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Introduction

PURPOSE AND SCOPE

In this bibliography are listed and indexed references relating to the geology and mineral technology of New Mexico that have appeared in the literature during the years 1956 through 1960. This volume thus serves as a supplement to the "Bibliography of New Mexico Geology and Mineral Technology Through 1950" and "Bibliography of New Mexico Geology and Mineral Technology, 1951-1955," issued as Bulletins 43 and 52, respectively, of the New Mexico Bureau of Mines and Mineral Resources. A few references published before 1956, but not cited in Bulletins 43 or 52, are also included.

The listing includes that published and unpublished material which is available to the general public and which contains enough information to be useful. Short news items and articles containing only brief mention of New Mexico are omitted. Undoubtedly some references have been overlooked. The reader is urged to call to the authors' attention such omissions so that the omitted references may be included in a future supplement. Other suggestions for improving this series of bibliographies will also be welcome.

Part I, *Bibliography,* is a list of authors, arranged alphabetically. Each author's writings are placed under his name in chronological order and are numbered. Each title is given in full; explanatory notes added to the title by the compilers of this bibliography are enclosed in brackets. Following the title are the name of the publication, the volume and number of the periodical, the page or pages on which the paper appears, notes on illustrations, if any, and finally the date.

Part II, *Index,* is an alphabetical list of subjects arranged under 14 major headings. These headings are subdivided according to the nature of the material indexed. Most papers are indexed under more than one heading, but under each heading the name of the author and the serial number of his paper follow appropriately. Using these data the reader can find the title and reference of the paper in Part I, *Bibliography*. Further details regarding subdivision are given in the section preceding the *Index*.

HOW PUBLICATIONS MAY BE OBTAINED

Many publications of the various governmental agencies may be obtained from the department or bureau of issue; there is a charge for some reports, but others will be furnished gratis. The stock of many bulletins has been exhausted. Whether or not a given publication of the U.S. Geological Survey is available, and its price, can be determined from a pamphlet entitled "Publications of the Geological Survey," issued in May 1953, and from monthly supplements entitled "New Publications of the Geological Survey." These pamphlets may be ob-

tained free of charge from the Superintendent of Documents, Government Printing Office, Washington 25, D.C.

Many volumes or numbers of periodicals may be obtained from the issuing society or association. Books, indicated in the bibliography by italic print, may be ordered from the publishers. Out-of-print periodicals and books occasionally may be found in the stock of dealers in secondhand books.

A stock of publications relating to areas in New Mexico is kept at the State Bureau of Mines and Mineral Resources in Socorro, New Mexico. Included among these, in addition to the Bureau's own publications, are publications of the U.S. Geological Survey and other organizations, a list of which, with prices, is presented at the end of this bulletin.

New Mexico libraries where government and other publications cited in this bibliography may possibly be consulted include The University of New Mexico, Albuquerque; New Mexico Highlands University, Las Vegas; State Library Extension Service, Santa Fe; New Mexico Western University, Silver City; New Mexico Institute of Mining and Technology, Socorro; New Mexico State University, University Park; Eastern New Mexico University, Portales.

The State Bureau of Mines and Mineral Resources will be glad to supply current data regarding the availability of New Mexico geologic literature and to assist in obtaining original, typewritten, or photostat copies.

SOURCES OF INFORMATION

Most of the references listed in this bibliography were found by searching the literature available in the libraries of the New Mexico Institute of Mining and Technology and the Mackay School of Mines (University of Nevada), files of the New Mexico Bureau of Mines and Mineral Resources, private libraries of the Bureau of Mines staff, and periodicals obtained by interlibrary loans. A list of the periodicals and serials examined is found under *Serials,* page 3.

A few additional articles were found in bibliographies encountered during this search. Others were reported as omissions from Bulletins 43 and 52 or were found listed in the "Monthly Catalog—United States Government Publications," published by the Superintendent of Documents, Government Printing Office, Washington 25, D.C. Two other important sources were used. Unpublished (open-file) reports of the U.S. Geological Survey were obtained from Circulars 379, 401, 403, and 412, of the U.S. Geological Survey. Unpublished theses were taken from the "Bibliography of Theses in Geology" by John Chronic and Halka Chronic, and from information supplied by various schools, colleges, and universities. References from these sources were indexed by title only, unless the particular report was locally available for examination.

ACKNOWLEDGMENTS

Grateful acknowledgment is made to Alvin J. Thompson, director, and Frank E. Kottlowski, economic geologist, New Mexico Bureau of Mines and Mineral Resources, for their encouragement and support; to John D. McKee, publications editor, New Mexico Institute of Mining and Technology, for the editing of the manuscript; to W. Martin Speare, librarian, Donald A. Stephenson, a student at the Institute, and Robert A. Bieberman, petroleum geologist at the Bureau, for their help in locating references. Barbara Hamilton ably assisted with the indexing and proofreading. We also wish to thank the many other institutions and individuals that provided information used in this bibliography.

SERIALS

The following list gives both the abbreviated citation and the full name of the periodicals and serials which have been examined in the compilation of the bibliography. The place of publication is given, if known.

Acad. Nat. Sci. Phila. Notulae Naturae; Proc.—Academy of Natural Sciences of Philadelphia Notulae Naturae; Proceedings. Philadelphia, Pa.

Acta Cryst.—Acta Crystallographica. Copenhagen, Denmark.

A.I.M.E., Min.-Geol.-Geophys. Div. Ann. Mtg., Min Br. Abs.—American Insitute of Mining, Metallurgical, and Petroleum Engineers, Mining-Geology-Geophysics Division Annual Meeting, Mining Branch Abstracts.

Am. Assoc. Adv. Sci. Pub.—American Association for the Advancement of Science Publication.

Am. Assoc. Petrol. Geol. Bull.—American Association of Petroleum Geologists Bulletin. Tulsa, Okla.

Am. Caver—American Caver. See National Speleological Society Bulletin.

Am. Ceram. Soc. Bull.; Jour.—American Ceramic Society Bulletin; Journal (contains Ceramic Abstracts). Columbus, Ohio.

Am. Geol. Inst. Geol. Abs.; Geosci. Abs.—American Geological Institute Geological Abstracts; Geoscience Abstracts. Geoscience Abstracts replaced Geological Abstracts.

Am. Geophys. Union Trans.—American Geophysical Union Transactions. Washington, D.C.

Am. Jour. Sci.—American Journal of Science. New Haven, Conn.

Am. Mineral.—American Mineralogist. Ann Arbor, Mich.

Am. Mus. Nat. Hist. Bull.; Novitates—American Museum of Natural History Bulletin; Novitates. New York City.

Am. Scientist—American Scientist. New Haven, Conn.

Ariz. Univ., Ariz. Bur. Mines Bull. Geol. Ser.; Mineral Tech. Ser.—University of Arizona, Arizona Bureau of Mines Bulletin, Geological Series; Mineral Technology Series. Tucson, Ariz.

Ariz. Univ. Thesis—University of Arizona Thesis. Tucson, Ariz.

Bur. Am. Ethnol. Bull.—Bureau of American Ethnology Bulletin. Washington, D.C.

Cal. Tech. Thesis—California Institute of Technology Thesis. Pasadena, Calif.
Chem. Abs.—Chemical Abstracts. Columbus, Ohio.
Cincinnati Univ. Thesis—University of Cincinnati Thesis. Cincinnati, Ohio.
Coal Age. New York City.
Colo. Min. Assoc. Min. Yearbook—Colorado Mining Association Mineral Yearbook. Denver, Colo.
Colo. Sci. Soc. Proc.—Colorado Scientific Society Proceedings. Denver, Colo.
Colo. Univ. Thesis—University of Colorado Thesis. Boulder, Colo.
Columbia Univ. Thesis—Columbia University Thesis. New York City.
Compass—Provo, Utah.
Compressed Air Mag.—Compressed Air Magazine. Phillipsburg, N.J.
Cornell Univ. Thesis—Cornell University Thesis. Ithaca, N.Y.

Dissert. Abs.—Dissertation Abstracts. Ann Arbor, Mich.

Econ. Geol.—Economic Geology. Urbana, Ill.
Eng. Min. Jour.—Engineering and Mining Journal. New York City.
Explos. Eng.—Explosives Engineer. Wilmington, Del.

Four Corners Geol. Soc. Guidebook—Four Corners Geological Society Guidebook.

Geochimica et Cosmochimica Acta. London, Eng.
Geol. Soc. Am. Bull.; Mem.; Special Papers—Geological Society of America Bulletin; Memoir; Special Papers. New York City. Geophysics. Austin, Tex.
Geophys. Soc. Tulsa Proc.—Geophysical Society of Tulsa Proceedings. Tulsa, Okla.

Harvard Univ. Thesis—Harvard University Thesis. Cambridge, Mass.

Ill. Univ. Thesis—University of Illinois Thesis. Urbana, Ill.
Ind. Univ. Thesis—Indiana University Thesis. Bloomington, Ind.
Internatl. Boundary and Water Commission U.S. and Mex. Water Bull.—International Boundary and Water Commission, United States and Mexico Water Bulletin.
Internatl. Conf. Peaceful Uses Atomic Energy, Geneva, 1955, Proc.—International Conference on Peaceful Uses of Atomic Energy, Geneva, 1955, Proceedings.
Internatl. Geol. Cong., 20th, Mexico-20th International Geological Congress. Mexico City, Mexico.

Internatl. Geol. Cong., 21st, Copenhagen-21st International Geological Congress. Copenhagen, Denmark.
Iowa Univ. Thesis—State University of Iowa Thesis. Iowa City, Iowa.

Johns Hopkins Univ. Thesis—The Johns Hopkins University Thesis. Baltimore, Md.
Jour. Geol.—Journal of Geology. Chicago, Ill.
Jour. Geophys. Research—Journal of Geophysical Research. Washington, D.C.
Jour. Paleont.—Journal of Paleontology. Tulsa, Okla.
Jour. Petrol. Tech.—Journal of Petroleum Technology. Dallas, Tex.
Jour. Sed. Petrology—Journal of Sedimentary Petrology. Tulsa, Okla.

Kans. Acad. Sci. Trans.—Kansas Academy of Science Transactions. Topeka, Kans.
Kans. Univ. Mus. Nat. Hist. Pub.; Paleont. Contr.; Thesis—University of Kansas Museum of Natural History Publication; Paleontological Contributions; Thesis. Lawrence, Kans.
Kans. Univ., State Geol. Surv. Bull.—University of Kansas, State Geological Survey Bulletin. Lawrence, Kans.
Kennecott Chinorama. Hurley, N. Mex.

Meteoritics. Albuquerque, N. Mex.
Mich. Univ. Thesis—University of Michigan Thesis. Ann Arbor, Mich.
Micropaleont.—Micropaleontology. New York City.
Min. Cong. Jour.—Mining Congress Journal. Washington, D.C.
Min. Eng.—Mining Engineering. New York City.
Mineral. Mag.—Mineralogical Magazine. London, Eng. Includes separately paged Mineralogical Abstracts.
Mineralogist. Portland, Ore.
Mines Mag.—Mines Magazine. Denver, Colo.
Min. Mag.—Mining Magazine. London, Eng.
Min. World—Mining World. San Francisco, Calif.
Minn. Univ. Thesis—University of Minnesota Thesis. Minneapolis, Minn.
Miss. State College Thesis—Mississippi State College Thesis. State College, Miss.

Natl. Geog. Mag.—National Geographic Magazine. Washington, D.C.
Natl. Oil Scouts and Landmen's Assoc. Year Book—National Oil Scouts and Landmen's Association Year Book. Austin, Tex.
Natl. Speleol. Soc. Bull.—National Speleological Society Bulletin. Arlington, Va.
Neues Jahrb. Min., Monatshefte—Neues Jahrbuch fur Mineralogie, Monatshefte. Stuttgart, Germany.
N. Mex. Bus. Rev.—New Mexico Business Review. Albuquerque.
N. Mex. Econ. Devel. Comm.—New Mexico Economic Development Commission. Santa Fe, New Mex.

N. Mex. Geol. Soc. Guidebook; Program Annual Meeting—New Mexico Geological Society Guidebook; Program Annual Meeting.

N. Mex. Hist. Rev.—New Mexico Historical Review. Albuquerque, N. Mex.

N. Mex. Inst. Min. Tech. Alumni Bull.; Alumni Newsletter; Thesis—New Mexico Institute of Mining and Technology Alumni Bulletin; Alumni Newsletter; Thesis. The Alumni Bulletin replaced the Alumni Newsletter. Socorro, N. Mex.

N. Mex. Inst. Min. Tech., Research Dev. Div.—New Mexico Institute of Mining and Technology, Research and Development Division. Socorro, N. Mex.

N. Mex. Inst. Min. Tech., State Bur. Mines and Mineral Res. Bienn. Rpt.; Bull.; Circ.; Geol. Map; Ground-Water Rpt.; Guidebook; Mem.; Petrol. Expl. Map—New Mexico Institute of Mining and Technology, State Bureau of Mines and Mineral Resources Biennial Report; Bulletin; Circular; Geologic Map; Ground-Water Report; Guidebook; Memoir; Petroleum Exploration Map. Socorro, N. Mex. Formerly New Mexico School of Mines, State Bureau of Mines and Mineral Resources.

N. Mex. Mag.—New Mexico Magazine. Santa Fe, N. Mex.

N. Mex. Oil and Gas Eng. Committee Ann. Rpt.; Eng. Rpt—New Mexico Oil and Gas Engineering Committee Annual Report; Engineering Report. Hobbs, N. Mex.

N. Mex. Oil Conserv. Commission Monthly Stat. Rpt.—New Mexico Oil Conservation Commission Monthly Statistical Report. Santa Fe, N. Mex.

N. Mex. Prof. Eng.—New Mexico Professional Engineer. Albuquerque, N. Mex.

N. Mex. State Eng. Tech. Rpt.—New Mexico State Engineer Technical Report. Santa Fe, N. Mex.

N. Mex. State Inspector Mines Ann. Rpt.—New Mexico State Inspector of Mines Annual Report. Albuquerque, N. Mex.

N. Mex. Univ. Alumnus; Pub., Anthro. Ser.; Chem. Ser.; Geol. Ser.; Meteoritics Ser.; Thesis—University of New Mexico Alumnus; Publication, Anthropology Series; Chemistry Series; Geology Series; Meteoritics Series; Thesis. Albuquerque, N. Mex.

N. Mex. Univ., Bur. Bus. Research, N. Mex. Studies Bus. Econ.—University of New Mexico, Bureau of Business Research, New Mexico Studies in Business and Economics. Albuquerque, N. Mex.

Northwestern Univ. Thesis—Northwestern University Thesis. Evanston, Ill.

Nuclear Sci. Abs.—Nuclear Science Abstracts. Oak Ridge, Tenn.

Oil and Gas Jour.—Oil and Gas Journal. Tulsa, Okla.

Okla. City Geol. Soc. Guidebook—Oklahoma City Geological Society Guidebook. Oklahoma City, Okla.

Okla. Geol. Surv. Bull.; Circ.; Mineral Rpt.—Oklahoma Geological Survey Bulletin; Circular; Mineral Report. Norman, Okla.

Okla. Univ. Thesis—University of Oklahoma Thesis. Norman, Okla.

Paldontologische Zeitschr.—Paldontologische Zeitschrift. Stuttgart, Germany.
Pecos River Commission. Carlsbad, New Mexico.
Petrol.—Petroleum. London, Eng.
Petrol. Eng.—Petroleum Engineer. Dallas, Tex.
Petrol. Refiner—Petroleum Refiner. Houston, Tex.
Petrol. Wk.—Petroleum Week. New York City.
Pipeliner. El Paso Natural Gas Company, El Paso, Tex.
Pit and Quarry. Chicago, Ill.
Plateau. Flagstaff, Ariz.

Rock Products. Chicago, Ill.
Rocks and Minerals. Peekskill, N.Y.
Rocky Mt. Assoc. Geologists Guidebook—Rocky Mountain Association of Geologists Guidebook.
Rocky Mt. Oil. Rptr.—Rocky Mountain Oil Reporter. Denver, Colo. Formerly Oil Reporter.
Roswell Geol. Soc. Guidebook—Roswell Geological Society Guidebook. Roswell, N. Mex.

Science. Washington, D.C.
Second Internatl. Conf. Peaceful Uses of Atomic Energy, Proc.—Second International Conference on Peaceful Uses of Atomic Energy, Proceedings.
Seismol. Soc. Am. Bull.—Seismological Society of America Bulletin. Berkeley, Calif.
Smithsonian Inst. Ann. Rpt.; Misc. Coll.—Smithsonian Institute Annual Report; Miscellaneous Collections. Washington, D.C.
Soc. Econ. Paleont. and Mineral. Permian Basin Sec., Guidebook—Society of Economic Paleontologists and Mineralogists. Permian Basin Section, Guidebook.
Soc. Min. Eng. Preprint—Society of Mining Engineers Preprint. New York City.
Stanford Univ. Thesis—Stanford University Thesis. Stanford, Calif.

Tex. Tech. College Thesis—Texas Technological College Thesis. Lubbock, Tex.
Tex. Univ. Thesis—University of Texas Thesis. Austin, Tex.
Tex. Univ., Bur. Econ. Geol. Pub.; Rpt. Inv.—University of Texas, Bureau of Economic Geology Publications; Report of Investigation. Austin, Tex.
Tulsa Geophys. Soc. Proc.—Tulsa Geophysical Society Proceedings. Tulsa, Okla.
Tulsa Univ. Thesis—University of Tulsa Thesis. Tulsa, Okla.

Univ. Calif. Los Angeles Thesis—University of California at Los Angeles Thesis. Los Angeles, Calif.

Univ. Washington Thesis—University of Washington Thesis. Seattle, Wash.
Uranium. Denver, Colo.
Uranium Information Digest. Grand Junction, Colo.
U.S. Atomic Energy Commission Map; Prelim. Map; RME; RMO-United States Atomic Energy Commission Map; Preliminary Map; Raw Materials Exploration Report; Division of Raw Material Report.
U.S. Bur. Mines Bull.; Inf. Circ.; Materials Surv.; Minerals Yearbook; Rpt. Inv.; Tech. Paper—United States Bureau of Mines Bulletin; Information Circular; Materials Survey; Minerals Yearbook; Report of Investigation; Technical Paper. Washington, D.C.
U.S. Cong., S. Doc.; H. Doc.—United States Congress, Senate Document; House of Representatives Document. Washington, D.C.
U.S. Geol. Surv. Bull.; Circ.; Coal Inv. Map; Geol. Quad. Map; Mineral Inv. Field Studies Map; Mineral Inv. Res. Appraisals Map; Misc. Geol. Inv. Map; Oil and Gas Inv. Map; Open-File Rpt.; Prof. Paper; TEI; TEM; Water-Supply Paper—United States Geological Survey Bulletin; Circular; Coal Investigations Map; Geologic Quadrangle Map; Mineral Investigations Field Studies Map; Mineral Investigations Resource Appraisals Map; Miscellaneous Geologic Investigations Map; Oil and Gas Investigations Map; Open-File Report; Professional Paper; Trace Elements Investigations Report; Trace Elements Memorandum Report; Water-Supply Paper. Washington, D.C.
U.S. Natl. Mus. Bull.; Proc.—United States National Museum Bulletin; Proceedings. Washington, D.C.
U.S. Natl. Park Serv.—United States National Park Service. Washington, D.C.
U.S. Soil Conserv. Serv. Regional Bull. Geol. Ser.; Soil Ser.—United States Soil Conservation Service Regional Bulletin, Geological Series; Soil Series. Albuquerque, N. Mex.
Utah Univ. Thesis—University of Utah Thesis. Salt Lake City, Utah.

Washington Univ. Thesis—Washington University Thesis. St Louis, Mo.
Water Well Jour.—Water Well Journal. Urbana, Ill.
Wisc. Univ. Thesis—University of Wisconsin Thesis. Madison, Wisc.
World Oil. Houston, Tex.
World Petrol.—World Petroleum. New York City.
World Petrol. Cong., 5th, New York City, Tech. Paper-5th World Petroleum Congress Technical Paper. New York City.

Zeitschr. Kryst.—Zeitschrift fiir Krystallographie und Mineralogie. Leipzig, Germany.
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1. Geology of the Walnut Wells quadrangle: Columbia Univ., Ph.D. thesis, 1957.
2. Geology of Walnut Wells quadrangle, Hidalgo County, New Mexico [abs.]: Geol. Soc. Am. Bull., v. 68, n. 12, p. 1694, 1957.
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Southeastern New Mexico pipelines and refineries, in The oil and gas fields of southeastern New Mexico—a symposium: Roswell Geol. Soc., p. 27-28, 1956.

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1. The aerial tramway—as used in the transportation of ore at the Pecos mines of the American Metal Company of New Mexico, Tererro, New Mexico: N. Mex. Inst. Min. Tech., E.M. thesis, 1938.

2. Mining in the southern part of the Sangre de Cristo Mountains, in Guidebook of southeastern Sangre de Cristo Mountains, New Mexico: N. Mex. Geol. Soc. Guidebook, Seventh Field Conference, p. 139-142, 1956.

3. The metal resources of New Mexico and their economic features through 1954: N. Mex. Inst. Min. Tech., State Bur. Mines and Mineral Res. Bull. 39, 183 p., 5 pl., 3 fig., 1957; [abs.] Am. Geol. Inst. Geol. Abs., v. 6, n. 2, p. 142-143, 1958.

4. Carbon dioxide in New Mexico (1959): N. Mex. Inst. Min. Tech., State Bur. Mines and Mineral Res. Circ. 43, 13 p., illus., map, 1959; [abs.] Am. Geol. Inst. Geosci. Abs., v. 2, n. 4, p. 41, 1960.

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Geology and geomorphology of the Santo Domingo basin, Sandoval and Santa Fe Counties, New Mexico: N. Mex. Univ., M.S. thesis, 110 **p., 14** pl., 3 fig., 1960.

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I. The Black Mountain mining district, in Mineral resources of New Mexico: International Industrial Record (El Paso), v. 3, n. 25, p. 41, illus., 1901.

2. Organ Mountain mining district, in Mineral resources of New Mexico: International Industrial Record (El Paso), v. 3, n. 25, p. 39-40, illus., 1901.

Anderson, Ludlow G. See Look, A.D.

Anderson, Roger Yates. See also Carten, T. L.

1. Cretaceous-Tertiary palynology of the eastern side of the San Juan Basin, New Mexico: Stanford Univ., Ph.D. thesis, 147 p., 1959.

2. Floral and faunal changes at the Cretaceous-Tertiary boundary, San Juan Basin, New Mexico [abs.]: N. Mex. Geol. Soc. Program, Thirteenth Annual Meeting, 1959; N. Mex. Geol. Soc. Guidebook, Tenth Field Conference, p. 159, 1959.

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4. (and Kirkland, D. W.). Origin, varves, and cycles of Jurassic Todilto formation, New Mexico: Am. Assoc. Petrol. Geol. Bull., v. 44, n. 1, p. 37-52, 11 fig., 1960; [abs.] Am. Geol. Inst. Geosci. Abs., v. 2, n. 2, p. 35-36, 1960.

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3. How miners solve tough problems at Ambrosia Lake's wet mines: Min. World, v. 21, n. 8, p. 34-38, 67, illus., 1959.
4. Miners beat Ambrosia Lake problems; raise tonnage to 235,000 per month: Min. World, v. 22, n. 8, p. 30-33, illus., 1960.

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1. The Mississippian Caloso and Kelly formations of west central New Mexico: Cincinnati Univ., M.S. thesis, 134 p., 1957.
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Index

INTRODUCTORY NOTE

Because the index to a bibliography can be used most effectively when the reader is familiar with its organization, the system of headings, subheadings, and entries used in this index is described below.

In this index the literature in Part I, *Bibliography,* is listed by subject under 14 major headings, as follows:

Areas. Papers which cover some phase of the geology or mineral technology for a given area are listed under that area.

Economic Geology. Papers dealing with mineral deposits (mines, mining districts, and oil and gas fields), substances (metallics, nonmetallics, and fuels), and general mining and petroleum geology.

Geochemistry. Geochemical and geobotanical studies.

Geophysics. Papers covering gravity, magnetic, electric, seismic, radioactivity, and other geophysical methods used to prospect for mineral deposits and to determine structures, and papers concerning general geophysical subjects.

Historical and Stratigraphic Geology. Papers covering the description, history, correlation, or geographic extent of formations and other rock units.

Maps. Geologic maps showing by colors, patterns, or symbols the areas of outcrop and ages of rock units; geophysical maps showing the results of geophysical surveys; and mineral industry maps showing the occurrence of specific mineral commodities and the installations (mines, mills, pipelines, wells, refineries, etc.) related to their utilization. Does not include maps as illustrations in papers.

Mineralogy. Papers giving mineral descriptions and localities, and descriptions of meteorites.

Mining Technology. Prospecting and exploration, development, mining, concentration, processing, refining, transportation, and utilization of metals, nonmetals, and coal, and the history of mining areas.

Oil and Gas Technology. Exploration, drilling, production, processing, refining, transportation, and utilization of oil and gas.

Paleontology. Papers describing or interpreting fossil remains of animals, plants, and early man.

Petrology. Descriptions of igneous and metamorphic rocks.

Physical and Structural Geology. Papers on structural geology, erosion and sedimentation, and general physical geology.

Physiography. Land forms and their formation as related to geologic structures and stratigraphy.

Water. Papers on underground and surface water geology and technology, including water level, quality, quantity, springs, wells, stream investigations and measurements, irrigation, pumping, pollution, etc.

The 14 major headings are divided further into subheadings. These subheadings are of two types: geographic and subject. A glance through the index will give the reader a general picture of the varying types of subheadings used under each major heading.

Under each subheading the names of the authors and the serial numbers of their papers follow appropriately. Using these data the reader can find the title and reference of a paper in Part I, *Bibliography.*

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- Mineral technology: Anderson, E. C., 3; Garcia, 1-3; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.

Chaves County:
- Geology: Allen, J. E., 1; Anderson, E. C., 3; Bachman, 1; Bean; Boardman; Bone; Conover, 3-5; Dunn; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Roswell Geol. Soc., 1, 2; Schilling, C. F.
- Mineral technology: Anderson, E. C., 3; Garcia, 1-3; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.

Chuska Mountains, McKinley and San Juan Counties, geology: Appledorn; Watson.

Coal fields: *see Economic Geology*

Colfax County:
- Geology: Anderson, E. C., 2-4; Andreasen; Baltz, 3; Berktresser; Boardman; Bone; Carter, D. A.; Griggs, 2; Johnson, R. B., 1-4; Mitchell; Muehlberger, 2, 3; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; N. Mex. Geol. Soc., 1; Northrop, 1; Okla. City Geol. Soc.; Reiland; Schilling, C. F.; Turner, 1; Wanek.
- Mineral technology: Anderson, E. C., 3; Antia; Garcia, 1-3; Hays, 1, 2; Herrick; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.

Curry County:
- Geology: Anderson, E. C., 3; Boardman; Bone; Galloway; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Schilling, C. F.
- Mineral technology: Anderson, E. C., 3; Garcia, 1-3; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.

De Baca County:
- Geology: Anderson, E. C., 3; Andreasen; Boardman; Bone; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Roswell Geol. Soc., 1, 2; Schilling, C. F.
- Mineral technology: Anderson, E. C., 3; Garcia, 1-3; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.

Delaware Basin: *see* Permian Basin

Dona Ana County:
- Geology: Allen, V. T.; Ames, 1, 2;

Anderson, E. C., 3; Belknap; Boardman; Bone; Bowers; Buddington; Flower, 1-3, 5-9; Hewett, 1, 2; Hood, 3; Jicha, 7; Kottlowski, 2, 3, 5, 7, 8, 12, 13, 15, 17; Myers, R. E.; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Rapp; Roswell Geol. Soc., 10; Schilling, C. F.; Shoemaker, 2.

Mineral technology: Anderson, E. C., 3; Anderson, J. Y., 1, 2; Garcia, 1-3; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.

Eastern New Mexico, geology: Herrin; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Schilling, C. F.

Eddy County:

Geology: Anderson, E. C., 3; Bean; Bjorklund, 2; Black; Boardman; Boles; Bone; Boyd, 1, 2; Byerly; Clark, H. N.; Conover, 6; Cox; Davies; Downey; Good; Hayes, 3, 5, 6; Ives; Jones, C. L., 1-4; Knill; Motts, 1-4; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Olive; Roswell Geol. Soc., 1, 4, 5; Schilling, C. F.; Schroeder; Von Buttlar, 1, 2.

Mineral technology: Anderson, E. C., 3; Arend; Bird; Bruhn; Garcia, 1-3; Gidney; Hays, 1, 2; Lilly; Kolb; N. Mex. Bur. Mines and Mineral Res., 1; Rector; Schilling, C. F.; Tong; Anon., 6, 10, 23.

Florida Mountains, Luna County, geology: Lochman-Balk, 1; Roswell Geol. Soc., 7.

Four Corners area: *see* San Juan Basin

Fra Cristobal Mountains, Sierra County, geology: Cserna, 1, 2; Jacobs, 1, 2; Kelley, 7; McCleary.

Gila River basin, Catron and Grant Counties, geology: Gatewood, 3; U.S. Geol. Surv., 4, 7, 11, 13, 15, 18, 25, 26.

Grant County:

Geology: Allen, V. T.; Anderson, E. C., 3; Ballman, 1-3; Barnes, H. L., 1-3; Beckman; Belt, 1, 2; Boardman; Bone; Buddington; Carpenter, D. W.; Cooley, M. E., 1; Creasey; Edwards; Elston, 1-4, 7; Fleischer; Gatewood, 3; Gillerman, 1; Griffitts; Heindl; Hewitt, 1, 2; Hewlett; Jaster; Jensen, 2; Jones, W. R.; Kelly, W. C., 1, 2; Knox, M. S.; Kuellmer, 1-3; Kulp, 1; Maise; McKinstry; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Parsons, 1, 2; Pradhan; Rose, 1-3; Roswell Geol. Soc., 7; Schilling, C. F.; Schilling, J. H., 3; Schwartz; U.S. Geol. Surv., 4, 7, 11, 13, 15, 18, 25, 26; Van de Water; Von Buttlar, 1, 2; Wargo, 1-5; Weber, 3; Anon., 20.

Mineral technology: Anderson, E. C., 3; Garcia, 1-3; Hardwick; Hays, 1, 2; Hunter; Lemke; McNaughton; N. Mex. Bur. Mines and Mineral Res., 1; Porterfield; Richardson; Schilling, C. F.; Schilling, J. H., 3; Wilmeth; Wolle; Anon., 13, 15, 19.

Guadalupe County:

Geology: Anderson, E. C., 3; Boardman; Bone; Clebsch, 2; Griggs, 3; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Roswell Geol. Soc., 2; Schilling, C. F.

Mineral technology: Anderson, E. C., 3; Andreasen; Garcia, 1-3; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.

Guadalupe Mountains, southeastern New Mexico, geology: Boyd, 1, 2.

Harding County:

Geology: Anderson, E. C., 3, 4; Boardman; Bone; Griggs, 3; Krisle; Lang; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Parrish; Schilling, C. F.

Mineral technology: Anderson, E. C., 3, 4; Garcia, 1-3; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.

Hatchet Mountains, Hidalgo County, geology; Roswell Geol. Soc., 7; Zeller, 1, 5, 7.

Hidalgo County:

Geology: Alper, 1-3; Anderson, E. C., 3; Belt, 1, 2; Boardman; Bone; Cargo; Doty; Elston, 1, 4, 6, 7; Flege; Gillerman, 2, 3; Hewett, 1, 2; Kintzinger; LeMone, 2; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and

Areas (continued)
Mechanic Arts; Northrop, 1; Pradhan; Reeder, 1; Roswell Geol. Soc., 7; Schilling, C. F.; Strongin; Zeller, 1, 3-5, 7.
Mineral technology: Anderson, E. C., 3; Garcia, 1-3; Gifford; Hays, 1, 2; Look; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.
Hueco Mountains, Otero County, geology: Cooley, B. B., 2; Hardie, 1, 2; McBride; West Tex. Geol. Soc., 1.
Jemez Mountains, Sandoval County, geology: Bailey, 1, 2; Griggs, 1.
La Ventana Mesa, Sandoval County, geology: Bachman, 4; Cannon, 1, 2.
Lea County:
Geology: Anderson, E. C., 3; Barker, 1, 2; Boardman; Bone; Colton; Elias; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Phifer; Rambo, G. D.; Schilling, C. F.; Swenumson; U.S. Geol. Surv., 1.
Mineral technology: Anderson, E. C., 3; Garcia, 1-3; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Phifer; Schilling, C. F.
Lincoln County:
Geology: Allen, J. E., 1, 2; Anderson, E. C., 3; Bachman, 1; Boardman; Bodine; Bone; Craddock; Griswold; Krauskopf; Mains; Mourant; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Ramdohr; Rawson, 1, 2; Roswell Geol. Soc., 2; Schilling, C. F.; Smith, C. T., 6; Von Buttlar, 1, 2; Walker.
Mineral technology: Anderson, E. C., 3; Dunn; Garcia, 1-3; Gaylord, 1, 2; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.
Little Burro Mountains, Grant County, geology: Edwards.
Llano Estacado, Lea County, geology: Barker, 1, 2; Bone; Elias.
Los Alamos County:
Geology: Griggs, 1; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1.
Lucero Mesa, Valencia County, geology: Duschatko; Mirsky; Wengerd, 4, 8.
Luna County:
Geology: Anderson, E. C., 3; Boardman; Bone; Elston, 2, 3; Griffitts; Hewett, 1, 2; Homme, 1, 2; Jaster; Kuellmer, 2; Lochman-Balk, 1; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Rosenzweig; Roswell Geol. Soc., 7; Schilling, C. F.
Mineral technology: Agey; Anderson, E. C., 3; Garcia, 1-3; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.
Magdalena Mountains, Socorro County, geology: Austin, 2.
Manzano Mountains, Torrance and Valencia Counties, geology: Stark.
McKinley County:
Geology: Akers, 1, 2; Allen, J. E., 1; Anderson, E. C., 3; Appledorn; Birdseye, 1, 2; Boardman; Bone; Colman, 1, 2; Cooley, M. E., 2-4; Dane, 1, 2; Ealy, 1-3; Foster, 4; Four Corners Geol. Soc., 1; Gabelman, 2, 4-6; Gadway; Granger; Gruner, 1, 2; Hilpert, 1, 3, 4; Holze; King, V. L.; Knox, J. A.; Konigsmark, 1, 2; Kover, Mathewson, 2; Miller, D. S.; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; O'Sullivan; Schilling, C. F.; Smith, C. T., 1, 2, 4, 5; Sun, 3, 4, 6, 7; Truesdell, 1, 2; U.S. Atomic Energy Commission, 1, 2; Watson; Weeks, 2; West, 1, 3; Willard, 1; Woodyard; Young, 1-3; Zitting.
Mineral technology: Anderson, E. C., 3; Argall, 1-4; Chapman; Evans; Garcia, 1-3; Hays, 1, 2; Hazen, 2; Hough; Huttl, 1; Jenkins; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.; Schlosser; Wilson, G. M.; Anon., 5, 7, 11, 12, 14, 18, 22, 27, 29.
Mines: *see Economic Geology; Mining Technology*
Mining districts: *see Economic Geology*
Mora County:
Geology: Aldrich; Anderson, E. C., 2-4; Andreasen; Baltz, 1-4; Boardman; Bogart; Bone; Griggs, 2; Hayes, 2; Lang; Montgomery, A., 2; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; N.

Mex. Geol. Soc., 1; Northrop, 1; Schilling, C. F.; Sidwell; Winograd, 2.
Mineral technology: Anderson, E. C., 3; Garcia, 1-3; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.
Nacimiento Mountains, Sandoval County, geology: Parker, J. W.
Northeastern New Mexico:
Geology: Anderson, E. C., 2-4; Andreasen; Baldwin, B., 1, 3-7; Baltz, 3; Beebe; Berktresser; Boardman; Bone; Cardwell; Carter, D. A.; Cazeau; Cooley, B. B., 1; Foster, 1, 8; Gabelman, 3; Gatewood, 1; Glassmire, 2; Griggs, 2, 3; Hardison; Johnson, R. B., 1-4; Krisle; Lang; Mankin, 1, 2; Mitchell; Muehlberger, 2, 3; Neiler; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; N. Mex. Geol. Soc., 1; Northrop, 1; Oborne; Okla. City Geol. Soc.; Panhandle Geol. Soc., 1; Parrish; Perkins, B. F.; Reiland; Rocky Mt. Assoc. Geologists; Schilling, C. F.; Shaw; Turner, 1; U.S. Geol. Surv., 3, 6, 9, 12, 14, 17, 20, 23; Wanek; Worden.
Mineral technology: Anderson, E. C., 3, 4; Antia; Baldwin, B., 3, 4; Foster, 8; Garcia, 1-3; Glassmire, 2; Hays, 1, 2; Herrick; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C.. F.
Northwestern New Mexico: *see* San Juan Basin
Oil and gas fields: *see Economic Geology; Oil and Gas Technology*
Organ Mountains, Dona Ana County, mineral technology: Anderson, E. C., 3; Anderson, J. Y., 2.
Ortiz Mountains, Santa Fe County, geology: McRae; Peterson, J. W.
Otero County:
Geology: Allen, J. E., 1; Anderson, E. C., 3; Bachman, 1-3, 5; Belknap; Bergeron; Bjorklund; Boardman; Bone; Boyd, 1, 2; Cave; Clark, T.; Cline; Cooley, B. B., 2; Cooper, G. A., 3; Dunn; Foster, 9; Hardie, 1, 2; Hayes, 1; Hood, 1-3; Jicha, 7; Kottlowski, 8, 15; McBride; Motts, 3, 5, 6; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Oppel, 1, 2; Otte, 1, 2; Pray, 1-4; Rapp; Reyer; Reynolds, C. B.; Roswell, Geol. Soc., 9; Schilling, C. F.; U.S. Geol. Surv. 2; Wesh; West Tex. Geol. Soc. 1; Wray.
Mineral technology: Anderson, E. C., 3; Dunn; Garcia, 1-3; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.
Pecos River basin, geology: Allen, J. E., 1; Conover, 3-6; Gatewood, 2; Motts, 2; U.S. Geol. Surv., 3, 6, 10, 12, 14, 19, 20, 24.
Pedernal Hills, Torrance County, geology: Fallis; Kottlowski, 19.
Peloncillo Mountains, Hidalgo County, geology: Elston, 6; Gillerman, 2, 3.
Permian Basin:
Geology: Allen, J. E., 1; Anderson, E. C., 3; Bachman, 1; Barker, 1, 2; Barnes, C. E.; Barnes, V. E., 1-5; Bean; Bieberman, 2; Bjorklund, 1, 2; Black; Boardman; Boles; Bone; Boyd, 1, 2; Byerly; Clark, H. N.; Cloud; Colton; Conover, 3-6; Cox; Dane, 5; Davies; Downey; Dunn; Elias; Flawn; Folk; Galley; Good; Hantush, 1; Hayes, 3, 5, 6; Helmig; Hull, 1, 2; Ives; Jarvis; Jones, C. L., 1-4; King, H. H.; Knill; Lahee; Mason; Miller, D. N., 1, 2; Montgomery, R. F., 1, 2; Motts, 1-4; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Olive; Phifer; Podpechan; Rambo, G. D.; Roswell Geol. Soc., 1, 3-6, 8; Schilling, C. F.; Schroeder; Soc. Econ. Paleont. and Mineral.; Stipp, 1, 2; Swenumson; Trostle, 1, 2; Tynan; U.S. Geol. Surv., 1; Vertrees; Vine, 2-4; Von Buttlar, 1, 2; West Tex. Geol. Soc., 1, 2; Williamson, B.; Anon., 25, 34.
Mineral technology: Albright; Anderson, D. B.; Anderson, E. C., 3; Arend; Baskin; Bieberman, 1, 4; Bird; Blanpied, 1-3; Bruhn; Clark, H. N.; Culbertson; Downey; Foster, 2, 5-7; Garcia, 1-3; Gidney; Hanson, B. M.; Hantush, 1; Hays, 1, 2; Helmig; Hough; Ives; Kolb; LeBaron; Ley; Lilly; Logan; Miller, E. H.; Montgomery, R. F., 2; Moody; N. Mex. Bur Mines and Mineral Res., 1; N. Mex. Oil and Gas Eng. Committee, 2, 4, 6, 7, 9, 11; N. Mex. Oil Conserv. Commis-

Areas (continued)
sion, 2, 3; Oehler; Peek; Phifer: Podpechan; Rector; Schilling, C. F.; Smith, C. W.; Smith, K. L.; Smith, S. L.; Stewart, F. H.; Tong; Trostle, 1, 2; Williamson, B.; Anon., 6, 10, 23, 25, 34.
Quay County:
Geology: Anderson, E. C., 3; Boardman; Bone; Griggs, 3; Krisle; Myers, J. D.; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Schilling, C. F.; Trauger.
Mineral technology: Anderson, E. C., 3; Garcia, 1-3, Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.
Raton Mesa, Colfax County, geology: Baltz, 3; Johnson, R. B., 4.
Rio Arriba County:
Geology: Adams, G. E.; Anderson, E. C., 3; Barker, 3; Bertholf; Boardman; Bone; Budding, 1, 2; Cameron; Colbert; Corey; Dane, 1, 9; Davis; Fitter; Heinrich; Hutson; Kelley, 1, 3; Kulp, 2; Longgood; Miller, R. R.; Muehlberger, 1, 4-7; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; N. Mex. Geol. Soc., 5; Northrop, 1; Romer; Schilling, C. F.; Silliman; St. John; Trice; Winograd, 1.
Mineral technology: Anderson, E. C., 3; Garcia, 1-3; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.
Rio Grande basin, geology: Gatewood, 2; M'Gonigle; Ruhe; Thompson, J. C.; U.S. Geol. Surv., 3, 6, 10, 12, 14, 19, 20, 24.
Roosevelt County:
Geology: Anderson, E. C., 3; Boardman; Bone; Cooper, J. B.; Galloway; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Schilling, C. F.
Mineral technology: Anderson, E. C., 3; Garcia, 1-3; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.
Sacramento Mountains, Otero County, geology: Allen, J. E., 1; Bachman, 1-3, 5; Bergeron; Cave; Clark, T.; Cline; Cooper, G. A., 3; Dunn; Foster, 9; Hayes, 1; Motts, 5; Oppel, 1, 2; Otte, 1, 2; Pray, 1-4; Reyer; Roswell Geol. Soc., 9; Wray.
San Andres Mountains, Dona Ana and Sierra Counties, geology: Flower, 4; Kottlowski, 2, 13; Myers, R. E.; Roswell Geol. Soc., 10.
San Augustin Plains, Catron and Socorro Counties, geology: Clisby; Foreman, 1, 2; Potter; Stearns.
Sandia Mountains, Bernalillo County, geology: Bruns; Caprio; Peltier.
Sandoval County:
Geology: Anderson, E. C., 3; Anderson, J. E.; Bachman, 4; Bailey, 1, 2; Baldwin, B., 2; Boardman; Bone; Bundy, 1-3; Cannon, 1, 2; Caprio; Dane, 1; Griggs, 1; Hewett, 1, 2; Holze; Hutson; Jaster; Kelley, 1, 3; Kennon; Lovejoy; Mathewson, 1; Moench, 1, 2; Mutschler, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Ostrander; Parry; Parker, J. W.; Perkins, R. D., 1, 2; Romer; Schilling, C. F.; Schroeder; Schumm; Simpson, G. G., 1; Smith, R. L., 2; Weir.
Mineral technology: Anderson, E. C., 3; Garcia, 1-3; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.
Sangre de Cristo Mountains, geology: Anderson, E. C., 2; Baltz, 1-4; Fitzsimmons, 1; Gabelman, 1; Land; Miller, J. P., 1, 2; Montgomery, A., 1, 2; N. Mex. Geol. Soc., 1; Panhandle Geol. Soc., 2; Rambo, C. E.; Schilling, J. H., 1, 2, 4; Sutherland.
San Juan Basin:
Geology: Adams, G. E.; Akers, 1, 2; Allen, J. E., 1; Anderson, E. C., 3; Anderson, R. Y., 1-4; Appledorn; Baars; Barker, 3; Barnes, H.; Beaumont, 1, 2; Berry; Bertholf; Bieberman, 2, 3; Birdseye, 1, 2; Boardman; Bone; Boone; Brainerd; Budd, 1, 2; Budding, 1, 2; Burford; Burgener; Byington, 2; Callahan; Cameron; Carter, K. E.; Chenoweth, 1, 2; Chew; Colbert; Colman, 1, 2; Cooley, M. E., 2-4; Cooper, J. C.; Craig; Cumella; Curtis; Dane, 1-3, 6-9; Davis; Devlin; Dilworth; Dodd; Ealy, 1-3; Ekren; Fetzner;

Fischer; Fitter; Fitzsimmons, 2; Foster, 3, 4; Four Corners Geol. Soc., 1, 2; Freeman; Gabelman, 2, 4-9; Gadway; Garrels; Gatewood, 3; Granger; Gray; Gruner, 1-4; Hayes, 4; Harshbarger, 1, 2; Heinrich; Holze; Hilpert, 1-4; Hunt; Hutson; Isachsen; Jensen, 1; Kelley, 1-6; Kerr; King, V. L.; Kirkland, 1, 2; Knight, W. V.; Knox, J. A.; Konigsmark, 1, 2; Kottlowski, 6; Kover; Kulp, 2; Laverty; Link; Lochman-Balk, 2; Longgood; Lovering; Matheny, 1, 2; Mathewson, 2; McBirney; Melin; Miller, D. S.; Miller, R. R.; Momper, 1, 2; Muehlberger, 1, 4-7; Mullens; Murphy; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; N. Mex. Geol. Soc., 2-5; Noble; Northrop, 1; O'Sullivan; Peterson; Picard, 1, 2; Pierce; Pliler; Plouff; Pye; Reese; Reneau; Repenning, 1, 2; Romer; Ross; Sabins; Schilling, C. F.; Schumm; Shoemaker, 1; Silliman; Silver, 1, 2; Simpson, G. G., 2; Smith, C. T., 1-5; Speer; Stern; Stewart, 1, 2; Stieff; St. John; Strobell; Sun, 3, 4, 6, 7; Thompson, M. E.; Tomkins; Trice; Truesdell, 1, 2; Turnbow; Turner, 2; Tyrrell; U.S. Atomic Energy Commission, 1, 2; Van Couvering; Watson; Weeks, 1, 2; Wenger; Wengerd, 1-3, 5-7; West, 1-3; Willard, 1; Williams; Winograd, 1; Wood, H. B., 1, 2; Wood, J. W.; Woods, 1; Woodyard; Wright, H. E.; Wright, M. S.; Young, 1-4; Zitting; Anon. 18, 26, 31, 33.

Mineral technology: Anderson, E. C., 3; Argall, 1-4; Arnold; Bagwell; Baldwin, B. F.; Bieberman, 1, 3, 4; Birdseye, 2; Blakely; Blanpied, 1-3; Budd, 3-5; Byington, 1, 2; Chapman; Chew; Crentz; Dougherty; Dudenhoeffer, 1, 2; Evans; Foster, 2, 5-7; Fowler; Gabelman, 4-6; Garcia, 1-3; Gray; Guthrie; Hampton; Hays, 1, 2; Hazen, 1, 2; Hough; Huttl, 1, 2; Jenkins; Leese; McGhee; Moody; N. Mex. Bur. Mines and Mineral Res., 1; N. Mex. Oil and Gas Eng. Committee, 1, 3, 5, 8, 10, 11; N. Mex. Oil Conserv. Commission, 2, 4; Osborn; Parker, M. T., 1, 2; Repenning, 2; Schilling, C. F.; Schlosser; Schumm; Silver, 2; Smith, C. T., 7; Stoehr; Utley; Van de Water; Wilson, G. M.; Anon., 2, 5, 7, 9, 11, 12, 14, 18, 22, 27, 29, 31, 33.

San Juan County:

Geology: Akers, 2; Anderson, E. C., 3; Appledorn; Boardman; Bone; Burford; Callahan; Dane, 1; Dilworth; Knight, W. V.; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; O'Sullivan; Schilling, C. F.; Speer; Watson; Williams; Wood, J. W.

Mineral technology: Anderson, E. C., 3; Crentz; Garcia, 1-3; Hays, 1, 2; Hazen, 1; N. Mex. Bur. Mines and Mineral Res., 1; Osborn; Schilling, C. F., Schumm; Utley; Anon., 2.

San Juan River basin, geology: U.S. Geol. Surv., 4, 7, 11, 13, 15, 18, 25, 26.

San Miguel County:

Geology: Anderson, E. C., 2, 3; Andreasen; Baltz, 1-4; Boardman; Bone; Cameron; Glassmire, 1; Griggs, 2, 3; Krisle; Kulp, 2; Land; Montgomery, A., 2; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; N. Mex. Geol. Soc., 1; Northrop, 1; Parks; Rambo, C. E.; Romer; Schilling, C. F.; Sidwell; Stegall; Trauger.

Mineral technology: Anderson, E. C., 3; Garcia, 1-3; Glassmire, 1; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.

San Pedro Mountains, Santa Fe County, geology: Atkinson.

Santa Fe County:

Geology: Anderson, E. C., 2, 3; Anderson, J. E.; Atkinson; Baldwin, B., 2; Baltz, 1, 3, 4; Boardman; Bone; Boyer; Carroll; Carten, 1, 2; Dane, 1; Disbrow; Gabelman, 1; Griggs, 1; Hayward; Jensen, 1; Kelley, 1, 3; Land; Leopold, 2; Lustig, 1, 2; McRae; Miller, J. P., 1-3; Montgomery, A., 2; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; N. Mex. Geol. Soc., 1; Northrop, 1; Peterson, J. W.; Rambo, C. E.; Robinson; Schilling,

Areas (continued)
C. F.; Schwartz; Sun, 5; Sutherland.
Mineral technology: Anderson, E. C., 1; Garcia, 1-3; Hays, 1, 2; Hayward; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.
Sierra County:
Geology: Ames, 1, 2; Anderson, E. C., 3; Boardman; Bone; Cserna, 1, 2; Elston, 2, 3; Flower, 4; Gehrig; Griffitts; Hewitt, 1, 2; Hill, J. D.; Hood, 3; Jacobs, 1, 2; Jaster; Kelley, 7; Kottlowski, 1, 2, 13, 15; Kuellmer, 1-4; McCleary; Murray, C. R.; Myers, R. E.; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Oda; Roswell Geol. Soc., 10; Schilling, C. F.
Mineral technology: Anderson, E. C., 3; Brown, C. T., 1, 2; Garcia, 1-3; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.
Socorro County:
Geology: Allen, V. T.; Ames, 1, 2; Anderson, E. C., 3; Armstrong, 1-5, 7; Austin, 2-4; Belt, 1, 2; Boardman; Bone; Callaghan, 3; Clebsch, 1; Clisby; Dane, 1, 4; Fitzsimmons, 2; Foreman, 1, 2; Gentile, 1, 2; Givens; Griffitts; Hambleton; Hewett, 1, 2; Jaster; Jicha, 3-5; Kottlowski, 1, 2, 11-15; Lemone, 1; McCleary; Miesch; Myers, R. E.; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; N. Mex. Geol. Soc., 4; Northrop, 1; Potter; Romer; Sanford; Schilling, C. F.; Stearns; Sun, 1; Titley, 1, 2; Tonking; Von Buttlar, 1, 2; Waldron; Weber, 1; Wengerd, 4, 8; Willard, 2, 4; Anon., 32.
Mineral technology: Anderson, E. C., 3; Brown, C. T., 3; Garcia, 1-3; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.; Anon., 4.
Southeastern New Mexico: *see* Permian Basin
Southern New Mexico, geology: Armstrong, 5, 7; Boardman; Bone; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Ramírez; Ruhe; Schilling, C. F.
Southwestern New Mexico:
Geology: Allen, V. T.; Alper, 1-3; Anderson, E. C., 3; Armstrong, 6, 7; Ballman, 1-3; Barnes, H. L., 1-3; Beckman; Belt, 1, 2; Boardman; Bone; Buddington; Callaghan, 4; Cargo; Cooley, M. E., 1; Creasey; Dickinson; Doty; Edwards; Elston, 1-7; Flege; Fleischer; Gatewood, 3; Gillerman, 1-3; Griffitts; Heindl; Hewett, 1, 2; Hewitt, 1, 2; Hewlett; Homme, 1, 2; Jaster; Jensen, 2; Jones, W. R.; Kelly, 1, 2; Kintzinger; Knox, M. S.; Kottlowski, 10, 12, 18; Kuellmer, 1-3; Kulp, 1; LeMone, 2; Lochman-Balk, 1; Maise; McKinstry; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Packard; Parsons, 1, 2; Pradhan; Reeder, 1; Rose, 1-3; Rosenzweig; Roswell Geol. Soc., 7; Sandeen; Schilling, C. F.; Schilling, J. H., 3; Schlaudt; Schwartz; Stringham; Strongin; U.S. Geol. Surv., 4, 7, 11, 13, 15, 18, 25, 26; Van de Water; Von Buttlar, 1, 2; Wargo, 1-5; Weber, 3; Zeller, 1-7; Anon., 20.
Mineral technology: Agey; Anderson, E. C., 3; Garcia, 1-3; Gifford; Hardwick; Hays, 1, 2; Hunter; Lemke; Look; McNaughton; N. Mex. Bur. Mines and Mineral Res., 1; Porterfield; Richardson; Schilling, C. F.; Schilling, J. H., 3; Wilmeth; Wolle; Anon., 13, 15, 19.
Taos County:
Geology: Aldrich; Anderson, E. C., 3; Armstrong, 2, 7; Baltz, 1, 3, 4; Boardman; Bone; Cameron; Carpenter, R. H. Damon; Fitzsimmons, 1; Fleischer; Gabelman, 1; Hewett, 1, 2; Jahns, 2-4; Jaster; Kuellmer, 3, 5; Kulp, 2; McKinlay, 1, 2; Miller, R. R.; Montgomery, A., 1; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; N. Mex. Geol. Soc., 1, 5; Northrop, 1; Schilling, C. F.; Schilling, J. H., 1, 2, 4; Silliman; Smith, R. L., 1; Upshaw; Winograd, 1, 3.
Mineral technology: Anderson, E. C., 3; Garcia, 1-3; Hays, 1, 2; N. Mex.

Bur. Mines and Mineral Res., 1; Schilling, C. F.; Schilling, J. H., 1, 2, 4; Upshaw.

Torrance County:

Geology: Anderson, E. C., 3, 4; Boardman; Bone; Clebsch; Dane, 1; Fallis; Harbour, 1, 2; Kottlowski, 19; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Schilling, C. F.; Smith, R. E.; Stark.

Mineral technology: Anderson, E. C., 3; Garcia, 1-3; Hays, 1, 2; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.

Tres Hermanas Mountains, Luna County, geology: Homme, 1, 2; Rosenzweig.

Union County:

Geology: Anderson, E. C. 3, 4; Baldwin, B., 1, 3-7; Boardman; Bone; Cardwell; Cooley, B. B., 1; Foster, 1; Mitchell; Muehlberger, 2, 3; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Okla. City Geol. Soc.; Schilling, C. F.

Mineral technology: Anderson, E. C., 3; Baldwin, B., 3, 4; Garcia, 1-3; Hays, 1, 2; Herrick; N. Mex. Bur. Mines and Mineral Res., 1; Schilling, C. F.

Valencia County:

Geology: Anderson, E. C., 3; Armstrong, 1-5, 7; Boardman; Bone; Coleman; Colman, 1, 2; Cook; Dane, 1; Duschatko; Fitzsimmons, 2; Foster, 4; Four Corners Geol. Soc., 1; Gabelman, 2; Gadway; Gratton; Gruner, 1, 2; Hilpert, 1, 3, 4; Huttl, 2; Jaster; Jensen, 1; Jicha, 1, 4; Konigsmark, 1, 2; Marr; Mathewson, 1, 2; Mirsky; Mitcham; Moench, 1-4; Mohar; N. Mex. Bur. Mines and Mineral Res., 1-3; N. Mex. College Agriculture and Mechanic Arts; Northrop, 1; Schilling, C. F.; Schlee, 1, 2; Simpson, G. G., 1; Smith, C. T., 1-5; Smith, H. L.; Stark; Sullivan; Truesdell, 1, 2; U.S. Atomic Energy Commission, 2; Von Buttlar, 2; Weeks, 2; Wengerd, 4, 8.

Mineral technology: Anderson, E. C., 3; Argall, 1; Birdseye, 2; Duschatko; Evans; Fitch; Garcia, 1-3; Hays, 1, 2; Marquardt, 1, 2; Miller, D. S.; N. Mex. Bur. Mines and Mineral Res., 1; Peterson, E. C.; Schilling, C. F.; Anon. 8, 16-18, 30.

White Sands, Dona Ana and Otero Counties, geology: Belknap; Jicha, 7; Kottlowski, 8; Weber, 2.

Zuni Mountains, McKinley and Valencia Counties, geology: Foster, 4; Four Corners Geol. Soc., 1; Gabelman, 2; Konigsmark, 1, 2.

Economic Geology

Abiquiu mining district, Rio Arriba County: Anderson, E. C., 3.

Alhambra mining district, Grant County: *see* Black Hawk mining district

Alteration:

Cochiti district: Bundy, 1-3.

Questa Molybdenum mine: Carpenter, R. H.

Santa Rita mine: Carpenter, D. W.; Creasey; Knox, M. S.

Ambrosia Lake mining district, McKinley County: Birdseye, 1; Ealy, 1, 2; Gableman, 4-6; Garrels; Granger; Gruner, 2; Hilpert, 1, 3, 4; Isachsen; Kerr; Knox, J. A.; Konigsmark, 1, 2; Miller, D. S.; Noble; Stieff; Vine, 1; Young, 1-3; Zitting; Anon., 18.

Anchor mining district, Taos County: Anderson, E. C., 3.

Anderson mining district, Hidalgo County: *see* Apache No. 2 mining district

Apache mining district, Sierra County: *see* Chloride mining district

Apache No. 2 mining district, Hidalgo County: Anderson, E. C., 3.

Arroyo Hondo mining district, Taos County: *see* Twining mining district

Asbestos: Hewitt, 2.

Asphalt (natural): Roswell Geol. Soc., 2.

Baldy mining district, Colfax County: Anderson, E. C., 2, 3.

Barite: Callaghan, 3; N. Mex. Bur. Mines and Mineral Res., 3; Peters, 2; Sun, 1.

Bayard mining district, Grant County: Anderson, E. C., 3.

Bear Mountain mining district, Grant County: *see* Fleming mining district

Economic Geology (continued)
Bent mining district, Otero County: *see* Tularosa mining district
Beryllium:
From pegmatites: *see* Pegmatites
Nonpegmatic: Holser; Oda.
Bisti oil field, San Juan County: Curtis; Devlin; Dougherty; Tomkins.
Black Hawk mining district, Grant County: Anderson, E. C., 3; Gillerman, 1.
Black Mountain–Gold Camp mining district, Dona Ana County: Anderson, E. C., 3.
Black Range mining district, Catron County: Anderson, E. C., 3. *See also* Chloride and Kingston mining districts
Bland mining district, Sandoval County: *see* Cochiti mining district
Boston Hill mining subdistrict, Grant County: Anderson, E. C., 3.
Botanical prospecting: Cannon, 1, 2.
Brice mining district, Otero County: *see* Orogrande mining district
Bromide mining district, Sierra County: *see* Tierra Blanca mining district
Bromide–Hopewell mining district, Rio Arriba County: Anderson, E. C., 3.
Bueyeros carbon dioxide fields, Harding County; Anderson, E. C., 4; Lang.
Bullard's Peak mining district, Grant County: *see* Black Hawk mining district
Burro Mountains mining district, Grant County: Anderson, E. C., 3; Hewitt, 2.
Caballo Mountains mining district, Sierra County: Anderson, E. C., 3.
Caliche: Baldwin, B., 7; Motts, 2.
Canyoncito mining district, Socorro County: *see* Joyita Hills mining district
Capitan coal field, Lincoln County: Bodine; Griswold.
Cap Rock Mountain Manganese mining district, Grant County: Anderson, E. C., 3.
Carbon dioxide: Anderson, E. C., 4; Baldwin, B., 7; Lang; Picard, 1.
Carlsbad mining district, Eddy County: Hardison; Jones, C. L., 1-4; N. Mex. Bur. Mines and Mineral Res., 3; Anon., 23.
Carpenter mining district, Grant County: Anderson, E. C., 3. *See also* Swartz mining district
Carrizalillo Hills mining district, Luna County: Anderson, E. C., 3.
Carrizo Mountains mining district: *see* Shiprock mining district
Carthage mining district, Socorro County: *see* Hansonburg mining district
Cat Mountain mining district, Socorro County: Anderson, E. C., 3.
Central mining district, Grant County: Allen, V. T.; Beckman; Griffitts; Jones, W. R.; Kelly, W. C., 1, 2; Kulp, 1; Rose, 1-3; Stringham.
Cerrillos mining district, Santa Fe County: Anderson, E. C., 3; Disbrow; Hayward.
Chloride mining district, Sierra County: Anderson, E. C., 3.
Chloride Flat mining subdistrict, Grant County: Anderson, E. C., 3; Stringham.
Chupadera mining district, Socorro County: Anderson, E. C., 3.
Cimarroncito mining district, Colfax County: Anderson, E. C., 3.
Clay: Baldwin, B., 7; Glassmire, 2; Griswold; N. Mex. Bur. Mines and Mineral Res., 3; Turner, 1; Woodyard.
Coal: N. Mex. Bur. Mines and Mineral Res., 1; Wier.
Capitan field: Bodine; Griswold.
La Ventana Mesa: Bachman, 4.
Raton Mesa: Carter, D. A.; Johnson, R. B., 4.
Reserves: Averitt; Vine, 1.
San Juan Basin: Hayes, 4.
Union County: Baldwin, B., 7.
Cobalt: Gillerman, 1.
Cochiti mining district, Sandoval County: Anderson, E. C., 3; Bundy, 1-3; Schwartz.
Cooks Peak mining district, Luna County: Anderson, E. C., 3; Griffitts.
Cooks Range Manganese mining district, Luna County: Anderson, E. C., 3.
Cooney mining district, Catron County: *see* Mogollon mining district

Cooper mining district, San Miguel County: *see* Willow Creek mining district
Copper: N. Mex. Bur. Mines and Mineral Res., 2; Schmitt, 2.
Big Burro Mountains: Hewitt, 2; Stringham.
Central district: Kulp, 1; Rose, 2, 3; Stringham.
Coyote district: Tschanz.
Hanover–Fierro district: Belt, 1, 2.
Hermosa district: Jahns, 1.
Hillsboro district: Kuellmer, 4.
Lincoln County: Griswold.
Lone Star prospect: Lustig, 1, 2.
Lordsburg district: Belt, 1, 2; Flege; Stringham.
Magdalena district: Belt, 1, 2; Stringham.
Pecos mine: Anderson, E. C., 2; Montgomery, A., 2.
Santa Rita mine: Anderson, E. C., 3; Burnham, 1, 2; Carpenter, D. W.; Creasey; Fleischer; Griffitts; Jensen, 2; Knox, M. S.; Schilling, J. H., 3; Schwartz; Stringham; Anon., 20.
Sedimentary: Fischer; Roswell Geol. Soc., 2; Soule.
Stauber mine: Roswell Geol. Soc., 2.
Taos County: Schilling, J. H., 4.
Union County; Baldwin, B., 7.
Copper Hill mining district, Taos County: *see* Picuris mining district
Council Rock mining district, Socorro County: Anderson, E. C., 3.
Cow Springs mining district, Grant County: *see* Burro Mountains mining district
Coyote Creek mining district, Mora County: Anderson, E. C., 2, 3; Tschanz.
Coyote–Youngsville mining district, Rio Arriba County: *see* Gallina mining district
Cuba mining district, Rio Arriba County: *see* Nacimiento Mountains mining district
Cuba mining district, Sandoval County: *see* Nacimiento Mountains mining district
Cuchillo Negro mining district, Sierra County: *see* Chloride mining district
Derry mining district, Sierra County: Ames, 1, 2; Anderson, E. C., 3.
Des Moines field, Union County: Anderson, E. C., 4.
Dolomite: Kottlowski, 3, 5.
Dolores mining district, Santa Fe County: *see* Old Placers mining district
East Caprock oil field, Lea County: Rambo.
Elizabethtown mining district, Colfax County: Anderson, E. C., 2, 3; Schilling, J. H., 2.
Elk Mountain mining district, San Miguel County: Cameron.
El Porvenir mining district, San Miguel County: Anderson, E. C., 2, 3.
El Rito placer mining district, Rio Arriba County: Anderson, E. C., 3.
Estancia Valley carbon dioxide field, Torrance County: Anderson, E. C., 4.
Estey mining district, Lincoln County: Anderson, E. C., 3.
Eureka mining district, Hidalgo County: *see* Hachita mining district
Eureka mining district, Grant County: *see* Hachita mining district
Fierro mining district, Grant County: *see* Hanover–Fierro mining district
Fleming mining district, Grant County: Anderson, E. C., 3.
Florida Mountains mining district, Luna County: Anderson, E. C., 3.
Fluorite: Elston, 2, 3; Flege; Gillerman, 2, 3; Griswold; Hewitt, 2; N. Mex. Bur. Mines and Mineral Res., 3; Peters, 1; Schilling, J. H., 4; Sun, 1.
Fra Cristobal Range mining district, Sierra County: Anderson, E. C., 3.
Fremont mining district, Hidalgo County: Anderson, E. C., 3.
Fremont mining district, Luna County: Anderson, E. C., 3.
Gage mining district, Luna County: *see* Victorio mining district
Gallegos–Gallup oil field, San Juan County: Matheny, 2.
Gallina mining district, Rio Arriba County: Anderson, E. C., 3; Griswold.
Gallinas Mountains mining district, Lincoln County: Anderson, E. C., 3.
Gallup mining district, McKinley County: Hilpert, 1, 3, 4.
Gas: *see* Oil and gas

Economic Geology (continued)

Georgetown mining district, Grant County: Anderson, E. C., 3.
Gillespie mining district, Hidalgo County: *see* Red Hill mining district
Glorieta mining district, Santa Fe County: Anderson, E. C., 2, 3.
Gold: Griswold; Jahns, 1; McKinlay, 1, 2; N. Mex. Bur. Mines and Mineral Res., 2; Schilling, J. H., 2-4; Schwartz; Silliman; Stringham.
Gold Dust placer mining district, Sierra County: *see* Las Animas mining district
Gold Hill mining district, Grant County: Anderson, E. C., 3.
Gold Hill mining district, Hidalgo County: Anderson, E. C., 3.
Goodfortune Creek mining subdistrict, Socorro County: Anderson, E. C., 3.
Gossans: Kelly, W. C., 1, 2.
Grandview Canyon mining subdistrict, Socorro County: Anderson, E. C., 3.
Grants mining district, Valencia County: Coleman; Colman, 1, 2; Ealy, 3; Gabelman, 2, 7; Gruner, 1-3; Hilpert, 1, 3, 4; Jensen, 1; Kerr; Mathewson, 2; Miller, D. S.; Mitcham; Noble; Stern; Sun, 4, 6, 7; Truesdell, 1, 2; Weeks, 2; Anon., 18.
Graphite: Schilling, J. H., 4.
Gypsum: Griswold; Jicha, 4, 7; Kottlowski, 8; Weber, 2.
Hachita mining district, Grant County: Anderson, E. C., 3.
Hachita mining district, Hidalgo County: Anderson, E. C., 3; Burnham, 1, 2.
Hanover–Fierro mining district, Grant County: Anderson, E. C., 3; Barnes, H. L., 1-3; Belt, 1, 2; Burnham, 1, 2; Griffitts; Hewett, 2; Kelly, W. C., 1, 2; McKinstry.
Hansonburg mining district, Socorro County: Ames, 1, 2; Anderson, E. C., 3; Austin, 3, 4; Callaghan, 3; Sun, 1.
Harding mine, Picuris mining district: Aldrich; Anderson, E. C., 3; Cameron; Damon; Jahns, 2-4; Kulp, 2; Schilling, J. H., 4.
Headstone mining district, Rio Arriba County: *see* Bromide–Hopewell mining district
Helium: Boone; Picard, 1, 3.
Hembrillo–San Andrecito mining district, Dona Ana County: Anderson, E. C., 3.
Hermit Mountain mining district, San Miguel County: *see* El Porvenir mining district
Hermosa mining district, Sierra County: Anderson, E. C., 3; Burnham, 1, 2; Jahns, 1.
High Rolls mining district, Otero County: *see* Sacramento mining district
Hillsboro mining district, Sierra County: Anderson, E. C., 3; Kuellmer, 4; Stringham.
Hop Canyon mining district, Socorro County: Anderson, E. C., 3.
Horseshoe–Gallup oil field, San Juan County: Knight.
Hospah oil field, San Juan County: King, V. L.
Hot Springs mining district, Sierra County: Anderson, E. C., 3.
Iron: Bertholf; Griswold; Hewitt; Krauskopf; N. Mex. Bur. Mines and Mineral Res., 2; Ramdohr; Schilling, J. H., 4; Walker, G. W.
Iron Mountain mining district, Socorro County; Anderson, E. C., 3; Griffitts; Oda.
Jarilla mining district, Otero County: *see* Orogrande mining district
Jemez Springs mining district, Sandoval County: Anderson, E. C., 3.
Jicarilla mining district, Lincoln County: Anderson, E. C., 3; Griswold.
Jones Camp mining district, Socorro County: Anderson, E. C., 3.
Joyita Hills mining district, Socorro County: Anderson, E. C., 3.
Kingston mining district, Sierra County: Anderson, E. C., 3; Hewett, 2; Stringham.
La Bajada mining district, Santa Fe County: Anderson, E. C., 3.
La Belle mining district, Taos County: *see* Anchor mining district
Ladron Mountains mining district, Socorro County: Anderson, E. C., 3.
Laguna mining district, Valencia County: Coleman; Colman, 1, 2; Cook; Gabelman, 2; Hilpert, 1, 3, 4; Jensen, 1; Kerr; Mathewson, 1; Mitcham; Moench, 3, 4; Noble; Truesdell, 1, 2; Weeks, 2.
Lake Valley mining district, Sierra

County: Anderson, E. C., 3; Hewett, 1, 2.
Las Animas mining district, Sierra County: *see* Hillsboro mining district
Las Animas placer mining district, Sierra County: Anderson, E. C., 3.
Lead: N. Mex. Bur. Mines and Mineral Res., 2.
Big Burro Mountains: Hewitt, 2; Stringham.
Central district: Kelly, W. C., 1, 2; Kulp, 1; Stringham.
Cerrillos district: Disbrow.
Hansonburg district: Sun, 1.
Hermosa district: Jahns, 1.
Lincoln County: Griswold.
Lordsburg district: Flege; Stringham.
Magdalena district: Titley, 1, 2.
Pecos mine: Anderson, E. C., 2; Montgomery, A., 2.
Taos County: Schilling, J. H., 4.
Lemitar Mountains mining district, Socorro County: Anderson, E. C., 3.
Lime: Jicha, 1, 4.
Little Florida Mountains mining district, Luna County: Anderson, E. C., 3; Hewett, 1, 2.
Lone Mountain mining district, Grant County: Anderson, E. C., 3.
Lone Star prospect, Santa Fe County: Lustig, 1, 2.
Lordsburg mining district, Hidalgo County: Anderson, E. C., 3; Belt, 1, 2; Burnham, 1, 2; Flege, Stringham.
Luis Lopez Manganese mining district, Socorro County: Anderson, E. C., 3; Hewett, 1, 2; Jicha, 3, 5; Miesch.
Macho mining district, Sierra County: Anderson, E. C., 3.
Magdalena mining district, Socorro County: Allen, V. T.; Anderson, E. C., 3; Austin, 2; Belt, 1, 2; Burnham, 1, 2; Stringham; Titley, 1, 2.
Magdalena Mountains Manganese mining district, Socorro County: Anderson, E. C., 3.
Magnesite: Hewitt, 2.
Malone mining district, Grant County: Anderson, E. C., 3.
Manganese: Griswold; Hewett, 1, 2; Hewitt, 2; Jicha, 3, 5; Miesch; N. Mex. Bur. Mines and Mineral Res., 2; Park.
Manganese Valley mining district, Luna County: *see* Little Florida Mountains mining district
Medio oil field, Sandoval County: Ostrander.
Mescalero oil field, Lea County: Rambo.
Mica: Glassmire, 1; Hewitt, 2.
Mill Canyon mining district, Socorro County: Anderson, E. C., 3.
Mimbres mining district, Grant County: *see* Georgetown mining district
Mockingbird Gap mining district, Socorro County: Anderson, E. C., 3.
Mogollon mining district, Catron County: Anderson, E. C., 3; Stringham.
Molybdenum: Carpenter, R. H.; Fleischer; Geilmann; Griswold; Hiskey; Kuellmer, 3-5; McKinlay, 2; N. Mex. Bur. Mines and Mineral Res., 2; Schilling, J. H., 1-4; Upshaw, 2.
Moore oil field, Lea County: Rambo.
Moreno mining district, Colfax County: *see* Elizabethtown mining district
Mud Springs mining district, Sierra County: *see* Hot Springs mining district
Nacimiento Mountains mining district, Rio Arriba and Sandoval Counties: Anderson, E. C., 3.
New Empire oil field, Permian Basin: Podpechan.
New Placers mining district, Santa Fe County: Anderson, E. C., 3.
Nickel: Gillerman, 1.
Nitrogen: Picard, 1.
No Agua mining district, Taos County: Schilling, J. H., 4; Smith, R. L., 1.
Nogal mining district, Lincoln County: Anderson, E. C., 3; Burnham, 1, 2; Griswold.
Nogal mining district, Socorro County: *see* San Jose mining district
North Magdalena mining district, Socorro County: Anderson, E. C., 3.
Oil and gas: N. Mex. Bur. Mines and Mineral Res., 1. *See also* Oil and gas possibilities
Anadarko Basin: Beebe.
Bisti oil field: Curtis; Devlin; Dougherty; Tomkins.
Chama Basin: Bieberman, 3.
East Caprock oil field: Rambo.
Gallegos–Gallup oil field: Matheny, 2.

Economic Geology (continued)
Horseshoe–Gallup oil field: Knight.
Hospah oil field: King, V. L.
Medio oil field: Ostrander.
Mescalero oil field: Rambo.
Moore oil field: Rambo.
New Empire oil field: Podpechan.
Permian Basin: Galley; Helmig; King, H. H.; Phifer; Picard, 2; Roswell Geol. Soc., 3; Stipp, 2; Anon., 25, 34.
Rattlesnake field: Pierce.
San Juan Basin: Carter, K. E.; Curtis; Matheny, 1; Peterson, J. A.; Reese; Wenger; Wengerd, 1, 5, 7; Anon., 31, 33.
Union County: Baldwin, B., 7; Dougherty.
Verde–Gallup oil field: Speer.
Oil and gas possibilities: *see also* Oil and gas
Lucero Basin: Gardner, F. J.; Wengerd, 2, 4, 8.
Permian Basin: Barnes, C. E.; Cooley, B., 2; Montgomery, A., 2.
San Juan Basin: Budd, 2; Gray; Silver, 2; Wengerd, 6.
Southwestern New Mexico: Kottlowski, 12; Zeller, 6.
Ojo Caliente mining district, Socorro County: Anderson, E. C., 3.
Old Placers mining district, Santa Fe County: Anderson, E. C., 3.
Organ mining district, Dona Ana County: Allen, V. T.; Anderson, E. C., 3; Burnham, 1, 2.
Orogrande mining district, Otero County: Anderson, E. C., 3; Burnham, 1, 2.
Ortiz mining district, Santa Fe County: *see* Old Placers mining district
Oscuro mining district, Lincoln County: *see* Estey mining district
Palomas mining district, Sierra County: *see* Hermosa mining district
Pastura mining district, Guadalupe County: Anderson, E. C., 3.
Pecos mine, Willow Creek district: Anderson, E. C., 2; Montgomery, A., 2.
Pecos mining district, San Miguel County: *see* Willow Creek mining district
Pegmatites:
Elk Mountain district: Cameron.
Harding mine: Aldrich; Anderson, E. C., 3; Cameron; Damon; Jahns, 2-4; Kulp, 2; Schilling, J. H., 4.
Petaca district: Anderson, E. C., 3; Cameron; Kulp, 2.
With mica: Glassmire.
Perlite: Elston, 2, 3; Flege; Jaster; N. Mex. Bur. Mines and Mineral Res., 3; Schilling, J. H., 4; Smith, R. L., 1; Weber, 1.
Petaca mining district, Rio Arriba County: Anderson, E. C., 3; Cameron; Corey; Kulp, 2.
Picuris mining district, Taos County: Aldrich; Anderson, E. C., 3; Cameron; Damon; Jahns, 2-4; Kulp, 2; Schilling, J. H., 4.
Pinos Altos mining district, Grant County: Anderson, E. C., 3; Stringham.
Pintada mining district, Guadalupe County: *see* Pastura mining district
Pittsburg placer mining district, Sierra County: Anderson, E. C., 3.
Placer deposits:
Gold: Griswold; Silliman.
Titanium: Allen, J. E., 1; Chenoweth, 1, 2.
Placitas mining district, Sandoval County: Anderson, E. C., 3.
Ponil mining district, Colfax County: Anderson, E. C., 3.
Possibilities: *see* Oil and gas possibilities
Potash: Hardison; Jones, C. L., 1-4; N. Mex. Bur. Mines and Mineral Res., 3; Anon., 23.
Pumice: Kelley, 1; N. Mex. Bur. Mines and Mineral Res., 3.
Pyramid mining district, Hidalgo County: *see* Lordsburg mining district
Questa Molybdenum mine, Taos County: Carpenter, R. H.; Fleischer; Kuellmer, 3, 5; McKinlay, 2; Schilling, J. H., 1, 2, 4; Upshaw, 2.
Radium: Barker, 1, 2.
Rare-earths: Griswold.
Rattlesnake oil and gas field, San Juan County: Pierce.
Rayo mining district, Socorro County: Anderson, E. C., 3.
Redbed copper deposits: *see* Copper, Sedimentary
Red Cloud mining district, Lincoln County: *see* Gallinas Mountains mining district
Red Hill mining district, Hidalgo County: Anderson, E. C., 3.

Red River mining district, Taos County: Anderson, E. C., 3: McKinlay, 1, 2; Schilling, J. H., 4.
Refractory minerals: Corey; Schilling, J. H., 4.
Rhenium: Fleischer; Geilmann; Hiskey.
Rinconada mining district, Rio Arriba County: Anderson, E. C., 3.
Rincon manganese mining district Dona Ana County: Anderson, E. C., 3.
Rio Grande placer mining district, Taos County: Anderson, E. C., 3; Schilling, J. H., 4; Silliman.
Rio Hondo mining district: *see* Twining mining district
Rociada mining district, San Miguel County: Anderson, E. C., 2, 3.
Rosedale mining district, Socorro County: Anderson, E. C., 3.
Sacramento mining district, Otero County: Anderson, E. C., 3.
Salinas Peak mining subdistrict, Socorro County: Anderson, E. C., 3.
San Acacia mining district, Socorro County: *see* San Lorenzo mining district
San Andres Mountains mining district, Socorro County: Anderson, E. C., 3.
San Jose mining district, Socorro County: Anderson, E. C., 3.
San Lorenzo mining district, Socorro County: Anderson, E. C., 3.
San Mateo mining district, Socorro County: *see* San Jose mining district
San Mateo Mountains mining district, Sierra County: Anderson, E. C., 3.
San Pedro mining district, Santa Fe County: *see* New Placers mining district
Santa Fe mining district, Santa Fe County: Anderson, E. C., 2, 3.
Santa Fe manganese mining district, Santa Fe County: Anderson, E. C., 3.
Santa Rita mine, Grant County: Anderson, E. C., 3; Burnham, 1, 2; Carpenter, D. W.; Creasey; Fleischer; Griffitts; Jensen, 2; Knox, M. S.; Schilling, J. H., 3; Schwartz; Stringham; Anon., 20.
Scholle mining district, Socorro County: Anderson, E. C., 3.
Scoria: Baldwin, B., 7.
Selenium: Coleman.
Serpentine: Hewitt, 2.
Shiprock mining district, San Juan County: Kerr; Ross; Thompson, M. E.
Silver: Hewitt, 2; Jahns, 1; N. Mex. Bur. Mines and Mineral Res., 2; Stringham.
Silver City mining district, Grant County: Anderson, E. C., 3.
Silver Hill mining district, Otero County: *see* Orogrande mining district
Shandon placer mining district, Sierra County: *see* Pittsburg mining district
Socorro Peak mining district, Socorro County: Anderson, E. C., 3.
Source rocks: Stringham.
Steeple Rock mining district, Grant County: Anderson, E. C., 3; Burnham, 1, 2; Elston, 1; Stringham.
Steins Pass–San Simon mining district, Hidalgo County: Anderson, E. C., 3.
Stendel perlite deposit, Socorro County: Weber, 1.
Sulfur: Wideman.
Sulphur Canyon mining subdistrict, Socorro County: Anderson, E. C., 3.
Swartz mining district, Grant County: Anderson, E. C., 3.
Sylvanite mining district, Hidalgo County: see Hachita mining district
Taylor Creek mining district, Catron County: *see* Black Range mining district
Taylor Creek tin mining district, Sierra County: Anderson, E. C., 3.
Tecolote mining district, San Miguel County: Anderson, E. C., 2, 3; Griswold.
Telegraph mining district, Grant County: Anderson, E. C., 3.
Thorium: Pliler.
Tierra Blanca mining district, Sierra County: Anderson, E. C., 3.
Tijeras Canyon mining district, Bernalillo County: Anderson, E. C., 3.
Titanium: Allen, J. E., 1; Chenoweth, 1, 2; Murphy; Sun, 3.
Tres Hermanas mining district, Luna County: Anderson, E. C., 3.
Tularosa mining district, Otero County: Anderson, E. C., 3.
Tungsten: N. Mex. Bur. Mines and Mineral Res., 2.
Big Burro Mountains: Hewitt, 2.

Economic Geology (continued)
Lincoln County: Griswold.
Magdalena district: Austin, 2.
New Mexico: Dale.
Peloncillo Mountains: Gillerman, 2, 3.
Turquoise: Disbrow; Hayward.
Twining mining district, Taos County: Anderson, E. C., 3; Schilling, J. H., 4.
Tyrone mining district, Grant County: Anderson, E. C., 3; Hewitt, 2; Stringham. *See also* Burro Mountains mining district
Uranium: Kehn; Lovering; Melin; N. Mex. Bur. Mines and Mineral Res., 2.
Ambrosia Lake District: Birdseye, 1; Ealy, 1, 2; Gabelman, 4-6; Garrels; Granger; Gruner, 2; Hilpert, 1, 3, 4; Isachsen; Kerr; Knox, J. A.; Konigsmark, 1, 2; Miller, D. S.; Noble; Stieff; Vine, 1; Young, 1-3; Zitting; Anon., 18.
Bear Mountains: Anon., 32.
Big Burro Mountains: Hewitt, 2.
Black Hawk district: Gillerman, 1.
Coyote Creek district: Tschanz.
Datil Mountains: Anon., 32.
Gallup district: Hilpert, 1, 3, 4.
Grants district: Coleman; Colman, 1, 2; Ealy, 3; Gabelman, 2, 7; Gruner, 1-3; Hilpert, 1, 3, 4; Jensen, 1; Kerr; Mathewson, 2; Miller, D. S.; Mitcham; Noble; Stern; Sun, 4, 6, 7; Truesdell, 1, 2; Weeks, 2; Anon., 18.
Laguna district: Coleman; Colman, 1, 2; Cook; Gableman, 2; Hilpert, 1, 3, 4; Jensen, 1; Kerr; Mathewson, 1; Mitcham; Moench, 3, 4; Noble; Truesdell, 1, 2; Weeks, 2.
La Ventana Mesa: Bachman, 4; Cannon, 1, 2.
Llano Estacado: Bachman, 4.
Lone Star prospect: Lustig, 1, 2.
San Juan Basin: Chew; Dodd; Fischer; Gabelman, 8, 9; Gruner, 4; Laverty; Pliler; Shoemaker, 1; Stern; Weeks, 1; Wood, H. B., 1, 2.
Shiprock district: Kerr; Ross; Thompson, M. E.
Ute Creek mining district, Colfax County: *see* Baldy mining district
Vanadium: Fischer; Ross.
Verde–Gallup oil field, San Juan County: Speer.
Victorio mining district, Luna County: Anderson, E. C., 3.
Virginia mining district, Hidalgo County: *see* Lordsburg mining district
Water Canyon mining district, Socorro County: Anderson, E. C., 3.
West Picuris mining district, Rio Arriba County: *see* Rinconada mining district
White Oaks mining district, Lincoln County: Anderson, E. C., 3; Griswold.
White Signal mining district, Grant County: Anderson, E. C., 3.
Willow Creek mining district, Colfax County: Anderson, E. C., 2, 3; Burnham, 1, 2.
Willow Creek mining district, San Miguel County: Anderson, E. C., 3; Montgomery, A., 2.
Woodrow mine, Laguna district: Cook.
Zinc: N. Mex. Bur. Mines and Mineral Res., 2.
Central district: Allen, V. T.; Kelly, W. C., 1, 2; Kulp, 1; Rose, 1-3; Stringham.
Cerrillos district: Disbrow.
Hanover–Fierro district: Barnes, H. L., 1-3; Belt, 1, 2; Kelly, W. C., 1, 2.
Hermosa district: Jahns, 1.
Lincoln County: Griswold.
Lordsburg district: Flege; Stringham.
Magdalena district: Allen, V. T.; Belt, 1, 2; Stringham; Titley, 1, 2.
Organ Mountains district: Allen, V. T.
Pecos mine: Anderson, E. C., 3; Montgomery, A., 2.
Taos County: Schilling, J. H., 4.
Zirconium: Allen, J. E., 1; Chenoweth, 1, 2.

Geochemistry

Argon, in beryl: Damon.
Beryllium, exploration: Oda.
Central mining district, trace-element distribution: Rose, 1-3.
Composition of:
Inclusions: Ames, 1, 2.
Pre-Simpson Paleozoic rocks: Barnes, V. E., 2.
Copper:
In monzonitic intrusives: Griffitts.
In shale: Barnes, H. L., 1-3.
Exploration, beryllium: Oda.
Hanover–Fierro mining district, trace-

element distribution: Barnes, H. L., 1-3.
Helium, in beryl: Damon.
Inclusions, liquid, composition of: Ames, 1, 2.
Iron, in shale: Barnes, H. L., 1-3.
Iron Mountain mining district, exploration for beryllium: Oda.
Lead, in monzonitic intrusives: Griffitts.
Pegmatites, Harding mine: Jahns, 2, 3.
Rhenium, in molybdenite: Fleischer; Geilmann; Hiskey.
Selenium, in sulfide minerals: Coleman.
Trace-element distribution:
Central mining district: Rose, 1-3.
Hanover–Fierro mining district: Barnes, H. L., 1-3.
In monzonitic intrusives: Griffitts.
In ore deposits: Burnham, 1, 2.
In shale: Barnes, H. L., 1-3.
In sulfide minerals, Central mining district: Rose, 1-3.
Uranium: Garrels; Weeks, 2.
Zinc:
In monzonitic intrusives: Griffitts.
In shale: Barnes, H. L., 1-3.

Geophysics

Age determinations, radioactive:
Ambrosia Lake mining district: Miller, D. S.
Granitic rocks: Aldrich.
Grants mining district: Miller, D. S.
Harding mine: Aldrich; Kulp, 2.
Picuris mining district: Aldrich; Kulp, 2.
Ambrosia Lake mining district, radioactive age determinations: Miller, D. S.
Anderson Ranch oil field, case history: Swenumson.
Case history, Anderson Ranch oil field: Swenumson.
Electrical survey, induced polarization: Vacquier.
Gamma logging, uranium: Chapman; Hilpert, 2.
General: Rabbitt, 1-3.
Geothermal survey of hot ground: Kintzinger.
Grants mining district:
Radioactive age determinations: Miller, D. S.
Sulfur isotope ratios: Jensen, 1.
Gravity surveys:
Carrizo Mountains: Plouff.
In 1959: Patrick.
Ground-water exploration, induced electrical polarization: Vacquier.
Hansonburg mining district, lead isotope ratios: Austin, 3, 4.
Harding mine:
Pegmatites: Jahns, 2, 3.
Radioactive age determinations: Aldrich; Kulp, 2.
Inclusions, liquid, used to estimate temperatures: Schlaudt.
Induced electrical polarization, ground-water exploration: Vacquier.
Isotope ratios:
Lead: Austin, 3, 4.
Sulfur: Jensen, 1, 2; Kulp, 1.
Lead isotope ratios: Austin, 3, 4.
Magnetic survey, Rio Grande depression: M'Gonigle.
Magnetic susceptibility, volcanic rocks: Wargo, 5.
Magnetization, direction in basalts: Muehlberger, 2, 3.
Pegmatites, Harding mine: Jahns, 2, 3.
Petaca mining district, radioactive age determinations: Kulp, 2.
Radioactive age determinations: *see* Age determinations, radioactive.
Radioactivity, relation to alteration at Santa Rita: Knox, M. S.
Rio Grande depression:
Magnetic survey: M'Gonigle.
Telluric current survey: Sullivan.
Santa Rita mine:
Relation of radioactivity to alteration: Knox, M. S.
Sulfur isotope ratios: Jensen, 2.
Seismic exploration:
Delaware Basin: Trostle, 1, 2.
In 1959: Patrick.
Seismic measurements, high-explosive tests: Byerly.
Sulfur isotope ratios: Jensen, 1, 2; Kulp, 1.
Telluric current survey, Rio Grande depression: Sullivan.
Temperatures, estimated from liquid inclusions: Schlaudt.
Thermoluminescence: Barnes, V. E., 3.

Historical and Stratigraphic Geology

Note: To find the articles on an area that include some stratigraphy or historical geology, look under the given area in the section *Areas*. (A few articles listed under *Areas* do not include stratig-

Historical and Stratigraphic Geology (continued)

raphy or historical geology, although most do.)
Abiquiu tuff: Baldwin, B., 2.
Abo formation: Bachman, 2, 3; Elston, 2, 3; Hayes, 1; Jicha, 4; Kottlowski, 2, 9, 13, 17, 18; Kuellmer, 1; Otte, 1; Podpechan; Pray, 3; Romer; Smith, C. T., 1, 3, 4; Tonking; Weber, 2.
Aleman formation: Flower, 2; Kottlowski, 2.
Amalia formation: McKinlay, 1.
Ancha formation: Baldwin, B., 2; Sun, 5.
Aneth formation: Baars; Cooper, J. C.
Animas formation: Simpson, 2.
Animas quartz monzonite: Alper, 1-3.
Arbuckle group: Barnes, V. E., 1, 3-5; Cloud; Foster, 1; Tynan.
Arroyo Penasco formation: Armstrong, 2, 7; Fitzsimmons, 1.
Baca formation: Givens; Kottlowski, 1, 2; Tonking.
Bandelier tuff: Smith, R. L., 2.
Beartooth quartzite: Elston, 2, 3, 7.
Beeman formation: Bergeron; Pray, 3.
Bernal formation: Baltz, 1; Read, 2; Smith, C. T., 6.
Bidahochi formation: Repenning, 1.
Blanco Basin formation: Muehlberger, 5.
Bliss sandstone: Ballman, 2, 3; Elston, 2, 3; Flower, 6, 7; Kottlowski, 2, 13; Kuellmer, 1; Lochman-Balk, 1; Pray, 3.
Blue Springs schist: Stark.
Bone Springs formation: Boyd, 1, 2.
Burned Mountain metarhyolite: Barker, 3; Muehlberger, 4.
Bursum formation: Kottlowski, 2, 13; Oppel, 1, 2; Pray, 3.
Caballero formation: Kottlowski, 2, 13; Kuellmer, 1; Pray, 3.
Cabresto metaquartzite: McKinlay, 1, 2.
Caloso formation: Armstrong, 1, 3, 4, 7.
Cambrian: Gillerman, 2, 3; Jacobs, 1, 2; Jicha, 2, 6; Kottlowski, 2, 13, 17; Momper, 1, 2; Zeller, 3.
Arbuckle group: Barnes, V. E., 1, 3-5; Cloud; Foster, 1; Tynan.
Bliss sandstone: Ballman, 2, 3; Elston, 2, 3; Flower, 6, 7; Kottlowski, 2, 13; Kuellmer, 1; Lochman-Balk, 1; Pray, 3.
Riley formation: Barnes, V. E., 1-5; Cloud; Tynan.
Wilberns formation: Barnes, V. E., 1-5; Cloud; Tynan.
Capitan limestone: Moore; Motts, 4.
Carlile shale: Baldwin, B., 7; Baltz, 1; Griggs, 2.
Carrizozo basalt flow: Allen, J. E., 3.
Castile formation: Olive.
Chalk Bluff formation: Foster, 1; Read, 2.
Cherry Run formation: Hayes, 6.
Chinle formation: Akers, 1, 2; Budding, 2; Colbert; Cooley, M. E., 1, 4; Foster, 3; Givens; Harshbarger, 1, 2; Jicha, 4; Muehlberger, 5; Smith, C. T., 1, 3, 4, 6; Stark; Willard, 4, 5.
Chuska sandstone: Repenning, 1; Wright, H. E.
Cieneguilla limburgite: Disbrow; Sun, 5.
Cisneros basalt: Barker, 3.
Climate, Pleistocene: Murray, K. F.
Colorado shale: Elston, 2, 3, 7; Kuellmer, 1.
Conejos formation: Barker, 3; Muehlberger, 5.
Contadero formation: Flower, 6, 7; Kottlowski, 2, 13.
Correlation, igneous rocks by fusion methods: Callaghan, 2.
Cow Springs formation: Harshbarger, 1, 2.
Cretaceous: Alper, 1, 2; Anderson, R. Y., 1-3; Barnes, H.; Berry; Bodine; Chenoweth, 1, 2; Crutcher; Dane, 1, 5, 7; Ekren; Flege; Gillerman, 2, 3; Griggs, 3; Hayes, 4; Hewitt, 2; Kelley, 7; Kottlowski, 2, 6, 13, 14; Lochman-Balk, 2; Mankin, 2; Okla. City Geol. Soc.; Perkins, B. F.; Rawson, 1, 2; Reese; Reneau; Silver, 1; Smith, H. L.; Sun, 5; Weber, 2; Willard, 1; Zeller, 1, 3, 4.
Animas formation: Simpson, 2.
Beartooth quartzite: Elston, 2, 3, 7.
Carlile shale: Baldwin, B., 7; Baltz, 1; Griggs, 2.
Colorado shale: Elston, 2, 3, 7; Kuellmer, 1.
Dakota formation: Baldwin, B., 1, 7; Baltz, 1; Budding, 2; Dane, 2, 4, 9; Foster, 1, 3; Gabelman, 8; Gadway; Givens; Griggs, 2; Harshbarger, 1, 2; Jicha, 4; Kottlowski, 2, 13; Muehlberger, 5; Pray, 1; Smith, C.

T., 1, 3, 4, 6; Stegall; Tonking; Tyrrell; Willard, 4, 5; Young, 4; Anon., 33.
Eagle Ford formation: Kottlowski, 2, 13.
Farmington sandstone: Dilworth.
Fruitland formation: Burgener; Simpson, 2.
Graneros shale: Baldwin, B., 1, 7; Griggs, 2.
Greenhorn limestone: Baldwin, B., 1, 7; Baltz, 1; Griggs, 2.
Kirtland formation: Anderson, R. Y., 1-3; Simpson, 2.
Lewis shale: Anderson, R. Y., 3; Muehlberger, 5.
Lobo formation: Ballman, 2, 3; Kottlowski, 9; Lochman-Balk, 1.
Mancos shale: Budding, 2; Dane, 2, 4, 6, 9; Foster, 3; Gadway; Givens; Jicha, 4; Kottlowski, 2, 13; Muehlberger, 5; Pliler; Smith, C. T., 1, 3, 4, 6; Tonking; Willard, 4, 5.
McRae formation: Kottlowski, 1, 2.
Mesaverde group: Allen, J. E., 1; Beaumont, 1, 2; Budd, 1; Dane, 3, 4; Foster, 3; Gadway; Givens; Jicha, 4; Kottlowski, 2, 13; Link; Muehlberger, 5; Parry; Sabins; Smith, C. T., 1, 3; Sun, 3; Tonking; West, 3; Willard, 3-5; Williams; Wood, J. W.
Niobrara formation: Baldwin, B., 7; Baltz, 1; Griggs, 2.
Ojo Alamo formation: Anderson, R. Y., 1-3; Simpson, 2.
Pictured Cliffs sandstone: Burgener.
Pierre shale: Griggs, 2; Johnson, R. B., 1-3.
Purgatoire formation: Baldwin, B., 1, 7; Foster, 1.
Sarten quartzite: Elston, 2, 3; Kottlowski, 2, 13.
Trinidad formation: Johnson, R. B., 1-3.
Vermejo formation: Johnson, R. B., 1-4.
Virden formation: Elston, 7.
Cuchara formation: Johnson, R. B., 1-3.
Cutler formation: Romer.
Cutter formation: Flower, 2.
Dakota formation: Baldwin, B., 1, 7; Baltz, 1; Budding, 2; Dane, 2, 4, 9; Foster, 1, 3; Gabelman, 8; Gadway; Givens; Griggs, 2; Harshbarger, 1, 2; Jicha, 4; Kottlowski, 2, 13; Muehlberger, 5; Pray, 1; Smith, C. T., 1, 3, 4, 6; Stegall; Tonking; Tyrrell; Willard, 4, 5; Young, 4; Anon., 33.
Datil formation: Givens; Tonking; Weber, 4; Willard, 2-5.
Delaware Mountain sandstone: Hull, 2.
Devil's Hole formation: Johnson, R. B., 1, 3.
Devonian: Baltz, 1; Flower, 4, 5; Gillerman, 2, 3; Jicha, 6; Kottlowski, 17; LeMone, 2; Momper, 1, 2; Zeller, 3.
Aneth formation: Baars; Cooper, J. C.
Contadero formation: Flower, 6, 7; Kottlowski, 2, 13.
Elbert formation: Baars; Cooper, J. C.
Espiritu Santo formation: Baltz, 4.
Onate formation: Flower, 6, 7; Kottlowski, 2, 13; Kuellmer, 1; Pray, 3.
Ouray limestone: Baars; Cooper, J. C.
Percha shale: Cooper, G. A., 1, 2; Elston, 2, 3; Flower, 6, 7; Kottlowski, 2; Kuellmer, 1; Pray, 3.
Sly Gap formation: Flower, 6, 7; Kottlowski, 2, 13; Pray, 3.
Dockum group: Baldwin, B., 1, 7; Baltz, 1; Cazeau; Foster, 1; Griggs, 2; Kottlowski, 2, 13.
Dorado basalt: Barker, 3.
Eagle Ford formation: Kottlowski, 2, 13.
Elbert formation: Baars; Cooper, J. C.
Ellenberger group: Barnes, V. E., 1-5; Cloud; Folk; Tynan.
El Paso limestone: Ballman, 2, 3; Dickinson; Elston, 2, 3; Flower, 1, 6, 7; Kottlowski, 2, 5, 13; Kuellmer, 1; Lochman-Balk, 1; Pray, 3.
El Rito formation: Budding, 2.
Embudo granite: Montgomery, A., 1.
Entrada formation: Budding, 2, Harshbarger, 1, 2; Jicha, 4; Muehlberger, 5; Smith, C. T., 3-5.
Espinoso volcanics: Disbrow.
Espiritu Santo formation: Baltz, 4.
Exeter formation: Foster, 1; Mankin, 1.
Farasita conglomerate: Johnson, R. B., 1, 3.
Farmington sandstone: Dilworth.
Fresnal group: Oppel, 1, 2; Wesh.
Fruitland formation: Burgener; Simpson, 2.
Fusselman limestone: Elston, 2, 3;

Historical and Stratigraphic Geology (continued)
Flower, 6, 7; Kottlowski, 2, 5, 13; Kuellmer, 1; Pray, 3.
Galisteo formation: Disbrow; Robinson; Sun, 5.
Gallup sandstone: Beaumont, 2; Budd, 1; Dane, 3. *See also* Mesaverde group
Gila conglomerate: Ballman, 2, 3; Elston, 7; Heindl; Weber, 3, 4; Willard, 2, 5, 6.
Glorieta sandstone: Foster, 1; Jicha, 4; Smith, C. T., 1, 3, 4.
Gobbler formation: Pray, 3.
Graneros shale: Baldwin, B., 1, 7; Griggs, 2.
Grayburg formation: Hayes, 6.
Greenhorn limestone: Baldwin, B., 1, 7; Baltz, 1; Griggs, 2.
Holder formation: Cline; Otte, 1; Pray, 3; Reyer.
Horquilla limestone: Zeller, 7.
Hueco limestone: Bachman, 2, 3; Hayes, 1; Kottlowski, 2, 9, 13; Weber, 2.
Huerfano formation: Johnson, R. B., 1-3.
Jurassic: Berry; Dane, 1; Ekren; Griggs, 3; Kottlowski, 2, 6; Lochman-Balk, 2; Mankin, 2; Mirsky; Momper, 1, 2; Okla. City Geol. Soc.
Cow Springs formation: Harshbarger, 1, 2.
Entrada formation: Budding, 2; Harshbarger, 1, 2; Jicha, 4; Muehlberger, 5; Smith, C. T., 3-5.
Exeter formation: Foster, 1; Mankin, 1.
Morrison formation: Baldwin, B., 1, 7; Baltz, 1; Budding, 2; Craig; Dodd; Foster; Freeman; Griggs, 2; Harshbarger, 1, 2; Jicha, 4; Konigsmark, 1, 2; Muehlberger, 5; Mullens; Myers, J. D.; Parks; Smith, C. T., 4, 5; Swift.
Ocate sandstone: Baltz, 1.
San Rafael group: Cumella; Griggs, 2; Harshbarger, 1, 2.
Summerville formation: Harshbarger, 1, 2; Jicha, 4.
Thoreau formation: Smith, C. T., 3-5.
Todilto formation: Anderson, R. Y., 4; Ash; Baltz, 1; Budding, 2; Byers; Colman, 1, 2; Ealy, 3; Erskine; Harshbarger, 1, 2; Kirkland, 1, 2; Muehlberger, 5; Smith, C. T., 4, 5; Truesdell, 1, 2; Weber, 2.
Wanakeh formation: Baldwin, B., 1; Baltz, 1; Foster, 1; Muehlberger, 5.
Zuni sandstone: Smith, C. T., 1.
Kelly formation: Armstrong, 1, 3-7.
Kiawa Mountain formation: Barker, 3; Muehlberger, 4.
Kirtland formation: Anderson, R. Y., 1-3; Simpson, 2.
Laborcita formation: Otte, 1, 2.
Lake Valley limestone: Armstrong, 5-7; Elston, 2, 3; Flower, 6; Kilps; Kottlowski, 2, 13; Kuellmer, 1; Pray, 3.
Las Cruces formation: Kottlowski, 2; Pray, 3.
Leadville limestone: Baars; Cooper, J. C.
Lewis shale: Anderson, R. Y., 3; Muehlberger, 5.
Lexicon of geologic names: Wilson, D., 1, 2.
Lobo formation: Ballman, 2, 3; Kottlowski, 9; Lochman-Balk, 1.
Los Pinos formation: Barker, 3; Budding, 2.
Love Ranch formation: Kottlowski, 2, 13, 17.
Madera limestone: *see* Magdalena group
Madison limestone: Cooper, J. C.
Magdalena group: Bachman, 2, 3, 5; Baltz, 1, 2; Carten, 1, 2; Elston, 2, 3; Kottlowski, 10-13; Perkins, R. D., 1, 2; Pray, 3.
Mancos shale: Budding, 2; Dane, 2, 4, 6, 9; Foster, 3; Gadway; Givens; Jicha, 4; Kottlowski, 2, 13; Muehlberger, 5; Pliler; Smith, C. T., 1, 3, 4, 6; Tonking; Willard, 4, 5.
Maquinita granodiorite: Barker, 3; Muehlberger, 4.
McRae formation: Kottlowski, 1, 2.
Mesaverde group: Allen, J. E., 1; Beaumont, 1, 2; Budd, 1; Dane, 3, 4; Foster, 3; Gadway; Givens; Jicha, 4; Kottlowski, 2, 13; Link; Muehlberger, 5; Parry; Sabins; Smith, C. T., 1, 3; Sun, 3; Tonking; West, 3; Willard, 3-5; Williams; Wood, J. W.
Mississippian: Baltz, 1; Dane, 1, 5; Gillerman, 2, 3; Jicha, 6; Kottlowski, 2, 13, 17; Land; Lochman-Balk, 2; Momper, 1, 2; Montgomery, A., 2;

Picard, 1; Pray, 2, 4; Read, 1; Strimple; Sutherland; Turnbow; Zeller, 3.
Arroyo Penasco formation: Armstrong, 2, 7; Fitzsimmons, 1.
Caballero formation: Kottlowski, 2, 13; Kuellmer, 1; Pray, 3.
Caloso formation: Armstrong, 1, 3, 4, 7.
Kelly formation: Armstrong, 1, 3-7.
Lake Valley limestone: Armstrong, 5-7; Elston, 2, 3; Flower, 6; Kilps; Kottlowski, 2, 13; Kuellmer, 1; Pray, 3.
Las Cruces formation: Kottlowski, 2; Pray, 3.
Leadville limestone: Baars; Cooper, J. C.
Madison formation: Cooper, J. C.
Paradise formation: Packard.
Rancheria formation: Kottlowski, 2-13; Pray, 3.
Spergen formation: Foster, 1.
St. Genevieve formation: Foster, 1.
St. Louis formation: Foster, 1.
Tererro formation: Baltz, 4.
Moenkopi formation: Akers, 1, 2; Cooley, M. E., 4.
Monte Largo granite: Stark.
Montoya group: Elston, 2, 3; Flower, 3, 6-9; Kottlowski, 2, 13; Kuellmer, 1; Lochman-Balk, 1; Pray, 3.
Moppin metavolcanic series: Barker, 3; Muehlberger, 4.
Morrison formation: Baldwin, B., 1, 7; Baltz, 1; Budding, 2; Craig; Dodd; Foster, 1; Freeman; Griggs, 2; Harshbarger, 1, 2; Jicha, 4; Konigsmark, 1, 2; Muehlberger, 5; Mullens; Myers, J. D.; Parks; Smith, C. T., 4, 5; Swift.
Nacimiento formation: Anderson, R. Y., 3; Simpson, 1, 2.
Naranjo formation: Baltz, 1; Griggs, 2.
Niobrara formation: Baldwin, B., 7; Baltz, 1; Griggs, 2.
Oak Creek tuff: Alper, 1-3.
Ocate sandstone: Baltz, 1.
Ogallala formation: Baldwin, B., 7; Elias.
Ojo Alamo formation: Anderson, R. Y., 1-3; Simpson, 2.
Onate formation: Flower, 6, 7; Kottlowski, 2, 13; Kuellmer, 1; Pray, 3.
Ordovician: Flower, 5; Hill, D.; Jicha, 2, 6; Kottlowski, 2, 13, 17; Zeller, 3.
Aleman formation: Flower, 2.
Arbuckle group: *see* Arbuckle group
Bliss sandstone: *see* Bliss sandstone
Cutter formation: Flower, 2.
Ellenberger group: Barnes, V. E., 1-5; Cloud; Folk; Tynan.
El Paso limestone: Ballman, 2, 3; Dickinson; Elston, 2, 3; Flower, 1, 6, 7; Kottlowski, 2, 13; Kuellmer, 1; Lochman-Balk, 1; Pray, 3.
Montoya group: Elston, 2, 3; Flower, 3, 6-9; Kottlowski, 2, 13; Kuellmer, 1; Lochman-Balk, 1; Pray, 3.
Shandon formation: Flower, 6.
Simpson group: Colton; Tynan.
Valmont dolomite: Pray, 3.
Wilberns formation: *see* Wilberns formation
Ortega quartzite: Barker, 3; Miller, R. R.; Montgomery, A., 1; Muehlberger, 4, 5.
Ouray limestone: Baars; Cooper, J. C.
Panther Seep formation: Kottlowski, 2, 13, 15, 18; Weber, 2.
Paradise formation: Packard.
Parea Mesa basalt flow: Carman.
Pennsylvanian: Baldwin, B., 7; Baltz, 3; Budding, 2; Cooper, G. A., 3, 4; Cserna, 1, 2; Dane, 1, 5; Fetzner; Gehrig; Gillerman, 2, 3; Hambleton; Hardie, 1, 2; Jacobs, 1, 2; Jicha, 6; Kottlowski, 2, 9-14, 15, 17, 18; Lochman-Balk, 2; Momper, 1, 2; Montgomery, A., 1, 2; Muehlberger, 1, 5; Myers, R. E.; Peltier; Picard, 2; Pye; Rambo; Read, 1; Sidwell; Smith, C. T., 3, 4; Stark; Van Sant; Weber, 4; Wengerd, 3-6; Wray; Zeller, 3.
Beeman formation: Bergeron; Pray, 3.
Fresnal group: Oppel, 1, 2; Wesh.
Gobbler formation: Pray, 3.
Holder formation: Cline; Otte, 1; Pray, 3; Reyer.
Horquilla limestone: Zeller, 7.
Magdalena group: Bachman, 2, 3, 5; Baltz, 1, 2; Carten, 1, 2; Elston, 3, 4; Kottlowski, 10-13; Perkins, R. D., 1, 2; Pray, 3.
Panther Seep formation: Weber, 2.
Sangre de Cristo formation: *see* Sangre de Cristo formation
Percha shale: Cooper, G. A., 1, 2; Elston, 2, 3; Flower, 6, 7; Kottlowski, 2; Kuellmer, 1; Pray, 3.
Permian: Alper, 1, 2; Bachman, 5; Baldwin, B., 7; Dane, 1, 5; Dunbar;

Historical and Stratigraphic Geology (continued)

Foster, 3; Gillerman, 2, 3; Hardison; Jarvis; Jicha, 6; Jones, C. L., 3; Kottlowski, 9, 14, 17; Lochman-Balk, 2; Momper, 1, 2; Rawson, 1, 2; Read, 1; Sidwell; Soc. Econ. Paleont. and Mineral.; Stark; Zeller, 3; Anon., 26.

Abo formation: Bachman, 2, 3; Elston, 2, 3; Hayes, 1; Jicha, 4; Kottlowski, 2, 9, 13; Kuellmer, 1; Otte, 1; Podpechan; Pray, 3; Romer; Smith, C. T., 1, 3, 4; Tonking; Weber, 2.

Bernal formation: Baltz, 1; Read, 2; Smith, C. T., 6.

Bone Springs formation: Boyd, 1, 2.

Bursum formation: Kottlowski, 2, 13; Oppel, 1, 2; Pray, 3.

Capitan limestone: Moore; Motts, 4.

Castile formation: Olive.

Chalk Bluff formation: Foster, 1; Read, 2.

Cherry Run formation: Hayes, 6.

Cutler formation: Romer.

Delaware Mountain sandstone: Hull, 2.

Glorieta sandstone: Foster, 1; Jicha, 4; Smith, C. T., 1, 3, 4.

Grayburg formation: Hayes, 6.

Horquilla limestone: Zeller, 7.

Hueco limestone: Bachman, 2, 3; Hayes, 1; Kottlowski, 2, 9, 13; Weber, 2.

Laborcita formation: Otte, 1, 2.

San Andres formation: Bachman, 2; Baltz, 1; Boyd, 1, 2; Foster, 1; Hayes, 6; Jicha, 4; Kottlowski, 2, 5, 13; Pray, 3; Smith, C. T., 1, 3, 4, 6; Tonking; Weber, 2.

Sangre de Cristo formation: *see* Sangre de Cristo formation

Whitehorse group: Weber, 2.

Yeso formation: Bachman, 2, 3; Baltz, 1; Boyd, 1, 2; Foster, 1; Jicha, 4; Kottlowski, 2, 13, 19; Otte, 1; Pray, 3; Smith, C. T., 1, 3, 4, 6; Speed, 1, 2; Tonking; Weber, 2.

Petaca schist: Barker, 3; Muehlberger, 4.

Pictured Cliffs sandstone: Burgener.

Picuris tuff: Baldwin, B., 2; Montgomery, A., 1.

Pierce Canyon redbeds: Miller, D. N., 1, 2.

Pierre shale: Griggs, 2; Johnson, R. B., 1-3.

Piloncillo sediments: Elston, 2, 3.

Poison Canyon formation: Johnson, R. B., 1-4.

Precambrian: Baldwin, B., 7; Ballman, 2, 3; Baltz, 1, 4; Bertholf; Carpenter; Dane, 1, 5; Elston, 7; Flawn; Foster, 1, 9; Gillerman, 2, 3; Hewitt, 1, 2; Jacobs, 1, 2; Jicha, 2, 6; Kottlowski, 2, 13, 17; Kuellmer, 1; Lochman-Balk, 1; McKinlay, 1, 2; Momper, 1, 2; Montgomery, A., 2; Pray, 3; Schilling, J. H., 1; Smith, C. T., 1, 3, 4; Zeller, 3.

Blue Springs schist: Stark.

Burned Mountain metarhyolite: Barker, 3; Muehlberger, 4.

Cabresto metaquartzite: McKinlay, 1, 2.

Embudo granite: Montgomery, A., 1.

Kiawa Mountain formation: Barker, 3; Muehlberger, 4.

Maquinita granodiorite: Barker, 3; Muehlberger, 4.

Monte Largo granite: Stark.

Moppin metavolcanic series: Barker, 3; Muehlberger, 4.

Ortega quartzite: Barker, 3; Miller, R. R.; Montgomery, A., 1; Muehlberger, 4, 5.

Petaca schist: Barker, 3; Muehlberger, 4.

Priest granite: Stark.

Sais quartzite: Stark.

Sandia granite: Aldrich.

Sevilleta metarhyrolite: Stark.

Tigeras gneiss: Lodewick.

Tijeras greenstone: Bruns.

Tres Piedras granite: Barker, 3; Muehlberger, 4.

Vadito formation: Montgomery, A., 1.

White Ridge quartzite: Stark.

Priest granite: Stark.

Puerco formation: Simpson, 1.

Purgatoire formation: Baldwin, B., 1, 7; Foster, 1.

Puye gravel: Baldwin, B., 2.

Quaternary: Dane, 1, 5; Flege; Foreman, 1, 2; Gillerman, 2, 3; Griggs, 1; Heindl; Howell; Hunt; Jacobs, 1, 2; Kottlowski, 2, 7, 13, 17; Lochman-Balk, 2; Okla. City Geol. Soc.; Otte, 1; Schilling, J. H., 1; Smith, C. T., 4, 6; Tonking; Weber, 2, 3; Zeller, 3, 4.

Ancha formation: Baldwin, B., 2; Sun, 5.

Parea Mesa basalt flow: Carmar

Picuris tuff: Baldwin, B., 2; Montgomery, A., 1.
Puye gravel: Baldwin, B., 2.
Santa Fe group: *see* Santa Fe group
Servilleta formation: Miller, R. R.
Tuerto gravel: Baldwin, B., 2.
Volcanic rocks: Baldwin, B., 7; Barker, 3; Carman; Dane, 1, 5; Elston, 5; Givens; Griggs, 1, 2; Hewitt, 2; Kelley, 1; McKinlay, 1, 2; Miesch; Smith, C. T., 1, 6; Weber, 4; Willard, 3-5.
Rancheria formation: Kottlowski, 2, 13; Pray, 3.
Raton formation: Johnson, R. B., 1-4.
Recent: Harbour, 1, 2; Hibben; Miller, J. P., 3; Murray, K. F.; Zeller, 2.
Carrizozo basalt flow: Allen, J. E., 3.
Reefs: Elias.
Riley formation: Barnes, V. E., 1-5; Cloud; Tynan.
Ritito conglomerate: Barker, 3.
Sais quartzite: Stark.
San Andres formation: Bachman, 2; Baltz, 1; Boyd, 1, 2; Foster, 1; Hayes, 6; Jicha, 4; Kottlowski, 2, 5, 13; Pray, 3; Smith, C. T., 1, 3, 4, 6; Tonking; Weber, 2.
Sandia formation: *see* Magdalena group
Sandia granite: Aldrich.
Sangre de Cristo formation: Baltz, 1; Carpenter; Foster, 1; McKinlay, 1, 2; Schilling, J. H., 1.
San Jose formation: Simpson, 2.
San Rafael group: Cumella; Griggs, 2; Harshbarger, 1, 2.
Santa Fe group: Baldwin, 2; Barker, 3; Boyer; Budding, 2; Disbrow; Elston, 2, 3; Givens; Griggs, 1; Kottlowski, 2, 7, 13, 17; Kuellmer, 1; LeMone, 1; Miller, R. R.; Montgomery, A., 1; Tonking; Willard, 4, 6.
Santa Rosa sandstone: Foster, 1; Smith, C. T., 6.
Sarten quartzite: Elston, 2, 3; Kottlowski, 2, 13.
Servilleta formation: Miller, R. R.
Sevilleta metarhyolite: Stark.
Shandon formation: Flower, 6.
Shinarump formation: Cooley, M. E., 4.
Sierra Negra basalt: Budding, 2.
Silurian: Jicha, 2, 6; Kottlowski, 2, 13, 17.
Fusselman limestone: Elston, 2, 3; Flower, 6, 7; Kottlowski, 2, 5, 13; Kuellmer, 1; Pray, 3.
Simpson group: Colton; Tynan.
Sly Gap formation: Flower, 6, 7; Kottlowski, 2, 13; Pray, 3.
Spergen formation: Foster, 1.
St. Genevieve formation: Foster, 1.
St. Louis formation: Foster, 1.
Summerville formation: Harshbarger, 1, 2; Jicha, 4.
Tererro formation: Baltz, 4.
Tertiary: Anderson, R. Y., 1-3; Dane, 1, 5; Foreman, 1, 2; Gillerman, 2, 3; Griggs, 1; Heindl; Howell; Hunt; Jicha, 4; Kelley, 7; Kottlowski, 7, 13, 17; Lochman-Balk, 2; Okla. City Geol. Soc.; Rawson, 1, 2; Schilling, J. H., 1; Smith, C. T., 1; Weber, 2, 3.
Abiquiu tuff: Baldwin, B., 2.
Amalia formation: McKinlay, 1.
Animas formation: *see* Animas formation
Animas quartz monzonite: Alper, 1-3.
Baca formation: Givens; Kottlowski, 1; Tonking.
Bandelier tuff: Smith, R. L., 2.
Bidahochi formation: Repenning, 1.
Blanco Basin formation: Muehlberger, 5.
Chuska sandstone: Repenning, 1; Wright, H. E.
Cieneguilla limburgite: Disbrow; Sun, 5.
Cisneros basalt: Barker, 3.
Conejos formation: Barker, 3; Muehlberger, 5.
Cuchara formation: Johnson, R. B., 1-3.
Datil formation: Givens; Tonking; Weber, 4; Willard, 2-5.
Devil's Hole formation: Johnson, R. B., 1, 3.
Dorado basalt: Barker, 3.
El Rito formation: Budding, 2.
Espinoso volcanics: Disbrow.
Farasita conglomerate: Johnson, R. B., 1, 3.
Galisteo formation: Disbrow; Robinson; Sun, 5.
Gila conglomerate: Ballman, 2, 3; Elston, 7; Heindl; Weber, 3, 4; Willard, 2, 5, 6.
Huerfano formation: Johnson, R. B., 1-3.
Los Pinos formation: Barker, 3; Budding, 2.
Love Ranch formation: Kottlowski, 2, 13, 17.

Historical and Stratigraphic Geology (continued)

McRae formation: *see* McRae formation
Nacimiento formation: Anderson, R. Y., 3; Simpson, 1, 2.
Oak Creek tuff: Alper, 1-3.
Ogallala formation: Baldwin, B., 7; Elias.
Picuris tuff: Baldwin, B., 2; Montgomery, A., 1.
Piloncillo sediments: Elston, 2, 3.
Poison Canyon formation: Johnson, R. B., 1-4.
Puerco formation: Simpson, 1.
Raton formation: Johnson, R. B., 1-4.
Ritito conglomerate: Barker, 3.
San Jose formation: Simpson, 2.
Santa Fe group: *see* Santa Fe group
Servilleta formation: Miller, R. R.
Sierra Negra basalt: Budding, 2.
Tesuque formation: Baldwin, B., 2; Boyer.
Tiffany beds: Simpson, 2.
Torrejon formation: Wilson, R. W., 1.
Treasure Mountain formation: Barker, 3; Muehlberger, 5.
Volcanic rocks: Alper, 1-3; Appledorn; Baldwin, B., 7; Ballman, 2, 3; Barker, 3; Carpenter; Dane, 1, 5; Elston, 2, 3, 5; Flege; Gentile, 1, 2; Givens; Griggs, 1, 2; Hewitt, 2; Kelley, 1; Kottlowski, 1, 2, 14, 17; Kuellmer, 1; McKinlay, 1, 2; Miesch; Schilling, J. H., 1; Sun, 5; Tonking; Wargo, 1, 2, 4, 5; Weber, 1, 3, 4; Willard, 2-6; Zeller, 3, 4. Boyer.
Tesuque Formation: Baldwin, B., 2; Boyer.
Thoreau formation: Smith, C. T., 3-5.
Tiffany beds: Simpson, 2.
Tigeras gneiss: Lodewick.
Tijeras greenstone: Bruns.
Todilto formation: Anderson, R. Y., 4; Ash; Baltz, 1; Budding, 2; Byers; Colman, 1, 2; Ealy, 3; Erskine; Harshbarger, 1, 2; Kirkland, 1, 2; Muehlberger, 5; Smith, C. T., 4, 5; Truesdell, 1, 2; Weber, 2.
Torrejon formation: Wilson, R. W., 1.
Treasure Mountain formation: Barker, 3; Muehlberger, 5.
Tres Piedras granite: Barker, 3; Muehlberger, 4.
Triassic: Dane, 1; Griggs, 3; Kottlowski, 2, 6, 13; Lochman-Balk, 2; Momper, 1, 2; Okla. City Geol. Soc.; Rawson, 1, 2; Stewart, J. H., 1, 2; Tonking.
Chinle formation: Akers, 1, 2; Budding, 2; Colbert; Cooley, M. E., 1, 4; Foster, 3; Givens; Harshbarger, 1, 2; Jicha, 4; Muehlberger, 5; Smith, C. T., 1, 3, 4, 6; Stark; Willard, 4, 5.
Dockum group: Baldwin, B., 1, 7; Baltz, 1; Cazeau; Foster, 1; Griggs, 2; Kottlowski, 2, 13.
Moenkopi formation: Akers, 1, 2; Cooley, M. E., 4.
Naranjo formation: Baltz, 1; Griggs, 2.
Pierce Canyon redbeds: Miller, D. N., 1, 2.
Santa Rosa sandstone: Foster, 1; Smith, C. T., 6.
Shinarump formation: Cooley, M. E., 4.
Wingate sandstone: Cooley, M. E., 4; Harshbarger, 1, 2; Smith, C. T., 3, 4.
Trinidad formation: Johnson, R. B., 1-3.
Tuerto gravel: Baldwin, B., 2.
Vadito formation: Montgomery, A., 1.
Valmont dolomite: Pray, 3.
Vermejo formation: Johnson, R. B., 1-4.
Virden formation: Elston, 7.
Wanakeh formation: Baldwin, B., 1; Baltz, 1; Foster, 1; Muehlberger, 5.
Whitehorse group: Weber, 2.
White Ridge quartzite: Stark.
Wilberns formation: Barnes, V. E., 1-5; Cloud; Tynan.
Wingate sandstone: Cooley, M. E., 4; Harshbarger, 1, 2; Smith, C. T., 3, 4.
Yeso formation: Bachman, 2, 3; Baltz, 1; Boyd, 1, 2; Foster, 1; Jicha, 4; Kottlowski, 2, 13, 19; Otte, 1; Pray, 3; Smith, C. T., 1, 3, 4, 6; Speed, 1, 2; Tonking; Weber, 2.
Zuni sandstone: Smith, C. T., 1.

Maps

Note: Unless otherwise indicated, maps are geologic maps.
Ambrosia Lake mining district, McKinley county: Young, 3.
Apache Hills, Hidalgo County: Strongin
Bear Creek Canyon area, Grant County: Maise.

Big Burro Mountains, Grant County: Hewitt, 1, 2.
Big Hatchet Peak quadrangle, Hidalgo County: Zeller, 5.
Bluewater area, McKinley and Valencia Counties: U.S. Atomic Energy Commission, 2.
Cabezon-3 quadrangle, McKinley and Sandoval Counties: Holze.
Canon Largo quadrangle, Catron County: Willard, 5.
Carlsbad area, Eddy County: Motts, 1.
Carlsbad Caverns East quadrangle, Eddy County: Hayes, 3.
Carlsbad Caverns West quadrangle, Eddy County: Hayes, 5.
Carrizo Mountains, San Juan County: Strobell.
Carrizo Mountains, gravity survey: Plouff.
Central mining district, Grant County: Jones, W. R.
Cerrillos area, Santa Fe County: Disbrow.
Chaco Canyon-2 quadrangle, McKinley County: Kover.
Chama area, Rio Arriba County: Adams, G. E.
Chromo Peak area, Rio Arriba County: Longgood.
Cienega area, Santa Fe County: Sun, 5.
Cienega Amarilla area, Catron County: O'Brien.
Coal fields in New Mexico: N. Mex. Bur. Mines and Mineral Res., 1.
Cochiti mining district, Sandoval County: Bundy, 1, 2.
Costilla quadrangle, Taos County: McKinlay, 1.
Datil quadrangle, Catron and Socorro Counties: Willard, 4.
Dixon area, Rio Arriba and Taos Counties: Miller, R. R.
Dog Mountains quadrangle, Hidalgo County: Zeller, 4.
Dog Springs quadrangle, Catron and Socorro Counties: Givens.
Dry Cimarron Canyon, Union County: Cooley, B. B., 1.
Dwyer quadrangle, Grant, Luna, and Sierra Counties: Elston, 2, 3.
East Potrillo Hills, Dona Ana County: Bowers.
El Vado area, Rio Arriba County: Davis, J. H.
Energy resources map of New Mexico: N. Mex. Bur. Mines and Mineral Res., 1.
Foster Canyon quadrangle, McKinley and Valencia Counties: Smith, C. T., 4.
Fra Cristobal Range, Sierra County: Cserna, 1; Jacobs, 1; McCleary.
Fracture systems, San Juan Basin: Kelley, 6.
French Mesa area, Rio Arriba County: Fitter.
Gallup area, McKinley County: U.S. Atomic Energy Commission, 1.
Gas fields in New Mexico: N. Mex. Bur. Mines and Mineral Res., 1.
Gravity survey, Carizzo Mountains: Plouff.
Guadalupe Mountains, Eddy and Otero Counties: Boyd, 1, 2.
Hidden Mountains, Valencia County: Gratton.
Hillsboro Peak quadrangle, Grant and Sierra Counties: Kuellmer, 1.
Hueco Mountains, Otero County: Hardie, 1.
Igneous provinces: Eardley.
Index map of geologic maps in New Mexico: Boardman; Bone.
Inscription Rock quadrangle, Valencia County: Smith, C. T., 3.
Jemez Springs area, Sandoval County: Lovejoy.
Knight Range, Grant County: Ball man, 2, 3.
Laguna-4 NW quadrangle, Bernalillo, Sandoval, and Valencia Counties: Moench, 1.
Laguna-4 SW quadrangle, Bernalillo and Valencia Counties: Moench, 2.
Lagunitas Lakes area, Rio Arriba County: Trice.
Las Cruces quadrangle, Dona Ana County: Kottlowski, 17.
Las Tablas quadrangle, Rio Arriba County: Barker, 3.
Latir Peak quadrangle, Taos County: McKinlay, 1.
Lea County, quality of ground water: U.S. Geol. Surv., 1.
Lincoln County: Griswold.
Little Black Peak quadrangle, Lincoln County: Smith, C. T., 6.
Little Burro Mountains, Grant County: Edwards.
Lordsburg quadrangle, Hidalgo County: Flege.
Luera Springs quadrangle, Catron and Socorro Counties: Willard, 2.
Luis Lopez mining district, Socorro County: Miesch.

Maps (continued)
Lynch Ranches, Catron and Valencia Counties: Marr.
Manzano Mountains, Bernalillo, Torrance, and Valencia Counties: Stark.
Mesa del Oro quadrangle, Socorro and Valencia Counties: Jicha, 4.
Metal deposits in New Mexico: N. Mex. Bur. Mines and Mineral Res., 2.
Mining districts: Anderson, E. C., 3.
Mogollon quadrangle, Catron and Grant Counties: Weber, 3.
Mud Springs Mountains, Sierra County: Hill, J. D.
Nonmetallic deposits in New Mexico: N. Mex. Bur. Mines and Mineral Res., 3.
Northwestern New Mexico: Dane, 1.
Oil fields in New Mexico: N. Mex. Bur. Mines and Mineral Res., 1.
Ortiz Mountains, Santa Fe County: McRae; Peterson, J. W.
Otero County, quality of ground water: U.S. Geol. Surv., 2.
Palomas mining district, Sierra County: Jahns, 1.
Pedernal Hills, Torrance County: Fallis.
Peloncillo Mountains, Hidalgo County: Gillerman, 2, 3.
Permian Basin, structure contour map: Stipp, 2.
Philmont Ranch quadrangle, Colfax County: Wanek.
Photogeologic maps: Holze, Kover.
Piñonville quadrangle, Catron County: Willard, 3.
Pipelines in New Mexico: N. Mex. Bur. Mines and Mineral Res., 1.
Playas quadrangle, Hidalgo County: Zeller, 3.
Portales Valley, Roosevelt and Curry Counties: Galloway.
Puertecito quadrangle, Socorro County: Tonking.
Quality of ground water:
Lea County: U.S. Geol. Surv., 1.
Otero County: U.S. Geol. Surv., 2.
Questa quadrangle, Taos County: McKinlay, 2.
Questa Molybdenum mine area, Taos County: Schilling, J. H., 1.
Red Rock quadrangle, Grant County: Ballman, 1; Hewitt, 1, 2; Pradhan.
Reserve quadrangle, Catron County: Weber, 4.
Rinconada Canyon area, Valencia County: Mohar.
Sacramento Mountains, Chaves, Lincoln, and Otero Counties: Bachman, 1.
Sangre de Cristo Mountains, southern: Montgomery, 2.
San Juan Basin, western: O'Sullivan.
San Pedro Mountains, Rio Arriba and Sandoval Counties: Hutson.
San Pedro Mountains, Santa Fe County: Atkinson.
Santo Domingo basin, Sandoval and Santa Fe Counties: Anderson, J. E.
Schoolhouse Mountain quadrangle, Grant County: Wargo, 3.
Sheep Springs quadrangle, San Juan County: Burford.
Snake Ranch Flats area, Socorro County: Waldron.
Soil-type distribution map of New Mexico: N. Mex. College Agriculture and Mechanic Arts.
Southeastern New Mexico: Dane, 5.
Structure contour map, Permian Basin: Stipp, 2.
Tecolote Hills area, Lincoln County: Rawson, 2.
Tecolote Point area, Rio Arriba County: St. John.
Tectonic map, San Juan Basin: Kelley, 6.
Tectonic provinces: Eardley.
Torrance County: Smith, R. E.
Union County: Baldwin, B., 7.
Uranium deposits, San Juan Basin: Chew.
Vanadium deposits, San Juan Basin: Chew.
Virden quadrangle, Grant and Hidalgo Counties: Elston, 1, 7.
Walnut Wells quadrangle, Hidalgo County: Alper, 1.

Mineralogy
Ambrosia Lake mining district: Knox, J. A.
Anatase:
Near Gallup: Allen, J. E., 1.
San Juan Basin: Chenoweth, 1, 2.
Andalusite, Kiawa Mountain, Rio Arriba County: Heinrich.
Barite, Hansonburg mining district: Ames, 1, 2; Callaghan; Sun, 1.
Beryl, Harding mine: Damon; Jahns, 4.
Biotite: Aldrich; Miller, D. N., 2.

Brookite, near Gallup: Allen, J. E., 1; Sun, 3.
Butlerite, Lone Star deposit, Santa Fe County: Lustig, 1, 2.
Chalcopyrite, Central mining district: Rose, 2, 3.
Clay minerals:
Cochiti mining district: Bundy, 1-3.
In Cretaceous rocks: Willard, 1.
Near St. John's, Arizona: Woodyard.
Coffinite: Stieff.
Copiapite, Lone Star deposit, Santa Fe County: Lustig, 1, 2.
Diopside, Organ Mountains: Allen, V. T.
Dolomite: Kottlowski, 3, 5.
Endellite, Carlsbad Caverns: Davies.
Feldspar: Hewlett; Kuellmer, 3-5; Schilling, J. H., 2.
Fluorite:
Derry mining district: Ames, 1, 2.
Hansonburg mining district: Ames, 1, 2; Sun, 1.
Galena, Hansonburg mining district: Ames, 1, 2; Austin, 3, 4; Sun, 1.
General: Northrop, 1.
Gypsum:
New Mexico: Weber, 2.
White Sands: Kottlowski, 8.
Halotrichite, Lone Pine deposit, Santa Fe County: Lustig, 1, 2.
Hansonburg mining district: Sun, 1.
Hedenbergite, Pewabic mine: Allen, V. T.
Helvite, Iron Mountain mining district: Oda.
Hematite, Prince mine: Walker, G. W.
Hydromagnesite, Carlsbad Caverns: Davies.
Iddingsite, in basalt: Sun, 2.
Ilmenite:
Near Gallup: Allen, J. E., 1.
San Juan Basin: Chenoweth, 1, 2.
Johannsenite, Central mining district: Allen, V. T.
Kyanite, Petaca mining district: Corey.
Lepidolite: Aldrich.
Leucoxene, near Gallup: Allen, J. E., 1.
Limonite, in lead-zinc gossans: Kelly, W. C., 1.
Magnetite:
Prince mine: Walker, G. W.
Rio Arriba County: Bertholf.
Metatyuyamunite: Stern.
Meteorites:
Glorieta fall: LaPaz.
In Jurassic rocks: Erskine.
Roy fall: Parrish.
Molybdenite:
Questa Molybdenum mine: Fleischer; Schilling, J. H., 1.
Santa Rita mine: Fleischer.
Monazite, San Juan Basin: Chenoweth, 1, 2.
Monticellite, Tres Hermanas Mountains: Homme, 1, 2.
Muscovite: Aldrich; Schilling, J. H., 2.
Olivine, Parea Mesa, Bernalillo County: Carman.
Orthoclase, Fort Bayard area: Hewlett; Schilling, J. H., 2.
Pitchblende, Ambrosia Lake mining district: Granger.
Plagioclase: Kuellmer, 3-5.
Rutile:
Near Gallup: Allen, J. E., 1.
San Juan Basin: Chenoweth, 1, 2.
Scheelite, Magdalena mining district: Austin, 2.
Santafeite, Grants mining district: Sun, 4, 6.
Selenium (native), Ambrosia Lake mining district: Sun, 7.
Sherwoodite, Carrizo Mountains mining district: Thompson, M. E.
Sphalerite, Central mining district: Rose, 1-3.
Spurrite, Tres Hermanas Mountains: Homme, 1, 2; Rosenzweig.
Sulfur (native): Wideman.
Lone Star deposit, Santa Fe County: Lustig, 1, 2.
Uranium minerals: Garrels; Gruner, 1 4; Knox, J. A.; Walker, G. W.; Weeks, 1, 2.
Vanadium minerals: Ross.
Voltaite, Lone Star deposit, Santa Fe County: Lustig, 1, 2.
Zircon:
Animas Range: Alper, 3.
Near Gallup: Allen, J. E., 1.
San Juan Basin: Chenoweth, 1, 2.

Mining Technology

Note: For listing of mining technology subjects by county *see Areas.*
Aerial tramways: Anderson, E. C., 1.
Ambrosia Lake mining district, history: Gabelman, 4, 5; Huttl, 1.
Ambrosia Lake uranium mill: *see* Kerr-Mac Ambrosia Lake uranium mill
Anaconda Bluewater uranium mill: Argall, 1; Peterson, E. C.
Assaying uranium: Anon., 17.
Automation, assaying uranium: Anon., 17.

Mining Technology (continued)
Banner mine: Look.
Barite:
Economics: Peters, 2.
Mining: Peters, 2.
Beneficiation: *see* Milling
Bluewater uranium mill: *see* Anaconda Bluewater uranium mill
Botanical prospecting: Cannon, 1, 2.
Calumet & Hecla uranium mine: Anon., 16.
Cement, Tijeras plant: Maschter; Anon., 21, 28.
Central mining district: Porterfield.
Cerrillos mining district, history: Hayward.
Chloride mining district, history: Brown, C. T., 1, 2.
Classification, using cyclones: Lemke.
Clay, economics: Glassmire, 2.
Coal, washability: Antia; Crentz.
Concentration: *see* Milling
Conveyor belts: Knill.
Copper:
Milling: Lemke; Schilling, J. H., 3.
Mining: Hardwick; Hunter; McNaughton; Schilling, J. H., 3; Wilmeth; Anon., 13, 15, 19.
Cyclones: Lemke.
Developments, mining: *see* Mining
Drill-hole logging, in potash: Jones, C. L., 4.
Drilling:
Santa Rita mine: McNaughton.
Shafts: Wilson, G. M.; Anon., 7.
Using shaped charges: Austin, 1, 5.
Duval Sulphur & Potash Company potash mill: Bird.
Duval Sulphur & Potash Company potash mine: Bird; Tong.
Economics:
Clay: Glassmire, 2.
Barite: Peters, 2.
Mica: Glassmire, 1.
Uranium: Hampton.
Electric power: Bird; Rector.
Electrostatic beneficiation, potash: LeBaron.
Exploration:
Botanical methods: Cannon, 1, 2.
Logging, drill-hole: Jones, C. L., 4.
Potash: Jones, C. L., 4.
Radioactive methods: Chapman.
Uranium: Cannon, 1, 2; Chapman; Hampton.
Farm Chemical Resources Development Corporation potash mine: Lilly.
Haulage:
Aerial tramways: Anderson, E. C., 1.
Continuous: Anon., 6.
Conveyor belts: Knill.
Roads: Anon., 19.
Trackless haulage: Tong.
Trucks: Wilmeth.
History, mining:
All districts: Anderson, E. C., 3.
Ambrosia Lake mining district: Gabelman, 4, 5; Huttl, 1.
Central mining district: Porterfield.
Cerrillos mining district: Hayward.
Chloride mining district: Brown, C. T., 1, 2.
Lincoln County: Griswold.
Lordsburg mining district: Gifford.
Magdalena mining district: Brown, C. T., 3.
Pinos Altos mining district: Porterfield; Wolle.
Santa Rita mine: Porterfield; Richardson; Schilling, J. H., 3.
Taos County: Schilling, J. H., 4.
Uranium: Birdseye; Gabelman, 4, 5; Smith, C. T., 7.
White Oaks mining district: Gaylord, 1, 2; Mains.
Homestake–New Mexico Partners uranium mill: Marquardt, 1, 2.
Hurley mill: *see* Kennecott Hurley mill
Ideal Cement Company cement plant: Meschter; Anon., 21, 28.
Industrial engineering: Anon., 15.
International Minerals & Chemical Corporation potash mill: LeBaron.
Jackpile uranium mine: Fitch; Huttl, 2; Schlosser; Anon., 8, 17.
Kennecott Hurley mill: Lemke; Schilling, J. H., 3.
Kerr–Mac Ambrosia Lake uranium mill: Hazen, 2; Anon., 27.
Kerr–Mac Shiprock uranium mill: Hazen, 1; Osborn; Anon., 2.
Lincoln County, history: Griswold.
Logging drill holes in potash: Jones, C. L., 4.
Lordsburg mining district, history: Gifford.
Magdalena mining district, history: Brown, C. T., 3.
Manganese:
Mining: Anon., 4.
Ore purchasing depot: Agey.
Mica, economics: Glassmire, 1.
Milling:
Copper: Lemke; Schilling, J. H., 3.

Molybdenum: Schilling, J. H., 1, 2.
Potash: Albright; Arend; Bird; Downey; Gidney; Kolb; LeBaron; Miller, E. H.; Stewart, F. H.
Uranium: Argall, 1; Evans; Hazen, 1, 2; Hough; Marquardt, 1, 2; Osborn; Peterson, E. C.; Anon., 2, 27.
Mines, active: Garcia, 1-3; U.S. Bur. Mines, 3, 6, 9, 12, 15, 18.
Mining:
Barite: Peters, 2.
Copper: Hardwick; Hunter; McNaughton; Schilling, J. H., 3; Wilmeth; Anon., 13, 15, 19.
Drilling: Austin, 1, 5.
History: *see* History, mining
Manganese: Anon., 4.
Mines, active: Garcia, 1-3; U.S. Bur. Mines, 3, 6, 9, 12, 15, 18.
Molybdenum: Schilling, J. H., 1, 2.
Open-pit: *see* Open-pit mining
Potash: Albright; Arend; Bird; Bruhn; Clark, H. N.; Downey; Gidney; Knill; Kolb; Lilly; Miller, E. H.; Rector; Stewart, F. H.; Tong; Anon., 6, 10, 23.
Production: *see* Production
Safety program: Hunter; Lilly.
Uranium: Argall, 2-4; Birdseye, 2; Chew; Evans; Fitch; Hampton; Huttl, 1, 2; Jenkins; Smith, C. T., 7; Stoehr; Anon., 5, 7, 8, 12, 14, 16-18, 22, 29, 30.
Vanadium: Chew.
1955: Murphey, 1.
1956: Murphey, 2; Steele.
1957: Murphey, 3.
1958: Van de Water.
1959: Kelly, F. J.
Molybdenum:
Milling: Schilling, J. H., 1, 2.
Mining: Schilling, J. H., 1, 2.
National Potash potash mine: Anon., 10.
Open-pit mining: *see* Santa Rita mine; Jackpile mine
Ore purchasing depot, manganese: Agey.
Pecos mine, aerial tramways: Anderson, E. C., 1.
Pinos Altos mining district, history: Porterfield; Wolle.
Potash:
Drill-hole logging: Jones, C. L., 4.
Electric power: Bird; Rector.
Haulage, continuous: Anon., 6.
Haulage, conveyor belts: Knill.
Haulage, trackless: Tong.
Milling: Albright; Arend; Bird; Downey; Gidney; Kolb; LeBaron; Miller, E. H.; Stewart, F. H.
Mining: Albright; Arend; Bird; Bruhn; Clark, H. N.; Downey; Gidney; Knill; Kolb; Lilly; Miller, E. H.; Rector; Stewart, F. H.; Tong; Anon., 6, 10, 23.
Storage: Ives.
Power, electric: Bird; Rector.
Production:
Uranium: Chew.
Vanadium: Chew.
1953: U.S. Bur. Mines, 1, 2.
1954: U.S. Bur. Mines, 4, 5.
1955: Garcia, 1; U.S. Bur. Mines, 7, 8.
1956: Garcia, 1, 2; U.S. Bur. Mines, 10, 11.
1957: Garcia, 2, 3; U.S. Bur. Mines, 13, 14.
1958: Garcia, 3; Hays, 1; U.S. Bur. Mines, 16, 17.
1959: Hays, 1, 2; U.S. Bur. Mines, 19, 20.
1960: Hays, 2.
Prospecting: *see* Exploration
Questa Molybdenum mine: Schilling, J. H., 1, 2.
Radioactive methods of exploration: Chapman.
Rio de Oro uranium mine: Anon., 5, 12, 14.
Roads, Santa Rita mine: Anon., 19.
Safety program:
Santa Rita mine: Hunter.
Shaft sinking: Lilly.
Sampling uranium: Schlosser.
Santa Rita mine: Anon., 13.
Drilling: McNaughton.
Haulage roads: Anon., 19.
History: Porterfield; Richardson; Schilling, J. H., 3.
Industrial engineering: Anon., 15.
Open-pit mining methods: Hardwick; Schilling, J. H., 3.
Safety program: Hunter.
Shaped charges, application to mining: Austin, 1. 5.
Shiprock uranium mill: *see* Kerr–Mac Shiprock uranium mill
Sinking shafts: Lilly; Wilson, G. M.; Anon., 7.
Solvent extraction, uranium: *see* Uranium, Milling
Southwest Potash potash mine: Anon., 6.

Mining Technology (continued)
Stockpiling:
Manganese: Agey.
Potash: Ives.
Storage:
Manganese: Agey.
Potash: Ives.
Taos County, history: Schilling, J. H., 4.
Tijeras cement plant: *see* Ideal Cement Company cement plant
Timbering, shafts: Look.
Towers manganese mine: Anon., 4.
Trackless haulage: Tong.
Uranium:
Economics: Hampton.
Exploration: Cannon, 1, 2; Chapman; Hampton.
History: Birdseye; Gabelman, 4, 5; Smith, C. T., 7.
Milling: Argall, 1; Evans; Hazen, 1, 2; Hough; Marquardt, 1, 2; Osborn; Peterson, E. C.; Anon., 2, 27.
Mining: Argall, 2-4; Birdseye, 2; Chew; Evans; Fitch; Hampton; Huttl, 1, 2; Jenkins; Smith, C. T., 7; Stoehr; Anon., 5, 7, 8, 12, 14, 16-18, 22, 29, 30.
Production: Chew.
Sampling: Schlosser.
Vanadium:
Mining: Chew.
Production: Chew.
Washing coal: Antia; Crentz.
White Oaks mining district, history: Gaylord, 1, 2; Mains.

Oil and Gas Technology
Note: For listing of oil and gas technology subjects by county *see Areas.*
Access roads, building: Leese.
Automation:
Pipeline pumping stations: Walsh, 1.
Pipelines: Guthrie.
Carbon dioxide: Anderson, E. C., 4.
Completion methods: Foster, 2, 5, 7.
Dehydration, gas: Fowler.
Developments:
Chama Basin: Bieberman, 3.
Lucero Basin: Wengerd, 2.
New Mexico:
1955: Foster, 2; Lahee.
1956: Bieberman, 1; Foster, 5; Moody.
1957: Blanpied, 1; Foster, 6, 7.
1958: Bieberman, 4; Blanpied, 2.
1959: Blanpied, 3.
Northeastern New Mexico: Foster, 8.
Permian Basin: Cooley, B. B., 2; Helmig; Podpechan.
1955: Foster, 2; Lahee; Ley; N. Mex. Oil and Gas Eng. Committee, 2, 11; N. Mex. Oil Conserv. Commission, 2, 3.
1956: Bieberman, 1; Culbertson; Foster, 5; Moody; N. Nex. Oil and Gas Eng. Committee, 4, 11; N. Mex. Oil Conserv. Commission, 2, 3; Phifer.
1957: Blanpied, 1; Foster, 6, 7; N. Mex. Oil and Gas Eng. Comittee, 6, 11; N. Mex. Oil Conserv. Commission, 2, 3; Smith, C. W.; Smith, S. L.
1958: Bieberman, 4; Blanpied, 2; Hanson, B. M.; N. Mex. Oil and Gas Eng. Committee, 7, 11; N. Mex. Oil Conserv. Commission, 2, 3.
1959: Blanpied, 3; N. Mex. Oil and Gas Eng. Committee, 9, 11; N. Mex. Oil Conserv. Commission, 2, 3; Peek.
San Juan Basin: Byington, 2; Dougherty; Silver, 2.
1955: Baldwin, B. F.; Foster, 2; Lahee; N. Mex. Oil and Gas Eng. Committee, 1, 11; N. Mex. Oil Conserv. Commission, 2, 4.
1956: Bieberman, 1; Byington, 1; Foster, 5; Moody; N. Mex. Oil and Gas Eng. Committee, 3, 11; N. Mex. Oil Conserv. Commission, 2, 4.
1957: Blanpied, 1; Budd, 3; Foster, 6, 7; N. Mex. Oil and Gas Eng. Committee, 5, 11; N. Mex. Oil Conserv. Commission, 2, 4.
1958: Bieberman, 4; Blanpied, 2; Budd, 4; N. Mex. Oil and Gas Eng. Committee, 8, 11; N. Mex. Oil Conserv. Commission, 2, 4.
1959: Blanpied, 3; Budd, 5; N. Mex. Oil and Gas Eng. Committee, 10, 11; N. Mex. Oil Conserv. Commission, 2, 4; Anon., 31.
1960: Anon., 33.
Western New Mexico: Budd, 3-5; Byington, 1.
Drilling:
Activities: *see* Developments
Practice: *see* Drilling practice
Drilling practice:
Completion methods: *see* Completion methods

Fluids: Oehler:
Permian Basin: Baskin; Oehler.
San Juan Basin: Parker, M. T., 1, 2.
With air: Sneed.
With gas: Baskin.
Economics, exploration costs: Leese.
Estimating reserves: Beinschek.
Exploration: *see* Developments
Future possibilities: *See Economic Geology*, Oil and gas possibilities
Gas:
Dehydration: Fowler.
Pipelines: Anderson, D. B.; Logan; N. Mex. Bur. Mines and Mineral Res., 1; Anon., 34.
Prorationing: Arnold.
Pumping: Dudenhoeffer, 1; Walsh, 2.
Recovery methods: Dudenhoeffer, 2; Fowler.
Secondary recovery using gas: Blakely.
History: *see* Developments
Natural gas: *see* Gas
Oil:
Estimating reserves: Beinschek.
Pipelines: Anderson, D. B.; Bagwell; Dougherty; Guthrie; McGhee; N. Mex. Bur. Mines and Mineral Res., 1; Anon., 9.
Refineries: Anderson, D. B.; Anon., 11.
Secondary recovery: Blakely.
Petroleum: *see* Oil
Pipelines: N. Mex. Bur. Mines and Mineral Res., 1.
Automation: Guthrie; Walsh, 1.
Gas: Anderson, D. B.; Logan; Anon., 34.
Oil: Anderson, D. B.; Bagwell; Dougherty; Guthrie; McGhee; Anon., 9.
Petroleum products: Anderson, D. B.; Ansley.
Pumping, gas: Dudenhoeffer, 2; Walsh, 2.
Production, oil and gas: *see also* Developments
1953: U.S. Bur. Mines, 2.
1954: U.S. Bur. Mines, 5.
1955: U.S. Bur. Mines, 8.
1956: U.S. Bur. Mines, 11.
1957: U.S. Bur. Mines, 14.
1958: U.S. Bur. Mines, 17.
1959: U.S. Bur. Mines, 20.
Products pipeline: Anderson, D. B.; Ansley; N. Mex. Bur. Mines and Mineral Res., 1.
Prorationing, gas: Arnold.
Pumping, gas: Dudenhoeffer, 1; Walsh, 2.
Recovery methods:
Gas: Dudenhoeffer, 2; Fowler.
Water flooding: Smith, K. L.
Wellhead dehydrators: Fowler.
Refineries, Oil: Anderson, D. B.; Anon., 11.
Secondary recovery:
Using gas: Blakely.
Using water: Smith, K. L.
Staking well locations: Leese.
Water flooding: Smith, K. L.

Paleontology

Note: Only those articles that deal primarily with paleontology are cited here. Many articles listed under *Areas* and *Historical and Stratigraphic Geology* contain sections describing the paleontology of an area or formation.

Acanthocladia guadalupensis: Rigby.
Actinoceroids: Flower, 5.
Actinocrinitidae: Kilps.
Algae: Elias; Wray.
Ammonites: Sabins.
Bioherms: Baltz, 2; Pray, 2, 4; Wray.
Brachiopods: Cooper, G. A., 1-4; Gehrig; Otte, 1.
Bryozoa: Pray, 2; Rigby.
Cephalopods: Otte, 1.
Corals: Flower, 8, 9; Hill.
Crinoids: Strimple.
Cryptacanthia: Cooper, G. A., 4.
Ellipsodon: Wilson, R. W., 2.
Endoceroids: Flower, 1.
Endothrids: Armstrong, 2.
Eucosmodon: Wilson, R. W., 3.
Flora: *see* Plants
Fusulinids: Myers, R. E.; Otte, 1; Peltier; Van Sant.
Gastropods: Otte, 1.
Insoluble fossils: Tynan.
Macroloxoceras: Flower, 5.
Mammals: Simpson, G. G., 1.
Microcrinoids: Strimple.
Multituberculate: Wilson, R. W., 1, 3.
Paleobotany: *see* Plants
Palynology, Cretaceous–Tertiary: Anderson, R. Y., 1-3.
Plants: Read, 1.
Pollen: Foreman, 2.
Spores: Carten, 1, 2.
Syringospira prima: Cooper, G. A., 1.
Tempskya minor: Zeller, 1.
Terebratulids: Cooper, G. A., 4.

Paleontology (continued)

Vertebrates: Colbert; Romer; Simpson, G. G., 1.

Petrology

Note: Many of the articles describing the geology of a given area briefly mention the petrology of any igneous or metamorphic rocks in that area. These articles are not mentioned in this section but are cited under *Areas.*

Andesite: Elston, 2, 3; Hewitt, 2; Sun, 5.
Anorthosite: Hewitt, 2.
Basalt: Carman; Elston, 2, 3; Hewitt, 2, Miller, R. R.; Sun, 2, 5.
Diabase: Hewitt, 2.
Felsite: Sun, 5.
Gneiss: Hewitt, 2; Lodewick; Montgomery, A., 1.
Granite: Aldrich; Belt, 1, 2; Carpenter, R. H.; Hewitt, 2; Kuellmer, 3; Montgomery, A., 1; Schilling, J. H., 1.
Granodiorite: Belt, 1, 2; Elston, 2, 3; Griffitts.
Greenstone: Bruns.
Hornfels: Hewitt, 2.
Ignimbrite: Elston, 2, 3.
Latite: Elston, 2, 3; Hewitt, 1, 2; Sun, 5.
Limburgite: Sun, 5.
Metadiabase: Hewitt, 2.
Minette: Appledorn.
Monzonite: Griffitts; Kuellmer, 3, 4; Sun, 5.
Pegmatite: Cameron; Jahns, 2-4; Kuellmer, 3; Montgomery, A., 1.
Perlite: Jaster; Weber, 1.
Pumice: Kelley, 1.
Quartzite: Hewitt, 2; Montgomery, A., 1.
Quartz monzonite: Alper, 3; Belt, 1, 2.
Rhyolite: Elston, 2, 3; Gentile, 1, 2; Hewitt, 1, 2.
Schist: Hewitt, 2; Montgomery, A., 1.
Trachybasalt: Appledorn.
Tuff: Alper, 3.

Physical and Structural Geology

Note: To find the articles on an area that include some physical and structural geology, look under the given area in the section *Areas.* (A few articles listed under *Areas* do not include physical or structural geology, although most do.)

Arroyos: Schumm.
Ash flows: Smith, R. L., 2.
Basin and Range structures: Callaghan, 4.
Block faulting: Callaghan, 4.
Calderas: Appledorn; Shoemaker, 2; Weir.
Cauldron sinks: Mutschler, 1, 2.
Caverns: *see* Caves
Caves: Boles; Motts, 4.
Chama Basin platform: Muehlberger, 6, 7.
Clastic plugs: Baldwin, B., 1.
Craters, volcanic: Appledorn.
Cross-bedding: Cazeau.
Diatremes: Shoemaker, 1.
Dikes: Appledorn; Jones, C. L., 2.
Domes: Hayes, 2; Vine, 2, 4.
  Volcanic: Appledorn.
Dunes: Belknap; Jicha, 7; Kottlowski, 8; Weber, 2.
Erosion: Leopold, 1, 2; Miller, J. P., 1-3; Schumm.
Faults:
  High-angle: Budding, 1; Callaghan, 4.
  Thrust faults: Alper, 1, 2; Stark.
Flows: *see* Ash flows; Lava flows
Folds: Craddock.
Foliation: Lodewick.
Fractures: Duschatko; Kelley, 6; Mitcham.
High-angle faults: Budding, 1.
Ice caves: Foster, 5; Porter.
Lakes: Zeller, 2.
Landslides: Watson.
Laramide orogeny: Kelley, 7.
Lava flows: Allen, J. E., 2, 3.
Lineaments: Mayo.
Maars: Shoemaker, 2.
Necks, volcanic: McBirney; Woods, 1.
Orogeny, Laramide: Kelley, 7.
Pipes, sandstone: Schlee, 2.
Plugs:
  Clastic: Baldwin, B., 1.
  Igneous: Appledorn.
  Salt: Vine, 2, 4.
Salt plugs: Vine, 2, 4.
Sinkholes: Clebsch, 2; Vine, 2, 4.
Sinks: *see* Cauldron sinks; Sinkholes; Subsidence troughs
Streams: Miller, J. P., 1-3.
Subsidence troughs: Olive.
Tectonics:
  New Mexico: Eardley.
  Raton Basin: Gabelman, 3; Shaw.
  Recent activity: Woollard.
  Rio Grande depression: Kelley, 3.

San Juan Basin: Fetzner; Isachsen; Kelley, 2, 4-6.
Terraces: Miller, J. P., 3.
Thrust faults: Alper, 1, 2; Stark.
Vents, volcanic: Appledorn; McBirney.
Volcanoes: Appledorn; Bail; Griggs, 1; Porter.

Physiography
Arroyos: Leopold, 1; Schumm.
Basin and Range Province: Callaghan, 4.
Big Burro Mountains, Grant County: Hewitt, 2.
Chama basin, Rio Arriba County: N. Mex. Geol. Soc., 5.
Chuska Mountains, San Juan County: Appledorn; Cooley, M. E., 2; Watson.
Cooks Range, Grant and Luna Counties: Roswell Geol. Soc., 7.
Dog Springs quadrangle, Catron and Socorro Counties: Givens.
Dunes: Belknap; Jicha, 7; Kottlowski, 8.
Ephemeral streams: Leopold, 2.
Florida Mountains, Luna County: Roswell Geol. Soc., 7.
Franklin Mountains, Dona Ana County: Roswell Geol. Soc., 10.
Hatchet Mountains, Hidalgo and Luna Counties: Roswell Geol. Soc., 7.
Karst topography: Clebsch, 2; Olive.
Lakes: Zeller, 2.
Landslide topography: Watson.
Lordsburg quadrangle, Hidalgo County: Flege.
Peloncillo Mountains, Hidalgo County: Gillerman, 3.
Puertecito quadrangle, Socorro County: Tonking.
Sacramento Mountains: Motts, 5.
Sangre de Cristo Mountains: N. Mex. Geol. Soc., 1.
San Juan Basin: Cooley, M. E., 2; Fitzsimmons, 2; N. Mex. Geol. Soc., 2, 3.
Santo Domingo basin, Sandoval and Santa Fe Counties: Anderson, J. E.
Streams: Leopold, 2; Miller, J. P., 1, 2.
Terraces: Miller, J. P., 3.
West-central New Mexico: Fitzsimmons, 2; N. Mex. Geol. Soc., 4.
White Sands: Belknap; Jicha, 7; Kottlowski, 8.
Zuni Mountains, McKinley and Valencia Counties: Foster, 4.

Water
Albuquerque, ground-water: Beahm; Conover, 1.
Analyses: *see* Quality
Animas Valley, ground-water: Reeder, 2.
Aquifers:
Gallup sandstone: West, 3.
Leaky: Hantush, 1.
Artesian wells, pressures: Reeder, 1.
Bibliography:
U.S. Geol. Surv. publications: Vorhis.
1951-1955: Schilling, C. F.
Canadian River basin:
Quality, surface water: Gatewood, 1; U.S. Geol. Surv., 3, 6, 12, 14, 20.
Stream (flow) measurements: Gatewood, 1; U.S. Geol. Surv., 9, 12, 14, 17, 20, 23.
Capulin Peak National Monument, ground-water: Cardwell.
Carlsbad area, ground-water: Motts, 1.
Carlsbad Springs, Eddy County, stream (flow) measurements: Bjorklund, 2.
Causey–Lingo area, Roosevelt County, ground-water: Cooper, J. B.
Chaco Canyon National Monument, ground-water: West, 2.
Chuska Mountains, ground-water: Akers, 2.
Colfax County, ground-water: Bjorklund, 1.
Colorado River basin: *see* Gila River basin; San Juan River basin
Conservation: Thompson, C. B.; Thompson, J. C.
Crow Flats area, Otero County, ground-water: Bjorklund, 1.
Curry County, ground-water: Galloway.
Evapotranspiration: Hantush, 2.
Floods: Vaudrey.
Fort Union area, ground-water: Winograd, 2.
Gaging stations: *see* Stream (flow) measurements
Gallup, wells: West, 1.
General: Fiedler.
Gila River basin:
Quality, surface water: Gatewood, 3; U.S. Geol. Surv., 4, 7, 13, 15.
Stream (flow) measurements: Gatewood, 3; U.S. Geol. Surv., 11, 18, 25, 26.
Gran Quivira National Monument, ground-water: Clebsch, 1.

Water (continued)
Ground-water:
Albuquerque: Conover, 1.
Animas Valley: Reeder, 2.
Capulin Peak National Monument: Cardwell.
Carlsbad area: Motts, 1.
Causey–Lingo area, Roosevelt County: Cooper, J. B.
Chaco Canyon National Monument: West, 2.
Chuska Mountains: Akers, 2.
Colfax County: Bjorklund, 1.
Curry County: Galloway.
Fort Union area: Winograd, 2.
Gran Quivira National Monument: Clebsch, 1.
Guadalupe County: Clebsch, 2.
Guadalupe Mountains: Motts, 3.
Hidalgo County: Doty; Reeder, 2.
Holloman Air Force Base: Hood, 2.
Hondo Valley: Mourant.
Hueco bolson: McBride.
Importance to state: Conover, 2.
Llano Estacado: Barker, 1, 2; Williamson.
McGregor Range, Otero County: Hood, 1; Rapp.
Mesa del Oro quadrangle, Socorro and Valencia Counties: Jicha, 4.
Otero County: Bjorklund, 1; Hood, 1, 2.
Pecos River basin: Bean; Cox.
Philmont Boy Scout Ranch: Berktresser.
Playas Valley: Doty.
Portales Valley: Galloway.
Prospecting for: Vacquier.
Quality: *see* Quality, ground-water
Relation to present streams: Spiegel, 3.
Relation to stream flow in late Cenozoic time: Spiegel, 1.
Roosevelt County: Cooper, J. B.; Galloway.
Roswell artesian basin: Bean; Hantush.
Sandia Mountains: Caprio.
San Juan Basin: Akers, 2; Callaghan; West, 3.
Sierra County: Murray, C. R.
Socorro County: Clebsch, 1; Waldron.
Sunshine Valley: Winograd, 3.
Taos County: McKinlay, 1, 2; Winograd, 1, 3.
Tracing flow using tritium: Von Buttlar, 1, 2.
Tucumcari area: Trauger.
Tularosa Basin: Hood, 2, 3.
Union County: Baldwin, B., 7; Cardwell.
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GUIDEBOOKS

Scenic Trips to the Geologic Past

1	Santa Fe, New Mexico; Brewster Baldwin and Frank E. Kottlowski	1955	.25
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7	High Plains—Northeastern New Mexico (Raton-Capulin Mountain-Clayton); William R. Muehlberger and Roy W Foster	1961	In press

ANNUAL REPORTS

1	For the Fiscal Year July I, 1945-June 30, 1946; E. C. Anderson	1946	Out of print
2	For the Fiscal Year July 1, 1946-June 30, 1947 (includes Annual Report of State Inspector of Mines); E. C. Anderson	1947	Out of print
3	For the Fiscal Year July 1, 1947-June 30, 1948 (includes Annual Report of State Inspector of Mines); E. C. Anderson	1948	Out of print
4	For the Fiscal Year July 1, 1948-June 30, 1949 (includes Annual Report of State Inspector of Mines); E. C. Anderson	1949	Out of print
5	For the Fiscal Year Ending June 30, 1950; Eugene Callaghan	1950	Out of print
6	For the Fiscal Years Ending June 30, 1951 and 1952; Eugene Callaghan	1952	Out of print
7	For the Fiscal Years Ending June 30, 1953 and 1954; Eugene Callaghan	1954	Out of print

8 For the Fiscal Years Ending June 30, 1955 and 1956; Eugene Callaghan ..... 1956 No charge
9 For the Fiscal Years Ending June 30, 1957 and 1958; A. J..... Thompson ..... 1958 No charge
10 For the Fiscal Years Ending June 30, 1959 and 1960; A. J..... Thompson ..... 1960 No charge

MAPS

Oil and Gas Map of New Mexico; revised and enlarged to Jan. 1, 1949, by Richard C. Northup and Donald D. Forrey .... Scale about 101/2 miles to 1 inch ..... 1949 .75
Map Showing Location of Wells and Springs and the Availability of Ground Water in San Miguel County, New Mexico. (This map is included in Ground-Water Report 2.) ..... 1951 .35
Geology of San Miguel County. (This map is included in Ground-Water Report 2.) ..... 1951 .35
Wells and Springs and Availability of Ground Water in Eddy County, New Mexico. (This map is included in Ground-Water Report 3.) ..... 1952 .35
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Geologic Map and Sections of Lake Valley Quadrangle, New Mexico. (This map is included in Bulletin 37.) ..... 1954 .80
Geology of Northeastern Socorro County, New Mexico. (This map is included in Ground-Water Report 4.) ..... 1955 .35
Availability of Water in Northeastern Socorro County, New Mexico. (This map is included in Ground-Water Report 4.) 1955 .25
Geologic Map and Sections of Puertecito Quadrangle, New Mexico. (This map is included in Bulletin 41.) 1955 1.00
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Geologic Map and Sections, Questa Molybdenum Mine Area, Taos County, New Mexico. (This map is included in Bulletin 51.) ..... 1956 .85
Block Diagram of the Questa Molybdenum Mine, Taos County, New Mexico. (This map is included in Bulletin 51.) 1956 .35
Metal Mining Districts and Subdistricts, New Mexico-1955. (This map is included in Bulletin 39.) 1957 1.00
Geologic Map and Sections of Las Tablas Quadrangle, New Mexico. (This map is included in Bulletin 45.) 1958 1.00

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14	Reconnaissance Geologic Map of Las Cruces Thirty-Minute Quadrangle; Frank E. Kottlowski	1960	.50
15	Reconnaissance Geologic Map of Virden Thirty-Minute Quadrangle; Wolfgang E. Elston	1960	.50
16	Geologic Map of Tres Hermanas Mountains; Robert Balk	1961	In press

PETROLEUM EXPLORATION MAPS

These maps show the location of all tests for oil and gas (both completed and in the process of drilling), section lines, and the larger towns; published as blue-line prints at a scale of 2 miles to the inch; prepared by Robert A. Bieberman and Roy W. Foster. All counties available EXCEPT

Chaves, Eddy, Lea, Rio Arriba, San Juan, and Taos	1958	1.00 (per county)

RESOURCES AND LAND STATUS MAPS

New Mexico Energy Resources Map	1958	1.00
New Mexico Metal Resources Map	1958	1.00
New Mexico Non-Metal Resources Map	1958	1.00
New Mexico Land Ownership Status Map	1958	1.50
Vegetative Type Map of New Mexico; prepared by the New Mexico College of Agriculture and Mechanic Arts	1957	.50
Soils Resource Map of New Mexico; prepared by the New Mexico College of Agriculture and Mechanic Arts	1957	.50

WELL LOGS

More than 7,600 typed drillers' logs of wells drilled in New Mexico.

1 log	$ .30
2 logs	.55
3 logs	.80
4 logs	1.05

5 logs 1.30
6 logs 1.50
7 logs 1.70
8 logs 1.90
9 logs 2.10
10 logs 2.30
11 to 50 logs, $2.30 for first 10 logs, plus 18 cents for each additional log
51 to 200 logs, $9.50 for first 50 logs, plus 16 cents for each additional log.

Orders for well logs should include as much as possible of the following information for each log ordered: location of the well in terms of section, township, range, and county; name of the person or company which drilled the well; well number; and lease name.