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The Arizona Geological Survey is not responsible for the accuracy of the records, information, or opinions that may be contained in the files. The Survey collects, catalogs, and archives data on mineral properties regardless of its views of the veracity or accuracy of those data.

BULLETINS--Continued

- Pardee. p. 159-239; The Dunkleberg mining district, Granite County, Mont., by J. T. Pardee. p. 241-247.
- *661. Contributions to economic geology, 1917--Part 2. 1918. Contains: The Bowdoin dome, Montana--A possible reservoir of oil or gas, by A. J. Collier. p. 193-209; Phosphatic oil shales near Dell and Dillon, Beaverhead County, Mont., by C. F. Bowen. p. 315-328.
- *690. Contributions to geology, 1918--Part 1. 1919. Contains: Manganese at Butte, Mont., by J. T. Pardee. p. 111-130; Some manganese deposits in Madison County, Mont., by J. T. Pardee. p. 131-147.
- *691. Contributions to economic geology, 1918--Part 2. 1919. Contains: The structure of parts of the central Great Plains, by N. H. Darton. p. 1-26; Geology and oil and gas prospects of the Lake Basin field, Montana, by E. T. Hancock. p. 101-147; Oil and gas geology of the Birch Creek-Sun River area, northwestern Montana, by Eugene Stebinger. p. 149-184; Anticlines in a part of the Musselshell Valley, Musselshell, Meagher, and Sweetgrass Counties, Mont., by C. F. Bowen. p. 185-209.
- *697. Gypsum deposits of the United States, by R. W. Stone and others. 1920. 326 p. (See Map MR-33.)
- *711. Contributions to economic geology, 1919--Part 2. 1920. Contains: Oil shale in western Montana, southeastern Idaho, and adjacent parts of Wyoming and Utah, by D. D. Condit. p. 15-40; Geology and oil and gas prospects of the Huntley field, Montana, by E. T. Hancock. p. 105-148.
- *715. Contributions to economic geology, 1920--Part 1. 1921. Contains: Deposits of iron ore near Stanford, Mont., by L. G. Westgate. p. 85-92; Phosphate rock near Maxville, Granite County, Mont., by J. T. Pardee. p. 141-145.
- *725. Contributions to economic geology, 1921--Part 1. 1922. Contains: Deposits of chromite in Stillwater and Sweetgrass Counties, Mont., by L. G. Westgate. p. 67-84; Deposits of manganese ore in Montana, Utah, Oregon, and Washington, by J. T. Pardee. p. 141-243.
- *729. Oil shale of the Rocky Mountain region, by D. E. Winchester. 1923. 204 p.
- *736. Contributions to economic geology, 1922--Part 2. 1923. Contains: Oil and gas prospects in and near the Crow Indian Reservation, Mont., by W. T. Thom, Jr. p. 35-53; Possibility of finding oil in laccolithic domes south of the Little Rocky Mountains, Mont., by A. J. Collier and S. H. Cathcart. p. 171-178.
- *740. Mica deposits of the United States, by D. B. Sterrett. 1923. 342 p.
- *749. Geology of the Tullock Creek coal field, Rosebud and Bighorn Counties, Mont., by G. S. Rogers and Wallace Lee. 1923. 181 p.
- *751. Contributions to economic geology, 1923-24--Part 2. Contains: Geology and possible oil and gas resources of the faulted area south of the Bearpaw Mountains, Mont., by Frank Reeves. p. 71-114; The Scobey lignite field, Valley, Daniels, and Sheridan Counties, Mont., by A. J. Collier. p. 157-230; The Ekalaka lignite field, southeastern Montana, by C. M. Bauer. p. 231-267.
- *761. Molybdenum deposits, a short review, by F. L. Hess. 1924. 35 p.
- *780. Contributions to economic geology, 1925--Part 1. 1926. Contains: The Melrose phosphate field, Montana, by R. W. Richards and J. T. Pardee. p. 1-32.
- *786. Contributions to economic geology, 1926--Part 2. 1927. Contains: The geology of the Ingomar anticline, Treasure, and Rosebud Counties, Mont., by K. C. Heald. p. 1-37; Geology of the Cat Creek and Devils Basin oil fields and adjacent areas in Montana, by Frank Reeves. p. 39-98.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

GEOLOGIC AND WATER-SUPPLY REPORTS AND MAPS

MONTANA

APRIL 1971

This list contains reports and maps published by the Geological Survey relating to the geology and mineral and water resources of Montana. A separate list of bibliographies and publications of general interest is available on request, as are a general catalog of Geological Survey publications (not including topographic maps), and State indexes to topographic mapping.

AN ASTERISK (*) INDICATES THAT THE PUBLICATION IS OUT OF PRINT AND NOT PURCHASABLE FROM ANY OFFICIAL SOURCE. Bulletins, professional papers, and water-supply papers for which a price is stated are for sale by the SUPERINTENDENT OF DOCUMENTS, GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C., 20402, prepayment being required. Numerous libraries and educational institutions throughout the country are depositories for this material and a list of Montana depositories is included.

Maps, folios, hydrologic atlases, and charts are sold by the Geological Survey. They may be ordered from the WASHINGTON DISTRIBUTION SECTION, U.S. GEOLOGICAL SURVEY, 1200 S. EADS STREET, ARLINGTON, VA. 22202, or from the DENVER DISTRIBUTION SECTION, U.S. GEOLOGICAL SURVEY, FEDERAL CENTER, DENVER, COLO. 80225. Remittances should be made by check or money order payable to the Geological Survey. A discount of 20 percent is allowed on orders of \$20 or more, and 40 percent on orders of \$100 or more, based on the retail price. Maps, charts, bulletins, professional papers, and water-supply papers, that are available, may be purchased over the counter only at the following GEOLOGICAL SURVEY offices: 8102 Federal Office Bldg., SALT LAKE CITY, Room 678 U.S. Court House Bldg., SPOKANE, WASH., and 1012 Federal Bldg., DENVER, COLO.

References to geologic information on Montana may be obtained from the following Geological Survey publications: Geologic Map Index of Montana, described herein, from Bibliographies of North American geology - Bulletins *746 (1785-1918), *747 (1785-1918), 823 (1919-1928) \$3, 937 (1929-1939) \$4.25, *1049 (1940-1949), *985 (1950), *1025 (1951), 1035 (1952-1953) \$2, 1054 (1954) \$1.50, *1065 (1955), *1075 (1956), *1095 (1957), *1115 (1958), *1145 (1959), *1195 (1950-1959) set of 4 volumes, 1196 (1960) \$2.25, *1197 (1961), *1232 (1962), 1233 (1963) \$3.25, *1234 (1964), 1235 (1965) \$4.75, 1266 (1966) \$4.75, 1267 (1967) \$4.25, and 1268 (1968) \$5.25. Bibliographies and indexes of publications relating to ground water are Water-Supply Papers *992 (1879-1945), *1492 (1946-1955), 1863 (1963) 55c, and 1864 (1964) \$1. A water resources investigations folder, available free upon request to the Geological Survey, Washington, D.C. 20242, shows the location of stream-gaging stations, observation wells, quality-of-water sample collection sites, areal hydrologic studies, average annual runoff, average discharge of principal streams, and availability of ground

water. A brief text lists the hydrologic network, the areal and Statewide projects, and selected references. Additional information is obtainable from Associate Director and State Geologist, Montana Bureau of Mines and Geology, Montana College of Mineral Science and Technology, Butte, Mont. 59701.

Information on altitudes in the United States is contained in Bulletins *5, *76, *160, *274, *689, *817, and 1212 (\$1.75); information on boundaries and areas of the United States, with historical outlines of boundary changes, is contained in Bulletins *13, *171, *226, *302, *689, *817, and 1212 (\$1.75); information on results of primary triangulation and primary traverse from 1894 to 1918, is contained in Bulletins *122, *181, *201, *216, *245, *276, *310, *440, *551, *644, *709, and Parts *1 of the *18th, *19th, *20th, and *21st Annual Reports. Further information on more recent triangulation, transit traverse, and spirit leveling in Montana is obtainable upon specific request.

Current publications are announced by means of monthly notices, "New Publications of the Geological Survey." Free on application to the Geological Survey, Washington, D.C. 20242.

ANNUAL REPORTS

*Twelfth, 1890-91. 1801. Part 1 contains: The eruptive rocks of Electric Peak and Sepulchre Mountain, Yellowstone National Park, by J. P. Iddings. p. 569-664.

*Eighteenth, 1896-97. 1897. Part 3 (1898) contains: Geology and mineral resources of the Judith Mountains of Montana, by W. H. Weed and L. V. Pirsson. p. 437-616.

*Nineteenth, 1897-98. 1898. Part 5 (1899) contains: Bitterroot Forest Reserve, by J. B. Leiberger. p. 253-282.

*Twentieth, 1898-99. 1899. Part 3 (1900) contains: Geology of the Little Belt Mountains, Mont., with notes on the mineral deposits of the Neihart, Barker, Yogo, and other districts, by W. H. Weed, accompanied by a report on the petrography of the igneous rocks of the district, by L. V. Pirsson. p. 257-581. Part 5 (1900) contains: Flathead Forest Reserve, by H. B. Ayres. p. 245-316; Bitterroot Forest Reserve, by J. B. Leiberger. p. 317-410.

*Twenty-first, 1899-1900. 1900. Part 2 contains: Mineral-vein formation at Boulder Hot Springs, Mont., by W. H. Weed. p. 227-255. Part 5 contains: Lewis and Clarke Forest Reserve, Mont., by H. B. Ayres. p. 27-80.

*Twenty-second, 1900-1901. 1901. Part 2 contains: Geology and ore deposits of the Elkhorn mining district, Jefferson County, Mont., by W. H. Weed, with an appendix on the microscopical petrography of the district, by Joseph Barell. p. 399-550. Part 3 (1902) contains: Coal fields of the United States, by C. W. Hayes. p. 7-24; and Rocky Mountain coal fields, by L. S. Storrs. p. 415-471.

(Beginning with the twenty-third (1901-2), the annual reports of the Geological Survey contain no technical papers but were published separately until 1933. Since 1933 a condensed form has been included in the annual report of the Secretary of the Interior. For the fiscal years 1936 to 1963, a limited number of copies of the report as it appeared in the annual report of the Secretary were reprinted separately for official use; copies of these may be had free by persons directly interested, insofar as they are in stock.)

MINERAL RESOURCES OF THE UNITED STATES

The annual volumes of Mineral Resources of the United States contain statistics of production by calendar years and matters relating to technology and resources. Some of the chapters deal with a particular mineral or group of

BULLETINS--Continued

- p. 316-328; Coal discovered in a reconnaissance survey between Musselshell and Judith, Mont., by C. F. Bowen. p. 329-337; The Cleveland coal field, Blaine County, Mont., by C. F. Bowen. p. 338-355; The Big Sandy coal field, Chouteau County, Mont., by C. F. Bowen. p. 356-378; Analyses of coal samples from various fields of the United States, by M. R. Campbell. p. 491-526.
- *574. The mining district of the Dillon quadrangle, Montana, and adjacent areas, by A. N. Winchell. 1914. 191 p.
- *580. Contributions to economic geology, 1913--Part 1. 1915. Contains: The Elliston phosphate field, Montana, by R. W. Stone and C. A. Bonine. p. 373-383.
- *585. Useful minerals of the United States, compiled by Samuel Sanford and R. W. Stone. 1914. 250 p. (See also Bulletin 624.)
- *599. Our mineral reserves--How to make American industrially independent, by G. O. Smith. 1914. 48 p.
- *600. The Glacier National Park--A popular guide to its geology and scenery, by M. R. Campbell. 1914. 54 p.
- *611. Guidebook of the western United States--Part A, The Northern Pacific Route, with a side trip to Yellowstone Park, by M. R. Campbell and others. 1915. 218 p.
- *612. Guidebook of the western United States--Part B, The Overland Route, with a side trip to Yellowstone Park, by W. T. Lee, R. W. Stone, H. S. Gale, and others. 1915. 244 p.
- *620. Contributions to economic geology, 1915--Part 1. 1916. Contains: Potash in certain copper and gold ores, by B. S. Butler, with a note on muscovite, by George Steiger. p. 227-236.
- *621. Contributions to economic geology, 1915--Part 2. 1916. Contains: Possibilities of oil in the Porcupine dome, Rosebud County, Mont., by C. F. Bowen. p. 61-70; Geology and coal resources of northern Teton County, Mont., by Eugene Stebinger. p. 117-156; Analyses of coal samples from various parts of the United States, by M. R. Campbell and F. R. Clark. p. 251-375.
- *623. Petroleum withdrawals and restorations affecting the public domain, by M. W. Ball. 1916. 427 p.
- *624. Useful minerals of the United States, compiled by F. C. Schrader, R. W. Stone, and Samuel Sanford. 1916. 412 p.
- *625. The enrichment of ore deposits, by W. H. Emmons. 1917. 530 p.
- *640. Contributions to economic geology, 1916--Part 1. 1917. Contains: The Garrison and Philipsburg phosphate fields, Montana, by J. T. Pardee. p. 195-228.
641. Contributions to economic geology, 1916--Part 2. 1917. Contains: Possibilities of oil and gas in north-central Montana by Eugene Stebinger. p. 49-91; Geology of the upper Stillwater Basin, Stillwater and Carbon Counties, Mont., with special reference to coal and oil, by W. R. Calvert. p. 199-214; Geology of the Hound Creek district of the Great Falls coal field, Cascade County, Mont., by V. H. Barnett. p. 215-231; Anticlines in the Blackfeet Indian Reservation, Mont., by Eugene Stebinger. p. 281-305.
- *647. The Bull Mountain coal field, Musselshell and Yellowstone Counties, Mont., by L. H. Woolsey, R. W. Richards, and C. T. Lupton. 1917. 218 p.
- *652. Tungsten minerals and deposits, by F. L. Hess. 1917. 85 p. (See Map MR-25.)
- *660. Contributions to economic geology, 1917--Part 1. 1918. Contains: Ore deposits of the northwestern part of the Garnet Range, Mont., by J. T.

BULLETINS--Continued

- *395. Radioactivity of the thermal waters of Yellowstone National Park, by Herman Schlund and R. B. Moore. 1909. 35 p.
- *427. Manganese deposits of the United States, by E. C. Harder. 1910. 298 p. (See Map MR-23.)
- *430. Contributions to economic geology, 1909—Part 1. 1910. Contains Notes on the mineral deposits of the Bearpaw Mountains, Mont., by L. J. Pepperberg. p. 135-146.
- *431. Contributions to economic geology, 1909—Part 2. 1911. Contains: The eastern part of the Bull Mountain coal field, Montana, by C. T. Lupton. p. 163-189.
- *470. Contributions to economic geology, 1910—Part 1. Contains: Phosphates in Montana, by H. S. Gale. p. 440-451; Gold-bearing ground moraine in Northwestern Montana, by F. C. Schrader. p. 62-74; Geologic relation of ore deposits in the Elkhorn Mountains, Mont., by R. W. Stone. p. 75-98; Rock phosphate near Melrose, Mont., by H. S. Gale. p. 440-451; Graphite near Dillon, Mont., by A. N. Winchell. p. 528-532.
- *471. Contributions to economic geology, 1910—Part 2. 1912. Contains: Geology of certain lignite fields in eastern Montana, by W. R. Calvert. p. 187-210; The Baker lignite field, Custer County, Mont., by C. F. Bowen. p. 202-226; The Terry lignite field, Custer County, Mont., by F. A. Herald. p. 227-270; The Glendive Lignite field, Dawson County, Mont., by J. H. Hance. p. 271-283; The Sidney lignite field, Dawson County, Mont., by Eugene Stebinger. p. 284-318; The Culbertson lignite field. Valley County. Mont., by A. L. Beekly. p. 319-358; The southern extension of the Milk River coal field. Chouteau County, Mont., by L. J. Pepperberg. p. 359-383; The Livingston and Trail Creek coal fields, Park, Gallatin, and Sweetgrass Counties, Mont., by W. R. Calvert. p. 384-405; The Electric coal field, Park County, Mont., by W. R. Calvert. p. 406-422; Miscellaneous analyses of coal samples from various fields of the United States. p. 629-655.
- *482. Results of spirit leveling in Montana, 1896 to 1910, inclusive. 1911. 154 p.
- *507. The mining districts of the Western United States, by J. M. Hill. 1912. 309 p.
- *522. Portland cement materials and industry in the United States, by E. C. Eckel, with contributions by E. F. Burchard and others. 1913. 401 p.
- *527. Ore deposits of the Helena mining region, Montana, by Adolph Knopf. 1913. 143 p.
- *529. The enrichment of sulphide ores, by W. H. Emmons. 1913. 260 p. (See also Bulletin 625.)
- *530. Contributions to economic geology, 1911—Part 1. 1913. Contains: Some further discoveries of rock phosphate in Montana, by J. T. Pardee. p. 285-291.
- *531. Contributions to economic geology, 1911—Part 2. 1913. Contains: The Little Sheep Mountain coal field, Dawson, Custer and Rosebud Counties, Mont., by G. S. Rogers. p. 159-227; Coal in the Tertiary lake beds of southwestern Montana, by J. T. Pardee. p. 229-244; Miscellaneous analyses of coal samples from various fields in the United States. p. 331-355.
- *540. Contributions to economic geology, 1912—Part 1. 1914. Contains: Economic geology of the region around Mullan, Idaho, and Saltse, Mont., by G. C. Calkins and E. J. Jones, Jr. p. 167-211; Titaniferous magnetite beds on the Blackfeet Indian Reservation, Mont., by Eugene Stebinger. p. 329-337; Clay in northeastern Montana, by C. M. Bauer. p. 369-372; Niter near Melrose, Mont., by R. W. Richards. p. 470-473.
- *541. Contributions to economic geology, 1912—Part 2. 1914. Contains: Lignite in the vicinity of Plentywood and Scobey, Sheridan County, Mont., by C. M. Bauer. p. 293-315; Geology and coal resources of the area southwest of Custer, Yellowstone, and Bighorn Counties, Mont., by G. S. Rogers.

MINERAL RESOURCES OF THE UNITED STATES--Continued

minerals but much of the information is statistical. These volumes are not listed. The volumes of Mineral Resources were issued by the Geological Survey for the years 1882 to 1923. Reports for 1924 and subsequent years are published by the Bureau of Mines, Washington, D.C. 20240, as Minerals Yearbooks.

MONOGRAPHS

- *32. Geology of the Yellowstone National Park—Part 2, Descriptive geology, petrology, and paleontology, by Arnold Hague and others. 1899. 893 p. Atlas of 27 sheets folio. (Part 1, General Geology, not published.)
- *35. The later extinct floras of North America, by J. S. Newberry. 1898. 295 p.
- *44. Pseudoceratites of the Cretaceous, by Alpeus Hyatt, edited by T. W. Stanton. 1903. 351 p.
- *48. Status of the Mesozoic floras of the United States, by L. F. Ward and others. 1905. In two parts. Part 1, 616 p.; part 2, 119 pls.
- *49. The Ceratopsia, by J. B. Hatcher. 1907. 300 p.
- *51. Cambrian Brachiopoda, by C. D. Walcott. 1912. In two parts. Part 1, 872 p.; part 2, 363 p.
- *54. The Mesozoic and Cenozoic Echinodermata of the United States, by W. B. Clark and M. W. Twitchell. 1915. 341 p.

GEOLOGIC FOLIOS

- *1. Livingston, Mont., by J. P. Iddings and W. H. Weed. 1894. 5 p., 4 maps.
- *24. Three Forks, Mont., by A. C. Peale. 1896. 7 p., 4 maps.
- *38. Butte special, Montana, by W. H. Weed, S. F. Emmons, and G. W. Tower. 1897. 8 p., 3 maps.
- *55. Fort Benton, Mont., by W. H. Weed. 1899. 9 p., 4 maps.
- *56. Little Belt Mountains, Mont., by W. H. Weed. 1899. 11 p., 4 maps.
- *128. Aladdin, Wyo.-S. Dak.-Mont., by N. H. Darton and C. C. O'Harra. 1905. 8 p., 4 maps.
- *196. Philipsburg, Mont., by F. C. Calkins and W. H. Emmons. 1915. 26 p., 1 sheet of illus., 3 maps.

PROFESSIONAL PAPERS

- *27. A geological reconnaissance across the Bitterroot Range and Clearwater Mountains in Montana and Idaho, by Waldemar Lindgren. 1904. 123 p.
- *29. Forest conditions in the Absaroka division of the Yellowstone Forest Reserve Mont., and the Livingston and Big Timber quadrangles, by J. B. Leiberg. 1904. 148 p.
- *30. Forest conditions in the Little Belt Mountains Reserve, Mont., and the Little Belt Mountains quadrangle, by J. B. Leiberg. 1904. 75 p.
- *32. Preliminary report on the geology and underground water resources of the central Great Plains, by N. H. Darton. 1905. 433 p.
- *50. The Montana lobe of the Keewatin ice sheet, by F. H. H. Calhoun. 1906. 62 p.
- *51. Geology of the Bighorn Mountains, by N. H. Darton. 1906. 129 p.
- *57. Geology of the Marysville mining district, Montana—A study of igneous intrusion and contact metamorphism, by Joseph Barrell. 1907. 178 p.
- *74. Geology and ore deposits of the Butte district, Montana, by W. H. Weed. 1912. 262 p.
- *78. Geology and ore deposits of the Philipsburg quadrangle, Montana, by W. H. Emmons and F. C. Calkins. 1913. 271 p. (See Bulletin 1237.)
- *85. Shorter contributions to general geology, 1913. 1914. Contains: Resins in Paleozoic plants and in coals of high rank, by David White. p. 65-96.

PROFESSIONAL PAPERS--Continued

- *90. Shorter contributions to general geology, 1915. Contains: The Montana group of northwestern Montana, by Eugene Stebinger. p. 61-68; The stratigraphy of the Montana group, with special reference to the position and age of the Judith River formation in north-central Montana, by C. F. Bowen. p. 95-153.
- *98. Shorter contributions to general geology, 1916. 1917. Contains: North American Upper Cretaceous corals of the genus *Micrabacia*, by L. W. Stephenson. p. 115-131.
- *103. Brachyceratops, a ceratopsian dinosaur from the Two Medicine formation of Montana, with notes on associated fossil reptiles, by C. W. Gilmore. 1917. 45 p.
- *108. Shorter contributions to general geology, 1917. 1918. Contains: Baked shale and slag formed by the burning of coal beds, by G. S. Rogers. p. 1-10; The Flaxville gravel and its relation to other terrace gravels of the northern Great Plains, by A. J. Collier and W. T. Thom, Jr. p. 179-184.
- *118. Some American Jurassic ammonites of the genera *Quenstedticeras*, *Cardioceras* and *Amoeboceras*, family *Cardioceratidae*, by J. B. Reeside, Jr. 1919. 64 p.
- *120. Shorter contributions to general geology, 1918. 1919. Contains: Geology of northeastern Montana, by A. J. Collier. p. 17-39; Relations of late Paleozoic and early Mesozoic formations of southwestern Montana and adjacent parts of Wyoming, by D. D. Condit. p. 111-121.
- *125. Shorter contributions to general geology, 1919. 1921. Contains: Gradations from continental to marine conditions of deposition in central Montana during the Eagle and Judith River epochs, by C. F. Bowen. p. 11-21.
- *132. Shorter contributions to general geology, 1923-24. 1925. Contains: A new fauna from the Colorado group of southern Montana, by J. B. Reeside, Jr. p. 25-33.
- *147. Shorter contributions to general geology, 1926. 1927. Contains: The Montana earthquake of June 27, 1925, by J. T. Pardee. p. 7-23.
- *149. Correlation of geologic formations between east-central Colorado, central Wyoming, and southern Montana, by W. T. Lee. 1927. 80 p.
- *151. The cephalopods of the Eagle sandstone and related formations in the western interior of the United States, by J. B. Reeside, Jr. 1927. 87 p.
- *154. Shorter contributions to general geology, 1928. 1929. Contains: Origin of the siliceous Mowry shale of the Black Hills region, by W. W. Rubey. p. 153-170.
- *158. Shorter contributions to general geology, 1929. 1930. Contains: The contact of the Fox Hills and Lance formations, by C. E. Dobbin and J. B. Reeside, Jr. p. 1-25; The flora of the Frontier formation, by E. W. Berry. p. 129-135.
- *165. Shorter contributions to general geology, 1930. 1931. Contains: Lithologic studies of fine-grained Upper Cretaceous sedimentary rocks of the Black Hills region, by W. W. Rubey. p. 1-54; Geology of the Big Snowy Mountains, Mont., by Frank Reeves. p. 135-149.
- *174. Physiography and glacial geology of eastern Montana and adjacent areas, by W. C. Alden. 1932. 133 p.
- *186-F. American Cretaceous ferns of the genus *Tempskya*, by C. B. Read and R. W. Brown. 1937. p. 105-131.
- *189-I. Fossil plants from the Colgate member of the Fox Hills sandstone and adjacent strata, by R. W. Brown. 1939. p. 239-275.
- *214-B. Characteristic marine Jurassic fossils from the western interior of the United States, by R. W. Imlay. p. 13-33.

BULLETINS--Continued

- *258. The origin of certain place names in the United States, by Henry Gannett. 1905. 334 p.
- *260. Contributions to economic geology, 1904. 1905. Contains: The production of gold in the United States in 1904, by Waldemar Lindgren. p. 32-38; The production of silver in the United States in 1904, by Waldemar Lindgren. p. 39-44.
- *269. Corundum and its occurrence and distribution in the United States, by J. H. Pratt. 1906. 175 p.
- *285. Contributions to economic geology, 1905. 1906. Contains: Economic features of northwestern Montana, by D. F. MacDonald. p. 41-52; Development of the Bear Creek coal fields, Montana, by C. A. Fisher. p. 269-270; The North Dakota-Montana lignite area, by A. G. Leonard. p. 316-330.
- *315. Contributions to economic geology, 1906--Part 1. 1907. Contains: The Granite-Bimetallic and Cable mines, Philipsburg quadrangle, Montana, by W. H. Emmons. p. 31-55.
- *316. Contributions to economic geology, 1906--Part 2. 1907. Contains: The Great Falls coal field, Montana, by C. A. Fisher. p. 161-173; Coals of Carbon County, Mont., by N. H. Darton. p. 174-193; The coal fields of parts of Dawson, Rosebud, and Custer Counties, Mont., by A. G. Leonard. p. 194-211.
- *340. Contributions to economic geology, 1907--Part 1. 1908. Contains: Gold deposits of the Little Rocky Mountains, Mont., by W. H. Emmons. p. 96-116; Clays in the Kootenai formation near Belt, Mont., by C. A. Fisher. p. 417-423.
- *341. Contributions to economic geology, 1907--Part 2. 1909. Contains: The Sentinel Butte lignite field, North Dakota and Montana, by A. G. Leonard and C. D. Smith. p. 15-35; The Miles City coal field, Montana, by A. J. Collier and C. D. Smith. p. 36-61; The Bull Mountain coal field, Montana, by L. H. Woolsey. p. 62-77; Coal near the Crazy Mountains, Mont., by R. W. Stone. p. 78-91; The Red Lodge coal field, Montana, by E. G. Woodruff. p. 92-107; The Lewistown coal field, Montana, by W. R. Calvert. p. 108-122; Coal fields of the northeast side of the Bighorn Basin, Wyo., and of Bridger, Mont., by C. W. Washburne. p. 165-199.
- *356. Geology of the Great Falls coal field, Montana, by C. A. Fisher. 1909. 85 p.
- *360. Pre-Cambrian geology of North America, by C. R. Van Hise and C. K. Leith. 1909. 939 p. Contains: Montana. p. 853-865.
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- *501-C. Geological Survey Research 1964. 1964. p. C1-C197. Contains the following articles, which are not available separately.
- Strike-slip faulting and broken basin-ranges in east-central Idaho and adjacent Montana, by E. T. Ruppel. p. C14.
- Occurrence and paleogeographic significance of the Maywood Formation of Late Devonian age in the Gallatin Range, southwestern Montana, C. A. Sandberg and W. J. McMannis. p. C50.
- *501-D. Geological Survey Research 1964. 1964 (1965). p. D1-D209. Contains the following article, which is not available separately.
- Variation in modes and norms of an "homogeneous" pluton on the Boulder batholith, Montana, by R. I. Tilling. p. D8.
- *503-E. Revision of some Paleozoic coral species from the Western United States, by W. J. Sando. 1965. p. E1-E38.

GEOPHYSICAL INVESTIGATIONS MAPS--Continued

- GP-383. Chinook quadrangle, Blaine County, Mont., by R. W. Johnson, Jr., E. R. King, and D. R. Hawkins. 1963. Lat 48° 30' to 48° 45', long 109° to 109° 15'.
- GP-384. Part of the Lloyd quadrangle, Blaine and Hill Counties, Mont., by R. W. Johnson, Jr., E. R. King, and F. A. Petrafeso. 1963. Lat 48° 15' to 48° 30', long 109° 15' to 109° 30'.
- GP-385. Part of the Cleveland quadrangle, Blaine County, Mont., by R. W. Johnson, Jr., E. R. King, and E. E. Page. 1963. Lat 48° 15' to 48° 30', long 109° to 109° 15'.
- GP-439. Bouguer gravity, aeromagnetic, and generalized geologic map of Townsend and Duck Creek Pass quadrangles, Broadwater County, Mont., by W. T. Kinoshita, W. E. Davis, H. W. Smedes, and W. H. Nelson. 1964. Lat 46° 15' to 46° 40', long 111° 15' to 111° 45'. Scale 1:62,500. \$1 per set.
- GP-444. Bouguer gravity, aeromagnetic, and generalized geologic map of East Helena and Canyon Ferry quadrangles and part of the Diamond City quadrangle, Lewis and Clark, Broadwater, and Jefferson Counties, Mont., by W. E. Davis, W. T. Kinoshita, and H. W. Smedes. 1963. Sheet 1, lat 46° 30' to 46° 45', long 111° 21' to 112°. Scale 1:62,500. Sheet 2, Overlay showing aeromagnetic data. Accompanied by 6-page text. \$1 per set.
- GP-496. Aeromagnetic, Bouguer gravity, and generalized geologic map of Toston and Radersburg quadrangles and part of the Devils Fence quadrangle, Gallatin, Broadwater and Jefferson Counties, Mont., by W. T. Kinoshita, W. E. Davis, and G. D. Robinson. 1965. Lat 46° to 46° 15', long 111° 15' to 112°. Sheet 1, gravity and geologic map. Scale 1:62,500. Sheet 2, aeromagnetic map. Scale 1:62,500. Accompanied by 6-page text. \$1 per set.
- GP-497. Bouguer gravity, aeromagnetic, and generalized geologic map of the western part of the Three Forks Basin, Jefferson, Broadwater, Madison, and Gallatin Counties, Mont., by W. E. Davis, W. T. Kinoshita, and G. D. Robinson. 1965. Lat 45° 30' to 46°, long 111° 30' to 111° 55'. Sheet 1, gravity and geologic map. Scale 1:62,500. Sheet 2, aeromagnetic map. Scale 1:62,500. Accompanied by 5-page text. \$1 per set.
- GP-498. Bouguer gravity, aeromagnetic, and generalized geologic map of the eastern part of the Three Forks Basin, Broadwater, Madison, and Gallatin Counties, Mont., by W. E. Davis, W. T. Kinoshita, and G. D. Robinson. 1965. Sheet 1, gravity and geologic map; lat 45° 30' to 46°, long 110° 55' to 111° 30'. Sheet 2, aeromagnetic map (transparent overlay); lat about 45° 40' to 46°, long 110° 55' to 111° 30'. Scale 1:62,500. Accompanied by 5-page text. \$1 per set.
- GP-538. Aeromagnetic map of the Boulder batholith area, southwestern Montana, by R. W. Johnson, Jr., J. R. Henderson, and N. S. Tyson. 1965. Lat 45° 30' to 46° 45', long 111° 15' to 113° 30'. Scale 1:250,000 50c.
- GP-682. Aeromagnetic map of the Libby and Mt. Pend Oreille quadrangles, Lincoln and Sanders Counties, Mont., and Bonner County, Idaho. 1969. Lat 48° to 48° 30', long 115° 30' to 116°. Scale 1:62,500. 50c.
- GP-683. Aeromagnetic map of the Thompson Lakes quadrangle, Lincoln, Sanders, and Flathead Counties, Mont. 1969. Lat 48° to 48° 30', long 115° to 115° 30'. Scale 1:62,500. 50c.
- GP-684. Aeromagnetic map of the McGregor Lake-Tally Lake area, Flathead and Lincoln Counties, Mont. 1969. Lat 48° to 48° 30', long 114° 30' to 115°. Scale 1:62,500. 50c.

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- *795. Contributions to economic geology, 1927--Part 1. 1928. Contains: Phosphate rock in the Three Forks-Yellowstone Park region, Montana, by D. D. Condit and others. p. 147-209.
- *805. Contributions to economic geology, 1928--Part 1. 1929. Contains: Deposits of vermiculite and other minerals in the Rainy Creek district, near Libby Mont., by J. T. Pardee and E. S. Larsen. p. 17-29.
- *806. Contributions to economic geology, 1928--Part 2. Contains: The northward extension of the Sheridan coal field, Bighorn and Rosebud Counties, Mont., by A. A. Baker. p. 15-67; Thrust faulting and oil possibilities in the plains adjacent to the Highwood Mountains, Mont., by Frank Reeves. p. 155-195.
- *811. Contributions to economic geology, 1929--Part 1. 1930. Contains: The New World or Cooke City mining district, Park County, Mont., by T. S. Lovering. p. 1-87.
- *812. Contributions to economic geology, 1929--Part 2. 1930. Contains: The Forsyth coal field, Rosebud, Treasure and Bighorn Counties, Mont., by C. E. Dobbin. p. 1-55; The Kevin-Sunburst oil field and other possibilities of oil and gas in the Sweetgrass arch, Montana, by A. J. Collier. p. 57-189.
- *822. Contributions to economic geology, 1930--Part 2. 1931. Contains: Geology and mineral resources of parts of Carbon, Bighorn, Yellowstone, and Stillwater Counties, Mont., by R. S. Knappen and G. F. Moulton. p. 1-70.
- *831. Contributions to economic geology, 1931-1932--Part 2. 1932. Contains: The Ashland coal field, Rosebud, Powder River, and Custer Counties, Mont., by N. W. Bass. p. 19-105.
- *838. Nitrate deposits of the United States, by G. R. Mansfield and Leona Boardman. 1932. 107 p.
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- *847-B. The Rosebud coal field, Rosebud and Custer Counties, Mont., by W. G. Pierce. 1936. p. 43-120.
- *847-C. The Richey-Lambert coal field, Richland and Dawson Counties, Mont., by F. S. Parker. 1936. p. 121-174.
- *847-D. Phosphate rock near Maxville, Philipsburg, and Avon, Mont., by J. T. Pardee. 1936. p. 175-188.
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- *856. Geology of Bighorn County and the Crow Indian Reservation, Mont., with special reference to the water, coal, oil, and gas resources, by W. T. Thom, Jr., G. M. Hall, C. H. Wegemann, and G. F. Moulton. 1935. 200 p.
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- 1019-E. Magnesium resources of the United States—A geologic summary and annotated bibliography to 1953, by R. E. Davis. 1957. p. 373-515. 70c.
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- *1021-L. Geology of the area east and southeast of Livingston, Park County, Mont., by P. W. Richards. 1957. p. 385-438.
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1026. Geology of the Bighorn Canyon-Hardin area, Montana and Wyoming, by P. W. Richards. 1955 (1956). 93 p. \$4.

GEOLOGIC QUADRANGLE MAPS--Continued

- GQ-454. Geologic map of the Pretty Prairie quadrangle, Lewis and Clark County, Mont., by M. R. Mudge. 1966. Lat 37° 30' to 47° 37' 30", long 112° 52' 30" to 113°. Scale 1:24,000. \$1.
- GQ-499. Geologic map of the Glenn Creek quadrangle, Lewis and Clark, and Teton Counties, Mont., by M. R. Mudge. 1966. Lat 47° 37' 30" to 47° 45', long 112° 52' 30" to 113°. Scale 1:24,000. \$1.
- GQ-580. Geologic map of the Montauqua quadrangle, Carbon and Stillwater Counties, Mont., by E. D. Patterson. 1966. Lat 45° 30' to 45° 37' 30", long 108° 52' 30" to 109°. Scale 1:24,000. \$1.
- GQ-597. Geologic map of the Arsenic Peak quadrangle, Teton, and Lewis and Clark Counties, Mont., by M. R. Mudge. 1967. Lat 47° 37' 30" to 47° 45', long 112° 45' to 112° 52' 30". Scale 1:24,000. \$1.
- GQ-610. Surficial geologic map of the Sawtooth Ridge quadrangle, Teton and Lewis and Clark Counties, Mont., by M. R. Mudge. 1967. Lat 37° 30' to 37° 37' 30", long 112° 37' 30" to 112° 45'. Scale 1:24,000. \$1.
- GQ-711. Bedrock geologic map of the Castle Reef quadrangle, Teton and Lewis and Clark Counties, Mont., by M. R. Mudge. 1968. Lat 47° 37' 30" to 37° 45', long 112° 37' 30" to 112° 45'. Scale 1:24,000. \$1.
- GQ-729. Geologic map of the Hatfield Mountain quadrangle, Gallatin County, Mont., by Betty Skipp and Mary-Margaret Hepp. 1968. Lat 46° to 46° 07' 30", long 110° 52' 30" to 111°. Scale 1:24,000. \$1.
- GQ-813. Geologic map of the Cameron quadrangle, Madison County, Mont., by J. B. Hadley. 1969. Lat 45° to 45° 15', long 111° 30' to 111° 45'. Scale 1:62,500. \$1.
- GQ-814. Geologic map of the Varney quadrangle, Madison County, Mont., by J. B. Hadley. 1969 (1970). Lat 45° to 45° 15', long 111° 45' to 112°. Scale 1:62,500. \$1.
- GQ-840. Geologic map of the upper Holter Lake quadrangle, Lewis and Clark County, Mont., by G. D. Robinson, M. E. McCallum, and W. H. Hays. 1969 (1970). Lat 46° 45' to 46° 52' 30", long 111° 52' 30" to 112°. Scale 1:24,000. \$1.
- GQ-898. Geologic map of the Barker quadrangle, Judith Basin and Cascade Counties, Mont., by I. J. Witkind. 1971. Lat 47° to 47° 15', long 110° 30' to 110° 45'. Scale 1:62,500 (1 inch = about 1 mile). Sheet 29 by 40 inches. \$1.

GEOPHYSICAL INVESTIGATIONS MAPS

- Aeromagnetic maps printed at the scale of 1:31,680, 50c each, except as indicated.
- GP-150. Laredo quadrangle, Bearpaw Mountains, Mont., by J. R. Balsley, Jr., F. P. Gilbert, G. B. Mangan, and others. 1957. Lat 48° 15' to 48° 30', long 109° 45' to 110°.
- GP-151. Shambo quadrangle, Bearpaw Mountains, Mont., by J. R. Balsley, Jr., F. P. Gilbert, G. B. Mangan, and others. 1957. Lat 48° 15' to 48° 30', long 109° 30' to 109° 45'.
- GP-152. Part of the Centennial Mountain quadrangle, Bearpaw Mountains, Mont., by J. R. Balsley, Jr., F. P. Gilbert, G. B. Mangan, and others. 1957. Lat 48° to 48° 15', long 109° 45' to 110°.
- GP-153. Part of the Warrick quadrangle, Bearpaw Mountains, Mont., by J. R. Balsley, Jr., F. P. Gilbert, G. B. Mangan, and others. 1957. Lat 48° to 48° 15', long 109° 30' to 109° 45'.
- GP-382. Yantic quadrangle, Blaine and Hill Counties, Mont., by R. W. Johnson, Jr., E. R. King and C. L. Long. Lat 48° 30' to 48° 45', long 109° 15' to 109° 30'.

COAL INVESTIGATIONS MAPS--Continued

C-24. Geology of the northern part of the Girard coal field, Richland County, Mont., by G. E. Prichard and E. R. Landis. 1955. Scale 1:48,000. 2 sheets. 75c per set.

C-33. Uraniferous coal beds in parts of North Dakota, South Dakota, and Montana, by N. M. Denson and others. 1955. Scales 1:31,680 and 1:63,360. 50c.

*CORRELATION CHART OF MONTANA. Tentative correlation of the named geologic units, by M. G. Wilmarth. 1932.

CUT BANK-WEST KEVIN BORDER DISTRICTS. Preliminary structure contour map of the Cut Bank-West Kevin border districts, Glacier, Toole, and Pondera Counties, Mont., by C. E. Erdmann, N. A. Davis, William Beer, and J. W. Nordquist. 1946. Scale 1:126,720. 25c.

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GEOLOGIC MAP INDEX OF MONTANA. 1956 reprint of revised 1955 edition by Leona Boardman revised by A. N. Bove (scale 1:750,000) and Geologic map index of Montana, 1955-67, a 1969 supplement by W. L. McIntosh and I. M. Morgan (scale 1:1,000,000). 75c per set.

GEOLOGIC MAP OF MONTANA, compiled by C. P. Ross, D. A. Andrews, and I. J. Witkind. 1955. Color patterns show the distribution and extent of about 75 different rock units ranging from highly metamorphosed schist and gneiss of Precambrian age to Recent alluvial deposits of sand and gravel. Scale 1:500,000. 2 sheets. \$3.50 per set.

GEOLOGIC QUADRANGLE MAPS

GQ-29. Eagleton, Mont. Geology, by R. M. Lindvall. 1953 (1954). Lat 47° 45' to 48°, long 109° 45' to 110°. Scale 1:62,500. \$1.

GQ-67. Wolf Point, Mont. Geology, by R. B. Colton. 1955. Lat 48° to 48° 15', long 105° 30' to 105° 45'. Scale 1:62,500. \$1.

GQ-135. Vaughn, Mont. Geology, by E. K. Maughan. 1961. Lat 47° 30' to 47° 45', long 111° 30' to 111° 45'. Scale 1:62,500. \$1.

GQ-256. Geology of the Brisbin quadrangle, Montana, by A. E. Roberts. 1964. Lat 45° 30' to 45° 37'30", long 110° 30' to 110° 37'30". Scale 1:24,000. \$1.

GQ-257. Geology of the Chimney Rock quadrangle, Montana, by A. E. Roberts. 1964. Lat 45° 30' to 45° 37'30", long 110° 37'30" to 110° 45'. Scale 1:24,000. \$1.

GQ-258. Geology of the Hoppers quadrangle, Montana, by A. E. Roberts. 1964. Lat 45° 37'30" to 45° 45'. long 110° 37'30" to 110° 45'. Scale 1:24,000. \$1.

GQ-259. Geology of the Livingston quadrangle, Montana, by A. E. Roberts. 1964. Lat 45° 37'30" to 45° 45'. long 110° 30' to 110° 37'30". Scale 1:24,000. \$1.

GQ-381. Bedrock geologic map of the Sawtooth Ridge quadrangle, Teton and Lewis and Clark Counties, Mont., by M. R. Mudge. 1965. Lat 47° 30' to 47° 37'30", long 112° 37'30" to 112° 45'. Scale 1:24,000. \$1.

GQ-453. Geologic map of the Patricks Basin quadrangle, Teton, and Lewis and Clark Counties, Mont., by M. R. Mudge. 1966 Lat 47° 30' to 47° 37'30", long 112° 45' to 112° 52'30". Scale 1:24,000. \$1.

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*1027-A. Physical stratigraphy of the Phosphoria formation in part of southwestern Montana, by E. R. Cressman. 1955. p. 1-31.

*1027-J. Geology of the Stanford-Hobson area, central Montana, by J. D. Vine. 1956. p. 405-470.

*1027-M. Reconnaissance geology of western Mineral County, Mont., by R. E. Wallace and J. W. Hosterman. 1956. p. 575-612.

1030-H. Uranium in black shale deposits northern Rocky Mountains and Great Plains, by W. J. Mapel. 1956. p. 211-235. 55c.

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*1042-M. Optical calcite deposits in Park and Sweet Grass Counties, Mont., by W. C. Stoll and F. C. Armstrong. 1958. p. 431-479.

*1042-N. Geology of part of the Townsend Valley, Broadwater and Jefferson Counties, Mont., by V. L. Freeman, E. T. Ruppel and M. R. Kleeper. 1958 (1959). p. 481-556.

1046-E. Reconnaissance for uranium in asphalt-bearing rocks in the Western United States, by W. J. Hail, Jr. 1957. p. 55-85. 20c.

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*1071-E. Geology of the lower Marias River area, Chouteau, Hill, and Liberty Counties, Mont., by J. F. Smith, Jr., I. J. Witkind, and D. E. Trimble. 1959 (1960). p. 121-155.

*1071-F. Corals from well cores of Madison group, Williston basin, by W. J. Sando. 1960 (1961). p. 157-190.

*1071-H. Igneous and tectonic structures of the Stillwater Complex, Mont., by W. R. Jones, J. W. Peoples, and A. L. Howland. 1960. p. 281-340.

*1072-B. Barite resources of the United States, by D. A. Brobst. 1958. p. 67-130. (The volume title given in the publication is incorrect.) (See Map MR-43.)

*1072-J. Reconnaissance geology of the Birney-Broadus coal field, Rosebud and Powder River Counties, Mont., by W. C. Warren. 1959 (1960). p. 561-585.

*1072-N. Stratigraphy of the Little Rocky Mountains and encircling foothills, Montana, by M. M. Knechtel. 1959 (1960). p. 723-752.

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1080. Review and annotated bibliography of ancient lake deposits (Precambrian to Pleistocene) in the Western States, by J. H. Feth. 1964. 119 p. \$2.50.

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*1081-C. Geology of the Maddux quadrangle, Bearpaw Mountains, Blaine County, Mont., by Bruce Bryant, R. G. Schmidt, and W. T. Pecora. 1960 (1961). p. 91-116.

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- *1082-C. Iron-ore resources of the United States including Alaska and Puerto Rico, 1955, by M. S. Carr and C. E. Dutton. 1959. p. 61-134. (See Map MR-51.)
- *1082-E. Strategic graphite—A survey, by E. N. Cameron and P. L. Weis. 1960. p. 201-321.
- *1082-I. Geology and mineral deposits of the St. Regis-Superior area, Mineral County, Mont., by A. B. Campbell. 1960 (1961). p. 545-612.
- *1082-M. Bentonite deposits of the northern Black Hills district, Wyoming, Montana, and South Dakota, by M. M. Knechtel and S. H. Patterson. 1962. p. 893-1030.
- *1084-C. Selenium content of some volcanic rocks from Western United States and Hawaiian Islands, by D. F. Davidson and H. A. Powers. 1959. p. 60-81.
- *1084-K. Berillium content of American coals, by Taisia Stadnichenko, Peter Zubovic, and N. B. Sheffey. 1961. p. 253-295.
- *1087-I. Relation of uranium deposits to tectonic pattern of the Central Cordilleran foreland, by F. W. Osterwald and B. G. Dean. 1961. p. 337-390.
- *1097-A. Evaluation of the lead-alpha (Larsen) method for determining ages of igneous rocks, by David Gottfried, H. W. Jaffe, and F. E. Senftle. 1959. p. 1-63.
- 1097-B. Lead-alpha age determinations of accessory minerals of igneous rocks (1953-1957), by H. W. Jaffe, David Gottfried, C. L. Waring, and H. W. Worthing. 1959. p. 65-148. 30c.
Title page and contents for volume available free on application to the Geological Survey.
- *1111-F. Geology of the Bonner quadrangle, Montana, by W. H. Nelson, and J. P. Dobell. 1961. p. 189-235.
- *1111-G. Geology of the Otter Creek quadrangle, Montana, by R. B. Colton. 1962. p. 237-288.
- 1112-D. Distribution and thickness of Devonian rocks in Williston basin and in central Montana and north-central Wyoming, by C. A. Sandberg. 1961 (1962). p. 105-127. \$2.50.
- *1117-A. Geochemistry of minor elements in coals of the Northern Great Plains coal province, by Peter Zubovic, Taisia Stadnichenko, and N. B. Sheffey. 1961. p. A1-A58.
- *1121-J. Geology of the Duck Creek Pass quadrangle, Montana, by W. H. Nelson. 1963. p. J1-J56.
- *1126. Geology and thorium-bearing deposits of the Lemhi Pass area, Lemhi County, Idaho, and Beaverhead County, Mont., by W. N. Sharp and W. S. Cavender. 1962 (1963). 76 p.
- *1135-A. Oxidized zinc deposits of the United States—Part 1, General Geology, by A. V. Heyl and C. N. Bozion. 1962. p. A1-A49.
- *1136. Coal reserves of the United States—A progress report, January 1, 1960, by Paul Averitt. 1961. 116 p. (Superseded by Bulletin 1275.)
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- *1141-K. Geology of the Clark Fork quadrangle, Idaho—Montana, by J. E. Harrison and D. A. Jobin. 1963. p. K1-K38.
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Year	WSP	Price	Year	WSP	Price	Year	WSP	Price	Year	WSP	Price
Stream measurements in the years mentioned--Continued											
1933	*752		1941	*925		1948	1116	\$1.75	1955	1396	\$1.25
1934	*760			*926			1122	1.00	1956	1438	1.75
	*761			*932		1949	1145	1.25		1439	1.50
	*767		1942	*955			1146	1.75		1446	1.25
1935	*785			*956			1152	1.00	1957	1508	2.00
	*786			*962		1950	1175	1.50		1509	1.50
	*792		1943	*975			1176	2.25		1516	1.00
1936	*805			*976			*1182		1958	1558	2.00
	*806			*982		1951	*1208			1559	1.50
	*812		1944	*1005			1209	1.50		1566	1.25
1937	*825			*1006			1216	1.00	1959	1628	1.75
	*826			*1012		1952	1238	1.75		1629	1.50
	*832		1945	*1035			*1239			1636	1.50
1938	*855			*1036			1246	1.25	1960	1708	2.00
	*856			*1042		1953	*1278			1709	1.50
	*862		1946	*1055			*1279			*1716	
1939	*875			*1056			*1286		1961-65	1916	3.75
	*876			*1062		1954	*1338			1917	3.00
	*882		1947	*1085			*1339			1933	3.50
1940	*895			1086	\$1.75		*1346				
	*896			1092	.75	1955	1388	1.75			
	*902		1948	1115	1.25		1389	1.50			

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- 1899-L. A preliminary evaluation of bank storage associated with Libby Reservoir in northwestern Montana, by D. L. Coffin. p. L1-L25. 25c.

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Year	WSP	Price									
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Information on water levels and artesian pressure in observation wells

1935	*777		1942	*948		1949	*1160		1956-60	1760	\$1.00
1936	*817		1943	*990		1950	1169	\$0.35	1961-65	*1845	
1937	*840		1944	*1020		1951	1195	.55			
1938	*845		1945	*1027		1952	*1225				
1939	*886		1946	*1075		1953	1269	.65			
1940	*910		1947	1100	\$0.45	1954	1325	.60			
1941	*940		1948	1130	.40	1955	1408	.60			

Information on the quality of the surface water
 ("a" indicates data on quality of water for irrigation)

1947	1102	\$1.50	1954(a)	1430	\$0.75	1959	1643	\$1.00	1963	1949	\$1.50
1948	1132	1.50	1955	1401	1.00		*1645			*1951	
1949	1162	2.00	(a)	1465	1.00	(a)	1699	.70	(a)	1952	1.00
1950	1187	1.50	1956	1451	1.25	1960	*1743		1964	1956	2.00
1951	1198	2.00		*1453			*1745			1959	2.00
(a)	*1264		(a)	1485	.75	(a)	1746	1.25	(a)	1960	1.00
1952	1251	1.50	1957	1521	1.25	1961	1883	1.25	1965	1963	2.50
(a)	1362	.75		*1523			1885	2.25		1966	2.00
1953	1291	1.25	(a)	1524	1.00	(a)	1886	1.00	(a)	1967	1.00
(a)	1380	1.00	1958	1572	1.25	1962	1943	1.50			
1954	1351	1.00		1574	1.75		*1945				
	*1353		(a)	1575	1.00	(a)	1946	1.00			

Stream measurements in the years mentioned

1897	*15		1909	*265		1916	*436		1925	*612
1898	*27			*266		1917	*455		1926	*625
	*28			*272			*456			*626
1899	*36		1910	*285			*462			*632
	*37			*286		1918	*475		1927	*645
	*38			*292			*476			*646
1900	*49		1911	*305			*482			*652
	*51			*306		1919-20	*505		1928	*665
1901	*66			*312			*506			*666
1902	*84		1912	*325			*512			*672
	*85			*326		1921	*525		1929	*685
1903	*99			*332			*526			*686
	*100		1913	*355			*532			*692
1904	*130			*356		1922	*545		1930	*700
	*135			*362			*546			*701
1905	*171		1914	*385			*552			*707
	*172			*386		1923	*565		1931	*715
	*178			*392			*566			*716
1906	*207		1915	*405			*572			*722
	*208			*406		1924	*585		1932	*730
	*214			*412			*586			*731
1907-8	*245			*413			*592			*737
	*246		1916	*435		1925	*605		1933	*745
	*252			*436			*606			*746

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- *1077. Gaging-station records in the Missouri River basin, by B. R. Colby and R. E. Oltman. 1948 (1949). 219 p.
1080. Floods of May-June 1948 in Columbia River basin, with a section on Magnitude and frequency of floods, by S. E. Rantz and H. C. Riggs. 1949. 476 p. \$1.25.

WATER-SUPPLY PAPERS--Continued

- *1137-I. Summary of floods in the United States during 1950. 1954. p. 957-991.
- *1220. Irrigation and streamflow depletion in Columbia River basin above The Dallas, Oreg., by W. D. Simons. 1953 (1954). 126 p.
- *1260-B. Floods of April 1952 in the Missouri River Basin. 1955. p. 49-302.
- *1260-F. Summary of floods in the United States during 1952. 1959. p. 687-713.
- *1263. Geology and ground-water resources of the Missouri River valley in northeastern Montana, by F. A. Swenson, with a section on the quality of the ground water, by W. H. Durum. 1955 (1956). 128 p.
- *1300. The industrial utility of public water supplies in the United States, 1952--Part 2, States west of the Mississippi River, by E. W. Lohr and S. K. Love. 1954. 462 p.
1308. Compilation of records of surface waters of the United States through September 1950--Part 5, Hudson Bay and upper Mississippi River basins. 1959. 708 p. \$3.
- *1309. Compilation of records of surface waters of the United States through September 1950--Part 6-A, Missouri River basin above Sioux City, Iowa. 1959. 672 p.
- *1316. Compilation of records of surface waters of the United States through September 1950--Part 12, Pacific slope basins in Washington and upper Columbia River basin. 1955. 592 p.
- *1320-B. Floods of May-June 1953 in Missouri River basin in Montana. 1957. p. 69-153.
- *1320-E. Summary of floods in the United States during 1953. 1959. p. 341-364.
- *1355. Geology and ground-water resources of the lower Yellowstone River valley, between Glendive and Sidney, Mont., by A. E. Torrey and F. A. Kohout, with a section on Chemical quality of the water, by H. A. Swenson. 1956. 92 p.
- *1360-A. Reservoirs in the United States, by N. O. Thomas and G. E. Harbeck, Jr. 1956. p. 1-99. (Superseded by Water-Supply Paper 1838.)
- *1360-C. Geology and occurrence of ground water in the Townsend Valley, Mont., by H. W. Lorenz and R. G. McMurtrey, with a section on Chemical quality of the ground water, by H. A. Swenson. 1956. p. 171-290.
- *1370-C. Summary of floods in the United States during 1954. 1959. p. 201-263.
- *1374. Preliminary survey of the saline-water resources of the United States, by R. A. Krieger, J. L. Hatchett, and J. L. Poole. 1957. 172 p.
1418. Geology and ground water, Heart Mountain and Chapman Bench Divisions, Shoshone irrigation project, Wyoming, by F. A. Swenson, with a section on Chemical quality of the water, by H. A. Swenson. 1957. 55 p. \$1.
1424. Ground-water factors affecting drainage in the First Division, Buffalo Rapids Irrigation Project, Prairie and Dawson Counties, Mont., by A. E. Moulder and F. A. Kohout, with a section on Chemical quality of the water, by E. R. Jochens. 1958. 198 p. \$2.50.
- 1460-B. Geology and ground-water resources of the Lower Marias irrigation project, Montana, by F. A. Swenson, with a section on Chemical quality of the ground water, by H. A. Swenson. 1957 (1958). p. 41-98. \$1.25.
1473. Study and interpretation of the chemical characteristics of natural water, *second edition*, by J. D. Hem. 1970. 363 p. \$2.25. (Revised.)
- *1475-I. Hydrology of small watersheds in Western States, by H. V. Peterson. 1962. p. 217-356.
- *1482. Geology and ground-water resources of the Gallatin Valley, Gallatin County, Mont., by O. M. Hackett, F. N. Visher, R. G. McMurtrey, and W. L. Steinhilber, with a section on Surface-water resources, by Frank Stermitz and F. C. Boner, and a section on Chemical quality of the water, by R. A. Krieger. 1960. 282 p. \$3.50.

WATER-SUPPLY PAPERS--Continued

- *1487. Geology and ground-water resources of the lower Little Bighorn River Valley, Big Horn County, Mont., with special reference to the drainage of water-logged lands, by E. A. Moulder, M. F. Klung, D. A. Morris, and F. A. Swenson, with a section on Chemical quality of the water, by R. A. Krieger. 1960. 223 p.
- *1496-D. Occurrence and distribution of strontium in natural water, by M. W. Skougstad and C. A. Horr. 1963. p. 55-97.
- *1530. Summary of floods in the United States during 1956. 85 p.
- *1550. Geology of damsites on Flathead River, mouth to Flathead Lake, Lake and Sanders Counties, Mont., by K. S. Soward. 1965 (1966). 91 p.
- *1576-F. Geology and Hydrology of the Fort Belknap Indian Reservation, Mont., by D. C. Alverson. 1965. p. F1-F59.
- *1660-B. Summary of floods in the United States during 1958. 1963. p. B1-B97.
1678. Magnitude and frequency of floods in the United States--Part 5, Hudson Bay and upper Mississippi River basins, by J. L. Patterson and C. R. Gamble. 1968. 546 p. \$2.50.
- *1679. Magnitude and frequency of floods in the United States--Part 6-A, Missouri River basin above Sioux City, Iowa, by J. L. Patterson. 1966. 471 p.
- *1687. Magnitude and frequency of floods in the United States--Part 12, Pacific Slope basins in Washington and upper Columbia River basin, by G. L. Bodhaine and D. M. Thomas. 1964. 337 p.
- *1728. Compilation of records of surface waters of the United States, October 1950 to September 1960--Part 5, Hudson Bay and upper Mississippi River basins. 1964. 269 p.
1729. Compilation of records of surface waters of the United States, October 1950 to September 1960--Part 6-A, Missouri River basin above Sioux City, Iowa. 1964. 507 p. \$2.25.
- *1736. Compilation of records of surface waters of the United States, October 1950 to September 1960--Part 12, Pacific slope basins in Washington and upper Columbia River basin. 1964. 415 p.
1760. Ground-water levels in the United States, 1956-60, Northwestern States. 1963. 222 p. \$1. (See table.)
- *1779-J. Geology and water resources of the Bluewater Springs area, Carbon County, Mont., by E. A. Zimmerman. 1964. p. J1-J24.
- *1800. The role of ground water in the national water situation, by C. L. McGuinness. 1963. 1121 p.
1804. Drought of the 1950's, with special reference to the Midcontinent, by R. L. Nace and E. J. Pluhowski. 1965. 88 p. 70c.
- *1810. Summary of floods in the United States during 1961, by J. O. Rostvedt. 1965. 123 p.
- *1813. Flood peak runoff and associated precipitation in selected drainage basins in the United States, by Tate Dalrymple. 1965. 406 p.
1838. Reservoirs in the United States, by R. O. R. Martin and R. L. Hanson. 1966. 115 p. \$1.
- 1840-B. Floods of June 1964 in northwestern Montana, by F. C. Boner and Frank Stermitz. 1967. p. B1-B242. \$1.50.
- 1840-C. Summary of floods in the United States during 1964, by J. O. Rostvedt and others. 1970. p. C1-C124. 60c.
- *1845. Ground-water levels in the United States, 1961-65--Northwestern States. 1968. 199 p. (See table.)
- *1849. Roughness characteristics of natural channels, by H. H. Barnes, Jr. 1967. 213 p.
- 1850-E. Summary of floods in the United States during 1965, by J. O. Rostvedt and others. p. E1-E110. 60c.

OIL AND GAS INVESTIGATIONS MAPS--Continued

- OM-139. Geology of the Stanford area, Judith Basin and Fergus Counties, Mont., by J. D. Vine and W. D. Johnson, Jr. 1954. Covers an area of about 625 square miles in central Montana. Scale 1:63,360. 50c.
- OM-165. Structure contour map of the base of Mississippian rocks in the Williston basin and adjoining areas of Montana, North Dakota, South Dakota, and Wyoming, R. P. Kunkel. 1954 (1955). Covers eastern Montana, all but the eastern one-third of North Dakota, northwestern and north-central South Dakota, and part of northeastern Wyoming. Scale 1:1,000,000. 50c.
- OM-170. Map of Montana showing oil and gas fields and test wells for oil and gas, by H. R. Smith. 1956. Scale 1:500,000. 2 sheets. \$1 per set.
- OM-178-A. Structure contour map of the Montana Plains, by C. E. Dobbin and C. E. Erdmann. 1955. Scale 1:500,000. 50c.
- *OM-178-B. Structure contour map of the Montana Plains, by C. E. Dobbin and C. E. Erdmann. 1955. Scale 1:1,000,000.
- OM-179. Structure contour map on top of the middle member of the Piper formation of Middle Jurassic age in the Williston basin and adjacent areas in Montana, North Dakota, and South Dakota, by D. T. Sandberg. 1959. Scale 1:760,320. 75c.
- *OM-182. Structure contour map of the Tensleep sandstone in the Bighorn Basin, Wyoming and Montana, by A. D. Zapp. 1956. Scale 1:250,000.
- OM-184. Index map of central midcontinent region giving lines of sections that show detailed lithology Paleozoic and Mesozoic rocks, by Jeannette Fox and M. G. Sheldon. 1957. Scale 1:2,500,000. 50c.
- OM-191. Geologic and structure contour map of the northern and western flanks of the Black Hills, Wyo., Mont., and S. Dak., by W. J. Mapel, C. S. Robinson, and P. K. Theobald. 1959. Scale 1:96,000. 2 sheets. \$1.50 per set.
- OM-199. Geologic map of the Lewistown area, Fergus County, Mont., by L. S. Gardner. 1959. Scale 1:63,360. 75c.
- OM-202. The Bighorn dolomite and correlative formations in southern Montana and northern Wyoming by P. W. Richards and C. L. Nieschmidt. 1961. Scale 1:750,000. 2 sheets. 75c per set.
- OM-211. Geology of the Melstone-Sumatra area in central Montana, by H. R. Smith. 1962. Scale 1:63,360. 75c.
- *PALEOCENE DEPOSITS OF THE ROCKY MOUNTAINS AND PLAINS, by R. W. Brown. 1949. Shows the areas of outcrop of the earliest Tertiary (Paleocene) rocks from Montana and North Dakota south to Arizona and New Mexico. The upper and lower boundaries of the Paleocene deposits and their areal relations with Cretaceous and younger Tertiary rocks are indicated. A brief discussion of paleocene formations is printed on the same sheet. Scale 1:1,000,000. (See Professional Paper 375.)

MISCELLANEOUS REPORTS (free upon application to the Geological Survey Washington, D.C. 20242):

- List 1. Press releases, preliminary maps, and preliminary reports released between Jan. 1, 1938, and Jan. 1, 1945.
- List 2. Press releases, preliminary maps, and preliminary reports released between Jan. 1, 1945, and Jan. 1, 1946.

GEOPHYSICAL INVESTIGATIONS MAPS--Continued

- GP-685. Aeromagnetic map of the Trout Creek quadrangle, Sanders and Lincoln Counties, Mont., and Shoshone County, Idaho. 1969. Lat 47° 30' to 48°, long 115° 30' to 116°. Scale 1:62,500. 50c.
- GP-686. Aeromagnetic map of the Thompson Falls quadrangle, Lincoln and Sanders Counties, Mont. 1969. Lat 47° 30' to 48°, long 115° to 115° 30'. Scale 1:62,500. 50c.
- GP-687. Aeromagnetic map of the Hubbard Reservoir-Hot Springs area, Sanders, Flathead, and Lake Counties, Mont. 1969. Lat 47° 30' to 48°, long about 114° 26' to 115°. Scale 1:62,500. 50c.
- GP-689. Aeromagnetic map of part of the Avery quadrangle, Shoshone County, Idaho, and Mineral and Sanders Counties, Mont. 1969. Lat 47° 07'30" to 47° 30', long 115° 30' to 116°. Scale 1:62,500. 50c.
690. Aeromagnetic map of the Haugan and St. Regis quadrangles and parts of the Simmons Peak and Illinois Peak quadrangles, Shoshone County, Idaho, and Mineral and Sanders Counties, Mont. 1969. Lat 47° to 47° 30', long 115° to 115° 30'. Scale 1:62,500. 50c.
- GP-691. Aeromagnetic map of the Plains, Perma, Superior, and Tarkio quadrangles, Sanders, Mineral, and Missoula Counties, Mont. 1969. Lat 47° to 47° 30', long 114° 30' to 115°. Scale 1:62,500. 50c.

HYDROLOGIC INVESTIGATIONS ATLASES

- HA-61. Stream composition of the conterminous United States, by F. H. Rainwater. 1962. 3 sheets. \$1.50 per set.
- HA-189. Calcium, sodium, sulfate, and chloride in stream water of the western conterminous United States to 1957, by J. H. Feth. 1965. 4 maps. \$1.50 per set.
- HA-194. Generalized map showing annual runoff and productive aquifers in the conterminous United States, compiled by C. L. McGuinness. 1964. Scale 1:5,000,000. 75c.
- HA-199. Preliminary map of the conterminous United States showing depth to and quality of shallowest ground water containing more than 1,000 parts per million dissolved solids, by J. H. Feth and others. 1965. Scale 1:3,168,000. 2 sheets. Accompanied by 31-page text. \$1.25 per set.
- HA-200. Chemical quality of public water supplies of the United States and Puerto Rico, 1962, shown as Statewide averages, mainly in graphic and tabular form, by C. N. Durfor and Edith Becker. 1964. 50c.
- HA-212. Annual runoff in the conterminous United States, by M. W. Busby. 1966. Scale 1:7,500,000. 75c.
- HA-217. General availability of ground water and depth to water level in the Missouri River basin, by G. A. La Raocque, Jr. 1966. Lat 36° to 49°, long 90° to 114°. Scale 1:2,500,000. 75c.
- HA-224. Availability of ground water from the alluvium along the Missouri River in northeastern Montana, by W. B. Hopkins and J. R. Tilstra. 1966. Area in vicinity of lat 48°, long 105°. Scale 1:96,000. 75c.
- HA-235. Temperature of surface waters in the conterminous United States, by J. F. Blakey. 1966. Scale 1:5,000,000. 3 sheets. Accompanied by 8-page text. \$1.25 per set.
- HA-308. Occurrence of ground water in the Judith River Formation, north-central Montana, by W. R. Osterkamp. 1968. Lat 47° 15' to 48°, long 107° to 109°. Scale 1:250,000. 75c.

*INTERPRETING GEOLOGIC MAPS FOR ENGINEERING PURPOSES. 1953. (1954). Six maps of the Hollidaysburg, Pa., quadrangle. Scale 1:62,500.

KEVIN-SUNBURST OIL FIELD, TOOLE COUNTY, MONT.

Map 1, by C. E. Erdmann, A. B. Cozzens, J. T. Gist, and J. W. Nordquist. 1964. Scale 1:63,360. 2 sheets. 10c per set.

Map 2, by C. E. Erdmann, J. T. Gist, G. W. Beer, and J. W. Nordquist. 1947. Scale 1:63,360. 2 sheets. 10c per set.

Map 3, by C. E. Erdmann, J. T. Gist, and J. W. Nordquist, 1947. Scale 1:63,360. 2 sheets. 10c per set.

***LAND CLASSIFICATION MAPS NORTHERN GREAT PLAINS, by A. E. Aldous and J. F. Deeds:**

*Sheet 1, northwestern North Dakota and northeastern Montana.

*Sheet 2, northeastern, north-central, and east-central Montana.

*Sheet 3, north-central and central Montana.

*Sheet 4, central and south-central Montana.

*Sheet 5, southeastern Montana.

MINERAL INVESTIGATIONS FIELD STUDIES MAPS

MF-36. Bentonite deposits of the northern Black Hills district, Montana, Wyoming, and South Dakota, by M. M. Knechtel and S. H. Patterson. 1955 (1956). Scale 1:48,000. 2 sheets. \$1.50 per set.

MF-120. Uranium deposits and principal ore-bearing formations of the central Cordilleran foreland region, by T. L. Finnell and I. S. Parrish. 1958. 2 sheets: sheet 1 (map), scale 1:750,000; sheet 2 (table and text). 75c per set. (See also Bulletin 1087-I.)

MF-126. Preliminary tectonic map of eastern Montana showing the distribution of uranium deposits, compiled by F. W. Osterwald and B. G. Dean. 1958. Scale 1:500,000. 2 sheets. 50c per set.

MF-171. Preliminary geologic map of the northern half of the Jefferson City quadrangle, Jefferson and Lewis and Clark Counties, Mont., by G. E. Becraft. 1960 (1961). Lat 46° 22' to 46° 30', long 112° to 112° 15'. Scale 1:24,000. 50c.

MF-172. Preliminary geologic map of the southern half of the Jefferson City quadrangle, Jefferson County, Mont., by G. E. Becraft. 1960 (1961). Lat 46° 15' to 46° 22', long 112° to 112° 15'. Scale 1:24,000. 50c.

MF-174. Reconnaissance geologic map of the Deer Lodge quadrangle, Powell, Deer Lodge, and Jefferson Counties, Mont., by E. T. Ruppel. 1961. Lat 46° 15' to 46° 30', long 112° 30' to 112° 45'. Scale 1:48,000. 50c.

MF-183. Preliminary geologic map of the northwest quarter of the Boulder quadrangle, Montana, by G. E. Becraft, and D. M. Pinckney. 1961. Lat 46° 07'30" to 46° 15', long 112° 07'30" to 112° 15'. Scale 1:24,000. 50c.

MF-187. Preliminary geologic map of the southwest quarter of the Boulder quadrangle, Montana, by D. M. Pinckney and G. E. Becraft. 1961. Lat 46° to 46° 07'30", long 112° 07'30" to 112° 15'. Scale 1:24,000. 50c.

MF-243. Preliminary geologic map of the northern Elkhorn Mountains, Jefferson and Broadwater Counties, Mont., by H. W. Smedes. 1962. Lat 46° 25'30" to 46° 30', long 111° 45' to 112°. Scale 1:24,000. 50c.

MF-246. Preliminary geologic map of the Elk Park quadrangle, Jefferson and Silver Bow Counties, Mont., by H. W. Smedes, M. R. Klepper, D. M. Pinckney, G. E. Becraft, and E. T. Ruppel. 1962. Lat 46° to 46° 15', long 112° 15' to 112° 30'. Scale 1:48,000. 50c.

MF-264. Geologic map of the Castagne quadrangle, Carbon County, Mont., by H. L. Smith. 1963. Lat 45° 15' to 45° 22'30", long 109° 15' to 109° 22'30". Scale 1:24,000. 50c.

MF-265. Geologic map of the Cooney Reservoir quadrangle, Carbon and Stillwater Counties, Mont., by A. A. Wanek. 1963. Lat 45° 22'30" to 45° 30', long 109° 07'30" to 109° 15'. Scale 1:24,000. 50c.

OIL AND GAS INVESTIGATIONS CHARTS--Continued

32. Marine Jurassic formations of Montana, by R. W. Imlay, L. S. Gardner, C. P. Rogers, Jr., and H. D. Hadley. 1948. 50c.

*OC-40. Subsurface stratigraphy of Paleozoic rocks in southeastern Montana and adjacent parts of Wyoming and South Dakota, by Constance Leatherock. 1950.

OC-50. Subsurface stratigraphy of the Heath shale and Amsden formation in central Montana, by C. L. Nieschmidt. 1953. 50c.

OIL AND GAS INVESTIGATIONS MAPS

*3. Structure contour map of the Big Horn Basin, Wyoming and Montana, by W. G. Pierce, D. A. Andrews, and J. J. Kirby. 1944. Scale 1:190,080. (Superseded by Map 74.)

4. Plains adjacent to Little Rocky Mountains, Mont., by M. M. Knechtel. 1944. Geologic map of about 130 square miles along eastern and southern borders of the Mountains. Scale 1:48,000. 30c.

10. Map showing thickness and general character of the Cretaceous deposits in the western interior of the United States, by J. B. Reeside, Jr. 1944. Scale 1:13,939,200. 25c. (Reprinted 1968.)

*25. Geologic map of Montana, by D. A. Andrews, G. S. Lambert, and G. W. Stose. 1945. Shows geologic formations, geologic contacts, faults, and dikes. (Black and white only.) Scale 1:500,000. 2 sheets. (Superseded by Geologic map of Montana, 1955, in color.)

*33. Structure contour map of the Powder River Basin, Wyoming and Montana, by W. G. Pierce and Roselle Girard. 1945. Scale 1:253,440. (Superseded by Map OM-133.)

43. Maps showing thickness and general distribution of Mesozoic and Paleozoic rocks in south-central Montana, by C. P. Rogers, Jr., L. S. Gardner, and H. D. Hadley. 1945. Scale 1:1,330,560. 40c.

71. Geologic map of the Big Horn Basin, Wyoming and Montana, showing terrace deposits and physiographic features, by D. A. Andrews, W. G. Pierce, and D. H. Eargle. 1947. Scale 1:126,720. 50c.

*74. Structure contour map of the Big Horn Basin, Wyoming and Montana, by W. G. Pierce, D. A. Andrews, and J. K. Keroher. 1947. Scale 1:190,080.

87. Geology of the Lothair area, Liberty County, Mont., by C. E. Erdmann. 1948. Map of 216 square miles showing the distribution of Upper Cretaceous formations that crop out along the Marias River and the location of the high-water flood level of the proposed Tiber Dam. Scale 1:48,000. 60c.

106. Geology of the Button Butte-Forestgrove area, Fergus County, Mont., by L. S. Gardner. 1950. Covers an area of about 500 square miles. Scale 1:63,360. 60c.

108. Geologic map of the Hobson area, central Montana, by J. D. Vine and W. J. Hail, Jr. 1950. Covers an area of about 675 square miles in the Judith Basin. Scale 1:63,360. 50c.

OM-111. Geology of the Hardin area, Big Horn and Yellowstone Counties, Mont., by P. W. Richards and C. P. Rogers, Jr. 1951. Covers an area of over 1,100 square miles. Scale 1:63,360. 2 sheets. \$1 per set.

*OM-130. Map of Montana showing oil and gas fields and test wells for oil and gas, by J. D. Vine and C. E. Erdmann. 1952. Scale 1:500,000. 2 sheets. (Revised as Map OM-170.)

OM-133. Structure-contour map of the Powder River Basin, Wyoming and Montana, by W. G. Pierce and R. M. Girard. 1945. Revised by A. D. Zapp. 1951 (1952). Scale 1:316,800. 75c.

MISCELLANEOUS GEOLOGIC INVESTIGATIONS MAPS--Continued

- I-417. Preliminary geologic map of the Tepee Creek quadrangle, Montana-Wyoming, by I. J. Witkind. 1964. Lat 44°45' to 45°, long 111° to 111°15'. Scale 1:48,000. 50c.
- I-429. Aggregate and riprap resources map of the Wolf Point area, Montana, by R. B. Colton. 1964. Lat about 48° to 48°40', long 104°45' to 106°30'. Scale 1:125,000. 50c.
- I-433. Geologic map of the Bannack-Grayling area, Beaverhead County, Mont., by W. R. Lowell. 1965. Lat 45° to 45°15', long 112°45' to 113°. Scale 1:31,680. Accompanied by 6-page text. 75c.
- I-452. Geologic map of the Maudlow quadrangle, southwestern Montana, by Betty Skipp and A. D. Peterson. 1965. Lat 46° to 46°15', long 111° to 111°15'. Scale 1:24,000. 2 sheets. \$1.50 per set..
- I-468. Preliminary geologic map of the Comb Rock quadrangle, Lewis and Clark County, Mont., by R. G. Schmidt. 1966. Lat 47°07'30" to 47°15', long 112°07'30" to 112°15'. Scale 1:24,000. 50c.
- I-486. Geologic map of the Toston quadrangle, southwestern Montana, by G. D. Robinson. 1967. Lat 46° to 46°15', long 111°15' to 111°30'. Scale 1:24,000. 2 sheets. \$1.50 per set.
- I-564. Preliminary geologic map of the Roberts Mountain quadrangle, Lewis and Clark County, Mont., by R. G. Schmidt and C. P. Strong, Jr. 1968. Lat 47° to 47°07'30", long 112°07'30" to 112°15'. Scale 1:24,000. 50c.

MISSOURI BASIN STUDIES

1. Mineral resources of the Missouri Valley region, by D. H. Sow, D. M. Larrabee, and S. E. Clabaugh. 1954-46. These maps cover the entire basin. They show the sedimentary and igneous rocks of different ages. Structure contour lines are also given. Part 1, shows metallic mineral resources; part 2, the nonmetallic mineral resources; part 3, fuel resources; and part 4, construction materials. Scale 1:2,500,000. 4 sheets. \$1.50 per set.
 6. Preliminary map showing sand and gravel deposits of Montana, by D. M. Larabee and A. F. Shride. 1946. Scale 1:500,000. 2 sheets. 70c. per set.
 11. Map showing construction materials and nonmetallic mineral resources of Montana, by M. M. Knechtel, D. M. Larrabee, E. C. Fischer, and others. 1948. Scale 1:750,000. 2 sheets. 90c per set.
 16. Map showing metallic mineral deposits of Montana, by F. M. Chace, Fred Cater, Virginia Byers, and others. 1947. Scale 1:1,000,000. 30c.
- *MONTANA PLAINS. Structure contour map of the Montana plains, by C. E. Dobbin and C. E. Erdmann. 1946. Scale 1:506,880. (Superseded by Maps OM-178-A and 178-B.)

OIL AND GAS INVESTIGATIONS CHARTS

15. Mississippian and Devonian stratigraphy of northwestern Montana, by L. L. Sloss and W. M. Laird. 1945. 30c.
18. Columnar sections of Mesozoic and Paleozoic rocks in the mountains of south-central Montana, by L. S. Gardner, T. A. Hendricks, H. D. Hadley, and C. P. Rogers, Jr. 1945. 40c.
19. Subsurface stratigraphy of Lower Mesozoic and Upper Paleozoic formations in the basin area of south-central Montana, by H. D. Hadley, L. S. Gardner, and C. P. Rogers, Jr. 1945. 40c.
25. Devonian stratigraphy of central and northwestern Montana, by L. L. Sloss and W. M. Laird 1946. 35c.

MINERAL INVESTIGATIONS FIELD STUDIES MAPS--Continued

- MF-266. Geologic map of the Roberts quadrangle, Carbon County, Mont., by H. D. Zeller. 1963. Lat 45°14' to 45°22'30", long 109°07'30" to 109°15'. Scale 1:24,000. 50c.
- MF-267. Geologic map of the Roscoe NE quadrangle, Stillwater and Carter Counties, Mont., by E. D. Patterson. 1963. Lat 45°22'30" to 45°30', long 109°15' to 109°22'30". Scale 1:24,000. 50c.
- MF-270. Geologic map of the Rapids quadrangle, Carbon and Stillwater Counties, Mont., by A. A. Wanek. 1963. Lat 45°30' to 45°37'30" to 45°37'30", long 109° to 109°07'30". Scale 1:24,000. 50c.

MINERAL INVESTIGATIONS RESOURCE MAPS

- MR-50. Reported occurrences of selected minerals in Montana, compiled by C. B. Bentley and G. D. Mowat. 1967. 2 sheets (East and West halves.) Scale 1:500,000.

The following maps cover the resources indicated for the United States, exclusive of Alaska and Hawaii. All are printed at a scale of 1:3,168,000 and are sold at 75c each, except as indicated.

- MR-1. Geologic environment map of alumina resources of the Columbia Basin, by I. G. Sohn. 1952. Scale 1:1,500,000. 80c.
- MR-2. The uranium deposits, compiled by R. W. Schnabel. 1955. Scale 1:5,000,000. 50c.
- MR-3. Potash occurrences, by M. F. Byrd. 1955. Scale 1:5,000,000. 50c.
- MR-13. Copper, by A. R. Kinkle, Jr., and N. P. Peterson. 1962.
- MR-15. Lead, by E. T. McKnight, W. L. Newman, and A. V. Heyl. 1962.
- MR-16. Vanadium, by R. P. Fischer. 1962.
- MR-17. Asbestos, by A. H. Chidester and A. F. Shride. 1962.
- MR-18. Pyrophyllite, and kyanite and related minerals, by G. H. Espenshade. 1962.
- MR-19. Zinc, by E. T. McKnight, W. L. Newman, and A. V. Heyl. 1962.
- MR-20. Antimony, by D. E. White. 1962.
- MR-21. Epigenetic uranium deposits, by A. P. Butler, Jr., W. I. Finch, and W. S. Twenhofel. 1962.
- MR-22. Bismuth, by J. R. Cooper. 1962.
- MR-23. Manganese, by M. D. Crittenden and Louis Pavlides. 1962.
- MR-24. Gold, by A. H. Koschmann and M. H. Bergendahl. 1962.
- MR-25. Tungsten by D. M. Lemmon and O. L. Tweto. 1962.
- MR-26. Chromite, by T. P. Thayer and M. H. Miller. 1962.
- MR-28. Thorium and rare earths, by J. C. Olson and J. W. Adams. 1962.
- MR-29. Titanium, by C. L. Rogers and M. C. Jaster. 1962.
- MR-31. Talc and soapstone, by A. H. Chidester and H. W. Worthington. 1962. (See Bulletin 1167.)
- MR-33. Gypsum and anhydrite, by C. F. Withington. 1962.
- MR-34. Silver, by E. T. McKnight, W. L. Newman, Harry Klemic, and A. V. Heyl. 1962.
- MR-36. Niobium and tantalum, by R. L. Parker. 1963.
- MR-37. High-alumina kaolinitic clay, by Helen Mark. 1963.
- MR-43. Barite, by D. A. Br obst. 1965. Accompanied by 10-page text.
- MR-44. Tin, by P. L. Killeen and W. L. Newman. 1965. Accompanied by 9-page text.
- MR-51. Iron, by M. S. Carr, P. W. Guild, and W. B. Wright. 1967. Accompanied by 20-page text.
- MR-55. Molybdenum, by R. U. King. 1970. Accompanied by 21-page text.

MINERAL INVESTIGATIONS (STRATEGIC) MAPS

- 3-198. Map of Permian phosphate deposits of Montana, Wyoming, Idaho, and Utah, by P. S. Clabaugh. 1946. Scale 1:013,760. 30c.
 *3-212. Iron-ore deposits of the Western United States, by C. E. Dutton and M. S. Carr. 1947. Scale 1:5,000,000. (See Bulletin 1082-C and Map MR-51.)

MISCELLANEOUS GEOLOGIC INVESTIGATIONS MAPS

- I-129. Geology of the Kenilworth quadrangle, Montana, by R. M. Lindvall. 1956. Lat 48° to 48° 15', long 110° 15' to 110° 30'. Scale 1:62,500. 75c.
 I-130. Geology of the Big Sandy quadrangle, Montana, by R. M. Lindvall. 1956. Lat 48° to 48° 15', long 110° to 110° 15'. Scale 1:62,500. 75c.
 I-155. Geology of the Cartersville and Hathaway quadrangles, Montana, by J. F. Smith, Jr. 1956. Lat 46° 15' to 46° 30', long 106° to 106° 30'. Scale 1:62,500. 50c.
 I-225. Geologic and structure contour map of the Fort Peck Indian Reservation and vicinity, Montana, by R. B. Colton and A. F. Bateman, Jr. 1956. Lat 48° to 48° 30', long 104° 30' to 106° 30'. Scale 1:125,000. 75c.
 I-234. Preliminary general geologic map of the Laredo quadrangle, Bearpaw Mountains, Mont., by W. T. Pecora, I. J. Witkind, and D. B. Stewart. 1957. Lat 48° 15' to 48° 30', long 109° 45' to 110°. Scale 1:31,680. 75c.
 I-235. Preliminary geologic map of the Centennial Mountain quadrangle, Bearpaw Mountains, Mont., by D. B. Stewart, W. T. Pecora, D. E. Engstrom, and H. R. Dixon. 1947. Lat 48° to 48° 15', long 109° 45' to 110°. Scale 1:31,680. 75c.
 I-236. Preliminary geologic map of the Shambo quadrangle, Bearpaw Mountains, Mont., by J. H. Kerr, W. T. Pecora, D. B. Stewart, and H. R. Dixon. 1957. Lat 48° 15' to 48° 30', long 109° 30' to 109° 45'. Scale 1:31,680. 75c.
 I-237. Preliminary geologic map of the Warrick quadrangle, Bearpaw Mountains, Mont., by W. T. Pecora and others. 1957. Lat 48° 48' 15', long 109° 30' to 109° 45'. Scale 1:31,680. 75c.
 I-296. Geologic map of the Bonner quadrangle, Montana, by W. H. Nelson and J. P. Dobell. 1959. Lat 46° 45' to 47°, long 113° 45' to 114°. Scale 1:62,500. 2 sheets. 75c per set.
 I-311. Geologic map of the igneous and metamorphic rocks of Montana showing location of uranium deposits, compiled by E. A. Merewether. 1960. Lat 45° to 49°, long 104° to 109° (east half); lat 45° to 49°, long 110° to 115° (west half). Scale 1:500,000. 2 sheets. \$1.50 per set.
 I-327. Glacial map of Montana east of the Rocky Mountains, by R. B. Colton, R. W. Lemke, and R. M. Lindvall. 1961. Lat 47° to 49°, long 104° to 113°. Scale 1:500,000. \$1.50.
 I-338. Geology of the Boxelder quadrangle, Montana, by R. M. Lindvall. 1961 (1962). Lat 48° 15' to 48° 30', long 110° to 110° 15'. Scale 1:62,500. 75c.
 I-349. Geology of the Eagle Buttes quadrangle, Chouteau County, Mont., by R. M. Lindvall. 1962. Lat 47° 45' to 48°, long 110° to 110° 15'. Scale 1:62,500. 50c.
 I-353. Geology of the Eskay quadrangle, Chouteau and Blaine Counties, Mont., by R. M. Lindvall. 1962. Lat 47° 45' to 48°, long 109° 30' to 109° 45'. Scale 1:62,500. 50c.
 I-361. Geologic map of the south half of the Baylor, Larlsan West Fork, Police Creek, Kahle and Lundville quadrangles, Valley, Roosevelt, and Daniels Counties, Mont., by R. B. Colton. 1964. Lat about 48° 30' to 48° 38' 07", long 105° to 106° 30'. Scale 1:62,500. \$1.

MISCELLANEOUS GEOLOGIC INVESTIGATIONS MAPS--Continued

- I-362. Geologic map of the Brockton quadrangle, Roosevelt and Richland Counties, Mont., by R. B. Colton. 1963. Lat 48° to 48° 15', long 104° 45' to 105°. Scale 1:62,500. \$1.
 I-363. Geologic map of the Chelsea quadrangle, Roosevelt and McCone Counties, Mont., by R. B. Colton. 1963. Lat 48° to 48° 15', long 105° 15' to 105° 30'. Scale 1:62,500. \$1.
 I-364. geologic map of the Cuskers quadrangle, Roosevelt County, Mont., by R. B. Colton. 1963. Lat 48° 15' to 48° 30', long 105° 15' to 105° 30'. Scale 1:62,500. \$1.
 I-365. Geologic map of the Hay Creek quadrangle, Roosevelt County, Mont., by R. B. Colton. 1963. Lat 48° 15' to 48° 30', long 105° to 105° 15'. Scale 1:62,500. \$1.
 I-366. Geologic map of the Oswego quadrangle, Valley, Roosevelt, and McCone Counties, Mont., by R. B. Colton. 1963. Lat 48° to 48° 15', long 105° 45' to 106°. Scale 1:62,500. \$1.
 I-367. Geologic map of the Poplar quadrangle, Roosevelt, Richland, and McCone Counties, Mont., by R. B. Colton. 1963. Lat 48° to 48° 15', long 105° to 105° 15'. Scale 1:62,500. \$1.
 I-368. Geologic map of the Porcupine Valley quadrangle, Valley County, Mont., by R. B. Colton. 1963. Lat 48° 15' to 48° 30', long 106° 15' to 106° 30'. Scale 1:62,500. \$1.
 I-369. Geologic map of the Spring Creek quadrangle, Valley County, Mont., by R. B. Colton. 1963. Lat 48° 15' to 48° 30', long 106° to 106° 15'. Scale 1:62,500. \$1.
 I-370. Geologic map of the Todd Lakes quadrangle, Valley and Roosevelt Counties, Mont., by R. B. Colton. 1963. Lat 48° 15' to 48° 30', long 105° 45' to 106°. Scale 1:62,500. \$1.
 I-371. Geologic map of the Tule Valley quadrangle, Roosevelt County, Mont., by R. B. Colton. 1963. Lat 48° 15' to 48° 30', long 105° 30' to 105° 45'. Scale 1:62,500. \$1.
 I-379. Preliminary geologic map and sections of the Hogan 4 Southeast quadrangle, Lewis and Clark County, Mont., by R. G. Schmidt. 1963. Lat 47° to 47° 07' 30", long 112° to 112° 07' 30". Scale 1:24,000. 50c.
 I-381. Geology of the northern part of the Boulder batholith and adjacent area, Montana, by Adolph Knopf. 1963. Lat 46° 30' to about 46° 43', long 111° 52' 30" to 112° 20'. Scale 1:48,000. \$1.
 I-387. Fluoride content of ground water in the conterminous United States (maximum reported value for each county), by Michael Fleischer. 1962. Scale 1:5,000,000. 50c.
 I-396. Geologic map of the Maxey Ridge quadrangle, Montana, by A. E. Roberts. 1964. Lat 45° 30' to 45° 37' 30", long 110° 45' to 110° 52' 30". Scale 1:24,000. \$1.
 I-397. Geologic map of the Fort Ellis quadrangle, Montana, by A. E. Roberts. 1964. Lat 45° 37' 30" to 45° 45', long 110° 52' 30" to 111°. Scale 1:24,000. \$1.
 I-398. Geologic map of the Mystic Lake quadrangle, Montana, by A. E. Roberts. 1964. Lat 45° 30' to 45° 37' 30", long 110° 52' 30" to 111°. Scale 1:24,000. \$1.
 I-399. Geologic map of the Bozeman pass quadrangle, Montana, by A. E. Roberts. 1964. Lat 45° 37' 30" to 45° 45', long 110° 45' to 110° 52' 30". Scale 1:24,000. \$1.
 I-409. Preliminary geologic map and sections of the Hogan 4 Northeast quadrangle, Lewis and Clark, and Cascade Counties, Mont., by R. G. Schmidt, assisted by D. A. Swanson and Peter Zubovic. 1964. Lat 47° 07' 30" to 47° 15', long 112° to 112° 07' 30". Scale 1:24,000. 50c.

REFERENCE LIBRARIES

Many of the publications listed herein may be consulted in the following libraries in Montana:

BILLINGS:

Eastern Montana College.
Parmly Billings Memorial.

BOZEMAN:

Montana State University.

BUTTE:

Montana College of Mineral Science
and Technology.
State Bureau of Mines and Geology.

HELENA:

Historical Society of Montana.
Public.

MISSOULA:

University of Montana.

RED LODGE:

Yellowstone-Bighorn Research Assn.

BULLETINS--Continued

- Pardee. p. 159-239; The Dunkleberg mining district, Granite County, Mont., by J. T. Pardee. p. 241-247.
- *661. Contributions to economic geology, 1917--Part 2. 1918. Contains: The Bowdoin dome, Montana--A possible reservoir of oil or gas, by A. J. Collier. p. 193-209; Phosphatic oil shales near Dell and Dillon, Beaverhead County, Mont., by C. F. Bowen. p. 315-328.
- *690. Contributions to geology, 1918--Part 1. 1919. Contains: Manganese at Butte, Mont., by J. T. Pardee. p. 111-130; Some manganese deposits in Madison County, Mont., by J. T. Pardee. p. 131-147.
- *691. Contributions to economic geology, 1918--Part 2. 1919. Contains: The structure of parts of the central Great Plains, by N. H. Darton. p. 1-26; Geology and oil and gas prospects of the Lake Basin field, Montana, by E. T. Hancock. p. 101-147; Oil and gas geology of the Birch Creek-Sun River area, northwestern Montana, by Eugene Stebinger. p. 149-184; Anticlines in a part of the Musselshell Valley, Musselshell, Meagher, and Sweetgrass Counties, Mont., by C. F. Bowen. p. 185-209.
- *697. Gypsum deposits of the United States, by R. W. Stone and others. 1920. 326 p. (See Map MR-33.)
- *711. Contributions to economic geology, 1919--Part 2. 1920. Contains: Oil shale in western Montana, southeastern Idaho, and adjacent parts of Wyoming and Utah, by D. D. Condit. p. 15-40; Geology and oil and gas prospects of the Huntley field, Montana, by E. T. Hancock. p. 105-148.
- *715. Contributions to economic geology, 1920--Part 1. 1921. Contains: Deposits of iron ore near Stanford, Mont., by L. G. Westgate. p. 85-92; Phosphate rock near Maxville, Granite County, Mont., by J. T. Pardee. p. 141-145.
- *725. Contributions to economic geology, 1921--Part 1. 1922. Contains: Deposits of chromite in Stillwater and Sweetgrass Counties, Mont., by L. G. Westgate. p. 67-84; Deposits of manganese ore in Montana, Utah, Oregon, and Washington, by J. T. Pardee. p. 141-243.
- *729. Oil shale of the Rocky Mountain region, by D. E. Winchester. 1923. 204 p.
- *736. Contributions to economic geology, 1922--Part 2. 1923. Contains: Oil and gas prospects in and near the Crow Indian Reservation, Mont., by W. T. Thom, Jr. p. 35-53; Possibility of finding oil in laccolithic domes south of the Little Rocky Mountains, Mont., by A. J. Collier and S. H. Cathcart. p. 171-178.
- *740. Mica deposits of the United States, by D. B. Sterrett. 1923. 342 p.
- *749. Geology of the Tullock Creek coal field, Rosebud and Bighorn Counties, Mont., by G. S. Rogers and Wallace Lee. 1923. 181 p.
- *751. Contributions to economic geology, 1923-24--Part 2. Contains: Geology and possible oil and gas resources of the faulted area south of the Bearpaw Mountains, Mont., by Frank Reeves. p. 71-114; The Scobey lignite field, Valley, Daniels, and Sheridan Counties, Mont., by A. J. Collier. p. 157-230; The Ekalaka lignite field, southeastern Montana, by C. M. Bauer. p. 231-267.
- *761. Molybdenum deposits, a short review, by F. L. Hess. 1924. 35 p.
- *780. Contributions to economic geology, 1925--Part 1. 1926. Contains: The Melrose phosphate field, Montana, by R. W. Richards and J. T. Pardee. p. 1-32.
- *786. Contributions to economic geology, 1926--Part 2. 1927. Contains: The geology of the Ingomar anticline, Treasure, and Rosebud Counties, Mont., by K. C. Heald. p. 1-37; Geology of the Cat Creek and Devils Basin oil fields and adjacent areas in Montana, by Frank Reeves. p. 39-98.

20 JUN 1971

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

GEOLOGIC AND WATER-SUPPLY REPORTS AND MAPS

MONTANA

APRIL 1971

MONTANA

This list contains reports and maps published by the Geological Survey relating to the geology and mineral and water resources of Montana. A separate list of bibliographies and publications of general interest is available on request, as are a general catalog of Geological Survey publications (not including topographic maps), and State indexes to topographic mapping.

AN ASTERISK (*) INDICATES THAT THE PUBLICATION IS OUT OF PRINT AND NOT PURCHASABLE FROM ANY OFFICIAL SOURCE. Bulletins, professional papers, and water-supply papers for which a price is stated are for sale by the SUPERINTENDENT OF DOCUMENTS, GOVERNMENT PRINTING OFFICE, WASHINGTON, D.C., 20402, prepayment being required. Numerous libraries and educational institutions throughout the country are depositories for this material and a list of Montana depositories is included.

Maps, folios, hydrologic atlases, and charts are sold by the Geological Survey. They may be ordered from the WASHINGTON DISTRIBUTION SECTION, U.S. GEOLOGICAL SURVEY, 1200 S. EADS STREET, ARLINGTON, VA. 22202, or from the DENVER DISTRIBUTION SECTION, U.S. GEOLOGICAL SURVEY, FEDERAL CENTER, DENVER, COLO. 80225. Remittances should be made by check or money order payable to the Geological Survey. A discount of 20 percent is allowed on orders of \$20 or more, and 40 percent on orders of \$100 or more, based on the retail price. Maps, charts, bulletins, professional papers, and water-supply papers, that are available, may be purchased over the counter only at the following GEOLOGICAL SURVEY offices: 8102 Federal Office Bldg., SALT LAKE CITY, Room 678 U.S. Court House Bldg., SPOKANE, WASH., and 1012 Federal Bldg., DENVER, COLO.

References to geologic information on Montana may be obtained from the following Geological Survey publications: Geologic Map Index of Montana, described herein, from Bibliographies of North American geology - Bulletins *746 (1785-1918), *747 (1785-1918), 823 (1919-1928) \$3, 937 (1929-1939) \$4.25, *1049 (1940-1949), *985 (1950), *1025 (1951), 1035 (1952-1953) \$2, 1054 (1954) \$1.50, *1065 (1955), *1075 (1956), *1095 (1957), *1115 (1958), *1145 (1959), *1195 (1950-1959) set of 4 volumes, 1196 (1960) \$2.25, *1197 (1961), *1232 (1962), 1233 (1963) \$3.25, *1234 (1964), 1235 (1965) \$4.75, 1266 (1966) \$4.75, 1267 (1967) \$4.25, and 1268 (1968) \$5.25. Bibliographies and indexes of publications relating to ground water are Water-Supply Papers *992 (1879-1945), *1492 (1946-1955), 1863 (1963) 55c, and 1864 (1964) \$1. A water resources investigations folder, available free upon request to the Geological Survey, Washington, D.C. 20242, shows the location of stream-gaging stations, observation wells, quality-of-water sample collection sites, areal hydrologic studies, average annual runoff, average discharge of principal streams, and availability of ground

water. A brief text lists the hydrologic network, the areal and Statewide projects, and selected references. Additional information is obtainable from Associate Director and State Geologist, Montana Bureau of Mines and Geology, Montana College of Mineral Science and Technology, Butte, Mont. 59701.

Information on altitudes in the United States is contained in Bulletins *5, *76, *160, *274, *689, *817, and 1212 (\$1.75); information on boundaries and areas of the United States, with historical outlines of boundary changes, is contained in Bulletins *13, *171, *226, *302, *689, *817, and 1212 (\$1.75); information on results of primary triangulation and primary traverse from 1894 to 1918, is contained in Bulletins *122, *181, *201, *216, *245, *276, *310, *440, *551, *644, *709, and Parts *1 of the *18th, *19th, *20th, and *21st Annual Reports. Further information on more recent triangulation, transit traverse, and spirit leveling in Montana is obtainable upon specific request.

Current publications are announced by means of monthly notices, "New Publications of the Geological Survey." Free on application to the Geological Survey, Washington, D.C. 20242.

ANNUAL REPORTS

- *Twelfth, 1890-91. 1801. Part 1 contains: The eruptive rocks of Electric Peak and Sepulchre Mountain, Yellowstone National Park, by J. P. Iddings. p. 569-664.
- *Eighteenth, 1896-97. 1897. Part 3 (1898) contains: Geology and mineral resources of the Judith Mountains of Montana, by W. H. Weed and L. V. Pirsson. p. 437-616.
- *Nineteenth, 1897-98. 1898. Part 5 (1899) contains: Bitterroot Forest Reserve, by J. B. Leiberg. p. 253-282.
- *Twentieth, 1898-99. 1899. Part 3 (1900) contains: Geology of the Little Belt Mountains, Mont., with notes on the mineral deposits of the Neihart, Barker, Yogo, and other districts, by W. H. Weed, accompanied by a report on the petrography of the igneous rocks of the district, by L. V. Pirsson. p. 257-581. Part 5 (1900) contains: Flathead Forest Reserve, by H. B. Ayres. p. 245-316; Bitterroot Forest Reserve, by J. B. Leiberg. p. 317-410.
- *Twenty-first, 1899-1900. 1900. Part 2 contains: Mineral-vein formation at Boulder Hot Springs, Mont., by W. H. Weed. p. 227-255. Part 5 contains: Lewis and Clarke Forest Reserve, Mont., by H. B. Ayres. p. 27-80.
- *Twenty-second, 1900-1901. 1901. Part 2 contains: Geology and ore deposits of the Elkhorn mining district, Jefferson County, Mont., by W. H. Weed, with an appendix on the microscopical petrography of the district, by Joseph Barell. p. 399-550. Part 3 (1902) contains: Coal fields of the United States, by C. W. Hayes. p. 7-24; and Rocky Mountain coal fields, by L. S. Storrs. p. 415-471.

(Beginning with the twenty-third (1901-2), the annual reports of the Geological Survey contain no technical papers but were published separately until 1933. Since 1933 a condensed form has been included in the annual report of the Secretary of the Interior. For the fiscal years 1936 to 1963, a limited number of copies of the report as it appeared in the annual report of the Secretary were reprinted separately for official use; copies of these may be had free by persons directly interested, insofar as they are in stock.)

MINERAL RESOURCES OF THE UNITED STATES

The annual volumes of Mineral Resources of the United States contain statistics of production by calendar years and matters relating to technology and resources. Some of the chapters deal with a particular mineral or group of

BULLETINS--Continued

- p. 316-328; Coal discovered in a reconnaissance survey between Musselshell and Judith, Mont., by C. F. Bowen. p. 329-337; The Cleveland coal field, Blaine County, Mont., by C. F. Bowen. p. 338-355; The Big Sandy coal field, Chouteau County, Mont., by C. F. Bowen. p. 356-378; Analyses of coal samples from various fields of the United States, by M. R. Campbell. p. 491-526.
- *574. The mining district of the Dillon quadrangle, Montana, and adjacent areas, by A. N. Winchell. 1914. 191 p.
- *580. Contributions to economic geology, 1913--Part 1. 1915. Contains: The Elliston phosphate field, Montana, by R. W. Stone and C. A. Bonine. p. 373-383.
- *585. Useful minerals of the United States, compiled by Samuel Sanford and R. W. Stone. 1914. 250 p. (See also Bulletin 624.)
- *599. Our mineral reserves--How to make American industrially independent, by G. O. Smith. 1914. 48 p.
- *600. The Glacier National Park--A popular guide to its geology and scenery, by M. R. Campbell. 1914. 54 p.
- *611. Guidebook of the western United States--Part A, The Northern Pacific Route, with a side trip to Yellowstone Park, by M. R. Campbell and others. 1915. 218 p.
- *612. Guidebook of the western United States--Part B, The Overland Route, with a side trip to Yellowstone Park, by W. T. Lee, R. W. Stone, H. S. Gale, and others. 1915. 244 p.
- *620. Contributions to economic geology, 1915--Part 1. 1916. Contains: Potash in certain copper and gold ores, by B. S. Butler, with a note on muscovite, by George Steiger. p. 227-236.
- *621. Contributions to economic geology, 1915--Part 2. 1916. Contains: Possibilities of oil in the Porcupine dome, Rosebud County, Mont., by C. F. Bowen. p. 61-70; Geology and coal resources of northern Teton County, Mont., by Eugene Stebinger. p. 117-156; Analyses of coal samples from various parts of the United States, by M. R. Campbell and F. R. Clark. p. 251-375.
- *623. Petroleum withdrawals and restorations affecting the public domain, by M. W. Ball. 1916. 427 p.
- *624. Useful minerals of the United States, compiled by F. C. Schrader, R. W. Stone, and Samuel Sanford. 1916. 412 p.
- *625. The enrichment of ore deposits, by W. H. Emmons. 1917. 530 p.
- *640. Contributions to economic geology, 1916--Part 1. 1917. Contains: The Garrison and Philipsburg phosphate fields, Montana, by J. T. Pardee. p. 195-228.
- 641. Contributions to economic geology, 1916--Part 2. 1917. Contains: Possibilities of oil and gas in north-central Montana by Eugene Stebinger. p. 49-91; Geology of the upper Stillwater Basin, Stillwater and Carbon Counties, Mont., with special reference to coal and oil, by W. R. Calvert. p. 199-214; Geology of the Hound Creek district of the Great Falls coal field, Cascade County, Mont., by V. H. Barnett. p. 215-231; Anticlines in the Blackfeet Indian Reservation, Mont., by Eugene Stebinger. p. 281-305.
- *647. The Bull Mountain coal field, Musselshell and Yellowstone Counties, Mont., by L. H. Woolsey, R. W. Richards, and C. T. Lupton. 1917. 218 p.
- *652. Tungsten minerals and deposits, by F. L. Hess. 1917. 85 p. (See Map MR-25.)
- *660. Contributions to economic geology, 1917--Part 1. 1918. Contains: Ore deposits of the northwestern part of the Garnet Range, Mont., by J. T.

BULLETINS--Continued

- *395. Radioactivity of the thermal waters of Yellowstone National Park, by Herman Schlund and R. B. Moore. 1909. 35 p.
- *427. Manganese deposits of the United States, by E. C. Harder. 1910. 298 p. (See Map MR-23.)
- *430. Contributions to economic geology, 1909--Part 1. 1910. Contains Notes on the mineral deposits of the Bearpaw Mountains, Mont., by L. J. Pepperberg. p. 135-146.
- *431. Contributions to economic geology, 1909--Part 2. 1911. Contains: The eastern part of the Bull Mountain coal field, Montana, by C. T. Lupton. p. 163-189.
- *470. Contributions to economic geology, 1910--Part 1. Contains: Phosphates in Montana, by H. S. Gale. p. 440-451; Gold-bearing ground moraine in Northwestern Montana, by F. C. Schrader. p. 62-74; Geologic relation of ore deposits in the Elkhorn Mountains, Mont., by R. W. Stone. p. 75-98; Rock phosphate near Melrose, Mont., by H. S. Gale. p. 440-451; Graphite near Dillon, Mont., by A. N. Winchell. p. 528-532.
- *471. Contributions to economic geology, 1910--Part 2. 1912. Contains: Geology of certain lignite fields in eastern Montana, by W. R. Calvert. p. 187-210; The Baker lignite field, Custer County, Mont., by C. F. Bowen. p. 202-226; The Terry lignite field, Custer County, Mont., by F. A. Herald. p. 227-270; The Glendive Lignite field, Dawson County, Mont., by J. H. Hance. p. 271-283; The Sidney lignite field, Dawson County, Mont., by Eugene Stebinger. p. 284-318; The Culbertson lignite field. Valley County. Mont., by A. L. Beekly. p. 319-358; The southern extension of the Milk River coal field. Chouteau County, Mont., by L. J. Pepperberg. p. 359-383; The Livingston and Trail Creek coal fields, Park, Gallatin, and Sweetgrass Counties, Mont., by W. R. Calvert. p. 384-405; The Electric coal field, Park County, Mont., by W. R. Calvert. p. 406-422; Miscellaneous analyses of coal samples from various fields of the United States. p. 629-655.
- *482. Results of spirit leveling in Montana, 1896 to 1910, inclusive. 1911. 154 p.
- *507. The mining districts of the Western United States, by J. M. Hill. 1912. 309 p.
- *522. Portland cement materials and industry in the United States, by E. C. Eckel, with contributions by E. F. Burchard and others. 1913. 401 p.
- *527. Ore deposits of the Helena mining region, Montana, by Adolph Knopf. 1913. 143 p.
- *529. The enrichment of sulphide ores, by W. H. Emmons. 1913. 260 p. (See also Bulletin 625.)
- *530. Contributions to economic geology, 1911--Part 1. 1913. Contains: Some further discoveries of rock phosphate in Montana, by J. T. Pardee. p. 285-291.
- *531. Contributions to economic geology, 1911--Part 2. 1913. Contains: The Little Sheep Mountain coal field, Dawson, Custer and Rosebud Counties, Mont., by G. S. Rogers. p. 159-227; Coal in the Tertiary lake beds of southwestern Montana, by J. T. Pardee. p. 229-244; Miscellaneous analyses of coal samples from various fields in the United States. p. 331-355.
- *540. Contributions to economic geology, 1912--Part 1. 1914. Contains: Economic geology of the region around Mullan, Idaho, and Saltese, Mont., by G. C. Calkins and E. J. Jones, Jr. p. 167-211; Titaniferous magnetite beds on the Blackfoot Indian Reservation, Mont., by Eugene Stebinger. p. 329-337; Clay in northeastern Montana, by C. M. Bauer. p. 369-372; Niter near Melrose, Mont., by R. W. Richards. p. 470-473.
- *541. Contributions to economic geology, 1912--Part 2. 1914. Contains: Lignite in the vicinity of Plentywood and Scobey, Sheridan County, Mont., by C. M. Bauer. p. 293-315; Geology and coal resources of the area southwest of Custer, Yellowstone, and Bighorn Counties, Mont., by G. S. Rogers.

MINERAL RESOURCES OF THE UNITED STATES--Continued

minerals but much of the information is statistical. These volumes are not listed. The volumes of Mineral Resources were issued by the Geological Survey for the years 1882 to 1923. Reports for 1924 and subsequent years are published by the Bureau of Mines, Washington, D.C. 20240, as Minerals Yearbooks.

MONOGRAPHS

- *32. Geology of the Yellowstone National Park--Part 2, Descriptive geology, petrology, and paleontology, by Arnold Hague and others. 1899. 893 p. Atlas of 27 sheets folio. (Part 1, General Geology, not published.)
- *35. The later extinct floras of North America, by J. S. Newberry. 1898. 295 p.
- *44. Pseudoceratites of the Cretaceous, by Alpeus Hyatt, edited by T. W. Stanton. 1903. 351 p.
- *48. Status of the Mesozoic floras of the United States, by L. F. Ward and others. 1905. In two parts. Part 1, 616 p.; part 2, 119 pls.
- *49. The Ceratopsia, by J. B. Hatcher. 1907. 300 p.
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 108. Distribution of niobium in three contrasting comagmatic series of igneous rocks, by David Gottfried, Lillie Jenkins, and F. S. Grimaldi. p. B259.
 126. Insoluble residues and Ca:Mg ratios in the Madison group, Livingston, Mont., by A. E. Roberts. p. B294.
 127. Manganese oxide minerals at Phillipsburg, Mont., by W. C. Prinz. p. B296.
- *424-C. Short papers in the geologic and hydrologic sciences, Articles 147-292. 1961. p. C1-C398. Contains the following articles, which are not available separately.
211. Cobern Mountain overthrust, Lewis and Clark County, Mont., by R. G. Schmidt and Peter Zubovic. p. C175.
 246. Aftershock-energy release versus tidal effects, Hebgen Lake earthquake, Montana, by R. B. Hofmann. p. C267.
 252. X-ray determinative curve for some natural plagioclases of composition An₆₀₋₈₅ by E. D. Jackson. p. C286.
 253. Boron in bentonite and shale from the Pierre shale, South Dakota, Wyoming, and Montana, by H. A. Tourtelot, L. G. Schultz, and Claude Huffman, Jr. p. C288.
 269. Field measurements of silica in water from hot springs and geysers in Yellowstone National Park, by G. W. Morey, R. O. Fournier, J. J. Hemley, and J. J. Rowe. p. C333.
- 424-D. Short papers in the geologic and hydrologic sciences, Articles 293-435. 1961. p. D1-D408. \$2.75. Contains the following articles, which are not available separately.
346. Deformation of the epicentral area, Hebgen Lake, Mont., earthquake of August 17, 1959, dual-basin concept, by I. J. Witkind. p. D161.
 347. Deformation accompanying Hebgen Lake Mont., earthquake of August 17, 1959, single-basin concept, by W. B. Myers and Warren Hamilton. p. D168.
 352. Stratigraphy of lower and middle parts of the Pierre shale, northern Great Plains, by J. R. Gill and W. A. Cobban. p. D185.
 382. Stratigraphic significance of the Cretaceous fern *Tempskya* in the western conterminous United States, by C. B. Read and S. R. Ash. p. D250.
 406. Geographic distribution of major constituents in stream waters of the western conterminous United States, by C. E. Robertson. p. D334.
- *426. Data on uranium and radium in ground water in the United States, 1954 to 1957, by R. C. Scott and F. B. Barker. 1962. 115 p.
- *428. Geology and mineral deposits of the Jefferson City quadrangle, Jefferson and Lewis and Clark Counties, Mont., by G. E. Becraft, D. M. Pinckney, and Sam Rosenblum. 1963 (1964). 101 p.

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- *435. The Hebgen Lake, Mont., earthquake of August 17, 1959. 1964. 242 p.
- *450-A. Geological Survey Research 1962, Synopsis of geologic, hydrologic, and topographic results. 1962. p. A1-A257.
- *450-B. Short papers in geology, hydrology, and topography, Articles 1-59. 1962. p. B1-B145. Contains the following articles, which are not available separately.
3. Possible detachment faults in the Teepee Creek quadrangle, Gallatin County, Mont., by I. J. Witkind. p. B6.
 8. Red Bird Silty Member of the Pierre Shale, a new stratigraphic unit, by J. R. Gill and W. A. Cobban. p. B21.
 10. Volcanic rocks of Oligocene age in the southern part of the Madison Range, Montana and Idaho, by Warren Hamilton and E. B. Leopold. p. B26.
 12. Origin of spherulitic phosphate nodules in basal Colorado Shale, Bearpaw Mountains, Mont., by W. T. Pecora, B. C. Hearn, Jr., and Charles Milton. p. B30.
 22. Recent discoveries of the Cretaceous ammonite *Haresiceras* and their stratigraphic significance, by W. A. Cobban. p. B58.
- *450-C. Short papers in geology and hydrology, Articles 60-119. 1962. p. C1-C146. Contains the following articles, which are not available separately.
84. Zinc in magnetite from alluvium and from igneous rocks associated with ore deposits, by P. K. Theobald, Jr., and C. E. Thompson. p. C72.
 85. Metal content of some black shales of Western Conterminous United States—Part 2, by D. F. Davidson and H. W. Lakin. p. C74.
- *450-D. Short papers in geology hydrology, and topography, Articles 120-179. 1962. p. D1-D195. Contains the following article, which is not available separately.
161. Late Cretaceous *Desmoscaphites* Range Zone in the western interior region, by W. A. Cobban. p. D140.
- *450-E. Short papers in geology, hydrology, and topography, Articles 180-239. 1963. p. E1-E189. Contains the following article, which is not available separately.
182. Landslides near Gardiner, Mont., by H. A. Waldron and H. J. Hyden. p. E11.
- 454-I. The Late Cretaceous cephalopod *Haresiceras* Reeside and its possible origin, by W. A. Cobban. 1964. p. I1-I19. 35c.
- *455-A-F. Geology of uranium-bearing veins in the conterminous United States. 1963 (1964). 120 p. Includes the following chapters.
- A. Introduction to the geology of uranium-bearing veins in the conterminous United States, including sections on geographic distribution and classification of veins, by G. W. Walker and F. W. Osterwald. p. 1-28.
 - B. Age of uranium-bearing veins in the conterminous United States, by G. W. Walker. p. 29-35.
 - C. Host rocks and their alterations as related to uranium-bearing veins in the conterminous United States, by G. W. Walker. p. 37-53.
 - D. Mineralogy, internal structural and textural characteristics, and paragneeses of uranium-bearing veins in the conterminous United States, by G. W. Walker and J. W. Adams. p. 55-90.
 - E. Supergene alteration of uranium-bearing veins in the conterminous United States, by G. W. Walker. p. 91-103.
 - F. Concepts of origin of uranium-bearing veins in the conterminous United States, by G. W. Walker and F. W. Osterwald. p. 105-120.

PROFESSIONAL PAPERS--Continued

- *455-G. Structural control of uranium-bearing vein deposits and districts in the conterminous United States, by F. W. Osterwald. 1965. p. 121-146. (Includes title page and contents for volume.)
- *463. Uranium-bearing lignite and carbonaceous shale in the southwestern part of the Williston basin, a regional study, by N. M. Denson and J. R. Gill, with a section on Heavy minerals in Cretaceous and Tertiary rocks associated with uranium occurrences, by W. A. Chisholm. 1965. 75 p.
- 474-A. Uranium in carbonate rocks, by K. G. Bell. 1963. p. A1-A29. 30c.
- *475-A. Geological Survey Research 1963, Summary of investigations. 1963. p. A1-A300.
- *475-B. Short papers in geology and hydrology, Articles 1-59. 1963. p. B1-B219. Contains the following articles, which are not available separately.
2. Thortveitite associated with fluorite, Ravalli County, Mont., by R. L. Parker and R. G. Havens. p. B10.
 22. The Livingston Group of south-central Montana, by A. E. Roberts. p. B86.
 23. Age of certain post-Madison rocks in southwestern Montana and western Wyoming, by J. T. Dutro, Jr., and W. J. Sando. p. B93.
 32. Paleogeology of the Permian Phosphoria Formation and related rocks, by E. L. Yochelson. p. B123.
- 475-C. Short papers in geology and hydrology, Articles 60-121. 1963. p. C1-C233. \$2. Contains the following articles, which are not available separately.
64. Dark shale unit of Devonian and Mississippian age in northern Wyoming and southern Montana, by C. A. Sandburg. p. C17.
 80. Petrology of rhyolite and basalt, northwestern Yellowstone Plateau, by Warren Hamilton. p. C78.
- *475-D. Short papers in geology and hydrology, Articles 122-172. 1964. p. D1-D223. Contains the following articles, which are not available separately.
135. Cadmium in samples of the Pierre Shale and some equivalent stratigraphic units, Great Plains region, by H. A. Tourtelot, Claude Huffman, Jr., and L. F. Rader. p. D73.
 141. Age of rocks from the Williston basin of North Dakota and adjacent areas, by Z. E. Peterman and C. E. Hedge. p. D100.
- *491-A. Introduction, spread, and extent of saltcedar *Tamarix* in the Western States, by T. W. Robinson. 1965. p. A1-A12.
- *492. Thermal springs of the United States and other countries of the world—A summary, by G. A. Waring, revised by R. R. Blankenship and Ray Bentall. 1965. 383 p.
- *501-A. Geological Survey Research 1964. 1964. p.,A1-A367.
- *501-C. Geological Survey Research 1964. 1964. p. C1-C197. Contains the following articles, which are not available separately.
- Strike-slip faulting and broken basin-ranges in east-central Idaho and adjacent Montana, by E. T. Ruppel. p. C14.
- Occurrence and paleogeographic significance of the Maywood Formation of Late Devonian age in the Gallatin Range, southwestern Montana, C. A. Sandberg and W. J. McMannis. p. C50.
- *501-D. Geological Survey Research 1964. 1964 (1965). p. D1-D209. Contains the following article, which is not available separately.
- Variation in modes and norms of an "homogeneous" pluton on the Boulder batholith, Montana, by R. I. Tilling. p. D8.
- *503-E. Revision of some Paleozoic coral species from the Western United States, by W. J. Sando. 1965. p. E1-E38.

GEOPHYSICAL INVESTIGATIONS MAPS--Continued

- GP-383. Chinook quadrangle, Blaine County, Mont., by R. W. Johnson, Jr., E. R. King, and D. R. Hawkins. 1963. Lat 48° 30' to 48° 45', long 109° to 109° 15'.
- GP-384. Part of the Lloyd quadrangle, Blaine and Hill Counties, Mont., by R. W. Johnson, Jr., E. R. King, and F. A. Petrafeso. 1963. Lat 48° 15' to 48° 30', long 109° 15' to 109° 30'.
- GP-385. Part of the Cleveland quadrangle, Blaine County, Mont., by R. W. Johnson, Jr., E. R. King, and E. E. Page. 1963. Lat 48° 15' to 48° 30', long 109° to 109° 15'.
- GP-439. Bouguer gravity, aeromagnetic, and generalized geologic map of Townsend and Duck Creek Pass quadrangles, Broadwater County, Mont., by W. T. Kinoshita, W. E. Davis, H. W. Smedes, and W. H. Nelson. 1964. Lat 46° 15' to 46° 40', long 111° 15' to 111° 45'. Scale 1:62,500. \$1 per set.
- GP-444. Bouguer gravity, aeromagnetic, and generalized geologic map of East Helena and Canyon Ferry quadrangles and part of the Diamond City quadrangle, Lewis and Clark, Broadwater, and Jefferson Counties, Mont., by W. E. Davis, W. T. Kinoshita, and H. W. Smedes. 1963. Sheet 1, lat 46° 30' to 46° 45', long 111° 21' to 112°. Scale 1:62,500. Sheet 2, Overlay showing aeromagnetic data. Accompanied by 6-page text. \$1 per set.
- GP-496. Aeromagnetic, Bouguer gravity, and generalized geologic map of Toston and Radersburg quadrangles and part of the Devils Fence quadrangle, Gallatin, Broadwater and Jefferson Counties, Mont., by W. T. Kinoshita, W. E. Davis, and G. D. Robinson. 1965. Lat 46° to 46° 15', long 111° 15' to 112°. Sheet 1, gravity and geologic map. Scale 1:62,500. Sheet 2, aeromagnetic map. Scale 1:62,500. Accompanied by 6-page text. \$1 per set.
- GP-497. Bouguer gravity, aeromagnetic, and generalized geologic map of the western part of the Three Forks Basin, Jefferson, Broadwater, Madison, and Gallatin Counties, Mont., by W. E. Davis, W. T. Kinoshita, and G. D. Robinson. 1965. Lat 45° 30' to 46°, long 111° 30' to 111° 30' to 111° 55'. Sheet 1, gravity and geologic map. Scale 1:62,500. Sheet 2, aeromagnetic map. Scale 1:62,500. Accompanied by 5-page text. \$1 per set.
- GP-498. Bouguer gravity, aeromagnetic, and generalized geologic map of the eastern part of the Three Forks Basin, Broadwater, Madison, and Gallatin Counties, Mont., by W. E. Davis, W. T. Kinoshita, and G. D. Robinson. 1965. Sheet 1, gravity and geologic map; lat 45° 30' to 46°, long 110° 55' to 111° 30'. Sheet 2, aeromagnetic map (transparent overlay); lat about 45° 40' to 46°, long 110° 55' to 111° 30'. Scale 1:62,500. Accompanied by 5-page text. \$1 per set.
- GP-538. Aeromagnetic map of the Boulder batholith area, southwestern Montana, by R. W. Johnson, Jr., J. R. Henderson, and N. S. Tyson. 1965. Lat 45° 30' to 46° 45', long 111° 15' to 113° 30'. Scale 1:250,000 50c.
- GP-682. Aeromagnetic map of the Libby and Mt. Pend Oreille quadrangles, Lincoln and Sanders Counties, Mont., and Bonner County, Idaho. 1969. Lat 48° to 48° 30', long 115° 30' to 116°. Scale 1:62,500. 50c.
- GP-683. Aeromagnetic map of the Thompson Lakes quadrangle, Lincoln, Sanders, and Flathead Counties, Mont. 1969. Lat 48° to 48° 30', long 115° to 115° 30'. Scale 1:62,500. 50c.
- GP-684. Aeromagnetic map of the McGregor Lake-Tally Lake area, Flathead and Lincoln Counties, Mont. 1969. Lat 48° to 48° 30', long 114° 30' to 115°. Scale 1:62,500. 50c.

BULLETINS--Continued

- *795. Contributions to economic geology, 1927--Part 1. 1928. Contains: Phosphate rock in the Three Forks-Yellowstone Park region, Montana, by D. D. Condit and others. p. 147-209.
- *805. Contributions to economic geology, 1928--Part 1. 1929. Contains: Deposits of vermiculite and other minerals in the Rainy Creek district, near Libby Mont., by J. T. Pardee and E. S. Larsen. p. 17-29.
- *806. Contributions to economic geology, 1928--Part 2. Contains: The northward extension of the Sheridan coal field, Bighorn and Rosebud Counties, Mont., by A. A. Baker. p. 15-67; Thrust faulting and oil possibilities in the plains adjacent to the Highwood Mountains, Mont., by Frank Reeves. p. 155-195.
- *811. Contributions to economic geology, 1929--Part 1. 1930. Contains: The New World or Cooke City mining district, Park County, Mont., by T. S. Lovering. p. 1-87.
- *812. Contributions to economic geology, 1929--Part 2. 1930. Contains: The Forsyth coal field, Rosebud, Treasure and Bighorn Counties, Mont., by C. E. Dobbin. p. 1-55; The Kevin-Sunburst oil field and other possibilities of oil and gas in the Sweetgrass arch, Montana, by A. J. Collier. p. 57-189.
- *822. Contributions to economic geology, 1930--Part 2. 1931. Contains: Geology and mineral resources of parts of Carbon, Bighorn, Yellowstone, and Stillwater Counties, Mont., by R. S. Knappen and G. F. Moulton. p. 1-70.
- *831. Contributions to economic geology, 1931-1932--Part 2. 1932. Contains: The Ashland coal field, Rosebud, Powder River, and Custer Counties, Mont., by N. W. Bass. p. 19-105.
- *838. Nitrate deposits of the United States, by G. R. Mansfield and Leona Boardman. 1932. 107 p.
- *842. Metalliferous deposits of the greater Helena mining region, Montana, by J. T. Pardee and F. C. Schrader. 1933. 318 p.
- *847-B. The Rosebud coal field, Rosebud and Custer Counties, Mont., by W. G. Pierce. 1936. p. 43-120.
- *847-C. The Richey-Lambert coal field, Richland and Dawson Counties, Mont., by F. S. Parker. 1936. p. 121-174.
- *847-D. Phosphate rock near Maxville, Philipsburg, and Avon, Mont., by J. T. Pardee. 1936. p. 175-188.
- *847-F. Geology and mineral resources of north-central Chouteau, western Hill, and eastern Liberty Counties, Mont., by W. G. Pierce and C. B. Hunt. 1937. p. 225-270.
- *856. Geology of Bighorn County and the Crow Indian Reservation, Mont., with special reference to the water, coal, oil, and gas resources, by W. T. Thom, Jr., G. M. Hall, C. H. Wegemann, and G. F. Moulton. 1935. 200 p.
- *896. Lexicon of geologic names of the United States (including Alaska), by M. G. Wilmarth. 1938. Part 1, A-L, p. 1-1244; part 2, M-Z, p. 1245-2396. (See Bulletin 1200 and 1350.)
- *905. The coal resources of McCone County, Mont., by A. J. Collier and M. M. Knechtel. 1939. 80 p.
- *906-C. The Mizpah coal field, Custer County, Mont., by F. S. Parker and D. A. Andrews. 1939 (1940). p. 85-133.
- *922-G. Manganese deposits at Philipsburg, Granite County, Mont.--A preliminary report, by E. N. Goddard. 1940. p. 157-204. (See Bulletin 1237.)
- *922-N. Chromite deposits of the eastern part of the Stillwater complex, Stillwater County, Mont., by J. W. Peoples and A. L. Howland. 1940 (1941). p. 371-416.
- *928-C. Adsorbent clays, their distribution, properties, production, and uses, by P. G. Nutting. 1943. p. 127-221.

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- *945-F. Chromite deposits near Red Lodge, Carbon County, Mont., by H. L. James. 1946 (1947). p. 151-189.
- *948-C. Chromite deposits of Boulder River area, Sweet Grass County Mont., by A. L. Howland, E. M. Garrels, and W. R. Jones. 1949. p. 63-82.
- *955-E. Fluorspar prospects of Montana, by C. P. Ross. 1950. p. 173-224.
- *956. Geology and ore deposits of the Libby quadrangle, Montana, by Russell Gibson, with sections on Pleistocene Glaciation, by W. C. Alden and Physiography, by J. T. Pardee. 1948. 131 p.
- *969-B. Corundum deposits of Gallatin and Madison Counties, Mont., by S. E. Clabaugh and F. C. Armstrong. 1950 (1951). p. 29-53.
- *969-C. A geologic reconnaissance of parts of Beaverhead and Madison Counties, Mont., by M. R. Klepper. 1950 (1951). p. 55-85.
- *972. Geology of the Canyon Ferry quadrangle, Montana, by J. B. Mertie, Jr., R. P. Fischer, and S. W. Hobbs. 1951 (1952). 97 p.
- *973-B. The Coalwood coal field, Powder River County, Mont., by R. P. Bryson. 1952. p. 23-106.
- *974-E. The eastern front of the Bitterroot Range, Mont., by C. P. Ross. 1952. p. 135-175.
- *978-C. Gold placer deposits of the Pioneer district. Montana, by J. T. Pardee. 1951 (1952). p. 69-99.
- *983. Corundum deposits of Montana, by S. E. Clabaugh. 1952. 100 p.
- *988-F. Uranium-bearing deposits west of Clancey, Jefferson County, Mont., by W. A. Roberts and A. J. Gude 3d. 1953. p. 121-141.
- *988-G. Geology of the area adjacent to the Free Enterprise mine, Jefferson County, Mont., by W. A. Roberts and A. J. Gude 3d. 1953. p. 143-155.
- *988-H. Uranium and thorium deposits in east-central Idaho and southwestern Montana, by A. F. Trites, Jr. and E. W. Tooker. 1953. p. 157-209.
- *995-E. Strippable coal in Custer and Powder River Counties, Mont. by Andrew Brown, W. C. Culbertson, R. J. Dunham, R. C. Kepferle, and P. R. May. 1954. p. 151-199.
- *995-G. Strippable lignite deposits in the Wibaux area, Montana and North Dakota, by P. R. May. 1954. p. 255-292.
- *995-H. Three deposits of strippable lignite west of the Yellowstone River, Mont., by W. C. Culbertson. 1954. p. 293-332.
- *995-I. Selected deposits of strippable coal in central Rosebud County, Mont., by R. C. Kepferle. 1954. p. 333-381.
- *1009-D. Further studies of the distribution of uranium in rich phosphate beds of the Phosphoria formation, by M. E. Thompson. 1954. p. 107-123.
- *1015-D. Chromite deposits in central part of the Stillwater complex, Sweet Grass County, Mont., by A. L. Howland. 1955. p. 99-121.
- 1019-E. Magnesium resources of the United States—A geologic summary and annotated bibliography to 1953, by R. E. Davis. 1957. p. 373-515. 70c.
- *1021-F. Ordovician and Silurian coral faunas of Western United States, by Helen Duncan. 1956. p. 209-236.
- *1021-L. Geology of the area east and southeast of Livingston, Park County, Mont., by P. W. Richards. 1957. p. 385-438.
- 1021-M. Ordovician fossils from wells in the Williston basin, eastern Montana, by R. J. Ross, Jr. 1957. p. 439-510. 85c.
- *1023. Bentonite deposits in marine Cretaceous formations of the Hardin district, Montana and Wyoming, by M. M. Knechtel and S. H. Patterson, with a section on laboratory procedures used for testing the bentonites, by S. H. Patterson. 1956. 116 p.
1026. Geology of the Bighorn Canyon-Hardin area, Montana and Wyoming, by P. W. Richards. 1955 (1956). 93 p. \$4.

GEOLOGIC QUADRANGLE MAPS--Continued

- GQ-454. Geologic map of the Pretty Prairie quadrangle, Lewis and Clark County, Mont., by M. R. Mudge. 1966. Lat 37° 30' to 47° 37' 30", long 112° 52' 30" to 113°. Scale 1:24,000. \$1.
- GQ-499. Geologic map of the Glenn Creek quadrangle, Lewis and Clark, and Teton Counties, Mont., by M. R. Mudge. 1966. Lat 47° 37' 30" to 47° 45', long 112° 52' 30" to 113°. Scale 1:24,000. \$1.
- GQ-580. Geologic map of the Montauqua quadrangle, Carbon and Stillwater Counties, Mont., by E. D. Patterson. 1966. Lat 45° 30' to 45° 37' 30", long 108° 52' 30" to 109°. Scale 1:24,000. \$1.
- GQ-597. Geologic map of the Arsenic Peak quadrangle, Teton, and Lewis and Clark Counties, Mont., by M. R. Mudge. 1967. Lat 47° 37' 30" to 47° 45', long 112° 45' to 112° 52' 30". Scale 1:24,000. \$1.
- GQ-610. Surficial geologic map of the Sawtooth Ridge quadrangle, Teton and Lewis and Clark Counties, Mont., by M. R. Mudge. 1967. Lat 37° 30' to 37° 37' 30", long 112° 37' 30" to 112° 45'. Scale 1:24,000. \$1.
- GQ-711. Bedrock geologic map of the Castle Reef quadrangle, Teton and Lewis and Clark Counties, Mont., by M. R. Mudge. 1968. Lat 47° 37' 30" to 37° 45', long 112° 37' 30" to 112° 45'. Scale 1:24,000. \$1.
- GQ-729. Geologic map of the Hatfield Mountain quadrangle, Gallatin County, Mont., by Betty Skipp and Mary-Margaret Hepp. 1968. Lat 46° to 46° 07' 30", long 110° 52' 30" to 111°. Scale 1:24,000. \$1.
- GQ-813. Geologic map of the Cameron quadrangle, Madison County, Mont., by J. B. Hadley. 1969. Lat 45° to 45° 15', long 111° 30' to 111° 45'. Scale 1:62,500. \$1.
- GQ-814. Geologic map of the Varney quadrangle, Madison County, Mont., by J. B. Hadley. 1969 (1970). Lat 45° to 45° 15', long 111° 45' to 112°. Scale 1:62,500. \$1.
- GQ-840. Geologic map of the upper Holter Lake quadrangle, Lewis and Clark County, Mont., by G. D. Robinson, M. E. McCallum, and W. H. Hays. 1969 (1970). Lat 46° 45' to 46° 52' 30", long 111° 52' 30" to 112°. Scale 1:24,000. \$1.
- GQ-898. Geologic map of the Barker quadrangle, Judith Basin and Cascade Counties, Mont., by I. J. Witkind. 1971. Lat 47° to 47° 15', long 110° 30' to 110° 45'. Scale 1:62,500 (1 inch = about 1 mile). Sheet 29 by 40 inches. \$1.

GEOPHYSICAL INVESTIGATIONS MAPS

- Aeromagnetic maps printed at the scale of 1:31,680, 50c each, except as indicated.
- GP-150. Laredo quadrangle, Bearpaw Mountains, Mont., by J. R. Balsley, Jr., F. P. Gilbert, G. B. Mangan, and others. 1957. Lat 48° 15' to 48° 30', long 109° 45' to 110°.
- GP-151. Shambo quadrangle, Bearpaw Mountains, Mont., by J. R. Balsley, Jr., F. P. Gilbert, G. B. Mangan, and others. 1957. Lat 48° 15' to 48° 30', long 109° 30' to 109° 45'.
- GP-152. Part of the Centennial Mountain quadrangle, Bearpaw Mountains, Mont., by J. R. Balsley, Jr., F. P. Gilbert, G. B. Mangan, and others. 1957. Lat 48° to 48° 15', long 109° 45' to 110°.
- GP-153. Part of the Warrick quadrangle, Bearpaw Mountains, Mont., by J. R. Balsley, Jr., F. P. Gilbert, G. B. Mangan, and others. 1957. Lat 48° to 48° 15', long 109° 30' to 109° 45'.
- GP-382. Yantic quadrangle, Blaine and Hill Counties, Mont., by R. W. Johnson, Jr., E. R. King and C. L. Long. Lat 48° 30' to 48° 45', long 109° 15' to 109° 30'.

COAL INVESTIGATIONS MAPS--Continued

C-24. Geology of the northern part of the Girard coal field, Richland County, Mont., by G. E. Prichard and E. R. Landis. 1955. Scale 1:48,000. 2 sheets. 75c per set.

C-33. Uraniferous coal beds in parts of North Dakota, South Dakota, and Montana, by N. M. Denson and others. 1955. Scales 1:31,680 and 1:63,360. 50c.

*CORRELATION CHART OF MONTANA. Tentative correlation of the named geologic units, by M. G. Wilmarth. 1932.

CUT BANK-WEST KEVIN BORDER DISTRICTS. Preliminary structure contour map of the Cut Bank-West Kevin border districts, Glacier, Toole, and Pondera Counties, Mont., by C. E. Erdmann, N. A. Davis, William Beer, and J. W. Nordquist. 1946. Scale 1:126,720. 25c.

*DUNKIRK-CHESTER REGION. Structure-contour map of the Dunkirk-Chester region, Toole and Liberty Counties, Mont., by C. E. Erdmann. 1939.

*ELK BASIN OIL AND GAS FIELD AND VICINITY, PARK COUNTY, WYO., AND CARBON COUNTY, MONT. Geologic and structure map, by C. E. Dobbin, W. B. Kramer, J. C. Miller, and Harvey French. 1945. Scale 1:31,680.

GEOLOGIC MAP INDEX OF MONTANA. 1956 reprint of revised 1955 edition by Leona Boardman revised by A. N. Bove (scale 1:750,000) and Geologic map index of Montana, 1955-67, a 1969 supplement by W. L. McIntosh and I. M. Morgan (scale 1:1,000,000). 75c per set.

GEOLOGIC MAP OF MONTANA, compiled by C. P. Ross, D. A. Andrews, and I. J. Witkind. 1955. Color patterns show the distribution and extent of about 75 different rock units ranging from highly metamorphosed schist and gneiss of Precambrian age to Recent alluvial deposits of sand and gravel. Scale 1:500,000. 2 sheets. \$3.50 per set.

GEOLOGIC QUADRANGLE MAPS

GQ-29. Eagleton, Mont. Geology, by R. M. Lindvall. 1953 (1954). Lat 47° 45' to 48°, long 109° 45' to 110°. Scale 1:62,500. \$1.

GQ-67. Wolf Point, Mont. Geology, by R. B. Colton. 1955. Lat 48° to 48° 15', long 105° 30' to 105° 45'. Scale 1:62,500. \$1.

GQ-135. Vaughn, Mont. Geology, by E. K. Maughan. 1961. Lat 47° 30' to 47° 45', long 111° 30' to 111° 45'. Scale 1:62,500. \$1.

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	*761			*932		1949	1145	1.25		1439	1.50
	*767		1942	*955			1146	1.75		1446	1.25
1935	*785			*956			1152	1.00	1957	1508	2.00
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	*792		1943	*975			1176	2.25		1516	1.00
1936	*805			*976			*1182		1958	1558	2.00
	*806			*982		1951	*1208			1559	1.50
	*812		1944	*1005			1209	1.50		1566	1.25
1937	*825			*1006			1216	1.00	1959	1628	1.75
	*826			*1012		1952	1238	1.75		1629	1.50
	*832		1945	*1035			*1239			1636	1.50
1938	*855			*1036			1246	1.25	1960	1708	2.00
	*856			*1042		1953	*1278			1709	1.50
	*862		1946	*1055			*1279			*1716	
1939	*875			*1056			*1286		1961-65	1916	3.75
	*876			*1062		1954	*1338			1917	3.00
	*882		1947	*1085			*1339			1933	3.50
1940	*895			1086	\$1.75		*1346				
	*896			1092	.75	1955	1388	1.75			
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- *93. Ground-water resources of the lower Yellowstone River valley between Miles City and Glendive, Mont., by A. E. Torrey and F. A. Swenson, with a section on The Chemical quality of the water, by H. A. Swenson. 1951. 72 p.
- *97. A preliminary report on the electrical resistivity survey at Medicine Lake, Mont., by G. J. Edwards. 1951. 16 p.

WATER-SUPPLY PAPERS--Continued

1862. Geology and ground-water resources of the Deer Lodge Valley, Mont., by R. L. Konizeski, R. G. McMurtrey, and Alex Brietkrietz, with a section on Gravimetric survey, by E. A. Cremer, III. 1968 (1969). 55 p. \$1.25.
1871. Water data for metropolitan areas, compiled by W. J. Schneider. 1968. 397 p. \$1.50.
1876. Geology and ground-water resources of the lower Bighorn Valley, Mont., by L. J. Hamilton and Q. E. Paulson. 1968. 39 p. 65c.
- 1899-L. A preliminary evaluation of bank storage associated with Libby Reservoir in northwestern Montana, by D. L. Coffin. p. L1-L25. 25c.

Annual reports of the Geological Survey containing data of the water resources of the United States.

Year	WSP	Price									
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Information on water levels and artesian pressure in observation wells

1935	*777		1942	*948		1949	*1160		1956-60	1760	\$1.00
1936	*817		1943	*990		1950	1169	\$0.35	1961-65	*1845	
1937	*840		1944	*1020		1951	1195	.55			
1938	*845		1945	*1027		1952	*1225				
1939	*886		1946	*1075		1953	1269	.65			
1940	*910		1947	1100	\$0.45	1954	1325	.60			
1941	*940		1948	1130	.40	1955	1408	.60			

Information on the quality of the surface water
 ("a" indicates data on quality of water for irrigation)

1947	1102	\$1.50	1954(a)	1430	\$0.75	1959	1643	\$1.00	1963	1949	\$1.50
1948	1132	1.50	1955	1401	1.00		*1645			*1951	
1949	1162	2.00	(a)	1465	1.00	(a)	1699	.70	(a)	1952	1.00
1950	1187	1.50	1956	1451	1.25	1960	*1743		1964	1956	2.00
1951	1198	2.00		*1453			*1745			1959	2.00
(a)	*1264		(a)	1485	.75	(a)	1746	1.25	(a)	1960	1.00
1952	1251	1.50	1957	1521	1.25	1961	1883	1.25	1965	1963	2.50
(a)	1362	.75		*1523			1885	2.25		1966	2.00
1953	1291	1.25	(a)	1524	1.00	(a)	1886	1.00	(a)	1967	1.00
(a)	1380	1.00	1958	1572	1.25	1962	1943	1.50			
1954	1351	1.00		1574	1.75		*1945				
	*1353		(a)	1575	1.00	(a)	1946	1.00			

Stream measurements in the years mentioned

1897	*15		1909	*265		1916	*436		1925	*612
1898	*27			*266		1917	*455		1926	*625
	*28			*272			*456			*626
1899	*36		1910	*285			*462			*632
	*37			*286		1918	*475		1927	*645
	*38			*292			*476			*646
1900	*49		1911	*305			*482			*652
	*51			*306		1919-20	*505		1928	*665
1901	*66			*312			*506			*666
1902	*84		1912	*325			*512			*672
	*85			*326		1921	*525		1929	*685
1903	*99			*332			*526			*686
	*100		1913	*355			*532			*692
1904	*130			*356		1922	*545		1930	*700
	*135			*362			*546			*701
1905	*171		1914	*385			*552			*707
	*172			*386		1923	*565		1931	*715
	*178			*392			*566			*716
1906	*207		1915	*405			*572			*722
	*208			*406		1924	*585		1932	*730
	*214			*412			*586			*731
1907-8	*245			*413			*592			*737
	*246		1916	*435		1925	*605		1933	*745
	*252			*436			*606			*746

WATER-SUPPLY PAPERS--Continued

- *560. Contributions to the hydrology of the United States, 1925. Contains: Water power and irrigation in the Madison River basin, Montana, by J. F. Deeds and W. N. White. p. 1-30; Chemical character of ground waters of the northern Great Plains, by H. B. Riffenburg. p. 31-52.
- *580. Contributions to the hydrology of the United States, 1926. 1927. Contains: Water power and irrigation in the Jefferson River basin, Montana, by J. F. Deeds and W. N. White. p. 41-116.
- *599. Ground water in Yellowstone and Treasure Counties, Mont., by G. M. Hall and C. S. Howard. 1929. 118 p.
- *600. Geology and ground-water resources of central and southern Rosebud County, Mont., by B. C. Renick, with Chemical analyses of the waters, by H. B. Riffenburg. 1929. 140 p.
- *657. Water utilization in the Snake River basin, by W. G. Hoyt, with a preface by Herman Stabler. 1935. 379 p.
- *658. The industrial utility of public water supplies in the United States, 1932, by W. D. Collins, W. L. Lamar, and E. W. Lohr. 1934. 135 p. (See Water-Supply 1300.)
- *659. Contributions to the hydrology of the United States, 1932. 1932. Contains: Index of analyses of natural waters in the United States, 1926 to 1931, by W. D. Collins and C. S. Howard. p. 191-209.
- *679-B. Thermal springs in the United States, by N. D. Stearns, H. T. Stearns and G. A. Waring. 1937. p. 59-206. (See Professional Paper 492.)
- *771. Floods in the United States--Magnitude and frequency, by C. S. Jarvis and others. 1936. 497 p.
- *820. Drought of 1936. with discussion on the significance of drought in relation to climate, by J. C. Hoyt. 1938. 62 p.
- *847. Maximum discharges at stream-measurement stations through December 31, 1937, by G. R. Williams and L. C. Crawford, with a supplement including additions and changes through September 30, 1938, by W. S. Eisenlohr, Jr. 1940 (1941). 272 p.
- *849-B. Effect upon ground-water levels of proposed surface-water storage in Flathead Lake, Mont., by R. C. Cady. 1941. p. 59-81.
- *866. Geology of dam sites on the upper tributaries of the Columbia River in Idaho and Montana. Issued only in separate parts, as indicated below:
- *A. Part 1, Katka, tunnel no. 8, and Kootenai Falls dam sites, Kootenai River, Idaho and Montana, by C. E. Erdmann. 1941. p. 1-36.
 - *B. Part 2, Hungry Horse dam and reservoir site, South Fork Flathead River, Flathead County, Mont., by C. E. Erdmann, with a section of Geophysical investigations by B. E. Jones. 1944. p. 37-116.
 - *C. Part 3, Miscellaneous dam sites on the Flathead River upstream from Columbia Falls, Mont., by C. E. Erdmann. 1947. p. 117-219. (Includes title page, contents, and list of illustrations for volume.)
- *916. Summary of records of surface waters of upper Columbia River basin in Montana and Idaho, 1898-1938, by A. H. Tuttle and T. R. Newell. 1943. 216 p.
- *917. Summary of records of surface waters of Missouri and St. Mary River basins in Montana, 1881-1938, by A. H. Tuttle and T. R. Newell. 1943. 593 p.
- *995. Index to river surveys made by the United States Geological Survey and other agencies revised to July 1, 1947, by B. E. Jones and R. O. Helland. 1948. 145 p.
- *1077. Gaging-station records in the Missouri River basin, by B. R. Colby and R. E. Oltman. 1948 (1949). 219 p.
1080. Floods of May-June 1948 in Columbia River basin, with a section on Magnitude and frequency of floods, by S. E. Rantz and H. C. Riggs. 1949. 476 p. \$1.25.

WATER-SUPPLY PAPERS--Continued

- *1137-I. Summary of floods in the United States during 1950. 1954. p. 957-991.
- *1220. Irrigation and streamflow depletion in Columbia River basin above The Dallas, Oreg., by W. D. Simons. 1953 (1954). 126 p.
- *1260-B. Floods of April 1952 in the Missouri River Basin. 1955. p. 49-302.
- *1260-F. Summary of floods in the United States during 1952. 1959. p. 687-713.
- *1263. Geology and ground-water resources of the Missouri River valley in northeastern Montana, by F. A. Swenson, with a section on the quality of the ground water, by W. H. Durum. 1955 (1956). 128 p.
- *1300. The industrial utility of public water supplies in the United States, 1952--Part 2, States west of the Mississippi River, by E. W. Lohr and S. K. Love. 1954. 462 p.
1308. Compilation of records of surface waters of the United States through September 1950--Part 5, Hudson Bay and upper Mississippi River basins. 1959. 708 p. \$3.
- *1309. Compilation of records of surface waters of the United States through September 1950--Part 6-A, Missouri River basin above Sioux City, Iowa. 1959. 672 p.
- *1316. Compilation of records of surface waters of the United States through September 1950--Part 12, Pacific slope basins in Washington and upper Columbia River basin. 1955. 592 p.
- *1320-B. Floods of May-June 1953 in Missouri River basin in Montana. 1957. p. 69-153.
- *1320-E. Summary of floods in the United States during 1953. 1959. p. 341-364.
- *1355. Geology and ground-water resources of the lower Yellowstone River valley, between Glendive and Sidney, Mont., by A. E. Torrey and F. A. Kohout, with a section on Chemical quality of the water, by H. A. Swenson. 1956. 92 p.
- *1360-A. Reservoirs in the United States, by N. O. Thomas and G. E. Harbeck, Jr. 1956. p. 1-99. (Superseded by Water-Supply Paper 1838.)
- *1360-C. Geology and occurrence of ground water in the Townsend Valley, Mont., by H. W. Lorenz and R. G. McMurtrey, with a section on Chemical quality of the ground water, by H. A. Swenson. 1956. p. 171-290.
- *1370-C. Summary of floods in the United States during 1954. 1959. p. 201-263.
- *1374. Preliminary survey of the saline-water resources of the United States, by R. A. Krieger, J. L. Hatchett, and J. L. Poole. 1957. 172 p.
1418. Geology and ground water, Heart Mountain and Chapman Bench Divisions, Shoshone irrigation project, Wyoming, by F. A. Swenson, with a section on Chemical quality of the water, by H. A. Swenson. 1957. 55 p. \$1.
1424. Ground-water factors affecting drainage in the First Division, Buffalo Rapids Irrigation Project, Prairie and Dawson Counties, Mont., by A. E. Moulder and F. A. Kohout, with a section on Chemical quality of the water, by E. R. Jochens. 1958. 198 p. \$2.50.
- 1460-B. Geology and ground-water resources of the Lower Marias irrigation project, Montana, by F. A. Swenson, with a section on Chemical quality of the ground water, by H. A. Swenson. 1957 (1958). p. 41-98. \$1.25.
1473. Study and interpretation of the chemical characteristics of natural water, *second edition*, by J. D. Hem. 1970. 363 p. \$2.25. (Revised.)
- *1475-I. Hydrology of small watersheds in Western States, by H. V. Peterson. 1962. p. 217-356.
- *1482. Geology and ground-water resources of the Gallatin Valley, Gallatin County, Mont., by O. M. Hackett, F. N. Visser, R. G. McMurtrey, and W. L. Steinhilber, with a section on Surface-water resources, by Frank Stermitz and F. C. Boner, and a section on Chemical quality of the water, by R. A. Krieger. 1960. 282 p. \$3.50.

WATER-SUPPLY PAPERS--Continued

- *1487. Geology and ground-water resources of the lower Little Bighorn River Valley, Big Horn County, Mont., with special reference to the drainage of water-logged lands, by E. A. Moulder, M. F. Klung, D. A. Morris, and F. A. Swenson, with a section on Chemical quality of the water, by R. A. Krieger. 1960. 223 p.
- *1496-D. Occurrence and distribution of strontium in natural water, by M. W. Skougstad and C. A. Horr. 1963. p. 55-97.
- *1530. Summary of floods in the United States during 1956. 85 p.
- *1550. Geology of damsites on Flathead River, mouth to Flathead Lake, Lake and Sanders Counties, Mont., by K. S. Soward. 1965 (1966). 91 p.
- *1576-F. Geology and Hydrology of the Fort Belknap Indian Reservation, Mont., by D. C. Alverson. 1965. p. F1-F59.
- *1660-B. Summary of floods in the United States during 1958. 1963. p. B1-B97.
1678. Magnitude and frequency of floods in the United States--Part 5, Hudson Bay and upper Mississippi River basins, by J. L. Patterson and C. R. Gamble. 1968. 546 p. \$2.50.
- *1679. Magnitude and frequency of floods in the United States--Part 6-A, Missouri River basin above Sioux City, Iowa, by J. L. Patterson. 1966. 471 p.
- *1687. Magnitude and frequency of floods in the United States--Part 12, Pacific Slope basins in Washington and upper Columbia River basin, by G. L. Bodhaine and D. M. Thomas. 1964. 337 p.
- *1728. Compilation of records of surface waters of the United States, October 1950 to September 1960--Part 5, Hudson Bay and upper Mississippi River basins. 1964. 269 p.
1729. Compilation of records of surface waters of the United States, October 1950 to September 1960--Part 6-A, Missouri River basin above Sioux City, Iowa. 1964. 507 p. \$2.25.
- *1736. Compilation of records of surface waters of the United States, October 1950 to September 1960--Part 12, Pacific slope basins in Washington and upper Columbia River basin. 1964. 415 p.
1760. Ground-water levels in the United States, 1956-60, Northwestern States. 1963. 222 p. \$1. (See table.)
- *1779-J. Geology and water resources of the Bluewater Springs area, Carbon County, Mont., by E. A. Zimmerman. 1964. p. J1-J24.
- *1800. The role of ground water in the national water situation, by C. L. McGuinness. 1963. 1121 p.
1804. Drought of the 1950's, with special reference to the Midcontinent, by R. L. Nace and E. J. Pluhowski. 1965. 88 p. 70c.
- *1810. Summary of floods in the United States during 1961, by J. O. Rostvedt. 1965. 123 p.
- *1813. Flood peak runoff and associated precipitation in selected drainage basins in the United States, by Tate Dalrymple. 1965. 406 p.
1838. Reservoirs in the United States, by R. O. R. Martin and R. L. Hanson. 1966. 115 p. \$1.
- 1840-B. Floods of June 1964 in northwestern Montana, by F. C. Boner and Frank Stermitz. 1967. p. B1-B242. \$1.50.
- 1840-C. Summary of floods in the United States during 1964, by J. O. Rostvedt and others. 1970. p. C1-C124. 60c.
- *1845. Ground-water levels in the United States, 1961-65--Northwestern States. 1968. 199 p. (See table.)
- *1849. Roughness characteristics of natural channels, by H. H. Barnes, Jr. 1967. 213 p.
- 1850-E. Summary of floods in the United States during 1965, by J. O. Rostvedt and others. p. E1-E110. 60c.

OIL AND GAS INVESTIGATIONS MAPS--Continued

- OM-139. Geology of the Stanford area, Judith Basin and Fergus Counties, Mont., by J. D. Vine and W. D. Johnson, Jr. 1954. Covers an area of about 625 square miles in central Montana. Scale 1:63,360. 50c.
- OM-165. Structure contour map of the base of Mississippian rocks in the Williston basin and adjoining areas of Montana, North Dakota, South Dakota, and Wyoming, R. P. Kunkel. 1954 (1955). Covers eastern Montana, all but the eastern one-third of North Dakota, northwestern and north-central South Dakota, and part of northeastern Wyoming. Scale 1:1,000,000. 50c.
- OM-170. Map of Montana showing oil and gas fields and test wells for oil and gas, by H. R. Smith. 1956. Scale 1:500,000. 2 sheets. \$1 per set.
- OM-178-A. Structure contour map of the Montana Plains, by C. E. Dobbin and C. E. Erdmann. 1955. Scale 1:500,000. 50c.
- *OM-178-B. Structure contour map of the Montana Plains, by C. E. Dobbin and C. E. Erdmann. 1955. Scale 1:1,000,000.
- OM-179. Structure contour map on top of the middle member of the Piper formation of Middle Jurassic age in the Williston basin and adjacent areas in Montana, North Dakota, and South Dakota, by D. T. Sandberg. 1959. Scale 1:760,320. 75c.
- *OM-182. Structure contour map of the Tensleep sandstone in the Bighorn Basin, Wyoming and Montana, by A. D. Zapp. 1956. Scale 1:250,000.
- OM-184. Index map of central midcontinent region giving lines of sections that show detailed lithology Paleozoic and Mesozoic rocks, by Jeannette Fox and M. G. Sheldon. 1957. Scale 1:2,500,000. 50c.
- OM-191. Geologic and structure contour map of the northern and western flanks of the Black Hills, Wyo., Mont., and S. Dak., by W. J. Mapel, C. S. Robinson, and P. K. Theobald. 1959. Scale 1:96,000. 2 sheets. \$1.50 per set.
- OM-199. Geologic map of the Lewistown area, Fergus County, Mont., by L. S. Gardner. 1959. Scale 1:63,360. 75c.
- OM-202. The Bighorn dolomite and correlative formations in southern Montana and northern Wyoming by P. W. Richards and C. L. Nieschmidt. 1961. Scale 1:750,000. 2 sheets. 75c per set.
- OM-211. Geology of the Melstone-Sumatra area in central Montana, by H. R. Smith. 1962. Scale 1:63,360. 75c.
- *PALEOCENE DEPOSITS OF THE ROCKY MOUNTAINS AND PLAINS, by R. W. Brown. 1949. Shows the areas of outcrop of the earliest Tertiary (Paleocene) rocks from Montana and North Dakota south to Arizona and New Mexico. The upper and lower boundaries of the Paleocene deposits and their areal relations with Cretaceous and younger Tertiary rocks are indicated. A brief discussion of paleocene formations is printed on the same sheet. Scale 1:1,000,000. (See Professional Paper 375.)

MISCELLANEOUS REPORTS (free upon application to the Geological Survey Washington, D.C. 20242):

- List 1. Press releases, preliminary maps, and preliminary reports released between Jan. 1, 1938, and Jan. 1, 1945.
- List 2. Press releases, preliminary maps, and preliminary reports released between Jan. 1, 1945, and Jan. 1, 1946.

GEOPHYSICAL INVESTIGATIONS MAPS--Continued

- GP-685. Aeromagnetic map of the Trout Creek quadrangle, Sanders and Lincoln Counties, Mont., and Shoshone County, Idaho. 1969. Lat 47° 30' to 48°, long 115° 30' to 116°. Scale 1:62,500. 50c.
- GP-686. Aeromagnetic map of the Thompson Falls quadrangle, Lincoln and Sanders Counties, Mont. 1969. Lat 47° 30' to 48°, long 115° to 115° 30'. Scale 1:62,500. 50c.
- GP-687. Aeromagnetic map of the Hubbart Reservoir-Hot Springs area, Sanders, Flathead, and Lake Counties, Mont. 1969. Lat 47° 30' to 48°, long about 114° 26' to 115°. Scale 1:62,500. 50c.
- GP-689. Aeromagnetic map of part of the Avery quadrangle, Shoshone County, Idaho, and Mineral and Sanders Counties, Mont. 1969. Lat 47° 07' 30" to 47° 30', long 115° 30' to 116°. Scale 1:62,500. 50c.
690. Aeromagnetic map of the Haugan and St. Regis quadrangles and parts of the Simmons Peak and Illinois Peak quadrangles, Shoshone County, Idaho, and Mineral and Sanders Counties, Mont. 1969. Lat 47° to 47° 30', long 115° to 115° 30'. Scale 1:62,500. 50c.
- GP-691. Aeromagnetic map of the Plains, Perma, Superior, and Tarkio quadrangles, Sanders, Mineral, and Missoula Counties, Mont. 1969. Lat 47° to 47° 30', long 114° 30' to 115°. Scale 1:62,500. 50c.

HYDROLOGIC INVESTIGATIONS ATLASES

- HA-61. Stream composition of the conterminous United States, by F. H. Rainwater. 1962. 3 sheets. \$1.50 per set.
- HA-189. Calcium, sodium, sulfate, and chloride in stream water of the western conterminous United States to 1957, by J. H. Feth. 1965. 4 maps. \$1.50 per set.
- HA-194. Generalized map showing annual runoff and productive aquifers in the conterminous United States, compiled by C. L. McGuinness. 1964. Scale 1:5,000,000. 75c.
- HA-199. Preliminary map of the conterminous United States showing depth to and quality of shallowest ground water containing more than 1,000 parts per million dissolved solids, by J. H. Feth and others. 1965. Scale 1:3,168,000. 2 sheets. Accompanied by 31-page text. \$1.25 per set.
- HA-200. Chemical quality of public water supplies of the United States and Puerto Rico, 1962, shown as Statewide averages, mainly in graphic and tabular form, by C. N. Durfor and Edith Becker. 1964. 50c.
- HA-212. Annual runoff in the conterminous United States, by M. W. Busby. 1966. Scale 1:7,500,000. 75c.
- HA-217. General availability of ground water and depth to water level in the Missouri River basin, by G. A. La Raocque, Jr. 1966. Lat 36° to 49°, long 90° to 114°. Scale 1:2,500,000. 75c.
- HA-224. Availability of ground water from the alluvium along the Missouri River in northeastern Montana, by W. B. Hopkins and J. R. Tilstra. 1966. Area in vicinity of lat 48°, long 105°. Scale 1:96,000. 75c.
- HA-235. Temperature of surface waters in the conterminous United States, by J. F. Blakey. 1966. Scale 1:5,000,000. 3 sheets. Accompanied by 8-page text. \$1.25 per set.
- HA-308. Occurrence of ground water in the Judith River Formation, north-central Montana, by W. R. Osterkamp. 1968. Lat 47° 15' to 48°, long 107° to 109°. Scale 1:250,000. 75c.

*INTERPRETING GEOLOGIC MAPS FOR ENGINEERING PURPOSES. 1953. (1954). Six maps of the Hollidaysburg, Pa., quadrangle. Scale 1:62,500.

KEVIN-SUNBURST OIL FIELD, TOOLE COUNTY, MONT.

- Map 1, by C. E. Erdmann, A. B. Cozzens, J. T. Gist, and J. W. Nordquist. 1964. Scale 1:63,360. 2 sheets. 10c per set.
Map 2, by C. E. Erdmann, J. T. Gist, G. W. Beer, and J. W. Nordquist. 1947. Scale 1:63,360. 2 sheets. 10c per set.
Map 3, by C. E. Erdmann, J. T. Gist, and J. W. Nordquist, 1947. Scale 1:63,360. 2 sheets. 10c per set.

*LAND CLASSIFICATION MAPS NORTHERN GREAT PLAINS, by A. E. Aldous and J. F. Deeds:

- *Sheet 1, northwestern North Dakota and northeastern Montana.
*Sheet 2, northeastern, north-central, and east-central Montana.
*Sheet 3, north-central and central Montana.
*Sheet 4, central and south-central Montana.
*Sheet 5, southeastern Montana.

MINERAL INVESTIGATIONS FIELD STUDIES MAPS

- MF-36. Bentonite deposits of the northern Black Hills district, Montana, Wyoming, and South Dakota, by M. M. Knechtel and S. H. Patterson. 1955 (1956). Scale 1:48,000. 2 sheets. \$1.50 per set.
MF-120. Uranium deposits and principal ore-bearing formations of the central Cordilleran foreland region, by T. L. Finnell and I. S. Parrish. 1958. 2 sheets: sheet 1 (map), scale 1:750,000; sheet 2 (table and text). 75c per set. (See also Bulletin 1087-I.)
MF-126. Preliminary tectonic map of eastern Montana showing the distribution of uranium deposits, compiled by F. W. Osterwald and B. G. Dean. 1958. Scale 1:500,000. 2 sheets. 50c per set.
MF-171. Preliminary geologic map of the northern half of the Jefferson City quadrangle, Jefferson and Lewis and Clark Counties, Mont., by G. E. Becraft. 1960 (1961). Lat $46^{\circ}22'$ to $46^{\circ}30'$, long 112° to $112^{\circ}15'$. Scale 1:24,000. 50c.
MF-172. Preliminary geologic map of the southern half of the Jefferson City quadrangle, Jefferson County, Mont., by G. E. Becraft. 1960 (1961). Lat $46^{\circ}15'$ to $46^{\circ}22'$, long 112° to $112^{\circ}15'$. Scale 1:24,000. 50c.
MF-174. Reconnaissance geologic map of the Deer Lodge quadrangle, Powell, Deer Lodge, and Jefferson Counties, Mont., by E. T. Ruppel. 1961. Lat $46^{\circ}15'$ to $46^{\circ}30'$, long $112^{\circ}30'$ to $112^{\circ}45'$. Scale 1:48,000. 50c.
MF-183. Preliminary geologic map of the northwest quarter of the Boulder quadrangle, Montana, by G. E. Becraft, and D. M. Pinckney. 1961. Lat $46^{\circ}07'30''$ to $46^{\circ}15'$, long $112^{\circ}07'30''$ to $112^{\circ}15'$. Scale 1:24,000. 50c.
MF-187. Preliminary geologic map of the southwest quarter of the Boulder quadrangle, Montana, by D. M. Pinckney and G. E. Becraft. 1961. Lat 46° to $46^{\circ}07'30''$, long $112^{\circ}07'30''$ to $112^{\circ}15'$. Scale 1:24,000. 50c.
MF-243. Preliminary geologic map of the northern Elkhorn Mountains, Jefferson and Broadwater Counties, Mont., by H. W. Smedes. 1962. Lat $46^{\circ}25'30''$ to $46^{\circ}30'$, long $111^{\circ}45'$ to 112° . Scale 1:24,000. 50c.
MF-246. Preliminary geologic map of the Elk Park quadrangle, Jefferson and Silver Bow Counties, Mont., by H. W. Smedes, M. R. Klepper, D. M. Pinckney, G. E. Becraft, and E. T. Ruppel. 1962. Lat 46° to $46^{\circ}15'$, long $112^{\circ}15'$ to $112^{\circ}30'$. Scale 1:48,000. 50c.
MF-264. Geologic map of the Castagne quadrangle, Carbon County, Mont., by H. L. Smith. 1963. Lat $45^{\circ}15'$ to $45^{\circ}22'30''$, long $109^{\circ}15'$ to $109^{\circ}22'30''$. Scale 1:24,000. 50c.
MF-265. Geologic map of the Cooney Reservoir quadrangle, Carbon and Stillwater Counties, Mont., by A. A. Wanek. 1963. Lat $45^{\circ}22'30''$ to $45^{\circ}30'$, long $109^{\circ}07'30''$ to $109^{\circ}15'$. Scale 1:24,000. 50c.

OIL AND GAS INVESTIGATIONS CHARTS--Continued

32. Marine Jurassic formations of Montana, by R. W. Imlay, L. S. Gardner, C. P. Rogers, Jr., and H. D. Hadley. 1948. 50c.
*OC-40. Subsurface stratigraphy of Paleozoic rocks in southeastern Montana and adjacent parts of Wyoming and South Dakota, by Constance Leatherrock. 1950.
OC-50. Subsurface stratigraphy of the Heath shale and Amsden formation in central Montana, by C. L. Nieschmidt. 1953. 50c.

OIL AND GAS INVESTIGATIONS MAPS

- *3. Structure contour map of the Big Horn Basin, Wyoming and Montana, by W. G. Pierce, D. A. Andrews, and J. J. Kirby. 1944. Scale 1:190,080. (Superseded by Map 74.)
4. Plains adjacent to Little Rocky Mountains, Mont., by M. M. Knechtel. 1944. Geologic map of about 130 square miles along eastern and southern borders of the Mountains. Scale 1:48,000. 30c.
10. Map showing thickness and general character of the Cretaceous deposits in the western interior of the United States, by J. B. Reeside, Jr. 1944. Scale 1:13,939,200. 25c. (Reprinted 1968.)
*25. Geologic map of Montana, by D. A. Andrews, G. S. Lambert, and G. W. Stose. 1945. Shows geologic formations, geologic contacts, faults, and dikes. (Black and white only.) Scale 1:500,000. 2 sheets. (Superseded by Geologic map of Montana, 1955, in color.)
*33. Structure contour map of the Powder River Basin, Wyoming and Montana, by W. G. Pierce and Roselle Girard. 1945. Scale 1:253,440. (Superseded by Map OM-133.)
43. Maps showing thickness and general distribution of Mesozoic and Paleozoic rocks in south-central Montana, by C. P. Rogers, Jr., L. S. Gardner, and H. D. Hadley. 1945. Scale 1:1,330,560. 40c.
71. Geologic map of the Big Horn Basin, Wyoming and Montana, showing terrace deposits and physiographic features, by D. A. Andrews, W. G. Pierce, and D. H. Eargle. 1947. Scale 1:126,720. 50c.
*74. Structure contour map of the Big Horn Basin, Wyoming and Montana, by W. G. Pierce, D. A. Andrews, and J. K. Keroher. 1947. Scale 1:190,080.
87. Geology of the Lothair area, Liberty County, Mont., by C. E. Erdmann. 1948. Map of 216 square miles showing the distribution of Upper Cretaceous formations that crop out along the Marias River and the location of the high-water flood level of the proposed Tiber Dam. Scale 1:48,000. 60c.
106. Geology of the Button Butte-Forestgrove area, Fergus County, Mont., by L. S. Gardner. 1950. Covers an area of about 500 square miles. Scale 1:63,360. 60c.
108. Geologic map of the Hobson area, central Montana, by J. D. Vine and W. J. Hail, Jr. 1950. Covers an area of about 675 square miles in the Judith Basin. Scale 1:63,360. 50c.
OM-111. Geology of the Hardin area, Big Horn and Yellowstone Counties, Mont., by P. W. Richards and C. P. Rogers, Jr. 1951. Covers an area of over 1,100 square miles. Scale 1:63,360. 2 sheets. \$1 per set.
*OM-130. Map of Montana showing oil and gas fields and test wells for oil and gas, by J. D. Vine and C. E. Erdmann. 1952. Scale 1:500,000. 2 sheets. (Revised as Map OM-170.)
OM-133. Structure-contour map of the Powder River Basin, Wyoming and Montana, by W. G. Pierce and R. M. Girard. 1945. Revised by A. D. Zapp. 1951 (1952). Scale 1:316,800. 75c.

MISCELLANEOUS GEOLOGIC INVESTIGATIONS MAPS--Continued

- I-417. Preliminary geologic map of the Tepee Creek quadrangle, Montana-Wyoming, by I. J. Witkind. 1964. Lat $44^{\circ}45'$ to 45° , long 111° to $111^{\circ}15'$. Scale 1:48,000. 50c.
- I-429. Aggregate and riprap resources map of the Wolf Point area, Montana, by R. B. Colton. 1964. Lat about 48° to $48^{\circ}40'$, long $104^{\circ}45'$ to $106^{\circ}30'$. Scale 1:125,000. 50c.
- I-433. Geologic map of the Bannack-Grayling area, Beaverhead County, Mont., by W. R. Lowell. 1965. Lat 45° to $45^{\circ}15'$, long $112^{\circ}45'$ to 113° . Scale 1:31,680. Accompanied by 6-page text. 75c.
- I-452. Geologic map of the Maudlow quadrangle, southwestern Montana, by Betty Skipp and A. D. Peterson. 1965. Lat 46° to $46^{\circ}15'$, long 111° to $111^{\circ}15'$. Scale 1:24,000. 2 sheets. \$1.50 per set..
- I-468. Preliminary geologic map of the Comb Rock quadrangle, Lewis and Clark County, Mont., by R. G. Schmidt. 1966. Lat $47^{\circ}07'30''$ to $47^{\circ}15'$, long $112^{\circ}07'30''$ to $112^{\circ}15'$. Scale 1:24,000. 50c.
- I-486. Geologic map of the Toston quadrangle, southwestern Montana, by G. D. Robinson. 1967. Lat 46° to $46^{\circ}15'$, long $111^{\circ}15'$ to $111^{\circ}30'$. Scale 1:24,000. 2 sheets. \$1.50 per set.
- I-564. Preliminary geologic map of the Roberts Mountain quadrangle, Lewis and Clark County, Mont., by R. G. Schmidt and C. P. Strong, Jr. 1968. Lat 47° to $47^{\circ}07'30''$, long $112^{\circ}07'30''$ to $112^{\circ}15'$. Scale 1:24,000. 50c.

MISSOURI BASIN STUDIES

1. Mineral resources of the Missouri Valley region, by D. H. Sow, D. M. Larrabee, and S. E. Clabaugh. 1954-46. These maps cover the entire basin. They show the sedimentary and igneous rocks of different ages. Structure contour lines are also given. Part 1, shows metallic mineral resources; part 2, the nonmetallic mineral resources; part 3, fuel resources; and part 4, construction materials. Scale 1:2,500,000. 4 sheets. \$1.50 per set.
 6. Preliminary map showing sand and gravel deposits of Montana, by D. M. Larabee and A. F. Shride. 1946. Scale 1:500,000. 2 sheets. 70c. per set.
 11. Map showing construction materials and nonmetallic mineral resources of Montana, by M. M. Knechtel, D. M. Larrabee, E. C. Fischer, and others. 1948. Scale 1:750,000. 2 sheets. 90c per set.
 16. Map showing metallic mineral deposits of Montana, by F. M. Chace, Fred Cater, Virginia Byers, and others. 1947. Scale 1:1,000,000. 30c.
- *MONTANA PLAINS. Structure contour map of the Montana plains, by C. E. Dobbin and C. E. Erdmann. 1946. Scale 1:506,880. (Superseded by Maps OM-178-A and 178-B.)

OIL AND GAS INVESTIGATIONS CHARTS

15. Mississippian and Devonian stratigraphy of northwestern Montana, by L. L. Sloss and W. M. Laird. 1945. 30c.
18. Columnar sections of Mesozoic and Paleozoic rocks in the mountains of south-central Montana, by L. S. Gardner, T. A. Hendricks, H. D. Hadley, and C. P. Rogers, Jr. 1945. 40c.
19. Subsurface stratigraphy of Lower Mesozoic and Upper Paleozoic formations in the basin area of south-central Montana, by H. D. Hadley, L. S. Gardner, and C. P. Rogers, Jr. 1945. 40c.
25. Devonian stratigraphy of central and northwestern Montana, by L. L. Sloss and W. M. Laird 1946. 35c.

MINERAL INVESTIGATIONS FIELD STUDIES MAPS--Continued

- MF-266. Geologic map of the Roberts quadrangle, Carbon County, Mont., by H. D. Zeller. 1963. Lat $45^{\circ}14'$ to $45^{\circ}22'30''$, long $109^{\circ}07'30''$ to $109^{\circ}15'$. Scale 1:24,000. 50c.
- MF-267. Geologic map of the Roscoe NE quadrangle, Stillwater and Carter Counties, Mont., by E. D. Patterson. 1963. Lat $45^{\circ}22'30''$ to $45^{\circ}30'$, long $109^{\circ}15'$ to $109^{\circ}22'30''$. Scale 1:24,000. 50c.
- MF-270. Geologic map of the Rapids quadrangle, Carbon and Stillwater Counties, Mont., by A. A. Wanek. 1963. Lat $45^{\circ}30'$ to $45^{\circ}37'30''$ to $45^{\circ}37'30''$, long 109° to $109^{\circ}07'30''$. Scale 1:24,000. 50c.

MINERAL INVESTIGATIONS RESOURCE MAPS

- MR-50. Reported occurrences of selected minerals in Montana, compiled by C. B. Bentley and G. D. Mowat. 1967. 2 sheets (East and West halves.) Scale 1:500,000.

The following maps cover the resources indicated for the United States, exclusive of Alaska and Hawaii. All are printed at a scale of 1:3,168,000 and are sold at 75c each, except as indicated.

- MR-1. Geologic environment map of alumina resources of the Columbia Basin, by I. G. Sohn. 1952. Scale 1:1,500,000. 80c.
- MR-2. The uranium deposits, compiled by R. W. Schnabel. 1955. Scale 1:5,000,000. 50c.
- MR-3. Potash occurrences, by M. F. Byrd. 1955. Scale 1:5,000,000. 50c.
- MR-13. Copper, by A. R. Kinkle, Jr., and N. P. Peterson. 1962.
- MR-15. Lead, by E. T. McKnight, W. L. Newman, and A. V. Heyl. 1962.
- MR-16. Vanadium, by R. P. Fischer. 1962.
- MR-17. Asbestos, by A. H. Chidester and A. F. Shride. 1962.
- MR-18. Pyrophyllite, and kyanite and related minerals, by G. H. Espenshade. 1962.
- MR-19. Zinc, by E. T. McKnight, W. L. Newman, and A. V. Heyl. 1962.
- MR-20. Antimony, by D. E. White. 1962.
- MR-21. Epigenetic uranium deposits, by A. P. Butler, Jr., W. I. Finch, and W. S. Twnhofel. 1962.
- MR-22. Bismuth, by J. R. Cooper. 1962.
- MR-23. Manganese, by M. D. Crittenden and Louis Pavlides. 1962.
- MR-24. Gold, by A. H. Koschmann and M. H. Bergendahl. 1962.
- MR-25. Tungsten by D. M. Lemmon and O. L. Tweto. 1962.
- MR-26. Chromite, by T. P. Thayer and M. H. Miller. 1962.
- MR-28. Thorium and rare earths, by J. C. Olson and J. W. Adams. 1962.
- MR-29. Titanium, by C. L. Rogers and M. C. Jaster. 1962.
- MR-31. Talc and soapstone, by A. H. Chidester and H. W. Worthington. 1962. (See Bulletin 1167.)
- MR-33. Gypsum and anhydrite, by C. F. Withington. 1962.
- MR-34. Silver, by E. T. McKnight, W. L. Newman, Harry Klemic, and A. V. Heyl. 1962.
- MR-36. Niobium and tantalum, by R. L. Parker. 1963.
- MR-37. High-alumina kaolinitic clay, by Helen Mark. 1963.
- MR-43. Barite, by D. A. Br obst. 1965. Accompanied by 10-page text.
- MR-44. Tin, by P. L. Killeen and W. L. Newman. 1965. Accompanied by 9-page text.
- MR-51. Iron, by M. S. Carr, P. W. Guild, and W. B. Wright. 1967. Accompanied by 20-page text.
- MR-55. Molybdenum, by R. U. King. 1970. Accompanied by 21-page text.

MINERAL INVESTIGATIONS (STRATEGIC) MAPS

- 3-198. Map of Permian phosphate deposits of Montana, Wyoming, Idaho, and Utah, by P. S. Clabaugh. 1946. Scale 1:013,760. 30c.
 *3-212. Iron-ore deposits of the Western United States, by C. E. Dutton and M. S. Carr. 1947. Scale 1:5,000,000. (See Bulletin 1082-C and Map MR-51.)

MISCELLANEOUS GEOLOGIC INVESTIGATIONS MAPS

- I-129. Geology of the Kenilworth quadrangle, Montana, by R. M. Lindvall. 1956. Lat 48° to 48° 15', long 110° 15' to 110° 30'. Scale 1:62,500. 75c.
 I-130. Geology of the Big Sandy quadrangle, Montana, by R. M. Lindvall. 1956. Lat 48° to 48° 15', long 110° to 110° 15'. Scale 1:62,500. 75c.
 I-155. Geology of the Cartersville and Hathaway quadrangles, Montana, by J. F. Smith, Jr. 1956. Lat 46° 15' to 46° 30', long 106° to 106° 30'. Scale 1:62,500. 50c.
 I-225. Geologic and structure contour map of the Fort Peck Indian Reservation and vicinity, Montana, by R. B. Colton and A. F. Bateman, Jr. 1956. Lat 48° to 48° 30', long 104° 30' to 106° 30'. Scale 1:125,000. 75c.
 I-234. Preliminary general geologic map of the Laredo quadrangle, Bearpaw Mountains, Mont., by W. T. Pecora, I. J. Witkind, and D. B. Stewart. 1957. Lat 48° 15' to 48° 30', long 109° 45' to 110°. Scale 1:31,680. 75c.
 I-235. Preliminary geologic map of the Centennial Mountain quadrangle, Bearpaw Mountains, Mont., by D. B. Stewart, W. T. Pecora, D. E. Engstrom, and H. R. Dixon. 1947. Lat 48° to 48° 15', long 109° 45' to 110°. Scale 1:31,680. 75c.
 I-236. Preliminary geologic map of the Shambo quadrangle, Bearpaw Mountains, Mont., by J. H. Kerr, W. T. Pecora, D. B. Stewart, and H. R. Dixon. 1957. Lat 48° 15' to 48° 30', long 109° 30' to 109° 45'. Scale 1:31,680. 75c.
 I-237. Preliminary geologic map of the Warrick quadrangle, Bearpaw Mountains, Mont., by W. T. Pecora and others. 1957. Lat 48° 48' 15', long 109° 30' to 109° 45'. Scale 1:31,680. 75c.
 I-296. Geologic map of the Bonner quadrangle, Montana, by W. H. Nelson and J. P. Dobell. 1959. Lat 46° 45' to 47°, long 113° 45' to 114°. Scale 1:62,500. 2 sheets. 75c per set.
 I-311. Geologic map of the igneous and metamorphic rocks of Montana showing location of uranium deposits, compiled by E. A. Merewether. 1960. Lat 45° to 49°, long 104° to 109° (east half); lat 45° to 49°, long 110° to 115° (west half). Scale 1:500,000. 2 sheets. \$1.50 per set.
 I-327. Glacial map of Montana east of the Rocky Mountains, by R. B. Colton, R. W. Lemke, and R. M. Lindvall. 1961. Lat 47° to 49°, long 104° to 113°. Scale 1:500,000. \$1.50.
 I-338. Geology of the Boxelder quadrangle, Montana, by R. M. Lindvall. 1961 (1962). Lat 48° 15' to 48° 30', long 110° to 110° 15'. Scale 1:62,500. 75c.
 I-349. Geology of the Eagle Buttes quadrangle, Chouteau County, Mont., by R. M. Lindvall. 1962. Lat 47° 45' to 48°, long 110° to 110° 15'. Scale 1:62,500. 50c.
 I-353. Geology of the Eskay quadrangle, Chouteau and Blaine Counties, Mont., by R. M. Lindvall. 1962. Lat 47° 45' to 48°, long 109° 30' to 109° 45'. Scale 1:62,500. 50c.
 I-361. Geologic map of the south half of the Baylor, Larlan West Fork, Police Creek, Kahle and Lundville quadrangles, Valley, Roosevelt, and Daniels Counties, Mont., by R. B. Colton. 1964. Lat about 48° 30' to 48° 38' 07", long 105° to 106° 30'. Scale 1:62,500. \$1.

MISCELLANEOUS GEOLOGIC INVESTIGATIONS MAPS--Continued

- I-362. Geologic map of the Brockton quadrangle, Roosevelt and Richland Counties, Mont., by R. B. Colton. 1963. Lat 48° to 48° 15', long 104° 45' to 105°. Scale 1:62,500. \$1.
 I-363. Geologic map of the Chelsea quadrangle, Roosevelt and McCone Counties, Mont., by R. B. Colton. 1963. Lat 48° to 48° 15', long 105° 15' to 105° 30'. Scale 1:62,500. \$1.
 I-364. geologic map of the Cuskers quadrangle, Roosevelt County, Mont., by R. B. Colton. 1963. Lat 48° 15' to 48° 30', long 105° 15' to 105° 30'. Scale 1:62,500. \$1.
 I-365. Geologic map of the Hay Creek quadrangle, Roosevelt County, Mont., by R. B. Colton. 1963. Lat 48° 15' to 48° 30', long 105° to 105° 15'. Scale 1:62,500. \$1.
 I-366. Geologic map of the Oswego quadrangle, Valley, Roosevelt, and McCone Counties, Mont., by R. B. Colton. 1963. Lat 48° to 48° 15', long 105° 45' to 106°. Scale 1:62,500. \$1.
 I-367. Geologic map of the Poplar quadrangle, Roosevelt, Richland, and McCone Counties, Mont., by R. B. Colton. 1963. Lat 48° to 48° 15', long 105° to 105° 15'. Scale 1:62,500. \$1.
 I-368. Geologic map of the Porcupine Valley quadrangle, Valley County, Mont., by R. B. Colton. 1963. Lat 48° 15' to 48° 30', long 106° 15' to 106° 30'. Scale 1:62,500. \$1.
 I-369. Geologic map of the Spring Creek quadrangle, Valley County, Mont., by R. B. Colton. 1963. Lat 48° 15' to 48° 30', long 106° to 106° 15'. Scale 1:62,500. \$1.
 I-370. Geologic map of the Todd Lakes quadrangle, Valley and Roosevelt Counties, Mont., by R. B. Colton. 1963. Lat 48° 15' to 48° 30', long 105° 45' to 106°. Scale 1:62,500. \$1.
 I-371. Geologic map of the Tule Valley quadrangle, Roosevelt County, Mont., by R. B. Colton. 1963. Lat 48° 15' to 48° 30', long 105° 30' to 105° 45'. Scale 1:62,500. \$1.
 I-379. Preliminary geologic map and sections of the Hogan 4 Southeast quadrangle, Lewis and Clark County, Mont., by R. G. Schmidt. 1963. Lat 47° to 47° 07' 30", long 112° to 112° 07' 30". Scale 1:24,000. 50c.
 I-381. Geology of the northern part of the Boulder batholith and adjacent area, Montana, by Adolph Knopf. 1963. Lat 46° 30' to about 46° 43', long 111° 52' 30" to 112° 20'. Scale 1:48,000. \$1.
 I-387. Fluoride content of ground water in the conterminous United States (maximum reported value for each county), by Michael Fleischer. 1962. Scale 1:5,000,000. 50c.
 I-396. Geologic map of the Maxey Ridge quadrangle, Montana, by A. E. Roberts. 1964. Lat 45° 30' to 45° 37' 30", long 110° 45' to 110° 52' 30". Scale 1:24,000. \$1.
 I-397. Geologic map of the Fort Ellis quadrangle, Montana, by A. E. Roberts. 1964. Lat 45° 37' 30" to 45° 45', long 110° 52' 30" to 111°. Scale 1:24,000. \$1.
 I-398. Geologic map of the Mystic Lake quadrangle, Montana, by A. E. Roberts. 1964. Lat 45° 30' to 45° 37' 30", long 110° 52' 30" to 111°. Scale 1:24,000. \$1.
 I-399. Geologic map of the Bozeman pass quadrangle, Montana, by A. E. Roberts. 1964. Lat 45° 37' 30" to 45° 45', long 110° 45' to 110° 52' 30". Scale 1:24,000. \$1.
 I-409. Preliminary geologic map and sections of the Hogan 4 Northeast quadrangle, Lewis and Clark, and Cascade Counties, Mont., by R. G. Schmidt, assisted by D. A. Swanson and Peter Zubovic. 1964. Lat 47° 07' 30" to 47° 15', long 112° to 112° 07' 30". Scale 1:24,000. 50c.

REFERENCE LIBRARIES

Many of the publications listed herein may be consulted in the following libraries in Montana:

BILLINGS:

Eastern Montana College.
Parmly Billings Memorial.

BOZEMAN:

Montana State University.

BUTTE:

Montana College of Mineral Science
and Technology.
State Bureau of Mines and Geology.

HELENA:

Historical Society of Montana.
Public.

MISSOULA:

University of Montana.

RED LODGE:

Yellowstone-Bighorn Research Assn.