

## A SHELF OF GEOLOGIC LITERATURE FOR THE SMALL LIBRARY, WITH A GUIDE TO THE MORE IMPORTANT REPORTS ON OHIO.\*

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The scarcity or absence of standard local and general geologic literature in many public libraries is far too frequently discovered to his sorrow by the field geologist, who is so rash as to go into a region without his "trunk-ful" of books. Recently I had occasion to visit libraries in a number of the larger towns in eastern Ohio, many of which are fine large structures of the Carnegie class. On inquiring for certain publications of the United States Geological Survey, I was informed that the library had none. "A complete set was received several years ago, but has recently been sent back, because they occupied so much space and because there was no call for them."

There was a similar scarcity or absence of reports by the State Geological Survey. I was referred to the books on geology in the general reading room. These usually would be Le Conte's Textbook, works of Lyell and Tyndall, or other writings of ancient vintage.

Certainly a town of sufficient size to own a library of any description should have all geological literature available pertaining to its vicinity, if not to the entire State. It is asking too much from them to straightway harbor formidable volumes of a highly technical character, such as rock analyses or principles of metamorphism, and when these come *en masse* they are almost sure to be stored in the musty, dusty space assigned to "Government documents." But a well selected educational set must find favor when its existence is revealed to the public, and any library, however small it may be, should be provided with a collection such as is herein suggested. The list should include one or two up to date, elementary text books on physiography and geology, State Survey publications of local and general interest, and the publications of the Federal Survey concerning local geology, together with

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a few reports of an educational nature. The entire lot should be assembled on a "geology shelf" and the librarian should provide space in the main reading room, where accessible to the public.

It is not with purely selfish motives that this plea is made, for convenient reference books to meet the needs of the geologist, but rather it is desired to place in the way of the average layman a means of access to local and general geologic information, for after all it is he whom the State and Federal Geological Surveys hope to serve.

The study of geology is a broad application of all the elementary sciences and the up-to-date practical geologist must be a mathematician, chemist, physicist and civil engineer, and should also have an intimate knowledge of zoology, botany, astronomy and other sciences. His long years of training prepare him to go forth and determine the location of undiscovered oil and gas pools, the extension of ore bodies, the depth of coal beds, the height to which artesian water will rise when the well is drilled, and other problems in applied geology. His conclusions with proofs are described in "geologic reports."

Although the geologist deals with such difficult problems, he is expected to write reports that will straightway be comprehended by the average reader. Even though the utmost attempt is made to write in simple and plain "English," the report must necessarily be of a semi-technical tone in order to state facts without greatly amplifying and encumbering the discourse with definitions and explanations which have place only in an elementary text book. It is therefore highly desirable that everyone interested in geology should make an effort to become sufficiently familiar with its fundamental principles to be able to intelligently read geologic reports.

It is believed that a collection of great value as a ready source of general and local geologic information need not include more than twenty-five to forty books that can be housed on a single "geology" shelf. It is true that even in this immature stage of geologic investigation the literature is so voluminous that a well-stocked library will contain thousands of volumes. The library of the U. S. Geological Survey, the most complete in geology in the country, has on its shelves 120,000 bound volumes and 100,000 pamphlets. The selection of a "shelf"

of books of first importance for local and general geologic information is therefore an exceedingly difficult task, which is attempted with some misgivings and it is hoped that the effort will be accepted in good part by the public.

In preparing the list here compiled an effort is made to make it suited for use in public schools and small libraries. In fact, the number is so limited that it can well be accommodated in the private library. The need of keeping the list from attaining unwieldy dimensions prevents the mention of dozens of books, many of which are of equal merit with the State and Federal Survey publications that are mentioned. Persons wishing more ample information concerning books on special subjects will be given earnest attention on application to either the State or Federal Geological Surveys. Only a few of the numerous excellent modern books on geology can be mentioned here and an effort is made to hold strictly to elementary treatises. More ample lists are given in the recent announcements of the American Library Association. There are a number of geologic magazines which furnish channels for prompt publication of investigations of general interest, and in fact there is much information of prime importance which is printed only in such magazines. Some of the more important ones are given in the lists that follow.

The material suggested for the geological library falls in two classes: (1) Text books and other books of interest as a general source of geologic information and educational value; (2) Reports concerning the geology of specific areas including the most important State and Federal Survey publications and also geologic and topographic maps. The first class is useful no matter in what part of America the reader lives. The second class must necessarily consist of many lists, each of which will be appropriate for a State or, where the interests are varied, for part of a State.

The following lists include, in addition to text books and books of general interest, the more important publications of interest to people living in Ohio.

Class I. Consisting of text books, periodicals and publications of the U. S. Geological Survey and Bureau of Mines of general educational value and interest.

## TEXT BOOKS AND PERIODICALS.

## (a) General geology (one or more to be selected).

1. Pirsson, L. V., and Schuchert, C. Text-Book of Geology. John Wiley & Sons, Inc., New York, 1915. Part I, Physical Geology, by L. V. Pirsson. Part II, Historical Geology, by C. Schuchert. Complete in one volume. 1051 pages. Price \$4.00. Also published in two parts. Profusely illustrated and contains colored geological map of North America.
2. Chamberlin, T. C., and Salisbury, R. D. Introductory Geology. A Text Book for Colleges, 708 pages. Henry Holt & Co., 1914. One volume. Price \$2.00. Profusely illustrated.
3. Blackwelder, Eliot, and Barrows, H. H. Elements of Geology, 475 pages. American Book Company, 1911. Price \$1.40. An excellent elementary treatise with numerous illustrations.
4. Scott, William B. Introduction to Geology, 573 pages. The Macmillan Company, 2nd ed., 1907. Price \$2.60. A standard elementary text book.

## (b) Physiography (one or more to be selected).

1. Salisbury, R. D. Elementary Physiography, 359 pages. Henry Holt & Co., 1910. Price \$1.30.
2. Gilbert, G. K., and Brigham, A. P. Introduction to Physical Geography, 412 pages. Appleton, 1908. Price \$1.25.
3. Davis, W. M. Elementary Physical Geography, 401 pages. Ginn & Co., 1902. Price \$1.25.
4. Hobbs, W. H. Earth Features and Their Meaning, 506 pages. The Macmillan Company, 1912. Price \$3.00.
5. Bowman, Isaiah. Forest Physiography. Physiography of United States and Principles of Soils in Relation to Forestry, 759 pages. John Wiley & Sons, 1911. Price \$5.00. An interesting and highly instructive book.

## (c) Economic geology (one or more to be selected).

1. Ries, Heinrich, and Watson, Thomas L. Engineering Geology, 2nd ed., 722 pages, 104 plates and 175 figures. John Wiley & Sons, 1915. Price \$4.00. Describes fundamental principles of geology which relate to engineering problems.
2. Lindgren, Waldemar. Mineral Deposits, 883 pages. McGraw-Hill Book Company, New York, 1913. Price \$5.00.
3. Kemp, J. F. Ore Deposits of the United States and Canada, 481 pages. The Scientific Publishing Company, 3rd ed., 1900. Price \$5.00.
4. Ries, Heinrich. Economic Geology, 4th ed., revised, 856 pages, tables, plates. John Wiley & Sons, 1916. Price \$4.00.
5. Hayes, C. Willard. Handbook for Field Geologists, 159 pages. John Wiley & Sons, 2nd ed., 1909. Price \$1.50.

(d) Mineralogy and petrography (one of the first two and one of the second two should be selected).

1. Moses, A. J., and Parsons, C. L. *Elements of Mineralogy, Crystallography and Blowpipe Analysis*, 389 pages. I. Van Nostrand Company, New York, 4th ed., 1909. Price \$2.50.
2. Brush, G. J., and Penfield, S. L. *Manual of Determinative Mineralogy*, 312 pages. John Wiley & Sons, New York, 16th ed., 1903. Price \$4.00.
3. Kemp, J. F. *Handbook of Rocks*, 272 pages. D. Van Nostrand Company, 5th ed., 1911. Price \$1.50.
4. Merrill, George P. *Treatise on Rocks, Rock Weathering and Soils*, 400 pages. The Macmillan Company, 2nd ed., 1906. Price \$4.00.

(e) Principal periodicals devoted wholly or in part to geology, not essential to the small library, but of interest to the geologist.

1. *Journal of Geology*. Published semi-quarterly. The University of Chicago Press. Subscription \$4.00 per year.
2. *Economic Geology*. Published semi-quarterly. Devoted to geology as applied to mining and allied industries. The Economic Geology Publishing Company. Subscription \$3.00 per year.
3. *Bulletin of the Geological Society of America*. Published quarterly. Subscription \$7.50 per year.
4. *American Journal of Science*. Published monthly at New Haven, Conn. Subscription \$6.00 per year.
5. *Bulletin of the American Institute of Mining Engineers*. Published monthly in New York. Subscription \$10.00 per year.

A FEW BOOKS OF GENERAL EDUCATIONAL INTEREST PUBLISHED  
BY THE U. S. GEOLOGICAL SURVEY AND BUREAU  
OF MINES.

1. Professional Paper No. 60, U. S. Geological Survey. *The Interpretation of Topographic Maps*. By R. D. Salisbury and W. W. Atwood, 1908. 84 pp., 170 pls. Sold by the Superintendent of Documents, Washington, D. C., for \$2.75.
2. Professional Paper 71, U. S. Geological Survey. *Index to Stratigraphy of North America*. By Bailey Willis. Accompanied by a geologic map of North America. Compiled from various sources. 1912. 894 pages, 1 pl. Sold by the Superintendent of Documents, Washington, D. C., for \$2.00.
3. Bulletin 616, U. S. Geological Survey, 1916. *The Data of Geochemistry*. Third edition. By F. W. Clarke. 821 pages. Available for free distribution by the Survey.

4. U. S. Geological Survey Bulletins 611, 612, 613 and 614. Popular Guide Books for western railroads, containing descriptions of geology and other features of interest along several transcontinental railroads.
  - Bulletin 611. The Northern Pacific Route.
  - Bulletin 612. The Overland Route.
  - Bulletin 613. The Santa Fe Route.
  - Bulletin 614. The Shasta Route and Coast Line.Sold by Superintendent of Documents for 50 cents each.
5. U. S. Geological Survey Bulletins 127, 188, 189, 203, 221, 240, 271, 301, 372, 409, 444, 495, 524, 545, 584, 617, and 645. Bibliography of North American Geology, 1732 to 1915. Bulletin 127 is now only available for consultation in public libraries, the supply being exhausted. Bulletins 188, 189, 271, 301 and 617 are sold by the Superintendent of Documents, Washington, for 40, 25, 15, 50 and 15 cents respectively. Bulletins 203, 221, 240, 372, 409, 444, 495, 524, 584, and 645 are available for free distribution by the Survey.

A cumulation bibliography of North America, which will comprise all articles and books on American geology from the earliest date to 1916, is now under way and will be published in a year or two by the Survey.
6. The more recent chapters of Mineral Resources, U. S. Geological Survey. Distributed free by the Director of the Survey.
7. U. S. Geological Survey, Water Supply Paper 122. Relation of the Law to Underground Waters. By D. W. Johnson. Available for distribution by the Survey.
8. U. S. Geological Survey, Water Supply Paper 340. Stream Gaging Stations and Publications relating to Water Resources, 1885-1913. Compiled by B. D. Wood. Available only for consultation in public libraries, the supply being exhausted.

The U. S. Bureau of Mines, although one of the youngest of the Government scientific bureaus, has published more than 130 bulletins and about the same number of "Technical Papers." Many of these, as would be expected, are of interest chiefly to persons engaged in the exploitation of coal, oil and gas, and metalliferous deposits. A list of publications can be obtained on application to Van H. Manning, Director of the Bureau of Mines, Washington. Among reports of general interest are the following:

9. U. S. Bureau of Mines, Bulletin 38, 1913. The Origin of Coal. By David White and Reinhardt Theissen, with a chapter on the formation of peat by C. A. Davis. Sold by the Superintendent of Documents, Washington, for 80 cents.

10. U. S. Bureau of Mines, Bulletin 94, 1915. United States Mining Statutes Annotated. By J. W. Thompson. Part I, Sections and Statutes relating to metalliferous and coal mining. Part II, Miscellaneous mining subjects. Sold by the Superintendent of Documents, Washington, for \$2.50.

Class II. Literature concerning geology of Ohio:

The work of the Federal Survey in Ohio has consisted largely in topographic mapping and the area is practically completed. There are, however, reports on the glacial geology, the underground waters of the southwestern part of the State, recent destructive floods in the Ohio Valley, oil and gas geology of certain quadrangles in the eastern part of the State and other reports that will be listed. The Geological Survey of Ohio ranks among the most progressive of State Surveys and its publications include many valuable reports, covering nearly all phases of geology in the State. One of the most useful of these reports is a bibliography of Ohio geology.

PRINCIPAL REPORTS OF U. S. GEOLOGICAL SURVEY CONCERNING OHIO.\*

(Classified into (a) reports of general interest, and (b) reports on small areas chiefly of local interest.)

(a) Reports of general interest.

1. Professional Paper 13. Drainage modifications in southeastern Ohio and adjacent parts of West Virginia and Kentucky. By W. G. Tight. 1903, 111 pp., 17 pls.  
Describes ancient rivers, many of which have been modified, reversed, or abandoned in the production of modern drainage, largely through the influence of Pleistocene glaciers. Distributed free by the Director, U. S. Geological Survey.
2. Monograph 41. Glacial formations and drainage features of the Erie and Ohio basins. By Frank Leverett. 1902. 802 pp., 26 pls.  
Describes in detail the striking features of glacial drift, its character in Ohio and adjacent States; the influence of the ice invasions on drainage, and also on the development of the Great Lakes. Sold by the Superintendent of Documents, Washington, for \$1.75.
3. Water Supply Paper 334. The Ohio Valley flood of March-April, 1913, (including comparisons with some earlier floods). By A. H. Horton and H. J. Jackson, 1913. 96 pp., 22 pls. Distributed free by the Director, U. S. Geological Survey.

\*A complete catalogue of publications of the U. S. Geological Survey can be obtained on application to George Otis Smith, Director, Washington.

4. Bulletin 552. Results of triangulation and primary traverse in Ohio, 1898-1911, inclusive. R. B. Marshall, Chief Geographer. 1914. 232 pp., 2 pls. Distributed free by the Director, U. S. Geological Survey.
5. Bulletins 411, 476, 518. Results of spirit leveling in Ohio, describing elevations of numerous localities above sea level as shown by permanent bench marks. Distributed free by the Director, U. S. Geological Survey.

*Topographic Maps.*—Most of the topographic maps are published in quadrangles covering areas approximately 13 by 17½ miles, on a scale of about one inch to a mile. These maps show streams, hills and valleys, roads, houses and other surface features. Variations in elevation above sea level are represented by contours of either 10 or 20 feet interval, depending on the relief. The locations of permanent bench marks are also shown. Each quadrangle is designated by the name of some town, village, or geographic feature within it. Topographic maps are sold by postmasters or may be obtained direct from the Survey at a cost of 10 cents each, or 6 cents when ordered in lots of fifty or more maps. An index map showing the locations and names of the quadrangles can be obtained on application to the Director of the Geological Survey.

It is suggested that each library obtain maps covering its vicinity and have them mounted for hanging on the wall, where they will be brought to the attention of the public.

(b) Reports of the U. S. Geological Survey on limited areas in Ohio, chiefly of local interest.

#### SOUTHERN AND SOUTHWESTERN PART OF STATE.

1. Water Supply Paper 259. The underground waters of southwestern Ohio. By M. L. Fuller and F. G. Clapp. With a discussion of the chemical character of the waters by R. B. Dole. 1912. 228 pp., 9 pls. Distributed free by the Director, U. S. Geological Survey.
2. Water Supply Paper 353, Part III. Surface water supply of the Ohio River Basin, 1913. By A. H. Horton, W. E. Hall and H. L. Jackson. 1915. 264 pp., 5 pls. Distributed free by the Director, U. S. Geological Survey.
3. Folio 184. A report on the geology of the Kenova quadrangle, 938 square miles, including part of Lawrence County, Ohio, and adjacent areas in Kentucky and West Virginia. By W. C. Phalen. Sold by the Director, U. S. Geological Survey. Library edition, 18 by 22 inches, 5 cents; octavo edition, 6 by 9 inches, 25 cents.



4. Folio 69. A report on the geology of the Huntington quadrangle, 938 square miles, including part of Lawrence County, Ohio, and an adjacent area in West Virginia. By M. R. Campbell. Sold by the Director, U. S. Geological Survey, for 5 cents. Published in library edition only, 18 by 22 inches.
5. Bulletin 349. Economic geology of the Kenova quadrangle (Kentucky, Ohio, and West Virginia). By W. C. Phalen. 1908. 158 pp., 6 pls. Sold by the Superintendent of Documents, Washington, for 25 cents.

EASTERN AND NORTHEASTERN PART OF STATE.

6. Bulletin 318. Geology of oil and gas fields in Steubenville, Burgettstown, and Claysville quadrangles, Ohio, West Virginia, and Pennsylvania. By W. T. Griswold and M. J. Munn. 1907. 196 pp., 13 pls. Sold by the Superintendent of Documents, Washington, for 75 cents.
7. Bulletin 346. Structure of the Berea oil sand in the Flushing quadrangle, Harrison, Belmont and Guernsey counties. By W. T. Griswold, 1908. 30 pp., 2 pls. Distributed free by the Director, U. S. Geological Survey.
8. Bulletin 541-A. Oil and gas in the northern part of the Cadiz quadrangle, Harrison, Jefferson and Carroll counties. By D. Dale Condit, 9 pp., 1 pl. Distributed free by the Director, U. S. Geological Survey.
9. Bulletin 621-H. Anticlines in the Clinton sand near Wooster, Wayne County, Ohio. By C. A. Bonine. 12 pp., 1 pl. Distributed free by the Director, U. S. Geological Survey.
10. Bulletin 621-N. Structure of Berea oil sand in Summerfield quadrangle, Guernsey, Belmont and Monroe counties. By D. Dale Condit. 15 pp., 2 pls. Distributed free by the Director, U. S. Geological Survey.
11. Bulletin 621-O. Structure of Berea oil sand in Woodsfield quadrangle, Guernsey, Noble and Monroe counties. By D. Dale Condit. 17 pp., 2 pls. Distributed free by the Director, U. S. Geological Survey.

CENTRAL PART OF STATE.

12. Folio 197. A report on the geology of the Columbus quadrangle, 915 square miles. By C. R. Stauffer, G. D. Hubbard, J. A. Bownocker and others. Sold by the Director, U. S. Geological Survey. Library edition, 18 by 22 inches, 25 cents; octavo edition, 6 by 9 inches, 50 cents.

NORTHERN PART OF STATE.

13. Monograph 41. (Already listed as of general interest in Ohio).

PRINCIPAL REPORTS OF THE STATE GEOLOGICAL  
SURVEY.\*

1. Geological map of Ohio. Scale 8 miles to 1 inch. 1909. By J. A. Bownocker, State Geologist. Price 25 cents.
2. Bulletin 1. Oil and gas. 325 pp., 9 lithographic maps. 1903. By J. A. Bownocker. Describes fields in Trenton, Clinton and Carboniferous oil and gas bearing formations. Price 65 cents.
3. Bulletins 4 and 5. The lime resources and the lime industry in Ohio. 361 pp., 1906. By Edward Orton, Jr., and Samuel V. Peppel. The manufacture of artificial snadstone or sand-lime brick. 79 pp., 1905. By Samuel V. Peppel. Price of Bulletins 4 and 5 conjointly 45 cents.
4. Bulletin 6. Bibliography of Ohio geology. 332 pp., 1906. By Alice Greenwood Derby and Mary Wilson Prosser. Price 35 cents.
5. Bulletin 7. Revised nomenclature of the Ohio geological formations. 36 pp., 1905. By Charles S. Prosser. Price 6 cents.
6. Bulletin 9. Coal. 342 pp., 1908. By J. A. Bownocker, N. W. Lord and E. E. Somermeier. Part I describes Pittsburg, Pomeroy and Meigs Creek coals. Part II gives chemical analyses and calorific tests of the Clarion, Lower Kittanning, Middle Kittanning and Upper Freeport coals. Price 50 cents.
7. Bulletin 14. Geology of the Columbus quadrangle. 133 pp., 1911. By C. R. Stauffer, G. D. Hubbard and J. A. Bownocker. Price 30 cents.
8. Bulletin 18. Building stones of Ohio. About 150 pp., 1915. By J. A. Bownocker. Price 30 cents.
9. Bulletin 19. Geology of Cincinnati and vicinity, — pp., 1916. By N. M. Fenneman.
10. Bulletin 20. Geology of southern Ohio. — pp., 1916. (In press). By Wilbur Stout. Includes Jackson and Lawrence counties and parts of Scioto, Gallia and Pike counties.

Other bulletins published since 1900 comprise the following subjects:

- Bulletin 3. Manufacture of hydraulic cement.
- 8. Salt deposits and salt industry in Ohio.
- 10. The Middle Devonian in Ohio.
- 11. The manufacture of roofing tiles.
- 12. The Bremen oil field.
- 13. The Maxville limestone.
- 15. Devonian and Mississippian of northeastern Ohio.
- 16. Peat deposits of Ohio.
- 17. The Conemaugh formation in Ohio.

\*A complete list of publications of the Geological Survey of Ohio can be obtained from Prof. J. A. Bownocker, State Geologist, at Columbus, who distributes those in stock.

State Survey organizations previous to 1900 published a number of excellent reports, some of which are listed. The State Geologist has a limited number which can be obtained at prices given below.

Volume I. Geology. 680 pp., 1873.

Chapter I. Historical sketch; physical geography; geological relations, geological structures of the Silurian and Devonian systems. By J. S. Newberry.

Chapter II. Local geology. The geology of Cuyahoga, Summit, Gallia, Meigs, Athens, Morgan, Muskingum, Hamilton, Clermont, Clark, Ashtabula, Trumbull, Lake, Geauga, Williams, Fulton, Lucas, Sandusky, Seneca, Wyandot and Marion counties. Price \$1.25.

Volume II. Geology. 701 pp., 1874.

Section I. Surface geology; The Carboniferous System. By J. S. Newberry.

Section II. Local Geology. The geology of Erie, Lorain, Ottawa, Crawford, Morrow, Delaware, Van Wert, Union, Paulding, Hardin, Hancock, Wood, Putnam, Allen, Auglaize, Mercer, Henry, Defiance, Washington, Noble, Guernsey (southern half), Belmont (southern half), Monroe, Pickaway, Fairfield, Pike, Ross and Greene counties. Price \$1.25.

Volume III. Geology. 958 pp., 1878.

Section I. Review of Geological Structure of Ohio.

Section II. Local Geology. The geology of Tuscarawas, Columbiana, Portage, Stark, Carroll, Harrison, Guernsey, Muskingum, Belmont, Huron, Richland, Knox, Licking, Medina, Warren, Butler, Preble, Madison, Clinton, Fayette, Shelby, Miami, Logan, Champaign, Darke, Ashland, Wayne, Holmes, Coshocton, Franklin, Jefferson, Mahoning and Brown counties. Price \$1.25.

Volume V. Geology. 1124 pp., 1884.

The stratigraphical order of the Lower Coal Measures of Ohio; the Coal Seams of the Lower Coal Measures of Ohio. By Edw. Orton.  
The Meigs Creek coal in Morgan, Muskingum, Guernsey and Noble counties. By C. N. Brown.

Coal mining in Ohio. By Andrew Roy.

The gas coals of Ohio. By Emerson McMillen.

The iron ores of Ohio. By Edward Orton.

Iron manufacture in Ohio. By N. W. Lord.

The manufacture of coke. By Henry Newton.

Building stones of Ohio; the clays of Ohio and the industries established upon them. By Edward Orton, Jr.

The glacial boundary in Ohio. By G. Frederick Wright.

Report of the chemical department. By N. W. Lord.

Price \$2.50.

Volume VI. Geology. 831 pp., 1888.

Nearly 600 pages of this volume treat of petroleum and natural gas, by Edward Orton, F. W. Minshall, F. J. Newell, Emerson McMillen and S. W. Robinson.

The volume contains chapters on the Pittsburg coal in Belmont, Jefferson and Guernsey counties, by C. N. Brown; the Pomeroy and Federal Creek coal field, by Ellis Lovejoy; the manufacture of salt and bromine, by W. J. Root; natural and Portland cement, by N. W. Lord; gypsum and land plaster in Ohio, by Edward Orton; the production of lime in Ohio, by Edward Orton; the drift deposits of Ohio, by Edward Orton. Price \$2.00.

U. S. Geological Survey, Washington.

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