-621.

—Niagara fossils.

Bull. Mus. Univ. State Missouri, vol. I, no. I, 1884, pp. 5-61, 9 pls. See p. 35.

—High level shores in the region of the Great Lakes, and their deformation.

Am. Jour. Sci., 3d series, vol. XLI, 1891, pp. 201-211.

Spencer, J. W. [Joseph William Winthrop].

Post-Pliocene continental subsidence in America versus Glacial dams.

Bull. Geol. Soc. Am., vol. II, 1891, pp. 465-476, 1 pl.

Geol. Mag., 3d dec., vol. VIII, 1891, pp. 262-272.

Abstracts: Am. Nat., vol. XXV, 1891, p. 653.

Am. Geol., vol. VII, 1891, p. 141; vol. VIII, 1891, p. 186.

Stearns, C. H.

Some observations on the topography of Athens and vicinity.

Seventh Ann. Rep., Ohio State Acad. Sci., 1899, pp. 67-70.

Stevens, R. P.

Description of new Carboniferous fossils from the Appalachian, Illinois and Michigan coal-fields.

Am. Jour. Sci., 2d series, vol. XXV, 1858, pp. 258-265.

—Contributions to the paleontological synchronism of the Coal-measures of Ohio and Illinois.

Am. Jour. Sci., 2d series, vol. XXVI, 1858, pp. 72-79.

Stevenson, J. J. [John James].

The upper Coal-measures west of the Alleghany mountains.

Annals New York Lyceum Nat. Hist., vol. X, 1874, pp. 226-252, map, pl. XII.

Abstract: Am. Jour. Sci., 3d series, vol. V, 1873, p. 477.

—On the alleged parallelism of coal beds.

Proc. Am. Phil. Soc., vol. XIV, p. 283.

Abstract: Am. Jour. Sci., 3d series, vol. IX, 1875, pp. 321-322.

—Prof. I. C. White's "Stratigraphy of the bituminous coal fields of Pennsylvania, Ohio and West Virginia."

Am. Geol., vol. IX, 1892, pp. 352-355.

—Notes upon the Mauch Chunk of Pennsylvania.

Am. Geol., vol. XXIX, 1902, pp. 242-249.

—Lower Carboniferous of the Appalachian basin.

Bull. Geol. Soc. Am., vol. 14, 1903, pp. 15-96.

See pp. 26, 27, 54.

—Carboniferous of the Appalachian Basin.

Bull. Geol. Soc. Am., vol. 15, 1904, pp. 37-210. See pp. 26, 54.

Stoddard, O. N.

Diluvial striæ on fragments in situ.

Am. Jour. Sci., 2d series, vol. XXVIII, 1859, pp. 227-228.

Stokes, H. N.

Sandstones and cherts. Three samples of the "Peebles-Henley" sandstone from Portsmouth.

Bull. United States Geol. Surv., no. 148, 306 pp., 1897. See p. 247, and Bull. no. 168, p. 244.

Stroop, L. J.

Did a glacier flow from Lake Huron into Lake Erie?
Am. Nat., vol. iv, 1871, pp. 623-625.

Tappan, Benjamin.

On the bowlders of primitive rocks found in Ohio and other western states and territories.
Am. Jour. Sci., 1st series, vol. xiv, 1828, pp. 291-297.

Taylor, F. B. [Frank Bursley].

The great ice-dams of Lakes Maumee, Whittlesey and Warren.
Am. Geol., vol. xxvi, 1899, pp. 6-38, 2 pls.

Taylor, J. S.

Notice of trilobites in the cabinet of Dr. Julius S. Taylor.
Am. Jour. Sci., 2d series, vol. x, 1850, pp. 113, 114.

Taylor, R. C.

Statistics of coal. The geographical and geological distribution of mineral combustibles or fossil fuel, including also notices and localities of the various mineral bituminous substances employed in the arts and manufactures, [etc], CLXVIII, 754 pp., pls., maps, Philadelphia, 1848. Second edition edited by S. S. Haldeman, xx, 640 pp., pls., maps, Philadelphia, 1855.

Tight, W. G. [William George.]

Some observations on the crushing effects of the Glacial ice sheet.
Bull. Sci. Lab. Denison Univ., vol. vi, pt. i, 1891, pp. 12-14, 4 pls.

—A contribution to the knowledge of the pre-Glacial drainage of Ohio. Part I.

Bull. Sci. Lab. Denison Univ., vol. viii, pt. ii, 1894, pp. 35-62, 5 pls.

Abstract: *Am. Geol.*, vol. xiv, 1894, pp. 188-189.

—A Glacial ice dam and a limit to the ice sheet in central Ohio.

Am. Nat., vol. xxviii, 1894, pp. 488-493, 3 pls.

—Lake Licking—a contribution to the buried drainage of Ohio.

Second Ann. Rept., Ohio State Acad. Sci., 1894, pp. 17-20.

—A pre-Glacial tributary to Paint creek and its relation to the Beech flats of Pike county, Ohio.

Bull. Sci. Lab. Denison Univ., vol. ix, pt. i, 1895, pp. 25-34, 1 map.

—Some pre-Glacial drainage features of southern Ohio.

Bull. Sci. Lab. Denison Univ., vol. ix, pt. ii, 1897, pp. 22-32, 4 pls.

Tight, W. G. [William George].

A pre-Glacial valley in Fairfield county.

Bull. Sci. Lab. Denison Univ., vol. IX, pt. II, 1897, pp. 33-37,
4 pls.

—The development of the Ohio river.

Abstracts: Science, new series, vol. VIII, 1898, pp. 465-466.

Am. Geol., vol. XXII, 1898, p. 252.

—Some drainage modifications in Washington and adjacent counties.
[Ohio.]

Ohio State Acad. Sci., Special Papers, no. 3, 1900, pp. 11-31,
map, 5 pls.

—Topographic features of Ohio.

Abstract: Science, new series, vol. XI, 1900, p. 100.

—Drainage modifications in southeastern Ohio.

Abstract: Science, new series, vol. XI, 1900, pp. 100-101.

—Drainage modifications in southeastern Ohio, and adjacent parts
of West Virginia and Kentucky.

United States Geol. Surv., Professional Paper, no. 13, 111 pp.,
17 pls., 1 fig., 1903.

[**True, H. L.**]

[Evidences of glacial action in Morgan county].

Morgan county Democrat, 1895.

—The devil's tea-table.

Morgan county Democrat, Feb. 28, 1896. Republished in Mor-
gan county Atlas.

—The cause of the Glacial period. 162 pp., 14 figs., 1902.

Todd, J. H.

Some observations on the preGlacial drainage of Wayne and ad-
jacent counties.

Ohio State Acad. Sci., Special Papers, no. 3, 1900, pp. 46-67,
map.

Ulrich, E. O. [Edward Oscar].

Descriptions of some new species of fossils from the Cincinnati
group.

Jour. Cincinnati Soc. Nat. Hist., vol. I, 1878-1879, pp. 92-100,
1 pl.

—Descriptions of new genera and species of fossils from the Lower
Silurian about Cincinnati.

Jour. Cincinnati Soc. Nat. Hist., vol. II, 1879-1880, pp. 8-30.

—Description of a new genus and some new species of Bryozoans
from the Cincinnati group.

Jour. Cincinnati Soc. Nat. Hist., vol. II, 1879-1880, pp. 119-131,
1 pl.

Ulrich, E. O. [Edward Oscar].

Catalogue of fossils occurring in the Cincinnati group of Ohio, Indiana and Kentucky. 31 pp., Cincinnati, 1880.

—American Paleozoic Bryozoa.

Jour. Cincinnati Soc. Nat. Hist., vol. v, 1882, pp. 121-175, 3 pls.; pp. 232-257, 3 pls.

—American Paleozoic Bryozoa.

Jour. Cincinnati Soc. Nat. Hist., vol. vi, 1883, pp. 82-92, 1 pl. pp. 148-168, 2 pls; pp. 245, 279, 3 pls.

—American Paleozoic Bryozoa.

Jour. Cincinnati Soc. Nat. Hist., vol. vii, 1884-1885, pp. 24-51, 3 pls.

—A correlation of the Lower Silurian horizons of Tennessee and of the Ohio and Mississippi valleys with those of New York and Canada.

Am. Geol., vol. i, 1888, pp. 100-110; 179-190; 305-315.

—Reply of Mr. Ulrich. [Nomenclature of some Cincinnati group fossils].

Am. Geol., vol. i, 1888, pp. 333-335.

—A correlation of the Lower Silurian horizons of Tennessee and of the Ohio and Mississippi valleys with those of New York and Canada.

Am. Geol., vol. ii, 1888, pp. 39-44.

—A list of the Bryozoa of the Waverly group in Ohio. With descriptions of new species.

Bull. Sci. Lab. Denison Univ., vol. iv, 1888, pp. 63-96, 2 pls.

—Preliminary description of new Lower Silurian Sponges.

Am. Geol., vol. iii, 1889, pp. 233-248, 1 pl.

—On *Lingulasma*, a new genus, and eight new species of *Lingula* and *Trematis*.

Am. Geol., vol. iii, 1889, pp. 377-391, 1 pl.

—New Lower Silurian Bryozoa.

Jour. Cincinnati Soc. Nat. Hist., vol. xii, 1889-1890, pp. 173-198, 22 figs.

—New Lamellibranchiata, No. 1: containing descriptions of new species of *Modiolopsis*.

Am. Geol., vol. v, 1890, pp. 270-284, 10 figs.

—New Lamellibranchiata, No. 2; on two new genera and six new species.

Am. Geol., vol. vi, 1890, pp. 173-181, 5 figs.

—New Lamellibranchiata, No. 3; descriptions of new species, with remarks on others.

Am. Geol., vol. vi, 1890, pp. 382-389, 4 figs.

Ulrich, E. O. [Edward Oscar].

Palæozoic Bryozoa.

Geol. Surv. Illinois, vol. VIII, 1890, Geol. and Paleon. pt. II, Palæontology Illinois, sec. VI, pp. 285-688, 49 pls.

—New and little known American Paleozoic Ostracoda.

Jour. Cincinnati Soc. Nat. Hist., vol. XIII, 1890-1891, pp. 104-137, 4 pls.; pp. 173-211, 8 pls.

—On Lower Silurian Bryozoa of Minnesota.

Minnesota Geol. and Nat. Hist. Surv., Final Rept.; vol. III, pt. I, 1895, pp. 96-332, 28 pls.

—The Lower Silurian Lamellibranchiata of Minnesota.

Minnesota Geol. and Nat. Hist. Surv., Paleontology, vol. III, pt. II, 1897, pp. 475-628, 12 pls.

—The Lower Silurian Ostracoda of Minnesota.

Minnesota Geol. and Nat. Hist. Surv., Paleontology, vol. III, pt. II, 1897, pp. 629-693, 2 pls.

Ulrich, E. O., and Hayes, C. W.

Columbia Folio. Tennessee.

United States Geol. Surv., Geol. Atlas U. S., folio no. 95, 1903.

Ulrich, E. O., and Scofield, W. H.

The Lower Silurian Gastropoda of Minnesota.

Minnesota Geol. and Nat. Hist. Surv., Paleontology, vol. III, pt. II, 1897, pp. 813-1081, 12 pls.

Ulrich, E. O., and Winchell, N. H.

The Lower Silurian deposits of the upper Mississippi; correlation of the strata with those in the Cincinnati, Tennessee, New York and Canadian Provinces, and the stratigraphic and geographic distribution of the fossils.

Minnesota Geol. and Nat. Hist. Surv., Paleontology, vol. III, pt. II, 1897, pp. LXXXIII-CXXIX.

Upham, Warren.

Terminal moraines of the North American ice sheet.

Am. Jour. Sci., 3d series, vol. XVIII, 1879, pp. 81-92; 197-209. See pp. 82, 208, 209.

—Probable causes of glaciation. Appendix to. "The ice age of North America" by G. F. Wright, pp. 573-625, 1891, See p. 609.

—Pre-Glacial and post-Glacial valleys of the Cuyahoga and Rocky rivers.

Bull. Geol. Soc. Am., vol. 7, 1896, pp. 327-348, 1 pl., 4 figs.

Upham, Warren.

The Glacial lake Agassiz.

Monograph United States Geol. Surv., vol. xxv, 658 pp., 38 pls., 35 figs, 1896. See map of the glaciated area of North America, pl. xvi.

—Cuyahoga pre-Glacial gorge in Cleveland, Ohio.

Bull. Geol. Soc. Am., vol. 8, 1897, pp. 7-13.

Van Cleve, J. W.

On the fossil zoöphytes of western Ohio.

Proc. Am. Assoc. Adv. Sci., vol. 1, 1849, pp. 19-24.

Van Rensselaer, Jeremiah.

An essay on salt, containing notices of its origin, formation, geological position, and principal localities. Delivered as a lecture before the New York Lyceum of Natural History, 80 pp., New York, 1823.

Am. Jour. Sci., 1st series, vol. vii, 1824, pp. 360-362.

Vanuxem, Lardner.

Remarks on the characters and classification of certain American rock formations.

Am. Jour. Sci., 1st series, vol. xvi, 1829, pp. 254-256.

Veatch, A. C. [Arthur Clifford], Lines, E. F., Fuller, M. L., and.

Record of deep well drilling for 1904.

Bull. United States Geol. Surv., no. 264, 103 pp., 1905. See pp. 60 and 91.

Verneuil, Edouard de.

Sur l'importance de la limite qui sépare le calcaire de montagne des formations qui lui sont inférieures.

Bull. Soc. Géol. France, vol. xi, 1840, pp. 166-179.

—Sur l'importance de la limite qui sépare le calcaire de montagne des formations qui lui sont inférieures.

Bull. Soc. Géol. France, vol. xii, 1841, p. 87, *ibid.*, pp. 86-87.
J. W. Foster.

—On the Fusulina in the coal formation of Ohio.

Am. Jour. Sci., 2d series, vol. ii, 1846, p. 293.

—Lettre sur la géologie des États-Unis.

Bull. Soc. Géol. France, 2d series, vol. iv, 1847, pp. 12-13.

—Note sur le parallélisme des roches des dépôts paléozoïques de l'Amérique septentrionale avec ceux de l'Europe, suivive d'un tableau des espèces fossiles communes aux deux continents, avec l'indication des étages où elles se rencontrent, et terminée par un examen critique de chacune de ces espèces.

Bull. Soc. Géol. France, 2d series, vol. iv, 1847, pp. 646-709.

Translated and condensed by James Hall, Am. Jour. Sci., 2d series, vol. v, 1848, pp. 176-184, 359-370. See p. 182. *Ibid.*, vol. vii, 1849, pp. 45-51; 218-231. See p. 45.

Vogdes, A. W.

A bibliography of Palæozoic Crustacea, from 1698 to 1889, including a list of North American species and a systematic arrangement of genera.

Bull. United States Geol. Surv., no. 63, 177 pp., 1890.

Ward, L. F. [Lester Frank].

The geographical distribution of fossil plants.

United States Geol. Surv., 8th Ann. Rept., pt. II, 1889, pp. 884-891.

Warman, P. C. [Philip Creveling].

Catalogue and index of the publications of the United States Geological Survey, 1880-1901.

Bull. United States Geol. Surv., no. 177, 858 pp., 1901.

—Catalogue and index of the publications of the United States Geological Survey, 1901-1903.

Bull. United States Geol. Surv., no. 215, 234 pp., 1903.

Warner, A. J.

On the oil-bearing rocks of Ohio and West Virginia.

Am. Jour. Sci., 3d series, vol. II, 1871, p. 215.

Watkins, L. L.

The coals of Vinton county.

Ohio Min. Jour., whole no. 19, 1890, pp. 67-69.

Weeks, F. B. [Fred Boughton].

Bibliography and index of North American geology, paleontology, petrology and mineralogy for 1892 and 1893.

Bull. United States Geol. Surv., no. 130, 210 pp., 1896.

—Bibliography and index of North American geology, paleontology, petrology and mineralogy for the year 1894.

Bull. United States Geol. Surv., no. 135, 141 pp., 1896.

—Bibliography and index of North American geology, paleontology, petrology and mineralogy for 1895.

Bull. United States Geol. Surv., no. 146, 130 pp., 1896.

—Bibliography and index of North American geology, paleontology, petrology and mineralogy for 1896.

Bull. United States Geol. Surv., no. 149, 152 pp., 1897.

—Bibliography and index of North American geology, paleontology, petrology and mineralogy for 1897.

Bull. United States Geol. Surv., no. 156, 130 pp., 1898.

—Bibliography and index of North American geology, paleontology, petrology and mineralogy for the year 1899.

Bull. United States Geol. Surv., no. 172, 146 pp., 1900.

—Bibliography of North American geology, paleontology, petrology and mineralogy for the years 1892-1900, inclusive.

Bull. United States Geol. Surv., no. 188, 337 pp., 1902.

Weeks, F. B. [Fred Boughton].

Index to North American geology, paleontology, petrology and mineralogy for the years 1892-1900, inclusive.

Bull. United States Geol. Surv., no. 189, 337 pp., 1902.

—Bibliography and index of North American geology, paleontology, petrology and mineralogy for the year 1901.

Bull. United States Geol. Surv., no. 203, 144 pp., 1902.

—Bibliography and index of North American geology, paleontology, petrology and mineralogy for the year 1902.

Bull. United States Geol. Surv., no. 221, 200 pp., 1903.

—Bibliography and index of North American geology, paleontology, petrology and mineralogy for the year 1903.

Bull. United States Geol. Surv., no. 240, 243 pp., 1904.

—Bibliography and index of North American geology, paleontology, petrology and mineralogy for the year 1904.

Bull. United States Geol. Surv., no. 271, 218 pp., 1905.

Weeks, J. D. [Joseph D.]

Report on the manufacture of coke.

Tenth Census United States, vol. x, 1884, pp. 1-106, 20 figs., 2 maps.

—The manufacture of coke.

United States Geol. Surv., Min. Res. U. S., 1885, pp. 144-213.
See p. 171.

—The manufacture of coke.

United States Geol. Surv., Min. Res. U. S., 1886, pp. 74-129. See p. 93.

—Natural gas.

United States Geol. Surv., Min. Res. U. S., 1886, pp. 155-180,
See p. 166.

—The manufacture of coke.

United States Geol. Surv., Min., Res. U. S., 1887, pp. 378-436.
See p. 403.

—Petroleum.

United States Geol. Surv., Min. Res. U. S., 1887, pp. 437-487.
See p. 458.

—Natural gas.

United States Geol. Surv., Min. Res. U. S., 1887, pp. 488-516. See p. 504.

—The manufacture of coke.

United States Geol. Surv., Min. Res. U. S., 1888, pp. 382-435.
See p. 408.

Weeks, J. D. [Joseph D.]

Petroleum.

United States Geol. Surv., Min. Res. U. S., 1888, pp. 436-463. See p. 451.

—Natural gas.

United States Geol. Surv., Min. Res., U. S., 1888, pp. 464-502. See p. 479.

—Natural gas.

United States Geol. Surv., Min. Res. U. S., 1890, pp. 481-512. See p. 490.

—Natural gas.

United States Geol. Surv., Min. Res. U. S., 1893, pp. 652-698. See pp. 654-681.

—The manufacture of coke.

United States Geol. Surv., 16th Ann. Rept., 1895, pt. iv., Min. Res. U. S., pp. 218-304. See p. 264.

—Petroleum.

United States Geol. Surv., 16th Ann. Rept., 1895, pt. iv, Min. Res. U. S., pp. 315-404. See p. 348.

—Natural gas in 1894.

United States Geol. Surv., 16th Ann. Rept., 1895, pt. iv, Min. Res. U. S., pp. 405-429. See p. 422.

—Coke.

United States Geol. Surv., 17th Ann. Rept., 1896, pt. iii, Min. Res. U. S., pp. 543-620. See p. 588.

—Petroleum.

United States Geol. Surv., 17th Ann. Rept., 1896, pt. iii, Min. Res. U. S., pp. 621-731. See p. 670.

—Natural gas.

United States Geol. Surv., 17th Ann. Rept., 1896, pt. iii, Min. Res. U. S., pp. 733-750. See p. 741.

Weller, Stuart.

Bibliographic index of North American Carboniferous invertebrates. Bull. United States Geol. Surv., no. 153, 653 pp., 1898.

—The composition, origin and relationships of the Corniferous fauna in the Appalachian Province of North America.

Jour. Geol., vol. x, 1902, pp. 423-432.

Wells, D. A.

Notes and observations on the analyses and characters of the soil of the Scioto valley, Ohio, with some general considerations respecting the subject of soil analyses.

Am. Jour. Sci., 2d series, vol. xiv, 1852, pp. 11-19.

Boston Jour. Nat. Hist., vol. vi, 1852, pp. 324-336.

Wells, R. W.

On the origin of prairies.

Am. Jour. Sci., 1st series, vol. I, 1818, pp. 331-337.

Wells, W. E.

The topography and geology of Clifton gorge.

The Ohio Naturalist, vol. iv, no. 4, 1904, pp. 75-78, 1 fig., 1 map.

Westgate, L. G. [Lewis Gardner.]

The geographic development of the eastern part of the Mississippi drainage system.

Am. Geol., vol. xi, 1893, pp. 245-260, See p. 247.

—Shore line topography between Toledo and Huron, Ohio.

The Ohio Naturalist, vol. iv, no. 3, 1904, p. 61.

Wetherby, A. G.

Description of a new family and genus of Lower Silurian Crustacea.

Jour. Cincinnati Soc. Nat. Hist., vol. I, 1878-1879, pp. 162-166.

—Description of a new family and genus of Lower Silurian Crustacea.

Jour. Cincinnati Soc. Nat. Hist., vol. II, 1879-1880, pp. 162-166.

—Description of new fossils from the Lower Silurian and Subcarboniferous rocks of Ohio and Kentucky.

Jour. Cincinnati Soc. Nat. Hist., vol. iv, 1881, pp. 77-85, 1 pl.

Wetherby, A. G., Mickleborough, John, and.

A classified list of Lower Silurian fossils, Cincinnati group.

Jour. Cincinnati Soc. Nat. Hist., vol. I, 1878-1879, pp. 61-86.

Wheeler, B.

Clays and coals of Muskingum county.

Ohio Min. Jour., whole no. 18, 1889, pp. 52-54.

White, C. A. [Charles Abiathar].

[Remarks on bowlders from coal bed in Ohio and on occurrence of bowlders in coal in Iowa].

Am. Nat., vol. v, 1871, p. 606.

—Van Cleve's fossil Corals.

Indiana Dept. Geol. and Nat. Hist., 11th Ann. Rept., 1881, pp. 376-401, 12 pls. See p. 376.

White, C. A., and Whitfield, R. P.

Observations on the rocks of the Mississippi valley which have been referred to the Chemung group of New York, together with descriptions of new species of fossils from the same horizon at Burlington, Iowa.

Proc. Boston Soc. Nat. Hist., vol. VIII, 1862, pp. 289-306.

White, David.

Fossil flora of the Lower Coal-measures of Missouri.

Monograph United States Geol. Surv., vol. xxxvii, 307 pp., 73 pls., 1899. See p. 286.

White, I. C. [Israel Charles].

Special report on the correlation of the Coal-measures in western Pennsylvania and eastern Ohio; the geology of Lawrence county.

Second Geol. Surv. Pennsylvania, Rept. Q. Q., pp. 215-303. Harrisburg, 1880.

—Notes on the place of the Sharon conglomerate in the Paleozoic series.

Proc. Am. Phil. Soc., vol. xix, 1881, pp. 198-200.

—Relation of the glacial dam at Cincinnati to the terraces in the upper Ohio and its tributaries.

Proc. Am. Assoc. Adv. Sci., vol. xxxii, 1883, pp. 212-213.

Science, vol. ii, 1883, pp. 319-320.

The Virginias, vol. iv, 1883, pp. 139-140.

Kansas City Review, vol. vii, 1884, pp. 295-299; "The Glacial period;" The Glacial boundary in Ohio, Indiana and Kentucky by G. F. Wright, Western Reserve Hist. Soc., Cleveland, 1884, pp. 81-86.

Abstract: Am. Jour. Sci., 3d series, vol. xxvi, 1883, p. 327.

—Notes on the geology of West Virginia.

Proc. Am. Phil. Soc., vol. xx, 1883, pp. 479-496.

—The geology of natural gas.

The Virginias, vol. vi, 1885, pp. 100-101.

Science, vol. v, 1885, pp. 521-522.

Science, vol. vi, 1885, p. 43.

The Petroleum Age, vol. v, no. 2, March, 1886, pp. 1263-1267, map.

Am. Jour. Sci., 3d series, vol. xxxi, 1886, pp. 393-394.

—Rounded bowlders at high altitudes along some Appalachian rivers.

Am. Jour. Sci., 3d series, vol. xxxiv, 1887, pp. 374-381.

—Stratigraphy of the bituminous coal fields of Pennsylvania, Ohio and West Virginia.

Bull. United States Geol. Surv., no. 65, 212 pp., 11 pls., colored map, 152 figs., 1891.

—Report on coal.

West Virginia Geol. Surv., vol. ii, pt. ii, 1903, pp. 81-716.

—Petroleum and natural gas.

West Virginia Geol. Surv., vol. i (A), pt. i, 1904, pp. 1-557. See p. 230.

Whitfield, J. E. [J. Edward].

Limestone from the Auglaize river near Defiance.

Bull. United States Geol. Surv., no. 55, 96 pp., 1 pl., 16 figs., 1889.

See p. 80.

Whitfield, R. P. [Robert Parr].

Remarks on some Lamellibranchiate shells of the Hudson River group, with descriptions of four new species.

Jour. Cincinnati Soc. Nat. Hist., vol. 1, 1878-1879, pp. 137-141, 1 pl.

—Notice of new forms of fossil Crustaceans from the Upper Devonian rocks of Ohio, with descriptions of new genera and species.

Am. Jour. Sci., 3d series, vol. XIX, 1880, pp. 33-42.

—Notice of the occurrence of rocks representing the Marcellus shale of New York in central Ohio.

Proc. Am. Assoc. Adv. Sci., vol. XXVIII, 1880, pp. 297-299.

—Notice of a new genus and species of air-breathing mollusk from the Coal-measures of Ohio, and observations on *Dawsonella*.

Am. Jour. Sci., 3d series, vol. XXI, 1881, pp. 125-128, 6 figs.

—Descriptions of new species of fossils from Ohio, with remarks on some of the geological formations in which they occur.

Annals New York Acad. Sci., vol. II, 1883, p. 193.

—Species from the Marcellus shales.

Annals New York Acad. Sci., vol. II, 1883, pp. 212-215.

—Note on the Marcellus shale and other members of the Hamilton group in Ohio, as determined from paleontological evidence.

Annals New York Acad. Sci., vol. II, 1883, pp. 233-241.

—Description of fossils from the Paleozoic rocks of Ohio.

Annals New York Acad. Sci., vol. V, 1890, pp. 505-622, 1 pl.

Whitfield, R. P., and Hall, James.

Notice of three new species of fossil shells from the Devonian of Ohio.

New York State Mus., 23d Ann. Rep., 1873, pp. 240-241.

Whitfield, R. P., and White, C. A.

Observations on the rocks of the Mississippi valley which have been referred to the Chemung group of New York, together with descriptions of new species of fossils from the same horizon at Burlington, Iowa.

Proc. Boston Soc. Nat. Hist., vol. VIII, 1862, pp. 289-306.

Whitney, J. D., and Foster, J. W.

Report on the geology of the Lake Superior land district. Part II. The iron region together with the general geology.

United States Senate, Exec. Doc., no. 4, special sess., March, 1851, pp. v, 1-139; 190-202; 274-284. See p. 5.

Whittlesey, Charles.

- A statement of elevations in Ohio with reference to the geological formations, and also the heights of various points in this state and elsewhere.
 Am. Jour. Sci., 1st series, vol. XLV, 1843, pp. 12-18.
- Notes upon the drift and alluvium of Ohio and the west.
 Am. Jour. Sci., 2d series, vol. v, 1848, pp. 205-217.
- Outline sketch of the geology of Ohio. Outline map of the geological formations of Ohio.
 Howe's Historical Collections, 1848, p. 579.
- Description of a coal plant supposed to be new.
 Am. Jour. Sci., 2d series, vol. VIII, 1849, pp. 375-377, 1 fig.
- On the natural terraces and ridges of the country bordering Lake Erie.
 Am. Jour. Sci., 2d series, vol. x, 1850, pp. 31-39.
- On the "superficial deposits" of the northwestern part of the United States.
 Proc. Am. Assoc. Adv. Sci., vol. v, 1851, pp. 54-57. Discussed by Evans, Anthony and Owens, pp. 58-59.
 Abstract: E. Desor, Bull. Soc. Géol. France, 3d series, vol. IX, 1851, pp. 318-319.
- On the equivalency of the rocks of northeastern Ohio, and the Portage, Chemung and Hamilton rocks of New York.
 Proc. Am. Assoc. Adv. Sci., vol. v, 1851, pp. 207-221.
 Abstract: E. Desor, Bull. Soc. Géol. France, 1885, 2d series, vol. IX, pp. 316-317.
- Drift of the northern and western states.
 Annals of Science, [Cleveland], vol. I, 1853, pp. 47-48.
- Western Reserve coal field.
 Annals of Science, [Cleveland], vol. I, 1853, pp. 70-71.
- Geological map of Ohio, 2x2 feet. J. H. Colton & Co., New York, 1856.
- Paleontology and the moral sense (with maps), Cleveland, 1859.
- On the ice movements of the Glacial era in the valley of the St. Lawrence.
 Proc. Am. Assoc. Adv. Sci., vol. xv, 1867, pp. 43-54.
- On the fresh-water Glacial drift of the northwestern states.
 Smithsonian Contributions to Knowledge, vol. xv, 1867, pp. 1-32, 2 pls., 11 figs.
- Contributions to the geology of Ohio, 48 pp., Cleveland, 1869.
- The physical geology of eastern Ohio. Geological map of eastern Ohio.
 Memoirs Boston Soc. Nat. Hist., vol. I, 1869, p. 598.

Whittlesey, Charles.

Outlines of the geology. Cleveland, 1856, maps.

R. R. and township map reprinted in 1873, and outline map reprinted in "Paleontology and the moral sense," p. 8, Cleveland, 1873.

—The Alleghany coal field.

Proc. Cleveland Acad. Sci., vol. 1, 1874, pp. 99-113.

—Coal seam, No. 6, Ohio geology.

Proc. Boston Soc. Nat. Hist., vol. xvii, 1875, pp. 183-200.

—The physical structure of the Ohio coal field.

Proc. Am. Assoc. Adv. Sci., vol. xxiv, pt. II, 1876, pp. 73-80.

—Great coal seam region of Ohio. 7 pp., illus., 1877.

—Iron ores of the great coal seam region. 4 pp., pls., 1877.

—Ancient glacial action, Kelly's Island, Lake Erie.

Proc. Am. Assoc. Adv. Sci., vol. xxvii, 1879, pp. 239-245.

—Discovery of coal in Ohio and early mine work.

Ohio Min. Jour., vol. II, no. 1, 1883, pp. 15-18.

—The lower limestone group coal series of northeastern Ohio.

Ohio Min. Jour., vol. II, no. 2, 1884, pp. 55-62.

—Ohio surveys.

Ohio Min. Jour., vol. II, no. 3, 1884, pp. 136-144.

—The ice era in Ohio. 3 pp., 1884.

Willard, E. B.

The grouping of the coal strata.

Ohio Min. Jour. whole no. 23, 1895, pp. 79-81.

Williams, Jr., Albert.

Coal.

United States Geol. Surv., Min. Res. U. S., 1883, pp. 1-107. See p. 65.

—Salt.

United States Geol. Surv., Min. Res. U. S., 1885, pp. 827-850. See p. 834.

—Useful minerals of the United States. A partial list of ores, minerals, and mineral substances of industrial importance.

United States Geol. Surv., Min. Res. U. S., 1888, pp. 688-810. See p. 775.

Williams, D. W.

History of Jackson county. [Salt]. 188 pp., 1900.

Williams, H. S. [Henry Shaler].

On the classification of the Upper Devonian.

Proc. Am. Assoc. Adv. Sci., vol. xxxiv, 1885, pp. 222-234. See chart.

Abstracts: Science, vol. vi, 1885, pp. 220-221.

Am. Jour. Sci., 3d series, vol. xxx, 1885, p. 316.

—On the fossil faunas of the Upper Devonian—the Genessee section, New York.

Bull. United States Geol. Surv., no. 41, 123 pp., 4 pls., 1887. See pp. 17, 18, 20, 21.

—On the different types of the Devonian system in North America.

Am. Jour. Sci., 3d series, vol. xxxv, 1888, pp. 51-59.

Abstracts: Nature, vol. xxxvii, 1888, p. 358.

Proc. Am. Assoc. Adv. Sci., vol. xxxvi, 1888, pp. 207-208.

—An account of the progress in North American Palæontology for the years 1887, 1888.

Smithsonian Rep. for 1888, no. 749, pp., 261-326, 1890. [Reprint].

—Correlation papers; Devonian and Carboniferous.

Bull. United States Geol. Surv., no. 80, 279 pp., 1891. See pp. 173-192.

Abstract: Am. Geol., vol. ix, 1892, pp. 58-61.

—Shifting of faunas as a problem of stratigraphic geology.

Bull. Geol. Soc. Am., vol. 14, 1903, pp. 177-190, 1 pl. See p. 178 and chart opp. p. 177.

—The correlation of geological faunas, a contribution to Devonian paleontology.

Bull. United States Geol. Surv., no. 210, 134 pp., 1 pl., 1903. See pp., 120, 123, chart opp. p. 120.

Willis, Bailey.

Notes on the samples of iron ore collected in Ohio.

Tenth Census United States, vol. xv, 1886, Mining industries, pp. 235-243.

Winchell, Alexander.

Descriptions of new species of fossils from the Marshall group of Michigan, and its supposed equivalent in other states; with notes on some fossils of the same age previously described.

Proc. Acad. Nat. Sci. Philadelphia, vol. xvii, 1865, pp. 109-133.

Abstract: Am. Jour. Sci., 2d series, vol. xli, 1866, pp. 120-121.

—Geological report on the lands of the Neff Petroleum Company, lying in Knox and Coshocton counties. 11 pp., map and section, 1866.

Winchell, Alexander.

[Remarks on boulder from coal bed in Ohio].

Am. Nat., vol. v, 1871, p. 606.

—On the geological age and equivalents of the Marshall group.

Proc. Am. Phil. Soc., vol. xi, 1871, pp. 57-82; 385-418.

Abstract: Am. Nat., vol. ii, 1869, p. 445.

—Notes and descriptions of fossils from the Marshall groups of the western states with notes on fossils from other formations.

Proc. Am. Phil. Soc., vol. xi, 1871, pp. 245-260.

Winchell, N. H. [Newton Horace].

The drift deposits of the northwest.

Pop. Sci. Monthly, vol. iii, 1873, pp. 202-210.

—The surface geology of northwestern Ohio.

Proc. Am. Assoc. Adv. Sci., vol. xxi, 1873, pp. 152-186.

Abstract: Am. Jour. Sci., 3d series, vol. iv, 1872, pp. 321-322.

—The Devonian limestones in Ohio.

Proc. Am. Assoc. Adv. Sci., vol. xxii, pt. ii, 1874, pp. 100-104.

—On the Hamilton in Ohio.

Am. Jour. Sci., 3d series, vol. vii, 1874, pp. 395-398.

—Vegetable remains in the drift deposits of the northwest.

Proc. Am. Assoc. Adv. Sci., vol. xxiv, pt. ii, 1876, pp. 43-56.

—On the parallelism of Devonian outcrops in Michigan and Ohio.

Proc. Am. Assoc. Adv. Sci., vol. xxiv, pt. ii, 1876, pp. 57-59.

Winchell, N. H., and Schuchert, Charles.

The Lower Silurian Brachiopoda of Minnesota.

Minnesota Geol. and Nat. Hist. Surv., Paleontology, vol. iii, pt. i, 1893, pp. 333-474, 6 pls.

—Sponges, Graptolites and Corals from the Lower Silurian of Minnesota.

Minnesota Geol. and Nat. Hist. Surv., Final Rept., vol. iii, pt. i, 1895, pp. 55-95, 2 pls.

Abstract: Am. Geol., vol. xii, 1894, p. 331.

Winchell, N. H., and Ulrich, E. O.

The Lower Silurian deposits of the upper Mississippi: A correlation of the strata with those in the Cincinnati, Tennessee, New York and Canadian Provinces and the stratigraphic and geographic distribution of the fossils.

Minnesota Geol. and Nat. Hist. Surv., Paleontology, vol. iii, pt. ii, 1897, pp. LXXXIII-CXXIX.

Wood, B. D., Hoyt, J. C., and.

Index to the Hydrographic Progress reports of the United States Geological Survey, 1888-1903.

United States Geol. Surv., Water-Supply and Irrigation Papers, no. 119, 253 pp., 1905.

Wood, S. V.

American "surface geology" and its relation to British; with some remarks on the Glacial condition in Britain, especially in reference to the "great Ice age" of James Geike.

Geol. Mag., vol. iv, new series, 1877, pp. 481-496; 536-552, 1 pl.

—American "surface geology" and its relation to British; with some remarks on the Glacial condition in Britain, especially in reference to the "Great Ice Age" of James Geike.

Geol. Mag., vol. v, new series, 1878, pp. 13-29, 1 pl.

Woodward, S. F.

Altitude of the Clinton limestone at Osborn, Ohio.

Proc. Central Ohio Sci. Assoc., Urbana, vol. 1, 1878, pp. 50-51.

Wormley, T. G.

Part V. Report of chemical department.

Abstract: Am. Jour. Sci., 3d series, vol. III, 1872, p. 219.

Geol. Surv. Ohio, Rept. progress, 1870, pp. 401-462, Columbus, 1871.

Worthen, A. H. [Amos Henry], and Meek, F. B.

Introduction.

Geol. Surv. Illinois, vol. II, Paleontology, pp. III-XIX, Chicago, 1866. See pp. x, xvii, xviii.

Worthen, A. H., and Meek, F. B.

Part II, Paleontology. Geol. Surv. Illinois, vol. III, Geology and Paleontology, 574 pp. 20 pls. Chicago, 1869. See pp. 325, 327, 438, 443, 445, 457, 458 and pls. 4, 11, 12, 14.

Wright, A. A. [Albert Allen].

The ventral armor of *Dinichthys*.

Am. Geol., vol. xiv, 1894, pp. 313-320, 1 pl., 2 figs.

—New evidence upon the structure of *Dinichthys*.

Fifth Ann. Rep., Ohio State Acad. Sci., 1897, pp. 59-60.

—Ohio bowlders containing "huronite."

Fifth Ann. Rep., Ohio State Acad. Sci., 1897, pp. 60-61.

Wright, G. F. [George Frederick].

Recent investigations concerning the southern boundary of the glaciated area of Ohio.

Am. Jour. Sci., 3d series, vol. xxvi, 1883, pp. 44-56.

Abstract: Science, vol. I, pp. 269-271, "Glacial phenomena in Ohio."

—[On the terminal moraine in eastern United States.]

Bull. Essex Inst., vol. xiv, 1883, pp. 71-73.

Wright, G. F. [George Frederick].

The Niagara river and the Glacial period.

Am. Jour. Sci., 3d series, vol. xxviii, 1884, pp. 32-35.

—The theory of a Glacial dam at Cincinnati and verification.

Am. Nat., vol. xviii, 1884, pp. 563-567.

—The Glaciated area of North America.

Am. Nat., vol. xviii, 1884, pp. 755-767.

—The Glacial boundary in Ohio, Indiana and Kentucky, 86 pp., Cleveland, 1884. The Western Reserve Historical Society (Appendices by I. C. White and Charles Whittlesey, pp. 77-86).

Abstract: Science vol. iii, 1884, p. 464.

—The Niagara gorge as a chronometer.

Science, vol. v, 1885, pp. 399-401.

Bibliotheca Sacra, 1885.

Abstract: Science, vol. iii, 1885, p. 556.

—On the age of the Ohio gravel beds.

Proc. Boston Soc. Nat. Hist., vol. xxiii, 1888, pp. 427-436.

—The Glacial boundary in western Pennsylvania, Ohio, Kentucky, Indiana and Illinois.

Bull. United States Geol. Surv., no. 58, 112 pp., 8 pls., 10, figs., 1890.

Abstract: Am. Geol., vol. vi, 1890, pp. 390-391.

—[Notes on glacial features].

Macfarlane's Am. Geol. Railway Guide, 2d edition, 1890, pp. 178, 179, 181, 182, 184, 185, 206, 221, 395.

—The lake ridges of Ohio and their probable relations to the lines of glacial drainage into the valley of the Susquehanna.

Proc. Am. Assoc. Adv. Sci., vol. xxxviii, 1890, p. 247.

Abstract: Pop. Sci., Monthly, vol. xxxvi, 1890, pp. 423-424.

—Man and the Glacial period.

Pop. Sci. Monthly, vol. xxxix, 1891, pp. 314-319.

From supplementary notes to new edition of "The Ice Age of North America."

—The Glacial grooves on Kelly's Island to be preserved.

Science, vol. xvii, 1891, pp. 358-359.

Am. Geol., vol. viii, 1891, p. 266.

—The Ice Age in North America and its bearing upon the antiquity of man. Third edition, 1891, 571 pp., 148 figs.

—Unity of the Glacial epoch.

Am. Jour. Sci., 3d series, vol. xlv, 1892, pp. 351-373.

—Additional evidence bearing upon the Glacial history of the upper Ohio valley.

Am. Geol., vol. xi, 1893, pp. 195-199.

Wright, G. F. [George Frederick].

Evidences of Glacial man in Ohio.

Pop. Sci. Monthly, May, 1893, pp. 1-11, 9 figs.

—Past drainage systems of the upper Ohio basin.

Abstract: Am. Geol., vol. XIII, 1894, p. 219.

—Continuity of the Glacial period.

Am. Jour. Sci., 3d series, vol. XLVII, 1894, pp. 161-187, 7 figs.

Abstracts: Am. Geol., vol. XIII, 1894, p. 286.

Am. Nat., vol. XXVIII, 1894, pp. 508-510.

—Report of the bowlder committee of the Ohio State Academy of Sciences.

Second Ann. Rept., Ohio State Acad. Sci., 1894, pp. 5-10.

—The Cincinnati ice dam.

Pop. Sci. Monthly, vol. XIV, 1894, pp. 184-198.

—Report of the bowlder committee of the Ohio State Academy of Sciences.

Third Ann. Rept., Ohio State Acad. Sci., 1895, pp. 6-7.

—The age of the second terrace on the Ohio at Brilliant, near Steubenville.

Jour. Geol., vol. IV, 1896, pp. 218-219.

—Supposed "corduroy road" of late Glacial age at Amboy, Ohio.

Abstracts: Proc. Am. Assoc. Adv. Sci., vol. XLVII, 1898, p. 298.

Science, new series, vol. VIII, 1898, p. 470.

Am. Geol., vol. XXII, 1898, p. 259.

—Clayey bands of the Glacial delta of the Cuyahoga river at Cleveland, Ohio, compared with those in the implement bearing deposits of the Glacial delta at Trenton, N. J.

Abstracts: Science, new series, vol. VIII, 1898, p. 464.

Am. Geol., vol. XXII, 1898, p. 250.

—A recently discovered cave of celestite crystals at Put-in-Bay, Ohio.

Abstracts: Science, new series, vol. VIII, 1898, pp. 502-503.

Am. Geol., vol. XXII, 1898, p. 261.

Proc. Am. Assoc. Adv. Sci., vol. XLVII, 1898, p. 300.

—The relation of the Glacial period to Archæology in Ohio.

Ohio Arch. and Hist. Publications, vol. I, 1900, pp. 174-186, 2 pls.

—Pre-Glacial man in Ohio.

Ohio Arch. and Hist. Publications, vol. I, 1900, pp. 257-259.

—Glacial man in Ohio.

Howe's Hist. Collections Ohio, vol. I, 1904, pp. 90-99, 2 maps, 5 pls.

Wright, G. F., and Mills, W. C.

Discovery of a Palæolithic implement at New Comerstown, Ohio.
Western Reserve Hist. Soc., Tract no. 75, 1890, pp. 1-14, 4 pls.

Wrigley, H. E.

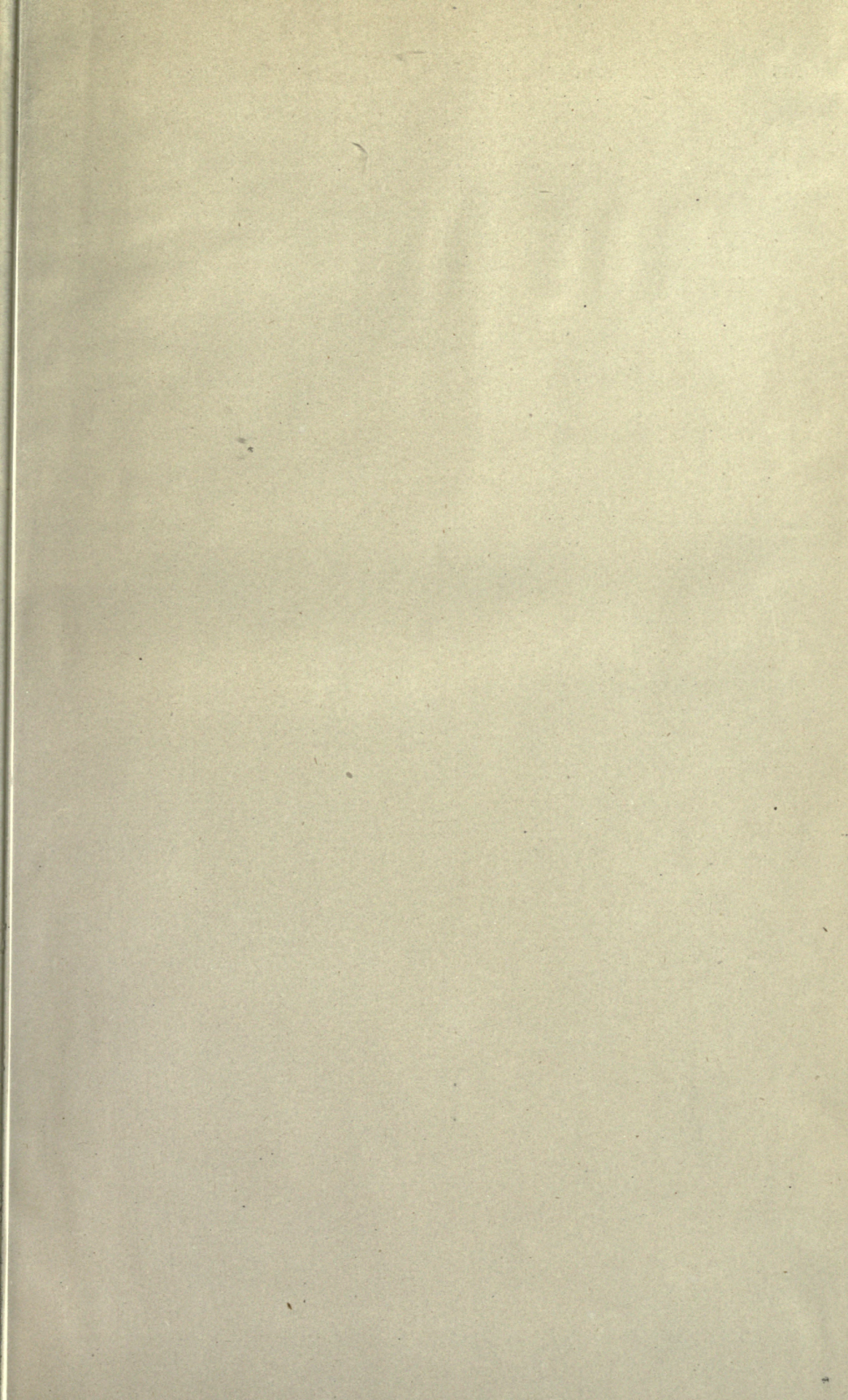
The geography of petroleum, geology of petroleum.

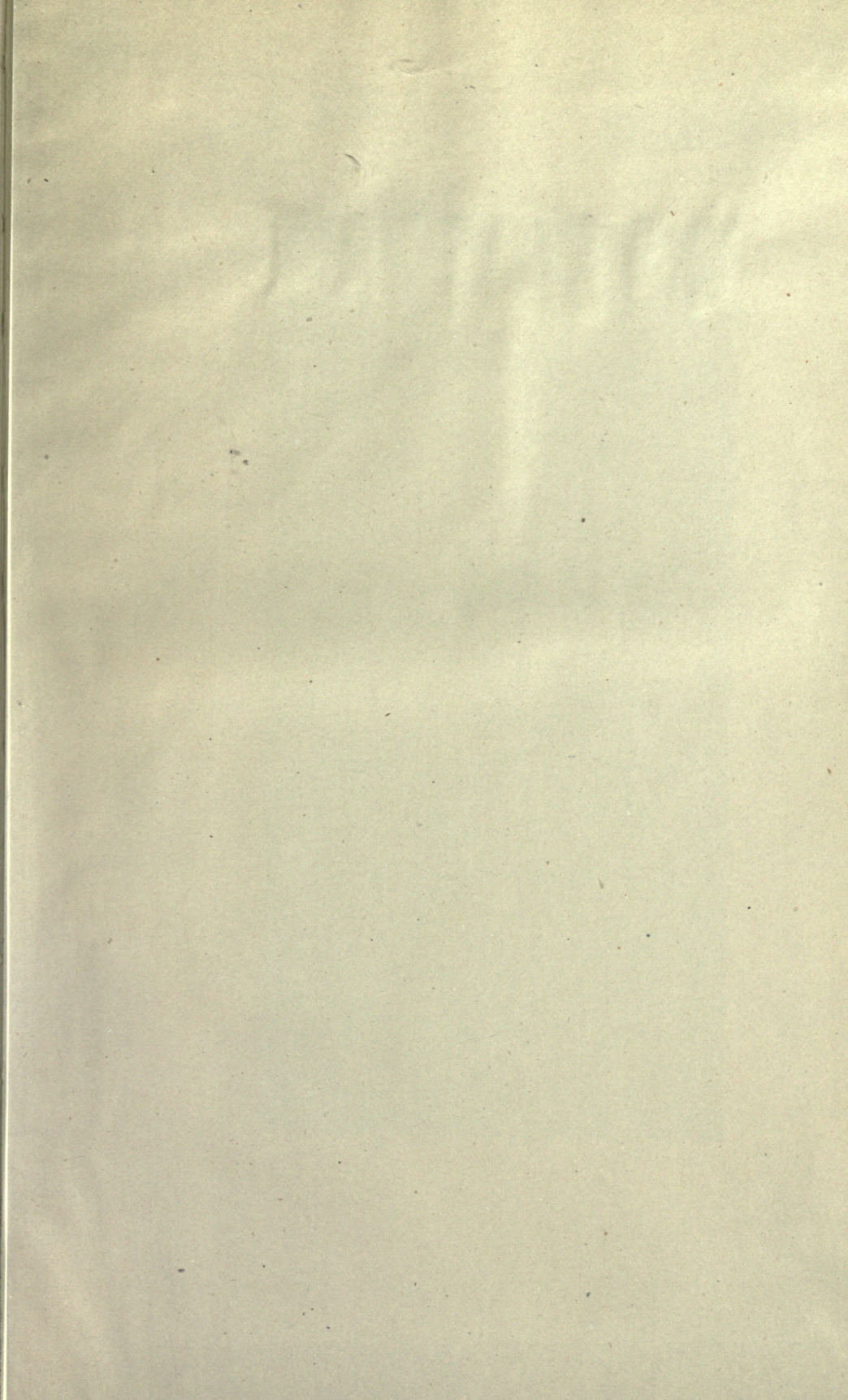
Second Geol. Surv. Pennsylvania, Rep. J. Special report on petroleum of Pennsylvania, pp. 15-40, 41-46, pls., maps, Harrisburg, 1871.

Wyman, Jeffries.

On some remains of Batrachian reptiles discovered in the coal formation of Ohio by Dr. J. S. Newberry and Mr. C. M. Wheatley.
Am. Jour. Sci., 2d series, vol. xxv, 1858, pp. 158-164, 2 figs.

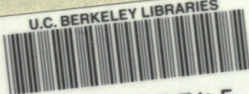






-532

U.C. BERKELEY LIBRARIES



C033558745

