

NEW MEXICO SCHOOL OF MINES

STATE BUREAU OF MINES AND MINERAL RESOURCES

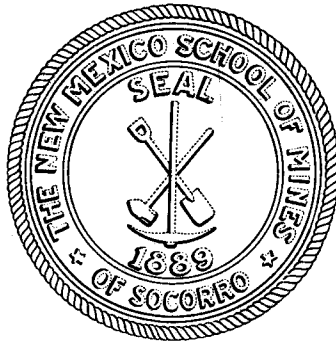
E. H. WELLS
President and Director

BULLETIN NO. 5

Geologic Literature of New Mexico

By

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THE NEW MEXICO BUREAU OF MINES AND MINERAL RESOURCES

The New Mexico Bureau of Mines and Mineral Resources was established by the New Mexico Legislature of 1927. It was made a department of the New Mexico School of Mines, and hence its activities are supervised by the board of regents of that institution. The chief objects and duties of the bureau, as provided for in the law, are as follows:

To collect, to compile and to publish statistics relative to New Mexico geology, mining, milling, metallurgy and oil and natural gas and the refining thereof.

To collect typical geological and mineral specimens and samples of products; to collect photographs, models and drawings of appliances used in the mines, mills, smelters, oil wells, natural gas wells and the refineries of oil and natural gas in New Mexico.

To collect a library and bibliography of literature pertaining to the progress of geology, mining, milling, smelting and the production of oil and natural gas and refining the same in New Mexico.

To study the geological formations of the State with special reference to their economic mineral resources, both metallic and non-metallic.

To examine the topography and physical features of the State with reference to their practical bearing upon the occupation of the people.

To study the mining, milling, smelting operations and oil and natural gas production and the refining of the same carried on in the State with special reference to their improvements.

To prepare and publish bulletins and reports with the necessary illustrations and maps, which shall embrace both a general and detailed description of the natural resources and geology, mines, mineral deposits, both metallic and non-metallic, oil wells, natural gas wells, reduction plants, smelters, mills, oil refineries and natural gas refineries.

To make qualitative examinations of rocks and mineral samples and specimens.

To assist in the education of miners and prospectors through lectures and publications.

To consider such other kindred, scientific and economic problems and questions as in the judgment of the Board shall be deemed of value to the people of the State.

To communicate special information on New Mexico geology, mining, both metallic and non-metallic, oil and natural gas and to serve as a Bureau of Exchange and Information on the mineral, oil and natural gas resources of New Mexico.

To co-operate with the University of New Mexico, with the State Mine Inspector and with other departments of State Government as may be mutually beneficial and to co-operate with the United States Geological Survey and with the United States Bureau of Mines in accordance with the regulations of those institutions.

The bureau began to function officially with the opening of the 16th fiscal year, July 1, 1927.

BOARD OF REGENTS

HIS EXCELLENCY, HONORABLE R. C. DILLON, *Governor of*
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PUBLICATIONS¹

- Bulletin No. 1. The Mineral Resources of New Mexico, Fayette A. Jones, 1915.
- Bulletin No. 2. Manganese in New Mexico, E. H. Wells, 1918.
- Bulletin No. 3. Oil and Gas Possibilities of the Puertecito District, Socorro and Valencia Counties, New Mexico, E. H. Wells, 1919.
- Bulletin No. 4. Fluorspar in New Mexico, W. D. Johnston, Jr., 1928.
(Price 60 cents.)
- Bulletin No. 5. Geologic Literature of New Mexico, T. P. Wootton, 1930.
(Price 25 cents.)

¹Bulletins 1, 2 and 3 were issued by the Mineral Resources Survey of the New Mexico State School of Mines. They are no longer available for distribution.

Geologic Literature of New Mexico

By T. P. Wootton

INTRODUCTION

PLAN AND SCOPE OF BIBLIOGRAPHY

This bibliography of literature on New Mexico lists papers, reports, etc., dealing with the geology of the state. Under this head are included physical geology, structural geology, geologic formations, historical geology, physiographic geology, economic geology, mineralogy, petrography and paleontology. Topographic, geologic and geographic maps are given, and articles dealing with records of borings, dams and reservoir sites, and underground water are also included.

Part I, Bibliography, consists of a list of authors and publications. The authors are arranged alphabetically. Under each author's name is given a list of his writings arranged chronologically and numbered serially on that basis. Maps are listed under the individual in charge of the survey or under the publisher or source of issue.

The title of each writing is given in full. Below it is the name of the publication and other pertinent data, abbreviations being used where practicable. The series number of the publication is only used where two or more series have been issued; when given it appears in parenthesis following the name of the publication. The volume number and inclusive pages, separated by a colon, come next; and lastly the date of issue, enclosed in parenthesis, is given. For example, Amer. Jnl. Sci. (5) 19: 337-350. (1930), should be read, American Journal of Science, 5th series, volume 19, pages 337 to 350 inclusive, published in 1930.

Part II, Index, is an index of the geologic literature of the state. It is given under 19 major heads, and these are further subdivided according to the nature of the material indexed. Maps are indexed under one or more of the following heads: Geologic maps; maps, general; and topographic maps. One paper may be indexed under several different heads. Additional details are given under "Plan of Index," page 85.

In the index the name of the author and the serial number of his paper as used in this bulletin follow the appropriate subheading. Using these data the titles of papers can be obtained in Part I.

The papers listed in this bulletin were taken largely from Bulletins 698, 731, 746, 747, 758, 784 and 802 of the U. S. Geological Survey by John M. Nickles. Additional titles were obtained by searching through the files of the Library of Congress, the U. S. Geological Survey, and the New Mexico School of Mines. This list is as nearly complete as it could be made, but undoubtedly some papers have been omitted.

ACKNOWLEDGMENTS

Special acknowledgments are due to Miss J. L. V. McCord, librarian, for permission to consult the publications on file in the U. S. Geological Survey library; to Dr. A. C. Spencer for suggestions concerning arrangements of the index; and to Mr. John M. Nickles for helpful

criticism and furnishing recent titles which appeared in publications not available to the writer.

HOW PUBLICATIONS MAY BE OBTAINED

Many of the government publications can be obtained by writing direct to the department or bureau of issue, Washington, D. C., some being distributed gratis and a charge made for others. The original stock of many of the publications of the U. S. Geological Survey, etc., is exhausted. Some of these can be purchased from the Superintendent of Documents, Washington, D. C. Publications no longer available at the government offices in Washington may be for sale in second-hand book stores.

Many of the publications listed in the bibliography may be obtained direct from the publisher. Wherever possible the publisher's address is given under "Serials," pages 8-12.

A number of New Mexico libraries are officially designated depositories for U. S. Geological Survey and various other government publications, and they may have on their shelves other publications listed in this bibliography. These can be consulted in the libraries and some of them may be loaned under certain conditions. A list of these New Mexico libraries is as follows:

Albuquerque, University of New Mexico.
Las Vegas, New Mexico Normal University.
Santa Fe, State.
Silver City, New Mexico State Teachers College.
Socorro, New Mexico School of Mines and State Bureau of Mines.
State College, New Mexico College of Agriculture & Mechanic Arts.

The Engineering Societies Library, 29 West 39th St., New York City, has an unusually complete file of the geologic literature of the world. Photostat copies of printed articles can be obtained from this library at 25c for each negative (white lines on black background) and 50c for each positive. The maximum size, 11 by 14 inches, is large enough to take one large magazine page or two small pages.

Special efforts are being made by the State Bureau of Mines and Mineral Resources of the New Mexico School of Mines to obtain at least one copy of every publication containing any geologic information on the state. Photostat copies of papers not otherwise obtainable are being accumulated as rapidly as funds permit. This material is available to the public in the school library. Those who find it impossible to visit the library may borrow certain publications through correspondence, a suitable deposit being required in most cases.

A complete stock of published U. S. Geological Survey geologic and topographic maps of areas in New Mexico is kept in the library of the State Bureau of Mines and Mineral Resources. These maps are for sale at the regular retail prices of the Survey.

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

ABBREVIATIONS USED

Abst.	Abstract	Miner.	Mineralogy
Acad.	Academy	Misc.	Miscellaneous
Agr.	Agriculture	Mo.	Monthly
Amer.	American	Mon.	Monograph
An.	Annals, annual	Mus.	Museum
Anon.	Anonymous	N.	New, north, etc.
App.	Appendix	N. Mex.	New Mexico
Ariz.	Arizona	n. d.	no date of publication given
Asso.	Association	Nat.	Natural
Bienn.	Biennial	Natl.	National
Bull.	Bulletin	n. p.	no place of publication given
Bur.	Bureau	n. s.	new series
C. I.	Contour interval	Phila.	Philadelphia
Chem.	Chemistry	pp.	pages
Col.	Collection	Proc.	Proceedings
Coll.	College	Prof.	Professional
Colo.	Colorado	Prel.	Preliminary
Cong.	Congress	Pt.	Part
Contr.	Contributions	Pub.	Publication
Dept.	Department	Q.	Quarterly
Doc.	Document	R. R.	Railroad
Ed.	Editor, edition	Rp.	Report
Eng.	Engineering	Res.	Resources
Engr.	Engineer	rev. ed.	revised edition
Ex.	Executive	Rv.	reviewed
Exper.	Experiment	S. Ex. Doc. ..	Senate executive document
Expl.	Exploration	Sch.	School
Extr.	Extract	Sci.	Science, scientific
Geog.	Geographic	s.	series
Geol.	Geology, geologist	sess.	session
G. S.	Geological Survey	Soc.	Society
g. s.	geological series	St.	Saint
H. Ex. Doc.	House executive document	Sta.	Station
Hist.	History	Suppl.	Supplement
il. ...	illustrated with figures of fossils	Trans.	Transactions
illus.	illustrated with photographs, diagrams, etc.	U. S.	United States
Inst.	Institute	U. S. G. S. ..	United States Geological Survey
Int.	International	Univ.	University
Jnl.	Journal	Vol.	Volume
Kryst.	Krystallographie	Wash.	Washington
Mag.	Magazine	Zool.	Zoology
Mem.	Memoirs	Zs.	Zeitschrift
Memo.	Memorandum		
Min.	Mining, mineral		

SERIALS

- Acad. Nat. Sci. of Phila., Proc.**
Academy of Natural Sciences of Philadelphia, Proceedings.
- Acad. Sci. Paris, Comptes rendus.**
Academie des sciences, Paris, Comptes rendus.
- Acad. Sci. St. Louis, Trans.**
Academy of Science of St. Louis, Transactions.
- Amer. Asso. Adv. Sci., Proc.**
American Association for the Advancement of Science, Proceedings.
- Amer. Asso. Petro. Geol., Bull.**
American Association of Petroleum Geologists, Bulletin, Tulsa, Okla.
- Amer. Ceramic Soc., Jnl.**
American Ceramic Society, Journal. Columbus, Ohio.
- Amer. Forestry.**
American Forestry. Place of publication not known.
- Amer. Geol.**
American Geologist. Formerly published at Minneapolis, Minn.; consolidated with Economic Geology, q. v., in 1905.
- Amer. Inst. Min. Engrs., Trans.; Bull.; Preprint; Tech. Pub.**
American Institute of Mining Engineers, Transactions; Bulletin; Preprint; Technical Publication. 29 West 39th St., New York City.
(Since 1918 these publications have appeared under the name of American Institute of Mining & Metallurgical Engineers.)
- Amer. Jnl. Sci.**
American Journal of Science. New Haven, Connecticut.
- Amer. Min. Cong., Jnl.; Proc.**
American Mining Congress, Journal; Proceedings. Washington, D. C.
See also International Mining Congress.
- Amer. Mineralogist.**
American Mineralogist. Princeton University, Princeton, N. J.
- Amer. Mus. Nat. Hist., Bull.; Jnl.**
American Museum of Natural History, Bulletin; Journal. New York City.
- Amer. Mus. Novitates.**
American Museum Novitates (American Museum of Natural History).
- Amer. Nat.**
American Naturalist. Salem, Mass., and elsewhere.
- Amer. Philosophical Soc., Proc.**
American Philosophical Society, Proceedings. Philadelphia.
- Amer. Soc. Civil Engrs., Trans.**
American Society of Civil Engineers, Transactions. New York City.
- An. Mines.**
Annales des mines. Paris.
- Ariz. Min. Jnl.**
Arizona Mining Journal. Later, the Mining Journal. Heard Building, Phoenix, Arizona.
- Asso. Amer. Geog., An.**
Association of American Geographers, Annals. Albany, New York.
- Boston Soc. Nat. Hist., Proc.**
Boston Society of Natural History, Proceedings. Boston, Mass.
- Bur. Amer. Ethnology, Bull.**
Bureau of American Ethnology, Bulletin, Washington, D. C.

- Bur. of Immigration.**
Bureau of Immigration. Santa Fe, New Mexico.
- Carnegie Inst. Wash., Pub.**
Carnegie Institute of Washington (D. C.), Publications.
- Carnegie Mus., An.**
Carnegie Museum, Annals. Pittsburgh, Pa.
- Cin. Soc. Nat. Hist., Jnl.**
Cincinnati Society of Natural History, Journal. Cincinnati, Ohio.
- Colo. Mus. Nat. Hist., Proc.**
Colorado Museum of Natural History, Proceedings. Denver, Colorado.
- Colo. Sci. Soc., Proc.**
Colorado Scientific Society, Proceedings. Denver, Colorado.
- Denison Univ. Sci. Lab., Bull.**
Denison University, Scientific Laboratories, Bulletin. Granville, Ohio.
- Econ. Geol.**
Economic Geology. Urbana, Illinois.
- Edinb. N. Philosophical Jnl.**
Edinburgh New Philosophical Journal. Edinburgh, Scotland.
- El Paso Min. Jnl.**
El Paso Mining Journal. El Paso, Texas. No longer published.
- Eng. Min. Jnl.**
Engineering and Mining Journal. 10th Ave., at 36th St., New York City.
- Eng. Mag.**
Engineering Magazine. New York City.
- Eng. News.**
See Engineering News-Record.
- Eng. News-Record.**
Engineering News-Record. 10th Ave. at 36th St., New York City.
- Field Mus., Pub. g. s.**
Field Museum, Publication, geological series. Chicago, Illinois.
- G. L. O.**
General Land Office. Washington, D. C.
- Geog. Review.**
Geographical Review. New York City.
- Geol. Soc. Amer., Bull.**
Geological Society of America, Bulletin. Florida Ave. and Eckington Place, Washington, D. C.
- Geographische Gesellschaft in Munchen, Jber.**
Geographische Gesellschaft in Munchen, Jahresbericht.
- Ind. Acad. Sci., Proc.**
Indiana Academy of Science, Proceedings. Indianapolis, Indiana.
- Int. Geol. Cong., Comptes rendus.**
International Geological Congress, Comptes rendus.
- Int. Min. Cong.**
International Mining Congress. Later, American Mining Congress.
- Iowa Acad. Sci., Proc.**
Iowa Academy of Sciences, Proceedings. Des Moines, Iowa.
- Jnl. Geol.**
Journal of Geology. University of Chicago, Chicago, Illinois.
- Jnl. Geog.**
Journal of Geography. Chicago, Illinois.

- K-k Naturh. Hofmus, An.**
Kaiserlich-konigliche naturhistorische Hofmuseum, Annalen. Wien.
- Kans. Acad. Sci., Trans.**
Kansas Academy of Science, Transactions. Topeka, Kansas.
- Kans. Univ., Sci. Bull.**
Kansas University, Science Bulletin. Lawrence, Kansas.
- Kans. City Rv. Sci.**
Kansas City Review of Science and Industry. Kansas City, Missouri.
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Michigan Academy of Science, Report. Lansing, Michigan.
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Mining Congress Journal. Washington, D. C.
- Min. Science.**
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- Min. Sci. Press.**
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- Min. World.**
Mining World. No longer published.
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Neues Jahrbuch fur Mineralogie, Geologie, und Palaontologie, Beilage Band. Stuttgart, Germany.
- N. Mex. Coll. Agr. and Mechanic Arts, Exper. Sta. Bull.**
New Mexico College of Agriculture and Mechanic Arts, Experiment Station Bulletin. Mesilla Park, New Mexico.
- N. Mex. Min. Record.**
New Mexico Mining Record. No longer published.
- N. Mex. Sch. Mines, State Bur. Mines & Min. Res., Bull.**
New Mexico School of Mines, State Bureau of Mines and Mineral Resources, Bulletin. Socorro, New Mexico.
- N. Mex. State Engr., Bienn. Rp.**
New Mexico State Engineer, Biennial Report. Santa Fe, New Mexico.
- N. Mex. State Sch. Mines, Min. Res. S., Bull.**
New Mexico State School of Mines, Mineral Resources Survey, Bulletin. Socorro, New Mexico.

- N. Mex. State Tax Commission.**
New Mexico State Tax Commission. Santa Fe, New Mexico.
- N. Mex. Univ., Bull., g. s.; chem. s.**
New Mexico University, Bulletin, geological series; chemical series. Albuquerque, New Mexico.
- N. Y. Acad. Sci., An.; Trans.**
New York Academy of Sciences, Annals; Transactions. New York City.
- Natl. Acad. Sci., Proc.**
National Academy of Sciences, Proceedings. Washington, D. C.
- Natl. Geog. Mag.**
National Geographic Magazine. Washington, D. C.
- Nature.**
Nature. London, England.
- Nautilus.**
Nautilus. Boston, Mass.
- Oil and Gas Jnl.**
Oil and Gas Journal. Tulsa, Oklahoma.
- Paleon. Bull.**
Paleontological Bulletins (Cope). Philadelphia, Pa.
- Pan-Amer. Geol.**
Pan-American Geologist. Des Moines, Iowa.
- Pan-Amer. Sci. Cong.**
Pan-American Scientific Congress. Washington, D. C.
- Philosophical Soc. Wash., Bull.**
Philosophical Society of Washington (D. C.), Bulletin.
- Pop. Sci. Mo.**
Popular Science Monthly. New York City.
- Republic.**
Republic. Washington, D. C.
- Rv. Scient.**
Revue Scientifique. Paris, France.
- Rv. Univ. Mines.**
Revue universelle des Mines..... Liège and Paris.
- Sci. Mo.**
Scientific Monthly. Grand Central Terminal, New York City.
- Sci. Amer.; Sci. Amer. Suppl.**
Scientific American; Scientific American Supplement. New York City.
- Sch. Mines. Q.**
School of Mines Quarterly. Columbia University, New York City.
- Science; Science, n. s.**
Science; Science, new series. New York City.
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Seismological Society of America, Bulletin. Stanford University, California.
- Smithson. Inst., An. Rp.; Misc. Col.**
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- Société géologique de France, Bull.**
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- Stone.**
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Tech. Q.

Technology Quarterly and Proceedings of the Society of Arts. Earlier, Technology Quarterly. Massachusetts Institute of Technology, Boston, Mass.

(U. S.)—Cong., —Sess., S. Ex. Doc.; H. Ex. Doc.

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U. S. Geol. and Geog. S. Terr. (Hayden).

United States Geological and Geographical Surveys of the Territories (in charge of F. V. Hayden).

U. S. G. S., An. Rp.; Prof. Paper; Mon.; Bull.; Water-Supply Paper; Min. Res.; Geol. Atlas; Topographic Atlas.

United States Geological Survey, Annual Report; Professional Paper; Monograph; Bulletin; Water-Supply Paper; Mineral Resources of the United States; Geologic Atlas, —Folio (No.—); Topographic Atlas No.—. Washington, D. C.

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U. S. Pacific R. R. Expl.

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United States (War Department), Chief of Engineers, Annual Report.

Utah Acad. Sci., Trans.

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1. Triassic of West Texas.
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Amerine, C. H.

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n. d., n. p. (Copyright, 1895).
(A perspective drawing of the region NE of Taos and NW of Elizabethtown).

Anderson, Carl.

1. The Cooney mining district, Socorro County (now Catron County), N. Mex.
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Antisell, Thomas.

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Argall, Philip B.

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Eng. Min. Jnl. 86: 366-370 (1908).

Ashburner, Charles A.

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1. Secondary enrichment in the Santa Rita district.
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2. Earthquakes in Socorro, New Mexico.
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Bailey, Jacob Whitman.

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Texas Univ., Bull. 1915 No. 57: 225 pp., maps (1915).
2. Contributions to the stratigraphy of eastern New Mexico.
Amer. Jnl. Sci. (4) 49: 99-126 (1920).
3. Caverns in the Guadalupe Mountain range.
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4. Discussion of Permian symposium.
Amer. Asso. Petro. Geol., Bull. 13: 1057-1063 (1929).
5. Depositional history of the red beds and saline residues of the Texas (and New Mexico and Kansas) Permian.
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1. Petroleum withdrawals and restorations.
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13. Unconformity separating the coal-bearing rocks in the Raton field, New Mexico; (*abst.*).
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3. A recent vein at Ojo Caliente, New Mexico (*abst.*).
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16 pp., Zurich 1858, privately published.
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Marcou, Jules (Continued).

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Marcy, R. B.

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Martin, Charles W.

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(A similar map dated 1919 is for sale by J. C. Berry & Co., Amarillo, Texas.)

Martin, G. A.

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Mather, Kirtley F.

See Atwood, 1.

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2. A recent lava flow in New Mexico.
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 2. (and Lonsdale, J. T.) Psuedo-cubic quartz crystals from Artesia, New Mexico.
Amer. Mineralogist 14:50-53, illus. (1929).
- See also Branson, 1.

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1. Historical epitome of the silver mines of Kingston, Sierra County, New Mexico (Written expressly for Merry's map, and appearing thereon).
Britton and Rey, San Francisco (1887).

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Amer. Geol. 36:271-284 (1905).

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1. Notes on certain ore deposits of the Southwest.
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2. Copper in the red beds of New Mexico.
Ec. Geol. 11:594-597 (1916).

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Kansas G. S., Bull. 9:135 pp., il. (1924).

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United States Bureau of Mines.

1. Mineral resources of the United States, 1923-date.
U. S. Bur. Mines, Washington, D. C.

United States Bureau of Soils.

1. Soil map, Carlsbad sheet.
Scale, 1" to 1 mile (1899).
(Has several columns showing nature of soil to depth of 6 feet).
2. Soil map, Roswell sheet.
Scale, 1" to 1 mile (1899).
(Has several columns showing nature of soil to depth of 6 feet).
3. Underground water map, Carlsbad sheet.
Scale, 1" to 1 mile (1899).
4. Underground water map, Roswell sheet.
Scale, 1" to 1 mile (1899).

United States Forest Service:

The following maps are printed in black only, show roads, railroads, towns, Land Grants, and the sub-divisions of the Public Domain:

1. Apache National Forest; Catron, and Greenlee and Apache (Arizona) Counties; 4 miles to 1 inch (approx.) (1924?).
2. Carson National Forest; Rio Arriba and Taos Counties; 4 miles to 1 inch (approx.) (1925?).
3. Coronado National Forest; Hidalgo, and Cochise (Arizona) Counties; 4 miles to 1 inch (approx.) (1922).
4. Datil National Forest; Catron, Socorro, and Sierra Counties; 4 miles to 1 inch (approx.) (1925).
5. Gila National Forest; Catron and Grant Counties; 4 miles to 1 inch (approx.) (1924).
6. Lincoln National Forest; Lincoln, Otero, Chaves and Eddy Counties; 4 miles to 1 inch (approx.) (1925).
7. Manzano National Forest; Eastern Division, Bernalillo, Sandoval, Torrance, Valencia, Socorro and Lincoln Counties; 4 miles to 1 inch (approx.) (1925?).
8. Manzano National Forest; Western Division, McKinley, Valencia, and Sandoval Counties; 4 miles to 1 inch (approx.) (1925?).
9. Santa Fe National Forest; Santa Fe, Rio Arriba, Sandoval, Taos, Mora, and San Miguel Counties; 4 miles to 1 inch (approx.) (1924).

United States Geological Survey.

1. Mineral resources of the United States, annual from 1882 to 1923.

U. S. G. S., Washington. D. C.

(Volumes for 1894-1899 were published in the Director's Annual Report.)

The following topographic maps, nos. 2-59, of areas of New Mexico have been published by the U. S. G. S., Washington, D. C. The first figure given is the scale, the second figure is the contour interval, and the figure in parenthesis is the date of issue:

2. Topographic map of New Mexico, compiled by N. H. Darton; 1:500,000; 100 meters (1925).
3. Albuquerque; Bernalillo and Sandoval Counties; 1:125,000; 50 feet (1893).
4. Alamo National Forest (now part of Lincoln National Forest); Otero County; 1:250,000; 200 feet (1914).
5. Alum Mountain; Grant and Catron Counties; 1:125,000; 100 feet (1913).
6. Animas Peak; Hidalgo County; 1:62,500; 25 feet (1920).
7. Antelope Wells; Hidalgo County; 1:62,500; 25 feet (1919).
8. Bernal; Guadalupe, San Miguel, and Torrance Counties; 1:125,000; 50 feet (1894).
9. Big Hatchet Peak; Hidalgo County; 1:62,500; 25 feet (1918).
10. Brilliant; Colfax County; 1:62,500; 50 feet (1915).
11. Camel Mountain; Dona Ana and Luna Counties; 1:62,500; 10 feet (1917).
12. Canutillo; Dona Ana, and El Paso (Texas) Counties; 1:62,500; 10 feet (1919).
13. Canyon de Chelly; San Juan, and Apache (Arizona) Counties; 1:250,000; 200 feet (1892).
14. Chaco; San Juan County; 1:250,000; (1892).
15. Chiricahua; Hidalgo, and Cochise (Arizona) Counties; 1:125,000; 100 feet (1919).
16. Cienega Springs; Hidalgo County; 1:62,500; 25 feet (1918).
17. Columbus; Luna County; 1:62,500; 10 feet (1920).
18. Corazon; Guadalupe and San Miguel Counties; 1:125,000; 50 feet (1894).
19. Deming; Luna County; 1:125,000; 100 feet (1915).
20. Dog Mountains; Hidalgo County; 1:62,500; 25 feet (1918).
21. Fort Bayard Special; Grant County; 1:12,000; 10 feet (1910).
22. Fort Defiance; McKinley, and Apache (Arizona) Counties; 1:250,000; 200 feet (1892).
23. Gallina; Rio Arriba and Sandoval Counties; 1:125,000; 100 feet (1909).
24. Hachita; Grant and Hidalgo Counties; 1:62,500; 25 feet (1918).
25. Hermanas; Luna County; 1:62,500; 10 feet (1918).
26. Jemez; Sandoval County; 1:125,000; 100 feet (1892).
27. Koehler; Colfax County; 1:62,500; 50 feet (1917).
28. Lamy; Santa Fe and San Miguel Counties; 1:125,000; 50 and 100 feet (1894).
29. Largo; Rio Arriba, Sandoval and San Juan Counties; 1:250,000; 200 feet (1895).
30. Las Cruces; Dona Ana County; 1:125,000; 25 and 50 feet (1893).
31. Las Vegas; San Miguel and Mora Counties; 1:125,000; 50 feet (1893).
32. Magdalena Special; Socorro County; 1:12,000; 25 feet (1912).
33. Mogollon; Catron and Grant Counties; 1:125,000; 100 feet (1912).
34. Morenci; Catron, Grant, and Greenlee (Arizona) Counties; 1:125,000; 100 feet (1915).

United States Geological Survey (Continued).

35. Mt. Riley; Dona Ana County; 1:62,500; 10 feet (1918).
36. Mt. Taylor; McKinley, Sandoval, Valencia and Bernalillo Counties; 1:250,000; 200 feet (1899).
37. Noria; Dona Ana County; 1:62,500; 10 feet (1918).
38. Pelona; Catron County; 1:125,000; 100 feet (1918).
39. Perilla; Hidalgo, and Cochise (Arizona) Counties; 1:125,000; 100 feet (1919).
40. Playas; Hidalgo County; 1:62,500; 25 feet (1919).
41. Point of Sands; Dona Ana and Otero Counties; 1:125,000; 50 feet (1916).
42. Pratt; Hidalgo County; 1:62,500; 25 feet (1919).
43. Raton; Colfax County; 1:62,500; 50 feet (1914).
44. Reserve; Catron County; 1:125,500; 100 feet (1918).
45. St. John's; Catron, Valencia, and Apache (Arizona) Counties; 1:250,000; 200 feet (1892).
46. San Pedro; Santa Fe, Sandoval, Bernalillo and Torrance Counties; 1:125,000; 50 and 100 feet (1892).
47. San Simon; Hidalgo, and Cochise and Graham (Arizona) Counties; 1:125,000; 100 feet (1917).
48. Santa Clara; Sandoval and Santa Fe Counties; 1:125,000; 100 feet (1892).
49. Santa Fe; Santa Fe, San Miguel and Mora Counties; 1:125,000; 100 feet (1894).
50. Santa Rita Special; Grant County; 1:24,000; 20 feet (1909).
51. Silver City; Grant County; 1:125,000; 100 feet (1909).
52. Socorro; Socorro County; 1:62,500; 50 feet (1906).
53. Tularosa; Otero, Lincoln and Socorro Counties; 1:125,000; 50 feet (1916).
54. Tyrone District; Grant County; 1:24,000; 25 feet (1922).
55. Victorio; Luna, Grant and Hidalgo Counties; 1:62,500; 25 feet (1918).
56. Walnut Wells; Hidalgo County; 1:62,500; 25 feet (1918).
57. Watrous; San Miguel and Mora Counties; 1:125,000; 50 feet (1894).
58. Wingate; McKinley and Valencia Counties; 1:250,000; 200 feet (1892).
59. (Base Map) State of New Mexico.
Scale 1:500,000 (1922).

The following memoranda for the press, Nos. 60-67, deal with New Mexico.

60. Result of core drilling in New Mexico.
Interior Dept., Memo. for the Press (10994): 2 pp., log of boring (1926).
61. First Government potash test encouraging.
Interior Dept., Memo. for the Press (17064): 4 pp., log of boring. (1927).
62. Government strikes potash in New Mexico.
Interior Dept., Memo. for the Press (17450): 2 pp., log of boring (1927).
63. Third Government test strikes substantial bodies of potash.
Interior Dept., Memo. for the Press (20893): 4 pp., (1928).
64. Potash struck by four Government tests in Texas.
Interior Dept., Memo. for the Press (23657): 7 pp. (1928).
(Gives potash analyses from 20 wells in New Mexico).
65. Potash struck by three more Government tests in Texas.
Interior Dept., Memo. for the Press (30714): 6 pp. (1929).
(Gives potash analysis from 21 wells in New Mexico).
66. (Eleventh and twelfth Government tests).
Interior Dept., Memo. for the Press (36351): 3 pp. (1929).
(Includes analyses of well cuttings from 12 New Mexico wells).

United States Geological Survey (Continued).**67. Potash found in Government test holes.**

Interior Dept., Memo. for the Press (41542): 5 pp. (1930).

(Results obtained in 13th and 14th test holes, Eddy and Lea Co.)

Van Diest, Peter H.**1. Report on the geological conditions of artesian basins in eastern Colorado and New Mexico.**

U. S., 51st Cong. 1st sess., S. Ex. Doc. 222: 87-97, maps (1890).

2. Remarks on the plication of the coal measures in southeastern Colorado and northeastern New Mexico.

Colo. Sci. Soc., Proc. 3: 185-190 (1890).

Van Hise, Charles Richard.**1. Correlation papers: Archean and Algonkian.**

U. S. G. S., Bull. 86: 549 pp., maps. (1892).

Van Wiebe, Walter A.**1. Tectonic classification of oil fields in the United States.**

Amer. Asso. Petro. Geol., Bull. 13: 409-440, map (1929).

Vaughan, T. W.

See Hill, 13.

Wade, William Rogers.**1. Burro Mountain copper district.**

Eng. Min. Jnl. 84: 355-356 (1907).

2. Minerals of the Tres Hermanas district.

Eng. Min. Jnl. 96: 589-590 (1913).

3. Apache mining district, New Mexico.

Eng. Min. Jnl. 97: 597-598 (1914).

4. Mining district of Pinos Altos, New Mexico.

Min. Sci. Press 109: 402-403 (1914).

Walcott, Charles Doolittle.**1. Correlation papers: Cambrian.**

U. S. G. S., Bull. 81: 447 pp., maps (1891).

Waller, E.**1. (and Moses, A. J.) A probably new nickel arsenide (from Grant Co., N. M.).**

Sch. of Mines Q. 14: 49-51 (1892).

Ward, Lester Frank.**1. The geographical distribution of fossil plants.**

U. S. G. S., An. Rp. 8 pt. 2: 663-960 (1889).

Warren, Charles Hyde.**1. Mineralogical notes.**

Amer. Jnl. Sci. (4) 6: 116-124 (1898).

Weatherby, W. J.**1. The Mogollon Range; a description of the region near Cooney, N. M.**
Mines and Minerals 22: 97-101 (1901).

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1. Notes on the geology of southwestern New Mexico.
Amer. Geol. 18: 56-57 (1896).

Weed, Walter Harvey.

1. The copper mines of the United States in 1905.
U. S. G. S., Bull. 285: 93-124 (1906).
2. The copper mines of the world.
New York, 375 pp., illus. (1908).

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1. North American geologic formation names; bibliography, synonymy, and distribution.
U. S. G. S., Bull. 191: 448 pp. (1902).

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U. S. G. S., Bull. 541: 419-452, maps (1914).

Weinschenk, E.

See Cohen, 1.

Wells, Edgar H.

1. Manganese in New Mexico.
N. Mex. State Sch. Mines, Min. Res. S., Bull. 2: 85 pp., map (1918).
2. Oil and gas possibilities of the Puertecito district, Socorro and Valencia Counties, New Mexico.
N. Mex. State Sch. Mines, Min. Res., Bull. 3: 47 pp., map (1919).
3. The mining industry and mineral resources of New Mexico.
Min. Cong. Jnl. 10: 397-398 (1924).
4. Geology of the El Vado dam site and reservoir, Rio Arriba County, New Mexico.
N. Mex., State Engr., 8th Bienn. Rp.: 241-251 (1928).

Wells, J. L.

1. Mines of the Lordsburg district, New Mexico.
Eng. Min. Jnl. May 1, 1909.

Wells, Roger C.

1. Sodium sulphate: its sources and uses.
U. S. G. S., Bull. 717: 43 pp., maps (1923).

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Wendt, Arthur Frederick.

1. The copper ores of the Southwest.
Amer. Inst. Min. Engrs., Trans. 15: 25-77, map (1887); Eng. Min. Jnl. 43: 94-96, 112-114, 133-134, 150-152, 183-185 (1887).

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1. Annual report upon the geographical and geological surveys and explorations west of the 100th meridian in Nevada, Utah, Colorado, New Mexico, and Arizona.

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Borings, page 87. Papers containing descriptive or graphic records of borings for oil, gas, water, etc.

Correlation, page 87. Papers dealing with the correlation of geologic formations.

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- Albuquerque region: Bryan, 1; Herrick, C. L., 6, 10; Reagan, 1, 5.
 Alum:
 Gila River, Grant County: Hayes, 1.
 Alunogen:
 Gila region: Blake, 5.
 Anthracite: Griffith, 1; Johnson, D. W., 4; Lakes, 1; Le Conte, 1; Owen, 1; Raymond, 1, 6.
 See also Coal, Cerrillos field, page 89.
 Apache Canyon:
 South-central: Keyes, 4.
 Apache district: Wade, 3.
 Artesia oil field: Davis, M. J., 1; Rich, A., 1.
 Aztec mine: Chase, 1; Lee, 22; Raymond, 1.
 Bauxite:
 Gila region: Blake, 5.
 Bentonite:
 Rio Arriba County: Ross, 1.
 Bernalillo County: Lindgren, 6; Anon., 7.
 Fluorspar: Johnston, 1.
 Black Range: Fishback, 1; Wright, J. W., 1.
 History: Thompson, 1.
 Manganese: Anon., 10.
 Tin district: Hill, J. M., 2; Naething, 1.
 Building stone: Antisell, 1; Jones, F. A., 1.
 Luna County: Darton, 12.
 Raton region: Lee, 29,
 Burro Mountains: Bush, 1, 7; Lang, 1; Paige, 3, 7; Reid, G. D., 1; Somers, 1; Stauber, 1; Wade, 1; Weed, 1.
 Turquoise: Zalinski, 1, 2.
 Brass ore in nature: Keyes, 70.
 Caballos Mountains, ore deposits of: Keyes, 20.
 Carbonaceous deposit, near Putnam: Foster, 1.

Economic geology (Continued).

- Catron County (separated from Socorro County in 1921):
 Fluorspar: Johnston, 1.
 Mogollon district: Anderson, 1, 2; Bush, 6; Ferguson, 1, 2; Henrich, 2; Scott, 1.
 Zuni salt deposits: Darton, 1, 2.
- Cement materials: Eckel, 1.
 Production: Min. Ind., 1.
- Central district: Birkenbine, 1; Lindgren, 6; Paige, 7; Weed, 1.
- Cerrillos Hills: Johnson, D. W., 4.
- Chloride Flat district: see Grant County.
- Chupadera Mesa:
 Iron deposits: Keyes, 67.
- Clay: Herrick, C. L., 12; Jones, F. A., 1; Shaler, 2.
 Analyses:
 Cretaceous clay from Capitan: Jones, 1.
 Cretaceous clay from Sandia Mountains: Jones, 1.
 Acequia clay from old Albuquerque: Jones, 1.
 Luna County: Darton, 12.
 Raton region: Lee, 29.
- Coal: Ashburner, 1; Campbell, 4, 6, 7; Finlay, 2; Fleming, 1; Griffith, 1; Jones, F. A., 1, 9; Judd, E. K., 1; Lakes, 2; Le Conte, 1; Macfarlane, 1; Parker, 1; Ritter, 1; Storrs, 1.
 Analyses: Campbell, 5; Jones, F. A., 1.
 Cerrillos field: Lee, 19; Stevenson, 12.
 Colfax County: Anon., 9.
 Gallup-Zuni Basin: Sears, 1.
 Lincoln County: Anon., 9.
 McKinley County: Campbell, 5; Anon., 9.
 Monero, Rio Arriba County: Gardner, 3.
 Raton coal field: Lee, 18, 31.
 San Miguel County: Gardner, 5.
 Socorro County: Campbell, 5; Gardner, 6.
- Bernalillo County:
 Tijeras field: Lee, 15.
- Carboniferous: Gardner, 5, 8; Keyes, 28.
- Carbon ratios: Dobbin, 1; Storm, 1.
- Carthage field: Gardner, 6; Owen, 1.
- Cerrillos field, Santa Fe County: Lee, 19; Johnson, D. W., 4; Lesquereux, 6; Stevenson, 11, 12.

Economic geology (Continued).

- Coal (Continued).
- Colfax County:
 Dawson field: Sheridan, 1.
 Raton field: Judd, E. K., 1; Lee, 31; Stevenson, 8.
- Cretaceous: Le Conte, 2.
- Cretaceous, carbon ratios of:
 Storm, 1.
- Dawson field: Sheridan, 1.
- Durango-Gallup field: Schrader, 1; Shaler, 3.
- Durango-Monero field: Gardner, 3.
- Engle field, Socorro County: Lee, 3.
- Fort Stanton Reservation, Lincoln County: Campbell, 3.
- Gallina-Raton Spring field: Gardner, 2.
- Gallup Basin: Kirk, 1; Sears, 1.
- Gallup-San Mateo field: Gardner, 4.
- Hagan field, Sandoval County: Keyes, 10.
- Jemez field: Reagan, 3.
- Lincoln County: Campbell, 3; Wegemann, 1.
- McKinley County: Gardner, 4; Kirk, 1; Schrader, 1; Shaler, 3; San Mateo-Cuba field: Gardner, 7.
- Map of fields: Campbell, 4, 7.
- Maxwell land grant: Conkling, 2, 3.
- Mescal Canyon field: Keyes, 35.
- Monero, Rio Arriba County: Gardner, 3.
- Northeastern: Van Diest, 2.
- North central: Lee, 16.
- Northern: Judd, E. W., 1; St. John, 1.
- O'Mara field: Keyes, 71.
- O'Mara and Pecos River fields: Gardner, 5.
- Otero County: Wegemann, 1.
- Pecos River field: Gardner, 5.
- Production figures: Jones, F. A., 1; Mineral Industry, 1; U. S. Bur. Mines, 1; U. S. G. S., 1.
 Cerrillos field: Johnson, D. W., 4.
 Raton field: Lee, 31.
- Quantity, in Fruitland formation: Bauer, 2.
- Raton-Brilliant-Kochler area: Lee, 29.
- Raton field, Colfax County: Judd, E. K., 1; Lakes, 4; Lee, 31; Owen, 1; Stevenson, 8.
- Reserves: Finlay, 2.

Economic geology (Continued).

Coal (Continued).

Rio Arriba County:

San Mateo-Cuba field: Gardner, 7.

Rio Puerco: Owen, 1.

Sandoval County: Campbell, 2.

San Mateo-Cuba field: Gardner, 7.

San Juan County: Bauer, 2.

San Mateo-Cuba field: Gardner, 7.

San Miguel County: Gardner, 8.

Santa Fe County:

Cerrillos field: Lee, 19; Raymond, 1, 6; Stevenson, 11.

Sierra Blanca field: Wegemann, 1.

Socorro County:

Carthage field: Gardner, 6.

Engle field: Lee, 3.

Tijeras field, Bernalillo County:

Lee, 15; Marcou, 2.

Una del Gato field: Campbell, 2.

Valencia County:

San Mateo-Cuba field: Gardner, 7.

White Mountain region: Fisher, C. A., 1.

Wootton area: Le Conte, 1; Lee, 23.

Cobalt:

Grant County, Black Hawk: Leach, A. A., 1.

Cochiti district: Barbour, 1; Otero, 1; Statz, 3; Wynkoop, 1.

Colfax County: Lindgren, 6.

Aztec mine: Chase, 1; Lee, 22; Raymond, 1; Stevenson, 4.

Dawson coal field: Lee, 31; Sheridan, 1.

Graphite: Lakes, 4; Lee, 18.

Moreno district: Raymond, 1, 3; Stevenson, 4.

Colorado Plateau: Butler, 3.

Contact metamorphism: Lindgren, 6.

Cooks Peak: Darton, 12, 15; Lindgren, 6; Wells, E. H., 1.

Cooney district: See Mogollon district, page 93.

Copper: Austin, 2; Cazin, 1; Lindgren, 6; Tovote, 2; Weed, 1, 2; Wendt, 1; Winchell, 1.

Apache district: Wade, 3.

Bent: Ball, S. H., 1.

Black Range district: Wright, J. W., 1.

Burro Mountain district: Bush, 1; Lang, 1; Paige, 3; Reid, G. D., 1; Somers, 1; Stauber, 1; Wade, 1.

Catron County:

Cooney district: Graham, 1.

Economic geology (Continued).

Copper (Continued).

Cooney district, Catron County: Graham, 1.

See also Mogollon district, page 93.

Depths at which formed: Keyes, 43.

Dona Ana County: Anon., 11.

Enrichment, Santa Rita: Bagg, 1.

Estey City: Turner, 1.

Grant County: Birnie, 1; Snow, 2.

Pinos Altos district: Blood, 1;

Paige, 2.

Santa Rita district: Bagg, 1;

McDonald, D. F., 1.

Silver City: Brinsmade, 4.

Tyrone district: Bush, 7; Paige, 9.

See also Burro Mountains, page 88.

Hell Canyon district: Statz, 2.

Hidalgo County:

Lordsburg region: Jones, F. A., 4.

Lincoln County:

Bent: Ball, S. H., 1.

Lordsburg region: Jones, F. A., 4.

Magdalena district: Argall, 1; Haddon, 1.

Mogollon district: Ferguson, 1, 2; Scott, 1.

Mora County: Austin, 1, 2.

Nacimiento district: Rogers, 1.

Oscura Mountains: Emmons, S. F., 4.

Pinos Altos district: Paige, 2.

Production: Mineral Industry, 1; U. S. Bur. Mines, 1; U. S. G. S., 1.

Mogollon district: Scott, 1.

Red beds: See Sandstone copper, page 94.

San Andres and Caballos Mountains: Emmons, S. F., 4; Her-

rick, C. L., 4.

San Pedro, Santa Fe County: Berryman, 1; Brinsmade, 3;

Henrich, 1; Keyes, 43; McCaffery, 1.

Santa Fe County:

Montezuma: Jenkins, 1.

San Pedro: Berryman, 1; Brinsmade, 3; Henrich, 1.

Santa Rita: MacDonald, D. F., 1; Rickard, 1.

Enrichment at: Bagg, 1.

Sierra Oscura: Peters, 1; Rogers, 1; Turner, 1.

Silver City: Brinsmade, 4.

Tyrone district, Grant County: Bush, 1, 7; Paige, 9.

Economic geology (Continued).

- Copper (Continued).
 Valencia County:
 Zufii Mountains: Schrader, 2.
 Zufii Mountains: Schrader, 2.
 Deming quadrangle: Darton, 15.
 Dona Ana County: Lindgren, 6.
 Fluorspar: Johnston, 1.
 Manganese: Jones, E. L., 1;
 Wells, E. H., 1; Anon., 10.
 Organ Mountains: Griffin, 1;
 Otero, 1.
 Sodium sulphate:
 Lake Lucero: Wells, R. C., 1.
 Epitome of economic geology: Jones,
 5.
 Eureka district: Birnie, 1.
 Fierro district: Birkenbine, 1; Lind-
 gren, 6; Paige, 1, 7; Wells, E.
 H., 1.
 Florida Mountains: Becker, 1; Dar-
 ton, 12, 15; Lindgren, 6; Wells,
 E. H., 1.
 Fluorine:
 in sericitization, Tyrone district:
 Paige, 8.
 Fluorspar: Johnston, 1; Ladoo, 1.
 Map showing distribution: John-
 ston, 1.
 Deming, Luna County: Burchard,
 1, 2, 3; Darton, 5, 12.
 Gallup Basin: Kirk, 1; Sears, 1.
 Fierro district, ores of: Birkenbine,
 1; Brinsmade, 4; Paige, 1;
 Schwartz, 1.
 Garnet:
 Luna County: Darton, 12.
 Production figures: Mineral In-
 dustry, 1.
 General: Browne, 1, 2; Finlay, 2;
 Frazer, 1; Hayden, 1; Herrick,
 C. L., 5, 7, 12, 13; Hewett, 1;
 Jones, F. A., 1, 5, 9; Lindgren,
 1, 6; Otero, 1; Owen, 1; Tovote,
 1; Wells, E. H., 3; Anon., 4, 5,
 6.
 Georgetown district: Larsh, 2; Lind-
 gren, 6; Paige, 7.
 Gold: Carruth, 1; Lindgren, 1, 6.
 Baldy, Colfax County: Chase, 1;
 Lee, 22; St. John, 1.
 Black Range: Fishback, 1; Wright,
 J. W., 1.
 Catron County:
 Cooney district: Graham, 1; Kid-
 der, 1.
 Cochiti district, Sandoval County:
 Barbour, 1.
 Colfax County, Baldy Mountains:
 Chase, 1; Lee, 1.

Economic geology (Continued).

- Gold (Continued).
 Cooney district, Catron County:
 Graham, 1; Kidder, 1.
 Grant County: Birnie, 1; Pickard,
 1.
 Pinos Altos district: Bush, 2;
 Paige, 2; Wright, I. L., 1.
 Silver City region: Brinsmade, 4.
 Hidalgo County:
 Lordsburg region: Jones, F. A., 4.
 Sylvanite: Dinsmore, 1; Jones,
 F. A., 6, 7.
 Lordsburg region: Jones, F. A., 4.
 Mogollon district: Scott, 1; Fer-
 guson, 1, 2.
 Pinos Altos district: Bush, 2;
 Paige, 2; Wright, I. L., 1.
 Placers: Carruth, 1;
 in arid regions: Stone, G. H., 2.
 Production: Mineral Industry, 1;
 U. S. Bur. Mines, 1; U. S. G. S.,
 1.
 Mogollon district: Scott, 1.
 Rio Arriba County: Silliman, 1.
 Sandoval County:
 Cochiti district: Barbour, 1.
 San Pedro Mountain: Brinsmade, 3.
 Santa Fe County: Jones, 3; Statz,
 1.
 San Pedro district: Brinsmade, 3.
 Santa Fe region: Blake, 3.
 Sierra County: Birnie, 1.
 Sierra del Oro: Keyes, 64.
 Socorro County:
 Magdalena district: Lindgren, 6.
 Rosedale district: Lindgren, 6.
 Silver City: Brinsmade, 4.
 Sylvanite: Dinsmore, 1; Jones, F.
 A., 6, 7.
 Taos County: Bush, 3; Silliman, 1.
 Grant County: Birnie, 1; Browne, 2;
 Lindgren, 6; Otero, 1; Raymond,
 1, 2, 3, 4, 7, 8, 9; Silliman, 3.
 Alunogen and bauxite: Blake, 5.
 Bremen mine: Furman, 1.
 Burro Mountains: Paige, 3.
 Chloride Flat district: Birnie, 1.
 Copper: Lindgren, 6; Snow, 2.
 See also Burro Mountain district,
 page 88; Tyrone district, page
 96; and Santa Rita district,
 page 95.
 Fluorspar: Johnston, 1.
 Georgetown mines: Furman, 1.
 Hanover district: Brinsmade, 4.
 Iron of: Birkenbine, 1; Paige, 1.
 Lone Mountain district: Birnie, 1;
 Lindgren, 6; Paige, 7; Ray-
 mond, 7.
 Malone mines: Leach, A. A., 3.

Economic geology (Continued).**Grant County (Continued).**

Manganese: Jones, E. L., 1; Wells, E. H., 1; Anon., 18.

Mimbres district: Birnie, 1.

Pinos Altos district: Birnie, 1;

Pinos Altos district: Birnie, 1;

Blood, 1; Bush, 2; Paige, 2;

Wade, 4.

Radium: Leach, F. I., 1.

Silver City: Brinsmade, 4.

Turquoise: Dinsmore, 3.

Tyrone district: Bush, 1, 7; Paige, 3.

White Signal district: Leach, F. I., 1.

Zinc ores: Blake, 6; Brinsmade, 4.

Graphite:

Raton, Colfax County: Lakes, 4; Lee, 12, 18, 29.

Tijeras Canyon: Herrick, C. L., 12.

Guano: Jones, F. A., 1.

Luna County: Darton, 12.

Socorro County: Brady, 2.

Gypsum: Adams, G. I., 1; Blake, 1;

Darton, 19; Herrick, C. L., 12;

Herrick, H. N., 1; Jones, 1;

Santmyers, 1; Stone, R. W., 1.

Analyses:

Ancho: Jones, F. A., 1.

White sands: Jones, F. A., 1;

Meinzer, 3; Otero, 1.

Map showing mills: Burchard, 4;

Stone, R. W., 2.

Northwestern: Shaler, 1.

Tularosa Basin: Meinzer, 3.

White sands: Brady, 1; Gibbs, 1;

Herrick, C. L., 11.

Hachita district: Jones, F. A., 6, 7;

Lindgren, 6; Martin, G. A., 1.

Hamilton mine: Lindgren, 2.

Hell Canyon: Otero, 1; Statz, 2.

Hematite:

Socorro County: Foshag, 1.

Hidalgo County (separated from

Grant County in 1920): Lind-

gren, 6.

Eureka district: Birnie, 1.

Lordsburg district: Fry, 1;

Jones, F. A., 4.

Tungsten: Apache No. 2 district:

Hess, 3.

Hillsboro: Birnie, 1; Lindgren, 6;

Otero, 1; Thompson, 1.

Hot Springs: Lindgren, 7.

See also Underground water, page 125.

Iron: Jones, F. A., 1; Raymond, 1.

Analyses: Jones, 1.

Hanover district: Paige, 1.

Economic geology (Continued).**Iron (Continued).****Analyses (Continued).**

Jones district, Emmens, 1; Jones, 1.

Chupadera Mesa: Keyes, 9, 67.

Fairview deposits: Smythe, 2.

Hanover deposits: Birkenbine, 1;

Brinsmade, 4; Paige, 1.

Jones field: Emmens, 1.

Map of fields: Harder, 1.

Kelly Camp: Argall, 1; Brinsmade, 2; Johnson, W. M., 1; Keyes, 70.

Kingston district: Fishback, 1;

Jones, E. L., 1; Lindgren, 6;

Wells, E. H., 1; Wright, J. W.,

1.

History: Thompson, 1.

Lake Valley: Clark, E., 1; Cope, 39; Endlich, 1; Keyes, 32, 36;

MacDonald, B., 1; Silliman, 4.

Manganese: Anon., 18.

Lead: Lindgren, 6.

Grant County: Larsh, 3.

Kelly mine: Johnson, W. M., 1.

Lordsburg district: Fry, 1; Jones, F. A., 4.

Magdalena district: Argall, 1;

Haddon, 1; Herrick, C. L., 2;

Tuttle, 1.

Production: Min. Ind., 1; U. S.

Bur. Mines, 1; U. S. G. S., 1.

San Andreas and Caballos Mountains: Herrick, C. L., 4.

San Pedro Mountain: Brinsmade, 3.

Silver City: Brinsmade, 4.

Tres Hermanas district: Lindgren, 5.

Lepidolite:

At Embudo: Roos, 1.

Lignite: Lesquereux, 6.

See also Coal, page 89.

Limestone:

Luna County: Darton, 12.

Lincoln County: Lindgren, 6.

Coal:

Fort Stanton Reservation: Campbell, 3.

Lone Mountain district: Lindgren, 6; Paige, 7.

Lordsburg district: Fry, 1; Lindgren, 6; Weed, 1; Wells, J. L., 1.

Luna County: Darton, 1, 12; Lindgren, 6.

Fluorspar:

Burchard, 2; Darton, 5, 12; Johnston, 1.

Tres Hermanas: Lindgren, 5.

McKinley County: Lindgren, 6.

San Mateo-Cuba coal field: Gardner, 7.

Economic geology (Continued).

- Magdalena district: Argall, 1; Haddon, 1; Herrick, C. L., 2; Johnson, W. M., 1; Keyes, 19; Lindgren, 6; Statz, 4; Tuttle, 1.
Manganese: Wells, E. H., 1.
See also Kelly camp, page 92.
- Manganese: Furness, 1; Harder, 2; Jones, E. L., 1; Wells, E. H., 1; Umpleby, 1; Anon., 10.
- Map showing distribution: Healey, 1; Hewett, D. F., 1; Wells, E. H., 1.
See also particular districts.
- Marble:
Luna County: Darton, 2.
See also Onyx, page 93.
- Meerschaum:
Grant County: Bush, 5; Michel, 1; Paige, 7; Sterrett, 1, 2.
- Mica: Jones, 1.
Mora County: Sterrett, 4; Anon., 8.
Rio Arriba County: Holmes, 1; Sterrett, 3, 4.
San Miguel County: Sterrett, 4.
- Mimbres district: See Grant County.
- Mineral deposits: Jones, F. A., 1, 9; Lindgren, 6.
- Mining districts: Hill, J. M., 1; Lindgren, 6; Otero, 1; Raymond, 5.
History: Browne, 2; Jones, 1; Lindgren, 6.
Aztec mine: Lee, 22.
Grant County: Birnie, 1.
Organ Mountain: Antisell, 1.
Map showing: Hill, 1; Otero, 1.
- Mining maps showing districts: Hill, J. M., 1; Jones, F. A., 9.
- Mining properties:
Appraisal: Finlay, 2.
- Mogollon district: Anderson, 1, 2; Bush, 6; Ferguson, 1, 2; Graham, 1; Henrich, 2; Kidder, 1; Lindgren, 6; Otero, 1; Scott, 1; Weatherby, 1; Weed, 1.
History: Ferguson, 2; Scott, 1.
- Molybdenum: Horton, 1.
San Miguel County: Bush, 8; Horton, 1.
Taos County: Larsen, 1; Sundberg, 1.
- Mora County: Lindgren, 6.
Copper: Austin, 1, 2.
Mica: Sterrett, 4; Anon., 8.
- Moreno district: See Colfax County, page 90.
- Natural gas: Ellis, 3.
Navajo country: Gregory, 1, 2.
- Nickel: Leach, A. A., 1.

Economic geology (Continued).

- Nitrates, southern: Gale, 1.
Northern: Stevenson, 5.
Placers: Carruth, 1.
- Onyx: Merrill, 2.
Luna County: Darton, 12.
- Ore deposits: Jones, F. A., 1, 9; Keyes, 73; Lindgren, 6; Tovote, 1.
Appraisal of: Finlay, 2.
Classification: Finlay, 2; Lindgren, 6.
Kelly limestone: Gordon, 2.
Lake Valley limestone: Gordon, 2.
Mogollon district: Ferguson, 1; Scott, 1.
Origin:
Pinos Altos district: Wade, 4.
Silver, Lake Valley: Clark, E., 1; Keyes, 36.
Turquoise, Burro Mountains, Paige, 5.
Rocky Mountain region: Butler, 3.
Secondary enrichment: Emmons, W. H., 1.
- Organ Mountains: Antisell, 1; Griffin, 1; Keyes, 14; Lindgren, 6; Raymond, 1; Weed, 1; Welsh, 1; Anon., 1, 11.
Production: Bond, 1.
- Ortiz grant:
Santa Fe County: Raymond, 7; Anon., 2.
See also Maps, page 110.
- Otero County: Lindgren, 6.
White sands (gypsum): Brady, 1.
- Petroleum: Ellis, 1, 3; Knox, 1, 2.
Alamosa Creek valley, Socorro County: Winchester, 2.
Artesia oil field: Davis, M. J., 1; Rich, A., 1.
- Carbon ratios: Dobbin, 1; Storm, 1.
- Chaves County: Merritt, 1.
Dayton: Richardson, 4.
Eastern: Knox, 1, 2.
Granite in wells: Lee, 27.
Gravity: Dobbin, 1.
- Hogback field, San Juan Basin: Nowels, 1.
- Map, United States: Day, 2.
Oil possibilities: Knox, 1, 2.
Alamosa Creek valley: Winchester, 2.
Puertecito district: Wells, E. H., 2.
- Oil resources, probable: Knox, 2.
Oil situation: Ellis, 1.
Pecos Valley: Dinsmore, 4.

Economic geology (Continued).

Petroleum (Continued).

Permian, accumulation in: Willis, 4.

Production figures:

San Juan Basin: Nowels, 1.

Puertecito district: Wells, E. H., 2.

Raton: Lakes, 4; Lee, 29.

Rattlesnake field, San Juan Basin: Nowels, 1.

San Juan Basin: Knox, 1, 2; Nowels, 1.

Shiprock district: Nowels, 1.

Socorro County: Wells, E. H., 2; Winchester, 2.

Southeastern: Willis, 1, 2.

Table Mesa field, San Juan Basin: Nowels, 1.

Valencia County: Wells, E. H., 2; Winchester, 2.

Well records: See Borings, page 87.

Withdrawals and restorations: Ball, M. W., 1.

Pinos Altos: Birnie, 1; Blood, 1;

Bush, 2; Otero, 1; Paige, 2;

Wade, 4; Wright, I. L., 1.

Pipe vein:

Silver Hill: Keyes, 65.

Placers: Lindgren, 6; Stone, 2.

Placers: Lindgren, 6; Stone, G. H., 2.

Arid region: Stone, G. H., 2.

Colfax County: St. John, 1.

Dry placers: Heikes, 1.

Mesa del Oro: Leatherbee, 3.

Santa Fe County: Brinsmade, 3; Carruth, 1; Jones, F. A., 3;

Newberry, 4; Statz, 1.

Rio Arriba County: Silliman, 1.

Sandoval County: Heikes, 1.

Sierra County: Leatherbee, 3.

Taos County: Silliman, 1.

Potash:

Crater salt lake: Hance, 1.

Estancia Valley: Hance, 1.

Otero Basin: Free, 1.

Southeastern: Hance, 1; Hoots, 1;

Mansfield, 3; Schaller, 3; U. S.

G. S., 60-67; Wroth, 1.

Production figures: Browne, 1, 2;

Henderson, 1-11; Jones, F. A., 2;

Lindgren, 6; Raymond, 1, 2, 3, 4,

7, 8.

It was found impossible to include statistics of mineral production. These will be found in the following works:

1. Mineral Resources of the United States, published annually by the U. S. Geological Survey, Washington, D. C., from 1882 until 1923. Published by the U. S. Bu-

Economic geology (Continued).

Production figures (Continued).

reau of Mines, Washington, D. C., since 1923.

2. The Mineral Industry, published annually since 1892 and for sale by the McGraw-Hill Book Company, New York City.

3. Annual report of the Director of the Mint, Washington, D. C.

4. Special numbers issued in January of each year by various mining journals.

Turquoise: Fenderson, 1.

Radium ore: Leach, A. A., 2; Leach, F. I., 1.

Rare metals: Keyes, 70.

See also, Cobalt, page 90; Molybdenum, page 93; Nickel, page 93; Radium, page 94; Tungsten, page 96; and Vanadium, page 96.

Raton Mesa region: Lee, 29.

Red River district: Bush, 3.

Rincon district:

Manganese: Jones, E. L., 1; Wells, E. H., 1.

Rio Arriba County: Lindgren, 6.

Bentonite: Ross, 1.

Coal:

San Mateo-Cuba field: Gardner, 7.

Mica: Holmes, 1; Sterrett, 3, 4.

Salt: Darton, 20; Herrick, C. L., 12;

Jones, F. A., 1; Phalen, 1.

Central: Herrick, C. L., 12; Johnson, D. W., 1, 3.

Crater Lake: Phalen, 1.

Estancia Valley: Herrick, C. L., 12; Phalen, 1.

Otero salt basin: Free, 1; Phalen, 1.

Southeastern: Hoots, 1.

White sands region: Gibbs, 1; Phalen, 1.

Zuñi salt lake: Darton, 1, 2, 20.

Samarskite:

Rio Arriba County: Hess, 5.

San Andreas Mountains:

Copper and lead deposits: Herrick, C. L., 4.

Sandia Mountains: Ellis, 2.

Sandoval County: Lindgren, 6.

Cochiti district: Barbour, 1.

Coal:

San Mateo-Cuba field: Gardner, 7.

Una del Gato field: Campbell, 2. Fluorspar: Johnston, 1.

Sandstone copper: Bains, 1; Cazin, 2;

Finch, 1; Jenks, 1, 2; Lindgren, 6; Newberry, 4; Turner, 2.

Economic geology (Continued).

- Sandstone Copper (Continued).
 Bent: Ball, S. H., 1.
 Mora County: Austin, 1, 2; Conkling, 2, 3.
 Oscura Mountains: Emmons, S. F., 4; Peters, 1; Turner, 1.
 San Andreas Mountains: Emmons, S. F., 4; Herrick, C. L., 4.
 San Juan County: Lindgren, 6.
 Coal: Bauer, 2.
 Petroleum, Nowels, 1.
 San Miguel County: Lindgren, 6.
 Coal: Gardner, 5, 8.
 Mica: Sterrett, 4.
 San Pedro district: Berryman, 1; Brinsmade, 3; Henrich, 1; Keyes, 43; McCaffery, 1; Raymond, 7; Anon., 3.
 Santa Fe County: Lindgren, 6.
 Santa Fe region: Berryman, 1; Blake, 3; Browne, 2; Henrich, 1; Lindgren, 6; Otero, 1; Raymond, 1, 2, 7; Statz, 1; Anon., 2.
 Iron: Raymond, 7.
 Los Cerrillos mines: Lakes, 4; Stevenson, 1.
 Placer districts: Blake, 1; Stevenson, 4; Wislizenus, 1.
 San Pedro: Berryman, 1; Brinsmade, 3; McCaffery, 1; Anon., 3.
 Turquoise: Johnson, D. W., 4; Raymond, 7.
 Santa Rita region: Birnie, 1; Clifford, 2; Dinsmore, 2; Lindgren, 6; MacDonald, D. F., 1; Paige, 6, 7; Raymond, 7; Rickard, 1; Weed, 1, 2.
 Enrichment at: Bagg, 1; Emmons, W. H., 1.
 Sierra County: Birnie, 1; Lindgren, 6; Otero, 1.
 Fluorspar: Johnston, 1.
 Manganese: Jones, E. L., 1; Wells, E. H., 1.
 See also Hillsboro, page 92; Kingston, page 92; Lake Valley, page 92; and Sierra de los Caballos, page 95.
 Sierra de los Caballos: Keyes, 20.
 Sierra del Oro: Keyes, 60.
 Silver: Lindgren, 1, 6; Winchell, 1.
 Black Range district: Fishback, 1; Wright, J. W., 1.
 Cerargyritic ores, genesis: Keyes, 32, 36.
 Cochiti district: Barbour, 1.
 Cooney district: Anderson, 1, 2.
 Grant County:
 Black Hawk: Leach, A. A., 1.
 Lake Valley district: Clark, 1;

Economic geology (Continued).

- Silver (Continued).
 Lake Valley district (Continued).
 Cope, 26; Keyes, 36; MacDonald, B., 1.
 Lordsburg region: Jones, F. A., 4.
 Magdalena district: Argall, 1; Jones, F. A., 1; Lindgren, 6; Tuttle, 1.
 Mogollon district: Ferguson, 1, 2; Scott, 1.
 Organ Mountain district: Welsh, 1.
 Pinos Altos district: Blood, 1; Paige, 2.
 Production: Min. Ind., 1; U. S. Bur. Mines, 1; U. S. G. S., 1.
 San Pedro Mountain: Brinsmade, 3.
 Silver Cell group, Pinos Altos district: Blood, 1.
 Silver City: Brinsmade, 4.
 Silver pipe:
 Central: Keyes, 3.
 Silver City district: Brinsmade, 4; Furman, 1; Lindgren, 6; Paige, 7; Tovote, 1.
 Copper: Tovote, 2.
 Manganese: Jones, E. L., 1; Wells, E. H., 1.
 Silver pipe:
 Central: Keyes, 3.
 Socorro County: Lindgren, 6; Raymond, 9.
 Coal: Gardner, 6.
 Copper: Lindgren, 6.
 Oscura Mountains: Emmons, S. F., 4.
 Fluorspar: Johnston, 1.
 Iron:
 Fairview deposit: Smythe, 1.
 Jones Camp: Emmens, 1; Jones, F. A., 1; Keyes, 9, 67.
 Manganese: Jones, E. L., 1; Wells, E. H., 1; Anon., 10.
 Rosedale district: Jones, F. A., 1; Lindgren, 6.
 Tripoli: Herrick, C. L., 1.
 Zinc: Argall, 1; Brinsmade, 2.
 See also Catron County, page 89.
 Soda:
 Dona Ana and Otero Counties: Otero, 1.
 Sodium sulphate:
 Dona Ana County:
 Lake Lucero: Wells, R. C., 1.
 Torrance County:
 Laguna Salina: Wells, R. C., 1.
 Soil surveys:
 Mesilla Valley: Nelson, 2.
 Pecos Valley: Cummins, 1; Means, 1.
 Rio Grande: Nelson, 1.

Economic geology (Continued).

- Southern: Endlich, 1; Furman, 1;
Silliman, 3; Tovote, 1.
Zinc deposits: Blake, 6.
Steeple Rock district: Bush, 4; Lindgren, 6; Pickard, 1.
Stone: Burchard, 5.
Sulphur: Jones, 1.
Guadalupe Mountains: Otero, 1.
Jemez Canyon: Mansfield, 1, 2.
Sylvanite district: Dinsmore, 1;
Jones, F. A., 6, 7; Martin, G. A., 1.
Taos County: Browne, 2; Lindgren, 6.
Fluorspar: Johnston, 1.
Molybdenum: Larsen, 1.
Red River district: Bush, 3.
Taylor Creek tin deposits: Hill, J. M., 2; Naething, 1.
Tin:
Catron and Sierra Counties: Hill, J. M., 2; Naething, 1.
Torrance County: Lindgren, 6.
Sodium sulphate:
Laguna Salina: Wells, R. C., 1.
Tres Hermanas district: Darton, 12; Lindgren, 5, 6; Wade, 2.
Tripoli:
Socorro County: Herrick, C. L., 1.
Tungsten: Hess, 2.
Hidalgo County: Hess, 3.
Luna County: Darton, 12.
Turquoise: Blake, 2; Clark, 2; Cowan, 1; Fenderson, 1; Jones, F. A., 1, 8, 9; Kunz, 5; Lakes, 3; Otero, 1; Silliman, 2; Snow, 1; Sterrett, 2a, 2b, 2c.
Burro Mountains: Jones, F. A., 8; Zalinski, 1, 2; Anon., 4, 5.
Azure mine: Dinsmore, 3.
Origin: Paige, 5.
Cerrillos Hills: Blake, 2; Clark, 2, 3; Johnson, D. W., 3.
Hachita: Cowan, 1; Hidden, 1.
Jarilla Mountains: Cowan, 1; Hidden, 1.
Tyrone district: Bush, 1, 7; Paige, 9.
Uranium: Keyes, 70; Leach, A. A., 2; Leach, F. I., 1.
Valencia County: Lindgren, 6.
Coal:
San Mateo-Cuba field: Gardner, 7.
Fluorspar: Johnston, 1.
Vanadium: Carrera, 1; Leatherbee, 1, 2; Johnson, E. D., 1; Larsh, 2.
Grant County: Larsh, 3.
Northwestern: Edwards, 1.
Sierra County:
Caballo Mountains: Allen, 1;

Economic geology (Continued).

- Vanadium (Continued).
Sierra County (Continued).
Caballo Mountains (Continued).
Clifford, 1; Hess, 1; Larsh, 1; Leatherbee, 1;
Elephant Butte: Keyes, 74.
Victorio district: Darton, 12.
Water resources: Newell, 1; Sullivan, 1.
Luna County: Darton, 7.
Mesilla Valley: Barker, 1.
See Underground water, page 125.
White Oaks: Lindgren, 6; Smith, E. P., 1.
Zinc: Brinsmade, 1; Demaret, 1; Lindgren, 1.
Carbonate ores:
Magdalena Mountains: Keyes, 19.
Grant County: Blake, 6; Brinsmade, 4.
Hanover: Blake, 6; Brinsmade 4.
Kelly Camp: Brinsmade, 2; Johnson, W. M., 1; Keyes, 19.
Luna County: Darton, 12; Lindgren, 5.
Magdalena district: Argall, 1; Haddon, 1; Tuttle, 1.
See also Kelly Camp, page 92.
Pinos Altos district: Paige, 2.
Production figures: Min. Ind., 1; U. S. Bur. Mines, 1; U. S. G. S., 1.
Silver City: Brinsmade, 4.
Southwestern: Blake, 6; Tovote, 2.
Tres Hermanas district: Lindgren, 5; Wade, 2.
Zuñi Mountains: Schrader, 2.

Geologic formations described.

- Abo sandstone:
Carboniferous: Baker, C. L., 2; Lindgren, 6; Richardson, 3.
Pennsylvanian: Bose, 1; Lee, 11; Semmes, 1.
Permian: Blanchard, 1; Darton, 22, 25, 29; Ellis, 2; Wells, E. H., 2; Willis, 1, 3.
Sandoval County: Renick, 2.
Alamito formation:
Pennsylvanian: Keyes, 24, 45, 57, 62.
Albuquerque marl: Bryan, 1; Keyes, 57, 62; Reagan, 1.
Allison barren member:
Cretaceous: Sears, 1.
Anian period:
Proterozoic: Keyes, 62.

Geologic formations described (Continued).

- Animas formation:
 - Tertiary (?): Knowlton, 8; Reeside, 2.
- Antonio terrane:
 - Proterozoic: Keyes, 57, 62.
- Antonito terrane:
 - Permian: Keyes, 57, 62.
- Apishapa shale:
 - Cretaceous: Darton, 22; Garrett, 1; Keyes, 57, 62.
- Archuleta terrane:
 - Eocene: Keyes, 57, 62.
- Armendaris terrane:
 - Ordovician: Keyes, 57, 62.
- Arriban series:
 - Miocene: Keyes, 34, 57, 62.
- Aztecan series:
 - Eocene: Keyes, 57, 62.
- Bartlett barren member:
 - Cretaceous: Sears, 1.
- Beartooth quartzite:
 - Cretaceous: Darton, 22.
 - Silver City: Paige, 7.
- Bella shales:
 - Devonian: Keyes, 38, 57, 62.
- Bell Mountain sandstone member:
 - Cretaceous: Winchester, 2.
- Bernalillo shale:
 - Carboniferous: Keyes, 45, 57, 62.
- Berenda limestone:
 - Devonian: Keyes, 36, 57, 62.
- Bibliography: Keyes, 55, 57; Weeks, 1.
 - Paleozoic: Gordon, 1.
 - San Juan Basin: Bauer, 1.
- Bliss sandstone:
 - Cambrian: Darton, 12, 15, 16, 22, 29; Keyes, 57; Richardson, 1, 2.
 - Luna County: Darton, 12, 15.
 - Silver City region: Paige, 7.
- Bolson deposits: Hill, R. T., 14; Tight, 1.
 - Quaternary: Darton, 29; Keyes, 7.
 - Structure: Keyes, 1.
- Burro terrane:
 - Cambrian: Keyes, 57, 62.
- Canyon Largo sandstones:
 - Oligocene: Keyes, 34, 57, 62.
- Capitan limestone:
 - Permian: Baker, C. L., 2; Beede, 1; Crandall, 1; Girty, 2; Keyes, 24, 45, 57, 62; King, P. B., 1; Lloyd, 1; Richardson, 1, 2, 3; Tarr, 3.
- Carlile shale:
 - Cretaceous: Darton, 22, 25; Garrett, 1.
- Carlsbad limestone member: Blanchard, 1; Crandall, 1; Darton, 24.

Geologic formations described (Continued).

- Carrasco terrane:
 - Cambrian: Keyes, 57, 62.
- Castile formation:
 - Permian: Meinzer, 5.
 - Roswell Basin: Blanchard, 1; Darton, 25, 29; Fielder, 2; Willis, 1, 3.
 - Trans-Pecos Texas: Richardson, 1; Udden, 1.
- Cenocene series:
 - Quaternary: Keyes, 57.
- Chaco terrane:
 - Oligocene: Keyes, 57, 62.
- Chacra terrane:
 - Cretaceous: Keyes, 57, 62.
- Chaman series:
 - Oligocene: Keyes, 34, 57, 62.
- Chamisco formation:
 - Cretaceous: Winchester, 2.
- Chaquaqua terrane:
 - Jurassic: Keyes, 57, 62.
- Chaves terrane:
 - Permian: Keyes, 57, 62.
- Chinle formation:
 - Triassic: Darton, 22, 29; Renick, 2.
- Chiricahuan series:
 - Cambrian: Keyes, 57, 62.
- Chloridian series:
 - Cambrian: Keyes, 57, 62.
- Chupadera formation:
 - Permian: Crandall, 1; Darton, 22, 25, 29; Ellis, 2; Keyes, 62.
 - Eddy County: Nye, 1; Renick, 3.
 - Roswell Basin: Fielder, 2.
 - Sandoval County: Renick, 2.
- Chuska sandstone:
 - Tertiary: Darton, 29; Gregory, 2.
- Cibola terrane:
 - Silurian: Keyes, 57, 62.
- Cimarronian series:
 - Carboniferous: Keyes, 45, 57.
 - Permian: Keyes, 24, 62.
- Cliff House sandstone:
 - Cretaceous: Bauer, 2; Darton, 22.
- Coconino sandstone: Darton, 3, 29; Gregory, 2.
- Colorado shale:
 - Cretaceous: Darton, 12, 15, 29; Stanton, 1.
 - Silver City: Paige, 7.
- Comanchan series:
 - Cretaceous: Keyes, 57.
 - Luna County: Darton, 12.
- Coyote terrane:
 - Carboniferous: Keyes, 45, 57.
 - Pennsylvanian: Keyes, 24, 62.
- Cranktown sandstone:
 - Mogollon district: Ferguson, 2.

Geologic formations described (Continued).

- Cristobal terrane:
Ordovician: Keyes, 57, 62.
- Dakota sandstone:
Cerrillos Hills: Johnson, D. W., 4.
Cretaceous: Baker, C. L., 2; Darton, 22, 29; Gardner, 2; Garrett, 1; Gregory, 1, 2,; Keyes, 24, 57; Kirk, 1; Stevenson, 1; Wells, E. H., 2; Winchester, 1, 2.
Gallup-Zuñi Basin: Sears, 1.
Its relation to the Morrison formation: Stanton, 2.
Northern: Keyes, 26.
Origin of name: Gress, 1.
Sandoval County: Renick, 2.
- Datil formation:
Tertiary: Darton, 29; Winchester, 2.
- Delaware Mountain formation:
Keyes, 77.
Carboniferous: Beede, 2; Richardson, 3.
Permian: Baker, C. L., 2; Blanchard, 1; Crandall, 1; Darton, 24; Girty, 2; Richardson, 1, 2.
- Dilco coal member:
Cretaceous: Sears, 1.
- Dockum group:
Triassic: Adams, J. H., ; Darton, 22, 29.
- Dog Gulch formation:
Mogollon district: Ferguson, 2.
- Doloresian series:
Triassic: Keyes, 57, 62.
- Dragoonan series:
Cambrian: Keyes, 57, 62.
- Dune sands:
Quaternary: Darton, 29.
- Eddy terrane:
Carboniferous: Keyes, 45, 57.
Permian: Keyes, 24, 62.
- El Paso limestone:
Luna County: Darton, 12, 15.
Ordovician: Darton, 15, 16, 22, 29; Keyes, 36, 57, 62; Richardson, 1, 2.
Silver City: Paige, 7.
- Epicene series:
Quaternary: Keyes, 57.
- Exeter (?) formation:
Jurassic: Keyes, 57, 62.
Triassic: Garrett, 1.
- Farmington sandstone member:
Cretaceous: Bauer, 2; Reeside, 1, 2.
- Fierro limestone:
Carboniferous:
Silver City region: Paige, 7.
- Fort Benton:
Cerrillos Hills: Johnson, D. W., 4.

Geologic formations described (Continued).

- Fort Union group:
Albuquerque: Reagan, 1.
- Fredericksburg terrane:
Camanchean: Keyes, 57, 62.
- Froncosa terrane:
Ordovician: Keyes, 57, 62.
- Fruitland formation:
Cretaceous: Bauer, 1, 2; Darton, 22, 29; Reeside, 2.
- Fusselman limestone: Richardson, 2.
Luna County: Darton, 12, 15.
Silurian: Darton, 5, 16, 22, 29.
Silver City region: Keyes, 57; Paige, 7.
- Galisteo formation: Hayden, 1.
Cerrillos Hills: Cope, 14; Johnson, D. W., 4.
Tertiary: Baker, C. L., 2; Keyes, 57, 62.
Tertiary (?): Darton, 29.
- Gallego sandstone member:
Cretaceous: Keyes, 57, 62; Winchester, 2.
- Gallinas terrane:
Cretaceous: Keyes, 57.
- Gallup sandstone member:
Cretaceous: Sears, 2.
- Garnuan series:
Proterozoic: Keyes, 57, 62.
- Garrett terrane:
Comanchean: Keyes, 57, 62.
- General: Darton, 16, 29; Keyes, 5, 57, 62; Lee, 23; Shumard, G. G., 1.
- Gibson coal member:
Cretaceous: Sears, 1.
- Gila conglomerate:
Mogollon district: Ferguson, 2.
Quaternary: Darton, 29; Keyes, 57, 62.
- Glacial deposits:
Quaternary: Darton, 29.
- Glorieta sandstone:
Cretaceous: Keyes, 57, 62.
Permian: Baker, C. L., 2; Rich, J. L., 2; Willis, 1.
- Grande terrane:
Mississippian, Keyes, 36, 45, 57, 62.
- Graneros shale:
Cretaceous: Darton, 22; Garrett, 1.
- Graphic terrane:
Proterozoic: Keyes, 57, 62.
- Greenhorn limestone:
Cretaceous: Darton, 22; Garrett, 1.
- Greer terrane:
Permian: Keyes, 62.
- Guadalupe formation:
Permian: Merritt, 1.

Geologic formations described (Continued).

- Guadalupe group:
 Permian: Beede, 2; Darton, 24;
 Keyes, 24, 45, 57, 62.
- Gym limestone:
 Carboniferous: Darton, 12, 15, 25.
- Gypsum series:
 Albuquerque: Reagan, 1.
- Hawkins terrane:
 Cambrian: Keyes, 57, 62.
- Houten terrane:
 Cenezoic (Tertiary): Keyes, 57, 62.
- Hueco limestone:
 Carboniferous: Beede, 2; Darton,
 29; Keyes, 45.
 Trans-Pecos Texas: Girty, 1;
 Richardson, 1.
- Jemez marls:
 Albuquerque: Reagan, 1.
- Jornadan series:
 Present: Keyes, 57, 62.
- Kelly limestone:
 Mississippian: Gordon, 2, 3; Lind-
 gren, 6; Wells, E. H., 2.
- Kiowa terrane:
 Comanchean: Keyes, 57, 62.
- Kirtland shale:
 Cretaceous: Bauer, 1, 2; Darton,
 22, 29; Reeside, 1, 2.
- Ladronesian series:
 Pennsylvanian: Keyes, 24, 28, 45,
 57, 62.
- La Jara terrane:
 Cretaceous: Keyes, 57, 62.
- Lake Valley limestone: Cope, 26, 39.
- Lake Valley: Gordon, 2; Keyes,
 23; Springer, F., 1.
 Luna County: Darton, 12, 15.
- Magdalena Mountains: Keyes, 23.
- Mississippian: Darton, 15, 16, 22,
 29; Gordon, 2; Keyes, 24, 36, 45,
 57, 62; Lindgren, 6.
- La Plata group:
 Jurassic: Darton, 22; Gregory, 1,
 2; Keyes, 57, 62.
- Laramie: Newberry, 8.
- Cerrillos coal field: Stevenson, 12.
- Cretaceous: Cross, 4; Gardner, 2,
 7; Keyes, 62; Lee, 23; Steven-
 son, 1, 2, 6, 8.
- Northwestern: Cope, 55; Gardner,
 7; Lee, 16; Sinclair, 2.
- Raton coal field: Lee, 10.
- Sub-divided into Fruitland and
 Kirtland: Bauer, 2.
- Lewis shale:
 Cretaceous: Bauer, 1, 2; Darton,
 22, 29; Gardner, 2; Keyes, 57,
 62; Lee, 16, 23; Shaler, 3.
 Sandoval County: Renick, 2.

Geologic formations described (Continued).

- Lewis Shale, (Continued).
 San Juan Basin: Reeside, 2.
 San Mateo-Cuba coal field: Gard-
 ner, 7.
- Le Roux terrane:
 Triassic: Keyes, 57, 62.
- Llano Estacado terrane:
 Pliocene: Keyes, 34, 57, 62.
- Lobo formation:
 Triassic (?):
 Deming quadrangle: Darton, 12,
 15, 22.
- Lone terrane:
 Cambrian: Keyes, 57, 62.
- Loup Fork formation: Cope, 34, 47,
 50.
- Lufkin formation:
 Tertiary: Keyes, 36.
- Lunasan series:
 Pennsylvanian: Keyes, 57, 62.
- McDermott formation:
 Cretaceous (?): Darton, 29.
- McElmo formation:
 Cretaceous (?): Darton, 22.
 Jurassic (?): Gregory, 2; Keyes,
 57, 62.
- Gallup-Zuñi Basin: Sears, 1.
- Madera limestone:
 Pennsylvanian: Gordon, 3; Her-
 rick, C. L., 6; Keyes, 8, 14, 24;
 Lee, 11; Lindgren, 6; Wells, E.
 H., 2.
 Permian: Keyes, 45, 57, 62, 69.
- Madrid coal group:
 Cerrillos Hills: Johnson, D. W., 4.
- Magdalena group:
 Pennsylvanian: Baker, C. L., 2;
 Darton, 12, 22, 29; Ellis, 2; Gar-
 rett, 1; Gordon, 3; Keyes, 69;
 Lee, 11, 27; Lindgren, 6; Rich-
 ardson, 3; Semmes, 1; Wells, E.
 H., 2.
- Mancos shale:
 Cretaceous: Baker, C. L., 2; Bauer,
 2; Cross, 2; Darton, 3, 22, 29;
 Gardner, 2; Gregory, 1, 2; Kirk,
 1; Lee, 16; Wells, E. H., 2;
 Winchester, 1.
- Gallup-Zuñi Basin: Sears, 1.
- Sandoval County: Renick, 2.
- San Juan Basin: Reeside, 2.
- Mangas terrane:
 Cambrian: Keyes, 57, 62.
- Manzano group: Keyes, 77.
- Carboniferous: Keyes, 45, 57, 62;
 Richardson, 3.
- Pennsylvanian: Herrick, C. L., 11;
 Lee, 11; Lindgren, 6.

Geologic formations described (Continued).

- Manzano group, (Continued).
 Permian: Baker, C. L., 2; Darton, 10, 22, 25; Ellis, 2; Gordon, 3; Keyes, 24, 69; Wells, E. H., 2.
- Martinian series:
 Devonian: Keyes, 57, 62.
- Maxwell terrane:
 Cenezoic (Tertiary): Keyes, 57, 62.
- Maya terrane:
 Cenezoic (Tertiary): Keyes, 57, 62.
- Menefee formation:
 Cretaceous: Bauer, 2; Darton, 22.
- Mesaverde formation: Bauer, 1; Darton, 29; Gregory, 1, 2; Lee, 16, 23.
 Cretaceous: Darton, 3; Kirk, 1; Wells, E. H., 2; Winchester, 1.
 Gallup-Zuñi Basin: Sears, 1.
 Sandoval County: Renick, 2.
 San Mateo-Cuba coal field: Gardner, 7.
- Mesaverde group:
 Cretaceous: Bauer, 2; Darton, 22, 29; Gardner, 2; Keyes, 57, 62; Lee, 15, 16; Reeside, 2.
- Miguel formation:
 Cretaceous: Winchester, 2.
- Mimbres limestone:
 Lake Valley: Gordon, 2.
 Ordovician: Keyes, 57, 62.
- Modoc terrane:
 Mississippian: Keyes, 57, 62.
- Moenkopi formation:
 Carboniferous: Keyes, 45.
 Triassic: Darton, 3, 22, 29; Keyes, 24.
- Montanan:
 Cretaceous: Keyes, 57.
- Montosa terrane:
 Carboniferous: Keyes, 24, 45, 57, 62.
- Montoya limestone: Richardson, 2.
 Ordovician: Darton, 12, 15, 16, 22, 29; Keyes, 57, 62; Paige, 7.
- Monument formation:
 Tertiary: Keyes, 36.
- Mora sandstone: Keyes, 43.
- Morrison formation: Keyes, 57, 62; Lee, 1, 21; Mook, 2, 3.
 Cretaceous (?): Darton, 11, 12, 22, 29; Lee, 15.
 Its relation with Comanche and Dakota: Stanton, 2.
 Jurassic: Garrett, 1.
 Sandoval County: Renick, 2.
 Type section: Lee, 25.
- Mosca terrane:
 Pennsylvanian: Keyes, 24, 45, 57, 62.

Geologic formations described (Continued).

- Nacimiento group: Gardner, 9.
 Sandoval County: Renick, 2.
 San Juan Basin: Reeside, 2.
 Tertiary: Gardner, 9; Keyes, 34, 57, 62; Reeside, 2.
- Naiad terrane:
 Silurian: Keyes, 57, 62.
- Navajo sandstone:
 Cretaceous: Keyes, 57, 62.
 Gallup-Zuñi Basin: Sears, 1.
 Jurassic: Darton, 22, 29; Gregory, 2.
- Ninos terrane:
 Archeozoic: Keyes, 57, 62.
- Ogallala formation:
 Miocene and Pliocene: Darton, 29.
- Ojo Alamo sandstone:
 Cretaceous: Bauer, 1, 2; Brown, 1, 2; Darton, 22, 29; Reeside, 1.
 Tertiary (?): Reeside, 2; Sinclair, 1.
- Palomas gravel:
 Pleistocene: Darton, 22; Gordon, 3; Keyes, 57, 62; Lindgren, 6.
- Pecos formation:
 Carboniferous: Keyes, 45.
 Pliocene: Keyes, 34, 57, 62.
- Pecurisan series:
 Archeozoic: Keyes, 62.
- Penasco terrane:
 Archeozoic: Keyes, 57, 62.
- Percha shale: Gordon, 2.
 Devonian: Darton, 22, 29; Keyes, 57, 62; Kindle, 1; Lindgren, 6; Paige, 7.
 Lake Valley: Clark, E., 1; Gordon, 2.
 Percha shale (?):
 Franklin Mountains (New Mexico and Texas): Darton, 28.
- Pictured Cliffs sandstone:
 Cretaceous: Bauer, 1, 2; Darton, 22, 29; Keyes, 57, 62; Reeside, 2.
- Pierre shale:
 Cretaceous: Darton, 22, 29; Garrett, 1; Lee, 29, 31.
 Cerrillos hills: Johnson, D. W., 4.
- Pina Vitutos terrane:
 Cretaceous: Keyes, 57, 62.
- Placita marl:
 Albuquerque: Reagan, 1.
- Point Lookout sandstone:
 Cretaceous: Bauer, 2; Darton, 22.
- Poleo sandstone:
 Triassic: Darton, 22, 29; Renick, 2.
- Pre-Cambrian:
 Granite, gneiss, schist, etc.; Darton, 22, 29; Lindgren, 6.

Geologic formations described

(Continued).

- Pueblo quartzite:
Taos Range: Gruner, 1.
- Puerco formation:
Albuquerque: Reagan, 1.
Cretaceous: Brown, 1.
Tertiary: Bauer, 1, 2; Brown, 2;
Cope, 7, 34, 48; Darton, 22, 29;
Gardner, 7, 9; Keyes, 34, 62; Lee,
16; Reeside, 2; Shaler, 3; Sin-
clair, 1, 2.
- Puertecito formation:
Triassic: Wells, E. H.
- Puertecitos limestone:
Tertiary: Lee, 17.
- Purgatoire formation:
Cretaceous: Darton, 22, 29; Gar-
rett, 1; Lee, 23.
- Quartermaster terrane:
Permian: Keyes, 62.
- Raton formation:
Tertiary: Darton, 22, 29; Garrett,
1; Keyes, 57, 62; Lee, 23, 29, 31.
- Red beds: Case 8; Darton, 29.
Eastern: Baker, C. L., 5.
Rio Grande region: Lee, 6.
- Rio Grande beds:
Tertiary: Bryan, 1.
- Rio Grande gravels:
Quaternary: Bryan, 1.
- Rociada terrane:
Archeozoic: Keyes, 57, 62.
- Rustler limestone: Blanchard, 1;
Crandall, 1; Darton, 25, 29;
Richardson, 1; Udden, 1; Willis,
1, 3.
- Saline deposits:
Quaternary: Darton, 29.
- San Andreas limestone:
Carboniferous: Richardson, 3.
Pennsylvanian: Ellis, 2; Gordon, 2;
Keyes, 24, 69; Lee, 11; Lindgren,
6; Wells, E. H., 2.
Permian: Baker, C. L., 2; Blanch-
ard, 1; Ellis, 2; Lee, 11; Nye, 1;
Rich, 5; Semmes, 1; Willis, 1, 3.
- Sandia formation:
Carboniferous: Keyes, 45, 57.
Pennsylvanian: Herrick, C. L., 8,
9, 11, 17; Keyes, 62; Lindgren, 6.
- Sandoval terrane:
Proterozoic: Keyes, 57, 62.
- Santa Fe formation:
Tertiary: Cope 4; Darton, 22, 29;
Keyes, 34, 57, 62; Simpson, G.
G., 1.
- Santa Fe marls: Cope, 4.
Cerrillos Hills: Johnson, D. W., 4.
Tertiary: Henderson, J., 1.
- Santa Rita limestone:
Silurian: Keyes, 36, 57, 62.

Geologic formations described

(Continued).

- Santa Rosa sandstone:
Triassic: Darton, 22; Rich, J. L., 5.
- Sapello terrane:
Archeozoic: Keyes, 57, 62.
- Sarten sandstone:
Cretaceous: Darton, 12, 15, 22, 29.
- Selkirkian period:
Proterozoic: Keyes, 62.
- Serna terrane:
Archeozoic: Keyes, 57, 62.
- Seven Rivers gypsiferous member:
Permian: Crandall, 1; Fielder, 2;
Meinzer, 5; Willis, 1, 2.
- Shandon quartzite:
Cambrian: Darton, 16, 22, 29; Gor-
don, 1, 3; Keyes, 57; Lindgren, 6.
See also Bliss sandstone.
- Shinarump conglomerate:
Triassic: Darton, 22, 29.
- Shinarump sandstone:
Permian: Baker, C. L., 2.
Triassic: Keyes, 57, 62.
- Sierra limestone:
Mississippian: Keyes, 36, 45, 57, 62.
- Sierra Blanca series:
Cretaceous: Semmes, 1.
- Silver Pipe limestone: Gordon, 2.
- Silver shales:
Devonian: Keyes, 36, 57.
- Socorran series:
Mississippian: Keyes, 24, 45, 62.
- Solitario terrane:
Archeozoic: Keyes, 57, 62.
- Superioran period:
Proterozoic: Keyes, 62.
- Taosan series:
Archeozoic: Keyes, 57, 62.
- Tecovas terrane:
Triassic: Keyes, 57, 62.
- Tellera terrane:
Permian: Keyes, 57, 62.
- Tijeras terrane:
Proterozoic: Keyes, 57, 62.
- Timpas limestone:
Cretaceous: Darton, 22; Garrett, 1;
Keyes, 57, 62.
- Todilto formation:
Jurassic: Darton, 22, 29; Gregory,
2; Renick, 2; Sears, 1.
- Tohachi shale:
Tertiary: Darton, 29, 30; Gregory,
2.
- Torrance terrane:
Permian: Keyes, 57, 62.
- Torrejon formation:
Tertiary: Bauer, 1, 2; Darton, 22,
29; Gardner, 7, 9; Keyes, 34, 57,
62; Reeside, 2; Sinclair, 1, 2.
- Travester terrane:
Jurassic: Keyes, 57, 62.

Geologic formations described

(Continued).

- Trinidad sandstone:
 Cretaceous: Darton, 22, 29; Garrett, 1; Lee, 29, 31.
- Truchas terrane:
 Archeozoic: Keyes, 57, 62.
- Trujillo terrane:
 Triassic: Keyes, 57, 62.
- Unclassified:
 Early Tertiary: Darton, 29.
- University beds: Bryan, 1.
- Valencian series:
 Proterozoic: Keyes, 57, 62.
- Vermejo formation:
 Cretaceous: Darton, 22, 29; Garrett, 1; Knowlton, 3; Lee, 29, 31.
- Wasatch formation:
 Tertiary: Bauer, 1, 2; Cope, 7, 34; Darton, 22, 29; Gardner, 7; Keyes, 34; Reeside, 2.
- Washita terrane:
 Comanchean: Richardson, 1.
- Wingate sandstone:
 Jurassic: Darton, 3, 22, 29; Gregory, 2; Lee, 26; Renick, 2.
 Triassic: Keyes, 57, 62.
- Yeso formation: Keyes, 77.
- Carboniferous: Richardson, 3.
 Pennsylvanian: Lee, 11; Lindgren, 6; Semmes, 1.
 Permian: Baker, 2; Blanchard, 1; Ellis, 3; Keyes, 57, 62; Rich, J. L., 5.
- Ysidro terrane:
 Proterozoic: Keyes, 57, 62.
- Zuñi sandstone:
 Cretaceous: Winchester, 1.
 Jurassic: Keyes, 57, 62.
 Triassic: Darton, 3.

Geologic formations, tables and sections.

- Abo:
 Otero County: Blanchard, 1.
- Alamosa Creek valley: Winchester, 2.
- Beartooth quartzite:
 Silver City: Paige, 7.
- Bell ranch, San Miguel County: Lee, 1.
- Bliss sandstone: Darton, 22, 29; Lindgren, 6.
 Silver City Range: Paige, 7.
 Southern: Darton, 16; Gordon, 1.
- Caballos Mountains: Darton, 29.
- Carboniferous: Darton, 16; Gordon, 3; Keyes, 23, 24, 45.
- Carlsbad Cavern: Lee, 34.
- Carthage coal field: Gardner, 6.
- Cerrillos coal: Fleming, 1.

Geologic formations, tables and sections (Continued).

- Cerrillos coal field: Johnson, D. W., 4; Stevenson, 12.
- Chupadera formation: Darton, 25, 29.
- Cliff House sandstone:
 San Juan County: Reeside, 2.
- Cluster Mountain, Eddy County:
 Hoots, 1.
- Coal:
 Carthage field: Gardner, 6.
 Gallup-Zuñi Basin: Sears, 1.
 Raton Mesa region: Lee, 29, 31.
 San Juan County: Bauer, 2.
- Coal fields: Lee, 16.
- Colorado shale:
 Silver City: Paige, 7.
- Cooks Range: Darton, 15.
- Cornudas Mountains: Shumard, G. G., 3.
- Cretaceous: Gress, 1; Lee, 16.
 San Juan Basin: Reeside, 2.
 Texas-New Mexico: Hill, R. T., 13.
- Cretaceous-Tertiary:
 North America and Europe: Matthew, 4.
- Delaware Mountain formation: Richardson, 1.
- Deming quadrangle: Darton, 15.
- Durango-Gallup field: Shaler, 3.
- Eddy County: Blanchard, 1; Davis, M. J., 1; Hoots, 1; Willis, 1, 3.
- El Paso limestone: Darton, 16.
 Lone Mountain: Paige, 7.
- El Vado dam site, Rio Arriba County: Wells, E. H., 4.
- Farmington sandstone member:
 San Juan County: Reeside, 2.
- Fierro limestone:
 Silver City: Paige, 7.
- Florida Mountains: Darton, 15.
- Franklin Mountains (New Mexico and Texas): Richardson, 1.
- Fruitland formation:
 San Juan County: Reeside, 2.
- Galisteo Creek: Dall, 1.
- Gallina-Raton Springs coal field:
 Gardner, 2.
- Gallup coal: Fleming, 1.
- Gallup-San Mateo coal field: Gardner, 4.
- Gallup-Zuñi Basin: Sears, 1.
- General: Darton, 22, 29; Keyes, 8, 24, 25, 26, 27, 54, 55, 57, 62; Lindgren, 6; Wilmarth, 1.
- Guadalupe Mountains: Darton, 24, 29; Pope, 1.
- Gym limestone:
 Deming quadrangle: Darton, 15.
- Gypsum deposits: Darton, 20.

Geologic formations, tables and sections (Continued).

Hagan field: Lee, 16.
 Hidalgo County: Schwennesen, 3.
 Hillsboro: Darton, 15.
 Kingston: Darton 15.
 Kirtland formation:
 San Juan County: Reeside, 2.
 Laguna:
 Cretaceous rocks: Lee, 16.
 Lake Valley district: Clark, E., 1;
 Darton, 15; Gordon, 2; Keyes,
 36.
 Lake Valley limestone: Darton, 16,
 29.
 Lake Valley: Clark, E., 1.
 Luna County: Darton, 12, 15.
 Lakewood, Eddy County: Hoots, 1.
 Laramie:
 Northern: Stevenson, 1.
 Lea County: Hoots, 1.
 Lewis shale:
 San Juan County: Reeside, 2.
 Lobo formation, Triassic (?): Dar-
 ton, 12, 15.
 Luna County: Darton, 12, 15.
 McElmo formation: Mook, 3.
 McDermott formation:
 San Juan County: Reeside, 2.
 Menefee formation:
 San Juan County: Reeside, 2.
 Mesaverde group:
 San Juan County: Reeside, 2.
 Mesozoic: Keyes, 26.
 Mississippian: Gordon, 2.
 Mogollon district: Ferguson, 2.
 Monero coal area, Rio Arriba Coun-
 ty: Gardner, 3.
 Morrison formation: Mook, 3.
 Type section: Lee, 25.
 Nacimiento group: Gardner, 9.
 Navajo country: Gregory, 1, 2.
 Northern:
 Along Santa Fe Railway: Darton,
 10.
 Northwestern: Darton, 3.
 Ojo Alamo sandstone:
 San Juan County: Reeside, 2.
 Otero County: Blanchard, 1.
 Paleozoic: Lindgren, 6.
 Pennsylvanian: Darton, 3, 25; Gor-
 don, 3.
 Permian: Baker, A. A., 1; Darton,
 25.
 Great Plains: Gould, 2.
 Texas-New Mexico: Crandall, 1;
 Lloyd, 1; Willis, 1, 3.
 Permo-Carboniferous red beds:
 Colorado and New Mexico: Mel-
 ton, 2.
 Rio Grande Valley: Case, 9.
 Southeastern: Hoots, 1.

Geologic formations, tables and sections (Continued).

Pictured Cliffs sandstone:
 San Juan County: Reeside, 2.
 Point Lookout sandstone:
 San Juan County: Reeside, 2.
 Puerco formation:
 San Juan County: Reeside, 2.
 Puerco region: Gardner, 9.
 Pyroclastic rocks:
 Luna County: Darton, 12.
 Raton field: Lee, 10, 16, 31.
 Raton Mesa region: Lee, 23, 29.
 Red Hills, Eddy County: Hoots, 1.
 Rio Grande region: Keyes, 45; Lee,
 11; Lindgren, 6.
 Rio Puerco coal field: Lee, 16.
 Rustler limestone: Hoots, 1; Rich-
 ardson, 1.
 Sacramento Mountains: Darton, 15.
 San Andreas formation:
 Eddy County: Blanchard, 1.
 San Andreas Mountains: Darton, 15,
 29.
 San Juan County: Bauer, 1; Dutton,
 2; Reeside, 2.
 San Mateo-Cuba coal field: Gardner,
 7.
 San Pedro district: McCaffery, 1.
 San Ygnacio:
 Mesaverde rocks: Lee, 16.
 Seven Rivers-Carlsbad: Lee, 34.
 Sierra Blanca coal field: Wegemann,
 1.
 Sierra County: Lindgren, 6.
 Sierra Lucero: Darton, 29.
 Silver City region: Darton, 15;
 Paige, 7.
 Socorro County: Darton, 29; Lind-
 gren, 6.
 "Coal Measures," east of Socorro:
 Herrick, 14.
 Southeastern: Hoots, 1; Pope, 1.
 Staked Plains: Johnson, W. D., 1.
 Tertiary: Dall, 2; Keyes, 34.
 San Juan Basin: Reeside, 2.
 Texas-New Mexico salt basin: Hoots,
 1; Lloyd, 1; Willis, 1, 3.
 Tijeras coal field: Lee, 15, 16.
 Torrejon formation:
 Cedar Hill, San Juan County: Ree-
 side, 2.
 Triassic: Darton, 3, 12, 29; Lloyd, 1.
 Tucumcari Mountain: Cummins, 1;
 Drake, 1.
 Tularosa Basin: Meinzer, 3.
 Unconformities: Keyes, 25.
 Vermejo formation:
 Raton coal field: Lee, 31.
 Wasatch:
 Cedar Hill, San Juan County: Ree-
 side, 2.

Geologic formations, tables and sections (Continued).

- Willow mine, Van Houten: Lee, 18.
 Wingate sandstone: Sears, 1.
 Zuñi Plateau: Dutton, 2.
 Zuñi salt lake: Darton, 2.
 Zuñi uplift, near Guam: Darton, 3.

Geologic maps.

- Alamosa Creek valley: Winchester, 2.
 Albuquerque: Bryan, 1; Herrick, C. L., 10; Reagan, 1.
 Bernalillo County: Herrick, C. L., 9.
 Tijeras coal field: Lee, 15.
 Brilliant: Lee, 29.
 Burro Mountains: Paige, 3; Somers, 1.
 Carlsbad region: Meinzer, 5.
 Carthage coal field: Gardner, 6.
 Catalogue: Marcou, 7.
 Central: Darton, 29.
 Cerrillos Hills: Johnson, D. W., 4.
 Chama Basin: Darton, 29.
 Coal fields:
 San Mateo-Cuba field: Gardner, 7.
 Southern Rocky Mountain field, showing cretaceous coal formations: Storrs, 1.
 Deming Quadrangle: Darton, 5, 15.
 Eddy County: Darton, 24.
 Elephant Butte: Lee, 5.
 Estancia Valley: Meinzer, 2.
 Fluorite Ridge:
 Luna County: Darton, 5.
 Fluorspar deposits: Johnston, 1.
 Gallina coal field: Gardner, 2.
 Gallup coal district: Sears, 1; Shaler, 3.
 Gallup-San Mateo coal field: Gardner, 4.
 Gallup-Zuni Basin: Sears, 1.
 General: Darton, 27; Davis, W. M., 1; Ellis, 4; Jones, F. A., 9; Lindgren, 6; Marcou, 4, 7; Metcalfe, 1; Wheeler, 8; White, L. A., 1.
 Grant County: Schwennesen, 1.
 Great Plains:
 Showing red beds: Gould, 2.
 Guadalupe group: Darton, 24.
 Guadalupe Mountain region: Darton, 29.
 Hanover:
 Iron district: Paige, 1.
 Hidalgo County: Schwennesen, 3.
 Iron Mountain: Smythe, 2.
 Jemez: Reagan, 1.
 Jornada del Muerto: Darton, 22; Keyes, 14.
 Koehler: Lee, 19.

Geologic maps (Continued).

- Lake Valley: Clark, E., 1; Keyes, 36; Lindgren, 6.
 Luna County: Darton, 12.
 Fluorite Ridge: Darton, 5.
 Victorio Mountains: Darton, 12.
 Manzano Mountains: Darton, 22.
 Mogollon district: Ferguson, 1, 2.
 Morrison formation: Mook, 3.
 Nacimiento uplift:
 Southern end of: Darton, 29.
 Navajo Country: Gregory, 1, 2.
 North central: Darton, 29.
 Northern: Darton, 10; Gardner, 3; Stevenson, 5; Van Hise, 1.
 Northwestern: Darton, 3; Dutton, 2; Gregory, 1, 2.
 Oscura Mountains: Darton, 29.
 Otero County: Darton, 24.
 Permian:
 Southeastern: Willis, 1, 3.
 Pinos Altos: Paige, 2.
 Plateau province: Dutton, 2.
 Puerco region: Gardner, 9.
 Puertecito district: Wells, E. H., 2.
 Raton quadrangle: Lee, 29, 31.
 Rio Grande Valley: Lee, 5.
 Rio Grande-Pimo (Ariz.-N. Mex.): Antisell, 1.
 Roswell area: Fielder, 2; Fisher, 2.
 Sacramento Mountains: Darton, 29.
 San Andres Mountains: Darton, 29.
 Sandia Mountains: Darton, 22; Ellis, 2.
 San Juan County: Bauer, 1, 2; Reeside, 2.
 San Pedro district: Herrick, C. L., 6; McCaffery, 1.
 Santa Rita region: Paige, 6.
 Silver City quadrangle: Paige, 7.
 Socorro County: Darton, 22, 29; Wells, E. H., 2; Winchester, 2.
 Southeastern: Blanchard, 1; Darton, 24; Eccles & Hunter, 1; Hoots, 1; Willis, 1, 3; Anon., 12.
 Southern: Darton, 16.
 Southwestern: Wheeler, 8.
 Staked Plains: Cummins, 1.
 Taos Range: Gruner, 1.
 Taylor Creek:
 Tin deposits: Hill, J. M., 2.
 Tijeras area: Lee, 15, 16.
 Tularosa Basin: Darton, 22; Meinzer, 3; Powell, W. C., 1.
 Tyrone district: Paige, 9.
 Valencia County: Darton, 22, 29; Herrick, C. L., 9; Johnson, D. W., 2.
 Western: Van Hise, 1; Wheeler, 8.
 Zuñi Mountains: Darton, 29.
 Zuñi Reservation: Sears, 1.
 Zuñi salt lake: Darton, 2.

Historical Geology.

- Abo sandstone:
 Lincoln County, Böse, 1.
 Afton craters: Lee, 7.
 Alamosa Creek:
 Socorro County: Winchester, 2.
 Albuquerque: Bryan, 1; Herrick, C. L., 3, 6, 10.
 Apache Canyon:
 South central: Keyes, 4.
 Archean:
 North America: Van Hise, 1.
 Northern: Stevenson, 5.
 Basalt fields: Dutton, 1.
 Bishop's Cap, bone-cavern find:
 Bryan, W. A., 1.
 Buried Mountains:
 Estancia Valley: Lee, 27, Rich, J. L., 4.
 Burlington limestone:
 Lake Valley: Springer, F., 1.
 Burro Mountains: Somers, 1.
 Caballo Mountains: Herrick, C. L., 4.
 Cambrian: Gordon, 1; Keyes, 62;
 Lindgren, 6; Walcott, 1.
 Central: Lee, 8.
 Deming quadrangle: Darton, 15.
 Eastern: Baker, C. L., 2.
 Luna County: Darton, 12.
 Paleogeographic map: Willis, B., 1.
 Silver City quadrangle: Paige, 7.
 Southern: Darton, 16.
 Carbonic column:
 Rio Grande region: Keyes, 45.
 Carboniferous: Case, 6; Darton, 22, 29; Gordon, 1; Herrick, C. L., 17; Huene, 1; Keyes, 23, 24, 62; Lindgren, 6; Marcou, 10; Newberry, 3; Williams, H. S., 1.
 Burlington limestone: Springer, F., 1.
 Carlsbad region: Meinzer, 5.
 Central: Lee, 8.
 Chaves County: Merritt, 1.
 Coal measures: Herrick, C. L., 8.
 in Sierra Ladrones: Keyes, 28.
 Deming quadrangle: Darton, 15.
 Eastern: Baker, C. L., 2; Lee, 27; Rich, J. L., 5.
 Estancia plains: Keyes, 38.
 Estancia Valley: Meinzer, 2.
 Gallup-Zuñi Basin: Sears, 1.
 Guadalupe Mountains, Permian:
 Shumard, B. F., 1.
 Hanover district: Paige, 1.
 Jemez-Albuquerque region: Reagan, 1.
 Jornada del Muerto: Keyes, 14;
 Shumard, G. G., 2.
 Lake Valley district: Keyes, 36.
 Luna County: Darton, 12.

Historical geology (Continued).

- Carboniferous (Continued).
 Manzano group: Lee, 11, 26.
 Northeastern: Garrett, 1; St. John, 1.
 Northern: Stevenson, 1, 5; Williston, 4.
 Northwestern: Darton, 3; Dutton, 2.
 Paleogeographic map: Schuchert, 2.
 Pecos Valley: Semmes, 1.
 Permian: Darton, 25; Herrick, C. L., 11.
 Guadalupe Mountains: Shumard, B. F., 5.
 Pecos Valley: Wrather, 1.
 Pre-Moenkopi unconformity:
 Colorado Plateau: Dake, 1.
 Puertecito district: Wells, E. H., 2.
 Red beds: Case, 9; Darton, 29; Lee, 9.
 Rio Grande Valley: Gordon, 2, 3; Keyes, 45, 66.
 Manzano group: Lee, 11.
 Red beds: Case, 9; Darton, 29; Lee, 6.
 Rio Penasco Basin: Renick, 3.
 Roswell area: Fisher, 2.
 Sandia Mountains: Ellis, 2.
 San Miguel County: Gardner, 8.
 Santa Fe region: Blake, 4.
 Sierra Blanca field: Wegemann, 1.
 Silver City quadrangle: Paige, 7.
 Socorro County: Herrick, C. L., 9, 14.
 Southeastern: Hoots, 1; King, P. B., 1; Rich, A., 1; Richardson, 3.
 Southern: Darton, 16.
 Stratigraphy: Keyes, 24; Richardson, 3.
 Taos Range: Gruner, 1.
 Tijeras region: Herrick, C. L., 6.
 Tularosa Basin: Meinzer, 3.
 Valencia County: Herrick, C. L., 9.
 Carthage coal field: Gardner, 6.
 Cerrillos coal field: Johnson, D. W., 4; Lee, 19; Stevenson, 12.
 Cerrillos Hills: Johnson, D. W., 4.
 Chaco Canyon:
 Recent deposits of: Bryan, 7.
 Chaves County: Merritt, 1.
 Chupadera Mesa:
 Antiquity of: Keyes, 67.
 Coal formations: Lesquereux, 7; White, C. A., 11.
 Sierra Blanca field: Wegemann, 1.
 Fields around southern end of Rocky Mountains: Lee, 16.
 Coal measures:
 Near Socorro: Herrick, C. L., 8, 14.

Historical geology (Continued).

- Colorado Plateau:
 Uniformity of: Dake, 1.
 Comanche series: Hill, R. T., 11.
 See also Cretaceous, page 106.
 Cretaceous: Darton, 22, 29; Hill, R. T., 11; Keyes, 62; Knox, 1; Lee, 20; Marcou, 10; Matthew, 4; Newberry, 3; White, 13.
 Alamosa Creek valley: Winchester, 2.
 Albuquerque region: Herrick, C. L., 10.
 Carthage coal field: Gardner, 6.
 Cerrillos field: Lee, 19.
 Cerrillos Hills: Johnson, D. W., 4.
 Close of, in North America: Osborn, 4.
 Correlation: Brown, 2.
 Dakotan series: Keyes, 26.
 Deming quadrangle: Darton, 15.
 Eastern: Baker, C. L., 2.
 Estancia Valley: Meinzer, 2.
 Flora of the Dakota formation: Gress, 1.
 Galisteo Creek: Stevenson, 3.
 Gallina-Raton Spring coal field: Gardner, 2.
 Gallup Basin: Kirk, 1.
 Gallup-San Mateo field: Gardner, 4.
 Gallup-Zuñi Basin: Sears, 1.
 Jemez-Albuquerque region: Reagan, 1.
 Jornada del Muerto: Keyes, 14.
 Laramie group: Stevenson, 2.
 Laramie hiatus: Keyes, 72.
 Luna County: Darton, 12.
 Morrison formation: Darton, 11.
 Mount Taylor region: Shimer, 1.
 Navajo country: Gregory, 2.
 North America: White, 17.
 North central: Lee, 16.
 Northeastern: Garrett, 1; St. John, 1.
 Northern: Gardner, 3; Stevenson, 1, 5, 9.
 Northwestern: Darton, 3; Dutton, 2.
 Ojo Alamo beds: Brown, 1.
 Paleogeographic map: Willis, B., 1; Schuchert, 2.
 Pecos Valley: Semmes, 1.
 Puertecito district: Wells, E. H., 2.
 Raton field: Lee, 10, 29, 31.
 Raton Mesa region: Knowlton, 3; Lee, 23; Stevenson, 8.
 Rio Grande Valley: Lee, 6.
 Rocky Mountain region: Lee, 20; Lesquereux, 7.
 San Carlos Mountains: White, 14.
 Sandia Mountains: Ellis, 2.

Historical geology (Continued).

- Cretaceous (Continued).
 San Juan County: Bauer, 1, 2; Knowlton, 5; Reeside, 1, 2.
 San Mateo-Cuba district: Gardner, 7.
 Sierra Blanca field: Wegemann, 1.
 Silver City quadrangle: Paige, 7.
 Socorro County: Herrick, C. L., 9.
 Southeastern: Shumard, G. G., 1.
 Southern: Stevenson, 6.
 Tucumcari: Cummins, 1, 3; Hill, R. T., 3, 10.
 Tularosa Basin: Meinzer, 3.
 Valencia County: Herrick, C. L., 9.
 Western: Winchester, 1.
 Cretaceous-Tertiary boundary: Knowlton, 4; Stanton, 3.
 Dakotan series: Keyes, 26.
 Deming quadrangle: Darton, 15.
 Florida Mountains: Becker, 1.
 Devonian: Darton, 29; Gordon, 1; Grabau, 1; Keyes, 62; Kindle, 1; Lindgren, 6; Williams, H. S., 1.
 Deming quadrangle: Darton, 15.
 Eastern: Baker, C. L., 2.
 Fauna (Percha shale): Kindle, 1.
 Lake Valley district: Clark, E., 1; Keyes, 36.
 Luna County: Darton, 12.
 Paleogeographic map: Schuchert, 2; Willis, B., 1.
 Physical and faunal evolution of North America: Grabau, 1.
 Silver City quadrangle: Paige, 7.
 Southern: Darton, 16.
 Eastern: Baker, C. L., 2; Hill, R. T., 6; Lee, 27; Rich, J. L., 5; Van Diest, 1.
 Eocene: Cope, 3.
 Faunal horizons: Granger, 1.
 of North America: Clark, W. B., 1; Smith, J. H., 1.
 See also Tertiary, page 109.
 Estancia plains: Keyes, 38; Meinzer, 2.
 Evolution, physical and faunal: Grabau, 1.
 Florida Mountains: Becker, 1.
 Folsom culture: Brown, B., 3.
 Formations:
 Table of: Keyes, 55, 57.
 Galisteo Creek: Stevenson, 3.
 Gallup Basin: Kirk, 1; Sears, 1.
 General: Antisell, 1; Bailey, 1; Blake, 1; Cope, 7, 12, 14; Darton, 29; Gilbert, 1; Hayden, 1, 2; Herrick, C. L., 6, 13; Hill, R. T., 4, 6; Howell, 1; Jewett, 1; Keyes, 5, 25, 62; Knox, 1; Le Conte, 3; Lindgren, 6; Loew, 1; Macfarlane, 2; Marcou, 1, 3, 4, 5;

Historical geology (Continued).

- General (Continued).
 Newberry, 1, 3, 4; Stevenson, 5;
 Wheeler, 1 to 6.
 Geologic structure: Darton, 22.
 See also Structural geology, page 123.
 Geologic time classification: Wilmarth, 1.
 Guadalupe group: Darton, 24.
 Guadalupean reef theory: Keyes, 75.
 Jemez coal field: Reagan, 3.
 Jemez Plateau: Kelly, 1.
 Jemez-Albuquerque region: Reagan, 1.
 Jornada del Muerto: Keyes, 1, 14; Shumard, G. G., 1.
 Jurassic: Broadhead, 1; Darton, 22, 29; Huene, 1; Hyatt, 2; Keyes, 17, 63; Lee, 26; Marcou, 10; White, 8.
 Gallup-Zuñi Basin: Sears, 1.
 Morrison formation: Darton, 11.
 Navajo country: Gregory, 2.
 Northeastern: Garrett, 1.
 Northern: Lee, 1.
 Paleogeographic map: Schuchert, 2; Willis, B., 1.
 Southern end of Rocky Mountains: Keyes, 17.
 Lake Otero: Herrick, C. L., 16.
 Lake Valley:
 beds, age of: Cope, 26, 39; Keyes, 23, 36.
 Burlington limestone: Springer, F., 1.
 Laramie group: Cope, 55; Newberry, 8; Stevenson, 2, 6, 8.
 Laramie hiatus:
 Southern Rocky Mountains: Keyes, 72.
 Lava fields: Dutton, 3; Reagan, 2; Tarr, 2.
 Lignite:
 Age of: Lesquereux, 7.
 Formation of: Lesquereux, 8.
 Limar volcano: Herrick, C. L., 5.
 Loup Fork beds:
 Formation: Cope, 47.
 Gila River: Cope, 50.
 Luna County: Darton, 12.
 Deming quadrangle: Darton, 15.
 Florida Mountains: Becker, 1.
 Magdalena Mountains: Herrick, C. L., 2, 5; Keyes, 19, 23.
 and Black Range region: Gordon, 5.
 Manzano group:
 Rio Grande Valley: Lee, 11, 26.
 Mesozoic: Darton, 29; Hill, R. T., 1; Marcou, 10; Stevenson, 9; White, 12.

Historical geology (Continued).

- Mexican boundary: Emory, 2, 3; Hall, 2; Hill, 1.
 Mississippian formations:
 Rio Grande Valley: Gordon, 2.
 See also Carboniferous, page 105.
 Mogollon: Ferguson, 1, 2; Henrich, 2.
 Morrison formation: Berry, 1; Darton, 11; Lee, 1, 21; Lull, 1; Mook, 2, 3.
 Mountain ranges: Antisell, 1.
 Mount Taylor, region about: Dutton, 2; Shimer, 1.
 Volcanic necks: Johnson, D. W., 7.
 Mud and lava:
 Deposits of: Cope, 32.
 Navajo country: Gregory, 1, 2.
 Neocene:
 North America: Dall, 1.
 Northeastern: Baldwin, 1; Garrett, 1; Marcy, 1; St. John, 1.
 North central: Lee, 16.
 Northern: Conkling, 1; Keyes, 16; Lesquereux, 6; Marcou, 1, 3; Stevenson, 1, 5, 7.
 Northwestern: Darton, 3; Powell, J. W., 1.
 Ordovician: Gordon, 1; Grabau, 1; Keyes, 62; Lindgren, 6.
 Central: Lee, 8.
 Deming quadrangle: Darton, 15.
 Eastern: Baker, C. L., 2.
 Lake Valley district: Keyes, 36.
 Luna County: Darton, 12.
 Paleogeographic map: Schuchert, 2; Willis, B., 1.
 Physical and faunal evolution of North America: Grabau, 1.
 Silver City quadrangle: Paige, 7.
 Southern: Darton, 16.
 Organ Mountains: Antisell, 1.
 Ortiz Mountains: Keyes, 43; Ogilvie, 3.
 Paleogeography: Gould, 2; Keyes, 61; Schuchert, 2; Willis, B., 1.
 Maps: See the various geologic systems under Historical geology, page 105.
 Paleozoic formations: Darton, 29; Gordon, 1; Keyes, 61, 68.
 Central: Lee, 8.
 Luna County: Darton, 12.
 Southern: Darton, 15, 16, 17; Keyes, 69; Richardson, 2.
 Paleogeographic map: Case, 10; Schuchert, 2; Willis, B., 1.
 Pecos Valley: Means, 1; Semmes, 1.
 Permian formations of: Wrather, 1.

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- Pennsylvanian formations:
 Rio Grande Valley: Gordon, 3.
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- Permian: Archaic, 1; Beede, 2; Case, 10; Cope, 28; Darton, 25, 29; Girty, 1; Huene, 1; Marsh, 2; Shumard, B. F., 4; White, 1; Williston, 1; Wrath, 1.
- Guadalupe Mountains: Beede, 2; Crandall, 1; Shumard, B. F., 1.
- Paleogeography: Case, 10.
- Great Plains: Gould, 2.
- Pecos Valley: Wrath, 1.
- Revolution in North America: Finlay, 1.
- Texas-New Mexico: Baker, C. L., 4, 5; Crandall, 1; King, P. B., 1; Willis, 1.
- See also Carboniferous, page 105.
- Permo-Carboniferous:
 Northern: Case, 6; Williston, 4.
- Pre-Cambrian: Keyes, 16, 53, 62; Lindgren, 6.
- Burro Mountains: Somers, 1.
- Deming quadrangle: Darton, 15.
- At Hamilton mine: Lindgren, 2.
- Jornada del Muerto: Keyes, 14.
- Luna County: Darton, 12.
- Paleogeographic map: Schuchert, 2.
- Silver City quadrangle: Paige, 7.
- Taos Range: Gruner, 1.
- Pre-Moenkopi:
 Unconformity, Colorado Plateau: Dake, 1.
- Puerco formation: Cope, 5, 55; Gardner, 9; Matthew, 2.
- Puertecito: Wells, E. H., 2.
- Quaternary: Keyes, 62; Lindgren, 6.
- Deming quadrangle: Darton, 15.
- Luna County: Darton, 12.
- Navajo country: Gregory, 2.
- Northeastern: Garrett, 1.
- Raton-Brilliant-Koehler Area: Lee, 29.
- Raton coal field:
 Unconformity in: Lee, 10, 13.
- Raton Mesa: Knowlton, 3; Lee, 10, 14, 23, 29.
- Igneous rocks of: Mertie, 1.
- Red beds: Case, 5, 7; Darton, 9, 29; Lee, 6, 9.
- Rio Grande Valley, age: Case, 9.
- Rio Grande region: Henderson, J., 1.
- Carboniferous of: Keyes, 66.
- Rio Grande Valley: Henderson, J., 1; Keyes, 69; Lee, 5, 11.
- Mississippian formations: Gordon, 2.
- Rio Penasco Basin: Renick, 3.

Historical geology (Continued).

- Rocky Mountains:
 Building of: Lee, 30; Melton, 1.
- Roswell area: Fielder, 2; Fisher, 2.
- Saline basins:
 Central: Johnson, D. W., 3.
- San Andreas Mountains: Herrick, C. L., 4.
- Sandia Mountains: Ellis, 2; Herrick, C. L., 6.
- San Jose and Rio Puerco Valley, Sandoval County: Renick, 2.
- San Juan Basin: Endlich, 1; Reeside, 2; Sinclair, 2.
- Paleocene deposits: Sinclair, 1.
- Puerco and Torrejon formations: Matthew, 2.
- San Juan County: Bauer, 1, 2; Knowlton, 5; Reeside, 1.
- San Pedro district: Berryman, 1; Herrick, C. L., 6.
- San Simon Valley: Schwennesen, 2.
- Santa Fe region: Blake, 3; Simpson, G. G., 1.
- Santa Rita region: Paige, 6; Rickard, 1.
- Santa Rosa: Prout, F. S., 1.
- Sierra de los Caballos: Keyes, 14.
- Silver City quadrangle:
 General: Paige, 7.
- Silurian: Gordon, 1; Grabau, 1; Keyes, 62; Lindgren, 6.
- Deming quadrangle: Darton, 15.
- Eastern: Baker, C. L., 2.
- Lake Valley district: Keyes, 36.
- Luna County: Darton, 12.
- Organ Mountains: Jenney, 1.
- Paleogeographic map: Schuchert, 2; Willis, B., 1.
- Physical and faunal evolutions of North America: Grabau, 1.
- Silver City quadrangle: Paige, 7.
- Southern: Darton, 16.
- Socorro County: Herrick, C. L., 9.
- Socorro Mountains: Herrick, 5.
- Southeastern: Hoots, 1; Jenney, 1; Rich, A., 1; Richardson, 1; Shumard, G. G., 1; Tarr, 3.
- Southern: Antisell, 1; Darton, 14, 16; Endlich, 1; Shumard, G. G., 3.
- Southwestern: Antisell, 1; Schwennesen, 1, 2; Webster, 1.
- Staked Plains: Blake, 1; Cummins, 1; Hill, R. T., 1, 2, 6.
- Mesozoic stratigraphy: Jenney, 1.
- Stratigraphy: Darton, 29; Willis, B., 1.
- Abo formation, age of: Baker, C. L., 2.
- Albuquerque: Bryan, 1.

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- Stratigraphy (Continued).
 Benton formation, eastern N. Mex.:
 Baker, C. L., 2.
 Burlington limestone, Lake Valley:
 Springer, F., 1.
 Carboniferous, southeastern: King,
 P. B., 1; Richardson, 3.
 Carthage coal field: Gardner, 6.
 Central: Darton, 22, 25.
 Chaco Valley: Bauer, 1.
 Chama Basin: Darton, 22.
 Coal fields: Lee, 16.
 Comanche series: Hill, R. T., 11.
 Correlation:
 Cretaceous-Eocene: Brown, 2.
 See also Correlation, page 87.
 Cretaceous: Brown, 1, 2; Knowl-
 ton, 4; Reeside, 2; Stanton, 3.
 Type section: Lee, 16.
 Unconformity on older rocks:
 Keyes, 8.
 Deming quadrangle: Darton, 15.
 Eastern: Baker, C. L., 2; Rich, J.
 L., 5; Willis, 1.
 Eddy County: Renick, 3.
 Cactus Flat dam site: Nye, 1.
 Permian: King, P. B., 1; Willis,
 1, 2, 3, 4.
 Gallina-Raton Spring coal field:
 Gardner, 2.
 Gallup coal fields: Sears, 1; Sha-
 ler, 3.
 Gallup-Zuñi Basin: Darton, 22.
 Glorieta sandstone: Baker, C. L., 2.
 Guadalupe group: Darton, 24.
 Guadalupe Mountains: Tarr, 3.
 Hagan field: Lee, 16.
 Jornada del Muerto: Darton, 22;
 Keyes, 14.
 Jura-Trias: Broadhead, 1.
 Lake Valley: Clark, E., 1; Keyes,
 36.
 Laramie: relation to Puerco: Cope,
 55.
 Lea County: King, P. B., 1; Wil-
 lis, 1, 3.
 Luna County: Darton, 12.
 Manzano group: Lee, 11, 26.
 Monero, Rio Arriba County: Gard-
 ner, 3.
 Morrison: Lee, 25.
 Mount Taylor region: Blodgett, 1;
 Shimer, 1.
 Northeastern: Darton, 22; Garrett,
 1.
 Northwestern: Darton, 3, 22; Dut-
 ton, 2; Reeside.
 Paleozoic:
 Northern: Case, 4.
 Southern: Darton, 16.

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- Stratigraphy (Continued).
 Permian: Darton, 25.
 Northern: Baker, A. A., 1; Case,
 4.
 Texas-New Mexico: Crandall, 1;
 King, P. B., 1; Willis, 1, 3.
 Permo-Carboniferous:
 Northern: Case, 4.
 Plateau region: Reagan, 2.
 Puerco, relation to Laramie: Cope,
 55.
 Raton coal field: Lee, 31.
 Red beds: Darton, 9, 29.
 Eastern: Baker, C. L., 2; Case,
 4, 5, 9.
 Northeastern: Case, 5, 7.
 Southeastern: Davis, M. J., 1;
 King, P. B., 1; Willis, 1 to 4.
 Roswell artesian basins: Fielder, 2.
 Sandoval County: Renick, 2.
 San Juan County: Bauer, 1, 2;
 Holmes, 1; Reeside, 1, 2.
 San Mateo-Cuba coal field: Gard-
 ner, 7.
 Santa Rita: Rickard, 1.
 Silver City quadrangle: Paige, 7.
 Southeastern: Hoots, 1; Mansfield,
 3; Willis, 1 to 4.
 Southern: Darton, 6; Richardson,
 2.
 Staked Plains: Cummins, 1; Dar-
 ton, 22; Drake, 1.
 Tertiary: Brown, 2; Reeside, 2.
 Triassic: Drake, 1.
 Tucumcari Mountain: Baker, C. L.,
 2; Case, 7; Cummins, 1, 2, 3;
 Hill, R. T., 2, 6, 10.
 Tularosa Basin: Darton, 22; Mein-
 zer, 3; Powell, W. C., 1.
 Yeso formation: Baker, C. L., 2;
 Darton, 29.
 Zuñi Mountains: Darton, 22.
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 scribed, page 96, and Geologic
 formations, table and sections,
 page 102.
 Taos Range: Gruner, 1.
 Tertiary: Cope, 3, 7, 20, 34; Dall, 2;
 Darton, 22, 29; Herrick, C. L., 6;
 Keyes, 34, 62; Knox, 1; Lind-
 gren, 6; Matthew, 2, 4.
 Alamosa Creek valley: Winchester,
 2.
 Albuquerque region: Bryan, 1;
 Herrick, C. L., 10; Reagan, 1.
 Carthage coal field: Gardner, 6.
 Cerrillos Hills: Johnson, D. W., 4.
 Colorado Plateau: Newberry, 4.
 Correlation: Brown, 2.
 Deming quadrangle: Darton, 15.

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Tertiary (Continued).

- Eocene: Granger, 1.
 Eocene formations:
 Petrographic analysis: Johannsen, 1.
 Formations, table of: Dall, 2.
 Gallina-Raton Spring coal field: Gardner, 2.
 Gallup-Zuñi Basin: Sears, 1.
 Intrusives, Pecos Valley: Semmes, 1.
 Jemez region: Reagan, 1.
 Jornada del Muerto: Keyes, 14.
 Lake Valley district: Keyes, 36.
 Loup Fork beds: Cope, 47, 50.
 Luna County: Darton, 12.
 Mexican boundary: Hall, 2.
 Mogollon district: Ferguson, 2.
 Navajo country: Gregory, 2.
 North central: Lee, 16.
 Northeastern: Garrett, 1.
 Northern: Gardner, 3; Stevenson, 5.
 Northwestern: Darton, 3.
 Opening of, in North America: Osborn, 4.
 Paleogeographic map: Schuchert, 2; Willis, B., 1.
 Pecos Valley: Semmes, 1.
 Peneplains: Robinson, 1.
 Plateau district: Robinson, 1.
 Puerco formation: Gardner, 9; Matthew, 2.
 Raton-Brilliant-Koehler area: Lee, 29.
 Raton coal field: Lee, 29, 31.
 Raton Mesa region: Knowlton, 3, 6; Lee, 23, 28.
 Rio Grande region: Henderson, J., 1.
 San Juan Basin: Reeside, 2.
 Paleocene deposits: Sinclair, 1.
 San Juan County: Bauer, 1, 2.
 San Mateo-Cuba district: Gardner, 7.
 Santa Fe marls: Cope, 4.
 Silver City quadrangle: Paige, 7.
 Socorro and Valencia Counties: Herrick, 9.
 Torrejon formation: Gardner, 9; Matthew, 2.
 Tularosa Basin: Meinzer, 3.
 Tertiary plateau:
 Northeastern: St. John, 1.
 Tijeras coal field: Lee, 15.
 Torrejon formation: Gardner, 9; Matthew, 2.
 Triassic: Adams, J. E., 1; Darton, 22, 29; Huene, 1, 3; Hyatt, 2;

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Triassic (Continued).

- Keyes, 18, 26; Lee, 26; Marcou, 10.
 Deming quadrangle: Darton, 15.
 Eastern: Adams, J. E., 1; Baker, C. L., 2; Drake, 1; Rich, J. L., 5.
 Gallup-Zuñi Basin: Sears, 1.
 Luna County: Darton, 12.
 Navajo country: Cross, 3; Gregory, 2.
 Northern: Cross, 3; Williston, 4.
 Northeastern: Garrett, 1.
 Northwestern: Dutton, 2.
 Paleogeographic map: Schuchert, 2; Willis, B., 1.
 Puertecito district: Wells, E. H., 2.
 Red beds: Case, 7.
 Tucumcari Mountain: Cummins, 1, 3; Hill, R. T., 1, 2, 3, 10, 11; Marcou, 11, 12, 13.
 Tuertos Mountains: Keyes, 43.
 Tularosa Basin: Meinzer, 3; Powell, W. C., 1.
 Tyrone district: Paige, 9.
 Unconformity:
 At base of Cretaceous: Keyes, 8.
 Pre-Moenkopi, Colorado Plateau: Dake, 1.
 Significance of: Keyes, 25.
 Valencia County: Herrick, C. L., 9; Johnson, D. W., 2.
 White sands: Herrick, C. L., 11; Herrick, H. N., 1.
 White Oaks: Smith, E. P., 1.
 Zuñi Plateau: Dutton, 2.

Maps, general.

- Apache National Forest: U. S. F. Serv., 1.
 Absorption areas:
 Roswell area: Fisher, 2.
 Alkali flat, Dona Ana County: Wells, R. C., 1.
 Areas of artesian flow:
 Roswell Basin: Fisher, 2.
 Baldy mining district: Belcher, 1.
 Bernalillo County: U. S. F. Serv., 7.
 Black Range and Apache districts:
 Bender, 1; Irumbar, 1; Lindgren, 6; Merry, 1.
 Burro Mountains mining district:
 Johnson, C. E., 1.
 Canadian region, sketch map: St. John, 1.
 Carlsbad Cavern National Monument: Lee, 34.

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- Carlsbad irrigation project: Meinzer, 5.
 Carson National Forest: U. S. F. Serv., 2.
 Catron County: U. S. F. Serv., 1, 4, 5.
 Cooney district: Ferguson, 2; McKee, 1.
 Cerrillos coal field: Lee, 19.
 Cerrillos Hills, old mining map: Hayward, 1; Johnson, D. W., 4.
 Chaves County: U. S. F. Serv., 6.
 Claim map:
 Black Range district: Bender, 1; Irumbar, 1.
 Burro Mountain district: Johnson, C. E., 1.
 Cooney district: McKee, 1.
 Mogollon district: Ferguson, 2.
 Sylvanite district: Ober Eng. Co., 1.
 Clark's coal mine: Fleming, 1.
 Coal fields: Campbell, 4, 7; Parker, 1.
 Southern Rocky Mountain region: Lee, 20.
 Colfax County: Amerine, 1; Belcher, 1; White, E. D., 1.
 Colorado and New Mexico:
 Showing continental divide: Conkling, 2.
 Contact-metamorphic deposits, location of: Lindgren, 6.
 Cook and White coal mine, Madrid: Fleming, 1.
 Cooney mining district: Ferguson, 2; McKee, 1.
 Copper-producing districts, location of: Butler, 1, 2.
 Coronado National Forest: U. S. F. Serv., 3.
 Datil National Forest: U. S. F. Serv., 4.
 Dawson coal district: Lee, 31.
 Elizabethtown mining district: Belcher, 1.
 Estancia Valley:
 Water condition: Meinzer, 2.
 Fluorspar deposits, location of: Johnston, 1.
 Forest maps: U. S. F. Serv., 1-9.
 General: Darton, 29; G. L. O., 1, 2; Long, 1; Sullivan, 1; U. S. F. Serv., 1-9; U. S. G. S., 59.
 Geologic: See Geologic maps, page 104.
 Gila National Forest: U. S. F. Serv., 5.
 Grant County: U. S. F. Serv., 5.

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- Grant County (Continued).
 Burro Mountain mining district: Johnson, C. E., 1.
 Gypsum, showing location of: Darton, 19.
 Gypsum mills, location of: Burchard, 4; Stone, R. W., 2.
 Hidalgo County: U. S. F. Serv., 3.
 Hillsboro district: Lindgren, 6.
 Iron districts, location of: Harder, 1.
 Keystone mining district: Amerine, 1.
 Kingston, Carpenter and Sierra Blanca districts: Lindgren, 6; Merry, 1.
 Lincoln County: U. S. F. Serv., 6, 7.
 Lincoln National Forest: U. S. F. Serv., 6.
 Lucas coal mine, Madrid: Fleming, 1.
 Luna County:
 Water conditions: Darton, 7, 12.
 McKinley County: U. S. F. Serv., 8.
 Magdalena mining district: Lindgren, 6.
 Manganese deposits, location of: Healey, 1; Hewett, D. F., 1; Wells, E. H., 1.
 Manzano National Forest: U. S. F. Serv., 7, 8.
 Mining districts, showing location of: General Land Office, 1; Hill, J. M., 1; Lindgren, 4a, 6; Otero, 1.
 Mogollon district, showing faults and veins: Ferguson, 2; Scott, 1.
 See also Cooney district.
 Monero coal area, Rio Arriba County: Gardner, 3.
 Mora County: U. S. F. Serv., 9.
 Navajo Reservation:
 Oil structures: Nowels, 1.
 Northern: Long, 1.
 Northwestern: Newberry, 4.
 Oil and gas fields: Day, 1, 2.
 Ortiz mine grant: Ortiz Syndicate, 1.
 Otero County: U. S. F. Serv., 6.
 Paleogeographic: See the various geologic systems under Historical geology, page 105.
 Pittsburg district: Lindgren, 6.
 Plateau country: Dutton, 2.
 Public surveys: General Land Office, 1.
 Quay County:
 Tucumcari oil field: Martin, 1.
 Raton Coal & Coke Company mine: Fleming, 1.
 Red River district: Belcher, 1.
 Relief map: Darton, 29.
 Southwestern: Darton, 15.
 Rio Arriba County: U. S. F. Serv., 2, 9.

Maps, general (Continued).

- Roswell artesian basin: Fielder, 2.
 Salt basin:
 Southeastern: Hoots, 1.
 Sandoval County: U. S. F. Serv., 7, 8, 9.
 "Sandstone Copper," showing location of: Lindgren, 6.
 San Juan Basin: Reeside, 2.
 Oil structures: Kroeger & Ritter, 1; Nowels, 1.
 Puerco-Torreon type locality: Gardner, 9.
 San Juan County, coal field: Bauer, 2.
 San Miguel County: U. S. F. Serv., 9.
 San Simon Valley:
 Showing water condition: Schwennesen, 2.
 Santa Fe County: U. S. F. Serv., 9.
 Santa Fe National Forest: U. S. F. Serv., 9.
 Sierra County: U. S. F. Serv., 4.
 Black Range district: Bender, 1; Irumbar, 1; Merry, 1.
 Socorro County: U. S. F. Serv., 4, 7.
 Soil resources:
 Carlsbad sheet: U. S. Bur. Soils, 1.
 Mesilla Valley: Nelson, 1.
 Middle Rio Grande: Nelson, 2.
 Pecos Valley: Means, 1.
 Roswell sheet: U. S. Bur. Soils, 2.
 Southeastern: Darton, 20; Hoots, 1.
 Stag Canyon fuel company, mine workings: Sheridan, 1.
 Stone quarries, location: Burchard, 5.
 Structural: Darton, 22, 29.
 Artesia field: Davis, M. J., 1.
 Capulin Mesa: Darton, 29.
 Deming quadrangle: Darton, 15.
 Dunken dome: Darton, 29, Renick, 3.
 Eastern: Darton, 29.
 Esterito dome, Guadalupe County: Darton, 22.
 Gallup coal district: Sears, 1.
 Hogback field: Nowels, 1.
 McKinley County: Darton, 22.
 Northeastern: Darton, 22, 29.
 Puertecito district: Darton, 29; Wells, E. H., 1; Winchester, 2.
 Rattlesnake field: Nowels, 29.
 Rio Arriba County: Darton, 22.
 Salado and Alamosa Creeks: Darton, 22.
 San Juan County: Kroeger & Ritter, 1.
 Socorro County: Darton, 29; Wells, E. H., 2.
 Southeastern: Hoots, 1.

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- Structural (Continued).
 Valencia County: Wells, E. H., 2.
 Sylvanite district: Ober Engineering Company, 1; Lindgren, 6.
 Taos County: Belcher, 1; U. S. F. Serv., 2, 9.
 Tijeras coal field: Lee, 15.
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 Torrance County: U. S. F. Serv., 7.
 Tucumcari region: Cummins, 2; Martin, C. W., 1.
 Tularosa Basin and adjacent territory: Meinzer, 3; Powell, W. C., 1.
 Tyrone district:
 Exploration: Paige, 9.
 Burro Mountain Copper Co.: Paige, 9.
 Valencia County: U. S. F. Serv., 7, 8.
 Veins, Tertiary, showing locations of: Lindgren, 6.
 Water condition:
 Estancia Valley: Meinzer, 2.
 Hidalgo County: Schwennesen, 2, 3.
 Luna County: Darton, 7, 12.
 Tularosa Basin: Meinzer, 3.
 Water supply papers, areas covered by: Meinzer, 4.
 Water table, contours:
 Navajo country: Gregory, 1.
 Deming quadrangle: Darton, 15.
 Water table, depths to:
 Carlsbad area: U. S. Bur. Soils, 3.
 Deming quadrangle: Darton, 15.
 Estancia Valley: Meinzer, 2.
 Hidalgo County: Schwennesen, 1.
 Luna County: Darton, 7, 12.
 Roswell area: U. S. Bur. Soils, 4.
 San Simon Valley: Schwennesen, 2.
 Tularosa Basin: Meinzer, 3.
 White Oaks district: Wegemann, 1.
 White sands: Herrick, C. L., 11.
 Zuñi dam, Black Rock: Bryan, 14; Eng. News, 1.
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- Mineralogy.**
 Alum:
 Grant County, Gila River: Hayes, 1.
 Alunogen:
 Gila River: Blake, 5.
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- Alunogen (Continued).
 Description: Clarke, 1.
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 Alunogen, Grant County: Clarke, 1, 4, 6.
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 Augite, Mount Taylor: Clarke, 4, 6.
 Bentonite, Rio Arriba County: Ross, 1.
 Chrysolite, Fort Wingate: Clarke, 4, 6.
 Descloizite, Grant County: Clarke, 4, 6.
 Fluorspar: Burchard, 3; Johnston, 1.
 Halotrichite, Grant County: Clarke, 4, 6.
 Nickel-skutterudite, Grant County: Waller, 1.
 Picrallumogene, Las Vegas: Clarke, 4, 6.
 Plumbojarosite, Cooks Peak: Clarke, 4, 6.
 Turquoise, Los Cerrillos: Clarke, 3, 4.
 Zinc ores, Tres Hermanas: Lindgren, 5.
 Arsenides:
 Nickel and cobalt: Clarke, 4; Hillebrand, 1; Waller, 1.
 Arsenopyrite:
 Tres Hermanas Mountains: Smythe, 1.
 Augite:
 Analysis:
 Mount Taylor region: Clarke, 4, 6.
 Aurichalcite:
 Magdalena Mountains: Keyes, 11, 70.
 Autunite:
 Grant County: Leach, F. I., 1.
 Socorro County: Keyes, 70.
 Azurite:
 Socorro County: Paul, 1.
 Barite:
 Bremen mine, Grant County: Furman, 1.
 Bauxite:
 Gila River: Blake, 5.
 Bentonite:
 Rio Arriba County: Ross, 1.
 Bornite:
 Microscopic nature of: Baumhauer, 1.
 Burro Mountains: Paige, 3, 7; Somers, 1.
 Caballo Mountains: Clifford, 1.

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- Calamine:
 Crystals, Organ Mountains: Ford, 1.
 Grant County: Blake, 6.
 Calcite:
 Hillsboro: Schaller, 1.
 Caledonite:
 Las Cruces: Farrington, 1.
 Cave pearls:
 Carlsbad Caverns: Hess, 4.
 Chalmersite, at Fierro: Schwartz, 1.
 Chrysolite:
 Fort Wingate:
 Analysis: Clarke, 4, 6.
 Cobalt:
 Grant County: Clarke, 4; Hillebrand, 1; Waller, 1.
 Contact-metamorphic: Lindgren, 6.
 Copper:
 At Chloride: Baumhauer, 1.
 Crystallization, Grant County: Snow, 2.
 Red-beds type: Rogers, 1.
 Descloizite:
 Commercial mine, Georgetown, Grant County: Hillebrand, 2.
 Analysis of: Clarke, 4, 6.
 Dona Ana County: Genth, 3.
 Endlichite: Bowman, 1.
 Feldspar:
 Analysis:
 Mount Taylor region: Clarke, 6.
 Ferberite: Hess, 2.
 Fluorspar: Johnston, 1.
 Galena:
 Analyses:
 Organ Mountains: Antisell, 1.
 crystals from Sierra County: Chisholm, 1.
 General: Bailey, 1; Frazer, 1; Jones, F. A., 1, 9; Lindgren, 6; Loew, 2; Raymond, 1; Schrader, 3; Simpson, J. H., 1; Stone, G. H., 3; Warren, 1; Williams, A., 1.
 Grant County: Hillebrand, 1.
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 Colfax County: Lakes, 4; Lee, 18.
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 Nacimiento Mountains, analysis: Clarke, 6.
 Halotrichite:
 Grant County, analysis: Clarke, 4, 6.
 Hematite: Foshag, 1.
 Hubnerite: Hess, 2.
 Iron:
 Fairview deposit: Smythe, 2.
 Hanover district: Paige, 1.
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- Lepidolite:
Embudo: Ross, 1.
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Lindgren, 6; Schrader, 3; Smock,
1; Williams, A., 1.
Magdalena district: Argall, 1.
Manganese: Wells, E. H., 1.
Meerschaum: Bush, 5; Michel, 1;
Paige, 7; Sterrett, 1, 2.
Analysis, Grant County: Clarke, 6.
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Hillsboro: Warren, 2.
Meteorite: Cohen, 1, 2; Genth, 1.
Albuquerque: Eakins, 1.
Analysis: Clarke, 6.
Bonanza: Shepard, 1.
Cañoncito, Santa Fe County: Kunz,
1.
Castilla, Taos County: Hills, 2.
El Capitan Mountains: Howell, 2.
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Four corners, San Juan County:
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County: Cohen, 1, 2; Hills, 4;
Kunz, 2, 3, 4.
Kingston siderite: Hovey, 1.
Luis Lopez, Socorro County: Pres-
ton, 1.
Oscura Mountains: Hills, 3.
Sacramento Mountains, Eddy Coun-
ty: Foote, 1.
Sandia Mountains: Nininger, 1.
Mimetite, refractive index of: Bow-
man, 1.
Montmorillonite:
Rio Arriba County: Ross, 1.
Muscovite:
Purple, Taos County: Schaller, 2.
Natural coke:
Purgatory Canyon: Riggs, 1.
Nickel:
Nickel-skutterudite, Grant County:
Waller, 1.
See also, Cobalt, page 113, and
Arsenides, page 113.
Onyx: Merrill, 2.
Picralumogene:
Las Vegas: Analysis: Clarke, 4, 6.
Plumbojarosite:
Cooks Peak:
Description: Hillebrand, 3.
Analysis: Clarke, 4, 6.
Potash:
Southeastern: Mansfield, 3; Schal-
ler, 3.
Pseudomorphs:
Copper after azurite, Grant Coun-
ty: Yeates, 1.

Mineralogy (Continued).

- Pyromorphite, refractive index of:
Bowman, 1.
Quartz crystals, southeastern: Tarr,
W. A., 1, 2.
Samarskite:
Analysis: Hess, 5.
Rio Arriba County: Hess, 5.
Scheelite: Hess, 2.
Selenite:
Fort Stanton: Hills, 1.
Silver City: Packard, 1.
Smithsonite:
Grant County: Blake, 6.
Socorro County: Lindgren, 6.
Sphalerite:
Grant County: Blake, 6.
Tetradymite:
Hachita: Short, 1.
Torbernite:
Grant County: Leach, F. I., 1.
Tres Hermanas: Wade, 2.
Turquoise: Blake, 2; Jones, F. A., 8;
Penfield, 3.
Burro Mountains, Grant County:
Dinsmore, 3; Hidden, 1; Paige,
5; Snow, 1; Zalinski, 1, 2.
Los Cerrillos: Clarke, 1, 3, 4; Cow-
an, 1; Johnson, D. W., 4.
Ultramarine:
Grant County: Merrill, 1; Pack-
ard, 1.
Uranium: Keyes, 70; Leach, F. I., 1.
Vanadate:
Lake Valley: Genth, 3.
and iodyrite, Sierra County: Genth,
2.
Vanadinite: Paul, 1; Penfield, 1.
Lake Valley: Penfield, 1.
Refractive index of: Bowman, 1.
Willemite:
New occurrence (Tres Hermanas):
Lindgren, 4.
Socorro County:
Merritt mine: Penfield, 2.
Tres Hermanas Mountains, analy-
sis: Clarke, 6.
Wulfenite:
Jarilla Mountains: Ingersoll, 1.
Wolframite: Hess, 2.
Zinc:
Grant County: Blake, 6.
- Paleontology.**
Abo sandstone, ammonoids of: Böse,
1.
Alamosaurus:
Ojo Alamo formation: Gilmore, 4.

Paleontology (Continued).

- Algae:
 Guadalupe Mountains: Ruedemann, 1.
- Ammonoids:
 Abo sandstone: Böse, 1.
- Amphibia: Case, 1.
Brothellus Williston: Williston, 7.
Chenoprosopus Mehl: Williston, 1.
Eryops Cope: Williston, 7.
 Permian: Case, 1; Douthitt, 1.
Platyhystrix Williston: Williston, 7.
- Animas formation:
 Flora: Knowlton, 8.
- Antelope deer:
 Santa Fe marls: Cope, 10.
- Araucarioxylon: Knowlton, 1.
- Arriba Saurus:
 El Cobre Canyon: Williston, 5.
- Ashmunella:
 San Miguel County: Cockerell, 1.
- Aves: Cope, 13.
Diatryma: Cope, 18.
 Turkey:
 Puye Indian ruins: Shufeldt, 1.
- Batrachia:
 Catalogue: Cope, 8.
- Belodon: Cope, 27.
- Bird:
 Loup Fork marls: Cope, 13.
 Bishop's Cap: Bryan, W. A., 1.
 Bliss sandstone: Richardson, 1.
 Boundary region: Hall, 2.
- Brachiopoda:
 Bibliography and synonymy:
 Schuchert, 1.
- Bryozoa: Prout, H. A., 1
- Burlington limestone: Springer, F., 1.
- Camarasaurus* Cope: Mook, 1.
- Capitan limestone: Richardson, 1.
- Carboniferous: Hall, 1; Keyes, 13;
 Newberry, 3, 5; White, 3.
- Burlington limestone: Springer, F., 1.
- Coal measures: Herrick, C. L., 8.
- Guadalupe Mountains: Shumard, B. F., 2, 3, 5.
- Invertebrata: White, 3.
- Lake Valley district:
 Mississippian: Miller, 1.
- Limnoscelis*: Williston, 3.
- Manzano group: Girty, 3.
- Permian: Herrick, C. L., 11.
- Reptiles: Williston, 2.
- Permo-Carboniferous, vertebrates:
 Case, 6.
- Sphenacoden: Williston, 8.

Paleontology (Continued).

- Carnivora:
 Eocene: Cope, 17.
- Castile gypsum: Richardson, 1; Udden, 1.
- Catalogue:
 Batrachia and Reptilia of North America: Cope, 8.
- Cephalopoda:
 Abo sandstone:
 Ammonoids: Böse, 1.
 Mancos shale: Reeside, 3.
 Mesaverde sandstone: Reeside, 3.
 Cerrillos Hills: Johnson, D. W., 4.
 Champsosaurus: Cope, 24.
- Chara:
 Las Vegas: Knowlton, 2.
- Chirox:
 Puerco beds: Cope, 58.
- Chupadera formation: Darton, 25.
- Coal-measure forest: Herrick, C. L., 8, 14.
- Coelophysis:
 Triassic: Cope, 61.
- Colorado shale: Darton, 12; Stanton, 1.
- Conchochelys:
 Puerco beds: Hay, 2.
- Coryphodon radians*: Osborn, 2.
- Cretaceous: Brown, 1; Conrad, 1;
 Cope, 2; Hill, R. T., 13; Lee, 16;
 Matthew, 7; Meek, 2.
- Albuquerque region: Herrick, C. L., 10.
- Boundary region: Conrad, 1; Hall, 2.
- Cerrillos Hills: Johnson, D. W., 4.
- Comanche: Hill, R. T., 11; Twenhofel, 1.
- Dakota: Twenhofel, 1.
- Distribution of invertebrate: Lee, 16.
- Exogyra Texana* Roemer: Twenhofel, 1.
- Mount Taylor region: Shimer, 1.
- Ojo Alamo beds: Brown, 1; Hay, 4.
- Ostrea quadruplicata* Shumard:
 Twenhofel, 1.
- Pinna*: Twenhofel, 1; White, 4.
- San Juan County: Gilmore, 1;
 Knowlton, 5, 8; Reeside; Stanton, 5.
- Trigona emoryi* Conrad: Twenhofel, 1.
- Tucumcari: Hill, R. T., 10.
- Vermejo flora: Knowlton, 6.
- Vertebrata: Cope, 5.
- Washita formation: Twenhofel, 1.
- Crinoids: Springer, F., 2.

Paleontology (Continued).

- Dakota formation: Gress, 1; White, 18.
 Delaware Mountain formation: Richardson, 1; Darton, 24.
 Devonian:
 Lime Creek fauna: Keyes, 30.
 Percha shale: Kindle, 1.
 Diadectes lentus:
 Rio Arriba County: Case, 2.
 Dinosauria: Mook, 4.
 San Juan County: Reeside, 1.
 Triassic: Cope, 61.
 Eddy County:
 Recent shells: Sterki, 1.
 El Paso limestone: Richardson, 1.
 Eocene: Cope, 3.
 Bird: Cope, 18.
 Faunas: Cope, 19.
 Mammalia: Cope, 22, 29; Wortman, 3.
 Vertebrata: Cope, 6, 20, 30.
 Zalambdodont insectivore: Matthew, 3.
 Eryopsoides:
 Permian: Douthitt, 1.
 Fauna:
 Laramie: Newberry, 8.
 Puerco: Cope, 40; Matthew, 1.
 San Juan Basin, faunal zones: Reeside, 2.
 Triassic: Huene, 3.
 Tucumcari: Hyatt, 1.
 Flora: Lesquereux, 1; Newberry, 2, 6.
 Abiquiu copper mines: Fontaine, 1; Ward, 1.
 Animas formation: Knowlton, 8.
 Carboniferous, Socorro County: Herrick, C. L., 14.
 Cerrillos: Lesquereux, 4.
 Chara, Las Vegas: Knowlton, 2.
 Coal flora: Lesquereux, 1, 2, 6.
 Cretaceous, Raton Mountains: Knowlton, 7; Lesquereux, 3, 7.
 Dakota formation: Gress, 1; Lesquereux, 7.
 Fisher's Peak: Newberry, 6.
 Fruitland formation: Knowlton, 5.
 Kirtland formation: Knowlton, 5.
 Laramie group: Newberry, 8.
 Fisher's Peak: Newberry, 6.
 Vermejo Canyon: Newberry, 6.
 Placer Mountains: Ward, 1.
 Raton region: Emory, 1; Knowlton, 3, 6; Lesquereux, 4, 5; Ward, 1.
 Rio Grande: LeConte, 1.
 San Juan County: Knowlton, 5.
 Tertiary: Lesquereux, 4, 6; Newberry, 6.

Paleontology (Continued).

- Flora (Continued).
 Triassic: Fontaine, 1.
 Trinidad: Knowlton, 3.
 Tucumcari beds:
 Cretaceous: Cummins, 1.
 Vermejo: Knowlton, 6.
 Vermejo Canyon, Laramie: Newberry, 6.
 Folsom: Brown, B., 3; Science Service, 1.
 Fossil wood: Knowlton, 1.
 Abiquiu copper mines: Fontaine, 1.
 Fruitland formation, flora of:
 Knowlton, 5.
 Vertebrate fauna: Gilmore, 1.
 Fusselman limestone:
 Silurian: Darton, 29.
 Gastropoda: Cockerell, 1, 2; Springer, A., 1.
 Ashmunella: Cockerell, 1.
 Physa: Springer, A., 1.
 Tertiary: Cockerell, 4.
 General: Bailey, 1; Cope, 12; Darton, 29; Hall, 1; Knowlton, 4; Meek, 1; Newberry, 3.
 Guadalupe group: Darton, 24.
 Guadalupian fauna: Girty, 2.
 Gryphaea pitcheri: Hill, R. T., 13; Marcou, 9.
 Guadalupe Mountains: Darton, 24; Ruedemann, 1; Shumard, B. F., 2, 3, 5.
 Gym limestone:
 Carboniferous, Luna County: Darton, 12, 15.
 Haploconus:
 Puerco: Cope, 35.
 Hemiganus:
 Puerco beds: Cope, 37, 53.
 Hueco formation:
 Franklin Mountains: Girty, 1; Richardson, 1.
 Invertebrata: Meek, 1; White, 1, 2a, 3.
 Brachiopoda: Schuchert, 1.
 Carboniferous: Newberry, 5; White, 3.
 Cerrillos Hills: Johnson, D. W., 4.
 Coal measures: Herrick, C. L., 8.
 Cretaceous: Meek, 2.
 Dakota formation: White, 18.
 Guadalupe Mountains: Shumard, B. F., 2, 5.
 Jurassic: White, 9.
 Lake Valley district: Cope, 33; White, 5.
 Mississippian: Miller, 1.
 Manzano group: Girty, 3.
 Morrison formation: Mook, 3.
 Permian: Beede, 1.

Paleontology (Continued).

- Invertebrata (Continued).
 Plateau province: White, 2.
 San Juan County, Nonmarine Cretaceous: Stanton, 5.
 Kirtland formation:
 Fauna: Gilmore, 1; Reeside, 2.
 Flora of: Knowlton, 5.
 Kritosaurus, new dinosaur: Brown, 1.
 Laramie: Lee, 16.
 Lake Valley limestone:
 Carboniferous: Darton, 29.
 Lake Valley: Cope, 33; Gordon, 2; Miller, 1; Springer, F., 1; White, 5.
 Laramie group:
 Molluscan fauna: White, 6.
 Lemniscoids:
 Puerco formation: Cope, 51.
 Lepidodendrids:
 Clay beds, east of Socorro: Her-
 rick, C. L., 14.
 Lewis shale:
 San Juan Basin: Reeside, 2.
 Lime Creek fauna of Iowa, at Lake
 Valley: Keyes, 30.
 Limnoscelis: Williston, 3.
 Lobo formation:
 Triassic (?): Darton, 12.
 Loup Fork fauna: Cope, 20.
 Magdalena formation:
 Carboniferous: Darton, 12, 29.
 Mammalia:
 Bison, Folsom: Hay, 5.
 Cenozoic horizons: Osborn, 3.
 Cretaceous-Tertiary: Matthew, 4.
 Eocene: Cope, 6, 22, 25, 29, 30, 35;
 Wortman, 3.
 Puerco beds: Cope, 38, 45, 52.
 Zalambdodont insectivore: Mat-
 thew, 3.
 Mastodon: Cope, 9; Leidy, 1.
 Santa Fe marls: Cope, 4, 16.
 Pantolambda, Puerco beds: Cope,
 35.
 Puerco beds: Cope, 35, 36, 38, 42,
 43, 44, 45, 48, 52, 59; Matthew,
 1; Osborn, 1.
 Psittacotherium: Cope, 31, 57;
 Wortman, 2.
 Ungulates: Earle, 1.
 Rhinoceros: Cope, 49.
 Ruminant, Pleistocene: Gidley, 1.
 San Juan Basin: Granger, 2.
 Santa Fe marls: Cope, 4.
 Stenocoeloceras: Cope, 9.
 Tertiary: Matthew, 4.
 Faunal lists: Osborn, 3.
 Trusodon: Cope, 40.
 Zalambdodont insectivore, Eocene:
 Matthew, 3.

Paleontology (Continued).

- Man: Brown, B., 3; Cook, 1; Science
 Service, 1.
 Mancos shale:
 San Juan County: Reeside, 2.
 Manzano group:
 Rio Grande Valley: Girty, 3.
 Marsupials:
 Eocene: Cope, 54, 58.
 Mastodon: Cope, 9, 16; Leidy, 1.
 Mesaverde: Lee, 16; Wieland, 1.
 San Juan County: Reeside, 2.
 Mexican boundary: Conrad, 1; Hall,
 1.
 Mississippian:
 Lake Valley district: Miller, 1.
 Mollusca:
 Laramie group: White, 6, 10.
 Mount Taylor region: Shimer, 1.
 San Juan County, Nonmarine Cre-
 taceous: Stanton, 5.
 Tertiary: Cockerell, 3, 4; White, 7.
 Montoya formation:
 Ordovician: Darton, 12, 15, 16, 29;
 Richardson, 1.
 Morrison formation, age of, from
 paleobotanic evidence: Berry, 1;
 Knowlton, 7.
 Invertebrate and vertebrate fauna:
 Lull, 1; Mook, 3; Stanton, 4.
 Mount Taylor region: Shimer, 1.
 Nothodectes:
 San Juan Basin: Matthew, 6.
 Ojo Alamo:
 Fauna: Brown, 1; Gilmore, 1, 3, 4;
 Hay, 4; Reeside, 2.
 Organ Mountains:
 Paleozoic: Jenney, 1.
 Paleocene mammals, new genera:
 Matthew, 7.
 Vertebrates: Granger, 2; Matthew,
 4.
 Pantolambda:
 Puerco: Cope, 35.
 Pelecypoda:
 Pinna: White, 4.
 Pentaceratops: Osborn, 5.
 Percha shale: Darton, 16, 29; Kin-
 dle, 1.
 Permian: Cope, 28; Girty, 1, 2; King,
 R. E., 1; Shumard, B. F., 2-5;
 White, 16; Williston, 1.
 Abo sandstone:
 Ammonoites of: Böse, 1.
 Amphibia: Case, 1.
 Eryopsoides: Douthitt, 1.
 Eryopsoides: Douthitt, 1.
 Invertebrate, Upper Permian:
 Beede, 1.
 Pisces: Case, 1.
 Reptilia: Cope, 21; Williston, 2, 6.

Paleontology (Continued).

- Permian (Continued).
 Vertebrates: Williston, 1, 5.
 Permo Carboniferous:
 Amphibia: Case, 6; Cope, 28.
 Vertebrates: Case, 6, 9; Williston, 4.
 Physa:
 Las Vegas: Springer, A., 1.
 Phytosaur:
 Triassic, Guadalupe County: Mehl, 2.
 Pictured Cliffs sandstone:
 San Juan Basin: Reeside, 2.
 Pinna:
 Cretaceous: White, 4.
 Pisces:
 Paleozoic: Newberry, 7.
 Plagiaulacidae:
 Puerco beds: Cope, 56.
 Plantae: Newberry, 6.
 Plateau Province:
 Invertebrate: White, 2.
 Psittacotherium:
 Puerco beds: Cope, 57; Wortman, 2.
 Puerco and Torrejon faunas: Gardner, 9; Matthew, 1; Reeside, 2.
 Fauna: Cope, 35, 38, 40, 42, 44, 45, 48, 50, 59, 60; Hay, 1; Osborn, 1.
 Marsupials: Cope, 36, 54.
 San Juan Basin: Reeside, 2.
 Ungulates: Earle, 1.
 Puercosaurus:
 Miller bone-bed: Williston, 5.
 Quaternary, ruminant, Pleistocene:
 Gidley, 1.
 Raton flora: Knowlton, 6; Lesquereux, 3.
 Red beds:
 Eastern: Case, 5; Lee, 9.
 Invertebrates of: Beede, 1.
 Reptilia: Cope, 1; Marsh, 2; Williston, 1, 3.
Animasaurus Case and Williston: Williston, 7.
 Arribasaurus, El Cobre Canyon: Williston, 5, 7.
 Belodon: Cope, 27.
 Catalogue: Cope, 8.
Chamasaurus Williston: Williston, 7.
 Champsosaurus: Cope, 24.
 Coelophysis:
 Triassic: Cope, 61.
 Conchochelys, Puerco beds: Hay, 2.
 Cretaceous, San Juan County: Gilmore, 2; Matthew, 4.
Diadectus Cope: Williston, 7.
Diasparactus Case: Williston, 7.

Paleontology (Continued).

- Reptilia (Continued).
Edaphosaurus Cope: Williston, 7.
 Eocene: Cope, 6.
 Kritosaurus, Ojo Alamo beds: Brown, 1.
Limnoscelis Williston: Williston, 3, 7.
 Ojo Alamo, Kirtland and Fruitland faunas:
 San Juan Basin: Gilmore, 1.
 Ophiacodon Marsh: Williston, 7.
 Pentaceratops: Osborn, 5.
 Permian: Cope, 21; Williston, 2, 6, 8.
 Permo-Carboniferous: Case, 6.
Puercosaurus Williston: Williston, 7.
 San Juan County: Gilmore, 1, 2.
 ?*Scaliomus* Williston and Case: Williston, 7.
Sphenacodon Marsh: Williston, 7, 8.
 Tertiary: Gilmore, 2; Matthew, 4.
 Triassic: Huene, 2; Mehl, 1.
 Rhinoceros: Cope, 49.
 Rio Arriba County:
 Arribasaurus:
 El Cobre Canyon: Williston, 5.
Diadectus lentus: Case, 2.
 Ruminant:
 Pleistocene: Gidley, 1.
 Rustler formation: Richardson, 1.
 San Juan Basin:
 Invertebrates, Cretaceous: Stanton, 5.
 Mammalia: Granger, 2; Reeside, 2.
 San Juan County:
 Flora: Knowlton, 5, 8.
 Nonmarine Cretaceous Invertebrata: Stanton, 5.
 Vertebrata: Gilmore, 1.
 Santa Fe marls: Cope, 4, 7.
 Antelope deer: Cope, 10.
 Sarten sandstone:
 Cretaceous: Darton, 12, 15.
 Sauropod dinosaur, habitat of: Mook, 4.
 San Juan Basin: Gilmore, 3, 4.
 Silver City quadrangle: Paige, 7.
 Sloth: Lull, 2.
 Snails:
 Pleistocene: Cockerell, 2.
 Sphenacodon: Williston, 8.
 Staked Plains:
 Vertebrata: Cope, 62, 63.
 Steneofiber: Cope, 9.
 Tertiary: Cope, 46.
 Eocene Vertebrata: Cope, 6, 19, 29.

Paleontology (Continued).

- Tertiary (Continued).
 Mammalia: Matthew, 4.
 Mexican boundary: Conrad, 1.
 Mollusca: Cockerell, 3, 4; White, 7.
 Plantae: Fontaine, 1; Lesquereux, 4.
 Puerco fauna: Cope, 30a, 40; Gardner, 9; Matthew, 1.
 Puerco beds: Hay, 2.
 Raton flora: Knowlton, 6.
 Reptilia: Matthew, 4.
 San Juan Basin: Granger, 2; Reeside, 2.
 Torrejon fauna: Gardner, 9.
 Vertebrata: Cope, 8, 20, 46.
 Tillodonts:
 Tooth: Cope, 41.
 Puerco?: Cope, 31.
 Torrejon:
 San Juan Basin: Reeside, 2.
 Triassic: Cazin, 2; Huene, 3; Newberry, 5.
 Copper-bearing rocks: Cazin, 2.
 Dinosauria: Cope, 61.
 Phytosaur: Mehl, 2.
 Reptilia: Cope, 62; Huene, 2; Mehl, 1.
 Triisodon:
 Eocene: Cope, 23, 40.
 Tucumcari: Cummins, 1, 3; Hill, R. T., 10, 11; Hyatt, 1; Marcou, 4, 13.
 Turtles, new species: Hay, 4.
 North America: Hay, 3.
 Ungulates: Cope, 11.
 Structure and affinity of: Earle, 1.
 Vermejo, and Raton floras: Knowlton, 6.
 Vertebrata: Case, 6, 7, 8, 9; Cope, 3, 7, 20, 62; Marsh, 1.
 Bibliography: Hay, 1.
 Cretaceous: Brown, 1; Cope, 5; Gilmore, 1.
 Eocene: Cope, 6, 30, 30a.
 Fruitland formation: Gilmore, 1.
 Kirtland formation: Gilmore, 1.
 Mesozoic: Cope, 20.
 Morrison formation: Mook, 3.
 North America: Hay, 1.
 Ojo Alamo beds: Brown, 1, 2; Gilmore, 1; Hay, 4.
 Permian: Williston, 1, 5.
 Puerco fauna: Cope, 60; Gardner, 9.
 San Juan County: Gilmore, 1.
 Santa Fe marls: Cope, 7.
 Staked Plains: Cope, 63.
 Tertiary: Cope, 46.

Paleontology (Continued).

- Vertebrata (Continued).
 Torrejon fauna: Gardner, 9.
 Wasatch fauna: Matthew, 5; Reeside, 2; Wortman, 1.
 Mammalia: Cope, 7, 17.
 White sands: Herrick, C. L., 11.
 Wood: Knowlton, 1.
 Zalambdodont insectivore, Eocene: Matthew, 3.

Petrology.

- Albuquerque district, igneous rocks:
 Bryan, 1; Herrick, C. L., 3, 10; Lindgren, 6.
 Analyses: Clarke, 3, 4, 6; Lindgren, 6.
 Adobe soil: Clarke, 3, 6.
 Andesite:
 Mount Taylor region: Clarke, 3, 6.
 Colfax County: Clarke, 6.
 Hillsboro: Clarke, 6.
 Basalt:
 Rio Grande Canyon: Clarke, 6.
 Mount Taylor region: Clarke, 6.
 Colfax County: Clarke, 6.
 Grant County: Clarke, 3.
 Caballo Mountains:
 Limestone and shale: Lee, 5.
 Camptonite, Las Vegas: Ogilvie, 1.
 Capitan limestone, El Capitan Peak: Richardson, 1.
 Colfax County: Clarke, 6.
 Cooks Peak:
 Porphyry: Clarke, 6; Dalton, 12.
 Dacite, Mount Taylor region: Clarke, 6.
 Dolomite: Richardson, 1.
 Gabbro porphyry, Los Cerrillos Hills: Clarke, 6.
 Hillsboro, andesite: Clarke, 6.
 Lava, Mount Taylor region: Clarke, 6.
 Limestone:
 Northern end of Caballo Mountains: Lee, 5.
 El Capitan Peak: Richardson, 1.
 Organ Mountains: Antisell, 1.
 Los Cerrillos hills: Clarke, 6.
 Mexican boundary: Easter, 1.
 Mount Capulin, basalt: Clarke, 6.
 Mount Taylor region: Clarke, 6.
 "Natural Coke": Clarke, 3.
 Nepheline basanite, Colfax County: Clarke, 6.
 Obsidian, Tewan Mountains: Clarke, 6.

Petrology (Continued).

Analyses (Continued).

- Organ Mountains, quartz syenite: Clarke, 6.
- Ortiz Mountains, rocks from: Ogilvie, 3.
- Phonolite, Colfax County: Clarke, 6.
- Plagioclase basalt, Colfax County: Clarke, 6.
- Porphyry, Cooks Peak: Clarke, 6; Darton, 12.
- Pyroxene andesite, Colfax County: Clarke, 6.
- Quartz latite, Mount Taylor region: Clarke, 6.
- Rustler formation: Richardson, 1.
- Shale:
 - Hermosa: Clarke, 6.
 - Northern end of Caballo Mountains: Lee, 5.
- Syenite porphyry, Cooks Peak: Clarke, 6.
- Tewan Mountains, obsidian: Clarke, 6.
- Trachyte:
 - Los Cerrillos: Clarke, 6.
 - Peloncillo Hills: Antisell, 1.
- Analcite camptonite: Oglivie, 1.
- Andesite:
 - Luna County: Darton, 12.
- Basalt:
 - Luna County: Darton, 12.
 - Rio Grande Canyon:
 - Analysis: Clarke, 6.
 - Description: Idding, 1, 2.
- Brilliant quadrangle: Mertie, 2.
- Burro Mountains: Paige, 3; Somers, 1.
- Camptonite:
 - Las Vegas: Ogilvie, 1.
- Carlsbad Cavern:
 - Cave pearls: Hess, 4.
- Cerrillos Hills: Johnson, D. W., 4.
- Cooks Peak:
 - Porphyries: Clarke, 6; Darton, 12.
- Crystalline rocks of the plains: Gould, 1.
- Deming quadrangle: Darton, 15.
- Eocene formations:
 - Puerco: Cope, 5.
 - Rocky Mountains: Johannsen, 1.
- General: Lindgren, 6; Loew, 1, 2.
- Granite:
 - Luna County: Darton, 12.
- Hanover district, igneous rocks: Paige, 1.
- Keratophyre:
 - Luna County: Darton, 12.
- Koehler quadrangle: Mertie, 2.

Petrology (Continued).

Latite:

- Luna County: Darton, 12.
- Luna County: Darton, 12.
- Magdalena district: Argall, 1; Lindgren, 6.
- Mexican boundary: Lord, 1.
- Mogollon district: Ferguson, 1, 2; Scott, 1.
- Mount Taylor region, igneous rocks: Johnson, D. W., 7.
- Navajo country: Gregory, 2.
- Northeastern, igneous rocks: Garrett, 1; Lee, 17; St. John, 1.
- Northern: Conkling, 2.
- Northwestern, igneous rocks: Dutton, 2.
- Ortiz Mountains: Ogilvie, 3.
- Pecos Valley: Semmes, 1.
- Pre-Cambrian rocks: Lindgren, 6.
- Puertecito district: Wells, E. H., 2.
- Pyroxenic Rock:
 - Gila River: Merrill, 1.
- Raton region: Mertie, 1, 2.
- Rhyolite:
 - Luna County: Darton, 12.
- Rio Grande Valley, igneous rocks: Lee, 5.
- Sandia Mountains: Ellis, 2.
- San Pedro: Berryman, 1.
- Santa Rita region, igneous rocks: Paige, 6.
- Sierra Blanca coal field: Wegemann, 1.
- Silver City quadrangle, igneous rocks: Paige, 7.
- Taos Range: Gruner, 1.
- Taylor Creek district: Hill, J. M., 2.
- Tewan Mountains: Iddings, 2.
- Tyrone district: Paige, 9.

Physical geology.

- Alamogordo desert: McBride, 1.
- Albuquerque region: Bryan, 1; Herrick, C. L., 6, 10.
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- Pedestal rocks: Bryan, 2.
- Arid monadnocks: Keyes, 39.
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 - Jornada del Muerto: Keyes, 22.
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 - Cretaceous, base of: Keyes, 8.
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- Terracing bajada belts: Keyes, 59.
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- Mountain blocks, bisection: Keyes, 21.
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- Navajo country: Gregory, 1, 2; Nowels, 1.
- Northeastern: Lee, 17; St. John, 1.
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- Origin of depressions in Sandia Mountains: Reagan, 4.
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- Otero salt basin: Herrick, C. L., 16.
- Pecos Valley: Lee, 4.
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- Penepplain: Robinson, 1.
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- Sandia Mountains:
 - Pedestal rocks: Bryan, 2.
- San Luis Valley, physiographic history: Atwood, 1.
- Santa Fe penepplain: Campbell, 1.
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 - Block Mountain: Johnson, D. W., 5; Keyes, 6.
 - Jornada del Muerto: Keyes, 22.
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 - Toyalane and Lucero: Keyes, 50.
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 - Valencia County: Johnson, D. W., 2.
 - Volcanic craters: Darton, 13; Keyes, 31; Lee, 7.
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 - Extinct: Hill, R. T., 12; Lee, 17.
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- Zuñi dam, erosion and sedimentation: Bryan, 15; Robinson, H. F., 1, 2.
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- Cerrillos coal field: Stevenson, 12.
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- Coal, metamorphism:
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- Alamo National Forest: See Lincoln National Forest.
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- Luna County: Darton, 7, 12, 15; U. S. G. S., 11, 17, 19, 25, 55.
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- Luna County: Darton, 7, 12.
- Mimbres Valley: Fielder, 3.
- Mesilla Valley: Barker, 1.
- Movement in cementation belt: Slichter, 1.
 - Estancia Valley: Meinzer, 2.
 - Luna County: Darton, 7, 12.
 - Roswell area: Fisher, 2.
 - Rio Grande Valley: Slichter, 2.
 - Tularosa Valley: Meinzer, 3.
 - Discussion of principles: King, F. H., 1.
- Navajo country: Gregory, 1.
- Northwestern: Darton, 3.
- Pecos Valley: Lee, 4.
- Playas Basin: Schwennesen, 1.
- Quality: Clarke, 5.
 - Estancia Valley: Meinzer, 1, 2.
 - Hidalgo County: Schwennesen, 1.
 - Jornada del Muerto: Keyes, 14.
 - Rio Grande Valley: Lee, 5.
 - Tularosa Basin: Meinzer, 3.
- Red beds, springs in:
 - High Plains: Johnson, W. D., 1.
 - Jornada del Muerto: Keyes, 14.
- Rio Grande Valley: Lee, 5; Slichter, 2.
- Rio Penasco Basin: Renick, 3.
- Rio Puerco and San Jose Valley: Renick, 2.
- Rio Salado:
 - Saline springs: Clark, J. D., 1.
- Roswell area: Fisher, 2.
 - Artesian basin, Chaves and Eddy Counties: Fielder, 1, 2.
- Salt Water:
 - Estancia Valley: Meinzer, 2.
 - Rio Salado: Clark, J. D., 1.
 - Tularosa Basin: Meinzer, 3.
- Sandoval County: Renick, 1.

Underground water (Continued).

- Sandoval County (Continued).
 - Jemez Springs: Otero, 1.
 - Saline springs: Clark, J. D., 1.
 - San Jose-Rio Puerco Valley: Renick, 2.
- San Jose and Rio Puerco Valley: Renick, 2.
- San Luis Basin: Schwennesen, 1.
- San Simon Valley: Schwennesen, 2.
- Silver City quadrangle: Paige, 7.
- Socorro County: Black, 1; Bryan, 5.
- Springs: Meinzer, 6; Peale, 1.
 - Analyses: Goss, 1.
 - Luna County: Darton, 7, 12.
 - Navajo country: Gregory, 1.
 - Rio Grande Valley: Lee, 5.
 - Roswell Basin: Fisher, 2.
 - Sandoval County: Clark, J. D., 1.
 - San Miguel County: Otero, 1.
 - Silver City quadrangle: Paige, 7.
 - Taos County: Otero, 1.
 - Tularosa Basin: Meinzer, 3.
 - Union County, Folsom: Otero, 1.
- Staked Plains: Cummins, 1.
- Taos County:
 - Ojo Caliente: Otero, 1.
- Tertiary formations, water in:
 - High Plains: Johnson, W. D., 1.
 - Navajo country: Gregory, 1.
- Triassic formations, water in:
 - Navajo country: Gregory, 1.
 - Northwestern: Darton, 3.
- Tularosa Basin: Meinzer, 3; Powell, 1.
- Torrance County: Black, 1.
- Union County:
 - Folsom Springs, near Capulin: Otero, 1.
- Valley fill, water in:
 - Deming quadrangle: Darton, 15.
 - Estancia Valley: Meinzer, 1, 2.
 - Jornada del Muerto: Keyes, 14.
 - Luna County: Darton, 7, 12.
 - Rio Grande Valley: Lee, 5.
 - Roswell area: Fisher, 2.
 - San Simon Valley: Schwennesen, 2.
 - Silver City quadrangle: Paige, 7.
 - Tularosa Basin: Meinzer, 3.