GEORGIA
STATE DIVISION OF CONSERVATION
DEPARTMENT OF MINES, MINING AND GEOLOGY
A. S. Furcron, Director

THE GEOLOGICAL SURVEY
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# ANNOTATED BIBLIOGRAPHY OF GEORGIA GEOLOGY THROUGH 1959

by

Howard Ross Cramer, Arthur Thomas Allen, Jr. and
James George Lester
Emory University, Atlanta, Georgia

ATLANTA
1967

# LETTER OF TRANSMITTAL

**Department of Mines, Mining and Geology**

September 1, 1967

His Excellency, Lester G. Maddox
Governor of Georgia and
Commissioner Ex-Officio
State Division of Conservation
Atlanta, Georgia 30334

Dear Governor Maddox:

I have the honor to submit herewith Bulletin No. 79 of the Department of Mines, Mining and Geology entitled, "Annotated Bibliography of Georgia Geology Through 1959," by Drs. Howard R. Cramer, Arthur T. Allen, Jr., and James G. Lester of the Department of Geology, Emory University.

This bibliography contains all significant references to the geology and mineral resources of Georgia from early times through 1959. It is anticipated that it will be in much demand and will be invaluable to all individuals engaged in research upon Georgia problems; for this reason, it will remain in continuous demand. It is a repository for the compilation of mineral resources for all parts of the state. Information derived from this work can be coded directly into a computer for rapid retrieval of available information upon a large number of specific mineral and geological topics, thus, rendering the solution to these problems rapid and automatic.

Very respectfully yours,

A. S. Furcron

A. S. Furcron
Director

ASF:pl

# ANNOTATED BIBLIOGRAPHY OF GEORGIA GEOLOGY THROUGH 1959

by

Howard Ross Cramer, Arthur Thomas Allen, Jr., and James George Lester

Emory University, Atlanta, Georgia

## INTRODUCTION

This bibliography is modeled after the Bibliography of North American Geology which is published annually and decennially by the United States Geological Survey. References were read, annotated, and indexed by county, subject, and geological age. In many entries a portion of the state larger than a county is discussed, so that larger subdivisions of the state are considered in the indexing. These larger subdivisions, corresponding roughly to the major physiographic provinces, are outlined in Fig. 1.

Each index entry to a county or one of the larger subdivisions is also referred to one of the major aspects of geology. The heading **Areas described** is used when an article deals with the entire geological aspect of the area. **Economic geology; Engineering geology; Maps; Geobotanical, Geochemical,** and **Geophysical investigations; Ground water; Mineralogy; Paleontology;** and **Physiographic geology** are all more or less self-explanatory. **Historical geology** includes stratigraphy. **Petrology** generally, though not always, means igneous or metamorphic petrology, and **Physical geology** is intended to cover process, or dynamic geology.

While geographic boundaries are sharp, every geologist knows that subject boundaries cannot be so easily recognized. For instance, publications dealing with **surface water**, such as stream flow measurements, flood records, etc., are excluded, although springs, because they are in part **ground water** are included. Articles dealing with soils **per se** are not included unless they include discussions or descriptions of the geological origin of the soils or the parent rocks from which they were derived. Articles dealing with mining engineering problems, or those dealing exclusively with economic aspects of geological materials, are not included unless they include descriptions of the material.

Abstracts are not included if the full article has appeared, and those abstracts which are included are not annotated. Theses, both M.S. and Ph.D. are included but not annotated, and biographies of Georgia authors are included without annotation.

The junior authors of this bibliography began the compilation which was completed by the senior author. The senior author did the indexing and annotating.

The assistance of Mr. William Heers and his able staff of the United States Geological Survey Library in Washington, D. C., is gratefully acknowledged, as is the help of the reference departments of the Yale University and New York Public Libraries. It is an especial pleasure to acknowledge

that the skill of the members of the Reference Department of the Emory University Library in locating obscure and otherwise inaccessible material was exceeded only by their patience with the authors.

Mrs. Rena Faye Ritchey Smith typed the bibliography manuscript and assisted with the proofreading, and Mrs. Verna Laidecker Fisher and Mrs. Elizabeth Chambers Nunan assisted with the proofreading of the index.

Readers are encouraged to notify the Director of the Georgia Department of Mines, Mining, and Geology of any omissions detected in this bibliography so that they can be included in later supplements.

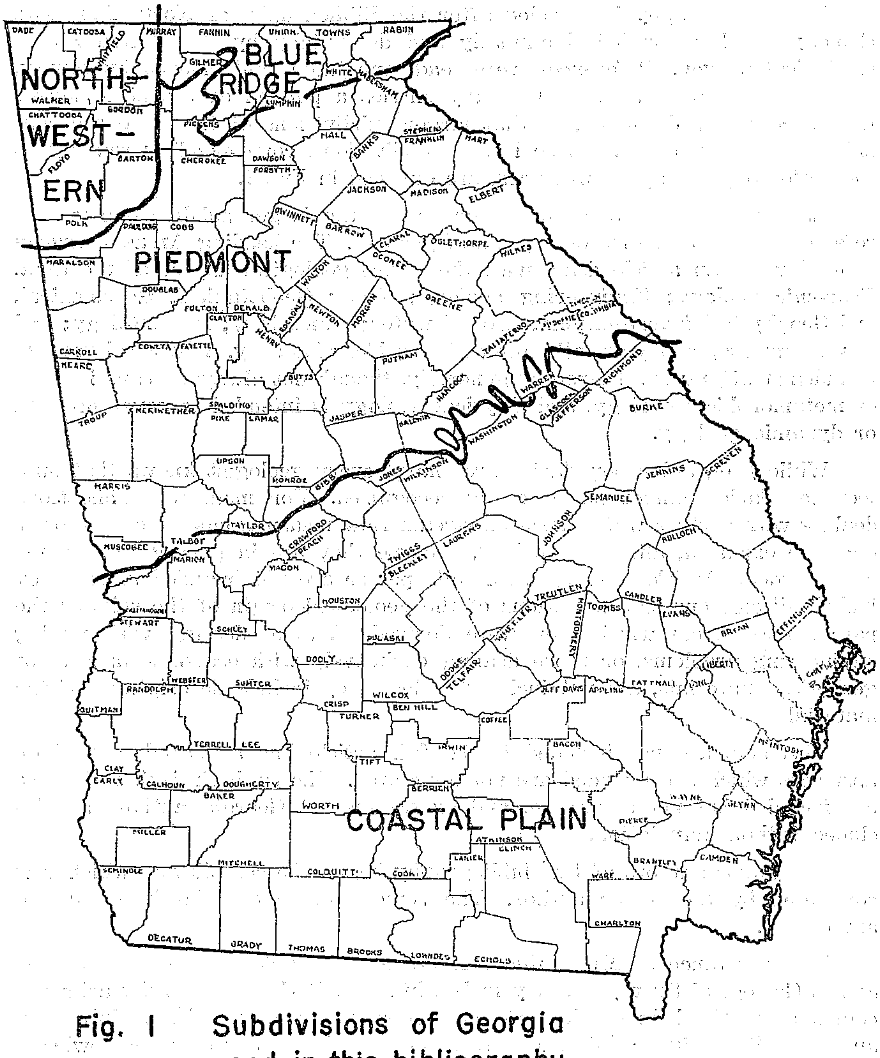


Fig. 1 Subdivisions of Georgia used in this bibliography

# BIBLIOGRAPHY

## ABBREVIATIONS OF SERIALS CITED IN THIS BIBLIOGRAPHY

Note that foreign-language serials are spelled out completely and not abbreviated.

**ACAD. NATURAL SCIENCE PHILADELPHIA PROC.; . . . JOUR.** Proceedings, and Journal of the Academy of Natural Science of Philadelphia. Published by the Academy from Philadelphia, Pennsylvania.

**ACAD. SCIENCE ST. LOUIS TRANS.** Transactions of the St. Louis Academy of Science. Published by the Academy from St. Louis, Missouri.

**ACADÉMIE DES SCIENCES DE PARIS COMPTES RENDUS.** Published by the Academy from Paris, France.

**AGRICULTURAL ENGINEERING.** Agricultural Engineering. Published by the American Society of Agricultural Engineers from Ames, Iowa.

**AKADEMIE DER WISSENSCHAFTEN WIEN MATH-NATURWISSENSCHAFT KLASSE SITZUNGSBERICHTE.** Published by the Academy from Vienna, Austria.

**ALABAMA ACAD. SCIENCE JOUR.** Journal of the Alabama Academy of Science. Published by the Academy from Birmingham, Alabama.

**ALABAMA GEOL. SURVEY BULL.** Bulletin of the Alabama Geological Survey. Published by the Survey from University, Alabama, and elsewhere.

**ALABAMA INDUSTRIAL AND SCIENTIFIC SOC. PROC.** Proceedings of the Alabama Industrial and Scientific Society. Published by the Society from Tuscaloosa, Alabama.

**AMER. ACAD. ARTS AND SCIENCE PROC.** Proceedings of the American Academy of Arts and Science. Published by the Academy from Boston, Massachusetts.

**AMER. ALPINE JOUR.** American Alpine Journal. Published by the American Alpine Club from New York City, New York.

**AMER. ANTHROPOLOGIST.** American Anthropologist. Published by the American Anthropological Association, the Anthropological Society of Washington, and the American Ethnological Society of New York from various places.

**AMER. ANTIQUITY.** American Antiquity. Published by the Society for American Archeology from Menasha, Wisconsin.

**AMER. ASSOC. ADVANCEMENT SCIENCE PROC.** Proceedings of the American Association for the Advancement of Science. Published by the Association from New York City, New York.

AMER. ASSOC. PETROLEUM GEOLOGISTS BULL. Bulletin of the American Association of Petroleum Geologists. Published by the Association from Tulsa, Oklahoma.

AMER. CERAMIC SOC. BULL.; . . . JOUR. Bulletin, and Journal of the American Ceramic Society. Published by the Society from Easton, Pennsylvania.

AMER. FERTILIZER. American Fertilizer. Published commercially from Philadelphia, Pennsylvania.

AMER. FORESTS. American Forests. Published by the American Forestry Association from Washington, D. C.

AMER. GEOGRAPHICAL SOC. BULL. Bulletin of the American Geographical Society. Published by the American Geographical Society of New York from New York City, New York.

AMER. GEOLOGIST. American Geologist. Published commercially from Minneapolis, Minnesota.

AMER. GEOPHYSICAL UNION TRANS. Transactions of the American Geophysical Union. Published by the National Research Council for the Union from Washington, D. C.

AMER. INST. CHEMICAL ENGINEERS TRANS. Transactions of the American Institute of Chemical Engineers. Published by the Institute from Philadelphia, Pennsylvania.

AMER. INST. MINING AND METALLURGICAL ENGINEERS TECH. PUB.; . . . TRANS. Technical Publications, and Transactions of the American Institute of Mining and Metallurgical Engineers. Published by the Institute from New York City, New York.

AMER. INST. MINING ENGINEERS BULL.; . . . CONTRIB.; . . . TRANS. Bulletin, Contributions, and Transactions of the American Institute of Mining Engineers. Published by the Institute from New York City, New York.

AMER. JOUR. MINING. American Journal of Mining. Published commercially from New York City, New York.

AMER. JOUR. SCIENCE. American Journal of Science. Published commercially from Yale University, New Haven, Connecticut.

AMER. MEDICAL ASSOC. TRANS. Transactions of the American Medical Association. Published by the Association from various places.

AMER. MIDLAND NATURALIST. American Midland Naturalist. Published by Notre Dame University, Notre Dame, Indiana.

AMER. MINERALOGIST. American Mineralogist. Published by the Mineralogical Society of America from Lancaster, Pennsylvania.

AMER. MUSEUM JOUR. American Museum Journal. Published by the American Museum of Natural History from New York City, New York.

AMER. MUSEUM NATURAL HIST. BULL. Bulletin of the American Museum of Natural History. Published by the Museum from New York City, New York.

AMER. MUSEUM NOVITATES. American Museum Novitates. Published by the American Museum of Natural History from New York City, New York.

AMER. NATURALIST. American Naturalist. Published by the American Society of Naturalists from Boston, Massachusetts, New York City, New York, and elsewhere.

AMER. PHILOS. SOC. PROC.; . . . TRANS.; . . . YEARBOOK. Proceedings, Transactions, and Yearbook of the American Philosophical Society. Published by the Society from Philadelphia, Pennsylvania.

AMER. SOC. CIVIL ENGINEERS PROC.; . . . (JOUR. HYDRAULICS DIV.). Proceedings of the American Society of Civil Engineers, Journal of the Hydraulics Division. Published by the Society from New York City, New York.

AMER. WATER WORKS ASSOC. JOUR.; . . . PROC. Journal, and Proceedings of the American Water Works Association. Published by the Association from various places.

AMER. WATER WORKS ASSOC. SOUTHEASTERN DIV. JOUR. Journal of the Southeastern Division of the American Water Works Association. Published by the Division from various places.

ANNALEN DER PHYSIK UND CHEMIE. Published commercially from Halle and Leipzig, Germany.

ANNALES DE CHIMIE ET DE PHYSIQUE. Published commercially from Paris, France.

ANNALES DE GÉOGRAPHIE. Published commercially from Paris, France.

ANNALES DES MINES. Published by Ministère des Travaux Publix, des Postes, et des Télégraphies from Paris, France.

ANNALS AND MAG. OF NATURAL HIST. Annals and Magazine of Natural History. Published commercially from London, England.

ANNALS OF IOWA. Annals of Iowa. Published by the Iowa State Historical Department from Des Moines, Iowa.

ANNUAIRE GÉOLOGIQUE UNIVERSEL. Published commercially from Paris, France.

ANTHROPOLOGIE. Published commercially from Paris, France.

APPALACHIA. Appalachia. Published by the Appalachian Mountain Club from Boston, Massachusetts.

ARCHIV FUER MINERALOGIE. Published commercially from Berlin, Germany.

ARIZONA UNIV. PRESIDENT'S REPT. Annual Report of the President of the University of Arizona. Published by the University from Tucson, Arizona.

ARKANSAS GEOL. SURVEY REPT. Report of the Arkansas Geological Survey. Published by the Survey from Little Rock, Arkansas.

ASSOC. AMER. GEOGRAPHERS ANNALS. Annals of the Association of American Geographers. Published by the Association from various places.

ASSOC. AMER. GEOGRAPHERS SOUTHEAST DIV. MEMORANDUM FOLIO. Memorandum Folio of the Southeast Division of the Association of American Geographers. Published by the Division from various places.

ASSOC. AMER. GEOLOGISTS AND NATURALISTS REPT. Report of the American Association of Geologists and Naturalists. Published by the Association from various places.

ASSOC. AMER. STATE GEOLOGISTS GUIDEBOOK. Guidebook of the annual meeting of the Association of American State Geologists. Published by the Association from various places.

ATLANTA MEDICAL AND SURGICAL JOUR. Atlanta Medical and Surgical Journal. Published by the Fulton County Medical Society from Atlanta, Georgia.

BAYERISCHE AKADEMIE DER WISSENSCHAFT JAHRBUCH. Published by the Academy from Munich, Germany.

BEITRAEGE ZUR GEOPHYSICS. Published commercially from Leipzig and Stuttgart, Germany.

BERG- UND HUTTENMAENISCHE ZEITUNG. Published commercially from Freiburg and Leipzig, Germany.

**BIOL. SOC. WASHINGTON PROC.** Proceedings of the Biological Society of Washington, D. C. Published by the Society from Washington, D. C.

**BOSTON JOUR. NATURAL HIST.** Boston Journal of Natural History. Published by the Boston Society of Natural History from Boston, Massachusetts.

**BOSTON SOC. NATURAL HIST. PROC.** Proceedings of the Boston Society of Natural History. Published by the Society from Boston, Massachusetts.

**BOT. GAZETTE.** Botanical Gazette. Published commercially from Crawfordsville, Indiana.

**BOT. REVIEW.** Botanical Review. Published commercially from Lancaster, Pennsylvania.

**BRICK AND CLAY RECORD.** Brick and Clay Record. Published commercially from Chicago, Illinois.

**BRITISH ASSOC. ADVANCEMENT SCIENCE REPT.** Report of the British Association for the Advancement of Science. Published by the Association from various places.

**BULLETIN VOLCANOLOGIQUE.** Published by the International Geodetic and Geophysical Union, Association of Volcanology from various places.

**BULLS. AMER. PALEONTOLOGY.** Bulletins of American Paleontology. Published by the Paleontological Research Institute from Ithaca, New York

**CALIFORNIA UNIV. PUBS. ASTRONOMY.** University of California Publications in Astronomy. Published by the University from Berkeley, California.

**CANADA GEOL. SURVEY MEM.** Memoirs of the Canada Geological Survey. Published by the Survey from Ottawa, Canada.

**CANADIAN ALPINE JOUR.** Canadian Alpine Journal. Published by the Alpine Club of Canada from Winnepeg, Canada.

**CANADIAN FIELD-NATURALIST.** Canadian Field-Naturalist. Published by the Ottawa Field-Naturalists Club from Ottawa, Canada.

**CANADIAN JOUR.** Canadian Journal. Published commercially from Toronto, Canada.

CANADIAN MINING AND METALLURGICAL BULL. Canadian Mining and Metallurgical Bulletin. Published by the Canadian Institute of Mining and Metallurgy from Ottawa, Canada.

CANADIAN MINING INST. MONTHLY BULL. Canadian Mining Institute Monthly Bulletin. Published by the Institute from Ottawa, Canada.

CANADIAN RECORD OF SCIENCE. Canadian Record of Science. Published by the Natural History Society of Montreal from Montreal, Canada.

CARNEGIE INST. WASHINGTON PUB. Publications of the Carnegie Institute of Washington, D. C. Published by the Institute from Washington, D. C.

CENTURY MAG. Century Magazine. Published commercially from New York City, New York.

CHARLESTON MEDICAL JOUR. AND REVIEW. Charleston Medical Journal and Review. Published commercially from Charleston, South Carolina.

CINCINNATI SOC. NATURAL HIST. JOUR. Journal of the Cincinnati Society of Natural History. Published by the Society from Cincinnati, Ohio.

CLAY MINERALS BULL. Clay Minerals Bulletin. Published commercially from Galashiels, Scotland and London, England.

CLIMATOLOGIST. Climatologist. Published commercially from Philadelphia, Pennsylvania.

COLLIERY ENGINEER. Colliery Engineer. Published commercially from Pottsville and Scranton, Pennsylvania.

COMPASS. The Compass of Sigma Gamma Epsilon. Published by the Fraternity from Menasha, Wisconsin, and elsewhere.

COPEIA. Copeia. Published by the American Society of Icthyologists and Herpetologists from New York City, New York.

CUSHMAN FOUNDATION FORAMINIFERAL RESEARCH CONTRIBS.; . . . SPEC. PUB. Contributions, and Special Publications of the Cushman Foundation for Foraminiferal Research. Published for the Foundation by the Paleontological Research Institute from Ithaca, New York.

CUSHMAN LAB. FORMINIFERAL RESEARCH CONTRIBS.; . . . SPEC. PUB. Contributions, and Special Publications from the Cushman Laboratory of Foraminiferal Research. Published by the Laboratory from Sharon, Massachusetts.

DE BOW'S REVIEW. DeBow's Review. Published commercially from New Orleans, Louisiana.

DENISON UNIV. BULL. (SCIENTIFIC LAB. JOUR.). Denison University Bulletin (Journal of the Scientific Laboratories). Published by the University from Granville, Ohio.

DENISON UNIV. SCIENTIFIC LAB. BULL. Bulletin of the Scientific Laboratories of Denison University. Published by the University from Granville, Ohio.

DE RE METALLICA. De Re Metallica. Published by the students and Alumni of the Montana School of Mines from Butte, Montana.

DESERT MAG. Desert Magazine. Published commercially from El Centro, California.

DEUTSCHE GEOLOGISCHE GESELLSCHAFT ZEITSCHRIFT. Published by the Society from Berlin, Germany.

DISSERTATION ABSTRACTS. Dissertation Abstracts. Published by the University of Michigan from Ann Arbor, Michigan.

DIXIE. Dixie. Published commercially from Atlanta, Georgia.

EARTH SCIENCE DIGEST. Earth Science Digest. Published commercially from Omaha, Nebraska.

ECLOGAE GEOLOGICAE HELVITIAE. Published by the Societé géologique suisse from Lausanne, Switzerland and elsewhere.

ECOLOGY. Ecology. Published by the Ecological Society of America from Brooklyn, New York.

ECON. GEOLOGY. Economic Geology. Published by the Society of Economic Geologists from Lancaster, Pennsylvania.

EDINBURGH NEW PHILOS. JOUR. Edinburgh New Philosophical Journal. Published commercially from Edinburgh, Scotland.

ELISHA MITCHELL SCIENTIFIC SOC. JOUR. Journal of the Elisha Mitchell Scientific Society. Published by the Society from Chapel Hill, North Carolina.

EMORY UNIV. QUARTERLY. Emory University Quarterly. Published by the University from Atlanta, Georgia.

ENGINEERING AND MINING JOUR. Engineering and Mining Journal. Published commercially from New York City, New York.

ENGINEERING AND MINING JOUR-PRESS. Engineering and Mining Journal-Press. Published commercially from New York City, New York.

ENGINEERING ASSOC. SOUTH PROC. [PAPERS]; . . . TRANS. Proceedings and Papers, and Transactions of the Engineering Association of the South. Published by the Association from Nashville, Tennessee.

EXPLOSIVES ENGINEER. Explosives Engineer. Published commercially from Wilmington, Delaware.

FERN BULL. Fern Bulletin. Published by the American Fern Society from Binghampton, New York.

FIELD COLUMBIAN MUSEUM PUBS. GEOL. SERIES. Field Columbian Museum Geology Series Publications. Published by the Museum from Chicago, Illinois.

FIELD MUSEUM NATURAL HIST. GEOL. SERIES. Field Museum of Natural History, Geological Series. Published by the Museum from Chicago, Illinois.

FLORIDA GEOL. SURVEY ANN. REPT.; . . . BULL.; . . . REPT. INV. Annual Report, Bulletin, and Reports of Investigations of the Florida Geological Survey. Published by the Survey from Tallahassee, Florida.

FLORIDA STATE UNIV. STUDIES. Florida State University Studies. Published by the University from Tallahassee, Florida.

FORESTRY-GEOLOGICAL REVIEW. Forestry-Geological Review. Published by the Georgia Department of Forestry and Geological Development from Atlanta, Georgia.

FRANKLIN INST. JOUR. Journal of the Franklin Institute. Published by the Institute from Philadelphia, Pennsylvania.

GAS AGE. Gas Age. Published commercially from New York City, New York.

GEMS AND MINERALS. Gems and Minerals. Published commercially by numerous California Mineral Societies from Mentonne, California.

GEOCHEMICA ET COSMOCHEMICA ACTA. Geochemica et Cosmochemica Acta. Published by the Geochemical Society from London, England.

GEOCHEMICAL NEWS. Geochemical News. Published by the Sargent Geochemical Corporation, Casper, Wyoming.

GEOGRAPHICAL JOUR. Geographical Journal. Published by the Royal Geographical Society from London, England.

**GEOGRAPHICAL REVIEW.** Geographical Review. Published by the American Geographical Society of New York from New York City, New York.

**GEOGRAPHICAL SOCIETY CHINA JOUR.** Journal of the Geographical Society of China. Published by the Society from Peking, China.

**GEOGRAPHICAL SOC. PHILADELPHIA BULL.** Bulletin of the Geographical Society of Philadelphia. Published by the Society from Philadelphia, Pennsylvania.

**GEOGRAPHISCHE GESELLSCHAFT WIEN MITTHEILUNGEN.** Published by the Society from Vienna, Austria.

**GEOL. SOC. AMERICA BULL.; . . . MEM.; . . . PROC.; . . . SPEC. PAPER.** Bulletin, Memoir, Proceedings, and Special Papers of the Geological Society of America. Published by the Society from New York City, New York.

**GEOL. SOC. CHINA BULL.** Bulletin of the Geological Society of China. Published by the Society from Peiping, China.

**GEOL. SOC. JAPAN JOUR.** Journal of the Geological Society of Japan. Published by the Society from Tokyo, Japan.

**GEOL. SOC. LONDON QUART. JOUR.** Quarterly Journal of the Geological Society of London. Published by the Society from London, England.

**GEOL. SOC. PENNSYLVANIA TRANS.** Transactions of the Geological Society of Pennsylvania. Published by the Society from Philadelphia, Pennsylvania.

**GEOLOGICAL MAG.** Geological Magazine. Published commercially from London, England.

**GEOLOGISKA FOERENINGENS I STOCKHOLM FORHANDLINGAR.** Published by the Society from Stockholm, Sweden.

**GEOLOGIST.** Geologist. Published by the Geologists' Association of London from London, England.

**GEOPHYSICS.** Geophysics. Published by the Society of Exploration Geophysicists from Tulsa, Oklahoma, and Houston, Texas.

**GEORGIA ACADEMY OF SCIENCE BULL.** Bulletin of the Georgia Academy of Science. Published by the Academy from various places.

**GEORGIA GEOL. SURVEY BULL.. . . . INF. CIRC.; . . . PROG. REPT.** Bulletin, Information Circular, and Progress Report of the Georgia Geological Survey. Also known *as* Department of Mines, Mining, and Geology, and *as* Department of Natural Resources, Division of Mines, Mining, and Geology.

GEORGIA INST. TECHNOLOGY ENGINEERING EXPER. STA. BULL.; . . . SPEC. REPT. Bulletin, and Special Report of the Georgia Institute of Technology Engineering Experiment Station. Published by the Institute from Atlanta, Georgia.

GEORGIA MINERAL NEWSLETTER. Georgia Mineral Newsletter. Published by the Georgia Geological Survey from Atlanta, Georgia. Succeeds Georgia Mineral Society Newsletter.

GEORGIA MINERAL SOC. NEWSLETTER. Georgia Mineral Society Newsletter. Published by the Society from Atlanta, Georgia. Succeeded by above.

GEORGIA REVIEW. Georgia Review. Published by the University of Georgia from Athens, Georgia.

GEORGIA SPELUNKER. Georgia Spelunker. Published by the Atlanta Grotto of the National Speleological Society from Forest Park, Georgia, and elsewhere.

GEORGIA UNIV. BULL. Bulletin of the University of Georgia. Published by the University from Athens, Georgia.

GEOTIMES. GeoTimes. Published by the American Geological Institute from Washington, D. C.

GESELLSCHAFT DEUTSCHER NATURFORSCHER UND AERTZE VERHANDLUNGEN. Published by the Society from Leipzig, Germany.

GULF COAST ASSOC. GEOL. SOCS. TRANS. Transactions of the Gulf Coast Association of Geological Societies. Published by the Association from various places.

HARVARD COLLEGE MUSEUM COMP. ZOOL. BULL.; . . . MEM. Bulletin, and Memoir of Harvard College Museum of Comparative Zoology. Published by Harvard University from Cambridge, Massachusetts.

HARVARD ENGINEERING JOUR. Harvard Engineering Journal. Published by Harvard University from Cambridge, Massachusetts.

HARVARD UNIV. BOT. MUSEUM LEAFLET. Leaflet of the Harvard University Botanical Museum. Published by the University from Cambridge, Massachusetts

HISTOIRE DE L'ACADEMIE ROYALE DES SCIENCES PHYSIQUES. Published by the Academy from Paris, France.

HOBBIES. Hobbies. Published commercially from Chicago, Illinois.

ILLINOIS STATE ACAD. SCIENCE TRANS. Transactions of the Illinois State Academy of Science. Published by the Academy from Springfield, Illinois.

ILLINOIS STATE GEOL. SURVEY REPT. INV. Report of Investigations of the Illinois Geological Survey. Published by the Survey from Urbana, Illinois.

INDIA GEOL. SURVEY MEM. Memoirs of the India Geological Survey. Published by the Survey from Calcutta, India.

INDIANA ACAD. SCIENCE PROC. Proceedings of the Indiana Academy of Science. Published by the Academy from Brookville, Indiana.

INST. MINING AND METALLURGY TRANS. Transactions of the Institute of Mining and Metallurgy. Published by the Institute from London, England.

INTERSTATE OIL COMPACT COMMISSION BULL. Bulletin of the Interstate Oil Compact Commission. Published by the Commission from Oklahoma City, Oklahoma. Succeeds the Quarterly Bulletin.

INTERSTATE OIL COMPACT COMMISSION QUART. BULL. Quarterly Bulletin of the Interstate Oil Compact Commission. Published by the Commission from Oklahoma City, Oklahoma. Succeeded by above.

JOHNS HOPKINS UNIV. CIRC. Circular of the Johns Hopkins University. Published by the University from Baltimore, Maryland.

JOUR. GEORGRAPHY. Journal of Geography. Published commercially from various places.

JOUR. GEOLOGY. Journal of Geology. Published by the University of Chicago from Chicago, Illinois.

JOUR. GEOMORPHOLOGY. Journal of Geomorphology. Published commercially from New York City, New York.

JOUR. MAMMALOLOGY. Journal of Mammalology. Published by the American Society of Mammalologists from Baltimore, Maryland.

JOUR. PALEONTOLOGY. Journal of Paleontology. Published by the Paleontological Society, the Society of Economic Paleontologists and Mineralogists, and the Geological Society of America from Menasha, Wisconsin.

JOUR. SEDIMENTARY PETROLOGY. Journal of Sedimentary Petrology. Published by the Society of Economic Paleontologists and Mineralogists from Menasha, Wisconsin.

JOURNAL DE PHYSIQUE, DE CHEMIE, D'HISTOIRE NATURELLE ET DES ARTS. Published commercially from Paris, France.

JOURNAL FUER PRAKTISCHE CHEMIE. Published commercially from Leipzig, Germany.

K. AKADEMIE DER WISSENSCHAFTEN BERLIN ABHANDLUNGEN. Published by the Academy from Berlin, Germany.

K. AKADEMIE DER WISSENSCHAFTEN BERLIN PHYSICHE ABHANDLUNGEN. Published by the Academy from Berlin, Germany.

K. PREUSSISCHE AKADEMIE DER WISSENSCHAFTEN BERLIN SITZUNGSBERICHTE. Published by the Academy from Berlin.

K. K. GEOLOGISCHE REICHANSTALT JAHRBUCH; ... VERHANDLUNGEN. Published by the Institution from Vienna, Austria.

K. K. NATURHISTORISCHEN HOFMUSEUMS ANNALEN. Published by the Museum from Vienna, Austria, and elsewhere.

KENTUCKY GEOL. SURVEY MEM.; . . . SPEC. PUB. Memoir and Special Publication of the Kentucky Geological Survey. Published by the Survey from Frankfort, Kentucky.

L'ACADÉMIE IMPÉRIAL DES SCIENCES DE ST. PETERSBOURG BULLETIN. Published by the Academy from St. Petersburg, Russia.

LITERARY AND PHILOS. SOC. NEW YORK TRANS. Transactions of the Literary and Philosophical Society of New York. Published by the Society from New York City, New York.

LITERARY MAG. OR UNIVERSAL REVIEW. Literary Magazine, or Universal Review. Published commercially from London, England.

LYCEUM NATURAL HIST. NEW YORK ANNALS. Annals of the Lyceum of Natural History of New York. Published by the Lyceum from New York City, New York.

MACON MAG. Macon Magazine. Published by the Macon Chamber of Commerce from Macon, Georgia.

MADEN TETKIK VE ARAMA, ENSTITUSII MECMUARI. Published by the Institute from Ankara, Turkey.

MAGAZINE OF NATURAL HIST. Magazine of Natural History. Published commercially from London, England.

**MANUFACTURERS' RECORD.** Manufacturers' Record. Published commercially from Baltimore, Maryland.

**MARYLAND GEOL. SURVEY.** Maryland Geological Survey. Published by the Survey from Baltimore, Maryland.

**MAZAMA.** Mazama. Published commercially from Portland, Oregon.

**MEDICAL REPOSITORY.** Medical Repository. Published commercially from New York City, New York.

**MEDICAL SOC. STATE OF GEORGIA ANN. MTG. TRANS.** Transactions of the Annual Meetings of the Medical Society of the State of Georgia. Published by the Society from Savannah, Georgia.

**METEORITICS.** Meteoritics. Published by the Meteoritical Society from Albuquerque, New Mexico.

**MICHIGAN UNIV. MUSEUM ZOOLOGY OCCASIONAL PAPER.** Occasional Paper of the University of Michigan Museum of Zoology. Published by the University from Ann Arbor, Michigan.

**MICROPALEONTOLOGIST.** Micropaleontologist. Published by the American Museum of Natural History from New York City, New York.

**MINERAL COLLECTOR.** Mineral Collector. Published commercially from New York City, New York and elsewhere.

**MINERALOGICAL MAG.** Mineralogical Magazine. Published by the Mineralogical Society from London, England.

**MINERALOGISCHE UND PETROGRAPHISCHE MITTHEILUNGEN.** Published commercially from Vienna, Austria.

**MINERALOGIST.** Mineralogist. Published commercially from Portland, Oregon.

**MINES AND MINERALS.** Mines and Minerals. Published commercially from Scranton, Pennsylvania.

**MINING AND ENGINEERING WORLD.** Mining and Engineering World. Published commercially from Butte, Montana, and Chicago, Illinois.

**MINING AND METALLURGICAL SOC. AMERICA BULL.** Bulletin of the Mining and Metallurgical Society of America. Published by the Society from New York City, New York.

**MINING AND METALLURGY.** Mining and Metallurgy. Published by the American Institute of Mining and Metallurgical Engineers from New York City, New York.

MINING AND SCIENTIFIC PRESS. Mining and Scientific Press. Published commercially from San Francisco, California.

MINING AND STATISTICAL MAG. Mining and Statistical Magazine. Published commercially from New York City, New York.

MINING CONGRESS JOUR. Mining Congress Journal. Published by the American Mining Congress from Denver, Colorado.

MINING ENGINEERING. Mining Engineering. Published by the American Institute of Mining and Metallurgical Engineers from New York City, New York.

MINING MAG. Mining Magazine and Journal of Geology. Published commercially from New York City, New York.

MINING WORLD. Mining World. Published commercially from Seattle, Washington.

MONTHLY WEATHER REVIEW. Monthly Weather Review. Published by the United States Department of Commerce, Weather Bureau, from Washington, D. C.

MUSÉE ROYALE D'HISTOIRE NATURELLE BELGIQUE MEMOIRE. Published by the Museum from Brussels, Belgium.

NATL. ACAD. SCIENCE BIOG. MEM.; . . . MEM. Biographical Memoir, and Memoir of the National Academy of Sciences. Published by the Academy from Washington, D. C.

NATL. GEOGRAPHIC MAG. National Geographic Magazine. Published by the National Geographic Society from Washington, D. C.

NATL. INSTITUTE [WASHINGTON, D. C.] PROC. Bulletin of Proceedings of the National Institute for the Promotion of Science. Published by the Institute from Washington, D. C.

NATL. OIL SCOUTS AND LANDSMENS' ASSOC. YEARBOOK. Yearbook of the National Association of Oil Scouts and Landsmen. Published by the Association from Houston, Texas, and elsewhere.

NATL. SPELEOLOGICAL SOC. BULL. Bulletin of the National Speleological Society. Published by the Society from Washington, D. C.

NATUR UND VOLK. Published by the Senckenbergische Naturforschende Gesellschaft from Frankfort/Main, Germany.

NATURAL HIST. REVIEW. Natural History Review. Published by the Natural History Society of Dublin from London, England.

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1. Gold mining in Georgia: Amer. Inst. Mining Engineers Contrib. 57, 8 p., illus., 1933; . . . Trans., vol. 109, p. 61-68, illus., 1934. A general survey of the occurrence of gold as placers, in saprolite, and in quartz veins is given. Details from the Allatoona Mine, in Bartow Co., are given as examples. The future is not promising.

ANDERSON, ROBERT LAFAYETTE, *see* Young, William Harvey, 1, 2.

ANDREWS, ROY CHAPMAN, 1884-1960.

1. (and others). Henry Fairfield Osborn, August 8, 1857-November 6, 1935, tributes paid at memorial meetings in New York City, November 7, November 12, and December 18, 1935: Natural History, vol. 37, no. 2, supplement, 15 p., port., 1936.

ANTEVS, ERNST VALDEMAR, 1888-

1. Quaternary marine terraces in nonglaciated regions and changes of level of sea and land: Amer. Jour. Science, 5th ser. vol. 17, p. 35-49, illus., 1929. A generalized discussion of the terraces along the east coast of the United States includes those of Georgia. The terraces are marine in origin and are due both to sea-level oscillation related to Pleistocene glaciation and to vertical movements of the land areas.
2. The Quaternary of North America, sec. 3b *of* Die Alten Kerne, vol. 1 *of* Regionale Geologie der Erde, K. Andrée, H. A. Brouwer, and W. H. Bucher, eds. 21 p., illus., Leipzig, Akad. Verlagsgesell., 1941. A generalized review of Pleistocene geology includes brief descriptions of the terraces along the coasts. No new data are included.

APPLIN, ESTHER ENGLISH RICHARDS, 1895- *see also* Applin, Paul Livingston, 1, 2; Cushman, Joseph Augustine, 10.

1. (and Jordan, Louise). Correlation of subsurface rocks of Florida and southern Georgia: Natl. Oil Scouts and Landsmen's Assoc. Yearbook 1954, vol. 15, p. 149, 1945; . . . Yearbook 1946, vol. 16, p. 151, 1946; . . . Yearbook 1947, vol. 17, p. 126, 1947; . . . Yearbook 1949, vol. 19, p. 132, 1949; . . . Yearbook 1951, vol. 21, p. 144, 1951; . . . Yearbook 1952, vol. 22, p. 128, 1952; . . . Yearbook 1953, vol. 23, p. 136, 1953; . . . Yearbook 1954, vol. 24, p. 125, 1954. A chart shows the time-rock and biostratigraphic correlations between Georgia, Florida, and Texas, from the Cretaceous to the Oligocene.
2. (and Jordan, Louise). Fossils of Florida and southern Georgia: Natl. Oil Scouts and Landsmen's Assoc. Yearbook 1945, vol. 15, p. 148, 1945; . . . Yearbook 1946, vol. 16, p. 146, 1946; . . . Yearbook 1947, vol. 17, p. 124, 1947; . . . Yearbook 1949, vol. 19, p. 133, 1949; . . . Yearbook 1951, vol. 21, p. 145, 1951; . . . Yearbook 1952, vol. 22, p. 129, 1952; . . . Yearbook 1953, vol. 23, p. 137, 1953. A plate shows illustrations of some of the common Foraminifera of Cretaceous to Oligocene rocks.
3. A biofacies of Woodbine age in the southeastern Gulf Coast region: U. S. Geol. Survey Prof. Paper 264-I, p. 157-198, illus., 1955. The Atkinson Formation in the subsurface of the Coastal Plain is correlated with the Woodbine and Eagle Ford Formations in Texas on the basis of lithology and microfauna. Foraminifera from wells in Echols, Clinch, and Early Cos. are described and illustrated.

APPLIN, PAUL LIVINGSTON, 1891-

1. (and Applin, Esther English Richards). Regional subsurface stratigraphy and structure of Florida and southern Georgia: Amer. Assoc. Petroleum Geologists Bull., vol. 28, p. 1673-1753, 1944. Cretaceous to Oligocene rocks are described. Pre-Tuscaloosa Cretaceous rocks are recognized. Small-scale paleogeologic maps of each unit are included as are structure contour maps of some of the units. Illustrations of important Foraminifera are also given. Some generalized well log data are present.

2. (and Applin, Esther English Richards). Regional subsurface stratigraphy, structure, correlation of middle and early Upper Cretaceous rocks in . . . [Coastal Plain] Georgia . . . : U. S. Geol. Survey Oil and Gas Investigations Prelim. Chart 26, 3 sheets, 1947. Structure sections, well-log stratigraphic cross sections and facies maps are presented, along with well data. The Cretaceous rocks are shown to dip seaward, and the various facies are shown.
3. Mesozoic rocks in Florida and [Coastal Plain] Georgia [abs.]: Geol. Soc. America Bull., vol. 61, pt. 2, p. 1441, 1950.
4. Georgia, *in* Southeastern United States, *in* Possible future petroleum provinces of North America: Amer. Assoc. Petroleum Geologists Bull., vol. 35, p. 409-410, 1951. This contains an extremely cursory review of the Coastal Plain stratigraphy of Georgia and of the petroleum potential.
5. Preliminary report on buried pre-Mesozoic rocks in Florida and adjacent states: U. S. Geol. Survey Circ. 91, i, 28 p., illus., 1951; Assoc. Amer. State Geologists Guidebook, 44th Ann. Mtg., p. 1-28(‡), illus., Florida Geol. Survey, 1952. The material from oil wells in southern Georgia, mostly southeastern Georgia, is described and mapped. Basalt, diabase, granite, schist, gneiss, volcanic tuff or ash, and various types of Paleozoic sedimentary rocks are included.
6. Volume of Mesozoic sediments in Florida and Georgia, Pt. 1 *of* Murray, Grover Elmer, Jr., ed., Sedimentary volumes in Gulf Coastal Plain of the United States and Mexico: Geol. Soc. America Bull., vol. 63, p. 1159-1163, illus., 1952. Volumes, based on isopach contours, are calculated for over 93,000 square miles in Georgia and Florida. There are 60-75,000 cubic miles of Cretaceous sediments and sedimentary rocks. The pre-Cretaceous Mesozoic rocks are roughly estimated at 10-15,000 cubic miles.

**ARBER, MURIEL A.**

1. Professor Charles Schuchert [1858-1942]: Nature, vol. 152, p. 15-16, London, 1943.

**ARDEN, DANIEL DOUGLAS, JR., 1922-**

1. The microstratigraphy of a Carolina Bay [Burke Co.]. M.S. Thesis, Emory Univ., 1949.
2. Statistical methods applied to species determination of fossil brachiopods, *in* Short contributions to the geology, geography, and archaeology of Georgia: Georgia Geol. Survey Bull. 50, p. 106-111, illus., 1950. Examples of statistical analyses to differentiate brachiopod species from Mississippian rocks in Catoosa County are shown. *Composita trinuclea, C. subquadrata,* and *Cleiothyridina sublamellosa,* which otherwise resemble one other, are separated statistically.

**ARMSTRONG, CHARLES HARRIS, JR. 1929-**

1. Analysis of Ordovician red bed sediments in N.W. Georgia [Whitfield Co.] [abs.]: Georgia Acad. Science Bull., vol. 14, p. 39, 1956.

**ASHLEY, GEORGE HALL**, 1866-1951.

1. Memorial to Marius Robinson Campbell [1858-1940]: Geol. Soc. America Proc. 1940, p. 171-183, port., 1941.

**ATWOOD, WALLACE WALTER**, 1872-1949.

1. The physiographic provinces of North America. xvi, 536 p., illus., Boston, Ginn and Co., 1940. A general review of the physiographic provinces of the United States includes those of Georgia. The whole is very generalized.

**AXELROD, DANIEL ISAAC**, 1910- *see* Barghoorn, Elso Sterrenberg, 1.

**BABCOCK, KENDRIC CHARLES**, 1864-1932.

1. The published writings of William Phipps Blake [1826-1910], 1850-1910: Arizona Univ. President's Rept. 1909, 23 p., 1910.

**BAILEY, JACOB WHITMAN**, 1811-1857.

1. Fossil Infusoria of the southern ricefields: Amer. Jour. Science, 2d ser. vol. 11, p. 85-86, 1851. Diatoms are listed from several places along the Atlantic Coast in Chatham and Glynn Cos. The age is not given but they are most certainly Pleistocene if they are fossil.
2. Microscopical observations made in South Carolina, Georgia, and Florida: Smithsonian Contribs. Knowledge, vol. 2, art. 8, 48 p., illus., 1851. Diatoms, algae, and Foraminifera are listed, described, and some illustrated from fresh water ponds, canals, and rice-field ditches in Chatham, Bryant, Glynn, Bibb and Clarke Cos. Author attributes the presence of the marine forms on the land area to a recent withdrawal of the sea.

**BAIN, HARRY FOSTER**, 1871-1948.

1. Samuel Franklin Emmons [1841-1911]: Mining and Scientific Press, vol. 102, p. 551-552, 1911.

**BAKER, WARREN LOGAN.**

1. (and others). Absolute gravity survey in Gulf Coast states would be of great value to petroleum industry: Oil Weekly, vol. 79, no. 9, p. 38-46, illus., 1935. This is an exhortation by many prominent geologists to support a gravity survey of the Gulf Coast states, including Georgia. It would be entirely on the Coastal Plain if carried out, and in north-south traverses about 20 miles apart.

**BAKEWELL, ROBERT**, 1768-1843.

1. On the recent discovery of gold mines in the United States of America: Magazine of Natural Hist., vol. 5, p. 434-440, London, 1832. This is an early account of the knowledge of the geology of the gold belts in Georgia. Placer deposits are recognized, as well as are vein deposits. The rocks are considered to be Transition in age.

**BALCH, DANIEL M.** *see* Jackson, Charles Thomas, 3.

BALK, CHRISTINA LOCHMAN.

1. (and Wilson, James Lee). Cambrian biostratigraphy in North America: Jour. Paleontology, vol. 32, p. 312-350, illus., 1958. A generalized, large-scale map and a discussion of the distribution of Cambrian faunas includes those found in northwestern Georgia. No details are cited from Georgia.

BALK, ROBERT, 1899-1955. *see* Ruedemann, Rudolf, 3.

BALL, S. MAYS.

1. Review of fossil iron-ore deposits of [northwestern] Georgia: Engineering and Mining Jour., vol. 88, p. 200-204, illus., 1909. Descriptions and details of the occurrence of the iron ore in the Red Mountain Formation are given. Analyses are included. Little new data are given.

BALLAGH, JAMES CURTIS.

1. (editor, and others). Mines and mining, *in* Economic history, vol. 6 *of* The South in the building of the nation, p. 179-252, illus., Richmond, Va., Southern Historical Publication Society, 1910. A cursory review of the mineral deposits of the entire South include those in Georgia. No details are given.

BALLARD, THOMAS JANNEY.

1. Exploration of the Hog Creek Corundum Mine, Towns County, Ga.: U. S. Bur. Mines Rept. Inv. 3855, 3 p. (‡), illus., 1946. Small amounts of corundum are present in chlorite schist, but no veins, as previously reported, were found.
2. (and McIntosh, Frank Kenyon). Diamond drilling at the Tallapoosa Copper Mine, Haralson County, Ga.: U.S. Bur. Mines Rept. Inv. 4316, 8 p. (‡), illus., 1948. Drill holes determine in part the extent of the sulphide veins below the surface. The ore is in schist and is believed to be a replacement of limestone. Analyses of the ore are included.
3. Investigation of Louise chromite deposits, Troup County, Ga.: U. S. Bur. Mines Rept. Inv. 4311, 24 p. (‡), illus., 1948. A description of the deposit, in peridotite bodies in gneiss, and of the associated mineralogy, is given. Cores are logged. The ore is low-grade, with a high iron content.
4. Investigation of Track Rock Corundum Mine, Union County, Ga.: U. S. Bur. Mines Rept. Inv. 4309, 5 p. (‡), illus., 1948. Corundum deposits in weathered schist in highly intruded metamorphic rock are described. Very little corundum is present.

BALSLEY, JAMES ROBINSON, JR., 1916- *see* McKelvey, Vincent Ellis, 1.

BANKS, J. T.

1. Indian Spring [Butts Co.]—location, properties, and medicinal virtues of the water: Atlanta Medical and Surgical Jour., vol. 9, p. 333-336, 1872. This is a semi-popular account, and an analysis of the water, of this then-famous spring.

BARGE, EDWARD MASON, 1926-

1. Evidence of recent stream capture near Lithonia [DeKalb Co.], Georgia [abs.].: Georgia Acad. Science Bull., vol. 10, no. 1, p. 14, 1952.
2. (and Pruitt, Robert Grady, Jr.). Heavy mineral prospecting, Cohutta Mountains, Georgia [abs.]: Georgia Acad. Science Bull., vol. 10, no. 1, p. 10, 1952.
3. (and Pruitt, Robert Grady, Jr.). Testing a collapse origin hypothesis for Providence Canyon [Stewart Co.] [abs.]: Georgia Acad. Science Bull., vol. 10, no. 1, p. 11, 1952.

BARGHOORN, ELSO STERRENBERG, 1915-

1. Age and environment—a survey of North American Tertiary floras in relation to paleoecology: Jour. Paleontology, vol. 25, p. 736-744, illus., 1951; discussion with title, Age-curve analysis of angiosperm floras, by Daniel Isaac Axelrod, vol. 31, p. 273-280, 1957. Several examples of the material used in the analysis are from Georgia. The generic composition of floras is compared with geologic age to show that there is a correlation; Axelrod disagrees.

BARKER, GEORGE FREDERICK, 1835-1910.

1. Memoir of Frederick Augustus Genth, 1820-1893: Natl. Acad. Science Biog. Mem., vol. 4, p. 201-231, port., 1902.

BARLOW, ALFRED ERNEST, 1861-1914.

1. Corundum, its occurrence, distribution, exploitation, and uses: Canada Geol. Survey Mem. 57, vii, 377 p., illus., Ottawa, 1915. A detailed treatise on this mineral includes generalized data regarding the corundum occurrences in the Piedmont and Blue Ridge. It occurs as an associate of peridotite rocks.

BARNES, VIRGIL EVERETT, 1903-

1. (and Bruce, George A.). Tektites in [Irwin and Dodge Cos.] Georgia: Geotimes, vol. 3, no. 7, p. 18, 1959. Tekties from the Miocene terrane are announced. Generalized descriptions are included.

BARROIS, CHARLES, 1851-1939.

1. Notice sur James Hall [1811-1898]: Societé géologique de France Bull., 3d ser. vol. 27, p. 168-173, Paris, 1899.
2. Notice nécrologique sur le géologue C[harles] D[oolittle] Walcott [1850-1927]: Académie des Science de Paris Comptes Rendu, vol. 184, p. 489-493, 1927.

BARROWS, HARRY H., 1874-

1. (and Phillips, James V., and Brantly, John Edward). Agricultural drainage in Georgia: Georgia Geol. Survey Bull. 32, xii, 122 p., illus., 1917; summary with title, Swamp lands of Georgia, by Roland McMillan Harper: Geographical Review, vol. 10, p. 342-344, illus., 1920. A discussion of the topography of the state, with emphasis upon the drainage characteristics, swamps, and other factors, is given. The effects of erosion on drainage are considered, as are elevation, rainfall, and other factors.

**BARTH, THOMAS FREDERICK WEYBYE.**

1. Henry Stephens Washington, born January 17, 1867, died January 7, 1934: Mineralogische und Petrographische Mittheilungen, new ser. vol. 47, p. 371-372, Vienna, 1936.

**BARTRAM, WILLIAM,** 1739-1823.

1. Travels through North and South Carolina, Georgia, east and west Florida. . . . xxxiv, 522 p., illus., Philadelphia, Janes and Johnson, 1791; 1792 edition, London; also a 1793 edition. This early traveller in Georgia recorded many descriptions of physiographic features throughout the state. It is largely of historical interest.

**BARTSCH, PAUL,** 1871-1960.

1. (and Rehder, Harald Alfred and Shields, Beulah Electa). A bibliography and short biographical sketch of William Healey Dall [1845-1927]: Smithsonian Misc. Collections, vol. 104, no. 15, 96 p., port., 1946.

**BASSLER, RAY SMITH,** 1878-1961. *see also* Canu, Ferdinand, 1, 2; Ulrich, Edward Oscar 4, 5.

1. (and others). Systematic paleontology of the Upper Cretaceous deposits of Maryland, *in* Upper Cretaceous, [vol. 1], p. 343-578, [vol. 2], p. 579-901, Maryland Geol. Survey, 1916. Many fossils, of all types, are described and illustrated. Many are recorded from the Cretaceous System of Georgia.
2. American and European Tertiary Bryozoa: Geol. Soc. America Bull., vol. 35, p. 847-850, 1924. The Midway-Stage Bryozoa fauna of Georgia resembles the Cretaceous fauna. Genera are listed. The fauna of the Jackson Stage contains mostly genera which are still living.
3. Memorial of August F[rederick] Foerste [1862-1936]: Geol. Soc. America Proc. 1936, p. 143-157, port., 1937.
4. Edward Oscar Ulrich (1857-1944): Amer. Assoc. Petroleum Geologists Bull., vol. 28, p. 687-689, port., 1944.
5. Memorial to Edward Oscar Ulrich [1857-1944]: Geol. Soc. America Proc. 1944, p. 331-351, ports., 1945.
6. Faunal lists and descriptions of Paleozoic corals: Geol. Soc. America Mem. 44, ix, 315 p., illus., 1950. *Tetradium spiculatum* from Ordovician rocks at Catlett Gap and *T. minus antecedens* from the Ordovician Murfreesboro Limestone in Walker Co. are described and illustrated.

**BATES, THOMAS FULCHER,** 1917- *see also* Sand, Leonard B., 1.

1. Selected electron micrographs of clays and other fine-grained minerals: Pennsylvania State Univ. Mineral Industries Exper. Sta. Circ. 51, vi, 61 p., illus., 1958. Excellent electron photomicrographs of kaolin from Twiggs Co., and attapulgite from Decatur Co., are shown; a very brief text is included.
2. Electron micrographs of some Georgia clays: Georgia Mineral Newsletter, vol. 12, p. 17-19, illus., 1959. Micrographs of kaolinite from Twiggs Co., and attapulgite from Decatur Co. are given. A brief description of each photo is included.

BAUER, GEORGE, *see* Cope, Edward Drinker, 2.

BAUM, ROBERT B., 1920-

1. Exploration activity in the southeastern states: Oil and Gas Jour., vol. 51, no. 42, p. 183-186, illus. incl. port., 1953. A general survey of the area includes discussions of Georgia. Small-scale maps show some of the large tectonic features of the Coastal Plain. The Coastal Plain is mapped as being an area of possible production from Mesozoic and Paleozoic rocks.
2. Oil and gas exploration in . . . Georgia . . . : Geophysics, vol. 18, p. 340-359, illus., 1953. A detailed review of the geologic structures of the southeastern states, amplified by geophysical information, is given. Many small-scale maps showing different features are included.

BAY, HARRY X., 1906-

1. (and Munyan, Arthur Claude). The bleaching clays of Georgia: U. S. Geol. Survey Bull. 901, p. 251-300, illus., 1940; summary, Forestry-Geological Review, vol. 5, no. 10, p. 7-8, illus.; no. 11, p. 7-8, illus.; no. 12, p. 7-8, illus., 1935; Georgia Geol. Survey Inf. Circ. 6, 4 p., illus., 1935. Bentonite from Dade, Chattooga, and Walker Cos. is described and analyzed, and many types of fullers earth deposits on the Coastal Plain are also described and analyzed. The Twiggs Clay of Eocene age, the Oligocene Flint River Formation, and the Miocene Hawthorn Formation are the big sources of bleaching clay.

BAYLEY, WILLIAM SHIRLEY, 1861-1943, *see also* Ries, Heinrich, 4.

1. Geology of the Tate Quadrangle, [Pickens, Cherokee, Dawson, Forsyth Cos.] Georgia: Georgia Geol. Survey Bull. 43, ix, 170 p., illus. incl. geol. map, 1928. A complete geological description of the area is given. Precambrian-Cambrian metamorphosed rocks are mapped as are Paleozoic or older igneous rocks, and post-Paleozoic diabase. Folding, faulting, and accompanying metamorphism dominate the structure. Gold, pyrite, rutile, marble, and other materials are the mineral resources present. Each is described; analyses are included.
2. Memorial of Samuel Washington McCallie [1856-1933]: Geol. Soc. America Proc. 1933, p. 227-243, port., 1934.

BEALL, ELIAS.

1. Georgia meteor and aerolite [Monroe Co.]: Amer. Jour. Science, vol. 18, p. 388, 1830. A description of the Forsyth meteor fall is given. A generalized description of the meteorite is given also.

BEAUJOUR, LOUIS AUGUSTE FELIX DE, 1763-1836.

1. Aperçu des États Unis. . . . 272 p., illus. incl. geol. map, Paris, Delaunay Libraire, 1814; also an English edition, London, J. Booth and others, 1814. An extremely cursory description of the geology of the United States is included, with no direct allusion to Georgia at all. Maclure's geological map of the United States, dated 1814, which includes Georgia, is reproduced, however.

BECK, WILLIAM AUGUST, *see also* Kline, Mitchell Heeney, 1.

1. Exploration of the Piedmont manganese belt, . . . Wilkes County, Georgia: U. S. Bur. Mines Rept. Inv. 3858, 5 p. (‡) illus., 1946. Manganese deposits, as lenses of massive ore conforming with the foliation of the enclosing schist, and as beds of nodules in the weathered zone, are described. Pyrolusite and psilomelane are the chief minerals. Analyses are included.

2. Georgia mica spots, Cherokee, Upson, Lamar and Monroe Counties: U.S. Bur. Mines Rept. Inv. 4239, 29 p. (‡), illus., 1948. Descriptions of the mica-bearing pegmatites are given, and cores are drilled and logged.

3. Investigation of the Andersonville Bauxite District, Sumter, Macon, and Schley Counties, Ga.: U. S. Bur. Mines Rept. Inv. 4538, 150 p. (‡), illus., 1949; summary, Georgia Mineral Newsletter, vol. 12, p. 41, 1959. A cursory description of the geological setting, Eocene rocks, is followed by a description of the bodies of kaolin and bauxite. Many cores are taken and detailed analyses are given.

4. Investigation of the Irwinton Bauxite District, Wilkinson County, Ga.: U. S. Bur. Mines Rept. Inv. 4495, 16 p. (‡), illus., 1949. Bauxite occurs in lenses in the upper part of the Cretaceous System in the area. The edges of the lenses are largely kaolin which enclose bauxite within them. Cores are taken and analyzed.

5. Investigation of the Springvale Bauxite District, Randolph County, Ga.: U. S. Bur. Mines Rept. Inv. 4555, 20 p. (‡), illus., 1949. A bauxite lens in Eocene rocks is cursorily described, and numerous drill samples are chemically analyzed.

BECKER, GEORGE FERDINAND, 1847-1919.

1. Gold fields of the southern Appalachians: U. S. Geol. Survey Ann. Rept. 16, pt. 3, p. 251-331, illus., 1895. Gold occurs in quartz veins in metamorphic rocks, as placer deposits, and in the surface residuum. General aspects are described and details of many deposits in the Piedmont of Georgia are included.

2. Major C[larence] E[dward] Dutton [1841-1912]: Amer. Jour. Science, 4th ser. vol. 33, p. 387-388, 1912.

3. Biographical notice of Samuel Franklin Emmons [1841-1911]: Amer. Inst. Mining Engineers Bull., vol. 57, p. 673-691, port., 1911; . . . Trans., vol. 42, p. 643-661, port., 1912: reprinted *in* Samuel Franklin Emmons, Ore deposits, p. xxix-xlvii, New York, The Institute, 1913.

BEHRE, CHARLES HENRY, JR., 1896-

1. Problems of the genesis of mineral deposits of the southeastern states, *in* Snyder, Frank G., ed., Symposium on mineral resources of the southeastern United States, p. 26-41, illus., 1950. A general review of the geologic setting and genesis of mineral deposits in the southeast includes a few references to examples from Georgia. No details are included.

BELL, AGRIPPA NELSON, 1820-1911.

1. Climatology and mineral waters of the United States. 386 p., illus., New York, William Wood and Co., 1885. This is a treatise on the influence of climate and one's health, and the concurrent influence of mineral waters. A cursory description of the topography of Georgia is included, as are descriptions of numerous mineral springs. Analyses are included for Warm Springs in Meriwether County and Indian Springs in Butts County.

BELL, ALFRED HANNAM, 1895-

1. Don Llewellyn Carroll (1902-1954): Amer. Assoc. Petroleum Geologists Bull., vol. 38, p. 2254-2257, 1954.

BELL, ISAAC LOWTHIAN, 1816-1904.

1. On the American iron trade and its progress during sixteen years, *in* Iron and Steel Inst. in America, Spec. Vol. of "Proc.," p. 1-208, illus., London, E. and F. N. Spon, 1892. A review of the entire iron trade as reported by a British observer includes descriptions of the ore occurrences in the United States and in Georgia. No new data are given, however. A geological map of the United States is included, along with a survey of the coal and iron fields. Some analyses are given also.

BELL, JOHN, 1796-1872.

1. Mineral and thermal springs of the U. S. and Canada. xx, 394 p., Philadelphia, Parry and McMillan, 1855. A treatise on the origin and use of mineral spring water includes descriptions of Indian Springs in Butts Co., Warm Springs in Meriwether Co., Madison Spring in Madison Co., Roward Spring in Bartow Co., and Gordon's Spring in Murray County. Their medicinal properties are stressed more than their chemistry.

BEMENT, CLARENCE SWEET, 1843-1923.

1. Ueber neuere amerikanische Mineralvorkommen: Zeitschrift fuer Kristallographie und Mineralogie, vol. 14, p. 256-257, Leipzig, 1888. A rutile specimen from Graves Mountain in Lincoln County is considered to be the best example in the world.

BENJAMIN, MARCUS, 1857-1932.

1. Charles Abiathar White [1826-1910]: Science, new ser. vol. 32, p. 146-149, 1910.
2. Edward Drinker Cope, paleontologist, 1840-1897, *in* Leading American Men of Science, David Starr Jordan, ed., p. 313-340, port., New York, H. Holt and Co., 1910.
3. George Perkins Merrill [1854-1929]: Amer. Jour. Science, 5th ser. vol. 18, p. 364, 1929.
4. George Perkins Merrill [1854-1929]: Science, new ser. vol. 70, p. 274-275, 1929.

BERDAN, JEAN MILTON, 1916- *see* Bridge, Josiah, 2.

**BERKEY, CHARLES PETER,** 1867-1955, *see also* Fairbanks, Helen R., 1.

1. Charles Richard van Hise (1837-1918): Amer. Museum Jour., vol. 18, p. 705-706, 1918.
2. James Furman Kemp [1859-1926]: Engineering and Mining Jour., vol. 122, p. 872-873, 1926; Mining and Metallurgical Soc. America Bull. 186, (vol. 19), p. 114-116, 1926; Science, new ser. vol. 64, p. 639-642, 1926.
3. Memorial of Frederick James Hamilton Merrill [Jr.], [1861-1916]: Geol. Soc. America Bull., vol. 42, p. 165-171, port., 1931.
4. Obituary notice, [Edward Salisbury Dana, 1849-1935]: Geol. Soc. London Quart. Jour., vol. 92, pt. 3, p. lxxxix-xci, 1936.
5. Waldemar Lindgren (1869-1939): Amer. Philos. Soc. Yearbook 1941, p. 386-389, 1942; condensed, Geol. Soc. London Quart. Jour., vol. 97, pts. 2-4, p. lxxviii-lxxix, 1942.
6. Douglas Wilson Johnson (1878-1944): Amer. Philos. Soc. Yearbook 1944, p. 374-379, 1945.
7. Memorial to William Frederick Prouty [1879-1949]: Geol. Soc. America Proc. 1950, p. 115-117, port., 1951.

**BERONI, ERNEST PETE,** *see* Gott, Garland Bayard, 1.

**BERRY, EDWARD WILBUR,** 1875-1945, *see also* Clark, William Bullock, 4.

1. Contributions to the Mesozoic flora of the Atlantic Coastal Plain [Part] VI, Georgia: Torrey Bot. Club Bull., vol. 37, p. 503-511, illus., 1910. Plants from the Cretaceous rocks in Chattahoochee, Marion, and Houston Counties are listed. Thirty-two species are present. One new species is illustrated.
2. (An) Eocene flora in Georgia and the indicated physical conditions. Bot. Gazette, vol. 50, p. 202-208, illus., 1910. Claiborne sediments in Columbia County contain a flora of 14 species, mixed with estuarine and shallow water marine invertebrates. They represent a much warmer climate than now exists at this place. They are related to the modern flora of tropical America.
3. (A) study of the Tertiary floras of the Atlantic and Gulf Coastal Plain: Amer. Philos. Soc. Proc., vol. 50, p. 301-315, illus., 1911. A generalized review of the Cenozoic rocks of the Coastal Plain includes those of Georgia. Floral lists for each Tertiary stage are included. The position of the shoreline at various times is estimated from the nature of the plant remains. Few details are included.
4. The affinities and distribution of the Lower Eocene flora of southeastern North America: Amer. Philos. Soc. Proc., vol. 53, p. 129-250, illus., 1914. A review of the Lower Eocene flora includes much about the Coastal Plain of Georgia. The North American distribution in time and space of the various groups of plants is discussed; many are from Georgia. The Wilcox Stage is especially discussed; the flora is a subtropical strand-line type.
5. (The) Upper Cretaceous and Eocene floras of South Carolina and Georgia: U. S. Geol. Survey Prof. Paper 84, 200 p., illus., 1914. Many genera and species from many places in the Coastal Plain are described and illustrated.

6. (The) Upper Cretaceous floras of the world, *in* Upper Cretaceous, vol. 1, p. 183-313, Maryland Geol. Survey, 1916. The flora of the Eutaw and Ripley formations are listed and compared with similar floras from elsewhere around the world.
7. (The) delta character of the Tuscaloosa Formation: Johns Hopkins Univ. Circ., new ser. 1917, no. 3, p. 18-24, illus., 1917. The Tuscaloosa Formation in Alabama is shown to be deltaic, thus supporting the idea of the Coosa River having been the main drainage toward the southwest during at least Upper Cretaceous time. The Tertiary capture of the Coosa River by the Tennessee River interrupted the delta deposition.
8. (A) Middle Eocene member of the "Sea Drift" [Clay Co.]: Amer. Jour. Science, 4th ser. vol. 43, p. 298-300, illus., 1917. A seed of *Caropa xylocarpoides* from the Claiborne Stage of Clay County is described and illustrated. It is exotic to the fossil flora and probably was mixed with the local flora after having drifted ashore.
9. William Bullock Clark [1860-1917]: Amer. Jour. Science, 4th ser. vol. 44, p. 247-248, 1917.
10. Upper Cretaceous flora of the eastern gulf region in Tennessee, Mississippi, Alabama, and Georgia: U. S. Geol. Survey Prof. Paper 112, 178 p., illus., 1919. Cretaceous plants from the Eutaw Formation in Muscogee and Chattahoochee Counties and from the Ripley Formation [Cusseta Sand] in Marion and Houston Counties are described and illustrated.
11. American Tertiary terrestrial plants and their interdigitation with marine deposits: Geol. Soc. America Bull., vol. 35, p. 767-784, 1924. The floras of the various stages of the Tertiary are described, and the relationships of the flora deposits to the various Tertiary strand lines are considered; a fluctuation of the strand is interpreted. Material from Georgia is used in the evaluation and in a comparison of the North American flora with similarly-aged European floras.
12. (The) Middle and Upper Eocene floras of southeastern North America: U. S. Geol. Survey Prof. Paper 92, 206 p., illus., 1924. Several genera and species of poorly-preserved plants from the Claiborne Stage in Clay County are described and illustrated, as are genera and species from the Jackson Stage in Columbia and Bibb Counties.
13. (The) Mississippi Gulf in the Middle and Upper Eocene: Scientific Monthly, vol. 19, p. 30-42, illus., 1924. This is a popular account of the sediments and flora of this time interval on the Gulf Coast, including Georgia. No new data are included.
14. (The) flora of the Ripley Formation: U. S. Geol. Survey Prof. Paper 136, 94 p., illus., 1925. The Cretaceous flora from Tennessee is described and discussed. It is compared with the Cretaceous flora of Georgia, mostly that from Houston and Marion Counties, which is in turn analyzed.
15. Eocene botany of our Gulf states: Pan-Amer. Geologist, vol. 47, p. 269-278, illus., 1927. A very general review of the Eocene history of the Coastal Plain shows the reasons why the paleobotanical material is distributed the way it is. Very little direct reference to the Georgia Coastal Plain is made, however.

16. [Charles] David White [1862-1935]: Amer. Jour. Science, 5th ser. vol. 29, p. 390-391, 1935.
17. Tertiary floras of eastern North America: Bot. Review, vol. 3, p. 31-46, 1937. A general review of the Tertiary flora of the North American Coastal Plain includes lists of known genera from the Eocene Claiborne and Jackson Stages in Georgia. No new data are included.

**BERRY, EDWARD WILLARD, 1900-**

1. The Pleistocene plant remains of the Coastal Plain of eastern North America: Palaeobotanist, vol. 1, p. 79-98, illus., Lucknow, 1952. A list of known Pleistocene plants is given, along with a brief abstract of their past and present distribution. An exposure along the Chattahoochee River is mentioned, as is an unidentifiable location.

**BERSHAD, SUZANNE F.**

1. (and Duncan, John Kenneth). Environmental conditions affecting the deposition of beach sands between Virginia and Florida [abs.]: Jour. Paleontology, vol. 30, p. 1009, 1956.

**BETHUNE, PIERRE DE.**

1. La physiographie de l'est des Etats Unis d' Amérique: Revue des questions scientifiques, 4th ser. vol. 22, p. 335-354, illus., Brussels, 1932. A very general review of the physiography of the eastern United States includes that of Georgia. No new data are included.

**BEURLEN, KARL.**

1. (and Lehmann, Ulrich). [Henry Fairfield] Osborn [1857-1935] und seine Stellung in der modernen Palaeontologie: Deutsche geologische Gesellschaft Zeitschrift, vol. 96, p. 229-236, Bonn, 1944.

**BEVAN, ARTHUR CHARLES, 1888-**

1. William Barton Rogers [1804-1882], first State Geologist of Virginia (1835-1841): Virginia Acad. Science Proc. 1934-35, p. 63-67, [1935].
2. Mineral resources of the South: Univ. Virginia News Letter, vol. 15, no. 16, p. 1, 1939. A review of southern mineral resources includes those in Georgia. No new data or details are included.
3. William Barton Rogers [1804-1882], pioneer American scientist: Scientific Monthly, vol. 50, p. 110-124, illus., 1940.
4. Roy Jay Holden, 1870-1945: Econ. Geology, vol. 41, p. 180-181, 1946.
5. Memorial to Charles Butts [1863-1946]: Geol. Soc. America Proc. 1947, p. 125-129, port., 1948.

**BIEDERMAN, C. A.**

1. Das nordliche Georgia (die georgische Schweiz) und seine Hulfsquellen. Ein wuenschenwerthes Ansiedelungserl fur thatige Landwirthe und Weinbauer auf Grundlage einiger Anschauungen und Einfahrungen dargestellt. 35 p., illus., Basel, Verlag des schweiz-amerikanische Landbureau, 1882.

   A prospectus for the sale of land in New Switzerland, Habersham Co., includes general, attractive descriptions of the geology and topography. It is made to sound like Valhalla here in Georgia.

BILLINGS, MARLAND PRATT, 1902-

1. (and Williams, Charles Regan). Origin of the Appalachian Highlands: Appalachia, vol. 19, (Appalachian Mountain Club Bull., vol. 25, no. 10) p. 1-33, illus., 1932. This is a popular account of the geology of the Appalachian Mountains. Those in Georgia are mentioned only as a part of the larger dimension, and no new data are included.

BIRKINBINE, JOHN, 1844-

1. The iron ores east of the Mississippi River: U. S. Geol. Survey Mineral Resources 1886, p. 39-103, 1887. Analyses of iron ore from Silurian rocks in northwestern Georgia are included in a very brief review of the occurrence of the ore.

BLACKWELDER, ELIOT, 1880-

1. United States of North America, *in* Handbuch der regionalen Geologie, vol. 8, part 2, 258 p., illus., Heidelberg, 1912; also reprinted *as* United States of North America, New York, G. E. Stechert, [1913]. A generalized review of the stratigraphy, structure, and economic geology of the United States includes Georgia. No details are included.
2. Bailey Willis [1857-1949]: Geol. Soc. London Quart. Jour., vol. 105, pt. 3, p. lvi-lviii, 1950.

BLAIR, WILLIAM FRANKLIN, 1912-

1. Distributional patterns of vertebrates in the southern United States in relation to past and present environments, [Chap.] 17 *in* Pt. 2, *of* Hubbs, Carl Leavitt, ed., Zoogeography: p. 433-468, illus., Amer. Assoc. Advancement Science, 1958. Evidence is shown by the distribution of modern and Pleistocene vertebrates, that the Pleistocene glaciation in the north forced certain animals to move southward, some into Georgia, where they now remain as relict populations.

BLAKE, WILLIAM PHIPPS, 1826-1910, *see also* Hitchcock, Charles Henry, 2, 3; Lumpkin Chestatee Fluming and Mining Co., 1; Marcou, Jules, 2; Nacoochee Hydraulic Mining Co., 1; Southern Gold Mining Co., 1.

1. On the parallelism between the deposits of auriferous drift of the Appalachian gold fields and those of California [abs.]: Amer. Jour. Science, 2d ser. vol. 26, p. 128, 1858.
2. Report upon the gold placers of a part of Lumpkin County, Georgia. . . . 39 p., illus., New York, J. F. Trow, 1858; also *in* Prospectus of the Chestatee Hydraulic Company, 39 p., New York, John F. Trow, 1858; also *in* Mining and Statistics Mag., vol. 10, p. 457-476, 1858. A description of gold occurring as residuum in the saprolite of the area is given. Gold also occurs as placers in the river as well as in gold-bearing quartz veins in mica schist. Hydraulic methods are proposed as a mining technique.

3. (and Jackson, Charles Thomas). (The) gold placers of the vicinity of Dahlonega [Lumpkin Co.] Georgia. Report . . . to the Yahoola River and Cane Creek Hydraulic Hose Mining Company. . . . 64 p., illus., Boston, 1859; in part, Mining Mag., 2d ser. vol., 1, p. 360-366, 1860. A description of the occurrence of gold in placer deposits is given. The gold's origin in quartz veins in mica schist is also described; hydraulic mining methods are recommended.

4. Contributions to the mineralogy and geology of Georgia, no. 1, Notices of some mineral localities, with remarks: Mining Mag., 2d ser. vol. 2, p. 76-80, 1860. The important minerals of many of the counties in the Piedmont and Blue Ridge are cursorily described. There is little more than a list of what he considers significant mineral species.

5. The Fields gold vein, [Lumpkin Co.] Georgia: Mining Mag., 2d ser. vol. 1, p. 480-481, 1860. A discussion of the reasons for the lack of mining in this mine is given. Gold occurs in quartz veins at the level of the Chestatee River. It is associated with tetradymite and other rare minerals.

6. Report on the Cherokee gold mine [Cobb Co.]: Mining Mag., 2d ser. vol. 1, p. 453-457, illus., 1860. Four gold-bearing, micaceous quartz veins in mica schist are described. Pyrite is also present. The problems associated with the mining engineering are discussed.

7. Report on the Hendricks gold lots, Lumpkin County, Georgia: Mining Mag., 2d ser. vol. 1, p. 457-461, illus., 1860. Placer and residual saprolite deposits of gold are described, as is the gold-bearing Hendricks Vein. Much emphasis is placed on the engineering problems of the vein-mining, with very little mineralogy included.

8. Report upon the property of the mining company called the "Auraria Mines of Georgia" situated in Lumpkin County, Georgia. 11 p., illus., Boston, [n.p.] 1860. An account of the occurrences of gold in placers, saprolite, and in quartz veins is given. All occurrences are south of Dahlonega. Much emphasis is placed upon the potential of hydraulically working the deposits with water from the local rivers.

9. Wood tin in [White Co.] Georgia [abs.]: Amer. Jour. Science, 3d ser. vol. 8, p. 392, 1874.

10. Notes and recollections concerning the mineral resources of northern Georgia and western North Carolina: Amer. Inst. Mining Engineers Trans., vol. 25, p. 796-811, 1896. This is a generalized review of the occurrence of gold, copper, and a few other less-important mineral resources. No new data are included.

**BLAKEMORE, PAGE B., JR.**

1. Minerals of the Ducktown Basin: Mineralogist, vol. 4, no. 8, p. 5-6, 28, 1936. A popular account is given of the variety of minerals which are to be found in the "Twenty One Mine" in Fannin Co. No details are given.

BLANK, EUGENE W.

1. Diamond finds in the United States: Rocks and Minerals, vol. 9, p. 147-150, 163-166, 179-182, 1934; vol. 10, p. 7-10, 23-26, 39-40, illus., 1935. A popular review of diamond occurrences includes cursory reference to those found in the placer deposits of the Piedmont of Georgia and neighboring states. No details are given.

BLOSS, FRED DONALD, 1920-

1. Geochemical prospecting in the southeastern states: Southeastern Geology, vol. 1, p. 33-38, illus., 1959. This is an exhortation for the use of various geochemical prospecting methods in the southeastern United States, including Georgia. The lack of glacial cover, deep weathering, and known potential are cited as being favorable factors for consideration.

BOARDMAN, LEONA, 1894-1957.

1. (and Brown, Annabel, and Watson, Elaine). Geologic map index of Georgia. Scale, 1 inch to 10 miles, U. S. Geol. Survey, 1949.

BODLE, RALPH ROBINSON, *see* Heck, Nicholas Hunter, 2.

BOESCH, HANS HEINRICH, 1911-

1. Zur Geologie des oestlichen Nordamerika: Eclogae Geologicae Helvetiae, vol. 32, p. 17-23, illus., Basel, 1939. A review of the geological history of the Appalachian Geosyncline includes that portion which was in Georgia. The relationships of the American orogenic phases to the orogenic phases of Europe are pointed out.

BONINI, WILLIAM EMORY, 1926- *see* Woollard, George Prior, 5.

BOONE, WILLIAM JEFFERSON, JR.

1. Helium-bearing natural gases of the United States . . . supplement to Bull. 486: U. S. Bur. Mines Bull. 576, 117 p. (‡), illus., 1958. Gas from a well in Decatur Co., from the Cretaceous Eutaw Sand, at a depth of 3005 feet, is analyzed. It contains, among other gases, 0.27 mol. percent helium.

BOUÉ, AMI, 1794-1881.

1. Carte géologique du globe terrestre. 1 broadside sheet, Paris, Andriveau—Goujon and Sons, 1843 [not seen]; Mémoire à l'appui d'une essai de carte géologique du globe terrestre . . . : Societé géologique de France Bull., 2d ser. vol. 1, p. 296-371, Paris, 1844.
2. The geological structure of the globe, with corrections and additions to 1855 by A. K. Johnston, Plate I *in* Physical atlas of natural phenomena, by Alexander Keith Johnston, new and enlarged ed., London and Edinburgh, William Blackwood and Sons, 1856; also a German edition *in* Berghaus' Physikalischer atlas, pl. 9, Stuttgart, Trautgott Bromme, 1856.

**BOUVÉ, THOMAS TRACY.**

1. [Echinoid from Baker Co.] [abs.]: Boston Soc. Natural Hist. Proc., vol. 2, p. 193, 1846; discussion by Louis Agassiz, p. 193; with title, *Pygorhynchus gouldii,* a new echinus from the millstone grit of [Baker Co.] Georgia: Amer. Jour. Science, 2d ser. vol. 3, p. 437, 1847; Annals and Mag. of Natural Hist., vol. 20, p. 142, London, 1847. This echinoid is described. It is probably from Oligocene rocks in Baker Co. It is illustrated in a later work, q.v.
2. [New species of echinoids from the Lower Tertiary rocks of Georgia]: Boston Soc. Natural Hist. Proc., vol. 4, p. 2-4, illus., 1851. Several echinoids are described and illustrated; no age or location are included, but they appear to be Oligocene.

**BOWDEN LITHIA SPRINGS.**

1. Bowden lithia water, and Georgia bromine lithia water. The American Carlsbad . . . , [Douglas Co.]. 32 p., illus., Lithia Springs, Ga., [priv. pub.] [1889?]; 2d ed., New York, 1891. A riotous account of the healthful aspects of this spring and spa include analyses which show the lithium and bromine content to be unusually high.

**BOWEN, BOONE MOSS, JR.,** 1933- *see* Edgerton, J. H., 1.

**BOWLES, EDGAR OLIVER,** 1911- *see also* Gardner, Julia Anna, 5.

1. Eocene and Paleocene Turritellidae of the Atlantic and Gulf Coastal Plain of North America: Jour. Paleontology, vol. 13, p. 267-336, illus., 1939. Many species from many places throughout the Coastal Plain are described and illustrated.

**BOWLES, OLIVER,** 1877-1958.

1. The stone industries. 1st ed., xi, 519 p., illus., New York, McGraw-Hill Book Co., 1934; 2d ed., 519 p., 1939. The general principles of stone occurrence and use are discussed. A brief outline of occurrences in each state, of different types of stone, includes those from Georgia.
2. William Clifton Phalen [1877-1949]: Mining Engineering, vol. 1, no. 9, p. 65, 1949.

**BOWMAN, ISAIAH,** 1878-1950.

1. Forest physiography. xxii, 759 p., illus., New York, John Wiley and Sons, 1911. A discussion of the physiographic provinces of the United States includes those in Georgia. Much emphasis is placed upon the factors relating to soil formation.

**BOYD, WILLIAM BAXTER.**

1. Recovery of kyanite from north Georgia schist: Amer. Ceramic Soc. Bull., vol. 19, p. 461-463, illus., 1940. A description of the mining and milling techniques for kyanite in schist in the Piedmont and Blue Ridge include cursory descriptions of the deposits.

**BRADLEY, FRANK HOWE,** 1838-1879.

1. Geological chart [map] of the United States east of the Rocky Mountains. . . . Scale 1 inch to 105.5 miles and variable, New Haven, Punderson and Crisand, 1875; discussion, Amer. Jour. Science, 3d ser. vol. 12, p. 286-291, 1876. A shaded geological map is given. Tertiary and Cretaceous rocks are recognized in the Coastal Plain. The Piedmont is mapped as Paleozoic.
2. On the Silurian age of the southern Appalachians: Amer. Jour. Science, 3d ser. vol. 9, p. 279-288, 370-383, 1875. The metamorphic terrane of Georgia, north of a line parallel with, and 10 miles north of, the Chattahoochee River, and probably a little south of the line, are Silurian in age or younger. The unmetamorphosed Cambrian to Silurian section in eastern Tennessee is described and is compared to the metamorphosed stratigraphic sequence in the Blue Ridge and Piedmont areas. The Murphy marble is correllated with the Knox Dolomite, for example. Gross structural trends are described.

**BRADLEY, WILLIAM FRANK,** 1908-

1. The structural scheme of attapulgite: Amer. Mineralogist, vol. 25, p. 405-410, illus., 1940. X-ray diffraction patterns of attapulgite from Decatur County are used in determining the internal crystal structure of the mineral.

**BRANNER, GEORGE CASPER,** 1890-

1. Are our aluminum ore reserves adequate?: Mining and Metallurgy, vol. 22, p. 351-353, illus., 1941. A generalized review of the bauxite reserves of the southeastern states includes those of Georgia. Four hundred and fifty six thousand tons are estimated to remain in Georgia.

**BRANSON, CARL COLTON,** 1906-

1. Memorial to Charles Elijah Decker (1868-1958): Geol. Soc. America Proc. 1958, p. 123-126, port, 1959.

**BRANTLY, JOHN EDWARD,** *see also* Barrows, Harry H., 1.

1. (A) report on the limestones and marls of the Coastal Plain of Georgia: Georgia Geol. Survey Bull. 21, x, 300 p., illus. incl. geol. map, 1916. A general review of Cretaceous to Quaternary rocks includes measured sections and fossil lists. Individual occurrences of limestone and marl are then described; analyses are included.
2. Agricultural drainage in Georgia: Georgia Geol. Survey Bull. 32, xii, 122 p., illus., 1917. A discussion designed to point out the problems in draining swampy lands for agricultural use includes a general description of much of the swampy lands of Georgia.
3. Resumé of the geology of the Gulf Coastal Plain: Amer. Assoc. Petroleum Geologists Bull., vol. 8, p. 21-28, 1924. An extremely cursory description of the Coastal Plain rocks and related geological history, from Florida to Mexico, includes those of Georgia. Rocks of Cretaceous to Recent age are present.
4. Memorial, Harold Kurtz Shearer (1888-1946): Amer. Assoc. Petroleum Geologists Bull., vol. 30, p. 1315-1317, port., 1946.

**BRATTSTROM, BAYARD HOLMES, 1929-**

1. The fossil pit-vipers (Reptilia: Crotaliidae) of North America: San Diego Soc. Natural Hist. Trans., vol. 12, p. 31-46, illus., 1954. A monograph on the group includes a discussion of *Crotalus horridus* vertebrae which are reported from near Cartersville, Bartow County. They are Pleistocene.

**BRAUNSTEIN, JULES, 1913-**

1. Habitat of oil in eastern Gulf Coast, *in* Weeks, Lewis George, ed., Habitat of oil—a symposium, p. 511-522, illus., 1958; summary, with title, Eastern Gulf Coast oil and gas geology: World Oil, vol. 146, no. 7, p. 133-139, illus., 1958; Georgia Mineral Newsletter, vol. 12, p. 12-16, illus., 1959. A general discussion of the occurrence of petroleum in the southeastern Coastal Plain includes discussions of some of the major structural features of Georgia. In Georgia are to be found the Decatur Arch, the Peninsular Arch, the Suwanee Strait, and the Suwanee River Basin.

**BRAYLEY, EDWARD WEDLAKE,** 1773-1854, *see* Couper, John Hamilton, 2; Lyell, Charles, Jr., 2.

**BRAZEE, RUTLAGE J.**

1. (and Cloud, William K.). United States earthquakes 1957. v, 108 p., illus., U. S. Coast and Geod. Survey, 1959. The earthquake of April 23, 1957, with an intensity of V, is described. The epicenter was in Alabama but the quake was felt in western Georgia. Another quake, whose epicenter was in North Carolina, was felt in northeastern Georgia on November 24, 1957.

**BRENT, WILLIAM BONNEY.**

1. Toccoa quartzite and adjacent rocks in Stephens County, Georgia. M. A. Thesis, Cornell Univ., 1952.

**BREWER, WILLIAM HENRY, 1829-1910.**

1. John Wesley Powell [1834-1902]: Amer. Jour. Science, 4th ser. vol. 14, p. 377-382, 1902.

**BREWER, WILLIAM MARTEN,** *see also* King, Francis Plaisted, 1; Nitze, Henry Benjamin Charles, 1.

1. Mineral resources of Georgia—gold—manganese—iron ores—bauxite—mica—coal—pyrites—marble: Dixie, vol. 9, no. 10, p. 45-46, 1893. A review of the mineral resources of Georgia points out that Georgia was at one time first in gold production.
2. Bauxite . . . : Dixie, vol. 10, no. 8, p. 42-44; no. 9, p. 42-43, illus., 1894. A review of the occurrence, distribution, and origin of bauxite includes descriptions of the deposits in Floyd and Polk Counties. Bauxite occurs in the deeply weathered Knox Formation, the product of reaction of the clay with vertically-rising solutions.

3. (The) first gold mining camp in the United States [Dahlonega, Lumpkin Co.] . . . : Dixie, vol. 10, no. 12, p. 49-54, illus. incl. port. [on p. 41], 1894. An historical account of the development of the gold fields around Dahlonega includes much description of the occurrence of the gold and its mining.
4. Georgia gold fields—Cherokee, Paulding, and Carroll Counties—the Franklin, Latham, Bonner, and Clopton mines: Dixie, vol. 11, no. 1, p. 42, 1895. A few cursory remarks about these deposits are given. No new information is included.
5. Iron ores of the south . . . : Dixie, vol. 11, no. 12, p. 43-49, illus., 1895. A general survey of iron ore deposits includes very general descriptions of the residual deposits in Bartow County.
6. Mineral resources on the Southern Railway from Atlanta to Birmingham: Engineering and Mining Jour., vol. 60, p. 610-611, 1895. A general description of the mineral resources of the Piedmont area west of Atlanta is given. No new data are included. Granite and gold are the chief products.
7. Minerals of northwest Georgia. Iron ores—bauxite in the Paleozoic area—Coal Measures: Dixie, vol. 11, no. 5, p. 47-48; no. 6, p. 44-45; no. 8, p. 43-44, 1895. A cursory review of these mineral resources is given. No new data are included.
8. Talc in Georgia—Murray County's talc mines . . . : Dixie, vol. 11, no. 6, p. 44, 1895. An extremely brief description of the deposit is given.
9. (The) gold regions of Georgia and Alabama: Amer. Inst. Mining Engineers Trans., vol. 25, p. 569-587, 1896. This is a generalized review of the occurrence of gold in Georgia. While it deals extensively with mining problems and techniques, a little data about the gold ore is included. No new data are given, however.
10. (The) manganese ores of Georgia: Alabama Industrial and Scientific Soc. Proc., vol. 6, pt. 2, p. 72-78, 1896. A cursory description of the residual manganese ore in Bartow and Floyd Counties is given. Little new data are included.
11. Mineral resources along the line of the East Tennessee, Virginia, and Georgia Division of the Southern Railway: Engineering and Mining Jour., vol. 61, p. 65-66, 1896. A general discussion of the mineral resources of northwestern Georgia is included. No new data are present. Iron ore, bauxite, talc, and slate are the major products.
12. Further notes on the Alabama and Georgia gold fields: Amer. Inst. Mining Engineers Trans., vol. 26, p. 464-472, 1897. Scattered remarks about the occurrence of gold in Georgia are included. The low-grade gold ore is most commonly associated with the mica schist or garnet slate and basic igneous rocks. High-grade gold ore occurs in narrow quartz veins.
13. Gold fields of the south: Colliery Engineer, vol. 17, p. 333-335, illus., 1897. A cursory description of the gold mining areas of the Piedmont and Blue Ridge Provinces places some emphasis upon the engineering aspects. The metamorphic rocks containing the gold-bearing quartz veins are described.

14. Gold mining in [Haralson and Carroll Cos.] Georgia: Engineering and Mining Jour., vol. 63, p. 280, 1897. A brief description of the occurrence of the gold in quartz veins in metamorphic rocks in the Tallapoosa and Villa Rica Districts is given along with much engineering data.

15. (The) Villa Rica mining district of [Carroll Co.] Georgia: Engineering and Mining Jour., vol. 63, p. 483, 1897. The gold occurs in a quartz vein in granite and in metamorphic-rock saprolite. Most of the article deals with development progress.

BREWSTER, EDWIN TENNEY, 1866-

1. Life and letters of Josiah Dwight Whitney [1819-1896]. 411 p., port., Boston, 1909.

BREZINA, ARISTIDES, i.e., MARIA ARISTIDES SEVERIN FERDINAND, 1848-1909.

1. Vorlaufiger Bericht ueber neue oder wenig bekannte Meteoriten: Akademie der Wissenschaften Wien Math.-Naturwissenschaftliche Klasse Sitzungsberichte, vol. 82, abt. 1, p. 348-352, 1880. A brief description of the Whitfield Co. meteorite is given; the text indicates that a meteorite from Casey Co., Georgia, is also known, but this is probably an error for Casey Co., Kentucky.

2. (Die) Meteoritensammlung des k. k. mineralogischen Hofkabinetes in Wien am 1 Mai, 1885; K. k. geologische Reichsanstalt Jahrbuch 1885, vol. 35, p. 151-276, illus., Vienna, 1885; also separate, A. Holder, Vienna, 1885. A discussion of the physical and chemical classification of meteorites is followed by a brief discription of each of those in the museum. The museum contains fragments of the Monroe, Union, Cherokee, Stewart, Whitfield, Casey, Dalton, and Putnam County meteorites in its collection. The Casey County reference is probably an error for Casey County, Kentucky.

3. (and Cohen, Emil Wilhelm). (Die) Struktur und Zusammensetzung der Meteoreisen. . . . vol. 1, Lithosiderite und Octahedrite mit feinsten und feinen Lamellen. 6 p., illus. with heavy plates, Stuttgart, E. Schweizerbart'sche, 1886-1906. Illustrations of polished sections of the Putnam Co. siderite are included.

4. Neue Meteoriten des k. k. naturhistorischen Hofmuseums: K. k. geologische Reichanstalt Verhandlungen, vol. 13, p. 288-289, Vienna, 1887. Fragments of the Dalton, Whitfield Co., iron meteorite are described.

5. Ueber neuere Meteorite: Gesellschaft deutscher Naturforscher und Aertze Verhandlungen, [vol. 65], p. 158-167, Leipzig, 1893. A brief description of the Holland's Store, Chattooga Co., meteorite is given in a review of new finds for the ten years preceding the article.

6. (Die) Meteoritensammlung des k. k. naturhistorischen Hofmuseums am 1 Mai, 1895: K. k. Naturhistorischen Hofmuseums Annalen, vol. 10, p. 231-370, illus., Vienna, 1896. A discussion of the classification of meteorites is followed by a catolog of the museum. Brief data about each specimen are included. Fragments of the Putnam, Union, Cherokee, Stewart, Whitfield, Casey [= Bartow?], and Chattooga County meteorites are there. At the Tubingen museum are fragments of the Monroe and Union County meteorites. The Casey County reference is probably an error for Casey County, Kentucky.

**BRIDGE, JOSIAH,** 1890-1953, *see also* Yochelson, Ellis Leon, 1.

1. Bauxite deposits of the southeastern United States, *in* Snyder, Frank G., ed., Symposium on mineral resources of the southeastern United States, p. 170-201, illus., 1950. A generalized discussion of the occurrence of bauxite includes descriptions of those deposits in northwestern Georgia and in the Coastal Plain. A detailed explanation of the origin of the ore is given. All are thought to be Tertiary in age.
2. (and Berdan, Jean Milton). Preliminary correlation of the Paleozoic rocks from test wells in Florida and adjacent parts of Georgia and Alabama: U. S. Geol. Survey Repts. Open File 79, 8 p. (‡), illus., 1951; Assoc. Amer. State Geologists Guidebook, 44th Ann. Mtg., p. 29-38(‡), illus., Florida Geol. Survey, 1952. Fifty two deep wells, eleven of which are in southern Georgia, are mapped. The lithology and tentative Paleozoic correlation of the rocks at the bottom of each are given. All of the basement rocks encountered are clastic. The Paleozoic rocks appear to be in a great triangular area and are surrounded by crystalline rocks.

**BRILL, KENNETH GRAY, JR.,** 1910-

1. The Chattanooga earthquake of October 19, 1940 [abs.]: Tennessee Acad. Science Jour., vol. 16, p. 256, 1941.

**BRINDLEY, GEORGE WILLIAM,** 1905- *see also* Caillère, S., 1.

1. Fuller's earth from near Dry Branch [Twiggs Co.] Georgia, a montmorillonite-cristobalite clay: Clay Minerals Bull., vol. 3, p. 167-169, illus., London, 1957. X-ray analysis shows the Twiggs Clay to be composed of montmorillonite and cristobalite. An electron photomicrograph is included.

**BRITISH MUSEUM (NATURAL HISTORY).**

1. A guide to the collection of meteorites in the department of mineralogy. . . . 40 p., [London?], 1882. Fragments of meteorites from Putnam, Cherokee, Whitfield, Forsyth, and Stewart Counties are present in this collection. Only the weight of the fragment and date of fall are given.

**BROADHURST, SAM DAVIS.**

1. (and Teague, Kefton Harding). Halloysite in Chattooga County, Georgia: Georgia Mineral Newsletter, vol. 7, p. 56-61, illus., 1954. Halloysite, of unknown origin, occurs within the Armuchee Chert formation. It may be of sedimentary origin as it replaces the chert in part. It averages 28 inches thick. Sketch maps are included.

**BROBST, DONALD ALBERT,** 1925-

1. Barite resources of the United States: U. S. Geol. Survey Bull. 1072, p. iv, 67-130, illus., 1958. A general discussion of the geochemistry of barium and the nature of barite deposits is followed by a review of the residual barite deposits in the Cartersville District in Bartow County. No new data are included.

**BROECKER, WALLACE S.**

1. (and Kulp, John Laurence, and Tucek, Charles S.). Lamont natural radiocarbon measurements III [Brantley Co.]: Science, vol. 124, p. 154-165, 1956. Material from soil in Brantley County is dated. That from 17-20 inches deep is 1,150 years old, whereas that from 88-133 inches is 23,000 years old.

**BROKAW, ALBERT DUDLEY,** 1880-1966

1. (and Smith, Leon P.). Zonal weathering of a hornblende-gabbro [Troup Co.]: Jour Geology, vol. 24, p. 200-205, illus., 1916. Detailed petrographical and chemical analyses are given for fresh rock and the altered, or weathered surface. The transition is very sharp, which is unusual. The original rocks are Triassic diabase dikes.

**BROOKS, ALFRED HUISE,** 1871-1924, *see also* Hayes, Charles Willard, 13.

1. Memorial of Charles Willard Hayes [1859-1916]: Geol. Soc. America Bull., vol. 28, p. 81-123, port., 1917.

**BROOKS, WILLIAM KEITH,** 1848-1908.

1. Joseph Leidy [1823-1891]: Popular Science Monthly, vol. 70, p. 311-314, port., 1907.

**BROTZEN, FREDERIK.**

1. Joseph A[ugustine] Cushman [1880-1949]: Geologiska Foereningens i Stockholm Forhandlingar, vol. 71, p. 312, 1949.

**BROWN, ANNABEL,** *see* Boardman, Leona, 1.

**BROWN, CARL BARRIER,** 1910-

1. Rates of silting in representative reservoirs throughout the United States: Amer. Geophysical Union Trans., vol. 18, p. 554-557, 1937. Lloyd Shoals Reservoir, near Jackson, in Jasper County, is silting at the rate of .51 ft. per year. No other details are given.

**BROWN, EUGENE,** 1919- *see also* Thomson, Medford Theodore, 2.

1. (The) geochemistry of the groundwaters of northeastern Florida and southeastern Georgia. Ph.D. Thesis, Univ. Florida, 1952; Dissertation Abstracts, vol. 14, p. 2037, 1954.

**BROWN, HARRISON SCOTT,** 1917- *see* Goldberg, Edward D., 1.

**BROWN, ROLAND WILBUR,** 1893-1961, *see also* Cloud, Preston Ercelle, Jr., 1.

1. Edward Wilbur Berry [1875-1945]: Washington Acad. Science Jour., vol. 36, p. 31, 1946.
2. Nelson Horatio Darton [1865-1948]: Washington Acad. Science Jour., vol. 39, p. 114, 1949.

**BROWN, WILLIAM ROBERT.**

1. (and others). Magnetic reconnaissance, Dahlonega Special Quadrangle, Lumpkin County, Georgia, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 136-141, illus., 1953. Magnetite and hematite zones, conformable with the surrounding schists, are examined. They are structurally distorted but are worth more detailed investigation.

**BROWNE, JOHN ROSS,** 1821-1875.

1. (and Taylor, James Wickes). Georgia, *in* Reports upon the mineral resources of the United States. . . . p. 343-344, Washington, D.C., U.S. Treasury Dept., 1867. A cursory description of the gold deposits of Piedmont Georgia are included. No new details are given.

**BRUCE, GEORGE A.,** *see also* Barnes, Virgil Everett, 1.

1. Tektites in [Dodge and Irwin Cos.] Georgia: Gems and Minerals, no. 264, p. 22-23, 65-69, illus., 1959. This is a popular account of the origin and occurrence of the tektites found in Dodge and Irwin Counties. The name empirites is proposed. Nine specimens are known, and three others have been reported.

**BRUHL, PAUL T.**

1. Gold in McDuffie County, Ga.: Engineering and Mining Jour., vol. 110, p. 265, 1920. Gold occurs in quartz veins and in galena, pyrite, and chalcopyrite veins in metamorphic rocks. The gold is no doubt igneous in origin, and secondary enrichment is inconspicuous.

**BUCH, LEOPOLD VON, i.e., CHRISTIAN LEOPOLD,** 1774-1853.

1. Betrachtungen ueber die Verbreitung und die Grenzen der Kreide-Bildungen: Naturhistorischen Verein der preussischen Rheinlande und Westphalens Verhandlungen, vol. 5, p. 211-242, illus. incl. geol. map, Bonn, 1849. [not seen]
2. Ueber die Juraformation auf der Erdoberflaeche: Berg- und Huttenmanischer Zeitung, vol. 12, cols. 321-325, 341-345, 358-362, illus. incl. geol. map, Leipzig, 1853. [not seen]

BUCHER, WALTER HERMANN, 1888-1965.

1. Memorial to Nevin M[elancthon] Fenneman [1865-1945]: Geol. Soc. America Proc. 1945, p. 215-228, port., 1946.
2. Biographical memoir of Douglas Wilson Johnson, 1878-1944: Natl. Acad. Science Biog. Mem., vol. 24, p. 197-230, port., 1947.

BUCHNER, CHRISTIAN LUDWIG OTTO, 1828-1897.

1. (Die) Feuermeteore, insbesondere die Meteoriten, historisch und naturwissenschaftliche betrachtet. 192 p., Geissen, J. Riker'sche Buchhandlung, 1859. In a general treatise on meteorites, those from Union and Putnam Counties are cursorily described.
2. (Die) Meteoriten in Sammlungen . . . . xxvi, 202 p., Leipzig, Wilhelm Engelmann, 1863. A general treatise on meteorites includes descriptions and discussions of those from Monroe, Putnam, and Union Counties.

BUCK, CATHERINE LUTZ, *see* Twenhofel, William Stephens, 1.

BUCKLEY, STUART EDWARD, 1908-

1. (and Hocott, Claude Richard, and Taggart, Millard Seals, Jr.). Distribution of dissolved hydrocarbons in sub-surface waters, *in* Weeks, Lewis George, ed., Habitat of oil—a symposium, p. 850-882, illus., 1958. A discussion of the analytical techniques used is followed by a review of the results. Water from Cretaceous formations in southeastern Georgia contains no appreciable amount of dissolved hydrocarbons.

BUDDINGTON, ARTHUR FRANCIS, 1890-

1. Granite emplacement with special reference to North America: Geol. Soc. America Bull., vol. 70, p. 671-747, illus., 1959. Granite emplacements in general are classified. The Lithonia Gneiss and the Stone Mountain Granite from DeKalb County are examples of plutons emplaced in the mesozone [moderate depth] but which contain catazone [deep] features.

BUERGER, MARTIN JULIAN, 1903-

1. Memorial of Waldemar Lindgren [1860-1939]: Amer. Mineralogist, vol. 25, p. 184-188, port., 1940.

BUNCE, ELIZABETH T., *see* Hersey, John Brackett, 1.

BURCHARD, ERNEST FRANCIS, 1875-1961. *see also* Pallister, Hugh Davidson, 3; Thoenen, John Roy, 1; Watson, Thomas Leonard, 13.

1. Notes on various glass sands, mainly undeveloped: U. S. Geol. Survey Bull. 315, p. 377-382, 1907. Sand from the Savannah River, location not given, but probably from the Coastal Plain, is being used to make glass bottles. Both clear and milky quartz make up the angular sand.

2. Southern red hematite as an ingredient of metallic paint: U.S. Geol. Survey Bull. 315, p. 430-434, 1907. Exposures of the hematite-bearing rocks of the [Red Mountain Formation] are described as possible sources of paint-color ore. Dade County is the chief source of the material.
3. Tonnage estimates of Clinton iron ore in the Chattanooga region of Tennessee, [northwestern] Georgia, and Alabama: U.S. Geol. Survey Bull. 380, p. 169-187, 1909. Several exposures of the ore in the Red Mountain Formation are examined, all within 80 miles of Chattanooga. Well over 40 million tons of ore are still in the ground in northwestern Georgia.
4. Glass sand, other sand, and gravel: U.S. Geol. Survey Mineral Resources 1909, pt. 2, p. 519-542, 1911; . . . Mineral Resources 1911, pt. 2, p. 585-638, 1912. Analyses of sand from Bartow, Muscogee, and Walker Counties are given.
5. . . . Georgia . . . , *in* Stone: U.S. Geol. Survey Mineral Resources 1911, pt. 2, p. 827-831, illus., 1912. Little detail is included, but a map shows the distribution of sources of stone in the state. Most stone sources are in the northwestern part and in the Piedmont.
6. Preliminary report on the red iron ores of . . . northwest Georgia: U.S. Geol. Survey Bull. 540, p. 279-328, illus., 1914; summary, U.S. Geol. Survey Mineral Resources 1912, pt. 1, p. 180-190, 1913. Various exposures of hematite-bearing rocks are described. The iron occurs in Ordovician sandstone and in the [Red Mountain Formation]. Analyses are given.
7. Iron ore resources of the south: Manufacturer's Record, vol. 86, no. 24, pt. 2, The South's Development, p. 283-289, illus. incl. port., 1924. A general review of the occurrence of iron ore in Silurian rocks includes brief mention of that in Georgia. Little new is included except analyses.
8. Memorial of George Irving Adams [1870-1932]. Geol. Soc. America Bull., vol. 44, pt. 2, p. 288-301, port., 1933.
9. Memorial to William Clifton Phalen [1877-1949]: Geol. Soc. America Proc. 1949, p. 213-216, port., 1950.

**BURDICK, GLENN A.**

1. (and Straley, H. W., 3d). Needed geochemical and geo-physical studies in the Waycross-Valdosta area [abs.]: Georgia Acad. Science Bull., vol. 17, p. 74, 1959.

**BURFOOT, JAMES DABNEY, JR.**, 1896-

1. The barite deposits of the southern Appalachian states. M.S. Thesis, Univ. Virginia, 1925.

**BURGESS, BLANDFORD CORNEILOUS**, 1893-1959, *see also* Warriner, Lendall P., 1.

1. The Tuscaloosa kaolins of Georgia, *in* Proceedings of the southeastern mineral symposium 1950: Kentucky Geol. Survey, ser. 9, Spec. Pub. 1, p. 69-87, illus., 1953. A very generalized review of the nature and occurrence of the clay is included with a discussion of the production processes, and marketing aspects. No new details are included.

BURNS, JAMES AUSTIN.

1. An outline of the structural, surface, and economic geology of northern [!northwestern] Georgia: Dixie, vol. 8, p. 640-643, 896-899, illus., 1892; also separate, 22 p., Atlanta, Constitution Book and Job Print, 1887. A cursory geological description and review of the region is given. Precambrian to Pennsylvanian rocks are described, as are the mineral resources associated with each system.

BUTLER, ARTHUR PIERCE, JR., 1908-

1. The Geological Survey's work on the geology of uranium and thorium deposits: U. S. Geol. Survey Trace Elements Investigations 207, 26 p., illus., 1952. A general discussion about the occurrence of radioactive materials includes maps showing the places that have been examined by geologists of the U.S. Geological Survey. Georgia has been extensively investigated.

BUTLER, BERT SYLVENUS, 1877-1960.

1. Memorial to Waldemar Lindgren [1860-1939]: Geol. Soc. America Proc. 1949, p. 177-196, port., 1950.

BUTTS, A. G.

1. Map of the State of Georgia . . . . Scale, 1 inch to 5 miles, Macon, Georgia, 1882. The locations of some mineral resources are noted on an otherwise political map.

BUTTS, CHARLES, 1863-1946.

1. Contributions to the black shale problem [abs.]: Geol. Soc. America Bull., vol. 24, p. 113, 1913.
2. Memorial of Eugene Allen Smith [1841-1927]: Geol. Soc. America Bull., vol. 39, p. 51-65, port., 1928.
3. Variations in Appalachian stratigraphy: Washington Acad. Science Jour., vol. 18, p. 357-380, illus., 1928. A general discussion of facies changes, both formational and systematic, includes many examples from the Paleozoic terrane of northwestern Georgia. Local movements within the Appalachian Geosyncline during the Paleozoic Era are cited as the major causes of the variations.
4. (and Gildersleeve, Benjamin). Geology and mineral resources of the Paleozoic area in northwest Georgia: Georgia Geol. Survey Bull. 54, xii, 176 p., illus. incl. geol. map, 1948. A complete geological description of the area is given. Cambrian-Pennsylvanian rocks are described and mapped. Folds and thrust faults are the major structures. Sections are measured; fossils are listed and illustrated; analyses are given. Iron, barite, and stone are the chief mineral resources. Bauxite, bentonite, cement, clay, coal, fluorite, halloysite, manganese, ochre, potash, and others are also discussed.

BUZARDE, LAVERNE ERNEST, JR., 1933-

1. A study of Upper Ordovician Bryozoa by zones [northwestern Georgia]. M. S. Thesis, Emory Univ., 1956.

C.—, J. M.

1. Waldemar Lindgren [1860-1939]: Sociedad nacional de Mineria Bol. Minero, año 46, no. 477, p. 5-8, port., Santiago de Chile, 1940.

CAHN, ALVIN ROBERT, 1892-

1. Records and distribution of the fossil beaver *Castoroides ohioensis:* Jour. Mammalogy, vol. 13, p. 229-241, illus., 1932; addition with title, Further notes on the giant beaver, vol. 17, p. 66-67, 1936. Reference is made, in a list, to the occurrence of incisor teeth of this animal from along the Savannah River, in Chatham County.

CAILLÉRE, SIMONNE.

1. (and Hénin, Stéphane). Palygorskite—attapulgite, Chap, 9 *of* X-ray identification and crystal structures of clay minerals, George William Brindley, ed., p. 234-243, illus., London, Mineralogical Society, 1951. Crystallographic details, and chemical and x-ray data are used to show that these two minerals, one much developed in Decatur Co., are the same.

CAIN, ANDREW W.

1. Gold in the history of Lumpkin County, Chap. 6 *in* History of Lumpkin County . . . , p. 92-118, incls. port. of Matthew F. Stephenson, Atlanta, Stein Printing Co., 1933. An historical resumé of the gold mining operations around Dahlonega is given. There is little geological data however.

CALHOUN, FRED HARVEY HALL, 1873-1959.

1. Memorial of Patrick Hues Mell [Jr.] [1850-1918]: Geol. Soc. America Bull., vol. 30, p. 43-57, port., 1919.
2. Geological resources [along the] Seaboard Airline Railway Territory. 51 p., illus., [Savannah?], Seaboard Airline Railway, 1925. A general description of the mineral resources along the railroad area is given. No geological data are included. Some analyses are given. The whole of Georgia is included.
3. Origin of the pink granite in the Elberton, [Piedmont] Georgia batholith [abs.]: Geol. Soc. America Proc. 1934, p. 441, 1935.

CALLAHAN, JAMES EMMETT, 1933-

1. (A) petrographic study of some Silurian and Mississippian sediments southeast of Ringgold, [Catoosa Co.] Georgia [abs.]: Georgia Acad. Science Bull., vol. 14, p. 40, 1956.
2. (The) structure of Houston Valley [Catoosa Co.]. M.S. Thesis, Emory Univ., 1956.

CALLAHAN, JOSEPH THOMAS, 1922-

1. Georgia's ground water resources: Georgia Mineral Newsletter, vol. 10, p. 94-95, illus., 1957. This is a popular account of the occurrence of ground water in Georgia. No new data are included.

2. Ground water in Floyd County, Georgia: Georgia Mineral Newsletter, vol. 11, p. 16-18, 1958. The various rocks which produce ground water in the county are described. Springs are described and the water analyzed. The dolomite in the Knox Formation is the best water source.

3. Large springs in northwestern Georgia: Georgia Mineral Newsletter, vol. 11, p. 80-86, illus., 1958. Over one hundred springs issuing from the Paleozoic rocks of the region are located. Tables show temperature and flowage. Some are analyzed; some flow over 2000 gallons per minute.

4. (and Stewart, Joseph William). Geologic and hydrologic properties of weathered crystalline rocks in the Piedmont of [Dawson Co.] Georgia [abs.]: Geol. Soc. America Bull., vol. 70, p. 1758-1759, 1959.

5. Ground-water investigations add to our knowledge of Georgia [abs.]: Georgia Acad. Science Bull., vol. 17, p. 75-76, 1959.

6. Is the water table falling?: Georgia Mineral Newsletter, vol. 12, p. 9-11, illus., 1959. A generalized description of the origin of the water table includes many graphs and charts relating to Georgia. The question is not answered.

7. Jekyll Island [Glynn Co.]—its geology and water resources: Georgia Mineral Newsletter, vol. 12, p. 33-39, illus., 1959. A popular account of the geology of the island includes a discussion of its water supply which is artesian and which is from Eocene limestone over 500 feet below the surface.

CALVER, JAMES LEWIS, 1913- *see also* Furcron, Aurelius Sydney, 13.

1. The fuller's earth industry in the Georgia-Florida district: Georgia Mineral Newsletter, vol. 9, p. 37-44, illus., 1956. A popular survey of the nature and occurrence of fuller's earth includes descriptions of those deposits in Decatur County. No new data are included.

CAMP, CHARLES LEWIS, 1893-

1. (and Vanderhoof, Vertress Lawrence). Annotated bibliography of William Diller Matthew, *in* Climate and evolution, by William Diller Matthew: New York Acad. Science Spec. Pub., vol. 1, p. 201-223, 1939.

CAMPBELL, JOHN LYLE, 1818-1886.

1. (and Ruffner, William Henry). A physical survey from Atlanta, Ga. . . . , to the Mississippi River along the line of the Georgia Pacific Railway . . . . 147 p., illus., E.F. Weeks, New York, 1883. An outline of the geology, topography, and mineral resources is given. Only Archean [Pre-Cambrian] and Silurian to Devonian rocks are along the route in Georgia. They are cursorily described.

**CAMPBELL, MARIUS ROBINSON**, 1858-1940, *see also* Hayes, Charles Willard, 5, 15; LaForge, Lawrence, 3; Parker, Edward Wheeler, 1.

1. Drainage modifications and their interpretations: Jour. Geology, vol. 4, p. 567-581, 657-678, illus., 1896. A general treatise on geomorphic interpretation of streams includes an example from Georgia. The peculiar shape of the Chattahoochee River drainage basin above Columbus is due to the migration of the southern divide caused by the southeastward flowing streams' headward erosion. The course of the stream is due also, in part, to the influence of downwarping which took place during Triassic time.
2. [Map of] Coal fields of the United States, Scale, 1: 7,000,000, with explanation, Washington, D.C., U.S. Geol. Survey, 1908.
3. David Talbot Day [1859-1925]: Amer. Inst. Mining and Metallurgical Engineers Trans., vol. 71, p. 1071-1073, port., 1925; Mining and Metallurgy, vol. 6, p. 302-304, port., 1925.
4. The coal fields of the United States, general introduction: U.S. Geol. Survey Prof. Paper 100, p. 1-35, illus., 1929. A very generalized account of the coal fields of the United States includes those in northwestern Georgia. Analyses of coal from Dade Co. is included.

**CANNON, L. C.**

1. Gold mining in the Piedmont belt: Products of the Piedmont, vol. 1, Spartanburg, South Carolina, 1895 [not seen].

**CANRIGHT, JAMES EDWARD.**

1. History of paleobotany in Indiana [Leo Lesquereux, 1806-1889]: Indiana Acad. Science Proc. 1957, vol. 67, p. 268-273, illus., 1958.

**CANU, FREDINAND**, 1863-1932.

1. (and Bassler, Ray Smith). A synopsis of American early Tertiary cheilostome Bryozoa: U.S. Natl. Museum Bull. 96, 87 p., illus., 1917. Eocene Bryozoa from especially Crawford and Decatur Cos., but also elsewhere in the state, are described and illustrated.
2. (and Bassler, Ray Smith). North American early Tertiary Bryozoa: U.S. Natl. Museum Bull. 106, 879 p., illus. incl. vol. of plates, 1920; discussion with title, Notes on fossil and Recent Bryozoa, by Ray Smith Bassler: Washington Acad. Science Jour., vol. 24, p. 404-408, 1934. Paleocene Bryozoa from the Midway Stage in Clay Co., and Upper Eocene Bryozoa from many places in Georgia, are described and illustrated.

**CAPPEL, HOWARD NOBLE, JR.**, 1932-

1. A study of Lower Ordovician Bryozoa in northwest Georgia. M.S. Thesis, Emory Univ., 1957.

**CARLSTON, CHARLES WILLIAM**, 1912-

1. Notes on the early history of water-well drilling in the United States: Econ. Geology, vol. 38, p. 119-136, illus., 1943. An extremely brief history of artesian well drilling on the Coastal Plain is included. In 1881, the first artesian well was drilled near Albany, Dougherty County.

2. Superposed streams of the Atlantic and east Gulf slope [abs.]: Geol. Soc. America Bull., vol. 59, p. 1314-1315, 1948.

CARROLL, DON LLEWELLYN, 1902-1954.

1. Southeast Georgia—north Florida area getting big exploration play: Oil Weekly, vol. 112, no. 2, p. 46-50, illus., 1943. A very generalized description of Cretaceous to Cenozoic rocks of the area is given. No new data are included.

CARSEY, J. BEN.

1. Geology of the Gulf Coastal area and continental shelf: Amer. Assoc. Petroleum Geologists Bull., vol. 34, p. 361-385, illus., 1950. A general review of the structure and stratigraphy of the Coastal Plain includes that part which is in Georgia. No new data are included.

CARTER, GEORGE FRANCIS, *see* Wright, John Kirtland, 2.

CARTER, ROLAND W.

1. (and Herrick, Stephen Marion). Water resources of the Atlanta metropolitan area: U.S. Geol. Survey Circ. 148, 19 p., illus., 1951. A detailed hydrologic survey of the area includes a discussion of the ground water potential, which is considerable.

CASE, ERMINE COWLES, 1871-1953.

1. [Edward Drinker] Cope [1840-1897]—the man: Copeia, no. 2., p. 61-65, illus. incl. port., 1940.

CASWELL, ALEXIS, 1799-1877.

1. Memoir of Benjamin Silliman, Sr., 1779-1864: Natl. Acad. Science Biog. Mem., vol. 1, p. 99-112, 1877.

CATHCART, JAMES BATCHELDER, 1917- *see also* McKelvey, Vincent Ellis, 2.

1. Drilling of airborne radioactivity anomalies in Florida, Georgia, and South Carolina—1954: U.S. Geol. Survey Repts. Open File 291, 10 p.(‡), illus., [1954]. The Altamaha River drainage area, which showed a bit higher count in a radioactivity survey, was drilled by three holes; none showed radioactivity indications above the background count.

CATLETT, CHARLES, *see also* Watson, Thomas Leonard, 9.

1. [Discussion of] A new theory of the genesis of brown hematite ores; and a new source of sulphur supply, by Henry Martyn Chance: Amer. Inst. Mining Engineers Bull., vol. 24, p. 1179-1183, 1908. Evidence from the Cartersville area in Bartow Co. is cited to support the idea that the source of the iron in the residuum of the area was originally from carbonate minerals rather than sulphide minerals as proposed by Chance, who used data from other areas for his theory.

**CAVE, HAROLD SERGIUS,** 1895- *see also* Prettyman, Thomas Mann, 1.

1. Historical sketch of the Geological Survey of Georgia. Bibliography, and other data: Georgia Geol. Survey Bull. 39, [vi], 154 p., illus., 1922. A detailed account of the history of the Survey from 1792, with Bartram's obsevations, to 1922 is given. An indexed bibliography is also included.

**CAZEAU, CHARLES J.**

1. (The) size, distribution and character of the sediments carried by the Chattahoochee River in the State of Georgia. M.S. thesis, Florida State Univ., 1955.
2. (and Lund, Ernest Howard). Sediments of the Chattahoochee River, Georgia-Alabama: Southeastern Geology, vol. 1, p. 51-58, illus., 1959. Samples from the headwaters of the river, to Florida, are analyzed. The average diameter decreases downstream; sorting improves downstream, and the river sands are generally unimodal. Mineralogical analyses are included.

**CENTRAL OF GEORGIA RAILWAY INDUSTRIAL DEVELOPMENT DEPT.**

1. Map of kaolin, refractory clay, bauxite, [in the] western portion [of] Washington County, Georgia. Scale 1 inch to 1 mile, Savannah, [nd].

**CHAMBERLIN, ROLLIN THOMAS,** 1881-1948.

1. Richard Alexander Fullerton Penrose, Jr., 1863-1931: Jour. Geology, vol. 39, p. 756-760, port., 1931.

**CHAMBERLIN, THOMAS CHROWDER,** 1843-1928.

1. Charles Richard Van Hise, 1857-1918: Jour. Geology, vol. 26, p. 690-697, 1918.
2. Biographical memoir of Charles Richard Van Hise, 1857-1918: Natl. Acad. Science Biog. Mem., vol. 17, p. 143-151, port., 1924.
3. The work of [Charles Doolittle] Walcott [1850-1927]: Jour. Geology, vol. 35, p. 670, 1927.

**CHAMBERLIN, WILLIS A.** *see* Wright, Frank James, 3.

**CHANCE, HENRY MARTYN,** *see* Catlett, Charles, 1.

**CHANCEY, C. N.,** *see* Furcron, Aurelius Sydney, 43.

**CHAPMAN, ASHTON.**

1. Gem stones of the Appalachians: Nature Mag., vol. 44, p. 21-24, illus., 1951. A popular account of the occurrence of gems includes casual references to those found in Georgia. No new data are included.

**CHAPMAN, EDWARD JOHN,** 1821-1904.

1. On the klaprothine or lazulite of North Carolina: Canadian Jour., new ser. vol. 6, p. 363-368, illus., 1861; correction, p. 455-456, 1861. Lazulite from Lincoln County is described chemically and crystallographically. He is in error in thinking it from North Carolina and in being the first occurrence from North America. The correction rectified this.

CHAPMAN, HENRY CADWALADER, 1845-1909.

1. The life and work of Joseph Leidy [1823-1891]: Science, new ser. vol. 26, p. 812-814, 1907.

CHAPMAN, H. H., *see* Pallister, Hugh Davidson, 3.

CHAPMAN, JOSEPH ROY, 1898-1957.

1. Georgia hyalite opal [DeKalb Co.]: Mineralogist, vol. 7, p. 184, 1939. A popular account of the occurrence of hyalite in the quarry at Stone Mountain is given. It occurs in seams in joints.
2. Case Cave, Dade County, Georgia: Georgia Mineral Soc. Newsletter, vol. 2, no. 4, p. 18-21 (‡), illus., 1949. A popular account of this large cave is given.
3. Horseshoe Cave, Walker County: Georgia Mineral Soc. Newsletter, vol. 2, no. 2, p. 13-15 (‡), illus., 1949. A brief description of the cave is given.
4. Saltpeter Cave, Bartow County: Georgia Mineral Soc. Newsletter, vol. 2, no. 3, p. 10-12 (‡), illus., 1949. A brief, popular account of this large cave near Kingston is given.
5. The caves of Georgia: Georgia Mineral Soc. Newsletter, vol. 4, p. 111-112 (‡); Part 2, p. 156-157 (‡), illus.; Part 3, p. 192-193 (‡), illus.; correction, vol. 5, p. 84; Part 4, p. 225-226 (‡), illus., 1951; Part 5, vol. 5, p. 15-16 (‡), illus.; Part 6, p. 51-52 (‡), illus.; Part 7, p. 83-84 (‡), illus.; Part 8, p. 116-117 (‡), illus.; [Part] 9, p. 161-162 (‡), illus.; [Part] 10, p. 191-192 (‡), illus., 1952. Cursory, popular descriptions of many caves from around the state are given. Most are in northwestern Georgia.

CHATARD, THOMAS MAREAN, 1848- *see also* Clarke, Frank Wigglesworth, 1.

1. Altered feldspar from Laurel Creek [Rabun Co.], Ga., *in* Report of work done in the division of chemistry and physics . . . 1885-86: U. S. Geol. Survey Bull. 42, p. 138, 1887. A single analysis is included.

CHELIKOWSKY, JOSEPH RUDOLPH, 1907-

1. Geologic distribution of fire clays in the United States: Amer. Ceramic Soc. Jour., vol. 18, p. 367-390, 1935. Fire clay occurs in the Paleocene Midway Formation and the Cretaceous Tuscaloosa Formation on the Coastal Plain; it occurs as residual clay in the Paleozoic terrane of northwestern Georgia. A small amount is known from the weathering of pegmatites in the Piedmont also. No details are given.

CHENEY, MONROE GEORGE, 1893-1952.

1. Gilbert D[ennison] Harris: Amer. Assoc. Petroleum Geologists Bull., vol. 19, p. 922, 1935.
2. Elias Howard Sellards, honorary member [A.A.P.G.]: Amer. Assoc. Petroleum Geologists Bull., vol. 30, p. 735-736, port., 1946.

**CHILDS, ROSS RENFROE.**

1. Some soils of Georgia, their origin and physical properties. M.S. Thesis, Univ. Georgia, 1913.

**CHRISTIAN, SCHUYLER MEDLOCK.**

1. A sketch of the history of science in Georgia: Georgia Review, vol. 2, p. 415-427, 1948; vol. 3, p. 57-69, 1949. An historical, biographical sketch of several Georgia geologists is included; among them is James Hamilton Couper.

**CHRISTY, DAVID, 1802-**

1. Letters on geology . . . . 68 p., 11 p., illus., Rossville, Ohio, J. M. Christy, 1848. These are published letters written by a traveller to a person in Cincinnati, describing the geology and mineral resources of various places, some being in Georgia. Very cursory descriptions of the area between Augusta and Sandersville are included. His observations are very good.

**CIZANCOURT, MARYA DE,** *see* Cole, William Storrs, 2.

**CLARK, FRANK RINKER, 1881-**

1. Horace Gardiner Richards, recipient of President's Award [A.A.P.G.]: Amer. Assoc. Petroleum Geologists Bull., vol. 30, p. 736-738, port., 1946.

**CLARK, LORIN DELBERT, 1918-**

1. Guide to prospecting in Springvale Bauxite District [Randolph Co.] Georgia. Map, scale 1 inch to 1 mile, text on map, U.S. Geol. Survey Strategic Minerals Investigations Prelim. Map, 1943.

**CLARK, THOMAS HENRY, 1893-**

1. Charles Schuchert—1858-1942; Canadian Field-Naturalist, vol. 57, nos. 2-3, p. 47-48, Ottawa, 1943.

**CLARK, WILLIAM BULLOCK, 1860-1917.**

1. Correlation papers—Eocene: U. S. Geol. Survey Bull. 83, 173 p., illus., 1891. Generalized descriptions of the Eocene [and Paleocene] rocks of the Coastal Plain are given. Correlations with adjacent states are made. No new data are included.
2. Memorial of George Huntington Williams [1856-1894]: Geol. Soc. America Bull., vol. 6, p. 432-440, port., 1895.
3. (and Twitchell, Mayville William). The Mesozoic and Cenozoic Echinodermata of the United States: U. S. Geol. Survey Mon. 54, 341 p., illus., 1915. Many echinoids, one from the Cretaceous Ripley Formation in Clay Co., and the rest from Eocene and Oligocene rocks in many other Coastal Plain counties, are described and illustrated.
4. (and Berry, Edward Wilbur, and Gardner, Julia Anna). Correlation of the Upper Cretaceous formations, *in* Upper Cretaceous, vol. 1, p. 315-341, illus., Maryland Geol. Survey, 1916. A general discussion of the Upper Cretaceous beds of Maryland and those of elsewhere around the Atlantic Coast and the world include discussions of the Georgia Cretaceous, especially in relation to its paleontology.

**CLARKE, FRANK WIGGLESWORTH**, 1847-1931.

1. (and Chatard, Thomas Marean). Margarite, no. 5 *of* Mineralogical notes from the laboratory of the U. S. Geological Survey: Amer. Jour. Science, 3d ser. vol. 28, p. 22, 1884. Margarite, from Soapstone Hill, near Gainesville in Hall County, is described and analyzed.
2. Miscellaneous analyses, *in* Report of work done in the division of chemistry and physics . . . 1886-87: U. S. Geol. Survey Bull. 55, p. 77-93, 1889. Analyses of ground water from artesian wells from several places on the Coastal Plain are included.
3. Report of work done in the division of chemistry and physics . . . 1890-91: U. S. Geol. Survey Bull. 90, 77 p., illus., 1892. Marble from Happy Valley, Catoosa Co., is analyzed.
4. Analyses of rocks . . . 1880-1896: U. S. Geol. Survey Bull. 148, 306 p., 1897; . . . 1880-1899, Bull. 168, 308 p., 1900; . . . 1880-1903, Bull. 228, 375 p., 1904; . . . rocks and minerals . . . 1880-1908, Bull. 419, 324 p., 1910; . . . 1880-1914, Bull. 591, 376 p., 1915. These are cumulative. That is, the last contains all the data of the others. Chemical analyses for meta quartz diorite from Gordon Co., augite-microcline granite from Bartow Co., quartz gabbro from Cherokee Co., marble and black shale from Walker Co., and clay from Richmond Co. are included. Analyses of the meteorites from Cherokee and Chattooga Cos. are also present.
5. Mineralogical work [of Joseph Leidy, 1823-1891]: Acad. Natural Science Philadelphia Proc., vol. 75, appendix, p. 49-52, 1924.

**CLARKE, JAMES WOOD**, 1922-

1. Geology and mineral resources of the Thomaston quadrangle, [Upson, Talbot, Pike, Lamar Cos.] Georgia: Ph.D. Thesis, Yale Univ., 1950; Georgia Geol. Survey Bull. 59, x, 99 p., illus. incl. geol. map, 1952. A complete geologic description of the area is given. All the rocks are metamorphic and are considered Precambrian (?). Much faulting also characterizes the area. Mica, graphite, iron ore, sand and gravel, and kyanite are the mineral resources present.

**CLARKE, JOHN MASON**, 1857-1925, *see also* Hall, James, 4.

1. George Huntington Williams [1856-1894]: Amer. Geologist, vol. 15, p. 69-81, port., 1895.
2. James Hall [1811-1898]: New York Univ. Regents Bull. 48, p. 382-385, 1899.
3. Memorial of William Bullock Clark [1860-1917]: Geol. Soc. America Bull., vol. 29, p. 21-29, port., 1918.
4. Biographical memoir of William Bullock Clark, 1860-1917. Natl. Acad. Science Biog. Mem., vol. 9, p. 3- 18, port., 1919.
5. A great American geologist of the last century, Professor James Hall (1811-1898): Geological Mag., vol. 57, p. 483-486, port., London, 1920.
6. James Hall of Albany, geologist and paleontologist, 1811-1898. 565 p., illus. incl. ports., Albany, New York, [priv. pub.?], 1921; reprinted 1932.

**CLEAVELAND, PARKER,** 1780-1858.

1. An elementary treatise on mineralogy and geology . . . . 2 vols., 668 p., illus. incl. geol. map, Boston, Cummings and Hilliard, 1816; 2d ed., 1822. A discussion of the origin, classification, and distribution of minerals includes a geological map of the United States which includes Georgia.

**CLEMENT, WILLIAM GILBERT,** 1922-

1. Pre-Pennsylvanian stratigraphy of the west half of the Durham Quadrangle [Dade Co.]. M.S. Thesis, Emory Univ., 1952.

**CLOUD, PRESTON ERCELLE, JR.,** 1912-

1. (and Brown, Roland Wilbur). Early Cenozoic sediments in the Appalachian region [Polk Co.] [abs.]: Geol. Soc. America Bull., vol. 55, p. 1466, 1944.

**CLOUD, WILLIAM K.,** *see* Brazee, Rutlage J., 1.

**COBBAN, WILLIAM AUBREY,** 1916-

1. John Bernard Reeside, Jr. (1889-1958): Amer. Assoc. Petroleum Geologists Bull., vol. 43, p. 2530-2533, port., 1959.

**COFER, HARLAND ELBERT, JR.,** 1922- *see also* Peyton, Alexander L., 2.

1. Petrology, petrography, mineralogy, and structure of the Arabia Mountain Gneiss, DeKalb County, Georgia. M.S. Thesis, Emory Univ., 1948.
2. The association of pegmatites and garnet inclusions in Lithonia Granite Gneiss [DeKalb Co.] [abs.]: Georgia Acad. Science Bull., vol. 7, no. 1, p. 22, 1949.
3. Cenozoic fossils in a conglomerate interstratified with Paleozoic rocks [Polk Co.], *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 200-204, illus., 1953; Georgia Mineral Newsletter, vol. 6, p. 114-115, 1953. Tertiary to Recent gastropods are found in a breccia interbedded between two Paleozoic limestone beds. The breccia formed locally by the filling of the space with limestone fragments, snails, and other detritus and then was cemented by calcite.
4. Gahnite occurrence and association at Magruder Mine, Lincoln County, Georgia, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 309-312, 1953. Gahnite and spessartite in the schist which borders the mineralized zones is due largely to wall-rock alteration produced early in the mineralization process.
5. (and Renshaw, Ernest Wilroy). Luminescent properties of some of the minerals of Arabia Mountain, DeKalb County, Georgia, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 312-315, 1953. Fluorapatite, fluorite, and microcline in granite display various luminescent properties which are described and explained. Each type of luminescence is different.

6. (and Lester, James George). Petrographic study of the porphyroblasts of the Fairburn Granite, East Point, [Fulton Co.] Georgia [abs.]: Georgia Acad. Science Bull., vol. 11, p. 11, 1953.

7. Structural relations of the granites and the associated rocks of south Fulton County, Georgia. Ph. D. Thesis, Univ. Illinois, 1948; [abs.], Dissertation Abstracts, vol. 18, p. 1768-1769, 1958.

8. Topography and its relationship to a bauxite deposit in the Andersonville District, [Sumter Co.] Georgia [abs.]: Georgia Acad. Science Bull., vol. 17, p. 73, 1959.

**COHEN, ALVIN JEROME, 1918-**

1. The absorption spectra of tektites and other natural glasses: Geochemica et Cosmochemica Acta, vol. 14, p. 279-286, illus., London, 1958. The absorption spectra of the Empire, Dodge Co., tektite is such that this tektite can be considered similar to moldavites. Much detail regarding the methods used, and comparisons with other tektites are given.

2. Moldavites and similar tektites from [Dodge, Irwin Cos.] Georgia, U.S.A.: Geochemica et Cosmochemica Acta, vol. 17, p. 150-153, illus., London, 1959. The Georgia tektites are compared chemically and physically with tektites from elsewhere. They resemble moldavites and bediasites. They are also compared geologically with the others, and since all may be in or on rocks of about the same age, they may be related genetically to one great fall.

**COHEN, EMIL WILHELM, 1842-1905,** *see also* Brezina, Aristides, 3.

1. Meteoritenkunde. 3 parts, 355, 302, 419 p., illus., Stuttgart, E. Schweizerbart'sche, 1894-1905. A treatise on the characteristics, chemical, physical, and otherwise, of meteorites, includes descriptions of several from Georgia. Those from Chattooga, Stewart, Whitfield, Monroe, and Henry Cos. are included.

2. Meteoreisen-studien IV: K. k. Naturhistorischen Hofmuseums Annalen, vol. 10, p. 81-93, Vienna, 1895. The Putnam Co. iron meteorite is shown to be permanently magnetic and the Holland's Store meteorite, from Whitfield Co., has a specific gravity of 7.615.

3. (Das) Meteoreisen von Forsyth County, Georgia [!North Carolina] Vereinigte Staaten: K. preussische Akademie der Wissenschaften Berlin Sitzungsberichte 1897, p. 386-396, illus., 1897. This meteorite is described chemically and physically. It is composed of about 94 per cent iron, 5 per cent nickel, and a little cobalt and phosphorous. It is from North Carolina, however; the title is in error.

4. Ueber ein neues Meteoreisen von Locust Grove, Henry Co., Nord-Carolina [!Georgia] Vereinigte Staaten: K. preussische Akademie der Wissenschaften Berlin Sitzungsberichte 1897, p. 76-81, 1897; correction, *in* Meteoritenkunde, vol. 3, p. 44-77, Stuttgart, E. Schweitzerbart'sche, 1905. This iron, which fell in 1857, is described physically and chemically. It weighs 10,326 grams.

5. Zusammenfassung der bei der Untersuchung der Koernigen bis dichten Meteoreisen erhaltenen Resultate: K. preussische Akademie der Wissenschaften Berlin Sitzungsberichte 1900, pt. 2, p. 1122-1135, 1900. This is a study of granular, dense iron meteorites. The Locust Grove, Henry Co., meteorite is in the schlieren-free group with the nickel-cobalt content between 6 and 7 per cent.

COLE, WILLIAM STORRS, 1902-

1. Thomas Wayland Vaughan, 1870-1952: Micropaleontologist, vol. 6, no. 2, p. 45-46, port., 1952.

2. (and Herrick, Stephen Marion). Two species of larger Foraminifera from Paleocene beds in Georgia: Bulls. Amer. Paleontology, vol. 35, no. 148, 16 p., illus., 1953; discussion by Marja de Cizancourt: Societé géologique de France Comptes Rendus Sommaire, no. 9, p. 178-179, Paris, 1954. *Operculinoides georgianus* and *Pseudophragmina (Athecocyclina) stephensoni* are described and illustrated. They come from Paleocene rocks in numerous oil wells drilled in southern Georgia.

3. Names of and variation in certain American larger Foraminifera, particularly the camerinids, no. 2: Bulls. Amer. Paleontology, vol. 38, no. 173, p. 261-284, illus., 1958. A general discussion of the classification problems of this group includes a detailed review of the species of six different genera. Some are from the Georgia Eocene.

COLEMAN, GEORGE L., 2d.

1. William H[enry] Twenhofel [1875-1957]: Compass, vol. 35, p. 139-140, port., 1958.

COLLINS, GEORGE ERNEST, 1870-1946.

1. Vein-structures at the Reynolds [gold] Mine, [White Co.] Georgia: Engineering and Mining Jour., vol. 72, p. 68-70, illus., 1901; Inst. Mining Metallurgy Trans., vol. 9, p. 365-371, illus., London, 1901. The distortion of gold-bearing quartz veins in saprolite of mica schist is described. The veins originally intruded faulted and jointed rocks, resulting in irregularites in the veins which could now be mistaken for tectonic distortion.

COLLINS, WILLIAM DENNIS, 1875-

1. (and Lamar, William Luther, and Lohr, Edwin Wallace). The industrial utility of public water supplies in the United States 1932: U. S. Geol. Survey Water-Supply Paper 658. 135 p., 1934. Analyses of ground water from many places in Georgia are included.

COLTON, HENRY E.

1. Notes on the topography and geology of western North Carolina—the Hiawassee Valley: Amer. Inst. Mining Engineers Trans., vol. 16, p. 839-851, illus., 1888. A discussion of the topographic boundaries of this valley region includes those parts which are in Georgia. The divides which separate the valley from its neighbors can be traced southwestward into the Georgia Piedmont.
2. The East Tennessee, Virginia, and Georgia Railway System. Mineral wealth, agriculture, and timber resources of the main line and branches . . . . 97 p., illus., [n. p.] 1890 [not seen].

CONANT, LOUIS COWLES, 1902-

1. Environment of accumulation of the Chattanooga Shale: Internatl. Conference on Peaceful Uses of Atomic Energy, [1st], Geneva 1955, Proc., vol. 6, p. 435-438, illus., 1955; U. S. Geol. Survey Prof. Paper 300, p. 463-467, illus., 1956. Evidence is described, some from northwestern Georgia, to support the hypothesis that the shale is marine, and was deposited on a very smooth erosion surface, if not a peneplane.

CONDRA, GEORGE EVERT.

1. (and Elias, Maxim Konrad). Study and revision of *Archemides* (Hall): Geol. Soc. America Spec. Paper 53, viii, 243 p., illus., 1944. A detailed discusson of this genus includes descriptions of its species, many of which are from Mississippian rocks in northwestern Georgia.

CONN, WILLIAM V.

1. Soil and geologic features of the Buford Project, [Gwinnett, Forsyth Cos.] Georgia: Amer. Soc. Civil Engineers Proc., vol. 80, no. 425, 10 p., illus., 1954. Features of the gneiss, such as foliation, depth of weathering, etc., are described in relation to their influence on the Buford Dam site.
2. (and Sowers, George Frederick). Engineering properties of bedrock weathering products in the southeastern [United States] Piedmont [abs.]: Econ. Geology, vol. 50, p. 769, 1955; Geol. Soc. America Bull., vol. 66, p. 1544, 1955.

CONNELL, JAMES FREDERICK LOUIS, 1920-

1. Stratigraphy and paleontology of the Jackson Group of Georgia. Ph. D. Thesis, Univ. Oklahoma, 1955; Southwestern Louisiana Jour., vol. 2, p. 321-348, illus., 1958. Detailed descriptions of the formations are given, and faunal lists are included. Correlations are discussed.
2. Historical geology laboratory manual for the southern states. vi, 143 p., illus., Dubuque, Iowa, Wm. C. Brown, [1959]. This is a college classroom workbook, with many of the exercises pointed at the geology of Georgia.

3. (The) Tivola Member of the Ocala Limestone of Georgia: Southeastern Geology, vol. 1, p. 59-72, illus., 1959. The Eocene limestone unit is described in detail. Sections are measured; fossils are listed. It occurs along the Fall Line and southward.

**CONRAD, TIMOTHY ABBOTT,** 1803-1877, *see also* Hodge, James Thacher, 1.

1. Fossil shells of the Tertiary formations of North America: Vol. 1, no. 1, Introduction, Brief view of the Tertiary formations of the United States. viii, p. 9-20x, illus., Philadelphia, Judah Dobson, 1832; no. 2, p. 21-28, illus., Philadelphia, W. P. Gibbons, 1832; no. 3, p. 29-39, illus., 1833; republished, with title, Eocene fossils of Claiborne . . . , p. 29-56, illus., 1835; no. 4, p. 39-46, 1833. All numbers republished by Gilbert Dennison Harris, Washington, D.C., Rufus Darby, 1893. A general discussion of the Tertiary rocks of the Coastal Plain includes those of Georgia. Many fossils, all mollusks, are described and illustrated.

2. Observations on the Tertiary and more recent formations of a portion of the southern states: Acad. Natural Science Philadelphia Jour., vol. 7, p. 116-129, 1834. Eocene rocks are described from along the Coastal Plain. They occur along the Savannah River at Shell Bluff and vicinity, along the Oconee River, and at Fort Gaines, in Clay Co. The Pliocene is not recognized from Georgia, although Recent sediments are discussed.

3. Observations on a portion of the Atlantic Tertiary region, with a description of new species of organic remains: Natl. Inst. [Washington, D.C.] Proc. Bull. no. 2, p. 171-196, illus., 1842. A general description of the entire Atlantic Coastal Plain is given. Eocene rocks are described from the eastern part of the Coastal Plain in Georgia and from along the Chattahoochee River. No Miocene or Pliocene rocks are recognized.

4. Description of one new Cretaceous, and seven new Eocene fossils [Lee, Baker Cos.]: Acad. Natural Science Philadelphia Jour., 2d ser. vol. 2, p. 39-41, illus., 1850. One gastropod, *Mitra georgiana,* from the Eocene of Georgia, and six echinoids from the Eocene formations in Lee and Baker Counties are described and illustrated.

5. Remarks on the Tertiary strata of St. Domingo and Vicksburg (Miss.): Acad. Natural Science Philadelphia Proc., vol. 6, p. 198-199, 1854. The occurrence of *Ecphora 4-costata* in Georgia, found on St. Simons Island, Glynn Co., is cited as supporting evidence that the deposits at Vicksburg, occurring farther north, may be [Oligocene].

6. Notice of a new group of Eocene shells [Burke Co.]: Amer. Jour. Science, 2d ser. vol. 41, p. 96, 1866. The age of the *Ostrea georgiana* beds at Shell Bluff, in Burke Co., is considered to be Eocene, based upon the finding of this large oyster in undoubted Eocene beds in Mississippi.

**CONYBEARE, ADRIENNE B.,** *see* Joffe, Jacob Samuel, 1.

COOKE, CHARLES WYTHE, 1887- *see also* Flint, Richard Foster, 1; Henderson, Edward Porter, 1; LaForge, Lawrence, 3.

1. The age of the Ocala Limestone: U. S. Geol. Survey Prof. Paper 95, p. 107-120, illus., 1916. Stratigraphic and paleontological data are evaluated to show that the Ocala Limestone is Upper Eocene in age. Some of the data come from Decatur County. Fossils are listed.
2. (and Shearer, Harold Kurtz). Deposits of Claiborne and Jackson age in Georgia: U. S. Geol. Survey Prof. Paper 120, p. 41-81, illus. incl. geol. map, 1918. Eocene rocks from many places on the Coastal Plain are described. Sections are measured and fossils are listed. Intertonguing and facies changes are described.
3. (The) stratigraphic position and faunal associates of the orbitoid Foraminifera of the genus *Orthophragmina* from Georgia and Florida: U. S. Geol. Survey Prof. Paper 108, p. 109-113, illus., 1918. The faunal content of the Ocala Limestone from numerous exposures along Flint River in southwestern Georgia is listed. An Eocene age for the Foraminifera is supported.
4. Stratigraphic significance of *Ortholaux* [abs.]: Geol. Soc. America Bull., vol. 31, p. 206, 1920.
5. Macon [Bibb Co.] five million years ago: Macon Mag., vol. 1, no. 6, p. 7-8, 1921. This is a popular account of the geological history of the area. Most of the emphasis is upon Cretaceous and Eocene history.
6. (The) correlation of the Vicksburg Group: U. S. Geol. Survey Prof. Paper 133, p. ii, 1-9, 1923. A regional discussion of the Middle Oligocene of the Gulf Coastal Plain includes a description of the Glendon Limestone or Glendon Chert. The fauna from Decatur Co. is listed and analyzed.
7. Recent contributions to the stratigraphy of the Coastal Plain of the United States [abs.]: Pan-Pacific Science Cong. [2d], Melbourne, Australia 1923, Proc., vol. 1, p. 862-863, illus., [1923].
8. American and European Eocene and Oligocene mollusks: Geol. Soc. America Bull., vol. 35, p. 851-856, 1924. Reference is made to Georgia in pointing out that faunal comparisons between the two continents show that paleontologically both have much in common. Stages are in general recognizable, but formation to formation correlation is not practicable.
9. Coastal terraces of Georgia [abs.]: Washington Acad. Science Jour., vol. 15, p. 184, 1925; Pan-Amer. Geologist, vol. 43, p. 375, 1925.
10. Correlation of the basal Cretaceous beds of the southeastern states: U. S. Geol. Survey Prof. Paper 140, p. 137-139, illus., 1925. The basal Cretaceous rocks of Georgia and neighboring states are shown to be Upper rather than Lower Cretaceous. The evidence is primarily lithological correlation with fossiliferous beds elsewhere. This is the Tuscaloosa Formation here in Georgia.
11. Correlation of coastal terraces: Jour. Geology, vol. 38, p. 577-589, illus., 1930; discussion with title, Cooke's correlation of coastal terraces, by Richard Foster Flint, vol. 39, p. 82-83, 1931. The Atlantic coast terraces, including those in Georgia, are correlated internationally and shown to be the result of Pleistocene inundation rather than crustal upwarp.

12. Pleistocene seashores: Washington Acad. Science Jour., vol. 20, p. 389-395, 1930. The terraces of Georgia are horizontal and not warped. They therefore represent Pleistocene high-water marks associated with the glaciation.

13. Radial calcite concretions in marine beds in [Effingham Co.] Georgia [abs.]: Washington Acad. Science Jour., vol. 21, p. 27, 1931.

14. Seven coastal terraces in the southeastern states: Washington Acad. Science Jour., vol. 21, p. 503-513, 1931. Seven terraces are described; they are: Brandywine, 270 feet; Coharie, 215 feet; Sunderland, 170 feet; Wicomico, 100 feet; Penhaloway, 70 feet; Talbot, 42 feet; and Pamlico, 25 feet. They are attributed to interglacial sea level changes.

15. Tentative correlation of American glacial chronology with the marine time scale: Washington Acad. Science Jour., vol. 22, p. 310-312, illus., 1932. A table shows the relationships of the coastal terraces of the Atlantic coast to the glacial stages. The upper Brandywine Terrace is a result of pre-Nebraskan warm stage and the lowest Princess Anne Terrace is correlated with the third interglacial substage of the Wisconsin.

16. Notes on the Vicksburg Group: Amer. Assoc. Petroleum Geologists Bull., vol. 19, p. 1162-1172, 1935; reprinted *in* Gulf coast oil fields, edited by Donald Clinton Barton, and George Sawtelle, p. 358-368, Tulsa, Amer. Assoc. Petroleum Geologists, 1936. A stratigraphic description and discussion of the group from Texas to Florida includes those rocks that are in Georgia. The chert-bearing beds are called Flint River Formation here.

17. Tentative ages of Pleistocene shore lines: Washington Acad. Science Jour., vol. 25, p. 331-333, illus., 1935. The Brandywine Terrace is considered to be Aftonian in age; the Coharie and Sunderland are Yarmouth; the Wicomico, Penhaloway and Talbot are Sangamon, and the Pamlico Terrace is of Peorian interglacial age. A table shows the relationships.

18. (and Munyan, Arthur Claude). Stratigraphy of Coastal Plain of Georgia: Amer. Assoc. Petroleum Geologists Bull., vol. 22, p. 789-793, illus., 1938. An extremely cursory description of the nature and distribution of Cretaceous to Recent rocks on the Coastal Plain is given.

19. Boundary between Oligocene and Miocene: Amer. Assoc. Petroleum Geologists Bull., vol. 23, p. 1560-1561, 1939. The Vicksburg Group, which includes the Flint River Formation in Georgia, has been classed as Oligocene chiefly because it lies between known Eocene and Miocene and because its suspected West Indies equivalent is considered Oligocene. The Miocene boundary awaits further international correlation.

20. Cenozoic regular echinoids of eastern United States: Jour. Paleontology, vol. 15, p. 1-20, illus., 1941. *Psammechinus* (?) *ocalanus* from the Ocala Limestone in Decatur Co. and *Phyllacanthus mortoni* from the same formation in Lee, Mitchell and Decatur Cos., are described and illustrated.

21. Cenozoic irregular echinoids of eastern United States: Jour. Paleontology, vol. 16, p. 1-62, illus., 1942. Many species from Paleocene, Eocene, Oligocene, and Pleistocene rocks on the Coastal Plain are described and illustrated.

22. (and Gardner, Julia Anna, and Woodring, Wendell Phillips). Correlation of the Cenozoic formations of the Atlantic and Gulf Coastal Plain and the Caribbean region: Geol. Soc. America Bull., vol. 54, p. 1713-1722, chart, 1943; discussion by Horace Gardiner Richards, vol. 56, p. 401-408, 1945. A time-rock chart shows the relationships of the Georgia Cenozoic formations with those of nearby areas.

23. Geology of the Coastal Plain of Georgia: U. S. Geol. Survey Bull. 941, vi, 121 p., illus. incl. geol. map, 1943. Cretaceous to Recent rocks and sediments are mapped and described. Sections are measured; fossils are listed.

24. American Upper Cretaceous Echinoidea: U. S. Geol. Survey Prof. Paper 254-A, p. iii, 1-44, illus., 1953. Several echinoids from the Providence Formation in the narrows of Pataula Creek in Clay Co. are described and illustrated. Several also are from deep wells in Decatur County.

25. Cenozoic echinoids of eastern United States: U. S. Geol. Survey Prof. Paper 32, iii, 106 p., illus., 1959. Many echinoids from many rock units in many counties on the Coastal Plain are described and illustrated.

**COOPER, BYRON NELSON, 1912-**

1. In memoriam, Roy Jay Holden [1870-1945]: Compass, vol. 26, p. 246-247, port., 1949.

2. Marcellus Henry Stow, 1902-1957: Virginia Jour. Science, vol. 9, no. 1, p. [2] - 4, port., 1958.

**COOPER, GEORGE FRANKLIN, 1825-1882.**

1. Topography and prevalent diseases of the third congressional district [Central Georgia]: Medical Soc. State of Georgia Ann. Mtg. Trans., vol. 4, p. 28-34, 1853. The area from the Okmulgee River to the Chattahoochee River, on both sides of the Fall Line, is cursorily described. The distinction of the Piedmont and Coastal Plain is recognized. While geology is scant, the relationship of disease to geology is discussed.

2. Essay on the [topography and] diseases of Perry, [Houston Co.] and vicinity: Medical Soc. State of Georgia Ann. Mtg. Trans., vol. 3, p. 37-52, 1852 [not seen].

**COOPER, GUSTAV ARTHUR, 1902-**

1. (and others). Correlation of the Devonian sedimentary formations of North America: Geol. Soc. America Bull., vol. 53, p. 1729-1794, chart, 1942. A general discussion of terminology and formations includes a time-rock chart. Only the Frog Mountain Sandstone and the Armuchee Chert are considered to be present; they are Lower Devonian.

2. Obituary [Charles Schuchert, 1858-1942]: Washington Acad. Science Jour., vol. 33, p. 352, 1943.

3. Chazyan and related brachiopods: Smithsonian Misc. Collections, vol. 127, 2 vols., 1245 p., illus., 1956. Many brachiopods of Middle and Upper Ordoviciam age from the limestones of Walker Co. are described and illustrated; many are new. New correlations are suggested.

**COOPER, HILTON HAMMOND, JR.**, 1913- *see also* Stringfield, Victor Timothy, 3, 5.

1. (and Warren, Moultrie Alfred). The perennial yield of artesian water in the coastal area of Georgia and northeastern Florida: Econ. Geology, vol. 40, p. 263-282, illus., 1945. A large cone of depression in the Ocala Limestone is present at Savannah as is a smaller one in the same limestone at Brunswick. Most of the withdrawal is coming from storage and not recharge. New wells should be in other aquifers. Piezometric maps are included.

**COOPER, WILLIAM**, -1864.

1. On the remains of the *Megatherium* recently discovered in [Chatham Co.] Georgia: Lyceum Natural Hist. New York Annals, vol. 1, p. 114-124, illus., 1823 [1824]. Some bones and teeth of the giant sloth from [Pleistocene] sediments on Skidaway Island are described and illustrated.

2. Further discovery of fossil bones in [Chatham Co.] Georgia—and remarks on their identity with those of Paraguay: Lyceum Natural Hist. New York Annals, vol. 2, p. 267-270, 1828. Various kinds of bones of *Megatherium* and *Megalonyx* are described. They are [Pleistocene].

**COPE, EDWARD DRINKER**, 1840-1897.

1. Synopsis of the extinct Mammalia of the cave formations in the United States . . . : Amer. Philos. Soc. Proc., vol. 11, p. 171-192, illus., 1871. Fragments of teeth of *Megalonyx jeffersoni* are reported from caves in Georgia, presumably northwestern, and *Anopolonassa forcipata*, a cetacean, from [Pleistocene] beds in Chatham Co., is described and illustrated.

2. On a new species of Adocidae from the Tertiary of [Macon Co.] Georgia: Amer. Philos. Soc. Proc., vol. 17, p. 82-84, 1878; Paleontological Bull., no. 25, p. 2-4, 1877; addition, with title. Osteologische Notizen ueber Reptilien, by George Bauer: Zoologischer Anzeiger, vol. 11, p. 592-597, Leipzig, 1888. *Amphiemys oxysternum*, a turtle, from what is probably Eocene limestone, is described. Bauer discusses nomenclatural alterations.

3. Paleontology of [Coastal Plain] Georgia [abs.]: Amer. Naturalist, vol. 12, p. 129, 1878.

4. Syllabus of lectures on the Vertebrata with an introduction [biography] by Henry Fairfield Osborn. 135 p., illus. incl. port., Philadelphia, Univ. Pennsylvania, 1898.

CORMIER, RANDALL F., *see* Pinson, William Hamet, Jr., 3.

CORNELIUS, ELIAS, 1758-1823.

1. On the geology, mineralogy, scenery, and curiosities of parts of Virginia, Tennessee, and the Alabama and Mississippi Territories, etc.: Amer. Jour. Science, vol. 1, p. 214-226, 317-331, 1818. Nicojack [Nickajack] Cave, in Dade Co., is described. Nitrate is present.

COTTING, JOHN RUGGLES, 1784-1868.

1. Analysis of a species of clay found in Richmond County, which is eagerly sought after, and eaten, by many people, particularly children: Southern Medical and Surgical Jour., vol. 1, p. 288-290, 1836; discussion, p. 290-292, 1836. An analysis, as well as a description of the practice, is given. Judging from the description, the clay resembles kaolin. Its medicinal properties are questioned.

2. Report of a geological and agricultural survey of Burke and Richmond Counties, Georgia . . . . 198 p., Augusta, Guieu and Thompson, 1836. A detailed account of the general geology of the area is given. [Precambrian]-Quaternary rocks are described, as are the soils and mineral resources. Fossils are listed. Analyses are included.

3. An essay on the soils and available manures of the State of Georgia . . . . 121 p., Milledgeville, Park and Rogers, 1843. A very general description, including origin, of the various soils around the state is given. A general discussion of fertilizer, some inorganic, is also included. The [Cretaceous rocks] are recognized as a source of [glauconite]. Analyses are included.

COULSON, ARTHUR LENNOX.

1. A catalogue of meteorites . . . Indian Museum, Calcutta . . . : India Geol. Survey Mem. 75, 346 p., illus., Delhi and Calcutta, 1940. A very brief description of the meteorites in the collection includes fragments of those from Whitfield, Putnam, and Union Counties.

COUNTS, HARLAN BRYAN, *see also* Davis, George Hamilton, 1.

1. (and Donsky, Ellis). Salt-water encroachment, geology, and ground-water resources of Savannah area, [Chatham Co.] Georgia and South Carolina—a summary: Georgia Mineral Newsletter, vol. 12, p. 96-104, illus., 1959. The Cretaceous to Quaternary rocks of the area are briefly described, as well as are their hydrological properties. The lower part of the Ocala Limestone has some salt water in it; this limestone is the main aquifer of the area.

COUPER, JAMES HAMILTON, 1794-1866.

1. [Fossil bones and shells from the Brunswick Canal, Glynn Co.] [abs.]: Acad. Natural Science Philadelphia Proc., vol. 1, p. 216-217, 1842.

2. On fossil bones found in digging the new Brunswick Canal in [Glynn Co.] Georgia: Geol. Soc. London Proc., vol. 4, p. 33-34, 1843; Geologist 1843, p. 163-164, London, 1843; Philosophical Mag., 3d ser. vol. 23, p. 189-190, London, 1843; discussion by E[dward] W[edlake] B[rayley], p. 193-194. The mammal bones found are associated with [Pleistocene] marine shells which are in rocks which extend as far north as Maryland. Since there is no discontinuity of time between these and the present, the large mammals must be relatively young.
3. [Eocene fossils from the burr mill-stone at Bainbridge, Decatur Co.] [abs.]: Boston Soc. Natural Hist. Proc., vol. 2, p. 123-124, 1846.
4. Observations on the geology of a part of the sea-coast of Georgia, with a description of the fossil remains of the *Megatherium*, [Glynn Co.] . . . , *in* William Brown Hodgson, Memoir on the *Megatherium*, p. 31-47, illus., 1846. A discussion of the Pleistocene sediments of the Glynn Co. area and Skidaway Island in Chatham Co. includes a list of the fossil vertebrates which have been found enclosed in them. The deposits of the two areas are considered contemporaneous.

**COUPER, ROBERT H.**

1. The yellow ocher mines of the Cartersville District, [Bartow Co.] Georgia: Engineering and Mining Jour., vol. 69, p. 738, 1900. Ochery clay occurs at the contact of the [Weisner] Formation with the overlying formations. A cursory review of its nature, occurrence, and origin is given.

**CRABB, GEORGE ARTHUR, 1915-**

1. (and others). Reconnaissance erosion survey of the state of Georgia. Map, scale 1:500,000, U. S. Dept. Agriculture, Soil Conserv. Ser., 1934.

**CRANE, WALTER RICHARD, 1870-** *see also* Hull, Joseph Poyer Deyo, 2.

1. Gold and silver . . . . xii, 727 p., illus., New York, John Wiley and Sons, 1908. A general treatise on the precious metals includes descriptions of the gold occurrences in Georgia. No new data are included.

**CRAWFORD, THOMAS JONES, 1932-**

1. Natural etching on quartz crystals, Jackson County, *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 8, p. 150, 1955. Small crystals, ranging from 0.2 cm. to 8 cm., occur in weathered pegmatite. The etching may be from alkalies released during the weathering process.
2. Geology of parts of Indian Mountain, Polk County, Georgia and Cherokee County, Alabama: M. S. Thesis, Emory Univ., 1957; Georgia Mineral Newsletter, vol. 10, p. 39-51, illus. incl. geol. map, 1957. A complete geologic description of the area is given. Cambrian, Ordovician, and Mississippian rocks are present. Fossils are listed and illustrated. Large folds compose the major structural features. Iron ore is the chief mineral resource.

CREDNER, HERMANN.

1. Beschreibung einiger paragenetisch interessanter Goldvorkommen in [Piedmont] Georgia, Nord-Amerika: Neues Jahrbuch fur Mineralogie . . . 1867, p. 442-448, Stuttgart, 1867. Gold, occurring with granite and tellurbismuth in chlorite schist, with tellurbismuth in hornblende gneiss, with sulphides in talc-schist, and with sulphides and [hematite] in quartz, is discussed. The occurrences are in several different places.
2. Geognostische Skizze der Goldfelder von Dahlonega, [Lumpkin Co.] Georgia, Nordamerika: Deutsche geologische Gesellschaft Zeitschrift, vol. 19, p. 33-40, Berlin, 1867. A generalized discussion of the geology of the Dahlonega gold-field area is given. Gold occurs as placers and in quartz veins in the metamorphic rocks.
3. (Die) Gleiderung der eozoischen (vorsilurischen) Formationsgruppe Nord-Amerikas: Zeitschrift fuer die gesammte Naturwissenschaften, vol. 32, p. 353-405, illus., Berlin, 1868; also Habilitationschrift, Leipzig Univ., 54 p., Halle, 1869. A general survey of the [Precambrian] rocks of North America includes much discussion of those in the [Blue Ridge and Piedmont], and cursorily those in Georgia. Laurentian and Huronian rocks are recognized and described. Little or no detail is included.
4. (Die) Geognosie und der Mineralreichtum des Alleghany-Systems: Zeitschrift fuer die gesammte Naturwissenschaften, 2d ser. vol. 3, p. 179-201, Halle, 1871; summary, Petermann's geographische Mittheilungen, vol. 17, p. 41-50, Leipzig, 1871.

CRESSEY, GEORGE BABCOCK, 1896-1963.

1. Wallace W[alter] Atwood, 1872-1949: Assoc. Amer. Geographers Annals, vol. 39, p. 296-306, port., 1949.

CRIBB, ROBERT EUGENE, 1922-

1. Areal geology of the northern half of Calhoun Quadrangle, [Whitfield, Murray Cos.] Georgia. M. S. Thesis, Emory Univ., 1953.

CRICKMAY, GEOFFREY WILLIAM, *see also* Hewett, Donnel Foster, 1; Park, Charles Frederick, Jr., 1.

1. (The) ore deposits of the Cartersville district, [Bartow Co.] Georgia, *in* Mining districts of the eastern states: Internatl. Geol. Cong. 16th, Washington 1933, Guidebook 2, p. 126-139, illus., 1932. A generalized review of the occurrence of residual manganese and barite is given. Iron is mined as ocher, and limonite comes from the local bedrock.
2. Gold in Georgia: Forestry-Geological Review, vol. 3, no. 4, p. 7-8, illus.; no. 5, p. 7-8, illus., 1933; Georgia Geol. Survey Inf. Circ. 1, 6 p. (‡), illus., 1933. This is a popular account of the origin and occurrence of gold in the Piedmont and Blue Ridge areas of Georgia. No new details are included.
3. Manganese, barite, and ochre, and the 16th International Geological Congress [Bartow Co.]: Forestry-Geological Review, vol. 3, no. 1, p. 7-8, 1933. A popular account of the origin and occurrence of the minerals of the Cartersville District is given. No new details are included.

4. (The) occurrence of mylonites in the crystalline rocks of Georgia: Amer. Jour. Science, 5th ser. vol. 26, p. 161-177, illus., 1933. Mylonite exposures near Neel's Gap, Union Co., are described in detail. They occur in Carolina Gneiss. They are not associated with any known major thrust zone but result from local movement within the Carolina Gneiss. Photomicrographs are included. Other mylonite exposures from elsewhere in the Piedmont are discussed also.

5. Oil possibilities in Georgia: Forestry-Geological Review, vol. 3, no. 11, p. 7-8, illus., 1933. A cursory, popular account of the origin and occurrence of petroleum includes a pessimistic consideration of the potential of Georgia.

6. Pine Mountain District, [Meriwether, Lamar Cos.], Georgia: Forestry-Geological Review, vol. 3, no. 8, p. 7-8, illus., 1933. This is a cursory, popular account of the geology of the Pine Mountain area. A block diagram is described.

7. (The) precious stones of Georgia: Forestry-Geological Review, vol. 3, no. 7, p. 7-8, 1933. This is a cursory, popular account of the various types of gem stones found in Georgia. Most are from the Blue Ridge and Piedmont.

8. Meteorites found in Georgia: Forestry-Geological Review, vol. 4, no. 7, p. 7-8, illus, 1934. A popular account of the origin of meteorites is followed by a brief discussion of some of those found in Georgia.

9. (and Mitchell, Lane). Earthquakes in Georgia: Forestry-Geological Review, vol. 5, no. 3, p. 7-8, illus., 1935. A general, popular discussion of the origin of earthquakes includes a brief resumé of seven which have had epicenters in Georgia.

10. Granite pedestal rocks in the southern Appalachian Piedmont: Jour. Geology, vol. 43, p. 745-758, illus., 1935. Pedestal rocks, composed of a cap and a shaft, from many places in the Piedmont are described and illustrated. The chief agent is granular disintegration brought about by hydration from water near the ground.

11. Kyanite in Fulton County, *in* Prindle, Lewis Marcus, and others, Kyanite and vermiculite deposits of Georgia: Georgia Geol. Survey Bull. 46, p. 36-37, 1935. Kyanite occurs in a garnet-mica schist and in the residuum therefrom.

12. Kyanite in Talbot and Upson Counties, *in* Prindle, Lewis Marcus, and others, Kyanite and vermiculite deposits of Georgia: Georgia Geol. Survey Bull. 46, p. 32-36, illus., 1935. In Talbot Co., kyanite occurs in a schist, in pegmatites, and quartz veins in the schist. In Upson Co. it occurs in a schist. Individual deposits are described.

13. Origin of barite in the Appalachian Valley: Econ. Geology, vol. 30, p. 563-564, 1935. The barite in the Cartersville district in Bartow Co. is both hypogene and supergene. Barite occurs as veins, replacement deposits in limestone, in breccia, as matrix to limestone fragments, and as fragments with ocher as the matrix. These are hypogene. Barite occurs as supergene concentrations in open cavities created by post-vein-forming movement.

14. (and Mitchell, Lane). (The) southern Appalachian earthquake of January 1, 1935: Seismol. Soc. America Bull., vol. 25, p. 247-251, illus., 1935. An earthquake of intensity IV to V, with the epicenter in part in Towns Co., is described.

15. Stone Mountain, [DeKalb Co.] Georgia: Forestry-Geological Review, vol. 5, no. 5, p. 7-8, illus., 1935; Georgia Mineral Soc. Newsletter [vol.] 1, no. 9, p. 17-20(‡), illus., 1948; Earth Science Digest, vol. 3, no. 3, p. 16-19, illus., 1948. A popular, cursory account of the origin of Stone Mountain is given. No new data are included.

16. Age of the Talledega Series in Alabama, [Piedmont] Georgia, and North Carolina [abs.]: Geol. Soc. America Proc. 1935, p. 72, 1936.

17. (The) caves of Georgia: Forestry-Geological Review, vol. 6, no. 10, p. 7-8, 1936. A general, popular discussion of the origin of caves in general includes brief descriptions of some of the larger caves of Georgia.

18. (and Mitchell, Lane). (The) Georgia State Museum: Georgia Geol. Survey Inf. Circ. 7, 4 p., illus., 1936; reprinted from Forestry-Geological Review, vol. 6, nos. 5 and 6, 1936. A popular account of the museum and the geological display is given. Most of the material on display is from Georgia.

19. Ground water in the crystalline rocks of Georgia: Forestry-Geological Review, vol. 6, no. 12, p. 7-8, illus., 1936. A general, popular account of the occurrence of ground water includes a discussion of the water in the rocks of the Piedmont and Blue Ridge. No new details are included.

20. Status of the Talledega Series in southern Appalachian stratigraphy: Geol. Soc. America Bull., vol. 47, p. 1371-1392, illus., 1936. The Talledega Series is described stratigraphically and geographically. They are separated from the known Paleozoic rocks of northwestern Georgia by a great fault, and also by a fault from Precambrian crystalline rocks to the south. The Talledega Series are considered a possible metamorphic equivalent of both bounding terranes. Age evidence is reviewed and no positive conclusion reached; they are considered probably Precambrian, however.

21. Talc deposits of Georgia: Forestry-Geological Review, vol. 6, no. 11, p. 7-8, illus., 1936. A general, popular account of the origin and occurrence of talc in Georgia is given. Most of the talc is from Murray County.

22. Tripoli deposits of Georgia: Forestry-Geological Review, vol. 7, no. 1, p. 7-8, illus., 1937; enlarged, Georgia Geol. Survey Inf. Circ. 9, 8 p., illus., 1937. A popular, general discussion of tripoli includes a description of its origin and occurrence in Georgia. It occurs as weathered chert from the Knox Formation in northwestern Georgia. Analyses are included.

23. (The) mineral resources of Georgia: Georgia Univ. Bull., vol. 41, no. 9, (Inst. Study Georgia Problems Pamph. 7), 30 p., illus., 1941. A general survey of the mineral resources of Georgia is given. Very few geologic data are included.

24. (A) catalog of Georgia minerals: Georgia Mineral Soc. Newsletter, [vol. 1] no. 6, p. 9-10 (‡); no. 7, p. 12 (‡); no. 8, p. 13-14 (‡); no. 9, p. 9 (‡); no. 10, p. 16-17 (‡); no. 11, p. 17 (‡); no. 12, p. 12 (‡), 1948; vol. 2, no. 2, p. 10 (‡); no. 3, p. 7-9 (‡); no. 4, p. 17 (‡), 1949; vol. 3, p. 10-12 (‡), 48-49 (‡), 161-162 (‡), 211-213 (‡), 1950; vol. 4, p. 4-5 (‡), 53-55 (‡), 1951.

25. Geology of the crystalline rocks of Georgia: Georgia Geol. Survey Bull. 58, vi, 54 p., illus., 1952. Metamorphic rocks of all varieties, probably Precambrian in age from the Piedmont and Blue Ridge, are described in great detail as are igneous rocks of great varieties which have intruded the metamorphic rocks. Analyses are included. The major structural features are also discussed.

**CRISLER, ROBERT MALCOLM, JR., 1930-**

1. (and Murphy, Robert Emmett). Columnar mud-cracks in a northeast [!northwest] Georgia [Dade Co.] cave [abs.]: Georgia Acad. Science Bull., vol. 11, p. 9, 1953.

**CROFT, MACK G.**

1. The geology of Cloudland Canyon State Park, Dade County, Georgia: Georgia Mineral Newsletter, vol. 12, p. 84-90, illus. incl. geol. map, 1959. A complete geologic description of the area is given. Mississippian, Pennsylvanian, and Quaternary rocks are mapped and described. The park is underlain by a broad syncline.

**CROOK, JAMES KING, 1859-**

1. Mineral waters of the United States and their therapeutic uses. viii, 587 p., New York, Lea Bros. and Co., 1899. 28 different springs, from many locations in Georgia, are described and analyzed.

**CROSBY, WILLIAM OTIS, 1850-1925.**

1. Mr. [Thomas Tracy] Bouvé's work in geology and mineralogy: Boston Soc. Natural Hist. Proc., vol. 27, p. 236-239, 1896.

**CROSS, CHARLES WHITMAN, 1854-1949.**

1. Personal reminiscences [of Samuel Franklin Emmons, 1841-1911]: Geol. Soc. Washington [D. C.], Memorial of Samuel Franklin Emmons, p. 6-8, 1911.

**CUDWORTH, JAMES ROWLAND, 1897-** *see* Shotts, Reynold Quinn, 1.

**CUMINGS, EDGAR ROSCOE, 1874-**

1. August Frederick Foerste, 1862-1936: Indiana Acad. Science Proc., vol. 46, p. 20-21, 1937.

**CUMMING, W. P.,** *see* LeMoyne de Morgues, Jacques, 1; Tatton, M., 1.

**CUNYUS, LUCY JOSEPHINE.**

1. Minerals, Chapter 15 *of* The history of Bartow County, formerly Cass, p. 187-205, illus., [Cartersville], Bartow Co., Georgia [1933]. A review of the mineral wealth of the county is given. Little detail is included, as the emphasis is upon the historical development of the deposits.

**CUPPELS, NORMAN PAUL,** *see* Overstreet, William Courtney, 1.

**CURRIE, WILLIAM,** 1754-1828.

1. Historical account of the climates and diseases of the United States of America. 409 p., Philadelphia, T. Dobson, 1792. Each state is discussed separately, Georgia last; the topography of the eastern part of the state is cursorily described; few details are included.

**CURRIER, LOUIS WADE,** 1890-

1. Memorial to Josiah Bridge (1890-1953): Geol. Soc. America Proc. 1953, p. 93-96, port., 1954.

**CURRY, RICHARD O.**

1. (and Proctor, Charles A.). Copper district of Tennessee, Georgia, North Carolina and Virginia—its history-geography-geology and mining interests: Southern Jour. Medical and Physical Sciences, vol. 3, p. 38-44, 1855. An account of the early history of the area around Ducktown is given. References are made to northern Georgia also. Iron, gold, and copper are the mineral deposits present. It is far more historical than geological.

**CUSHMAN, JOSEPH AUGUSTINE,** 1880-1949.

1. Orbitoid Formaminifera of the genus *Orthophragmina* from Georgia and Florida: U. S. Geol. Survey Prof. Paper 108, p. 115-118, illus., 1918. Six species from the Eocene Ocala Limestone from many places along Flint River are described and illustrated.
2. The American species of *Orthophragmina* and *Lepidocylina:* U. S. Geol. Survey Prof. Paper 125, p. 39-108, illus., 1920. Several species of *Orthophragmina* from the Eocene Ocala Limestone in the Coastal Plain, and several species of *Lepidocyclina* from the same formation and also Oligocene rocks, are described and illustrated.
3. American species of *Operculina* and *Heterostegina* and their faunal relations: U. S. Geol. Survey Prof. Paper 128, p. 125-143, illus., 1921. Several genera and species from the Ocala Limestone in Lee, Worth, and Crisp Cos. and elsewhere are described and illustrated.
4. (and Ozawa, Yoshiaki). A monograph of the forminiferal Family Polymorphinidae, Recent and fossil: U. S. Natl. Museum Proc., vol. 77, art. 6, 145 p., illus., 1931. Many genera and species are reported from Eocene rocks in Jenkins, Decatur, and Crawford Counties. All are illustrated and described.
5. Upper Eocene Foraminifera of the southeastern United States: U. S. Geol. Survey Prof. Paper 181, ii, 88 p., illus., 1935. Many genera and species from the Ocala Limestone and Barnwell Formation from many places on the Coastal Plain are described and illustrated.
6. A monograph of the Subfamily Virgulinidae of the foraminiferal Family Buliminidae: Cushman Lab. Foraminiferal Research Spec. Pub. 9, xv, 228 p., illus., 1937. *Bolivina jacksonensis* and *B. gardnerae* are described and illustrated. They occur in the Eocene Ocala Limestone in Jenkins County.

7. A monograph of the foraminiferal Family Nonionidae; U. S. Geol. Survey Prof. Paper 191, ii, 100 p., illus., 1939. *Nonion chapapotense*, from the Eocene Ocala Limestone in Houston Co., and *N. advenum*, from the Eocene of many places on the Coastal Plain, are described and illustrated.
8. (and Herrick, Stephen Marion). (The) Foraminifera of the type locality of the McBean Formation [Richmond Co.]: Cushman Lab. Foraminiferal Research Contribs., vol. 21, p. 55-73, illus., 1945. Eighty two species in 41 genera are described and illustrated. Many are new.
9. (A) foraminiferal fauna from the Twiggs Clay of [Washington Co.] Georgia: Cushman Lab. Foraminiferal Research Contribs., vol. 21, p. 1-11, illus., 1945. Thirty two species in 22 genera are described and illustrated. Most are new. They occur in exposures along Lamar Creek, near Sandersville.
10. (and Applin, Esther English Richards). Some Foraminifera of Woodbine age from Texas, Mississippi, Alabama, and Georgia: Cushman Lab. Foraminiferal Research Contribs., vol. 22, p. 71-76, illus., 1946. *Ammobaculites stephensoni* and *A. bergquisti* from marine shale in the Tuscaloosa Formation in wells in the Coastal Plain are described and illustrated; *Ammobaculoides plummerae* is from the same unit in Pierce County.
11. (A) supplement to the monograph of the foraminiferal Family Verneuilinidae: Cushman Foundation Foraminiferal Research Spec. Pub. 7A, 45 p., illus., 1946. *Pseudoclavulina clavata* from Upper Cretaceous rocks is described and illustrated. It is recorded from Georgia, but with no definite locations.
12. (and Parker, Frances Lawrence). *Bulimina* and related foraminiferal genera: U. S. Geol. Survey Prof. Paper 210, p. 55-160, illus., 1947. Many Foraminifera from Eocene formations on the Coastal Plain are described and illustrated.

**CUVIER, GEORGE LEOPOLD CHIÉTIEN FRÉDERIC DAGOBERT, BARON,** 1769-1832.

1. Sur des os de *Megatherium* trouvé dans les États Unis en Georgia, *in* Recherches sur les ossemens fossiles . . . . 3d ed., vol. 5, part 2, p. 519, Paris, G. Dufort et E. D'Ocogne, 1825. A comment on the then-recent report by Mitchill on the finding of *Megatherium* fragments in Chatham Co. indicates that more material should be sought after. It is not surprising that the species should be found as far north of the equator as it is south (in Paraguay).

**DALE, THOMAS NELSON,** 1845-1937.

1. Slate in the United States: U. S. Geol. Survey Bull. 586, 220 p., illus., 1914; summary with title, The commercial qualities of the slates of the United States and their localities: U. S. Geol. Survey Mineral Resources 1912, pt. 2, p. 693-707, illus., 1913. A general description of the origin and uses of slate is followed by detailed descriptions of slate deposits in each state. The deposits in Polk and Bartow Cos. are included.

**DALL, WILLIAM HEALEY**, 1845-1927, *see also* Smith, Eugene Allen, 3.

1. List of [published] papers, 1866-1882. 11 p., [Washington, Judd and Detweiler, printers, 1882].
2. Contributions to the Tertiary fauna of Florida: Wagner Free Inst. Science Trans., vols. 3 and 4, in six parts, 1653 p., illus., 1890-1903. Many hundreds of fossils are described and illustrated; all are mollusks, with a few Brachiopoda included. Many are from the Eocene and Miocene Series of Georgia.
3. (and Harris, Gilbert Dennison). Correlation papers—Neocene: U. S. Geol. Survey Bull. 84, 349 p., illus., 1892. A generalized summary of the Miocene and Pliocene rocks of the Coastal Plain of Georgia is included, along with a discussion of their correlation with similar rocks in adjacent states.
4. (and Stanley-Brown, Joseph). Cenozoic geology along with Apalachicola River [and Flint River, Decatur Co.]: Geol. Soc. America Bull., vol. 5, p. 147-170, illus., 1894. Descriptions of the [Oligocene] and Miocene formations along the Flint River in Decatur Co. are given. Fossils are listed.
5. A singular Eocene *Turbinella* [Richmond Co.]: Nautilus, vol. 18, p. 9-10, 1904; addition with title, Note on the genus *Psilocochilis* Dall, vol. 20, p. 128, 1907. An unnamed species of *Turbinella (Psilocochilis)* sp. from Eocene rocks of the Claiborne Stage is described. He later recommends the erection of genus *Psilocochilis*.
6. John Wesley Powell [1834-1902]: Philos. Soc. Washington Bull., vol. 14, p. 300-308, 1905.
7. Notes on some Upper Cretaceous Volutidae, with descriptions of new species and a revision of the groups to which they belong: Smithsonian Misc. Collections, vol. 50, p. 1-23, illus., 1907. *Psilocochilis mccallei* from Eocene rocks in Richmond Co. is described and illustrated.
8. Biographical memoir of William More Gabb, 1839-1878: Natl. Acad. Science Biog. Mem., vol. 6, p. 345-361, port., 1909.
9. Charles Abiathar White, 1826-1910: Natl. Acad. Science Biog. Mem., vol. 7, p. 223-243, port., 1911.
10. On a brackish water Pliocene fauna of the southern Coastal Plain [Wayne Co.]: U. S. Natl. Museum Proc., vol. 46, p. 225-237, illus., 1913. Seven species of gastropods and pelecypods from an exposure on the Satilla River are illustrated; some are described.
11. A contribution to the invertebrate fauna of the Oligocene beds of Flint River, [Decatur Co.] Georgia: U. S. Natl. Museum Proc., vol. 51, p. 487-524, illus., 1916. Sixty one species, of which 29 are new, of gastropods and pelecypods from the limestone exposures around Bainbridge are described and illustrated.

**DANA, EDWARD SALISBURY**, 1849-1935.

1. On staurolite crystals from Fannin Co., Georgia, no. 1 *of* On new twins of staurolite and pyrrhotite, no. 3 *of* Mineralogical notes: Amer. Jour Science, 3d ser. vol. 11, p. 384-386, illus., 1876. Staurolite twins are described and illustrated. Several types of twinning occur.

2. Catalogue of the collection of meteorites in the Peabody Museum of Yale College: Amer. Jour. Science, 3d ser. vol. 32, Sept., appendix p. 1-4, illus., 1886. Meteorites from Monroe, Putnam, and Union Counties are present in the collection.
3. Catalogue of American localities of minerals. 51 p., New York, John Wiley and Sons, 1893. Minerals are listed by county. Nothing more than the list is given.

**DARBY, JOHN,** *see* Glade Gold Mines, 1.

**DARLING, ROBERT WILLIAM,** 1923-

1. Geology of eastern half of the Durham Quadrangle, [Dade, Walker Cos.] northwest Georgia. M. S. Thesis, Emory Univ., 1952.
2. Differential thermal analysis of some Paleozoic shales, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 82-86, illus., 1953. Samples of shales from Pennsylvania, Devonian, and Silurian formations from Walker Co. are used in a test of the validity of differential thermal analyses in correlation. The results of the tests are favorable.

**DARRAH, WILLIAM CULP,** 1909-

1. Leo Lesquereux [1806-1889]: Harvard Univ. Bot. Museum Leaflets, vol. 2, p. 113-119, 1934.
2. [John Wesley] Powell of the Colorado [1834-1902]. ix, 426 p., illus., Princeton, New Jersey, Princeton Univ. Press, 1951.

**DARTON, NELSON HORATIO,** 1865-1948.

1. Artesian well prospects in the Atlantic Coastal Plain regions: U. S. Geol. Survey Bull. 138, 288 p., illus., 1896. An extremely cursory description of ground water conditions is given. Artesian wells from numerous places along the coast are described in tabular form. Some analyses are included.
2. Preliminary list of deep borings in the United States, Part 1 (Alabama—Montana): U. S. Geol. Survey Water-Supply Paper 57, 61 p., 1902. Data from wells in Georgia are tabulated. The column headings are: depth, diameter, yield, water height, and remarks. Most of the wells are on the Coastal Plain.
3. Preliminary list of deep borings in the United States, second edition, with additions: U. S. Geol. Survey Water-Supply Paper 149, 175 p., 1905. Water- and oil-well information from many places in Georgia, mostly on the Coastal Plain, is given in tables. Depth, yield, diameter, water height, and remarks are the column headings.
4. Memoir of W J McGee [1853-1912]: Assoc. Amer. Geographers Annals, vol. 3, p. 103-110, 1915.
5. Geothermal data of the United States, including many original determinations of the underground temperature: U. S. Geol. Survey Bull. 701, 97 p., illus., 1920. Temperature gradients from many wells in many places on the Coastal Plain are tabulated. No unusual circumstances are reported.

6. Memorial of Charles Doolittle Walcott [1850-1927]: Geol. Soc. America Bull., vol. 39, p. 80-116, port., 1928.
7. Memorial of David Talbot Day [1859-1925]: Geol. Soc. America Proc. 1933, p. 185-192, port., 1934.
8. Memorial of Curtis Fletcher Marbut [1863-1935]: Geol. Soc. America Proc. 1936, p. 221-227, port., 1937.

DAVIS, GEORGE HAMILTON, 1921-
1. (and Small, James Barter, and Counts, Harlan Bryan). Land subsidence, related to decline of artesian head in the Ocala Limestone at Savannah, [Chatham Co.] Georgia [abs.]: Geol. Soc. America Bull., vol. 70, p. 1585, 1959.

DAVIS, GORDON LESLIE, 1912- *see* Aldrich, Lyman Thomas, 1, 2.

DAVIS, MORGAN JONES.
1. (and O'Bannon, Prentice Howard). The oil & gas possibilities of the southeastern Gulf Coastal Plain [abs.]: Gulf-Coast Assoc. Geol. Socs. Trans., vol. 2, p. 24, 1952.

DAVIS, ROBERT ELLIS, 1924-
1. Georgia, *in* Magnesium resources of the United States—a geologic summary . . . : U. S. Geol. Survey Bull. 1019, p. 411-412, 1957. A cursory description of the occurrences of dolomite in Georgia is given. This is a review of then-known information, and no new data are included. It occurs predominantly in the Shady and Knox formations in northwestern Georgia and also in the Murphy Marble and Talladega Slate in the Piedmont and Blue Ridge.

DAVIS, ROYALL OSCAR EUGENE, 1880-
1. Soil erosion in the south: U. S. Dept. Agriculture Bull. 180, 23 p., illus., 1915. A general treatise on erosion factors, results, and solutions, includes numerous examples from the Coastal Plain of Georgia. The southern Coastal Plain, because of certain factors, has several unique types of erosion.

DAVIS, WILLIAM HARPER.
1. Edward Drinker Cope [1840-1897] as a geographer: Geog. Soc. Philadelphia Bull., vol. 30, p. 157-162, 1932.

DAVIS, WILLIAM MORRIS, 1850-1934, *see also* Hayes, Charles Willard, 1; Jones, S. Percy, 1.
1. Professor Nathaniel S[outhgate] Shaler [1841-1906]: Amer. Jour. Science, 4th ser. vol. 21, p. 480-481, 1906.
2. Professor [Nathaniel Southgate] Shaler [1841-1906] and the Lawrence Scientific School: Harvard Engineering Jour., vol. 5, p. 129-138, 1906.
3. Biographical memoir of John Wesley Powell, 1834-1902: Natl. Acad. Science Biog. Mem., vol. 8, p. 11-83, port., 1915.

**DAWSON, JOHN WILLIAM,** 1820-1899.

1. Thomas Sterry Hunt [1826-1892]: Canadian Record of Science, vol. 5, p. 145-149, port., Montreal, 1892.

**DAY, ARTHUR LOUIS,** 1869-1960.

1. (and Sosman, Robert Browning and Hostetter, John Clyde). The determination of mineral and rock densities at high temperatures: Amer. Jour. Science, 4th ser. vol. 37, p. 1-39, illus., 1914; [in German] Neues Jahrbuch fuer Mineralogie . . . , Beilage Band 40, p. 119-162, illus., Stuttgart, 1916. Volume, and therefore density changes, associated with heating, is determined for many different kinds of rocks. Stone Mountain Granite, from DeKalb Co., among others, is used. Unequal expansion of minerals causes shattering as well as does the escaping gas.
2. George Ferdinand Becker [1847-1919]: Amer. Jour. Science, 4th ser. vol. 48, p. 242-245, 1919.
3. Memorial of George Ferdinand Becker [1847-1919]: Geol. Soc. America Bull., vol. 31, p. 14-25, port., 1920.

**DAY, DAVID TALBOT,** 1859-1925.

1. The occurrence of fuller's earth in the United States: Franklin Inst. Jour., vol. 150, p. 214-223, 1900. A cursory description of the material includes analyses of some of the fuller's earth from Decatur Co., Georgia.

**DEBOW, JAMES DUNWOODY BROWNSON,** 1820-1867.

1. [Georgia . . . ], *in* The industrial resources, etc., of the southern and western states . . . , vol. 1, p. 354-365, New Orleans, DeBow's Review, 1852. This is a cursory survey of the geology and mineral resources of Georgia, largely abstracted from other persons' work.
2. Mineral resources of Georgia: DeBow's Review, vol. 24, p. 58-61, 1858. A very generalized popular review of the mineral resources of the state is given. No details are included.
3. Newly discovered gold mines in [Bartow Co.] Georgia [abs.]: DeBow's Review, vol. 27, p. 735, 1859.

**DEBY, JULIEN MARC,** 1827-1895.

1. Canton copper mine, Cherokee Co., Georgia: Mining Mag., vol. 5, p. 395-397, illus., 1855. Chalcopyrite-bearing quartz veins in metamorphic rocks are described. Gossan occurs at the surface. Numerous other minerals are present, as is silver.

**DECKER, CHARLES ELIJAH,** 1868-1958.

1. Stratigraphic significance of graptolites of Athens Shale: Amer. Assoc. Petroleum Geologists Bull., vol. 36, p. 1-145, illus., 1952. The Ordovician Athens Shale is present in Murray Co. and nearby. A section is cursorily described from near Tennga, and a graptolite fauna of eight species is listed. They are characteristic of those found in the Athens Shale elsewhere. They are illustrated. The position of the Georgia fauna is discussed as part of a world-wide correlation problem.

DELLENBAUGH, FREDERICK SAMUEL, 1853-1935.

1. Memorial to John Wesley Powell [1834-1902]: Amer. Anthropologist, vol. 20, p. 432-436, 1918.

DELONY, EDWARD.

1. Topography and diseases of Talbot County, Ga.: Southern Medical and Surgical Jour., vol. 1, p. 601-606, 1837. A very cursory description of the general topography is included. The account of the sparsely-settled county is interesting.

DENNISON, H. E.

1. (director, and research staff). Lime prospectus: Georgia Inst. Technology, Engineering Experiment Station, [Spec. Rept. 13], 23 p. (‡), 1945. Descriptions of limestone deposits throughout Georgia are included in a general discussion of the uses of lime industrially.

DENSON, NORMAN MC CLAREN, *see* White, Walter Stanley, 2.

DESOR, EDOUARD, 1811-1882.

1. Post Pliocene of the southern states and its relation to the Laurentian of the north and the deposits of the valley of the Mississippi: Amer. Jour. Science, 2d ser. vol. 14, p. 49-59, 1852. The post-Pliocene deposits of Georgia and Florida are paleontologically correlated with the marine Pleistocene clays of the northeastern United States. The Pleistocene deposits of the north, however, are younger and more bouldery. Also, there are some terrestrial fossils in the southern beds, whereas none are enclosed in the northern beds. Explanations are proposed.

2. Synopsis des échinides fossiles. xx, 490 p., illus. [atlas], Paris, C. Reinwald, Weisbade, Kreidel u Niedner, 1858. A review of the fossil echinoids of the times includes brief descriptions and illustrations of three from Eocene rocks in Georgia. No new data are included.

DICKSON, JAMES.

1. An essay on the gold region of the United States: Geol. Soc. Pennsylvania Trans., vol. 1, p. 16-32, 1834; summary, Amer. Jour. Science, vol. 27, p. 348-351, 1835; Edinburgh New Philos. Jour., vol. 19, p. 185-188, 1835. Gold, occurring as placers and in quartz veins in metamorphic rocks, is discussed. The general location of the veins is outlined. The work is intended largely as an exhortation to mineral producers.

DICUS, JOSEPH MARTIN.

1. The geology and stratigraphy of the Cedar Grove Quadrangle of [Dade, Walker Cos.] northwest Georgia. M. S. Thesis, Emory Univ., 1952.

**DIEFFENBACH, OTTO.**

1. Beobachtungen ueber die Erz-Gaenge und das Gang-Gebirge von *Nord-Carolina* und den angrenzenden Staaten: Neues Jahrbuch fuer Mineralogie . . . 1854, p. 663-669, Stuttgart, 1855. A general discussion of the mineral resources of the Piedmont and Blue Ridge of North Carolina includes cursory descriptions of some of the Georgia deposits. No details are included, however.
2. Bemerkungen ueber den Mineralreichtum der Vereinigten Staaten von Nord-Amerika: Neues Jahrbuch fuer Mineralogie . . . 1855, p. 527-532, 1856; . . . 1856, p. 385-394, 1856. A general review of the mineral industry of the United States includes that of Georgia. No new data are included.

**DIETZ, FRANK TOBIAS**, 1920- *see* Hersey, John Brackett, 1.

**DILLER, JOSEPH SILAS**, 1850-1928.

1. Major Clarence Edward Dutton [1841-1912]: Seismol. Soc. America Bull., vol. 1, p. 137-142, port., 1911.
2. Memoir of Clarence Edward Dutton [1841-1912]: Geol. Soc. America Bull., vol. 24, p. 10-18, port., 1918.

**DILLON, LAWRENCE SAMUEL**, 1910-

1. Wisconsin climate and life zones in North America: Science, vol. 123, p. 167-176, illus., 1956. The biota of the United States, including that of Georgia, is evaluated to determine the life zones during the maximum glaciation. Maps show proposed boundaries, which are generally compressed and shifted southward, and the distribution of individual types of organisms.

**DOAK, JOHN B.**, *see* Aldrich, Lyman Thomas, 1.

**DOBBIN, CARROLL EDWARD**, 1892-

1. Joseph Poyer Deyo Hull, an appreciation: Amer. Assoc. Petroleum Geologists Bull., vol. 35, p. 1698-1700, port., 1951.

**DOBSON, CHARLES M.**

1. Report on the iron fields of Dahlonega [Lumpkin Co.], Ga. 29 p., illus., Atlanta, Jas. P. Harrison, 1889. Hematite and magnetite ores in schist are described. They occur in belts paralleling, in part, the gold belts. Analyses are included. They are interpreted as metamorphosed veins.

**DODGE, W. R.**

1. Gold mining and milling in the southeastern states: Mining and Scientific Press, vol. 110, p. 59-62, 1915. An extremely short, cursory description of the occurrence of gold in quartz veins in the metamorphic rocks of the Piedmont and Blue Ridge is given. No new data are included.

DOERING, JOHN A.

1. Citronelle age problem: Amer. Assoc. Petroleum Geologists Bull., vol. 42, p. 764-786, illus., 1958. The Citronelle Formation is described regionally; it occurs in Georgia on the Coastal Plain. It rests unconformably on older formations and is considered to be the terrestrial, or up-dip equivalent of marine, Lower Pleistocene rocks which are down-dip. It reflects an uplift in the interior of the United States after a time of quiet.

DOLE, RICHARD BRYANT, 1880-1917, *see also* Stephenson, Lloyd William, 6.

1. Chemical character of the waters of the Coastal Plain of Georgia: U. S. Geol. Survey Water-Supply Paper 341, p. 470-532, 1915. Tables of analyses of ground water from various stratigraphic horizons from many places on the Coastal Plain are given.

DONNAY, GABRIELLE HAMBURGER, 1920- *see* Hurst, Vernon James, 22.

DONNAY, JOSEPH DESIRE HUBERT, 1902- *see* Hurst, Vernon James, 22.

DONNELLY, H. F., *see* Nagelschmidt, Gunter, 1.

DONSKY, ELLIS, *see* Counts, Harlan Bryan, 1.

DORSEY, GEORGE EDWIN, 1892-1953.

1. The habitat of *Belemnitella americana* and *mucroanata:* Johns Hopkins Univ. Circ., new ser. 1917, no. 3, p. 107-129, 1917. *B. americana,* the American species, and *B. mucronata,* the European species, are shown always to be found in the same lithology, yet showing no evidence of adaption. The absence of *B. americana* in the Ripley Formation, where it should be found, in Georgia is significant, and is explained by the Georgia Ripley being a more near-shore deposit, therefore more sandy, whereas the *B. americana*-bearing beds elsewhere are always chalky or glauconitic.

DOTT, ROBERT HENRY, 1896-

1. Hugh D[insmore] Miser, an appreciation: Tulsa Geol. Soc. Guidebook, Field Conference May 8-10, p. 3-4, port., 1947.

DOUGLAS, HAMILTON.

1. Report on the Banks [pyrite] Mine, Paulding Co., Georgia, Sept. 8, 1883. [not seen]

DOUGLAS, JAMES, 1837-1918.

1. Biographical notice of Thomas Sterry Hunt [1826-1899]: Amer. Inst. Mining Engineers Trans., vol. 21, p. 400-410, 1893.

**DOUVILLE, JOSEPH HENRI FERDINAND**, 1846-1937.

1. Les couches à orbitoides de l'Amérique du Nord: Académie des Sciences Paris Comptes Rendus, vol. 167, p. 261-267, illus., 1918. The Eocene Jackson Stage can be distinguished from the Oligocene Vicksburg Stage by the presence of *Lepidocyclina mantelli, L. superba* and *Orthophragmina* spp. in the former and by the disappearance of *Orthophragmina,* greater development of *L. superba,* and the appearance of transition forms toward *Eulepidina* in the latter. Examples from the Coastal Plain are cited.
2. Revision des lèpidocyclines: Societé géologique de France Mém., new ser. mem. 2, 115 p., illus., Paris, 1924. *Isolepidina georgiana* from the Eocene Ocala Limestone in Decatur Co. is described and illustrated, as part of a general review of the group.
3. Notice sur Henry Fairfield Osborn [1857-1935]: Académie des Sciences de Paris Comptes Rendus, vol. 201, p. 1074-1076, 1935.

**DRENNEN, CHARLES WILLIAM**, 1926-

1. Geology of the Piedmont-Coastal Plain contact in eastern Alabama and western Georgia. M. S. Thesis, Univ. Alabama, 1950.

**DRYDEN, ABRAHAM LINCOLN, JR.**, 1903-

1. Thorium and monazite deposits, [part 1] Southeastern Coastal Plain: U. S. Geol. Survey Trace Elements Investigations 390, p. 189-190, 1953. Heavy minerals from the Tuscaloosa Formation are radioactive. Monazite usually comprises about 1 percent of the heavy mineral suites, although it locally may be 2-3 percent, and may be up to 10 percent in some locations.
2. Monazite in part of the southern Atlantic Coastal Plain: U. S. Geol. Survey Bull. 1042, p. 393-429, illus., 1958. A general description of monazite occurrence in igneous rocks and as a heavy-mineral component of sedimentary rocks, is followed by a discussion of its occurrence in Cretaceous and Tertiary rocks and in Recent stream sediments.

**DUGGAN, J. R.**

1. The mineral springs of Georgia. 56 p., Macon, J. W. Burke and Co., 1881. A general treatise on the occurrence and therapeutic value of mineral water is followed by a description and analysis of many of the leading springs of the state. Twenty eight are given, most being in the northern half of the state. Medicinal claims are cited.

**DUMBLE, EDWIN THEODORE**, 1852-1927.

1. Memorial of Anthony Wayne Vogdes [1843-1923]: Geol. Soc. America Bull., vol. 35, p. 37-42, port., 1924.

**DUNBAR, CARL OWEN**, 1891-

1. Charles Schuchert (1858-1942): Amer. Philos. Soc. Yearbook 1942, p. 374-377, 1942; Geol. Soc. America Proc. 1942, p. 217-240, port., 1943; Science, vol. 97, p. 301-303, 1943; Jour. Paleontology, vol. 17, p. 219-220, 1943; Geol. Soc. London Quart. Jour., vol. 99, pts. 3-4, p. lxxviii-lxxix, 1944.

DUNCAN, JOHN KENNETH, *see* Bershad, Suzanne E., 1.

DUNKLE, DAVID HOSBROOK, 1911-

1. New western hemisphere occurrences of fossil selachians: Washington Acad. Science Jour., vol. 41, p. 344-347, illus., 1951. Spines of the pristid shark *Propristis* cf. *schweinfurthi* from the Eocene Barnwell Sand of Twiggs Co. are described and illustrated. This is the first known occurrence of this genus outside of Africa. Other vertebrate fragments are also present.

DUTTON, CLARENCE EDWARD, 1841-1912.

1. (and Hayden, Edward Everett). Abstract of the results of the investigation of the Charleston earthquake: Science, vol. 9, p. 489-501, illus., 1887; discussion by Thomas Corwin Mendenhall, p. 584-587; reply by authors, vol. 10, p. 10-11; discussion by Joseph LeConte, p. 22-24, illus.; reply by authors, p. 35-36, 1887. A description of the results of the earthquake and a review of the possible causes includes an isoseismal map which includes Georgia. The intensity ranged from VI to VIII in Georgia.
2. The Charleston [South Carolina] earthquake: U. S. Geol. Survey Ann. Rept. 9, p. 203-528, illus., 1889. The great earthquake of 1886, centered near Charleston, was felt in Georgia, along the coast mostly. Intensities in Georgia of VI to VIII are reported; the effects are described.

EARDLEY, ARMAND JOHN, 1901-

1. Tectonic divisions of North America: Amer. Assoc. Petroleum Geologists Bull., vol. 35, p. 2229-2237, illus., 1951; summary, Tulsa Geol. Soc. Digest, vol. 19, p. 60-67, illus., 1951. A very general review includes a discussion of those divisions in Georgia. No new data are included.

EARGLE, DOLAN HOYLE, 1905-

1. (The) outcropping Cretaceous rocks of Georgia, *in* Short contributions to the geology, geography, and archaeology of Georgia (No. 2): Georgia Geol. Survey Bull. 60, p.1-20, illus., 1953. The entire Cretaceous System is described in considerable detail. All rocks dip gently seaward and the geological history is evaluated. Projected cross sections are included.
2. Stratigraphy of the outcropping Cretaceous rocks of Georgia: U. S. Geol. Survey Bull. 1014, iv, 101 p., illus. incl. geol. map, 1955. Detailed descriptions of the Cretaceous rocks are given. Sections are measured; fossils are listed.

EARLE, RAYMOND BARTLETT.

1. The genesis of certain Paleozoic interbedded iron ore deposits: ScD. Thesis, New York Univ., 1914; New York Acad. Science Annals, vol. 24, p. 115-170, illus., 1914. Various theories of origin for the iron ore deposited during the Silurian Period are reviewed and rejected. The theory of artesian water (confined ground water) having deposited the iron as cement is advanced. Sections from northwestern Georgia are cited for evidence.

EATON, GORDON PRYOR, *see* Johnston, John Edward, 1.

EBAUGH, WILLIAM CLARENCE, *see* Wright, Frank James, 3.

ECKEL, EDWIN CLARENCE, 1875-1941, *see also* Hayes, Charles Willard, 20, 22.

1. Preliminary report on the Dahlonega Gold District of [Lumpkin Co.] Georgia: U. S. Geol. Survey Repts. Open File 570, 48 p.(‡), illus., [?1902]. A hand-written manuscript outlines the geology of the area. The gold occurs in quartz veins in mica schist, and in placers. Folding and faulting are very obvious. This is apparently a manuscript for a publication which was never completed.

2. Dahlonega gold district of [Lumpkin Co.] Georgia: Engineering and Mining Jour., vol. 75, p. 219-220, 1903; U. S. Geol. Survey Bull. 213, p. 57-63, 1903. A survey of the geology and ore deposits is given. Mica schist and hornblende gneiss have been intruded by diorite and granite. The gold occurs in placers in the streams, in saprolite, and in quartz veins at the contacts of the metamorphic and igneous rocks. Pyrite is also common in the quartz veins.

3. Dahlonega mining district, [Lumpkin Co.] Georgia [abs.]: Science, new ser. vol. 17, p. 793, 1903.

4. Cement materials and industry of the United States: U. S. Geol. Survey Bull. 243, 395 p., illus., 1905. A detailed discussion of the technology of cement is followed by a survey of the potential of cement-making resources in each state. Several sources of limestones are described from many places in Georgia. Analyses are included.

5. Cements, limes, and plasters. . . . xxxiv, 712 p., illus., New York, John Wiley, 1905; also several printings and several editions. A general discussion of these materials includes descriptions and analyses of Georgia limestones used in the manufacture of cement.

6. Georgia, *in* Slate deposits and slate industry of the United States: U. S. Geol. Survey Bull. 275, p. 59-60, 1906. A brief survey of the slate deposits in Polk Co. is given. Analyses are included.

7. Building stones and clays—their origin, characters, and examination. xiv, 264 p., illus., New York, John Wiley and Sons, 1912. This is essentially a textbook, but it does contain many analyses of different rocks from Georgia.

8. Portland cement materials and industry in the United States: U. S. Geol. Survey Bull. 522, 401 p., illus., 1913. A general description of the natural resources of the cement industry is followed by a review of the occurrence of these resources in each state, including Georgia. Various limestones are described and anlayzed.

9. Iron ores, their occurrence, valuation, and control. xvii, 430 p., illus., New York, McGraw Hill, 1914. A general discussion of the occurrence of iron ore includes a cursory description of those deposits in the Paleozoic rocks of northwestern Georgia. No new data are included.

10. (and Kelly, Junea W.). Extent and limits of glacial migration in eastern America [abs.]: Pan-Amer. Geologist, vol. 60, p. 378, 1933; with discussion, Internatl. Geol. Cong. 16th, 1933 Washington, D. C., Rept., vol. 2, p. 813-814, 1936.

11. Geological work of the Tennessee Valley Authority, 1933-1935: Tennessee Valley Auth. Div. Geology Bull. 3, 20 p. (‡), 1935. In an otherwise report of progress is a reference to finding *Larix americana*, a Pleistocene fossil plant, near Dahlonega, Lumpkin County.

**ECKELMANN, FRANK DONALD,** *see* Kulp, John Lawrence, 1; Long, Leon Eugene, 1.

**EDGERTON, J. H.**

1. (and Bowen, Boone Moss, Jr.). The Lockheed Radiation Effects Facility and radioactive waste disposal system [Dawson Co.]: Georgia Mineral Newsletter, vol. 12, p. 105-112, illus., 1959. A cursory review of the geology of the local metamorphic rocks and their hydrologic properties is included in an otherwise technical description of the problems of radioactive production and waste disposal.

**EDMUNDSON, RAYMOND SMITH,** 1908- *see* Nelson, Wilbur Armistead, 2.

**EHRENBURG, KURT.**

1. Henry Fairfield Osborn [1857-1935]: Zoologische-botanische Gesellschaft Wien, Jahr 1935, vol. 85, no. 1-4, p. 157-160, 1936.

**EINECKE, GUSTAV.**

1. Die Eisenerzevorraete der Welt. 418 p. incl. vol. of atlas, Dusseldorf, Stahleisen, 1950. A review of the world-wide occurrences of iron ore include discussion of those deposits in northwestern Georgia. No new details are included.

**EISELEY, LORIN COREY.**

1. Charles Lyell [1797-1875]: Scientific Monthly, vol. 201, p. 98-106, illus., 1939.

**ELIAS, MAXIM KONRAD,** *see* Condra, George Evert, 1.

**ELLIOTT, JOHN B.**

1. The age of the Southern Appalachians: Amer. Jour. Science, 3d ser. vol. 25, p. 282-298, illus., 1883. Details of the rocks in the southern part of the Blue Ridge Province, northeast of Acworth in Cobb Co., are given. The Knox Group, from the unmetamorphosed area, is recognized by lithologic sequence in the metamorphic areas.

**ELLIS, ARTHUR JACKSON,** 1885-1920.

1. Mineral waters: U. S. Geol. Survey Mineral Resources 1918, pt. 2, p. 495-531, illus., 1921. In an otherwise statistical survey of the trade, a map showing the distribution of mineral springs in the United States includes those in Georgia.

EMERSON, BENJAMIN KENDALL, 1843-1932.

1. (and others). Honors to James Hall at Buffalo: Science, new ser. vol. 4, p. 697-717, port., 1896.
2. William Bullock Clark (1860-1917): Amer. Acad. Arts and Science Proc., vol. 54, p. 412-415, 1919.
3. James Furman Kemp, 1859-1926: Amer. Acad. Arts and Science Proc., vol. 63, p. 462, 1929.

EMMONS, EBENEZER, 1799-1863, *see* Glade Gold Mines, 1.

EMMONS, SAMUEL FRANKLIN, 1841-1911.

1. Geological distribution of the useful metals in the United States: Amer. Inst. Mining Engineers Trans., vol. 22, p. 53-95, 1894; discussions, p. 732-738; vol. 23, p. 755-756, 1899; reprinted *in* Ore deposits, by Samuel Franklin Emmons, p. 65-91, New York, Amer. Inst. Mining Engineers, 1913. A generalized survey of the metal-bearing ore deposits of the United States includes those in Georgia. No new data are included. Iron is the most important metal ore deposit here.

EMMONS, WILLIAM HARVEY, 1876-1948.

1. (and Laney, Francis Baker). Geology and ore deposits of the Ducktown Mining District, Tennessee [Fannin Co.]: U. S. Geol. Survey Prof. Paper 139, 114 p., illus. incl. geol. map, 1926. A complete, detailed geologic description of the area is given, a small portion of which is in Fannin County. The copper-bearing ore and associated minerals are found in veins and as replacements in metamorphic rocks of Paleozoic age. Details of the ore occurrence are included.

ENGLAND, CHARLES BENNETT.

1. (and Perkins, Henry Frank). Clay mineralogy of three reddish-brown lateritic soils [abs.]: Georgia Acad. Science Bull., vol. 16, p. 3, 1958.

EPPLEY, ROBERT ASHTON, *see* Heck, Nicholas Hunter, 1.

ERWIN, JAMES WALTER, 1934-

1. Contributions to the [Paleocene and Oligocene] paleontology [and lithology] of the northern part of Randolph County, Georgia. M. S. Thesis, Emory Univ., 1956.
2. (A) grain size study of some Eocene beds [Randolph Co.] [abs.]: Georgia Acad. Science Bull., vol. 14, p. 39, 1956.

ERWIN, WALTER LAMBUTH, 1923- *see* Vernon, Robert Orion, 2.

ESPENSHADE, GILBERT HOWRY, 1912-

1. Occurrences of tungsten minerals in the southeastern United States, *in* Snyder, Frank G., ed., Symposium on mineral resources of the southeastern United States, p. 56-66, illus., 1950. A general description of the occurrence and origin of tungsten includes brief descriptions of the occurrences of scheelite in the Piedmont. Little detail is given.

**EVANS, ISABEL P.,** *see* Merrill, George Perkins, 7.

**EVANS, LEWIS,** 1700-1756.

1. A map of North America showing the places where metals, minerals, fossils, and medicinal waters are to be found. . . . No scale, about 12x12 inches, with discussion: Literary Mag. or Universal Review, vol. 1, p. 293-299, London, 1756. This early map shows the relationship of Georgia to the Appalachian Mountains as known at that time. This map is from that of Guettard, q.v., or vice versa.

**EYERMAN, JOHN,** 1867-

1. A catalog of the paleontological publications of Joseph Leidy [1823-1891]: Amer. Geologist, vol. 8, p. 333-342, 1891.

**FAGAN, JAMES MICHAEL,** 1936-

1. Abrasion study of rocks from the Lookout Formation in Dade County, Georgia [abs.]: Georgia Acad. Science Bull., vol. 17, p. 75, 1959.

**FAIRBAIRN, HAROLD WILLIAMS,** 1906- *see* Pinson, William Hamet, Jr., 3.

**FAIRBANKS, HELEN R.**

1. (and Berkey, Charles Peter). Life and letters of R[ichard] A[lexander] F[ullerton] Penrose, Jr. [1863-1931]. x, 765 p., illus., New York, Geol. Soc. America, 1952.

**FAIRCHILD, HERMAN LEROY,** 1850-1943.

1. Edwin Eugene Howell [1845-1911]: Rochester Acad. Science Proc., vol. 5, p. 259-261, 1919.

2. Henry Augustus Ward [1834-1906]: Rochester Acad. Science Proc., vol. 5, p. 241-251, port., 1919.

**FAIRCLOTH, WAYNE R.**

1. A summary of the geology of Georgia with particular emphasis on the Coastal Plain and Grady County. 24 p.(‡), illus., [np] [nd] [?1959]. A brief, popular survey of the geology of the Coastal Plain is given. It is a summary of already known work. Cretaceous rocks to Recent sediments are described.

**FALCONER, HUGH,** 1808-1865.

1. On the species of *Mastodon* and *Elephant* occurring in the fossil state in Great Britain. Part 1, Mastodon: Geol. Soc. London Quart. Jour., vol. 13, p. 307-360, illus., 1857; reprinted *in* Palaeontological memoirs and notes of the late Hugh Falconer, by Charles Murchison, vol. 2, p. 1-64, illus., London, Robert Hardwicke, 1868. *Euelephas columbi* is listed from Georgia in the chart. No data are included. It is considered to be post-Pliocene (?) in age.

2. On the American fossil elephant of the regions bordering the Gulf of Mexico (*E. columbi*, Falc.); with general observations on the living and extinct species: Natural Hist. Review, vol. 3, p. 43-114, illus., London and Edinburgh, 1863; enlarged, *in* Palaeontological memoirs and notes of the late Hugh Falconer, by Charles Murchison, vol. 2, p. 212-291, illus., London, Robert Hardwicke, 1868. Details of the dentition of the type specimen, which is from [Pleistocene] sediments in Glynn Co., are given within a monographic treatment of the group as a whole.

**FARQUHAR, FRANCIS S.**

1. François Émile Matthes, 1874-1948: Amer. Alpine Jour., vol. 7, p. 201-203, port., 1949.

**FARRINGTON, OLIVER CUMMINGS,** 1864-1933.

1. Handbook and catalogue of the meteorite collection: Field Columbian Museum Pub. Geol. Series, vol. 1, p. 1-70, illus., 1895. Meteorites from Putnam, Union, Chattooga, and Monroe Cos. are cursorily described. Fragments of them are in the collection of the Chicago Museum.
2. Catalogue of the collection of meteorites, May 1, 1903: Field Columbian Museum Pubs. Geol. Series, vol. 2, p. 79-124, illus., 1903. Meteorites from Whitfield, Monroe, Putnam, and Union Cos. are cursorily described in tabular form. Fragments of them are present in the Chicago Museum.
3. Professor Henry A[ugustus] Ward [1834-1906]: Science, new ser. vol. 24, p. 153-154, 1906.
4. Analyses of iron meteorites compiled and classified: Field Columbian Museum Pubs. Geol. Series, vol. 3, p. 59-110, 1907. Several meteorite fragments from Georgia are included in the analyses.
5. Catalogue of the meteorites of North America to January 1, 1909: Natl. Acad. Science Mem. 13, 513 p., illus., 1915. A detailed description, analyses, and discussion of all of the known meteorites, including many from Georgia, are given. Georgia ranks seventh in the number of known meteorites; nine are described.
6. Catalogue of the collection of meteorites: Field Columbian Museum Pubs. Geol. Series, vol. 3, p. 231-312, illus., 1916. Many fragments of specimens from Georgia are included in the collection. Data are tabulated.
7. Tribute to George Perkins Merrill [1854-1929]: Geol. Soc. America Bull., vol. 41, p. 27-29, 1930.

**FATH, ARTHUR EARL,** 1887-

1. George Edwin Dorsey (1892-1953): Amer. Assoc. Petroleum Geologists Bull., vol. 38, p. 177-180, port., 1954.

**FAUST, GEORGE TOBIAS,** 1908- *see* Alexander, Lyle Thomas, 1; Mitchell, Lane, 3.

FEATHERSTONHAUGH, GEORGE WILLIAM, 1780-1866.

1. A canoe voyage up the Minnay Sotor . . . with an account of the gold region in the Cherokee Country. . . . 2 vols., 416, 351 p., illus., London, Richard Bentley, 1847. Volume 2 contains some early descriptions of the geology in northwestern Georgia and in the Blue Ridge and Piedmont.

FENNEMAN, NEVIN MELANCTHON, 1865-1945.

1. Physiographic boundaries within the United States: Assoc. Amer. Geographers Annals, vol. 4, p. 84-134, illus., 1914. The philosophy of boundary problems is discussed and specific examples are shown, some of which are from Georgia. Topographic expression is the chief criterion, with geologic structure being closely related.
2. Physiographic divisions of the United States: Assoc. Amer. Geographers Annals, vol. 6, p. 19-98, illus., 1916. A general description of the physiographic provinces in the United States includes those in Georgia. Considerable local details are included.
3. Physiographic divisions of the United States, 3rd edition, revised and enlarged: Assoc. Amer. Geographers Annals, vol. 18, p. 261-353, map, 1928. A map of the United States showing the boundaries of the physiographic provinces includes those of Georgia. A brief explanatory text is included for each boundary.
4. (and others). [Map of] Physical divisions of the United States. Scale, 1:7,000,000, with text, Washington, D. C., U. S. Geol. Survey, 1930.
5. Physiography of the eastern United States. 714 p., illus., New York, McGraw Hill, 1938. A detailed description of the physiographic provinces of the United States includes those in Georgia. The geologic controls on the topography are stressed.
6. Physical divisions of the United States. Map, scale 1 inch to 7,000,000 inches, U. S. Geol. Survey, 1946. A map of the United States is divided into physiographic provinces and subprovinces; Georgia is included. Only the approximate boundaries are given.

FENNER, CLARENCE NORMAN, 1870-1949.

1. Henry Stephens Washington [1867-1934]: Science, new ser. vol. 79, p. 47-48, 1934.

FIELDNER, ARNO CARL, 1881-

1. (and Rice, William Elmer, and Moran, H. E.). Typical analyses of coals of the United States: U. S. Bur. Mines Bull. 446, 45 p., 1942. A correlation of some of the coal beds of the eastern United States is given, followed by analyses of selected beds in the bituminous coal regions of Dade and Walker Counties.
2. (and others). Analyses of Tennessee coals (including Georgia): U. S. Bur. Mines Tech. Paper 671, 243 p., illus., 1945. Proximate and ultimate analyses of coal from Walker and Dade Cos. are given, along with much discussion and description of various physical and chemical properties.
3. Reserves [of] solid fuels . . . : Oil and Gas Jour., vol. 47, no. 46, p. 138-140, 142, 145, illus. incl. port., 1949. A general survey of the coal reserves of the United States shows that the reserves in Georgia are negligible compared to the total of the United States.

FINCH, JOHN.

1. Geological essay on the Tertiary formations in America: Amer. Jour. Science, vol. 7, p. 31-43, 1824. A very general description of the rocks of the Coastal Plain of the United States includes those of Georgia. The rocks are, in ascending order: plastic clay and sand formation [Paleocene], siliceous limestone, or buhrstone [Eocene], calcaire ostrée [Eocene], upper marine formation [Miocene] and diluvial [Pleistocene]. Comparison with the European rock succession is given.

FIREMAN, EDWARD LEONARD, 1922-

1. (and Schwarzer, D.). Measurement of $Li^6$, $He^3$, and $H^3$ in meteorites and its relation to cosmic radiation: Geochemica et Cosmochemica Acta, vol. 11, p. 252-262, London, 1957. Analyses of the Henry Co. meteorite are included. The suggestion of an extraterrestrial origin of the isotopes is the intent of the publication.

FISHER, DANIEL JEROME, 1896-

1. Oliver Cummings Farrington, 1864-1933: Illinois State Acad. Science Trans., vol. 27, p. 43, 1934.

FISHER, GEORGE PARK, 1827-1909.

1. Life of Benjamin Silliman [Sr.] [1779-1864]. 2 vols., 815 p., illus. incl. port., New York, C. Scribner and Co., 1866.

FITCH, WILLIAM EDWARD, 1867-

1. Mineral waters of the United States and American spas. xvi, 798 p., illus., Philadelphia and New York, Lea and Febiger, 1927; 2d ed., 1930. A treatise on the joys and values of mineral-water baths and drinks includes descriptions of fifty five springs in Georgia alone. Analyses are included for many.

FLANIGAN, JAMES C.

1. Geography and geology, Chapter 3 *of* History of Gwinnett County, Georgia, 1818-1943, p. 19-23, Hapeville, Ga., [priv. pub.], 1943. A cursory survey of the mineral resources of the county is given. No new data are included.

FLEENER, FRANK LESLIE.

1. [Edward Salisbury] "Dana" [1849-1935]—of the Danas: Mineralogist, vol. 13, no. 1, p. 3-4, 16-22, incl. ads, 1945.

FLEISCHER, MICHAEL, 1908-

1. John Charles Rabbitt [1907-1957]: Geochemical News, no. 9, p. 6, 1958.

FLEMING, HENRY STUART, 1863-

1. General description of the ores used in the Chattanooga District: Amer. Inst. Mining Engineers Trans., vol. 15, p. 757-761, 1887. Analyses of several different iron ores from different sources in northwestern Georgia are included.

[FLETCHER, LAZARUS, 1854-1921].

1. An introduction to the study of meteorites, with a list of the meteorites represented in the collection [of the British Museum]. 77 p., [London?] 1886; revised, 1904; 1908. A fascinating review of the history of meteorites is followed by a catalogue of the collection. Brief remarks are made about most of the fragments. Pieces of meteorites from Whitfield, Monroe, Cherokee, Putnam, Stewart, Union and Walker Cos. are present.

FLIGHT, WALTER, 1811-1885.

1. A chapter in the history of meteorites: Geological Mag., 2d ser. vol. 2, p. 16-30, 70-80, 115-123, 152-163, 214-226, 257-267, 311-320, 362-372, 401-412, 497-504, 548-560, 589-608, illus., London, 1875; supplement, 2d ser. vol. 9, p. 58-69, 106-111, 164-170, 212-219, 311-316, 356-362, 424-429, 446-452, 505-509, 1882; vol. 10, p. 59-65, 1883; reprinted, 224 p., illus., London, Dulau and Co., 1887. A description of the fall of, and details about, the Stewart, Cherokee, and Whitfield Co. meteorites are included.

FLINSCH-BUBA, MARGRET.

1. H[enry] F[airfield] Osborn [1857-1935], ein Nachdruf aus Amerika: Natur und Volk, vol. 66, no. 2, p. 54, Frankfurt/Main, 1936.

FLINT, RICHARD FOSTER, 1902-

1. Pleistocene features of the Atlantic Coastal Plain: Amer. Jour. Science, vol. 238, p. 757-787, illus., 1940; discussion by Charles Wythe Cooke, with title, Two shorelines or seven, vol. 239, p. 457-458, 1941; reply by author with title, Pleistocene strandlines, a rejoinder, p. 459-462, 1941. A survey of the literature regarding the origin of the terraces along the Atlantic coast, including Georgia, is followed by detailed descriptions of features from Georgia. Ridges, stream offsets, and scarps (wave cut cliffs), are noted. Marine microfossils are listed also. A marine origin for the features is indicated.

2. Atlantic coastal "terraces": Washington Acad. Science Jour., vol. 32, p. 235-237, 1942. The features along the east coast of the United States, including Georgia, which are called terraces, are reviewed. All are shown to be other types of marine features, and the term terrace is not applicable. Two scarps are recognized.

FLUKER, W. H.

1. Gold mining in McDuffie County, Georgia: Engineering and Mining Jour., vol. 73, p. 725-726, 1902; Amer. Inst. Mining Engineers Trans., vol. 33, p. 119-125, 1903. Gold occurs in quartz veins in mica schist. Some of the veins are described.

2. Deep veins in the Appalachian belt: Engineering and Mining Jour.-Press, vol. 114, p. 93-94, illus., 1922. Details of gold-bearing quartz veins in the Dahlonega Belt and in the Columbia Mine in McDuffie Co. show that while the quartz veins vary in thickness with depth in the latter, the value of the gold remains consistent per ton, and the veins do not "degenerate" as some have suggested.

**FOERSTE, AUGUST FREDERICK,** 1862-1936.

1. Notes on Clinton Group fossils with special reference to collections from Indiana, Tennessee, and [northwestern] Georgia: Boston Soc. Natural Hist. Proc., vol. 24, p. 263-355, illus., 1889. *Calymene blumenbachii* var. *vodgesi* from Catoosa and Walker Counties; *C. rostra* from Catoosa County, *Leptaena transversalis prolongata* from Dade Co., and *Leptocoelia hemisphaerica* from Catoosa Co., are discussed. Some are described and illustrated. All are Silurian.

2. On the Clinton oolitic iron ores: Amer. Jour. Science, 3d ser. vol. 41, p. 28-29, 1891. Cells of Bryozoa, filled with iron salts, are cited as one of the origins of the oolites. Examples from Dade County are cited. In some cases the Bryozoa is replaced and the cells are still unreplaced. All gradations are known. No concretionary origin for the oolites is evident.

3. Studies on the Chipola Miocene of Bainbridge, [Decatur Co.] Georgia, and of Alum Bluff, Florida, with an attempt to correlate certain Grand Gulf Group beds with marine Miocene beds eastward: Amer. Jour. Science, 3d ser. vol. 46, p. 244-254, 1893. In a regional facies study, comparing the marine beds with non-marine beds toward the northwest, examples are taken from Decatur County. The section in "Gastropod Gully" is described, and fossils are listed.

4. The upper Vicksburg Eocene and the Chattahoochee Miocene of [Decatur Co.] southwest Georgia and adjacent Florida: Amer. Jour. Science, 3d ser. vol. 48, p. 41-54, illus., 1894. The Vicksburg beds (Oligocene) are identified as residual chert in the Flint River Valley. A vertical section is reconstructed on the assumption that the chert, while not *in situ*, is left relatively in stratigraphic position in the residuum. A section is constructed; it is 150 feet thick. Fossils are listed. The overlying Miocene rocks are also described.

**FORBES, EDWARD,** 1815-1854, *see* Lyell, Charles, Jr., 4.

**FORD, WILLIAM EBENEZER,** 1878-1939.

1. Edward Salisbury Dana [1849-1935]: Science, new ser. vol. 82, p. 342-344, 1935; Compass, vol. 16, no. 1, p. 15-18, 1935.

2. Memorial of Edward Salisbury Dana [1849-1935]: Amer. Mineralogist, vol. 21, p. 173-177, port., 1936.

**[FORT, TOMLINSON,** 1886-] *see* Little, George, 1.

**FORTSON, CHARLES WELBORN, JR.,** 1934-

1. (and Navarre, Alfred Theodore). Limestones exposed in the lower Withlacoochee Valley of [Brooks and Lowndes Cos.] Georgia: Southeastern Geology, vol. 1, p. 73-76, illus., 1959. Two formations, the Oligocene Suwanee Limestone and the Miocene Tampa Limestone, are recognized in the river valley and in sink holes. Each is described and analyzed.

2. (and Navarre, Alfred Theodore). Monazite-bearing pegmatites in the [Crawford Co.] south Georgia Piedmont: Econ. Geology, vol. 54, p. 1309-1311, illus., 1959. Pegmatites, a few inches thick, occur in shear zones in metamorphic rocks. They contain quartz, potash feldspar and small monazite crystals. The origin is uncertain but they may be genetically related to monazite-bearing granites a few miles away.

3. Preliminary reconnaissance of the geology and mineral resources of Hancock County, Georgia. ii, 16 p. (‡), illus. geol. map, Georgia Inst. Technology, Engineering Experiment Station, Project no. A-436-2, 1959. A generalized geological description of the county is included. The metamorphic and igneous rocks of the Piedmont are described, as are the Cretaceous and Eocene sedimentary rocks. Kaolin is the chief mineral resource, and granite, clay, stone, and sand and gravel are also present.

**FOSBROOKE, S. H.**

1. Gold in Georgia: Dixie, vol. 5, p. 423-424, 1889. Gold from near Stockbridge, in Henry Co. is reported but without detail, as is a gold vein reported from Oglethorpe Co. Other gold areas are described from throughout the Piedmont.

**FRAME, JAMES.**

1. Further notes on the gold deposits of the southern Appalachians: Engineering and Mining Jour., vol. 111, p. 4, 1921. Details of the occurrence of gold-bearing quartz veins in fissures in metamorphic rocks are given. Placers and mineralized zones in schist are also sources of gold. Emphasis is placed on the Dahlonega Belt.

**FRANCK, MONA L.**, *see* Pinson, William Hamet, Jr., 2.

**FRAZER, PERSIFOR, JR.**, 1844-1909.

1. Joseph Leidy [1823-1891] M. D., LL. D.: Amer. Geologist, vol. 9, p. 1-5, port., 1892.

2. Thomas Sterry Hunt [1826-1899]: Amer. Geologist, vol. 11, p. 1-13, port., 1893.

3. [Obituary notice of Edward Drinker Cope, 1840-1897]: Amer. Naturalist, vol. 31, p. 410-413, port., 1897.

4. Alphabetical cross reference catalogue of all the publications of Edward Drinker Cope from 1859 till his death in 1897: Sociedad Cientifica "Antonio Alzate" Memoria, vol. 14, p. 39-72, 233-256, 439-466, 1899; vol. 15, p. 31-96, Mexico, 1900.

5. (The) life and letters of Edward Drinker Cope [1840-1897]: Amer. Geologist, vol. 26, p. 67-128, port., 1900.

6. Catalogue chronologique des publications de Edward Drinker Cope [1840-1897] de 1859 à 1897 inclusivement: Societé géologique de Belgique Annales, vol. 29, p. BB 3-77, Liege, 1902.

FREEMAN, JACK.

1. Harrisburg Cave [Walker Co.]: Georgia Spelunker, vol. 1, no. 3, p. 8 (‡), illus., 1957. A map of the cave in Lookout Mountain is included along with a very brief description.

FRIIS, HERMAN RALPH, 1905-

1. W[olfgang] L[ouis] G[ottfried] Joerg, 1885-1952: Assoc. Amer. Geographers Annals, vol. 43, p. 255-283, port., 1953.

FRINK, JOHN WESTLAKE, 1916-

1. (and Murray, Grover Elmer Jr.). Elliptical "bays" or "craters" of southeastern United States: Compass, vol. 17, p. 227-233, 1937. Twenty five features of the "Carolina Bays," some of which are in Georgia, are described. A meteorite impact origin is proposed.

FRYXELL, FRITIOF MELVIN, 1900-

1. Memorial to François Émile Matthes, (1874-1948): Geol. Soc. America Proc. 1955, p. 153-168, port., 1956.

FULLER, GLEN LOREN, 1891-

1. Reconnaissance erosion survey of the state of Georgia. Map, scale 1 inch to 500,000 inches, U. S. Dept. Agriculture, Soil Conservation Service [n.d.]. A map of the state shows relative rates of erosion by colors, from little or none to destroyed by gullying.
2. Charting the effects of erosion in the Old-Plantation Belt of the southern Piedmont: Amer. Geophysical Union Trans., vol. 15, pt. 2, p. 495-500 (‡), 1934. The rates of various types of soil erosion in different types of soils are studied. The figures are tabulated. Morgan and Jasper Cos. are used as examples for the entire region.

FULLER, MYRON LESLIE, 1873-1960.

1. (and Lines, Edwin Fuller, and Veatch, Arthur Clifford). Record of deep well drilling for 1904: U. S. Geol. Survey Bull. 264, 106 p., 1905. Five wells from 305 to 700 feet deep, were reported drilled in Georgia; three are in the Coastal Plain and two are in Walker Co. Depth to water, rise of water in well, yield, and remarks are the table headings; no lithologic logs are included.
2. Peculiar mineral waters from crystalline rocks of [Cobb Co.] Georgia: U. S. Geol. Survey Water-Supply Paper 160, p. 86-91, 1906. Water from several springs in Cobb Co. is analyzed. The chlorine and sulphate content is very high. The local geology is described, and possible origins for the mineral water are discussed. The minerals may come from deep-seated sodalite- or apatite-bearing rocks, or may be water excluded from an igneous magma.
3. (and Sanford, Samuel). Record of deep-well drilling for 1905: U. S. Geol. Survey Bull. 298, 299 p., 1906. Eight wells were drilled in 1905, varying from 180 to 918 feet deep. The data are in tables which include as headings, depth to water, rise in well, yield, and remarks. Most are in the Coastal Plain; one is in Fulton Co. Generalized lithologic logs are included for most.

4. Artesian waters of the Atlantic Coastal Plain: Amer. Water Works Assoc. Proc. 28th Ann. Convention, p. 294-322, illus., [1908]. A general review of the geology of the Coastal Plain is given, followed by a discussion of the origin of artesian water. Potential artesian source rocks are described, some of which are in Georgia.

**FULTON, JOHN FARQUHAR,** 1899-1960.

1. Benjamin Silliman, [Sr.] 1779-1864, pathfinder in American science. xiii, 294 p., illus., New York, Henry Schuman [1947].

**FURCRON, AURELIUS SYDNEY,** 1899- *see also* Henderson, Edward Porter, 2, 4, 5; Hootman, James Albert, 1; LeGrand, Henry Elwood, 2; Lester, James George, 7.

1. The gold deposits of the southeastern United States. M. S. Thesis, Univ. Virginia, 1923.
2. (and others). Mineral resources of Georgia, *in* Natural resources of Georgia, p. 121-222, illus., Atlanta, State Dept. Education, 1938; reprinted as separate, 1938. This is a summary of the various mineral resources of the state presented in popular form, and designed for the educational system of the state. No new details are given.
3. (and Munyan, Arthur Claude, and Smith, Richard Wellington). Rock wool opportunities for manufacturing in Georgia: Georgia Geol. Survey Inf. Circ. 10, 18 p. (‡), 1939. Exhortation for the use of Georgia material in the manufacture of rock-wool insulation includes many descriptions and analyses of rocks, mostly limestone, from the state.
4. The flagstone industry of Georgia: Georgia Geol. Survey Inf. Circ. 12, 8 p. (‡), illus., 1940. A general description of the origin and use of flagstone is followed by a description of occurrences in Georgia. Most comes from the Pottsville Formation in northwestern Georgia and from several different crystalline rocks in the Piedmont and Blue Ridge.
5. Magnesium and magnesium salts in Columbia County, Georgia: Manufacturer's Record, vol. 110, no. 2, p. 19, 1941. A body of serpentine, very pure and extensive, is described as a potential source of magnesium.
6. Dolomites and magnesium limestones in Georgia: Georgia Geol. Survey Inf. Circ. 14, 29 p. (‡), illus., 1942. A general discussion of the origin and uses of dolomite and magnesium limestone is followed by descriptions of occurrences in Georgia. Most comes from the Paleozoic terrane of northwestern Georgia, and some comes from the various marble belts in the Piedmont. Analyses are included.
7. (and Teague, Kefton Harding). Mica-bearing pegmatites of Georgia: Georgia Geol. Survey Bull. 48, xii, 192 p., illus., 1943. A general discussion of the origin of mica in pegmatites is followed by a description of individual properties in many counties in the Blue Ridge and Piedmont. Small-scale sketch maps are included.
8. The crystalline basement: Southeastern Geol. Soc. [Guidebook] Field Trip 2, p. 1-2 (‡), 1944. A very cursory review of the rocks encountered on a field trip in the Macon and Bibb Co. area is given.

9. Amethyst in Georgia: Rocks and Minerals, vol. 20, p. 210-211, illus., 1945. This is a popular account of the occurrence of amethyst. Most comes from the Blue Ridge area in Rabun and Towns Counties.

10. (and Teague, Kefton Harding). Geologic map of the southern end of the Blue Ridge Mountains in [Pickens, Forsyth, Lumpkin and Cherokee Cos.] Georgia. Scale 1 inch to about 1 mile, Georgia Geol. Survey, 1945.

11. (and Teague, Kefton Harding). Geology of the southern end of the Blue Ridge in [Cherokee and Dawson Cos.] Georgia [abs.]: Geol. Soc. America Bull., vol. 56, p. 1161, 1945; Georgia Acad. Science Bull., vol. 3, no. 2, p. 5, 1945.

12. (and Teague, Kefton Harding, and others). Sillimanite and kyanite in Georgia (a preliminary report): Georgia Geol. Survey Bull. 51, x, 76 p., illus. incl. geol. map, 1945. Sillimanite-bearing schist is described from Hart, Elbert, Madison, and Towns Cos. as are massive kyanite-bearing rocks from Cherokee, Pickens, Dawson, and Gilmer Counties. Descriptions of the associated rocks are included.

13. (and Teague, Kefton Harding, and Calver, James Lewis). Talc deposits of Murray County, Georgia: Georgia Geol. Survey Bull. 53, x, p. 1-75, illus. incl. geol. map, 1947. Precambrian-Cambrian rocks are described, as are the numerous faults and folds. Talc occurs in dolomitic portions of the Cohutta Schist. Its occurrence and distribution is described and discussed. Analyses are included, as are descriptions of individual properties.

14. Cloudland Canyon State Park and Lookout Mountain, [Dade Co.] Georgia: Earth Science Digest, vol. 3, no. 5, p. 13-15, illus., 1948; Georgia Mineral Soc. Newsletter, vol. 1, no. 10, p. 22-26 (‡), illus., 1948. A popular account of the geology of the area is given. Some of the geological features are described in a guidebook-like description.

15. Amethyst near Hightower Bald, [Union Co.] Georgia: Rocks and Minerals, vol. 23, p. 796, 1948; Georgia Mineral Soc. Newsletter, [vol. 1] no. 7, p. 8-9 (‡), 1948. A popular account of the occurrence of amethyst is given. No details are included.

16. Ketchum's cave: Georgia Mineral Soc. Newsletter, [vol. 1] no. 9, p. 12-13 (‡), illus., 1948. A brief popular description of this cave in Whitfield Co. is given.

17. Meteorites in Georgia: Georgia Mineral Soc. Newsletter, [vol. 1] no. 7, p. 13-17 (‡), illus., 1948. This is a popular account of some of the known meteorite falls in Georgia. A complete list is included.

18. (The) mineralogy of Indian artifacts in Georgia [abs.]: Georgia Acad. Science Bull., vol. 6, no. 1, p. 20, 1948.

19. Staurolite in Georgia: Georgia Mineral Soc. Newsletter, vol. 1, no. 12, p. 3-8 (‡), illus., 1948; Earth Science Digest, vol. 3, no. 7, p. 7-12, 1949. A brief, popular account of staurolite includes descriptions of its occurrences in the Blue Ridge area of Georgia.

20. (The) geology of Tallulah Gorge [Habersham and Rabun Cos.]: Georgia Mineral Soc. Newsletter, vol. 2, no. 2, p. 11-12 (‡), illus., 1949. This is a popular account of the origin of the gorge. A tributary of the southeastward-flowing Tugaloo River beheaded and captured part of the southwestward-flowing Chattahoochee River.

21. (The) Georgia story (the geological history of Georgia): [Part 1], Georiga Mineral Soc. Newsletter, vol. 2, no. 4, p. 2-14 (‡), illus.; [Part 2], the Paleozoic, no. 5, p. 2-5 (‡), illus.; [Part 3], the Paleozoic, no. 6, p. 2-6 (‡), illus.; [Part 4], the Paleozoic, no. 7, p. 4-7 (‡), illus., 1949; [Part 5], Paleozoic structures, vol. 3, p. 2-9 (‡), illus.; [Part 6], Paleozoic rocks and minerals, p. 44-47 (‡), illus.; [Part 7], Mesozoic and Cenozoic, p. 74-75 (‡); [Part 8], the Mesozoic, p. 109-112 (‡), illus.; [Part 9], Cenozoic times, p. 160 (‡); [Part 10], the Tertiary rocks, p. 209-210 (‡), 1950; [Part 11], Pleistocene, vol. 4, p. 1-3 (‡), 1951. This is a popular account of the geological history of Georgia. No new data are included.

22. Peculiar quartz growths near Statham, Barrow County: Georgia Mineral Soc. Newsletter, vol. 2, no. 2, p. 7-9 (‡), illus., 1949. The occurrence of crystalline quartz is described. The crystals occur in a lens in granite-injected schist.

23. Petroleum in the southeastern states: Georgia Mineral Soc. Newsletter, vol. 2, no. 2, p. 2-6 (‡), 1949. A cursory discussion of the petroleum potential of the southeastern United States includes that of Georgia. A chart lists the locations of the 36 wells drilled in Georgia.

24. Structural features of the Brevard Belt in Georgia [abs.]: Georgia Acad. Science Bull., vol. 7, no. 1, p. 20, 1949.

25. Geological provinces of Georgia and their principal mineral resources, *in* Short contributions to the geology, geography, and archaeology of Georgia: Georgia Geol. Survey Bull. 56, p. 10-20, 1950. This is a short, generalized review of the chief mineral resources of Georgia. No new data are included.

26. Kyanite and sillimanite in the southeastern states, *in* Snyder, Frank G., ed., Symposium on mineral resources of the southeastern United States, p. 99-111, illus., 1950. A generalized discussion of the nature and occurrence of this mineral includes occurrences in Rabun and Habersham Counties. The mineral occurs in a muscovite schist. Other occurrences in the Piedmont and Blue Ridge are described. Sillimanite in biotite-muscovite schist in the Piedmont is also discussed.

27. Geology of the crystalline rocks, *in* Geology of the crystalline rocks and of the Paleozoic area of northwest Georgia: Southeastern Geol. Soc. [Guidebook], Field Trip 7, p. 2-8 (‡), illus., 1951. A generalized description of the rocks is given along with an itemized road log of a field trip from Atlanta, Fulton Co., to Allatoona, Cobb County.

28. Radioactive garnet from Towns County: Georgia Mineral Soc. Newsletter, vol. 4, p. 130 (‡), 1951. A brownish-red garnet rock which is radioactive is described. The nature and source of the radioactivity are not known.

29. Relation of stratigraphy and structure to origin of the north Georgia Highland [abs.]: Georgia Acad. Science Bull., vol., 9, no. 1, p. 19, 1951.

30. Salt springs and wells of Cobb and Douglas Counties, Georgia—a groundwater enigma: Georgia Mineral Soc. Newsletter, vol. 4, p. 8-10 (‡), 1951. Brines from wells in the metamorphic rocks are discussed; analyses are included. No explanation is available.

31. Stratigraphy and structure of Georgia crystalline rocks [abs.]: Geol. Soc. America Bull., vol. 62, p. 1551, 1951.
32. *Basilosaurus cetoides* from Crawford County, Georgia [abs]: Georgia Mineral Soc. Newsletter, vol. 5, p. 54 (‡), 1952.
33. Diamonds near Macon, [Bibb Co.] Georgia [abs.]: Georgia Mineral Soc. Newsletter, vol. 5, p. 154 (‡), 1952.
34. Dr. [Thomas Poole] Maynard [1883-1952]: Georgia Mineral Soc. Newsletter, vol. 5, p. 167 (‡), 1952.
35. Georgia's copper deposits: Georgia Mineral Soc. Newsletter, vol. 5, p. 137-139 (‡), 1952. This is a popular account of the occurrence of copper in the Blue Ridge and Piedmont of Georgia.
36. Mastodon tooth from near Cartersville, [Bartow Co.] Georgia [abs.]: Georgia Mineral Soc. Newsletter, vol. 5, p. 53-54 (‡), 1952.
37. Spore discs from Cambrian shale [Floyd Co.] [abs.]: Georgia Mineral Soc. Newsletter, vol. 5, p. 54 (‡), 1952.
38. Thar's gold in them hills: Georgia Mineral Soc. Newsletter, vol. 5, p. 129-134 (‡), illus., 1952. This is a popular account of the gold deposits of northern Georgia, with special consideration given to the Chamber's Nugget from White County.
39. Aquamarine prospect, Pickens County: Georgia Mineral Newsletter, vol. 6, p. 40-41, illus., 1953. Aquamarine and golden beryl occur in a pegmatite in the local biotite granulite.
40. Bloating granites in the Cohutta Mountains of Murray County, Georgia: Georgia Mineral Newsletter, vol. 6, p. 8-11, illus., 1953. Granite, which expands when heated to make a potential aggregate, is described. The granite intrudes granite gneiss.
41. Comments on the geology of the Ellijay Quadrangle [Fannin, Gilmer, Union, Pickens, Dawson, and Lumpkin Cos.] Georgia-North Carolina-Tennessee, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 32-40, illus., 1953. A generalized description of the stratigraphy of the quadrangle is given. There are 4 great sequences of metamorphic rocks, the youngest one, the Murphy Series, is considered to be Paleozoic in age, the others Precambrian. Very little igneous intrusion is evident.
42. Siliceous oolite and doubly-terminated quartz crystals in [Murray Co.] northwest Georgia [abs.]: Georgia Mineral Newsletter, vol. 6, p. 32, 1953.
43. (and Chancey, C. N.). (The) Minerals Processing Company Mine and other beryl deposits in Troup County, Georgia: Georgia Mineral Newsletter, vol. 7, p. 140-144, illus., 1954. Beryl occurs in kaolinized pegmatite surrounding a quartz core; the entire mass is enclosed in biotite gneiss. Some aquamarine occurs also. Other local deposits are described.
44. Silica gel at Laurel Creek corundum mine, Rabun County: Georgia Mineral Newsletter, vol. 7, p. 122, 1954. Silica gel is found at the surface near the mine; it is a weathering product of several basic silicate minerals.
45. Apatite near Nachoochee, [White Co.] Georgia: Georgia Mineral Newsletter, vol. 8, p. 77, 1955. A gem quality, high-calcium green apatite occurs in coarsely crystalline biotite gneiss.

46. Prospecting for uranium in Georgia, Part 1: Georgia Mineral Newsletter, vol. 8, p. 38-46, illus., 1955. A brief description of the general geology of the state is followed by a discussion of some of the known uranium locations in the state. None is very big or important.

47. (The) Georgia Highland: Georgia Mineral Newsletter, vol. 9, p. 91-104, illus., 1956; correction, vol. 10, p. 38, 1957. This is a semi-popular, abundantly illustrated, account of the geology, physiography and economics of the Blue Ridge Province.

48. Iron ores of the Clayton Formation in Stewart and Quitman Counties, Georgia: Georgia Mineral Newsletter, vol. 9, p. 116-124, illus., 1956. The ore is mostly limonite occurring as geodes or as the cement of sandstone. It occurs at the base of the Paleocene Clayton Formation. Maps show the location of known ore outcrops. Analyses are included.

49. (and Ray, Donald L.). Clayton iron ores of Webster County, Georgia: Georgia Mineral Newsletter, vol. 10, p. 73-76, illus. incl. geol. map, 1957. Iron ore, as hematite, goethite and limonite, occurs as geodes and as cement in sandstone. It is near the base of the Paleocene Clayton Formation. Several analyses are included.

50. (and Perry, Eugene Carleton, Jr.). Limestones of Lee County, Georgia: Georgia Mineral Newsletter, vol. 11, p. 111-118, illus., 1958. The distribution of the Ocala Limestone in the county is described, and analyses are given for many outcrops. Most outcrops are associated with sink holes.

51. (and Perry, Eugene Carleton, Jr.). Mineral resource survey of Crisp County, Georgia: Georgia Mineral Newsletter, vol. 11, p. 37-44, illus., 1958. Limestone and fuller's earth are the two economic products described. They are located and analyzed.

52. Mineral resource survey of Floyd County, Georgia: Georgia Mineral Newsletter, vol. 11, p. 1-15, illus., 1958. The presence and economic potential of shale, limestone, bauxite, iron, manganese, light weight aggregate, sand and gravel, chert, tripoli, barite, and mineral springs are described. Analyses are included for most.

53. Beryl in Georgia: Georgia Mineral Newsletter, vol. 12, p. 91-95, 1959. A brief description of the occurrence and properties of beryl is followed by an account of its occurrences in Georgia. It is reported from 23 counties in the Piedmont and Blue Ridge.

54. [Columbite in Paulding, Troup, and Fayette Cos.] [abs.]: Georgia Mineral Newsletter, vol. 12, p. 26, 1959.

55. Helium and [!] helium [?argon] in Georgia: Georgia Mineral Newsletter, vol. 12, p. 60-61, 1959. Helium has been reported from natural gas wells in Decatur and Walker Counties. None is in commercial quantity, however. A trace of argon is also reported.

56. Notes of some iron ore deposits in Worth County: Georgia Mineral Newsletter, vol. 12, p. 62, 1959. Sandy ironstone pebbles, and goethite-hematite geodes are reported from near Sylvester. The origin and age of the ore are not discussed; an analysis is included.

57. (The) distribution and character of stone for aggregate in Georgia: Symposium on geology as applied to highway engineering, Proc. 10th, p. 5-25, illus., Atlanta, Georgia Inst. Technology, 1959; Georgia Mineral Newsletter, vol. 12, p. 1-8, illus., 1959; correction, p. 62. This is a review of the great variety of rocks available throughout the state. Each type is lithologically described, and its qualities as aggregate stone are discussed.

**FURNISH, WILLIAM MADISON, JR.,** 1912- *see* Miller, Arthur Keith, 1.

**G.——**

1. James Furman Kemp [1859-1926]: Canadian Mining and Metallurgical Bull. 177, p. 22-25, port., Ottawa, 1927.

**GABB, WILLIAM MORE,** 1839-1878, *see also* Morton, Samuel George, 1.

1. Notes on American Cretaceous fossils with descriptions of some new specimens: Acad. Natural Science Philadelphia Proc. 1876, p. 276-324, 1877. Many mollusks from the [Providence] Formation in Clay County are described. Many are new. Some pelecypods from the Ripley Formation in Stewart and Quitman Cos. are also included.

**GALPIN, SIDNEY LONGMAN,** 1886-1962.

1. A preliminary report on the feldspar and mica deposits of Georgia: Georgia Geol. Survey Bull. 30, xii, 190 p., illus., 1915. A general discussion of the nature and occurrence of rocks in the Piedmont and Blue Ridge is followed by details of the occurrences of feldspar and mica in pegmatites, by county. Analyses are included.

**GARDNER, CHARLES HARWOOD,** 1937-

1. (and Grant, Willard Huntington). An unusual occurrence of gypsum crystals [Lumpkin Co.] [abs.]: Georgia Acad. Science Bull., vol. 17, p. 76, 1959.

**GARDNER, JULIA ANNA,** 1882-1960, *see also* Clark, William Bullock, 4; Cooke, Charles Wythe, 22.

1. Coastal Plain and European Miocene and Pliocene mollusks: Geol. Soc. America Bull., vol. 35, p. 857-866, 1924. Inference to Georgia is made in a generalized comparison of European and American Miocene Stages. The fauna in general, and some genera and species, are compared.
2. The detection of the Chipola fauna in the Marks Head Marl: Washington Acad. Science Jour., vol. 15, p. 264-268, 1925. The fauna of the type area in Effingham Co. is re-evaluated and determined to be a Chipola equivalent rather than an equivalent of the Calvert or Alum Bluff Formations.
3. The molluscan fauna of the Alum Bluff Group of Florida [and Decatur Co.] [in 8 parts]: U. S. Geol. Survey Prof. Paper 142, 707 p., illus., 1926-50. Over 800 species of mollusks are described and illustrated. Fossils from the Oak Grove Sand, south of Bainbridge, are included.

4. Memorial of Truman Heminway Aldrich [1848-1932]: Geol. Soc. America Bull., vol. 44, p. 301-307, port., 1933.
5. (and Bowles, Edgar Oliver). The *Venericardia planicosta* group in the Gulf Province: U. S. Geol. Survey Prof. Paper 189-f, p. ii, 143-215, illus., 1939. A detailed description of the evolutionary differentiation and geographic distribution of the group includes descriptions of those found in the Eocene rocks of western Coastal Plain Georgia.
6. [Wendell Clay Mansfield, 1874-1939]: Washington Acad. Science Jour., vol. 30, p. 494-495, 1940.

**GARRARD, JAMES A.**

1. A study of the soil series of Georgia, their distribution, physical characteristics, and chemical composition. M. S. Thesis, Univ. Georgia, 1930.

**GATES, DANIEL WILLIAM,** 1921- *see* Brown, William Robert, 1; Olson, Jerry Chipman, 1.

**GEIJER, PER ADOLF, 1886-**

1. James Furman Kemp [1859-1926]: Geologiska Foreningens i Stockholm Förhandlingar, vol. 48, p. 593, 1926.
2. Waldemar Lindgren, February 14, 1860 — November 3, 1939: Geologiska Foreningens i Stockholm Forhandlingar, vol. 61, p. 509-512, port., 1939.

**GENTH, FREDERICK AUGUSTUS,** 1820-1893, *see also* Jackson, Charles Thomas, 3; Pratt, Nathaniel Alpheus, Jr., 1; Shepard, Charles Upham, 5.

1. Automolite, no. 7 *of* Contributions to mineralogy: Amer. Jour. Science, 2d ser. vol. 33, p. 196, 1862. The mineral, probably spinel, from the Canton Mine, in Cherokee County, is analyzed.
2. Gold, pseudomorph after aikinite, no. 1 *of* Contributions to mineralogy: Amer. Jour. Science, 2d ser. vol. 33, p. 190, 1862. A small specimen, probably from Georgia, is described. The gold occurs in a bismuth carbonate which has the form of the aikinite on the same specimen.
3. Staurotide ?, no. 11 *of* Contributions to mineralogy: Amer. Jour. Science, 2d ser. vol. 33, p. 198-199, 1862. The mineral from the Canton Mine in Cherokee Co. is analyzed.
4. Corundum, its alteration and associated minerals: Amer. Philos. Soc. Proc., vol. 13, p. 361-406, 1873; Pennsylvania Univ. Lab. Contrib. 1, 46 p., Philadelphia [1873]; Journal fuer praktische Chemie, vol. 9, p. 49-112, Leipzig, 1874. A treatise on the origin and occurrence of corundum includes descriptions of deposits in northern Georgia, especially in soapstone, in Rabun, Towns, and Hall Counties. The associates and alteration minerals are discussed also, though little of the data come from Georgia.

5. On American tellurium and bismuth minerals: Amer. Philos. Soc. Proc., vol. 14, p. 223-231, 1876; Journal fuer praktische Chemie, vol. 10, p. 355-368, Leipzig, 1874. Tetradymite from Spalding Co. (error for Pauding Co.?) is associated with the gold ore in small, lead-colored scales.
6. Corundum, altered to zoisite [Towns Co.], no. 2 *of* Contributions to mineralogy: Amer. Philos. Soc. Proc., vol. 20, p. 382, 1883. Corundum altered to zoisite is mentioned. No details are included.
7. (and Penfield, Samuel Lewis). Fuchsite, no. 10 *of* Contributions to mineralogy, no. 54: Amer. Jour. Science, 3d ser. vol. 44, p. 388-389, 1892. Deep emerald-green scales in a quartz-mica schist from Habersham Co. are analyzed and described. They are crystals of fuchsite.

GEORGIA INSTITUTE OF TECHNOLOGY INDUSTRIAL ECONOMIC RESEARCH STAFF.

1. Economic study of northeast Georgia: Georgia Inst. Technology Engineering Exper. Sta. Spec. Rept. 21, 292 p., 1946. In an otherwise exclusively economic survey of the Blue Ridge Province, a few pages are devoted to a cursory description of the geology and mineral resources of the area. No new data are included.
2. Economic study of the Rome [Floyd Co.] area: Georgia Inst. Technology Engineering Exper. Sta. Bull. 9 [!Spec. Rept. 20], 271 p., illus., 1946. An economic survey, which includes much statistical data, also includes a summary of the mineral deposits of the area. Descriptions of deposits and analyses are included.

GEORGIA MEDICAL SOCIETY.

1. The substance of a report read before the Georgia Medical Society by a committee of its members, February 4, 1809 . . . . 34 p., Savannah, Everitt and Evans, 1809; summary, Medical Repository, 3d hex. vol. 1, p. 153-158, 1810. A report on the medical aspects of growing rice in the low swampy areas of Chatham Co. includes a description of the physiography of the region. Yellow fever and malaria are fearsome.

GIBBES, LEWIS R., 1810-1894.

1. Xenotime from the gold region of [Habersham Co.] Georgia [abs.]: Amer. Jour. Science, 2d ser. vol. 13, p. 142-143, 1852.

GIBBES, ROBERT WILSON, 1809-1866.

1. Monograph of the fossil Squalidae of the United States: Acad. Natural Science Philadelphia Jour., 2d ser. vol. 1, p. 139-147, 191-206, illus., 1848-1849. Teeth of *Lamna cuspidata* from Eocene rocks in [Washington Co.?] are described and illustrated, as are many other shark teeth from elsewhere.
2. [Discussion of] On a new application of the magnetic telegraph, by Matthew Fontaine Maury: Amer. Assoc. Advancement Science Proc., vol. 3, p. 57, 1850. Stone Mountain, in DeKalb Co., is suggested as a possible locale for an experiment in determining geophysical and geodetic values of the gravity of the earth. It is the best location in Georgia for gravity-determining experiments.

3. Remarks on the fossil *Equus:* Amer. Assoc. Advancement Science Proc., vol. 3, p. 66-68, 1850. A tooth of *Equus americana,* from [Pleistocene] rocks on Skidaway Island, in Chatham Co., is reported.
4. (A) memoir on *Mososaurus* and the three allied new genera *Holcodus, Conosaurus,* and *Amphorosteus:* Smithsonian Contribs. Knowledge, vol. 2, art. 5, 13 p., illus., 1851. Teeth of *Mososaurus couperi* from Cretaceous rocks exposed along the Chattahoochee River are described and illustrated. Teeth from *M. minor* from Cretaceous rocks in Georgia [probably along the Chattahoochee River] are also described and illustrated.

**GIBSON, COUNT DILLON,** 1888-1961.
1. The wonderful marshes of Glynn [County]: Emory Univ. Quarterly, vol. 3, p. 116-121, 1947. This is a popular account of the origin of the salt- and the fresh-water swamps in Glynn County. They are formed by poor drainage on recently-evacuated coastal flat areas.
2. Sea Islands of Georgia, their geologic history. 73 p., illus., Athens, Univ. Georgia Press, 1948. A generalized description of the geology of Georgia is followed by a detailed description of the geology of the offshore islands. They are thought to be erosional remnants from meandering streams, the whole area having been recently inundated.

**GILBERT, GROVE KARL,** 1843-1918.
1. John Wesley Powell [1834-1902]: Science, new ser. vol. 16, p. 561-567, port., 1902; Smithsonian Inst. Ann. Rept. 1902, p. 633-640, port., 1903.
2. (editor, and others). John Wesley Powell, [1834-1902]—a memorial to an American explorer and scholar. 75 p., port., Chicago, Open Court Pub. Co., 1903; reprinted from The Open Court, vol. 16, p. 705-716, 1902; vol. 17, p. 14-25, 86-94, 162-174, 228-239, 281-290, 342-351, port., 1903.
3. [John Wesley] Powell [1834-1902] as a geologist: Washington Acad. Science Proc., vol. 5, p. 113-118, 1903.

**GILDERSLEEVE, BENJAMIN,** 1907- *see also* Butts, Charles, 4; Hunter, Charles Eugene, 4.
1. Minerals and structural materials of the Guntersville Reservoir area: Tennessee Valley Auth. Commerce Dept. Regional Products Research Div. Rept. 3, 20 p. (‡), illus., revised, 1946. Coal and other mineral resources from Dade Co. are described in a survey of the resource potential of the area. Few details are included except analyses of the coal.
2. Minerals and structural materials of the Hales Bar and Chickamauga Reservoir areas: Tennessee Valley Auth. Commerce Dept. Regional Products Research Div. Rept. 4, 54 p. (‡), illus., revised, 1946. Bentonite and coal from Dade and Walker Cos. are described as mineral resources in the area of the reservoirs. Coal analyses are included. Other resources are alluded to, but no specific discussion is included.

GILES, ALBERT WILLIAM, 1885-1954.

1. Thomas Leonard Watson [1871-1924]: Science, new ser. vol. 61, p. 225-226, 1925.

GILL, THEODORE NICHOLAS, 1837-1914.

1. Edward Drinker Cope [1840-1897], naturalist—a chapter in the history of science: Amer. Naturalist, vol. 31, p. 831-863, port., 1897; Science, new ser. vol. 6, p. 225-243, 1897.

GILMORE, CHARLES WHITNEY, 1874-1945.

1. Fossil snakes of North America: Geol. Soc. America Spec. Paper 9, vii, 96 p., illus., 1938. *Crotalus* sp., a rattlesnake, is reported from Bartow Co. in Pleistocene sediments.

GLADE GOLD MINES.

1. Reports of Professor [Ebenezer] Emmons . . . and Professor [John] Darby . . . together with other matters relative to the Glade Gold Mines, Cass [Bartow] County, Georgia. 19 p., illus., Montgomery, Alabama, Barrett and Wimbish, 1859. A prospectus includes descriptions of the gold-bearing quartz veins near Allatoona. Ten distinct veins are present, all trending northeast-southwest. Great promise is shown.

GLASS, HERBERT DAVID, 1915-

1. High-temperature phases from kaolinite and halloysite: Amer. Mineralogist, vol. 39, p. 193-207, illus., 1954; reprinted *as* Illinois State Geol. Survey Rept. Inv. 173, 1954. Kaolin from Dry Branch, Twiggs Co., is used along with other samples from elsewhere in x-ray and differential thermal analyses in establishing the significance of various observed thermal effects.

GLEASON, F. E.

1. Smoky quartz in [Jasper Co.] Georgia: Georgia Mineral Newsletter, vol. 11, p. 132-133, 1958. Smoky quartz occurs in veins from 2 inches to greater in thickness.

GLENN, LEONIDAS CHALMERS, 1871-1951.

1. Denudation and erosion in the southern Appalachian region . . . : U. S. Geol. Survey Prof. Paper 72, 137 p., illus., 1911. A description of erosion effects as a result of deforestation includes much of northern Georgia. The Chattahoochee, Coosa, and Savannah River basins are discussed.

GLENNIE, E. A.

1. Crustal warping in the United States: Beitraege zur Geophysics, vol. 46, p. 193-197, Leipzig, 1936. In a discussion showing the relationship between isostatic anomalies and latitude, a map of the United States shows that the Appalachian region is downwarped, and that this downwarping passes southward through Georgia all the way to the Gulf of Mexico. The Atlantic Coastal Plain area is upwarped.

2. Gravity anomalies in the United States: Jour. Geology, vol. 44, p. 765-782, illus., 1936. The theory of warp anomaly is explained, and a map of the United States shows this anomaly; Georgia is included. The Appalachian area is clearly defined by positive and negative anomalies.

GLOCK, WALDO SUMNER, 1897-

1. The development of drainage systems, a synoptic view: Geographical Review, vol. 21, p. 475-482, illus., 1931; discussion with title, Development of drainage systems and the dynamic cycle, by Douglas Wilson Johnson, vol. 23, p. 114-121, illus., 1933. The drainage pattern of the Egypt Quadrangle, Effingham and Bulloch Cos., is used as an example of initial drainage in a study involving certain factors in the development of drainage patterns. Johnson uses the same examples to suggest other fatcors as the cause of the current pattern.

GLOVER, LYNN.

1. Chattanooga Shale in Alabama, Georgia, and Tennessee, *in* Black shale investigations, *in* Uranium in carbonaceous rocks [Part 5] *of* Geologic investigations of radioactive deposits: U. S. Geol. Survey Trace Elements Investigations 540, p. 170-174 (‡), illus., 1955. A cursory description of the physical properties and distribution of the Chattanooga Shale includes locations in northwestern Georgia. A sketch-isopach map is included.

2. Stratigraphy and uranium content of the Chattanooga Shale in northeastern Alabama, northwestern Georgia, and eastern Tennessee: U. S. Geol. Survey Bull. 1087-E, p. iv, 133-168, illus., 1959. Detailed stratigraphic correlations are made, many from northwestern Georgia. Sections are measured and pre- and post-Chattanooga Shale formation contacts are described. The uranium content is tabulated. Conodonts from Floyd, Chattooga, and Walker Cos. are listed.

GOEBEL, ADOLPH.

1. Kritische Uebersicht der im Besitze der kaiserlichen Akademie der Wissenschaften befindlichen aërolithen: L'académie Imperial des Sciences de St. Petersbourg Bull., vol. 11, col. 222-282, illus., 1867. Notice is made of the purchase of a part of the Monroe Co. meteorite by the Royal Academy. No details are included.

GOLDBERG, EDWARD D., 1921-

1. (and Uchiyama, Aiji, and Brown, Harrison Scott). The distribution of nickel, cobalt, gallium, palladium, and gold in iron meteorites: Geochemica et Cosmochemica Acta, vol. 2, p. 1-25, illus., London, 1951. Very detailed analyses of many meteorites includes that of the Cedartown, Polk Co. stone. The data are used in a gallium-based classification.

GOLDRING, WINIFRED, 1888-

1. Memorial to Rudolf Ruedemann (1864-1956): Geol. Soc. America Proc. 1957, p. 153-161, port., 1958.

GOODELL, HORACE GRANT.

1. (and Nettles, James Edward). New evidence [Stewart Co.] in support of a detrital origin for the Upper Cretaceous kaolin deposits of the southeastern United States [abs.]: Geol. Soc. America Bull., vol. 70, p. 1763, 1959.

GOODWIN, MELVIN H., JR., *see* Hendricks, Ernest LeRoy, 1, 2.

GORANSON, ROY WALDEMAR, 1900-1957.

1. The solubility of water in granite magmas: Amer. Jour. Science, 5th ser. vol. 22, p. 481-502, illus., 1931. The solubility of water in granite glass with the pressure effect from 500 to 4000 bars at 900°C and with the temperature effect from 600 to 1200°C at 980 bars is studied. Stone Mountain Granite, from DeKalb County, is used as one of the examples.
2. Some notes on the melting of [Stone Mountain, DeKalb Co.] granite: Amer. Jour. Science, 5th ser. vol. 23, p. 227-236, 1932. Stone Mountain Granite is melted in the presence of water in a bomb. All of the minerals become liquid at different temperatures depending upon the amount of water in the bomb and the pressure.

GORSLINE, DONN SHERRIN.

1. Preliminary report on shelf and slope sediments from Cape Hatteras, North Carolina, to Jupiter Inlet, Florida [abs.]: Geol. Soc. America Bull., vol. 69, p. 1571-1572, 1958.

GOTT, GARLAND BAYARD.

1. (and Wyant, Donald Gray, and Beroni, Ernest Pete). Uranium in black shales, lignites, and limestones in the United States, *in* Selected papers on uranium deposits in the United States: U. S. Geol. Survey Circ. 220, p. 31-35, illus., 1952. The Chattanooga Shale of northwestern Georgia and elsewhere is known to contain radioactive elements, but the concentration is not very high. No specific figures are given.

GOTTLIEB, SIDNEY, 1918- *see* Klinefelter, Theron Albert, 1.

GOULD, JOSEPH CHARLES, 1931-

1. (A) study of the Ordovician Ostracoda below the green chert horizon in [Walker and Catoosa Cos.] northwest Georgia. M. S. Thesis, Emory Univ., 1957.
2. (The) study of the parting and heavy mineral content of a Piedmont stream and its saprolitic bedrock [DeKalb Co.] [abs.]: Georgia Acad. Science Bull., vol. 15, p. 62, 1957.

GRABAU, AMADEUS WILLIAM, 1870-1946.

1. Types of sedimentary overlap: Geol. Soc. America Bull., vol. 17, p. 567-636, illus., 1906. Recognition of marine transgression, or overlap, from a study of the vertical succession of rocks is pointed out. Examples are taken from the Devonian System near Rome, Floyd County.
2. The age and stratigraphic relation of the Chattanooga black shale [abs.]: Science, new ser. vol. 25, p. 771, 1907.
3. Physical and faunal evolution of North America during Ordovicic, Siluric, and early Devonic time: Jour. Geology, vol. 17, p. 209-252, illus., 1909. A cursory comparison, in large part by maps, of the major physical features of the United States during these times includes Georgia. Rough correlations of major time-rock units and the enclosed fauna are included. No details are given.
4. Dr. Henry Fairfield Osborn [1857-1935], an appreciation: Peking Natural Hist. Bull., vol. 10, pt. 2, p. 165-166, port., 1935.
5. Palaeozoic formations in the light of the pulsation theory. 4 vols., 680 p., 751 p., 850 p., 941 p., illus., Peking Univ. Press, 1934-1938; 2d ed. vol. 1, 1936; summary with title, Revised classification of the Palaeozoic Systems in the light of the Pulsation theory: Geol. Soc. China Bull., vol. 15, p. 22-44, discussion, p. 44-51, Nanking, 1936. The theory of universal simultaneous overlap and offlap is advocated, with some of the examples of results coming from Georgia. Rock units are related to "pulses". The Weisner to Rome formations represent one pulsation, the Taconian; the Conasauga Formation is the Cambrian Pulsation; the Knox Formation is in the Cambrordovician Pulsation. Small scale paleogeographic maps are included. The work was never completed.
6. Classification of Paleozoics on Pulsation theory: Pan-Amer. Geologist, vol. 66, p. 19-34, illus., 1936. A summary of the evidence for the Pulsation theory around the world is given. Allusion is made to the Paleozoic rocks in northwestern Georgia. Little detail is given, however.

GRANGER, WALTER WILLIS, 1872-1941.

1. William Diller Matthew [1871-1930]: Jour. Mammalology, vol. 12, p. 189-194, port., 1931.
2. Memorial to Frederick Brewster Loomis [1873-1937]: Geol. Soc. America Proc. 1937, p. 173-181, port., 1938.

GRANT, LELAND FAUNTLEROY, 1913- *see* Kellberg, John M., 3.

GRANT, WILLARD HUNTINGTON, 1923- *see also* Gardner, Charles Harwood, 1.

1. Alums from Rabun County: Georgia Mineral Soc. Newsletter, vol. 2, no. 6, p. 8-9 (‡), 1949. Yellowish to white alum crystals, formed under ledges, from near Rabun Gap, are analyzed.
2. (The) lithology and structure of the Brevard Schist and the hornblende gneiss in the Lawrenceville, [Gwinnett Co.] Georgia area. M. S. Thesis, Emory Univ., 1949.

3. (A) new hornblende locality in Towns County: Georgia Mineral Soc. Newsletter, vol. 2, no. 5, p. 6 (‡), illus., 1949. Crystals from the Lower Bell Creek corundum mine, from behind an inglorious chicken coop, are described.

4. Picrolite from Buck Creek, N. C. and Track Rock Gap, Union County, Georgia: Georgia Mineral Soc. Newsletter, vol. 2, no. 6, p. 7 (‡), 1949. Dark green, fibrous picrolite is described from the tailings of the Track Rock Gap corundum mine.

5. The petrography of three Georgia itacolumites, [Hall, Barrow, and Meriwether Cos.], *in* Short contributions to the geology, geography, and archaeology of Georgia: Georgia Geol. Survey Bull. 56, p. 91-96, table, 1950. All are metamorphic rocks; all are analyzed. The degree of flexibility is related to the interstitial distances. Mica decreases the friability but does not add to the flexibility.

6. Preliminary investigation of the relation of the granites to regional metamorphism in Hart County, Georgia [abs.]: Geol. Soc. America Bull., vol. 64, p. 1531, 1953.

7. Cubic-looking quartz crystals near Chickamauga, [Walker Co.] Georgia, *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 8, p. 150, illus., 1955. Several crystals have an overdevelopment of positive rhombohedra and an underdevelopment of the negative rhombohedra and prisms, resulting in a cubic appearance.

8. (The) geology of Hart County, Georgia: Ph D. Thesis, Johns Hopkins Univ., 1955; Georgia Geol. Survey Bull. 67, viii, 75 p., illus. incl. geol. map, 1958. A complete geologic description is given. Metamorphosed sedimentary rocks and granitic igneous rocks of unspecified age are mapped, as are Triassic diabase dikes and Quaternary alluvium. The metamorphism is discussed, as are the resulting structures. Petrographic diagrams are included. Mica, sillimanite, and a few other minor economic products are discussed.

9. Iron deposit near Bowersville, Hart County, Georgia, *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 8, p. 65, 1955. A limonite gossan, weathered from a pyrite schist, is the origin of the ore.

10. (An) occurrence of halloysite at Emory University [DeKalb Co.], *in* Mineralogical note: Georgia Mineral Newsletter, vol. 8, p. 65, 1955. The clay occurs as joint and fracture fillings from a fraction of an inch to an inch thick, in amphibolite saprolite.

11. Secondary calcite from Mitchell Creek Mica Mine [Upson Co.] *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 8, p. 150, 1955. The calcite occurs as coatings on fracture surfaces in pyrite-bearing, biotite quartz schist. The coatings range upward to ¼ inch in thickness.

12. Ferruginous nodules occurring in the soils of some areas of the Piedmont and the Coastal Plain: Georgia Acad. Science Bull., vol. 14, p. 4-6, 1956. Nodules containing material from the underlying bedrock, cemented with magnetite, are described. The magnetite has been precipitated within the soil and nodules; it is not present in the bedrock.

13. Example of diopside amphibolite weathering near Atlanta, [Fulton Co.] Georgia [abs.]: Geol. Soc. America Bull., vol. 69, p. 1573, 1958.
14. Mineral changes produced by weathering a feldspathic amphibolite gneiss from DeKalb County, Georgia [abs.]: Georgia Acad. Science Bull., vol. 16, p. 7, 1958.
15. An interpretation of some granite contacts [DeKalb Co.] [abs.]: Georgia Acad. Science Bull., vol. 17, p. 72, 1959.
16. Preliminary study of the Towaliga Fault in Pike and Lamar Counties, Georgia [abs.]: Geol. Soc. America Bull., vol. 70, p. 1763, 1959.

**GRASTY, JOHN SHARSHALL,** 1880-1930, *see also* Watson, Thomas Leonard, 20, 21.

1. The geology and barite deposits of the Cartersville, [Bartow Co.] Georgia district, part 2 *of* Mineral resources of the south: Tradesman, vol. 69, no. 21, p. 35-37, illus., 1913. A generalized description of the residual-barite-bearing Cambrian rocks is given. Originally, the barite was deposited by ground water in fissures in the Weisner and [Shady] formations and was later redistributed by the same water system.

**GRATACAP, LOUIS POPE,** 1850-1917.

1. Relations of James Hall [1811-1898] to American geology: Amer. Naturalist, vol. 32, p. 891-902, port., 1898.
2. The state museum of minerals at Atlanta, Georgia: Mineral Collector, vol. 15, p. 129-132, 1908. A popular account of the exhibits in the cases of the State Museum in the Capitol building is given. Both minerals and rocks are on display, as are industrial exhibits.

**GRATON, LOUIS CARYL,** 1880-

1. Life and scientific work of Waldemar Lindgren, *in* Ore deposits of the western states (Lindgren volume), p. xiii-xxxii, port., New York, Amer. Inst. Mining and Metallurgical Engineers, 1933.
2. Waldemar Lindgren, 1860-1939: Econ. Geology, vol. 34, p. $850_a$-$850_f$, port., 1939.

**GREAVES-WALKER, ARTHUR FREDERICK.**

1. The origin, mineralogy and distribution of the refractory clays of the United States: North Carolina Univ. Engineering Exper. Sta. Bull. 19, 87 p., illus., 1939. A general discussion of the origin of fire clays is followed by a review of occurrences in all of the states, including Georgia. The kaolin and bauxite of the Coastal Plain are discussed. Analyses are included.

**GREENE, C. F.**

1. Placer mining kyanite in [Habersham Co.] Georgia: Brick and Clay Record, vol. 86, p. 131, 1936 [not seen].

GREGORY, HERBERT ERNEST, 1869-1952.

1. Memoir of Angelo Heilprin [1853-1907]: Geol. Soc. America Bull., vol. 19, p. 527-536, port., 1909.

GREGORY, JOHN WALTER, 1864-1932.

1. Henry Darwin Rogers [1808-1866], an address to the Glascow University Geological Society, 20th January, 1916; with bibliography by Colin M. Leatch. 38 p., port., Glascow, J. MacLehose and Sons, 1916.

GREGORY, WILLIAM KING, 1876-

1. The master builder, Henry Fairfield Osborn [1857-1935]: Natural History, vol. 33, p. 251-256, 1933.
2. Henry Fairfield Osborn [1857-1935]: Science, new ser. vol. 82, p. 452-454, 1935; Natural History, vol. 36, p. 370-373, port., 1935; . . . an appreciation: Scientific Monthly, vol. 41, p. 566-569, port., 1935; Amer. Philos. Soc. Proc., vol. 76, p. 395-408, 1936.
3. Biographical memoir of Henry Fairfield Osborn, 1857-1935: Natl. Acad. Science Biog. Mem., vol. 19, p. 53-119, port., 1938.
4. William Diller Matthew, paleontologist [1871-1930]: Science, new ser. vol. 72, p. 642-645, 1930; summary *in* Climate and evolution, by William Diller Matthew: New York Acad. Science Spec. Pub., vol. 1, p. vii-xi, port., 1939.

GRIFFIN, ROBERT HARRELL.

1. A report on the geology of Chehaw State Park, [Dougherty Co.] Georgia, SP-9, and vicinity [abs.]: Alabama Acad. Science Jour., vol. 9, pt. 2, p. 32, 1937.

GRIFFITTS, WALLACE RUSH, 1919- *see also* Jahns, Richard Henry, 2.

1. (and Olson, Jerry Chipman). Hartwell District, [Hart, Elbert Cos.] Georgia and South Carolina, Part 7 *of* Mica deposits of the southeastern Piedmont: U. S. Geol. Survey Prof. Paper 248-E, p. iv, 293-315, illus., 1953. A general description of the occurrence and structures of pegmatites in the area is followed by detailed descriptions of many of the individual deposits.

GRIM, RALPH EARLY, 1902-

1. Petrography of the fuller's earth deposits, Olmstead, Illinois, with a brief study of some non-Illinois earths: Econ. Geology, vol. 28, p. 344-363, illus., 1933; reprinted *as* Illinois State Geol. Survey Rept. Inv. 26, 1933. Clay from Twiggs and Decatur Cos. is analyzed. It is mostly montmorillonite.

GROVER, NATHAN CLIFFORD.

1. (and others). Surface water supply of the United States, 1933, Part 3, Ohio River Basin: U. S. Geol. Survey Water-Supply Paper 743, ix, 357 p., illus., 1935. Freemans Spring, near Villanow, Walker Co.; Yates Spring, near Rock Springs, Walker Co.; Rock Spring, near Rock Springs, Walker Co.; Ellis Springs, in Whitfield Co.; Crawfish Springs, in Walker Co.; and Grant's Blowing Spring, in Walker Co., are recorded by discharge in sec.-feet.

2. (and others). Surface water supply of the United States, 1934, Part 2, South Atlantic Slope . . . : U. S. Geol. Survey Water-Supply Paper 757, vii, 216 p., illus., 1936. The discharge of North Springs, near Warm Springs, in Meriwether Co., is recorded for a period of a year; the results are tabulated. It varies from .742 to .832 sec.-feet. Blue Spring, near Hamilton, Harris Co. is also measured.
3. (and others). Surface water supply of the United States, Part 2, South Atlantic Slope . . . : U. S. Geol. Survey Water-Supply Paper 782, 233 p., illus., 1937. Discharge measurements on Blue Springs, near Hamilton, Harris Co., are recorded for a period of a year. In sec.-feet it varies from .651 to .818.
4. (and others). Surface water supply of the United States, Part 2, South Atlantic Slope . . . : U. S. Geol. Survey Water-Supply Paper 822, vi, 266 p., 1938. The discharge of Blue Springs, in Brooks Co., is 18.9 cu. ft./sec., and that of Radium Springs in Dougherty Co. is 69.3 cu. ft./sec.
5. (and others). Surface water supply of the United States, Part 2, South Atlantic Slope . . . : U. S. Geol. Survey Water-Supply Paper 852, vi, 293 p., 1940. The discharge of Cave Spring, in Floyd Co., is 3.61 cu. ft./sec.

GRUMBLES, GEORGE ROBERT, 1933-

1. Preferred orientation of pebbles in a sedimentary deposit [Cherokee Co.] [abs.]: Georgia Acad. Science Bull., vol. 14, p. 40, 1956.
2. Stratigraphy and sedimentation of the [Eocene] Wilcox Formation in the Andersonville [Macon, Schley and Sumpter Cos.] Bauxite District of Georgia. M. S. Thesis, Emory Univ., 1957.

GRUNENFELDER, MARC H.

1. (and Silver, Leon T.). Radioactive age dating and its petrologic implications for some Georgia granites [abs.]: Geol. Soc. America Bull., vol. 69, p. 1574, 1958.

GUETTARD, JEAN ETIENNE, 1715-1786.

1. Mémoire dans lequel on compare le Canada à la Suisse, par rapport à ses mineraux: Histoire de l'Académie Royale des Sciences Physiques, Annee 1752, p. 189-220, 524-538, illus., Paris, 1756; summary, Literary Magazine or Universal Review, vol. 1, p. 465-466, London, 1756 [1757]. There is nothing in the text regarding Georgia, but the accompanying map of North America, with Georgia as a part of Louisiane, indicates the presence of gold. The scale makes the boundaries unclear. Mountains run from the northeast corner southward to the center of the state.

GUTTERY, THOMAS HOBSON, 1933-

1. (and Albritton, John Allan). A study of Upper Cretaceous deposits exposed at Thiele Kaolin Company pits eight miles west of Sandersville [Washington Co.], Georgia: Georgia Acad. Science Bull., vol. 13, p. 89-93, illus., 1955. Sand lenses in and below kaolin beds are described and petrographically analyzed. A nearby provenance is interpreted; the kaolin was probably deposited in lakes.

GUYOT, ARNOLD HENRY, 1807-1884.

1. On the Appalachian Mountain system: Amer. Jour. Science, 2d ser. vol. 31, p. 157-187, illus., 1861. This is a very generalized description of the physiography of the Appalachian Mountains, including the Blue Ridge portion of Georgia. Little detail is given. Elevations of certain peaks are given, and a map of the whole chain is included.

HABERSHAM, JOSEPH CLAY, -1855.

1. Memorandum of the old fossil bones and shells, now in his possession, which were discovered in the year 1842, on the island of Skiddaway on the sea-coast of [Chatham Co.] Georgia, *in* Hodgson, William Brown, Memoir on the *Megatherium*, p. 24-30, 1846. *Megatherium cuvieri* and fragments of other mammals and reptiles from Pleistocene deposits are described and illustrated. Marine invertebrates were found associated with them.

HABERSHAM, S. E., *see* Phillips, William E., 2.

HABERSHAM, WILLIAM WARING.

1. The mineral resources of the south: Dixie, vol. 1, no. 3, p. 125-126, 1885. In a general exhortation to capitalists, the mineral potential of all of the southern states is described. Much emphasis is placed upon the gold deposits of northern Georgia. Not much geological detail is included.
2. Mining in the southern states: Dixie, vol. 4, p. 767-768, 1888. In an exhortation to capitalists, much emphasis is placed upon the gold deposits of Hall and Lumpkin Counties. No new geological details are included, however.

HABERSHAM COUNTY DEPARTMENT OF EDUCATION.

1. History and resources of the hills of Habersham County. [ii], 54 p. (‡), illus., Clarkesville, Ga., 1937. Kyanite is the only mineral resource described; its distribution in individual deposits is discussed.

HAFER, C.

1. [William Earl] Hidden of North Carolina: Mineralogist, vol. 9, p. 291, 305-306, 1941.

HAGUE, ARNOLD, 1840-1917.

1. Memoir of Samuel Franklin Emmons [1841-1911]: Geol. Soc. America Bull., vol. 23, p. 12-28, port., 1912.

HAIDINGER, WILHELM KARL VON, 1795-1891.

1. Die Meteoriten des k. k. Hof-Mineralien Cabinetes am 7 Januar 1859 chronologisch geordnet: Akademie der Wissenschaften Wien Math.-Naturwissenschaft Klasse Sitzungsberichte, vol. 34, p. 21-26, 1859. Part of the Forsyth, Monroe Co., meteorite is present in this collection.
2. Die Rutilkrystalle von Graves' Mount in [Lincoln Co.] Georgia, U. S. N. A.: Akademie der Wissenschaften Wien, Math.-Naturwissenschaft Klasse Sitzungsberichte, vol. 39, p. 5-8, illus., 1860. Rutile crystals are described in detail.

**HALL, BENJAMIN MORTIMER**, 1853-1929, *see also* McCallie, Samuel Washington, 13.

1. Gold mining in Georgia: Engineering Assoc. South Trans., vol. 7, p. 110-113, 1896. The lack of interest in the gold mines of Georgia is attributed in part to their relative accessibility and therefore the lack of romance associated with them. Very little geologic information is included.
2. (and Yeates, William Smith). Measurements of large springs in northwest Georgia, *in* Operations at river stations, 1899, part 1: U. S. Geol. Survey Water-Supply Paper 36, p. 147-148, 1900. Many springs are measured, the discharge being recorded in second-feet. Most are from the eastern part of the Paleozoic terrane.
3. (and Hall, M. R.). Water resources of Georgia: U. S. Geol. Survey Water-Supply Paper 197, 342 p., illus., 1907. Included in an otherwise descriptive and statistical review of the surface water supplies of the state is a brief survey of the general geology.
4. (and sons). Report on the Columbia Mines of McDuffie Co. April 30, 1920. [not seen]

**HALL, COURTNEY ROBERT**, 1894-

1. A scientist in the early republic, Samuel Latham Mitchill, 1764-1831. vi, 162 p., port., New York, Columbia Univ. Press, 1934.

**HALL, JAMES**, 1811-1898.

1. Report upon the property of the Empire State Iron and Coal Company of [Dade Co.] Georgia. 24 p., illus., Albany, 1866. [not seen]
2. Geological history of the North American continent. 24 p., Albany, The Argus Co., 1869. An extremely cursory review of the geology of the continent includes allusions to Georgia, the emphasis being upon the similarity of terrane along the eastern United States and Canada.
3. An introduction to the study of the genera of Palaeozoic Brachiopoda: New York Geol. Survey, Palaeontology, vol. 8, pt. 2, 394 p., illus., 1894. *Conchidium georgiae,* from Silurian rocks in Dade Co., is described and illustrated.
4. (and Clarke, John Mason). The new species of Brachiopoda described in Paleontology of New York, vol. VIII, parts 1 and 2, 1892-1894: New York State Geologist Ann. Rept. 14, p. 323-402, illus., 1895; New York State Museum Ann. Rept. 48, vol. 2, p. 323-402, illus., 1895. *Conchidium georgiae,* from the Silurian Clinton Group near Trenton, Dade Co., is described and illustrated.

**HALL, M. R.**, *see also* Hall, Benjamin Mortimer, 3.

1. (and Hoyt, John Clayton). Report of progress of stream measurements for the calender year 1904, part IV, Santee, Savannah, Ogeechee, and Altamaha Rivers and the eastern Gulf of Mexico drainages: U. S. Geol. Survey Water-Supply Paper 127, 192 p., illus., 1904. The discharges of Blue Spring, in Dougherty Co. and of Cave Spring, in Floyd Co., are recorded.

2. (and Hoyt, John Clayton). Report of progress of stream measurements for the calender year 1905, part IV, Santee, Savannah, Ogeechee, and Altamaha Rivers and eastern Gulf of Mexico drainages: U. S. Geol. Survey Water-Supply Paper 168, 164 p., 1906. The discharges of Blue Spring, Dougherty Co. and Warm Springs, in Meriwether Co., are recorded.

**HAMILTON, S. HARBERT.**

1. Meteorite studies . . . : Mineral Collector, vol. 8, p. 97-101, 120-126, illus., 1901. A pleasant discussion of the history of knowledge regarding meteorites and a review of their chemistry, are followed by a catalogue of the collection in the Academy of Natural Sciences. Fragments of the Forsyth, Monroe Co., and the Whitfield Co. aerolites are present.

**HAMLIN, AUGUSTUS CHOATE,** 1825-1905.

1. The gems of the United States: Amer. Assoc. Advancement Science Proc., vol. 18, p. 210-216, 1870. An association of diamonds with itacolumite in Hall County is noted as is amethyst from [Piedmont?] Georgia. No details are included.

1. The mining of paint—yellow ochre deposits of the Cartersville

**HAMLIN, HOWARD P.**

1. Halloysite in the Cartersville District [Bartow Co.] [abs.]: Georgia Mineral Newsletter, vol. 12, p. 42, 43, illus., 1959.

**HAMNER, EDWARD JOHN.**

1 Petroleum development in southeastern United States [abs.]: Geol. Soc. America Bull., vol. 68, p. 1878, 1957.

**HAND, BRYCE M.,** *see* Richards, Horace Gardiner, 20.

**HANEY, MARSHALL.**

District, [Bartow Co.] Georgia: Engineering and Mining Jour., vol. 110, p. 859-860, illus., 1920. Ochre occurs impregnating shattered Weisner Quartzite; its occurrence is described, but its origin is not discussed.

**HANNA, GEORGE BYRON.**

1. Mines of the Appalachian range: School of Mines Quarterly, vol. 3, p. 208-214, 1882. An extremely cursory description of the occurrence of gold-bearing quartz veins in metamorphic rocks of northern Georgia is given.

2. The fineness of native gold in the Carolinas and Georgia: Engineering and Mining Jour., vol. 42, p. 201, 1886. The grade in Georgia placers is uniformly above 900. Specific examples are cited from many locations in the gold belt.

HANSON, HIRAM STANLEY, 1923-

1. A study of the relative frequency of feldspar twin types in crystalline rocks [DeKalb Co.]. M. S. Thesis, Emory Univ., 1958.

HARDEN, JOHN M. B.

1. Observations on the soil, climate, and diseases of Liberty [and Long] County, Georgia: Southern Medical and Surgical Jour. new ser. vol. 1, p. 545-569, 1845. The eastern portion of the counties (only one in 1845) is swampy; the western portion is higher and sandy; the terrace step is described, as is the sea-coast origin of the sand features on the terrace. Some subsurface information is given, and soil analyses are included.

HARDER, EDMUND CECIL

1. Manganese deposits of the United States; U. S. Geol. Survey Bull. 380, p. 255-277, 1909. A brief resumé of the manganese ocurrences in northwestern Georgia is given. No new data are included.
2. Manganese deposits of the United States: U. S. Geol. Survey Bull. 427, 298 p., illus., 1910. The manganese deposits in the Cartersville District of Bartow Co. are cursorily described as are the deposits near Cave Spring in Floyd and Polk Counties. Analyses are included.
3. Stratigraphy and the origin of bauxite deposits: Geol. Soc. America Bull., vol. 60, p. 887-908, illus., 1949. A general description of the occurrence of bauxite includes those deposits from the Eocene of the Coastal Plain of Georgia. A review of the various theories of bauxitization and the factors involved is given. The author supports the theory of alteration-in-place of pre-existing aluminum-bearing material.

HARLAN, RICHARD, 1796-1843.

1. Critical notices of various organic remains hitherto discovered in North America: Geol. Soc. Pennsylvania Trans., vol. 1, p. 46-112, illus., 1834; in part, Edinburgh New Philos. Jour., vol. 17, p. 342-362, 1834; vol. 18, p. 28-40, 1835; reprinted *in* Medical and physical researches, p. 253-313, illus., Boston, Lydia R. Bailey, 1835. In a survey of the vertebrate fossil remains known from the United States, a brief description of *Megatherium cuvieri* is included. It is from Skidaway Island, in Chatham County. *Manatus* bones are noted from Tertiary rocks in Georgia also.
2. Notice of two new fossil mammals from Brunswick Canal, [Glynn Co.] Georgia, with observations on some fossil quadrupeds of the United States: Amer. Jour. Science, vol. 43, p. 141-144, illus., 1842; correction by Joseph Leidy: Acad. Natural Sciences Philadelphia Proc., vol. 7, p. 89, 1856. Fragments of a wild hog, *Sus americana* and of a marine turtle *Chelonia couperi*, are described and illustrated. They are from Pleistocene material exposed in a canal. Leidy says the hog is a bison.

**HARPER, ROLAND MCMILLAN,** 1878- *see also* Barrows, Harry H., 1, and Veatch, Jethro Otto, 9.

1. Notes on the Lafayette and Columbia Formations and some of their botanical features: Science, new ser. vol. 16, p. 68-70, 1902. The Coastal Plain formations are shown to be identifiable by the plants which grow on them. Certain plants are confined to each.
2. *Taxodium distichum* and related species, with notes on some geological factors influencing their distribution: Torrey Bot. Club Bull., vol. 29, p. 383-399, 1902. Descriptions and discussions of several species of cypress trees are given. The distribution of the different species on the Coastal Plain, Georgia included, is influenced by the underlying formations, the Lafayette Gravel, Pliocene, and the Columbia Formation [Pleistocene]. The relative imperviousness of the two formations is taken as one of the important factors.
3. Botanical explorations in Georgia during the summer of 1901: Torrey Bot. Club Bull., vol. 30, p. 282-295, 319-342, illus., 1903. A running account of his travels includes descriptions of topographic features from many places. Little detail is included.
4. Explorations in the Coastal Plain of Georgia during the season of 1902: Torrey Bot. Club Bull., vol. 31, p. 9-27, illus., 1904. A running account of his travels includes much description of the topography. Few details are included.
5. (The) fern flora of Georgia: Fern Bull., vol. 13, p. 1-17, 1905. The living fern flora of the state is listed with much added information about the rocks on which they are located.
6. Phytogeographical explorations in the Coastal Plain of Georgia in 1903: Torrey Bot. Club Bull., vol. 32, p. 141-171, illus., 1905. Numerous descriptions of topography and lithology are included in an otherwise botanical description. Few details are included.
7. (A) phytogeographical sketch of the Altamaha Grit region of the Coastal Plain of Georgia. Ph. D. Thesis, Columbia Univ., 1906; New York Acad. Science Annals, vol. 17, p. 1-415, illus., 1906. A generalized description of the Coastal Plain sedimentary rocks is given. A discussion of drainage, soils, and other properties relative to plant growth is included also.
8. Some hitherto undescribed outcrops of Altamaha Grit and their vegetation [Coffee, Johnson, and Washington Cos.]: Torreya, vol. 6, p. 241-246, illus., 1906. Much is made of the flora of this particular rock type. While the emphasis is placed upon the plant communities, a little data about the rocks is also listed.
9. Okefinokee Swamp: Popular Science Monthly, vol. 74, p. 596-614, illus., 1909. A general historical account of the swamp, and a cursory description of its origin are given. No details are included.
10. A new method of mapping complex geographical features, illustrated by some maps of Georgia: School Science and Mathematics, vol. 18, p. 699-708, illus., 1918. In order to make maps showing many geographical variables, what is called the quantitative regional method is explained. Little geology is included, but the influence of the physiographic provinces on other geographical variables is very evident.

11. Some vanishing scenic features of the southeastern United States: Natural History, vol. 19, p. 192-204, illus., 1919. Okefenokee Swamp, Tallulah Falls, and Stone Mountain are cited, along with other features from elsewhere, as natural regions worthy of preservation. They are popularly described.
12. The natural resources of Georgia: Georgia Univ. Bull., vol. 30, no. 3, xii, 105 p., illus., 1930. A generalized review of the resources of the state includes, among other things, a cursory description of the geology and topography. No new details are included.
13. Lowering of ground water in the Coastal Plain of Georgia: Assoc. Amer. Geographers Southeast Div. Memorandum Folio, vol. 8, p. 33-34 (‡), 1957; privately reprinted with additions [1957]. The disappearance of certain plants in the "Pine Barrens" of the Altamaha Grit terrane is attributed to a lowering of the ground water table due to increased usage of water.

**HARR, LUTHER.**

1. (and Rice, William Elmer, and Moran, H. E.). Typical analyses [of] bituminous coals produced in district 13. 11 p., illus., Washington, D. C., Office of the Bituminous Coal Consumers Council in cooperation with the U. S. Bur. Mines, Data Book, vol. 4, 1942. Analyses of coal from Dade and Walker Cos. are included.

**HARRIS, ELIJAH PADDOCK, 1832-1920.**

1. The chemical constitution and chronological arrangement of meteorites . . . . Ph. D. Thesis, Georgia Augusta Univ., Gottingen, 1859. Brief descriptions and analyses of meteorites include those from Union and Putnam Cos.; the latter was seen to fall in 1829 and is the first one known from Georgia.

**HARRIS, GILBERT DENNISON, 1864-1952,** *see also* Dall, William Healey, 3.

1. (The) Eocene stages of Georgia [abs.]: Amer. Geologist, vol. 18, p. 236, 1896.
2. (The) Midway Stage: Bulls. Amer. Paleontology, vol. 1, no. 4, p. 115-270, [156 p.], illus., 1896. A description of [Paleocene] Midway rocks at Fort Gaines, Clay Co., includes a list of the fossils. The Paleocene rocks overlie the Cretaceous rocks unconformably. Pelecypods and gastropods are described and illustrated.
3. The Lignitic Stage, Part 1, Stratigraphy and Pelecypoda: Bulls. Amer. Paleontology, vol. 2, no. 9, p. 193-294, illus., 1897; Part 2, Scaphopoda, Gastropoda, Pteropoda and Cephalopoda, vol. 3, no. 11, p. 1-128, illus., 1899. Lower Eocene beds are described. They occur in Clay Co. and a little toward the east. A section is measured. Pelecypods and gastropods, rare at that, are described and illustrated.
4. Eocene outcrops in central Georgia: Bulls. Amer. Paleontology, vol. 4, no. 16, p. 1-7, 1902. Very brief descriptions of outcrops of lower Claiborne Stage-beds and Wilcox Stage-beds in Jones Co. and lower Tertiary beds from Columbia Co. are given. The fossils from the Wilcox beds near Roberts are listed.

5. Age flow and ebb of the Eocene seas: Science, new ser. vol. 48, p. 646-647, 1918. The Eocene [and Paleocene] Series are shown to be related to overlap and offlap conditions. The following stages are from overlap: Midway, St. Maurice, Jackson; the following stages are from offlap: Sabine and Claiborne. Georgia is implied.
6. Pelecypoda of the St. Maurice and Claiborne Stages: Bulls. Amer. Paleontology, vol. 6, no. 31, 268 p., illus., 1919. Numerous pelecypods are described from Middle and Upper Eocene deposits throughout the Coastal Plain.
7. Preliminary notes on Ocala bivalves: Bulls. Amer. Paleontology, vol. 33, no. 138, p. 219-272, illus., 1951. Numerous pelecypods from the Georgia Coastal Plain are included. All are illustrated and described.

HARRIS, HUNTER L.

1. History of the Atlantic shore line: Elisha Mitchell Scientific Soc. Jour., vol. 11, pt. 2, p. 33-49, illus., 1894. This is an extremely generalized account of the geology of the Coastal Plain in which Georgia is included. No details are given, however.

HARRIS, R. MERRILL.

1. (and Payne, Willard M.). [Coastal Plain of] Georgia, *in* [oil and gas] Developments in the southeastern states in 1946 and 1947: Amer. Assoc. Petroleum Geologists Bull., vol. 32, p. 1069, 1948.
2. (and Payne, Willard M.). [Coastal Plain of] Georgia, *in* [oil and gas] Developments in the southeastern states in 1948: Amer. Assoc. Petroleum Geologists Bull., vol. 33, p. 1004, 1949.

HARRISON, ALFRED C.

1. (and others). Persifor Frazer, [Jr.] 1844-1909: Franklin Inst. Jour., vol. 168, p. 75-79, port., 1909.

HARSHBERGER, JOHN WILLIAM, 1869-1929.

1. Phytogeographic survey of North America. lxiii, 790 p., illus., New York, G. E. Stechert, 1911. A general description of the floral provinces of the United States includes a discussion of the paleobotanical background which in turn includes paleofloristic maps of the United States. Georgia is included.

HASELTINE, RAYMOND HOLDEN, 1898-

1. Iron ore deposits of Georgia: Georgia Geol. Survey Bull. 41, vi, 222 p., illus., 1924. A general review of iron ores in the state includes detailed descriptions of limonite deposits from the lower Paleozoic residuum of northwestern Georgia, the metamorphic terrane of the adjacent Piedmont and Blue Ridge, and from the Coastal Plain in Cretaceous and/or Eocene sedimentary rocks. The hematite in Silurian rocks of northwestern Georgia is described also. Some magnetite is known from the metamorphic terrane. Numerous analyses are included.

**HASH, LEWIS J.**

1. (and Van Horn, Earl C., and Teague, Kefton Harding, editors). Sillimanite deposits in North Carolina: North Carolina Div. Mineral Resources Bull. 61, vi, 51 p., illus., 1951. Some of the North Carolina deposits continue into Towns County. The sillimanite occurs in narrow zones in muscovite-quartz schist. Little detail is included, however.

**HASS, WILBERT HENRY,** 1906-1959.

1. Age of the Chattanooga Shale and the Maury Formation [abs.]: Geol. Soc. America Bull., vol. 64, p. 1532, 1953.

**HAWKINS, ALFRED CARY,** 1887-1954.

1. We collected minerals in Georgia: Rocks and Minerals, vol. 12, p. 227-228, 1937. This is a popular, extremely cursory description of the minerals to be found in Georgia. No details are given.

**HAY, OLIVER PERRY,** 1846-1930.

1. Descriptions of seven new species of turtles from the Tertiary of the United States: Amer. Museum Natural Hist. Bull., vol. 23, p. 847-863, illus., 1907. A Pleistocene box turtle, larger than any living species, from Skidaway Island in Chatham Co. is described and illustrated. It is *Terrapene canaliculata.*
2. The fossil turtles of North America: Carnegie Inst. Washington Pub. 75, iv, 568 p., illus., 1908. *Peritresius ornatus* and *Taphrosphys dares*, from the Ripley Formation in Stewart Co. are described. *Agomphus oxysternum*, from the Paleocene Midway Formation in Macon Co., is described and illustrated. *Terrapene canaliculata,* from Pleistocene rocks in Chatham Co., is also described and illustrated.
3. The Pleistocene of North America and its vertebrated animals from the states east of the Mississippi River and from the Canadian Provinces east of longitude 95°: Carnegie Inst. Washington Pub. 322, viii, 499 p., illus., 1923. An account of the occurrence, along with a complete list, of the mammals found in the Pleistocene deposits of Glynn and Chatham Cos. is given. Small-scale maps are included showing the distribution of each of the types in eastern North America.

**HAYDEN, EDWARD EVERETT,** 1858-1932, *see* Dutton, Clarence Edward, 1.

**HAYES, CHARLES WILLARD,** 1859-1916.

1. The overthrust faults of the southern Appalachians: Geol. Soc. America Bull., vol. 2, p. 141-152, illus., 1891; discussion by Charles Doolittle Walcott, p. 153; discussion by William Morris Davis, p. 153-154. The Paleozoic stratigraphy of northwestern Georgia is outlined. The Rome Thrust Fault and the Cartersville Thrust Fault are identified and described from numerous places. Both are low-angled with great horizontal displacement. The thrusting followed the folding of the beds, as an erosion surface under the fault planes is evident; they are possibly post-Triassic.

2. Report on the geology of north-eastern Alabama and adjacent portions of [northwestern] Georgia and Tennessee: Alabama Geol. Survey Bull. 4, 89 p., illus. incl. geol. map, 1892. A discussion of the topography and its origin as being associated with the structures of the rocks is followed by a description of the stratigraphy. Cambrian to Pennsylvanian rocks are described. Folds and faults are the main structures.

3. Bauxite: U. S. Geol. Survey Mineral Resources 1893, p. 159-167, 1894. A very generalized summary of the bauxite which occurs in northwestern Georgia is given. Some of the largest deposits are described. The ore comes from the precipitation, near the surface, of aluminum compounds derived from underlying shale.

4. Geology of a portion of the Coosa Valley in [northwestern] Georgia and Alabama: Geol. Soc. America Bull., vol. 5, p. 465-480, illus., 1894. Paleozoic rocks southwest of Rome are described as are the folds and faults. The Coosa Thrust Fault and minor thrust faults are recognized. The Paleozoic and post-Paleozoic geological history is outlined. A sketch map is included.

5. (and Campbell, Marius Robinson). Geomorphology of the southern Appalachians: Natl. Geographic Mag., vol. 6, p. 63-126, illus., 1894; discussion by Charles Henry White with title, The Appalachian River versus a Tertiary trans-Appalachian River in eastern Tennessee: Jour. Geology, vol. 12, p. 34-39, 1904. Northwestern and Piedmont Georgia are included. The oldest feature in the area is the deformed Cretaceuos peneplain. The various features are described. Post-Cretaceous tilting and subsequent Tertiary peneplanation are recognized and the evidence described. The two surfaces are coincident. The drainage modifications are described, with the southwestward-flowing Appalachian River the main drainage. This was later captured by the westward flowing, eastward-cutting Tennessee River, and the beheaded portion is now the Coosa River. White claims the original streams flowed northwestward on the peneplain.

6. On the Devonian (Oriskany) in the southern Appalachians: Amer. Jour. Science, 3d ser. vol. 47, p. 237-238, 1894. The Devonian Frog Mountain Sandstone in Polk Co. unconformably overlies Cambrian to Silurian rocks. Fossils are listed.

7. Ringgold Atlas Sheet [Catoosa, Dade, Chattooga, Walker, Whitfield, Floyd, and Gordon Cos.]: U. S. Geol. Survey Geol. Atlas U. S. Folio 2, 3 p., illus. incl. geol. map, 1894. A complete geologic description of the area is given. Cambrian to [Pennsylvanian] rocks are described and mapped. Large folds and thrust faults comprise the major structural features. Coal and iron are the chief mineral resources; manganese, paint ore and stone are also described.

8. Description of the Stevenson sheet [Quad.] [Chattooga, Dade and Walker Cos.]: U. S. Geol. Survey Geol. Atlas U. S. Folio 19, [4 p.] illus. incl. geol. map, 1895. A complete geologic description of the area is given. [Ordovician to Pennsylvanian] rocks are mapped and described. Broad folds make up the predominant structures. Bituminous coal and iron are the chief mineral resources; stone and clay are also present.

9. (The) geological relations of the southern Appalachian bauxite deposits: Amer. Inst. Mining Engineers Trans., vol. 24, p. 243-254; discussions, p. 855-861, illus., 1895. The ore is irregularly distributed in a narrow belt in Floyd County. A survey of the stratigraphy and structure of the area is followed by a discussion of the occurrence of the bauxite. It occurs in the residuum at fault contacts of the Knox dolomite with overlying formations. The ore was precipitated by thermal solutions which rose along the fault planes.

10. Geology of the bauxite region of Georgia and Alabama, *in* Bauxite: U. S. Geol. Survey Ann. Rept. 16, pt. 3, p. 551-597, illus., 1895. Details of the occurrence of bauxite in Floyd, Bartow, and Polk Cos. are included. Its origin both as a residual and as a replacement deposit is discussed. A geological sketch map is included. Individual deposits are described.

11. Notes on the geology of the Cartersville sheet, [Bartow Co.] Georgia [abs.]: Science, new ser. vol. 1, p. 668-669, 1895.

12. The southern Appalachians, [Chapter 10] *of* The physiography of the United States, p. 305-336, illus., New York, Natl. Geog. Soc. and Amer. Book Co., [1896]. A review of the area includes much of northern Georgia. Explanations for the various features are given. No new data are included.

13. (and Brooks, Alfred Huise). The crystalline and metamorphic rocks of northwest Georgia [abs.]: Jour. Geology, vol. 5, p. 321-322, 1897; Science, new ser. vol. 5, p. 97, 1897.

14. Physiography of the Chattanooga District in Tennessee, [northwestern] Georgia, and Alabama: U. S. Geol. Survey Ann. Rept. 19, pt. 2, p. 1-58, illus., 1899. A generalized description of the Paleozoic sedimentary rocks and structural geology of the area is followed by detailed descriptions of the physiographic features. The Cumberland and Coosa peneplains are recognized. Drainage systems and cycles are analyzed in detail.

15. (and Campbell, Marius Robinson). The relation of biology to physiography: Science, new ser. vol. 12, p. 131-133, illus., 1900. The authors are elated that their earlier opinions, regarding the capture of the headwaters of the Coosa, Etowah, and Chattahoochee Rivers, are substantiated by biological data also. The clam fauna in these rivers and in their captors are similar.

16. Geological relations of the iron ores in the Cartersville District, [Bartow Co.] Georgia: Amer. Inst. Mining Engineers Trans., vol. 30, p. 403-419, illus., 1901. A stratigraphical summary of the Cambrian and Precambrian rocks includes a sketch map. Folds and faults are common. Specular hematite occurs as bands in the Weisner Quartzite. Hematite and limonite occur as residual concentrates in the residuum of what is called the Beaver [Shady] Limestone. The presence of ocher and manganese is also mentioned.

17. (The) coal fields of the United States: U. S. Geol. Survey Ann. Rept., vol. 22, pt. 3, p. 7-24, illus., 1902; summary without map, U. S. Geol. Survey Bull. 213, p. 257-269, 1903. A map of the coal fields includes those in northwestern Georgia. The text is very generalized.

18. Description of the Rome Quadrangle [Chattooga, Floyd, Gordon, Polk, and Bartow Cos.]: U. S. Geol. Survey Geol. Atlas U. S. Folio 78, 6 p., illus. incl. geol. maps, 1902. A complete geologic description of the area is given. Cambrian to Pennsylvanian and Neocene (?) rocks are mapped and described. Folds and faults constitute the major structural features. Iron ore is the chief mineral resource; bauxite, slate, and limestone are also present.

19. (The) southern Appalachian coal field: U. S. Geol. Survey Ann. Rept., vol. 22, pt. 3, p. 227-264, illus., 1902. A brief description of the occurrence of coal in Dade Co. is given. No detail is included.

20. (and Eckel, Edwin Clarence). Iron ores in the Cartersville District [Bartow Co.] Georgia: U. S. Geol. Survey Bull. 213, p. 233-242, 1903. A generalized description of the geology of the area is followed by a description of the ore occurrences. Specular hematite occurs as bands in quartzite. Limonite is the most important ore and occurs as residual concentrate in the limestone's weathered zone.

21. Manganese ores of the Cartersville District, [Bartow Co.] Georgia: U. S. Geol. Survey Bull. 213, p. 232, 1903. Manganese occurs within the local iron ore minerals, in nodules in the residual clay, and as small veins in the clay.

22. (and Eckel, Edwin Clarence). Occurrence and development of ocher deposits in the Cartersville District, [Bartow Co.] Georgia: U. S. Geol. Survey Bull. 213, p. 427-432, 1903. Ocher, as a groundwater precipitate, occurs along the contact of the Weisner Quartzite and the overlying, deeply-weathered limestone.

23. (and Phalen, William Clifton). (A) commercial occurrence of barite near Cartersville, [Bartow Co.] Georgia: U. S. Geol. Survey Bull. 340, p. 458-462, illus., 1908. Barite is noted occurring as nodules in the residual mantle of clay and gravel.

24. Graphite deposits near Cartersville, [Bartow Co.] Georgia: U. S. Geol. Survey Bull. 340, p. 463-465, 1908. A graphitic, talcose slate is wrought for the graphite. It was probably a carbonaceous shale.

25. (The)mineral wealth of the south: Official proceedings at the 1st session of the Southern Commercial Cong., p. 84-98, 1908. A generalized review of the mineral wealth and potential of the South includes Georgia. Few details are included.

26. The state geological surveys of the United States: U. S. Geol. Survey Bull. 465, 177 p., illus., 1911. This includes an historical account of the Georgia Geological Surveys from their inception to 1910.

**HAYES, RICHARD.**

1. Catalog of earthquakes for the years 1872-1873: Acad. Science St. Louis Trans., vol. 3, p. 243-245, 1878. A sharp shock is catalogued from Georgia on June 17, 1872. No details are listed.

**HAYS, LOUISE FREDERICK,** 1881- *see* Stephenson, Lloyd William, 14.

**HECK, NICHOLAS HUNTER,** 1882-1953.

1. Earthquake history of the United States: U. S. Coast and Geod. Survey Spec. Pub. 149, 61 p., illus., 1928; [2d edition], . . . Ser. 609, part 1, 83 p., illus., 1939; revised, 1947; 3d edition by Robert Ashton Eppley, 1958. A map gives the locations of epicenters, four of which are in Piedmont Georgia and one in the Chattanooga area. Earthquakes in nearby areas have also been felt in Georgia. Brief descriptions of them are given.

2. (and Bodle, Ralph Robinson). United States earthquakes 1928: U. S. Coast and Geod. Survey Ser. 483, 29 p., illus., 1930. A very brief record of a possible earthquake in Valdosta, Lowndes Co., on May 23, is given. The big quake of Nov. 2, centered in the Appalachian Mountains to the north was felt in north Georgia.

3. A new map of earthquake distribution: Geographical Review, vol. 25, p. 125-130, illus., 1935. A small-scale map of the world shows Georgia to have been in the area of the Charleston earthquake of 1886 only.

4. Earthquake problems of the Atlantic Coastal Plain: Seismol. Soc. America Bull., vol. 30, p. 109-143, illus., 1940. A general discussion of the relation of earthquakes to the physiographic provinces includes maps showing the distribution of the epicenters. Eight are reported from Georgia, five on the Coastal Plain, three in the Piedmont.

**HEILPRIN, ANGELO,** 1853-1907, *see also* White, Charles Abiathar, 2.

1. The Tertiary geology of the eastern and southern United States: Acad. Natural Science Philadelphia Jour., 2d ser. vol. 9, p. 115-154, illus., 1884; reprinted *in* Contributions to the Tertiary geology and paleontology of the United States, p. 1-40, illus., [priv. pub.], Philadelphia, 1884. A general description of the distribution of Tertiary rocks on the Coastal Plain from New Jersey to Texas is followed by detailed analyses of each of the states. Little is known of the Tertiary of Georgia. Only Eocene and Micene are recognized; the Oligocene should be present, but has not yet been determined. A small-scale map is included.

HEINRICH, EBERHARDT WILLIAM, 1918- *see also* Jahns, Richard Henry, 2.

1. (and Jahns, Richard Henry). Outlying deposits in Georgia, Part 10 *of* Mica deposits of the southeastern Piedmont: U. S. Geol. Survey Prof. Paper 248-F, p. 377-400, illus., 1953. Descriptions of the occurrence of mica in pegmatites from many places in Piedmont Georgia are given.
2. (and Klepper, Montis Ruhl and Jahns, Richard Henry). Thomaston-Barnesville District, [Upson, Lamar, Monroe Cos.] Georgia, Part 9 *of* Mica deposits of the southeastern Piedmont: U. S. Geol. Survey Prof. Paper 248-F, p. v, 327-376, illus., 1953. A general description of the origin and occurrence of pegmatites includes detailed descriptions of individual mica-bearing deposits in these areas.

HENBEST, LLOYD GEORGE, 1900-

1. Joseph Augustine Cushman [1881-1949] and the contemporary epoch in micropaleontology: Geol. Soc. America Proc. 1951, p. 95-102, port., 1952.
2. John B[ernard] Reeside, Jr., 1889-1958: Cushman Foundation Foraminiferal Research Contribs., vol. 10, pt. 2, preceding p. 25, 1959.

HENDERSON, EDWARD PORTER.

1. (and Cooke, Charles Wythe). The Sardis [Jenkins Co.] Georgia meteorite: U. S. Natl. Museum Proc., vol. 92, p. 141-150, illus., 1942. A deeply-altered iron meteorite weighing over 1700 pounds is described and analyzed in great detail. It is perhaps Miocene in age, and is the tenth largest meteorite in the country.
2. (and Perry, Stuart Hoffman). A restudy of the Social Circle, [Walton Co.] Georgia, meteorite: Amer. Mineralogist, vol. 36, p. 603-608, illus., 1951; discussion by Aurelius Sydney Furcron: Georgia Mineral Soc. Newsletter, vol. 4, p. 165 (‡), 1952. A new analysis and density of this famous meteorite is given. The iron is evenly granulated throughout.
3. (and Perry, Stuart Hoffman). A discussion of the densities of iron meteorites: Geochemica et Cosmochemica Acta, vol. 6, p. 221-240, London, 1954. A general discussion of the relationship of the density of meteorites to chemical composition includes data from the Walton, Oglethorpe, and Chattooga Co. meteorites, whose densities and nickel contents are compared. The density increases with increasing nickel content.
4. (and Furcron, Aurelius Sydney). Meteorites in Georgia, Part 1: Georgia Mineral Newsletter, vol. 9, p. 126-135, illus., 1956; Part 2, Descriptions of falls, vol. 10, p. 113-142, illus., 1957. A general discussion of meteor types and features is followed by descriptions of those from Georgia. Twenty one are known, of which two, from Pulaski and Emmanuel Cos., are described for the first time.
5. (and Furcron, Aurelius Sydney). A forged meteorite from Cave Spring, [Chattooga Co.] Georgia: Georgia Mineral Newsletter, vol. 11, p. 86-91, illus., 1958. A piece of forged meteorite is described and compared with known Georgia meteorites. It is tentatively considered to be a part of the Holland's Store meteorite from Chattooga County.

HENDERSON, E. T., *see* Standard Gold Mining Co., 1.

HENDERSON, JOHN T.

1. The Commonwealth of Georgia . . . . viii, 379 p., illus., Atlanta, J. P. Harrison and Co., 1885. A general review of the entire state includes chapters on topography, geology, and mineral resources. No new data are given.

HENDRICKS, ERNEST LEROY.

1. (and Goodwin, Melvin H., Jr.). Observations on surface-water temperatures in lime sink ponds and evaporation pans in [Baker Co.] southwestern Georgia: Ecology, vol. 33, p. 385-397, illus., 1952. Maximum water temperatures are higher than maximum air temperatures in the summer, and are lower in the winter. The minimum water temperature is always lower than the minimum air temperature. Size, surface exposure, and other factors are the cause of the variations.

2. (and Goodwin, Melvin H., Jr.). Water-level fluctuations in limestone sinks in [Baker and Early Cos.] southwestern Georgia: U. S. Geol. Survey Water-Supply Paper 1110-E, vii, p. 157-243, illus., 1952. General ground water conditions in the area are described. The relation of the ground water table to the ponded water in the sinks and to general hydrologic conditions is described. The ground water table has little effect on the level of the water in the sinks.

3. Some notes on the relation of ground-water levels to pond levels in limestone sinks of southwestern Georgia: Amer. Geophysical Union Trans., vol. 35, p. 796-804, illus., 1954. Pond-water levels were compared with ground-water levels nearby. The pond levels were higher than ground water levels most of the time. The relations between the two levels depend upon the permeability of the bottom of the pond unless the ground-water level is at or above pond water level at which time there is hydrologic continuity.

HENDRICKS, STERLING BROWN, 1902- *see* Alexander, Lyle Thomas, 1; Mitchell, Lane, 3.

HENDRY, CHARLES WALTER, JR., *see also* Jordan, Louise, 4.

1. (and Yon, J. William, Jr.). Geology of the area in and around the Jim Woodruff reservoir [Decatur and Seminole Cos.]: Florida Geol. Survey Rept. Inv. 16, p. 1-52, illus. incl. geol. map, 1958. A detailed geologic report of the area is given. Eocene to Miocene rocks are mapped. Sections are measured, and an insoluble residue study is included.

HÉNIN, STÉPHANE, *see* Caillère, Simonne, 1.

HENRY, ARTHUR VAN, 1892-1937.

1. (and Vaughan, William Harry). Geologic and technologic aspects of the sedimentary kaolins of Georgia: Amer. Inst. Mining and Metallurgical Engineers Tech. Pub. 774, 11 p., illus., 1937. A generalized discussion of the origin and occurrence of kaolin in the Coastal Plain is given. Various kinds of kaolin are present, reflecting varying conditions of origin, though all are sedimentary. Many analyses are included.

HENRY, EDWARD CARLETON, 1905- *see* Mitchell, Lane, 4.

HERRICK, STEPHEN MARION, 1904- *see also* Carter, Roland W., 1; Cole, William Storrs, 2; Cushman, Joseph Augustine, 8; Thomson, Medford Theodore, 2; Warren, Moultrie Alfred, 7.

1. (and La Moreaux, Philip Elmer). Upper Cretaceous Series: Southeastern Geol. Soc. [Guidebook] Field Trip 2, p. 6-20 (‡), 1944. A discussion of the Cretaceous rocks of the Coastal Plain includes many measured sections and lists of fossils.
2. (and Thomson, Medford Theodore). Water resources [of the Fort Benning area, Chattachoochee, Muscogee, and Marion Cos.]. Map, scale 1 inch to about 1 mile, text on back, U. S. Geol. Survey for U. S. Army Chief of Engineers [1946]. A lithologic map, based on water-bearing properties of rocks, is shown. The rocks are Cretaceous and Quaternary in age. The ground water potential of the area is included in the discussion.
3. (and Le Grand, Harry Elwood). Karst development by ground water in [Baker and Mitchell Cos.] southwest Georgia [abs.]: Georgia Acad. Science Bull., vol. 6, no. 1, suppl., p. [2], 1948.
4. (and Le Grand, Harry Elwood). Geology and ground water resources of the Atlanta area, [Piedmont] Georgia: Georgia Geol. Survey Bull. 55, viii, 124 p., illus. incl. geol. map, 1949. Those counties adjacent to Fulton Co. are included, as well as are Rockdale and Gwinnett Counties. Precambrian and early Paleozoic metamorphosed sedimentary rocks are mapped and described, as are late Paleozoic metamorphosed igneous rocks. The water-bearing properties of each are discussed. Well records and analyses are included.
5. Ground water in the crystalline rocks of Georgia [abs.]: Georgia Acad. Science Bull., vol. 8, no. 1, p. 12-13, 1950.
6. Paleozoic rocks as revealed by deep wells in Florida and [southern] Georgia [abs.]: Georgia Mineral Soc. Newsletter, vol. 3, p. 123-125 (‡), illus., 1950.
7. Clayton Formation, an important aquifer in southwest Georgia [abs.]: Geol. Soc. America Bull., vol. 65, p. 1362, 1954.
8. Ground water for irrigation in Georgia: Agricultural Engineering, vol. 27, p. 521-522, illus., 1946; Georgia Mineral Newsletter, vol. 8, p. 14-17, illus., 1955. This is an exhortation for the use of ground water for irrigation. Some of the problems associated with gathering data are outlined. Only small areas could be serviced north of the Fall Line. In the Coastal Plain, however, large quantities of water are available.

9. (and Wait, Robert L.). Ground water in the Coastal Plain of Georgia: Amer. Water Works Assoc. Southeastern Sec. Jour., vol. 20, p. 73-85, illus., 1956. A generalized discussion of the occurrence of ground water in the Coastal Plain includes analyses.

**HERRING, BARBARA F.**, *see* Kaiser, Edward Pick, 1.

**HERMANN, LEO ANTHONY.**

1. Geology of the Stone Mountain-Lithonia District, [DeKalb, Rockdale, and Gwinnett Cos.] Georgia: Ph. D. Thesis, Johns Hopkins Univ., 1951; Georgia Geol. Survey Bull. 61, xvi, 139 p., illus. incl. geol. map, 1954. Stone Mountain Granite of Permian (?) age has intruded a variety of Precambrian (?) metamorphic rocks. Triassic diabase dikes are also present. All are described in detail and mapped. Much detail of the structures is included. Stone is the chief mineral resource.

**HERRON, EDWARD A.**

1. William Healey Dall [1845-1927], Alaska pioneer: Natural History, vol. 57, p. 176-179, illus. incl. port., 1948.

**HERSEY, JOHN BRACKETT, 1913-**

1. (and others). Geophysical investigation of the continental margin between Cape Henry, Virginia and Jacksonville, Florida: Geol. Soc. America Bull., vol. 70, p. 437-466, illus., 1959. Siesmic reflection and refraction profiles from the Continental Shelf of Georgia are included. Interpretations, based upon known surface geology, are made. Depths to various units are calculated. The basement is easily identified.

**HERZOG, LEONARD FREDERICK, 2d, 1926-** *see also* Aldrich, Lyman Thomas, 1, 2; Pinson, William Hamet, Jr., 3.

1. Rb-Sr and K-Ca analyses and ages, Chapter 17 *of* Nuclear processes in geologic settings, Proceedings of 2d Conference: Natl. Research Council Committee on Nuclear Science, Nuclear Science Series Rept. 19, p. 114-130, 1956. Biotite in Stone Mountain Granite from DeKalb Co. is 326 million years old, whereas biotite from nearby Lithonia Gneiss, also in DeKalb Co., is 343 million years old.

**HEWETT, DONNEL FOSTER, 1881-**

1. (and Crickmay, Geoffrey William). The warm springs of Georgia [Meriwether, Talbot, Harris, Upson, and Pike Cos.] — their geologic relations and origin, a summary report: U. S. Geol. Survey Water-Supply Paper 819, iv, 40 p., illus. incl. geol. map, 1937. A geological map of the Warm Springs Quadrangle is given. Precambrian, Triassic, and Cenozoic rocks are described and mapped. The springs are described in detail and the waters are analyzed. The source of the heat is from the geothermal gradient at the depth to which the ground water is forced to descend before it ascends back to the surface.

**HEY, MAX HUTCHINSON,** *see* Prior, George Thorland, 1.

**HIDDEN, WILLIAM EARL,** 1853-1918.

1. On the Whitfield County, Georgia, meteoric iron: Amer. Jour. Science, 3d ser. vol. 21, p. 286-287, illus., 1881. A 13 pound iron meteorite is described and illustrated. No detailed analyses are included.

**HILGARD, EUGENE WOLDEMAR,** 1833-1916.

1. On the geological history of the Gulf of Mexico: Amer. Jour. Science, 3d ser. vol. 2, p. 391-404, illus., 1871; Amer. Assoc. Advancement Science Proc., vol. 20, p. 222-236, illus., 1871. A very generalized description of Cretaceous, Tertiary and Quaternary rocks of the Gulf Coastal area includes brief references to those in southwestern Georgia. No detail is given.
2. The later Tertiary of the Gulf of Mexico: Amer. Jour. Science, 3d ser. vol. 22, p. 58-65, illus., 1881. Evidence is discussed to support the hypothesis that the Gulf of Mexico was temporarily partially separated from the Atlantic Ocean during the Upper Tertiary Epoch. The [Central Georgia Uplift] is discussed as an extension of the Florida Arch. A generalized geological map includes Georgia.

**HILLYER, EBEN.**

1. Structure of Stone Mountain, a granite mass in [DeKalb Co.] Georgia: Amer. Jour. Science, 3d ser. vol. 10, p. 234-235, 1875. A physiographic and physical description of Stone Mountain is given.

**HINTON, JOHN HOWARD,** 1791-1873.

1. (ed.). The history and topography of the United States . . . . 2 vols., xvii, 476 p., x, 580 p., illus. incl. vol. of atlas, London, Simpkin and Marshall, and Philadelphia, Thomas Wardell, 1833. Volume 2 is devoted to descriptions of the topography of the United States, including that of Georgia. Cursory geological descriptions are also present.

**HITCHCOCK, CHARLES HENRY,** 1836-1919, *see also* New England Company, 1.

1. Description of the geological map: U. S. Census 9th, vol. 3, p. 754-756, illus. geol. map, 1872. A brief description accompanies a small-scale colored map of the United States; Georgia is included.
2. (and Blake, William Phipps). General geological map of the United States *in* Raymond, Rossiter Worthington, Statistics of mines and mining . . . 5th Ann. Rept., p. 480-484, illus. incl. geol. map, 1873. A map of the United States includes Georgia.
3. (and Blake, William Phipps). Geological map of the United States and territories: U. S. Census 9th, Statistical Atlas, p. 6-9, pls. 13-14, illus. geol. map., 1874; summary, Geological Mag., vol. 10, p. 371-373, London, 1873.
4. Map of the coal fields of the United States . . . : U. S. Census 9th, Statistical Atlas, pls. 11-12, 1874.

5. Gray's geological map of the United States, *in* The National Atlas . . . special edition, p. 204-205, no scale, about 1 inch to 300 miles, Philadelphia, O. W. Gray, 1886; originally published 1876.

6. (and Hitchcock, Edward). Geological map of the United States. Compiled for R.P. Smith's Wall Map of the United States. Scale, 1 inch per 20 miles, New York, J. Bien, [1881]; text with similar title, 29 p., 1881.

7. Geological map of the United States and part of Canada. . . . Scale 1 inch to about 200 miles, Amer. Inst. Mining Engineers, 1886.

8. The geological map of the United States: Amer. Inst. Mining Engineers Trans., vol. 15, p. 465-488, illus. geol. map, 1887. A review of the various maps of the United States is followed by a description of the one accompanying this report. Georgia is included.

9. Edward Hitchcock [1793-1864]: Amer. Geologist, vol. 16, p. 133-149, port., 1895.

[**HITCHCOCK, DONALD**].

1. Pleistocene bones found [Walker Co.] [abs.]: Georgia Spelunker, vol. 1, no. 1, p. 3, 1957.

**HITCHCOCK, EDWARD**, 1793-1864, *see also* Hitchcock, Charles Henry, 6.

1. Outline of the geology of the globe, and of the United States in particular . . . . 136 p., illus. incl. geol. map, Boston, Phillips, Sampson, and Co., 1853; 2d ed., Boston, 1854; 3d ed., Boston, 1856. A brief summary of the geology of the world, as known at that time, includes a small-scale geological map of the world and one of the United States, which includes Georgia. No new data are included.

2. Reminiscences of Amherst College . . . . Northampton, Mass., Bridgman and Childs, 1863. [not seen]

**HOBBS, WILLIAM HERBERT**, 1864-1923.

1. Nathaniel Southgate Shaler [1841-1906]: Wisconsin Acad. Science Trans., vol. 15, p. 924-927, port., 1907.

2. John Wesley Powell, 1834-1902: Scientific Monthly, vol. 39, p. 519-529, illus., 1934.

**HOCOTT, CLAUDE RICHARD**, 1909- *see* Buckley, Stuart Edward, 1.

**HODGE, JAMES THACHER**, 1816-1871, *see also* Southern Gold Co., 1.

1. Observations on the Secondary and Tertiary formations of the southern Atlantic states, with an appendix by Timothy Abbott Conrad: Assoc. Amer. Geologists and Naturalists Rept., p. 94-111, illus., 1843; Amer. Jour. Science, vol. 41, p. 332-344, illus., 1843. Casual reference to Cretaceous and Tertiary rocks exposed along the Savannah River is made. Little new data are included.

HODGSON, WILLIAM BROWN, 1800-

1. On the megatheroid fossils of the Atlantic coast of Georgia [abs.?]: National Institute [Washington, D. C.] Proc., Bull. no. 3, vol. 1, p. 431, 1844 [not seen].
2. Memoir on the *Megatherium* and other extinct gigantic quadrupeds of the coast of [Chatham Co.] Georgia . . . . 47 p., illus., New York, Bartlett and Welford, 1846. A complete description of the near-shore Atlantic Coastal Plain and the offshore islands is given. Bone deposits of mammals including *Megatherium*, from [Pleistocene] deposits on Skidaway Island, are described.

HOFF, KARL ERNEST ADOLF VON, 1771-1837.

1. Neue Beitraege zu Chladni's Verzeichnissen von Feuermeteoren und herabgefallenen Massen, Achten Lieferung: Annalen der Physik und Chemie, [2d ser.] vol. 24, p. 221-242, Leipzig, 1832. A description of the observed meteorite fall in Monroe Co. is given.

HOFFMAN, JOHN NATHAN, 1923-

1. Manganese, its minerals, deposits and uses: Pennsylvania State Univ. Mineral Industries Exper. Sta. Circ. 49, vi, 116 p., illus., 1957; revised, 1958. A general review of the manganese occurrences of the world includes those from the Paleozoic terrane in northwestern Georgia and also those from the Piedmont. Not much detail is given.

HOLDEN, FREDERICK THOMPSON, 1915-

1. [Coastal Plain of] Georgia, *in* [oil and gas] Developments in the southeastern states in 1949: Amer. Assoc. Petroleum Geologists Bull., vol. 34, p. 1214-1215, 1950.

HOLDEN, ROY JAY, 1870-1945.

1. The "Punch" Jones and other Appalachian diamonds: Virginia Polytechnic Inst. Bull. 37, no. 4, (Engineering Exper. Sta. ser. no. 56), 32 p., illus., 1944. Six finds of diamonds in Georgia are given in a brief list. One is from Hall Co.; three are from White Co.; one is from Clayton Co., and one is from Fulton Co., near Atlanta. References are cited.

HOLDER, CHARLES FREDERICK, 1851-1915.

1. Louis Agassiz [1807-1873]—his life and work. 327 p., illus. incl. port., New York, G. P. Putnam's and Sons, 1893.

HOLLAND, THOMAS HENRY, 1868-

1. Prof. W[aldemar] Lindgren [1860-1939]: Nature, vol. 144, p. 1083-1084, London, 1939.

HOLLAND, WILLIS A., JR., 1931- *see also* Hurst, Vernon James, 35.

1. (The) geology of the Panola Shoals area, DeKalb County, Georgia. M. A. Thesis, Emory Univ., 1954.
2. Heavy mineral analysis of saprolite from a selected area of the Piedmont [abs.]: Georgia Acad. Science Bull., vol. 12, p. 35, 1954.

3. (A) study of sorting in several small streams in Decatur, DeKalb County, Georgia: Georgia Acad. Science Bull., vol. 12, p. 69-73, illus., 1954. The deposits of four small streams are studied. The sorting results are shown to be associated with the provenance of the material, the nature of the tributary junctions, bedrock in the stream bed, and time.

4. (and Hurst, Vernon James). Metallic-looking object reported to have fallen from the sky near Waycross [Ware Co.] [abs.]: Georgia Acad. Science Bull., vol. 17, p. 76, 1959.

**HOLMES, FRANCIS SIMMONS**, 1815-1882, *see* Leidy, Joseph, 4.

**HOLMES, JOSEPH AUSTIN**, 1859-1915.

1. Corundum deposits of the southern Appalachian region [Rabun Co.]: U. S. Geol. Survey Ann. Rept. 17, pt. 3, (cont'd), p. 935-943, illus., 1896. A general survey of the occurrence of corundum includes a description of that occurring in Rabun County. No detail is included.

2. Notes on the underground supplies of potable waters in the South Atlantic Piedmont Plateau: Amer. Inst. Mining Engineers Trans., vol. 25, p. 936-943, 1896. This is a general description of the ground water occurrence and potential in the Piedmont Province. Reference is made to a well in Fulton Co., Georgia.

**HOLSTEAD, J. B.**, *see* Stevens, Ray E., 1.

**HOOTMAN, JAMES ALBERT.**

1. (and Nelms, William Stockton). The radioactivity of Stone Mountain [DeKalb Co.] springs: Amer. Jour. Science, 5th ser. vol. 21, p. 37-38, 1931; discussion by Aurelius Sydney Furcron, with title, Radioactive springs of Stone Mountain: Georgia Mineral Soc. Newsletter, vol. 4, p. 55-58, (‡), 1951. An account of the measurement method is followed by a table of results. Eighteen springs are tested.

**HOPKINS, MARY SUZANNE.**

1. The inexpensive mountain [Stone Mountain, DeKalb Co.]: Nature Mag., vol. 48, p. 77-78, 108, illus., 1955. This is a popular account of the origin of Stone Mountain.

**HOPKINS, OLIVER BAKER**, 1886-

1. Asbestos deposits of Georgia: Amer. Inst. Mining Engineers Bull. 93, p. 2275-2284, illus., 1914; . . . Trans., vol. 50, p. 964-973, illus., 1915. Chrysotile occurs in serpentine derived from peridotite in insignificant quantities in the Piedmont. Amphibole also occurs in scattered deposits in the Piedmont. Mass-fibre anthophyllite occurs in commercial quantities in the Blue Ridge. It is derived from metamorphosed enstatite-olivine rocks.

2. (A) report on the asbestos, talc, and soapstone deposits of Georgia: Georgia Geol. Survey Bull. 29, 319 p., illus. incl. geol. map, 1914. A general discussion of the origin of these materials is followed by descriptions of individual deposits. They are found throughout the Blue Ridge and Piedmont. Included is a discussion of the occurrence in Georgia of basic igneous rocks. Analyses and photomicrographs are included.

**HOPKINS, T. S.**

1. Mineral springs and climate of Georgia: Climatologist, vol. 1, p. 97-103, 1891 [not seen].

**HOPSON, CLIFFORD AMDRAE, 1928-**

1. Exfoliation and weathering at Stone Mountain, [DeKalb Co.] Georgia, and their bearing on disfigurement of the Confederate Memorial: Georgia Mineral Newsletter, vol. 11, p. 65-79, illus., 1958. Exfoliation due to sheeting is common. The sheeting continues into the mass of the mountain for an unknown distance. Weathering, because of Georgia's warm humid climate, is proceeding at a faster-than-average rate.
2. Origin of ring-shaped weathering pits at Stone Mountain, [DeKalb Co.] Georgia [abs.]: Geol. Soc. America Bull., vol. 70, p. 1764, 1959.

**HOSTETTER, JOHN CLYDE,** 1886- *see* Day, Arthur Louis., 1.

**HOVEY, HORACE CARTER,** 1833-1914.

1. The life and work of James Hall [1811-1898] LL. D.: Amer. Geologist, vol. 23, p. 137-168, port., 1898.

**HOWARD, ARTHUR DAVID,** 1906-

1. Terrace studies in the United States and Hawaii, 1934-1937: Committee pour L'étude des Terrasses Pliocènes et Pleistocènes, Rept. 5, p. 27-63, Paris, Bur. de Sec. Gén., Union Géog. International, 1938. This is a review of the work done during the years cited on problems relating to sea-level changes. The terraces of Georgia are discussed. The various terraces are correlated with glacial action.

**HOWE, HENRY VAN WAGENEN,** 1896-

1. Large oysters from the Gulf Coast Tertiary: Jour. Paleontology, vol. 11, p. 355-366, illus., 1937; Georgia Mineral Newsletter, vol. 10, no. 1, p. 25-32, illus., 1957. A taxonomic discussion of *Ostrea gigantissima* from Burke Co. shows that other large oysters have been confounded with this one. A detailed history of the confusion, with solutions, is included. *O. gigantissima,* from Eocene beds, is described and illustrated.
2. Neglected Gulf Coast Tertiary microfossils: Amer. Assoc. Petroleum Geologists Bull., vol. 26, p. 1188-1199, illus., 1942. In a general description of the variety of microfossils, aside from Foraminifera and Ostracoda which are to be found, reference is made to Eocene collecting grounds in Burke and Worth Counties; echinoderm parts are abundant.

3. Status of micropaleontology in eastern Gulf Region: Amer. Assoc. Petroleum Geologists Bull., vol. 31, p. 713-730, 1947. A generalized historical survey of some of the milestones in micropaleontology includes some reference to those from Georgia. A selected bibliography is included.
4. (and Laurencich, Laura). Introduction to the study of Cretaceous Ostracoda. 536 p., illus., Louisiana State Univ. Press, 1958. A survey and a taxonomic review of the Cretaceous Ostracoda include many genera and species from Georgia. All are described and illustrated.

**HOWELL, BENJAMIN FRANKLIN, SR. 1890-**

1. (chairman, and others). Correlation of the Cambrian Formations of North America: Geol. Soc. America Bull., vol. 55, p. 993-1003, chart, 1944. A time-rock chart shows the time relationships of the Cambrian rocks of northwestern Georgia to themselves and to similarly aged rocks in other areas.
2. Memorial to Charles Elmer Resser [1889-1943]: Geol. Soc. America Proc. 1943, p. 217-223, port., 1944.

**HOWELL, EDWIN EUGENE, 1845-1911.**

1. On two new meteorites: Amer. Jour. Science, 3d ser. vol. 50, p. 252-254, illus., 1895. An 8½ pound iron meteorite from Cherokee Co. is analyzed.

**HOWELL, THOMAS J., 1842-1912.**

1. The geological distribution of North American forests: Popular Science Monthly, vol. 23, p. 517-524, 1883. The correspondence between the distribution of forest types and geological provinces is pointed out. The various provinces in Georgia are mentioned. No details are included, however.

**HOYT, JOHN CLAYTON, 1874-** *see* Hall, M. R., 1, 2.

**HSU, GIUN-TZE.**

1. A biographical sketch of Douglas Wilson Johnson [1878-1944]: Geographical Society China Jour., vol. 14, no. 1, p. 23-41, port., Peking, 1947.

**HUBBS, CARL LEAVITT, 1894-** *see* Blair, William Franklin, 1.

**HUDSON, WALLER CHENAULT.**

1. Sillimanite find in south proves important: Engineering and Mining Jour., vol. 145, no. 9, p. 81, 1944. A cursory description of the occurrence of sillimanite schists in the Piedmont of Georgia is given. They occur in a belt 30 miles wide from Talbotton northeastward into South Carolina.
2. Exploration of [Elbert and Hart Cos.] Georgia and South Carolina sillimanite deposits: U. S. Bur. Mines Rept. Inv. 3927, 44 p. (‡), illus., 1946. Sillimanite-bearing schist is described and outlined by core drilling.

3. Investigation of the McLeod glass-sand pits, Wheeler County, Ga.: U. S. Bur. Mines Rept. Inv. 3859, 3 p (‡), illus., 1946. The deposit, along the Little Ocmulgee River, is described and delineated. Analyses are included.

**HUFFMAN, GEORGE GARRETT,** 1916-

1. Memorial, Charles E[lijah] Decker (1868-1958): Oklahoma Geology Notes, vol. 18, p. 162-170, port., 1958.
2. Charles E[lijah] Decker (1868-1958): Compass, vol. 36, p. 240-243, port., 1959.

**HULL, EDWARD,** 1829-1917, *see* Spencer, Joseph William Winthrop, 7.

**HULL, JOSEPH POYER DEYO,** 1889- *see also* Shearer, Harold Kurtz, 2.

1. (and Teas, Livingston Pierson). (A) preliminary report on the oil prospect near Scotland, Telfair County, Georgia. ix, 23 p., illus., Georgia Geol. Survey, 1919. An oil seepage is investigated and described. The geology of the region is outlined. Some sort of potential structural deformation is indicated by the elevation of a recognizable limestone bed in artesian wells, and further investigation is recommended.
2. (and LaForge, Laurence, and Crane, Walter Richard). Report on the manganese deposits of Georgia (second report on manganese): Georgia Geol. Survey Bull. 35, xvi, 295 p., illus., 1919. A general discussion of the origin and occurrence of manganese includes detailed descriptions of occurrences in Georgia. Most occurs as residual concentrate in Lower-Paleozoic-formation-residuum in Bartow Co. and in small amounts in Polk, Floyd, and other counties in northwestern Georgia. It occurs in cavity fillings on a small scale in some of the Piedmont and Blue Ridge counties. Analyses are included.
3. Report on the barytes deposits of Georgia: Georgia Geol. Survey Bull. 36, xiii, 146 p., illus., 1920. Barite occurs: in veins in lower Paleozoic limestone, as replacements, in breccias, as a residual deposit in the clays from the limestones, as colluvial deposits, and also as alluvial material. Only the residual and colluvial deposits are commercially important. Most comes from Bartow Co. and a little from nearby. Individual occurrences are described; analyses are included.

**HUMPHREYS, WILLIAM JACKSON,** 1862-

1. Earthquakes felt in the United States during 1916: Monthly Weather Review, vol. 44, p. 697-698, 1916. Numerous cities in Georgia, most in the northern half, are included in a list of locations reporting earthquakes. Most report but one, though several report two. A large quake occurred in the southern Appalachians during this year.
2. (The) southern Appalachian earthquake of February 21, 1916: Monthly Weather Review, vol. 44, p. 154-155, illus., 1916. An earthquake, centered in western North Carolina, was felt throughout northern Georgia. An isoseismal map shows its extent. Its intensity at Atlanta was III.

**HUNT, THOMAS STERRY, 1826-1899,** *see also* Whitney, Josiah Dwight, 1.

1. Notes on the geology and economic mineralogy of the southeastern Appalachians [abs.]: Amer. Assoc. Advancement Science Proc., vol. 22, pt. 2, p. 113-115, 1874.

2. Mineral physiology and physiography . . . . xvii, 710 p., illus., Boston, Samuel E. Cassino, 1886. A detailed review of mineralogy, petrography, and metamorphism is followed by a discussion of the historical geology of the eastern United States, from the Precambrian through the Lower Paleozoic. Numerous references to Georgia are included. The depth of weathering is discussed extensively.

**HUNTER, CHARLES EUGENE, 1911-**

1. (and Mattocks, Philip Ward). Vermiculites of western North Carolina and [Towns Co.] north Georgia: Tennessee Valley Auth. Water Control Planning Dept. Geol. Div. Bull. 5, p. 1-10 (‡), illus., 1936. A general discussion of the origin and occurrence of vermiculite includes a description of occurrences in Towns County. No detail is included, however.

2. Chromite in western North Carolina and [Towns Co.] north Georgia: Tennessee Valley Auth. Water Control Planning Dept. Div. Geol. Bull. 10, p. 18-20 (‡), 1938. Chromite in peridotite intrusions in Towns Co. is reported from the Hog Creek area. Little information is included.

3. (and Rankin, Hiram S.). Forsterite olivine deposits of North Carolina and Georgia: Georgia Geol. Survey Bull. 47, 117 p., illus., 1941; North Carolina Div. Mineral Resources Bull. 41, 117 p., illus., 1941. Dunites and saxonites (olivine rocks), are known from Rabun and Towns Cos., having intruded into hornblende gneiss and schist. Some have been serpentinized. Analyses are included, as are small geological sketch maps of each of the individual deposits.

4. (and Gildersleeve, Benjamin). Minerals and structural materials of western North Carolina and north Georgia: Tennessee Valley Auth. Commerce Dept. Regional Products Research Div. Rept. C, 94 p. (‡), illus., 1944; revised, 1946. A survey of mineral resources, mostly from White, Habersham and Rabun Cos., is given. It is mostly a list of known and new locations of various types of material.

5. Vermiculite of the southeastern states, *in* Snyder, Frank G., ed., Symposium on mineral resources of the southeastern United States, p. 120-127, illus., 1950. A general discussion of the origin and occurrence of vermiculite includes those deposits in the Piedmont and Blue Ridge of Georgia. Few details are included.

**HUNTINGTON, OLIVER WHIPPLE, 1858-**

1. Catalogue of all recorded meteorites . . . : Amer. Acad. Arts and Science Proc., vol. 23, p. 37-110, illus., 1888. Fragments of meteorites from Chattooga, Whitfield, Monroe, Cherokee, Stewart, Putnam, Union, and Walker Cos. are in the Harvard Collection. The weight and a brief description of each is given. Some are illustrated.

2. The crystalline structure of the Coahuila irons: Amer. Acad. Arts and Science Proc., vol. 24, (new ser. vol. 16), p. 30-35, illus., 1889. The Chattooga Co. meteorite is shown to have a similar chemical and crystalline structure to the numerous Coahuila iron meteorites from Mexico. These and others could be from the same original mass which broke into many fragments upon entering the atmosphere.

**HURLEY, PATRICK MASON**, 1912- *see* Pinson, William Hamet, Jr., 3.

**HURST, VERNON JAMES**, 1923- *see also* Holland, Willis A., Jr., 4; Kelly, Arthur Randolph, 1.

1. Heavy minerals in rock differentiation [Clarke Co.] [abs.]: Georgia Acad. Science Bull., vol. 9, no. 1, p. 16-17, 1951.
2. Geology of the Kennesaw Mountain—Sweat Mountain area, Cobb County, Georgia. M. S. Thesis, Emory Univ., 1952.
3. Chertification in the Fort Payne Formation, Georgia, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 215-238, illus., 1953. Petrographic descriptions of the chert and its accompanying Lavender Shale Member are given. Siliceous limestone is also described. Possible origins of the chert are discussed. No positive solution is available yet, as several modes of origin are possible. Samples from Floyd and Walker Cos. are used.
4. Heavy minerals in saprolite differentiation, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 244-264, illus., 1953. Much data come from Clarke Co., the rest from elsewhere in the Piedmont. The heavy mineral variation and concentration in various saprolites, which otherwise resemble one another, are significantly different so that the saprolites can be distinguished and the parent rock identified.
5. Staurolite in Fannin County, Georgia [abs.]: Georgia Acad. Science Bull., vol. 12, p. 34-35, 1954.
6. Chrysacolla [DeKalb Co.], *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 8, p. 65, 1955. Chrysacolla is reported as blue, transparent coatings on foliation planes on, and interspersed with, biotite in Stone Mountain Granite.
7. Epistilbite and laumontite near Columbus, [Muskogee Co.] Georgia, *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 8, p. 149-150, 1955. Both rare zeolites occur in veinlets up to ¼ inch thick traversing amphibolite and biotite gneiss. Both result from the alteration of feldspar.
8. New evidence of volcanism in [Piedmont] Georgia [abs.]: Georgia Acad. Science Bull., vol. 13, p. 57, 1955.
9. Pseudomeionite from Buford Dam [Forsyth and Gwinnett Cos.], *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 8, p. 21, 1955. The mineral occurs in small, pod-like masses and in crude prismatic crystals up to 2 inches long. It occurs in a biotite gneiss.

10. (A) sample of heavy sand from St. Simon's Island [Glynn Co.] *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 8, p. 21, 1955. A sedimentary analysis of sand samples from the island is given. The sand contains 73 per cent opaque grains, which are mainly ilmenite and rutile.

11. Singing sands from Satilla River, [Ware Co.] south Georgia: Georgia Mineral Newsletter, vol. 8, p. 65-66, 1955. A sample of the sand is analyzed and the size distribution is shown in a histogram. The sonorousness is due to the rubbing together of the rough, angular surfaces of the sand.

12. Spinel, [Morgan Co.], *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 8, p. 98, 1955. Crystals occur singly and in clusters, the largest being ⅜ inch across.

13. Stilbite [Lamar Co.], *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 8, p. 65, 1955. Stilbite, in sheaf-like aggregates, is reported from seams and cavities in biotite gneiss.

14. Stratigraphy of the Murphy Series and underlying formations in [Fannin Co.] northern Georgia [abs.]: Geol. Soc. America Bull., vol. 66, p. 1689, 1955.

15. Stratigraphy, structure, and mineral resources of the Mineral Bluff Quadrangle [Fannin Co.], Georgia. Ph. D. Thesis, Johns Hopkins Univ., 1955; Georgia Geol. Survey Bull. 63, xii, 137 p., illus. incl. geol. map, 1955. Igneous-intruded, metamorphosed sedimentary rocks of Cambrian and possibly Precambrian age are mapped and described. Primary sedimentary structures, folds, faults, and other structures are described and mapped. Petrofabric diagrams are included. Iron, kyanite, marble, stone, staurolite, and talc are the mineral resources described.

16. Anatase pseudomorphs after titanite [Fannin Co.] *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 9, p. 73, 1956. The crystals, resembling those of titanite, occur in a clay seam in weathered metagraywacke.

17. Andalusite [Baldwin Co.] *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 9, p. 125, illus., 1956. Andalusite occurs as nodules and pyroblasts in gneiss and schist. A photomicrograph is included.

18. Apatite [Jasper and Lamar Cos.], *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 9, p. 90, illus., 1956. Colorless crystals to 1 cm. long are described and illustrated from near Monticello; larger crystals come from the uranium-bearing pegmatite near Barnesville.

19. Coincident rock alteration and growth of K feldspar porphyroblasts near Macon [Bibb Co.] Georgia [abs.]: Geol. Soc. America Bull., vol. 67, p. 1752, 1956.

20. Cordierite [Monroe Co.], *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 9, p. 73, 90, illus., 1956. The mineral occurs in knots and masses up to ¾ inch across in a garnetiferous sillimanite-biotite-plagioclase gneiss.

21. Sapphire [Dougherty Co.], *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 9, p. 90, 1956. A sapphire from the Coastal Plain gravels near Albany is described.

22. (and Donnay, Joseph Désiré Hubert, and Donnay, Gabrielle Hamburger). Staurolite twinning: Mineralogical Mag., vol. 31, p. 145-163, illus., London, 1956. Many specimens from Fannin Co. and elsewhere are used in a study of the laws of twinning. Several types of twinning are detected.

23. Mineralogical notes: Georgia Mineral Newsletter, vol. 10, p. 95, 1957. Green beryl of gem emerald quality from Fannin Co. is described.

24. Mineralogical notes: Georgia Mineral Newsletter, vol. 10, p. 149, 1957. Fuchsite is reported from Pickens, Cobb, Carroll, Paulding, Wilkes, and Albert Counties.

25. (The) occurrence of radioactive minerals in Georgia [abs.]: Georgia Acad. Science Bull., vol. 15, p. 61, 1957.

26. Polymorphism of micas in the Mineral Bluff and Epworth Quadrangles [Fannin Co.]: Geol. Soc. America Bull., vol. 68, p. 1581-1584, illus., 1957. Micas are analyzed by x-ray, and all of the muscovites are of the 2M variety; the biotites are 1M or 3T. Temperature was probably the chief factor in the creation of the different kinds of mica. Post metamorphic alteration environment is also evident, indicated by the varying amounts of water which were available.

27. Prehistoric vertebrates of the Georgia Coastal Plain: Georgia Mineral Newsletter, vol. 10, p. 77-93, illus., 1957. This is a popular account, including drawings of restorations, of the large Pleistocene vertebrate fauna which is known from the Atlantic Coastal Plain area; most are from near Brunswick and Savannah.

28. Rare sillimanite crystals [Gilmer Co.], *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 10, p. 55, 1957. Terminated sillimanite crystals from near Ellijay are described.

29. Uraninite [Fulton and Hart Cos.], *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 10, p. 55, 1957. Black uraninite cubes occur in a pink pegmatite in Hart Co., and black, irregular masses of uraninite occur in a coarse pegmatite in Fulton County.

30. Absolute ages of Georgia rocks under investigation: Georgia Acad. Science Bull., vol. 16, p. 70-72, 1958. A discussion of absolute age determination by radioactive decay of minerals includes a table of those dates already determined for the Stone Mountain and Lithonia bodies in DeKalb Co. and the Ben Hill Granite in Fulton County.

31. Chatoyant tourmaline, garnet, hornblende, calcite, zeolite, and alum [Dawson Co.], *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 11, p. 48, 1958. These minerals occur in dark green amphibolite schist and in quartz veins in the schist.

32. (and Larson, Lewis H., Jr.). On the source of copper at the Etowah site, [Bartow Co.] Georgia: Amer. Antiquity, vol. 24, p. 177-181, illus., 1958. Spectrographic analyses for trace elements of Etowah Indian copper artifacts and native copper from many sources in the United States show that the copper from Fannin Co. is the most likely Indian source, and not that from Michigan, as had been previously suspected.

33. Rare-earth-bearing apatite [Lamar Co.], *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 11, p. 31, 1958. The apatite occurs as fractured, irregularly shaped crystals in pegmatite. The crystals, several millimeters in size, are generally enclosed by feldspar, less often in quartz.

34. Stibnite and beryl at Consolidated Quarries [Dawson Co.], *in* Mineralogical notes: Georgia Mineral Newsletter, vol. 11, p. 48, 1958. Gray crystals associated with black tourmaline occur in pegmatite. Some are over one inch long.

35. (and Holland, Willis A., Jr.). Coronites near Culloden [Monroe Co.] [abs.]: Georgia Acad. Science Bull., vol. 17, p. 74, 1959.

36. (The) geology and mineralogy of Graves Mountain, [Lincoln Co.] Georgia: Georgia Geol. Survey Bull. 68, v, 33 p., illus. incl. geol. map, 1959. Kyanite bearing quartz-sericite rock and quartz schist are described and mapped. Quartz conglomerate and quartz veins are also present. The kyanite and many other minerals were introduced into the metamorphic rocks at different intervals, each of which is described and evaluated.

37. (A) natural example of the pyrite→ pyrrhotite+ sulphur reaction [Bibb Co.] [abs.]: Georgia Acad. Science Bull., vol. 17, p. 77, 1959.

**IDDINGS, JOSEPH PAXSON, 1857-1920.**

1. George Huntington Williams [1856-1894]: Jour. Geology, vol. 2, p. 759-767, port., 1894.

2. Memoir of Samuel Lewis Penfield [1856-1906]: Geol. Soc. America Bull., vol. 18, p. 572-582, port., 1908.

**IMBEAUX, CHARLES EDOUARD AUGUSTIN, 1861-**

1. Les eaux souterraines des États Unis, specialment dans les terrains quaternaires, *in* Hyllningsskrift tillägnad J. Gust. Richert . . . , p. 221-258, illus., Stockholm, Teknish Tidskrift, Cederquists Grafiska Aktiebolog, 1917. A generalized discussion of the occurrence of ground water in the United States includes comments upon the Quaternary deposits of the Coastal Plain of Georgia. No new data are included.

**IMLAY, RALPH WILLARD, 1908-**

1. Memorial to John Bernard Reeside, Jr., (1889-1958): Geol. Soc. America Proc. 1958, p. 173-178, port., 1959.

**INGALLS, WALTER RENTON, 1865-**

1. Rossiter W[orthington] Raymond [1840-1918]: Engineering and Mining Jour., vol. 107, p. 135-142, illus. incl. port., 1919.

**INGOLS, ROBERT SMALLEY, 1911-**

1. (A) geochemical study of Georgia waters [Rabun Co.] [abs.]: Georgia Acad. Science Bull., vol. 10, no. 1, p. 4, 1952.

2. (and Navarre, Alfred Theodore). "Polluted" water from the leaching of igneous rock: Science, vol. 116, p. 595-597, 1952. Evidence is presented to show that inorganic nitrogen can be introduced into surface water and therefore the nitrogen content alone cannot be used as a test of pollution in an area of rapidly-weathering granite.
3. Some observations on the limnology of [Piedmont] Georgia lakes [abs.]: Georgia Acad. Science Bull., vol. 11, p. 24, 1953.

INGRAM, FRANK THOMPSON, 1930-
1. Oolites from the St. Genevieve and Gasper Limestones of [Catoosa and Walker Cos.] northwest Georgia, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 264-270, illus., 1953. Thin sections of oolites are evaluated. Calcite rhombs are common in the nuclei and small fossils, largely Foraminifera, are also present. The oolites were formed in shallow, agitated water.
2. The stratigraphy and paleontology of the Ordovician System in Lookout Valley, [Dade Co.] Georgia. M. S. Thesis, Emory Univ., 1954.

INGRAM, WILLIAM FRANKLIN, 1916-
1. The kyanite, staurolite, and garnet association in Upson County, Georgia, *in* Short contributions to the geology, geography, and archaeology of Georgia: Georgia Geol. Survey Bull. 56, p. 85-91, 1950. These minerals occur individually and in various combinations. Each is described petrographically as are other associated minerals. A metamorphic origin is proposed.

IRELAND, HUBERT ANDREW, 1904-
1. "Lyell" Gully, a record of a century of erosion [Baldwin Co.]: Jour. Geology, vol. 47, p. 47-63, illus., 1939. A gully, formed in conglomerate-capped granite saprolite, is described. The rate and nature of its growth are discussed. Data come from Lyell's early report (1841) and others, since his time, and show the rate of gully formation.

JACKSON,—— *see* Meigs, Josiah, 1.

JACKSON, CHARLES FREEMAN, 1886-1945.
1. (and Knaebel, John Ballentine). Small-scale placer-mining methods: U. S. Bur. Mines Inf. Circ. 6611, 17 p. (‡), illus., 1932. A discussion of the techniques of placer mining includes a map showing potential mining locations in the Georgia Piedmont and Blue Ridge.

JACKSON, CHARLES THOMAS, 1805-1880, *see also* Blake, William Phipps, 3; Lincoln Gold Mining Co., 1; Lumpkin Chestatee Fluming and Mining Co., 1; Southern Gold Co., 1.
1. [Gold mines of Lumpkin County, Georgia] [abs.]: Boston Soc. Natural Hist. Proc., vol. 4, p. 400, 1854.

2. Moore's gold mines, Dahlonega, [Lumpkin Co.] Georgia: Mining Mag., vol. 2, p. 24-27, 1854. Gold-bearing pyritiferous quartz veins in schist are described. Gold in saprolite is very common also.

3. On bornite from Dahlonega [Lumpkin Co.] Georgia: Amer. Jour. Science, 2d ser. vol. 27, p. 366-367, 1859; summary and discussion, Journal fuer praktische Chemie, vol. 79, p. 507-508, Leipzig, 1860; discussion, Répértoire de chemie pure, vol. 2, p. 288, 1860; discussion by Frederick Augustus Genth, with title, Re-examination of the tetradymite (bornite *Jackson*) . . . , Mining Mag., 2d ser. vol. 1, p. 358-359, 1860; reply by author, p. 466-468; reply by F. A. Genth, . . . vol. 2, p. 64-66, 1861; discussion by David M. Balch, with title, On tellurbismuth from Dahlonega . . . : Amer. Jour. Science, 2d ser. vol. 35, p. 99-101, 1863. Bornite from the Field Gold Mine is described and analyzed. Genth considers it tetradymite. Balch supports neither and considers it new.

4. Sur la bornite de Dahlonega [Lumpkin Co.] et sur les diamants de [Hall Co.] de l'état de Georgie [abs.]: Academie des Sciences de Paris Comptes Rendus, vol. 48, p. 850-851, 1859.

5. Sur les gisements de l'or dans [Lumpkin Co.] le Georgie [abs.]: Academie des Sciences de Paris Comptes Rendus, vol. 48, p. 638-639, 1859.

6. [On the origin of flattened and contorted pebbles in rocks of Roxbury, Newport, etc., and on the depth of decomposition of rocks of Dahlonega, Lumpkin County, Georgia [abs.]: Boston Soc. Natural Hist. Proc., vol. 7, p. 354, 1861.

7. [Pyrophyllite from Lincoln County] [abs.]: Boston Soc. Natural Hist. Proc., vol. 7, p. 24-25, 1861.

8. [Tetradymite from Lumpkin County] [abs.]: Boston Soc. Natural Hist. Proc., vol. 7, p. 22-23, 1861.

9. Notice of the death of Francis Alger of Boston [1807-1863]: Boston Soc. Natural Hist. Proc., vol. 10, p. 2-6, 1865.

**JACKSON, LAWSON ERWIN, JR., 1926-**

1. A study of the [Ordovician] Blackford Breccia in the Dalton Quadrangle [Murray and Whitfield Cos.]. M. S. Thesis, Emory Univ., 1951.

**JACOB, KENNETH DONALD, 1896-**

1. (and others). The composition and distribution of phosphate rock with special reference to the United States: U. S. Dept. Agriculture Tech. Bull. 364, 90 p., 1933. A detailed description of the origin and occurrence of phosphate-bearing rocks includes references to occurrences in Georgia. It occurs on the Coastal Plain and in nodules in Devonian rocks in northwestern Georgia.

**JAHNS, RICHARD HENRY,** 1915- *see also* Heinrich, Eberhardt William, 1, 2.

1. (and Lancaster, Forrest W.). Physical characteristics of commercial sheet muscovite in the southeastern United States: U. S. Geol. Survey Prof. Paper 225, iv, 110 p., illus., 1950. Descriptions of testing procedures for physical properties are followed by tabular data. Many examples come from the Piedmont of Georgia.
2. (and Griffitts, Wallace Rush and Heinrich, Eberhardt William). General features, Part 1 *of* Mica deposits of the southeastern Piedmont: U. S. Geol. Survey Prof. Paper 248-A, p. v, 1-102, illus., 1953. A general description of the nature and occurrence of mica in pegmatites includes discussions of many deposits in Georgia.

**JANES, THOMAS P.,** *see also* Little, George, 2.

1. A manual of Georgia, for the use of immigrants and capitalists. ii, 110 p., illus., Atlanta, Georgia Dept. Agriculture, J. P. Harrison, printer, 1878 [includes much geological information prepared by George Little]. A review of the mineral resources, physiography, and other related topics is given. The whole is very general.

**JENNY, WILLIAM PAUL,** 1899-

1. Geological interpretation of regional magnetic anomalies in central and southern United States: Oil Weekly, vol. 103, no. 3, p. 17-19, 22, illus., 1941; geophysical map issued as separate supplement. An exhortation for the use of magnetic anomaly-interpretation includes a discussion of large regional anomalies in the eastern United States, Georgia included. The basement-surface configuration below the Georgia Coastal Plain is discussed. The map shows areas of high intensity and some flexures.

**JEWELL, WILLARD BROWNELL,** 1899-

1. (and Wilson, Charles William, Jr.). Leonidas Chalmers Glenn (1871-1951): Amer. Assoc. Petroleum Geologists Bull., vol. 35, p. 1920-1923, port., 1951.
2. (and Wilson, Charles William, Jr.). Memorial to Leonidas Chalmers Glenn (1871-1951): Geol. Soc. America Proc. 1952, p. 101-104, port., 1953.

**JOERG, WOLFANG LOUIS GOTTFRIED,** 1885-1952.

1. The subdivision of North America into natural regions—a preliminary inquiry: Assoc. Amer. Geographers Annals, vol. 4, p. 55-83, illus., 1914. A discussion of the principles of a natural region (any portion of the surface whose physical conditions are homogeneous) concludes with a map of North America, including Georgia, divided into regions. They conform with well known physiographic provinces here in Georgia.

**JOFFE, JACOB SAMUEL,** 1887-

1. (and Conybeare, Adrienne B.). Analyses of United States soils Sec. II, South Atlantic states, New Brunswick, New Jersey, Agricultural Experiment Sta., Rutgers Univ., 1943. Numerous analyses from Georgia and other states are given in tabular form. The various elements are reported in percentages.

JOHNS, WILLIAM DAVIS, 1925-

1. (and Murray, Hayden Herbert). Empirical crystallinity index for kaolinite [abs.]: Geol. Soc. America Bull., vol. 70, p. 1624, 1959.

JOHNS HOPKINS UNIVERSITY.

1. George Huntington Williams [1856-1894]. The minutes of a commerative meeting held in Johns Hopkins University, October 14, 1894. 19 p., port., Baltimore, J. Murphy and Co., 1894.

JOHNSON, DOUGLAS WILSON, 1878-1944, *see also* Glock, Waldo Sumner, 1; Schalie, Henry van der, 1.

1. (The) distribution of fresh-water faunas as evidence of drainage modifications: Science, new ser. vol. 21, p. 588-592, 1905. The evidence of similar molluscan faunas in the Tennessee and Coosa Rivers to support the diversion of the Tennessee River by stream capture from the west is questioned. Molluscan fauna can be dispersed by other than direct water migration.

2. (The) Tertiary history of the Tennessee River: Jour. Geology, vol. 13, p. 194-231, illus., 1905. The evidence, pro and con, regarding the course of Tennessee River through the Appalachian Plateau, as to whether the Tennessee River ever flowed out the Coosa River valley, is reviewed. Some evidence comes from northwestern Georgia. The river did not flow through Georgia.

3. Drainage modifications in the Tallulah District [Blue Ridge]: Boston Soc. Natural Hist. Proc., vol. 33, p. 211-248, illus., 1907. Geomorphologic evidence is presented to show that the Chattahoochee River has been beheaded, the diverted portion, the Chattooga River, being captured by the westward-eroding Tugaloo River, and diverted to the Savannah River.

4. River capture in the Tallulah District, [Rabun Co.] Georgia: Science, new ser. vol. 25, p. 428-432, 1907. Evidence is reviewed and more offered, particularly physiographic, to support the hypothesis of the capture of the upper Chattachoochee River by a Savannah River tributary, the Tugaloo River.

5. Fixité de la côte Atlantique de l'Amérique du Nord: Annales de Géographie, vol. 21, p. 193-212, illus., Paris, 1912. A case is made for the lack of very recent coastal submergence, shown in part by elevated stumps which were from trees destroyed by previous submergence. The phenomena can come about other than by sea-level changes. Georgia is cited in some of the examples.

6. Physiography of the Atlantic coast of North America: Internatl. Geog. Cong. [12th], Cambridge, Mass. 1928, Rept. Proc., p. 85-100, 1930. The coast line of the United States, including that of Georgia, is described in relationship to the relatively recent movements of the land. Georgia shows features of submergence. Very little detail from Georgia is included.

7. The correlation of ancient marine levels: Internatl. Geog. Cong. [13th], Paris 1931, Comptes Rendus sec. 2, vol. 2, part 1, p. 42-54, illus., 1933. A review of the terraces along the Atlantic Coast is given. The causes of the divergent views respecting their origin are given, and are followed by a review of the principles of marine-level correlations. No specific results are discussed, but some of the examples come from Georgia.

8. Scenery of the Atlantic shoreline: Rice Inst. Pamphlet 22, p. 47-82, illus., 1935. This is a generalized, popular description of shoreline phenomena. The coasts of Georgia and its neighbors are described as examples of emergent shorelines. Examples of more recent sea encroachment are also included.

**JOHNSON, HENRY STANLEY, JR.**

1. Southeast district [abs.], *in* Reconnaissance for uranium in the United States, [Part 7] *of* Geologic investigations of radioactive deposits: U. S. Geol. Survey Trace Elements Investigations 390, p. 198-199, 1952.

**JOHNSON, LAURENCE CLEMENT,** *see* Smith, Eugene Allen, 2.

**JOHNSON, ROBERT WILLIAM, JR.,** *see* Moxham, Robert Morgan, 2.

**JOHNSON, THOMAS CARY, JR.**

1. Scientific interests in the old south. vii, 217 p., illus., New York, D. Appleton-Century Co., 1936. An interesting account of scientific activity before the Civil War includes much reference to geology and geologists in Georgia.

**JOHNSON, VARD HAYES,** 1909-

1. Coal deposits on Sand and Lookout Mountains, Dade and Walker Counties, Georgia. Map, scale 1 inch to 4000 feet, text on map, U. S. Geol. Survey Prelim. Map, 1946.

**JOHNSON, W. RAY, JR.,** 1913-1952.

1. (and Straley, H. W., 3d, and Straley, H. W., 4th). Depth to anomaly source for Carolina Bays, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 125-130, table, 1953; summary by H. W. Straley, 3d, and W. F. Straley, Meteoritics, vol. 1, p. 207, 1954. Calculations based upon data gathered from elsewhere, and gravimeter data from the location, suggest that the meteoric source of the gravity anomaly near the Shell Bluff Carolina Bay in Burke Co. is between 1400 and 2400 feet deep.

**JOHNSTON, ALEXANDER KEITH,** 1804-1871, *see* Boué, Ami, 2.

**JOHNSTON, JOHN EDWARD,** 1919-

1. (and Trumbull, John, and Eaton, Gordon Pryor). The petroleum potential of the emerged and submerged Atlantic Coastal Plain of the United States: World Petroleum Cong. 5th, New York 1959, Proc. sec. 1, p. 435-445, illus., 1959; revised with title, Will we find natural gas near northeast markets?: Gas age, vol. 124, no. 4, p. 25, 28-31, illus., 1959. A general review of stratigraphic and structural phenomena related to petroleum accumulation is given. Potential sources in the area, including Georgia, are discussed. The Southeast Georgia Basin is described.

**JOHNSTON, WILLIAM DRUMM, JR.,** 1899-

1. Hydrothermal mineralization at Graves Mountain, [Lincoln Co.] [abs.]: Amer. Mineralogist, vol. 20, p. 201, 1935; Geol. Soc. America Proc. 1934, p. 86-87, 1935.
2. Kyanite at Graves Mountain [Lincoln Co.], *in* Prindle, Louis Marcus, and others, Kyanite and vermiculite deposits of Georgia: Georgia Geol. Survey Bull. 46, p. 26-32, illus., 1935. Kyanite occurs in quartz veins associated with rutile and lazulite. It has a hydrothermal origin. All are in quartzite.

**JONAS, ANNA ISABEL,** *see also* Stose, Anna Isabel Jonas, 1881-

1. Structure of the metamorphic belt of the southern Appalachians: Amer. Jour. Science, 5th ser. vol. 24, p. 228-243, illus., 1932. The Piedmont and Blue Ridge Provinces of Georgia are included. Metamorphic rocks, largely schists, predominate. A second metamorphic period resulted in a retrogressive effect on previously-formed high rank metamorphic rocks. The age of the second metamorphism and the accompanying giant overthrusts is late Paleozoic. The rocks were originally Precambrian in age.

**JONES, JOSEPH,** 1833-1896.

1. Chemical examination of the marls of Burke Co., Chapter 2 *of* First report to the Cotton Planters' Convention of Georgia . . . , p. 7-23, Augusta, Steam Press of Chronicle and Sentinel, 1860. Limestone from Eocene exposures throughout the county is analyzed. Emphasis is placed upon its use as a potential fertilizer.
2. Chemical examination of the shell limestone [Eocene] of Washington County, Ga., Chapter 3 *of* First report to the Cotton Planters' Convention of Georgia . . . , p. 24-30, Augusta, Steam Press of Chronicle and Sentinel, 1860. The [Sandersville Limestone], near Tennile, is analyzed chemically with a view to its potential as a source of fertilizer.
3. Comparison of the [Eocene] shell-limestone and marls of Georgia with the limestones and marls of Europe . . . [and elsewhere in the U. S.], Chapter 4 *of* First report to the Cotton Planters' Convention of Georgia . . . , p. 31-53, Augusta, Steam Press of the Chronicle and Sentinel, 1860. Chemical analyses of Eocene limestone in Georgia are given and compared with limestone analyses from elsewhere. The emphasis is placed upon the fertilizing potential of the rocks. Most of the samples are from Burke and Washington Counties.

4. Comparison of the shell limestone and marls of Georgia with various commercial manures, Chapter 5 *of* First report to the Cotton Planters' Convention of Georgia . . . , p. 54-91, Augusta, Steam Press of the Chronicle and Sentinel, 1860. Chemical analyses of limestones and marls from Georgia are given in tables, the emphasis being placed upon the fertilizing potential.

5. First report to the Cotton Planters' Convention of Georgia, on the agricultural resources of Georgia. xv, 312 p., Augusta, Steam Press of the Chronicle and Sentinel, 1860; reprinted in part with title, On the shell-limestone and marls of Georgia: Southern Medical and Surgical Jour., new ser. vol. 16, p. 721-752, 801-832, 881-912, 1860, and in part with title, On the Tertiary formation of Georgia . . . vol. 17, p. 1-31, 1861. Analyses of limestones from many places throughout Georgia, but mostly the Coastal Plain, are given. The emphasis is upon the fertilizer potential.

6. Geological position and extent of the Tertiary lime formation of Georgia, Chapter 1 *of* First report to the Cotton Planters' Convention of Georgia . . . , p. 3-4, Augusta, Steam Press of the Chronicle and Sentinel, 1860. A cursory description of the distribution of the Eocene rocks in Georgia is given. Special emphasis is placed on their value as potential fertilizers.

7. Other sources of fertility in Georgia, Chapter 13 *of* First report to the Cotton Planters' Convention of Georgia . . . , p. 243-312, Augusta, Steam Press of the Chronicle and Sentinel, 1860. Water from wells and springs from many places in Georgia is analysed with the intent to show their general purity.

8. Other sources of lime in Georgia [beside the Coastal Plain], Chapter 9 *of* First report to the Cotton Planters' Convention of Georgia . . . , p. 169-174, Augusta, Steam Press of the Chronicle and Sentinel, 1860. Limestones from other parts of Georgia than the Coastal Plain are potential sources of lime also. An analysis of limestone from Cass [Bartow] Co. is included as an example. Its value as fertilizer is stressed.

9. Other sources of phosphate of lime in Georgia; joint clay of the Eocene formation. Kaolin clay of Georgia and South Carolina, Chapter 11 *of* First report to the Cotton Planters' Convention of Georgia . . . , p. 197-209, Augusta, Steam Press of the Chronicle and Sentinel, 1860. Analyses of fuller's earth and kaolin from numerous places throughout the upper Coastal Plain are given with a view to their potential use as sources of phosphate for fertilizer. Most of the material is from Burke County.

10. Relations of the marls and shell limestone of Georgia to soils, Chapter 6 *of* First report to the Cotton Planters' Convention of Georgia . . . , p. 93-132, Augusta, Steam Press of the Chronicle and Sentinel, 1860. Many analyses of Eocene limestones and their resulting soils are given. The emphasis is upon the retention by the soil of the phosphate from the limestone. The various factors resulting in variation are discussed.

11. General view of the medical topography and climate of Camp Sumpter, Andersonville, [Sumter Co.] Georgia, and of the country in the immediate vicinity, *in* Sanitary memoirs of the War of the Rebellion, vol. 1 [Medical], p. 483-500, Cambridge, Riverside Press, U. S. Sanitary Commission, 1867. A general description of the areal geology of the Confederate Andersonville Prison site is given. Eocene rocks are recognized at the site. A fascinating review of the geology of the whole state is given. Well water is analyzed. "No blame can be attached to the Confederate authorities for the collection of the Federal prisoners at this elevated and healthy locality, which was more salubrious than one half of the territory of South Carolina, Georgia, Alabama, Mississippi, and Louisiana."

**JONES, OWEN THOMAS.**

1. Edward Oscar Ulrich [1857-1944]: Geol. Soc. London Quart. Jour., vol. 100, pts. 3-4, p. lviii-lix, 1945.

**JONES, S. PERCY.**

1. The geology of the Tallulah Gorge, [Rabun Co.] Georgia: Amer. Geologist, vol. 27, p. 67-75, illus., 1901; discussion [in review] by William Morris Davis: Science, new ser. vol. 13, p. 871, illus., 1901. The valley of the Tallulah River, including the gorge, is described. The metamorphic rocks through which the river flows are described. The gorge is in a quartz schist, trending across the strike. Various theories of the origin of the gorge are outlined. Some problems relating to a capture origin are discussed.

2. Second report on the gold deposits of Georgia: Georgia Geol. Survey Bull. 19, 283 p., illus., 1909. A general discussion of the origin and occurrence of gold is followed by detailed descriptions of the occurrences in the Piedmont and Blue Ridge of Georgia. The gold originates from quartz veins in metamorphic rocks and in placers and in the residual deposits derived therefrom. Nine areas, or belts, are recognized, each of which is discussed in detail.

**JONES, WALDO.**

1. The monazite bearing sands of the Atlantic beaches: Mineralogist, vol. 17, p. 457-458, illus., 1949. This is a popular account of the occurrence of monazite as a heavy mineral in beach sands. No details are included.

**JONES, WALTER BRYAN, 1895-**

1. Eugene Allen Smith [1841-1927]: Engineering and Mining Jour., vol. 124, p. 993, 1927.

2. Eugene Allen Smith [1841-1927]: Science, new ser. vol. 67, p. 7-9, 1928.

3. Eugene Allen Smith [1841-1927]: Alabama Geol. Survey Bull. 60, p. 19-21, 1948.

**JORDAN, LOUISE,** *see also* Applin, Esther English Richards, 1, 2; Toulmin, Lyman Dorgan, Jr., 2.

1. (chairman, and others). Mesozoic cross-section, B-B,' Beaufort County, S. C. to Highlands County, Fla. Scale, 1 in. to 10 miles, Southeastern Geol. Soc. Mesozoic Committee, 1949. Electric log and lithologic columnar sections are used to correlate the subsurface Lower and Upper Cretaceous rocks of the southeastern Coastal Plain of Georgia.
2. (chairman, and others). Mesozoic cross section, C-C,' Toombs County, Ga. to Volusia County, Fla. Scale, 1 in. to 10 miles, Southeastern Geol. Soc. Mesozoic Committee, 1949. Electric log and lithologic column cross sections suggest correlations of Lower and Upper Cretaceous rocks in the subsurface of southeastern Georgia.
3. (chairman, and others). Mesozoic cross-section, E-E,' Bullock County, Ala. to Franklin County, Fla. Scale, 1 in. to 10 miles, Southeastern Geol. Soc. Mesozoic Committee, 1949. A well in Early Co. is logged. It contains Upper and Lower Cretaceous rocks, possible Triassic, and Paleozoic rocks.
4. (and Hendry, Charles Walter, Jr.). [Map of] oil and gas test wells in Florida and adjacent counties of Alabama and Georgia. Scale, 1 in. to 10 miles, Tallahassee, Florida Geol. Survey, 1952. The location and names of wells in many of the Coastal Plain counties are given. No other data are included.
5. Preliminary notes on the Mesozoic rocks of Florida, *in* A summary of the geology of Florida and a guidebook to the Cenozoic exposures of a portion of the state. Prepared for the field trip of the 44th annual meeting of the Association of American State Geologists, p. 39-45 (‡), illus., 1952. Structure contour maps on the top of the Upper Cretaceous System, include parts of southern Georgia. They are very generalized.

**JUHAN, CHARLES DODGE,** 1927- *see* Pruitt, Robert Grady, Jr., 2.

**KAISER, EDWARD PECK,** 1912-

1. (and Herring, Barbara F., and Rabbitt, John Charles). Minor elements in some rocks, ores, and mill and smelter products: U. S. Geol. Survey Trace Elements Investigations 415, 119 p. (‡), 1954. Manganese ore-tailing from five locations in Bartow and Polk Cos. are analyzed spectrographically for rare elements. A table of results is included.

**KAY, GEORGE MARSHALL,** 1904-

1. Distribution of Ordovician altered volcanic materials and related clays: Geol. Soc. America Bull., vol. 46, p. 225-244, illus., 1935. Correlation of Appalachian-area Ordovician formations is made on the basis of bentonite layers. Some exposures from northwestern Georgia from the Chickamauga and Little Oak Limestones are described and interpreted. The age of the volcanism is Middle Ordovician.

KEENEY, J. C.

1. Novaculite in [Lincoln and Oglethorpe Cos.] Georgia [abs.]: Amer. Jour. Science, vol. 16, p. 185, 1829.

KEARNS, MARGARET M., *see* Ahrens, Louis Herman, 1.

KEITH, ARTHUR, 1864-1944, *see also* LaForge, Laurence, 3.

1. Topography and geology of the southern Appalachians: U. S. Cong. 57th, 1st Sess., Sen. Doc. 84, p. 111-122, illus., 1902. A general review of topographic features and their geologic control is given. No new data are included, but the illustrations are spectacular. The Blue Ridge portion of Georgia is included.
2. Folded faults of the southern Appalachians: Internatl. Geol. Cong. 9th, Vienna 1903, Comptes Rendus, vol. 2, p. 541-545, illus., Vienna, 1904. An extremely generalized description of the evidence for folded thrust-fault planes is given; no specific details are included, however. The evidence comes from the Blue Ridge, Piedmont, and Valley and Ridge Provinces.
3. The Appalachian mountains and valleys [abs.]: Science, new ser. vol. 25, p. 865-867, 1907.
4. Outlines of Appalachian structure: Geol. Soc. America Bull., vol. 34, p. 309-380, illus., 1923. The entire Appalachian System is discussed, including that part in Georgia. The nature of the folding, faulting, metamorphism, intrusions, and other physical events are described. The deforming forces have come from the southeastward direction. The physics of the folding and faulting is discussed.
5. Structural symmetry in North America: Geol. Soc. America Bull., vol. 39, p. 321-386, illus., 1928. A generalized discussion of the structural geology of North America includes the Appalachian Mountains and that part of them which is in Georgia. The relationships of the various structural features of the Appalachian Mountains are described. No new data are included.

KELLBERG, JOHN M.

1. Basic intrusives in the Chatuge Reservoir in North Carolina and [Towns Co.] Georgia [abs.]: Geol. Soc. America Bull., vol. 58, p. 1199, 1947.
2. Geology of Nottely Dam, [Union Co.] Georgia [abs.]: Geol. Soc. America Bull., vol. 58, p. 1199-1200, 1947.
3. (and Grant, Leland Fauntleroy). Coarse conglomerates of the Middle Ordovician in the southern Appalachian Valley: Geol. Soc. America Bull., vol. 67, p. 697-716, illus., 1956. A section near Cisco, Murray Co., is measured and described. It is about 25 feet thick and occurs within the Tellico Formation. The lithology of the pebbles is interpreted. The unit is part of a southward-thinning wedge of conglomerate which is very thick in Virginia. Pebbles range from ¼ to 4 inches in diameter and make up 50-70 percent of the rock which is otherwise red sandstone.

KELLOGG, ARTHUR REMINGTON, 1893-

1. A review of the Archaeoceti: Carnegie Inst. Washington Pub. 482, xv, 366 p., illus., 1936. A complete discussion of the toothed whales includes descriptions, illustrations, and discussions of parts of *Basilosaurus cetoides* from the Ocala Limestone in Houston County and parts of *Zygorhiza kochii* and an unknown form from the Ocala Limestone of Crisp County.

KELLY, ARTHUR RANDOLPH, 1900-

1. (and Hurst, Vernon James). Patination and age relationship in south Georgia flint: Amer. Antiquity, vol. 22, p. 193-194, illus., 1957. Some of the Indian artifacts collected from along the lower Chattahoochee River are made from Oligocene Flint River Formation chert. The amount of patination, from the concentration by weathering of iron at the surface, reflects the age of the artifact.

KELLY, JUNEA W., *see* Eckel, Edwin Clarence, 10.

KEMP, JAMES FURMAN, 1859-1926.

1. Granites of southern Rhode Island and Connecticut, with observations on the Atlantic coast granites in general: Geol. Soc. America Bull., vol. 10, p. 361-382, illus., 1899. Granites of the Atlantic seaboard area, including those of Stone Mountain and Lithonia, despite the great varieties of age, are predominantly biotite-granites and related types. Basic rocks are also present throughout. Might there be some genetic relationship?

KEMPER, C. GERALD, JR., 1936-

1. Kingston Saltpeter [cave] [Bartow Co.]: Georgia Spelunker, vol. 1, no. 3, p. 9, 12 (‡), illus., 1957. A brief description of the cave includes a map.

KERR, PAUL FRANCIS, 1897-

1. Memorial of George Frederick Kunz [1856-1932]: Amer. Mineralogist, vol. 18, p. 91-94, port., 1933.
2. Attapulgus clay [Decatur Co.]: Amer. Mineralogist, vol. 22, p. 534-550, illus., 1937. The clay mineral is an accumulation of weathered montmorillonite, deposited in shallow water after erosion from the Piedmont during the Miocene Epoch. Clay analyses are included.
3. (and Kulp, John Laurence). Preliminary reports, reference clay minerals: Amer. Petroleum Inst. Proj. 49, 101 p. (‡), illus. incl. geol. map, 1949; revised, 103 p. (‡), 1951. Kaolin from Twiggs Co. and attapulgite from Decatur Co. are used as standard references for various physical and chemical tests used in clay mineralogy. Location sketch maps are included. The various tests are recorded, to be used as reference curves, etc.

KESLER, THOMAS LINGLE, 1908-

1. Sienna ("ocher") deposits of the Cartersville District, [Bartow Co.] Georgia: Econ. Geology, vol. 34, p. 324-341, illus., 1939. Hydrothermal iron-bearing solutions filled fissures which were formed in folded, Lower Paleozoic carbonate rocks. Later, meteoric water deposited the iron as hydrous oxides near and below the contact of the carbonates and the underlying quartzite, and also in the overlying residuum.

2. Structure and ore deposition at Cartersville, [Bartow Co.] Georgia: Amer. Inst. Mining and Metallurgical Engineers Tech. Pub. 1226, 18 p., illus., 1940; . . . Trans., vol. 144, p. 276-293, illus., 1941. Examples are given to show that the Shady Formation was replaced in part by iron-ore-bearing solutions and that the solutions were introduced to the carbonates through definite faults and fracture zones in the rocks. Later weathering has resulted in the accumulation of residual ores.

3. Barite deposits southeast of the Appalachian Plateaus, *in* Snyder, Frank G., ed., Symposium on mineral resources of the southeastern United States, p. 88-98, illus., 1950. A cursory review of the nature of occurrence, origin, and age of the barite deposits in Bartow Co. is included.

4. Geology and mineral resources of the Cartersville District [Bartow and Cherokee Cos.] Georgia: U. S. Geol. Survey Prof. Paper 224, 97 p., illus. incl. geol. map, 1950; summary in part, with title, Occurrence and exploration of barite deposits at Cartersville, Georgia: Amer. Inst. Mining and Metallurgical Engineers Trans., vol. 184, p. 371-375, illus., 1949. A complete geological description of the area is given. Cambrian metasedimentary rocks and late Carboniferous gneisses are mapped and described. The complex structure is analyzed; folds and faults are common. The Cartersville Overthrust is questioned. Many economic minerals are present, of which barite, manganese, and limonite are the most common.

5. Occurrence and exploration of Georgia's kaolin deposits: Mining Engineering, vol. 3, p. 879-885, illus., 1951; Amer. Inst. Mining and Metallurgical Engineers Trans., vol. 190, illus., 1951; *in* Problems of clay and laterite genesis, p. 162-177, illus., New York, Amer. Inst. Mining and Metallurgical Engineers, 1952. Kaolin occurs as lenses in Cretaceous deposits near the Fall Line, and is overlain by Eocene deposits. The problems of its origin are reviewed, with its origin as the result of the *in situ* weathering of feldspar, which had been deposited in alluvial or deltaic conditions, being emphasized.

6. Environment and origin of the Cretaceous kaolin deposits of [central] Georgia and South Carolina: Econ. Geology, vol. 51, p. 541-554, illus., 1956; Georgia Mineral Newsletter, vol. 10, p. 1-7, illus., 1957. The kaolin has resulted from the deltaic, rapid deposition of detrital feldspar from the Piedmont and Blue Ridge areas which then was decomposed to kaolinite, to be deposited in fresh, quiet water in ponds formed by distributaries on the deltas. These ponds were later covered with Cretaceous and younger sediments.

KEYES, CHARLES ROLLIN, 1864-1942.

1. W J McGee [1853-1912], geologist, anthropologist, hydrologist: Annals of Iowa, 3d ser. vol. 11, p. 180-187, port., 1913.
2. Life and work of Charles Abiathar White [1826-1910]: Annals of Iowa, 3d ser. vol. 11, p. 497-504, port., 1914.
3. Foundation of American stratigraphy by Ebenezer Emmons [1800-1863]: Pan-Amer. Geologist, vol. 40, p. 1-14, port., 1923.
4. Geological pioneering of Jules Marcou [1824-1898]: Pan-Amer. Geologist, vol. 40, p. 321-332, 1923.
5. Microscopical petrography in the interpretation of rock metamorphosis as introduced into America by George Huntington Williams [1856-1894]: Pan-Amer. Geologist, vol. 39, p. 257-272, port., 1923.
6. Raphael Pumpelly [1837-1923], premier explorer: Pan-Amer. Geologist, vol. 40, p. 241-250, port., 1923.
7. Anthony Wayne Vogdes [1843-1923]: Pan-Amer. Geologist, vol. 41, p. 161-168, port., 1924.
8. Exploratory coal stratigraphy of John James Stevenson [1841-1924]: Pan-Amer. Geologist, vol. 42, p. 161-172, 1924.
9. John Mason Clarke [1857-1925], paleontologist: Pan-Amer. Geologist, vol. 44, p. 1-16, port., 1925.
10. Louis Agassiz [1807-1873] and glacial hypothesis: Pan-Amer. Geologist, vol. 44, p. 241-242, port., 1925.
11. Thomas Leonard Watson [1871-1924]: Pan-Amer. Geologist, vol. 43, p. 81-84, port., 1925.
12. William Maclure [1763-1840], father of modern geology: Pan-Amer. Geologist, vol. 44, p. 81-94, port., 1925.
13. [Henry Darwin] Rogers [1808-1866] of the folded mountains: Pan-Amer. Geologist, vol. 45, p. 1-14, port., 1926.
14. Charles Doolittle Walcott [1850-1927]: Pan-Amer. Geologist, vol. 47, p. 161-170, port., 1927.
15. James Furman Kemp [1859-1926], economic geologist: Pan-Amer. Geologist, vol. 47, p. 137-142, 1927.
16. [Edward Drinker] Cope [1840-1897] and American geology: Pan-Amer. Geologist, vol. 54, p. 1-16, 1930.
17. Henry Fairfield Osborn [1857-1935], modern paleontologist: Pan-Amer. Geologist, vol. 65, p. 161-178, port., 1936.
18. William Phipps Blake [1826-1910], pioneer of southwest: Pan-Amer. Geologist, vol. 72, p. 1-8, 1939.

KEYES, MARY G.

1. Henry Stephens Washington [1867-1934]: Zeitschrift fuer Vulkanologie, vol. 10, no. 1, p. 1-6, port., Berlin, 1934.

KIDWELL, ALBERT LAWS, 1919-

1. Mesozoic igneous activity in the northern Gulf Coastal Plain: Gulf-Coast Assoc. Geol. Socs. 1st Ann. Mtg., p. 182-199, illus., 1951. Igneous activity under and around the Coastal Plain is described. Georgia is in the diabase petrographic province. No details are given.

KING, FRANCIS PLAISTED, 1867- *see also* Yeates, William Smith, 1.

1. A preliminary report on the corundum deposits of Georgia: Georgia Geol. Survey Bull. 2, 133 p., illus. incl. geol. map, 1894; summary by William Marten Brewer, Dixie, vol. 11, no. 4, p. 44-45, 1895. A general discussion of the varieties of corundum and associated minerals is followed by descriptions of occurrences in Georgia. Corundum occurs in basic rocks which have intruded into the metamorphic rocks in a belt from Rabun Co. southwestward to Alabama. Individual occurrences are described. An additional discussion of abrasives in general, including descriptions of those found in Georgia, is added.
2. Basic magnesian rocks associated with the corundum deposits of [Blue Ridge] Georgia. Ph. D. Thesis, Johns Hopkins Univ., 1897.

KING, HELEN DEAN, 1869-

1. Edward Drinker Cope [1840-1897]: Amer. Geologist, vol. 23, p. 1-41, port., 1899.

KING, JAMES A., 5th, 1934-

1. (The) petrography and structure of Soapstone Ridge, DeKalb and Clayton Counties, Georgia. M. S. Thesis, Emory Univ., 1957.
2. (A) study of the influence of an ultrabasic body on stream sedimentation [DeKalb Co.] [abs.]: Georgia Acad. Science Bull., vol. 15, p. 62-63, 1957.

KING, PHILIP BURKE, 1903-

1. An outline of the structural geology of the United States: Internatl. Geol. Cong. 16th, Washington 1933, Guidebook 28, 57 p., illus., 1932. The major structural features of the Appalachian Mountains, including those in Georgia, are described. No new details are given.
2. (and others). Tectonic map of the United States, 1944. Scale, 1 inch to 2,500,000 inches, 2 sheets, with text, Tulsa, Amer. Assoc. Petroleum Geologists, 1944; summary, Science, vol. 101, p. 577, 1945; Washington Acad. Science Jour., vol. 30, p. 135, 1946. Northwestern Georgia is shown in relation to its structural and tectonic aspects. All the rocks are in the Precambrian and Paleozoic metamorphic belt and the folded Paleozoic belt. Paleozoic intrusive bodies are also noted. Schematic structure contours on top of the Cretaceous of the Coastal Plain are also included.
3. The base of the Cambrian in the southern Appalachians: Amer. Jour. Science, vol. 247, p. 513-530, 622-645, illus., 1949. The Chilhowee Group is composed largely of clastic miogeosynclinal rocks and the underlying Ocoee Group is composed of largely clastic nonvolcanic eugeosynclinal rocks. The base of the Cambrian is placed at the contact of the two groups. Many exposures of the Ocoee Group from the Blue Ridge Province in Georgia are described.
4. Memorial to Nelson Horatio Darton [1865-1948]: Geol. Soc. America Proc. 1948, p. 145-169, 1949.

5. Tectonic framework of the southeastern United States: Amer. Assoc. Petroleum Geologists Bull., vol. 34, p. 635-671, illus., 1950; in part *in* Snyder, Frank G., ed., Symposium on mineral resources of the southeastern United States, p. 9-25, illus., 1950. The major tectonic framework of the Appalachian Mountain System, including that part in Georgia, is reviewed and interpreted. Thrust faults and folds are the major features. The Piedmont and Blue Ridge Provinces are composed of igneous-rock intruded metamorphosed eugeosynclinal deposits, whereas the Valley and Ridge Province is made up of miogeosynclinal rocks. The nature of "Appalachia" is discussed, as is the geosynclinal history.

6. The tectonics of middle North America—Middle North America east of the Cordilleran system. xix, 203 p., illus. incl. geol. maps, Princeton, New Jersey, Princeton Univ. Press, 1951. Georgia is included in a detailed resumé of the structural geological history of the Continent.

7. The base of the Cambrian in the southern Appalachians: Washington Acad. Science Jour., vol. 42, p. 170-174, 1952. A review of the base-of-the-Cambrian problem includes a generalized description of the Chilhowee-Ocoee Group contact, some of which is in Georgia. No conclusions are offered.

8. The evolution of North America. 189 p., illus., Princeton, New Jersey, Princeton Univ. Press, 1959. A survey of the historical geology of North America, with emphasis on structural geology, includes Georgia.

**KING, WILLIAM NEPHEW.**

1. Report on the [topography and] principle diseases that prevailed in and about Roswell, Cobb County, Georgia, for the years 1850 and 1851: Medical Soc. State of Georgia Ann. Mtg. Trans., vol. 3, p. 53-60, 1852 [not seen].

**KINGMAN, OWEN,** *see* Simmons, Woodrow Wilson, 1.

**KINGSLEY, JOHN STERLING,** 1854-1929.

1. Edward Drinker Cope [1840-1897]: Amer. Naturalist, vol. 31, p. 414-419, 1897.

**KIRKPATRICK, SAMUEL ROGER,** 1936-

1. Heavy minerals in the Miocene Hawthorn of the Cochran, Georgia (15') Quadrangle [Bleckley Co.] [abs.]: Georgia Acad. Science Bull., vol. 16, p. 7, 1958.

2. The geology of a portion of Stewart County, Georgia [Lumpkin SW Quad.]. M. S. Thesis, Emory Univ., 1959.

**KLEPPER, MONTIS RUHL,** 1915- *see* Heinrich, Eberhardt William, 2.

KLINE, MITCHELL HEENEY.

1. (and Beck, William August). Investigation of the Chestatee copper and pyrite prospect, Lumpkin Co., Georgia: U. S. Bur. Mines Rept. Inv. 4397, 12 p. (‡), illus., 1949. The sulphide ore body in gneiss is outlined by core drilling.

KLINEFELTER, THERON ALBERT, 1886-

1. (and others). Hard and soft kaolins of Georgia: U. S. Bur. Mines Rept. Inv. 3682, 21 p. (‡), illus., 1943. Chemical, x-ray, spectrographic, D. T. and base exchange analyses, and other tests on kaolins from the Coastal Plain are given. Many tables are included.

KNAEBEL, JOHN BALLENTINE, *see* Jackson, Charles Freeman, 1.

KNAPPEN, RUSSELL STAFFORD, 1892-

1. James Furman Kemp [1859-1926]: Amer. Assoc. Petroleum Geologists Bull., vol. 11, p. 221-222, 1927.

KNOPF, ADOLPH, 1882-1966.

1. Biographical memoir of Edward Salisbury Dana, 1849-1935: Natl. Acad. Science Biog. Mem., vol. 18, p. 349-365, port., 1938.
2. Charles Schuchert, 1858-1942: Natl. Acad. Science Biog. Mem., vol. 27, p. 363-389, 1952.

KNOWLTON, FRANK HALL, 1860-1926.

1. Memoir of W J McGee [1853-1912]: Geol. Soc. America Bull., vol. 24, p. 18-29, port., 1913.

KOENIG, GEORGE AUGUSTUS.

1. On enstatite: Acad. Natural Science Philadelphia Proc. 1877, p. 198-199, 1877. Enstatite, associated with corundum, from an unknown location in Georgia, is analyzed.

KOLLOCK, PHINEAS MILLER, 1804-1882.

1. Topography of the first congressional district [eastern coastal area] . . . : Medical Soc. State of Georgia Ann. Mtg., Trans., vol. 4, p. 22-27, 1853. An early, cursory description of the topography of southeastern Georgia is given. The sea islands, pine barrens, and [Tifton Upland] are described, as are the common diseases associated with them.

KRUSEKOPF, HENRY HERMAN.

1. (editor). Life and work of C[urtis] F[letcher] Marbut [1863-1935]. 271 p., illus., Columbia, Missouri, Soil Science Soc. America, 1942.

KUEMMEL, HENRY BARNARD, 1867-1945.

1. Memorial of John Conover Smock [1842-1926]: Geol. Soc. America Bull., vol. 38, p. 93-100, port., 1927.
2. Memorial of Mayville W[illiam] Twitchell [1868-1927]: Geol. Soc. America Bull., vol. 39, p. 47-51, port., 1928.

KULP, JOHN LAURENCE, *see also* Broecker, W. S., 1; Kerr, Paul Francis, 3; Long, Leon Eugene, 1; Turekian, Karl K., 1.

1. (and Long, Leon Eugene, and Eckelmann, Frank Donald). Age of the Piedmont and southern Appalachians [abs.]: Geol. Soc. America Bull., vol. 68, p. 1758, 1957.
2. (and Long, Leon Eugene). Chronology of major metamorphic events in southeastern United States [abs.]: Amer. Geophysical Union Trans., vol. 39, p. 522, 1958.

KUNZ, GEORGE FREDERICK, 1856-1932.

1. Is the East Tennessee meteorite from Whitfield Co., Georgia?, no. 3 *of* On some American meteorites: Amer. Jour. Science, 3d ser. vol. 34, p. 473-475, illus., 1887. Speculation is offered that the East Tennessee meteorite may be one which fell in Whitfield Co., was sent to Tennessee, and then "lost sight of."
2. The Chattooga County, Georgia, meteorite, no. 2 *of* On some American meteorites: Amer. Jour. Science, 3d ser. vol. 34, p. 471-472, illus., 1887. Several pieces, totalling 27 pounds in weight, are described and illustrated.
3. Gems and precious stones of North America. 336 p., illus., New York, Scientific Press, 1890. A popular treatise on gem types and occurrences includes those from Georgia. Minerals are classed by groups, and occurrences described. All those in Georgia are from the crystalline rocks in the Piedmont and Blue Ridge.
4. Occurrence of the diamond in North America [abs.]: Geol. Soc. America Bull., vol. 17, p. 692-693, 1906.
5. Biographical sketch of the late L[ouis] P[ope] Gratacap [1850-1917]: Amer. Museum Jour., vol. 18, p. 302-304, port. [p. 298], 1918.
6. Reminiscences of William E[arl] Hidden [1853-1918]: Amer. Mineralogist, vol. 4, p. 100, 128-129, 142-145, 1919.

LADD, GEORGE EDGAR, 1864-

1. A preliminary report on a part of the clays of Georgia: Georgia Geol. Survey Bull. 6-A, 204 p., illus., 1898. A general discussion of the nature, composition, and origin of clays is followed by descriptions of specific types of deposits in the state and of specific locations. Sections are measured; analyses are included. All of the deposits described are on the Coastal Plain, and most are in the Fall Line Hills.
2. Notes on the Cretaceous and associated clays of middle Georgia: Amer. Geologist, vol. 23, p. 240-249, 1899. The Cretaceous rocks are recognized all along the Fall Line; they are described, as is the enclosed kaolin. Analyses are included.

LADD, HARRY STEPHEN, 1899-

1. Thomas Wayland Vaughan [1870-1952]: Washington Acad. Science Jour., vol. 42, p. 207-208, 1952.

LA FLAMME, JOSEPH CLOVIS KEMNER, 1849-1910.

1. Le docteur Thomas Sterry Hunt [1826-1899]. Univ. Laval Annuaire 1892-93, Quebec, 1892.

LA FORGE, LAURENCE, *see also* Hull, Joseph Poyer Deyo, 2.

1. The structure of the marble belt of Fannin County, Georgia [abs.]: Science, new ser. vol. 27, p. 537, 1908.
2. (and Phalen, William Clifton). Description of the Ellijay Quadrangle [Fannin, Lumpkin, Pickens, Union, Gilmer Cos.]: U. S. Geol. Survey Geol. Atlas U. S., Folio 187, 18 p., illus. incl. geol. map, 1913; also a field edition, 126 p., illus. incl. geol. map, 1913. A complete geologic description of the area is given. Precambrian to Cambrian and "post Cambrian" rocks are mapped and described. Metamorphism, folding, and faulting characterize the area. Much economic material is present, of which gold, copper, iron, and marble are the chief representatives.
3. (and others). Physical geography of Georgia: Georgia Geol. Survey Bull. 42, ix, 189 p., illus., 1925. Extremely detailed decsriptions of the various physiographic provinces of Georgia are given.

LAMAR, WILLIAM LUTHER, 1905- *see also* Collins, William Dennis, 1.

1. Chemical character of the larger public water supplies in Georgia: Amer. Water Works Assoc. Jour., vol. 34, p. 505-512, illus., 1942. Chemical analyses of ground water being used by many large cities in the state are given in tabular form.
2. Industrial quality of public water supplies in Georgia 1940: U. S. Geol. Survey Water-Supply Paper 912, 83 p., illus., 1942. Analyses of ground water from many parts of the state, mostly the Coastal Plain, are included.
3. Chemical character of public water supplies in the southeastern states: Amer. Water Works Assoc. Southeastern Div. Jour., vol. 11, p. 15-21, 1944. Analyses of ground water from many places in Georgia and elsewhere are given in tabular form.

LAMB, GEORGE MARION, 1928-

1. Depositional features of the Silurian Red Mountain Formation in northwest Georgia. M. S. Thesis, Emory Univ., 1954.
2. Penecontemporaneous deformation in the Silurian Red Mountain Formation [Whitfield Co.]: Georgia Acad. Science Bull., vol. 12, p. 73-75, 1954. Inter- and intra-stratal flow of clastic material is described. It is interpreted as having been moved by gravity before consolidation into rock.

LAMBERT, GUILLIAME, 1818-

1. Voyage dans l'Amérique du Nord in 1853 et 1854 . . . , illus. incl. geol. map by Jules Marcou, Bruxelles, M. Hayes, 1855 [not seen].

LA MOREAUX, PHILIP ELMER, 1920- *see also* Herrick, Stephen Marion, 1.

1. Geology and ground-water resources of the Coastal Plain of east-central Georgia: Georgia Geol. Survey Bull. 52, xi, 173 p., illus. incl. geol. map, 1946. A general physiographic description is followed by a discussion of the principles of ground water occurrence. Cretaceous to Recent rocks and their water-bearing properties are described. Baldwin, Hancock, Jones, Twiggs, Washington and Wilkinson Cos. are included. Well records and water analyses are given also.

2. Geology of the Coastal Plain of east-central Georgia: Georgia Geol. Survey Bull. 50 — Part 1, p. vi, 1-26, illus., 1946. Cretaceous to Miocene sedimentary rocks along the Fall Line from Twiggs Co. to Washington Co. are described. Sections are measured; fossils are listed.

LANCASTER, FORREST W., *see* Jahns, Richard Henry, 1.

LAND, WILLIAM J.

1. Catoosa Springs, [Catoosa Co.] Georgia. 13 p., Atlanta, 1879 [not seen].

LANE, ALFRED CHURCH, 1863-1948.

1. Memorial of Marshman E[dward] Wadsworth [1847-1921]: Geol. Soc. America Bull., vol. 35, p. 15-25, port., 1924.
2. Nathaniel Southgate Shaler (1841-1906): Amer. Acad. Arts and Science Proc., vol. 61, p. 557-561, 1926.

LANEY, FRANCIS BAKER, 1875-1938, *see* Emmons, William Harvey, 1.

LANGDON, DANIEL W., JR., 1864-1909, *see also* Smith, Eugene Allen, 2.

1. Geological section along the Chattahoochee River from Columbus [Muscogee Co.] to Alum Bluff [Fla.]: Georgia Geol. Survey Prog. Rept. 1, 1890-91, p. 90-97, illus., 1891. A very detailed section from the Cretaceous System to the Miocene Series is given. Fossils are listed.
2. Variations in the Cretaceous and Tertiary strata of Alabama: Geol. Soc. America Bull., vol. 2, p. 587-605, illus., 1891; discussions, p. 606. A detailed section of the Cretaceous and Tertiary strata along the Chattahoochee River is given. Much of the section is measured in Georgia. Fossils are listed. Comparison is made with western Alabama.

LANGLEY, SAMUEL PIERPONT, 1834-1906.

1. (and others). In memory of John Wesley Powell [1834-1902]: Science, new ser. vol. 10, p. 782-790, 1902.

LA PAZ, LINCOLN, 1897-

1. The distribution of the recognized meteorites of North America: Popular Astronomy, vol. 48, p. 157-165, 205-212, illus., 1940; Soc. for Research on Meteorites Contrib. 2, p. 172-188, illus., 1940. An unusually high concentration of meteorites in the southern Appalachians includes Georgia. A mathematical treatment of the distribution of meteorites in the United States is also given. The finding of meteorites in the search for placer gold in the southeastern region is given as the explanation for the high meteorite concentration, rather than non-random infall, as had been proposed.

LAPPARENT, JACQUES DE, 1883-1948.

1. Sur un constituent essential des terres à foulon: Academie des Sciences de Paris Comptes Rendus, vol. 201, p. 481-483, 1935. The mineral name attapulgite is proposed for the clay mineral constituent of the fuller's earth from Decatur County. It is analyzed and shown to be different from montmorillonite, which the clay was thought to be.
2. Charactères minéralogiques des smectites . . . : Annales de l'office national des combustibles liquides, no. 5, Sept. 1936, p. 863-943, illus., Paris, Imp. Nat., 1936. X-ray and differential thermal analyses on various types of absorbent clays include attapulgite from Decatur County. Many detailed data are included.
3. Défense de l'attapulgite: Societé Française de Minéralogie Bull., vol. 61, p. 253-283, illus., Paris, 1938. Detailed analyses, both chemical and x-ray, are given to demonstrate the validity of the mineral attalpulgite from Decatur County.

LARSEN, ESPER SIGNIUS, JR., 1876-1961.

1. A hydrothermal origin of corundum and albitite bodies: Econ. Geology, vol. 23, p. 398-433, illus., 1928. Corundum occurs in the Blue Ridge area and elsewhere in the United States in dikes of peridotite which are in gneiss and schist. A high-temperature hydrothermal origin is proposed.
2. Memorial to Arthur Keith [1864-1944]: Geol. Soc. America Proc. 1944, p. 241-245, port., 1945.

LARSEN, ESPER SIGNIUS, 3d, 1912-1961.

1. Memorial of John Charles Rabbitt [1907-1957]: Amer. Mineralogist, vol. 43, p. 307-309, port., 1958.

LARSON, LEWIS H., JR., *see* Hurst, Vernon James, 32.

LASAULX, ARNOLD CONSTANTIN PETER FRANZ VON, 1839-1886.

1. Optisch-mikroskopische Untersuchung der Krystalle von Lazulith von Graves Mountain, Lincoln-County in Georgia: Neiderheinischen Gesellschaft fuer Natur-und Heilkunde in Bonn Sitzungsberichte [vol. 40], p. 274-276, 1883. Details of the crystals are given.

LAUNER, PHILIP JULES, 1922-

1. Regularities in the infrared absorption spectra of silicate minerals: Amer. Mineralogist, vol. 37, p. 764-784, illus., 1952. Internal structures of various silicates are observed to have predictable effects upon absorption of infrared light. Kyanite from Clarksville, Habersham Co., is one of the standards used to check the technique.

LAURENCE, ROBERT ABRAHAM, 1908- *see also* Simmons, Woodrow Wilson, 1; Spain, Ernest Lynwood, Jr., 1.

1. Mineral resources of the southeastern states [abs.]: Amer. Inst. Mining Engineers, Mining, Geology and Geophysics Div., Ann. Mtg. Feb. 1955, Abs. Tech. Papers, p. 31-32, [1955].

2. Geologic features of the southeastern states: Symposium on geology as applied to highway engineering Proc. 7th, p. 45-47 (‡), North Carolina State College [1956]. An extremely brief survey of the types of construction materials and problems to be encountered in the various physiographic provinces is given. No specific locations in Georgia are included, however.

**LAURENCICH, LAURA,** *see* Howe, Henry van Wagenen, 4.

**LE CONTE, JOSEPH,** 1823-1901, *see* Dutton, Clarence Edward, 1.

**LE GRAND, HARRY ELWOOD,** 1917- *see also* Herrick, Stephen Marion, 3, 4.

1. Sheet structure, a major factor in the occurrence of ground water in the granites of Georgia: Econ. Geology, vol. 44, p. 110-118, illus., 1949. Sheeting joints, generally subparallel with the surface, control the circulation of ground water. Valleys, where the sheeting forms pseudosynclinal basins, are better ground water sources than are hills or slopes.
2. (and Furcron, Aurelius Sydney). Geology and ground-water resources of central-east Georgia: Georgia Geol. Survey Bull. 64, ix, 174 p., illus. incl. geol. map, 1956. A general description of the occurrence of ground water in crystalline and sedimentary rocks is followed by detailed descriptions of well-occurrences in those counties which lie athwart the Fall Line and which lie eastward from the Savannah River. Crystalline, Cretaceous, and Cenozoic rocks are described and mapped; analyses are included.

**LE GRAND, JOHN R.,** *see* Teague, Kefton Harding, 1.

**LEHMANN, ULRICH,** *see* Beurlen, Karl, 1.

**LEIDY, JOSEPH,** 1823-1891, *see also* Harlan, Richard, 1; Owen, Richard, 2.

1. On the fossil horse of America: Acad. Natural Science Philadelphia Proc., vol. 3, p. 262-266, illus., 1848. A tooth of *Equus americanus* from [Pleistocene] rocks of the Brunswick Canal in Glynn Co. is described and illustrated.
2. Memoir on the extinct species of American ox: Smithsonian Contribs. Knowledge, vol. 5, art. 3, 20 p., illus., 1853. Fragments of *Bison latifrons* from Pleistocene sediments in Glynn Co. are described.
3. A memoir on the extinct sloth tribe of North America: Smithsonian Contribs. Knowledge, vol. 7, art. 5, 68 p., illus., 1855. *Megatherium mirabile* from Skidaway Island in Chatham Co. is illustrated and described in great detail.
4. Description of vertebrate fossils, *in* Post-Pleiocene fossils of South Carolina, by Francis Simmons Holmes, p. 98-122, illus., Charleston, South Carolina, Russell and Jones, 1860. Teeth of *Equus* are described and illustrated. Some are from the [Pleistocene] of Chatham County.

5. (The) extinct mammalian fauna of Dakota and Nebraska . . . : Acad. Natural Science Philadelphia Jour., 2d ser. vol. 7, p. 1-362, illus., 1869. Mastodon and elephant teeth from Glynn Co. are described.
6. Synopsis of extinct Mammalia of North America: Acad. Natural Science Philadelphia Jour., 2d ser. vol. 7, p. 363-472, illus., 1869. *Mastodon obscurus*, from the Pleistocene of Glynn Co., Georgia, is described.

**LEIGHTON, MORRIS MORGAN,** 1887-

1. Memorial to Dr. Thomas L[eonard] Watson [1871-1924]: Science, new ser. vol. 61, p. 255-256, 1925.
2. William Shirley Bayley [1861-1943]: Science, vol. 98, p. 145-146, 1943; Illinois State Acad. Science Trans., vol. 36, p. 29-30, port., 1943; Geol. Soc. America Proc. 1943, p. 105-115, port., 1944.

**LEITH, CHARLES KENNETH,** 1875-1956, *see also* Van Hise, Charles Richard, 3.

1. Memorial of Charles Richard Van Hise [1857-1918]: Geol. Soc. America Bull., vol. 31, p. 100-110, port., 1920.

**LEMOYNE DE MORGUES, JACQUES.**

1. Floridae americae provinciae . . . descriptio. Map, 1591; reproduced *in* The southeast in early maps, by W. P. Cumming, pl. 15, p. 96, Princeton, New Jersey, Princeton Univ. Press, 1953. The earliest known map with the area of possibly Georgia labelled "Montes Apalatci, in quibus aurum argentum & asinuenstur."

**LEONARD, FREDERICK CHARLES,** 1896-1960.

1. (and Slanin, Boris). A statistical study of the meteoric falls of the world as of date 1941 January 1: Popular Astronomy, vol. 49, p. 151-159, 206-214, 551-560, 1941. Tables present much statistical data on falls of the world, Georgia included. For instance, 4 aerolites and 13 siderites are known, 4 having been observed to fall. The siderite concentration in Georgia is very high (4th in the nation).
2. (and others). Catalog of provisional co-ordinate numbers for the meteoric falls of the world: Univ. New Mexico Pub. Meteoritics, vol. 1, xiv, 54 p., 1946. Meteoritic falls of the world are catalogued by a seven digit number. The first four are the longitude and the last three the latitude. Italicized numbers are used for east longitude and south latitude. Sixteen meteorites from Georgia are included.
3. (and Alley, Dorothy H.). (A) catalog of the largest known meteorites of the world: Popular Astronomy, vol. 55, p. 497-502, 1947; Soc. for Research on Meteorites Contrib., vol. 4, p. 71-75, 1947; addition, Popular Astronomy, vol. 56, p. 156-158, 1948; Soc. for Research on Meteorites Contrib., vol. 4, p. 101-103, 1948. The Sardis Meteorite, from Burke and Jenkin Cos., which weighs 790.9 kg., is the 36th largest known in the world.

4. (The) Smithsonia, Oglethorpe County, Georgia, siderite (0832, 340): Popular Astronomy, vol. 55, p. 102-103, illus., 1947; Soc. for Research on Meteorites Contrib., vol. 4, no. 1, p. 17-18, illus., 1947; addition with title, Second note on the Smithsonia . . . : Popular Astronomy, vol. 55, p. 167-168, 1947; Soc. for Research on Meteorites Contrib., vol. 4, no. 1, p. 31-32, 1947. The 154-pound iron hexahedrite is described and illustrated.
5. (and Violini, Robert de). (A) classificational catalog of the meteoritic falls of the world: California Univ. Pubs. Astronomy, vol. 2, no. 1, p. 1-80, 1956. A description of a classification of meteorites in general is followed by a table of meteorite falls arranged by classification. Those from Georgia are included.
6. (and Rowland, Gerald Lee). (An) index catalog of the multiple meteoritic falls of the world: Meteoritics, vol. 1, p. 440-450, 1956. The Dalton, Whitfield Co., and the Pitts, Wilcox Co. meteorites are included. The latter was observed to fall. Each had a "few" or "several" members.

LESHER, CARL EUGENE, 1885-

1. [Map of] State of Alabama and part of Georgia [showing] coal fields and producing districts. Scale, 1 inch to 1,000,000 inches, U. S. Geol. Survey, 1919. The map shows the areas in Dade, Chattooga, and Walker Cos. which are underlain by coal-bearing strata; a small area in Walker Co. is the only coal-producing region.

LESLEY, J. PETER, 1819-1903.

1. Memoir of Edward Hitchcock, 1793-1864: Natl. Acad. Science Biog. Mem., vol. 1, p. 113-134, port., 1877.
2. Obituary notice of Leo Lesquereux [1806-1889]: Amer. Philos. Soc. Proc., vol. 28, p. 65-70, 1890.
3. Memoir of Leo Lesquereux, 1806-1889: Natl. Acad. Science Biog. Mem., vol. 3, p. 187-212, 1895.

LESQUEREUX, LEO, 1806-1889.

1. Description of the coal flora of the Carboniferous formation of Pennsylvania and throughout the United States: Pennsylvania Geol. Survey, 2d ser. [Bull.] P, 3 vols., xv, 694 p., illus incl. atlas, 1880. Many plants from the [Pennsylvanian] rocks of Dade and Walker Cos. are described and illustrated.

LESTER, JAMES GEORGE, 1897- *see also* Allen, Arthur Thomas, Jr., 2, 3, 5, 7; Cofer, Harland Elbert, Jr., 6; Rogers, Wiley Samuel, 2.

1. The geology of the region around Stone Mountain, [DeKalb Co.] Georgia. Ph. D. Thesis, Univ. Colorado, 1938; [abs], Colorado Univ. Studies, vol. 26, no. 1, p. 88-91, 1938.
2. Garnet segregations in granite gneiss of DeKalb County, Georgia: Jour. Geology, vol. 47, p. 841-847, illus., 1939. Almandine garnet segregations in granite gneiss are described. They are a result of convection currents in the magma and were broken and offset by tangential forces acting on the mass before final consolidation was effected. Most are on Mount Arabia and Little Stone Mountain.

3. Inclusions in muscovite from Mitchell Creek Mine, Upson County, Georgia: Amer. Mineralogist, vol. 31, p. 77-81, illus., 1946. Muscovite, in a pegmatite in augen gneiss, contains biotite crystals within it. Fluor-apatite is often found embedded in the muscovite, as is pyrite. Milky and clear quartz and microcline are also found as inclusions in the muscovite.
4. (and Allen, Arthur Thomas, Jr.). Diabase of the Georgia Piedmont: Geol. Soc. America Bull., vol. 61, p. 1217-1224, illus. incl. geol. map, 1950. Diabase dikes intruding metamorphic rocks are mapped and petrographically described. No sills or flows are evident.
5. (The) Geiger-Mueller counter in geologic work, *in* Short contributions to the geology, geography, and archaeology of Georgia: Georgia Geol. Survey Bull. 56, p. 112-117, illus., 1950. Examples of the detection of geologic contacts by differential radio-activity are taken from Georgia. Faults and shear zones were examined as were the boundaries of monazite-bearing sands.
6. Stone Mountain Granite and Lithonia Granite Gneiss [DeKalb Co.] [abs.]: Georgia Acad. Science Bull., vol. 8, no. 1, p. 10, 1950.
7. (and Furcron, Aurelius Sydney). Memorial to Thomas Poole Maynard (1883-1952): Geol. Soc. America Proc. 1952, p. 119-120, port., 1953.
8. Georgia itineraries, *in* Russell, Richard Joel, ed., Guides to southeastern geology, p. 62-76, illus., New York, Geol. Soc. America, 1955. Highlights of Georgia geology along many of the major highways are given. No new details are included, however.
9. Gem minerals of Georgia: Emory Univ. Quarterly, vol. 15, p. 160-167, 1959; Georgia Mineral Newsletter, vol. 12, p. 102-104, 1959. This is a generalized, semi-popular account of gem minerals from Georgia. No new data are included.

**LEUCHS, KURT.**

1. Charles Schuchert [1858-1942]: Almanach fur das Jahre 1947, Jahrgang 97, p. 317-320, Vienna, Osterreichische Akademie der Wissenschaften, 1948.

**LEVORSEN, ARVILLE IRVING, 1894-1965.**

1. Studies in paleogeology: Amer. Assoc. Petroleum Geologists Bull., vol. 17, p. 1107-1132, illus., 1933. Paleogeologic maps show the areal geology and regional structure of the United States at the beginning of Mississippian, in Early Pennsylvanian, and at the beginning of Cretaceous times. Georgia is included.
2. William Harvey Emmons, honorary member [A.A.P.G.]: Amer. Assoc. Petroleum Geologists Bull., vol. 30, p. 733-734, port., 1946.
3. Memorial to William Harvey Emmons [1876-1948]: Geol. Soc. America Proc. 1949, p. 151-157, port., 1950.

**LEVY, LOUIS EDWARD, 1846-**

1. In memoriam: Angelo Heilprin [1853-1907]: Franklin Inst. Jour., vol. 164, p. 313-326, port., 1907.

LEWEICKI, WALTER T., *see also* Peyton, Alexander L., 1.

1. Georgia iron deposits, Cherokee, Bartow, Floyd, and Polk Counties, Part 1: U. S. Bur. Mines Rept. Inv. 4178, 28 p. (‡), illus., 1948. Limonite occurs in residual clay deposits of Cambrian limestones. Occurrences of the ore in various properties are described, and analyses of numerous drill holes are included. Some specular hematite is also known to occur at the contact of the limestone and the underlying Weisner Sandstone.
2. Investigation of the Hermitage Bauxite District, Bartow and Floyd Counties, Ga.: U. S. Bur. Mines Rept. Inv. 4577, 10 p. (‡), illus., 1949. Vertically oriented deposits of bauxite occur in the residuum of the Knox Dolomite. Deposits are described; cores are made and analyzed.

LEWIS, GEORGE EDWARD, 1908-

1. Memorial to Charles Whitney Gilmore [1874-1945]: Geol. Soc. America Proc. 1945, p. 235-243, port., 1946.

LEWIS, HENRY CARVILL, 1853-1888.

1. The iron ores of the Brandon Period [abs.]: Amer. Assoc. Advancement Science Proc., vol. 29, p. 427-428, 1881.

LEWIS, JOSEPH VOLNEY, 1869- *see also* Pratt, Joseph Hyde, 2.

1. Origin of the peridotites of the southern Appalachians: Elisha Mitchell Scientific Soc. Jour., vol. 12, pt. 2, p. 24-37, illus., 1895. Ultrabasic intrusive rocks of several varieties occur in lenticular-shaped masses, concordant with the planes of foliation in the gneissic country rock. They are plutonic. Much detail is given from the peridotite belt in general, north Georgia included.
2. Corundum of the Appalachian crystalline belt: Amer. Inst. Mining Engineers Trans., vol. 25, p. 852-906, 1896. Corundum occurrences from Rabun and Union Cos. are described. The corundum occurs in basic igneous rocks, such as peridotite and amphibolite, which have intruded the metamorphic rocks of the area. It is also reported from other counties in the Blue Ridge and Piedmont.
3. Memorial of Henry Stephens Washington [1867-1934]: Amer. Mineralogist, vol. 20, p. 179-184, port., 1935.

LIBBY, WILLARD FRANK, 1908-

1. Chicago radiocarbon dates V [Hall Co.]: Science, vol. 120, p. 733-742, 1954. Charcoal from an Indian site at Booger Bottom is 2104± 140 years old.

LIEBER, OSCAR MONTGOMERY, 1830-1862.

1. The copper veins of the south: Mining Mag., vol. 7, p. 367-371, 1856. The sulphide vein at the Waltruss Mine in Polk Co. is used as an example, along with others from elsewhere, of the intrusive nature of veins. Gamble's Mine is cited as a place where secondary enrichment of copper and iron may be present. An exhortation for deeper exploration is made.

LINCOLN GOLD MINING COMPANY.

1. The Lincoln Gold Mining Company [Lincoln Co.], capital, . . . $1,000,000. [Prospectus]. 15 p., illus., New York, George F. Nesbitt, 1854 [includes a geological report by Charles Thomas Jackson]. Gold-bearing quartz veins occur in the schists of the area. Their occurrence and distribution are described. Barite is a common mineral in the veins also.

LINDGREN, WALDEMAR, 1860-1939.

1. The gold deposits of Dahlonega, [Lumpkin Co.] Georgia: U. S. Geol. Survey Bull. 293, p. 119-128, illus., 1906. The general geology of the region is discussed. The gold occurs in quartz veins near the contact of granite with mica schist.
2. James Furman Kemp [1859-1926]; to his memory: Econ. Geology, vol. 22, p. 84-90, 1927.
3. Memorial of Richard Alexander Fullerton Penrose, Jr., December 17, 1863-July 31, 1931; a tribute to his life and achievements: Amer. Philos. Soc. Proc., vol. 72, p. 101-114, 1933.
4. Biographical memoir of George Perkins Merrill, 1854-1929: Natl. Acad. Science Biog. Mem., vol. 17, no. 2, p. 31-53, port. [*in* preprint, 1935] 1937.

LINES, EDWIN FULLER, 1875- *see* Fuller, Myron Leslie, 1.

LINTON, EDWARD.

1. On the formation of new ravines [Baldwin Co.]: Amer. Geologist, vol. 21, p. 329-330, 1898. The ravine described by Lyell in 1846 was, at that time, large and only 20 years old. This same ravine is described in 1898, 52 years later. It has grown proportionately less, due to the growth of trees along the rim.

LIPPS, EMMA LEWIS, 1919-

1. Paleontology in Georgia schools [abs.]: Georgia Acad. Science Bull., vol. 11, p. 11, 1953.

LITTLE, GEORGE, 1838-1924, *see also* Janes, Thomas P., 1; New England Company, 1; Whitney, Josiah Dwight, 1.

1. [First] Report of progress of the mineralogical, geological and physical survey of the State of Georgia. 30 p., Atlanta, J. H. Estill, 1874. In what otherwise is a report of work completed or in progress are analyses of various mineral resources of the state. Most are from the Paleozoic terrane in northwestern Georgia or from the Piedmont.
2. Geological survey of the state *in* Janes, Thomas P., Handbook of the State of Georgia, p. 17-113, illus. incl. geol. map, Atlanta, 1876; 2d ed., 1876. A general review of the topography, geology and mineral resources is given.

3. Second report of progress of the mineralogical, geological, and physical survey of the State of Georgia for 1875. 16 p., [Atlanta], J. H. Estill, public printer, 1876. The report of progress contains little geological data specifically. A list of minerals from various counties is given.
4. What makes Georgia an independent state? Atlanta, December 28, 1877 [not seen].
5. Catalogue of ores, rocks, and woods, selected from the Geological Survey collection of the State of Georgia, U. S. A., with a description of the geological formations. 16 p., Atlanta, James P. Harrison, 1878. This catalog accompanied the Georgia exhibit in the Paris Exposition. A cursory review of the geology of the state is included. No details are given.
6. Memoirs of George Little [edited by Tomlinson Fort]. 125 p., port., Tuscaloosa, Alabama, Weatherford Printing Co., 1924.

LLOYD, A. M.

1. Bauxite deposits in Alabama and [Floyd Co.] Georgia: Dixie, vol. 9, no. 1, p. 49-50, 1893. A cursory description of the occurrence of bauxite is given. Analyses are included.
2. Georgia bauxite: Dixie, vol. 9, no. 4, p. 51-52, illus., 1893. Bauxite from Floyd, Cobb, Polk, and Bartow Cos. is discussed. Very little new data are included.

LLOYD, STEWART JOSEPH, 1881-1959.

1. Geology of the nonmetallics of the southeast: Amer. Ceramic Soc. Bull., vol. 17, p. 325-326, illus., 1938. An extremely cursory review of the various industrial minerals occurring in the southeastern states includes those from Georgia. No new data are included.
2. Eugene Allen Smith [1841-1927]—Alabama's great geologist. 22 p., illus., New York, Newcomer Society in North America, 1954.
3. Geology of the Coosa River dams [Floyd Co.]: Alabama Acad. Science Jour., vol. 28, p. 35-38, 1958. The area in Georgia which will be inundated by backwaters from dams on the river lies along the Coosa River in Conasauga Shale. No leakage is anticipated.

LOBECK, ARMIN KOHL, 1886-1958.

1. A physiographic diagram [map] of the United States. Scale, 1 inch to 3,000,000 inches, Chicago, A. J. Nystrom, 1921.
2. Physiographic diagram of the United States. Scale, 1 inch to about 150 miles, 2 broadside sheets, with map and text, New York, Geographical Press, 1922; also 1957 revised edition. A generalized physiographic map of the United States includes Georgia.
3. Physiographic diagram of the United States. Small-scale edition, 8 p., [? Madison, Wisconsin], 1922.
4. Atlas of American geology. 92 sheets, 8½ x 11 inches (‡), New York, Geographic Press, 1932. A series of illustrations of the relationships between geology and topography are given. Several are from Georgia, particularly illustrating the Coastal Plain, Piedmont, and Blue Ridge.

5. Geologic map of the United States, with text on the reverse side. Scale, 1 inch to 5,000,000 inches, New York, Geographic Press, 1941.
6. Douglas [Wilson] Johnson [1878-1944]: Assoc. Amer. Geographers Annals, vol. 34, p. 216-222, port., 1944.
7. Geologic diorama of the United States. One sheet with text, New York, Geographic Press, 1948.
8. Physiographic provinces of North America. Physiographic map and diagram of North America, with brief notes. Scale 1 inch to about 12,000,000 inches, New York, Geographic Press, 1948.

LOEBLICH, ALFRED RICHARD, JR., 1914-
1. (and Tappan, Helen Niña). Correlation of the Gulf and Atlantic Coastal Plain Paleocene and Lower Eocene formations by means of planktonic Foraminifera: Jour. Paleontology, vol. 31, p. 1109-1137, illus., 1957. No details from Georgia are included, but the formations from Georgia are correlated with those from elsewhere on a time-rock chart.

LOHR, EDWIN WALLACE, 1897- *see also* Collins, William Dennis, 1.
1. (and others). The industrial utility of public water supplies in the south Atlantic states, 1952: U. S. Geol. Survey Circ. 269, iv, 162 p., illus., 1953. In an otherwise engineering report are included analyses of ground water from many areas in Georgia.
2. (and Love, Samuel Kenneth). The industrial utility of public water supplies in the United States, 1952: U. S. Geol. Survey Water-Supply Paper 1299, vi, 639 p., illus., 1954. Analyses of ground water from many places in the state are included.

LOMBARD, AUGUSTIN E.
1. Appalachian and alpine structures — a comparative study: Amer. Assoc. Petroleum Geologists Bull., vol. 32, p. 709-744, illus., 1948. A generalized description of Appalachian Mountain folding and faulting, for comparative purposes with the structures of the alps, includes some reference to the Georgia area.

LONG, LEON EUGENE, *see also* Kulp, John Laurence, 1, 2.
1. (and Kulp, John Laurence, and Eckelmann, Frank Donald). Chronology of major metamorphic events in the southeastern United States: Amer. Jour. Science, vol. 257, p. 585-603, illus., 1959. Potassium-argon dating of mica from many places in the southeastern United States, including Georgia, reveal that large portions appear to have been metamorphosed about 1,000 million years ago, with a great deal occurring later, at 350 million years ago, and some younger, about 230-310 million years ago. Samples come from Fannin, Elbert, DeKalb and Gwinnett Counties.

LONGWELL, CHESTER RAY, 1887-
1. Arthur Keith, 1864-1944: Natl. Acad. Science Biog. Mem., vol. 29, p. 190-200, port., 1956.
2. Clarence Edward Dutton, May 15, 1841-January 4, 1912: Natl. Acad. Science Biog. Mem., vol. 32, p. 132-145, port., 1958.

LONSDALE, WILLIAM.

1. Account of twenty-six species of *Polyparia* [corals and bryozoans] obtained from the Eocene Tertiary Formation of North America: Geol. Soc. London Quart. Jour., vol. 1, p. 509-533, illus., 1845. Many species of corals are described from the Eocene rocks in Screven Co., near Jacksonborough, and from Shell Bluff, in Burke County. All are illustrated.

LOOMIS, FREDERICK BREWSTER, 1873-1937.

1. Physiography of the United States. viii, 350 p., illus., Garden City, Doubleday, Doran and Co., 1937. A textbook includes brief descriptions of the general physiography of Georgia. Little detail is included.

LORD, NATHANIEL WRIGHT.

1. (and others). Analyses of coals in the United States, with descriptions of samples . . . : U. S. Bur. Mines Bull. 22, xiv, 1200 p., illus., 1913. Proximate and ultimate analyses of coal from Chattooga Co. are included.

LOUGHLIN, GERALD FRANCIS, 1880-1946.

1. [Waldemar Lindgren, 1860-1939]: Washington Acad. Science Jour., vol. 30, p. 497-499, 1940.

LOUGHRIDGE, ROBERT HILLS, 1843-1917.

1. Physico—geographical and agricultural features of the State of Georgia, Part 1 *of*, Report on the cotton production of the State of Georgia . . . : U. S. Census 10th, vol. 6, pt. 2, p. 275-319, illus., 1884. A very generalized description of the physiography of the state is outlined. The relation of topography to lithology is described.

LOVE, SAMUEL KENNETH, 1903- *see* Lohr, Edwin Wallace, 2.

LOVERING, THOMAS SEWARD, 1896-

1. William Harvey Emmons [1876-1948]: Washington Acad. Science Jour., vol. 39, p. 215-216, 1949.

LUCAS, FREDERICK AUGUSTUS, 1852-1929.

1. The fossil bison of North America: U. S. Natl. Museum Proc., vol. 21, p. 755-771, illus., 1899. Teeth of *Bison latifrons* from Pleistocene rocks in Glynn and McIntosh Cos. are reported.

LUDLUM, ALBERT CLAUDE, 1867-1928.

1. Chester Wells Purington [1871-1928]: Mining and Metallurgy, vol. 4, p. 578-579, port., 1923; Amer. Inst. Mining and Metallurgical Engineers Trans., vol. 70, p. 1235-1237, 1924.

**LULL, RICHARD SWANN,** 1867-1957.

1. Memorial of Oliver Perry Hay [1846-1930]: Geol. Soc. America Bull., vol. 42, p. 30-48, port., 1931.
2. Henry Fairfield Osborn [1857-1935]: Amer. Jour. Science, 5th ser. vol. 31, p. 158-159, 1936.
3. Charles Schuchert [1858-1942]: Amer. Jour. Science, vol. 241, p. 130-133, 1943.

**LUMPKIN CHESTATEE FLUMING AND MINING COMPANY.**

1. The gold placers of northern Georgia. Prospectus of the Lumpkin Chestatee Mining Company. 14 p., Washington, D. C., Joseph L. Pearson, 1867. A cursory description of the gold placers and of the gold in the saprolite is included. Extracts from reports of William Phipps Blake and Charles Thomas Jackson are included. The plans to divert Chestatee River water and mine the dry stream bottom are outlined.

**LUND, ERNEST HOWARD,** 1915- *see* Cazeau, Charles J., 2.

**LUSK, TRACY WALLACE,** *see* St. John, F. B., Jr., 1.

**LYDEKKER, RICHARD,** 1849-1915.

1. Catalogue of the fossil Mammalia in the British Museum . . . Part 4 . . . . vii, 233 p., illus., London, British Museum Natural History, 1886. Remains of *Elephas columbi*, the type specimen, from Glynn Co., are described along with fragments from other places. All are from Pleistocene rocks.

**LYELL, SIR CHARLES, JR.,** 1797-1875.

1. On the Tertiary formations and their connexion with the chalk in Virginia and other parts of the United States: Geol. Soc. London Proc., vol. 3, p. 735-742, 1842; Geologist 1842, p. 213-218, London, 1842. Various Tertiary exposures along the Atlantic Coastal Plain are visited and described. The Eocene formations at Shell Bluff and vicinity, along the Savannah River, are included. Fossils are listed. Subdivisions of the Eocene are suggested.
2. On the geological position of the *Mastodon giganteum* and associated fossil remains . . . in the United States [Glynn and Chatham Cos.] and Canada [abs.]: Geol. Soc. London Proc., vol. 4, p. 36-39, 1843; Annals and Mag. of Natural Hist., vol. 12, p. 125-128, London, 1843; Amer. Jour. Science, vol. 46, p. 320-323, 1844; Philosophical Mag., 3d ser. vol. 23, p. 190-193, London, 1843; discussion by E[dward] W[edlake] B[rayley], p. 193-194; Geologist 1843, p. 169-174, London, 1843. The remains of *Megatherium* and *Mastodon*, associated with [Pleistocene] marine shells in Georgia, helps establish the age of similar beasts located inland, away from the marine influence.

3. Notes on the Cretaceous strata of New Jersey and other parts of the United States bordering the Atlantic: Geol. Soc. London Quart. Jour., vol. 1, p. 55-60, 1845. The strata at Shell Bluff, Burke Co., are considered to be Eocene rather than Cretaceous, although Cretaceous fossils are noted from somewhere in Georgia [probably from along the Chattahoochee River].

4. Observations on the white limestones and other Eocene or older Tertiary formations of . . . Georgia: Geol. Soc. London Quart. Jour., vol. 1, p. 429-442, illus., 1845. The recognition of Eocene strata between Miocene and Cretaceous beds is made on the basis of the fossil contents of each. Sections on the Savannah River are described; fossils are listed and some are illustrated and described by Edward Forbes.

5. Travels in North America with geological observations on the United States, Canada, and Nova Scotia. 2 vols., 316, 272 p., illus. incl. geol. map, London, John Murray, 1845; 2d ed. 1855; also a German edition, Halle, 1846; also New York, Wiley and Putnam, 1845; another ed, New York, J. Wiley, 1842; 2d ed., New York, Wiley and Halsted 1856; also numerous other editions. Many aspects of Georgia geology are cursorily described. Tertiary strata of the Coastal Plain, Pleistocene mammals, and general Tertiary paleontology and stratigraphy of the Atlantic Coastal area are included. A geological map of the United States includes Georgia.

6. [On the Eocene of Georgia and Alabama] [abs.]: Amer. Jour. Science, 2d ser. vol. 1, p. 313-315, 1846.

7. On the newer deposits of the southern states of North America: Geol. Soc. London Quart. Jour., vol. 2, p. 405-410, illus., 1846. Brief descriptions of various Cenozoic formations from several places on the Georgia Coastal Plain are given. The fossiliferous, terrestrial Pleistocene beds are mentioned, as are the underlying Pleistocene marine beds. No Miocene rocks are noted; the Eocene rocks are extensive.

8. A second visit to the United States of America. 2 vols., 273, 283 p., New York, Harper and Bros., London, Murray, 1849. A description, both geological and paleontological, of the area around Glynn Co. is included, as is a geological description of the route along the Fall Line from Savannah to Columbus.

LYONS, PAUL LIGHTNER, 1911-

1. A gravity map of the United States: Tulsa Geol. Soc. Digest, vol. 18, p. 33-43, illus., 1950. A small-scale Bouguer gravity anomaly map of the United States includes Georgia. The Appalachian trends are clearly defined, whereas the pattern of the southern part of the state resembles that of Florida. Few details are recognizable because of the scale.

MC CAIN, LUCILE.

1. Mary Jane Rathbun [1860-1943]: Science, vol. 97, p. 435-436, 1943.

MC CALLEY, HENRY, 1852-1904.

1. Bauxite mining: Science, vol. 23, p. 29-30, 1894. A cursory description of the bauxite ore in Floyd Co. is included. It is residual, and it decreases in quality with depth.

2. Report on the valley regions of Alabama (Paleozoic strata) Part 1, he Tennessee Valley region. xvii, 436 p., illus., Alabama Geol. Survey, 1896; Part 2, xxii, 862 p., illus., 1897. A detailed description of the geology of northeastern Alabama includes references to a few measured sections in nearby northwestern Georgia.

MC CALLIE, SAMUEL WASHINGTON, 1856-1933, *see also* LaForge, Laurence, 3; Swartz, Joel Howard, 1; Torbert, John B., 1; Yeates, William Smith, 1.

1. A preliminary report on the marbles of Georgia: Georgia Geol. Survey Bull. 1, 87 p., illus., 1894; 2d ed., revised and enlarged, 126 p., illus., 1907. A general discussion of the marble industry, the origin of marble and limestone, and geology of the northern part of Georgia is followed by descriptions of individual deposits in counties. Sections are measured; analyses are made.

2. A preliminary report on a part of the phosphates and marls of Georgia: Georgia Geol. Survey Bull. 5-A, 98 p., illus., 1896. A review of the nature of the occurrence of phosphate-bearing deposits, especially those in South Carolina and Florida, is followed by a description of occurrences in the counties bordering Florida and the Atlantic Ocean. Not much phosphate is present. It is sedimentary and has an organic origin. Most occurs in limestones, and some is residual.

3. Gold deposits of Georgia. 17 p., illus., Atlanta, George W. Harrison, 1897. A complete description of the history, distribution, occurrence, and technology of the gold deposits in the Blue Ridge and Piedmont areas of Georgia includes a small-scale map.

4. A preliminary report on the artesian-well system of Georgia: Georgia Geol. Survey Bull. 7, 214 p., illus., 1898. Artesian systems, the word being used in the broadest sense, are described. A brief review of the stratigraphy of the Coastal Plain is followed by tabular and other descriptive data of artesian (or deep) wells. Analyses are included as are the logs of some of the wells.

5. A preliminary report on a part of the iron ores of Georgia—Polk, Bartow, and Floyd Counties: Georgia Geol. Survey Bull. 10-A, 190 p., illus., 1900. Limonite and hematite occur as residual concentrates in pockets and irregular geodes in the residuum of the Cambrian and Cambro-Ordovician limestones. Individual occurrences are described; analyses are included.

6. Notes on fossil iron ores of [northwestern] Georgia: Engineering and Mining Jour., vol. 70, p. 757-759, illus., 1900. A general discussion of the occurrence of the iron-bearing beds in the Silurian rocks of Dade, Walker, and Chattooga Cos., is given. The westward increase in volume of these beds is noted as is their stratigraphic position.

7. Some notes on the brown iron-ores of Georgia: Engineering and Mining Jour., vol. 69, p. 255-256, illus., 1900. The deposits of residual limonite in northwestern Georgia are cursorily described. No new data are included. Most come from Polk and Bartow Counties.

8. Mineral resources of Georgia: Internatl. Mining Cong. 4th, Proc., p. 33-42, 1901; reprinted as separate, 20 p., illus., Atlanta, Geo. W. Harrison, 1901; reprinted *in* Georgia, historical and industrial, by O. B. Stevens, p. 127-147, illus., Atlanta, Franklin Printing and Pub. Co., 1910. A survey of the mineral resources of the state is given. Little new information is included.

9. (A) preliminary report on roads and road-building materials of Georgia: Georgia Geol. Survey Bull. 8, 264 p., illus., 1901. A general discussion regarding road construction is followed by a description of various kinds of rock which can be used. Occurrences of different kinds in each county are then described.

10. Some notes on the trap dikes of Georgia: Amer. Geologist, vol. 27, p. 133-134, illus., 1901. Diabase dikes from the Piedmont area are described petrographically and geographically. They are thought to be Jurassic or Triassic in age.

11. The Ducktown copper mining district: Engineering and Mining Jour., vol. 74, p. 439-440, illus., 1902. A portion of Fannin Co. is included. A general description of the geology and the mineral resources of the area is given. The ore occurs in veins in igneous-intruded metamorphosed sedimentary rocks. Chalcopyrite is the chief mineral.

12. Sandstone dikes near Columbus, [Muscogee Co.] Georgia: Amer. Geologist, vol. 32, p. 199-202, illus., 1903. Nearly vertical sandstone bodies occur in the Cretaceous shale. The dikes vary in size from a fraction of an inch to two feet in width. They are considered to be sand-filled earthquake-formed fissures.

13. (and Hall, Benjamin Mortimer). Georgia, *in* Notes on wells, springs, and general water resources of certain eastern and central states: U. S. Geol. Survey Water-Supply Paper 102, p. 207-237, 1904. Tables of data regarding water sources in many places in Georgia include data of some springs.

14. (A) preliminary report on the coal deposits of Georgia: Georgia Geol. Survey Bull. 12, 121 p., illus. incl. geol. map, 1904. Coal occurs in the Pennsylvanian rocks of Dade, Chattooga, and Walker Counties. It occurs preserved in the troughs of synclines. Individual deposits are described; many analyses are included, and sections are measured.

15. Experiment relating to problems of well contamination at Quitman, [Brooks Co.] Ga.: U. S. Geol. Survey Water-Supply Paper 110, p. 45-54, illus., 1905. The general geology of the area, as well as a description of the occurrence of ground water, is included in the discussion of an engineering experiment.

16. Georgia, *in* Underground water of the eastern United States by Myron Leslie Fuller: U. S. Geol. Survey Water-Supply Paper 114, p. 153-158, illus., 1905. An extremely cursory review of the occurrence of ground water is given. No new details are included.

17. Stretched pebbles from the Ocoee Conglomerate [Gilmer Co.]: Jour. Geology, vol. 14, p. 55-59, illus., 1906. A narrow belt of stretched pebble-bearing conglomerate interbedded with mica schist is described. Both quartz and feldspar make up the pebbles. Each type is described and analyzed.

18. Blowing springs and wells of Georgia, with an explanation of the phenomena: Science, new ser. vol. 25, p. 226-229, 1907. Air is drawn in or exhaled from springs and wells. The Grant Blowing Spring, in Catoosa Co., is a cave responding to differences in barometric pressure. Others, in Thomas Co., draw air inward only. The inflow of the air is related to air friction on fast-moving water flowing through the wells.

19. Some notes on schist-conglomerate occurring in [Lumpkin Co.] Georgia: Jour. Geology, vol. 15, p. 474-478, illus., 1907. Boulders and pebbles of various sizes, composed mostly of quartz with a little mica, occur in a ground mass of quartz-biotite schist. The schist conglomerate is enclosed in biotite schist and diorite schist.

20. (A) preliminary report on the underground waters of Georgia: Georgia Geol. Survey Bull. 15, 370 p., illus. incl. geol. map, 1908. A general discussion of the occurrence of ground water is followed by a brief description of the physiography and general geology of Georgia. A discussion of wells throughout the state includes many analyses. Fossil lists from numerous places on the Coastal Plain are included in the appendix.

21. Report on the fossil iron ores of Georgia: Georgia Geol. Survey Bull. 17, 199 p., illus., 1908. A general discussion of Silurian iron-bearing rocks includes those from northwestern Georgia. Details of stratigraphy and distribution of the ore in Georgia are included. Individual deposits in various counties are described. The replacement and sedimentary theories of ore origin are discussed, with evidence drawn from Georgia; the replacement theory seems better. Analyses are included.

22. In memoriam, William Smith Yeates, 1856-1908: Georgia Geol. Survey Bull. 19, p. 7-8, 1909.

23. (The) Pickens County meteorite: Science, new ser. vol. 30, p. 772-773, 1909. A detailed microscopic description and a chemical analysis of this 14-ounce stony meteorite are given.

24. (and Veatch, Jethro Otto). (A) preliminary geological map of Georgia. No scale, [about 15 miles per inch], Georgia Geol. Survey, 1908; *in Georgia* Geol. Survey Bull. 18, 1909.

25. Georgia ocher mining and treatment: Mining World, vol. 33, p. 1225-1226, illus., 1910. This is a very generalized summary of the ocher deposits of the Cartersville area, Bartow County. The ocher occurs within cracks of the shattered Weisner Quartzite and in the residual clays derived therefrom. Analyses are included.

26. (A) preliminary report on the mineral resources of Georgia: Georgia Geol. Survey Bull. 23, 208 p., illus., 1910; revised, 164 p., illus., 1926. Each of the mineral resources of Georgia is discussed in a cursory way. Analyses are included.

27. (A) second report on the public roads of Georgia: Georgia Geol. Survey Bull. 24, 36 p., illus., 1910. Statistical data are followed by brief descriptions of some of the rock units around the state which are or could be used for road construction.

28. Bauxite deposits of southern Georgia: Engineering and Mining Jour., vol. 91, p. 1050, illus., 1911. Pisolitic bauxite, widely but sparsely scattered in Upper Cretaceous rocks, associated with kaolin, from Wilkinson and nearby counties, is described and analyzed.

29. Handbook of mineral resources of Georgia. 37 p., illus., Atlanta, Georgia Geol. Survey, 1911; revised, 48 p., illus., 1918; third edition, 48 p., illus., 1923. This is a small, pocket-sized book reviewing, in a popular manner, the mineral resources of the state.

30. (A) preliminary report on drainage investigations in Georgia: Georgia Geol. Survey Bull. 25, 123 p., illus., 1911. Descriptions of swamps in Georgia are included. The area of swamps in Georgia is exceeded only by that of Florida of all the Atlantic and Gulf states. The geological conditions leading to swamps are described.

31. The ocher deposits of [Bartow Co.] Georgia: Mines and Minerals, vol. 33, no. 1, p. 46-47, illus., 1912. A cursory description of the ocher deposits of the area is given, along with a discussion of the mining techniques and economics. It occurs in the fractures of the Weisner Formation and in the overlying residual clay. No new data are included.

32. A preliminary report on the mineral springs in Georgia: Georgia Geol. Survey Bull. 20, 190 p., illus., 1913. A general discussion of the nature and origin of mineral water from springs is followed by an account of their occurrence in Georgia. Analyses are included. Most of the springs are in the northwestern part of the state.

33. Outlook for the gold-mining industry of Georgia: Mining and Engineering World, vol. 38, p. 22-23, illus., 1913. A cursory description of the occurrence of gold in the Piedmont and Blue Ridge of Georgia is given. No new large bodies are likely to be discovered, but property purchasing is recommended as the prices are low.

34. High potash-bearing slates in [Bartow Co.] Georgia: Engineering and Mining Jour., vol. 104, p. 643, 1917. A slate body in a belt six miles long and three hundred feet thick, near Whites Station, is shown to contain an abnormally high potash content and is recommended as a source of ore. It is analyzed.

35. Notes on the geology of Georgia: Jour. Geology, vol. 27, p. 165-179, illus., 1919; Georgia Geol. Survey Bull. 39, p. 72-85, illus., 1922. A cursory description, with generalized columnar sections and a geological map, of Precambrian to Recent rocks is given.

36. Georgia, *in* Sulphur, pyrites, and sulphuric acid, by Phillip Sidney Smith: U. S. Geol. Survey Mineral Resources of the United States 1917, part 2, p. 33-37, 1920. A general discussion of the occurrence of pyrite deposits in Georgia is given, most coming from veins in the Piedmont.

37. The Pitts [Wilcox Co.] meteorite: Amer. Jour. Science, 5th ser. vol. 3, p. 211-215, illus., 1922; Georgia Geol. Survey Bull. 39, p. 141-149, illus., 1922. The fall of an iron meteorite is described. The four fragments weigh almost 10 pounds. An analysis is included.

38. The mineral resources of Georgia: Manufacturer's Record, vol. 86, no. 24, pt. 2, The south's development, p. 369-373, illus. incl. port., 1924. This is a cursory review of the various mineral products of the state and some of the highlights of their occurrence. No new data are included.

39. Notes on the Social Circle [Walton Co.] meteorite: Amer. Jour. Science, 5th ser. vol. 13, p. 360, 1927. A 219-pound iron meteorite is described and analyzed.

40. Georgian Coastal Plain terranes: Pan-Amer. Geologist, vol. 49, p. 167-178, 1928. A generalized survey of the geology of the Coastal Plain is given. A review of the major topographic features is followed by a cursory description of each of the geological formations from Cretaceous to Pleistocene in age.

41. Mesozoic and Cenozoic formations of Georgia [abs.]: Pan-Amer. Geologist, vol. 49, p. 325, 1928.

MC CLAIN, DONALD SCHOFIELD, JR., 1925-

1. Geophysical exploration [gravity] on the Coastal Plain of Georgia in Baker County, Georgia. M. S. Thesis, Emory Univ., 1953.

2. Oil tests in [Coastal Plain] Georgia: Georgia Geol. Survey Circ. 3, map, no scale, and text, 1953. A small-scale map shows the locations of many wells drilled in the Coastal Plain along with the total depth of each. The text gives pertinent data in tabular form.

3. Gravity exploration in Baker County, Georgia: Georgia Mineral Newsletter, vol. 7, p. 20-23, illus., 1954. A gradual decrease, from north to south, in the isogal contours is interpreted as being due to the increasing depth to the basement complex. The local anomaly super-imposed upon this pattern is due to water-filled limestone. Small-scale maps are included.

4. (and Straley, H. W., 3d). Petroleum possibilities in Georgia: Petroleum Engineer, vol. 26, no. 3, p. B 38-B 48, illus. incl. ports., 1954. A general review of the Coastal Plain geology of the state includes descriptions of structural features and related petroleum potential. There are no proved nor even probable areas for petroleum, however. Brief mention eliminates the Paleozoic terrane as a petroleum source also.

MC CUTCHEN, AUGUST R.

1. Northwest Georgia, *in* Physico-geographical and agricultural features of the state of Georgia, Part 1 *of* Report on the cotton production of the State of Georgia . . . : U. S. Census 10th, vol. 6, pt. 2, p. 285-295, illus., 1884. A generalized description of the Paleozoic terrane includes much description of the relationship of lithology and structure to topography.

MC DONALD, P. B.

1. Kaolin mining operations in the south: Mining and Engineering World, vol. 40, p. 281-282, illus., 1914. An extremely cursory description of the occurrences of kaolin in the Coastal Plain of the United States includes those of Georgia. No new information is included.

[MC ELRATH, THOMAS, 1807-1888].

1. Georgia, *in* Journal of gold mining operations: Mining and Statistical Mag., vol. 10, p. 395-396, 1858. A short resumé of the gold mining operations in the Piedmont and Blue Ridge of Georgia is given. Very little geology is included.

MC FALL, RUSSELL P.

1. Gem hunter's guide. (Revised ed.) 187 p., illus., Chicago, Illinois, Science and Mechanics Pub. Co., 1951; 2d revised ed., 188 p., illus., 1958; originally published 1946. Tables of locations of gem minerals follow a general discussion of the origin and occurrence of gems in general. Many gems are reported from Georgia, though specific locations are very nebulous.

MAC FARLANE, JAMES, 1819-1885.

1. An American geological railway guide . . . . 216 p., illus., New York, D. Appleton and Co., 1879; 2d ed., 426 p., illus., 1890. An account is given of the type of rocks at each railroad station in the nation, those in Georgia included. Few details are included, however.

MC GEE, EMMA R., 1865-

1. Life of W J McGee [1853-1912] . . . . 240 p., illus. incl. port., Farley, Iowa, privately printed, 1915.

MC GEE, W J, 1853-1912.

1. Carte géologique des États-Unis d'Amerique donnant la distribution actuellement connue des groupes géologiques. Scale, 1:7,000,000, [n.d.] [n.p.].
2. Map of the United States exhibiting the present status of knowledge relating to the areal distribution of geologic groups (preliminary compilation). Scale, 1:7,000,000, U. S. Geol. Survey, 1884.
3. Report of Mr. W J McGee [about preparation of a geologic map of the United States]: U. S. Geol. Survey Ann. Rept 5, p. 34-41, illus. geol. map, 1885; Annuaire géologique universel, vol. 2, App. p. 26-27, illus. geol. map, Paris, 1886. A geological map of the United States, including Georgia, is described.
4. The southern extension of the Appomattox Formation: Amer. Jour. Science, 3d ser. vol. 40, p. 15-41, 1890. This formation [post-Miocene, pre-Pleistocene] is described from many locations on the Coastal Plain of Georgia and elsewhere. It overlaps onto the Piedmont area in places. It is largely an orange, pebbly, clayey sand, composed of the immediately underlying rocks. It underlies Pleistocene material and overlies many units, including Miocene. Its relations to the overlying and underlying material in different parts of the state are discussed. It is a littoral or sub-littoral deposit.

5. The Lafayette Formation: U. S. Geol. Survey Ann. Rept. 12, pt. 1, p. 347-521, illus., 1891. A generalized description of the topography and geology of the Coastal Plain includes that part in Georgia. The Lafayette Formation is upper Tertiary in age as it lies on most of the other Coastal Plain formations but is often hard to distinguish. Many exposures in Georgia are described.

6. Distribution of the Lafayette Formation [abs.]: Amer. Geologist, vol. 10, p. 223-224, 1892.

7. Reconnaissance map of the United States showing the distribution of the geologic systems . . . : U. S. Geol. Survey Ann, Rept. 14, pt. 2, pl. 2, 1893. A geological map of the United States includes Georgia.

MC GILL, JOHN THOMAS, 1921-

1. Map of coastal landforms of the world: Geographical Review, vol. 48, p. 402-405, illus., 1958. A large map of the world shows the Georgia coast to be part of that which has recently emerged due to isostatic rebound. Coastal dunes are at the seaward edge.

MC GILL, WILLIAM MAHONE, 1897-

1. (and Roberts, Joseph Kent). In memoriam, Roy Jay Holden, Oct. 21, 1870-Dec. 16, 1945: Virginia Acad. Science Proc. 1945-46, p. 91-92, 1946.

MC GLAMERY, WINIFRED.

1. Middle Oligocene coral reefs in the Gulf Coastal Plain [Decatur Co.] [abs.]: Alabama Acad. Science Jour., vol. 6, p. 23, [1935].

2. Truman H[eminway] Aldrich [1848-1932]: Alabama Geol. Survey Bull. 60, p. 38-40, 1948.

MC INTOSH, FRANK KENYON, *see* Ballard, Thomas Jamey, 2.

MC KEE, EDWIN DINWIDDIE, 1906-

1. (and others). Paleotectonic maps of the Triassic System: U. S. Geol. Survey Misc. Geol. Investigations Map I-300, 33 p., illus. incl. geol. maps, 1959. An atlas of maps with text shows the nature of the Triassic rocks below the Coastal Plain. Clastic rocks occur in the southwestern area; they are over 1000 feet thick.

MC KELVEY, VINCENT ELLIS, 1916-

1. (and Balsley, James Robinson, Jr.). Distribution of coastal blacksands in North Carolina, South Carolina, and Georgia as mapped from an airplane: Econ. Geology, vol. 43, p. 518-524, illus., 1948. Black sands diminish in abundance northward, and their distribution is in part related to the configuration of the shoreline. They are on beaches facing the open sea only.

2. (and Cathcart, James Bachelder, and Altschuler, Zalman Samuel, and Swanson, Katherine Lutz). Domestic phosphate deposits: U. S. Geol. Survey Trace Elements Investigations 271, 49 p. (‡), illus., 1952; Chap. 11 *of* Soil and fertilizer phosphorous in crop nutrition, by W. H. Pierre and A. G. Norman, editors, p. 347-376, illus., New York, Academic Press, 1953. A general discussion of the occurrence of phosphate deposits in the United States includes some references to occurrences in Georgia. Guano occurs in caves in the northwestern corner, and an extension of the marine phosphorite, so common in Florida, is recognized in southwestern Georgia.

**MC KENNEY, J. WILSON.**

1. He [William Phipps Blake, 1826-1910] names Lake Cohuila: Desert Mag., vol. 10, no. 5, p. 11-13, illus., 1950.

**MC KINLEY, WILLIAM C.**

1. The gems of Georgia: Mineralogist, vol. 3, no. 1, p. 44-45, 1935. This is a popular account of the various types of gem minerals which are known from Georgia. No details are included.

**MAC LAREN, JAMES MALCOLM.**

1. Gold, its geological occurrence and geographical distribution. xxiii, 687 p., illus., London, The Mining Journal, 1908. A brief, cursory description of the Georgia gold fields, as a part of the whole Appalachian district, is given.

**MC LAUGHLIN, DONALD HAMILTON,** 1891-

1. Waldemar Lindgren [1860-1939]: Mining and Metallurgy, vol. 20, p. 571-572, 1939.

**MC LAUGHLIN, R. J. W.**

1. The geochemistry of some kaolinitic clays: Geochemica et Cosmochemica Acta, vol. 17, p. 11-16, illus., London, 1959. Numerous clays, including kaolinite from Twiggs Co., are examined chemically for various cations in the sand and silt fractions. Titanium and zirconium seem to be the most persistent elements regardless of grain size.

**MC LEAN, JAMES DOUGLAS, JR.**

1. A summary of the guide fossil Foraminifera of the Atlantic Coastal Plains between New Jersey and Georgia. 3 sheets, Alexandria, Va., [priv. pub.] 1949; revised, McLean Foram. Lab. Rept. 1, 6 p., 1953; correction with title, *Cibicides* or *Eponides cocoaensis:* Jour. Paleontology, vol. 25, p. 534-535, 1951. A chart lists the Foraminifera characteristic of the various stratigraphic units on the Atlantic Coastal Plain. Eocene rocks only are correlated in Georgia.
2. Later Tertiary foraminiferal zones of the Gulf Coast. 20 p. (‡), [priv. pub.] [1950]. A catalogue of the foraminiferal zones and the species known from them includes those from Georgia. The Oligocene Flint River Formation is in the *Lepidocyclina (Eulepidina)* and *L. mantelli* zones.

**MACLURE, WILLIAM, 1763-1840,** *see also* Marcou, Jules, 3.

1. Observations on the geology of the United States, explanatory of a geological map: Amer. Philos. Soc. Trans., vol. 6, p. 411-428, illus. incl. geol. map, 1809; [in French], Journal de Physique, de Chemie, d'Histoire Naturelle et des Arts, vol. 69, p. 204-213, Paris, 1809; vol. 72, p. 137-165, illus. incl. geol. map, Paris, 1811; 2d ed., Amer. Philos. Soc. Trans., new ser. vol. 1, p. 1-91, illus. incl. geol. map, 1817; also separately published, 127 p., illus. incl. geol. map, Philadelphia, 1817; summary, Zeitschrift fuer Mineralogie (Leonhard) 1826, pt. 1, p. 124-138, Frankfurt am Main, 1826. The first geological map of the United States includes Georgia. The Coastal Plain is mapped as Alluvial; the Piedmont is Primitive; the northwestern terrane and most of the Blue Ridge is Secondary, and the intervening region is Transition or unmapped.

**MAC NEILL, FRANCIS STEARNS, 1909-**

1. (The) Coastal Plain of Georgia: Southeastern Geol. Soc. [Guidebook] Field Trip 2, p. 3-5 (‡), illus., 1944. An extremely cursory review of the geology of the Coastal Plain, preliminary to a field trip, is given.

2. Oligocene stratigraphy of southeastern United States: Amer. Assoc. Petroleum Geologists Bull., vol. 28, p. 1313-1354, illus., 1944. A general survey of Oligocene rocks in the region includes those in Georgia. The Flint River Formation, the only Oligocene formation in Georgia, is Upper Oligocene in age, and rests on an angular unconformity.

3. (The) Tertiary formations: Southeastern Geol. Soc. [Guidebook] Field Trip 2, p. 21-37 (‡), 1944. A general discussion of the Tertiary rocks includes measured sections and fossil lists from the Paleocene and Eocene, in preparation for a field trip.

4. Limestone solution in southeast Alabama and southwest Georgia [abs.]: Geol. Soc. America Bull., vol. 56, p. 1180, 1945.

5. Correlation chart for the outcropping Tertiary formations of the eastern Gulf region: U. S. Geol. Survey Oil and Gas Investigations Prelim. Chart 29, 1947. A time-rock chart shows the formations in the Coastal Plain of Georgia correlated with those of adjacent and nearby states. A brief text is included.

6. Geologic map of the Tertiary and Quaternary formations of Georgia: U. S. Geol. Survey Oil and Gas Investigations Prelim. Map 72, Scale, 1 inch to 8 miles, 1947; also *in* Pierson, Richard Edwin, Possible stratigraphic relationships of the Sandersville Limestone to the Ocala Limestone of West Georgia. M. S. Thesis, Emory Univ., 1951.

7. Pleistocene shore lines in Florida and Georgia: U. S. Geol. Survey Prof. Paper 221-F, p. 95-107, illus., 1950. Cliffs, bars, lagoons, and bays are mapped. Four marine terraces and shorelines are recognized and ascribed to Pleistocene sea level oscillation.

MC VAUGH, ROGERS, 1909-

1. The vegetation of the granitic flat-rocks of the southeastern United States: Ecol. Monographs, vol. 13, p. 119-166, illus., 1943. The topography of great areas of granitic rocks in the Piedmont is described. Special emphasis is placed upon the flora which is present. Most of the flora has affinities with more western flora, in the Ozarks and Texas, suggesting that the migration was eastward after the Cretaceous Period.

MALLORY, J. M., *see also* Maynard, Thomas Poole, 7.

1. (and Maynard, Thomas Poole). Geological map showing mineral resources along Central of Georgia Ralway. Scale, 1 inch to 10 miles, Central of Georgia Railway, Industrial Dept., 1923.

MANSFIELD, WENDELL CLAY, 1874-1939.

1. Stratigraphic significance of Miocene, Pliocene, and Pleistocene Pectinidae in the southeastern United States: Jour. Paleontology, vol. 10, p. 168-192, illus., 1936. A brief resumé of the stratigraphy of these deposits, with the distribution of *Pecten* within them, is given. Only *Pecten*-bearing Miocene beds are present along the Atlantic coast of Georgia. These beds are correlated with those of the neighboring states. Three species of *Pecten* are present in the Georgia beds.

MARBUT, CURTIS FLETCHER, 1863-1935.

1. (and others). Soils of the United States (edition, 1913): U.S. Dept. Agriculture Bur. Soils Bull. 96, 791 p., 1913; revision of Bulls. 55 and 76. The soils of the various physiographic provinces of the United States, including those in Georgia, are described, with considerable emphasis upon the relation of the soil to the parent rock.

MARCOU, JOHN BELKNAP,? -1912.

1. Bibliography of publications relating to the collection of fossil invertebrates in the United States National Museum; including complete lists of the writings of Fielding B. Meek, Charles A. White, and Charles D. Walcott: U. S. Natl. Museum Bull., vol. 30, 333 p., 1885.

MARCOU, JULES, 1824-1898.

1. Geological map of the United States and British Provinces of North America, with an explanatory text . . . . 92 p., illus. incl. geol. map, Boston, Gould and Lincoln, 1853. A geological map of the United States includes Georgia. A little description is included; some fossils are listed and illustrated.

2. Resumé explicatif d'une carte géologique des États Unis . . . : Societé géologique de France Bull., 2d ser. vol. 12, p. 813-936, illus. geol. map, Paris, 1855; Annales des Mines, 5th ser. vol. 7, pl. 9, Paris, 1855; summary, in German, Petermann's geographische Mitteilungen 1855, p. 149-159, illus. geol. map, Gotha, 1855; Revista de los Progresos de la Ciencias, vol. 6, p. 288-313, Madrid, 1856; review [criticism] by William Phipps Blake, Amer. Jour. Science, 2d ser. vol. 22, p. 383-388, 1856. A summary of a small-scale, colored geological map of the United States, which includes Georgia, is given. No new details are included; Blake cautions the reader regarding validity of parts of it.

3. Geology of North America. 144 p., illus. incl. geol. map [by William Maclure], Zurich, Zurcher and Furrer, 1858; New York, Wiley and Halsted, 1858. A cursory description of the geology of the United States includes Georgia. A geological map of the United States is included.

4. Geological map of the world. Carte géologique de la terre. Scale, 1 inch to 23 million inches, eight sheets. Zurich, J. Wurster, 1861 [not seen]; 2d ed., 1875; reduced and *in* Vor der Suesidfluth, by Oskar F. Fraas, Stuttgart, 1865 [not seen]; also *in* La Terre, by Elisée Reclus, vol. 1, pl. 2, p. 30, Paris, 1868; 2d ed. 1870; also in numerous other English and German editions.

5. Ebenezer Emmons [1800-1863]: Science, vol. 5, p. 456-458, port., 1885.

6. Biographical notice of Ebenezer Emmons [1800-1863]: Amer. Geologist, vol. 7, p. 1-23, 1891.

7. Life, letters and works of Louis Agassiz [1807-1873]. 2 vols., 620 p., illus. incl. port., New York, MacMillan and Co., 1896.

MARGERIE, EMMANUEL DE, 1862-1953.

1. Sur la découverte de phénomènes de recouvrement dans les Appalaches [northwestern Georgia]: Societé géologique de France Bull., ser. 3, vol. 19, p. 426-429, Paris, 1891. A brief survey of the great overthrusts in northwest Georgia is given. Comparisons are made between those of Georgia and those of the Alpine areas in Europe. The data come from the paper of Hayes (1890).

MARLIN, LLOYD GARRISON.

1. Minerals and mining, Chapter 13 *of* The history of Cherokee County, p. 143-150, Atlanta, Walter W. Brown, [1932]. The occurrences of gold and copper minerals in the county are described; the emphasis is upon the historical development of the mines.

MARQUIS, URBAN CLYDE, 1925-

1. The relationship between the Fort Payne Chert and the Floyd Shale [Mississippian] in northwest Georgia. M. S. Thesis, Emory Univ., 1958.

MARR, JOHN EDWARD, 1857-1933.

1. Obituary, Charles Doolittle Walcott [1850-1927] LL. D., Sc. D., Ph. D.: Geological Mag., vol. 64, p. 189-190, London, 1927.

MARTENS, JAMES HART CURRY, 1901-

1. Beach deposits of ilmenite, zircon, and rutile in Florida: Florida Geol. Survey Ann. Rept. 19, p. 124-154, illus., 1928. The ilmenite, occurring as heavy minerals in beach sand, from Sapelo Island (McIntosh Co.) and St. Simons Island (Glynn Co.) is described. No details are given.

2. Beach sands between Charleston, South Carolina and Miami, Florida: Geol. Soc. America Bull., vol. 46, p. 1563-1596, illus., 1935. Many samples from along the Georgia coast are included. Many graphs, histograms, and other data are recorded to show the mineral composition, color, etc. of the sand. The geologic factors which influence the various characteristics are discussed.

MARTIN, PAUL SCHULTZ.

1. Pleistocene ecology and bio-geography of North America, [Chapter] 15 *in* Pt. 2 *of* Hubbs, C. L., ed., Zoogeography, p. 375-420, illus., New York, Amer. Assoc. Advancement Science, 1958. Problems of animal distribution as affected by the glacial advances are reviewed. Small-scale maps reproduce the vegetation zones in eastern North America, including Georgia. Georgia was in the deciduous forest environment during the maximum Wisconsin glaciation.

MARTONNE, EMMANUEL DE.

1. Douglas [Wilson] Johnson [1878-1944]: Annales de Géographie, no. 297, 55th Année, p. 49-52, Paris, 1945.

MARVIN, J. B., *see* Smith, John Lawrence, 4.

MASSACHUSETTS INSTITUTE OF TECHNOLOGY.

1. Age study of some crystalline rocks of the Georgia Piedmont, *in* Variations in isotopic abundances of strontium, calcium, and argon and related topics: U. S. Atomic Energy Commission Rept. NYO-3938, p. 58-60 (‡), illus., 1958. Biotite from Stone Mountain Granite, Lithonia Gneiss, and Panola Granite from DeKalb Co., and from Carolina Gneiss and Ben Hill Granite in Fulton Co., and Elberton Granite in Elbert Co., is analyzed for Sr/Rb age. The average age, excluding Carolina Gneiss (342 m.y.) is 288 million years; the rocks are considered Devonian, except for the Elberton Granite, which is younger.

MATHER, KIRTLEY FLETCHER, 1888-

1. Memorial to Wallace Walter Atwood [1872-1949]: Geol. Soc. America Proc. 1949, p. 107-112, port., 1950.

MATHEWS, EDWARD BENNETT, 1869-1944.

1. William Bullock Clark, [1860-1917] Ph. D., LL. D., State Geologist, 1896-1917: Maryland Geol. Survey, vol. 10, p. 31-37, port., 1918.

**MATTHES, FRANÇOIS ÉMILE,** 1874-1948.

1. The country around Camp Gordon [DeKalb Co.] Map, scale 1 inch to 125,000 inches, text on back, U. S. Geol. Survey, 1918. A general description of the topography and geology of the area is given. Camp Gordon was an army camp near Chamblee.

**MATTHEW, WILLIAM DILLER,** 1871-1930.

1. Hypothetical outlines of the continents in Tertiary times: Amer. Museum Natural Hist. Bull., vol. 22, p. 353-383, illus., 1906. Small-scale paleogeographic maps of the world, based on mammal distribution, are given; there is one for each Tertiary epoch. Georgia is included.

**MATTOCKS, PHILIP WARD,** *see* Hunter, Charles Eugene, 1.

**MAUCHER, ALBERT.**

1. Bailey Willis, 1857-1949: Bayerische Akademie der Wissenschaft Jahrbuch 1951, p. 173-175, Munich, 1952.

**MAURY, CARLOTTA JOAQUINA,** 1874-1938.

1. A comparison of the Oligocene of western Europe and the southern United States: Bulls. Amer. Paleontology, vol. 3, no. 15, p. 311-404 [3-94], illus., 1902. Descriptions of [Eocene], Oligocene, [and Miocene] rocks from different places in the Coastal Plain are included. The faunas are listed and compared with the similar fauna of Europe. There are few species in common.

**MAURY, MATTHEW FONTAINE,** 1806-1873, *see* Gibbes, Robert Wilson, 2.

**MAYNARD, THOMAS POOLE,** 1883-1953, *see also* Mallory, J. M., 1.

1. Report on Georgia's ceramic resources. [11 p.], Atlanta, The Industrial Bureau of Atlanta [n. d.]. An extremely cursory review of the various types of clay to be found in Georgia is given. No new data are included.
2. A report on the limestones and cement materials of north Georgia: Georgia Geol. Survey Bull. 27, xix, 293 p., illus., 1912. The occurrence and nature of the limestone, sandstone, and shale in northwestern Georgia and adjacent portions of the Blue Ridge and Piedmont are discussed. Descriptions of individual deposits and analyses are included, and some sections are measured.
3. The green slates of [Bartow and Gordon Cos.] Georgia: Stone, vol. 34, no. 4, p. 198-200, illus., 1913; Science Record, vol. 1, no. 3, p. 76-85, illus., 1913. The slate in the Cambrian formations is described.
4. Pottery possibilities in the vicinity of Macon, [Bibb Co.] Georgia. 51 p., illus., Macon, Georgia, Macon Chamber of Commerce, Central of Georgia Railway, [1917]. This is a prospectus designed to attract clay-product manufacturers. Kaolin deposits in Twiggs and Wilkinson Cos. are described and analyzed. Feldspar is also described, as is sand.

5. The potash-bearing slates of [Bartow Co.] Georgia: Manufacturer's Record, vol. 74, no. 12, p. 73, illus., 1918. Sericite slate in Bartow Co. is described as a source of potassium. It is described physically and chemically; it comes from the Conasauga Shale of Cambrian age.
6. Cartersville [Bartow Co.] potash slates—their economic relation to chemical and industrial post-war development [abs.]: Geol. Soc. America Bull., vol. 30, p. 112, 1919.
7. (and Mallory, J. M., and Stull, Ray Thomas). Directory of commercial minerals in Georgia and Alabama along the Central of Georgia Railway. 154 p., illus. incl. geol. map, Savannah, Central of Georgia Railway, [1923]. This is an account, by county, of the mineral resources of the area traversed by the railroad. A geological map shows a sketch of the geology along the routes as well as mineral resources.
8. How Stone Mountain [DeKalb Co.] was created. 20 p., illus., Atlanta, [priv. pub.?] 1929; also 29 p., Baltimore, Waverly Press, 1929. This is a popular account of the geology of the Stone Mountain area.
9. Memorial of John Sharshall Grasty [1880-1930]: Geol. Soc. America Bull., vol. 42, p. 25-30, port., 1931.
10. Bentonite deposits and uses [Crisp Co.]: Manufacturer's Record, vol. 104, no. 11, p. 27, 1935. Bentonite, containing about 17 percent sand, and overlain by 15 to 25 feet of overburden, is reported from near Musselwhite in Crisp County.
11. An outline of kaolin and china clay resources of Georgia and Alabama along Central of Georgia Railway. 6 p., illus., Savannah, Industrial Dept. Central of Georgia Railway, [193-]. A prospectus cursorily describes clay occurrences in several of the Coastal Plain counties through which the railroad passes. No new details are included.

**MEADE, RICHARD KIDDER,** 1874-

1. Economics and mineral resources of the south of interest to chemical manufacturers: Amer. Inst. Chemical Engineers Trans., vol. 12, pt. 2, p. 39-70, 1920. A list of known mineral resources of the south, including Georgia, is given. No geological data are included. Active, inactive, and abandoned resources are listed.

**MEADOWS, PAUL.**

1. John Wesley Powell [1834-1902]—frontiersman of science: Nebraska Univ. Studies, new ser. no. 10, viii, 106 p., 1952.

**MEANS, ALEXANDER,** 1801-1883.

1. Atlanta [Fulton Co.] mineral spring [abs.]: Atlanta Medical and Surgical Jour., vol. 5, p. 116-117, 1859.

**MEIGS, CHARLES DELUCENA,** 1792-1869.

1. A memoir of Samuel George Morton, M. D. [1799-1851], late president of the Academy of Natural Sciences of Philadelphia . . . . 45 p., port., Philadelphia, T. K. and G. P. Collins, Printers, 1851; in part, Amer. Jour. Science, 2d ser. vol. 13, p. 153-178, 1852.

**MEIGS, JOSIAH**, 1757-1822.

1. [The first?] earthquake in [east central] Georgia [abs.]: Medical Repository, 3d hex. vol. 2 [vol. 14], p. 393-394, 1811; addition by—Jackson, p. 394.

**MEINZER, OSCAR EDWARD**, 1876-1948.

1. The occurrence of ground water in the United States: U. S. Geol. Survey Water-Supply Paper 489, 321 p., illus., 1923. A discussion of the principles of the occurrence of ground water is followed by a generalized review of the main sources in the United States; Georgia is included, although little detail is given.
2. Large springs in the United States: U. S. Geol. Survey Water-Supply Paper 557, 94 p., illus., 1927. Several springs issuing from the limestone in the southern counties are considered "large." They are cursorily described. Blue Spring in Decatur Co. is the largest in Georgia. The flow is over 20 million gallons per day.

**MELL, PATRICK HUES, JR.**, 1850-1918.

1. Gold mining in [Paulding Co.] Georgia: Engineering and Mining Jour., vol. 24, p. 258-259, 275, illus., 1877. Gold-bearing quartz veins in metamorphic rock are described. Copper minerals are present also, but in different veins. Details from the Burnt Hickory gold region are cited.
2. Auriferous slate deposits of the southern mining region: Amer. Inst. Mining Engineers Trans., vol. 9, p. 399-402, 1881; Engineering and Mining Jour., vol. 31, p. 398-399, 1881. A description of the use of transported water power for mining gold from talcose slate in Lumpkin Co. includes a description of the appearance of the gold ore. The gold occurs in saprolite, and hydraulic mining is proposed.
3. The southern soapstones, kaolins and fire clays and their uses: Amer. Inst. Mining Engineers Trans., vol. 10, p. 318-322, 1882. Steatite, or soapstone, from Whitfield Co. is analyzed.

**MELLEN, JAMES VEDREY.**

1. Pre-Cambrian sedimentation in the northeast part of the Cohutta Mountain Quadrangle, [Fannin Co.] Georgia: Georgia Mineral Newsletter, vol. 9, p. 46-61, illus., 1956; M. S. Thesis, Cornell Univ., 1956. Abundant illustrations indicate a great variety of sedimentary features which are used in evaluating the Precambrian sedimentary rocks. Graywacke predominates; some sandstone, siltstones, slates and phyllites are present. The rocks, 15,000 feet thick, are part of the Great Smoky Group.

**MENDENHALL, THOMAS CORWIN**, 1841-1924, *see also* Dutton, Clarence Edward, 1.

1. Life and letters of William Barton Rogers [1804-1882]: Science, new ser. vol. 6, p. 1-9, port., 1897.

MENDENHALL, WALTER CURRAN, 1871-1957.

1. [Charles] David White [1862-1935]: Science, new. ser. vol. 81, p. 244-246, 1935.
2. [Charles] David White [1862-1935]; an appreciation: Scientific Monthly, vol. 40, p. 380-382, port., 1935.
3. Memorial of [Charles] David White [1862-1935]: Geol. Soc. America Proc. 1936, p. 271-280, port., 1937.

MERIWETHER, DAVID.

1. Particulars of a remarkable body of sea shells, now existing in the [Effingham Co.] interior part of the state of Georgia . . . [abs.]: Medical Repository, vol. 6, p. 329, 1803.
2. Extensive layers of marine shells found in Georgia and the Mississippi territory [abs.]: Medical Repository, 2d hex. vol. 3, [vol. 9], p. 436, 1806.

MERRIAM, CLINTON HART, 1855-

1. William Healey Dall [1845-1927]: Science, new ser. vol. 65, p. 345-347, 1927; Smithsonian Inst. Ann. Rept. 1927, p. 563-566, port., 1928.

MERRIAM, JOHN CAMPBELL, 1869-1945.

1. Doctor [Charles Doolittle] Walcott [1850-1927] as a paleontologist, and his relations with the Carnegie Institution of Washington: Smithsonian Misc. Collections, vol. 80, no. 12, p. 5-9, 1928.

MERRILL, FREDERICK JAMES HAMILTON, JR., 1861-1916.

1. Barrier beaches of the Atlantic coast: Popular Science Monthly, vol. 37, p. 736-745, 1890. This is a very generalized description of the physiography and origin of the barrier beaches. Very little is said about those of Georgia.

MERRILL, GEORGE PERKINS, 1854-1929.

1 Notes on asbestos and asbestiform minerals: U. S. Natl. Museum Proc., vol. 18, p. 281-292, illus., 1896. Material from Georgia and elsewhere is discussed and analyzed in a general review. Anthophyllite, though fibrous, differs from asbestos in many ways.
2. John Wesley Powell [1834-1902]: Amer. Geologist, vol. 31, p. 327-338, port., 1903.
3. The heretofore undescribed stony meteorite from Thomson, McDuffie County, Georgia: Smithsonian Misc. Collections, vol. 52, p. 473-476, illus., 1909. The stone is described but not anlayzed. It weighs 234 grams.
4. Memoir of W[illiam] S[mith] Yeates [1856-1908]: Geol. Soc. America Bull., vol. 20, p. 618-619, port., 1910.
5. Handbook and descriptive catalogue of the meteorite collections in the United States National Museum: U. S. Natl. Museum Bull., vol. 94, x, 205 p., illus., 1916. A general discourse on meteorites is followed by physical descriptions and chemical analyses of the meteorites in the collection. Many are from Georgia.

6. Notes on the Whitfield County, Georgia, meteoritic irons with new analyses: U. S. Natl. Museum Proc., vol. 51, p. 447-449, illus., 1916. Chemical analyses show that two previously reported meteorites are different rather than parts of the same fall.
7. Biographical memoir of George Ferdinand Becker, 1847-1919; bibliography compiled by Isabel P. Evans: Natl. Acad. Science Biog. Mem., vol. 21, 2d mem., 19 p., port., 1926.
8. (editor and compilor). Contributions to a history of American state geological and natural history surveys: U. S. Natl. Museum Bull. 109, 547 p., illus. incl. ports., 1920. One chapter of nine pages is devoted to the history of the several geological surveys of Georgia. The first, by John Ruggles Cotting, is described, as is the second, by George White, and the following ones by Joseph William Winthrop Spencer in 1890, William Smith Yeates, in 1920.

**MERTIE, JOHN BEAVER, JR.**, 1888-
1. Heavy minerals in the Pleistocene terrace deposits of South Carolina and Georgia: U. S. Geol. Survey Trace Elements Memorandum Rept. 23, 27 p. (‡), illus., 1950. Minor amounts of heavy minerals occur in the sands of the terraces, the mean percentage in Georgia being 0.37. Larger percentages of monazite occur in those samples which have small amounts of total heavy minerals. Most of the data is from the southeastern area of the state.
2. Monazite deposits of the southeastern Atlantic states: U. S. Geol. Survey Circ. 237, 31 p., illus., 1953. Monazite occurs in granitic intrusive rocks in the Piedmont of Georgia, in the saprolite resulting therefrom, and as placer concentrations in the Piedmont and Coastal Plain. Its geology and occurrences are described, and locations of deposits are given. Analyses are included.
3. Zirconium and hafnium in the southeastern Atlantic states: U. S. Geol. Survey Bull. 1082, p. iii, 1-28, illus., 1958. A discussion of the occurrence of the mineral zircon in igneous, metamorphic, and sedimentary rocks includes a general description of the various types of deposits. It occurs in all of the Coastal Plain rocks of Georgia.

**MERWIN, HERBERT EUGENE**, 1878-1963, *see also* Piggott, Charles Snowden, 2.
1. Memorial to Henry Stephens Washington [1867-1934]: Geol. Soc. America Proc. 1951, p. 165-173, port., 1952.

**MEUNIER, STANISLAUS**, 1843-1925.
1. Revision des fers météoritiques de la collection du muséum d'histoire naturelle de Paris: Societé d'Histoire Naturelle d'Autun Bull 6, p. 217-292, illus., 1893. A new classification of iron meteorites is described. The meteorites from Union, Cherokee, and Whitfield Cos. are described within the classification.
2. Guide dans la collection des météorites avec le catalogue . . . . 58 p., Paris, Lab. de géol. du Mus. [d'Hist. Naturelle], 1909. Fragments of the Union and Whitfield Co. meteroites are included in this collection. Little information is given.

**MEYER, ROBERT PAUL,** *see also* Woollard, George Prior, 5.

1. (and Woollard, George Prior). Seismic evidence for basement uplift in the Georgia-South Carolina Coastal Plain [abs.]: Geol. Soc. America Bull., vol. 67, p. 1721, 1956.
2. The geologic structure of the Cape Fear Axis as revealed by refraction seismic measurements. Ph. D. Thesis, Univ. Wisconsin, 1956 [1957]; Dissertation Abstracts, vol. 17, p. 1730, 1957.

**MIDDLETON, GEORGE.**

1. Notes on Georgia's geology: Mineral Collector, vol. 13, p. 101-104, 115-118, 137-141, 1906. This is a popular review of the mineral resources of the state. Much emphasis is placed upon the iron ores found in the northwestern Palozoic terrane. The granite intrusions, the basic-rock intrusions, and the Coastal Plain sedimentary rocks are also discussed.

**MIERS, HENRY ALEXANDER,** 1858-

1. Obituary, Samuel Lewis Penfield [1856-1906]: Mineralogical Mag., vol. 14, p. 264-268, port., London, 1907.

**MILLER, ARTHUR KEITH,** 1902-1963.

1. (and Furnish, William Madison, Jr.). Studies of Carboniferous ammonoids: Jour. Paleontology, vol. 14, parts 1-4, p. 356-377, illus., 1940. *Lyrogoniatites newsomi georgiensis,* from the Floyd Shale in Floyd Co., is described and illustrated. Correlations with Europe are discussed.
2. Tertiary nautiloids of the Americas: Geol. Soc. America Mem. 23, viii, 234 p., illus., 1947. *Aturia alabamensis* is described and illustrated. It is reported from an unknown level and location in Georgia; it is Eocene in age and therefore no doubt from the Coastal Plain.

**MILLER, EDWARD,** 1760-1812, *see* Mitchill, Samuel Latham, 2.

**MILLER, RALPH LE ROY,** 1909-

1. Memorial to Armin Kohl Lobeck (1886-1958): Geol. Soc. America Proc. 1958, p. 147-155, port., 1959.

**MILNE-EDWARDS, HENRI,** 1800-1885.

1. Histoire naturelle des coralliaires ou polyps proprement dits. 3 vols., 324, 633, 560 p., illus. atlas of plates, Paris, Librairie Encyclopédique de Roret, 1857-1860. *Dendracis gervillii,* from Eocene rocks at Jacksonboro, Screven Co., is described and illustrated in vol. 3.

**MILTON, CHARLES,** 1896-

1. Basement cores from Georgia, Alabama, and Florida [abs.]: Geol. Soc. America Bull., vol. 65, p. 1364, 1954.

MINOT, CHARLES SEDGWICK, 1852-1914.

1. A tribute to Joseph Leidy [1823-1891]: Science, new ser. vol. 37, p. 809-814, 1913.

MISER, HUGH DINSMORE, 1884-

1. [Charles] David White [1862-1935]: Amer. Assoc. Petroleum Geologists Bull., vol. 19, p. 925-931, port., 1935.
2. (and others). [Charles] David White [1862-1935]: Amer. Assoc. Petroleum Geologists Bull., vol. 20, p. 625-632, 1936.
3. N[elson] H[oratio] Darton, honorary member: Amer. Assoc. Petroleum Geologists Bull., vol. 22, p. 1118-1120, port., 1938.
4. Memorial to Miss Olive C[lara] Postley [1881-1941]: Washington Acad. Science Jour., vol. 33, p. 350, 1943.
5. Manganese deposits of the southeastern states, *in* Snyder, Frank G., ed., Symposium on mineral resources of the southeastern United States, p. 152-169, illus., 1950. A general review of the occurrences of this material includes those deposits of the Cartersville District in Bartow County. No new data are included.

MISSISSIPPI OIL SCOUTS ASSOCIATION.

1. Georgia: Natl. Oil Scouts and Landsmen's Assoc. Yearbook 1943, vol. 13, p. 144-146, illus., 1943. A small-scale structural contour map on the top of the Eocene is included in an otherwise tabular description of land-leasing activity.

MITCHELL, LANE, 1907- *see also* Crickmay, Geoffrey William, 18.

1. Geological museums in Georgia: Forestry-Geological Review, vol. 5, no. 7, p. 7-8, illus.; no. 8, p. 7-8, illus., 1935; revised with title, The common rocks and minerals of Georgia: Georgia Geol. Survey Inf. Circ. 5, 4 p., illus., [1935]; 2d ed., 1936. A collection of rocks and minerals from Georgia is described. It is available for display to any museum which requests it.
2. Mammoths and mastodons at Savannah, [Chatham Co.] Georgia [abs.]: Geol. Soc. America Proc. 1935, p. 402, 1936.
3. (and others). (The) mineralogy and genesis of hydroxylapatite: Amer. Mineralogist, vol. 28, p. 356-371, illus., 1943. The mineral is analyzed chemically and optically. It comes from Cherokee County near Holly Springs and is a product of metamorphism in the presence of much water.
4. Mineral and colloidal constitution of some Georgia kaolins. Ph. D. Thesis, Pennsylvania State Coll., 1941; (and Henry, Edward Carleton). Nature of Georgia kaolin [Part] 1—Evidence of chemical and colloidal analysis, [Part] 2—Evidence of mineralogical analysis: Amer. Ceramic Soc. Jour., vol. 26, p. 105-119, illus., 1943; Pennsylvania State College Mineral Industries Exper. Sta. Tech. Paper 85, 1943. Chemical-, physical chemical-, mineralogical-, thermal-, and x-ray-analyses of Georgia Fall Line kaolins are given. The clay is presumed to have been deposited as clay in fresh water lakes near the strand line. Other details are also described.

5. (A) new classification of the clays of Georgia, *in* Short contributions to the geology, geography, and archaeology of Georgia: Georgia Geol. Survey Bull. 50, p. 96-98, 1950. Clay is divided into the groups kaolinite, montmorillonite, and illite on the basis of chemical composition. The places in Georgia where the various types can be located are listed.
6. Thermal analysis of Georgia minerals, *in* Short contributions to the geology, geography, and archaeology of Georgia: Georgia Geol. Survey Bull. 50, p. 99-105, illus., 1950. The principles of differential thermal analysis are explained with examples of curves from Georgia clays.
7. J[oseph] Roy Chapman [1898-1957]: Georgia Mineral Newsletter, vol. 10, p. 108-109, port., 1957.
8. (and Poulos, Nick E.). The relationship of structure of Georgia kaolin to its viscosity: Georgia Inst. Technology Engineering Exper. Sta. Bull. 23, 41 p., illus., 1959. In an otherwise technical discussion of the properties of kaolin, chemical and x-ray analyses and electron photomicrographs of kaolin are given. Kaolinite is the common clay mineral, although halloysite and dickite are also present.

**MITCHELL, WILLIAM LOUIS**, 1919-

1. A detailed study of the Silurian stratigraphy in Walker County, Georgia. M. S. Thesis, Emory Univ., 1950.

**MITCHILL, SAMUEL LATHAM**, 1764-1831.

1. Uncommon petrifactions from Georgia and Kentucky: Medical Repository, 2d hex. vol. 5 [vol. 11], p. 415-416, illus., 1808. An echinoid of some sort, from somewhere on the Coastal Plain is described. It appears to be a sand-dollar type, and is probably Eocene.
2. (and Miller, Edward). Maclure's geological inquiries [in Georgia]: Medical Repository, 2d hex. vol. 6 [vol. 12], p. 295-296, 1809. This is a report of William Maclure's being in Georgia gathering information for a map to be published.
3. A detailed narrative of the earthquakes which occurred on the 16th day of December, 1811 . . . : Literary and Philos. Soc. New York Trans., vol. 1, p. 281-307, 1815. A general description of the New Madrid, Missouri, earthquake includes an account of its activity in Savannah. Another shock on Dec. 23d, 1812, is described from a place of uncertain origin, but appears to be the Savannah River area.
4. Observations on the geology of North America, *in* Essay on the theory of the earth, by G. Cuvier, p. 319-424, illus., New York, Kirk and Mercein, 1818. In this edition only, a description of the marine rocks along the Savannah River is given, as is a mention of echinoids from somewhere nearby. The origin of the Coastal Plain sediments is thought have been from the west side of the Blue Ridge Province and the Valley and Ridge Province, where great marine lakes were present, to eventually escape out of breaches (what are now known as watergaps) and deposit the sediments on the Coastal Plain.

5. Observations on the teeth of the *Megatherium* recently discovered in the United States [Chatham Co.]: Lyceum Natural Hist. New York Annals, vol. 1, p. 58-61, illus., 1823. An account of the first finding of the giant sloth from Skidaway Island is given. The teeth are described and illustrated. [They are Pleistocene.]

**MONEYMAKER, BERLEN CLIFFORD, 1904-**

1. Character and origin of certain clastic sediments in the southern Appalachians [abs.]: Geol. Soc. America Bull., vol. 56, p. 1183, 1945.
2. Nottely Project [Union Co.], *in* The Hiwassee Valley Projects: Tennessee Valley Auth. Tech. Rept. 5, vol. 2, p. 52-55, illus., 1948. A general description of the geology at the Nottely damsite is given. Little detail is included.
3. Some broad aspects of limestone solution in the Tennessee [River] Valley: Amer. Geophysical Union Trans., vol. 29, p. 93-96, illus., 1948. The limestone regions of northwestern Georgia are implied. Geological structure plays an important part in the amount of solution which has taken place. Some of the larger caves and channels may date back to Mesozoic time.
4. (and others). Geology and foundation treatment: Tennessee Valley Auth. Tech. Rept. 22, 548 p., illus., 1949. Details of the geology associated with T. V. A. damsites and the engineering solutions to the problems are discussed for the Nottely damsite in Union County.
5. Earthquakes in Tennessee and nearby sections of neighboring states—1851-1900: Tennessee Acad. Science Jour., vol. 30, p. 222-233, 1955. Many were felt in Georgia. One was centered in "northern Georgia" and was felt over an extensive area.
6. Earthquakes in Tennessee and nearby sections of neighboring states—1901-1925: Tennessee Acad. Science Jour., vol. 32, p. 91-105, 1957. Many quakes were felt in Georgia but only one epicenter was located here. It occurred in the Piedmont, southeast of Atlanta.

**MONNETT, VICTOR ELVERT, 1889-**

1. Charles Elijah Decker (1868-1958): Amer. Assoc. Petroleum Geologists Bull., vol. 43, p. 263-266, port., 1959.

**MONROE, WATSON HINER, 1907-**

1. Stratigraphy of outcropping Cretaceous beds of southeastern states: Amer. Assoc. Petroleum Geologists Bull., vol. 31, p. 1817-1824, illus., 1947. A general review of the Cretaceous formations includes those of the Georgia Coastal Plain. A comparison between those of Georgia and those of central Alabama is made.
2. Nelson Horatio Darton (1865-1948): Amer. Assoc. Petroleum Geologists Bull., vol. 33, p. 116-123, port., 1949.
3. General geologic features of the Atlantic and Gulf Coastal Plain, *in* Proceedings of the southeastern mineral symposium 1950: Kentucky Geol. Survey ser. 9, Spec. Pub. 1, p. 5-16, illus., 1953. A very general discussion of the Coastal Plain sedimentary history is given. Rocks of Jurassic-Tertiary age are included.

MOODY, CLARENCE LEMUEL, 1888-1963.

1. Mesozoic igneous rocks of northern Gulf Coastal Plain: Amer. Assoc. Petroleum Geologists Bull., vol. 33, p. 1410-1428, illus., 1949. Surface exposures of Mesozoic igneous rocks around the edges of the Coastal Plain are discussed; some Triassic dikes are in Georgia. An index map indicates igneous rocks present in the subsurface of southwestern Georgia, but no data are given.

MOORE, ELWOOD S., 1878-1966.

1. Memorial to Heinrich Ries [1871-1951]: Geol. Soc. America Proc. 1951, p. 141-144, port., 1952.

MOORE, JOHN BYRON, JR., 1924-

1. Some structural features of Ordovician red beds in [Whitfield Co.] northwest Georgia: Georgia Acad. Science Bull., vol. 12, p. 64-68, illus., 1954. Axial plane and flow cleavage, a-lineation and b-lineation in incompetent strata are described and used to determine the complex structural deformation of a local exposure and to determine its relationship to the regional structure.
2. (The) structure and stratigraphy of the Ordovician limestones in Mill Creek Valley [Whitfield Co.]. M. S. Thesis, Emory Univ., 1954.

MOORE, JOSEPH.

1. Description of a new species of gigantic beaver-like rodent: Cincinati Soc. Natural Hist. Jour., vol. 13, p. 26-30, illus., 1890; correction, p. 103. A large tooth from the "gold working area" in northern Georgia is described and illustrated. It was initially thought to be from a beaver, but corrected to be from a hippopotamus, and possibly not even fossil.

MOORE, RAYMOND CECIL, 1892-

1. Framework of southeastern North America [abs.]: Geol. Soc. America Bull., vol. 39, p. 181, 1928; Pan-Amer. Geologist, vol. 49, p. 141, 1928.
2. (chairman, and others). Correlation of Pennsylvanian formations of North America: Geol. Soc. America Bull., vol. 55, p. 657-706, chart, 1944. The Pennsylvanian rocks of northwestern Georgia are included in a comprehensive time-rock chart and discussion of the Pennsylvanian System of the United States.
3. Memorial to Charles Elijah Decker (1868-1958): Jour. Paleontology, vol. 32, p. 1160-1161, port., 1958.

MOORE, WILLIAM HALSELL, JR., 1930-

1. Chert horizons in the Mississippian limestones of Lookout Mountain [Dade Co.] [abs.]: Georgia Acad. Science Bull., vol. 12, p. 32, 1954.
2. (The) detailed stratigraphy and paleontology of the Mississippian System of the area between Cooper Heights [Walker Co.] and Trenton [Dade Co.] Georgia. M. S. Thesis, Emory Univ., 1954.

MOORMAN, JOHN JENNINGS, 1802-1885.

1. The Virginia springs, and springs of the south and west. ix, 403 p., illus., Philadelphia, J. B. Lippincott and Co., 1859. Brief, riotous descriptions of five mineral springs in Georgia are included. No details are given.
2. The mineral waters of the United States and Canada . . . . 507 p., illus., Baltimore, Kelly and Piet, 1867. In a general treatise on the joys and delights of the use of spring water for all sorts of ailments, is a discussion of many individual springs. Indian, in Butts Co., Madison, in Madison Co., Warm Springs in Meriwether Co., Rowlands Spring in Bartow Co., Gordon Springs in Murray Co., and Catoosa Springs in Catoosa Co. are exhorted. No analyses are given.
3. Springs of Georgia, Chap. 30 *of* Mineral springs of North America, p. 206-207, illus., Philadelphia, J. B. Lippincott and Co., 1873. A general discussion of mineral springs includes brief descriptions of some of those from Georgia. The medicinal claims are heroic.

MORAN, H. E. *see* Fieldner, Arno Carl, 1; Harr, Luther, 1.

MORCOM, A. J., *see* Nagelschmidt, Gunter, 1.

MOREHEAD, MARCUS BILLY, 1933-

1. Observations on cross laminations in some Pennsylvanian outcrops in northwest Georgia [abs.]: Georgia Acad. Science Bull., vol. 16, p. 7, 1958.

MORGAN, CECIL L., *see* Alexander, Clyde Wayne, 1.

MORRIS, CHARLES E.

1. (and Taylor, Frank Hamilton). Piedmont line, and illustrated guide to western North Carolina, South Carolina, and Georgia. 80 p., illus., Piedmont Air-line Railroad, Philadelphia [188-]. Colorful descriptions of Piedmont Georgia are included, some being topographic and others economic. The gold fields and mineral springs are given special attention.

MORRIS, F. GRAVE.

1. Soil erosion in south-eastern United States: Geographical Jour., vol. 90, p. 363-370, illus., London, 1937. A general discussion of soil erosion, the factors and results, includes examples of gully formation in Georgia. The "Lyell Gully," in Baldwin Co. and the "Grand Canyon" in Sumter Co. [?Stewart Co.] are described.

MORTON, PAUL C.

1. Mineral resources of Georgia: Amer. Jour. Mining, vol. 1, p. 265-266, 1866. A general review of the mineral resources of the state is given; no new data are included. Most of the emphasis is placed upon the metal ore resources.

**MORTON, SAMUEL GEORGE,** 1799-1851, *see also* Vanuxem, Lardner, 1.

1. Synopsis of the organic remains of the ferruginous sand formation of the United States: Amer. Jour. Science, vol. 17, p. 274-295; vol. 18, p. 243-250, 1830; supplements, vol. 23, p. 288-294, 1833; vol. 24, p. 128-132, 1833; discussion by William More Gabb with title, A revision of the species *Baculites* . . . : Acad. Natural Science Philadelphia Proc. 1861, p. 394-396, 1862. Upper Cretaceous glauconitic sand from Cockspur Island, Chatham Co., is described. It is said to be found near Sandersville (Washington Co.) where it is characterized by belemnites which are discussed by Gabb.
2. Synopsis of the organic remains of the Cretaceous group of the United States. 88 p., illus., Philadelphia, Key and Biddle, 1834; appendix, Catalog of the fossil shells of the Tertiary Formations of the United States . . . . 8 p. Allusion is made to the Cretaceous rocks in Georgia also, but the text suggests that the Eocene was also included. He has reported *Belemnitella americanus* from near Sandersville, Washington County.
3. Memoir of William Maclure [1763-1840] . . . . 37 p., Philadelphia, 1841; 2d ed., 33 p., port., Philadelphia, 1844; Amer. Jour. Science, vol. 47, p. 1-17, port., 1844.

**MOSIER, MC HENRY,** 1885-1952.

1. Charles F[reeman] Jackson [1886-1945], an appreciation: Mining and Metallurgy, vol. 26, p. 412, port., 1945.

**MOSS, RYCROFT GLEASON,** 1904-

1. Buried Pre-Cambrian surface in the United States: Geol. Soc. America Bull., vol. 47, p. 935-966, illus., 1936. A general discussion of the methods used to obtain and evaluate data is followed by a series of contour maps showing the surface. Gentle flexures are on an otherwise regularly seaward-dipping surface.

**MOXHAM, ROBERT MORGAN.**

1. Airborne radio-activity survey in the Folkston area, Charlton County, Georgia, . . . : U. S. Geol. Survey Geophysical Investgiation Map GP 119, with text, scale, 1 inch to 1 mile, 1954. Several areas of slightly higher-than-average radioactivity are outlined. No analysis is offered.
2. (and Johnson, Robert William, Jr.). Airborne radioactivity survey of parts of the Atlantic Ocean beach, Virginia to Florida: U. S. Geol. Survey Trace Elements Memorandum Rept. 644, map, scale, 1 inch to 10 miles, with text, 1953. The actual line of survey is along the coast of Georgia, and anomalies are reported from numerous places along the offshore islands. The radioactive anomalies are related to heavy mineral concentrations in the beach sands.

**MOXON, CHARLES.**

1. On the geology of the United States: Geologist 1843, p. 56-64, illus., London, 1843. An extremely cursory review of the geology of the eastern United States is given. A small-scale geological map is included.

MUEGGE, OTTO, 1858-

1. Bemerkungen ueber die Zwillingsbildung einiger Mineralien: Neues Jahrbuch fuer Mineralogie . . . 1884, vol. 1, p. 216-224, illus., Stuttgart, 1884. The crystals of kyanite from Graves Mountain, Lincoln Co., are included in a general discussion on twinning.

2. Beobachtungen an Korund und Rutil, [part] 3 *of* Zur Kenntniss der Flaechenveränderungen durch secondaere Zwillingsbildung II: Neues Jahrbuch fuer Mineralogie . . . 1886, vol. 1, p. 146-154, Stuttgart, 1886. Crystals of rutile from Graves Mountain in Lincoln Co. are used as examples of certain crystallographic features.

3. Rutil mit Absonderung nach (902), no. 17 *of* Mineralogisches Notizen: Neues Jahrbuch fuer Mineralogie . . . 1897, vol. 2, p. 82-84, illus., Stuttgart, 1897. Some aspects of the crystal structure of rutile from Graves Mountain in Lincoln Co. are discussed.

MUMPTON, FRED ALBERT.

1. (and Roy, Rustum). New data on sepiolite and attapulgite [Decatur Co.]: Natl. conference on clays and clay minerals 5th, Ada Swineford, ed., p. 136-143, illus., Washington, D. C. Natl. Research Council, Natl. Acad. Sciences, 1958. Detailed x-ray analyses show the differences between these two minerals which resemble one another greatly. The attapulgite contains more aluminum.

MUNYAN, ARTHUR CLAUDE, 1908- *see also* Bay, Harry X., 1; Cooke, Charles Wythe, 18; Furcron, Aurelius Sydney, 2, 3; Stringfield, Victor Timothy, 1; Warren, Moultrie Alfred, 1, 2.

1. Recent petroleum activities in Coastal Plain of Georgia: Amer. Assoc. Petroleum Geologists Bull., vol. 22, p. 794-798, 1938; Oil and Gas Jour., vol. 36, no. 55, p. 65, 1938. An extremely cursory description of the structures in the Coastal Plain is included. Few wells have been drilled; no petroleum is now being produced.

2. Supplement to sedimentary kaolins of Georgia: Georgia Geol. Survey Bull. 44-A, 42 p., illus., 1938. A general discussion of the nature and occurrence of kaolin is followed by a description of individual deposits in the Cretaceous rocks of the Coastal Plain. Sections are measured. Some bauxite deposits in Sumter and Meriwether Cos. are also discussed.

3. Oil search in Georgia covers wide front: Oil and Gas Jour., vol. 38, no. 44, p. 24-26, 99-100, illus. incl. port., 1940. A generalized review of the geology of the Coastal Plain includes a summary of the various Mesozoic and Cenozoic formations and their petroleum potential. Selected logs are included, and a cursory description of some of the structures is given. Brief mention of the petroleum potential of the Paleozoic terrane is included also.

4. (and others). [Economic study of the Macon, Bibb Co. area]: Georgia Inst. Technology, Engineering Exper. Sta. Spec. Rept. 1, [185 p. (‡)], illus., 1943. A prospectus type survey of the region includes descriptions of the mineral resources of the area of the 26 counties surrounding Macon. Bauxite, kaolin, sand, feldspar, fuller's earth, limestone, mica, clay and abrasives are present, and a generalized description of the geology is included. Maps of each county, showing kaolin and bauxite deposits are also included.

5. Subsurface stratigraphy and lithology of the Tuscaloosa Formation in the southeastern Gulf Coastal Plain: Amer. Assoc. Petroleum Geologists Bull., vol. 27, p. 596-607, illus., 1943. A general discussion of the Cretaceous formations in the region includes the log of a deep well in Pierce County. The Tuscaloosa Formation here is 380 feet thick. The lower part is marine; the upper part is terrestrial.

6. Geology of the Augusta area, *in* Economic study of Augusta [Richmond Co.] area: Georgia Inst. Technology, Engineering Exper. Sta. Spec. Rept. 2, p. 222-248 (‡), illus., 1944. A cursory description of the geology of the 31-county Augusta area is given. Clay and granite are the chief mineral resources discussed. Sand is also present in great quantities. Maps of each county, showing kaolin deposits, are also included.

7. Geology, [supplement to] Economic study of the Valdosta area, by the Industrial Economic Research Staff, Engineering Exper. Sta., 16 p. (‡), Atlanta, Georgia Inst. Technology, 1945. A cursory review of the geology of southwestern Georgia is given. No new details are included.

8. Geology, *in* Economic study of Waycross area: Georgia Inst. Technology, Engineering Exper. Sta. Spec. Rept. 10, 16 p. (‡) [p. 265-281 (‡)], illus., 1945. A survey of the general geology of the eight counties, centered around Ware Co., is given. No new details are included. Petroleum is the only mineral resource discussed.

9. Geology and geography, *in* Economic study of the Macon area Georgia, by the Industrial Economic Research Staff, Engineering Exper. Sta., p. 76-90 (‡), Atlanta, Georgia Inst Technology, 1945. A cursory review of the geology of the 26 counties around Macon is given. No new data are included.

10. Glass, *in* Economic study of the southwest, or Albany [Dougherty Co.] area: Georgia Inst. Technology Engineering Exper. Sta. Spec. Rept. 14, p. 181-193, illus., 1945. Deposits of sand and gravel from the southwestern counties are described; potential uses are discussed.

11. Industrial mineral planning in Georgia: Emory Univ. Quarterly, vol. 1, p. 90-100, illus., 1945. This is a popular account of some of the more valuable industrial mineral deposits of the state. No new data are included.

12. Limestone, *in* Economic study of the southwest Georgia, or Albany [Dougherty Co.] area: Georgia Inst. Technology, Engineering Exper. Sta. Spec. Rept. 14, p. 173-180 (‡), illus., 1945. A discussion of the occurrence of limestone in the entire southwestern area of the state includes analyses and potential values and uses.

13. Mineral industries, *in* Economic study of the Valdosta [Lowndes Co.] area: Georgia Inst. Technology, Engineering Exper. Sta. Spec. Rept. 11, p. 217-221 (‡), 1945. Sand and gravel are the chief mineral products of the area. They are found in Berrien, Brooks, Cook, Echols, and Lowndes Counties. Some appear to be of glass-sand quality.

14. (The) geology of the northeast Georgia area, *in* Economic study of northeast Georgia: Georgia Inst. Technology Engineering Exper. Sta. Spec. Rept. 21, p. 66-72, illus., 1946. A cursory, general description of the geology of the area is given. All the rocks are metamorphic and igneous. Gold and stone are the only mineral resources described, although others are mentioned throughout the text of the whole bulletin.

15. Mineral industries, *in* Economic study of the Rome [Floyd Co.] area: Georgia Inst. Technology Engineering Exper. Sta. Spec. Rept. 20, p. 123-201, illus., 1946. A cursory review of the mineral resources of Bartow, Chattooga, Floyd, Gordon, and Polk Cos. is given. Iron, limestone, cement, clay, shale, sand, and gravel are discussed; many analyses are included.

16. A new species of sponge from the Middle Cambrian of [Floyd Co.] Georgia: Jour. Paleontology, vol. 21, p. 546-548, illus., 1947. *Protospongia coosensis*, from nodules in the Conasauga Formation in Floyd Co., is described and illustrated.

17. Geology and mineral resources of the Dalton [15'] Quadrangle, [Murray, Whitfield, Catoosa Cos.] Georgia—Tennessee: Ph. D. Thesis, Univ. Cincinnati, 1951; Georgia Geol. Survey Bull. 57, vi, 128 p., illus. incl. geol. map, 1951. A complete geological description of the area is given. Cambrian to Ordovician, and Cenozoic rocks are mapped and described. Sections are measured. Folds and thrust faults are the dominant structures. Barite, clay, carbonate rocks, manganese, iron, and tripoli are the mineral resources discussed.

18. Geology of the Paleozoic area in northwest Georgia, *in* Geology of the crystalline rocks and the Paleozoic area of northwest Georgia: Southeastern Geol. Soc. [Guidebook] Field Trip 7, p. 14-41 (‡), illus., 1951. A generalized description of the Paleozoic rocks, their stratigraphy, paleontology, and structure, includes an itemized road log for a field trip. Emphasis is placed upon the Cambrian and Lower Ordovician rocks.

**MURCHISON, CHARLES,** *see* Falconer, Hugh, 1, 2.

**MURCHISON, RODERICK IMPEY,** 1792-1871.

1. Secondary and Tertiary rocks and superficial deposits of North America, *in* Anniversary address of the President [of the Geol. Soc. London]: Geol. Soc. London Proc., vol. 4, p. 127-133, 1846. In a review of the recently accumulated knowledge of the geology of the United States, reference to the presence of Tertiary rocks in Georgia is made; they are cursorily described, mostly abstracting from data already published by Lyell upon his return to Europe from his North American travels.

MURPHY, LEONARD MAURICE.

1. United States earthquakes 1947: U. S. Coast and Geod. Survey Ser. 730, iv, 62 p., illus., 1950. The earthquake of Dec. 27, 1947, is described. It was in the Chattanooga area and was felt in Walker and Whitfield Counties.

MURPHY, ROBERT EDWARD, JR., 1927-

1. Paleontology and stratigraphy of the Middle and Upper Ordovician limestones in Rabbitt Valley [Catoosa Co.] Georgia. M. S. Thesis, Emory Univ., 1953.

MURRAY, DAVID, 1830-1905.

1. A catalogue of the published works of James Hall, 1836-1882 [and supplement to 1883]: New York State Museum Ann. Rept. 36, p. 79-94, 1883; . . . Ann. Rept. 42, p. 75-97, 1889.

MURRAY, GROVER ELMER, JR., 1916- *see also* Frink, John Westlake, 1.

1. Claiborne Eocene species of the ostracod genus *Loxoconcha:* Jour. Paleontology, vol. 12, p. 586-595, illus., 1938. *Loxoconcha mcbeanensis,* from the Eocene McBean Formation, Richmond Co., is decribed and illustrated.
2. (and others). Bibliography of Gulf-Coast Cenozoic formations . . . to 1949. 94 p. (‡), Austin, Univ. Texas Geol. Soc., 1950.
4. Sedimentary volumes in Gulf Coastal Plain of United States and Mexico. Foreword and summary: Geol. Soc. America Bull., vol. 63, p. 1157-1158, table, 1952. The volume of the Cenozoic rocks in Georgia are included with those in Florida. The data are in tables. The total is from 48-52,000 cubic miles for Cenozoic rocks, 50-60,000 cubic miles for Cretaceous rocks and 10-15,000 cubic miles for those of pre-Cretaceous Mesozoic rocks.
4. Geological occurrence of oil and gas in Gulf Coastal Province of the United States, *in* Guzmán-Jimenez, E. J., ed., Symposium sobre yacimientos de petroleo y gas, vol. 3, America del Norte, p. 235-290, illus., Mexico, D. F., Internatl. Geol. Cong. 20th, 1956; revised, Gulf Coast Assoc. Geol. Soc. Trans. vol. 7, p. 253-299, illus., 1957; abridged, Oil and Gas Jour., vol. 55, no. 44, p. 109-116, illus., 1957. A detailed account of the general geological sedimentary history of the Gulf of Mexico includes Georgia. The major tectonic features of the Coastal Plain are outlined. Rocks from Lower Cretaceous to Recent age are present. Small-scale isopach maps are included.
5. Relationships of Paleozoic structures to large anomalies of coastal element of eastern North America: Gulf Coast Assoc. Geol. Socs. Trans., vol. 6, p. 13-24, illus., [1956]. Areas of Paleozoic structural deformation are outlined. Positive and negative areas are identified, and the geographic and geometric orientation and association of these features with Coastal Plain structural features are pointed out. The Rome Recess is aligned with the Central Georgia Arch; the Savannah Basin is aligned with the Knoxville, Tennessee, salient.

MURRAY, HAYDEN HERBERT, 1924- *see also* Johns, William Davis, 1.

1. Sedimentary kaolins of the southeastern United States—their present and future economic importance [abs.]: Geol. Soc. America Bull., vol. 69, p. 1716, 1958.

MUSSET, R.

1. La production de la bauxite aux Etats-Unis: Societé géologique et minéralogique de Bretagne Bull., vol. 2, p. 264-273, illus., Rennes, 1922. The deposits of the eastern United States, including those of northwestern Georgia, and the Coastal Plain, are described. A climatic control is suggested, indicating tropical conditions at the time of formation.

MYERS, GEORGE SPRAGE.

1. [Edward Drinker] Cope [1840-1897] as an icthyologist: Copeia, no. 2, p. 76-78, port., 1940.

MYERS, WILLIAM MARSH, 1892-1951.

1. (and Zerfoss, Samuel). Frederick Augustus Genth, 1820-1893, chemist, mineralogist, collector: Franklin Inst. Jour., vol. 241, p. 341-354, illus., 1946; Pennsylvania State College Mineral Industries Exper. Sta. Circ. 27, 1946.

NACOOCHEE HYDRAULIC MINING COMPANY.

1. Nacoochee Hydraulic Mining Company [White Co.] [prospectus]. 32 p., illus., [n.p.] [n.d.] [Boston, 1861] [includes reports by William Phipps Blake and Carl David Smith]. The occurrence of gold in veins, as placers, and in saprolite is described. Much emphasis is placed on the hydraulic engineering potential for mining.

NAGELSCHMIDT, GUNTER.

1. (and Donnelly, H. F., and Morcom, A. J.). On the occurrence of anatase in sedimentary kaolin [Coastal Plain]: Mineralogical Mag., vol. 28, p. 492-495, illus., London, 1949. Anatase is shown to be present in clay-sized particles. Electron micrographs, chemical, and x-ray studies are used. The kaolin is from Georgia, but is not further identified.

NAVARRE, ALFRED THEODORE, 1894-1962, *see also* Fortson, Charles Welborn, Jr., 1; Ingols, Robert Smalley, 2.

1. The Stone Mountain and Lithonia plutons [DeKalb Co.] [abs.]: Georgia Acad. Science Bull., vol. 9, no. 1, p. 15-16, 1951.
2. The utilization of Lithonia [DeKalb Co.] migmatite in agriculture, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 92-100, illus., 1953. Numerous analyses are included in an otherwise purely agricultural discussion of the use of such material for fertilizer.
3. Geochemical analysis of various minerals and rocks for nickel content [abs.]: Georgia Acad. Science Bull., vol. 13, p. 58, 1955.

NEEDHAM, J. G.

1. Between the hills and the sea—erosion's processes in Georgia's gullies and Florida's swamps: Amer. Forests, vol. 39, p. 198-199, illus., 1933 [not seen]. A cursory description of erosion on the Coastal Plain is given, with illustrations. The influence of forests, or lack of them, is cited.

NELMS, WILLIAM STOCKTON, 1883-1952, *see* Hootman, James Albert, 1.

NELSON, WILBUR ARMISTEAD, 1889-

1. Topography of the former continent of Appalachia (from geologic evidence): Amer. Geophysical Union Trans., vol. 21, p. 786-796, illus., 1940. Sedimentary evidence, some from Georgia, is used to evaluate the nature of the landmass Appalachia during Paleozoic, Mesozoic, and Cenozoic times.
2. (and Edmundson, Raymond Smith). In memoriam, Charles Butts, Sept. 18, 1863- Oct. 5, 1946: Virginia Acad. Science Proc. 1946-47, p. 105-106, [1947?].
3. Observations on the basement complex of the Atlantic Coastal Plain [abs.]: Virginia Jour. Science, new ser. vol. 3, p. 329-330, 1953.

NESBITT, R. T.

1. Georgia—her resources and possibilities. 468 p., illus., Atlanta, Franklin Printing Co., 1895. In a statistical review of the state, in a Chamber-of-Commerce type work, the economic mineral resources and the geology of Georgia are reviewed. No new data are given, however. A small-scale geological map is included.

NETTLES, JAMES EDWARD, *see* Goodell, Horace Grant, 1.

NEUMANN, FRANK, 1892-1964.

1. United States earthquakes 1933: U. S. Coast and Geod. Survey Ser. 579, ii, 82 p., illus., 1935; . . . 1935, ser. 600, iv, 90 p., illus., 1937; . . . 1936, ser. 610, iv, 44 p., illus., 1938; . . . 1940, ser. 647, iv, 74 p., illus., 1942. Shocks of questionable seismic origin are reported from Eatonton, Putnam Co., on June 9, 1933. A moderate quake is reported from along the North Carolina border on Jan. 1, 1935; the same is true for Jan. 1, 1936?.

NEVIUS J. NELSON.

1. Dr. James Hall [1811-1898]: Engineering and Mining Jour., vol. 66, p. 184, port., 1898.

NEW ENGLAND COMPANY.

1. Extensive coal and iron properties in Dade County, Georgia. New England City, the center of the great mineral quadrilateral . . . . 48 p., illus., New York, South Publishing Co., [n. d.] [post 1890] [contains reports by George Little, Charles Henry Hitchcock, and M. T. Singleton]. This is a prospectus for a land company in Dade Co., but contains geological reports on the mineral resources of the region. Coal, iron, stone, and clay are the chief resources. Their occurrence is described.

NEWHOUSE, WALTER HARRY, 1897- *see also* Park, Charles Frederick, Jr., 2.
1. Waldemar Lindgren, 1860-1939: Science, new ser. vol. 90, p. 584-585, 1939.

NICHOLS, EDWARD.
1. An aluminum-ore, [Floyd Co.] Georgia: Amer. Inst. Mining Engineers Trans., vol. 16, p. 905-906, 1888. The first occurrence of bauxite in the United States is reported from residual deposits in Cambro-Ordovician limestone. Analyses are included.

NININGER, ADDIE DELP.
1. Third catalog of meteoritic falls (S. R. M. nos. 183-321) reported to the Society for Research on Meteorites, January 1939 to October, 1940: Popular Astronomy, vol. 48, p. 555-560, 1940. The list includes information about the Aragon and Cedartown, Polk Co. irons, Paulding Co. iron, and Pickens Co. stone. Date of find, number of fragments, weights, and depository are given.

NITZE, HENRY BENJAMIN CHARLES, 1867-1900.
1. (and Wilkens, Henry A. J.). The present condition of gold-mining in the southern Appalachian states: Amer. Inst. Mining Engineers Trans., vol. 25, p. 661-796, illus., 1896; discussions, p. 1016-1027; discussion by William Marten Brewer, Dixie, vol. 12, no. 3, p. 47, 1896. A discussion of the technological aspects of the gold mining in the Piedmont and Blue Ridge in Georgia includes much reference to the occurrence of the ore minerals. Gold occurs in quartz veins in the gneiss and schists and in the saprolite.
2. Gold mining in North Carolina and adjacent southern Appalachian regions: North Carolina Geol. Survey Bull. 10, 164 p., illus., 1897. A general description of the gold-bearing quartz veins in metamorphic rocks of the Piedmont and Blue Ridge of Georgia are included. Little detail is given.

NORMAN, M. E., *see* Alexander, Clyde Wayne, 1.

NUTTALL, BRANDON D.
1. The Nantahala-Ocoee contact in north Georgia. M. S. Thesis, Univ. Cincinnati, 1950.

NUTTING, PERLEY GILMAN, 1873-1949.
1. The bleaching clays: U. S. Geol. Survey Circ. 3, 51 p. (‡), illus., 1933. The fuller's earth deposits around Macon and in the southwestern part of the Coastal Plain are cursorily described, with most of the emphasis placed upon the physical properties of the Eocene Twiggs clay and Miocene Hawthorne Formation.
2. Adsorbent clays, their distribution, properties, production, and use: U. S. Geol. Survey Bull. 928, p. vi, 127-221, illus., 1943. A general review of the occurrence and properties of bentonite and fuller's earth in Georgia is included.

O'BANNON, PRENTICE HOWARD, *see* Davis, Morgan Jones, 1.

**OKLAHOMA CITY GEOLOGICAL SOCIETY.**

1. Appreciation of Dr. [Charles] David White [1862-1935]: Amer. Assoc. Petroleum Geologists Bull., vol. 19, p. 931-932, 1935.

**OKULITCH, VLADIMIR JOSEPH,** 1906-

1. North American Pleospongia: Geol. Soc. America Spec. Paper 48, vii, 112 p., illus., 1943. Three genera and 8 species are described and illustrated from the Cambrian Shady Limestone in Bartow County.

**OLSON, EVERETT CLAIRE,** 1910-

1. The Upper Mississippian formations of North America. M. S. Thesis, Univ. Chicago, 1933.

**OLSON, JERRY CHIPMAN,** 1917- *see also* Griffitts, Wallace Rush, 1.

1. (and Gates, Daniel William). Map of the Mitchell Creek [mica] Mine, Upson County, Georgia. Scale, 1 inch to 20 feet, U. S. Geol. Survey Strategic Minerals Investigations Prelim. Map, 1943.

**OLSSON, AXEL ADOLF.**

1. Memorial to Gilbert Dennison Harris (1864-1952): Geol. Soc. America Proc. 1953, p. 125-130, port., 1954.

**O'MEARA, ROBERT GIBSON,** *see* Klinefelter, Theron Albert, 1.

**O'NEILL, JAMES F.**

1. (and Wyndham, C. E.). Reconnaissance of the Cartersville manganese deposits, Bartow County, Georgia: U. S. Bur. Mines Rept. Inv. 5017, 63 p. (‡), illus., 1954. A generalized discussion of the occurrence of manganese, occurring as fine oxide and concretionary pellets in residual clay, is followed by descriptions of individual occurrences and some of the mining problems and processes. Analyses are included.

**ORTON, EDWARD,** 1829-1899.

1. Leo Lesquereux [1806-1889]: Amer. Geologist, vol. 5, p. 284-296, port., 1890.

**OSBORN, CLARENCE C.,** *see* Soper, Edgar Kirke, 2.

**OSBORN, HENRY FAIRFIELD,** 1857-1935.

1. Edward D[rinker] Cope [1840-1897]: Science, new ser. vol. 5, p. 705-717, port., 1897.
2. (A) great naturalist, Edward Drinker Cope [1840-1897]: Century Mag., vol. 55, p. 10-15, illus. incl. ports., 1897.
3. Scientific publications of Henry Fairfield Osborn: New York Acad. Science Annals, vol. 13, p. 65-72, 1900.
4. Edward Drinker Cope [1840-1897]: Popular Science Monthly, vol. 70, p. 314-316, port., 1907.
5. Joseph Leidy, 1823-1891: Natl. Acad. Science Biog. Mem., vol. 7, p. 335-396, port., 1913.

6. Species of American Pleistocene mammoths, *Elephas jeffersonii*, new species: Amer. Museum Novitates 41, 16 p., illus., 1922. *Elephas columbi* is considered a synonym of *E. jeffersoni.* Details of the teeth are used as the basis. The Georgia material is not specifically alluded to, however. The type specimen, from Glynn Co., is considered to be a dwarfed female.

7. Joseph Leidy [1823-1891] founder of vertebrate paleontology in America: Science, new ser. vol. 59, p. 173-176, 1924; enlarged, Acad. Natural Science Philadelphia Proc., vol. 75, appendix, p. 54-61, 1924.

8. Biographical memoir of Edward Drinker Cope, 1840-1897: Natl. Acad. Science Biog. Mem., vol. 13, p. 125-171, port., 1930.

9. (and others). Bibliography of Edward Drinker Cope, 1859-1915: Natl. Acad. Science Biog. Mem., vol. 13, p. 172-317, 1930.

10. Fifty two years of research, observation, and publication, 1877-1929, a life adventure in breadth and depth. 160 p., illus. incl. port., New York, Charles Scribner's Sons, 1930.

11. [Edward Drinker] Cope [1840-1897] master naturalist: Science, new ser. vol. 73, p. 225-227, 1931.

12. Cope, master naturalist; the life and letters of Edward Drinker Cope [1840-1897] with a bibliography of his writings classified by subject. 740 p., illus. incl. port., Princeton, New Jersey, Princeton Univ. Press, 1931.

13. Memorial of William Diller Matthew [1871-1930]: Geol. Soc. America Bull., vol. 42, p. 55-94, port., 1931.

14. Proboscidea . . . . 2 vols., xl, 1675 p., illus., New York, Amer. Museum Natural Hist., 1936. A definitive monograph on the group includes a long discussion of *Parelephas columbi*, from Glynn Co., in Pleistocene sediments. It is described and illustrated.

**OVERSTREET, WILLIAM COURTNEY, 1919-**

1. (and Cuppels, Norman Paul, and White, Amos McNairy). Monazite in southeastern United States: Internatl. Conference on Peaceful Uses of Atomic Energy [1st], Geneva 1955, Proc., vol. 6, p. 593-596, 1956; U. S. Geol. Survey Prof. Paper 300, p. 597-601, illus., 1956. Monazite occurs as an accessory mineral in a belt of injection gneisses in the Piedmont. It also occurs in stream placers and as a heavy mineral constituent of the Coastal Plain sedimentary rocks. No details are included.

**OVEY, C. D.**

1. Obituary, Dr. J[oseph] A[ugustine] Cushman [1880-1949]: Nature, vol. 163, p. 944, London, 1949.

**OWEN, RICHARD, 1804-1892.**

1. Descriptive and illustrative catalogue of the fossil organic remains of Mammalia and Aves contained in the Museum of the Royal College of Surgeons in England. vii, 391 p., illus., London, Richard and John E. Taylor, 1845. An elephant, *Lophiodon bathygnathus*, is described from Pleistocene deposits in Glynn County. It was originally called a boar by Harlan. A few fragments and several teeth are present.

2. Observations on certain fossils from the collection of the Academy of Natural Sciences of Philadelphia: Acad. Natural Science Philadelphia Proc., vol. 3, p. 93-96, 1846; . . . Jour., 2d ser. vol. 1, p. 18-20, illus., 1847; correction by Joseph Leidy, . . . Proc., vol. 7, p. 89, 1856. Fragments of bison, horses, and mastodons from [Pleistocene] rocks from the Brunswick Canal in Glynn Co. are described. Genus *Harlanus*, a type of mastodon, is illustrated; Leidy says the *Harlanus* is a *Bison*.

**OWEN, VAUX, JR.**, 1927-1961.

1. Mississippian reef structures in [Dade Co.] northwest Georgia: Georgia Acad. Science Bull., vol. 13, p. 128-131, illus., 1955. *Lithostrotion* coral masses, surrounded by oolitic limestone, which is in turn engulfed by fine-grained limestone and minute fossils are interpreted as having grown as reefs. Dolomitization and replacement in part by silica occurred later.
2. The stratigraphy and lithology of Webster County, Georgia. M. S. Thesis, Emory Univ., 1956.
3. Summary of ground water resources of Lee County, Georgia: Georgia Mineral Newsletter, vol. 11, p. 118-121, 1958. The various subsurface formations of Cretaceous to Eocene age are described along with their water-bearing properties. Analyses of the water are included.
4. A summary of ground-water resources of Sumter County, Georgia: Georgia Mineral Newsletter, vol. 12, p. 42-51, illus., 1959. A survey of the Cretaceous to Recent rocks of the county is followed by a description of the water-bearing properties of each unit. Well data are tabulated. Some springs are present also.

**OZAWA, YOSHIAKI,** *see* Cushman, Joseph Augustine, 4.

**PALACHE, CHARLES,** 1869-1954.

1. Edward Salisbury Dana (1849-1935): Amer. Acad. Arts and Science Proc., vol. 70, p. 517-518, 1936.

**PALLISTER, HUGH DAVIDSON,** 1883-

1. Henry McCalley [1852-1904]: Alabama Geol. Survey Bull. 60, p. 22-24, 1943.
2. Dr. William Frederick Prouty [1879-1949]: Alabama Geol. Survey Bull. 60, p. 28-30, 1948.
3. (and Burchard, Ernest Francis). Natural resource base of the iron and steel industries of the south, Part 2 *of* The iron and steel industries of the south, by H. H. Chapman, p. 27-93, illus., University, Alabama, Univ. Alabama Press, 1953. An extremely generalized description of the occurrence of iron ore in the Silurian rocks, and as residual deposits in Cambrian rocks, and of the coal-field region of northwestern Georgia is included. No new data are given.

**PALMER, KATHERINE EVANGELINE HILTON VAN WINKLE,** 1895- *see also* Wheeler, Harry Edgar, 1.

1. The Veneridae of eastern North America, Cenozoic and Recent:

Palaeontographica Americana, vol. 1, no. 5, p. 209-522, illus., 1927, 1929. Many species from the Tertiary rocks of the Georgia Coastal Plain are described and illustrated.

2. Gilbert Dennison Harris (1864-1952): Amer. Assoc. Petroleum Geologists Bull., vol. 37, p. 2620-2626, port., 1953.

3. Gilbert Dennison Harris, 1864-1952: Jour. Paleontology, vol. 27, p. 615-618, port., 1953.

**PARDEE, JOSEPH THOMAS,** 1871-1960.

1. (and Park, Charles Frederick, Jr.). Gold deposits of the southern Piedmont: U. S. Geol. Survey Prof. Paper 213, vii, 156 p., illus. incl. geol. maps, 1948. Details of the geology and gold deposits of Piedmont and Blue Ridge Georgia are included. The gold occurs primarily in quartz veins in metamorphic rocks, and also as placers and as residual gold in the saprolite. Many individual occurrences in Georgia are mapped and discussed.

**PARIS MUSEUM D'HISTOIRE NATURELLE.**

1. Guide dans la collection de météorites . . . . 40 p., Paris, Libr. de l'Academie de Médicine, 1882. A general discussion of meteorites includes a catalogue in which fragments of the Union, Whitfield, and Monroe Co. meteorites are included. No new data are given.

**PARIZEK, ELDON JOSEPH,** 1920- *see also* Woodruff, James Frederick, 1, 2.

1. Inclusions in some granites of the Piedmont of [Clarke Co.] Georgia [abs.]: Georgia Acad. Science Bull., vol. 10, no. 1, p. 11, 1952.

2. Status of Georgia's geologic map: Assoc. Amer. Geographers Southeast Div. Memorandum Folio, vol. 4, p. 43-45 (‡), 1952. A criticism of the state geological map of 1939 is offered. Caution is urged in using the mapped boundaries especially in the Piedmont and Blue Ridge regions.

3. Does Georgia have any tidelands oil?: Georgia Review, vol. 7, p. 309-318, illus., 1953. This is a popular account of the emerged and submerged Coastal Plain, along with a description of legal problems attendant upon ownership.

4. Geology of a portion of the east-central Georgia [Clarke Co.] Piedmont [abs.]: Geol. Soc. America Bull., vol. 64, p. 1563, 1953.

5. Joseph LeConte [1823-1901]—one of Georgia's finest: Georgia Mineral Newsletter, vol. 6, p. 84-87, port., 1953.

6. Lithologic and structural control of southeast-flowing streams in the Georgia Piedmont: Assoc. Amer. Geographers Southeast Div. Memorandum Folio, vol. 5, p. 27-29 (‡), 1953. Lithology, joints, and faults are shown to influence the direction of some of the streams, but meanders and other stream patterns suggest that the rivers are flowing below an old peneplain upon which they were originally consequent.

7. Observations on the types and directions of lineation in a portion of the eastern Georgia Piedmont, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 296-303, illus., 1953. Lineation in the crystalline rocks is primary and secondary. Several kinds are mapped; they are:

primary flow, secondary flowage, slippage, rotation, and intersection of planes. In the southeast, Oglethorpe Co., the trends are N20-30E; in the center, Oconee, Clarke, Madison Cos., they trend north-south, and in the northwest, Barrow and Jackson Cos., they trend northwest-southeast.

8. (A) preliminary investigation of the geology of Clarke Co., Georgia, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 21-31, illus., 1953. A generalized description of the topography, petrography, and stratigraphy is given. Gneiss, migmatite, and gneissoid granite have been intruded by granite, and all of these intruded by diabase dikes. A sketch map is included. The metamorphic rocks are considered Precambrian in age; the age of the igneous rocks is uncertain.

9. (and Woodruff, James Frederick). The problem of a peculiar quartz horizon in the [north Georgia] Piedmont: Assoc. Amer. Geographers Southeast Div. Memorandum Folio, vol. 5, p. 30-34 (‡), 1953. A quartz zone, a few inches to a foot thick, and containing occasional residual bedrock fragments, lies horizontally between 6 and 10 feet below the surface. Possible sources are described, and ground water plus solid diffusion are offered as the explanation.

10. Sedimentary study of a commercial sand deposit in northwest Greene County, Georgia, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 270-277, illus., 1953. Histograms and other data are presented for a sand deposit occurring in the Oconee River floodplain. The sands are arkosic and nonfossiliferous. Fluvial deposition is suggested by the sorting. They may be of floodplain origin, or partly floodplain and partly marine. The Fall Line is not far to the south of the deposit.

11. (and Woodruff, James Frederick). The importance of soil-creep in the east Georgia Piedmont: Assoc. Amer. Geographers Southeast Div. Memorandum Folio, vol. 6, p. 60-62 (‡), 1954. Soil creep is not important in the east Georgia Piedmont. The various factors which show its presence are not recognized.

12. (The) influence of lithology and structure on the course of the upper Oconee River: Georgia Acad. Science Bull., vol. 12, p. 110-114, illus., 1954. In Hall, Jackson, Clarke, and Oconee Cos. the Oconee River has incised itself consequently from an original peneplain. Joints, faults, and hard rocks have caused the resulting post-uplift-streams to adopt peculiar courses resembling meanders.

13. (and Woodruff, James Frederick). Origin of a flat-lying siliceous layer in the [east-central] Georgia Piedmont [abs.]: Geol. Soc. America Bull., vol. 65, p. 1366, 1954.

14. River pirates in Georgia: Georgia Mineral Newsletter, vol. 7, p. 40-42, illus., 1954. A popular account of the diversion of the headwaters of the Chattahoochee River by the Tugaloo River near Tallulah Gorge, in Rabun and Habersham Cos., is followed by the description of a potential stream piracy in Hall County.

15. (and Woodruff, James Frederick). Influence of underlying rock structures on valley profiles in the Georgia Piedmont [abs.]: Assoc. Amer. Geographers Annals, vol. 45, p. 288-289, 1955.

16. Physiography and geology of Clarke County, Georgia [abs.]: Geol. Soc. America Bull., vol. 66, p. 1694-1695, 1955.

17. Xenoliths in granodiorites of the east Georgia [Clarke Co.] Piedmont: Georgia Acad. Science Bull., vol. 13, p. 85-89, illus., 1955. Schist and hornfels xenoliths in granodiorite are described. They are interpreted as being part of the original country rock. The long dimensions of the xenoliths and the flow patterns in the granodiorite are concordant.

18. (and Woodruff, James Frederick). (The) apparent absence of soil creep in the Georgia Piedmont: Geol. Soc. America Bull., vol. 67, p. 1111-1116, illus., 1956. Stone lines, layers of pebbles at the junction of the bedrock with the overlying soil, do not reflect creep in Georgia as the other obvious criteria for soil creep are not present. The lack of features reflecting creep in itself is remarkable.

19. (and Woodruff, James Frederick). Buried pre-modern erosional surface in the Georgia Piedmont [abs.]: Geol. Soc. America Bull., vol. 67, p. 1725, 1956.

20. (and Woodruff, James Frederick). Description and origin of stone layers in the soils of the southeastern states: Jour. Geology, vol. 65, p. 24-34, illus., 1957. Lenses and blankets of stones or pebbles, called carpedoliths, located in the soil zones of the southeastern United States, are interpreted as lag gravels, or surface accumulations which were later covered by sedimentary processes. Much data comes from Clarke County.

21. (and Woodruff, James Frederick). Mass wasting and the deformation of trees: Amer. Jour. Science, vol. 255, p. 63-70, illus., 1957. Illustrative examples, some from the Piedmont of Georgia, are used to show that the effect of soil creep on the curvature of trees need not be as important as is suggested in many books. Some trees on slopes are not curved; some are curved in opposite directions from each other, and some are curved opposite to the direction expected.

**PARK, CHARLES FREDERICK, JR.**, 1903- *see also* Pardee, Joseph Thomas, 1.

1. (and Wilson, Roy Arthur). The Battle Branch Gold Mine, Auraria, [Lumpkin Co.] Georgia: Econ. Geology, vol. 31, p. 73-92, 1936; summary by Geoffrey William Crickmay, Forestry-Geological Review, vol. 6, no. 3, p. 5, 1936. Gold occurs in hypogene veins in the last of three periods of mineralization. The veins occur irregularly in, though controlled by, schistosity planes in the gneiss country rock. The ore shoots are irregular pod-shaped bodies. The sequence of mineralization is described.

2. Some gold deposits in Georgia, *in* Walter Harry Newhouse, ed., Ore deposits as related to structural features, p. 199-201, illus., Princeton, New Jersey, Princeton Univ. Press, 1942. The gold-bearing veins of the Piedmont are cited as examples of deposits which are both parallel and oblique to the directions of layered rock. Fault planes served as channels for the emplacement of the veins.

3. Gold deposits of Georgia, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 60-67, illus., 1953; Georgia Mineral Newsletter,

vol. 6, p. 107-113, illus., 1953. This is an extremely generalized review of the occurrence of gold in Georgia. The gold comes from quartz veins intruded into the metamorphic rock of the Piedmont and Blue Ridge. It is commonly associated with pyrite.

PARKER, EDWARD WHEELER, 1860-

1. Coal fields of the United States: U. S. Geol. Survey Mineral Resources 1907, part 2, p. 31-37, illus., map by Marius Robinson Campbell, 1908. A map of the coal fields of the United States includes those in Dade and Walker Counties. Brief tables and analyses are included.

PARKER, FRANCES LAURENCE, 1906- *see* Cushman, Joseph Augustine, 12.

PARKER, GEORGE HOWARD, 1864-

1. William Healey Dall (1845-1927): Amer. Acad. Arts and Science Proc., vol. 62, p. 251-253, 1928.

PARKER, GLENN LANE, 1884-1946.

1. (and others). Surface water supply of the United States, part 2, South Atlantic Slope . . . : U. S. Geol. Survey Water-Supply Paper 892, viii, 441 p., illus., 1942. The measurement of discharge, in sec.-feet, for DeSoto Spring, near Milford, Baker Co., is recorded. It varies from .36 to .59.

PARKER, JOHN MASON, 3d., 1906-

1. Feldspar and mica deposits of southeastern United States, *in* Snyder, Frank G., ed., Symposium on mineral resources of the southeastern United States, p. 42-48, illus., 1950. A very generalized discussion of the occurrence and origin of these materials includes those from the Piedmont of Georgia. Little detail is given.

PARSONS, ARTHUR BARRETTE, 1887-

1. Gold in the land of cotton: Mining and Metallurgy, vol. 16, p. 251-255, 260, illus., 1935. This is a semipopular account of the occurrence of gold in the southeastern states, including the Piedmont and Blue Ridge of Georgia. No details are included.

PARTSCH, PAUL MARIA, 1791-1856.

1. Die Meteoriten oder vom Himmel gefallen Steine und Eisenmassen im k. k. Hof-mineralien Kabinette zu Wien. xii, 162 p., illus., Vienna, Kaulfuss Witwe, Prandel and Comp., 1843. A general description of the meteorites in the collection includes two of the pieces from the Monroe Co. stone.

PATTERSON, R. M.

1. [Diamond from Hall Co.] [abs.]: Amer. Philos. Soc. Proc., vol. 4, p. 240, 1847.
2. Ueber die Beschaffenheit und das Vorkommen des Goldes, Platins und der Diamanten in den Vereinigten Staaten: Deutsche geol-

ogische Gesellschaft Zeitschrift, vol. 2, p. 60-64, Berlin, 1850. A diamond from Hall Co. is described. It came from gold placer deposits and is 2⅛ carats in size. Others are reported.

**PATTON, JACOB L.**

1. Petroleum operations in south Alabama, Georgia, and Florida: Georgia Mineral Newsletter, vol. 7, p. 135-139, illus., 1954. This is a generalized review of the stratigraphy of the area and an account of the major structural features. In Georgia they are: Decatur Arch, the Southwest Georgia Trough, the Ocala Uplift and the Southeast Georgia Basin.

**PAULSEN, CARL GUSTAVE,** 1881-1961.

1. (and others). Surface water supply of the United States, part 2, South Atlantic Slope . . . : U. S. Geol. Survey Water-Supply Paper 872, ix, 388 p., 1941. The discharge of Magnolia Spring, in Jenkins Co., is 14.1 cu. ft./sec., and that of Cave Spring in Floyd Co., is 3.90 cu. ft./sec.
2. Obituary, Glenn Lane Parker [1884-1946]: Washington Acad. Science Jour., vol. 36, p. 248, 1946.

**PAYNE, WILLARD M.,** *see* Harris, R. Merrill, 1, 2.

**PEALE, ALBERT CHARLES,** 1849-1914, *see also* Stephenson, Lloyd William, 14.

1. Lists and analyses of the mineral springs of the United States: U. S. Geol. Survey Bull. 32, 235 p., 1886. Many springs in the state are included in tabular descriptions; analyses are included for many.
2. Natural mineral waters of the United States: U. S. Geol. Survey Ann. Rept. 14, pt. 2, p. 49-88, illus., 1894. A general treatise on mineral springs includes brief references to fifteen in Georgia.

**PEARE, CATHERINE OWENS.**

1. A scientist of two worlds—Louis Agassiz [1807-1873]. 188 p., port., Philadelphia, J. B. Lippincott Co., 1958.

**PECK, JACOB.**

1. Geological and mineralogical account of the mining districts in the State of Georgia . . . : Amer. Jour. Science, vol. 23, p. 1-10, illus., 1833; corrections, p. iii. A very general survey of the geology and topography of the Blue Ridge and Piedmont is given. Gold occurs in quartz veins which are in the slate and schist country rock, and sulphide ores are noted. Little detail is included.

**PEELE, ROBERT,** 1858-

1. James Furman Kemp [1859-1926]: Engineering and Mining Jour., vol. 122, p. 872, port., 1926.

**PEGRUM, REGINALD HERBERT.**

1. Louis Agassiz [1807-1873] and the glacial-age theory: Hobbies, vol. 9, p. 151-157, 174, illus. incl. port., 1929.

PELLOUX, ALBERTO.

1. Henry Stephens Washington [1867-1934]: Societa Geologica Italiana Bull., vol. 53, no. 2, p. cii-cvii, Rome, 1935; Bulletin volcanologique, 8th Annee, nos. 1-4, p. 151-158, port., 1936.

PENDLETON, EDMUND MONROE, 1815-1884.

1. General report on the topography, climate and diseases of Middle Georgia: Southern Medical Reports, vol. 1, p. 315-342, 1850; Charleston Medical Jour. and Review, vol. 7, p. 433-458, 1852; review *in* DeBow's Review, vol. 10 (new ser. vol. 4), p. 79-80, 1851. The cursory but fascinating description of the geology of the southern part of the Piedmont is given. The topographic influence of the igneous rocks is recognized. Kaolin is recoginzed as a potential mineral resource.

PENFIELD, SAMUEL LEWIS, 1856-1906, *see* Genth, Frederick Augustus, 7.

PENROSE, RICHARD ALEXANDER FULLERTON, JR., 1863-1931.

1. (The) distribution of manganese in North America: Engineering and Mining Jour., vol. 52, p. 126, 1891. A cursory description of the occurrence of manganese as a residual deposit includes that of Bartow County. No details are included.
2. Manganese, its uses, ores, and deposits: Arkansas Geol. Survey Rept. 1890, vol. 1, xxvii, 642 p., illus., 1891. A detailed treatise on manganese includes a discussion of the nature and occurrences of the ore in the Cartersville District of Bartow Co. and in the Cave Spring District of Polk County. The ore occurs primarily as residual material and as veins in the Cambrian terrane.
3. Memoir of Persifor Frazer [Jr.] [1844-1909]: Geol. Soc. America Bull., vol. 21, p. 5-12, port., 1910.

PEPPER, WILLIAM, 1843-1898.

1. (and others). Report of Committee on Sanitaria and on Mineral Springs: Amer. Medical Assoc. Trans., vol. 31, p. 537-565, 1880. A general description of mineral springs from the chemical-medical point of view, includes descriptions of Indian Springs, (aperient saline) in Butts Co. and Catoosa Springs, (calcareous) in Catoosa Co. The origin of the dissolved salts is discussed.

PERKINS, HENRY FRANK, *see* England, Charles Bennett, 1.

PERRY, ALEXIS.

1. Mémoire sur les tremblements de terre aux États-Unis et dans le Canada: Societé d'Emulation du Départment des Vosges Annales, vol. 7, p. 341-411, Épinal, France, [1849]. Four earthquakes centered in Georgia are listed, but no detailed information other than the date and the time of day are given.

PERRY, EUGENE CARLETON, JR., 1933- *see also* Furcron, Aurelius Sydney, 50, 51.

1. A study of sedimentation in a Cartersville [Bartow Co.] slime pond [abs.]: Georgia Acad. Science Bull., vol. 16, p. 7, 1958.

**PERRY, JOHN BULKLEY**, 1825-1872.

1. Sketch of the life of Dr. Ebenezer Emmons [1800-1863]: Boston Soc. Natural Hist. Proc., vol. 12, p. 214-216, 1869.

**PERRY, STUART HOFFMAN**, 1874-1957, *see also* Henderson, Edward Porter, 2, 3.

1. The metallography of meteoritic iron: U. S. Natl. Museum Bull. 184, vii, 206 p., illus., 1944. A detailed discussion of the metallographic techniques and their application to the study of iron meteorites is followed by illustrations of results. Many meteorites from Georgia are included.
2. The Cedartown, [Polk Co.] Georgia meteorite: Smithsonian Misc. Collections, vol. 104, no. 23, 3 p., illus., 1946. The iron-nickel meteorite of 25.5 pounds is described and analyzed. Photomicrographs are included.

**PETAR, ALICE VIRGINIA**, *see also* Tyler, Paul McIntosh, 1.

1. Sillimanite, kyanite, andalusite, and dumortierite: U. S. Bur. Mines Inf. Circ. 6255, 19 p. (‡), 1930. A general discussion of the uses and properties of these materials is followed by extremely cursory references to occurrences, some in Cherokee, Cobb, Habersham, and Upson Counties. Only kyanite is known from Georgia.

**PETERSON, HAZEL AGNES.**

1. Interval [isopach] maps of the Cretaceous sediments of the United States [abs.]: Texas Acad. Science Proc. Trans. 1942, vol. 26, p. 129-132, 1943.

**PETTY, JULIAN JAY**, 1901-

1. Pedestal rocks of granite in the southeastern Piedmont: Elisha Mitchell Scientific Soc. Jour., vol. 48, p. 119-122, illus., 1932. Chemical weathering, acting more rapidly near the soil at the base, results in mushroom-shaped outcrops. Some examples are from Jones and DeKalb Counties.

**PEYTON, ALEXANDER L.**

1. (and Leweicki, Walter T.). Investigation of the Cartersville Manganese District, Bartow County, Ga.: U. S. Bur. Mines Rept. Inv. 4539, 32 p. (‡), illus., 1949. A general discussion of the occurrence of the ore in the district is followed by analyses of cores taken from numerous individual deposits.
2. (and Cofer, Harland Elbert, Jr.). Magruder and Chambers copper deposits, Lincoln and Wilkes Counties, Ga.: U. S. Bur. Mines Rept. Inv. 4665, 23 p. (‡), illus., 1950. The Chambers Mine in Wilkes Co., and the Magruder Mine on the border of Wilkes and Lincoln Cos., are drilled for further sulphide potential investigation. Suphide-bearing solutions have invaded the Little River Series of metamorphic rocks. Pyrite is the main mineral, but chalcopyrite is present also. Cores are drilled and logged.

**PEYTON, GARLAND**, 1892-1964, *see also* Furcron, Aurelius Sydney, 2.

1. Geologic map of Georgia [abs.]: Geol. Soc. America Bull., vol. 50, p. 1927, 1939.
2. (and others). Glass sands and glass making materials in Georgia: Georgia Geol. Survey Inf. Circ. 11, 26 p. (‡), 1940. A general discussion of the origin of glass sand is followed by a description of occurrences in Georgia, listed by county. Analyses are included.
3. Mica deposits of Georgia [abs.]: Econ. Geology, vol. 38, p. 169, 1943.
4. Prospecting for oil and gas in Georgia: Interstate Oil Compact [Commission] Quart. Bull., vol. 3, no. 4, p. 20-22, 1944; Oil, vol. 4, no. 11, p. 13-14, 1945; World Petroleum, vol. 16, no. 2, p. 54-56, 1945; Rinehart's Yearbook 1945, [4 p.] (‡), Tulsa, Rinehart Oil News Pub. Co., 1945. A brief summary of the history of petroleum prospecting is given. Nineteen forty four was a peak year. 1938 being the first year in which an adequate test was made. No new data are given.
5. Progress of oil search in Georgia: Oil Weekly, vol. 123, no. 3, p. 92-94, 96, illus., 1946. A general review of the geology of the Coastal Plain and the Paleozoic terrane is given. Generalized well logs are included, as is a cross-section of the Coastal Plain. A history of drilling activity is included.
6. The industrial minerals of Georgia, *in* Short contributions to the geology, geography, and archaeology of Georgia: Georgia Geol. Survey Bull. 56, p. 1-10, 1950; Georgia Mineral Newsletter, vol. 7, p. 1-8, illus., 1954. This is a generalized review of the mineral industry of Georgia. No new data are included.
7. Georgia, *in* Underground storage of liquid petroleum hydrocarbons in the United States, p. 15-16, illus., Oklahoma City, Interstate Oil Compact Commission, Research and Coord. Committee, 1956. Limestone and shale terrane in northwestern Georgia contain potential storage structures, as does cavernous, shale-covered limestone in the Coastal Plain. Porosity could be created artificially in some of the crystalline rocks.

**PHALEN, WILLIAM CLIFTON**, 1877-1949, *see also* Hayes, Charles Willard, 23; LaForge, Laurence, 2.

1. Iron ores near Ellijay, [Gilmer Co.] Georgia: U. S. Geol. Survey Bull. 340, p. 330-334, 1908. The ore occurs as secondary limonite deposited by ground water in fault zones in metamorphic rocks.
2. On a peculiar cleavage structure resembling stretched pebbles near Ellijay, [Gilmer Co.] Georgia: Jour. Geology, vol. 18, p. 554-564, illus., 1910. Elongated pebbles in metamorphic rocks are attributed to being a peculiar combination of flow cleavage plus fracture cleavage and not to being stretched pebbles resulting from metamorphism.
3. Prospecting for bauxite-aluminum ore: Mining and Scientific Press, vol. 105, p. 305-307, illus., 1912. A general discussion of bauxite as an aluminum ore is followed by a review of its occurrences. Those deposits in northwestern Georgia are cursorily described.

**PHILIPS, JAMES V.**, *see* Barrows, Harry H., 1.

PHILLIPS, KENNETH N., 1897-

1. Memoir, Francois Emile Matthes (1874-1948): Mazama, vol. 30, p. 66-67, port., 1948.

PHILLIPS, WILLIAM E.

1. Essay on the Georgia gold mines: Amer. Jour. Science, vol. 24, p. 1-18, illus., 1833. Illustrations of placer-gold-deposit formation are given along with a discussion of the origin of placer deposits. The gold also occurs in quartz veins, both underground and in the weathered saprolite zone. The Shelton Mine, in Habersham Co., is described.
2. Geology, *in* Health and profit as found in the Hilly Pine region [Coastal Plain] of Georgia and South Carolina . . . , by S. E. Habersham, vii, p. 79-85, Augusta, Augusta Press Book and Job Office, 1869. This is in a prospectus designed to exhort the Savannah River area and attract immigrants. A description of the topography, Fall Line, and [Cretaceous and Tertiary] rocks is included.
3. Report . . . upon the topography and hydrography in the vicinity of Augusta, [Richmond Co.] Ga . . . . 28 p., illus., Augusta, John M. Weighs and Co., 1892. This is an engineers report to the city fathers explaining the periodic flooding of the city by the Savannah River. Descriptions of topographic details are included, along with various remedial engineering suggestions.

PIERCE, WILLIAM GAMEWELL, 1904-

1. Cobalt-bearing manganese deposits of . . . Georgia . . . : U. S. Geol. Survey Bull. 940, p. 265-285, illus., 1944. Cobalt-bearing manganese occurrences from Bartow, Floyd, and Polk Cos. are described. Analyses of the cobalt content of the ores are included.

PIERSON, RICHARD EDWIN, 1921-1963.

1. Possible stratigraphic relationships of the Sandersville Limestone [Eocene] to the Ocala Limestone of west Georgia [Coastal Plain]. M. S. Thesis, Emory Univ., 1951.

PIGGOTT, CHARLES SNOWDEN, 1892-

1. The radium content of the Stone Mountain Granite [DeKalb Co.]: Washington Acad. Science Jour., vol. 18, p. 313-316, 1928. A brief summary of the technique employed in the investigation is given; analyses are included. The content varies from 4.013 to 6.757 x $10^{-12}$ gms. radium per gm. of granite.
2. Radium in rocks [Part] 1, The radium content of some representative granites of the eastern seaboard of the United States: Amer. Jour. Science, 5th ser. vol. 17, p. 13-34, illus., 1929; [Part] 2, Granites of eastern North America from Georgia to Greenland, vol. 21, p. 28-36, 1931; (and Merwin, Herbert Eugene). [Part] 4, Location and association of radium in igneous rocks, vol. 23, p. 49-56, 1932. The chemical technique employed is described, and the results are cited. Stone Mountain Granite, from DeKalb Co., is unusually high in its Ra content. The radium is concentrated in the mica minerals. The granite from Stone Mountain is higher in Ra content than any other granite examined. Changes are made in part 2, but the value is still very high. The content of Ra from

Stone Mountain Granite, along with that from other granites, is used to show that the Ra content of granites is higher than that of basic rocks.

**PILSBRY, HENRY AUGUSTUS**, 1862-1957.

1. William Healey Dall [1845-1927]: Nautilus, vol. 41, no. 1, p. 1-6, 1927.

**PINSON, WILLIAM HAMET, JR.**, 1919- *see also* Ahrens, Louis Herman, 1; Aldrich, Lyman Thomas, 2.

1. Geology of Polk County, Georgia. M. S. Thesis, Emory Univ., 1949.
2. (and Ahrens, Louis Herman, and Franck, Mona L.). The abundances of Li, Sc, Sr, Ba, and Zr in chondrites and some ultramafic rocks: Geochemica et Cosmochemica Acta, vol. 4, p. 251-260, London, 1953. Numerous rocks and meteorites are analyzed, among them the Stewart Co. chondrite. The amounts of these rare elements are shown to be relatively uniform throughout, though low, of course; the distribution may be lognormal.
3. (and others). Age study of some crystalline rocks of the Georgia Piedmont [abs.]: Geol. Soc. America Bull., vol. 68, p. 1781, 1957.

**PIRSSON, LOUIS VALENTINE**, 1860-1919.

1. Samuel Lewis Penfield [1856-1906]: Amer. Jour. Science, 4th ser. vol. 22, p. 353-367, port., 1906.
2. Angelo Heilprin [1853-1907]: Amer. Jour. Science, 4th ser. vol. 24, p. 284, 1907.
3. Obituary notice of Samuel Franklin Emmons [1841-1911]: Amer. Jour. Science, 4th ser. vol. 31, p. 467-468, 1911.

**POPE, GEORGE S.**

1. Analyses of coals purchased by the government during the fiscal years 1908-1915: U. S. Bur. Mines Bull. 119, iv, 118 p., 1910. Proximate and ultimate analyses of bituminous coal samples from Walker Co. are included.

**PORTER, JOHN BONSALL**, 1861-

1. The iron ores of the region of southern Tennessee and the surrounding states. Ph. D. Thesis, Columbia Univ., 1884.
2. The iron ores and coals of Alabama, Georgia and Tennessee: Amer. Inst. Mining Engineers Trans., vol. 15, p. 170-218, illus., 1887. A general geological description of the region is followed by more detailed descriptions of the occurrence of residual limonite, Silurian oolitic iron ore, magnetite, and specular hematite in various parts of northwestern Georgia. Coal occurrences and limestone are also discussed. Analyses are included.

**POSEY, JOHN F.**

1. Report upon the topography and epidemic diseases of the state of Georgia: Amer. Medical Assoc. Trans., vol. 10, p. 127-148, 1857; Southern Medical and Surgical Jour. new ser. vol. 14, p. 106-114,

191-202, 1858. Descriptions of the physiography of the Coastal Plain, Piedmont, Blue Ridge, and what is called the limestone region of upper Georgia [the Paleozoic terrane] are given. The nature of the rocks and the resulting topographic expression are described. The origin and location of swamps are described, with the relationships of the swamps to diseases noted.

**POSTLEY, OLIVE CLARA, 1882-1941.**

1. Bibliography of [Charles] David White [1862-1935]: Geol. Soc. America Proc. 1936, p. 280-291, 1937.
2. Oil and gas possibilities in the Atlantic Coastal Plain from New Jersey to Florida: Amer. Assoc. Petroleum Geologists Bull., vol. 22, p. 799-815, illus., 1938. A summary of the stratigraphy and the known structures of the Coastal Plain includes those of southeastern Georgia. Remarks are given regarding certain oil wells which have been drilled.

**POULOS, NICK E.,** *see* Mitchell, Lane, 8.

**POUND, JAMES HANNON, JR., 1932-**

1. Recent stream sedimentation in the vicinity of Stone Mountain, DeKalb County, Georgia. M. S. Thesis, Emory Univ., 1957.
2. (A) study of the variation of sand-silt sizes, across two natural levees on the Chattahoochee River [Fulton Co.] [abs.]: Georgia Acad. Science Bull., vol. 15, p. 61-62, 1957.

**POWELL, JOHN WESLEY, 1834-1902.**

1. Physiographic regions of the United States, [Chap. 3] *of* The physiography of the United States, p. 65-100, illus., New York, Natl. Geographic Society and Amer. Book Co., [1896]. A cursory review of the physiographic provinces includes those of Georgia. No new details are given.

**PRATT, JOSEPH HYDE, 1870-1942.**

1. The occurrence and distribution of corundum in the United States: U. S. Geol. Survey Bull. 180, 98 p., illus., 1901; revised. . . . Bull. 269, 175 p., illus., 1906. This is a monograph of descriptions of occurrences in many Piedmont and Blue Ridge counties; no details are given, however.
2. (and Lewis, Joseph Volney). Corundum and the peridotites of western North Carolina: North Carolina Geol. Survey, vol. 1, 464 p., illus., 1905. Besides the detailed descriptions of the occurrence of corundum and peridotite in North Carolina, descriptions of occurrences in Georgia are included. Corundum occurs associated with the peridotite belt in the Piedmont and Blue Ridge Provinces of Georgia. Little detail is given. Peridotite bodies, and serpentine, are also described.
3. The occurrence and utilization of certain mineral resources of the southern states: Elisha Mitchell Scientific Soc. Jour., vol. 30, p. 1-25, 90-115, 1914. A generalized description of the various mineral

products of the area include those from Georgia. Little detail is given.

4. Memorial of Joseph Austin Holmes [1859-1915]: Geol. Soc. America Bull., vol. 27, p. 22-35, port., 1916.
5. Memorial sketch of Dr. Joseph Austin Holmes [1859-1915]: Elisha Mitchell Scientific Soc. Jour., vol. 32, p. 1-15, port., 1916.

PRATT, NATHANIEL ALPHEUS, JR., 1834-1906.

1. On two sulphurets of copper from the Canton, [Cherokee Co.] (Ga.) Mine: Amer. Jour. Science, 2d ser. vol. 23, p. 409-414, 1857; discussion with title, Cantonite (Pratt), a pseudomorph of covelline after galena, no. 3 *of* Contributions to mineralogy, by Frederick Augustus Genth: Amer. Jour. Science, 2d ser. vol. 23, p. 417-418, 1857. A cursory description of the rocks of the area is followed by a description of the occurrence of harrisite [chalcocite] and cantonite [covellite]. They occur below the weathered zone in the mine.
2. Report on the Banks [pyrite] Mine, Paulding County, Georgia, Atlanta, November 29, 1883. [not seen] [unpublished?]
3. Chestatee pyrites deposit [Lumpkin Co.]: Amer. Fertilizer, vol. 35, no. 5, p. 44c-44h, illus., 1911. A pyrite vein, 30 feet thick, has been intruded along a contact between mica schist and hornblende gneiss, and is exposed at the surface in the form of gossan. The vein is vertical and has been examined by drilling and by a shaft. The nature of the ore body and its occurrence are described.

PRETTYMAN, THOMAS MANN, 1888-1940.

1. (and Cave, Harold Sergius). Petroleum and natural gas possibilities in Georgia: Georgia Geol. Survey Bull. 40, viii, 167 p., illus., 1923. A general discussion of the origin and occurrence of oil and gas is followed by a discussion of the stratigraphy of the Coastal Plain of Georgia. Well logs are described as are structural features. The prospects for a future petroleum industry in Georgia are not bright.

PRICE, PAUL HOLLAND, 1898-

1. The Appalachian structural front: Jour. Geology, vol. 39, p. 24-44, illus., 1931. General descriptions of the folded rocks to the east of the front and relatively flat rocks to the west are given; Georgia is implied. The nature of the deformation is related to the stratigraphy which in turn is related to the depositional history.

PRICE, WILLIAM ARMSTRONG, 1889-

1. Nonmarine nature of Quaternary Atlantic and Gulf Coastal Plain of southeastern North America [abs.]: Geol. Soc. America Bull., vol. 65, p. 1296-1297, 1954.

PRINDLE, LOUIS MARCUS, 1865-1956.

1. (and others). Kyanite and vermiculite deposits of Georgia: Georgia Geol. Survey Bull. 46, ix, 50 p., illus., 1935. A generalized description of the origin and occurrence of kyanite is followed by descriptions of individual deposits, most of which are in the Blue Ridge. It occurs in schist, as placers, and in small veins.

PRIOR, GEORGE THORLAND, 1862-

1. Catalog of meteorites, with special reference to those represented in the collection of the British Museum (Natural History). 196 p., London, British Museum, 1923; revised 1926; appendix, 1927; 2d appendix by Max Hutchinson Hey, 1940. Brief descriptions of the material in the collection are given. Fragments from Cherokee, Whitfield, Monroe, Chattooga, Henry, Stewart, Paulding, Pickens, Wilcox, Putnam, Union, and other counties are present.

PROCTOR, CHARLES A., *see* Curry, Richard O., 1.

PROUTY, WILLIAM FREDERICK, 1879-1949.

1. Relation of geologic structures to marble quarrying [abs.]: Elisha Mitchell Scientific Soc. Jour., vol. 47, p. 124-125, 1931.
2. Further observations concerning Carolina Bays [abs.]: Elisha Mitchell Scientific Soc. Jour., vol. 63, p. 101, 1947.
3. Carolina Bays and their origin: Geol. Soc. America Bull., vol. 63, p. 167-224, illus., 1952. The nature of Carolina Bays, some of which are found on the Coastal Plain of Georgia, is described. An origin attributed to shock waves associated with meteorites is offered after much evidence is discussed. They are also associated with an area of great known meteorite occurrence, part of which is in Georgia.

PRUITT, ROBERT GRADY, JR., 1930- *see also* Barge, Edward Mason, 2, 3.

1. (The) Brevard zone of northeasternmost Georgia [Stephens and Habersham Cos.]. M. S. Thesis, Emory Univ. 1952.
2. (and Juhan, Charles Dodge). Structural investigations in the Cartersville-Whitestone Fault area, Rockmart, [Polk and Paulding Cos.] Georgia [abs.]: Georgia Acad. Science Bull., vol. 10, no. 1, p. 14, 1952.

PUMPELLY, RAPHAEL, 1837-1923.

1. Geological and geographical distribution of iron ores in the United States: U. S. Census 10th, vol. 15, p. 3-36, illus., 1886. A general review of the occurrence of iron ore includes brief descriptions of the ore in the [Red Mountain] Formation of northwestern Georgia. No new details are included.
2. An apparent time break between the Eocene and Chattahoochee Miocene in southwestern Georgia: Amer. Jour. Science, 3d ser. vol. 46, p. 445-447, 1893. The basal unit of the Chattahoochee Group is always a limestone conglomerate composed of fragments of the underlying Eocene limestone; the contact of this conglomerate with the underlying formations undulates. "The Eocene rises island-like into the Miocene." This evidence is interpreted as an unconformity. Most of the evidence is from Decatur County.
3. Memorial of Thomas Sterry Hunt [1826-1899]: Geol. Soc. America Bull., vol. 4, p. 379-393, 1893.

PURI, HARBANS SINGH, 1925-

1. Stratigraphy and zonation of the Ocala Group: Florida Geol. Survey Bull. 38, 248 p., illus., 1957. A detailed stratigraphic and paleontol-

ogical evaluation of this Eocene group includes some reference to its occurrence in the subsurface of southern Georgia. The Crystal River Formation is present in Decatur and Bacon Counties.

PURINGTON, CHESTER WELLS, 1871-1928.

1. Geological and topographical features of the region about Atlanta, Georgia: Amer. Geologist, vol. 14, p. 105-108, illus., 1894. A generalized description of the Piedmont Province of Georgia is given. A dissected flat area containing monadnocks is described. The monadnocks are recognized as igneous intrusions into now-deeply-weathered Archean metamorphic rocks.

RABBITT, JOHN CHARLES, 1907-1957, *see* Kaiser, Edward Peck, 1,

RAGOTZKIE, ROBERT A.

1. Drainage patterns in salt marshes [Coastal Plain]: Proc. Salt Marsh Conference, Marine Inst. Univ. Georgia, p. 22-25, illus., Athens, Georgia, 1959; discussions, p. 26-28. The coastal marshes of Georgia are used as examples in explaining drainage patterns which result from the action of various types of energy, mostly dynamic.

RAISZ, ERWIN JOSEPHUS, 1893-

1. Map of the landforms of the United States. Scale, 1 inch to 50 miles, Cambridge, Massachusetts, Harvard Inst. Geographic Exploration, 1939; also later editions. A map showing landforms, mountains, rivers, etc. includes those from Georgia. Generalized features are also named.
2. François Émile Matthes, 1874-1948: Appalachia, vol. 27, p. 224-226, port., 1948.
3. [Map of] United States and Canada, physiography. Scale, 1:12,000,-000, Chicago, Rand McNalley and Co. [1948]; text on the back; also a 1954 edition.
4. [Map of] land and water of the United States. Scale, 1:9,000,000, [n.p.], 1950.

RAMDOHR, PAUL.

1. Waldemar Lindgren [1860-1939]: Zeitschrift fuer praktische Geologie, vol. 47, no. 11, p. 187, Berlin, 1939.

RAMMELSBERG, KARL FRIEDRICH, 1818-1899.

1. Die chemische Natur der Meteoriten: K. Akademie der Wissenschaften Berlin Abhandlungen 1870, p. 75-160, 1871. The various chemical components and variations are discussed. The Putnam Co. meteorite is described and analyzed. It is virtually pure iron and nickel.

RANKIN, HIRAM S., *see* Hunter, Charles Eugene, 3.

RANSOME, FREDERICK LESLIE, 1868-1935.

1. Samuel Franklin Emmons [1841-1911]: Science, new ser. vol. 33, p. 601-604, 1911; reprinted *in* Geol. Soc. Washington [D. C.], Memorial of Samuel Franklin Emmons, p. 1-6, port., 1911.

RATH, GERHARD VOM, 1830-1888.

1. Ein neuer Beitrag zur Kenntniss der Kristallisation des Cyanit, no. 13 *of* Mineralogische Mittheilungen: Zeitschrift fuer Kristallographie und Mineralogie, vol. 5, p. 17-23, illus., Leipzig, 1881. A general discussion of new crystallization and crystallographic features of kyanite includes a description of material from Graves Mountain in Lincoln County.

RATHBUN, MARY JANE, 1860-1943.

1. Fossil Crustacea of the Atlantic and Gulf Coastal Plain: Geol. Soc. America Spec. Paper 2, vii, 160 p., illus., 1935; corrections . . . , Biol. Soc. Washington Proc., vol. 49, p. 37, 1936. *Callianassa mortoni* from the [Blufftown] Formation, Cretaceous, in Stewart Co., is described; *Ranina georgiana* from the Glendon Limestone, Oligocene, in Decatur Co., is also described and illustrated.

RAY, DONALD L., *see* Furcron, Aurelius Sydney, 49

RAY, LOUIS LAMY, 1909-

1. François Émile Matthes [1874-1948]: Washington Acad. Science Jour., vol. 39, p. 146-147, 1949.

RAYMOND, PERCY EDWARD, 1879-1952.

1. John Mason Clarke (1857-1925): Amer. Acad. Arts and Science Proc., vol. 69, p. 498-502, 1935.
2. Edward Oscar Ulrich [1857-1944]: Science, vol. 99, p. 256, 1944.

RAYMOND, ROSSITER WORTHINGTON, 1840-1918, *see also* Adelberg, Justus, 1, 2; Hitchcock, Charles Henry, 2.

1. Biographical notice of William Phipps Blake [1826-1910]: Amer. Inst. Mining Engineers Bull., vol. 45, p. 749-762, port., 1910; . . . Trans., vol. 41, p. 851-864, port., 1911.
2. Memoir of William Phipps Blake, 1826-1910: Geol. Soc. America Bull., vol. 22, p. 36-47, port., 1911.

READ, THOMAS THORNTON, 1880-1947.

1. Charles Henry Behre, Jr., Chairman, Industrial Minerals Division, A. I. M. E., 1945: Mining and Metallurgy, vol. 26, p. 162, port., 1945.

READE, ERNEST HERBERT, JR., 1936-

1. Distinguishing characteristics of bentonites in northwestern Georgia [abs.]: Georgia Acad. Science Bull., vol. 17, p. 72-73, 1959.

**REEDS, CHESTER ALBERT,** 1882-

1. James Furman Kemp, 1859-1926: Natural History, vol. 27, p. 105-107, port., 1927.

2. Catalogue of the meteorites in the American Museum of Natural History as of October 1, 1935: Amer. Museum Natural Hist. Bull. 73, p. 517-627, 1937. Pieces of eleven meteorites from Georgia are in the collection. Little information is included.
3. Memorial to Carlotta Joaquina Maury [1874-1938]: Geol. Soc. America Proc. 1938, p. 157-168, port., 1939.

**REESIDE, JOHN BERNARD, JR.,** 1889-1958.

1. Stratigraphic nomenclature in the United States: Internatl. Geol. Cong. 16th, Washington 1933, Guidebook 29, 7 p., illus., 1932. A discussion of stratigraphic philosophy in the United States, intended for foreign visitors, includes time-rock charts of all of the periods. The rocks of Georgia are included on most of the charts.
2. Memorial to Wendell Clay Mansfield [1874-1939]: Geol. Soc. America Proc. 1939, p. 213-217, port., 1940.
3. [Edward Oscar Ulrich, 1857-1944]: Washington Acad. Science Jour., vol. 24, p. 168, 1944.
4. Edward Wilber Berry, Feb. 10, 1875- Sept. 20, 1945: Science, vol. 102, p. 498-499, 1945.
5. Timothy William Stanton, 1860-1953: Science, vol. 119, p. 307-308, 1954.
6. Memorial to Timothy William Stanton (1860-1953): Geol. Soc. America Proc. 1954, p. 137-141, port., 1955.

**REHDER, HARALD ALFRED,** 1907- *see* Bartsch, Paul, 1.

**REICHENBACH, KARL FRIEDRICH VON.,** 1788-1869.

1. Ueber die Rinde der meteorischen Eisenmassen: Annalen der Physik und Chemie, [2d ser.] vol. 103, p. 637-644, Leipzig, 1858. A general treatise on the chemical and physical nature of the crust of iron meteorites, resulting from the fall through the atmosphere and subsequent weathering, includes a description of that on the Putnam Co. iron.
2. Anordnung und Eintheilung der Meteoriten: Annalen der Physik und Chemie, [2d ser.] vol. 107, p. 155-182, Leipzig, 1859. A discussion of a new type of classification based on the presence or absence of certain minerals, textures, and electro-chemical properties, includes the placing of the Monroe, Union, and Putnam Co. meteorites in various categories.
3. Ueber die chemische Beschaffenheit der Meteoriten: Annalen der Physik und Chemie, [2d ser.] vol. 107, p. 353-374, Leipzig, 1859. A general treatise on the chemical composition and variation of meteorites includes comparative analyses of those from Monroe and Putnam Counties.

**REITZ, T. A., DU.**

1. The deformation of the Pre-Cambrian peneplain of North America:

Geologiska Foereningens i Stockholm Forhandlingar, vol. 47, p. 250-257, illus., 1925. A map shows the nature and elevation of the Pre-cambrian surface in North America. In Georgia, it rises from below the Coastal Plain to over 1000 feet in the Blue Ridge. No details are included.

RENAUD, CHARLES L.

1. Thomas Mann Prettyman (1888-1940): Amer. Assoc. Petroleum Geologists Bull., vol. 25, p. 346-347, 1941.

RENNER, GEORGE THOMAS, JR.

1. The physiographic interpretation of the Fall Line: Geographical Review, vol. 17, p. 278-286, illus., 1927. The origin of the Fall Line of the southeastern United States, including Georgia, is discussed. He concludes that it is due to the intersection of two peneplains, the earlier one having been tilted.
2. The Fall Line of the eastern United States: Science, new ser. vol. 66, p. 356-357, 1927; discussion with title, The Fall Zone Peneplane, by Henry Staats Sharp, vol. 69, p. 544-545, 1929. The graded condition of streams on both sides of the Fall Zone eliminates rock-type resistance-differences as being the major cause of the Fall Zone. The Fall Zone is due rather to the intersection of two peneplains, one of which, tilted, is partly covered by the Tertiary sediments eroded during the formation of the second. Sharp suggests the name Fall Zone Peneplane for the buried one.

RENSHAW, ERNEST WILROY, 1927- *see also* Cofer, Harland Elbert, Jr., 5.

1. Pennsylvanian sediments in northwest Georgia. M. S. Thesis, Emory Univ., 1951.
2. (and Allen, Arthur Thomas, Jr.). Statistical studies of the sandstones within the Lee Group, Lookout Mountain [Dade Co.], Georgia, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 289-295, illus., 1953. Histograms and other statistical data are given to show the sedimentary distinctions between the Sewanee Conglomerate, Bonair Sandstone, and the Rockcastle Sandstone. The Sewanee is distinctly different.

RESSER, CHARLES ELMER, 1889-1943.

1. Memorial of Anthony W[ayne] Vogdes [1843-1923]: Geol. Soc. America Bull., vol. 35, p. 184, 1924.
2. Nomenclature of some Cambrian trilobites: Smithsonian Misc. Collections, vol. 93, no. 5, 46 p., 1935. Nomenclatural discussions involve many forms which come from northwestern Georgia. Among them are: *Alokistocare americanum* and *A. georgense* from the Conasauga Formation in Floyd Co.
3. Cambrian System (restricted) of the southern Appalachians: Geol. Soc. America Spec. Paper 15, vii, 140 p., illus., 1938. A general discussion of the Cambrian System includes that part in northwestern Georgia. Fossils are listed, described, and illustrated. Inarticulate brachiopods and trilobites are especially discussed.

4. Faunal content of the Maryville Formation: Smithsonian Misc. Collections, vol. 101, no. 10, 8 p., 1942. Evidence is presented to show that the Maryville Formation in Tennessee is an equivalent of the Conasauga Shale in northwestern Georgia. Fosils are listed.
5. Fifth contribution to the nomenclature of Cambrian fossils: Smithsonian Misc. Collections, vol. 101, no. 15, 58 p., 1942. Nomenclatural discussions include changes in names of the trilobites *Maryvillia georgica* and *Blountia antecepta* from the Nolichucky Formation in Bartow County.

**REYNOLDS, DUMOND STODDART,** *see* Mitchell, Lane, 3.

**RICE, WILLIAM ELMER,** 1897- *see* Fieldner, Arno Carl, 1; Harr, Luther, 1.

**RICH, JOHN LYON,** 1884-1956.

1. Memorial to Nevin M[elancthon] Fenneman [1865-1945]: Assoc. Amer. Geographers Annals, vol. 45, p. 181-189, port., 1945.

**RICHARD, LOUIS M.**

1. Garnet deposits of [Lumpkin Co.] Georgia: Mining World, vol. 34, p. 1135, 1911. Iron-alumina garnets in schist saprolite are described and analyzed. Some are of gem quality.
2. Geological survey of Macon County, Georgia, with list of minerals. 44 p., illus., Oglethorpe, Georgia, Macon Co. Geol. Survey Committee, 1958. This is a review of the geology and mineral resources of the county. Kaolin is the most important resource present.

**RICHARDS, HORACE GARDINER,** 1906- *see also* Cooke, Charles Wythe, 22; Straley, H. W., 3d, 1.

1. Fauna of the Pleistocene Pamlico Formation of the southern Atlantic Coastal Plain: Geol. Soc. America Bull., vol. 47, p. 1611-1656, illus., 1935. Only the Pamlico Terrace in Georgia contains fossils. Vertebrates and invertebrates are reported from Chatham and Glynn Counties. The occurrences are described; the fauna is listed.
2. Marine Pleistocene of the Atlantic and Gulf coasts [abs.]: Geol. Soc. America Bull., vol. 49, p. 1957, 1938.
3. Subsurface stratigraphy of the Atlantic Coastal Plain between New Jersey and Georgia: Amer. Assoc. Petroleum Geologists Bull., vol. 29, p. 885-955, illus., 1945; summary, New York Acad. Science Trans., 2d ser. vol. 8, p. 1-4, 1945. Cretaceous to Miocene rocks from Georgia are described. Correlations with other areas are based on macrofossils. Data are extracted from many wells for the identification of formations.
4. (The) Atlantic Coastal Plain, its geology and oil possibilities: World Oil, vol. 127, no. 3, p. 44-50, 58, illus., 1947. This is a generalized review of the Coastal Plain which includes cross sections from north to south and from east to west in Georgia. The petroleum potential is discussed.
5. Invertebrate fossils from deep wells along the Atlantic Coastal Plain: Jour. Paleontology, vol. 21, p. 23-37, illus., 1947. A list of

the fauna, mostly mollusks, is given along with references to locations. Many of the locations are from wells along the Atlantic Coastal Plain, although a few are from the Gulf Coastal Plain. Most are illustrated. *Ostrea peytoni*, *Hamulus howelli*, and *Pecten sealeyi*, all Cretaceous, from Dougherty Co., are described.

6. Studies on the subsurface geology and paleontology of the Atlantic Coastal Plain: Acad. Natural Science Philadelphia Proc., vol. 100, p. 39-76, illus., 1948. Correlations in the Cretaceous and Cenozoic rocks are made from well-log data. The configuration of the basement surface is discussed as well as is the presence of Paleozoic rocks.

7. The occurrence of Triassic rocks in the subsurface of the Atlantic Coastal Plain: Pennsylvania Acad. Science Proc., vol. 23, p. 45-48, 1949. Sandstone and shale at the bottom of an oil well in Mitchell Co. may be Triassic; diabase was also encountered.

8. (and Straley, H. W., 3d). Some structural and stratigraphic features of the Atlantic Coastal Plain [abs.]: Georgia Acad. Science Bull., vol. 8, no. 1, p. 12, 1950.

9. (and Straley, H. W., 3d). Geophysical and stratigraphic investigations on the Atlantic Coastal Plain, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 101-115, illus., 1953. An extremely cursory review of the Cretaceous and Cenozoic stratigraphy of the Atlantic Coastal Plain includes Georgia. The petroleum potential is discussed also.

10. Georgia's geology and the life of its past: Georgia Acad. Science Bull., vol. 11, p. 25-31, illus., 1953. This is a popular review of the geological history of the state. The events of each period are described and a brief mention of the common fossils is included.

11. Record of the rocks. xiv, 413 p., illus., New York, Ronald Press, 1953. A text book of the historical geology of the eastern United States includes some explanations of Georgia geology. No new data are included.

12. (The) Pleistocene of Georgia: Georgia Mineral Newsletter, vol. 7, p. 110-114, illus., 1954. A semi-popular account of the origin and distribution of Pleistocene Coastal Plain sediments includes descriptions and illustrations of some of the common invertebrate fossils.

13. (The) Pliocene of Georgia: Georgia Mineral Newsletter, vol. 7, p. 159-162, illus., 1954. This is a semi-popular account of the nature and distribution of Pliocene sediments on the Coastal Plain of Georgia. Lists and illustrations of common fossils are included.

14. (The) Miocene of Georgia: Georgia Mineral Newsletter, vol. 8, p. 27-33, illus., 1955. A semi-popular account of the origin and distribution of Miocene rocks on the Coastal Plain includes illustrations of the common fossils.

15. (The) Oligocene of Georgia: Georgia Mineral Newsletter, vol. 8, p. 60-64, illus., 1955. This is a semi-popular account of the origin and distribution of Oligocene rocks in the Coastal Plain of Georgia. Fossils are listed, and most are illustrated.

16. (The) Paleocene and Eocene of Georgia, (Part 1, Paleocene, lower and middle Eocene): Georgia Mineral Newsletter, vol. 8, p. 110-116,

illus., 1955; (Part 2, upper Eocene), p. 151-156, illus., 1955. A semi-popular account of the origin, occurrence, and distribution of Paleocene and Eocene rocks on the Coastal Plain includes fossil lists and illustrations.

17. (The) Cretaceous of Georgia, Part 1, Lower Cretaceous, Tuscaloosa and Eutaw Formations: Georgia Mineral Newsletter, vol. 9, p. 19-23, illus., 1956; Part 2, Blufftown, Cusseta, Ripley, and Providence Formations, p. 65-69, illus., 1956. A semi-popular account of the origin and distribution of Cretaceous rocks on the Coastal Plain of Georgia includes fossil lists and illustrations.
18. Don't write off the Atlantic Coastal Plain: Oil and Gas Jour., vol. 54, no. 52, p. 182-191, illus. incl. port., 1956. A general review of the Cretaceous and Cenozoic geology of the Atlantic Coastal Plain includes Georgia. Cross sections show the relationship of the basement to the overlying sedimentary rocks. Little detail is included.
19. (The) marine Pleistocene of eastern North America: Internatl. Quaternary Cong. 4th, Rome-Pisa 1953, Actes, [vol.] 2, p. 526-528, Rome, 1956. Sangamon interglacial deposits are the earliest recognized along the east coast. The fauna suggests a slightly warmer climate than that which now exists. No paleontological data support the existence of earlier Pleistocene deposits.
20. (and Hand, Bryce M.). Fossil shark teeth from the Coastal Plain of Georgia: Georgia Mineral Newsletter, vol. 11, p. 91-95, illus., 1958. A general description of shark teeth and the Coastal Plain of Georgia is followed by a list of the more important collecting localities. They range in age from Cretaceous to Miocene. Systematic descriptions and illustrations are included.
21. Recent studies on the Pleistocene of the south Atlantic Coastal Plain: Southeastern Geology, vol. 1, p. 11-21, 1959. The terraces of the Coastal Plain, including those in Georgia, are correlated within various states and to those of the Mediterranean Sea. This is a review of current work and few new data are included.

RICHARDSON, GEORGE BURR, 1872-1949.

1. Marius Robinson Campbell (1858-1940): Amer. Assoc. Petroleum Geologists Bull., vol. 25, p. 546-550, port., 1941.

RICHTER, RUDOLF.

1. Henry Fairfield Osborn und "Senckenberg": Natur und Volk, vol. 64, no. 11, p. 435-439, port., Frankfort/Main, 1934.
2. Henry Fairfield Osborn [1857-1935]: Natur und Volk, vol. 66, no. 2, p. 51-53, port., Frankfort/Main, 1936.

RICKARD, THOMAS ARTHUR, 1864-

1. (editor). Rossiter Worthington Raymond [1840-1918], a memorial published by the American Institute of Mining and Metallurgical Engineers. 95 p., New York, Engineering Societies Building, 1920.
2. James Furman Kemp [1859-1926]; in memoriam: Engineering and Mining Jour., vol. 123, p. 32-33, port., 1927.

**RIES, HEINRICH,** 1871-1951, *see also* Watkins, Joel Hill, 3.

1. A visit to the bauxite mines of [northwestern] Georgia and Alabama [abs.]: Science, new ser. vol. 3, p. 530-531, 1896.
2. The clays of the United States east of the Mississippi River: U. S. Geol. Survey Prof. Paper 11, 298 p., illus., 1903. A general discussion of the nature and origin of clay includes detailed descriptions of the occurrence of various types of clay in Georgia. Included are descriptions of residual clay and shale in the Paleozoic terrane and the Cretaceous and Tertiary rocks of the Coastal Plain. Analyses are made.
3. The occurrence of high grade American clays and the possibilities of their further development: Amer. Ceramic Soc. Jour., vol. 1, p. 446-467, illus., 1918. An extremely cursory review of the occurrence and distribution of clay includes references to and illustrations of Georgia kaolin deposits.
4. (and Bayley, William Shirley, and others). High-grade clays of the eastern United States . . . : U. S. Geol. Survey Bull. 708, xiv, 314 p., illus., 1922. Descriptions of the occurrence of kaolin on the Coastal Plain of Georgia are included in a general treatise on the occurrence of clay. No new data are included.
5. Memorial of Thomas L[eonard] Watson [1871-1924]: Amer. Mineralogist, vol. 10, p. 54-57, port., 1925.
6. Memorial of Thomas L[eonard] Watson [1871-1924]: Geol. Soc. America Bull., vol. 36, p. 116-128, port., 1925.
7. Clays—their occurrence, properties, and uses . . . . 1st ed., 1906; 2d ed., 1908; 3d ed., 613 p., illus., New York, Wiley, 1927. A complete discussion of the types, nature, occurrence, and use of clay includes descriptions of the kaolin deposits of the Fall Line area in Georgia. No details, save for analyses, are included.

**RIGNEY, HAROLD WILLIAM.**

1. The Middle Mississippian formations of North America. M. S. Thesis, Univ. Chicago, 1933.

**RINEHART OIL NEWS COMPANY.**

1. Review of Georgia oil development in 1947: Rinehart's Yearbook 1948, [1 p.] (‡), 1948. Thirty-two wells have been drilled in the Coastal Plain since 1938. They are summarized, and five drilled in 1947 are reviewed. The total depth of the well and the lithology at the bottom are given.

**RIPLEY, HARRIET ERNESTINE,** 1872-

1. Bibliography of the published writings of Henry Fairfield Osborn for the years 1877-1910. 30 p., Lancaster, Pennsylvania, Press of the New Era Printing Co., 1911.
2. Bibliography of the published writings of Henry Fairfield Osborn for the years 1877-1915, 2d ed., 74 p., [privately published] 1916.

**ROBERTS, JOSEPH KENT,** 1889- *see also* McGill, William Mahone, 1.

1. William Barton Rogers [1804-1882] and his contribution to the

geology of Virginia: Virginia Geol. Survey Bull. 46-C, p. 23-28, port., 1936; Geol. Soc. America Proc. 1935, p. 305-310, 1936.

2. [William Barton Rogers, 1804-1882] and [Thomas Leonard Watson, 1871-1924] *in* Biographical sketches of Virginia geologists, *in* Annotated geological bibliography of Virginia, p. 28-63, Charlottesville, Virginia, Alderman Library, 1942.

3. Memorial to Roy Jay Holden [1870-1945]: Geol. Soc. America Proc. 1946, p. 167-172, port., 1947.

**ROBERTSON, ALMON FULTON.**

1. Georgia iron deposits, Cherokee, Bartow, Floyd, and Polk Counties, Part 2: U. S. Bur. Mines Rept. Inv. 4179, 42 p. (‡), illus., 1948. Limonite in the residual clay of the Cambrian rocks is described. Holes have been drilled and samples analyzed. Only certain mines in Bartow and Polk Cos. are included.

**ROBINSON, HEATH MONTGOMERY,** 1890-

1. Roy Jay Holden (1870-1945): Amer. Assoc. Petroleum Geologists Bull., vol. 30, p. 464-467, port., 1946.

**ROBINSON, SAMUEL.**

1. A catalogue of American minerals with their localities . . . . viii, 316 p., Boston, Cummings, Hilliard, and Co., 1825. Each state, including Georgia, has a list of minerals and locations given. The locations are extremely brief. According to this account, Georgia is remarkably poor in minerals.

**ROCKWOOD, CHARLES GREENE,** 1814-1904.

1. Notices of recent earthquakes: Amer. Jour. Science, 3d ser. vol. 5, p. 260-263, 1873. An earthquake at Milledgeville [Baldwin Co.] is reported. Brick buildings were jarred and windows rattled.

2. Notices of recent American earthquakes: Amer. Jour. Science, 3d ser. vol. 12, p. 25-30, 1876. An earthquake at Milledgeville, Baldwin Co., is described, as is one which was felt throughout northern Georgia.

**RODGERS, JOHN,** 1914-

1. Evolution of thought on structure of middle and southern Appalachians: Amer. Assoc. Petroleum Geologists Bull., vol. 33, p. 1643-1654, illus., 1949. This is a general survey of the ideas of persons who have contributed much toward the unravelling of the structure of the Appalachians, including that part in Georgia.

2. The folds and faults of the Appalachian Valley and Ridge Province, *in* Proceedings of the Southeastern Mineral Symposium: Kentucky Geol. Survey, 9th ser. Spec. Pub. 1, p. 150-166, illus., 1953. A generalized review of the distribution and mechanism of major faults and folds is given. Small-scale maps include Georgia. Few details are presented.

3. (The) clastic sequence basal to the Cambrian System in the central and southern Appalachians, *in* El Sistema Cambrico, su paleoge-

ografia y el problema de su base, vol. 2, p. 385-413, illus., Mexico, Internatl. Geol. Cong. 20th, 1956. Eleven meta-sedimentary formations, mostly clastic, in the Murphy Marble belt of the Piedmont and Blue Ridge areas, are described, as are clastic sections from elsewhere in the Appalachians. On the basis of regional correlations as well as general sedimentary history, the uppermost formations are Cambrian (?) and the lower ones, the Great Smoky Group, may be Cambrian or Precambrian. The change in the nature of the deposition from the lower "dirty" to the upper "clean" clastic rocks is significant.

4. (The) known Cambrian deposits of the southern and central Appalachians, *in* El Sistema Cambrico, su paleogeografia y el problema de su base, vol. 2, p. 353-384, illus., Mexico, Internatl. Geol. Cong. 20th, 1956. A generalized review of the Cambrian rocks in the southern Appalachians includes those in Georgia. No new data are included, but the clastic-dolomite contact is noted and considered widespread and important. A paleogeographic summary is included.

**ROGERS, HENRY DARWIN**, 1808-1866, *see also* Rogers, William Barton, 1.

1. Report on the geology of North America: British Assoc. Advancement Science Rept. 4, p. 1-66, 1835. An extremely cursory description of the geology of the eastern United States includes that of Georgia. No details are included.

2. (and Rogers, William Barton). A system of classification and nomenclature of the Paleozoic rocks of the United States with an account of their distribution more particularly in the Appalachian Mountain chain [abs.]: Amer. Jour. Science, vol. 47, p. 111-112, 1844.

3. Geological map of the United States and British North America, Plate VIII, *in* Physical atlas of natural phenomena, by Alexander Keith Johnston, London and Edinburg, Blackwood and Sons, 1856.

4. On the geology and physical geography of North America: Royal Inst. Great Britain Proc., vol. 2, p. 167-187, London, 1856; Franklin Inst. Jour., 3d ser. vol. 33, p. 224-230, 319-326, 363-368, 1857; Mining Mag., vol. 8, p. 417-424; vol. 9, p. 45-51, 514-522, 1857. A generalized survey of the geology of the United States includes a cursory description of that of Georgia. No new information is included.

5. Sketch of the geology of the United States: Geology of Pennsylvania, vol. 2, p. 741-775, illus., Philadelphia, J. B. Lippincott, 1858. A very cursory description of the geology of the Appalachian Mountains and eastward includes that of Georgia.

**ROGERS, WILEY SAMUEL**, 1928-

1. The crystallographic and chemical examination of the crystal forms of titanite [Cobb Co.]. M. S. Thesis, Emory Univ., 1951.

2. (and Lester, James George). Titanite near Kennesaw Mountain, Cobb County, Georgia, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 303-308, illus., 1953. Titanite from pegmatite and from along the borders of other dikes is described chemically, physically, and optically.

ROGERS, WILLIAM BARTON, 1804-1882, *see also* Rogers, Henry Darwin, 2.

1. (and Rogers, Henry Darwin). On the physical structure of the Appalachian chain, as exemplifying the laws which have regulated the elevation of great mountain chains, generally: Assoc. Amer. Geologists and Naturalists Repts., p. 474-531, illus., 1843; reprinted *in* Geology of the Virginias, p. 601-642, illus., 1884; summary, Amer. Jour. Science, vol. 44, p. 359-363, 1843. A general description of the structural geology of the entire Appalachian Mountain System includes the Alabama Division, which embraces northwestern Georgia. The origin of the folds and faults is attributed to large-scale undulations in the earth's crust, similar to the wave-like motion of the earth's surface resulting from earthquakes.
2. Life and letters of William Barton Rogers [1804-1882], edited by his wife. 2 vols., 878 p., port., Boston, Houghton, Mifflin and Co., 1896.

ROMER, ALFRED SHERWOOD, 1894-

1. Frederick Brewster Loomis (1873-1937): Amer. Acad. Arts and Science Proc., vol. 73, p. 136-137, 1939.
2. Louis Agassiz [1807-1873]: Scientific American, vol. 181, p. 48-51, illus., 1949.

ROSE, GUSTAV, 1798-1883.

1. Ueber eine neue kreisformige Verwachsung des Rutils: Annalen der Physik und Chemie, [2d ser.], vol. 115, p. 643-649, illus., Leipzig, 1862. A study of the crystallization forms of rutile includes examples taken from Graves Mountain in Lincoln County.
2. Systematisches Verzeichniss der Meteoriten in dem mineralogischen Museum der Universität zu Berlin: Annalen der Physik und Chemie, [2d ser.], vol. 118, p. 418-423, Leipzig, 1863. Fragments of the Union, Putnam, and Monroe Co. meteorites are in the collection.
3. Beschreibung und Eintheilung der Meteoriten auf Grund der Sammlung in mineralogischen Museum zu Berlin: K. Akademie der Wissenschaften Berlin Physische Abhandlungen 1863, p. 23-161, illus., 1864. A general discussion of the classification of meteorites includes descriptions of fragments from those from Union and Putnam Counties. Chemical analyses are included.

ROSE, NICHOLAS ANTHONY, 1909-1955, *see* Spain, Ernest Lynwood, Jr., 1.

ROSENFELD, SIGMUND JUDITH, 1929-

1. An investigation of the relationship between the Armuchee Chert and the Frog Mountain Sandstone of Devonian age [northwestern Ga.] [abs.]: Georgia Acad. Science Bull., vol. 12, p. 31-32, 1954.
2. Depositional features of an Ordovician laminated limestone in northwest Georgia: Georgia Acad. Science Bull., vol. 13, p. 27-31, illus., 1955. These argillaceous and calcareous laminae are intercalated; they are interrupted or disturbed by breccias, conglomerates, and crumpling. All are described. Calcareous deposition was continuous with the argillaceous material being introduced cyclically. The environment of deposition was quiet.

3. (A) study of the Pleistocene shore lines between the Altamaha and the Savannah Rivers in [Coastal Plain] Georgia. M. S. Thesis, Emory Univ., 1955.

**ROSENKRANS, ROBERT RUSSELL, 1909-**

1. Stratigraphy of the Ordovician bentonite occurrences [abs.]: Geol. Soc. America Proc. 1935, p. 99, 1936.

**ROSS, CLARENCE SAMUEL, 1880-**

1. Copper deposits in the eastern United States, *in* Copper resources of the world, p. 151-166, illus., Washington, D. C., Internatl. Geol. Cong. 16th, 1935. Only the Magruder Mine, in Lincoln Co., has ever been worked primarily for copper. The ore is chalcopyrite in quartz veins.
2. William Shirley Bayley, 1861-1943: Econ. Geology, vol. 38, p. 263-264, 1943.
3. Memorial of William Shirley Bayley [1861-1943]: Amer. Mineralogist, vol. 29, p. 115-120, port., 1944.
4. Welded tuff from deep-well cores from Clinch County, Georgia: Amer. Mineralogist, vol. 43, p. 537-545, illus., 1958. The sequence begins with fine-grained, dacitic volcanic conglomerate which is overlain by rhyolitic welded tuff replaced by laumontite which is in turn overlain by more volcanic conglomerate. They are 4000 feet deep and are only slightly metamorphosed. Photomicrographs are included.

**ROWLAND, GERALD LEE, 1928-** *see* Leonard, Frederick Charles, 6.

**ROWLANDS, CHARLES EVANS, JR.,** *see also* Brown, William Robert, 1.

1. (and Straley, H. W., 3d). Geomagnetics of Savannah [River] Valley, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 119-125, illus., 1953. A small-scale isogam map includes a part of Georgia along the river. There is a magnetic high from Savannah (Chatham Co.) to Wentworth (Screven Co.) which then trends southwestward. The origin is not positively identified.

**ROY, RUSTUM, 1924-** *see* Mumpton, Fred Albert, 1.

**ROY, SHARAT KUMAR, 1897-**

1. Memorial of Oliver Cummings Farrington [1864-1933]: Geol. Soc. America Proc. 1933, p. 193-210, port., 1934.
2. (and Wyant, Robert Kriss). The Smithonia [Oglethorpe Co.] meteorite: Field Museum Natural Hist., Geol. Ser., vol. 7, p. 129-134, illus., 1950. This iron meteorite is described and illustrated. An analysis and photographs of the polished surface are given.

**RUEDEMANN, RUDOLF, 1864-1956,** *see also* Schuchert, Charles, 6.

1. On the symmetric arrangement in the elements of the Paleozoic platform of North America: New York State Museum Bull. 140, p.

141-149, illus., 1910. Isles Wisconsin and Adirondack enclose a giant basin which is divided into two basins by the Cincinnati arch. Isle Appalachia extends into Georgia. The eastern basin has been distorted by the Appalachian (or Atlantic) pressures. The symmetry of the whole is stressed.

2. Fundamental lines of North American geologic structure: Amer. Jour. Science, 5th ser. vol. 6, p. 1-10, illus., 1923; New York State Museum Bull. 260, p. 71-80, illus., 1925. A generalized description of the North American continent includes Georgia. The "grain", or Precambrian trends, of the continent, correspond to the major trends of Paleozoic and Mesozoic structures.
3. (and Balk, Robert, eds., and others). Geology of North America, vol. 1. 643 p., illus., Berlin, Gebrueder Borntraeger, 1939. This is a symposium-type volume, with each subject of the geology of the United States discussed by a leading authority. Georgia is included, although few new data are given.
4. Edward Oscar Ulrich, 1857-1944: Natl. Acad. Science Biog. Mem., vol. 24, p. 259-280, port., 1947.

**RUFFIN, EDMUND,** 1794-1865.

1. Report of the commencement and progress of the agricultural survey of South Carolina for 1843. 120 p., appendix, 55 p., illus., Columbia, A. H. Pemberton, 1843. The [Eocene] rocks at Shell Bluff, Burke Co., are described, with a view to considering their potential as fertilizer.

**RUFFNER, WILLIAM HENRY,** *see* Campbell, John Lyle, 1.

**RUSCHENBERGER, WILLIAM SAMUEL WAITHMAN,** 1807-1895.

1. A sketch of the life of Joseph Leidy [1823-1891]: Amer. Philos. Soc. Proc. vol. 30, p. 135-184, 1892.

**RUSSELL, RICHARD JOEL,** 1895- *see* Lester, James George, 8.

**SAFFER, PARKE E.**

1. A preliminary investigation of river and beach samples collected in the states of Florida, Georgia, and Alabama. M. S. Thesis, Florida State Univ., 1955.

**ST. JOHN, F. B., JR.**

1. (and Lusk, Tracy Wallace). [Stewart Co.] Georgia, *in* [oil and gas] Developments in the southeastern states in 1958: Amer. Assoc. Petroleum Geologists Bull., vol. 43, p. 1334, 1959.

**SALOMON-CALVI, WILHELM.**

1. Birlesik Amerika'daki Georgia (Warm Springs) [Meriwether Co.] banyolari seklinde Turkiye'de desicak banyolar tesin etmek kabil mi?: Maden Tetkik ve Arama Enstitüsü Mecmuasi, sene 6, sayi 3/24, p. 353-360, Ankara, 1941 [Turkish with German summary]. A description of the origin and occurrence of the Warm Springs, in Meriwether County, is given in a discussion of the possibility of finding similar phenomena in Turkey.

**SALTER, JOHN WILLIAM, 1820-1869.**

1. On the fossils of the *Lingula*-flags or "Zone Primordiale": Geol. Soc. London Quart. Jour., vol. 15, p. 551-555, illus., 1859. *Conocephalus antiquatus* is described and illustrated. It is presumably from Cambrian rocks in northwestern Georgia, but no location is given.

**SALTPETER, E. W.**

1. The Vatican collection of meteorites. 40 p., Vatican City, Specola Vaticana, 1957. Fragments of the Whitfield, Cherokee, Stewart, Putnam, and Union County meteorites are included in this museum. Few data are given

**SAND, LEONARD B., 1922-**

1. Mineralogy and petrology of residual kaolins of the southern Appalachian region. Ph. D. Thesis, Pennsylvania State Univ., 1952; (and Bates, Thomas Fulcher). Pennsylvania State Univ. School of Mineral Industries Tech. Rept. 7, 122 p. (‡), illus., 1952; summary with title, On the genesis of residual kaolins: Amer. Mineralogist, vol. 41, p. 28-40, illus., 1956. Weathered pegmatites from non-specifically indentified locations in the Georgia Piedmont are analyzed along with others from elsewhere to show that the formation of the kaolin minerals (especially hydrated halloysite) is a product of the environment. This has not changed appreciably since early Tertiary times when the commercial deposits were formed.

**SANDFORD, KENNETH STUART.**

1. Douglas Wilson Johnson [1878-1944], obituary notice: Geol. Soc. London Quart. Jour., vol. 100, pts. 3-4, p. lx-lxi, 1945.

**SANDLIN, WALTER LEE, JR., 1935-**

1. A heavy mineral study of portions of Peachtree Creek-South Fork and Peavine Creek [DeKalb Co.] [abs.]: Georgia Acad. Science Bull., vol. 17, p. 77, 1959.

**SANFORD, SAMUEL, 1867-1927,** *see also* Fuller, Myron Leslie, 3.

1. (and Stone, Ralph Walter). Useful minerals of the United States: U. S. Geol. Survey Bull. 585, 250 p., illus., 1914; (and Schrader, Frank Charles). revised, Bull. 624, 412 p., illus., 1917. An alphabetically arranged list of mineral resources of each state is given; Georgia is included. Brief remarks are included for each entry.

**SANTMYERS, REIGART MEREDITH, 1893-**

1. Ocher and ochery earths: U. S. Bur. Mines Inf. Circ. 6132, 20 p. (‡), illus., 1929. A general discussion of the origin, occurrence, and mining problems associated with this material includes a brief resumé of the deposits in the Cartersville area of Bartow County.

**SAY, THOMAS, 1787-1834.**

1. On the species of the Linnean genus *Echinus*, inhabiting the coast of the United States: Acad. Natural Science Philadelphia Jour., vol.

5, p. 225-229, 1827. *Scutella 5-faria* is described. It is reported from "near Milledgeville" It is probably from Eocene rocks.

SAYLER, NELSON.

1. An outline geological map of Tennessee, including portions of Mississippi, Alabama, and Georgia. Scale, 1 inch to about 20 miles, Cincinnati, E. Mendenhall, 1866. The northwestern part of the crystalline area is mapped as Azoic, the Valley and Ridge as Lower Silurian [Cambrian and Ordovician], and the Appalachian Plateau is considered [Pennsylvanian].

SAYRE, ALBERT NELSON, 1901-

1. Memorial to Oscar Edward Meinzer [1876-1948]: Geol. Soc. America Proc. 1948, p. 197-206, port., 1949.
2. Oscar Edward Meinzer [1876-1948]: Amer. Geophysical Union Trans., vol. 29, no. 4, pt. 1, p. 455-456, port., 1948; Washington Acad. Science Jour., vol. 39, p. 147-148, 1949.

SCHALIE, HENRY VAN DER.

1. The Naiades (fresh-water mussels) of the Cahaba River in northern Alabama: Michigan Univ. Museum Zoology Occasional Papers 392, p. 1-29, illus., 1938; review by Douglas Wilson Johnson, Jour. Geomorphology, vol. 2, p. 88-91, 1939; reply by author with title, Distributional studies of the Naiades as related to geomorphology, vol. 2, p. 251-257, 1939; discussion by Douglas Wilson Johnson, with title, Mussel distribution as evidence of drainage changes: Jour. Geomorpholgy, vol. 4, p. 307-321, 1941; vol. 5, p. 59-72, 1942. Several species of mussels in the south-flowing Cahaba River are ecologically confined in certain creeks and so must have come from the now west-flowing Tennessee River before the capture of the latter. Johnson contends capture is not necessary. Northwestern Georgia is implied.

SCHALLER, WALDEMAR THEODORE, 1882-

1. Frank Wigglesworth Clarke [1847-1931]: Amer. Mineralogist, vol. 16, p. 405-407, port., 1931.

SCHEPIS, EUGENE LOUIS, 1926-

1. Geology of eastern Douglas County, Georgia. M. S. Thesis, Emory Univ., 1952.
2. (A) possible origin of an Eocene stream channel in Baldwin County [abs.]: Georgia Acad. Science Bull., vol. 10, no. 1, p. 9, 1952.

SCHLEGEL, DOROTHY MC KENNEY.

1. Gemstones of the United States: U. S. Geol. Survey Bull. 1042-G, p. 203-253, 1957. A review of the properties of gem stones is followed by a list of various kinds of gems in tabular form. Locations are included, some of which are in Georgia.

SCHMIDHUBER, —

1. [Das Vorkommen des Goldes in einem Theil von Georgien und

Sudcarolina]: Archiv fuer Mineralogie . . . , vol. 17, p. 663-672, Berlin, 1843. This is a general description of the occurrence of gold in the Piedmont and Blue Ridge Provinces. It is recognized as placer, in the saprolite, and in quartz veins in metamorphic rock.

SCHMIDT, ROBERT GORDON.
1. Geologic significance of an aeroradioactivity map of part of South Carolina and [Augusta area] Georgia [abs.]: Geol. Soc. America Bull., vol. 70, p. 1670, 1959.

SCHMITT, WALDO LASALLE.
1. Obituary [Mary Jane Rathbun, 1860-1943]: Washington Acad. Science Jour., vol. 33, p. 351-352, 1943.

SCHNEIDERHOEN, HANS, 1887-1962.
1. Waldemar Lindgren (1860-1939): Zentrallblatt fuer Mineralogie 1940, Abt. A, no. 3, p. 65-69, port., Stuttgart, 1940.

SCHOPF, JAMES MORTON, 1911-
1. Sargassoid microfossil assemblage from black shale of early Paleozoic age in Florida and [Coastal Plain] Georgia [abs.]: Geol. Soc. America Bull., vol. 70, p. 1671, 1959.

SCHOTTENLOHER, RUDOLF.
1. Die Gebirgsumrahmung des nordamerikanischer Kontinents: Geographische Gesellschaft Wien Mittheilungen, vol. 77, nos. 7-9, p. 129-145, illus., 1934. A discussion of the distribution of tectonic elewide patterns, includes the Appalachian Mountains, some of which are in northwestern Georgia. No specific Georgia information is included.

SCHRADER, FRANK CHARLES, 1860- *see* Sanford, Samuel, 1.

SCHREIBER, F.
1. A geological map of the N-W portion of Georgia from a survey made in 1844-5. Scale, 1 inch to about 10 miles, Hesse Casse, Germany, [n. p.] [1845?]. A map of uncertain origin in the Library of Congress shows the Paleozoic terrain separated from the crystalline terrane as understood now (1966) with the gold and itacolumnite regions outlined. The map actually shows all of Georgia north of a line from Carroll to Wilkes Counties.

SCHUCHERT, CHARLES, 1858-1942, *see also* Ulrich, Edward Oscar, 1.
1. On the faunal provinces of the Middle Devonic of America and the Devonic coral subprovinces of Russia, with two paleogeographic maps: Amer. Geologist, vol. 32, p. 137-162, illus., 1903. Devonian ments, especially mountains, in North America in relation to world-faunal provinces are outlined. During Hamilton time, an arm of what is called the Indiana Basin is present in Georgia. Ostracods and corals of this fauna are reported from Floyd Co. from the base

of the Chattanooga Shale. The fauna of the Armuchee Chert is Oriskany in age. Lists are not included.

2. A new American pentremite [Dade Co.]: U. S. Natl. Museum Proc., vol. 30, p. 759-760, illus., 1906. *Pentremites mccalliei* from the Bangor Limestone in Dade Co. is described and illustrated.

3. Paleogeography of North America: Geol. Soc. America Bull., vol. 20, p. 427-606, illus., 1910. A detailed discussion of the methods and problems of paleogeography is followed by discussions of correlations, some of which involve Georgia. Small-scale maps are given for most of the epochs, and Georgia is included on these maps. Major structural features are described also.

4. Sites and nature of the North American geosynclines: Geol. Soc. America Bull., vol. 34, p. 151-230, illus., 1923. A general discussion of the paleogeography of the United States includes that of Georgia. Small-scale maps which include Georgia show the relative positions of lands and geosynclines during the various geologic periods.

5. John Mason Clarke, 1857-1925: Amer. Jour. Science, 5th ser. vol. 10, p. 92, 1925.

6. (and Ruedemann, Rudolf). John Mason Clarke (1857-1925): Science, new ser. vol. 62, p. 117-121, 1925.

7. Memorial of John Mason Clarke [1857-1925]: Geol. Soc. America Bull., vol. 37, p. 49-93, port., 1926.

8. Charles Doolittle Walcott, paleontologist, 1850-1927: Science, new ser. vol. 65, p. 455-456, 1927.

9. Eugene Allen Smith [1841-1927]: Amer. Jour. Science, 5th ser. vol. 14, p. 428, 1927.

10. James Furman Kemp, 1859-1926: Amer. Jour. Science, 5th ser. vol. 13, p. 99-100, 1927.

11. William Healey Dall, 1845-1927: Amer. Jour. Science, 5th ser. vol. 14, p. 88, 1927.

12. Biographical memoir of John Mason Clarke [1857-1925]: Natl. Acad. Science Biog. Mem., vol. 12, p. 183-244, port., 1928.

13. Charles Doolittle Walcott (1850-1927): Amer. Acad. Arts and Science Proc., vol. 62, p. 276-285, 1928.

14. William Diller Matthew [1871-1930]: Amer. Jour. Science, 5th ser. vol. 20, p. 483-484, 1930.

15. George Perkins Merrill (1854-1929): Smithsonian Inst. Ann. Rept. 1930, p. 617-643, port., 1931; Geol. Soc. America Bull., vol. 42, p. 95-122, port., 1931.

16. Richard Alexander Fullerton Penrose, Jr., 1863-1931: Amer. Jour. Science, 5th ser. vol. 22, p. 479-480, 1931.

17. Edward Salisbury Dana [1849-1935]: Amer. Jour. Science, 5th ser. vol. 30, p. 161-176, port., 1935; Geol. Soc. America Proc. 1935, p. 201-214, port., 1936.

18. Historical geology of the Antillean-Caribbean region . . . . xxvi, 811 p., illus., New York, John Wiley, 1935. A tiny portion of this book is devoted to a cursory review of the geology of the Coastal Plain of Georgia. No new data are given.

19. Biographical memoir of [Charles] David White, 1862-1935: Natl. Acad. Science Biog. Mem., vol. 17, p. 189-221, port., 1937.

20. Stratigraphy of the eastern and central United States. 1013 p., illus., New York, John Wiley, 1943. A cursory review of the Precambrian to Cenozoic geologic formations is given. No new data are included. This is a compilation of the stratigraphic understanding to that date.

SCHWARZER, D., *see* Fireman, Edward Leonard, 1.

SCHWEITZER, R. R.

1. Ground water resources for industry: Manufacturer's Record, vol. 107, no. 5, p. 44, 56, 1938. This is an exhortation for the use of ground water on the Coastal Plain of Georgia as well as elsewhere. The Brunswick Basin is described as an artesian area. Few technical details are given.

SCOTT, WILLIAM BERRYMAN, 1858-1947.

1. Memoir of Edward D[rinker] Cope [1840-1897]: Geol. Soc. America Bull., vol. 9, p. 401-408, 1898.
2. [Joseph] Leidy's [1823-1891] paleontological and geological work: Scientific Monthly, vol. 18, p. 433-439, 1924; Acad. Natural Science Philadelphia Proc., vol. 75, appendix, p. 36-43, 1924.
3. Memorial to Henry Fairfield Osborn [1857-1935]: Geol. Soc. America Proc. 1944, p. 287-292, port., 1945.

SCROGGS, FRED O.

1. Collecting staurolite crystals in North Carolina and Georgia: Mineralogist, vol. 14, p. 61-62, 1946. This is a popular account of the occurrence of staurolite in Fannin Co. and nearby areas. No details are given.

SELL, EDWARD SCOTT, 1887-

1. Geography of Georgia. ii, 126 p., illus., Chattanooga, Harlow Pub. Co., [1950]; 2d ed., 1958. An elementary-school textbook of geography includes a review of the mineral resources of the state.

SELLARDS, ELIAS HOWARD, 1875-1961.

1. The phosphate deposits of the southern states [abs.]: Science, new ser., vol. 39, p. 401, 1914.
2. Charles Schuchert (1858-1942): Amer. Assoc. Petroleum Geologists Bull., vol. 27, p. 1027-1029, port., 1943.

SEMMES, DOUGLAS RAMSAY, 1892-

1. Memorial, George Irving Adams [1870-1932]: Amer. Assoc. Petroleum Geologists Bull., vol. 17, p. 103-104, 1933.

SEMSEY, ANDOR VON, 1833-1923.

1. Die Meteoritensammlung des ungarischen national-Museums in Budapest. 14 p., Budapest [?Museum] 1886. Fragments of the Monroe, Putnam, Cherokee, and Union Co. meteorites are present in this museum. They are catalogued by classification.

**SENTFLE, FRANK EDWARD.**

1. (and Thorpe, Arthur Nathaniel). Magnetic susceptibility of tektites and some other glasses: Geochemica et Cosmochemica Acta, vol. 17, p. 234-247, illus., 1959. Numerous tektites, including one from Georgia, are examined. Obsidian has higher susceptibility unless heated to 1450°C, where its susceptibility then becomes similar to that of tektites. Therefore, tektites were probably heated over 1400°C. The tektites must have entered the earth as glass.

**SERVOS, KURT.**

1. Meteorites in the collections of Yale University: Postilla, no. 27, 24 p., 1956. Fragments of meteorites from Cherokee, Whitfield, Monroe, Chattooga, Henry, Putnam, and Union Cos. are present in this collection. Only the weight is given.

**SEVERINGHAUS, NELSON.**

1. Problems in the quarrying of Lithonia, Georgia, granite [DeKalb Co.], *in* Short contributions to the geology, geography, and archaeology of Georgia: Georgia Geol. Survey Bull. 56, p. 80-84, 1950. In an otherwise geographic and technical discussion of granite by-product uses, analyses are given.
2. Rock Chapel Mountain [DeKalb Co.] moves to use: Georgia Mineral Newsletter, vol. 6, p. 33-36, illus., 1953. The report deals largely with granite quarrying descriptions; an analysis of the granite [gneiss] is included.

**SEYBERT, ADAM,** 1773-1825.

1. A catalogue of some American minerals, which are found in the different parts of the United States: Philadelphia Medical Museum, vol. 5, p. 152-159, 256-268, 1808. This is one of the first lists of minerals in the United States. Many materials from many places include reference to porcelain clay of the Savannah River [area].

**SHALER, NATHANIEL SOUTHGATE,** 1841-1906.

1. The national survey and the resources of the southern states: Industrial South, vol. 6, p. 133-135, 1886. This is a general exhortation for a survey of the mineral resources of the southern states, Georgia included.
2. General account of the fresh-water morasses of the United States . . . : U. S. Geol. Survey Ann. Rept. 10, pt. 1, p. 255-359, illus., 1890. The great wide limestone valleys in north-western Georgia are cited as one example of the way in which flat, swamp-supporting terrain can form.
3. The geologic history of harbors: U. S. Geol. Survey Ann. Rept. 13, pt. 2, p. 93-209, illus., 1893. A general description of harbor types is followed by descriptions of geologic processes which can modify them. Brunswick Harbor is much affected by tidal marsh development.
4. The autobiography of Nathaniel Southgate Shaler [1841-1906], with a supplementary memoir by his wife. 481 p., port., Boston, Houghton, Mifflin and Co., 1909.

**SHARP, HENRY STAATS,** 1902- *see also* Renner, George Thomas, Jr., 2.

1. Memorial to Frank James Wright (1888-1954): Geol. Soc. America Proc. 1955, p. 183-185, port., 1956.
2. Armin Kohl Lobeck [1886-1958]: Geographical Review, vol. 48, p. 584-585, 1958.

**SHAW, DENIS MARTIN,** 1923-

1. The geochemistry of thallium: Geochemica et Cosmochemica Acta, vol. 2, p. 118-154, illus., London, 1952. Details of the method used are followed by tabular results of examinations of material. Zircon, from Mt. Titanium, somewhere in Georgia, has .36 ppm Tl.

**SHAW, EUGENE WESLEY,** 1881-1935.

1. Ages of peneplains of the Appalachian Province: Geol. Soc. America Bull., vol. 29, p. 575-586, illus., 1918. The floor of the Cretaceous sedimentary rocks on the Coastal Plain dips seaward about 30 feet per mile. The Coastal Plain sediments, if spread evenly over the Appalachian area would form a blanket between 2000 and 5000 feet thick. Therefore, surfaces which are now preserved are not likely to be very old, Tertiary at the oldest, and not Cretaceous.
2. Memorial of Joseph William Winthrop Spencer [1851-1921]: Geol. Soc. America Bull., vol. 35, p. 25-37, port., 1924.

**SHEARER, HAROLD KURTZ,** 1889-1946, *see also* Cooke, Charles Wythe, 2.

1. A report on the bauxite and fuller's earth of the Coastal Plain of Georgia: Georgia Geol. Survey Bull. 31, xv, 340 p., illus., 1917. A brief review of the geology of the Coastal Plain is followed by descriptions of individual deposits of bauxite and fuller's earth from the various counties. Sections are measured; analyses are made. The origin of the deposits is also discussed.
2. (and Hull, Joseph Poyer Deyo). (A) preliminary report on a part of the pyrites deposits of Georgia: Georgia Geol. Survey Bull. 33, xii, 229 p., illus., 1918. Pyrite occurs in the Piedmont and Blue Ridge Provinces. It occurs largely in metamorphosed pyrite veins and as limestone replacements. The deposits occur in a diagonal belt from Carroll to Rabun Cos. and in Fannin Co. near Ducktown. Individual deposits are described; analyses are made.
3. Report on the slate deposits of Georgia: Georgia Geol. Survey Bull. 34, x, 192 p., illus., 1918. Slate occurs in Polk, Bartow, Gordon, and Murray Counties. Individual occurrences are described. Sketch maps are included; sections are measured. The slate comes from Cambrian formations. Sericite schist from Pickens Co. is discussed also.

**SHEETS, MARTIN MEREDITH.**

1. Diastrophism during historic time in Gulf Coastal Plain: Amer. Assoc. Petroleum Geologists Bull., vol. 31, p. 201-226, illus., 1947. Two earthquakes are recorded from the Georgia Coastal Plain; both are minor. Not much other diastrophism is occurring.

SHELDON, PEARL GERTRUDE, 1885-

1. Atlantic slope arcas: Palaeontographica Americana, vol. 1, no. 1, 100 p., illus., 1916. Numerous examples of this pelecypod group from the Tertiary formations in Georgia are described and illustrated.

SHEPARD, CHARLES UPHAM, 1804-1886.

1. Geological observations upon Alabama, Georgia and Florida: Amer. Jour. Science, vol. 25, p. 162-173, 1834. On a trip from Columbus to Milledgeville to Augusta, he describes the rocks and scenery of the Fall Line area. No new data are given.
2. On the occurrence of itacolumite [Hall, Habersham, Rabun Cos.] and diamonds [Hall Co.] [abs.]: Assoc. Amer. Geologists and Naturalists Proc., vol. 6, p. 41-43, 1845.
3. Report on meteorites: Amer. Jour. Science, 3d ser. vol. 6, p. 402-417, illus., 1848. The Forsyth, Monroe Co., meteorite is used, along with others, as an example in a new classification of meteorites being proposed. It is in Class Stony, Order Trachytic, Section Fine-grained. It is also chemically analyzed.
4. Union County, Georgia, no. 3 *of* New localities of meteoric iron: Amer. Jour. Science, 2d ser. vol 17, p. 328, 1854; in German, Journal fuer praktische Chemie, vol. 62, p. 345-348, Leipzig, 1854. A fifteen pound meteorite is cursorily described. A rough chemical analysis is included.
5. Report on the copper and silver-lead mine at Canton, Cherokee County, Georgia, 2d ed. 20 p., illus., New Haven, Ezekiel Hayes, 1856; 1st ed., Savannah, Georgia, 1855; discussion by Frederick Augustus Genth, with title, A pseudomorph of copper-glance after galena: Amer. Jour. Science, 2d ser. vol. 23, p. 415-417, 1857; reply by author, vol. 24, p. 38-44, 1857; reply by Genth, p. 133. A sulphide-bearing vein has intruded the metamorphic country rock. Chalcopyrite, pyrite, and galena are the main ore minerals. Sphalerite and various manganese-bearing minerals are also present, as are many other rare minerals, some of which are new. Genth and Shepard are bickering over new minerals.
6. Report on the New Bangor Slate Quarry in Polk County, Georgia. 12 p., illus., New Haven, E. Hayes, 1858; Mining Mag., vol. 11, p. 179-185, 1858. A report, prepared as a prospectus, describes the slate deposits in detail. The slate lacks pyrite, but contains a small amount of quartz in veins; otherwise it is pure. Cleavage is excellent.
7. Report on the Pascoe Gold Mine, Cherokee County, Georgia. 15 p., illus., New Haven, E. Hayes, 1858; Mining Mag., vol. 11, p. 136-143, 1858. Gold occurs in quartz veins, but mostly in pyrite which is scattered throughout the area in the local schist. The veins and mines are mapped.
8. On lazulite, pyrophyllite and tetradymite from Georgia: Amer. Jour. Science, 2d ser. vol. 27, p. 36-40, illus., 1859. The occurrence of lazulite from Graves Mountain, in Lincoln Co., is described. Pyrophyllite is an associate. Tetradymite occurs as a gold associate in quartz veins in hornblende gneiss in Lumpkin County. Crystals are illustrated.

9. Report of the Mount Pisgah copper mine in Fannin County, Georgia. 8 p., illus., New Haven, printed by E. Hayes, 1859. A report for a prospectus describes a chalcopyrite-bearing quartz vein in metamorphic rock, called primary slate. The geological circumstances are similar to those at Ducktown, nearby.

10. A new locality of meteoric iron in Georgia: Amer. Jour. Science, 2d ser. vol. 46, p. 257-258, 1868. A six-pound iron meteorite from Cherokee County is grossly described.

11. Composition of meteoric iron from Losttown, Cherokee Co., Georgia, no. 3 *of* Notices of new meteoric irons in the United States: Amer. Jour. Science, 2d ser. vol. 47, p. 234, 1869. An analysis is given of this meteorite. It has over 95 per cent iron and over 3 per cent nickel.

12. On the corundum regions of North Carolina and Georgia . . . : Amer. Jour. Science, 3d ser. vol. 4, p. 109-114, 175-180, illus., 1872. Corundum occurs in irregular chrysotilic rock bodies in several of the Blue Ridge counties. The rock trends in a NE-SW direction in an *en echelon* pattern. Large corundum crystals are described chemically and crystallographically. One crystal, weighing over 11 pounds, from Rabun Co., is described.

13. Mineralogical notes: Amer. Jour. Science, 3d ser. vol. 20, p. 54-57, 1880. Hemihedral staurolite from Morganton, Fannin Co., and green pagodite from near Washington, Wilkes Co., are described.

14. On meteoric iron from near Dalton, Whitfield County, Georgia: Amer. Jour. Science, 3d ser. vol. 26, p. 336-338, illus., 1883. A 117-pound meteorite is described and analyzed.

**SHERIDAN, JOHN THOMAS, 1925-**

1. Paleontology and stratigraphy of known outcrops of the "Holston" Formation in [Whitfield Co.] north[western] Georgia. M. S. Thesis, Emory Univ., 1951.

**SHIELDS, BEULAH ELECTA,** *see* Bartsch, Paul, 1.

**SHIMER, HERVEY WOODBURN, 1872-1965.**

1. Correlation chart of geologic formations of North America: Geol. Soc. America Bull., vol. 45, p. 909-936, charts, 1934. A brief explanation is followed by time-rock correlation charts of all the systems. There is no column for Georgia but Alabama and Tennessee are included.

2. [Charles] David White (1862-1935): Amer. Acad. Arts and Science Proc., vol. 70, p. 600-602, 1936.

3. Henry Fairfield Osborn (1857-1935): Amer. Acad. Arts and Science Proc., vol. 72, p. 377-379, 1938.

4. Waldemar Lindgren (1860-1939): Amer. Acad. Arts and Science Proc., vol. 74, p. 141-142, 1940.

5. Amadeus William Grabau [1870-1946], an appreciation: Amer. Jour. Science, vol. 244, p. 735-736, 1946.

6. Memorial to Amadeus William Grabau [1870-1946]: Geol. Soc. America Proc. 1946, p. 155-166, port., 1947.

SHOTTS, REYNOLD QUINN, 1909-

1. (and Cudworth, James Rowland). Some general characteristics of the principle known sulfide deposits of the southern Appalachian and Piedmont area: Alabama Acad. Science Jour., vol. 25, p. 47-53, illus., [1953]. This is a general survey of the occurrence of sulphide bodies in the Piedmont and Blue Ridge. Most are of the "Creighton" type, which (1) are near the contact between a basic metamorphic rock and mica schist, (2) have a younger granitic body nearby, (3) are sometimes associated with gold; the gold, if present, is between the sulphide and granite, and (4) which are seldom, if ever, true fissure veins. Characteristics of other types are discussed also.

SHROCK, ROBERT RAKES, 1904-

1. William Henry Twenhofel, honorary member [A.A.P.G.]: Amer. Assoc. Petroleum Geologists Bull., vol. 31, p. 835-840, 1947.
2. Memorial to William Henry Twenhofel (1875-1957): Jour. Sedimentary Petrology, vol. 27, p. 202-203, port., 1957.
3. William Henry Twenhofel (1875-1957): Amer. Assoc. Petroleum Geologists Bull., vol. 41, p. 978-980, port., 1957.

SHULER, RAY MC KEE, *see* Swartz, Joel Howard, 1.

SILLIMAN, BENJAMIN, SR., 1779-1864.

1. Georgia meteor and aerolite [Monroe Co.]: Amer. Jour. Science, vol. 18, p. 388-389, 1830; Annales de Chemie et de Physique, 2d ser. vol. 45, p. 417, Paris, 1831; Royal Inst. Great Britain Jour., vol. 1, p. 415-416, London, 1831. This is a report of the fall of the meteorite in 1829, the first to be seen in Georgia.

SILLIMAN, BENJAMIN, JR., 1816-1885.

1. Memoir of John Lawrence Smith, 1818-1883: Natl. Acad. Science Biog. Mem., vol. 2, p. 217-248, 1886.

SILVER, LEON T., *see* Grunenfelder, Marc H., 1.

SIMMONS, WOODROW WILSON, 1912-

1. (and Kingman, Owen, and Laurence, Robert Abraham). Mineral resources index. 24 p., illus., [Amer. Inst. Mining Engineers Southeastern Section], 1952. A list of mineral resources of each of the various states, Georgia included, is given. No new geological data are given.

SIMPKINS, IRWIN F.

1. Georgia's gneiss: Index Petrocephalicus, vol. 203, p. 1011-1068, Bratiskursk, 1806.

SIMPSON, CHARLES TORREY, 1846-1932.

1. On the evidence of the Unionidae regarding the former courses of the Tennessee and other southern rivers: Science, new ser. vol. 12,

p. 133-136, 1900. Many of the genera and species of the Unionidae in the Alabama River system are found in the Tennessee River system, and many in the Chattahoochee River are found in the Savannah River. The hypothesis of a Tertiary continuity of each of these sets is presented, i.e., that the Tennessee River once was continuous with the Alabama, and that the Upper Savannah was once continuous with the Chattahoochee.

**SIMPSON, GEORGE GAYLORD, 1902-**

1. Edward Wilber Berry (1875-1945): Amer. Philos. Soc. Yearbook 1945, p. 346-349, 1946.

**SINGEWALD, JOSEPH THEOPHILUS, JR., 1884-1963.**

1. Memorial to Charles Kephart Swartz [1861-1949]: Geol. Soc. America Proc. 1950, p. 131-134, port., 1951.

**SINGLETON, M. T.,** *see* New England Company, 1.

**SINHA, EVELYN ZEPEL.**

1. Geomorphology of the lower Coastal Plain from the Savannah River area, Georgia, to the Roanoke River area, North Carolina. Ph. D. Thesis, Univ. North Carolina, 1959.

**SINKANKAS, JOHN.**

1. Gemstones of North America. xv, 675 p., illus., Princeton, New Jersey, Van Nostrand Co., 1959. A popular account of the origin and properties of gemstones of all sorts includes descriptions of occurrences in each of the states, Georgia included. Most are from the Blue Ridge and Piedmont areas.

**SISK, LEON J.**

1. All this started from the trickle from a roof: Soil Conservation, vol. 1, no. 2, p. 12-13, illus., 1935. An illustration of Providence Canyon in Stewart Co. is followed by a description of its supposed origin, the runoff from a barn roof in 1855. Little specific detail is included.

**SLANIN, BORIS,** *see* Leonard, Frederick Charles, 1.

**SLATE, FREDERICK.**

1. Bibliographical memoir of Eugene Woldemar Hilgard, 1833-1916: Natl. Acad. Science Biog. Mem., vol. 9, p. 95-155, port., 1919.

**SLICHTER, CHARLES SUMNER, 1864-**

1. Artesian wells of Savannah [Chatham Co.] Ga., *in* The motion of underground waters: U. S. Geol. Survey Water-Supply Paper 67, p. 97-101, illus., 1902. The artesian water system of the city of Savannah is cited as an example of the good use of artesian pressure in a paper otherwise devoted to theoretical considerations of the motion of ground water. The Savannah water comes from Cretaceous rocks.

**SLOAN, EARLE**, 1858-1926.

1. A summary of the mineral resources of South Carolina. 66 p., illus., Columbia, South Carolina Dept. Agriculture, Commerce, and Immigration, 1907; reprinted *in* Handbook of South Carolina, by E. J. Watson, p. 77-145, illus., South Carolina Dept. Agriculture, 1907. A general description of the geology and mineral resources of the state includes references to some from Georgia, just across the Savannah River. Eocene rocks are described also.
2. Catalog of the mineral localities of South Carolina: South Carolina Geol. Survey, 4th ser. Bull. 2, 505 p., illus., 1908. The exposures in the bluffs along the Savannah River are described. They are Eocene and Miocene in age. Locations are at Silver Bluff, Shell Bluff, Blue Bluff, Griffins Landing, Porters Landing, McBean Creek, and Ebenezer.

**SMALL, JAMES BARTER**, 1907- *see* Davis, George Hamilton, 1.

**SMALLWOOD, JOE KENNETH, JR.**, 1936-

1. Contact relations of the Providence and Ripley Formations [Stewart Co.] [abs.]: Georgia Acad. Science Bull., vol. 17, p. 76, 1959.

**SMITH, CARL DAVID**, 1879- *see also* Nacoochee Hydraulic Mining Co., 1.

1. Report of C. K. Jarrett's Gold Mines, located in Nacoochee Valley, [White Co.] Ga. 8 p., Waltons Ford, Georgia, Southern Watchman Power-Press Print., 1870. The structural complexity of the metamorphic country rock is given as the reason for the thinness of the gold-bearing quartz veins which have also been deeply weathered. Hydraulic mining in the saprolite is recommended. Veins and placers are also present.

**SMITH, CLIFFORD LEWIS**, *see* Smith, Leon Perdue, 2.

**SMITH, EUGENE ALLEN**, 1841-1927.

1. The Lafayette gravels [Muscogee Co.] [abs.]: Science, vol. 19, p. 31, 1892.
2. (and Johnson, Lawrence Clement and Langdon, Daniel W., Jr.). Report on the geology of the Coastal Plain of Alabama. xxiv, 759 p., illus., Montgomery, Alabama Geol. Survey, 1894. Detailed descriptions of the Cretaceous, Tertiary, and Quaternary formations include some locations in Georgia, generally along the Chattahoochee River. Sections are measured; fossils are listed and illustrated.
3. (and Aldrich, Truman Heminway). The Grand Gulf Formation: Science, new ser. vol. 16, p. 835-837, 1902; discussion by William Healey Dall, p. 946-947; reply by authors, vol. 18, p. 20-26, 1903. Evidence is presented, some from Decatur Co., that the formation is post-Miocene. It overlies the Chattahoochee Limestone and underlies the Lafayette Gravel.
4. Biographical sketch of Henry McCalley [1852-1904]: Amer. Geologist, vol. 35, p. 197-201, port., 1905.
5. Memoir of Henry McCalley [1852-1904]: Geol. Soc. America Bull., vol. 16, p. 555-558, 1906.

6. On some post-Eocene and other formations of the Gulf region of the United States: Science, new ser. vol. 23, p. 481-491, 1906; Amer. Assoc. Advancement Science Proc., vol. 55, p. 357-374, 1906. A general discussion of the Coastal Plain formations, with much data coming from along the Chattahoochee River, includes data about the "Grand Gulf Formation." It overlies marine Miocene beds and underlies the Pliocene Lafayette Formation.
7. Memoir of Daniel W. Langdon, Jr., [1864-1909]: Geol. Soc. America Bull., vol. 21, p. 12-16, 1910.
8. Memorial of Eugene Woldemar Hilgard [1833-1916]: Geol. Soc. America Bull., vol. 28, p. 40-67, port., 1917.
9. Memorial of Robert Hills Loughridge [1843-1917]: Geol. Soc. America Bull., vol. 29, p. 48-55, port., 1918.

SMITH, GEORGE OTIS, 1871-1944.
1. Charles Doolittle Walcott [1850-1927]: Amer. Jour. Science, 5th ser. vol. 14, p. 1-6, port., 1927.
2. Charles Doolittle Walcott [1850-1927]: Smithsonian Inst. Ann. Rept. 1927, p. 555-561, port., 1928.
3. Charles D[oolittle] Walcott [1850-1927] and the United States Geological Survey: Smithsonian Misc. Collections, vol. 80, no. 12, p. 17-18, 1928.

SMITH, GUY-HAROLD, 1895-
1. Armin Kohl Lobeck, geomorphologist and landscape artist, 1886-1958: Assoc. Amer. Geographers Annals, vol. 49, p. 83-87, port., 1959.

SMITH, HAROLD THEODORE UHR, 1908- *see* Thorp, James, 1.

SMITH, JAMES WILLIAM, 1934-
1. Graded bedding [Gordon Co.] a clue to the existence of the Cartersville Fault: Georgia Mineral Newsletter, vol. 10, p. 53-55, illus., 1957. Graded bedding in the metamorphic rocks indicates that the beds, which dip eastward, are not overturned east of the proposed fault. The metamorphic rocks are most likely pre Cambrian which overlie the eastward-dipping proposed fault; this predicates a fault.
2. Geology of an area along the Cartersville Fault near Fairmount, [Cherokee, Gordon, Bartow, and Pickens Cos.] Georgia. M. S. Thesis, Emory Univ., 1959.

SMITH, JOHN LAWRENCE, 1818-1883.
1. Xenotime in [Habersham Co.] Georgia, [no.] 41 *of* Part 4 *of* Re-examination of American minerals: Amer. Jour. Science, 2d ser. vol. 18, p. 377-378, 1854; *in* his Original researches . . ., p. 147-148, 1884. Xenotime crystals from the gold washings are described and analyzed.
2. Description and analysis of a meteoric stone that fell in Stewart County, Ga. (Stewart County Meteorite) on the 6th of October,

1869: Amer. Jour. Science, 2d ser. vol. 50, p. 339-341, 1870; *in* his Original researches . . . , p. 357-362, 1884. A small stone weighing 12¼ ounces is described.

3. Notes on the corundum of North Carolina, Georgia, and Montana, with a description of the gem variety of the corundum from these localities: Amer. Jour. Science, 3d ser. vol. 6, p. 180-186, 1873; Academie des Sciences Paris Comptes Rendus, vol. 77, p. 356-359, 439-442, 1873; *in* his Original researches . . . , p. 185-191, 1884. The occurrence of corundum and its associates is described. No specific location in Georgia is mentioned in the text. Corundum occurs in chrysolite or serpentine rocks and is associated with many minerals, including chlorite, margarite, zoisite, and andesite.
4. Original researches in mineralogy and chemistry, edited by J. B. Marvin. 401 p., Louisville, John P. Marton and Co., 1884; also an 1873 edition. Reprints of his numerous publications in journals are included.

**SMITH, LEON PERDUE,** *see also* Brokaw, Albert Dudley, 1.

1. Alteration of diorite by weathering. Ph. D. Thesis, Univ. Chicago, 1915.
2. Troup County minerals and rocks, chapter 10 *of* History of Troup County, by Clifford Lewis Smith, p. 82-87, Atlanta, [priv. pub.], 1933. An alphabetical list of rocks and minerals includes a brief description of each. No geographic data are included.

**SMITH, PAUL C.**

1. Erosion farm enemy no. 1: Bureau Farmer (Illinois Agric. Assoc. Sec.) vol. 9, p. 15-16, illus., March, 1934. "Story of Providence cave [!Canyon] at Lumpkin [Stewart Co.] Ga., and how the chasm 150 feet deep and nearly 1 mile wide first started as a small gully in 1874 and eventually swallowed up buildings. Losses through soil washing are estimated and reclamation by the C. C. C. is discussed at length."

**SMITH, PHILIP SIDNEY,** 1877- *see* McCallie, Samuel Washington, 36.

**SMITH, RENA FAYE RITCHEY,** *see* Smith, William Gilleland.

**SMITH, RICHARD WELLINGTON,** 1898- *see also* Furcron, Aurelius Sydney, 2, 3; Stose, George Willis, 3.

1. Sedimentary kaolins of the Coastal Plain of Georgia: Georgia Geol. Survey Bull. 44, x, 482 p., illus. incl. geol. map, 1929. A general description of the properties and uses of kaolin is followed by a brief review of the geological history of the Coastal Plain and then a detailed description of individual deposits, by county. Sections are measured; analyses are made. Most are in Cretaceous rocks; some are in Paleocene and Eocene rocks.
2. Cyanite in Georgia: Forestry-Geological Review, vol. 2, no. 10, p. 7-8, 1932. This is a popular account of the origin and occurrence of kyanite in Cherokee and Habersham Counties. No new data are included.

3. Kyanite, vermiculite, and olivine in Georgia: Georgia Geol. Survey Inf. Circ. 3, 4 p., illus., 1934; reprinted *from* Forestry-Geological Review, vol. 2, no. 12, 1932; vol. 4, nos. 5 and 6, 1934. A cursory review of these materials is given. They occur associated with ultrabasic rocks in the Blue Ridge Province and in the Piedmont. Little detail is included.
4. Feldspar in Georgia: Forestry-Geological Review, vol. 3, no. 10, p. 7, 1933. A general discussion of the origin and occurrence of feldspar includes a review of the potential of Georgia as a feldspar producer.
5. Mica in Georgia: Forestry-Geological Review, vol. 3, no. 9, p. 7-8, illus., 1933. A general, popular account of the origin and occurrence of mica in Georgia is given. It occurs in the Blue Ridge and Piedmont Provinces.
6. (The) shale deposits of Georgia: Forestry-Geological Review, vol. 3, no. 2, p. 7-8, illus., 1933. A general, popular account of the origin and occurrence of shale in Georgia is given. No new details are included.
7. Shales and brick clays of Georgia: Georgia Geol. Survey Bull. 45, xiii, 348 p., illus. incl. geol. map, 1931; summary, Amer. Ceramic Soc. Jour., vol. 16, p. 36-44, 1933. A general discussion of the various properties of clay and its uses is followed by a review of its occurrence in Georgia. The various shale formations of northwestern Georgia are described, as are individual deposits. Residual and alluvial clays, mostly on the Coastal Plain, are also described along with descriptions of individual deposits. Analyses are included. Bentonite in Ordovician limestone from many places in northwest Georgia is described and analyzed.
8. Rich find of gold nuggets [White Co.]: Forestry-Geological Review, vol. 5, no. 7, p. 8, 1935. Descriptions of several large nuggets and the conditions under which they were found are given.
9. (The) kyanite industry of [Habersham and Rabun Cos.] Georgia: Amer. Inst. Mining and Metallurgical Engineers Tech. Pub. 742, 11 p., illus., 1936; with discussions, . . . Trans., vol. 129, p. 520-530, illus., 1938. Kyanite-bearing schists are described. The kyanite is considered to have a metamorphic origin. Much emphasis is placed on mining and milling techniques.

**SMITH, WILLIAM GILLELAND,** *see* Smith, Rena Faye Ritchey.

**SMITH, WILLIAM LA RUE,** 1932-

1. A preliminary study of stream-bottom silt [DeKalb Co.] by the use of the pipette method [abs.]: Georgia Acad. Science Bull., vol. 15, p. 62, 1957.
2. The geology of the [Cambrian] Conasauga Formation in the vicinity of Ranger, [Gordon Co.] Georgia. M. S. Thesis, Emory Univ., 1958.

**SMOCK, JOHN CONOVER,** 1842-1926.

1. Georgia, *in* Useful minerals of the United States: U. S. Geol. Survey Mineral Resources [1882-1883], p. 675-677, 1883. The various mineral resources of the state are listed in tabular form along with a little data regarding their occurrence.

2. Geologico-geographical distribution of the iron ores of the eastern United States: Amer. Inst. Mining Engineers Trans., vol. 12, p. 130-144, 1884; Engineering and Mining Jour., vol. 37, p. 217-218, 230-232, 1884. A cursory description of the occurrence of iron ores calls attention to the Silurian ore of Dade and Walker Counties, to the residual ores in the Great Valley, and to potential ore bodies associated with what he calls Precambrian rocks in the Piedmont and Blue Ridge Provinces. No new data are included.

**SNOBBLE, JAMES B.**, see Wilbur, Robert O., 1.

**SNYDER, FRANK G.**, 1912- *see also* Behre, Charles Henry, Jr., 1; King, Phillip Burke, 6; Miser, Hugh Dinsmore, 5.

1. Symposium on mineral resources of the southeastern United States. vii, 236 p., illus., Knoxville, Univ. Tennessee, 1950. Contains numerous papers which are cited individually.

**SOMERS, RANSOM EVARTS**, 1885-

1. Microscopic examination of clays: Washington Acad. Science Jour., vol. 9, p. 113-126, illus., 1919; U. S. Geol. Survey Bull. 708, p. 292-305, illus., 1922. Clays of several types, from different places in the United States, including many different places in Georgia, are analyzed for their mineralogical content. Clay minerals and other forms are noted.

**SOPER, EDGAR KIRKE**, 1886-

1. Gold deposits of Georgia: Mining and Scientific Press, vol. 100, p. 923-924, 1910. A general description of the gold-bearing quartz veins in the local saprolite and metamorphic bedrock is given. No new details are included.
2. (and Osborn, Clarence C.). The occurrence and uses of peat in the United States: U. S. Geol. Survey Bull. 728, x, 207 p., illus., 1922. A general treatise on peat, its uses, and geological control, includes brief references to peat deposits in the Okefenokee Swamp in Effingham County. No details are included.

**SOSMAN, ROBERT BROWNING**, 1881- *see* Day, Arthur Louis, 1.

**SOUTHEASTERN GEOLOGICAL SOCIETY.**

1. Southwestern Georgia. Southeastern Geol. Soc. [Guidebook] Field Trip 2, iii, 63 p. (‡), illus., 1944; contains papers by authors which are cited separately.

**SOUTHERN GOLD COMPANY.**

1. Prospectus of the Southern Gold Company [Lumpkin Co.] . . . , with the report of Professor W[illiam] P[hipps] Blake, also abstracts of Professors Charles T[homas] Jackson and James T[hatcher] Hodge. 15 p., illus., [n. p.], 1859. The property called the Singleton, or Copp's, lot is described cursorily. The occurrence of gold in quartz veins, in placers, and in the saprolite is described. A map shows the distribution of the veins.

**SOWERS, GEORGE FREDERICK,** *see also* Conn, William V., 2.

1. Some foundation problems associated with bedrock west of Rome, [Floyd Co.] Georgia [abs.]: Georgia Acad. Science Bull., vol. 11, p. 11, 1953.

**SPAIN, ERNEST LYNWOOD, JR.,** 1910-

1. (and Laurence, Robert Abraham, and Rose, Nicholas Anthony). Building and crushed stone of the T. V. A. region: Tennessee Valley Auth. Div. Geol. Bull. 6, p. 3-18 (‡), illus., 1937. Marble from the Blue Ridge, and sand and gravel, and limestone from the Paleozoic terrane are described as sources of stone for various purposes.

**SPEIL, SIDNEY,** 1917-

1. Applications of thermal analysis to clays and aluminous materials: U. S. Bur. Mines Rept. Inv. 3764, 36 p. (‡), illus., 1944. A discussion of the technique and value of differential thermal analyses is followed by curves of examples. Some of the kaolin standards are from Georgia, as are some of the unknown examples. Various mixtures are analyzed.

**SPENCER, ARTHUR COE,** 1871-1964.

1. Memorial to Edwin Clarence Eckel [1875-1941]: Geol. Soc. America Proc. 1942, p. 179-187, port., 1943.

**SPENCER, JOSEPH WILLIAM WINTHROP,** 1851-1921.

1. Economic geological survey, in Georgia and Alabama, throughout the belt traversed by the Macon and Birmingham Railway . . . . 86 p., illus., Athens, J. E. Gardner, 1889. The general geology along the line from Macon to Birmingham is described. Precambrian and Cretaceous rocks are encountered in Georgia. Clay is the chief mineral resource present in Georgia.
2. Origin of soils geologically considered: Univ. Georgia Exper. Sta. Bull. 2, p. 27-31, 1889. A general discussion of the origin of soils alludes much to Georgia, but no new data are included.
3. "Southern drift" and its agricultural relations: Univ. Georgia Exper. Sta. Bull. 6, p. 90-94, 1890. This is a semi-popular description of the rocks of the Coastal Plain, explaning why they are different from the rocks of the rest of the state and why the resulting soil and agriculture are different.
4. [Stone Mountain, DeKalb Co.]: Geol. Soc. America Bull., vol. 1, p. 175, 1890. A description of Stone Mountain as an example of a rounded rock surface, due to causes other than glaciation, is given.
5. A general or preliminary geological report on southwest Georgia and report on Polk County: Georgia Geol. Survey Rept. Prog. 1, 1890-91, p. 11-90, 99-128, illus. incl. geol. map, 1891. A complete survey of the Coastal Plain along the Chattahoochee River and eastward is described. Cretaceous to Pleistocene rocks are described; sections are measured. Ground water, phosphate, clay, and limestone are the mineral resources present. A complete description of Polk

Co. is also given. Cambrian to Mississippian rocks are described, and structures explained. Iron ore is the chief mineral resource, and stone and clay are also present. Analyses of the iron ore are included.

6. The Paleozoic group, the geology of ten counties of northwestern Georgia and resources. 406 p., illus. incl. geol. map, Atlanta, Georgia Geol. Survey, 1893. A detailed survey of the Paleozoic rocks and the enclosed mineral resources is given. Folds and faults are described, as is the topography. Sections are measured; analyses are included. Iron, limestone, and clay are the chief economic products discussed.

7. The submarine valleys and cañons off the American coast, Chapter 9 *of* Monograph on the sub-oceanic physiography of the North Atlantic Ocean . . . , by Edward Hull, p. 21-30, illus., London, Edward Stanford, 1912. A chart shows the topography on the continental shelf off of the coast of Georgia. Submarine canyons are shown associated with the Savannah and Altamaha Rivers. The channel between the coast and the Blake [Bahama] Plateau is described. The Plateau is considered a submerged former Coastal Plain. The Savannah and Altamaha submarine canyons are filled with Pleistocene sediments shoreward. They are therefore pre-Pleistocene and indicate great submergence since then.

SPENCER, LEONARD JAMES, 1870-1959.

1. George Frederick Kunz [1856-1932]: Geol. Soc. London Quart. Jour., vol. 89, pt. 3, p. xcviii, 1933.

SQUIRES, DONALD FLEMING.

1. New species of caryophyllid corals from the Gulf Coast Tertiary: Jour. Paleontology, vol. 31, p. 992-996, illus., 1957. *Lophelia tubaeformis*, from a cherty boulder found in Decatur Co., is described and illustrated. The age is not specified, but it is in the Oligocene Flint River Formation.

STAIR, RALPH, 1900-

1. The spectral-transmissive properties of some of the tektites: Geochemica et Cosmochemica Acta, vol. 7, p. 43-50, illus., London, 1955. Data from spectral ultraviolet, visible, and infrared transmittances of Georgian and other tektites are compared with those of known artificial glasses. The absorption characteristics offer potential means of evaluating formation temperatures, etc.

STANDARD GOLD MINING COMPANY.

1. Prospectus, Standard Gold Mining Company. Dahlonega [Lumpkin Co.]. 47 p., illus., [n. p.] [n. d.] [includes reports by E. T. Henderson and William Smith Yeates]. Brief descriptions of numerous quartz veins in the Lumpkin Co. area are given. Among them are the Singleton and Tahloneka Veins. Few new data are included.

STANLEY-BROWN, JOSEPH, 1858-1941, *see also* Dall, William Healey, 4, 5, 10, 11.

1. Geological writings of Richard Owen [1804-1892]: Geol. Soc. America Bull., vol. 5, p. 571-572, 1894.
2. Richard Alexander Fullerton Penrose, Jr., December 17, 1863-July 31, 1931: Science, new ser. vol. 74, p. 476-477, 1931.
3. Memorial of Richard Alexander Fullerton Penrose, Jr. [1863-1931]: Geol. Soc. America Bull., vol. 43, p. 68-108, port., 1932.

STANTON, GILMAN S.

1. Louis Pope Gratacap [1850-1917]: Amer. Mineralogist, vol. 3, p. 31-33, port., 1918.

STANTON, TIMOTHY WILLIAM, 1860-1953.

1. A comparative study of the Lower Cretaceous formations and faunas of the United States: Jour. Geology, vol. 5, p. 579-624, 1897. The Tuscaloosa Formation, considered Lower Cretaceous, is cursorily described and correlated with other Cretaceous units around the country.
2. Supplement to the annotated catalogue of the published writings of Charles Abiathar White, 1886-1897: U. S. Natl. Museum Proc., vol. 20, p. 627-642, 1898.
3. Final supplement to the catalogue of the published writings of Charles Abiathar White, 1897-1908: U. S. Natl. Museum Proc., vol. 40, p. 197-199, 1911.
4. [Charles] David White [1862-1935]: Jour. Geology, vol. 43, p. 778-780, 1935.

STEARNS, HAROLD THORNTON, 1900- *see* Stearns, Norah Dowell, 1.

STEARNS, NORAH DOWELL, 1891-

1. (and Stearns, Harold Thornton, and Waring, Gerald Ashley). Thermal springs of the United States: U. S. Geol. Survey Water-Supply Paper 679-B, 206 p., illus., 1936. Several springs in Pike, Meriwether, and Upson Cos., in the vicinity of Pine Mountain, are described in a table, and are on a map. Little detail is included.

STEFANINI, GIUSEPPE, 1882-1938.

1. [American Tertiary echinoids]: Societa Geologica Italiana Bull., vol. 30, p. 677-714, illus., Rome, 1911; [in Italian]. *Mortonella rogersi,* from the Eocene Sandersville Limestone in Washington Co., is discussed, described, and illustrated. Its relationship to other scutelloids of the Eocene Epoch is discussed.
2. Relations between American and European Tertiary echinoid faunas: Geol. Soc. America Bull., vol. 35, p. 827-846, illus., 1924. Inference is made to the fauna in Georgia. Many genera in Georgia are in common with Europe, but no common species are recognized.

STEGNER, WALLACE EARLE.

1. C[larence] E[dward] Dutton [1841-1912], explorer, geologist, nature writer: Scientific Monthly, vol. 45 p. 82-85, port., 1935.

2. Beyond the hundredth meridian—John Wesley Powell [1834-1902] and the second opening of the west. xxiii, 438 p., illus., Boston, Massachusetts, Houghton, Mifflin and Co., 1954.

STENZEL, HENRYK BRONISLAW, 1899-

1. (and Turner, Francis Earl). The gastropod genera *Cryptochorda* and *Lapparia* in the Eocene of the Gulf Coastal Plain: Texas Univ. Pub. 3945, p. 795-822, illus., 1939. *Lapparia georgiana* from Eocene rocks of some part of Georgia is discussed.
2. Type invertebrate fossils of North America. 8½ x 11 inch cards, numbered consecutively, illus., Texas Bur. Econ. Geol., [?1943-]. Each card is devoted to an illustrated description of an invertebrate. Many are from the Tertiary of the Coastal Plain of Georgia.

STEPHENSON, LLOYD WILLIAM, 1876-1962. *see also* Veatch, Jethro Otto, 9.

1. The Mesozoic deposits of the Coastal Plain of North America. Ph. D. Thesis, Johns Hopkins Univ., 1907.
2. Cretaceous geology of the Carolinas and Georgia [abs.]: Science, new ser. vol. 30, p. 124-125, 1909.
3. Cretaceous deposits of the eastern Gulf region: U. S. Geol. Survey Prof. Paper 81, p. 1-40, illus., 1914. The Cretaceous rocks of Georgia are correlated with those in the rest of the Gulf region. The Tuscaloosa Formation is considered Lower Cretaceous and is overlain by the Upper Cretaceous Eutaw and Ripley Formations. The fauna is listed.
4. Species of *Exogyra* from the eastern Gulf Region and the Carolinas: U. S. Geol. Survey Prof. Paper 81, p. 41-77, illus., 1914. *Exogyra upatoiensis* new, *E. ponderosa, E. erraticostata, E. costata,* and *E. c. cancellata* are described and illustrated. They are from different Cretaceous Formations along the Chattahoochee River.
5. (The) Cretaceous-Eocene contact in the Atlantic and Gulf Coastal Plain: U. S. Geol. Survey Prof. Paper 90, p. 155-182, illus., 1915. A generalized description of the regional unconformable contact and the paleontology of these two systems is followed by detailed accounts of several exposures in several states, none in Georgia.
6. (and Dale, Richard Bryant). Preliminary report on Savannah [Chatham Co.] water supply, [Part 1] *of* Reports on the condition of water supply at Savannah, Georgia, *in* Savannah. Rept. Mayor of Savannah, p. 1-14, illus., 1915. A description of the ground water circumstances and water-well data are included. The aquifer is in the Oligocene and Eocene limestones below the city. Some of the water is contaminated from surface leakage.
7. (and Veatch, Jethro Otto). Underground waters of the Coastal Plain of Georgia: U. S. Geol. Survey Water-Supply Paper 341, 539 p., illus., 1915. A detailed description of the Cretaceous to Recent stratigraphic units of the Coastal Plain includes a discussion of the water-bearing properties. Each county is discussed separately. Sections are measured; fossils are listed. Analyses and well logs are included.
8. North American Upper Cretaceous corals of the genus *Micrabacia:* U. S. Geol. Survey Prof. Paper 98, p. 115-131, illus., 1916. *Micra-*

*bacia rotatilis georgiana* and *M. hilgardi* from the Ripley Formation in Quitman Co. are described and illustrated.

9. Major features of the geology of the Atlantic and Gulf Coastal Plain: Washington Acad. Science Jour., vol. 16, p. 460-480, illus., 1926. A general review of the stratigraphy and structure of the Coastal Plain of North America includes that of Georgia. No details are included.

10. Correlation of the Upper Cretaceous or Gulf Series of the Gulf Coastal Plain: Amer. Jour. Science, 5th ser. vol. 16, p. 485-496, illus., 1928. The exposed Cretaceous rocks in Georgia are cursorily described and correlated with other Cretaceous sections elsewhere. No new data are included.

11. Major marine transgressions and regressions and structural features of the Gulf Coastal Plain: Amer. Jour. Science, 5th ser. vol. 16, p. 281-298, illus., 1928. A generalized description of marine encroachments on the Gulf Coastal Plain includes small-scale maps which include Georgia. Cretaceous and Tertiary times are discussed. The Chattachoochee River area is upwarped.

12. Structural features of the Atlantic and Gulf Coastal Plain: Geol. Soc. America Bull., vol. 39, p. 887-900, illus., 1929. No details are included. The Coastal Plain is composed of a seaward thickening wedge of Cretaceous and Tertiary sedimentary rocks interrupted only locally by structural deformation. A small scale map shows two axes of warping in Georgia, one along the Chattahoochee River and the other along the Savannah River.

13. The zone of *Exogyra cancellata* traced twenty-five hundred miles: Amer. Assoc. Petroleum Geologists Bull., vol. 17, p. 1351-1361, illus., 1933. This oyster zone, in the Ripley Formation in Stewart and Marion Counties, is traced from central Texas to New York.

14. (and Veatch, Jethro Otto, and Peale, Albert Charles). Geological survey and topography, Chap. 3 *of* History of Macon County, Georgia, by Louise Frederick Hays, p. 60-68, Atlanta, Stein Printing Co., 1935. A cursory description of the geology of the county is given. Cretaceous to Eocene rocks are present; bauxite is the most important mineral product; kaolin, limestone, and sandstone are also present. Ground water is discussed.

15. (and others). Correlation of the outcropping Cretaceous formations of the Atlantic and Gulf Coastal Plain and Trans-Pecos Texas: Geol. Soc. America Bull., vol. 53, p. 435-448, chart, 1942. A time-rock chart and a discussion of all the exposed Cretaceous rocks includes those in Georgia.

16. Memorial to Edward Wilber Berry [1875-1945]: Geol. Soc. America Proc. 1945, p. 193-214, port., 1946.

17. Index fossils, with particular reference to the Upper Cretaceous of the eastern United States: Geol. Soc. Japan Jour., vol. 56, p. 89-94, Tokyo, 1950. An address regarding the relationship between stratigraphy and paleontology, with the emphasis placed upon index fossils, includes allusions to the Cretaceous rocks and fossils of Georgia. The genus *Exogyra* is especially valuable.

18. Fossils from the Eutaw Formation, Chattahoochee River region, Alabama—[Chattahoochee Co.] Georgia: U. S. Geol. Survey Prof.

Paper 274-J, p. iii, 227-250, illus., 1957. Nine mollusks, one an ammonite, are described and illustrated.

STEPHENSON, MATTHEW F., *see also* Adelberg, Justus, 1.

1. Geology and mineralogy of Georgia, with a particular description of her rich diamond district . . . . 244 p., illus. incl. geol. map, Atlanta, Globe Pub. Co., 1871. This is a general discussion of the geology of the state. There is little organization, but mineral resources and potentials are described, as are topography, climate, etc. Little space is given to the Coastal Plain.
2. Diamonds and precious stones in Georgia . . . . 32 p., Gainesville, Eagle Job Office, 1878. A general account of the occurrence of diamonds includes a description of their occurrence in Georgia. The relationship of diamond to itacolumite is noted. Diamonds are found as placers in White, Habersham, Hall and Banks Counties. The itacolumite in Hall Co. is made much of. Amethyst, beryl, topaz, quartz, and many other precious and semi-precious stones are discussed.

STERRETT, DOUGLAS BOVARD, 1883-

1. North Carolina, South Carolina, and Georgia, *in* Monazite and zircon: U. S. Geol. Survey Mineral Resources 1906, p. 1196-1204, 1907. This is a very generalized account of the occurrence of monazite in igneous rocks in Hall and Rabun Counties. Little detail is included.
2. Mica deposits of the United States: U. S. Geol. Survey Bull. 740, 342 p., illus., 1923. A general description of the origin and occurrence of mica in pegmatites is followed by descriptions of many specific occurrences in Georgia and elsewhere.

STEVENS, O. B., *see also* McCallie, Samuel Washington, 8.

1. (and Wright, R. F.). Economic geology and mineralogy, Chap. III *of* their Georgia—Historical and industrial, p. 55-126, illus., Atlanta, Franklin Printing and Pub. Co., 1901. A general review of the mineral resources of the state is given. No new data, aside from analyses, are included.

STEVENS, RAY E.

1. (and Holstead, J. B.). Georgia: Natl. Oil Scouts and Landmen's Assoc. Yearbook 1942, vol. 12, p. 108-110, illus., 1942. A structure-contour map on the top of the Eocene Series is included in an otherwise tabular discussion of land-leasing for the year.

STEVENS, ROLLIN ELBERT, 1905-

1. Perley G[ilman] Nutting [1873-1949]: Washington Acad. Science Jour., vol. 40, p. 175-176, 1950.

STEVENSON, JOHN JAMES, 1841-1924.

1. Memoir of James Hall [1811-1898]: Geol. Soc. America Bull., vol. 10, p. 425-431, port., 1900.

2. Lower Carboniferous of the Appalachian Basin: Geol. Soc. America Bull., vol. 14, p. 15-96, 1903. A regional discussion of the Mississippian System of the Appalachian area includes those rocks in northwestern Georgia. Few new details are included.

3. Carboniferous of the Appalachian Basin [Part 1]: Geol. Soc. America Bull., vol. 15, p. 37-210, illus., 1904. A complete discussion of the Pennsylvanian geology of the Appalachian Basin includes references to that in northwestern Georgia. Sections are measured nearby in Tennessee and Alabama, and the rocks in Georgia are not specifically discussed.

**STEWART, JOSEPH WILLIAM,** *see also* Callahan, Joseph Thomas, 4.

1. (and Counts, Harlan Bryan). Decline of artesian pressures in the Coastal Plain of Georgia . . . : Georgia Mineral Newsletter, vol. 11, p. 25-31, illus., 1958. Figures and graphs are given to demonstrate that the artesian water pressure of the area is diminishing due to increased pumping.

2. Earthquake history of Georgia: Georgia Mineral Newsletter, vol. 11, p. 127-128, table, 1958. A table of major United States earthquakes includes a brief description of those which centered in or were felt in Georgia.

3. The effect of earthquakes on water levels in wells in Georgia: Georgia Mineral Newsletter, vol. 11, p. 129-130, illus., 1958. Examples of the effects of long distance earthquakes on the water-level-recording devices in Georgia are described. Apparently Georgia water is very sensitive.

**STILLE, HANS,** 1876-

1. Einfuhrung in den Bau Amerikas. xx, 717 p., Berlin, Gebrueder Borntraeger, 1940. A survey of the structural geology of North and South America and the United States includes discussions of the tectonics of the Appalachian Mountains, northern Georgia included, but not much.

**STOCKDALE, PARIS BUELL,** 1896-1962.

1. Some problems in Mississippian stratigraphy of the southern Appalachians: Jour. Geology, vol. 56, p. 264-268, 1948. This is a review of the problems of correlation of the Mississippian formations including those in northwestern Georgia. No new data are included. More field work is needed.

**STOKES, HENRY NEWLIN,** 1859-

1. Kaolin [from Georgia side of Savannah River, near Augusta, Richmond Co.] *in* Miscellaneous analyses, *in* Report of work done in the division of chemistry and physics . . . 1889-90: U. S. Geol. Survey Bull. 78, p. 120, 1891. A single analysis is given.

**STONE, RALPH WALTER,** 1876-1964, *see* Sanford, Samuel, 1.

**STONE, ROSS CONWAY.**

1. The gold mines, scenery and climate of Georgia and the Carolinas

. . . for the Atlanta and Charlotte Air Line Railway Company. 40 p., illus., New York, Natl. Bank Note Co., 1878. A guide to the resort area of the Piedmont and Blue Ridge includes discussions and descriptions of the gold-bearing regions. Little technical information is included.

STOSE, ANNA ISABEL JONAS, 1881- *see* Jonas, Anna Isabel; Stose, George Willis, 6, 9, 10; White, William Alexander, 3.

STOSE, GEORGE WILLIS, 1869-1960, *see also* White, William Alexander, 3.

1. Manganese ores of the southern states: Engineering and Mining Jour., vol. 110, p. 256-262, illus., 1920. A cursory review of the occurrence of manganese includes those deposits from northwestern Georgia. The ore occurs as oxides in residual deposits in Cambrian rocks. No new data are included.
2. Geologic map of the United States. Scale, 1 inch to 2,500,000 inches, 4 sheets, U. S. Geol. Survey, 1932; southern Appalachian portion revised and reprinted in U. S. Geol. Survey Prof. Paper 213. A complete map of the United States includes Georgia which is on the southeastern quarter sheet.
3. (and Smith, Richard Wellington, and others). Geologic map of Georgia. Scale, 1 inch to 500,000 inches, Georgia Div. Mines, Mining and Geology and the U. S. Geol. Survey, 1939.
4. Source beds of manganese ore in the Appalachian Valley: Econ. Geology, vol. 37, p. 163-172, 1942. The residual manganese ores in northwestern Georgia came from the alteration of a manganese-rich zone at the contact of quartzite with the overlying dolomite. The manganese-rich zone was deposited upon the old land surface of the quartzite. Georgia is implied.
5. (and others). Geologic map of Georgia. Scale, 1 inch to 500,000 inches, Georgia Geol. Survey and U. S. Geol. Survey, 1939; Coastal Plain portion reprinted *in* U. S. Geol. Survey Bull. 941, 1943.
6. (and Stose, Anna Isabel Jonas). (The) Chilhowee Group and Ocoee Series of the southern Appalachians: Amer. Jour. Science, vol. 242, p. 367-390, 401-416, illus., 1944. A regional study includes the Blue Ridge Province of Georgia and a part of the Piedmont Province. The Ocoee Series (late Precambrian) is largely metamorphic rocks but with some igneous intrusions. The series is overthrust toward the northwest and overlies the Chilhowee Group (Cambrian). The Ocoee Series is correlated with the Talledega Series elsewhere in Georgia and Alabama. Numerous formations are involved.
7. Obituary, Arthur Keith [1864-1944]: Washington Acad. Science Jour., vol. 34, p. 240, 1944.
8. Obituary, Bailey Willis, 1857-1949: Washington Acad. Science Jour., vol. 39, p. 346-347, 1949.
9. (and Stose, Anna Isabel Jonas). Ocoee Series of the southern Appalachians [Blue Ridge]: Geol. Soc. America Bull., vol. 60, p. 267-320, illus. incl. geol. map, 1949. The Ocoee Series, Precambrian in age, is composed of metamorphosed sedimentary rocks which have been folded and thrust faulted. The rocks and structures are

described from the Blue Ridge area of Georgia and elsewhere. The overlying Cambrian and Ordovician rocks, adjacent to the overthrusts, are also described.

10. (and Stose, Anna Isabel Jones). Folded low-angle overthrusts of the southern Appalachians [abs.]: Geol. Soc. America Bull., vol. 61, p. 1506-1507, 1950.

**STOW, MARCELLUS HENRY, 1902-1957.**

1. Report of radiometric reconnaissance in . . . parts of . . . Georgia . . . : U. S. Atomic Energy Comm. Rept. RME—3107, 33 p. (‡), illus., 1955. A cursory scintillator traverse between Rome, Floyd Co., and Trenton, Dade Co., is described on one page. No areas of highly significant radioactivity were encountered. Some actual readings are recorded for various specific locations.

**STRACHAN, CLARICE B.**

1. Biographical sketches of recently elected honorary members [of the American Association of Petroleum Geologists] [Edward Oscar Ulrich]: Amer. Assoc. Petroleum Geologists Bull., vol. 20, p. 1265-1268, port., 1936.

**STRALEY, H. W., 3d, 1905-** *see also* Brown, William Robert, 1; Burdick, Glenn A., 1; Johnson, W. Ray, Jr., 1; McClain, Donald Schofield, Jr., 4; Richards, Horace Gardiner, 8, 9; Rowlands, Charles Evans, Jr., 1; Tucker, Charles V., Jr., 1.

1. (and Richards, Horace Gardiner). The Atlantic Coastal Plain: Internatal. Geol. Cong. 18th, Great Britain 1948, Rept. pt. 6, p. 86-91, illus., London, 1950; discussions, p. 91. A general description of Coastal Plain sedimentation includes generalized cross sections based on information obtained from deep wells. Cretaceous to Pleistocene rocks are present. Petroleum-associated structures are discussed.
2. Geomagnetic profiles along the Savannah River, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 115-119, illus., 1953. Magnetic highs and lows are recorded and are compared with similar features toward the northeast. Basement lithologic differences are interpreted as the causes in part.
3. Some [Burke Co.] Georgia Carolina Bays, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 130-132, 1953. Two closed magnetic highs were detected associated with some circular depressions considered to be Carolina Bays. One is associated with one "bay" and the larger high is associated with a number of overlapping "bays." The depth to the source of the anomaly is between 1400 and 2400 feet.
4. Geophysical investigations in the southeastern states [abs.]: Amer. Geophysical Union Trans., vol. 35, p. 372, 1954.
5. In memoriam [W. Ray Johnson, Jr., 1913-1952]: Compass, vol. 31, p. 331-332, 1954.

STRALEY, H. W., 4th, *see* Johnson, W. Ray, Jr., 1.

STRALEY, WILLIAM FOREST, *see* Johnson, W. Ray, Jr., 1.

STRINGFIELD, VICTOR TIMOTHY, 1902-

1. (and Warren, Moultrie Alfred, and Munyan, Arthur Claude). Georgia, *in* Water levels and artesian pressure in observation wells in the United States in 1938: U. S. Geol. Survey Water-Supply Paper 845, p. 52-54, 1939. The depth to the water table in observation wells in Chatham, Dougherty, and Glynn Cos. is recorded.
2. Groundwater in the southeastern states: Amer. Water Works Assoc. Southeastern Div. Jour., vol. 9, p. 58-70, illus., 1940; discussions, p. 70-74. The importance, general conditions, and problems of groundwater in the southeastern United States, including Georgia, are cursorily discussed. No new data are given.
3. (and Warren, Moultrie Alfred, and Cooper, Hilton Hammond, Jr.). Artesian water in the coastal area of Georgia and northeastern Florida: Econ. Geology, vol. 36, p. 698-711, illus., 1941. The Eocene Ocala Limestone is the greatest of the reservoirs. Most wells using it along the coast are artesian except those around Savannah. Piezometric maps are given, along with analyses. Over 180 million gallons per day are withdrawn.
4. Ground-water geology in the southeastern United States, *in* Snyder, Frank G., ed., Symposium on mineral resources of the southeastern United States, p. 211-222, illus., 1950. A very generalized review of the geology of the various provinces including those in Georgia, is given. A brief survey of the ground water potential is included. No new data are included.
5. (and Cooper, Hilton Hammond, Jr.). Geologic and hydrologic factors affecting perennial yield of aquifers: Amer. Water Works Assoc. Jour., vol. 43, p. 803-816, illus., 1951. Various factors effecting yields in aquifers are discussed, as are generalized principles of ground water movement. A small-scale piezometric surface map of southeastern Georgia is included. No new data are given.
6. Artesian water in the southeastern states, *in* Proceedings of the southeastern mineral symposium 1950: Kentucky Geol. Survey, ser. 9, Spec. Pub. 1, p. 24-39, illus., 1953. This is a generalized review of the nature and occurrence of artesian water. Small-scale piezometric and other maps are included. Few details are given.

STROMER, ERNST, 1871-

1. William Diller Matthew, 1871-1930: Zentralblatt fuer Mineralogie . . . 1931, Abt. B, no. 5, p. 266-268, Stuttgart, 1931.

STUART, ALFRED WRIGHT, 1932-

1. (A) detailed petrographic study of the Paleozoic sediments in the area of Fairmount [Gordon Co.] Georgia. M. S. Thesis, Emory Univ., 1956.
2. Dolomitic limestone and shale in the Fairmount area [Gordon Co.]: Georgia Mineral Newsletter, vol. 9, p. 85-89, illus. incl. geol. map, 1956. Dolomitic limestone and shale in the Conasauga Formation are analyzed chemically and petrographically. A detailed measured

section is included, as is a map showing the distribution of various deposits.

3. Paleozoic carbonate rocks at Fairmount [Gordon Co.] [abs.]: Georgia Acad. Science Bull., vol. 14, p. 38, 1956.

STUCKEY, JASPER LEONIDAS, 1891-

1. Memorial of Joseph Hyde Pratt [1870-1942]: Amer. Mineralogist, vol. 28, p. 155-166, port., 1943; Geol. Soc. America Proc. 1942, p. 201-215, port., 1943.
2. Talc, soapstone, and pyrophyllite in the southeastern United States, in Snyder, Frank G., ed., Symposium on mineral resources of the southeastern United States, p. 112-119, illus., 1950. A general description of the origin and occurrence of these materials includes brief references to those in Georgia. Most are in the Piedmont.

STULL, RAY THOMAS, 1875- *see also* Maynard, Thomas Poole, 7.

1. Distribution of kaolin and bauxite of the Coastal Plain of Georgia: Amer. Ceramic Soc. Jour., vol. 7, p. 513-522, illus., 1924. Kaolin and desilicated kaolin, bauxite, occur as sedimentary lenses in the Cretaceous rocks of Georgia. Their origin and distribution are described as is their relationship to each other. The kaolin was deposited in the sea after transoprtation from the Piedmont area, and hydraulic separation.

SULLIVAN, EUGENE CORNELIUS, 1872-

1. Arthur Louis Day: Amer. Ceramic Soc. Bull., vol. 20, p. 252-254, port., 1941.

SULLIVAN, JOHN WENTWORTH.

1. (The) geology of the Sand-Lookout Mountain area, northwest Georgia: Georgia Geol. Survey Inf. Circ. 15, 68 p. (‡), illus., 1942. A complete geologic description of the area is given. Ordovician to Pennsylvanian rocks are described. Sections are measured; fossils are listed. Folds are the dominant structure. Coal, clay, iron ore, bentonite, and stone are the chief mineral resources.
2. (An) occurrence of concretions in the Pottsville of [Dade Co.] Georgia: Jour. Geology, vol. 50, p. 209-212, illus., 1942. The concretions are in a sandy shale zone in the [Gizzard Formation]. They are elliptical, with central cores 3 to 8 feet in diameter. They are possibly a result of the ground water precipitating material in an area formed by a fortuitous combination of bedding planes and joints.

SUMNER, JAMES BATCHELLER, 1887-1955.

1. Memorial of Cleveland Abbe, Jr. [1872-1934]: Geol. Soc. America Proc. 1934, p. 151-160, port., 1935.

SUN, Y. C., 1897-

1. Professor Amadeus William Grabau [1870-1946], biographical note: Geol. Soc. China Bull., vol. 27, p. 1-26, port., Peiping, 1947.

SUTHERLAND, WILLIAM JAMES, 1865-1914.

1. Physiography of the Gulf Coastal Plains: Jour. Geography, vol. 6, p. 337-347, 1908. A very generalized geological history is given, which is followed by a review of the various physiographic features and materials. Hardly any detail is included for Georgia, however.

SWANSON, KATHERINE LUTZ, *see* McKelvey, Vincent Ellis, 2.

SWANSON, VERNON EMANUEL, 1922-

1. Uranium in marine black shales of the United States: Internatl. Conference on Peaceful Uses Atomic Energy [1st], Geneva 1955, Proc., vol. 6, p. 430-434, 1956; U. S. Geol. Survey Prof. Paper 300, p. 451-456, illus., 1956. This is a very generalized survey which incudes a discussion of the Chattanooga Shale, some of which is in Georgia. The uranium in the shale is a result of absorption, by the organic material in the original mud, of the uranium salts in solution in the sea.

SWARTZ, CHARLES KEPHART, 1861-1949.

1. (and others). Correlation of the Silurian Formations of North America: Geol. Soc. America Bull., vol. 53, p. 533-538, chart, 1942. A time-rock chart compares the Silurian rocks of Georgia with those from elsewhere. Only Lower and Middle Silurian rocks are present and are called the Red Mountain Group.

SWARTZ, FRANK MC KIM, 1899-

1. Muscle marks, hinge and overlap features and classification of some Leperditiidae: Jour. Paleontology, vol. 23, p. 306-327, illus., 1949. Besides the morphological discussion, *Chevroleperditia chevronalis*, from mid-Paleozoic rocks in Early Co., is described and illustrated.

SWARTZ, JOEL HOWARD, 1893-

1. (and MacCarthy, Gerald Raleigh, and Shuler, Ray McKee). A magnetic survey of the southern part of Georgia: U. S. Geol. Survey Repts. Open File 355, 123 p. (‡), illus., [1956]. Twelve traverses along roads, with reading intervals of about one mile are made; about 2/3 of the state is covered. The data are presented on tables showing miles, station number, vertical intensity in gammas, and remarks.

SWICK, CLARENCE HERBERT, 1883-

1. Gravitational determination of deep-seated crustal structure of continental borders (observations and methods): Amer. Geophysical Union Trans., vol. 21, p. 801-808, illus., 1940. A map of gravity-determination stations shows many in Georgia. An isoanomaly map of Florida includes some of southern Georgia. A gravity profile from Birmingham, Alabama, to Fernandina, Florida, crosses Georgia. Little interpretation is included.

SWINEFORD, ADA, *see* Mumpton, Fred Albert, 1.

SWINNERTON, ALLYN COATS, 1897-1952.

1. Arthur Keith (1864-1944): Amer. Assoc. Petroleum Geologists Bull., vol. 28, p. 1553-1556, port., 1944.

TABER, STEPHEN, 1882-1963.

1. The earthquake in the southern Appalachians: Seismol. Soc. America Bull., vol. 6, p. 218-226, illus., 1916. A large earthquake, centering in North Carolina, was recorded in southern Georgia. Another is recorded southeast of Atlanta with an intensity of VI.
2. Gold crystals from the southern Appalachians: Amer. Mineralogist, vol. 33, p. 482-488, illus., 1948. Small crystals of gold in quartz from White Co. are reported. Each is 3 to 4 mm. in diameter, but the faces are so imperfect that the crystal forms could not be determined for certain. They are produced in cavities.
3. Orogenic movements during Lafayette time [abs.]: Geol. Soc. America Bull., vol. 68, p. 1802-1803, 1957.

TAGGART, MILLARD SEALS, JR., 1909- *see* Buckley, Stuart Edward, 1.

TAPPAN, HELEN NINA, *see* Loeblich, Alfred Richard, Jr., 1.

TATHAM, WILLIAM.

1. Gold mining in Georgia: Franklin Inst. Jour., vol. 146, p. 19-26, 1898. This is an extremely cursory description of some of the gold deposits in the Blue Ridge and Piedmont. The gold occurs in quartz veins associated with galena, pyrite, chalcopyrite, and sphalerite. The quartz veins are in fissures in metamorphic rocks. Local details are described, but no new data are included.

TATTON, M.

1. Nova et rece terraum et regnorum Californiae. Map, 1616; reproduced *in* The Southeast in early maps, by W. P. Cumming, pl. 19, p. 96, Princeton, New Jersey, Princeton Univ. Press., 1953. An early map showing mountains where Georgia is and labelled there "Mons Appallaci, in quo aurum et argentum est."

TAYLOR, ARTHUR ELIJAH, 1877-

1. (and others). Soil survey [of] Catoosa County Georgia: U. S. Dept. Agriculture Bur. Plant Industry, [Rept.] ser. 1937, no. 4, 57 p,. illus., 1941. A portion of this otherwise purely descriptive account of the distribution of soils in the county includes a discussion of the origin of the soils from the various types of sedimentary rocks.
2. (and others). Soil survey [of] Dade County Georgia: U. S. Dept. Agriculture Bur. Plant Industry, [Rept.] ser. 1936, no. 20, 68 p., illus., 1942. A portion of this otherwise purely descriptive report on soil properties and distribution, is devoted to the origin of the different soils from different bedrocks.

**TAYLOR, FRANK HAMILTON**, 1846- *see* Morris, Charles E., 1.

**TAYLOR, JAMES WICKES**, 1819-1893 *see also* Browne, John Ross, 1.

1. Georgia, *in* Gold mines east of the Rocky Mountains: U. S. Congress 39th, 2d sess., House Exec. Doc. 92, p. 21-22, 1867. A very cursory description of the occurrence of gold in the Piedmont area is given. No details are new.

**TAYLOR, JOSEPH H.**

1. Pyrite and pyrrhotite resources of Ducktown, Tenn. [and Fannin Co.]: Amer. Inst. Mining Engineers Bull. 134, p. 529-533, 1918; . . . Trans., vol. 59, p. 88-92, 1918. Pyrite and pyrrhotite occur in lenticular bodies, more or less connected. Some are found in Georgia. Generalized analyses are included.

**TAYLOR, WILLIAM JOHNSON.**

1. Notice of a new locality of molybdate of iron? [Heard Co.] [abs.]: Amer. Jour. Science, 2d ser. vol. 19, p. 429, 1855.

**TEAGUE, KEFTON HARDING**, 1920- *see also* Broadhurst, Sam Davis, 1; Furcron, Aurelius Sydney, 7, 10, 11, 12, 13; Hash, Lewis J., 1; Hull, Joseph Poyer Deyo, 1.

1. (and LeGrand, John R.). Hartwell [Hart Co.] mica district (a preliminary report). 21 p (‡), illus., (unpublished), Georgia Dept. Mines, Mining and Geology and Tennessee Valley Auth. [193-]. An unusually coarse pegmatitic granite in Hart Co. is described and mapped. The mica content varies from 8 to 30 percent.
2. Georgia talc industry [Murray Co.] helped by geologic study: Engineering and Mining Jour., vol. 147, no. 11, p. 63-65, illus., 1946. A description of the talc occurrence, derived from the alteration of impure dolomitic limestone of Precambrian age, is given. The talc bodies occur in granite or granite gneiss. Talcose schist is also present.
3. (and Furcron, Aurelius Sydney). Geology and mineral resources of Rabun and Habersham Counties, Georgia. Map, scale, 1 inch to 126,720 inches, Georgia Geol. Survey and Tennessee Valley Auth., 1948. A single map sheet shows the geology contacts and locations of twenty different mineral resources.
4. Georgia's talc industry [Murray Co.] [abs.]: Georgia Acad. Science Bull., vol. 8, no. 1, p. 13, 1950.
5. Sillimanite in the southeast: Mining Engineering, [vol. 2] vol. 187, p. 785-789, illus., 1950; Amer. Inst. Mining Engineers Trans., vol. 187, illus., 1950. The geology of sillimanite-bearing schists in the Piedmont of the southeastern United States, including those of Georgia, are described.
6. Georgia [asbestos] occurrences [in Blue Ridge] described: Georgia Mineral Newsletter, vol. 9, p. 4-7, 1956. Abstracts of descriptions of individual deposits are presented. The original work was never published.

TEAS, LIVINGSTON PIERSON, 1893- *see also* Hull, Joseph Poyer Deyo, 1.

1. Preliminary report on the sand and gravel deposits of Georgia: Georgia Geol. Survey Bull. 37, xiii, 392 p., illus., 1921. A general discussion of the nature of sand and gravel, both physical and chemical, uses and production, is followed by a discussion of their distribution in Georgia. The individual deposits in each county are described. Sections are measured.
2. Heinrich Ries (1871-1951): Amer. Assoc. Petroleum Geologists Bull., vol. 35, p. 2638-2641, port., 1951.
3. Singing sands [Upson Co.]: Georgia Geol. Survey Bull. 37, p. 378-380, 1921; Georgia Mineral Newsletter, vol. 8, p. 21-22, 1955. The sand at Thunder Spring makes noise when rubbed or walked upon. The sound is due to the sand grains rubbing together, with the presence of mica adding to the sonorousness.

TEILHARD DE CHARDIN, PIERRE, 1881-1955.

1. Henry Fairfield Osborn [1857-1935]: Anthropologie, vol. 46, p. 704-706, Paris, 1936.

TELLER, JAMES DAVID.

1. Louis Agassiz [1807-1873], scientist and teacher: Ohio State Univ. Graduate School Studies, Educ. ser. no. 2, ix, 145 p., 1947.

TENNEY, WILLIAM J.

1. Gold deposits in South Carolina and Georgia [abs.]: Mining Mag., vol. 1, p. 628-629, 1853.
2. Silver mine in [Gwinnett Co.] Georgia [abs.]: Mining Mag., vol. 2, p. 568-569, 1854.

THEIS, CHARLES VERNON, 1900-

1. Savannah River site, *in* A review of the ground-water geology of the major waste-producing sites: U. S. Atomic Energy Comm. Rept. T I D—7517, pt. 1a, p. 126-131 (‡), illus., 1956. A very general review of the Cretaceous and Tertiary rocks of Burke and Richmond Cos. is followed by a discussion of the ground water and its movement in the area. The Tuscaloosa Formation is the major aquifer; waste disposal is allowed to seep into the overlying Tertiary rocks.

THOENEN, JOHN ROY, 1886-

1. (and Burchard, Ernest Francis). Bauxite resources of the United States: U. S. Bur. Mines Rept. Inv. 3598, 42 p. (‡), illus., 1941. A general review of the occurrence of bauxite includes brief descriptions of those deposits on the Coastal Plain and those in the Paleozoic terrane of northwestern Georgia. No new details are given.

THOM, WILLIAM TAYLOR, JR., 1891-

1. Marcellus Henry Stow (1902-1957): Amer. Assoc. Petroleum Geologists Bull., vol. 42, p. 1771-1773, port., 1958.
2. Memorial to Marcellus Henry Stow (1902-1957): Geol. Soc. America Proc. 1957, p. 165-166, port., 1958.

3. Tectonic sketch map of North America, showing regional structural features and approximate configuration of surface of basement complex. Scale, 1 inch to 10,000,000 inches, Red Lodge, Montana, Yellowstone-Big Horn Research Assoc., 1959. Georgia has the Appalachian Trough in the northwestern portion and the Okeefenokee Lineament running northwestward from the Okefenokee Swamp through the Albany, Dougherty Co., area.

**THOMAS, HENRY DIGHTON.**

1. Dr. Thomas Wayland Vaughan [1870-1952]: Nature, vol. 169, p. 734-735, London, 1952.

**THOMPSON, RAYMOND MELVIN,** 1918- *see also* Warren, Walter Cyrus, 1.

1. Geologic map of the principal clay area of Twiggs County, Georgia. Scale, 1:62,500, U. S. Geol. Survey, Strategic Mineral Investigations Prelim. Map, 1943; short text on map.
2. Geologic map of the principal clay area of Washington County, Georgia. Scale, 1:62,500, U. S. Geol. Survey Strategic Mineral Investigations Prelim. Map, 1943; short text on map.

**THOMPSON, THOMAS GORDON,** 1888-

1. Thomas Wayland Vaughan, September 20, 1870—January 16, 1952: Natl. Acad. Science Biog. Mem., vol. 32, p. 399-437, port., 1958.

**THOMSON, MEDFORD THEODORE,** 1904- *see also* Herrick, Stephen Marion, 2.

1. The influence of geology on stream flow in the vicinity of the Fall Belt in east-central Georgia [abs.]: Geol. Soc. America Bull., vol. 65, p. 1369, 1954.
2. (and Herrick, Stephen Marion, and Brown, Eugene). The availability and use of water in Georgia: Georgia Geol. Survey Bull. 65, xiii, 329 p., illus., 1956. A generalized discussion of the occurrence of water includes ground water. The nature of its occurrence, artesian wells, etc., are discussed cursorily. Analyses of water from wells in Coastal Plain rocks are included.

**THORP, JAMES,** 1896-

1. (and Smith, Harold Theodore Uhr, chairmen, and others). [Map of] Pleistocene eolian deposits of the United States, Alaska, and parts of Canada, 2 sheets. Scale, 1 inch to 2,500,000 inches, (1 inch to about 40 miles) Geol. Soc. America and Natl. Research Council, 1952. Much of the terrace material along the Atlantic Coast is mapped as eolian, as is a narrow band of sand dunes, running roughly east to west, in the south western portion of the state.

**THORPE, ARTHUR NATHANIEL,** *see* Sentfle, Frank Edward, 1.

**TINGLE, WOODROW WILSON.**

1. Geology of the clays of Twiggs County, Georgia. M. S. Thesis, Univ. North Carolina, 1957.

**TODD, JOHN DAVID.**

1. What's wrong with the eastern Gulf Coast?: Oil Weekly, vol. 123, no. 3, p. 89-91, illus., 1946. A survey of the general geology of the Coastal Plain is included. Large tectonic features in Georgia are shown on a structural contour map on the top of the Cretaceous System.

**TODD, MARGARET RUTH, 1913-**

1. Joseph A[ugustine] Cushman, 1881-1949: Micropaleontologist, vol. 3, no. 3, p. 15-18 (‡), port., 1949.
2. Joseph Augustine Cushman [1881-1949]: Cushman Lab. Foraminiferal Research Memorial Volume, 68 p., illus., 1950.

**TOLER, HENRY N.**

1. (chairman, and others). Georgia, *in* Possible future oil provinces of southeastern United States: Amer. Assoc. Petroleum Geologists Bull., vol. 25, p. 1575-1579, illus., 1941. A map shows some of the major structural features of the southeastern United States, including those of Georgia. The potential petroleum-bearing beds are very thin.

**TOMKINS, IVAN R.**

1. The Georgian oyster: Nature Mag., vol. 40, p. 432, 444, illus., 1947. This is a popular description of Shell Bluff in Burke County.

**TORBERT, JOHN BRYANT, 1867-1929.**

1. (and McGee, W J). Geological map of the United States showing the distribution of Pleistocene ice-work and water work so far as known. Scale, 1:15,000,000, *in* Johnson's Universal Cyclopaedia, vol. 3, following p. 796, New York, A. J. Johnson and Co., 1895.

**TOULMIN, LYMAN DORGAN, JR., 1904-**

1. Volume of Cenozoic sediments in Florida and Georgia: Geol. Soc. America Bull., vol. 63, p. 1165-1175, illus., 1952. Cenozoic rocks have a maximum thickness of 3000 feet and an average thickness of 1500 feet, and are under 33,000 square miles of southern Georgia. The total volume is 9500 cubic miles.
2. (and Jordan, Louise). Stratigraphy of the Coastal Plain in southeastern Alabama, Florida, and Georgia [abs.]: Oil and Gas Jour., vol. 51, no. 47, p. 175, 1953; Amer. Assoc. Petroleum Geologists Bull., vol. 37, p. 1130, 1953.
3. (and Winters, Stephen Samuel). Pre-Eocene solution features in southeast Alabama and southwest Georgia: Florida State Univ. Studies, no. 13, p. 72-83, illus., 1954. Solution pits in Paleocene Clayton Limestone in Clay Co. are described. They are filled with Tuscahoma and Nanafalia Sandstone, indicating a pre-Eocene age for the pits. Natural bridges are also present, but their age is indeterminate.
4. Cenozoic geology of southeastern Alabama, Florida, and Georgia: Amer. Assoc. Petroleum Geologists Bull., vol. 39, p. 207-235, illus.,

1955. A detailed discussion includes much data from the Coastal Plain of Georgia. Paleocene to post-Miocene rocks are described and correlated.

TRASK, PARKER DAVIES, 1899-1961.

1. Geology of some American estuarine harbors [Chatham Co.]: Amer. Soc. Civil Engineers Proc., vol. 82, Paper 956, (Jour. Hydraulics Div., no. HY 2.), 18 p., illus., 1956. Savannah harbor is the result of post-glacial sea level rise. When it was artificially deepened, the sedimentation regimen was changed. The sediments are in part deposited by tidal currents because the heavy minerals in the harbor are not from the Savannah River drainage basin.

TRAYLOR, HENRY GRADY, 1925-

1. Geology of a portion of the Kensington Quadrangle, [Walker Co.] northwest Georgia. M. S. Thesis, Univ. Iowa, 1951.

TROEDSSON, GUSTAF TIMOTEUS, 1891-1954.

1. Charles D[oolittle] Walcott [1850-1927]: Geologiska Foereningens i Stockholm Forhandlingar, vol. 49, p. 290-292, port., 1927.
2. Charles Schuchert [1858-1942] in memoriam: Geologiska Foereningens i Stockholm Forhandlingar, vol. 65, p. 427-429, illus., 1943.

TROWBRIDGE, ARTHUR CARLTON, 1885-

1. Eugene Wesley Shaw [1881-1935]: Amer. Assoc. Petroleum Geologists Bull., vol. 20, p. 239-240, 1936.
2. Mississippi River and Gulf Coast terraces and sediments as related to Pleistocene history—a problem: Geol. Soc. America Bull., vol. 65, p. 793-812, illus., 1954. The geology of the marine terraces on the Georgia Coastal Plain is reviewed. They are thought to be predominantly the result of tectonic uplift rather than by progressively decreasing sea level.

TROXELL, JOHN RUTMAN.

1. Exploration of Lookout Mountain and Sand Mountain coal deposits, Dade and Walker Counties, Georgia: U. S. Bur. Mines Rept. Inv. 3960, 10 p. (‡), illus., 1946. Columnar sections in Pennsylvanian rocks, derived from core drilling, are analyzed. Four coal seams are identified, and analyses are included.

TRUESDELL, G. C., *see* Klinefelter, Theron Albert, 1.

TRUMBULL, JOHN, *see* Johnston, John Edward, 1.

TRUXES, LEE SAYLES, 1927-

1. (The) geology of the Silurian Red Mountain Formation from Taylor Ridge to Horn Mountain [northwestern Ga.]. M. S. Thesis, Emory Univ., 1956.
2. (A) grain size analysis of the Red Mountain Formation in Maddox Gap [Walker Co.] [abs.]: Georgia Acad. Science Bull., vol. 14, p. 38, 1956.

TUCEK, CHARLES S., *see* Broecker, Wallace S., 1.

TUCKER, CHARLES V., JR.

1. (and Straley, H. W., 3d). A geomagnetic map of parts of Dawson and Lumpkin Counties, Georgia [abs.]: Georgia Acad. Science Bull., vol. 12, p. 36, 1954.

TUCKER, HELEN IONE, *also as* Tucker-Rowland, Helen Ione.

1. The Atlantic and Gulf Coast Pectinidae of the United States: Amer. Midland Naturalist, vol. 17, p. 471-490, 985-1017, illus., 1936. Many species of *Pecten* and *Chlamys* from the Eocene and Miocene of the Coastal Plain of Georgia, and elsewhere, are described and illustrated.
2. The Atlantic and Gulf Coast Tertiary Pectinidae of the United States, sec. 3, systematic descriptions: Musée Royal d'Histoire Naturelle Belgique Mém., 2d ser. vol. 13, 76 p., illus., Brussels, 1938. *Chlamys alpha* and *C. suwaneeensis* from "Oligocene" rocks in Decatur Co. are described and illustrated along with many others from elsewhere in the United States.

TUFFT, H. E.

1. Ocher, umber, and sienna: U. S. Bur. Mines Rept. Inv. 2139, 6 p. (‡), 1920. A general description of the ocher deposit of the Cartersville area in Bartow Co. is given. Analyses are included.

TUREKIAN, KARL K.

1. (and Kulp, John Laurence). The geochemistry of strontium: Geochemica et Cosmochemica Acta, vol. 10, p. 245-296, London, 1956. Numerous analyses of many rocks and minerals from many different places include some from Georgia. The Sr content is determined. Granite from Little Stone Mountain has 19 p p m Sr, and granite from Black Ledge has 67 p p m Sr. The locations are not specified.

TURNER, FRANCIS EARL, 1905- *see* Stenzel, Henryk Bronislaw, 1.

TURNER, PHILIP AMBROSE.

1. Sedimentation in the Upper Cretaceous of east-central Georgia. M. S. Thesis, Cornell Univ., 1959.

TURRENTINE, JOHN WILLIAM, 1880-

1. Potash. 188 p., illus., New York, Reinhold, 1926. A generalized discussion of the origin, occurrence, and development of potash-bearing minerals in the world includes a brief discussion of high-potassium slates near Cartersville, Bartow County.

TWENHOFEL, WILLIAM HENRY, 1875-1957.

1. Professor Charles Schuchert [1858-1942]: Jour. Sedimentary Petrology, vol. 12, p. 137, 1942; vol. 13, p. 121-129, port., 1943.
2. (chairman, and others). Correlation of the Ordovician formations of North America: Geol. Soc. America Bull., vol. 65, p. 247-298,

table, 1954. The Ordovician rocks of northwestern Georgia are included in a time-rock correlation chart. A brief description is included.

TWENHOFEL, WILLIAM STEPHENS, 1918-

1. (and Buck, Catherine Lutz). The geology of thorium deposits in the United States: Internatl. Conference on Peaceful Uses of Atomic Energy [1st], Geneva 1955, Proc., vol. 6, p. 562-567, illus., 1956; U. S. Geol. Survey Prof. Paper 300, p. 559-566, illus., 1956. A generalized discussion of the occurrence of thorium-bearing minerals includes a brief reference to the placer monazite occurrences on the Coastal Plain.

TWITCHELL, MAYVILLE WILLIAM, 1868-1927, *see also* Clark, William Bullock, 3.

1. Cenozoic Cassiduloidae of the United States. Ph. D. Thesis, Johns Hopkins Univ., 1905.

TYLER, PAUL MC INTOSH, 1889-

1. (and Petar, Alice Virginia). Arsenic: U. S. Bur. Mines Econ. Paper 17, iii, 35 p., 1934. A general discussion of the nature and occurrence of arsenic as an element includes a mention of its reported occurrence in arsenopyrite in Cherokee and Forsyth Counties. No details are given.

UCHIYAMA, AIJI, *see* Goldberg, Edward D., 1.

ULRICH, EDWARD OSCAR, 1857-1944.

1. (and Schuchert, Charles). Paleozoic seas and barriers in eastern North America: New York State Museum Bull. 52, p. 633-663, illus., 1902. The paleogeography of the Applachian Geosyncline area is discussed, including that of northwestern Georgia. The differences in the rock types are attributed to a provenance from different barriers, which were the result of folds. A generalized sketch map shows the relationships.
2. Revision of the Paleozoic Systems: Geol. Soc. America Bull., vol. 22, p. 281-680, illus., 1911; Index, vol. 24, p. 625-668, 1913. World-wide evidence is used to support the presence of the Canadian and Ozarkian Periods between the Cambrian and Ordovician Periods and the Waverlayan and Tennesseean Periods between the Devonian and Pennsylvanian. In northwestern Georgia, the Knox Formation is Ozarkian and Canadian in age; the Chattanooga Shale and Fort Payne Chert are Waverylayan and the Floyd Shale and limestone correlatives are Tennesseean. Paleontological data are used a great deal.
3. The Ordovician-Silurian boundary: Internatl. Geol. Cong. 12th, Canada 1913, Comptes Rendus, p. 593-667, illus., Ottawa, 1914. A general discussion of the stratigraphic and paleontological criteria used is followed by small-scale paleogeographic maps showing the

distribution of the various units adjacent to the boundary. Georgia is included on the maps.

4. (and Bassler, Ray Smith). American Silurian formations: Maryland Geol. Survey, Silurian, p. 233-270, illus., 1923. A generalized review of the Silurian formations includes cursory descriptions and correlation of those from Georgia. No details are given, although small-scale paleogeographic maps are included.
5. (and Bassler, Ray Smith). Arthropoda, *in* Systematic paleontology: Maryland Geol. Survey, Silurian, p. 500-718, illus., 1923. The ostracodes *Zygobolbina conradi* and *Mastigobolbina lata* are reported from the Silurian rocks in Floyd County. They are described and illustrated.

**UNITED STATES BUREAU OF MINES.**

1. Materials survey, bauxite. irreg. paged, illus., 1953. Analyses of bauxite from Wilkinson Co. are included and very cursory descriptions of the occurrence of bauxite on the Coastal Plain and in northwestern Georgia are cited.

**UNITED STATES GEOLOGICAL SURVEY.**

1. [Map of] Mineral resources of the Tennessee River Basin and adjoining areas. Scale, 1 inch to 500,000 inches; U. S. Geol. Survey, 1933 [not seen].

**UPHAM, WARREN,** 1850-1934.

1. Prof. Henry Carvill Lewis [1853-1885] and his work in glacial geology: Amer. Geologist, vol. 2, p. 371-379, port., 1888.
2. The work of Prof. Henry Carvill Lewis [1853-1888] in glacial geology: Geological Mag., 3d ser. vol. 6, p. 155-160, London, 1889.
3. Memorial of Charles Henry Hitchcock [1836-1919]: Geol. Soc. America Bull., vol. 31, p. 64-80, port., 1920.

**VANDERHOOF, VERTRESS LAWRENCE,** 1904-1964. *see* Camp, Charles Lewis, 1.

**VAN DER MEULEN, PETER ANDREW,** 1891-

1. A study of two so-called halloysites from [Chattooga Co.] Georgia and Alabama: Amer. Jour. Science, 4th ser. vol. 43, p. 140-144, illus., 1917. Chemical analyses show the mineral to be a mixture of kaolinite and hydrargillite.

**VAN HISE, CHARLES RICHARD,** 1857-1918.

1. Correlation papers—Archaean and Algonkian: U. S. Geol. Survey Bull. 86, 549 p., illus., 1892. The literature dealing with the Precambrian rocks in Georgia is reviewed.
2. Principles of North American Pre-Cambrian geology: U. S. Geol. Survey Ann. Rept. 16, pt. 1, p. 571-843, illus. incl. geol. map, 1896. A detailed discussion of metamorphism and its results includes very brief references to the crystalline rocks of Georgia. Their presence is acknowledged and mapped, but no details are included.

3. (and Leith, Charles Kenneth). Pre-Cambrian geology of North America: U. S. Geol. Survey Bull. 360, 939 p., illus., 1909. A monograph includes a summary of the literature dealing with the Blue Ridge and Piedmont Provinces.

VAN HORN, EARL C., *see also* Hash, Louis J., 1.

1. Talc deposits of the Murphy Marble Belt: North Carolina Div. Mineral Resources Bull. 56, vii, 54 p., illus. incl. geol. map, 1948. A small portion of the northern part of Fannin Co. is included. Numerous metamorphosed sedimentary formations of unspecified age are mapped. The talc occurs as hydrothermally-introduced solutions into the impure marble, although none is found in Georgia. The marble is conformable with Precambrian (?) Ocoee rocks. The rocks are much deformed, and new stratigraphic-structural interpretations are made.

VANUXEM, LARDNER.

1. Geological observations on the Secondary [Mesozoic], Tertiary, and Alluvial [Quaternary] formations of the Atlantic Coast of the United States of America, arranged from the notes of Lardner Vanuxem by Samuel George Morton: Acad. Natural Science Philadelphia Jour., vol. 6, p. 59-71, 1829; correction, foot-note, p. 107. What had theretofore been called and mapped as Alluvial is broken into the three recognizable units. The Cretaceous of Georgia is alluded to because of fossils, but no locations are known. Shell Bluff in Burke Co. is recognized as being composed of Eocene rocks. The *red-earth* portion of the Ancient Alluvial [Pliocene] is common, and the modern Alluvial [Pleistocene] contains the large mammal fragments.

VAN VALKENBURG, SAMUEL.

1. Wallace W[alter] Atwood [1872-1949]: Geographical Review, vol. 39, p. 675-676, 1949.

VAUGHAN, THOMAS WAYLAND, 1870-1952.

1. (The) Eocene and lower Oligocene coral faunas of the United States with descriptions of a few doubtful Cretaceous species: U. S. Geol. Survey Mon. 39, 263 p., illus., 1900; corrections . . . , Biol. Soc. Washington Proc., vol. 16, p. 101, 1903. Five different corals from the Eocene Ocala Limestone from Decatur and Screven Cos. are described and illustrated. Some are new.
2. (A) Tertiary coral reef near Bainbridge, [Decatur Co.] Georgia: Science, new ser. vol. 12, p. 873-875, 1900. A cursory description of what are called Oligocene rocks is given. About twenty-five or thirty species of coral are present. The tentative identification of the genera is included. They occur in cherty limestone.
3. Shell Bluff, [Burke Co.] Georgia, one of Lyell's original localities [abs.]: Science, new ser. vol. 13, p. 270, 1901.
4. Earliest Tertiary coral reefs in the Antilles and United States [abs.]: Science, new ser. vol. 15, p. 506-507, 1902.

5. Fuller's earth of southwestern Georgia and western Florida: U. S. Geol. Survey Mineral Resources 1902, p. 922-934, 1902. Descriptions of the occurrence of the clay from Decatur Co. are given. Sections are measured; analyses are included.

6. Fuller's earth deposits of Florida and [Decatur Co.] Georgia: U. S. Geol. Survey Bull. 213, p. 392-399, 1903. Descriptions and analyses of the clay are given; no geology is included. The age is considered upper Oligocene.

7. The Miocene horizons at Porters Landing, [Effingham Co.] Georgia: Science, new ser. vol. 31, p. 833-834, 1910. A section 111 feet thick is described and its stratigraphic position discussed. Miocene rocks rest unconformably on Oligocene rocks.

8. Resume of the present status of the geologic correlation of the Cretaceous and Tertiary formations of the Antilles [abs.]: Washington Acad. Science Jour., vol. 5, p. 489-490, 1915.

9. Correlation of the Tertiary geologic formations of the southeastern United States, central America, and the West Indies: Washington Acad. Science Jour., vol. 8, p. 268-276, illus., 1918. A table suggests correlations of the Tertiary formations of Georgia with those of other areas around the Gulff of Mexico.

10. Fossil corals from Central America, Cuba, and Porto Rico, with an account of the American Tertiary, Pleistocene, and Recent coral reefs, *in* Contributions to the geology and paleontology of the Canal Zone . . . : U. S. Natl. Museum Bull., vol. 103, p. vi, 189-524, illus., 1919. A detailed discussion of the geological history of the southeastern states includes Georgia. Eleven genera and species of corals from the Oligocene [Tampa] Limestone in Decatur Co. are described and illustrated. Others from limited exposures in southern Georgia are also present. These are in the earliest known reefs in the United States.

11. American and European Tertiary larger Foraminifera: Geol. Soc. America Bull., vol. 35, p. 785-822, illus., 1924. A comparison of the genera and species includes descriptions and discussions of many Foraminifera which come from the Georgia Coastal Plain. Many genera and some species are common to both continents.

12. Criteria and status of correlation and classification of Tertiary [and Quaternary] deposits: Geol. Soc. America Bull., vol. 35, p. 677-742, tables, 1924. The history of the subdivision of Cenozoic deposits from Europe is followed by an enumeration of the various stages as they are now understood. The American Coastal Plain Cenozoic formations are correlated with one another and with those of Europe. The rocks in Georgia are included.

13. New species of *Operculina* and *Discocyclina* from the Ocala Limestone: Florida Geol. Survey Ann. Rept. 19, p. 155-165, illus., 1928. *Discocyclina (Atkinocyclina) bainbridgensis*, from Decatur Co., is described and illustrated.

14. Memorial of Earle Sloan [1858-1926]: Geol. Soc. America Bull., vol. 40, p. 57-61, port., 1929.

**VAUGHN, WILLIAM HARRY,** *see* Henry, Arthur Van, 1.

**VEATCH, ARTHUR CLIFFORD**, 1878-1938, *see* Fuller, Myron Leslie, 1.

**VEATCH, JETHRO OTTO**, 1883- *see also* McCallie, Samuel Washington, 24; Stephenson, Lloyd William, 7, 14.

1. The term "colluvial" as applied to clay deposits: Science, new ser. vol. 24, p. 782, 1906. The term is used to include clay deposits which originated by being transported to the base of slopes in low areas by various agents.
2. Kaolin mining in [Twiggs Co.] Georgia: Engineering and Mining Jour., vol. 83, p. 278-279, illus., 1907. A general discussion of the industry at Dry Branch includes cursory descriptions of the Cretaceous rocks containing the kaolin and the kaolin itself. Analyses are included also.
3. Kaolins and fire clays of central Georgia: U. S. Geol. Survey Bull. 315, p. 303-314, illus., 1907. The Cretaceous kaolin and fire clay deposits of the Fall Line Hills are described. Detailed measured sections and analyses are included.
4. Altamaha Formation of the Coastal Plain of Georgia: Science, new ser. vol. 27, p. 71-74, 1908. A general description of this clastic formation is given. It is correlated with the Lafayette Formation of Pliocene age.
5. (The) kaolins of the Dry Branch region, [Twiggs Co.] Georgia: Econ. Geology, vol. 3, p. 109-117, illus., 1908. The occurrence of the sedimentary clay in Cretaceous sedimentary rocks is described. It occurs in massive lenses and was deposited as clay in quiet lakes and ponds by sediment-choked, rejuvenated streams.
6. (A) new discovery of bauxite in [Wilkinson Co.] Georgia: Engineering and Mining Jour., vol. 85, p. 688, 1908. A horizontal blanket of pisolitic bauxite is reported from the Cretaceous Tuscaloosa Formation. Analyses are included.
7. Second report on the clay deposits of Georgia: Georgia Geol. Survey Bull. 18, 453 p., illus. incl. geol. maps, 1909. A general discussion of the classification, origins, and chemistry of clays is followed by a discussion of their geological distribution in Georgia. Generalized discussions of the Coastal Plain formations are given as well as of those in northwestern Georgia. Individual deposits are described; analyses are included, as is a discussion of a bauxite occurrence in Wilkinson County.
8. Graphite in vein quartz [Troup Co.]: Science, new ser. vol. 33, p. 38, 1911. The occurrence of tiny flakes of graphite in vein quartz is described. Graphite comprises 2-3 percent of the rock. The igneous origin of the rocks is demonstrated.
9. (and Stephenson, Lloyd William). Preliminary report on the geology of the Coastal Plain of Georgia: Georgia Geol. Survey Bull. 26, 466 p., illus. incl. geol. map, 1911; summary by Roland McMillan Harper, Amer. Geographical Soc. Bull., vol. 46, p. 920-923, 1914. A complete geological report of the area is given. Cretaceous to Recent rocks are mapped. Fossils are listed; sections are measured. No mineral deposits are discussed.

VENABLE BROTHERS.

1. Stone Mountain and Lithonia granite [DeKalb Co.]. 36 p., illus., Atlanta, Byrd Printing Co., 1901. A brochure advertising the commercial aspects of the granite [and gneiss] includes analyses.

VERNON, ROBERT ORION, 1912-

1. (chairman, and others). Geology of the crystalline rocks and of the Paleozoic area of northwest Georgia: Southeastern Geol. Soc. [Guidebook] Field Trip 7, 41 p. (‡), illus., [Tallahassee, Fla.], 1951; contains several papers by different authors, each of which is cited separately.
2. (and Erwin, Walter Lambuth). [Coastal Plain of] Georgia, *in* [oil and gas] Developments in the southeastern states in 1955: Amer. Assoc. Petroleum Geologists Bull., vol. 40, p. 1276-1277, 1956.

VER WIEBE, WALTER AUGUSTUS, 1887-1961.

1. Present distribution and thickness of Mesozoic Systems: Geol. Soc. America Bull., vol. 44, p. 827-864, illus., 1933. A very generalized discussion and small-scale sketch maps show the paleogeography of the United States during the Mesozoic Era. Only Upper Cretaceous rocks are present in Georgia, occurring as a wedge, and over 2000 feet thick in southern Georgia.

VEST, ERNEST LOUIS, JR., 1929-

1. Paleontology and stratigraphy of the Ordovician limestones in the Chattanooga Valley, Georgia. M. S. Thesis, Emory Univ., 1952.
2. Sedimentation and paleoecology of the Ripley Formation in Stewart and Chattahoochee Counties [abs.]: Georgia Acad. Science, vol. 10, no. 1, p. 10-11, 1952.

VIOLINI, ROBERT DE, *see* Leonard, Frederick Charles, 5.

VISHER, STEPHEN SARGENT, 1887-

1. Memoir of Arthur Keith [1854-1944]: Assoc. Amer. Geographers Annals, vol. 34, p. 132-133, 1944.
2. François Émile Matthes, 1874-1948: Assoc. Amer. Geographers Annals, vol. 38, p. 301-304, port., 1948.
3. Nelson H[oratio] Darton, 1865-1948: Assoc. Amer. Geographers Annals, vol. 38, p. 226, 1948.
4. Bailey Willis, 1857-1949: Assoc. Amer. Geographers Annals, vol. 39, p. 291-292, 1949.

VIVIAN, ARTHUR C.

1. Barytes mining in [Bartow Co.] Georgia: Engineering and Mining Jour., vol. 102, p. 1083-1085, illus., 1916. A description of the occurrence of barite in nodules in residual clay is included in an otherwise technical report dealing with mining problems.

VOGDES, ANTHONY WAYNE, 1843-1923.

1. Short notes upon the geology of Catoosa County, Georgia: Amer.

Jour. Science, 3d ser. vol. 18, p. 475-477, 1879. A very cursory description of Ordovician and Silurian outcrops near Catoosa Station, Ringgold Gap, and Dug Gap in Whitfield Co. is given. Fossils are mentioned.

2. Description of a new crustacean from the Upper Silurian of [Catoosa and Walker Cos.] Georgia, with remarks on *Calymene clintoni:* Acad. Natural Science Philadelphia Proc. 1880, p. 176-178, illus., 1881. *Calymene rostrata* and *C. clintoni*, both Silurian, are described and illustrated. They both are reported from Taylor Ridge, Catoosa Co., and at Dug Gap, Walke rCounty.
3. Description of a new crustacean from the Clinton Group of [Catoosa Co.] Georgia with remarks upon others. 5 p., illus., New York City [priv. pub.], 1886. *Encrinurus americanus*, *Calymene rostrata*, and *C. clintoni* from Silurian rocks in Catoosa Co. are described and illustrated.

**VOLNEY, CONSTANTIN FRANCOIS CHASSEBOUEF,** 1757-1820.

1. Tableau du climat et du sol des États Unis. . . . 2 vols., 500 p., illus., Paris, Courcier, etc., 1803; English ed., 501 p., illus., London, C. Mercier and Co., 1804; American ed., 446 p., Philadelphia, J. Conrad and Co., 1804; German ed., Hamburg, 1804; Italian ed., Prato, 1845; also later French eds. An extremely cursory review of the geology of the United States includes that of Georgia. A map showing major physiographic features is included.

**WADSWORTH, MARSHMAN EDWARD,** 1847-1921, *see* Whitney, Josiah Dwight, 1.

**WAGGAMAN, WILLIAM HENRY,** 1883-

1. Report on kyanite and mullite refractories: Natl. Acad. Science Natl. Research Council Minerals and Metals Advisory Board Rept. MMAB-46-C, 31 p., 1953 [not seen].

**WAHL, WALTER.**

1. A check on some previously reported analyses of stony meteorites with exceptionally high content of salic constituents: Geochemica et Cosmochemica Acta, vol. 1, p. 28-32, London, 1950. A check suggests that some earlier analyses are in error for the $Al_2O_3$ content of the meteorite from Pickens County.

**WAIT, ROBERT L.,** *see also* Herrick, Stephen Marion, 9.

1. History of water supply at Albany [Dougherty Co.] Georgia: Georgia Mineral Newsletter, vol. 10, p. 143-147, illus., 1957. An historical review and a discussion of some of the engineering problems includes some references to the Tertiary rocks of the area.
2. Sources of groundwater for irrigation in Dougherty County, Georgia: Georgia Mineral Newsletter, vol. 11, p. 123-127, illus., 1958. A brief review of the subsurface geology of the county includes analyses and discussions of potential water yield for the various units. The Ocala Limestone is the principal, but not the only, source.

3. Summary of the ground-water resources of Crisp County, Georgia: Georgia Mineral Newsletter, vol. 11, p. 44-47, illus., 1958. Abundant ground water is avaialble from the Cretaceous and Tertiary rocks.

**WALCOTT, CHARLES DOOLITTLE**, 1850-1927, *see also* Hayes, Charles Willard, 1.

1. Correlation Papers—Cambrian: U. S. Geol. Survey Bull. 81, 447 p., illus., 1891. Very generalized descriptions of the Cambrian rocks in northwestern Georgia are given. Correlations with other areas in the Appalachian Mountains are included also.
2. (The) North American continent during Cambrian time: U. S. Geol. Survey Ann. Rept. 12, pt. 1, p. 523-568, illus., 1891. A general description of the paleogeography of the United States during Cambrian time includes Georgia, which, for the most part, was flooded in the northwestern corner and was being eroded elsewhere.
3. Notes on the Cambrian rocks of Virginia and the southern Appalachians: Amer. Jour. Science, 3d ser. vol. 44, p. 52-57, 1892. Generalized statements are made regarding the Cambrian fauna and rocks in northwestern Georgia. The Rome Formation is Middle Cambrian; the Shady Formation is Lower Cambrian, and the Knox Formation is Upper Cambrian in part.
4. Cambrian Brachiopoda—*Obolus* and *Lingulella*, with description of new species: U. S. Natl. Museum Proc., vol. 21, p. 385-420, illus., 1898. *Obolus (Lingulella) desideratus* from Cambrian rocks in Bartow *Co., O. (L.) ino* from the Rome Formation in Floyd Co., and *O. (L.) leos* from the Conasauga Shale in Floyd Co., are described and illustrated.
5. Cambrian Brachiopoda—*Acrotreta, Linnarssonella, Obolus*, with descriptions of new species [Walker Co.?]: U. S. Natl. Museum Proc., vol. 25, p. 577-612, 1902. *Acrotreta concentrica*, from Middle Cambrian shaly limestone in what appears to be Walker County, is described.
6. (and others). John Wesley Powell [1834-1902] . . . : Washington Acad. Science Proc., vol. 5, p. 99-130, port, 1903.
7. Louis Agassiz [1807-1873]: Smithsonian Misc. Collections, vol. 50 (Quart. Issue 4), p. 216-218, port., 1907.
8. *Olenellus* and other genera of the Mesonacidae, no. 6 *of* Cambrian geology and paleontology I: Smithsonian Misc. Collections, vol. 53, p. 231-422, illus., 1910. *Olenellus thompsoni* fragments from the Cambrian Weisner Quartzite in Bartow County are reported.
9. Cambrian Brachiopoda: U. S. Geol. Survey Mon. 51, 2 vols., 1235 p., illus., atlas of plates, 1912. Many brachiopods, mostly inarticulate, from the Knox Formation, the Conasauga Shale, the Rome Formation, and the Weisner Quartzite from Floyd and Bartow Cos., are described and illustrated.
10. Cambrian trilobites, no. 3 *of* Cambrian geology and paleontology III: Smithsonian Misc. Collections, vol. 64, p. 157-258, illus., 1916. *Acrocephalites tutus, Norwoodia gracilis* and *N. simplex* from the Conasauga Shale in Floyd Co., and *Crepicephalus thoosa* from the same formation in Whitfield County, are described and illustrated.
11. Cambrian trilobites, no. 5 *of* Cambrian geology and paleontology III:

Smithsonian Misc. Collections, vol. 64, p. 303-456, illus., 1916. *Dolichometopus productus* from the Conasauga Shale in Floyd Co. is described and illustrated.

12. Middle Cambrian Spongiae, no. 6 *of* Cambrian geology and paleontology IV: Smithsonian Misc. Collections, vol. 67, p. 261-364, illus., 1924. *Chancelloria drusilla* and *Protospongia fenestrata* from the Conasauga Shale in Floyd Co. are described and illustrated.
13. John Mason Clarke [1857-1925]: Science, new ser. vol. 62, p. 558, 1925.

WALKER, FRANCIS A.

1. Memoir of William Barton Rogers, 1804-1882: Natl. Acad. Science Biog. Mem., vol. 3, p. 3-13, 1895.

WALKER, LAWRENCE T.

1. Climax Cave [Decatur Co.]: Georgia Spelunker, vol. 1, no. 2, p. 3-4 (‡), illus., 1957. A map of the cave is included along with a very brief description.

WALTER, KENNETH GAINES, 1932-

1. Comparison of stream sediments from a metamorphic area [DeKalb Co.] with those from an igneous source: Georgia Acad. Science Bull., vol. 14, p. 6-12, illus., 1956. Sedimentary analyses of stream deposits are compared. Sphericity of metamorphic particles vary greatly, whereas the sphericity of igneous particles is not so varied. The metamorphic particles also vary more in roundness than do the igneous particles. No differenecs in sorting occur. Sediments derived from saprolite are also included in the analyses.
2. (A) study of the pegmaties of the Stone Mountain-Lithonia-Panola Shoals area [DeKalb, Rockdale Cos.]. M. S. Thesis, Emory Univ., 1956.

WALTERS, RAYMOND.

1. Nevin M[elancthon] Fenneman [1865-1945]: Science, vol. 102, p. 142-143, 1945.

WALTON, GEORGE EDWARD, 1839-

1. The mineral springs of the United States and Canada. vii, 390 p., illus., New York, D. Appleton, 1873; 2d ed., 1874; 3d ed., 1883. A treatise on the joys and pleasures of bathing in and drinking mineral spring water includes general descriptions of many, several of which are in Georgia. Analyses for many are included.

WANLESS, HAROLD ROLLIN, 1899-

1. Pennsylvanian stratigraphy of Tennessee, Georgia, and southeastern Kentucky [abs.]: Geol. Soc. America Bull., vol. 50, p. 1941-1942, 1939.
2. Pennsylvanian geology of a part of the southern Appalachian coal field: Geol. Soc. America Mem. 13, xi, 162 p., illus., 1946. A detailed description of Pennsylvanian rocks in northwestern Georgia

is included. The rocks in Georgia are considered to be a part of the Lee Group. Sections are measured, and correlations are made with surrounding areas.

3. Depositional basins of some widespread Pennsylvanian coal beds in the United States: Conference on origin and constitution of coal, 3d, Nova Scotia 1956, [Proc.], p. 94-125, illus., Nova Scotia Dept. Mines [1956]; discussions, p. 125-128. A description of the bituminous coal fields in the Appalachian area includes those in Georgia. They are discussed as sedimentary traps, and environmental maps are included. The rocks in Georgia are correlated with those in nearby areas.
4. Problems of the Pennsylvanian of the United States: Tulsa Geol. Soc. Digest, vol. 24, p. 56-61, illus., 1956. A summary of the Pennsylvanian System of the United States includes a brief allusion to the rocks in northwestern Georgia. No new data are included.
5. Classification of Paleozoic coal measures [abs.]: Geol. Soc. America Bull., vol. 70, p. 1693, 1959.

[WARD, HENRY AUGUSTUS], 1834-1906.

1. The Ward-Coonley collection of meteorites. iv, 100 p., illus., Chicago, [priv. pub.?], 1900; also a 1901 edition. Fragments of the Cherokee, Whitfield, Monroe, Chattooga, Henry, Putnam, Union, and Stewart County meteorites are in this collection. Very brief descriptions are included.

WARD, WILLARD P.

1. The gold deposits of the southern states: Engineering and Mining Jour., vol. 9, p. 392, 1870. Much economic discussion is included, but evidence is presented from mines near Acworth, Cobb Co., that the gold-bearing quartz is not in veins but rather in lenses conformable with the stratification.

WARDEN, DAVID BAILIE, 1778-1845.

1. Aérolithes [Monroe Co.]: Académie des Sciences Paris Comptes Rendus, vol. 3, p. 50-51, 1836. A report of a meteorite falling in Monroe Co. is given. It was seen and heard.

WARDROPER, D. LEE.

1. The formation of coal beds [?Walker Co.]: Engineering and Mining Jour., vol. 45, p. 473, illus., 1883. Coal fragments in sandstone overlying the main coal seam are described and illustrated. An explanation is sought.

WARING, GERALD ASHLEY, 1883- *see* Stearns, Norah Dowell, 1.

WARREN, HELEN ANN.

1. Survey of the life of Louis Agassiz [1807-1873]; the centenary of the glacial theory: Scientific Monthly, vol. 27, p. 355-366, 1928.

WARREN, MOULTRIE ALFRED, 1912-1956, *see also* Cooper, Hilton Hammond, 1; Stringfield, Victor Timothy, 1, 3.

1. (and Munyan, Arthur Claude). Georgia, *in* Water levels and artesian pressure in observation wells in the United States in 1939: U. S. Geol. Survey Water-Supply Paper 886, p. 69-90, illus., 1940. The depth to the water table in 48 wells is recorded; all are on the Atlantic Coastal Plain except for a few in Dougherty County. A piezometric map of the artesian pressure along the east coast is included.
2. (and Munyan, Arthur Claude). Georgia, *in* Water levels and artesian pressure in observation wells in the United States in 1940, part 2, southeastern states: U. S. Geol. Survey Water-Supply Paper 907, p. 35-55, 1942. Measurements of the depth to the water table are recorded for 103 wells. All are along the Atlantic coast except for a few in Dougherty County.
3. Georgia, *in* Water levels and artesian pressure in observation wells in the United States in 1941, part 2, southeastern states: U. S. Geol. Survey Water-Supply Paper 937, p. 28-64, 1943. One hundred forty wells along the Atlantic coast, save for a few in Dougherty Co., are used to record the depth to the water table. The information is in tables.
4. Artesian water in southeastern Georgia, with special reference to the coastal area: Georgia Geol. Survey Bull. 49, 140 p., illus., 1944. The Eocene Ocala Limestone and the Oligocene Suwanee Limestone are the major artesian aquifers. They are covered down-dip by Miocene clay and crop out updip in the Coastal Plain. Small-scale piezometric maps are included, as is a general discussion of the hydrology of the system.
5. Georgia, *in* Water levels and artesian pressure in observation wells in the United States in 1942, part 2, southeastern states: U. S. Geol. Survey Water-Supply Paper 945, p. 49-83, 1944. Wells in 27 counties, all on the Coastal Plain, are tabulated. They record the depth to the water table.
6. Artesian water in southeastern Georgia with special reference to the coastal area, well records: Georgia Geol. Survey Bull. 49-A, 83 p., illus., 1945. Well records, alphabetically arranged by county, do not include any lithologic data. There are over 1500 wells; the tables include depth, sea level depth, flow, and remarks.
7. (and Herrick, Stephen Marion). Georgia, *in* Water levels and artesian pressure in observation wells in the United States in 1943, part 2, southeastern states: U. S. Geol. Survey Water-Supply Paper 987, p. 44-86, 1945. The depth to the water table in 231 wells in 29 counties, all but seven being in the Coastal Plain, is given in tabular form. The seven are from the Piedmont, near Atlanta.

WARREN, WALTER CYRUS.

1. (and Thompson, Raymond Melvin). Bauxite and kaolin deposits of Wilkinson County, Georgia. Map, scale, 1 inch to 62,500 inches, U. S. Geol. Survey, Strategic Minerals Investigations Map, cross sections and text on second sheet, 1943.

WARRINER, LENDALL P.

1. (and Burgess, Blandford Corneilous). The pegmatites of Jasper

County, Georgia: Mining Engineering, vol. 1, p. 376-380, illus., 1949; Amer. Inst. Mining Engineers Trans., vol. 184, p. 376-380, illus., 1949. Pegmatites in gneiss are described. Quartz, microcline, and mica are the major components; little else is present. The origin is uncertain, but they are probably related to granitic intrusions nearby. Analyses are included. The feldspar is sought commercially.

WASHINGTON, HENRY STEPHENS, 1867-1934.

1. Catalogue of the collection of meteorites in the Peabody Museum of Yale University: Amer. Jour. Science, 4th ser. vol. 3, p. 83-87, 1897. Parts of the Monroe, Putnam, Union, Cherokee, and Whitfield County meteorites are in this collection.
2. Chemical analyses of rocks published from 1884 to 1900 . . . : U. S. Geol. Survey Prof. Paper 14, 495 p., 1903. A discussion of the C. I. P. W. classification is followed by tabular descriptions of analyses; three of the rocks are from Georgia.
3. Chemical analyses of igneous rocks published from 1884 to 1900 . . . : U. S. Geol. Survey Prof. Paper 99, 1200 p., 1917. Analyses and classification of rocks by the C. I. P. W. method includes analyses of many rocks from the Georgia Piedmont.

WASHINGTON ACADEMY OF SCIENCES.

1. The [W J] McGee memorial meeting of the Washington Academy of Sciences held at the Carnegie Institution, Washington, D. C., December 5, 1913. 121 p., port., Baltimore, Williams and Wilkens Company, 1916.

WATERS, JAMES ALTON, 1890-

1. Joseph Augustine Cushman (1881-1949): Amer. Assoc. Petroleum Geologists Bull., vol. 33, p. 1457-1465, port., 1949.

WATKINS, ELLA JOWETT.

1. Museum of Natural Resources of Georgia, directory and description of exhibits. 77 p. (‡), illus., Atlanta, Georgia Dept. Natural Resources, 1942. A guide to the mineral collection in the museum is included. Examples of ores and gem materials of the state are cursorily described.

WATKINS, JOEL HILL.

1. New occurrence and use of halloysite [Chattooga Co.]: Mining and Engineering World, vol. 38, p. 721-722, illus., 1913. Bedded halloysite occurs at the contact between the Fort Payne Chert and the Floyd Shale. It varies from 4 to 10 feet thick, and averages seven. It was probably secondarily formed from a bed of high-allumina shale.
2. Occurrence of bauxite in central [Coastal Plain] Georgia: Mining and Engineering World, vol. 42, p. 1073-1075, illus., 1915. The occurrence of this ore is in Sumter, Schley, and Macon Counties. The bauxite occurs as well-defined lenses in Cretaceous rocks near the contact with the overlying Tertiary rocks. Some are more

than ten feet thick, and all are invariably associated with Cretaceous clay, from which the bauxite was probably derived by alteration.

3. White-burning clays of the southern Appalachian states: Amer. Inst. Mining Engineers Bull. 98, p. 391-411, illus., 1915; . . . Trans., vol. 51, p. 481-501, illus., 1916; discussion, by Heinrich Ries, p. 501. Kaolin occurs in the Piedmont, although not in commercial quantities; it comes from weathered pegmatites. Generalized descriptions of the sedimentary kaolin in the Coastal Plain are included. No new details are given.
4. Kyanite in Graves Mountain [Lincoln Co.], Georgia: Amer. Ceramic Soc. Bull., vol. 21, no. 7, p. 140-141, illus., 1942. The geology of Graves Mountain and the composition of the kyanite which is present are discussed. The deposit is rich and workable, and commercial production could be accomplished quickly.

**WATSON, E. J.,** *see* Sloan, Earle, 1.

**WATSON, ELAINE,** *see* Boardman, Annabel Leona, 1.

**WATSON, JOHN WILBUR,** *see* Watson, Thomas Leonard, 18.

**WATSON, THOMAS LEONARD, 1871-1924.**

1. A preliminary petrographic report on the metamorphic rocks in and around Dahlonega, Lumpkin County, Georgia: Georgia Geol. Survey Bull. 4-A, p. 320-330, 1896. Twelve different schists from various locations in the gold region are described.
2. (The) Georgia bauxite deposits—their chemical constituents and genesis: Amer. Geologist, vol. 28, p. 25-45, illus., 1901. The deposits in Bartow, Floyd, and Polk Cos. are described. The ore is commonly associated with the Knox Formation. Analyses are included. The various theories of the origin of the ore are reviewed, and that of the deposition of aluminum from ascending ground water along faults is supported. The bauxite is Eocene in age.
3. (The) granitic rocks of Georgia and their relationships: Amer. Geologist, vol. 27, p. 199-225, illus., 1901. Many analyses and photomicrographs of granitic rocks of all sorts are given. They occur throughout the Piedmont. Evidence to support their intrusion into the metamorphic country rocks is reviewed. Some are definitely Precambrian, and others may be younger.
4. On the origin of the phenocrysts in the porphyritic granites of [Piedmont] Georgia: Jour. Geology, vol. 9, p. 97-122, illus., 1901. Numerous exposures are described, with detailed chemical and petrographical analyses included. The evidence points to the phenocrysts having grown in place at the same time as the gorundmass, rather than having formed earlier.
5. Weathering of granitic rocks of Georgia: Geol. Soc. America Bull., vol. 12, p. 93-108, illus., 1901. Chemical analyses of granitic rocks are compared with analyses of residual products derived from them from many places throughout the Piedmont. The relative proportions of the various minerals and elements and their geochemical

movement are discussed. The various factors affecting the types and rates of weathering are described.

6. On the occurrence of aplite, pegmatite, and tourmaline bunches in the Stone Mountain Granite of [DeKalb Co.] Georgia: Jour. Geology, vol. 10, p. 186-193, illus., 1902; Denison Univ. Scientific Lab. Bull., vol. 12, p. 17-24, illus., 1902. The granite, aplite, and tourmalines are described chemically and petrographically. The tourmaline is a derivative, in part, of feldspar, as a result of fumarolic action, rather than having been present as an original part of the magma.

7. On the occurrence of uranophane in [DeKalb Co.] Georgia: Denison Univ. Scientific Lab. Bull., vol. 12, p. 25-28, 1902; Amer. Jour. Science, 4th ser. vol. 13, p. 464-466, 1902. Uranophane occurs as incrustations on joint surfaces on the Stone Mountain Granite. It is described and analyzed.

8. (A) preliminary report on a part of the granites and gneisses of Georgia: Georgia Geol. Survey Bull. 9-A, 367 p., illus., 1902. A general petrographic description and an economic-product description are followed by descriptions of the occurrences of the rock throughout the entire Piedmont Province. Many analyses are included. A great deal of general granite petrology is included as are the weathering phenomena.

9. Geologic relations of the manganese ore-deposits of Georgia: Amer. Inst. Mining Engineers Trans., vol. 34, p. 207-253, illus., 1904; discussion by Charles Catlett, p. 968-969; reply by author, p. 970-973; Denison Univ. Scientific Lab. Bull., vol. 12, p. 147-198, illus., 1904; summary, Econ. Geology, vol. 4, p. 46-55, 1909; Mining World, vol. 30, p. 643-644, 1909. Manganese occurs in northwestern Georgia as residual concentrates in weathered Paleozoic rocks. It is also associated with other types of ores, mostly iron. The deposits in Bartow, Floyd, and Polk Cos. are described in detail. Manganese also occurs in pockets or small nests associated with iron in the rocks of the Blue Ridge and Piedmont. Here they are concentrates from the weathering of the manganese-bearing silicates.

10. (A) preliminary report on the bauxite deposits of Georgia: Georgia Geol. Survey Bull. 11, 169 p., illus. incl. geol. map, 1904. A general description of the stratigraphy in the Coosa River valley is followed by numerous analyses of the bauxite. Individual deposits are described. The ore occurs in sedimentary layers in the Knox Formation, as residual deposits in the overlying clay, and as concentrates in pockets in the bedrock. The aluminum came from the underlying Conasauga Shale and was brought to the surface and concentrated by ground water ascending along fault planes.

11. (The) Seminole copper deposit of [Lincoln and Wilkes Cos.] Georgia: U. S. Geol. Survey Bull. 225, p. 182-186, 1904. Descriptions of the ore, its occurrences, and geological environment, are given. The ore is copper-bearing galena, sphalerite, and pyrite. Some chalcopyrite is present, as is native copper.

12. (The) yellow ocher deposits of the Cartersville District, Bartow County, Georgia: Amer. Inst. Mining Engineers Trans., vol. 34, p. 643-666, illus., 1904; Denison Univ. Bull. (Scientific Lab. Jour., vol. 12), p. 199-221, illus., 1904. Ocher occurs in the fractures of

shattered Weisner Quartzite and in branching veins in the residual clay of the quartzite formation. The ocher was emplaced by solutions which replaced some of the quartzite with ocher; the residual clay deposits are of the same nature. Analyses are included.

13. A preliminary report on the ocher deposits of Georgia: Georgia Geol. Survey Bull. 13, 81 p., illus., 1906; summary with title, Georgia ocher deposits, by Ernest Francis Burchard: U. S. Geol. Survey Mineral Resources 1907, pt. 2, p. 700-702, 1907. Ocher occurs commercially in Bartow County. Detailed descriptions of the occurrences include analyses and sketch maps. The ocher occurs as a metasomatic replacement along fissures in the Weisner Quartzite and in the residual clays of this and other formations.

14. A preliminary report on the manganese deposits of Georgia: Georgia Geol. Survey Bull. 14, 195 p., illus., 1908; summary, Econ. Geology, vol. 4, p. 46-55, 1909; Mining World, vol. 30, p. 643-644, 1909. Manganese occurs in northwestern Georgia as a residual concentrate from Cambrian formations. It is distributed throughout the clay residuum. Analyses are included, and individual deposits are described. Manganese also occurs non-commercially in the Piedmont and Blue Ridge as concentrates from the decay of manganese-bearing silicate minerals. Individual occurrences are described, and analyses are included.

15. Granites of the southeastern Atlantic states: U. S. Geol. Survey Bull. 426, 282 p., illus., 1910. A general description of the Georgia Piedmont includes detailed descriptions of various granitic bodies. Analyses are included.

16. Intermediate (quartz monzonite) character of the central and southern Appalachian granites . . . : Univ. Virginia Philos. Soc. Bull., Science ser. vol. 1, p. 1-40, 1910. The granites of the Piedmont of Georgia are included in a general discussion. They are analyzed chemically and mineralogically, and are all mica-bearing, chiefly biotite. Hornblende-bearing varieties are infrequent. Plagioclase feldspar exceeds orthoclase feldspar in percentage.

17. (An) association of native gold with sillimanite [Union Co.]: Amer. Jour Science, 4th ser. vol. 33, p. 241-244, illus., 1912. Sillimanite schist was invaded by gold-bearing pegmatites. Photomicrographs show the relationships.

18. (and Watson, John Wilbur). (A) contribution to the geology and mineralogy of Graves Mountain [Lincoln Co.] Georgia: Univ. Virginia Philos. Soc. Bull., Science ser. vol. 1, p. 200-221, illus., 1912; summary, Virginia Geol. Survey Bull. 3-A, p. 23-27, illus., 1913. A general description of the geology of the area describes the fine-grained quartzite ridge amidst lower-lying, softer, metamorphic rocks. Pyropyhllite, lazulite, kyanite, rutile, and hematite are present; they are described and analyzed.

19. A meteoric iron from Paulding County, Georgia: Amer. Jour. Science, 4th ser. vol. 36, p. 165-168, illus., 1913. A 725 gram iron meteorite is described, analyzed, and illustrated.

20. (and Grasty, John Sharshall). The Piedmont limestones of the southeastern Atlantic states [abs.]: Science, new ser. vol. 39, p. 399, 1914.

21. (and Grasty, John Sharshall). Barite of the Appalachian states: Amer. Inst. Mining Engineers Bull. 98, p. 345-390, illus., 1915; . . . Trans., vol. 51, p. 514-559, illus., 1916. A general description of the origin and occurrence of barite includes a discussion of residual and vein deposits in Bartow County. No new data are given.
22. (The) rutile deposits of the eastern United States: U. S. Geol. Survey Bull. 580, p. 385-412, illus., 1915. A general discussion of the origin and occurrence of rutile includes a description of the occurrence at Graves Mountain, in Lincoln County. No new data are included.
23. Lazulite of Graves Mountain [Lincoln Co.], Georgia . . . : Washington Acad. Science Jour., vol. 11, p. 386-391, 1921. A brief description of the geology of Graves Mountain is followed by a detailed description of the occurrence of the lazulite there; it is analyzed chemically and optically. It is compared with lazulite from other parts of the world.
24. Thermal springs of the southeastern Atlantic states, part 3 *of* The temperatures of hot springs and the sources of their heat and water supply: Jour. Geology, vol. 32, p. 373-384, illus., 1924. A discussion of Warm Springs, in Meriwether County, Lifsey Spring in Pike County, and Thundering Spring in Upson County is included. Analyses are given. Geologic details are uncertain, but the springs seem to be related to faults along Pine Mountain. The water is of meteoric origin.

**WATTS, ARTHUR SIMEON, 1876-**

1. The mining and treatment of feldspar and kaolin in the southern Appalachians: U. S. Bur. Mines Bull. 53, 170 p., illus., 1913. In an otherwise technical report on mining and milling problems are descriptions of deposits of mica, feldspar, and kaolin, all having been derived from the weathering of pegmatites on the Piedmont.

**WEBB, JAMES EDWARD.**

1. Reconnaissance survey of the Talladega Series in parts of Polk and Haralson Counties, Georgia. M. S. Thesis, Cornell Univ., 1957.
2. Reconnaissance geologic survey of parts of Polk and Haralson Counties, Georgia: Georgia Mineral Newsletter, vol. 11, p. 19-24, illus. incl. geol. map, 1958. A complete but cursory description of the area is given. Possible Precambrian crystalline rocks, Cambro-Ordovician, and Mississippian sedimentary rocks are mapped. Much emphasis is placed upon the structural interpretations.

**WEED, WALTER HARVEY, 1862-1944.**

1. Copper deposits in Georgia: U. S. Geol. Survey Bull. 225, p. 180-181, 1904; summary, Mining and Scientific Press, vol. 93, p. 484-485, 1906. Reference is made to copper-bearing pyrite from near Dahlonega, Lumpkin Co., and in Carroll and Lincoln Counties. No new data are included.
2. Notes on certain hot springs of the southern United States: U. S. Geol. Survey Water-Supply Paper 145, p. 185-206, illus., 1905. A description of Warm Springs, in Meriwether County, is included.

The general geology is discussed; the origin of the spring is considered, and an analysis is included.

3. The copper mines of the United States in 1905: U. S. Geol. Survey Bull. 285, p. 93-124, illus., 1906. Brief diescriptions of copper production by states includes that from Fannin County, where copper ore in the extension of the Ducktown deposit is being wrought. No details are included.
4. Copper deposits of the Appalachian states: U. S. Geol. Survey Bull. 455, 166 p., illus., 1911. A generalized description of numerous occurrences of copper-bearing minerals is given. Much of the copper is associated with pyrite and is found in many places in the Piedmont and Blue Ridge.

WEIGEL, WILLIAM MELVIN, 1878-

1. Barite and ocher in the Cartersville [Bartow Co.] Georgia, District: U. S. Bur. Mines Rept. Inv. 2477, 11 p. (‡), 1923. A general review of the occurrence of barite and ocher in the district includes cursory references to the geology of the area. Most of the text deals with the mining and milling problems.
2. Georgia clays for rubber filler: Rubber Age, vol. 15, no. 8, p. 301-304, 1924. In an otherwise technical discussion of the use of kaolin as rubber filler are many chemical analyses of kaolin from the Coastal Plain.
3. Georgia and Alabama clays as fillers: U. S. Bur. Mines Tech. Paper 343, 34 p., illus., 1925. Chemical analyses of kaolin from the Coastal Plain are included in an otherwise technical discussion of the problems of working the clay.
4. High grade clays of the southeastern states: Mining Congress Jour., vol. 12, p. 157-161, 171, illus., 1926. A general description of kaolin deposits of the United States Coastal Plain includes cursory references to those of Georgia. Few new geologic data are included.

WEITZ, JOHN HILLS, 1916-

1. High-grade dolomite deposits in the United States: U. S. Bur. Mines Inf. Circ. 7226, 86 p. (‡), illus., 1942. Analyses of dolomite from various places in northwestern Georgia and from the Blue Ridge are given.

WELLER, JAMES MARVIN, 1899-

1. (and others). Correlation of Mississippian formations of North America: Geol. Soc. America Bull., vol. 59, p. 91-196, chart, 1948. A time-rock chart and accompanying discussion for the Mississippian System in North America includes the Mississippian rocks in northwestern Georgia.

WELLS, HORACE LEMUEL, 1855-1924.

1. Samuel Lewis Penfield [1856-1906]: Science, new ser. vol. 24, p. 252-253, 1906.
2. Biographical memoir of Samuel Lewis Penfield, 1856-1906: Natl. Acad. Science Biog. Mem., vol. 6, p. 119-146, port., 1907.

**WELLS, JOHN WEST, 1907-**

1. Corals of the Cretaceous of the Atlantic and Gulf Coastal Plains and western interior of the United States: Bulls. Amer. Paleontology, vol. 18, no. 67, p. 85-288, illus., 1933. *Trochocyathus woolmani* from the Blufftown Formation in Stewart Co. and *Micrabacia rotatilis georgiana* from the Ripley Formation in Quitman Co. are described and illustrated.
2. Thomas Wayland Vaughan (1870-1952): Amer. Assoc. Petroleum Geologists Bull., vol. 36, p. 1495-1497, port., 1952; Geol. Soc. London Quart. Jour., vol. 107, part 3, p. lii-liv, 1952.

**WELLS, ROGER CLARK, 1877-**

1. Analyses of rocks and minerals from the laboratory of the United States Geological Survey, 1914-1936: U. S. Geol. Survey Bull. 878, x, 134 p., 1937. Sericite schist and marble from Pickens Co., and gold, gahnite, and muscovite from Lumpkin Co., and garnet from Hart Co., are analyzed.

**WENDT, ARTHUR FREDERICK, 1852-1893.**

1. The pyrites deposits of the Alleghanies: School of Mines Quarterly, vol. 7, p. 154-188, 218-235, 301-323, illus., 1886; Engineering and Mining Jour., vol. 41, p. 407-410, 426-428, 446-447; vol. 42, p. 4-5, 22-24, illus., 1886. The pyrite and chalcopyrite bodies of the Piedmont region are considered to have been originally sedimentary bodies, having been altered by subsequent metamorphism. The Ducktown District, with some deposits in nearby Fannin Co., is extensively described. Much emphasis is placed upon the engineering and metallurgical aspects.

**WESTGATE, LEWIS GARDNER, 1868-1948.**

1. Memorial of Eugene Wesley Shaw [1881-1935]: Geol. Soc. America Proc. 1935, p. 311-318, port., 1936.

**WETMORE, ALEXANDER, 1886-**

1. Thomas Wayland Vaughan (1870-1952): Amer. Philos. Soc. Yearbook 1952, p. 347-350, 1953.

**WHATLEY, E. T.**

1. Geological report—Pike Courty [!sic.]: Georgia Geol. Survey Prog. Rept. 1, 1890-91, p. 133-144, 1891. A detailed description of the area is given. Precambrian metamorphic rocks underlie the area. Granite and other igneous rocks are also present. Stone, iron ore, graphite, kaolin, and clay are the mineral resources present.
2. The Yonah Land and Mining Company of White Co., Georgia. 1893 [not seen].

**WHEELER, GARLAND EDGAR, 1928-**

1. Zonation of the Mississippian strata in the vicinity of Pigeon Mountain in [Walker and Chattooga Cos.] northwest Georgia. M. S. Thesis, Emory Univ., 1954.

2. Occurrence, possible origin, and geological significance of the phosphatic concretions in the Maury Shale: Georgia Acad. Science Bull., vol. 13, p. 22-27, illus., 1955. Concentric calcium carbonate and phosphate nodules growing around nuclei are considered to be syngenetic accretions formed during the deposition of the enclosing shale in shallow water.

WHEELER, HARRY EDGAR.

1. Timothy Abbott Conrad [1803-1877], with particular reference to his work in Alabama one hundred years ago: Bulls. Amer. Paleontology, vol. 23, p. 1-158, illus. incl. port., 1935; review by Katherine Evangeline Hilton Van Winkle Palmer: Amer. Assoc. Petroleum Geologists Bull., vol. 20, p. 321-322, 1936.

WHITE, AMOS MC NAIRY, *see* Overstreet, William Courtney, 1.

WHITE, CHARLES ABIATHAR, 1826-1910.

1. Notes on the occurrence of *Stricklandinia salteri* and *S. davidsoni* in [Catoosa Co.] Georgia: U. S. Natl. Museum Proc., vol. 3, p. 48-49, 1881. These two species are reported from Clinton-aged beds in the [Red Mountain Formation] at Ringgold Gap.
2. A review of the fossil Ostreidae of North America and a comparison of the fossil with living forms: U. S. Geol. Survey Ann. Rept. 4, p. 273-430, illus., 1884; appendix by Angelo Heilprin. Oysters from Cretaceous and Eocene rocks are discussed. None of those illustrated, however, are from the Coastal Plain of Georgia.
3. Correlation papers—Cretaceous: U. S. Geol. Survey Bull. 82, 273 p., illus., 1891. A very generalized description of the Cretaceous System on the Coastal Plain is given. Correlations with adjacent states are suggested, although no new data are included.

WHITE, CHARLES DAVID, 1862-1935.

1. Deposition of the Appalachian Pottsville: Geol. Soc. America Bull., vol. 15, p. 267-282, illus., 1904. A discussion of the entire Appalachian sedimentary basin includes by inference that part which is now northwestern Georgia. The nature of the Lower Pennsylvanian sedimentation is discussed along with the history of the basin.
2. Charles Willard Hayes [1859-1916]: Science, new ser. vol. 44, p. 124-126, 1916.
3. Lower Pennsylvanian species of *Mariopteris, Eremopteris, Diplothmema,* and *Aneimites* from the Appalachian region: U. S. Geol. Survey Prof. Paper 197-C, p. 85-140, illus., 1943. *Mariopteris pottsvillea, Aneimites (Wardia) tenuifolia difoliatus,* and *A. pottsvilliensis intermedius* from the Lookout Formation in Dade County are described and illustrated.

WHITE, CHARLES HENRY, *see* Hayes, Charles Willard, 5.

WHITE, DALE.

1. John Wesley Powell [1834-1902], geologist-explorer. 192 p., New York, Julian Messner, 1958.

WHITE, GEORGE, 1802-1887.

1. Statistics of the State of Georgia. 624 p., illus. incl. geol. map, Savannah, W. Thorne Williams, 1849; summary, DeBow's Review, vol. 10, p. 65-73, 243-252, 375-386, 1851. One chapter is devoted to a cursory description of the general geology of the state. No new details are included, although the geological map is new.

WHITE, ISRAEL CHARLES, 1848-1927.

1. James Macfarlane [1819-1885]: Amer. Geologist, vol. 7, p. 145-149, port., 1891.
2. Memorial of John James Stevenson [1841-1924]: Geol. Soc. America Bull., vol. 36, p. 100-115, port., 1925.

WHITE, JAMES, 1863-1928.

1. Alfred E[rnest] Barlow [1861-1914]: Canadian Mining Inst. Monthly Bull., vol. 27, p. 51-54, 1914.

WHITE, JOSHUA E.

1. Topography of Waynesborough [Burke Co.] (Georgia), and its vicinity . . . : Medical Respository, 2d hex. vol. 3 [vol. 9], p. 36-47, 140-154, 241-248, 1806. A brief description of the topography of the area is followed by extensive descriptions of case histories of diseases, most of which are attributed to topographical pecularities, the swamps and standing water being the most offensive.
2. Cursory observations on the soils, climate, and diseases of the State of Georgia: Medical Repository, 2d hex. vol. 3 [vol. 9], p. 349-365, 1806; vol. 4 [vol. 10], p. 117-130, 1807. Descriptions of the Coastal Plain and southern Piedmont are given, with a view to showing the different types of topography and the relationships of the topography to diseases. The early geological observations are very good.
3. Topography of Savannah [Chatham Co.] and vicinity . . . : Medical Repository, 2d hex, vol. 4 [vol. 10], p. 352-363, 1807; vol. 5 [vol. 11], p. 12-24, 1808. This is a fascinating account of the topography of the Savannah area in 1808. Springs, hills, gullies, etc., are noted, and the emphasis is placed upon the relationship of the topographic features to diseases. The low areas are the worst, the whole area being bad.

WHITE, WALTER STANLEY, 1915-

1. Geologic map and structure section of the Warm Springs bauxite area, Meriwether County, Georgia. Scale, 1 inch to 200 feet, text and sections on a second sheet. U. S. Geol. Survey Strategic Minerals Investigations Prelim. Map [1943].
2. (and Denson, Norman McClaren). The bauxite deposits of Floyd, Bartow, and Polk Counties, northwest Georgia: U. S. Geol. Survey Circ. 193, iii, 27 p., illus. incl. geol. maps, 1952. A detailed account of the bauxite, occuring in the residuum of the Knox Formation, is given. Individual deposits are described.

WHITE, WILLIAM ALEXANDER, 1906-

1. Determining factors in the coloration of granite soils in the south-

eastern Piedmont: Amer. Jour. Science, vol. 242, p. 361-363, 1944. Jointing in granite, through its control of internal drainage, determines in part the soil coloration by its influence on oxidation and reduction. Red soils develop on closely-jointed granites and yellow soils develop on sparsely-jointed granites. Stone Mountain Granite, in DeKalb Co., is cited as an example of the latter.

2. Origin of granite domes in the southeastern Piedmont: Jour. Geology, vol. 53, p. 276-282, illus., 1945. The forms of granite domes, including Stone Mountain in DeKalb Co., which heretofore have been attributed to exfoliation, are regarded as largely the product of granular disintegration brought about by chemical weathering. Some exfoliation is present, however.

3. Blue Ridge front—a fault scarp: Geol. Soc. America Bull., vol. 61, p. 1309-1346, illus., 1950; discussion by George Willis Stose and Anna Isabel Jonas Stose, vol. 62, p. 1371-1373, 1951. The Blue Ridge Scarp is the result of a great normal fault. The fault has utilized pre-existing structural trends for movement. The various levels of plateaus, the Dahlonega Plateau in Georgia, reflect the uplifts. Various other geological features are also cited as evidence.

WHITFIELD, JAMES EDWARD, 1859-

1. Analyses of six new meteorites [Chattooga Co.], *in* Report of work done in the Division of Chemistry and Physics . . . 1887-88: U. S. Geol. Survey Bull. 60, p. 103-114, illus., 1890. A chemical analysis of the Chattooga Co. iron meteorite, weighing over 12 kilograms, is included.

WHITLOCK, HERBERT PERCY, 1868-

1. Memorial of George Frederick Kunz [1856-1932]: Geol. Soc. America Bull., vol. 44, p. 377-394, port., 1933.

WHITNEY, JOSIAH DWIGHT, 1819-1896.

1. (and Wadsworth, Marshman Edward). The Azoic System and its proposed subdivisions: Harvard College Museum Comp. Zool. Bull., vol. 7, p. 331-565, 1884. A survey of the Precambrian rocks of the United States includes a discussion of those in Georgia. George Little, the Georgia State Geologist at that time, is quoted as saying that there are no Precambrian rocks in Georgia, whereas T. S. Hunt is quoted as referring to some of the gneisses as being Montalbon [Precambrian] in age. No new data are included.

WILBUR, ROBERT O.

1. (and Snobble, James B.). Sedimentary petrology of some Atlantic and Gulf coast beach sands [Chatham Co.]: Virginia Jour. Science, vol. 3, p. 48-49, 1942. Samples from the beach sands near Savannah and from other places are analyzed mineralogically. Comparisons and distinctions between the various samples are noted. Quartz is the most common mineral, with much feldspar also being present, as are magnetite, ilmentite, garnet, hornblende, zircon, tourmaline, sillimanite, staurolite, and others. A crystalline-rock source is substantiated.

**WILCOX, WALTER DWIGHT, 1869-**

1. Dr. Charles D[oolittle] Walcott [1850-1927]: Canadian Alpine Jour., vol. 16, p. 231-234, port., 1928.

**WILDER, JOHN T.**

1. The Chattanooga mineral district: Iron, Coal, and Manufacturer's Association of Chattanooga Trans., p. 19-22, 1880. An extremely cursory review of the mineral resources of the area is given. Iron and coal also come from northwestern Georgia, although little detail is included.

**WILKENS, HENRY A. J.,** *see* Nitze, Henry Benjamin Charles, 1.

**WILKES, J. FRANK.**

1. Gold mining in the south: Engineering Assoc. South Proc. [Papers], vol. 19, no. 1, p. 1-15, illus., 1908. A general description of the gold mining situation at that time is given. Very little geological information is included, none of which is new anyway.

**WILLARD, BRADFORD, 1894-**

1. Memorial to Nicholas Hunter Heck (1882-1953): Geol. Soc. America Proc. 1954, p. 111-117, port., 1955.

**WILLET, JOSEPH E.**

1. Description of meteoric iron from Putnam County, Georgia: Amer. Jour. Science, 2d ser. vol. 17, p. 331-332, 1854; in German, Journal fuer praktische Chemie, vol. 62, p. 348-349, Leipzig, 1854. A general description and a gross chemical analysis of a 72-pound meteorite are given.
2. Account of the fall of a meteoric stone in Stewart County, Georgia: Amer. Jour. Science, 2d ser. vol. 50, p. 335-338, 1870. This is an eye-witness account of the descent of a small, 12-ounce stony meteorite.

**WILLIAMS, ALBERT, JR., 1852-1914.**

1. Georgia, *in* Useful minerals of the United States: U. S. Geol. Survey Mineral Resources 1887, p. 720-722, 1888. Numerous minerals found in the state are tabulated; brief remarks are included.

**WILLIAMS, CHARLES REGAN,** *see* Billings, Marland Pratt, 1.

**WILLIAMS, GEORGE HUNTINGTON, 1856-1894.**

1. The distribution of ancient volcanic rocks along the eastern border of North America: Jour. Geology, vol. 2, p. 1-31, illus., 1894. Volcanic rocks occur in a belt along the Piedmont, the southern limits probably being in Georgia and Alabama. None have been positively identified *in situ*, however, but areas of probable occurrence are mapped.

**WILLIAMS, HOWEL,** 1898-

1. Obituary, Prof. Bailey Willis [1857-1949]: Nature, vol. 163, p. 519-520, London, 1949.

**WILLIAMS, T.**

1. (and others). George Huntington Williams . . . 1856-1894. 150 p., port. [New York] [priv. pub.], 1896.

**WILLIAMS, W. THORNE.**

1. Bonner's map of the State of Georgia with the addition of geological features. Scale, 1 inch to 10 miles, Savannah, W. T. Williams, 1849, *in* George White, Statistics of the State of Georgia, 1849.

**WILLIAMSON, ERSKINE D.,** *see* Adams, Leason Heberling, 1.

**WILLIS, BAILEY,** 1857-1949.

1. Notes on the samples of iron ore collected in . . . [northwestern] Georgia: U. S. Census 10th, vol. 15, p. . . . 367-378, . . . , illus., 1886. Analyses and sample descriptions of iron ores, mostly limonite, from many places in the Paleozoic terrane and the Blue Ridge are given. Maps show the sources of the ore bodies.
2. Notes on the samples of manganese ore collected in [Bartow Co.] Georgia: U. S. Census 10th, vol. 15, p. 379-382, illus., 1886. Analyses and sample descriptions of manganese ore, mostly pyrolusite, are given.
3. The mechanics of Appalachian structure: U. S. Geol. Survey Ann. Rept. 13, part 2, p. 217-282, illus., 1893. A general description of the types of folds which occur in the Appalachian Mountains includes examples from Georgia, which is in the district of folds and faults. Laboratory experiments are conducted to ascertain the origin and nature of the structures.
4. Ueberschiebungen in den Vereinigten Staaten von Nordamerika: Internatl. Geol. Cong. 9th, Vienna 1904, Comptes Rendus, vol. 2, p. 529-540, illus., Vienna, 1904. A general description of types of overthrust faults includes some examples which are from Georgia. Fold-thrusts are the common type in the area. The mechanism and related paleogeography are also discussed.
5. Carte géologique de l'Amérique du Nord: Internatl. Geol. Cong. 10th, Mexico 1906, Comptes Rendus, vol. 1, p. 211-225, illus. geol. map, 1907; also an English edition of the map, 1906. A description of the time-rock units on the newly-published map is given. The map includes Georgia, although there is no direct reference to Georgia in the text.
6. Paleogeographic maps of North America: Jour. Geology, vol. 17, p. 203-208, 253-256, 286-288, 342-343, 403-409, 424-428, 503-508, 600-602, illus., 1909. Numerous small-scale maps of North America, one for each of the epochs of geological time, showing the distribution of the land and seas, include Georgia.
7. Index to the stratigraphy of North America. U. S. Geol. Survey Prof. Paper 71, 894 p., illus. incl. atlas of maps, 1912. A descrip-

tion of the 1912 edition of the Geological Map of the United States includes brief discussions of the rock units, some of which are in Georgia.

8. Memorial tribute to Raphael Pumpelly [1837-1923]: Geol. Soc. America Bull., vol. 35, p. 42-43, 1924.
9. Memorial of Raphael Pumpelly [1837-1923]: Geol. Soc. America Bull., vol. 36, p. 45-84, port., 1925.
10. Biographical memoir of Raphael Pumpelly, 1837-1923: Natl. Acad. Science Biog. Mem., vol. 16, p. 23-62, port., 1936.

**WILSON, CHARLES WILLIAMS, JR.,** 1905- *see* Jewell, Willard Brownell, 1, 2.

**WILSON, HEWITT,** 1891-

1. Iron oxide mineral pigments of the United States: U. S. Bur. Mines Bull. 370, vii, 198 p., illus., 1933. A summary of the nature and occurrence of ocher in the Cartersville District in Bartow Co. is included. The ocher is associated with the Weisner Quartzite at its contact with the overlying formations and in the residuum of these rocks.

**WILSON, JAMES LEE,** 1920- *see* Balk, Christina Lochman, 1.

**WILSON, ROY ARTHUR,** 1891- *see also* Park, Charles Frederick, Jr., 1.

1. The gold deposits of Georgia: Forestry-Geological Review, vol. 4, no. 10, p. 7-8, illus.; no. 11, p. 7-8, illus.; no. 12, p. 7-8, illus., 1934; vol. 5, no. 1, p. 7-8, illus.; no. 2, p. 7-8, illus., 1935; Georgia Geol. Survey Inf. Circ. 4, 14 p. (‡), illus., 1934. A semi-popular review of the occurrence of gold in the Piedmont and Blue Ridge of Georgia is given.

**WINDHAM, STEVE R.,** 1931-

1. Origin of green chert underlying the lower bentonite bed in the Ordovician System of northwest Georgia: Georgia Acad. Science Bull., vol. 12, p. 75-78, illus., 1954. Silicified fossils in chert which also shows bedding and ripple marks are used to interpret the origin of the chert as from the replacement of a limestone by silica. The silica came from the overlying volcanic clay which was then altered to bentonite.
2. The stratigraphy, paleontology, and structure of the Mississippian System in Ringgold Quadrangle [Catoosa Co.] Georgia. M. S. Thesis, Emory Univ., 1956.

**WINTERS, STEPHEN SAMUEL,** 1920- *see* Toulmin, Lyman Dorgan, Jr., 3.

**WOLFF, JOHN ELIOT,** 1857-1940.

1. Memoir of Nathaniel Southgate Shaler [1841-1906]: Geol. Soc. America Bull., vol. 18, p. 592-609, port., 1908.
2. Charles Richard Van Hise (1857-1918): Amer. Acad. Arts and Science Proc., vol. 55, p. 511-512, 1920.

**WOODRING, WENDELL PHILLIPS,** 1891- *see also* Cooke, Charles Wythe, 22.

1. William Healey Dall, August 21, 1845-March 27, 1927: Natl. Acad. Science Biog. Mem., vol. 31, p. 92-113, port., 1957.

**WOODRUFF, JAMES FREDERICK,** *see also* Parizek, Eldon Joseph, 9, 11, 13, 15, 18, 19, 20, 21

1. (and Parizek, Eldon Joseph). A critical analysis of soil creep in the Piedmont [abs.]: Georgia Acad. Science Bull., vol. 13, p. 51, 1955.
2. (and Parizek, Eldon Joseph). Influence of underlying rock structures on stream courses and valley profiles in the Georgia Piedmont: Assoc. Amer. Geographers Annals, vol. 46, p. 129-139, illus., 1956. Smooth profiles of equilibrium are interrupted at places where the lithology changes. Many small tributaries have their courses controlled by lithological variations, and valley slopes and terraces reflect lithologic control. Numerous examples are cited.

**WOODWARD, ARTHUR SMITH,** 1864-1944.

1. Edward Drinker Cope [1840-1897]: Natural Science, vol. 10, p. 377-381, port., 1897.
2. Henry Fairfield Osborn: Geological Mag., 6th ser. vol. 4, p. 193-196, port., London, 1917.
3. Dr. John M[ason] Clarke [1857-1925]: Nature, vol. 116, p. 368, London, 1925.
4. Dr. C[harles] D[oolittle] Walcott [1850-1927]: Nature, vol. 119, p. 325-326, London, 1927.
5. Prof. Henry Fairfield Osborn [1857-1935]: Nature, vol. 136, p. 784-785, London, 1935.
6. Henry Fairfield Osborn, 1857-1935: Royal Society Obituary Notices of Fellows, vol. 2, no. 5, p. 67-71, port., London, 1936.

**WOODWARD, HENRY,** 1832-1921.

1. Obituary, Prof. Henry Carvill Lewis [1853-1888]: Geological Mag., 3d ser. vol. 5, p. 428-430, London, 1888.

**WOODWARD, HERBERT PRESTON,** 1899-

1. The age and nomenclature of the Rome ("Watauga") Formation of the Appalachian valley: Jour. Geology, vol. 37, p. 592-602, illus., 1929. This is an exhortation to continue the use of the name Rome and to expand its meaning to engulf other units of similar appearance and stratigraphic position. Evidence is presented to support the recommendation. Rome ("Watauga") is considered an acceptable temporary substitute.
2. Paleozoic formations east of the main axis of Appalachian Uplift: Pan-Amer. Geologist, vol. 63, p. 97-114, 1935. Information about Paleozoic rocks in the Piedmont is summarized, some coming from Georgia. The Brevard Schist is considered a correlative of part of the Wissahickon Schist farther north, and since the Wissahickon could be Paleozoic, so then could the Brevard. The same is true for the Hiwassee Schist. Both units may be Cambrian. Other circumstantial evidence is also cited.

WOODWARD, LEROY ALBERT, 1916-

1. Variations in viscosity of clay-water suspensions of Georgia kaolins, *in* Clays and clay minerals, Natl. conference on clays and clay minerals, 3d, p. 246-259, illus., Washington, D. C., Natl. Research Council and Natl. Acad. Science, Pub. 395, 1955. The text deals exclusively with the physical properties of the kaolin in relation to its uses, but the illustrations include numerous electron-photomicrographs of Georgia kaolin.

WOODWORTH, JAY BACKUS, 1865-1925.

1. Charles Thomas Jackson [1805-1880]: Amer. Geologist, vol. 20, p. 69-110, port., 1897.

WOOLLARD, GEORGE PRIOR, 1908- *see also* Meyer, Robert Paul, 1.

1. A report on the building and ornamental stones of Georgia. M. S. Thesis, Georgia Inst. Technology, 1934.
2. Gravitational determination of deep-seated crustal structure of continental borders (structural interpretations of gravity observations): Amer. Geophysical Union Trans., vol. 21, p. 808-815, illus., 1940. A small-scale map of the eastern United States includes Georgia. A series of near parallel, northeastward trending zones of negative and positive anomalies are present. They are the result of density variations within the basement rocks and not the structure of the rocks. Some large faults are propsed to explain some of the variations.
3. Bouguer isoanomaly map of Georgia: Georgia Mineral Newsletter, vol. 7, p. 18-20, map, 1954. A ten milligal isoanomaly map of Georgia, part of a larger map of the United States, is given. Negative anomalies are common in the Appalachian Mountain region. Positive anomalies at the Fall Line and southward reflect crustal thinning.
4. Preliminary report on seismic investigation in Tift and Atkinson Counties, Georgia: Georgia Mineral Newsletter, vol. 8, p. 69-77, illus., 1955. Refraction tests are used to determine the depth to the pre-Cretaceous basement, which is at —4180 feet in Atkinson Co. and —5335 feet in Tift County. An ultrabasic-rock interpretation for the Tift County area conforms with the interpretation obtained from gravity and magnetic data. A basement-configuration map is included.
5. (and Bonini, William Emory, and Meyer, Robert Paul). A seismic refraction study of the sub-surface geology of the Atlantic Coastal Plain and continental shelf between Virginia and Florida. v, 128 p. (‡), illus., Univ. Wisconsin Dept. Geology and Geophysics, 1957. Structure-contour maps on the top of the pre-Cretaceous basement of the south Atlantic Coastal Plain include Georgia. The Cape Fear Arch, the Peninsular Arch, and the intervening Savannah Basin are clearly shown. Much supplemental well data is included. Bouguer anomaly maps are also included, and formations above the basement are described.

WOOSTER, LYMAN CHILD, 1849-

1. Geology of Kansas and each of the United States. 93 p., illus., Emporia, Kansas, [priv. pub.?], 1930. One half page is devoted to a popular account of the geology of Georgia. Little detail is included.

WORD, ROBERT CAMPBELL, 1825-1890.

1. Report on the topography and diseases of the limestone counties of north-western Georgia: Medical Soc. State of Georgia Ann. Mtg. Trans., vol. 4, p. 43-63, 1853. A generalized description of the geology and physiography of the area is given, along with extensive discourses on the diseases present.

WRIGHT, ANNA Z., *see* Wright, Frank James, 7.

WRIGHT, DAVID CRAIG, 1930-

1. Some sedimentary features of a settling pond [Bartow Co.] [abs.]: Georgia Acad. Science Bull., vol. 10, no. 1, p. 12, 1952.
2. Stratigraphy of the Chickamauga Limestone in the Kensington Quadrangle [Walker Co.]. M. S. Thesis, Emory Univ., 1952.

WRIGHT, FRANK JAMES, 1888-1954.

1. The older Appalachians of the south: Denison Univ. Bull. (Scientific Lab. Jour., vol. 26), p. 143-250, illus., 1931. The physiography of the Blue Ridge Province is described. The Schooley Peneplain is the oldest recognizable feature in the province, but it is not evident in Georgia. The topography of the Blue Ridge in Georgia is a product of the Harrisburg, or Valley Cycle. The Ocoee Basin [Ducktown Plateau] is one of the distinctive features of this cycle, as is the Chattahoochee River area in the Piedmont. Drainage patterns are extensively discussed.
2. Harrisburg erosion in the older Appalachians [abs.]: Assoc. Amer. Geographers Annals, vol. 22, p. 85-86, 1932.
3. (and Chamberlin, Willis A., and Ebaugh, William Clarence). August F[rederick] Foerste [1862-1936]: Science, new ser. vol. 83, p. 568, 1936.
4. Coosa Lowlands of the south [northwestern Georgia] [abs.]: Geol. Soc. America Proc. 1935, p. 119, 1936.
5. (The) newer Appalachians of the south, part 2, south of the New River: Denison Univ. Bull. (Scientific Lab. Jour., vol. 31), p. 93-142, illus., 1936. A review of the geomorphology of the area includes northwestern Georgia. No pre-Schooley Peneplain surfaces are evident. The Harrisburg Surface is the dominating feature. It is 600 feet in elevation in northwestern Georgia and rises gently northward. The "Coosa Lowlands" are a product of solution and some corrasion during the present erosion cycle.
6. Erosional history of the southern Appalachians: Jour. Geomorphology, vol. 5, p. 151-161, 1942. The Schooley Peneplain is the oldest surface, but it is not described from Georgia. The Harrisburg Surface is at the Tennessee-Coosa River divide in Walker

County. The Coosa Lowlands in northwestern Georgia are post-Harrisburg in age, but are due largely to solution rather than surface erosion.

7. (and Wright, Anna Z.). Memorial to Douglas [Wilson] Johnson [1878-1944]: Geol. Soc. America Proc. 1944, p. 223-239, port., 1945.

**WRIGHT, JOHN KIRTLAND, 1891-**

1. Douglas [Wilson] Johnson, 1878-1944: Geographical Review, vol. 34, p. 317-318, 1944.
2. (and Carter, George Francis). Isaiah Bowman, December 26, 1878-January 6, 1950: Natl. Acad. Science Biog. Mem., vol. 33, p. 39-64, port., 1959.

**WRIGHT, R. F.,** *see* Stevens, O. B., 1.

**WUELFING, ERNST ANTON, 1860-1930.**

1. Die Meteoriten in Sammlungen und ihre Literatur . . . . xlvi, 460 p., Tubingen, H. Laupp'schen, 1897. A general treatise on meteorites includes descriptions of fragments of those from Whitfield, Monroe, Chattooga, Stewart, Putnam, Union, Henry, and Marion Counties.

**WUENSCH, CHARLES ERB, 1893-1949.**

1. An appreciation of George Ernest Collins [1870-1946]: Engineering and Mining Jour., vol. 147, no. 7, p. 108-109, 1946.

**WYANT, DONALD GRAY, 1918-** *see* Gott, Garland Bayard, 1.

**WYANT, ROBERT KRISS, 1918-** *see* Roy, Sharat Kumar, 2.

**WYNDHAM, C. E.,** *see* O'Neill, James F., 1.

**WYRICK, R. F.,** *see* Hersey, John Brackett, 1.

**YEATES, WILLIAM SMITH, 1856-1908,** *see also* Hall, Benjamin Mortimer, 2; Standard Gold Mining Co., 1

1. (and McCallie, Samuel Washington, and King, Francis Plaisted). A preliminary report on part of the gold deposits of Georgia: Georgia Geol. Survey Bull. 4-A, 542 p., illus., 1896. The occurrence of gold in the Piedmont and Blue Ridge is described. Various mining properties are discussed in detail. The gold occurs in quartz veins in the metamorphic rocks, as placer deposits, and as a residual in the deep saprolite of the area.

**YOCHELSON, ELLIS LEON, 1928-**

1. (and Bridge, Josiah). The Lower Ordovician gastropod *Ceratopea*: U. S. Geol. Survey Prof. Paper 294-H, p. iii, 281-304, illus., 1957. *Ceratopea buttsi, C. keithi,* and *C. tennesseensis* are described and illustrated. The text does not identify the location or source rocks except as northwestern Georgia.

YOHO, WILLIAM HERBERT, 1911-

1. Provenance study of the heavy minerals in the streams of the gold belt portions of Lumpkin and White Counties, Georgia, *in* Short contributions to the geology, geography, and archaeology of Georgia (no. 2): Georgia Geol. Survey Bull. 60, p. 239-244, illus., 1953. Samples of bedrock, saprolite, and stream sands are analyzed for heavy mineral content and concentrations. Magnetite and zircon are common; both show many euhedral grains. Hematite occurs as altered magnetite coated on magnetite crystals.

YON, J. WILLIAM, JR., *see* Hendry, Charles Walter, Jr., 1.

YOUNG, WILLIAM HARVEY.

1. (and Anderson, Robert Lafayette). Thickness of bituminous-coal and lignite seams mined in the United States in 1945: U. S. Bur. Mines Inf. Circ. 7442, 17 p. (‡), illus., 1947. All of Georgia's coal is from seams less than four feet thick. One mine is underground; the other is a strip mine.
2. (and Anderson, Robert Lafayette). Thickness of bituminous-coal and lignite seams at all mines and thickness of overburden at strip mines in the United States in 1950: U. S. Bur. Mines Inf. Circ. 7642, 18 p. (‡), illus., 1952. All of the coal in Georgia in 1950 came from underground mines and from seams less than two feet thick. Seven mines were operating.

YOUNGMAN, E. P.

1. Deposits of titanium-bearing ores (domestic and foreign): U. S. Bur. Mines Inf. Circ. 6386, 41 p. (‡), 1930. A general discussion of the origin and nature of titanium minerals is followed by very general descriptions of known deposits, some from Georgia. It occurs in rutile from Lincoln County and in the heavy minerals along the Atlantic coastal area.

ZAPP, ALFRED DEXTER, 1916-1962.

1. [Geologic map of] Andersonville Bauxite District [Schley, Sumter, and Macon Cos.]. Scale, 1 inch to 400 inches, text on map, U. S. Geol. Survey Strategic Mineral Investigations Prelim. Map, 1943.
2. Geology of the Andersonville Bauxite District [Macon, Schley, and Sumter Cos.]: U. S. Geol. Survey Repts. Open File 28, 60 p. (‡), illus. incl. geol. map [1949]. Bauxite lenses occur within kaolin lenses which are in the Nanafalia Sandstone of Eocene age. Occurrences are described, and reserves are calculated. Over 256 million tons remain.

ZEIGLER, JOHN M.

1. Origin of the sea islands of the southeastern United States: Geographical Review, vol. 49, p. 222-237, illus., 1959. Erosion-remnant islands, marsh islands, and beach ridge islands are recognized. They are due to less-resistant sedimentary material having been eroded away, leaving the more resistant material behind as the barrier islands.

ZERFOSS, SAMUEL, 1912- *see* Myers, William Marsh, 1.

ZODAC, PETER.

1. Graves Mountain [Lincoln Co.] Georgia: Rocks and Minerals, vol. 14, p. 131-141, illus., 1939. This is a semi-popular account of the geology of the area, with an account of the variety of minerals to be found there. Quartz and kyanite are the most common of all.

ZUIDEMA, HENRY PETER.

1. Discovery of letters by [Charles] Lyell [Jr.] and [Charles] Darwin [with references to John Wesley Powell, 1834-1902]: Jour. Geology, vol. 55, p. 439-445, 1947.

ANONYMOUS, U. R.

1. [Diamonds from Piedmont Georgia] [abs.]: Amer. Philos. Soc. Proc., vol. 5, p. 106, 1848.
2. Benjamin Silliman [Sr.] [1779-1864]: Amer. Jour. Science, 2d ser. vol. 39, p. 1-9, 1865.
3. Professor John W[esley] Powell: Popular Science Monthly, vol. 20, p. 390-397, port., 1882.
4. Sketch of Professor James Hall: Popular Science Monthly, vol. 26, p. 120-123, port., 1884.
5. Edward Hitchcock [1793-1864]: Popular Science Monthly, vol. 47, p. 689-696, port., 1895.
6. Sketch of Ebenezer Emmons [1800-1863]: Popular Science Monthly, vol. 48, p. 406-411, port., 1896.
7. Sketch of Henry Darwin Rogers [1808-1866]: Popular Science Monthly, vol. 50, p. 258-264, port., 1896.
8. Sketch of Charles D[oolittle] Walcott: Popular Science Monthly, vol. 52, p. 547-553, port., 1898.
9. Sketch of Charles Henry Hitchcock: Popular Science Monthly, vol. 54, p. 260-268, port., 1898.
10. Angelo Heilprin [1853-1907]: Amer. Geographical Soc. Bull., vol. 39, p. 666-668, 1907.
11. Angelo Heilprin [1853-1907]: Geog. Soc. Philadelphia Bull., vol. 5, p. 67-68, 1907.
12. William Phipps Blake [1826-1910]: Amer. Jour. Science, 4th ser. vol. 30, p. 95-96, 1910; Engineering and Mining Jour., vol. 89, p. 1099, 1910.
13. Samuel Franklin Emmons [1841-1911]: Engineering and Mining Jour., vol. 91, p. 701-702, port., 1911.
14. Samuel Franklin Emmons [1841-1911]: Mining and Metallurgical Soc. America Bull. 35, p. 64-69, 1911.
15. [Charles] David White: Engineering and Mining Jour., vol. 94, p. 1066, port., 1912.
16. Obituary notice, W J McGee [1853-1912]: Engineering and Mining Jour., vol. 94, p. 484, 1912; Amer. Jour. Science, 4th ser. vol. 34, p. 496, 1912.
17. Obituary, Doctor Joseph Austin Holmes [1859-1915]: Mining and Metallurgical Soc. America Bull., vol. 36, p. 179-181, port., 1915.

18. Charles Richard Van Hise [1857-1918]: Engineering and Mining Jour., vol. 106, p. 999-1000, port., 1918.
19. Manganese ore in [Bartow Co.] Georgia: Science, new ser. vol. 48, p. 360-362, 1918. A generalized survey of the occurrence of manganese in the Cartersville District is given; few details are included.
20. Eminent living geologists: Charles Doolittle Walcott: Geological Mag., new ser. dec. 6, vol. 6, p. 1-10, port., London, 1919.
21. An eminent living American geologist and paleontologist—Professor John M[ason] Clarke: Geological Mag., vol. 58, p. 292-294, port., London, 1921.
22. James Furman Kemp: Engineering and Mining Jour.-Press, vol. 113, p. 367, 1922.
23. Charles D[oolittle] Walcott, president of the American Association for the Advancement of Science for the year 1923: Science, new ser., vol. 57, p. 120-121, 1923.
24. Obituary, Professor Raphael Pumpelly [1837-1923]: Amer. Jour. Science, 5th ser. vol. 6, p. 375-376, 1923.
25. In memoriam, John Mason Clarke, 1857-1925: New York State Museum Bull. 267, p. 7-11, 1926.
26. James Furman Kemp [1859-1926]: Mining and Metallurgy, vol. 7, p. 546, port., 1926.
27. Charles D[oolittle] Walcott [1850-1927]: Mining and Metallurgy, vol. 8, p. 153-154, port., 1927.
28. Bibliography of the published writings of Charles D[oolittle] Walcott [1850-1927]: Smithsonian Misc. Collections, vol. 80, no. 12, p. 23-37, 1928.
29. Waldemar Lindgren [1860-1939]: Mining and Metallurgy, vol. 12, p. 125, port., 1931.
30. [Charles David White, 1862-1935]: Washington Acad. Science Jour., vol. 25, p. 155, 1935.
31. August Frederick Foerste [1862-1936]: Washington Acad. Science Jour., vol. 26, p. 266, 1936.
32. Edward Salisbury Dana [1849-1935]: Mineralogist, vol. 4, p. 20, 22, 1936.
33. Dr. Henry V[an Wagenen] Howe: Gulf Coast Assoc. Geol. Socs. Trans., vol. 7, p. 337-340, 1937.
34. Thomas Nelson Dale [1845-1937]: Science, vol. 86, p. 603, 1937.
35. Heinrich Ries: Amer. Ceramic Soc. Bull., vol. 17, p. 490-491, port., 1938.
36. [Waldemar Lindgren, 1860-1939]: Washington Acad. Science Jour., vol. 30, p. 92, 1940.
37. Arno Carl Fieldner: Amer. Ceramic Soc. Bull., vol. 21, p. 186-187, port., 1942.
38. The father of modern geology [Charles Lyell, Jr., 1797-1875]: Mineralogist, vol. 13, no. 2, p. 50, 68-69, 1945.
39. T[homas] A[rthur] Rickard, mining engineer, editor, author: Explosives Engineer, vol. 24, no. 2, p. 37-38, port., 1946.
40. Death of honorary member [Roy Jay Holden, 1870-1945]: Natl. Speleol. Soc. Bull. 9, p. 38-39, 1947.
41. Diamonds in Georgia: Georgia Mineral Soc. Newsletter [vol. 1], no. 2, p. 2-3 (‡), 1948. Five diamonds have been reported. Each

find is discussed, and all have come from the gold placer deposits in the Piedmont and Blue Ridge Provinces.

42. Obituary, Nelson Horatio Darton [1865-1948]: Geographical Review, vol. 38, p. 506-507, 1948.
43. In memoriam [William Frederick Prouty, 1879-1949]: Compass, vol. 27, p. 112-113, port., 1949.
44. Society's last surviving charter member dies [Heinrich Ries, 1871-1951]: Amer. Ceramic Soc. Bull., vol. 30, p. 195, port., 1951.
45. William Henry Twenhofel, 1875-1957: Amer. Jour. Science, vol. 255, p. 235, 1957.
46. John Charles Rabbitt [1907-1957]: De Re Metallica, vol. 23, no. 5, p. 8, port., 1958.
47. [Map of the southeastern United States] Manuscript map, 1544, reproduced *in* Cummings, William P., The southeast in early maps, pl. 5, p. 94, Princeton, New Jersey, Princeton Univ. Press, 1958. A copy of the map resulting from DeSoto's travels in the United States includes representations of mountains and rivers in what must be Georgia. The names are not recognizable in today's features.

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chalcopyrite
Lincoln Co.: Peyton, A. L., 2
Wilkes Co.: Peyton, A. L., 2
clay
Coastal Plain: Bay, H. X., 1
Decatur Co.: Kerr, P. F., 2
Georgia: Eckel, E. C., 7; Ries, H., 2; Smith, R. W., 7; Veatch, J. O., 7
mineral impurities: Somers, R. E., 1
northwestern Ga.: Bay, H. X., 1
Richmond Co.: Clarke, F. W., 4; Cotting, J. R., 1
coal
Chattooga Co.: Lord, N. W., 1
Dade Co.: Fieldner, A. C., 1, 2; Gildersleeve, B., 1, 2; Harr, L., 1; Porter, J. B., 2; Troxell, J. R., 1
northwestern Ga.: Campbell, M. R., 4
Walker Co.: Fieldner, A. C., 1, 2; Gildersleeve, B., 2; Harr, L., 1; Pope, G. S., 1; Troxell, J. R., 1
copper, native, Fannin Co.: Hurst, V. J., 32
copper ore, Haralson Co.: Ballard, T. J., 2
diabase, Troup Co.: Brokaw, A. D., 1
dolomite
Blue Ridge: Weitz, J. H., 1
Georgia: Furcron, A. S., 6
northwestern Ga.: Weitz, J. H., 1
feldspar
Jasper Co.: Warriner, L. P., 1
Rabun Co.: Chatard, T. M., 1
fire clay, Coastal Plain: Greaves-Walker, A. F., 1; Veatch, J. O., 3
fuller's earth
Coastal Plain: Jones, J., 9; Shearer, H. K., 1
Crisp Co.: Furcron, A. S., 51
Decatur Co.: Day, D. T., 1; Vaughan, T. W., 5, 6
gahnite, Lumpkin Co.: Wells, R. C., 1
garnet
Hart Co.: Wells, R. C., 1
Lumpkin Co.: Richard, L. M., 1
glass sand, Georgia: Peyton, G., 2
gneiss
DeKalb Co.: Severinghaus, N., 1, 2; Venable Bros., 1
Piedmont: Watson, T. L., 8
gold ore, Lumpkin Co.: Wells, R. C., 1
granite
DeKalb Co.: Venable Bros., 1; Watson, T. L., 6
graphic, Jasper Co.: Warriner, L. P., 1
Piedmont: Turekian, K. K., 1; Watson, T. L., 5, 8
porphyritic: Watson, T. L., 4
granitic rocks: Watson, T. L., 3
ground water
Coastal Plain: Clarke, F. W., 2; Darton, N. H., 1; Dole, R. B., 1; Herrick, S. M., 9; LeGrand, H. E., 2; McCallie, S. W., 4; Thomson, M. T., 2; Stringfield, V. T., 3
Dougherty Co.: Wait, R. L., 2
Georgia: Collins, W. D., 1; Jones, J., 7; Lamar, W. L., 1, 2, 3; Lohr, E. W., 1, 2
Lee Co.: Owen, V., Jr., 3
Meriwether Co., Warm Springs: Weed, W. H., 2
Piedmont, southeastern: LeGrand, H. E., 2
Rabun Co.: Ingols, R. S., 1
igneous rocks
Bartow Co.: Clarke, F. W., 4; Washington, H. S., 2
Cherokee Co.: Clarke, F. W., 4; Washington, H. S., 2
Gordon Co.: Clarke, F. W., 4; Washington, H. S., 2
Piedmont: Crickmay, G. W., 25; Washington, H. S., 3
iron ore
Bartow Co.: McCallie, S. W., 5; Robertson, A. F., 1
Cherokee Co.: Willis, B., 1
Fannin Co.: Willis, B., 1
Floyd Co.: McCallie, S. W., 5

Gilmer Co.: Phalen, W. C., 1
Lumpkin Co.: Dobson, C. M., 1
northwestern Ga.: Ball, S. M., 1; Bell, I. L., 1; Birkinbine, J., 1; Burchard, E. F., 6, 7; Fleming, H. S., 1; McCallie, S. W., 21; Porter, J. B., 2; Willis, B., 1
Polk Co.: McCallie, S. W., 5; Robertson, A. F., 1; Spencer, J. W. W., 5
Quitman Co.: Furcron, A. S., 48
Stewart Co.: Furcron, A. S., 48
Webster Co.: Furcron, A. S., 49
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kaolin
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Augusta area: Munyan, A. C., 6
Macon area: Munyan, A. C., 4
Macon Co.: Beck, W. A., 3
Piedmont: Sand, L. B., 1
Richmond Co.: Stokes, H. N., 1
Schley Co.: Beck, W. A., 3
Sumter Co.: Beck, W. A., 3
Twiggs Co.: Mitchell, L., 8; Veatch, J. O., 2
Washington Co.: Mitchell, L., 8
Wilkinson Co.: Mitchell, L., 8
limestone
Bartow Co.: Jones, J., 8
Brookes Co.: Fortson, C. W., Jr., 1
Burke Co.: Jones, J., 1
Coastal Plain: Brantly, J. E., 1; Jones, J., 3, 4, 10; Munyan, A. C., 12
Crisp Co.: Furcron, A. S., 51
Georgia: Eckel, E. C., 4, 5, 8; Furcron, A. S., 3, 6; Jones, J., 5
Lee Co.: Furcron, A. S., 50
Lowndes Co.: Fortson, C. W., Jr., 1
northwestern Ga.: Porter, J. B., 2
Washington Co.: Jones, J., 2
manganese ore
Bartow Co.: Harder, E. C., 2; O'Neill, J. F., 1; Peyton, A. L., 1; Willis, B., 2
rare elements: Kaiser, E. P., 1
Polk Co.: Harder, E. C., 2
rare elements: Kaiser, E. P., 1
Wilkes Co.: Beck, W. A., 1
marble
Catoosa Co.: Clarke, F. W., 3
Georgia: Furcron, A. S., 3
Pickens Co.: Wells, R. C., 1
Tate Quad.: Bayley, W. S., 1
Walker Co.: Clarke, F. W., 4
marl, Coastal Plain: Brantly, J. E., 1
metamorphic rocks, Blue Ridge and Piedmont: Crickmay, G. W., 25
meteorites
Chattooga Co.: Clarke, F. W., 4; Whitfield, J. E., 1
Cherokee Co.: Clarke, F. W., 4; Shepard, C. U., 11
Georgia: Farrington, O. C., 4, 5; Merrill, G. P., 5
Monroe Co.: Reichenbach, K. F. von, 3; Shepard, C. U., 3
Pickens Co.: Wahl, W., 1
Putnam Co.: Rammelsberg, K. F., 1; Reichenbach, K. F. von, 3
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Butts Co.: Bell, A. N., 1
Douglas Co.: Bowden Lithia Springs, 1
Georgia: Crook, J. K., 1; Fitch, W. E., 1; McCallie, S. W., 32; Peale, A. C., 1, 2; Walton, G. E., 1
Meriwether Co.: Bell, A. N., 1
monazite, Coastal Plain: Mertie, J. B., Jr., 2
muscovite, Lumpkin Co.: Wells, R. C., 1
ocher, Bartow Co.: McCallie, S. W., 25; Watson, T. L., 12, 13
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quartz monzonite, Piedmont: Watson, T. L., 16
sand
Bartow Co.: Burchard, E. F., 4
Chatham Co., beaches: Wilbur, R. O., 1
Muscogee Co.: Burchard, E. F., 4
Walker Co.: Burchard, E. F., 4
Wheeler Co.: Hudson, W. C., 3
schist, Pickens Co.: Shearer, H. K., 3; Wells, R. C., 1
slate
Bartow Co.: McCallie, S. W., 34
northwestern Ga.: Shearer, H. K., 3
Polk Co.: Eckel, E. C., 6
shale
Georgia: Smith, R. W., 7
Walker Co.: Clarke, F. W., 4
soapstone, Whitfield Co.: Mell, P. H., Jr., 3
soil
Burke Co.: Cotting, J. R., 2
Georgia: Joffe, J. S., 1
Liberty Co.: Harden, J. M. B., 1
Long Co.: Harden, J. M. B., 1
Richmond Co.: Cotting, J. R., 2
springs
Butts Co.: Banks, J. T., 1
Fulton Co.: Means, A., 1
Georgia: McCallie, S. W., 32
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Stewart Co.: Wells, J. W., 1
Eocene
Burke Co.: Lonsdale, W., 1
Decatur Co.: Vaughan, T. W., 1
Screven Co.: Lonsdale, W., 1; Milne-Edwards, H., 1; Vaughan, T. W., 1
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Coastal Plain: Vaughan, T. W., 10
Decatur Co.: McGlamery, W., 1; Squires, D. F., 1; Vaughan, T. W., 2, 10
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Tertiary, Coastal Plain: Vaughan, T. W., 4

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White Co.: Furcron, A. S., 45

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popular: Crickmay, G. W., 3
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Georgia: Stull, R. T., 1
reserves: Branner, G. C., 1
Macon Co., Andersonville Dist.: Beck, W. A., 3; Grumbles, G. R., 2; Watkins, J. H., 2
Meriwether Co.: Munyan, A. C., 2; White, W. S., 1
northwestern Ga.: Adams, G. I., 1; Brewer, W. M., 7; Bridge, J., 1; Butts, C., 4; Hayes, C. W., 3; Musset, R., 1; Phalen, W. C., 3; Ries, H., 1; Thoenen, J. R., 1; Watson, T. L., 2, 10
Polk Co.: Brewer, W. M., 2; Hayes, C. W., 10; Lloyd, A. M., 2; White, W. S., 2
Randolph Co., Springvale Dist.: Beck, W. A., 5; Clark, L. D., 1
Schley Co., Andersonville Dist.: Beck, W. A., 3; Grumbles, G. R., 2; Watkins, J. H., 2
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Crisp Co.: Maynard, T. P., 10
Dade Co.: Bay, H. X., 1; Gildersleeve, B., 2
northwestern Ga.: Butts, C., 4; Kay, G. M., 1; Reade, E. H., Jr., 1; Rosenkrans, R. R., 1; Smith, R. W., 7; Sullivan, J. W., 1
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Rome Quad.: Hayes, C. W., 18
Forsyth Co., Tate Quad.: Bayley, W. S., 1
Georgia: Balk, C. L., 1
Gilmer Co., Ellijay Quad.: LaForge, L., 2
Gordon Co.: Smith, J. W., 2; Stuart, A. W., 2
Fairmount area: Stuart, A. W., 1
Ranger area: Smith, W. L., 2
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Lumpkin Co., Ellijay Quad.: LaForge, L., 2
Murray Co.
Calhoun Quad.: Cribb, R. E., 1
Dalton Quad.: Munyan, A. C., 17
northwestern Ga.: Burns, J. A., 1; Butts, C., 4; Grabau, A. W., 5; Hayes, C. W., 2, 4; Howell, B. F., Sr., 1; King, P. B., 7; McCutchen, A. R., 1; Resser, C. E., 3, 4; Rodgers, J., 4; Stose, G. W., 9; Ulrich, E. O., 2; Walcott, C. D., 1, 2, 3
Rome Formation: Woodward, H. P., 1
Pickens Co.: Smith, J. W., 2
Ellijay Quad.: LaForge, L., 2
Tate Quad.: Bayley, W. S., 1
Piedmont: Elliott, J. B., 1; Rodgers, J., 3
Polk Co.: Hayes, C. W., 6; Pinson, W. H., Jr., 1; Spencer, J. W. W., 5
Indian Mountain area: Crawford, T. J., 2
Rome Quad.: Hayes, C. W., 18
Union Co., Ellijay Quad.: LaForge, L., 2
Walker Co.
Cedar Grove Quad.: Dicus, J. M., 1
Kensington Quad.: Traylor, H. G., 1
Ringgold Quad.: Hayes, C. W., 7
Whitfield Co.
Calhoun Quad.: Cribb, R. E., 1
Dalton Quad.: Munyan, A. C., 17
Ringgold Quad.: Hayes, C. W., 7
**CANADIAN SYSTEM,** *see also* Ordovician, and Paleozoic
northwestern Ga.: Ulrich, E. O., 2
**CAROLINA BAYS**
Burke Co.: Arden, D. D., Jr., 1
geophysical investigations: Johnson, W. R., Jr., 1; Straley, H. W., 3d, 3
Coastal Plain: Frink, J. W., 1; Prouty, W. F., 2, 3
**CARROLL COUNTY,** *see also* Georgia, and Georgia—Piedmont
*Economic geology*
copper: Weed, W. H., 1
gold
Bonner Mine: Brewer, W. M., 4
Villa Rica Dist.: Brewer, W. M., 4, 14, 15
*Mineralogy*
fuchsite: Hurst, V. J., 24
**CASSITERITE,** *see also* Minerals
White Co.: Blake, W. P., 9
**CATALOGS**
Georgia exhibit, Paris Exhibition: Little, G., 5
Georgia minerals: Crickmay, G. W., 24; Dana, E. S., 3; Robinson, S., 1
**CATOOSA COUNTY,** *see also* Georgia, and Georgia—Northwestern
*Areas described*
Dalton Quad.: Munyan, A. C., 17
Ringgold area: Allen, A. T., Jr., 1
Ringgold Quad.: Hayes, C. W., 7
*Economic geology*
clay, Dalton Quad.: Munyan, A. C., 17
limestone, Dalton Quad.: Munyan, A. C., 17
limonite, Ringgold Quad.: Hayes, C. W., 7
manganese, Ringgold Quad.: Hayes, C. W., 7

*Ground water*
Blowing Spring: McCallie, S. W., 18
Catoosa Spring: Land, W. J., 1
mineral springs: Pepper, W., 1
*Historical geology*
Cambrian-Mississippian, Ringgold Quad.: Hayes, C. W., 7
Cambrian-Ordovician, Knox Group: Allen, A. T., Jr., 4
Cambrian-Ordovician, Tertiary, Dalton Quad.: Munyan, A. C., 17
Ordovician: Murphy, R. E., Jr., 1
Ordovician-Silurian: Vogdes, A. W., 1
Mississippian, Ringgold Quad.: Windham, S. R., 2
*Maps*
economic, mineral resources, Ringgold Quad.: Hayes, C. W., 7
geologic
Dalton Quad.: Munyan, A. C., 17
Ringgold Quad.: Hayes, C. W., 7
Mississippian: Windham, S. R., 2
*Paleontology*
Blastoidea, Mississippian: Allen, A. T., Jr., 3
Brachiopoda
Silurian: Foerste, A. F., 1; White, C. A., 1
Mississippian: Arden, D. D., Jr., 2
Invertebrata
Mississippian: Windham, S. R., 2
Ordovician: Murphy, R. E., Jr., 1
Ostracoda, Ordovician: Gould, J. C., 1
tracks, Ordovician: Allen, A. T., Jr., 2
Trilobita, Silurian: Foerste, A. F., 1; Vogdes, A. W., 2, 3
*Petrology*
clastic rocks, Silurian-Mississippian: Callahan, J. E., 1
marble, analyses: Clarke, F. W., 3
oolites, Mississippian: Ingram, F. T., 1
*Physical geology*
Houston Valley, structural geology: Callahan, J. E., 2
weathering, soils: Taylor, A. E., 1
**CAVES**
Bartow Co., Saltpeter Cave: Chapman, J. R., 4; Kemper, C. G., Jr., 1
Dade Co.
Case Cave: Chapman, J. R., 2
Nickajack Cave: Cornelius, E., 1
Decatur Co., Climax Cave: Walker, L. T., 1
Georgia, popular: Chapman, J. R., 5; Crickmay, G. W., 17
northwestern Ga.: Moneymaker, B. C., 3
Walker Co.
Horseshoe Cave: Chapman, J. R., 3
Harrisburg Cave: Freeman, J., 1
Whitfield Co., Ketchum's Cave: Furcron, A. S., 16
**CEMENT**, *see also* Mineral resources
Blue Ridge: Maynard, T. P., 2
Georgia: Eckel, E. C., 4, 5, 8
northwestern Ga.: Butts, C., 4; Maynard, T. P., 2
Piedmont: Maynard, T. P., 2
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bibliography: Murray, G. E., Jr., 2
volume of sediments: Murray, G. E., Jr., 3; Toulmin, L. D., Jr., 1
Georgia: Harshberger, J. W., 1; King, P. B., 6, 8; McCallie, S. W., 35; Richards, H. G., 10; Schuchert, C., 3; Willis, B., 6
Appalachia: Nelson, W. A., 1
popular: Furcron, A. S., 21
Polk Co.: Cofer, H. E., Jr., 3
Sumter Co.: Owen, V., Jr., 4
**CEPHALOPODA**, *see also* Invertebrata
Ammonoidea
Cretaceous
Chattahoochee Co.: Stephenson, L. W., 18
Clay Co.: Gabb, W. M., 1
Mississippian, Floyd Co.: Miller, A. K., 1
Nautiloidea, Coastal Plain, Eocene: Miller, A. K., 2
**CHALCOCITE**, *see also* Minerals
Cherokee Co.: Pratt, N. A., Jr., 1
**CHARLTON COUNTY**, *see also* Georgia, and Georgia—Coastal Plain.
*Geophysical investigations*
radioactivity survey: Moxham, R. M., 1
*Maps*
geophysical, radioactivity survey: Moxham, R. M., 1
**CHATHAM COUNTY**, *see also* Georgia, and Georgia—Coastal Plain.
*Engineering geology*
Savannah Harbor: Trask, P. D., 1
*Ground water*
Chatham Co.: Stringfield, V. T., 1
artesian: Davis, G. H., 1
salt water encroachment: Counts, H. B., 1
Savannah area: Stephenson, L. W., 6
wells: Slichter, C. S., 1
*Historical geology*
Cretaceous: Morton, S. G., 1
Pleistocene: Couper, J. H., 4
*Paleontology*
Diatomaceae, Pleistocene: Bailey, J. W., 1
Invertebrata, Pleistocene: Richards, H. G., 1
Mammalia, Pleistocene: Agassiz, L., 1; Cahn, A. R., 1; Cooper, W., 1, 2; Cope, E. D., 1; Couper, J. H., 4; Cuvier, G. L. C. F. D., 1; Gibbes, R. W., 3; Habersham, J. C., 1; Harlan, R., 1; Hay, O. P., 3; Hodgson, W. B., 1, 2; Leidy, J., 3, 4; Lyell, C., Jr., 2; Mitchill, S. L., 5
Mollusca, Pleistocene: Habersham, J. C., 1
Reptilia, Pleistocene: Habersham, J. C., 1; Hay, O. P., 1, 2
Vertebrata, Pleistocene: Mitchell, L., 2; Richards, H. G., 1

*Petrology*
heavy minerals, beaches: Wilbur, R. O., 1
*Physical geology*
earthquakes: Mitchill, S. L., 3
land subsidence: Davis, G. H., 1
*Physiographic geology*
Savannah area: Ga. Medical Soc., 1; White, J. E., 3

**CHATTAHOOCHEE COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Ground water*
Fort Benning area: Herrick, S. M., 2
*Historical geology*
Cretaceous, Ripley Formation: Vest, E. L., Jr., 2
*Maps*
ground water, Fort Benning area: Herrick, S. M., 2
*Paleontology*
Mollusca, Cretaceous: Stephenson, L. W., 18
plants, Cretaceous: Berry, E. Wilbur, 1, 10

**CHATTOOGA COUNTY,** *see also* Georgia, and Georgia—Northwestern
*Areas described*
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Stevenson Quad.: Hayes, C. W., 8
*Economic geology*
bentonite: Bay, H. X., 1
coal: Lord, N. W., 1; McCallie, S. W., 14
Ringgold Quad.: Hayes, C. W., 7, 8
halloysite: Broadhurst, S. D., 1; Watkins, J. H., 1
iron
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
limestone, Rome Quad.: Hayes, C. W., 18
*Historical geology*
Cambrian-Pennsylvanian
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Ordovician-Pennsylvanian, Stevenson Quad.: Hayes, C. W., 8
Pennsylvanian: McCallie, S. W., 14
Pliocene, Rome Quad.: Hayes, C. W., 18
*Maps*
economic
mineral resources
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
geologic: McCallie, S. W., 14
Pigeon Mountain: Wheeler, G. E., 1
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Stevenson Quad.: Hayes, C. W., 8
*Mineralogy*
halloysite: Van der Meulen, P. A., 1
hydrargillite: Van der Meulen, P. A., 1
kaolinite: Van der Meulen, P. A., 1
*Petrology*
meteorites: Brezina, A., 5; Clarke, F. W., 4; Henderson, E. P., 3, 5; Huntington, O. W., 2; Whitfield, J. E., 1

**CHEROKEE COUNTY,** *see also* Georgia, and Georgia—Piedmont.
*Areas described*
Blue Ridge, southern: Furcron, A. S., 11
Cartersville Dist.: Kesler, T. L., 4
Fairmount area: Smith, J. W., 2
Tate Quad.: Bayley, W. S., 1
*Economic geology*
arsenic: Tyler, P. M., 1
copper: Marlin, L. G., 1
Canton Mine: Deby, J. M., 1; Shepard, C. U., 5
gold: Marlin, L. G., 1
Franklin Mine: Brewer, W. M., 4
Pascoe Mine: Shepard, C. U., 7
iron: Leweicki, W. T., 1; Willis, B., 1
kyanite: Petar, A. V., 1; Smith, R. W., 2
lead, Canton Mine: Shepard, C. U., 5
mica: Beck, W. A., 2
mineral resources, Tate Quad.: Bayley, W. S., 1
*Historical geology*
Cambrian-Pennsylvanian, Cartersville Dist.: Kesler, T. L., 4
Precambrian-Cambrian: Smith, J. W., 2
Precambrian-Paleozoic, Tate Quad.: Bayley, W. S., 1
*Maps*
economic
gold, Cherokee Mine: Pardee, J. T., 1
gold, 301 Mine: Pardee, J. T., 1
geologic
Cartersville Dist.: Kesler, T. L., 4
Cherokee Mine area: Pardee, J. T., 1
Fairmount area: Smith, J. W., 2
Tate Quad.: Bayley, W. S., 1
301 Mine area: Pardee, J. T., 1
*Mineralogy*
chalcocite: Pratt, N. A., Jr., 1
covellite: Pratt, N. A., Jr., 1
hydroxyapatite: Mitchell, L., 3
minerals, Canton Mine: Shepard, C. U., 5
sapphire: Alger, F., 1
spinel: Genth, F. A., 1
staurotide: Genth, F. A., 3
*Petrology*
igneous rocks, analyses: Clarke, F. W., 4; Washington, H. S., 2
meteorites: Clarke, F. W., 4; Flight, W., 1; Howell, E. E., 1; Meunier, S., 1; Saltpeter, E. W., 1; Shepard, C. U., 10, 11
*Physical geology*
Cartersville Fault: Smith, J. W., 2
stream gravel: Grumbles, G. R., 1

**CHERT,** *see also* Minerals
Floyd Co.: Furcron, A. S., 52
northwestern Ga., Fort Payne Formation: Hurst, V. J., 3; Moore, W. H., Jr., 1
Ordovician: Windham, S. R., 1

**CHROMITE,** *see also* Mineral resources, and Minerals
Towns Co.: Hunter, C. E., 2
Troup Co., Louise Mine: Ballard, T. J., 3

**CHRYSOCOLLA,** *see also* Minerals
DeKalb Co.: Hurst, V. J., 6

**CLAMS,** *see* Pelecypoda

**CLARKE COUNTY,** *see also* Georgia, and Georgia—Piedmont
*Areas described*
Clarke Co.: Parizek, E. J., 4, 8, 16
*Paleontology*
Algae, Pleistocene: Bailey, J. W., 2
Diatomaceae, Pleistocene: Bailey, J. W., 2
*Petrology*
granite inclusions: Parizek, E. J., 1
heavy minerals, saprolite: Hurst, V. J., 1, 4

igneous rocks: Parizek, E. J., 8
metamorphic rocks: Parizek, E. J., 8
xenoliths in granodiorite: Parizek, E. J., 17
*Physical geology*
stone lines: Parizek, E. J., 20
*Physiographic geology*
Clarke Co.: Parizek, E. J., 16
CLAY, *see also* Mineral resources, and individual types of clay minerals
Blue Ridge: Allen, V. T., 2
Catoosa Co., Dalton Quad.: Munyan, A. C., 17
Coastal Plain: Ladd, G. E., 1; Seybert, A., 1; Spencer, J. W. W., 5
Central of Georgia Railway: Maynard, T. P., 11
petrology: Allen, V. T., 2
Dade Co.: New England Company, 1
Decatur Co.: Grim, R. E., 1
Georgia: Maynard, T. P., 1; Nutting, P. G., 2; Ries, H., 2; Smith, R. W., 7; Veatch, J. O., 7
classification: Mitchell, L., 5
colluvial: Veatch, J. O., 1
mineral impurities: Somers, R. E., 1
soils: England, C. B., 1
Hancock Co.: Fortson, C. W., Jr., 3
Murray Co., Dalton Quad.: Munyan, A. C., 17
northwestern Ga.: Butts, C., 4; Sullivan, J. W., 1
Piedmont: Allen, V. T., 2
Richmond Co.: Clarke, F. W., 4; Cotting, J. R., 1
Twiggs Co.: Brindley, G. W., 1; Grim, R. E., 1; Tingle, W. W., 1
Whitfield Co., Dalton Quad.: Munyan, A. C., 17
CLAY COUNTY, *see also* Georgia, and Georgia—Coastal Plain
*Paleontology*
Bryozoa, Paleocene: Canu, F., 2
Cephalopoda, Cretaceous: Gabb, W. M., 1
Echinoidea, Cretaceous: Clark, W. B., 3; Cooke, C. W., 24
Gastropoda
Cretaceous: Gabb, W. M., 1
Eocene: Harris, G. D., 3
Paleocene: Harris, G. D., 2
Pelecypoda
Cretaceous: Gabb, W. M., 1
Eocene: Harris, G. D., 3
Paleocene: Harris, G. D., 2
seed, Eocene: Berry, E. W., 8
*Physical geology*
solution pits: Toulmin, L. D., Jr., 3
*Physiographic geology*
natural bridges: Toulmin, L. D., Jr., 3
CLAYTON COUNTY, *see also* Georgia, and Georgia—Piedmont
*Areas described*
Soapstone Ridge: King, J. A., 5th, 1
*Maps*
Geologic, Soapstone Ridge: King, J. A., 5th, 1
*Mineralogy*
diamond: Holden, R. J., 1
CLEAVAGE, *see also* Structural geology
Gilmer Co.: Phalen, W. C., 2
Whitfield Co., Ordovician: Moore, J. B., Jr., 1
CLINCH COUNTY, *see also* Georgia, and Georgia—Coastal Plain
*Paleontology*
Foraminifera, Cretaceous: Applin, E. R., 3
*Petrology*
welded tuff: Ross, C. S., 4
COAL, *see also* Mineral resources
Chattooga Co.: Lord, N. W., 1; McCallie, S. W., 14
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
Dade Co.: Fieldner, A. C., 1, 2; Gildersleeve, B., 1, 2; Hall, J., 1; Harr, L., 1; Hayes, C. W., 19; Johnson, V. H., 1; McCallie, S. W., 14; New England Company, 1; Parker, E. W., 1; Porter, J. B., 2; Troxell, J. R., 1
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
northwestern Ga.: Bell, I. L., 1; Brewer, W. M., 7; Butts, C., 4; Campbell, M. R., 4; Fieldner, A. C., 3; Lesher, C. E., 1; Pallister, H. D., 3; Sullivan, J. W., 1; Young, W. H., 1, 2
Walker Co.: Fieldner, A. C., 1, 2; Gildersleeve, B., 2; Harr, L., 1; Johnson, V. H., 1; McCallie, S. W., 14; Pope, G. S., 1; Porter, J. B., 2; Troxell, J. R., 1
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
COBALT, *see also* cobalt-bearing minerals, and Minerals
northwestern Ga.: Pierce, W. G., 1
COBB COUNTY, *see also* Georgia, and Georgia—Piedmont
*Areas described*
Kennesaw-Sweat Mountain area: Hurst, V. J., 2
*Economic geology*
bauxite: Lloyd, A. M., 2
gold: Ward, W. P., 1
Cherokee Gold Mine: Blake, W. P., 6
O'Neill Property: Adelberg, J., 2
kyanite: Petar, A. V., 1
*Ground water*
mineral springs: Fuller, M. L., 2
salty spring: Furcron, A. S., 30
*Maps*
Geologic, Kennesaw-Sweet Mountain area: Hurst, V. J., 2
*Mineralogy*
fuchsite: Hurst, V. J., 24
titanite: Rogers, W. S., 1, 2
*Physiographic geology*
Roswell area: King, W. N., 1
COFFEE COUNTY, *see also* Georgia, and Georgia—Coastal Plain
*Historical geology*
Pliocene, Altamaha Grit: Harper, R. M., 8
COLUMBIA COUNTY, *see also* Georgia, Georgia—Coastal Plain, and Georgia—Piedmont
*Economic geology*
magnesium: Furcron, A. S., 5
serpentine: Furcron, A. S., 5
*Historical geology*
Eocene: Harris, G. D., 4
*Paleontology*
plants, Eocene: Berry, E. W., 2, 12

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Effingham Co.: Cooke, C. W., 13
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Ware Co.: Holland, W. A., Jr., 4
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northwestern Ga., Devonian: Glover, L., 2
CONSTRUCTION MATERIAL, *see also* Aggregate, Sand, Gravel, Stone, and individual materials
Blue Ridge: Spain, E. L., Jr., 1
Georgia: McCallie, S. W., 9
roads: McCallie, S. W., 27
sand and gravel: Teas, L. P., 1
northwestern Ga.: Spain, E. L., Jr., 1
COPPER, *see also* copper-bearing minerals, and Mineral resources.
Blue Ridge: Blake, W. P., 10; Curry, R. O., 1; Weed, W. H., 4
popular: Furcron, A. S., 35
Carroll Co.: Weed, W. H., 1
Cherokee Co.: Marlin, L. G., 1
Canton Mine: Deby, J. M., 1; Shepard, C. U., 5
Fannin Co.: Hurst, V. J., 32; McCallie, S. W., 11; Weed, W. H., 3; Wendt, A. F., 1
Ducktown area: Emmons, W. H., 1
Ellijay Quad.: LaForge, L., 2
Mt. Pisgah Mine: Shepard, C. U., 9
Gilmer Co., Ellijay Quad.: LaForge, L., 2
Haralson Co., Tallapoosa Mine: Ballard, T. J., 2
Lincoln Co.
Magruder Mine: Peyton, A. L., 1; Ross, C. S., 1
Seminole Mine: Watson, T. L., 11
Lumpkin Co.: Weed, W. H., 1
Chestatee Prospect: Kline, M. H., 1
Ellijay Quad.: LaForge, L., 2
Paulding Co., Banks Mine: Douglas, H., 1; Pratt, N. A., Jr., 2
Pickens Co., Ellijay Quad.: LaForge, L., 2
Piedmont: Blake, W. P., 10; Weed, W. H., 4
popular: Furcron, A. S., 35
Polk Co.: Lieber, O. M., 1
Union Co., Ellijay Quad.: LaForge, L., 2
Wilkes Co.
Chambers Mine: Peyton, A. L., 2
Seminole Mine: Watson, T. L., 11
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Monroe Co.: Hurst, V. J., 20
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Blue Ridge: Barlow, A. E., 1; King, F. P., 1; Larsen, E. S., Jr., 1; Lewis, J. V., 2; Pratt, J. H., 1, 2; Shepard, C. U., 12; Smith, J. L., 3
Hall Co.: Genth, F. A., 4
Piedmont: Barlow, A. E., 1; King, F. P., 1; Lewis, J. V., 2; Pratt, J. H., 1, 2
Rabun Co.: Genth, F. A., 4; Holmes, J. A., 1; Shepard, C. U., 12
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COVELLITE, *see also* Minerals
Cherokee Co.: Pratt, N. A., Jr., 1
CRAWFORD COUNTY, *see also* Georgia, Georgia—Coastal Plain, and Georgia—Piedmont
*Mineralogy*
monazite: Fortson, C. W., Jr., 2
*Paleontology*
Bryozoa, Eocene: Canu, F., 1
Foraminifera, Eocene: Cushman, J. A., 4
Mammalia, Eocene: Furcron, A. S., 32
CRETACEOUS, *see also* Mesozoic
Baldwin Co.: LaMoreaux, P. E., 2
Bibb Co., Macon area: Cooke, C. W., 5
Chatham Co.: Morton, S. G., 1
Chattahoochee Co., Ripley Formation: Vest, E. L., Jr., 2
Coastal Plain: Applin, P. L., 3, 4; Brantly, J. E., 1, 3; Braunstein, J., 1; Buch, L. von, 1; Carsey, J. B., 1; Clark, W. B., 4; Cooke, C. W., 18, 23; Faircloth, W. R., 1; Harper, R. M., 7; Herrick, S. M., 1; Hilgard, E. W., 1; Jones, J., 11; McCallie, S. W., 40, 41; Monroe, W. H., 3; Morton, S. G., 2; Munyan, A. C., 3; Murray, G. E., Jr., 4; Patton, J. L., 1; Peterson, H. A., 1; Peyton, G., 5; Postley, O. C., 2; Prettyman, T. M., 1; Richards, H. G., 4, 9, 17, 18; Schuchert, C., 18, 20; Shimer, H. W., 1; Spencer, J. W. W., 3, 5; Stephenson, L. W., 1, 2, 3, 7, 11; Straley, H. W., 3d, 1; Todd, J. D., 1; Toulmin, L. D., Jr., 2; Vanuxem, L., 1; Veatch, J. O., 7, 9; Ver Weibe, W. A., 1; Willis, B., 7
Chattahoochee River: Langdon, D. W., Jr., 1, 2; Lyell, C., Jr., 3; Smith, E. A., 2
east-central: LaMoreaux, P. E., 1, 2
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Eocene contact: Stephenson, L. W., 5
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index fossils: Stephenson, L. W., 17
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Savannah River area: Hodge, J. T., 1; Phillips, W. E., 2
sedimentation: Turner, P. A., 1
subsurface: Applin, E. E. R., 1; Applin, P. L., 1, 2; Carroll, D. L., 1; Jordan, L., 1, 2, 5; McClain, D. S., Jr., 2; Richards, H. G., 3, 6
Atkinson Formation: Applin, E. E. R., 3
Tuscaloosa Formation: Cooke, C. W., 10; Stanton, T. W., 1

volume of sediments: Applin, P. L., 6; Murray, G. E., Jr., 3
Early Co.: Jordan, L., 3
Georgia: Harshberger, J. W., 1
paleogeology: Levorsen, A. I., 1
Hancock Co.: Fortson, C. W., Jr., 3; La Moreaux, P. E., 2
Jones Co.: LaMoreaux, P. E., 2
Macon Co.: Stephenson, L. W., 14
Pierce Co., Tuscaloosa Formation: Munyan, A. C., 5
Stewart Co.
Lumpkin SW Quad.: Kirkpatrick, S. R., 2
Providence Formation: Goodell, H. G., 1
Providence-Ripley Formation contact: Smallwood, J. K., Jr., 1
Ripley Formation: Vest, E. L., Jr., 2
Sumter Co.: Owen, V., Jr., 4
Washington Co.: Guttery, T. H., 1; Morton, S. G., 1
Webster Co.: Owen, V., Jr., 2
CRISP COUNTY, *see also* Georgia, and Georgia—Coastal Plain
*Economic geology*
bentonite: Maynard, T. P., 10
fuller's earth: Furcron, A. S., 51
limestone: Furcron, A. S., 51
*Ground water*
Crisp Co.: Wait, R. L., 3
*Maps*
Economic, mineral resources: Furcron, A. S., 51
*Paleontology*
Mammalia, Eocene: Kellogg, A. R., 1
CRUSTACEA, *see also* individual types
Decatur Co., Oligocene: Rathbun, M. J., 1
Stewart Co., Cretaceous: Rathbun, M. J., 1
DADE COUNTY, *see also* Georgia, and Georgia—Northwestern
*Areas described*
Cedar Grove Quad.: Dicus, J. M., 1
Cloudland Canyon State Park: Croft, M. G., 1
popular: Furcron, A. S., 14
Durham Quad., eastern: Darling, R. W., 1
New England City area: New England Company, 1
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
*Economic geology*
bentonite: Bay, H. X., 1; Gildersleeve, B., 2
clay: New England Company, 1
coal: Fieldner, A. C., 1, 2; Gildersleeve, B., 1, 2; Hall, J., 1; Harr, L., 1; Hayes, C. W., 19; Johnson, V. H., 1; McCallie, S. W., 14; New England Company, 1; Porter, J. B., 2; Troxell, J. R., 1
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
iron: Hall, J., 1; New England Company, 1
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
mineral resources: Gildersleeve, B., 1
nitrate: Cornelius, E., 1
ocher: Burchard, E. F., 2
stone: New England Company, 1
*Historical geology*
Cambrian-Pennsylvanian
Cedar Grove Quad.: Dicus, J. M., 1
New England City area: New England Company, 1
Mississippian: Moore, W. H., Jr., 2
reef: Owen, V., Jr., 1
Mississippian-Quaternary, Cloudland Canyon Park: Croft, M. G., 1
Ordovician, Lookout Valley: Ingram, F. T., 2
Ordovician-Mississippian, Durham Quad., western: Clement, W. G., 1
Ordovician-Pennsylvanian
Durham Quad., eastern: Darling, R. W., 1
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
Pennsylvanian: McCallie, S. W., 14; Renshaw, E. W., 1, 2; Troxell, J. R., 1; Wanless, H. R., 5
Silurian, Clinton iron ore: Foerste, A. F., 2
*Maps*
Economic
coal: Johnson, V. H., 1; Parker, E. W., 1
mineral resources
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
Geologic: Johnson, V. H., 1; McCallie, S. W., 14; Renshaw, E. W., 1
Cedar Grove Quad.: Dicus, J. M., 1
Durham Quad.: Darling, R. W., 1
western: Clement, W. G., 1
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
Trenton area: Moore, W. H., Jr., 2
*Paleontology*
Blastoidea, Mississippian: Schuchert, C., 2
Brachiopoda, Silurian: Foerste, A. F., 1; Hall, J., 3, 4
Ordovician fauna: Ingram, F. T., 2
plants, Pennsylvanian: Abbott, M. L., 1; Lesquereux, L., 1; White, C. D., 3
*Petrology*
Clinton iron ore, Silurian: Foerste, A. F., 2
Lookout Formation, Pennsylvanian: Fagan, J. M., 1
reef, Mississippian: Owen, V., Jr., 1
Pennsylvanian sandstone: Renshaw, E. W., 2
*Physical geology*
concretions, Pennsylvanian: Sullivan, J. W., 2
mudcracks: Crisler, R. M., Jr., 1
weathering, soils: Taylor, A. E., 2
*Physiographic geology*
Case Cave: Chapman, J. R., 2
Nickajack Cave: Cornelius, E., 1
DAWSON COUNTY, *see also* Georgia, and Georgia—Piedmont
*Areas described*
Blue Ridge, southern: Furcron, A. S., 11
Ellijay Quad.: Furcron, A. S., 41
Tate Quad.: Bayley, W. S., 1
*Economic geology*
mineral resources, Tate Quad.: Bayley, W. S., 1
*Geophysical investigations*
magnetic survey: Tucker, C. V., Jr., 1

*Ground water:*
crystalline rocks: Callahan, J. T., 4
radioactive waste disposal: Edgerton, J. H., 1
*Historical geology*
Precambrian-Paleozoic, Tate Quad.: Bayley, W. S., 1
*Maps*
Economic, gold
Etowah Mine: Pardee, J. T., 1
Kin Mori area: Pardee, J. T., 1
Geologic
Etowah Mine area: Pardee, J. T., 1
Kin Mori Mine area: Pardee, J. T., 1
Tate Quad.: Bayley, W. S., 1
*Mineralogy*
minerals: Hurst, V. J., 31
stibnite: Hurst, V. J., 34
*Petrology*
metamorphic rocks, Ellijay Quad.: Furcron, A. S., 41
**DECATUR COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Areas described*
Jim Woodruff Reservoir: Hendry, C. W., Jr., 1
*Economic geology*
argon: Furcron, A. S., 55
fuller's earth: Calver, J. L., 1; Day, D. T., 1; Kerr, P. F., 2; Vaughan, T. W., 5, 6
helium: Furcron, A. S., 55
helium-bearing gas: Boone, W. J., Jr., 1
*Historical geology*
Eocene
Crystal River Formation: Puri, H. S., 1
Ocala Limestone: Cooke, C. W., 1
Eocene-Miocene: Pumpelly, R., 2
Jim Woodruff Reservoir area: Hendry, C. W., Jr., 1
Miocene: Foerste, A. F., 3
Oligocene-Miocene: Cooke, C. W., 4; Dall, W. H., 4; Foerste, A. F., 4
Tertiary, Grand Gulf Formation: Smith, A. E., 3
*Maps*
Geologic, Jim Woodruff Reservoir area: Hendry, C. W., Jr., 1
*Mineralogy*
attapulgite: Bradley, W. F., 1; Caillere, S., 1; Kerr, P. F., 2, 3; Lapparent, J. de, 1, 2, 3; Mumpton, F. A., 1
electron photomicrographs: Bates, T. F., 1, 2
reference: Kerr, P. F., 3
clay: Grim, R. E., 1
montmorillonite: Kerr, P. F., 2
*Paleontology*
Anthozoa
Eocene: Vaughan, T. W., 1
Oligocene: McGlamery, W., 1; Squires, D. F., 1; Vaughan, T. W., 2, 10
Bryozoa, Eocene: Canu, F., 1
Crustacea, Oligocene: Rathbun, M. J., 1
Echinoidea
Cretaceous: Cooke, C. W., 24
Eocene: Cooke, C. W., 20
Foraminifera, Eocene: Cushman, J. A., 4; Douvillé, J. H. F., 2; Vaughan, T. W., 13
Invertebrata
Eocene: Couper, J. H., 3
Oligocene: Cooke, C. W., 6
Mollusca
Miocene: Gardner, J. A., 3
Oligocene: Dall, W. H., 11
Pelecypoda, Oligocene: Tucker, H. I., 2
*Physical geology*
insoluble residue, Eocene-Miocene: Hendry, C. W., Jr., 1
*Physiographic geology*
Climax Cave: Walker, L. T., 1
**DEKALB COUNTY,** *see also* Georgia, and Georgia—Piedmont
*Areas described*
Arabia Mountain area: Cofer, H. E., Jr., 1
Camp Gordon area: Matthes, F. E., 1
Panola Shoals area: Holland, W. A., Jr., 1
Soapstone Ridge: King, J. A., 5th, 1
Stone Mountain area: Lester, J. G., 1
popular: Crickmay, G. W., 15; Maynard, T. P., 8
Stone Mountain-Lithonia area: Herrmann, L. A., 1
*Economic geology*
gneiss: Severinghaus, N., 2
stone: Herrmann, L. A., 1
*Geochemical investigations*
Radioactive dating: Grunenfelder, M. H., 1; Herzog, L. F., 2d, 1; Hurst, V. J., 30; Mass. Inst. Tech., 1
radium
Stone Mountain Granite: Piggott, C. S., 1, 2
Stone Mountain springs: Hootman, J. A., 1
Stone Mountain Granite
radioactive mica: Aldrich, L. T., 2
strontium-bearing mica: Aldrich, L. T., 1
*Geophysical investigations*
gravity, Stone Mountain: Gibbes, R. W., 2
*Ground water*
radioactive springs: Hootman, J. A., 1
*Historical geology*
Precambrian-Triassic, Stone Mountain-Lithonia area: Herrmann, L. A., 1
*Maps*
Economic, Stone Mountain-Lithonia Dist.: Herrmann, L. A., 1
Geologic
Panola Shoals area: Holland, W. A., Jr., 1
Soapstone Ridge: King, J. A., 5th, 1
Stone Mountain-Lithonia area: Herrmann, L. A., 1
Structural, Stone Mountain-Lithonia Dist.: Herrmann, L. A., 1
*Mineralogy*
apatite: Cofer, H. E., Jr., 5
chrysocolla: Hurst, V. J., 6
fluorapatite: Cofer, H. E., Jr., 5
fluorite: Cofer, H. E., Jr., 5
halloysite: Grant, W. H., 10
hyalite, popular: Chapman, J. R., 1
luminescent minerals: Cofer, H. E., Jr., 5
tourmaline: Watson, T. L., 6
uranophane: Watson, T. L., 7
*Petrology*
aplite: Watson, T. L., 6
Arabia Gneiss: Cofer, H. E., Jr., 1
feldspar twins, crystalline rocks: Hanson, H. S., 1

garnet segregations: Lester, J. G., 2
granite contacts: Grant, W. H., 15
heavy minerals, creeks: Sandlin, W. L., Jr., 1
igneous rocks, Stone Mountain area: Herrmann, L. A., 1
Lithonia Gneiss: Buddington, A. F., 1; Lester, J. G., 6; Navarre, A. T., 1; Severinghaus, N., 1; Venable Bros., 1
garnet inclusions: Cofer, H. E., Jr., 2
metamorphic rocks, Stone Mountain area: Herrmann, L. A., 1
migmatite: Navarre, A. T., 2
pegmatites: Cofer, H. E., Jr., 2; Walter, K. G., 2
Stone Mountain Granite: Buddington, A. F., 1; Day, A. L., 1; Goranson, R. W., 1, 2; Herrmann, L. A., 1; Kemp, J. F., 1; Lester, J. G., 1, 6; Navarre, A. T., 1; Spencer, J. W. W., 4; Venable Bros., 1; Watson, T. L., 6
age: Herzog, L. F., 2d, 1
analyses: Venable Bros., 1
compressibility: Adams, L. H., 1
density: Day, A. C., 1
melting features: Goranson, R. W., 2
popular: Crickmay, G. W., 15; Hopkins, M. S., 1; Maynard, T. P., 1
radioactive mica: Aldrich, L. T., 2
radium content: Piggott, C. S., 1, 2
strontium-bearing mica: Aldrich, L. T., 1
water solubility: Goranson, R. W., 1
stream sediments: Gould, J. R., 2; Smith, W. L., 1
*Physical geology*
joints, Stone Mountain Granite: Hopson, C. A., 1; White, W. A., 1
nodules: Grant, W. H., 12
sedimentation, Recent: Pound, J. H., Jr., 1
soil color: White, W. A., 1
sorting in streams: Holland, W. A., Jr., 3
structural geology, Stone Mountain: Hillyer, E., 1
stream deposits: King, J. A., 5th, 2; Walter, K. G., 1
weathering: Grant, W. H., 14
Stone Mountain Granite: Hopson, C. A., 1, 2
*Physiographic geology*
granite domes: White, W. A., 2
pedestal rocks: Petty, J. J., 1
Stone Mountain: Hillyer, E., 1; Spencer, J. W. W., 4
popular: Hopkins, M. S., 1; Maynard, T. P., 8
stream piracy: Barge, E. M., 1

**DEVONIAN**, *see also* Paleozoic
Catoosa Co., Ringgold Quad.: Hayes, C. W., 7
Chattooga Co.
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Coastal Plain: Bridge, J., 2; Herrick, S. M., 6
Dade Co.: New England Company, 1
Cedar Grove Quad.: Dicus, J. M., 1
Durham Quad.: Darling, R. W., 1
western: Clement, W. G., 1
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
Floyd Co.: Grabau, A. W., 1; Schuchert, C., 1
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Gordon Co.
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
northwestern Ga.: Burns, J. A., 1; Butts, C., 4; Cooper, G. A., 1; Grabau, A. W., 3; Hayes, C. W., 2, 4; McCutchen, A. R., 1; Rosenfeld, S. J., 1; Sullivan, J. W., 1
Chattanooga Shale: Butts, C., 1; Conant, L. C., 1; Glover, L., 1, 2; Grabau, A. W., 2; Hass, W. H., 1
Piedmont, western: Campbell, J. L., 1
Polk Co.: Spencer, J. W. W., 5
Frog Mountain Sandstone: Hayes, C. W., 6
Walker Co.
Cedar Grove Quad.: Dicus, J. M., 1
Durham Quad.: Darling, R. W., 1
Kensington Quad.: Traylor, H. G., 1
Ringgold Quad.: Hayes, C. W., 7
Whitfield Co., Ringgold Quad.: Hayes, C. W., 7

**DIABASE**, *see also* Igneous rocks
Coastal Plain: Kidwell, A. L., 1; Moody, C. L., 1
Piedmont: Lester, J. G., 4; McCallie, S. W., 10
Troup Co., altered: Brokaw, A. D., 1

**DIAMONDS**, *see also* Gems, Mineral resources, and Minerals
Bibb Co.: Furcron, A. S., 33
Blue Ridge: Stephenson, M. F., 2; Anon., 41
Clayton Co.: Holden, R. J., 1
Fulton Co.: Holden, R. J., 1
Hall Co.: Hamlin, A. C., 1; Holden, R. J., 1; Jackson, C. T., 4; Patterson, R. M., 1, 2; Shepard, C. U., 2
Piedmont: Blank, E. W., 1; Kunz, G. F., 4; Stephenson, M. F., 2; Anon., 1, 41
White Co.: Holden, R. J., 1

**DIATOMACEAE**, *see also* Microfossils, and Paleobotany
Chatham Co., Pleistocene: Bailey, J. W., 1
Clarke Co., Pleistocene: Bailey, J. W., 2
Coastal Plain, Pleistocene: Bailey, J. W., 2; Flint, R. F., 1
Glynn Co., Pleistocene: Bailey, J. W., 1

**DINOSAURS**, *see* Reptilia

**DODGE COUNTY**, *see also* Georgia, and Georgia—Piedmont
*Petrology*
tektites: Barnes, V. E., 1; Bruce, G. A., 1; Cohen, A. J., 1, 2
*Physical geology*
nodules: Grant, W. H., 12

**DOLOMITE**, *see also* Mineral resources, and Stone
Blue Ridge: Davis, R. E., 1; Weitz, J. H., 1
northwestern Ga.: Davis, R. E., 1; Furcron, A. S., 6; Weitz, J. H., 1
Piedmont: Davis, R. E., 1; Furcron, A. S., 6; Weitz, J. H., 1

**DOUGHERTY COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Areas described*
Chehaw State Park: Griffin, R. H., 1
*Ground water*
Albany area: Wait, R. L., 1
Blue Spring: Hall, M. R., 1, 2
Dougherty Co.: Stringfield, V. T., 1; Wait, R. L., 2
Radium Spring: Grover, N. C., 4
salty spring: Furcron, A. S., 30
*Historical geology*
Eocene, Chehaw State Park: Griffin, R. H., 1
*Mineralogy*
sapphire: Hurst, V. J., 21
*Paleontology*
Brachiopoda, Eocene: Dall, W. H., 2
Pelecypoda, Cretaceous: Richards, H. G., 5
**DOUGLAS COUNTY,** *see also* Georgia, and Georgia—Piedmont
*Areas described*
eastern: Schepis, E. L., 1
*Ground water*
springs: Bowden Lithia Spring, 1
*Maps*
Geologic, eastern: Schepis, E. L., 1
**DRAINAGE CHANGES,** *see also* Drainage patterns, and Physiography
Blue Ridge: Hayes, C. W., 15; Parizek, E. J., 14; Simpson, C. T., 1
Chattahoochee River: Campbell, M. R., 1
Tallulah River: Johnson, D. W., 3
DeKalb Co.: Barge, E. M., 1
northwestern Ga.: Hayes, C. W., 5, 14, 15
biological evidence: Adams, C. C., 1; Schalie, H. van der, 1; Simpson, C. T., 1
Coosa River: Berry, E. W., 7; Johnson, D. W., 1
Tennessee River: Adams, G. I., 2; Johnson, D. W., 1, 2
Piedmont: Campbell, M. R., 1; Hayes, C. W., 5; Parizsk, E. J., 14
Rabun Co., Tallulah River: Johnson, D. W., 4
**DRAINAGE PATTERNS,** *see also* Drainage changes, and Physiography
Blue Ridge: Wright, F. J., 1
Bullock Co., Egypt Quad.: Glock, W. S., 1
Coastal Plain, salt marshes: Ragotzkie, R. A., 1
Effingham Co., Egypt Quad.: Glock, W. S., 1
Georgia, superimposed streams: Carlston, C. W., 2
northwestern Ga.: Schalie, H. van der, 1
Piedmont: Parizek, E. J., 6, 15; Wright, F. J., 1
lithologic control: Woodruff, J. F., 2
Oconee River: Parizek, E. J., 12
**DUNITE,** *see also* Igneous rocks
Rabun-Towns Cos.: Hunter, C. E., 3
**EARLY COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Ground water*
sinkhole lakes: Hendricks, E. L., 2
*Historical geology*
Paleozoic-Triassic, Cretaceous: Jordan, L., 3
*Paleontology*
Foraminifera, Cretaceous: Applin, E. E. R., 3
Ostracoda, Paleozoic: Swartz, F. M., 1
**EARTHQUAKES**
Baldwin Co.: Rockwood, C. G., 1, 2
Blue Ridge: Heck, N. H., 2; Moneymaker, B. C., 5; Rockwood, C. G., 2
Chatham Co.: Mitchill, S. L., 3
Coastal Plain: Heck, N. H., 3; Meigs, J., 1; Sheets, M. M., 1
Georgia: Brazee, R. J., 1; Hayes, R., 1; Heck, N. H., 1, 4; Humphreys, W. J., 1, 2; Neumann, F., 1; Perry, A., 1; Stewart, J. W., 2; Taber, S., 1
Charleston, So. Car.: Dutton, C. E., 1, 2
effect on ground water levels: Stewart, J. W., 3
popular: Crickmay, G. W., 9
Lowndes Co.: Heck, N. H., 2
northwestern Ga.: Brill, K. G., Jr., 1; Murphy, L. M., 1
Piedmont: Meigs, J., 1; Moneymaker, B. C., 6; Rockwood, C. G., 2
Towns Co.: Crickmay, G. W., 14
**ECHINODERMATA,** *see also* Blastoidea, Echinoidea, and Invertebrata
Burke-Worth Cos., Eocene: Howe, H. van W., 2
**ECHINOIDEA,** *see also* Invertebrata
Baker Co.
Eocene: Conrad, T. A., 4
Oligocene: Bouvé, T. T., 1
Clay Co., Cretaceous: Clark, W. B., 3; Cooke, C. W., 24
Coastal Plain
Cenozoic: Twitchell, M. W., 1
Eocene: Clark, W. B., 9; Cooke, C. W., 21, 25; Desor, E., 2; Say, T., 1
Oligocene: Bouvé, T. T., 2; Clark, W. B., 3; Cooke, C. W., 21, 25
Paleocene: Cooke, C. W., 21, 25
Tertiary: Meriwether, D., 2; Mitchill, S. L., 1; Stefanini, G., 2
Decatur Co.
Cretaceous: Cooke, C. W., 24
Eocene: Cooke, C. W., 20
Glynn Co., Pleistocene: Cooke, C. W., 21
Lee Co., Eocene: Conrad, T. A., 4; Cooke, C. W., 20
Mitchell Co., Eocene: Cooke, C. W., 20
Screven Co., Eocene: Lyell, C., Jr., 4
Washington Co., Eocene: Stefanini, G., 1
**ECHOLS COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Paleontology*
Foraminifera, Cretaceous: Applin, E. E. R., 3
**EFFINGHAM COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Economic geology*
peat: Soper, E. K., 2
*Historical geology*
Miocene: Vaughan, T. W., 7
Marks Head Marl: Gardner, J. A., 2
Oligocene: Vaughan, T. W., 7
*Paleontology*
Invertebrata, Eocene: Meriwether, D., 1

Mollusca, Miocene, Marks Head Marl: Gardner, J. A., 2
*Physical geology*
concretions: Cooke, C. W., 13
*Physiographic geology*
drainage patterns, Egypt Quad.: Glock, W. S., 1
**ELBERT COUNTY**, *see also* Georgia, and Georgia—Piedmont
*Economic geology*
mica: Griffitts, W. R., 1
*Geochemical investigations*
radioactive dating: Grunenfelder, M. H., 1; Mass. Inst. Tech., 1
*Mineralogy*
fuchsite: Hurst, V. J., 24
*Petrology*
sillimanite schist: Hudson, W. C., 2
**ELECTRON PHOTOMICROGRAPHS**
attapulgite, Decatur Co.: Bates, T. F., 1, 2
kaolinite, Coastal Plain: Woodward, L. A., 1
kaolinite, Twiggs Co.: Bates, T. F., 1, 2
**EMERALD**, *see also* Gems, Mineral resources, and Minerals
Fannin Co.: Hurst, V. J., 23
**EMMANUAL COUNTY**, *see also* Georgia, and Georgia—Coastal Plain
*Petrology*
meteorites: Henderson, E. P., 4
**ENGINEERING GEOLOGY**
Chatham Co., Savannah Harbor: Trask, P. D., 1
Floyd Co.
bedrock conditions: Sowers, G. F., 1
Coosa River damsites: Lloyd, S. J., 3
Forsyth Co., Buford Dam site: Conn, W. V., 1
Georgia
construction material: McCallie, S. W., 9, 27; Furcron, A. S., 57
highway geology: Lawrence, R. A., 2
Gwinnett Co., Buford Dam site: Conn, W. V., 1
Piedmont, saprolite properties: Conn, W. V., 2
Union Co., Nottely Dam site: Kellberg, J. M., 2; Moneymaker, B. C., 2, 4
**ENSTATITE**, *see also* Minerals
Blue Ridge: Koenig, G. A., 1
**EOCENE**, *see also* Cenozoic, and Tertiary
Bacon Co., Crystal River Formation: Puri, H. S., 1
Baldwin Co., stream channel: Schepis, E. L., 2
Bibb Co., Macon area: Cooke, C. W., 5
Burke Co.: Conrad, T. A., 6; Lyell, C., Jr., 4; Ruffin, E., 1; Vaughan, T. W., 3
Coastal Plain: Applin, E. E. R., 1; Berry, E. W., 15; Clark, W. B., 1; Conrad, T. A., 2, 3; Cooke, C. W., 2, 7, 8; Douvillé, J. H. F., 1; Harris, G. D., 1, 5; Heilprin, A., 1; Hodge, J. T., 1; Jones, J., 6; Loeblich, A. R., Jr., 1; Lyell, C., Jr., 1, 3, 4, 6; McLean, J. D., Jr., 1; Morton, S. G., 2; Pierson, R. E., 1; Pumpelly, R., 2; Richards, H. G., 16; Sloan, E., 2
Chattahoochee River: Langdon, D. W., Jr., 1
east central: LaMoreaux, P. E., 1, 2
Jackson Group: Connell, J. F. L., 1
Ocala Limestone: Cooke, C. W., 3
popular: Berry, E. W., 13
Savannah River: Phillips, W. E., 2; Sloan, E., 1
southeastern: Applin, P. L., 1
southwestern: MacNeill, F. S., 4
Tivola Tongue, Ocala Limestone: Connell, J. F. L., 3
Columbia Co.: Harris, G. D., 4
Decatur Co.: Pumpelly, R., 2
Crystal River Formation: Puri, H. S., 1
Ocala Limestone: Cooke, C. W., 1
southern: Hendry, C. W., Jr., 1
Dougherty Co., Chehaw State Park: Griffin, R. H., 1
Hancock Co.: Fortson, C. W., Jr., 3
Jones Co.: Harris, G. D., 4
Macon Co.: Stephenson, L. W., 14
Andersonville area: Grumbles, G. R., 2; Zapp, A. D., 2
Randolph Co.: Erwin, J. W., 1
Schley Co., Andersonville area: Grumbles, G. R., 2; Zapp, A. D., 2
Screven Co.: Lyell, C., Jr., 4, 6
Seminole Co., southern: Hendry, C. W., Jr., 1
Sumter Co., Andersonville area: Grumbles, G. R., 2; Zapp, A. D., 2
Webster Co.: Owen, V., Jr., 2
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Muscogee Co.: Hurst, V. J., 7
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Blue Ridge: Glenn, L. C., 1
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gold: Pardee, J. T., 1
gold-diamond dist.: Schreiber, F., 1
metallic deposits, northern: Pardee, J. T., 1
mineral resources: Butts, A. G., 1
Central of Georgia Railway: Mallory, J. M., 1; Maynard, T. P., 7
sand and gravel: Teas, L. P., 1
stone: Burchard, E. F., 5
Geologic: Beaujour, L. A. F. de, 1; Boué, A., 1, 2; Bradley, F. H., 1; Buch, L. von, 2; Cleaveland, P., 1; Credner, H., 4; Henderson, J. T., 1; Hitchcock, C. H., 1, 2, 3, 5, 6, 7, 8; Hitchcock, E., 1; Lambert, G., 1; Little, G., 2; Lobeck, A. K., 5; McCallie, S. W., 20, 24; McGee, W J, 1, 2, 3, 7; Maclure, W., 1; Marcou, J., 1, 2, 3, 4; Moxon, C., 1; Munyan, A. C., 4; Nesbitt, R. T., 1; Peyton, G., 1; Rogers, H. D., 3; Sayler, N., 4; Stephenson, M. F., 1; Stose, G. W., 2, 3, 5; Torbert, J. B., 1; Van Hise, C. R., 2; White, G., 1; Williams, W. T., 1; Willis, B., 5
Central of Georgia Railway: Mallory, J. M., 1; Maynard, T. P., 7
index: Boardman, A. L., 1
review: Parizek, E. J., 2
west central: Spencer, J. W. W., 1
Geophysical
earthquake epicenters: Heck, N. H., 4
gravity: Lyons, P. L., 1; Woollard, G. P., 3
isoseismal: Humphrey, W. J., 2
magnetic anomalies: Jenny, W. P., 1
Ground water, mineral springs: Ellis, A. J., 1; McCallie, S. W., 32; Peale, A. C., 2
Paleofloristic: Harshberger, J. W., 1
Paleogeographic: Matthew, W. D., 1
Cambrian: Walcott, C. D., 2
Paleozoic-Cenozoic: Schuchert, C., 3; Willis, B., 6
Paleogeologic
Cretaceous: Levorsen, A. I., 1
Mississippian: Levorsen, A. I., 1
Pennsylvanian: Levorsen, A. I., 1
Physiographic: Evans, L., 1; Fenneman, N. M., 3, 4, 6; Lobeck, A. K., 1, 2, 3, 4, 7, 8; Raisz, E. J., 1, 3, 4; Volney, C. F. C., 1; Anon., 47
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Soil: Marbut, C. F., 1
Soil erosion: Crabb, G. A., 1; Fuller, G. L., 1
Structural, basement configuration: Thom, W. T., Jr., 3
Tectonic: King, P. B., 2
*Mineralogy*
catalog: Crickmay, G. W., 24; Dana, E. S., 3; Robinson, S., 1
clay: Somers, R. E., 1
classification: Mitchell, L., 5
soil: England, C. B., 1
gems: Lester, J. G., 9; Schlegel, D. M., 1; Sinkankas, J., 1
popular: Crickmay, G. W., 7; McKinley, W. C., 1
Indian artifacts: Furcron, A. S., 18
minerals, popular: Hawkins, A. C., 1
radioactive minerals: Hurst, V. J., 25
*Paleontology*
Cambrian faunas: Balk, C. L., 1
general, in schools in Georgia: Lipps, E. L., 1
paleobotany, Cretaceous-Quaternary: Harshberger, J. W., 1
plants, Pleistocene: Berry, E. Willard, 1
*Petrology*
limestone: Jones, J., 5
meteorites: Brezina, A., 2, 6; British Museum, 1; Cohen, E. W., 1; Farring-

ton, O. C., 1, 2, 4, 5, 6; Fletcher, L., 1; Furcron, A. S., 17; Henderson, E. P., 4; Huntington, O. W., 1; LaPaz, L., 1; Leonard, F. C., 1, 2, 5; Merrill, G. P., 5; Nininger, A. D., 1; Perry, S. H., 1; Prior G. T., 1; Reeds, C. A., 2; Semsey, A. von, 1; Servos, K., 1; Ward, H. A., 1; Washington, H. S., 1; Wuelfing, E. A., 1
popular: Crickmay, G. W., 8
*Physical geology*
basement configuration: Thom, W. T., Jr., 3
colluvial deposition: Veatch, J. O., 1
earthquakes: Brazee, R. J., 1; Hayes, R., 1; Heck, N. H., 1, 4; Humphreys, W. J., 1, 2; Neumann, F., 1; Perry, A., 1; Stewart, J. W., 2; Taber, S., 1
Charleston, So. Car.: Dutton, C. E., 1, 2
effects on ground water levels: Stewart, J. W., 3
popular: Crickmay, G. W., 9
sedimentation, Chattahoochee River: Cazeau, C. J., 1, 2
soils: Childs, R. R., 1; Cotting, J. R., 3; Garrard, J. A., 1; Marbut, C. F., 1; Spencer, J. W. W., 2
structural geology: Rodgers, J., 2
Appalachian structures: Keith, A., 4, 5
framework: Moore, R. C., 1
tectonic provinces: Eardley, A. J., 1; King, P. B., 2
*Physiographic geology*
caves, popular: Chapman, J. R., 5; Crickmay, G. W., 17
drainage and topography: Barrows, H. H., 1
Fall Line: Abbe, C., Jr., 1
Georgia: Bartram, W., 1; Bell, A. N., 1; Béthune, P. de, 1; Loomis, F. B., 1; Loughridge, R. H., 1; Posey, J. F., 1; Raisz, E. J., 1
eastern: Currie, W., 1
scenic features: Harper, R. M., 11
peneplains: Shaw, E. W., 1
physiographic provinces: Atwood, W. W., 1; Bowman, I., 1; Fenneman, N. M., 1, 2, 3, 5; Joerg, W. L. G., 1; LaForge, L., 3; Powell, J. W., 1
plant distribution controls: Howell, T. J., 1
Precambrian surface: Moss, R. G., 1
superimposed drainage: Carlston, C. W., 2
swamps: Brantly, J. E., 2; McCallie, S. W., 30

**GEORGIA—BLUE RIDGE,** *see also* Georgia, and individual counties in the Blue Ridge Province
*Areas described*
Blue Ridge: Billings, M. P., 1; Crickmay, G. W., 25; Featherstonhaugh, G. W., 1; Furcron, A. S., 47; Ga. Inst. Tech. Indus. Econ. Research Staff, 1; Hunt, T. S., 1; Keith, A., 1; Munyan, A. C., 14; Peck, J., 1
*Economic geology*
abrasives: King, F. P., 1
asbestos: Hopkins, O. B., 1, 2; Teague, K. H., 6
cement: Maynard, T. P., 2
copper: Blake, W. P., 10; Curry, R. O., 1; Weed, W. H., 4
popular: Furcron, A. S., 35
corundum: Barlow, A. E., 1; King, F. P. 1; Larsen, E. S., Jr., 1; Lewis, J. V., 2; Pratt, J. H., 1, 2; Shepard, C. U., 12
dolomite: Davis, R. E., 1; Weitz, J. H., 1
feldspar: Galpin, S. L., 1
gems, popular: Chapman, A., 1
gold: Anderson, C. S., 1; Bakewell, R., 1; Blake, W. P., 1, 10; Brewer, W. M., 9, 12, 13; Curry, R. O., 1; Dickson, J., 1; Dodge, W. R., 1; Frame, J., 1; Habersham, W. W., 1; Hall, B. M., 1; Hanna, G. B., 1; Jackson, C. F., 1; Jones, S. P., 2; McCallie, S. W., 3, 33; McElrath, T., 1; McLaren, J. M., 1; Mell, P. H., Jr., 1; Munyan, A. C., 14; Nitze, H. B. C., 1, 2; Pardee, J. T., 1; Park, C. F., Jr., 3; Parsons, A. B., 1; Peck, J., 1; Phillips, W. E., 1; Schmidhuber, 1; Soper, E. K., 1; Stone, R. C., 1; Tatham, W., 1; Tenney, W. J., 1; Wilkes, J. F., 1; Wilson, R. A., 1; Yeates, W. S., 1
early account: LeMoyne de Morgues, J., 1
fineness: Hanna, G. B., 2
popular: Crickmay, G. W., 2; Furcron, A. S., 38
granite: Munyan, A. C., 14
iron: Curry, R. O., 1
kyanite: Boyd, W. B., 1; Furcron, A. S., 12, 26; Prindle, L. M., 1; Waggaman, W. H., 1
limestone: Maynard, T. P., 2
manganese: Hoffman, J. N., 1; Hull, J. P. D., 2; Watson, T. L., 9, 14
marble: McCallie, S. W., 1
mica: Furcron, A. S., 7; Galpin, S. L., 1; Peyton, G., 3; Smith, R. W., 5; Stewart, D. B., 2
mineral resources: Dieffenbach, O., 1; Ga. Inst. Tech. Indus. Econ. Research Staff, 1; Hunter, C. E., 4
olivine: Smith, R. W., 3
pegmatites: Galpin, S. L., 1
pyrite: McCallie, S. W., 36; Shearer, H. K., 2; Shotts, R. Q., 11
sillimanite: Furcron, A. S., 12
silver, early account: LeMoyne de Morgues, J., 1
soapstone: Hopkins, O. B., 2
stone: Spain, E. L., Jr., 1
talc: Hopkins, O. B., 2
vermiculite: Hunter, C. E., 5; Smith, R. W., 3
*Geochemical investigations*
weathering: Allen, V. T., 2
*Ground water*
crystalline rocks: Crickmay, G. W., 19; Herrick, S. M., 5
*Historical geology*
Cambrian-Ordovician: Elliott, J. B., 1
Paleozoic: Furcron, A. S., 31
Precambrian: Credner, H., 3; Furcron, A. S., 31; Moneymaker, B. C., 1; Van Hise, C. R., 1, 2, 3; Whitney, J. D., 1; Willis, B., 7
Nantahala-Ocoee contact: Nuttall, B. D., 1
Ocoee Series: Stose, G. W., 6, 9
Precambrian-Cambrian: King, P. B., 3; Rodgers, J., 3
Precambrian-Paleozoic: King, P. B., 5; Schuchert, C., 20

Silurian: Bradley, F. H., 2
Taconic interval: Hunt, T. S., 2
*Maps*
Economic
asbestos: Hopkins, O. B., 2
feldspar: Galpin, S. L., 1
gold: Jones, S. P., 2; Tatton, M., 1
kyanite: Prindle, L. M., 1
mica: Sterrett, D. B., 2; Galpin, S. L., 1
mineral resources: Peck, J., 1; U. S. Geol. Survey, 1
pyrite: Shearer, H. K., 2
soapstone: Hopkins, O. B., 2
talc: Hopkins, O. B., 2
vermiculite: Prindle, L. M., 1
Geologic: King, F. P., 1
Precambrian: Stose, G. W., 9
southern: Furcron, A. S., 10, 12
*Mineralogy*
aikinite: Genth, F. A., 2
amethyst: Furcron, A. S., 9
beryl: Furcron, A. S., 53
corundum: King, F. P., 1; Shepard, C. U., 12; Smith, J. L., 3
diamond: Anon., 41
enstatite: Koenig, G. A., 1
gems: Kunz, G. F., 3
gold, pseudomorphs: Genth, F. A., 2
minerals: Blake, W. P., 4
staurolite: Furcron, A. S., 19
*Paleontology*
Mammalia, Pleistocene: Moore, J., 1
*Petrology*
heavy minerals, Cohutta Mountains: Barge, E. M., 2
igneous rocks: Crickmay, G. W., 25
basic: King, F. P., 2
itacolumite: Shepard, C. U., 2
metamorphic rocks: Crickmay, G. W., 25; Furcron, A. S., 12; Moneymaker, B. C., 1
peridotite: Lewis, J. V., 1; Pratt, J. H., 2
serpentine: Pratt, J. H., 2
volcanic rocks: Williams, G. H., 1
*Physical geology*
Blue Ridge Fault: White, W. A., 3
earthquakes: Heck, N. H., 2; Moneymaker, B. C., 5; Robinson, C. G., 2
erosion: Glenn, L. C., 1
faulting: Jonas, A. I., 1; Stose, G. W., 9
folded faults: Keith, A., 2
metamorphism: Jonas, A. I., 1
Precambrian surface deformation: Reitz, T. A. du, 1
structural geology: Furcron, A. S., 29; King, P. B., 1, 5; Lombard, A. E., 1
structural history: Stille, H., 1
*Physiographic geology*
Blue Ridge: Guyot, A. H., 1; Hayes, C. W., 12; Keith, A., 1; Stone, R. C., 1; White, W. A., 3; Wright, F. J., 1
drainage changes: Parizek, E. J., 14; Simpson, C. T., 1
Chattahoochee River: Campbell, M. R., 1; Hayes, C. W., 15; Johnson, D. W., 3
drainage patterns: Wright, F. J., 1
peneplain deformation: Reitz, T. A. du, 1
topography, Hiwassee Valley: Colton, H. E., 1
**GEORGIA—COASTAL PLAIN**, *see also* Georgia, and individual counties in the Coastal Plain Province.
bibliography: Murray, G. E., Jr., 2
*Areas described*
Coastal Plain: Applin, P. L., 4; Cooke, C. W., 23; Faircloth, W. R., 1; Jones, J., 11; Lyell, C., Jr., 8; McCallie, S. W., 40; MacNeill, F. S., 1; Richards, H. G., 8; Spencer, J. W. W., 3; Stephenson, L. W., 9; Veatch, J. O., 9
Atlantic coastal area: Harris, H. L., 1
Augusta area: Munyan, A. C., 6
eastern: Christy, D., 1; Johnson, J. E., 1; White, J. E., 2
Fall Line: Drennen, C. W., 1; Shepard, C. U., 1
Macon area: Munyan, A. C., 4, 9
Savannah River area: Phillips, W. E., 2
Valdosta area: Munyan, A. C., 7
Waycross area: Munyan, A. C., 8
*Economic geology*
bauxite: Adams, G. I., 1; Bridge, J., 1; Harder, E. C., 3; McCallie, S. W., 28; Musset, R., 1; Shearer, H. K., 1; Thoenen, J. R., 1; U. S. Bur. Mines, 1
clay: Ladd, G. E., 1; Seybert, A., 1; Spencer, J. W. W., 5
Central of Georgia Railway: Maynard, T. P., 11
fire clay: Greaves-Walker, A. F., 1; Veatch, J. O., 3
fuller's earth: Bay, H. X., 1; Nutting, P. G., 1; Shearer, H. K., 1
heavy minerals: Dryden, A. L., Jr., 1, 2; McKelvey, V. E., 1; Martens, J. H. C., 2; Mertie, J. B., Jr., 1, 3; Twenhofel, W. S., 1
radioactive survey: Moxham, R. M., 2
kaolin: Burgess, B. C., 1; Henry A. V., 1; Kesler, T. L., 5; Klinefelter, T. A., 1; Ladd, G. E., 1, 2; McDonald, P. B., 1; Mitchell, L., 4; Munyan, A. C., 2; Murray, H. H., 1; Ries, H., 3, 4, 7; Smith, R. W., 1; Veatch, J. O., 3; Watkins, J. H., 3; Weigel, W. M., 2, 3, 4
Central of Georgia Railway: Maynard, T. P., 11
Macon area: Maynard, T. P., 4
origin: Adams, G. I., 4; Kesler, T. L., 6
limestone: Brantly, J. E., 1; Spencer, J. W. W., 5
Albany area: Munyan, A. C., 12
marl: Brantly, J. E., 1; McCallie, S. W., 2
mineral resources
Augusta area: Munyan, A. C., 6
Macon area: Munyan, A. C., 4
monazite: Dryden, A. L., Jr., 1, 2; Mertie, J. B., Jr., 2; Overstreet, W. C., 1
natural gas: Harris, R. M., 1, 2; Holden, F. T., 1; Peyton, G., 4; Prettyman, T. M., 1; Rinehart Oil News Company, 1; Vernon, R. O., 2
well sites: Jordan, L., 4
petroleum: Alexander, C. W., 1; Applin, P. L., 4; Baum, R. B., 1, 2; Carroll, D. L., 1; Davis, M. J., 1; Furcron, A. S., 23; Hamner, E. J., 1; Harris, R. M., 1, 2; Holden, F. T., 1; Johnston, J. E., 1; McClain, D. S., Jr., 2, 4; Munyan, A. C., 1; Peyton, G., 4, 5; Postley, O. C., 2; Prettyman, T. M., 1; Richards, H. G., 4, 9; Rinehart Oil News Company, 1; Todd,

J. D., 1; Toler, H. N., 1; Vernon, R. O., 2
popular: Parizek, E. J., 3
Waycross area: Munyan, A. C., 8
well sites: Jordan, L., 4
phosphate: McCallie, S. W., 2; Sellards, E. H., 1; Spencer, J. W. W., 5
radioactive minerals: Cathcart, J. B., 1
sand
Albany area: Munyan, A. C., 10
Macon area: Maynard, T. P., 4
Savannah River area: Burchard, E. F., 1
sand and gravel, Valdosta area: Munyan, A. C., 13
titanium: Youngman, E. P., 1
*Geobotanical investigations*
cypress terrane: Harper, R. M., 2
geobotanical studies: Harper, R. M., 1, 6
*Geochemical investigations*
ground water: Brown, E., 1
temperature: Darton, N. H., 5
hydrocarbons, Cretaceous: Buckley, S. E., 1
kaolin: Mitchell, L., 4
radioactive minerals: Cathcart, J. B., 1
tektites, spectrochemical analyses: Stair, R., 1
Waycross-Valdosta area, needs: Burdick, G. A., 1
*Geophysical investigations*
geophysical surveys: Baum, R. B., 2
gravity survey: Baker, W. L., 1
gravity profile: Swick, C. H., 1
magnetic anomalies, basement surface: Jenny, W. P., 1
magnetic traverses: Swartz, J. H., 1
Savannah River area: Rowlands, C. E., Jr., 1; Straley, H. W., 3d, 2
magnetism, tektites: Sentfle, F. E., 1
radioactive survey, airborne: Moxham, R. M., 2; Schmidt, R. G., 1
seismic
basement configuration: Meyer, R. P., 1, 2; Woollard, G. P., 5
continental shelf: Hersey, J. B., 1
Waycross-Valdosta area, needs: Burdick, G. A., 1
*Ground water*
analyses: Clarke, F. W., 2; Dole, R. B., 1
artesian levels: Cooper, H. H., 1
artesian wells: Clarke, F. W., 2; Darton, N. H., 1; Fuller, M. L., 1, 3, 4; McCallie, S. W., 4; Stringfield, V. T., 3, 5, 6; Warren, M. A., 4, 6
Coastal Plain: Herrick, S. M., 9; Stephenson, L. W., 7
Atlantic coast: Stewart, J. W., 1
Brunswick Basin: Schweitzer, R. R., 1
east central: LaMoreaux, P. E., 1
northeastern: LeGrand, H. E., 2
Quaternary: Imbeaux, C. E. A., 1
southwestern, Clayton Formation: Herrick, S. M., 7
western: Spencer, J. W. W., 5
geochemical investigations: Brown, E., 1
history: Carlston, C. W., 1
pond levels: Hendricks, E. L., 3
springs: Meinzer, O. E., 2
temperatures: Darton, N. H., 5
water table levels: Warren, M. A., 1, 2, 3, 5, 7
water table lowering: Harper, R. M., 13
*Historical geology*
Cenozoic: Conrad, T. A., 2; Cooke, C. W., 22; Finch, J., 1; Hilgard, E. W., 2; Lyell, C., Jr., 7; MacNeill, F. S., 5, 6; Mitchill, S. L., 4; Murchison, R. I., 1; Spencer, J. W. W., 7; Toulmin, L. D., Jr., 4; Vaughan, T. W., 12
bibliography: Murray, G. E., Jr., 2
volume of sediments: Toulmin, L. D., Jr., 1
Cretaceous: Applin, P. L., 2; Berry, E. W., 6; Brantly, J. E., 3; Buch, L. von, 1; Clark, W. B., 4; Cooke, C. W., 10; Eargle, D. H., 1, 2; Herrick, S. M., 1; Jordan, L., 5; Monroe, W. H., 1; Peterson, H. A., 1; Richards, H. G., 17; Stephenson, L. W., 1, 2, 3, 10, 15; Turner, P. A., 1; Ver Wiebe, W. A., 1; White, C. A., 3
Atkinson Formation: Applin, E. E. R., 3
index fossils: Stephenson, L. W., 17
kaolin: Kesler, T. L., 6
southeastern: Jordan, L., 1, 2
Tuscaloosa Formation: Stanton, T. W., 1
volume of sediments: Applin, P. L., 6
Cretaceous-Cenozoic: Applin, P. L., 4; Brantly, J. E., 1, 3; Carroll, D. L., 1; Carsey, J. B., 1; Cooke, C. W., 18, 23; Faircloth, W. R., 1; Harper, R. M., 7; Hilgard, E. W., 1; LeGrand, H. E., 2; McCallie, S. W., 40, 41; Munyan, A. C., 3; Murray, G. E., Jr., 4; Patton, J. L., 1; Postley, O. C., 2; Prettyman, T. M., 1; Richards, H. G., 4, 6, 9, 18; Schuchert, C., 18, 20; Shimer, H. W., 1; Smith, E. A., 2; Spencer, J. W. W., 3, 5; Stephenson, L. W., 7; Straley, H. W., 3d, 1; Toulmin, L. D., Jr., 2; Vanuxem, L., 1; Veatch, J. O., 7, 9; Willis, B., 7
volume of sediments: Murray, G. E., Jr., 3
Cretaceous-Eocene: Hodge, J. T., 1; Lyell, C., Jr., 3; Morton, S. G., 2
east central: LaMoreaux, P. E., 1
Savannah River area: Phillips, W. E., 2
Cretaceous-Miocene: Richards, H. G., 3
Chattahoochee River: Langdon, D. W., Jr., 1
east central: LaMoreaux, P. E., 2
Cretaceous-Oligocene: Applin, E. E. R., 1
southeastern: Applin, P. L., 1
Cretaceous-Paleocene: Stephenson, L. W., 5
Cretaceous-Tertiary: Barghoorn, E. S., 1; Braunstein, J., 1; Jones, J., 11; Langdon, D. W., Jr., 2; McClain, D. S., Jr., 2; Monroe, W. H., 3; Peyton, G., 5; Stephenson, L. W., 11; Todd, J. D., 1
eastern: Johnston, J. E., 1
Eocene: Berry, E. W., 15; Conrad, T. A., 3; Cooke, C. W., 2; Harris, G. D., 1; Jones, J., 6; Lyell, C., Jr., 1, 4, 6; McLean, J. D., Jr., 1; Pierson, R. E., 1
Jackson Group: Connell, J. F. L., 1
Ocala Limestone: Cooke, C. W., 3
popular: Berry E. W., 13
Savannah River: Sloan, E., 1
Tivola Tongue, Ocala Limestone: Connell, J. F. L., 3
Wilcox Formation: Berry, E. W., 4

Eocene-Miocene: Heilprin, A., 1; Pumpelly, R., 2; Sloan, E., 2
Eocene-Oligocene: Cooke, C. W., 7, 8; Douvillé, J. H. F., 1
southwestern: MacNeill, F. S., 4
Mesozoic-Cenozoic, Paleozoic control: Murray, G. E., Jr., 5
Miocene: Gardner, J. A., 1; Maury, C. J., 1; Richards, H. G., 14
Miocene-Pliocene: Dall, W. H., 3
Miocene-Recent: Munyan, A. C., 8
Oligocene: Cooke, C. W., 16; MacNeill, F. S., 2; Maury, C. J., 1; Richards, H. G., 15
foraminiferal zones: McLean, J. D., Jr., 2
Glendon Limestone: Cooke, C. W., 6
Oligocene-Miocene: Cooke, C. W., 19
Ordovician-Devonian: Bridge, J., 2; Herrick, S. M., 6
Paleocene, Clayton Formation: Herrick, S. M., 7
Paleocene-Eocene: Clark, W. B., 1; Harris, G. D., 5; Loeblich, A. R., Jr., 1; Richards, H. G., 16
Paleozoic: Applin, P. L., 5; Nelson, W. A., 3; Richards, H. G., 6
Pleistocene: Brantly, J. E., 3; Desor, E., 1; Couper, J. H., 4; Flint, R. F., 1; Hodgson, W. B., 2; MacNeill, F. S., 7; Price, W. A., 1; Richards, H. G., 2, 12, 19; Rosenfeld, S. J., 3; Trowbridge, A. C., 2
Citronelle Formation: Doering, J. A., 1
eolian deposits: Thorp, J., 1
terraces: Antevs, E. V., 1, 2; Cooke, C. W., 11, 12, 14, 15, 17
Pliocene: Richards, H. G., 13
Altamaha Formation: Veatch, J. O., 4
Appomattox Formation: McGee, W J, 4
pre Mesozoic: Applin, P. L., 5
Tertiary: Berry, E. W., 3, 11; Brantly, J. E., 3; Conrad, T. A., 1; Lyell, C., Jr., 5; MacNeill, F. S., 3; Smith, A. E., 6; Stefanini, G., 2; Vaughan, T. W., 8, 9, 11
coral reefs: Vaughan, T. W., 4
Lafayette Formation: McGee, W J, 5, 6
Triassic: McKee, E. D., 1; Milton, C., 1
Triassic-Cretaceous: Applin, P. L., 3
*Maps*
Economic
bauxite and fuller's earth: Shearer, H. K., 1
kaolin, Augusta area: Munyan, A. C., 6
kaolin, Macon area: Munyan, A. C., 4
oil and gas well sites: Jordan, L., 4
sand, Macon area: Munyan, A. C., 4
Facies, Cretaceous: Applin, P. L., 2
Geologic: Brantly, J. E., 1; Cooke, C. W., 2, 23; Prettyman, T. M., 1; Veatch, J. O., 9
Cenozoic: MacNeill, F. S., 6
Cretaceous: Buch, L. von, 1; Eargle, D. H., 2; Veatch, J. O., 7
east central: LaMoreaux, P. E., 1
northeastern: LeGrand, H. E., 2
northern: Smith, R. W., 1
Tertiary: Heilprin, A., 1
western: Spencer, J. W. W., 5
Geophysical
basement configuration: Meyer, R. P., 2; Woollard, G. P., 5
gravity, Bouguer anomalies: Woollard, G. P., 5
isogam, Savannah River area: Rowlands, C. E., Jr., 1
magnetic traverses: Swartz, J. H., 1
Groundwater: LeGrand, H. E., 2; McCallie, S. W., 4
piezometric surface: Warren, M. A., 1
Physiographic
Augusta area: Munyan, A. C., 6
eolian deposits: Thorp, J., 1
shoreline types: McGee, J. T., 1
terraces: MacNeill, F. S., 7
Structure contour
Cretaceous: Jordan, L., 5
Eocene: Mississippi Oil Scouts Assoc., 1; Stevens, R. E., 1
Miocene, base: Prettyman, T. M., 1
*Mineralogy*
anatase: Nagelschmidt, G., 1
heavy minerals, Cretaceous: Dryden, A. L., Jr., 1, 2
kaolinite: Johns, W. D., 1
differential thermal analyses curves: Speil, S., 1
electronphotomicrographs: Woodward, L. A., 1
monazite: Overstreet, W. C., 1
popular: Jones, W., 1
*Paleontology*
algae, Pleistocene: Bailey, J. W., 2
Anthozoa, Oligocene: Vaughan, T. W., 10
Belemnoidea, paleoecology, Cretaceous: Dorsey, G. E., 1
Bryozoa
Eocene: Canu, F., 1, 2
Tertiary: Bassler, R. S., 2
Diatomaceae, Pleistocene: Bailey, J. W., 2; Flint, R. F., 1
Echinoidea
Cenozoic: Twitchell, M. W., 1
Eocene: Clark, W. B., 3; Cooke, C. W., 25; Desor, E., 2; Lyell, C., Jr., 4; Say, T., 1
Oligocene: Bouvé, T. T., 2; Clark, W. B., 3; Cooke, C. W., 25
Paleocene: Cooke, C. W., 25
Pleistocene: Cooke, C. W., 21
Tertiary: Cooke, C. W., 21; Stefanini, G., 2; Mitchill, S. L., 1
Eocene
fauna: Cooke, C. W., 2
flora, Wilcox Formation: Berry, E. W., 4
Foraminifera
Cretaceous: Cushman, J. A., 10, 11
Cretaceous-Oligocene: Applin, E. E. R., 2; Applin, P. L., 1
Eocene: Cole, W. S., 3; Cushman, J. A., 1, 2, 3, 5, 7, 12; McLean, J. D., Jr., 1
Oligocene: Cushman, J. A., 2; McLean, J. D., Jr., 2
Paleocene: Cole, W. S., 2
Pleistocene: Bailey, J. W., 2
Tertiary: Vaughan, T. W., 11
Gastropoda
Eocene: Bowles, E. O., 1; Conrad, T. A., 4; Dall, W. H., 2; Lyell, C. Jr., 4; Stenzel, H. B., 1
Miocene: Dall, W. H., 2
Paleocene: Bowles, E. O., 1
Invertebrata
Cenozoic: Veatch, J. O., 9

Cretaceous: Bassler, R. S., 1; Veatch, J. O., 9
Cretaceous-Cenozoic: Richards, H. G., 5
Cretaceous-Tertiary: McCallie, S. W., 20
Eocene, Ocala Limestone: Cooke, C. W., 3
Tertiary: Meriwether, D., 2; Stenzel, H. B., 2
Mammalia
Pleistocene: Falconer, H., 1
Tertiary: Harlan, R., 1
microfossils
Cretaceous: Herrick, S. M., 1
Cretaceous-Tertiary: Howe, H. van W., 3
Mollusca
Cretaceous: Richards, H. G., 17
Eocene: Pierson, R. E., 1; Richards, H. G., 16
Eocene-Oligocene: Cooke, C. W., 8
Miocene: Richards, H. G., 14
Oligocene: Richards, H. G., 15
Paleocene: Richards, H. G., 16
Pleistocene: Richards, H. G., 12
Pliocene: Richards, H. G., 13
Tertiary: Conrad, T. A., 1
Nautiloidea, Eocene: Miller, A. K., 2
Ostracoda, Cretaceous: Howe, H. van W., 4
Pelecypoda
Cretaceous: Stephenson, L. W., 4; White, C. A., 2
Eocene: Dall, W. H., 2; Gardner, J. A., 5; Harris, G. D., 6, 7; Tucker, H. I., 1; White, C. A., 2
Miocene: Dall, W. H., 2; Mansfield, W. C., 1; Tucker, H. I., 1
Tertiary: Palmer, K. E. H. V. W., 1; Sheldon, P. G., 1
Pisces, Cretaceous-Miocene: Richards, H. G., 20
plants
Cretaceous: Berry, E. W., 5, 6, 14
Eocene: Berry, E. W., 5, 15, 17
Paleozoic, microfossils: Schopf, J. M., 1
Tertiary: Berry, E. W., 11
Reptilia, Cretaceous: Cope, E. D., 3; Gibbes, R. W., 4
Tertiary, floral zones: Barghoorn, E. S., 1; Berry, E. W., 3
Vertebrata
Cenozoic: Veatch, J. O., 9
Cretaceous: Veatch, J. O., 9
Pleistocene: Hurst, V. J., 27
*Petrology*
basement complex: Nelson, W. A., 3
bauxitization: Allen, V. T., 1
beach sands: Martens, J. H. C., 2
clay: Allen, V. T., 2
Cretaceous sediments: Turner, P. A., 1
diabase: Kidwell, A. L., 1; Moody, C. L., 1
fuller's earth: Jones, J., 9
kaolin: Jones, J., 9
limestone: Jones, J., 3, 4, 10
resilication of gibbsite: Allen, V. T., 1
tektites: Sentfle, F. E., 1; Stair, R., 1
*Physical geology*
earthquakes: Heck, N. H., 3; Meigs, J., 1; Sheets, M. M., 1
erosion: Davis, R. O. E., 1; Needham, J. G., 1
limestone solution, southwest: MacNeill, F. S., 4
sedimentation
beach sand: Bershad, S. F., 1
continental shelf: Gorsline, D. S., 1
rivers and beach sand: Saffer, P. E., 1
soils, eastern: White, J. E., 2
structural control: Murray, G. E., Jr., 5
structural features: Baum, R. B., 2; Braunstein, J., 1; Carsey, J. B., 1; Stephenson, L. W., 12
structural geology: Munyan, A. C., 1; Murray, G. E., Jr., 4; Patton, J. L., 1; Richards, H. G., 8; Stephenson, L. W., 9, 11; Toler, H. N., 1
weathering, flint: Kelly, A. R., 1
*Physiographic geology*
Altamaha Grit terrane: Harper, R. M., 7
Carolina Bays: Frink, J. W., 1; Prouty, W. F., 2, 3
coast line, sea level changes: Johnson, D. W., 5
Coastal Plain: Harper, R. M., 3, 4, 6; McCallie, S. W., 40; Sutherland, W. J., 1
eastern: Kollock, P. M., 1
northwestern: Cooper, G. F., 1
drainage patterns, salt marshes: Ragotzkie, R. A., 1
Fall Line: Renner, G. T., Jr., 1
offshore islands: Gibson, C. D., 2; Zeigler, J. M., 1
popular: Merrill, F. J. H., Jr., 1
Okefenokee Swamp, popular: Harper, R. M., 9
peneplain, Fall Zone: Renner, G. T., Jr., 2
Savannah area: Lyell, C., Jr., 5
Savannah River area: Phillips, W. E., 2; Sinha, E. Z., 1
shoreline features: Johnson, D. W., 6, 8
shoreline types: McGill, J. T., 1
submarine topography, Atlantic continental shelf: Spencer, J. W. W., 7
terraces: Antevs, E. V., 1, 2; Cooke, C. W., 9, 11, 12, 14, 15, 17; Flint, R. F., 1, 2; Howard, A. D., 1; Johnson, D. W., 7; MacNeill, F. S., 7; Price, W. A., 1; Richards, H. G., 19, 21; Rosenfeld, S. J., 3; Trowbridge, A. C., 2
topography, geobotanical studies: Harper, R. M., 1
**GEORGIA—NORTHWESTERN**, *see also* Georgia, and individual counties in northwestern Georgia.
*Areas described*
northwestern Ga.: Billings, M. P., 1; Burns, J. A., 1; Butts, C., 4; Featherstonhaugh, G. W., 1; Hayes, C. W., 2; McCutchen, A. R., 1; Spencer, J. W. W., 6; Word, R. C., 1
Sand Mountain-Lookout Mountain area: Sullivan, J. W., 1
*Economic geology*
barite: Brewer, W. M., 7; Burfoot, J. D., Jr., 1; Butts, C., 4; Hull, J. P. D., 3
bauxite: Adams, G. I., 1; Brewer, W. M., 1; Bridge, J., 1; Butts, C., 4; Hayes, C. W., 3; Musset, R., 1; Phalen, W. C., 3; Ries, H., 1; Thoenen, J. R., 1; U. S. Bur. Mines, 1; Watson, T. L., 2, 10
bentonite: Butts, C., 4; Sullivan, J. W., 1
cement: Butts, C., 4; Maynard, T. P., 2
clay: Butts, C., 4; Sullivan, J. W., 1

coal: Bell, I. L., 1; Brewer, W. M., 7; Butts, C., 4; Campbell, M. R., 4; Fieldner, A. C., 3; Lesher, C. E., 1; Pallister, H. D., 3; Sullivan, J. W., 1; Young, W. H., 1, 2
construction material: Butts, C., 4
dolomite: Davis, R. E., 1; Furcron, A. S., 6; Weitz, J. H., 1
fluorite: Butts, C., 4
halloysite: Butts, C., 4
iron: Adams, G. I., 3; Ball, S. M. 1; Bell, I. L., 1; Brewer, W. M., 7; Burchard, E. F., 6, 7; Butts, C., 4; Eckel, E. C., 9; Einecke, G., 1; Fleming, H. S., 1; McCallie, S. W., 6, 7, 21; Pallister, H. D., 3; Porter, J. B., 1, 2; Pumpelly, R., 1; Sullivan, J. W., 1; Willis, B., 1
analyses: Birkinbine, J., 1
reserves: Burchard, E. F., 3
Silurian, origin: Earle, R. B., 1
limestone: Butts, C., 4; Furcron, A. S., 6; Maynard, T. P., 2; Porter, J. B., 2
manganese: Butts, C., 4; Harder, E. C., 1; Hoffman, J. N., 1; Hull, J. P. D., 2; Stose, G. W., 1, 4; Watson, T. L., 9, 14
marble: McCallie, S. W., 1
mineral resources: Brewer, W. M., 11; Burns, J. A., 1; Munyan, A. C., 15; Spencer, J. W. W., 6
Chattanooga area: Wilder, J. T., 1
ocher: Butts, C., 4
petroleum: McClain, D. S., Jr., 4
potash: Butts, C., 4
sand and gravel: Butts, C., 4; Spain, E. L., Jr., 1
sandstone: Butts, C., 4
slate: Butts, C., 4
stone: Spain, E. L., Jr., 1; Sullivan, J. W., 1
tripoli: Butts, C., 4
popular: Crickmay, G. W., 22
uranium, Chattanooga Shale: Glover, L., 2; Gott, G. B., 1; Swanson, V. E., 1
*Geophysical investigations*
radioactivity survey: Stow, M. H., 1
*Ground water*
springs: Callahan, J. T., 3; Grover, N. C., 1; Hall, B. M., 2
*Historical geology*
Cambrian: Howell, B. F., Sr., 1: Resser, C. E., 3, 4; Rodgers, J., 4; Ulrich, E. O., 2; Walcott, C. D., 1, 2, 3
Rome Formation: Woodward, H. P., 1
Cambrian-Ordovician: Grabau, A. W., 5; Stose, G. W., 9
Cambrian-Mississippian: Hayes, C. W., 4
Cambrian-Pennsylvanian: Butts, C., 4
Canadian System: Ulrich, E. O., 2
Devonian: Cooper, G. A., 1; Rosenfeld, S. J., 1
Chattanooga Shale: Butts, C., 1; Conant, L. C., 1; Glover, L., 1, 2; Grabau, A. W., 2; Hass, W. H., 1
Mississippian: Marquis, U. C., 1; Olson, E. C., 1; Rigney, H. W., 1; Stevenson, J. J., 2; Stockdale, P. B., 1; Ulrich, E. O., 2; Weller, J. M., 1
Fort Payne Chert: Hurst, V. J., 3
Ordovician: Allen, A. T., Jr., 7; Cooper, G. A., 3; Twenhofel, W. H., 2; Vest, E. L., Jr., 1
bentonite: Kay, G. M., 1; Rosenkrans, R. R., 1
Ordovician-Devonian: Grabau, A. W., 3
Ordovician-Silurian boundary: Ulrich, E. O., 3
Ordovician-Pennsylvanian: Sullivan, J. W., 1
Ozarkian Period: Ulrich, E. O., 2
Paleozoic: Butts, C., 3; Grabau, A. W., 6; Hayes, C. W., 2; King, P. B., 5; McCalley, H., 2; Munyan, A. C., 17; Rogers, H. D., 2; Schuchert, C., 20; Shimer, H. W., 1; Spencer, J. W. W., 6; Ulrich, E. O., 1, 2; Willis, B., 7
Pennsylvanian: Allen, A. T., Jr., 6; Moore, R. C., 2; Stevenson, J. J., 3; Wanless, H. R., 1, 2, 3, 4; White, C. D., 1
Sewanee Conglomerate: Albritton, J. A., 1
Precambrian-Pennsylvanian: Burns, J. A., 1; King, P. B., 7; McCutchen, A. R., 1
Silurian: Amsden, T. W., 1; Ball, S. M., 1; Earle, R. B., 1; McCallie, S. W., 6, 21; Swartz, C. K., 1; Ulrich, E. O., 4
Red Mountain Formation: Truxes, L. S., 1
sedimentary structures: Lamb, G. M., 1
Taconic interval: Hunt, T. S., 2
Tennesseean Period: Ulrich, E. O., 2
Tertiary: Wright, F. J., 6
Waverlayan Period: Ulrich, E. O., 2
*Maps*
Economic
bauxite: Watson, T. L., 10
coal: Campbell, M. R., 2; Hayes, C. W., 17; Hitchcock, C. H., 4; Lesher, C. E., 1
mineral resources: Butts, C., 4; U. S. Geol. Survey, 1
shale: Veatch, J. O., 7
Geologic: Butts, C., 4; Hayes, C. W., 2; Maynard, T. P., 2; Schreiber, F., 1; Smith, R. W., 7; Spencer, J. W. W., 6
Isopach
Devonian, Chattanooga Shale: Glover, L., 1
Lower Silurian: Amsden, T. W., 1
Lithofacies, Lower Silurian: Amsden, T. W., 1
Major-faunal-elements, Lower Silurian: Amsden, T. W., 1
Paleogeographic, Cambrian-Ordovician: Grabau, A. W., 5
Physiographic
deformed Cretaceous peneplain: Hayes, C. W., 5
Tertiary peneplain: Hayes, C. W., 5
structural, Pennsylvanian: Wanless, H. R., 2
*Paleontology*
Brachiopoda, Cambrian: Resser, C. E., 3
Bryozoa
Mississippian: Condra, G. E., 1
Ordovician: Buzarde, L. E., Jr., 1; Cappel, H. N., Jr., 1
Conodontomorpha, Devonian: Glover, L., 2
Gastropoda, Ordovician: Yochelson, E. L., 1
Invertebrata, Paleozoic: Allen, A. T., Jr., 5; Butts, C., 4

Mammalia, Pleistocene: Cope, E. D., 1
Ordovician fauna: Vest, E. L., Jr., 1
plants, Pennsylvanian: Allen, A. T., Jr., 5; Butts, C., 4
Trilobita, Cambrian: Resser, C. E., 3; Salter, J. W., 1
*Petrology*
bentonite: Reade, E. H., Jr., 1
chert
Mississippian: Hurst, V. J., 3; Moore, W. H., Jr., 1
Ordovician: Windham, S. R., 1
limestone: Jones, J., 8
Pennsylvanian, depositional features: Allen, A. T., Jr., 6
*Physical geology*
Appalachian deformation: Price, P. H., 1
concretions, Mississippian: Wheeler, G. E., 2
earthquakes: Brill, K. G., Jr., 1; Murphy, L. M., 1
erosion history: Wright, F. J., 6
Ordovician limestone, laminae: Rosenfeld, S. J., 2
sedimentary structures
Pennsylvanian: Albritton, J. A., 1
cross bedding: Morehead, M. B., 1
Silurian: Lamb, G. M., 1
solution surfaces: Wright, F. J., 6
structural geology: King, P. B., 1, 5; Lombard, A. E., 1; Rogers, W. B., 1; Schottenloher, R., 1; Willis, B., 3
thrust faults: Hayes, C. W., 1; Margerie, E. de, 1; Willis, B., 4
Coosa Thrust Fault: Hayes, C. W., 4
folded faults: Keith, A., 2
*Physiographic geology*
caves: Moneymaker, B. C., 3
Coosa Lowlands: Wright, F. J., 4
drainage changes: Hayes, C. W., 15; Simpson, C. T., 1
Coosa River: Berry, E. W., 7
faunal evidence: Adams, C. C., 1
Tennessee River: Adams, G. I., 2; Johnson, D. W., 1, 2
drainage patterns: Schalie, H. van der, 1
erosion surfaces: Wright, F. J., 5
northwestern Ga.: Hayes, C. W., 5, 12, 14; Keith, A., 3
peneplains: Hayes, C. W., 5; Wright, F. J., 2, 6
swamps: Shaler, N. S., 2
**GEORGIA—PIEDMONT,** *see also* Georgia, and individual counties in the Piedmont Province
*Areas described*
Atlanta area: Herrick, S. M., 4; Purington, C. W., 1
Augusta area: Munyan, A. C., 6
Fall Line: Drennen, C. W., 1; Shepard, C. U., 1
Macon area: Munyan, A. C., 4, 9
Piedmont: Billings, M. P., 1; Crickmay, G. W., 25; Featherstonhaugh, G. W., 1; Hunt, T. S., 1; Morris, C. E., 1; Munyan, A. C., 14; Peck, J., 1
eastern: White, J. E., 2
southern: Pendleton, E. M., 1
western: Campbell, J. L., 1
*Economic geology*
abrasives: King, F. P., 1
asbestos: Hopkins, O. B., 1, 2; Merrill, G. P., 1
cement: Maynard, T. P., 2
copper: Blake, W. P., 10; Weed, W. H., 4
popular: Furcron, A. S., 35
corundum: Barlow, A. E., 1; King, F. P., 1; Lewis, J. V., 2; Pratt, J. H., 1, 2
dolomite: Davis, R. E., 1; Furcron, A. S., 6
feldspar: Galpin, S. L., 1; Parker, J. M., 3d, 1; Watts, A. S., 1
Macon area: Maynard, T. P., 4
gneiss: Watson, T. L., 8
gold: Anderson, C. S., 1; Bakewell, R., 1; Becker, G. F., 1; Blake, W. P., 10; Brewer, W. M., 9, 12, 13; Browne, J. R., 1; Cannon, L. C., 1; Chestatee River Fluming Company, 1; Crane, W. R., 1; Dickson, J., 1; Dodge, W. R., 1; Fluker, W. H., 2; Fosbrooke, S. H., 1; Furcron, A. S., 1; Habersham, W. W., 1, 2; Hall, B. M., 1; Hanna, G. B., 1; Jackson, C. F., 1; Jones, S. P., 2; McCallie, S. W., 3, 33; McElrath, T., 1; McLaren, J. M., 1; Mell, P. H., Jr., 1; Morris, C. E., 1; Munyan, A. C., 14; Nitze, H. B. C., 1, 2; Pardee, J. T., 1; Park, C. F., Jr., 2, 3; Parsons, A. B., 1; Peck, J., 1; Schmidhuber, 1; Soper, E. K., 1; Stone, R. C., 1; Tatham, W., 1; Taylor, J. W., 1; Tenney, W. J., 1; Wilkes, J. F., 1; Wilson, R. A., 1; Yeates, W. S., 1
fineness: Hanna, G. B., 2
popular: Crickmay, G. W., 2
granite: Munyan, A. C., 14; Watson, T. L., 8, 15
kaolin: Watkins, J. H., 3; Watts, A. S., 1
kyanite: Boyd, W. B., 1; Furcron, A. S., 12, 26; Smith, R. W., 3; Waggaman, W. H., 1
limestone: Furcron, A. S., 6; Maynard, T. P., 2; Watson, T. L., 20
manganese: Hoffman, J. N., 1; Hull, J. P. D., 2; Watson, T. L., 9, 14
marble: McCallie, S. W., 1
mica: Furcron, A. S., 7; Galpin, S. L., 1; Heinrich, E. W., 1; Jahns, R. H., 1, 2; Parker, J. M., 3d, 1; Peyton, G., 3; Smith, R. W., 5; Sterrett, D. B., 2; Watts, A. S., 1
mineral resources: Brewer, W. M., 6; Dieffenbach, O., 1; Hunter, C. E., 4
Augusta area: Munyan, A. C., 6
Macon area: Munyan, A. C., 4
monazite: Mertie, J. B., Jr., 2; Overstreet, W. C., 1
pegmatites: Galpin, S. L., 1
pyrite: McCallie, S. W., 36; Shearer, H. K., 2; Shotts, R. Q., 1
pyrophyllite: Stuckey, J. L., 2
sillimanite: Furcron, A. S., 26; Hudson, W. C., 1; Teague, K. H., 5
soapstone: Hopkins, O. B., 2; Stuckey, J. L., 2
talc: Hopkins, O. B., 2; Stuckey, J. L., 2
tungsten: Espenshade, G. H., 1
vermiculite: Hunter, C. E., 5
*Engineering geology*
saprolite, properties: Conn, W. V., 2
*Geochemical investigations*
radioactive dating: Kulp, J. L., 1; Long, L. E., 1; Pinson, W. H., Jr., 3
strontium in granite: Turekian, K. K., 1
weathering: Allen, V. T., 2

*Geophysical investigations*
radioactivity survey, interpretation: Schmidt, R. G., 1
*Ground water*
Atlanta area: Carter, R. W., 1; Herrick, S. M., 4
crystalline rocks: Crickmay, G. W., 19; Herrick, S. M., 5
granite terrane: LeGrand, H. E., 1
mineral springs: Morris, C. E., 1
Piedmont: Holmes, J. A., 2
southeastern: LeGrand, H. E., 2
water table levels: Warren, M. A., 7
*Historical geology*
Cambrian-Ordovician: Elliott, J. B., 1
Paleozoic: Furcron, A. S., 31; Kulp, J. L., 1; Long, L. E., 1; Pinson, W. H., Jr., 3; Woodward, H. P., 2
Pleistocene: Parizek, E. J., 19
Precambrian: Credner, H., 3; Furcron, A. S., 31; LeGrand, H. E., 2; Van Hise, C. R., 1, 2, 3; Willis, B., 7
Ocoee Series: Stose, G. W., 6
Talladega Series: Crickmay, G. W., 16, 20
Precambrian-Cambrian: King, P. B., 5; Rodgers, J., 3
Precambrian-Devonian: Campbell, J. L., 1
Precambrian-Paleozoic: Herrick, S. M., 4; Kulp, J. L., 2; Schuchert, C., 20
Silurian: Bradley, F. H., 2
Taconic interval: Hunt, T. S., 2
Tertiary, Appomattox Formation: McGee, W J, 4
*Maps*
Economic
asbestos: Hopkins, O. B., 2
construction material: McCallie, S. W., 9
feldspar: Galpin, S. L., 1
gneiss: Watson, T. L., 8
gold: Guettard, J. E., 1; Jones, S. P., 2
granite: Watson, T. L., 8, 15
mica: Galpin, S. L., 1; Sterrett, D. B., 2
mineral resources: Peck, J., 1
monazite: Mertie, J. B., Jr., 2
pyrite: Shearer, H. K., 2
sillimanite-bearing schist: Furcron, A. S., 12
soapstone: Hopkins, O. B., 2
talc: Hopkins, O. B., 2
Geologic: King, F. P., 1
Atlanta area: Herrick, S. M., 4
southeastern: LeGrand, H. E., 2
Ground water: Herrick, S. M., 4; LeGrand, H. E., 2
Physiographic
Augusta area: Munyan, A. C., 6
deformed Cretaceous peneplain: Hayes, C. W., 5
Tertiary peneplain: Hayes, C. W., 5
*Mineralogy*
amethyst: Hamlin, A. C., 1
asbestos: Merrill, G. P., 1
beryl: Furcron, A. S., 53
corundum: King, F. P., 1
diamond: Blank, E. W., 1; Kunz, G. F., 4; Anon., 1, 41
gems: Kunz, G. F., 3
gold, paragenesis: Credner, H., 1
kaolinite; Sand, L. B., 1
minerals: Blake, W. P., 4
monazite: Overstreet, W. C., 1
tellurbismuth: Credner, H., 1
*Petrology*
Elberton Granite: Calhoun, F. H. H., 3
diabase: Lester, J. G., 4; McCallie, S. W., 10
granite: Turekian, K. K., 1; Watson, T. L., 8
granite porphyry: Watson, T. L., 4
granitic rocks: Watson, T. L., 3
heavy minerals, saprolite: Holland, W. A., Jr., 2; Hurst, V. J., 4
igneous rocks: Crickmay, G. W., 25; Washington, H. S., 3
metamorphic rocks: Crickmay, G. W., 25; Furcron, A. S., 12, 27; Hayes, C. W., 13
mylonite: Crickmay, G. W., 4
pegmatites: Jahns, R. H., 2
peridotite: Lewis, J. V., 1; Pratt, J. H., 2
quartz-monzonite: Watson, T. L., 16
serpentine: Pratt, J. H., 2
volcanic rocks: Hurst, V. J., 8; Williams, G. H., 1
*Physical geology*
creep: Parizek, E. J., 11, 18; Woodruff, J. F., 1
tree curvature: Parizek, E. J., 21
earthquakes: Meigs, J., 1; Moneymaker, B. C., 6; Rockwood, C. G., 2
erosion: Glenn, L. C., 1
faulting: Jonas, A. I., 1
folded faults: Keith, A., 2
metamorphic lineation: Parizek, E. J., 7
metamorphism: Jonas, A. I., 1
Precambrian surface deformation: Reitz, T. A. du, 1
quartz horizon: Parizek, E. J., 9
siliceous layer: Parizek, E. J., 13
soils, eastern: White, J. E., 2
stream flow: Thomson, M. T., 1
structural geology: King, P. B., 1, 5; Lombard, A. E., 1; Stose, G. W., 10
Brevard Belt: Furcron, A. S., 24
gold veins: Park, C. F., Jr., 2
marble belt: Prouty, W. F., 1
structural history: Stille, H., 1
weathering: Hunt, T. S., 2
diorite: Smith, L. P., 1
granite: Watson, T. L., 5, 8
*Physiographic geology*
Atlanta area: Purington, C. W., 1
drainage changes: Parizek, E. J., 14
Chattahoochee River: Campbell, M. R., 1
drainage patterns: Parizek, E. J., 6, 15; Wright, F. J., 1
lithologic control: Woodruff, J. F., 2
Oconee River: Parizek, E. J., 12
Fall Line Peneplain: Renner, G. T., Jr., 2
lakes: Ingols, R. S., 3
pedestal rocks: Crickmay, G. W., 10
peneplains: Hayes, C. W., 5
deformation: Reitz, T. A. du, 1
Piedmont: Hayes, C. W., 5, 12; Stone, R. C., 1; Wright, F. J., 1
southwestern: Cooper, G. F., 1
stream flow: Thomson, M. T., 1

GILMER COUNTY, *see also* Georgia, Georgia—Northwestern, and Georgia—Piedmont
*Areas described*
Ellijay Quad.: Furcron, A. S., 41; LaForge, L., 2
*Economic geology*
iron: Phalen, W. C., 1

mineral resources, Ellijay Quad.: LaForge, L., 2
*Ground water*
Ellijay Quad.: LaForge, L., 2
*Historical geology*
Precambrian-Cambrian, Ellijay Quad.: LaForge, L., 2
*Maps*
Economic, mineral resources, Ellijay Quad.: LaForge, L., 2
Geologic, Ellijay Quad.: LaForge, L., 2
*Mineralogy*
sillimanite: Hurst, V. J., 28
*Petrology*
metamorphic rocks, Ellijay Quad.: Furcron, A. S., 41
*Physical geology*
cleavage structure: Phalen, W. C., 2
stretched pebbles: McCallie, S. W., 17
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Georgia: Peyton, G., 2
Wheeler Co.: Hudson, W. C., 3
**GLYNN COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Economy geology*
ilmenite: Martens, J. H. C., 1
*Ground water*
Glynn Co.: Stringfield, V. T., 1
Jekyll Island: Callahan, J. T., 7
Pleistocene: Couper, J. H., 2, 4
*Paleontology*
Diatomaceae, Pleistocene: Bailey, J. W., 1
Echinoidea, Pleistocene: Cooke, C. W., 21
Gastropoda, Miocene: Conrad, T. A., 5
Invertebrata, Pleistocene: Couper, J. H., 1; Richards, H. G., 1
Mammalia, Pleistocene: Allen, J. A., 1; Couper, J. H., 1, 2, 4; Falconer, H., 2; Harlan, R., 2; Hay, O. P., 3; Leidy, J., 1, 2, 5, 6; Lucas, F. A., 1; Lydekker, R., 1; Lyell, C., Jr., 2: Osborn, H. F., 6, 14; Owen, R., 1, 2
Reptilia, Pleistocene: Couper, J. H., 1; Harlan, R., 2
Vertebrata, Pleistocene: Richards, H. G., 1
*Petrology*
heavy minerals: Hurst, V. J., 10
*Physiographic geology*
Brunswick Harbor: Shaler, N. S., 3
marshes, popular: Gibson, C. D., 1
**GNEISS,** *see also* Metamorphic Rocks, Mineral Resources, and Stone
DeKalb Co.: Buddington, A. F., 1; Lester, J. G., 6; Navarre, A. T., 1; Severinghaus, N., 1, 2
Piedmont: Watson, T. L., 3, 8
**GOLD,** *see also* Mineral resources
Bartow Co.: Anderson, C. S., 1; DeBow, J. B. D., 3
Glade Mines: Glade Gold Mines, 1
Blue Ridge: Anderson, C. S., 1; Bakewell, R., 1; Blake, W. P., 1, 10; Brewer, W. M., 9, 12, 13; Curry, R. O., 1; Dickson, J., 1; Dodge, W. R., 1; Frame, J., 1; Habersham, W. W., 1; Hall, B. M., 1; Hanna, G. B., 1; Jackson, C. F., 1; Jones, S. P., 2; McCallie, S. W., 3, 33; McElrath, T., 1; McLaren, J. M., 1; Mell, P. H., Jr., 1; Munyan, A. C., 14; Nitze, H. B. C., 1, 2; Pardee, J. T., 1; Park, C. F., Jr., 3; Parsons, A. B., 1; Peck, J., 1; Phillips, W. E., 1; Schmidhuber, 1; Soper, E. K., 1; Tatham, W., 1; Tenney, W. J., 1; Wilkes, J. F., 1; Wilson, R. A., 1; Yeates, W. S., 1
early account: LeMoyne de Morgues, J., 1
fineness: Hanna, G. B., 2
popular: Crickmay, G. W., 2; Furcron, A. S., 38
pseudomorphs: Genth, F. A., 2
Carroll Co.
Bonner Mines: Brewer, W. M., 4
Villa Rica area: Brewer, W. M., 4, 14, 15
Cherokee Co.: Marlin, L. G., 1
Franklin Mine: Brewer, W. M., 4
Pascoe Mine: Shepard, C. U., 7
Tate Quad.: Bayley, W. S., 1
Cobb Co.: Ward, W. P., 1
Cherokee Gold Mine: Blake, W. P., 6
O'Neill Property: Adelberg, J., 2
Dawson Co., Tate Quad.: Bayley, W. S., 1
Forsyth Co., Tate Quad.: Bayley, W. S., 1
Georgia: Guettard, J. E., 1
Gilmer Co., Ellijay Quad.: LaForge, L., 2
Habersham Co.: Peck, J., 1
Shelton Mine: Phillips, W. E., 1
Haralson Co., Tallapoosa Dist.: Brewer, W. M., 14
Hart Co.: Grant, W. H., 8
Henry Co.: Fosbrooke, S. H., 1
Lincoln Co., Lincoln Mine: Lincoln Gold Mining Company, 1
Lumpkin Co.: Blake, W. P., 3; Brewer, W. M., 3; Cain, A. W., 1; Credner, H., 2; Jackson, C. T., 1, 5; Lindgren, W., 1; Mell, P. H., Jr., 2; Wells, R. C., 1
Auraria Mines: Blake, W. P., 8
Battle Branch Mine: Park, C. F., Jr., 1
Chestatee Hydraulic Company Property: Blake, W. P., 2
Dahlonega Dist.: Eckel, E. C., 1, 2, 3
Ellijay Quad.: LaForge, L., 2
Field Gold Vein: Blake, W. P., 5
Hendricks Vein: Blake, W. P., 7
Moores Gold Mine: Jackson, C. T., 2
Singleton Lots: Southern Gold Company, 1
Standard Mines: Standard Gold Mining Company, 1
McDuffie Co.: Bruhl, P. T., 1; Fluker, W. H., 1
Columbia Mine: Fluker, W. H., 2; Hall, B. M., 4
Oglethorpe Co.: Fosbrooke, S. H., 1
Paulding Co.: Brewer, W. M., 4; Mell, P. H., Jr., 1
Pickens Co.
Ellijay Quad.: LaForge, L., 2
Tate Quad.: Bayley, W. S., 1
Piedmont: Anderson, C. S., 1; Bakewell, R., 1; Becker, W. F., 1; Blake, W. P., 10; Brewer, W. M., 9, 12, 13; Browne, J. R., 1; Cannon, L. C., 1; Chestatee Fluming Company, 1; Crane, W. R., 1; Dickson, J., 1; Dodge, W. R., 1; Fosbrooke, S. H., 1; Furcron, A. S., 1; Habersham, W. W., 1, 2; Hall, B. M., 1; Hanna, G. B., 1; Jackson, C. F., 1; Jones, S. P., 2; McCallie, S. W., 3, 33; Mc-

Elrath, T., 1; McLaren, J. M., 1; Mell, P. H., Jr., 1; Morris, C. E., 1; Munyan, A. C., 14; Nitze, H. B. C., 1, 2; Pardee, J. T., 1; Park, C. F., Jr., 2, 3; Parsons, A. B., 1; Peck, J., 1; Schmidhuber, 1; Soper, E. K., 1; Stone, R. C., 1; Tatham, W., 1; Taylor, J. W., 1; Tenney, W. J., 1; Wilkes, J. F., 1; Wilson, R. A., 1; Yeates, W. S., 1
Dahlonega Belt: Fluker, W. H., 2
fineness: Hanna, G. B., 2
paragenesis: Credner, H., 1
popular: Crickmay, G. W., 2
Rabun Co.: Peck, J., 1
Union Co.: Watson, T. L., 17
Ellijay Quad.: LaForge, L., 2
White Co.: Nacoochee Hydraulic Mining Company, 1; Smith, R. W., 8; Taber, S., 2
Garrett Mine: Smith, C. D., 1
Lewis Mine.: Adelberg, J., 1
popular: Furcron, A. S., 38
Reynolds Mine: Collins, G. E., 1
Yonah Land and Mining Company: Whatley, E. T., 2

**GORDON COUNTY,** *see also* Georgia, Georgia —Northwestern, and Georgia—Piedmont
*Areas described*
Fairmount area: Smith, J. W., 2; Stuart, A. W., 1
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
*Economic geology*
iron, Rome Quad.: Hayes, C. W., 18
limestone, Rome Quad.: Hayes, C. W., 18
limonite, Ringgold Quad.: Hayes, C. W., 7
manganese, Ringgold Quad.: Hayes, C. W., 7
slate: Maynard, T. P., 3; Shearer, H. K., 3
Rome Quad.: Hayes, C. W., 18
*Historical geology*
Cambrian: Stuart, A. W., 2
Fairmount area: Stuart, A. W., 1
Ranger area: Smith, W. L., 2
Cambrian-Mississippian
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Pliocene, Rome Quad.: Hayes, C. W., 18
Precambrian: Smith, J. W., 2
*Maps*
Economic
limestone: Stuart, A. W., 2
mineral resources, Ringgold Quad.: Hayes, C. W., 7
Geologic
Fairmount area: Smith, J. W., 2; Stuart, A. W., 1
Ranger area: Smith, W. L., 2
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
*Petrology*
graded bedding: Smith, J. W., 1
igneous rocks: Clarke, F. W., 4; Washington, H. S., 2
limestone and shale: Stuart, A. W., 2
Paleozoic rocks, Fairmount area: Stuart, A. W., 1, 3
*Physical geology*
Cartersville Fault: Smith, J. W., 1, 2

**GRADY COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Areas described*
Grady Co.: Faircloth, W. R., 1

**GRANITE,** *see also* Igneous rocks, and Mineral resources
Blue Ridge: Munyan, A. C., 14
Clarke Co., inclusions: Parizek, E. J., 1
DeKalb Co., Stone Mountain Granite: Buddington, A. F., 1; Day, A. L., 1; Goranson, R. W., 1, 2; Herrmann, L. A., 1; Kemp, J. F., 1; Lester, J. G., 1, 6; Navarre, A. T., 1; Spencer, J. W. W., 4; Watson, T. L., 6
age: Herzog, L. F., 2d, 1
analysis: Venable Bros., 1
compressibility: Adams, L. H., 1
density: Day, A. L., 1
granite contacts: Grant, W. H., 15
gravity survey: Gibbes, R. W., 2
melting features: Goranson, R. W., 2
popular: Crickmay, G. W., 15; Hopkins, M. S., 1; Maynard, T. P., 8
radioactive mica: Aldrich, L. T., 2
radium: Piggott, C. S., 1, 2
strontium-bearing mica: Aldrich, L. T., 1
water solubility: Goranson, R. W., 1
Fulton Co.: Cofer, H. E., Jr., 7
Fairburn Granite, porpyhroblasts: Cofer, H. E., Jr., 6
Gwinnett Co., Stone Mountain Granite: Herrmann, L. A., 1
Hancock Co.: Fortson, C. W., Jr., 3
Hart Co.: Grant, W. H., 6
Murray Co., bloating: Furcron, A. S., 40
Piedmont: Munyan, A. C., 14; Turekian, K. K., 1; Watson, T. L., 3, 8, 15
Elberton Granite: Calhoun, F. H. H., 3
porphyritic: Watson, T. L., 4
weathering: Watson, T. L., 5
Rockdale Co.: Herrmann, L. A., 1

**GRAPHITE,** *see also* Mineral resources, and Minerals
Bartow Co.: Hayes, C. W., 24
Lamar Co., Thomaston Quad.: Clarke, J. W., 1
Pike Co., Thomaston Quad.: Clarke, J. W., 1
Talbot Co., Thomaston Quad.: Clarke, J. W., 1
Troup Co., in quartz: Veatch, J. O., 8
Upson Co., Thomaston Quad.: Clarke, J. W., 1

**GRAPTOLITHINA,** *see also* Invertebrata
Murray Co., Ordovician: Decker, C. E., 1

**GRAVEL,** *see also* Aggregate, Construction material, and Mineral resources
Coastal Plain
Albany area: Munyan, A. C., 10
Valdosta area: Munyan, A. C., 13
Floyd Co.: Furcron, A. S., 52
Georgia: Teas, L. P., 1
Lamar Co., Thomaston Quad.: Clarke, J. W., 1
northwestern Ga.: Butts, C., 4
Pike Co., Thomaston Quad.: Clarke, J. W., 1
Talbot Co., Thomaston Quad.: Clarke, J. W., 1
Upson Co., Thomaston Quad.: Clarke, J. W., 1

GREENE COUNTY, *see also* Georgia, and Georgia—Piedmont
*Economic geology*
sand: Parizek, E. J., 10
GROUND WATER, *see also* Mineral resources, and Springs
Baker Co.
DeSoto Spring: Parker, G. L., 1
limesinks: Hendricks, E. L., 1, 2
Blue Ridge, crystalline rocks: Crickmay, G. W., 19; Herrick, S. M., 5
Brooks Co.: McCallie, S. W., 15
Blue Spring: Grover, N. C., 4
Burke Co., Radioactive waste disposal: Theis, C. V., 1
Butts Co., mineral spring: Banks, J. T., 1; Pepper, W., 1
Catoosa Co., spring: Land, W. J., 1; McCallie, S. W., 18; Pepper, W., 1
Chatham Co.: Stringfield, V. T., 1
artesian head: Davis, G. H., 1
salt water encroachment: Counts, H. B., 1
Savannah River area: Slichter, C. S., 1; Stephenson, L. W., 6
Chattahoochee Co., Fort Benning area: Herrick, S. M., 2
Coastal Plain: Herrick, S. M., 9; Imbeaux, C. E. A., 1; Spencer, J. W. W., 5; Stephenson, L. W., 7
analysis: Dole, R. B., 1
artesian levels: Cooper, H. H., 1
artesian wells: Clarke, F. W., 2; Darton, N. H., 1; Fuller, M. L., 4; McCallie, S. W., 4; Stringfield, V. T., 3, 5, 6; Warren, M. A., 4, 6
Atlantic coast: Stewart, J. W., 1
Brunswick area: Schweitzer, R. R., 1
Clayton Formation: Herrick, S. M., 7
deep wells: Fuller, M. L., 1, 3
east central: LaMoreaux, P. E., 1
geochemistry: Brown, E., 1
history: Carlston, C. W., 1
northeastern: LeGrand, H. E., 2
pond levels: Hendricks, E. L., 3
springs: Meinzer, O. E., 2
temperatures: Darton, N. H., 5
water table levels: Warren, M. A., 1, 2, 3, 5, 7
water table lowering: Harper, R. M., 13
Cobb Co.
mineral spring: Fuller, M. L., 2
salt spring: Furcron, A. S., 30
Crisp Co.: Wait, R. L., 3
Dawson Co.
crystalline rocks: Callahan, J. T., 4
radioactive waste disposal: Edgerton, J. H., 1
DeKalb Co., spring, radioactive: Hootman, J. A., 1
Dougherty Co.: Stringfield, V. T., 1; Wait, R. L., 2
Albany area: Wait, R. L., 1
Blue Spring: Hall, M. R., 1, 2
Radium Spring: Grover, N. C., 4
Douglas Co., salt spring: Furcron, A. S., 30
Early Co., sink hole lakes: Hendricks, E. L., 2
Fannin Co., Ellijay Quad.: LaForge, L., 2
Floyd Co.: Callahan, J. T., 2
Cave Spring: Grover, N. C., 5; Hall, M. R., 1; Paulsen, C. G., 1
Fulton Co.
Atlanta Mineral Spring: Means, A., 1
deep wells: Fuller, M. L., 3
Georgia: Callahan, J. T., 5; Darton, N. H., 2, 3; McCallie, S. W., 16, 20; Meinzer, O. E., 1; Stringfield, V. T., 2, 4; Thomson, M. T., 2
analyses: Collins, W. D., 1; Jones, J., 7; Lamar, W. L., 1, 2, 3; Lohr, E. W., 1, 2
effects of earthquakes: Stewart, J. W., 3
irrigation potential: Herrick, S. M., 8
mineral springs: Crook, J. K., 1; Duggan, J. R., 1; Ellis, A. J., 1; Fitch, W. E., 1; Hopkins, T. S., 1; McCallie, S. W., 13, 32; Moorman, J. J., 1, 2, 3; Peale, A. C., 1, 2; Walton, G. E., 1
nitrogen content: Ingols, R. S., 2
popular: Callahan, J. T., 1
water table levels: Callahan, J. T., 6
Gilmer Co., Ellijay Quad.: LaForge, L., 2
Glynn Co.: Stringfield, V. T., 1
Jekyll Island.: Callahan, J. T., 7
Harris Co.
Blue Spring.: Grover, N. C., 2, 3
Warm Springs Quad.: Hewett, D. F., 1
Jenkins Co., Magnolia Spring: Paulsen, C. G., 1
Lee Co.: Owen, V., Jr., 3
Lumpkin Co., Ellijay Quad.: LaForge, L., 2
Macon Co.: Stephenson, L. W., 14
Marion Co., Fort Benning area: Herrick, S. M., 2
Meriwether Co.
North Spring: Grover, N. C., 2
Warm Springs Quad.: Hewett, D. F., 1
Warm Springs: Hall, M. R., 2; Salomon-Calvi, W., 1; Stearns, N. D., 1; Watson, T. L., 24; Weed, W. H., 2
Muscogee Co., Fort Benning area: Herrick, S. M., 2
northwestern Ga., springs: Callahan, J. T., 3; Grover, N. C., 1; Hall, B. M., 2
Pickens Co., Ellijay Quad.: LaForge, L., 2
Piedmont: Holmes, J. A., 2
Atlanta area: Carter, R. W., 1; Herrick, S. M., 4
crystalline rocks: Crickmay, G. W., 19; Herrick, S. M., 5
granite terrain: LeGrand, H. E., 1
southeastern: LeGrand, H. E., 2
springs: Morris, C. E., 1
water table levels: Warren, M. A., 7
Pike Co., Warm Springs Quad.: Hewett, D. F., 1
Warm Springs: Stearns, N. D., 1; Watson, T. L., 24
Rabun Co., analyses: Ingols, R. S., 1
Richmond Co., radioactive waste disposal: Theis, C. V., 1
Sumter Co.: Owen, V., Jr., 4
Talbot Co., Warm Springs Quad.: Hewett, D. F., 1
Thomas Co., blowing wells: McCallie, S. W., 18
Union Co., Ellijay Quad.: LaForge, L., 2
Upson Co., Warm Springs Quad.: Hewett, D. F., 1
Warm Springs: Stearns, N. D., 1; Watson, T. L., 24
Walker Co., deep wells: Fuller, M. L., 1

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Coastal Plain, Macon to Fort Gaines: Southeastern Geol. Soc., 1
Georgia, highway geology: Lester, J. G., 8
northwestern Ga., Paleozoic rocks: Munyan, A. C., 18; Vernon, R. O., 1
Piedmont, crystalline rocks: Furcron, A. S., 27; Vernon, R. O., 1
GULLIES, *see also* Physiography
Baldwin Co.: Ireland, H. A., 1; Linton, E., 1; Morris, F. G., 1
Stewart Co., Providence Canyons: Barge, E. M., 1; Sisk, L. J., 1; Smith, P. C., 1
Sumter, Co.: Morris, F. G., 1
GWINNETT COUNTY, *see also* Georgia, and Georgia—Piedmont
*Areas described*
Lawrenceville area: Grant, W. H., 2
Stone Mountain-Lithonia area: Herrmann, L. A., 1
*Economic geology*
mineral resources: Flanigan, J. C., 1
silver: Tenney, W. J., 2
stone, Stone Mountain-Lithonia Dist.: Herrmann, L. A., 1
*Engineering geology*
Buford Dam site: Conn, W. V., 1
*Historical geology*
Brevard Schist: Grant, W. H., 2
Precambrian-Triassic, Stone Mountain-Lithonia Dist.: Herrmann, L. A., 1
*Maps*
Economic, stone, Stone Mountain-Lithonia Dist.: Herrmann, L. A., 1
Geologic
Lawrenceville area: Grant, W. H., 2
Stone Mountain-Lithonia area: Herrmann, L. A., 1
*Mineralogy*
pseudomeionite: Hurst, V. J., 9
*Petrology*
crystalline rocks, Stone Mountain area: Herrmann, L. A., 1
GYPSUM, *see also* Minerals
Lumpkin Co.: Gardner, C. H., 1
HABERSHAM COUNTY, *see also* Georgia, and Georgia—Blue Ridge, and Georgia—Piedmont
*Areas described*
Davidson-Panther Creek area: Pruitt, R. G., Jr., 1
Habersham Co.: Biederman, C. A., 1
*Economic geology*
gold: Peck, J., 1
Shelton Mine: Phillips, W. E., 1
kyanite: Furcron, A. S., 26; Greene, C. F., 1; Habersham Co. Dept. Education, 1; Launer, P. J., 1; Petar, A. V., 1; Smith, R. W., 2, 9
*Maps*
Economic
kyanite: Prindle, L. M., 1
mineral resources: Teague, K. H., 3
Geologic: Teague, K. H., 3
Davidson-Panther Creek area: Pruitt, R. G., Jr., 1
*Mineralogy*
fuchsite: Genth, F. A., 7
xenotime: Gibbes, L. R., 1; Smith, J. L., 1
*Physiographic geology*
Tallulah Gorge: Furcron, A. S., 20
HAFNIUM, *see also* hafnium-bearing minerals, and Mineral resources
Coastal Plain: Mertie, J. B., Jr., 3
HALL COUNTY, *see also* Georgia, and Georgia—Piedmont
*Economic geology*
monazite: Sterrett, D. B., 1
*Geochemical investigations*
gibbsite in soil: Alexander, L. T., 1
radioactive dating: Libby, W. F., 1
*Mineralogy*
corundum: Genth, F. A., 4
diamond: Hamlin, A. C., 1; Holden, R. J., 1; Jackson, C. T., 4; Patterson, R. M., 1, 2; Shepard, C. U., 2
margarite: Clarke, F. W., 1
*Petrology*
amphibolite, analysis: Alexander, L. T., 1
itacolumite: Grant, W. H., 5
*Physical geology*
weathering of amphibolite: Alexander, L. T., 1
HALLOYSITE, *see also* Clay, Mineral resources, and Minerals
Bartow Co.: Hamlin, H. P., 1
Chattooga Co.: Broadhurst, S. D., 1; Van der Meulen, P. A., 1; Watkins, J. H., 1
DeKalb Co.: Grant, W. H., 10
northwestern Ga.: Butts, C., 4
HANCOCK COUNTY, *see also* Georgia, Georgia—Coastal Plain, and Georgia—Piedmont
*Areas described*
Hancock Co.: Fortson, C. W., Jr., 3
*Economic geology*
mineral resources: Fortson, C. W., Jr., 3
*Historical geology*
Precambrian-Cretaceous: LaMoreaux, P. E., 2
Precambrian-Eocene: Fortson, C. W., Jr., 3
*Maps*
Geologic: Fortson, C. W., Jr., 3
HARALSON COUNTY, *see also* Georgia, and Georgia—Piedmont
*Areas described*
northern: Webb, J. E., 2
*Economic geology*
copper, Tallapoosa Mine: Ballard, T. J., 2
gold, Tallapoosa Dist.: Brewer, W. M., 14
*Historical geology*
Precambrian-Pennsylvanian, Talladega Series: Webb, J. E., 1
*Maps*
Geologic, northern: Webb, J. E., 2
*Physical geology*
structure, northern: Webb, J. E., 2
HARRIS COUNTY, *see also* Georgia, and Georgia—Piedmont
*Areas described*
Warm Springs Quad.: Hewett, D. F., 1
*Ground water*
Blue Springs: Grover, N. C., 2, 3
Warm Springs Quad.: Hewett, D. F., 1
*Historical geology*
Precambrian-Cenozoic, Warm Springs Quad.: Hewett, D. F., 1
*Maps*
Geologic, Warm Springs Quad.: Hewett, D. F., 1

**HART COUNTY**, *see also* Georgia, and Georgia—Piedmont
*Areas described*
Hart Co.: Grant, W. H., 8
*Economic geology*
iron: Grant, W. H., 9
mica: Griffitts, W. R., 1; Teague, K. H., 1
mineral resources: Grant, W. H., 8
*Maps*
Geologic, Hart Co.: Grant, W. H., 8
*Mineralogy*
garnet: Wells, R. C., 1
uraninite: Hurst, V. J., 29
*Petrology*
crystalline rocks: Grant, W. H., 8
granite: Grant, W. H., 6
sillimanite schist: Hudson, W. C., 2
*Physical geology*
nodules: Grant, W. H., 12
**HEARD COUNTY**, *see also* Georgia, and Georgia—Piedmont
*Mineralogy*
ferrimolybdite: Taylor, W. J., 1
**HEAVY MINERALS**, *see also* Mineral resources, Sand, and individual types of heavy minerals
Bleckley Co., Cochran Quad.: Kirkpatrick, S. R., 1
Blue Ridge, Cohutta Mountains: Barge, E. M., 2
Chatham Co.
beaches: Wilbur, R. O., 1
Savannah Harbor: Trask, P. D., 1
Clarke Co., saprolite: Hurst, V. J., 1, 4
Coastal Plain: Dryden, A. L., Jr., 1, 2; Jones, W., 1; McKelvey, V. E., 1; Martens, J. H. C., 2; Mertie, J. B., Jr., 1, 2, 3; Overstreet, W. C., 1; Twenhofel, W. S., 1; Youngman, E. P., 1
Cretaceous: Dryden, A. L., Jr., 1
radioactive survey: Moxham, R. M., 2
DeKalb Co.: Sandlin, W. L., Jr., 1
Glynn Co.: Hurst, V. J., 10; Martens, J. H. C., 1
Lumpkin Co.: Yoho, W. H., 1
McIntosh Co.: Martens, J. H. C., 1
Piedmont: Mertie, J. B., Jr., 2; Overstreet, W. C., 1
saprolite: Holland, W. A., Jr., 2; Hurst, V. J., 4
White Co.: Yoho, W. H., 1
**HELIUM**, *see also* Mineral resources, and Natural gas
Decatur Co.: Boone, W. J., Jr., 1; Furcron, A. S., 55
Walker Co.: Furcron, A. S., 55
**HEMATITE**, *see also* Iron, Mineral resources, and Minerals
Lincoln Co.: Watson, T. L., 18
**HENRY COUNTY**, *see also* Georgia, and Georgia—Piedmont
*Economic geology*
gold: Fosbrooke, S. H., 1
*Petrology*
meteorites: Cohen, E. W., 4, 5; Fireman, E. L., 1
**HISTORY**
Dahlonega area, Lumpkin Co.: Brewer, W. M., 3
Ducktown area, Fannin Co.: Curry, R. O., 1
Georgia Geological Survey: Cave, H. S., 1; Hayes, C. W., 26; Merrill, G. P., 8
Georgia science: Christian, S. M., 1; Johnson, T. C., Jr., 1
gold in Lumpkin Co.: Cain, A. W., 1
ground water, Coastal Plain: Carlston, C. W., 1
ideas of Appalachian geology: Rodgers, J., 1
William Maclure in Georgia: Mitchill, S. L., 2
**HORNBLENDE**, *see also* Amphibolite, and Minerals
Dawson Co.: Hurst, V. J., 31
Towns Co.: Grant, W. H., 3
**HOUSTON COUNTY**, *see also* Georgia, and Georgia—Coastal Plain
*Paleontology*
Foraminifera, Eocene: Cushman, J. A., 7
Mammalia, Eocene: Kellogg, A. R., 1
plants, Cretaceous: Berry, E. Wilbur, 1, 10, 14
*Physiographic geology*
Perry area: Cooper, G. F., 2
**HYALITE**, *see also* Minerals
DeKalb Co., popular: Chapman, J. R., 1
**HYDRARGILLITE**, *see also* Minerals
Chattooga Co.: Van der Meulen, P. A., 1
**HYDROTHERMAL MINERALIZATION**
Lincoln Co., Graves Mountain: Johnston, W. D., Jr., 1
**HYDROXYAPATITE**, *see also* Minerals
Cherokee Co.: Mitchell, L., 3
**IGNEOUS ROCKS**, *see also* individual types
Bartow Co.: Clarke, F. W., 4; Washington, H. S., 2
Blue Ridge: Crickmay, G. W., 25
basic: King, F. P., 2
Cherokee Co.: Washington, H. S., 2
Clarke Co.: Parizek, E. J., 8
Gordon Co.: Clarke, F. W., 4; Washington, H. S., 2
Piedmont: Crickmay, G. W., 25; Washington, H. S., 3
basic: Kemp, J. F., 1
Towns Co., ultrabasic: Kellberg, J. M., 1
**ILMENITE**, *see also* Heavy minerals, Mineral resources, Minerals, and Sand
Glynn Co.: Martens, J. H. C., 1
McIntosh Co.: Martens, J. H. C., 1
**INDUSTRIAL MINERALS**, *see also* Mineral resources, and individual types
Georgia: Lloyd, S. J., 1; Munyan, A. C., 11
**INSOLUBLE RESIDUES**
Decatur-Seminole Cos., Eocene-Miocene: Hendry, C. W., Jr., 1
**INVERTEBRATA**, *see also* individual types
Burke Co., Tertiary: Cotting, J. R., 2
Catoosa Co.
Mississippian: Windham, S. R., 2
Ordovician: Murphy, R. E., Jr., 1
Coastal Plain
Cenozoic: Richards, H. G., 5; Veatch, J. O., 9
Cretaceous: Bassler, R. S., 1; McCallie, S. W., 20; Richards, H. G., 5; Veatch, J. O., 9
Eocene, Ocala Limestone: Cooke, C. W., 3

Tertiary: McCallie, S. W., 20; Stenzel, H. B., 2
Dade Co., Ordovician: Ingram, F. T., 2
Decatur Co., Eocene: Couper, J. H., 3
Effingham Co., Eocene: Meriwether, D., 1
Floyd Co., Devonian: Schuchert, C., 1
Glynn Co., Pleistocene: Couper, J. H., 1
northwestern Ga., Paleozoic: Allen, A. T., Jr., 5; Butts, C., 4
Richmond Co., Tertiary: Cotting, J. R., 2

**IRON**, *see also* iron-bearing minerals, and Mineral resources
Bartow Co.: Brewer, W. M., 5; Crickmay, G. W., 1; Hayes, C. W., 16, 20; Kesler, T. L., 2, 4; Leweicki, W. T., 1; McCallie, S. W., 5; Robertson, A. F., 1
origin: Catlett, C., 1
Rome Quad.: Hayes, C. W., 18
Blue Ridge: Curry, R. O., 1
Catoosa Co., Ringgold Quad.: Hayes, C. W., 7
Chattooga Co.
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Cherokee Co.: Leweicki, W. T., 1; Willis, B., 1
Dade Co.: Hall, J., 1; New England Company, 1
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
Fannin Co.: Willis, B., 1
Mineral Bluff Quad.: Hurst, V. J., 15
Floyd Co.: Furcron, A. S., 52; Leweicki, W. T., 1; McCallie, S. W., 5
Rome Quad.: Hayes, C. W., 18
Georgia: Haseltine, R. H., 1; Smock, J. C., 2
Gilmer Co.: Phalen, W. C., 1
Ellijay Quad.: LaForge, L., 2
Gordon Co.
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Hart Co.: Grant, W. H., 9
Lamar Co., Thomaston Quad.: Clarke, J. W., 1
Lumpkin Co.: Brown, W. R., 1; Dobson, C. M., 1
Ellijay Quad.: LaForge, L., 2
Murray Co., Dalton Quad.: Munyan, A. C., 17
northwestern Ga.: Adams, G. I., 3; Ball, S. M., 1; Bell, I. L., 1; Birkinbine, J., 1; Brewer, W. M., 7; Burchard, E. F., 6, 7; Butts, C., 4; Eckel, E. C., 9; Einecke, G., 1; Fleming, H. S., 1; McCallie, S. W., 6, 7, 21; Pallister, H. D., 3; Porter, J. B., 1, 2; Pumpelly, R., 1; Sullivan, J. W., 1; Willis, B., 1
reserves: Burchard, E. F., 3
Silurian, origin: Earle, R. B., 1
Pickens Co., Ellijay Quad.: LaForge, L., 2
Pike Co., Thomaston Quad.: Clarke, J. W., 1
Polk Co.: Leweicki, W. T., 1; McCallie, S. W., 5; Robertson, A. F., 1; Spencer, J. W. W., 5
Indian Mountain area: Crawford, T. J., 2
Rome Quad.: Hayes, C. W., 18
Quitman Co.: Furcron, A. S., 48
Richmond Co.: Lewis, H. C., 1
Stewart Co.: Furcron, A. S., 48
Talbot Co., Thomaston Quad.: Clarke, J. W., 1
Union Co., Ellijay Quad.: LaForge, L., 2
Upson Co., Thomaston Quad.: Clarke, J. W., 1
Walker Co., Ringgold Quad.: Hayes, C. W., 7
Webster Co.: Furcron, A. S., 49
Whitfield Co.
Dalton Quad.: Munyan, A. C., 17
Ringgold Quad.: Hayes, C. W., 7
Worth Co.: Furcron, A. S., 56

**IRWIN COUNTY**, *see also* Georgia, and Georgia—Coastal Plain
*Petrology*
tektites: Barnes, V. E., 1; Bruce, G. A., 1; Cohen, A. J., 2

**ITACOLUMITE**, *see also* Mineral resources, and Stone
Barrow Co.: Grant, W. H., 5
Blue Ridge: Shepard, C. U., 2
Hall Co.: Grant, W. H., 5
Meriwether Co.: Grant, W. H., 5

**JACKSON COUNTY**, *see also* Georgia, and Georgia—Piedmont
*Mineralogy*
quartz etching: Crawford, T. J., 1

**JASPER COUNTY**, *see also* Georgia, and Georgia—Piedmont
*Mineralogy*
apatite: Hurst, V. J., 18
quartz: Gleason, F. E., 1
*Petrology*
pegmatites: Warriner, L. P., 1
*Physical geology*
silting rates, Lloyd Shoals Reservoir: Brown, C. B., 1
soil erosion rates: Fuller, G. L., 2

**JENKINS COUNTY**, *see also* Georgia, and Georgia—Coastal Plain
*Ground water*
Magnolia Spring: Paulsen, C. G., 1
*Petrology*
meteorite: Henderson, E. P., 1; Leonard, F. C., 3
*Paleontology*
Foraminifera, Eocene: Cushman, J. A., 4, 6

**JOHNSON COUNTY**, *see also* Georgia, and Georgia—Coastal Plain
*Historical geology*
Pliocene, Altamaha Grit: Harper, R. M., 8

**JOINTS**, *see also* Structural geology
DeKalb Co., Stone Mountain: Hopson, C. A., 1; White, W. A., 1

**JONES COUNTY**, *see also* Georgia, Georgia—Coastal Plain, and Georgia—Piedmont
*Historical geology*
Eocene: Harris, G. D., 4
Precambrian-Cretaceous: LaMoreaux, P. E., 2
*Physiographic geology*
pedestal rocks: Petty, J. J., 1

**JURASSIC**, *see also* Mesozoic
Coastal Plain: Applin, P. L., 3

**KAOLIN**, *see also* Clay, and Mineral resources
Coastal Plain: Burgess, B. C., 1; Henry, A. V., 1; Jones, J., 9; Kesler, T. L., 5; Klinefelter, T. A., 1; Ladd, G. E.,

1, 2; McDonald, P. B., 1; Mitchell, L., 4; Munyan, A. C., 2; Murray, H. H., 1; Ries, H., 3, 4, 7; Smith, R. W., 1; Veatch, J. O., 3; Watkins, J. H., 3; Weigel, W. M., 2, 3, 4
Central of Georgia Railway: Maynard, T. P., 11
electron photomicrographs: Woodward, L. A., 1
Macon area: Maynard, T. P., 4
origin: Adams, G. I., 4; Kesler, T. L., 6
resilication of gibbsite: Allen, V. T., 1
Georgia: Stull, R. T., 1
Hancock Co.: Fortson, C. W., Jr., 3
Macon Co.: Richard, L. M., 2
Andersonville area: Beck, W. A., 3
Piedmont: Watkins, J. H., 3; Watts, A. S., 1
Richmond Co., analysis: Stokes, H. N., 1
Schley Co., Andersonville area: Beck, W. A., 3
Stewart Co.: Goodell, H. G., 1
Sumter Co., Andersonville area: Beck, W. A., 3
Twiggs Co.: Glass, H. D., 1; McLaughlin, R. J. W., 1; Mitchell, L., 8; Veatch, J. O., 2, 5
Washington Co.: Mitchell, L., 8
Wilkinson Co.: Mitchell, L., 8
**KAOLINITE,** *see also* Clay, Kaolin, and Mineral resources
Chattahoochee Co.: Van der Meulen, P. A., 1
Coastal Plain: Johns, W. D., 1
D. T. A. curves: Speil, S., 1
Piedmont: Sand, L. B., 1
Twiggs Co.
electron photomicrographs: Bates, T. F., 1, 2
reference: Kerr, P. F., 3
**KARST TOPOGRAPHY,** *see also* Physiography, and Sinkholes
Baker-Mitchell Cos.: Herrick, S. M., 3
**KYANITE,** *see also* Mineral resources, and Minerals
Blue Ridge: Boyd, W. B., 1; Furcron, A. S., 12, 26; Prindle, L. M., 1; Waggaman, W. H., 1
Cherokee Co.: Petar, A. V., 1; Smith, R. W., 2
Cobb Co.: Petar, A. V., 1
Fannin Co., Mineral Bluff Quad.: Hurst, V. J., 15
Fulton Co.: Crickmay, G. W., 11
Habersham Co.: Furcron, A. S., 26; Greene, C. F., 1; Habersham Co. Dept. Education, 1; Launer, P. J., 1; Petar, A. V., 1; Smith, R. W., 2, 9
Lamar Co., Thomaston Quad.: Clarke, J. W., 1
Lincoln Co.: Hurst, V. J., 36; Johnston, W. D., Jr., 2; Muegge, O., 1; Rath, G. vom, 1; Watkins, J. H., 4; Watson, T. L., 18
Piedmont: Boyd, W. B., 1; Furcron, A. S., 12, 26; Smith, R. W., 3; Waggaman, W. H., 1
Pike Co., Thomaston Quad.: Clarke, J. W., 1
Rabun Co.: Furcron, A. S., 26; Smith, R. W., 9
Talbot Co.: Crickmay, G. W., 12
Thomaston Quad.: Clarke, J. W., 1
Upson Co.: Crickmay, G. W., 12; Ingram, W. F., 1; Petar, A. V., 1
Thomaston Quad.: Clarke, J. W., 1
**LAKES,** *see also* Physiography
Piedmont: Ingols, R. S., 3
**LAMAR COUNTY,** *see also* Georgia, and Georgia—Piedmont
*Areas described*
Pine Mountain area: Crickmay, G. W., 6
Thomaston Quad.: Clarke, J. W., 1
*Economic geology*
mica, Thomaston-Barnesville Dist.: Beck, W. A., 2; Clarke, J. W., 1; Heinrich, E. W., 2
mineral resources, Thomaston Quad.: Clarke, J. W., 1
*Historical geology*
Precambrian, Thomaston Quad.: Clarke, J. W., 1
*Maps*
Geologic, Thomaston Quad.: Clarke, J. W., 1
*Mineralogy*
apatite: Hurst, V. J., 18, 33
stilbite: Hurst, V. J., 13
*Petrology*
quartzite: Adams, A. A., 1
*Physical geology*
Towaliga Fault: Grant, W. H., 16
**LAUMONTITE,** *see also* Minerals
Muscogee Co.: Hurst, V. J., 7
**LAZULITE,** *see also* Minerals
Lincoln Co.: Chapman, E. J., 1; Lasaulx, A. C. P. F. von, 1; Shepard, C. U., 8; Watson, T. L., 18, 23
**LEAD,** *see also* Mineral resources, and lead-bearing minerals
Cherokee Co., Canton Mine: Shepard, C. U., 5
**LEE COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Economic geology*
limestone: Furcron, A. S., 50
*Ground water*
Lee Co.: Owen, V., Jr., 3
*Maps*
Economic, limestone: Furcron, A. S., 50
*Paleontology*
Echinoidea, Eocene: Conrad, T. A., 4; Cooke, C. W., 20
**LIBERTY COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Areas described*
Liberty Co.: Harden, J. M. B., 1
**LIGNITE,** *see also* Coal, and Mineral resources
Richmond Co., Oligocene: Lewis, H. C., 1
**LIMESTONE,** *see also* Cement, Mineral resources, and Stone
Bartow Co.: Jones, J., 8
Rome Quad.: Hayes, C. W., 18
Blue Ridge: Maynard, T. P., 2
Brooks Co.: Fortson, C. W., Jr., 1
Burke Co.: Jones, J., 1
Catoosa Co., Dalton Quad.: Munyan, A. C., 17
Chattooga Co., Rome Quad.: Hayes, C. W., 18

Coastal Plain: Brantly, J. E., 1; Jones, J., 3, 4, 10; Spencer, J. W. W., 5
Albany area: Munyan, A. C., 12
Crisp Co.: Furcron, A. S., 51
Floyd Co.: Furcron, A. S., 52
Rome Quad.: Hayes, C. W., 18
Georgia: Dennison, H. E., 1; Eckel, E. C., 5; Jones, J., 5
Gordon Co.: Stuart, A. W., 2
Rome Quad.: Hayes, C. W., 18
Lee Co.: Furcron, A. S., 50
Lowndes Co.: Fortson, C. W., Jr., 1
Murray Co., Dalton Quad.: Munyan, A. C., 17
northwestern Ga.: Butts, C., 4; Furcron, A. S., 6; Maynard, T. P., 2; Porter, J. B., 2
Piedmont: Furcron, A. S., 6; Maynard, T. P., 2; Watson, T. L., 20
Polk Co., Rome Quad.: Hayes, C. W., 18
Washington Co.: Jones, J., 2
Whitfield Co., Dalton Quad.: Munyan, A. C., 17

**LINCOLN COUNTY,** *see also* Georgia, and Georgia—Piedmont
*Areas described*
Graves Mountain area: Hurst, V. J., 36; Watkins, J. H., 4; Watson, T. L., 8
popular: Zodac, P., 1
*Economic geology*
copper: Weed, W. H., 1
Magruder Mine: Peyton, A. L., 2; Ross, C. S., 1
Seminole Mine: Watson, T. L., 11
gold, Lincoln Mine: Lincoln Gold Mining Company, 1
kyanite: Watkins, J. H., 4
novaculite: Keeney, J. C., 1
rutile: Watson, T. L., 22
titanium: Youngman, E. P., 1
*Maps*
Economic, gold: Lincoln Gold Mining Company, 1
Geologic, Graves Mountain area: Hurst, V. J., 36
*Mineralogy*
barite: Lincoln Gold Mining Company, 1
gahnite, Magruder Mine: Cofer, H. E., Jr., 4
Graves Mountain: Hurst, V. J., 36
popular: Zodac, P., 1
hematite: Watson, T. L., 18
kyanite: Johnston, W. D., Jr., 2; Muegge, O., 1; Rath, G. vom, 1; Watson, T. L., 18
lazulite: Chapman, E. J., 1; Lasaulx, A. C. P. F. von, 1; Shepard, C. U., 8; Watson, T. L., 18, 23
pyrophyllite: Jackson, C. T., 7; Shepard, C. U., 8; Watson, T. L., 18
rutile: Bement, C. S., 1; Haidinger, W. K. von, 2; Muegge, O., 2, 3; Rose, G., 1; Watson, T. L., 18
*Petrology*
hydrothermal mineralization: Johnston, W. D., Jr., 1
metamorphic rocks: Hurst, V. J., 36

**LONG COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Areas described*
Long Co.: Harden, J. M. B., 1

**LOWNDES COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Economic geology*
limestone: Fortson, C. W., Jr., 1
*Historical geology*
Oligocene-Miocene: Fortson, C. W., Jr., 1
*Physical geology*
earthquakes: Heck, N. H., 2

**LUMINESCENT MINERALS,** *see also* Minerals, and individual types
DeKalb Co.: Cofer, H. E., Jr., 5

**LUMPKIN COUNTY,** *see also* Georgia, and Georgia—Blue Ridge
*Areas described*
Ellijay Quad.: Furcron, A. S., 41; LaForge, L., 2
*Economic geology*
copper: Weed, W. H., 1
Chestatee Prospect: Kline, M. H., 1
Ellijay Quad.: LaForge, L., 2
gold: Brewer, W. M., 3; Cain, A. W., 1; Credner, H., 2; Eckel, E. C., 1, 2, 3; Jackson, C. T., 1, 5; Lindgren, W., 1; Mell, P. H., Jr., 2
Auraria Mines: Blake, W. P., 8
Battle Branch Mine: Park, C. F., Jr., 1
Chestatee Hydraulic Company Property: Blake, W. P., 2
Ellijay Quad.: LaForge, L., 2
Field Gold Vein: Blake, W. P., 5
Hendricks Vein: Blake, W. P., 7
Moore's Gold Mine: Jackson, C. T., 2
placers: Blake, W. P., 3
Singleton Lot: Southern Gold Company, 1
Standard Mines: Standard Gold Mining Company, 1
iron: Brown, W. R., 1; Dobson, C. M., 1
Ellijay Quad.: LaForge, L., 2
pyrite: Eckel, E. C., 2; Pratt, N. A., Jr., 3
Chestatee Prospect: Kline, M. H., 1
*Geophysical investigations*
magnetic survey: Brown, W. R., 1; Tucker, C. V., Jr., 1
*Ground water*
Ellijay Quad.: LaForge, L., 2
*Historical geology*
Precambrian-Cambrian Ellijay Quad.: LaForge, L., 2
*Maps*
Economic
gold: Blake, W. P., 3
Barlow Mine: Pardee, J. T., 1
Battle Branch Mine: Pardee, J. T., 1
Etowah Mine: Pardee, J. T., 1
Findley Ridge area: Pardee, J. T., 1
mineral resources, Ellijay Quad.: LaForge, L., 2
Geologic
Barlow Mine: Pardee, J. T., 1
Dahlonega area: Jones, S. P., 2
Ellijay Quad.: LaForge, L., 2
Etowah Mine area: Pardee, J. T., 1
Findley Ridge area: Pardee, J. T., 1
*Mineralogy*
bornite: Jackson, C. T., 3, 4
gahnite: Wells, R. C., 1
garnet: Richard, L. M., 1
gold: Wells, R. C., 1
gypsum: Gardner, C. H., 1
muscovite: Wells, R. C., 1
tellurbismuth: Jackson, C. T., 3

tetradymite: Blake, W. P., 5; Jackson, C. T., 3, 8; Shepard, C. U., 8
*Paleontology*
plants, Pleistocene: Eckel, E. C., 11
*Petrology*
heavy minerals: Yoho, W. H., 1
metamorphic rocks, Ellijay Quad.: Furcron, A. S., 41
schist: Watson, T. L., 1
schist-conglomerate: McCallie, S. W., 19
*Physical geology*
weathering, Dahlonega area: Jackson, C. T., 6

MACON COUNTY, *see also* Georgia, and Georgia—Coastal Plain
*Areas described*
Macon Co.: Richard, L. M., 2; Stephenson, L. W., 14
Andersonville Bauxite Dist.: Zapp, A. D., 2
*Economic geology*
bauxite, Andersonville Dist.: Beck, W. A., 3; Grumbles, G. R., 2; Watkins, J. H., 2; Zapp, A. D., 2
kaolin, Andersonville Dist.: Beck, W. A., 3
mineral resources: Richard, L. M., 2; Stephenson, L. W., 14
*Ground water*
Macon Co.: Stephenson, L. W., 14
*Historical geology*
Cretaceous-Eocene: Stephenson, L. W., 14
Eocene, Andersonville area: Grumbles, G. R., 2
Paleocene-Eocene, Andersonville area: Zapp, A. D., 2
*Maps*
Economic, bauxite, Munyan, A. C., 4; Zapp, A. D., 1, 2
Geologic, Andersonville area: Grumbles, G. R., 2; Zapp, A. D., 1, 2
*Paleontology*
Reptilia, turtle
Eocene: Cope, E. D., 2
Paleocene: Hay, O. P., 2

MAGNESIUM, *see also* magnesium-bearing minerals, and Mineral resources
Columbia Co.: Furcron, A. S., 5

MAMMALIA, *see also* Vertebrata
beaver, Chatham Co., Pleistocene: Cahn, A. R., 1
bison
Glynn Co., Pleistocene: Allen, J. A., 1; Leidy, J., 2; Lucas, F. A., 1; Owen, R., 1
McIntosh Co., Pleistocene: Lucas, F. A., 1
cetacean
Chatham Co., Pleistocene: Cope, E. D., 1
Coastal Plain, Tertiary: Harlan, R., 1
Crawford Co., Eocene: Furcron, A. S., 32
Crisp Co., Eocene: Kellogg, A. R., 1
Houston Co., Eocene: Kellogg, A. R., 1
Chatham Co., Pleistocene: Couper, J. H., 4; Habersham, J. C., 1; Hay, O. P., 3; Hodgson, W. B., 1; Lyell, C., Jr., 2
elephant
Coastal Plain, Pleistocene: Falconer, H., 1
Glynn Co., Pleistocene: Couper, J. H., 1, 2, 4; Falconer, H., 2; Hay, O. P., 3; Lyell, C., Jr., 2; Owen, R., 1
hippopotamus, Blue Ridge, Pleistocene: Moore, J., 1
hog, Glynn Co., Pleistocene: Harlan, R., 2
horse
Chatham Co., Pleistocene: Gibbes, R. W., 3; Leidy, J., 4
Glynn Co., Pleistocene: Leidy, J., 1; Owen, R., 2
mammoth, Glynn Co., Pleistocene: Leidy, J., 5, 6; Lydekker, R., 1; Osborn, H. F., 6, 14
mastodon
Bartow Co., Pleistocene: Furcron, A. S., 36
Glynn Co., Pleistocene: Owen, R., 2
sloth
Chatham Co., Pleistocene: Agassiz, L., 1; Cooper, W., 1, 2; Cuvier, G. L. C. F. D., 1; Harlan, R., 1; Hodgson, W. B., 1; Leidy, J., 3; Mitchill, S. L., 5
northwestern Ga., Pleistocene: Cope, E. D., 1
tapir, Walker Co., Pleistocene: Hitchcock, D., 1

MANGANESE, *see also* manganese-bearing minerals, and Mineral resources
Bartow Co.: Brewer, W. M., 10; Crickmay, G. W., 1; Harder, E. C., 2; Hayes, C. W., 16, 21; Kesler, T. L., 4; Miser, H. D., 5; O'Neill, J. F., 1; Penrose, R. A. F., Jr., 1, 2; Peyton, A. L., 1; Willis, B., 2; Anon., 19
popular: Crickmay, G. W., 3
Blue Ridge: Hoffman, J. N., 1; Hull, J. P. D., 2; Watson, T. L., 9, 14
Catoosa Co., Ringgold Quad.: Hayes, C. W., 7
Floyd Co.: Brewer, W. M., 10; Furcron, A. S., 52; Harder, E. C., 2
Gordon Co., Ringgold Quad.: Hayes, C. W., 7
northwestern Ga.: Butts, C., 4; Harder, E. C., 1; Hoffman, J. N., 1; Hull, J. P. D., 2; Stose, G. W., 1, 4; Watson, T. L., 9, 14
Murray Co., Dalton Quad.: Munyan, A. C., 17
Piedmont: Hoffman, J. N., 1; Hull, J. P. D., 2; Watson, T. L., 9, 14
Polk Co.: Harder, E. C., 2; Penrose, R. A. F., Jr., 2
Walker Co., Ringgold Quad.: Hayes, C. W., 7
Whitfield Co.
Dalton Quad.: Munyan, A. C., 17
Ringgold Quad.: Hayes, C. W., 7
Wilkes Co.: Beck, W. A., 1

MAPS
*Economic*
asbestos, Blue Ridge and Piedmont: Hopkins, O. B., 2
bauxite
Bartow Co.: White, W. S., 2
Coastal Plain: Shearer, H. K., 1
Floyd Co.: White, W. S., 2
Macon Co.: Munyan, A. C., 4; Zapp, A. D., 1, 2
northwestern Ga.: Watson, T. L., 10

Schley Co.: Zapp, A. D., 1, 2
Sumter Co.: Zapp, A. D., 1, 2
bloating granite, Murray Co.: Furcron, A. S., 40
clay
Twiggs Co.: Thompson, R. M., 1
Washington Co.: Central of Georgia Railway, 1; Thompson, R. M., 2
Wilkinson Co.: Warren, W. C., 1
coal
Dade Co.: Parker, E. W., 1
northwestern Ga.: Campbell, M. R., 2; Hayes, C. W., 17; Hitchcock, C. H., 4; Johnson, V. H., 1; Lesher, C. E., 1
construction material, Piedmont: McCallie, S. W., 9
feldspar
Blue Ridge-Piedmont: Galpin, S. L., 1
fuller's earth, Coastal Plain: Shearer, H. K., 1
gneiss, Piedmont: Watson, T. L., 8
gold
Blue Ridge: Jones, S. P., 2; Tatton, M., 1
Cherokee Co.
Cherokee Mine: Pardee, J. T., 1
301 Mine: Pardee, J. T., 1
Dawson Co.
Etowah Mine: Pardee, J. T., 1
Kin Mori area: Pardee, J. T., 1
Georgia: Pardee, J. T., 1
Lincoln Co.: Lincoln Gold Mining Company, 1
Lumpkin Co.: Blake, W. P., 3
Barlow Mine: Pardee, J. T., 1
Battle Branch Mine: Pardee, J. T., 1
Etowah Mine: Pardee, J. T., 1
Findley Ridge area: Pardee, J. T., 1
Piedmont: Guettard, J. E., 1; Jones, S. P., 2
White Co.
Nacoochee area: Nacoochee Hydraulic Mining Company, 1
White County Mine: Pardee, J. T., 1
gold-diamond district, Georgia: Schreiber, F., 1
granite, Piedmont: Watson, T. L., 8, 15
iron, northwestern Ga.: McCallie, S. W., 5
Macon area: Munyan, A. C., 4
kaolin, Coastal Plain
Augusta area: Munyan, A. C., 6
Macon area: Munyan, A. C., 4
kyanite
Blue Ridge: Prindle, L. M., 1
Habersham Co.: Prindle, L. M., 1
Rabun Co.: Prindle, L. M., 1
limestone
Gordon Co.: Stuart, A. W., 2
Lee Co.: Furcron, A. S., 50
metal deposits, Georgia: Pardee, J. T., 1
mica
Blue Ridge: Galpin, S. L., 1; Sterrett, D. B., 2
Piedmont: Galpin, S. L., 1; Sterrett, D. B., 2
Upson Co.: Olson, J. C., 1
mineral resources
Bartow Co., Rome Quad.: Hayes, C. W., 18
Blue Ridge: Peck, J., 1
Catoosa Co., Ringgold Quad.: Hayes, C. W., 7
Chattooga Co.
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Stevenson Quad.: Hayes, C. W., 8
Crisp Co.: Furcron, A. S., 51
Dade Co.
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
Fannin Co., Ellijay Quad.: LaForge, L., 2
Floyd Co.: Furcron, A. S., 52
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Georgia: Butts, A. G., 1
Central of Georgia Railway: Mallory, J. M., 1; Maynard, T. P., 7
Gilmer Co., Ellijay Quad.: LaForge, L., 2
Gordon Co.
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Habersham Co.: Teague, K. H., 3
Lumpkin Co., Ellijay Quad.: LaForge, L., 2
northwestern Ga.: Butts, C., 4; U. S. Geol. Survey, 1
Pickens Co., Ellijay Quad.: LaForge, L., 2
Piedmont: Peck, J., 1; U. S. Geol. Survey, 1
Polk Co.: Pinson, W. H., Jr., 1
Rome Quad.: Hayes, C. W., 18
Rabun Co.: Teague, K. H., 3
Union Co., Ellijay Quad.: LaForge, L., 2
Walker Co.
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
Whitfield Co., Ringgold Quad.: Hayes, C. W., 7
mineral springs, Georgia: Ellis, A. J., 1; McCallie, S. W., 32
monazite, Piedmont: Mertie, J. B., Jr., 2
oil and gas well sites, Coastal Plain: Jordan, L., 4
pyrite, Piedmont-Blue Ridge: Shearer, H. K., 2
sand, Coastal Plain, Macon area: Munyan, A. C., 4
sand and gravel, Georgia: Teas, L. P., 1
shale, northwestern Ga.: Veatch, J. O., 7
sillimanite-bearing rocks, Piedmont: Furcron, A. S., 12
soapstone, Blue Ridge and Piedmont: Hopkins, O. B., 2
stone
DeKalb, Gwinnett, Rockdale Cos.; Herrmann, L. A., 1
Georgia: Burchard, E. F., 5
talc, Blue Ridge and Piedmont: Hopkins, O. B., 2
vermiculite, Blue Ridge: Prindle, L. M., 1
*Facies*
Coastal Plain, Cretaceous: Applin, P. L., 2
*Geological*
Bartow Co.
Cartersville Dist.: Hull, J. P. D., 2, 3; Kesler, T. L., 4
Fairmount area: Smith, J. W., 2
Hermitage Dist.: White, W. S., 2
Rome Quad.: Hayes, C. W., 18
Blue Ridge: King, F. P., 1; Sayler, N., 1
Precambrian: Stose, G. W., 9
southern: Furcron, A. S., 10, 12

Catoosa Co.
Dalton Quad.: Munyan, A. C., 17
Ringgold Quad.: Hayes, C. W., 7
Mississippian: Windham, S. R., 2
Chattooga Co.: McCallie, S. W., 14
Pigeon Mountain: Wheeler, G. E., 1
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Stevenson Quad.: Hayes, C. W., 8
Cherokee Co.
Cartersville Dist.: Kesler, T. L., 4
Cherokee Mine area: Pardee, J. T., 1
Fairmount area: Smith, J. W., 2
Tate Quad.: Bayley, W. S., 1
301 Mine: Pardee, J. T., 1
Clayton Co., Soapstone Ridge: King, J. A., 5th, 1
Coastal Plain: Brantly, J. E., 1; Cooke, C. W., 2, 23; Prettyman, T. M., 1; Veatch, J. O., 9
Cenozoic: MacNeill, F. S., 6
Cretaceous: Buch, L. von, 1; Eargle, D. H., 2; Veatch, J. O., 7
east-central: LaMoreaux, P. E., 1
northeastern: LeGrand, H. E., 2
northern: Smith, R. W., 1
Tertiary: Heilprin, A., 1
western: Spencer, J. W. W., 5
Cobb Co., Kennesaw-Sweat Mountain area: Hurst, V. J., 2
Dade Co.: Johnson, V. H., 1; McCallie, S. W., 14; Renshaw, E. W., 1
Cedar Grove Quad.: Dicus, J. M., 1
Durham Quad.: Darling, R. W., 1
western: Clement, W. G., 1
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
Trenton area: Moore, W. H., Jr., 2
Dawson Co.
Etowah Mine area: Pardee, J. T., 1
Kin Mori area: Pardee, J. T., 1
Tate Quad.: Bayley, W. S., 1
Decatur Co., Jim Woodruff Reservoir area: Hendry, C. W., Jr., 1
DeKalb Co.
Panola Shoals area: Holland, W. A., Jr., 1
Soapstone Ridge: King, J. A., 5th, 1
Stone Mountain-Lithonia area: Herrmann, L. A., 1
Douglas Co., eastern: Schepis, E. L., 1
Fannin Co.: Van Horn, E. C., 1
Ducktown area: Emmons, W. H., 1
Ellijay Quad.: LaForge, L., 2
Mineral Bluff Quad.: Hurst, V. J., 15
Floyd Co.
Cave Spring Bauxite Dist.: White, W. S., 2
Hermitage Bauxite Dist.: White, W. S., 2
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Forsyth Co., Tate Quad.: Bayley, W. S., 1
Georgia: Beaujour, L. A. F. de, 1; Boué, A., 1, 2; Bradley, F. H., 1; Buch, L. von, 2; Cleaveland, P., 1; Credner, H., 4; Henderson, J. T., 1; Hitchcock, C. H., 1, 2, 3, 5, 6, 7, 8; Hitchcock, E., 1; Lambert, G., 1; Little, G., 2; Lobeck, A. K., 5; McCallie, S. W., 20, 24; McGee, W J, 1, 2, 3, 7; Maclure, W., 1; Marcou, J., 1, 2, 3, 4; Moxon, C., 1; Munyan, A. C., 4; Nesbitt, R. T., 1; Peyton, G., 1; Rogers, H. D., 3; Stephenson, M. F., 1; Stose, G. W., 2, 3, 5; Torbert, J. B., 1; Van Hise, C. R., 2; White, G., 1; Williams, W. T., 1; Willis, B., 5
Central of Georgia Railway: Mallory, J. M., 1; Maynard, T. P., 7
index: Boardman, A. L., 1
review: Parizek, E. J., 2
west central: Spencer, J. W. W., 1
Gilmer Co., Ellijay Quad.: LaForge, L., 2
Gordon Co.
Fairmount area: Smith, J. W., 2; Stuart, A. W., 1
Ranger area: Smith, W. L., 2
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Gwinnett Co.
Lawrenceville area: Grant, W. H., 2
Stone Mountain-Lithonia area: Herrmann, L. A., 1
Habersham Co.: Teague, K. H., 3
Hancock Co.: Fortson, C. W., Jr., 3
Haralson Co., northern: Webb, J. E., 2
Harris Co., Warm Springs Quad.: Hewett, D. F., 1
Hart Co.: Grant, W. H., 8
Lamar Co., Thomaston Quad.: Clarke, J. W., 1
Lincoln Co., Graves Mountain area: Hurst, V. J., 36
Lumpkin Co.
Barlow Mine area: Pardee, J. T., 1
Dahlonega area: Jones, S. P., 2
Ellijay Quad.: LaForge, L., 2
Etowah Mine area: Pardee, J. T., 1
Findley Ridge area: Pardee, J. T., 1
Macon Co., Andersonville area: Grumbles, G. R., 2; Zapp, A. D., 1, 2
Meriwether Co.
Warm Springs Bauxite area: White, W. S., 1
Warm Springs Quad.: Hewett, D. F., 1
Murray Co.
Calhoun Quad.: Cribb, R. E., 1
Chatsworth Talc Dist.: Furcron, A. S., 13
Dalton Quad.: Munyan, A. C., 17
northwestern Ga.: Butts, C., 4; Hayes, C. W., 2; Maynard, T. P., 2; Sayler, N., 1; Schreiber, F., 1; Smith, R. W., 7; Spencer, J. W. W., 6
Pickens Co.
Ellijay Quad.: LaForge, L., 2
Fairmount area: Smith, J. W., 2
Tate Quad.: Bayley, W. S., 1
Piedmont: King, F. P., 1; Sayler, N., 1
Atlanta area: Herrick, S. M., 4
southeastern: LeGrand, H. E., 2
Pike Co.
Thomaston Quad.: Clarke, J. W., 1
Warm Springs Quad.: Hewett, D. F., 1
Polk Co.: Pinson, W. H., Jr., 1
Cave Spring Bauxite Dist.: White, W. S., 2
Indian Mountain area: Crawford, T. J., 2
Rome Quad.: Hayes, C. W., 18
southern: Webb, J. E., 2
Rabun Co.: Teague, K. H., 3
Randolph Co.
northern: Erwin, J. W., 1
Springvale Bauxite Dist.: Clark, L. D., 1

Rockdale Co., Stone Mountain-Lithonia area: Herrmann, L. A., 1
Schley Co., Andersonville area: Grumbles, G. R., 2; Zapp, A. D., 1, 2
Seminole Co., Jim Woodruff Reservoir area: Hendry, C. W., Jr., 1
Stewart Co., Lumpkin SW Quad.: Kirkpatrick, S. R., 2
Sumter Co., Andersonville area: Grumbles, G. R., 2; Zapp, A. D., 1, 2
Talbot Co.
Thomaston Quad.: Clarke, J. W., 1
Warm Springs Quad.: Hewett, D. F., 1
Twiggs Co.: Thompson, R. M., 1
Union Co., Ellijay Quad.: LaForge, L., 2
Upson Co.
Thomaston Quad.: Clarke, J. W., 1
Warm Springs Quad.: Hewett, D. F., 1
Walker Co.: Johnson, V. H., 1; McCallie, S. W., 14; Renshaw, E. W., 1
Cedar Grove Quad.: Dicus, J. M., 1
Cooper Heights area: Moore, W. H., Jr., 2
Durham Quad.: Darling, R. W., 1
Kensington Quad., southern: Traylor, H. G., 1
Pigeon Mountain: Wheeler, G. E., 1
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
Washington Co.: Thompson, R. M., 2
Webster Co.: Furcron, A. S., 49; Owen, V., Jr., 2
White Co., White County Mine area: Pardee, J. T., 1
Whitfield Co.
Calhoun Quad.: Cribb, R. E., 1
Dalton Quad.: Munyan, A. C., 17; Sheridan, J. T., 1
Mill Creek Valley: Moore, J. B., Jr., 2
Ringgold Quad.: Hayes, C. W., 7
Wilkinson Co.: Warren, W. C., 1
*Geophysical*
earthquake epicenters, Georgia: Heck, N. H., 4
gravity
Baker Co.: McClain, D. S., Jr., 1
Coastal Plain
Bouguer anomalies: Woollard, G. P., 5
isogam, Savannah River area: Rowlands, C. E., Jr., 1
Georgia: Lyons, P. L., 1; Woollard, G. P., 3
isoseismal, Georgia: Humphreys, W. J., 2
magnetic
Coastal Plain: Swartz, J. H., 1
Georgia: Jenny, W. P., 1
radioactivity, Charlton Co.: Moxham, R. M., 1
seismic, Coastal Plain, basement configuration: Meyer, R. P., 2; Woollard, G. P., 5
*Ground water*
Chattahoochee Co., Fort Benning area: Herrick, S. M., 2
Coastal Plain
artesian wells: McCallie, S. W., 4
northeastern: LeGrand, H. E., 2
piezometric surface: Warren, M. A., 1
Georgia, mineral springs: Ellis, A. J., 1; Peale, A. C., 2
Marion Co., Fort Benning area: Herrick, S. M., 2
Muscogee Co., Fort Benning area: Herrick, S. M., 2
Piedmont
Atlanta area: Herrick, S. M., 4
southeastern: LeGrand, H. E., 2
*Isopach*
northwestern Ga.
Devonian, Chattanooga Shale: Glover, L., 1
Lower Silurian: Amsden, T. W., 1
*Lithofacies*
northwestern Ga., Lower Silurian: Amsden, T. W., 1
*Major faunal elements*
northwestern Ga., Lower Silurian: Amsden, T. W., 1
*Paleofloristic*
Pleistocene, Georgia: Harshberger, J. W., 1
*Paleogeographic*
Georgia: Matthew, W. D., 1
Cambrian: Walcott, C. D., 2
Paleozoic-Cenozoic: Schuchert, C., 3; Willis, B., 6
northwestern Ga., Cambrian-Ordovician: Grabau, A. W., 5
*Paleogeologic*
Georgia, Mississippian-Cretaceous: Levorsen, A. I., 1
*Quantitative regional variation*
Georgia: Harper, R. M., 10
*Physiographic*
Coastal Plain
Augusta area: Munyan, A. C., 6
eolian deposits: Thorp, J., 1
shore line types: McGill, J. T., 1
terraces: MacNeill, F. S., 7
Georgia: Evans, L., 1; Fenneman, N. M., 3, 4, 6; Lobeck, A. K., 1, 2, 3, 4, 7, 8; Raisz, E. J., 1, 3, 4; Volney, C. F. C., 1; Anon., 47
northwestern Ga.
deformed Cretaceous peneplain: Hayes, C. W., 5
Tertiary peneplain: Hayes, C. W., 5
Piedmont
deformed Cretaceous peneplain: Hayes, C. W., 5
Tertiary peneplain: Hayes, C. W., 5
*Soil*
Georgia: Marbut, C. F., 1
erosion: Crabb, G. A., 1; Fuller, G. L., 1
*Structural*
DeKalb Co., Stone Mountain-Lithonia area: Herrmann, L. A., 1
Georgia
basement configuration: Thom, W. T., Jr., 3
tectonic provinces: King, P. B., 2
northwestern Ga., Pennsylvanian: Wanless, H. R., 2
Rockdale Co., Stone Mountain-Lithonia area: Herrmann, L. A., 1
*Structure contour*
Coastal Plain
Cretaceous: Jordan, L., 5
Eocene: Mississippi Oil Scouts Assoc., 1; Stevens, R. E., 1
Miocene base: Prettyman, T. M., 1

**MARBLE**, *see also* Mineral resources
Blue Ridge: McCallie, S. W., 1
Catoosa Co., analysis: Clarke, F. W., 3

Cherokee Co., Tate Quad.: Bayley, W. S., 1
Dawson Co., Tate Quad.: Bayley, W. S., 1
Fannin Co., Mineral Bluff Quad.: Hurst, V. J., 15
Forsyth Co., Tate Quad.: Bayley, W. S., 1
Gilmer Co., Ellijay Quad.: LaForge, L., 2
northwestern Ga.: McCallie, S. W., 1
Pickens Co.: Wells, R. C., 1
Ellijay Quad.: LaForge, L., 2
Tate Quad.: Bayley, W. S., 1
Piedmont: McCallie, S. W., 1
structure: Prouty, W. F., 1
Union Co., Ellijay Quad.: LaForge, L., 2
Walker Co., analysis: Clarke, F. W., 4
**MARGARITE,** *see also* Minerals
Hall Co.: Clarke, F. W., 1
**MARION COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Ground water*
Fort Benning area: Herrick, S. M., 2
*Historical geology*
Cretaceous, *Exogyra cancellata* zone: Stephenson, L. W., 13
*Maps*
ground water, Fort Benning area: Herrick, S. M., 2
*Paleontology*
plants, Cretaceous: Berry, E. Wilbur, 1, 10, 14
**MARL,** *see also* Mineral resources
Coastal Plain: Brantly, J. E., 1; McCallie, S. W., 2
**McDUFFIE COUNTY,** *see also* Georgia, and Georgia—Piedmont
*Economic geology*
gold: Bruhl, P. T., 1; Fluker, W. H., 1
Columbia Mines: Fluker, W. H., 2; Hall, B. M., 4
*Petrology*
meteorites: Merrill, G. P., 3
**McINTOSH COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Economic geology*
ilmenite: Martens, J. H. C., 1
*Paleontology*
Mammalia, Pleistocene: Lucas, F. A., 1
**MERIWETHER COUNTY,** *see also* Georgia, and Georgia—Piedmont
*Areas described*
Pine Mountain area, popular: Crickmay, G. W., 6
Warm Spring Quad.: Hewett, D. F., 1
*Economic geology*
bauxite: Munyan, A. C., 2; White, W. S., 1
*Ground water*
Warm Springs Quad.: Hewett, D. F., 1
North Spring.: Grover, N. C., 2
Warm Springs: Hall, M. R., 2; Salomon-Calvi, W., 1; Stearns, N. D., 1; Watson, T. L., 24; Weed, W. H., 2
*Historical geology*
Paleozoic, Hollis Quartzite: Adams, G. I., 5
Precambrian-Cenozoic, Warm Springs Quad.: Hewett, D. F., 1
*Maps*
Geologic
Warm Springs Bauxite area: White, W. S., 1
Warm Springs Quad.: Hewett, D. F., 1
*Petrology*
itacolumite: Grant, W. H., 5
*Physiographic geology*
Pine Mountain: Adams, G. I., 5
**MESOZOIC,** *see also* individual periods
Coastal Plain: Reeside, J. B., Jr., 1; Richards, H. G., 11; Rogers, H. D., 5
Georgia: King, P. B., 6, 8; McCallie, S. W., 35; Richards, H. G., 10; Schuchert, C., 3, 4; Willis, B., 6
Appalachia: Nelson, W. A., 1
popular: Furcron, A. S., 21
**METAMORPHIC ROCKS,** *see also* individual types, and Stone
Blue Ridge: Crickmay, G. W., 25; Moneymaker, B. C., 1
Clarke Co.: Parizek, E. J., 8
Dawson Co., Ellijay Quad.: Furcron, A. S., 41
Fannin Co., Ellijay Quad.: Furcron, A. S., 41
Gilmer Co., Ellijay Quad.: Furcron, A. S., 41
Hart Co.: Grant, W. H., 8
Lincoln Co.: Hurst, V. J., 36
Lumpkin Co.
Ellijay Quad.: Furcron, A. S., 41
schist conglomerate: McCallie, S. W., 19
Pickens Co., Ellijay Quad.: Furcron, A. S., 41
Piedmont: Crickmay, G. W., 25; Hayes, C. W., 13
Union Co., Ellijay Quad.: Furcron, A. S., 41
**METAMORPHISM,** *see also* Physical geology
Blue Ridge-Piedmont: Jonas, A. I., 1
**METEORITES**
Burke Co.: Leonard, F. C., 3
Chattooga Co.: Brezina, A., 5; Clarke, F. W., 4; Cohen, E. W., 1; Henderson, E. P., 3, 5; Huntington, O. W., 2; Whitfield, J. E., 1
Cherokee Co.: Clarke, F. W., 4; Flight, W., 1; Howell, E. E., 1; Meunier, S., 1; Saltpeter, E. W., 1; Shepard, C. U., 10, 11
Emmanuel Co.: Henderson, E. P., 4
Georgia: Brezina, A., 2, 6; British Museum, 1; Farrington, O. C., 1, 2, 4, 5, 6; Fletcher, L., 1; Furcron, A. S., 17; Henderson, E. P., 4; Huntington, O. W., 1; LaPaz, L., 1; Leonard, F. C., 1, 2, 5; Merrill, G. P., 5; Nininger, A. D., 1; Perry, S. H., 1; Prior, G. T., 1; Reeds, C. A., 2; Semsey, A. von, 1; Servos, K., 1; Ward, H. A., 1; Washington, H. S., 1; Wuelfing, E. A., 1
popular: Crickmay, G. W., 8
Henry Co.: Cohen, E. W., 1, 4, 5; Fireman, E. L., 1
Jenkins Co.: Henderson, E. P., 1; Leonard, F. C., 3
McDuffie Co.: Merrill, G. P., 3
Monroe Co.: Beall, E., 1; Buchner, C. L. O., 2; Dana, E. S., 2; Goebel, A., 1; Haidinger, W. K. von, 1; Hamilton, S. H., 1; Hoff, K. E. A. von, 1; Paris Museum, 1; Partsch, P. M., 1; Reichenbach, K. F. von, 2, 3; Rose, G., 2; Shepard, C. U., 3; Silliman, B., Sr., 1; Warden, D. B., 1

Oglethorpe Co.: Henderson, E. P., 3; Leonard, F. C., 4; Roy, S. K., 2
Paulding Co.: Watson, T. L., 19
Pickens Co.: McCallie, S. W., 23; Wahl, W., 1
Polk Co.: Goldberg, E. D., 1; Perry, S. H., 2
Pulaski Co.: Henderson, E. P., 4
Putnam Co.: Brezina, A., 3; Buchner, C.L.O., 1, 2; Cohen, E. W., 2; Coulson, A. L., 1; Dana, E. S., 2; Harris, E. P., 1; Rammelsberg, K. F., 1; Reichenbach, K. F., von, 1, 2, 3; Rose, G., 2, 3; Saltpeter, E. W., 1; Willet, J. E., 1
Stewart Co.: Ahrens, L. H., 1; Cohen, E. W., 1; Flight, W., 1; Pinson, W. H., Jr., 2; Saltpeter, E. W., 1; Smith, J. L., 2; Willet, J. E., 2
Union Co.: Buchner, C. L. O., 1, 2; Coulson, A. L., 1; Dana, E. S., 2; Harris, E. P., 1; Meunier, S., 1, 2; Paris Museum, 1; Reichenbach, K. F. von, 1; Rose, G., 2, 3; Saltpeter, E. W., 1; Shepard, C. U., 4
Walton Co.: Henderson, E. P., 2, 3; McCallie, S. W., 39
Whitfield Co.: Brezina, A., 1, 4; Cohen, E. W., 1, 2; Coulson, A. L., 1; Flight, W., 1; Hamilton, S. H., 1; Hidden, W. E., 1; Kunz, G. F., 1, 2; Leonard, F. C., 6; Merrill, G. P., 6; Meunier, S., 1, 2; Paris Museum, 1; Saltpeter, E. W., 1; Shepard, C. U., 14
Wilcox Co.: Leonard, F. C., 6; McCallie, S. W., 37

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Blue Ridge: Furcron, A. S., 7; Galpin, S. L., 1; Peyton, G., 3; Smith, R. W., 5
Cherokee Co.: Beck, W. A., 2
Elbert Co.: Griffitts, W. R., 1
Fannin Co.: Hurst, V. J., 26
Hart Co.: Grant, W. H., 8; Griffitts, W. R., 1; Teague, K. H., 1
Lamar Co.: Beck, W. A., 2
Thomaston-Barnesville Dist.: Heinrich, E. W., 2
Thomaston Quad.: Clarke, J. W., 1
Monroe Co.: Beck, W. A., 2
Thomaston-Barnesville Dist.: Heinrich, E. W., 2
Piedmont: Furcron, A. S., 7; Galpin, S. L., 1; Heinrich, E. W., 1; Jahns, R. H., 2; Parker, J. M., 3d, 1; Peyton, G., 3; Smith, R. W., 5; Sterrett, D. B., 2; Watts, A. S., 1
physical properties: Jahns, R. H., 1
Pike Co., Thomaston Quad.: Clarke, J. W., 1
Talbot Co., Thomaston Quad.: Clarke, J. W., 1
Upson Co.: Beck, W. A., 2; Olson, J. C., 1
inclusions: Lester, J. G., 3
Thomaston-Barnesville Dist.: Heinrich, E. W., 2
Thomaston Quad.: Clarke, J. W., 1

**MIGMATITE,** *see also* Igneous rocks, and Metamorphic rocks
DeKalb Co.: Navarre, A. T., 2

**MINERAL RESOURCES,** *see also* individual materials
Bartow Co.: Cunyus, L. J., 1
Blue Ridge: Dieffenbach, O., 1; Ga. Inst. Tech. Indus. Econ. Res. Staff, 1; Hunter, C. E., 4
Burke Co.: Cotting, J. R., 2
Cherokee Co., Tate Quad.: Bayley, W. S., 1
Coastal Plain, Macon area: Munyan, A. C., 4
Dade Co.: Gildersleeve, B., 1
Dawson Co., Tate Quad.: Bayley, W. S., 1
Floyd Co.: Furcron, A. S., 52
Rome area: Ga. Inst. Tech. Indus. Econ. Res. Staff, 2
Forsyth Co., Tate Quad.: Bayley, W. S., 1
Georgia: Ballagh, J. C., 1; Behre, C. H., Jr., 1; Bevan, A. C., 2; Brewer, W. M., 1; Crickmay, G. W., 23; DeBow, J. D. B., 1, 2; Dieffenbach, O., 2; Furcron, A. S., 25; Harper, R. M., 12; Hayes, C. W., 25; Henderson, J. T., 1; Janes, T. P., 1; Laurence, R. A., 1; Little, G., 1, 3; Lloyd, S. J., 1; McCallie, S. W., 8, 26, 38; Meade, R. K., 1; Middleton, G., 1; Morton, P. C., 1; Nesbitt, R. T., 1; Peyton, G., 6; Pratt, J. H., 3; Sanford, S., 1; Sell, E. S., 1; Shaler, N. S., 1; Simmons, W. W., 1; Smock, J. C., 1; Snyder, F. G., 1; Spencer, J. W. W., 1; Stephenson, M. F., 1; Stevens, O. B., 1; Watkins, E. J., 1; White, G., 1; Williams, A., Jr., 1
Central of Georgia Railway: Maynard, T. P., 7
East Tennessee, Virginia, and Georgia Railway: Colton, H. E., 2
metals: Emmons, S. F., 1
popular: Furcron, A. S., 2; McCallie, S. W., 29
Seaboard Airline Railway: Calhoun, F. H. H., 2
Gwinnett Co.: Flanigan, J. C., 1
Macon Co.: Richard, L. M., 2; Stephenson, L. W., 14
northwestern Ga.: Brewer, W. M., 11; Burns, J. A., 1; Munyan, A. C., 15; Spencer, J. W. W., 6
Chattanooga area: Wilder, J. T., 1
Pickens Co., Tate Quad.: Bayley, W. S., 1
Piedmont: Brewer, W. M., 6; Dieffenbach, O., 1; Hunter, C. E., 4
Macon area: Munyan, A. C., 4
Pike Co.: Whatley, E. T., 1
Polk Co.: Pinson, W. H., Jr., 1; Spencer, J. W. W., 5
Richmond Co.: Cotting, J. R., 2

**MINERALS,** *see also* individual species
Blue Ridge: Blake, W. P., 4
Catalog of Georgia minerals: Crickmay, G. W., 24; Dana, E. S., 3; Robinson, S., 1
Fannin Co., Ducktown area: Blakemore, P. B., Jr., 1
Georgia
gems: Sinkankas, J., 1
popular: Hawkins, A. C., 1
Indian artifacts: Furcron, A. S., 18
Piedmont: Blake, W. P., 4
Troup Co.: Smith, L. P., 2

**MIOCENE,** *see also* Cenozoic, and Tertiary
Brooks Co.: Fortson, C. W., Jr., 1

Coastal Plain: Cooke, C. W., 19; Gardner, J. A., 1; Heilprin, A., 1; Maury, C. J., 1; Pumpelly, R., 2; Richards, H. G., 14; Sloan, E., 2
Chattahoochee River: Langdon, D. W., Jr., 1
east central: LaMoreaux, P. E., 2
Waycross area: Munyan, A. C., 8
Decatur Co.: Cooke, C. W., 4; Dall, W. H., 3, 4; Foerste, A. F., 3, 4; Hendry, C. W., Jr., 1; Pumpelly, R., 2
Effingham Co.
Marks Head Marl: Gardner, J. A., 2
Porters Landing: Vaughan, T. W., 7
Lowndes Co.: Fortson, C. W., Jr., 1
Seminole Co., southern: Hendry, C. W., Jr., 1
Washington Co.: LaMoreaux, P. E., 1
Webster Co.: Owen, V., Jr., 2
**MISSISSIPPIAN,** *see also* Paleozoic
Catoosa Co., Ringgold Quad.: Hayes, C. W., 7; Windham, S. R., 2
Chattooga Co.
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Dade Co.: Moore, W. H., Jr., 2; New England Company, 1
Cedar Grove Quad.: Dicus, J. M., 1
Cloudland Canyon Park: Croft, M. G., 1
Durham Quad.: Darling, R. W., 1
western: Clement, W. G., 1
reef: Owen, V., Jr., 1
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
Floyd Co.
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Georgia, paleogeology: Levorsen, A. I., 1
northwestern Ga.: Burns, J. A., 1; Butts, C., 4; Hayes, C. W., 2, 4; McCutchen, A. R., 1; Marquis, U. C., 1; Olson, E. C., 1; Rigney, H. W., 1; Stevenson, J. J., 2; Stockdale, P. B., 1; Sullivan, J. W., 1; Weller, J. M., 1
Fort Payne Chert: Hurst, V. J., 3
Polk Co.: Pinson, W. H., Jr., 1; Spencer, J. W. W., 5
Indian Mountain area: Crawford, T. J., 2
Walker Co.: Moore, W. H., Jr., 2
Cedar Grove Quad.: Dicus, J. M., 1
Durham Quad.: Darling, R. W., 1
Kensington Quad.: Traylor, H. G., 1
Ringgold Quad.: Hayes, C. W., 7
Whitfield Co., Ringgold Quad.: Hayes, C. W., 7
**MITCHELL COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Historical geology*
Triassic: Richards, H. G., 7
*Paleontology*
Echinoidea, Eocene: Cooke, C. W., 20
*Physiographic geology*
karst topography: Herrick, S. M., 3
**MOLLUSCA,** *see also* Invertebrata, and individual classes
Chatham Co., Pleistocene: Habersham, J. C., 1
Coastal Plain
Cretaceous: Richards, H. G., 17
Eocene: Pierson, R. E., 1; Richards, H. G., 16
Miocene: Richards, H. G., 14
Oligocene: Richards, H. G., 15
Paleocene: Richards, H. G., 16
Pleistocene: Richards, H. G., 12
Pliocene: Richards, H. G., 13
Tertiary: Conrad, T. A., 1; Meriwether, D., 2
Wayne Co., Pliocene: Aldrich, T. H., 1
**MONAZITE,** *see also* Heavy minerals, and Mineral resources, and Sand
Coastal Plain: Dryden, A. L., Jr., 2; Mertie, J. B., Jr., 2; Overstreet, W. C., 1; Twenhofel, W. S., 1
popular: Jones, W., 1
Crawford Co.: Fortson, C. W., Jr., 2
Hall Co.: Sterrett, D. B., 1
Piedmont: Mertie, J. B., Jr., 2; Overstreet, W. C., 1
Rabun Co.: Sterrett, D. B., 1
**MONROE COUNTY,** *see also* Georgia, and Georgia—Piedmont
*Economic geology*
mica: Beck, W. A., 2
Thomaston-Barnesville Dist.: Heinrich, E. W., 2
*Mineralogy*
cordierite: Hurst, V. J., 20
*Petrology*
coronites: Hurst, V. J., 35
meteorites: Beall, E., 1; Buchner, C. L. O., 2; Dana, E. S., 2; Goebel, A., 1; Haidinger, W. K. von, 1; Hamilton, S. H., 1; Hoff, K. E. A. von, 1; Paris Museum, 1; Partsch, P. M., 1; Reichenbach, K. F. von, 2, 3; Rose, G., 2; Shepard, C. U., 3; Silliman, B., Sr., 1; Warden, D. B., 1
**MONTMORILLONITE,** *see also* Clay, Mineral resources, and Minerals
Decatur Co.: Kerr, P. F., 2
**MORGAN COUNTY,** *see also* Georgia, and Georgia—Piedmont
*Mineralogy*
spinel: Hurst, V. J., 12
*Physical geology*
soil erosion rates: Fuller, G. L., 2
**MURRAY COUNTY,** *see also* Georgia, Georgia—Blue Ridge, and Georgia—Northwestern
*Areas described*
Calhoun Quad., northern: Cribb, R. E., 1
Dalton Quad.: Munyan, A. C., 17
*Economic geology*
bloating granite: Furcron, A. S., 40
mineral resources, Dalton Quad.: Munyan, A. C., 17
slate: Shearer, H. K., 3
talc: Brewer, W. M., 8; Furcron, A. S., 13; Teague, K. H., 2, 4
popular: Crickmay, G. W., 21
*Historical geology*
Cambrian-Ordovician
Calhoun Quad., northern: Cribb, R. E., 1
Dalton Quad.: Munyan, A. C., 17
Ordovician: Kellberg, J. M., 3
Blackford Breccia: Jackson, L. E., Jr., 1
Tertiary, Dalton Quad.: Munyan, A. C., 17
*Maps*
Economic, bloating granite: Furcron, A. S., 40
Geologic

Calhoun Quad., northern: Cribb, R. E., 1
Chatsworth Talc Dist.: Furcron, A. S., 13
Dalton Quad.: Munyan, A. C., 17
*Paleontology*
Graptolithina, Ordovician: Decker, C. E., 1
*Petrology*
oolites, Knox Formation: Furcron, A. S., 42
**MUSCOGEE COUNTY,** *see also* Georgia, and Georgia—Coastal Plain, and Georgia—Piedmont
*Economic geology*
sand: Burchard, E. F., 4
*Ground water*
Fort Benning area: Herrick, S. M., 2
*Historical geology*
Pliocene, Lafayette Gravel: Smith, E. A., 1
*Maps*
ground water, Fort Benning area: Herrick, S. M., 2
*Mineralogy*
epistilbite: Hurst, V. J., 7
laumontite: Hurst, V. J., 7
*Paleontology*
plants, Cretaceous: Berry, E. W., 10
*Physical geology*
sandstone dikes: McCallie, S. W., 12
**MUSCOVITE,** *see also* Mica, and Minerals
Lumpkin Co.: Wells, R. C., 1
**MYLONITE,** *see also* Faults and faulting, and Strucutral geology
Piedmont: Crickmay, G. W., 4
Union Co.: Crickmay, G. W., 4
**NATURAL GAS,** *see also* Mineral resources, and individual types of gas
Coastal Plain: Harris, R. M., 1, 2; Holden, F. T., 1; Peyton, G., 4; Rinehart Oil News Company, 1; Vernon, R. O., 2
well sites: Jordan, L., 4
Stewart Co.: St. John, F. B., Jr., 1
**NAUTILOIDEA,** *see* Cephalopoda
**NICKEL,** *see also* nickel-bearing minerals, and Mineral resources
Georgia, geochemical investigations: Navarre, A. T., 3
**NITRATE,** *see also* nitrate-bearing minerals, and Mineral resources
Dade Co.: Cornelius, E., 1
**NOVACULITE,** *see also* Mineral resources
Lincoln-Oglethorpe Cos.: Keeney, J. C., 1
**OCHER,** *see also* Mineral resources
Bartow Co.: Couper, R. H., 1; Haney, M., 1; Hayes, C. W., 16, 22; Kesler, T. L., 1; McCallie, S. W., 25, 31; Santmyers, R. M., 1; Tufft, H. E., 1; Watson, T. L., 12, 13; Weigel, W. M., 1; Wilson, H., 1
popular: Crickmay, G. W., 3
Dade Co.: Burchard, E. F., 2
northwestern Ga.: Butts, C., 4; McCutchen, A. R., 1
**OGLETHORPE COUNTY,** *see also* Georgia, and Georgia—Piedmont
*Economic geology*
gold: Fosbrooke, S. H., 1
novaculite: Keeney, J. C., 1
*Petrology*
meteorites: Henderson, E. P., 3; Leonard, F. C., 4; Roy, S. K., 2
**OLIGOCENE,** *see also* Cenozoic, and Tertiary
Brooks Co.: Fortson, C. W., Jr., 1
Coastal Plain: Applin, E. E. R., 1; Cooke, C. W., 7, 8, 16, 19; Douvillé, J. H. F., 1; MacNeill, F. S., 2; Maury, C. J., 1; Pumpelly, R., 2; Richards, H. G., 15
Chattahoochee River: Langdon, D. W., Jr., 1
east-central: LaMoreaux, P. E., 2
foraminiferal zones: McLean, J. D., Jr., 2
Glendon Limestone: Cooke, C. W., 6
southeastern: Applin, P. L., 1
southwestern: MacNeill, F. S., 4
Decatur Co.: Cooke, C. W., 4; Dall, W. H., 4; Foerste, A. F., 4; Hendry, C. W., Jr., 1; Pumpelly, R., 2
Effingham Co., Porters Landing: Vaughan, T. W., 7
Lowndes Co.: Fortson, C. W., Jr., 1
Randolph Co.: Erwin, J. W., 1
Richmond Co.: Lewis, H. C., 1
Seminole Co., southern: Hendry, C. W., Jr., 1
Washington Co.: LaMoreaux, P. E., 1
Webster Co.: Owen, V., Jr., 2
**OLIVINE,** *see also* Minerals
Blue Ridge: Smith, R. W., 3
Rabun-Towns Cos.: Hunter, C. E., 3
**OOLITES,** *see also* Limestone, and Sedimentary structures
Catoosa Co., Mississippian: Ingram, F. T., 1
Murray Co., Knox Formation: Furcron, A. S., 42
Walker Co., Mississippian: Ingram, F. T., 1
**ORDOVICIAN,** *see also* Paleozoic
Blue Ridge: Elliott, J. B., 1
Catoosa Co.: Murphy, R. E., Jr., 1; Vogdes, A. W., 1
Dalton Quad.: Munyan, A. C., 17
Knox Group: Allen, A. T., Jr., 4
Ringgold Quad.: Hayes, C. W., 7
Chattooga Co.
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Coastal Plain: Bridge, J., 2; Herrick, S. M., 6
Dade Co.: New England Company, 1
Cedar Grove Quad.: Dicus, J. M., 1
Durham Quad.: Darling, R. W., 1
western: Clement, W. G., 1
Lookout Valley: Ingram, F. T., 2
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
Floyd Co.
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Gordon Co.
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
northwestern Ga.: Allen, A. T., Jr., 7; Burns, J. A., 1; Butts, C., 4; Cooper, G. A., 3; Grabau, A. W., 3, 5; Hayes, C. W., 2, 4; Stose, G. W., 9; Sullivan, J. W., 1; Twenhofel, W. H., 2; Ulrich, E. O., 2; Vest, E. L., Jr., 1

bentonite: Kay, G. M., 1; Rosenkrans, R. R., 1
boundary: Ulrich, E. O., 3
chert: Windham, S. R., 1
Murray Co.: Kellberg, J. M., 3
Calhoun Quad.: Cribb, R. E., 1
Dalton Quad.: Munyan, A. C., 17
Blackford Breccia: Jackson, L. E., Jr., 1
Piedmont: Elliott, J. B., 1
Polk Co.: Hayes, C. W., 6; Pinson, W. H., Jr., 1; Spencer, J. W. W., 5
Indian Mountain area: Crawford, T. J., 2
Rome Quad.: Hayes, C. W., 18
Walker Co.
Cedar Grove Quad.: Dicus, J. M., 1
Durham Quad.: Darling, R. W., 1
Kensington Quad.: Traylor, H. G., 1; Wright, D. C., 2
Ringgold Quad.: Hayes, C. W., 7
Whitfield Co.: Vogdes, A. W., 1
Calhoun Quad.: Cribb, R. E., 1
Dalton Quad.: Munyan, A. C., 17
Blackford Breccia: Jackson, L. E., Jr., 1
Holston Formation: Sheridan, J. T., 1
Mill Creek Valley: Moore, J. B., Jr., 2
red beds: Moore, J. B., Jr., 1
Ringgold Quad.: Hayes, C. W., 7

**OSTRACODA,** *see also* Invertebrata
Catoosa Co., Ordovician: Gould, J. C., 1
Coastal Plain, Cretaceous: Howe, H. van W., 4
Early Co., Paleozoic: Swartz, F. M., 1
Floyd Co., Silurian: Ulrich, E. O., 5
Richmond Co., Eocene: Murray, G. E., Jr., 1
Walker Co., Ordovician: Gould, J. C., 1

**OYSTERS,** *see* Pelecypoda

**OZARKIAN PERIOD**
northwestern Ga.: Ulrich, E. O., 2

**PAGODITE,** *see also* Minerals
Wilkes Co.: Shepard, C. U., 13

**PALEOBOTANY,** *see also* Algae, Diatomaceae, and Paleontology
Bibb Co., Eocene: Berry, E. W., 12
Chatham Co., diatoms, Pleistocene: Bailey, J. W., 1
Chattahoochee Co., Cretaceous: Berry, E. Wilbur, 1, 10
Clarke Co., algae and diatoms, Pleistocene: Bailey, J. W., 2
Clay Co., Eocene: Berry, E. W., 8
Coastal Plain
Cretaceous: Barghoorn, E. S., 1; Berry, E. W., 5, 6, 14
Eocene: Berry, E. W., 4, 5, 15, 17
Paleozoic: Schopf, J. M., 1
Pleistocene
algae: Bailey, J. W., 2
diatoms: Bailey, J. W., 2; Flint, R. F., 1
Tertiary, floral zones: Berry, E. W., 3, 11
Columbia Co., Eocene: Berry, E. W., 2, 12
Dade Co., Pennsylvanian: Abbott, M. L., 1; Lesquereux, L., 1; White, C. D., 3
Floyd Co., spore, Cambrian: Furcron, A. S., 37
Georgia
Cretaceous-Quaternary: Harshberger, J. W., 1
Pleistocene: Berry, E. Willard, 1
Glynn Co., diatoms, Pleistocene: Bailey, J. W., 1
Houston Co., Cretaceous: Berry, E. Wilbur, 1, 10, 14
Lumpkin Co., tree, Pleistocene: Eckel, E. C., 11
Marion Co., Cretaceous: Berry, E. Wilbur 1, 10, 14
Muscogee Co., Cretaceous: Berry, E. W., 10
northwestern Ga., Pennsylvanian: Allen, A. T., Jr., 5; Butts, C., 4
Polk Co., Tertiary: Cloud, P. E., Jr., 1
Walker Co., Pennsylvanian: Lesquereux, L., 1

**PALEOCENE,** *see also* Cenozoic, Eocene, and Tertiary
Bibb Co., Macon area: Cooke, C. W., 5
Coastal Plain: Applin, E. E. R., 1; Applin, P. L., 1; Clark, W. B., 1; Harris, G. D., 5; Loeblich, A. R., Jr., 1; Richards, H. G., 16; Stephenson, L. W., 5
Clayton Formation: Herrick, S. M., 7
Macon Co.: Stephenson, L. W., 14; Zapp, A. D., 2
Randolph Co.: Erwin, J. W., 1
Schley Co., Andersonville area: Zapp, A. D., 2
Stewart Co., Lumpkin SW Quad.: Kirkpatrick, S. R., 2
Sumter Co., Andersonville area: Zapp, A. D., 2
Webster Co.: Owen, V., Jr., 2

**PALEOECOLOGY**
Coastal Plain, flora: Barghoorn, E. S., 1
Cretaceous, belemnoids: Dorsey, G. E., 1

**PALEONTOLOGY**
Georgia schools: Lipps, E. L., 1
*Cambrian*
Archaeocyatha, Bartow Co.: Kesler, T. L., 6; Okulitch, V. J., 1
Brachiopoda
Bartow Co.: Walcott, C. D., 4, 9
Floyd Co.: Walcott, C. D., 4, 9
northwestern Ga.: Resser, C. E., 3
Walker Co.: Walcott, C. D., 5
faunal facies: Balk, C. L., 1
Invertebrata
northwestern Ga.: Allen, A. T., Jr., 5
Polk Co., Indian Mountain area: Crawford, T. J., 2
Porifera, Floyd Co.: Munyan, A. C., 16; Walcott, C. D., 12
spore, Floyd Co.: Furcron, A. S., 37
Trilobitimorpha
Bartow Co.: Resser, C. E., 5; Walcott, C. D., 8
Floyd Co.: Resser, C. E., 2; Walcott, C. D., 10, 11
northwestern Ga.: Resser, C. E., 3; Salter, J. W., 1
Whitfield Co.: Walcott, C. D., 10
*Cenozoic*
Echinoidea, Coastal Plain: Twitchell, M. W., 1
Invertebrata, Coastal Plain: Veatch, J. O., 9
Vertebrata, Coastal Plain: Veatch, J. O., 9

*Cretaceous*
Anthozoa
Quitman Co.: Stephenson, L. W., 8; Wells, J. W., 1
Stewart Co.: Wells, J. W., 1
Belemnoidea
Coastal Plain, paleoecology: Dorsey, G. E., 1
Washington Co.: Morton, S. G., 1, 2
Cephalopoda, Clay Co.: Gabb, W. M., 1
Crustacea, Stewart Co.: Rathbun, M. J., 1
Echinoidea
Clay Co.: Clark, W. B., 3; Cooke, C. W., 24
Decatur Co.: Cooke, C. W., 24
Foraminifera
Clinch Co.: Applin, E. E. R., 3
Coastal Plain: Applin, E. E. R., 2; Applin, P. L., 1; Cushman, J. A., 10, 11; Herrick, S. M., 1
Early Co.: Applin, E. E. R., 3
Echols Co.: Applin, E. E. R., 3
Pierce Co.: Cushman, J. A., 10
Gastropoda, Clay Co.: Gabb, W. M., 1
Invertebrata, Coastal Plain: Bassler, R. S., 1; McCallie, S. W., 20; Richards, H. G., 5; Veatch, J. O., 9
microfossils, Coastal Plain: Howe, H. van W., 3
Mollusca
Chattahoochee Co.: Stephenson, L. W., 18
Coastal Plain: Richards, H. G., 5, 17
Ostracoda, Coastal Plain: Howe, H. van W., 4
Pelecypoda
Clay Co.: Gabb, W. M., 1
Coastal Plain: Stephenson, L. W., 4; White, C. A., 2
Dougherty Co.: Richards, H. G., 5
Quitman Co.: Gabb, W. M., 1
Stewart Co.: Gabb, W. M., 1
Pisces, Coastal Plain: Richards, H. G., 20
plants
Chattahoochee Co.: Berry, E. Wilbur, 1, 10
Coastal Plain: Berry, E. W., 5, 6, 14
Houston Co.: Berry, E. Wilbur, 1, 10, 14
Marion Co.: Berry, E. Wilbur, 1, 10, 14
Muscogee Co.: Berry, E. W., 10
Reptilia
Coastal Plain: Cope, E. D., 3; Gibbes, R. W., 4
Stewart Co.: Hay, O. P., 2
Vertebrata, Coastal Plain: Veatch, J. O., 9
*Devonian*
conodonts, northwestern Ga.: Glover, L., 2
Floyd Co., fauna: Schuchert, C., 1
Invertebrata, northwestern Ga.: Allen, A. T., Jr., 5
Polk Co., Frog Mountain Sandstone: Hayes, C. W., 6
*Eocene*
Anthozoa
Burke Co.: Lonsdale, W., 1
Decatur Co.: Vaughan, T. W., 1
Screven Co.: Lonsdale, W., 1; Milne-Edwards, H., 1; Vaughan, T. W., 1
Brachiopoda, Dougherty Co.: Dall, W. H., 2
Bryozoa
Coastal Plain: Canu, F., 1, 2
Crawford Co.: Canu, F., 1
Decatur Co.: Canu, F., 1
Cephalopoda, Coastal Plain: Miller, A. K., 2
Coastal Plain, fauna: Cooke, C. W., 2, 3
Echinodermata, Burke-Worth Cos.: Howe, H. van W., 2
Echinoidea
Baker Co.: Conrad, T. A., 4
Coastal Plain: Clark, W. B., 3; Cooke, C. W., 21, 25; Desor, E., 1; Say, T., 1
Decatur Co.: Cooke, C. W., 20
Lee Co.: Conrad, T. A., 4; Cooke, C. W., 20
Mitchell Co.: Cooke, C. W., 20
Screven Co.: Lyell, C., Jr., 4
Washington Co.: Stefanini, G., 1
Foraminifera
Coastal Plain: Applin, E. E. R., 2; Applin, P. L., 1; Cole, W. S., 3; Cushman, J. A., 1, 2, 3, 5, 7, 12; McLean, J. D., Jr., 1
Crawford Co.: Cushman, J. A., 4
Decatur Co.: Cushman, J. A., 4; Douvillé, J. H. F., 2; Vaughan, T. W., 13
Houston Co.: Cushman, J. A., 7
Jenkins Co.: Cushman, J. A., 4, 6
Richmond Co.: Cushman, J. A., 8
Washington Co.: Cushman, J. A., 9
Gastropoda
Burke Co.: Lyell, C., Jr., 4
Clay Co.: Harris, G. D., 3
Coastal Plain: Bowles, E. O., 1; Conrad, T. A., 4; Dall, W. H., 2; Stenzel, H. B., 1
Richmond Co.: Dall, W. H., 5, 7
Invertebrata
Decatur Co.: Couper, J. H., 3
Effingham Co.: Meriwether, D., 1
Mammalia
Crawford Co.: Furcron, A. S., 32
Crisp Co.: Kellogg, A. R., 1
Houston Co.: Kellogg, A. R., 1
Mollusca, Coastal Plain: Cooke, C. W., 8; Pierson, R. E., 1; Richards, H. G., 16
Ostracoda, Richmond Co.: Murray, G. E., Jr., 1
Pelecypoda
Burke Co.: Howe, H. van W., 1
Clay Co.: Harris, G. D., 3
Coastal Plain: Dall, W. H., 2; Gardner, J. A., 5; Harris, G. D., 6, 7; Tucker, H. I., 1; White, C. A., 2
Pisces
Twiggs Co.: Dunkle, D. H., 1
Washington Co.: Gibbes, R. W., 1
plants
Bibb Co.: Berry, E. W., 12
Coastal Plain: Berry, E. W., 5, 15, 17
Columbia Co.: Berry, E. W., 2, 12
Reptilia, Macon Co.: Cope, E. D., 2
seed, Clay Co.: Berry, E. W., 8
*Miocene*
Effingham Co., Marks Head Marl: Gardner, J. A., 2
Gastropoda
Coastal Plain: Dall, W. H., 2
Glynn Co.: Conrad, T. A., 5
Mollusca
Coastal Plain: Richards, H. G., 14
Decatur Co.: Gardner, J. A., 3
Pelecypoda, Coastal Plain: Dall, W. H., 2; Mansfield, W. C., 1; Tucker, H. I., 1

*Mississippian*
Blastoidea
Catoosa Co.: Allen, A. T., Jr., 3
Dade Co.: Schuchert, C., 2
Brachiopoda, Catoosa Co.: Arden, D. D., Jr., 2
Bryozoa, northwestern Ga.: Condra, G. E., 1
Cephalopoda, Floyd Co.: Miller, A. K., 1
Invertebrata
Catoosa Co.: Windham, S. R., 2
northwestern Ga.: Allen, A. T., Jr., 5
Polk Co., Indian Mountain area: Crawford, T. J., 2
*Oligocene*
Anthozoa
Coastal Plain: Vaughan, T. W., 10
Decatur Co.: McGlamery, W., 1; Squires, D. F., 1; Vaughan, T. W., 2, 10
Crustacea, Decatur Co.: Rathbun, M. J., 1
Echinoidea
Baker Co.: Bouvé, T. T., 1
Coastal Plain: Bouvé, T. T., 2; Clark, W. B., 3; Cooke, C. W., 21, 25
Foraminifera, Coastal Plain: Applin, E. E. R., 2; Applin, P. L., 1; Cushman, J. A., 2; McLean, J. D., Jr., 2
Invertebrata, Decatur Co.: Cooke, C. W., 6
Mollusca
Coastal Plain: Cooke, C. W., 8; Richards, H. G., 15
Decatur Co.: Dall, W. H., 11
Pelecypoda, Decatur Co.: Tucker, H. I., 2
*Ordovician*
Anthozoa, Walker Co.: Bassler, R. S., 6
Brachiopoda, Walker Co.: Cooper, G. A., 3
Bryozoa, northwestern Ga.: Buzarde, L. E., Jr., 1; Cappel, H. N., Jr., 1
Gastropoda, northwestern Ga.: Yochelson, E. L., 1
Graptolithina, Murray Co.: Decker, C. E., 1
Invertebrata
Catoosa Co.: Murphy, R. E., Jr., 1
Dade Co.: Ingram, F. T., 2
northwestern Ga.: Allen, A. T., Jr., 5; Vest, E. L., Jr., 1
Polk Co., Indian Mountain area: Crawford, T. J., 2
Ostracoda, Catoosa-Walker Cos.: Gould, J. C., 1
tracks, Catoosa Co.: Allen, A. T., Jr., 2
*Paleocene*
Bryozoa, Clay Co.: Canu, F., 2
Echinoidea, Coastal Plain: Cooke, C. W., 21, 25
Foraminifera, Coastal Plain: Applin, E. E. R., 2; Applin, P. L., 1; Cole, W. S., 2
Gastropoda
Clay Co.: Harris, G. D., 2
Coastal Plain: Bowles, E. O., 1
Mollusca, Coastal Plain: Richards, H. G., 16
Pelecypoda, Clay Co.: Harris, G. D., 2
Reptilia
Coastal Plain: Cope, E. D., 3
Macon Co.: Hay, O. P., 2
*Paleozoic*
Invertebrata, northwestern Ga.: Allen, A. T., Jr., 5; Butts, C., 4
Ostracoda, Early Co.: Swartz, F. M., 1
plant microfossils, Coastal Plain: Schopf, J. M., 1
*Pennsylvanian*
plants
Dade Co.: Abbott, M. L., 1; White, C. D., 3
northwestern Ga.: Allen, A. T., Jr., 5; Butts, C., 4; Lesquereux, L., 1
*Pleistocene*
algae
Clarke Co.: Bailey, J. W., 2
Coastal Plain.: Bailey, J. W., 2
Diatomaceae
Chatham Co.: Bailey, J. W., 1
Clarke Co.: Bailey, J. W., 2
Coastal Plain.: Bailey, J. W., 2; Flint, R. F., 1
Glynn Co.: Bailey, J. W., 1
Echinoidea, Glynn Co.: Cooke, C. W., 21
Foraminifera, Coastal Plain: Bailey, J. W., 2
Georgia, relict vertebrate fauna: Blair, W. F., 1
Invertebrata
Chatham Co.: Richards, H. G., 1
Coastal Plain: Richards, H. G., 5
Glynn Co.: Couper, J. H., 1; Richards, H. G., 1
Mammalia
Bartow Co.: Furcron, A. S., 36
Blue Ridge: Moore, J., 1
Chatham Co.: Agassiz, L., 1; Cahn, A. R., 1; Cooper, W., 1, 2; Cope, E. D., 1; Couper, J. H., 4; Cuvier, G. L. C. F. D., 1; Gibbes, R. W., 3; Habersham, J. C., 1; Harlan, R., 1; Hay, O. P., 3; Hodgson, W. B., 1, 2; Leidy, J., 3, 4; Lyell, C., Jr., 2; Mitchill, S. L., 5
Coastal Plain: Falconer, H., 1; Osborn, H. F., 6
Glynn Co.: Allen, J. A., 1; Couper, J. H., 1, 2, 4; Falconer, H., 2; Harlan, R., 2; Hay, O. P., 3; Leidy, J., 1, 2, 5, 6; Lucas, F. A., 1; Lydekker, R., 1; Lyell, C., Jr., 2; Osborn, H. F., 14; Owen, R., 1, 2
McIntosh Co.: Lucas, F. A., 1
northwestern Ga.: Cope, E. D., 1
Walker Co.: Hitchcock, D., 1
Mollusca
Chatham Co.: Habersham, J. C., 1
Coastal Plain: Richards, H. G., 12
plants
Georgia: Berry, E. Willard, 1
Lumpkin Co.: Eckel, E. C., 11
Reptilia
Bartow Co.: Brattstrom, B. H., 1; Gilmore, C. W., 1
Chatham Co.: Habersham, J. C., 1; Hay, O. P., 1, 2
Glynn Co.: Couper, J. H., 1; Harlan, R., 2
Vertebrata
Chatham Co.: Mitchell, L., 2; Richards, H. G., 1
Coastal Plain: Hurst, V. J., 27
Glynn Co.: Richards, H. G., 1
*Pliocene*
Mollusca
Coastal Plain: Richards, H. G., 13
Wayne Co.: Aldrich, T. H., 1; Dall, W. H., 10

*Silurian*
Brachiopoda
Catoosa Co.: Foerste, A. F., 1; White, C. A., 1
Dade Co.: Foerste, A. F., 1; Hall, J., 3, 4
Invertebrata, northwestern Ga.: Allen, A. T., Jr., 5
Ostracoda, Floyd Co.: Ulrich, E. O., 5
Trilobitimorpha
Catoosa Co.: Foerste, A. F., 1; Vogdes, A. W., 2, 3
Walker Co.: Foerste, A. F., 1; Vogdes, A. W., 2
*Tertiary*
Bryozoa, Coastal Plain: Bassler, R. S., 2
Echinoidea, Coastal Plain: Mitchill, S. L., 1; Stefanini, G., 2
Foraminifera, Coastal Plain: Vaughan, T. W., 11
Invertebrata
Burke Co.: Cotting, J. R., 2
Coastal Plain: McCallie, S. W., 20; Meriwether, D., 2; Richards, H. G., 5; Stenzel, H. B., 2
Richmond Co.: Cotting, J. R., 2
Mammalia, Coastal Plain: Harlan, R., 1
micropaleontology, Coastal Plain: Howe, H. van W., 3
Mollusca, Coastal Plain: Conrad, T. A., 1
Pelecypoda, Coastal Plain: Palmer, K. E. H. V. W., 1; Sheldon, P. G., 1
Pisces, Coastal Plain: Richards, H. G., 20
plants
Coastal Plain: Berry, E. W., 11
Polk Co.: Cloud, P. E., Jr., 1

**PALEOZOIC**, *see also* individual periods
Blue Ridge: Billings, M. P., 1; Furcron, A. S., 31; King, P. B., 5; Schuchert, C., 20
Coastal Plain: Applin, P. L., 5; Nelson, W. A., 3; Richards, H. G., 6
Early Co.: Jordan, L., 3
Georgia: Boesch, H. H., 1; King, P. B., 6, 8; McCallie, S. W., 35; Richards, H. G., 10; Ruedemann, R., 1; Schuchert, C., 3, 4; Willis, B., 6
Appalachia: Nelson, W. A., 1
popular: Furcron, A. S., 21
Meriwether Co., Hollis Quartzite: Adams, G. I., 5
northwestern Ga.: Billings, M. P., 1; Butts, C., 3, 4; Grabau, A. W., 6; King, P. B., 5; McCalley, H., 2; Munyan, A. C., 18; Reeside, J. B., Jr., 1; Richards, H. G., 11; Rogers, H. D., 2, 5; Schuchert, C., 20; Shimer, H. W., 1; Spencer, J. W. W., 6; Ulrich, E. O., 1, 2; Willis, B., 7
Piedmont: Billings, M. P., 1; Furcron, A. S., 31; King, P. B., 5; Kulp, J. L., 2; Long, L. E., 1; Pinson, W. H., Jr., 3; Schuchert, C., 20; Woodward, H. P., 2
Atlanta area: Herrick, S. M., 4
Talbot Co., Hollis Quartzite: Adams, G. I., 5

**PAULDING COUNTY**, *see also* Georgia, and Georgia—Piedmont
*Economic geology*
copper, Banks Mine: Douglas, H., 1; Pratt, N. A., Jr., 2
gold: Brewer, W. M., 4; Mell, P. H., Jr., 1
*Mineralogy*
columbite: Furcron, A. S., 54
fuchsite: Hurst, V. J., 24
*Petrology*
meteorites: Watson, T. L., 19
*Physical geology*
structure, Rockmart area: Pruitt, R. G., Jr., 2

**PEAT**, *see also* Mineral resources, and Swamps
Effingham Co.: Soper, E. K., 2

**PEDESTAL ROCKS**, *see also* Physiography, and Weathering
Piedmont: Crickmay, G. W., 10

**PEGMATITES**, *see also* Igneous rocks, and Mineral resources
Blue Ridge: Furcron, A. S., 7; Galpin, S. L., 1
DeKalb Co.: Walter, K. G., 2
Lithonia Gneiss: Cofer, H. E., Jr., 2
Jasper Co.: Warriner, L. P., 1
Piedmont: Furcron, A. S., 7; Galpin, S. L., 1; Jahns, R. H., 2
weathering: Sand, L. B., 1
Rockdale Co.: Walter, K. G., 2

**PELECYPODA**, *see also* Mollusca
Burke Co., Eocene: Howe, H. van W., 1
popular: Tomkins, I. R., 1
Chattahoochee Co., Cretaceous: Stephenson, L. W., 18
Clay Co.
Cretaceous: Gabb, W. M., 1
Eocene: Harris, G. D., 3
Paleocene: Harris, G. D., 2
Coastal Plain
Cretaceous: Stephenson, L. W., 4; White, C. A., 2
Eocene: Dall, W. H., 2; Gardner, J. A., 5; Harris, G. D., 6, 7; Tucker, H. I., 1; White, C. A., 2
Miocene: Dall, W. H., 2; Mansfield, W. C., 1; Tucker, H. I., 1
Tertiary: Palmer, K. E. H. V. W., 1; Sheldon, P. G., 1
Decatur Co.
Miocene: Gardner, J. A., 3
Oligocene: Dall, W. H., 11; Tucker, H. I., 2
Dougherty Co., Cretaceous: Richards, H. G., 5
Quitman Co., Cretaceous: Gabb, W. M., 1
Stewart Co., Cretaceous: Gabb, W. M., 1
Wayne Co., Pliocene: Dall, W. H., 10

**PENEPLAINS**, *see also* Physiography
Blue Ridge: Wright, F. J., 1
deformation: Reitz, T. A., du, 1
Coastal Plain, Fall Line Peneplain: Renner, G. T., Jr., 1, 2
Georgia: Shaw, E. W., 1
northwestern Ga.: Hayes, C. W., 5, 14; Wright, F. J., 2, 5, 6
Piedmont: Hayes, C. W., 5; Wright, F. J., 1
deformation: Reitz, T. A., du, 1

**PENNSYLVANIAN**, *see also* Paleozoic
Chattooga Co.: McCallie, S. W., 14
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
Stevenson Quad.: Hayes, C. W., 8
Dade Co.: McCallie, S. W., 14; New England Company, 1; Renshaw, E. W., 1, 2; Troxell, J. R., 1; Wanless, H. R., 5

Cedar Grove Quad.: Dicus, J. M., 1
Cloudland Canyon Park: Croft, M. G., 1
Durham Quad.: Darling, R. W., 1
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
Floyd Co., Rome Quad.: Hayes, C. W., 18
Georgia, paleogeology: Levorsen, A. I., 1
Haralson Co., Talladega Series: Webb, J. E., 1
northwestern Ga.: Allen, A. T., Jr., 6; Burns, J. A., 1; Butts, C., 4; Hayes, C. W., 2; McCutchen, A. R., 1; Moore, R. C., 2; Stevenson, J. J., 3; Sullivan, J. W., 1; Wanless, H. R., 1, 2, 3, 4; White, C. D., 1
sedimentary structures: Albritton, J. A., 1
Polk Co., Talladega Series: Webb, J. E., 1
Walker Co.: McCallie, S. W., 14; Renshaw, E. W., 1; Troxell, J. R., 1; Wanless, H. R., 5
Cedar Grove Quad.: Dicus, J. M., 1
Durham Quad.: Darling, R. W., 1
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
PERIDOTITE, *see also* Igneous rocks
Blue Ridge-Piedmont: Lewis, J. V., 1; Pratt, J. H., 2
PERMIAN, *see also* Paleozoic
DeKalb, Gwinnett, Rockdale Cos., Stone Mountain-Lithonia area: Herrmann, L. A., 1
PETROLEUM, *see also* Mineral resources
Coastal Plain: Alexander, C. W., 1; Applin, P. L., 4; Baum, R. B., 1, 2; Braunstein, J., 1; Carroll, D. L., 1; Davis, M. J., 1; Furcron, A. S., 23; Hamner, E. J., 1; Harris, R. M., 1, 2; Holden, F. T., 1; Johnston,, J. E., 1; McClain, D. S., Jr., 2, 4; Munyan, A. C., 1, 3; Peyton, G., 4, 5; Postley, O. C., 2; Richards, H. G., 4, 9; Rinehart Oil News Company, 1; Todd, J. D., 1; Toler, H. N., 1; Vernon, R. O., 2
popular: Parizek, E. J., 3
Waycross area: Munyan, A. C., 8
well sites: Jordan, L., 4
Georgia
popular: Crickmay, G. W., 5
underground storage: Peyton, G., 7
northwestern Ga.: McClain, D. S., Jr., 4; Munyan, A. C., 3
Stewart Co.: St. John, F. B., Jr., 1
Telfair Co.: Hull, J. P. D., 1
PHOSPHATE, *see also* phosphate-bearing minerals, and Mineral resources
Coastal Plain: McCallie, S. W., 2; Sellards, E. H., 1
Georgia: Jacob, K. D., 1; McKelvey, V. E., 2
Thomas Co.: Spencer, J. W. W., 5
PHYSICAL GEOLOGY, *see also* individual examples
Georgia
Appalachian structures: Keith, A., 4, 5
basement configuration: Thom, W. T., Jr., 3
Piedmont
creep: Parizek, E. J., 11, 18, 21; Woodruff, J. F., 1
lineation: Parizek, E. J., 7
quartz horizons: Parizek, E. J., 9
siliceous layer: Parizek, E. J., 13
stone lines: Parizek, E. J., 20
PHYSIOGRAPHY, *see also* individual physiographic features
Baker Co., karst topography: Herrick, S. M., 3
Baldwin Co., gully: Ireland, H. A., 1; Linton, E., 1; Morris, F. G., 1
Blue Ridge: Guyot, A. H., 1; Hayes, C. W., 12; Keith, A., 1; Stone, R. C., 1; Wright, F. J., 1
Burke Co., Waynesborough area: White, J. E., 1
Chatham Co., Savannah area: Ga. Medical Soc., 1; White, J. E., 3
Clarke Co.: Parizek, E. J., 16
Clay Co., pre-Eocene solution features: Toulmin, L. D., Jr., 3
Coastal Plain: Cooper, G. F., 1; Harper, R. M., 3, 4, 6; Kollock, P. M., 1; Lyell, C., Jr., 5; McCallie, S. W., 40; Sutherland, W. J., 1
Carolina Bays: Arden, D. D., Jr., 1; Frink, J. W., 1; Prouty, W. F., 2, 3
offshore islands: Gibson, C. D., 2; Merrill, F. J. H., Jr., 1; Zeigler, J. M., 1
Okefenokee Swamp, popular: Harper, R. M., 9
Savannah River area: Phillips, W. E., 2; Sinha, E. Z., 1
sea level changes: Johnson, D. W., 5
shoreline features: Johnson, D. W., 6, 7, 8
swamps, drainage patterns: Ragotzkie, R. A., 1
Cobb Co., Roswell area: King, W. N., 1
DeKalb Co.
granite domes: White, W. A., 2
pedestal rocks: Petty, J. J., 1
Georgia: Bartram, W., 1; Béthune, P. de, 1; Currie, W., 1; LaForge, L., 3; Loomis, F. B., 1; Loughridge, R. H., 1; Posey, J. F., 1; Raisz, E. J., 1
drainage and topography: Barrows, H. H., 1
Fall Line: Abbe, C., 1
physiographic provinces: Atwood, W. W., 1; Bowman, I., 1; Fenneman, N. M., 1, 2, 3, 5; Joerg, W. L. G., 1; Powell, J. W., 1
scenic features: Harper, R. M., 11
swamps: Brantly, J. E., 2; McCallie, S. W., 30
Glynn Co.
Brunswick Harbor: Shaler, N. S., 3
swamps: Gibson, C. D., 1, 2
Habersham Co.: Biederman, C. A., 1
Houston Co., Perry area: Cooper, G. F., 2
Jones Co., pedestal rocks: Petty, J. J., 1
Mitchell Co., karst topography: Herrick, S. M., 3
northwestern Ga.: Hayes, C. W., 5, 12, 14; Keith, A., 2
Coosa Lowlands: Wright, F. J., 4
erosion surfaces: Wright, F. J., 5
swamps: Shaler, N. S., 2
Piedmont: Cooper, G. F., 1; Hayes, C. W., 5, 12; Stone, R. C., 1; Wright, F. J., 1
stream flow, influence of geology: Thomson, M. T., 1

Rabun-Habersham Cos., Tallulah Gorge: Furcron, A. S., 20; Jones, S. P., 1
Richmond Co., Augusta area: Phillips, W. E., 3
Stewart Co., Providence Canyons: Barge, E. M., 3; Sisk, L. J., 1; Smith, P. C., 1
Sumter Co.: Morris, F. G., 1
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*Areas described*
Ellijay Quad.: Furcron, A. S., 41; LaForge, L., 2
Fairmount area: Smith, J. W., 2
Tate Quad.: Bayley, W. S., 1
*Economic geology*
mineral resources
Ellijay Quad.: LaForge, L., 2
Tate Quad.: Bayley, W. S., 1
schist: Shearer, H. K., 3
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Ellijay Quad.: LaForge, L., 2
*Historical geology*
Precambrian-Cambrian: Smith, J. W., 2
Ellijay Quad.: LaForge, L., 2
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*Maps*
Economic, Ellijay Quad.: LaForge, L., 2
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Fairmount area: Smith, J. W., 2
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*Mineralogy*
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schist: Wells, R. C., 1
*Physical geology*
Cartersville Fault: Smith, J. W., 2
**PICROLITE,** *see also* Minerals
Union Co.: Grant, W. H., 4
**PIERCE COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Historical geology*
Cretaceous, Tuscaloosa Formation: Munyan, A. C., 5
*Paleontology*
Foraminifera, Cretaceous: Cushman, J. A., 10
**PIKE COUNTY,** *see also* Georgia, and Georgia—Piedmont
*Areas described*
Pike Co.: Whatley, E. T., 1
Thomaston Quad.: Clarke, J. W., 1
Warm Springs Quad.: Hewett, D. F., 1
*Economic geology*
mineral resources: Whatley, E. T., 1
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*Ground water*
thermal springs: Stearns, N. D., 1; Watson, T. L., 24
Warm Springs Quad.: Hewett, D. F., 1
*Historical geology*
Precambrian: Whatley, E. T., 1
Thomaston Quad.: Clarke, J. W., 1
Precambrian-Cenozoic, Warm Springs Quad.: Hewett, D. F., 1
*Maps*
Geologic
Thomaston Quad.: Clarke, J. W., 1
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Coastal Plain
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Twiggs Co., Eocene: Dunkle, D. H., 1
Washington Co., Eocene: Gibbes, R. W., 1
**PLEISTOCENE,** *see also* Cenozoic, and Quaternary
Chatham Co.: Couper, J. H., 4
Coastal Plain: Antevs, E. V., 1, 2; Cooke, C. W., 11, 12, 14, 15, 17; Couper, J. H., 4; Desor, E., 1; Flint, R. F., 1; Hodgson, W. B., 2; MacNeill, F. S., 7; Price, W. A., 1; Richards, H. G., 2, 12, 19; Trowbridge, A. C., 2
Citronelle Formation: Doering, J. A., 1
eolian deposits: Thorp, J., 1
Waycross area: Munyan, A. C., 8
Georgia: Eckel, E. C., 10; Martin, P. S., 1
climate and life zones: Dillon, L. S., 1
relict vertebrate fauna: Blair, W. F., 1
Glynn Co.: Couper, J. H., 2, 4
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Waycross area: Munyan, A. C., 8
Coffee Co., Altamaha Grit: Harper, R. M., 8
Floyd Co., Rome Quad.: Hayes, C. W., 18
Georgia: Taber, S., 3
Gordon Co., Rome Quad.: Hayes, C. W., 18
Johnson Co., Altamaha Grit: Harper, R. M., 8
Muscogee Co., Lafayette Gravel: Smith, E. A., 1
Washington Co., Altamaha Grit: Harper, R. M., 8
**POLK COUNTY,** *see also* Georgia, Georgia—Northwestern, and Georgia—Piedmont
*Areas described*
Polk Co.: Pinson, W. H., Jr., 1; Spencer, J. W. W., 5
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Rome Quad.: Hayes, C. W., 18
southern: Webb, J. E., 2
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bauxite: Brewer, W. M., 2; Hayes, C. W., 10; Lloyd, A. M., 2; White, W. S., 2
cobalt: Pierce, W. G., 1
copper: Lieber, O. M., 1
iron: Leweicki, W. T., 1; McCallie, S. W., 5; Robertson, A. F., 1; Spencer, J. W. W., 5
Indian Mountain area: Crawford, T. J., 2
Rome Quad.: Hayes, C. W., 18
limestone, Rome Quad.: Hayes, C. W., 18
manganese: Harder, E. C., 2; Penrose, R. A. F., Jr., 2

mineral resources: Pinson, W. H., Jr., 1; Spencer, J. W. W., 5
slate: Dale, T. N., 1; Eckel, E. C., 6; Shearer, H. K., 3
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rare elements, manganese ore: Kaiser, E. P., 1
*Historical geology*
Cambrian-Devonian: Hayes, C. W., 6
Cambrian-Mississippian: Pinson, W. H., Jr., 1; Spencer, J. W. W., 5
Indian Mountain area: Crawford, T. J., 2
Rome Quad.: Hayes, C. W., 18
Cenozoic: Cofer, H. E., Jr., 3
Pliocene, Rome Quad.: Hayes, C. W., 18
Precambrian-Pennsylvanian, Talladega Series: Webb, J. E., 1
*Maps*
Economic
iron: McCallie, S. W., 5
mineral resources: Pinson, W. H., Jr., 1
Geologic
Cave Spring Bauxite Dist.: White, W. S., 2
Indian Mountain area: Crawford, T. J., 2
Polk Co.: Pinson, W. H., Jr., 1
Rome Quad.: Hayes, C. W., 18
southern: Webb, J. E., 2
*Paleontology*
Invertebrata
Cambrian-Mississippian, Indian Mountain area: Crawford, T. J., 2
Devonian, Frog Mountain Sandstone: Hayes, C. W., 6
Tertiary, plants: Cloud, P. E., Jr., 1
*Petrology*
breccia: Cofer, H. E., Jr., 3
meteorites: Goldberg, E. D., 1; Perry, S. H., 2
secondary enrichment: Lieber, O. M., 1
*Physical geology*
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Rockmart area: Pruitt, R. G., Jr., 2
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Blue Ridge: Billings, M. P., 1; Furcron, A. S., 47
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Georgia: Chapman, J. R., 5; Crickmay, G. W., 17
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Cloudland Canyon Park, Dade Co.: Furcron, A. S., 14
Coastal Plain geology: Faircloth, W. R., 1
copper, Piedmont and Blue Ridge: Furcron, A. S., 35
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Georgia: Callahan, J. T., 1
Glynn Co., Jekyll Island: Callahan, J. T., 7
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kyanite, Cherokee-Habersham Cos.: Smith, R. W., 2
manganese, Bartow Co.: Crickmay, G. W., 3
meteorites, Georgia: Crickmay, G. W., 8; Furcron, A. S., 17
mica, Piedmont and Blue Ridge: Smith, R. W., 5
mineral resources, Georgia: DeBow, J. B. D., 2; Furcron, A. S., 2; Harper, R. M., 12; McCallie, S. W., 29; Middleton, G., 1
minerals
Fannin Co., Ducktown area: Blakemore, P. B., Jr., 1
Georgia: Hawkins, A. C., 1
monazite, Coastal Plain: Jones, W., 1
ocher, Bartow Co.: Crickmay, G. W., 3
Okefenokee Swamp: Harper, R. M., 9
petroleum, Georgia: Crickmay, G. W., 5
tidelands oil: Parizek, E. J., 3
Pine Mountain area, Meriwether and Lamar Cos.: Crickmay, G. W., 6
plant-distribution controls: Howell, T. J., 1
scenic features, Georgia: Harper, R. M., 11
shale, Georgia: Smith, R. W., 6
Shell Bluff, Burke Co.: Tomkins, I. R., 1
State Museum: Crickmay, G. W., 18; Gratacap, L. P., 2; Mitchell, L., 1
museum guide: Watkins, E. J., 1
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Blue Ridge: Furcron, A. S., 19
Fannin Co.: Scroggs, F. O., 1
Stone Mountain, DeKalb Co.: Crickmay, G. W., 15; Hopkins, M. S., 1; Maynard, T. P., 8
swamps, Glynn Co.: Gibson, G. D., 1
talc, Murray Co.: Crickmay, G. W., 21
Tallulah Gorge, Habersham-Rabun Cos.: Furcron, A. S., 20
tektites, Dodge and Erwin Cos.: Bruce, G. A., 1
tripoli: Crickmay, G. W., 22
Vertebrata, Coastal Plain, Pleistocene: Hurst, V. J., 27
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Floyd Co., Cambrian: Munyan, A. C., 16; Walcott, C. D., 12
**PORPHYROBLASTS**, *see also* Metamorphic rocks, and Metamorphism
Fulton Co., Fairburn Granite: Cofer, H. E., Jr., 6
**POTASH**, *see also* Mineral resources, and potassium-bearing minerals
Bartow Co.: Maynard, T. P., 5, 6; McCallie, S. W., 34; Turrentine, J. W., 1
northwestern Ga.: Butts, C., 4
**PRECAMBRIAN**
Baldwin Co.: LaMoreaux, P. E., 2

Blue Ridge: Burns, J. A., 1; Credner, H., 3; Furcron, A. S., 31; King, P. B., 3, 5, 7; McCutchen, A. R., 1; Moneymaker, B. C., 1; Richards, H. G., 11; Rodgers, J., 3; Rogers, H. D., 5; Schuchert, C., 20; Van Hise, C. R., 1, 2; Whitney, J. D., 1; Willis, B., 7
Nantahala-Ocoee contact: Nuttall, B. D., 1
Ocoee Series: Stose, G. W., 6, 9
peneplain deformation: Reitz, T. A. du, 1
Burke Co.: Cotting, J. R., 2
Cherokee Co.: Smith, J. W., 2
Tate Quad.: Bayley, W. S., 1
Dawson Co., Tate Quad.: Bayley, W. S., 1
DeKalb Co., Stone Mountain-Lithonia area: Herrmann, L. A., 1
Fannin Co.: Mellen, J. V., 1; Van Horn, E. C., 1
Ellijay Quad.: LaForge, L., 2
Mineral Bluff Quad.: Hurst, V. J., 15
Murphy Series: Hurst, V. J., 14
Forsyth Co., Tate Quad.: Bayley, W. S., 1
Georgia: King, P. B., 6, 8; McCallie, S. W., 35; Richards, H. G., 10
popular: Furcron, A. S., 21
surface configuration: Moss, R. G., 1
Gilmer Co., Ellijay Quad.: LaForge, L., 2
Hancock Co.: Fortson, C. W., Jr., 3; LaMoreaux, P. E., 2
Haralson Co., Talladega Series: Webb, J. E., 1
Harris Co., Warm Springs Quad.: Hewett, D. F., 1
Jones Co.: LaMoreaux, P. E., 2
Lamar Co., Thomaston Quad.: Clarke, J. W., 1
Lumpkin Co., Ellijay Quad.: LaForge, L., 2
Meriwether Co., Warm Springs Quad.: Hewett, D. F., 1
northwestern Ga.: Burns, J. A., 1; King, P. B., 7; McCutchen, A. R., 1
Pickens Co.: Smith, J. W., 2
Ellijay Quad.: LaForge, L., 2
Tate Quad.: Bayley, W. S., 1
Piedmont: Burns, J. A., 1; Credner, H., 3; Furcron, A. S., 31; King, P. B., 5, 7; Kulp, J. L., 2; LeGrand, H. E., 2; McCutchen, A. R., 1; Richards, H. G., 11; Rodgers, J., 3; Rogers, H. D., 5; Schuchert, C., 20; Van Hise, C. R., 1, 2, 3; Willis, B., 7
Atlanta area: Herrick, S. M., 4
Ocoee Series: Stose, G. W., 6
peneplain deformation: Reitz, T. A., du, 1
southeastern: LeGrand, H. E., 2
Talladega Series: Crickmay, G. W., 16, 20
western: Campbell, J. L., 1
Pike Co.: Whatley, E. T., 1
Thomaston Quad.: Clarke, J. W., 1
Warm Springs Quad.: Hewett, D. F., 1
Polk Co., Talladega Series: Webb, J. E., 1
Rockdale Co., Stone Mountain-Lithonia area: Herrmann, L. A., 1
Stephens Co., Toccoa Quartzite: Brent, W. B., 1
Talbot Co.
Thomaston Quad.: Clarke, J. W., 1
Warm Springs Quad.: Hewett, D. F., 1
Union Co., Ellijay Quad.: LaForge, L., 2
Upson Co.
Thomaston Quad.: Clarke, J. W., 1
Warm Springs Quad.: Hewett, D. F., 1

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*Petrology*
meteorites: Henderson, E. P., 4

**PUTNAM COUNTY**, *see also* Georgia, and Georgia—Piedmont
*Petrology*
meteorites: Brezina, A., 3; Buchner, C. L. O., 1; Cohen, E. W., 2; Coulson, A. L., 1; Dana, E. S., 2; Harris, E. P., 1; Rammelsberg, K. F., 1; Reichenbach, K. F. von, 1, 2, 3; Rose, G., 2, 3; Saltpeter, E. W., 1; Willet, J. E., 1

**PYRITE**, *see also* Mineral resources, and Minerals
Blue Ridge: McCallie, S. W., 36; Shearer, H. K., 2; Shotts, R. Q., 1
Cherokee Co., Tate Quad.: Bayley, W. S., 1
Dawson Co., Tate Quad.: Bayley, W. S., 1
Fannin Co.: Taylor, J. H., 1
Forsyth Co., Tate Quad.: Bayley, W. S., 1
Lumpkin Co.: Eckel, E. C., 2; Pratt, N. A., Jr., 3
Chestatee Prospect: Kline, M. H., 1
Paulding Co., Banks Mins: Douglas, H., 1; Pratt, N. A., Jr., 2
Pickens Co., Tate Quad.: Bayley, W. S., 1
Piedmont: McCallie, S. W., 36; Shearer, H. K., 2; Shotts, R. Q., 1

**PYROPHYLLITE**, *see also* Mineral resources, and Minerals
Lincoln Co.: Jackson, C. T., 7; Shepard, C. U., 8; Watson, T. L., 18
Piedmont: Stuckey, J. L., 2

**PYRRHOTITE**, *see also* Mineral resources, and Minerals
Bibb Co., from pyrite: Hurst, V. J., 37
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Jackson Co., etching: Crawford, T. J., 1
Jasper Co.: Gleason, F. E., 1
Walker Co.: Grant, W. H., 7

**QUARTZITE**, *see also* Metamorphic rocks, Mineral resources, and Stone
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**QUARTZ MONZONITE**, *see also* Granite, and Igneous rocks
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Dade Co., Cloudland Canyon Park: Croft, M. G., 1
Harris Co., Warm Springs Quad.: Hewett, D. F., 1
Pike Co., Warm Springs Quad.: Hewett, D. F., 1
Talbot Co., Warm Springs Quad.: Hewett, D. F., 1
Upson Co., Warm Springs Quad.: Hewett, D. F., 1
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Pelecypoda, Cretaceous: Gabb, W. M., 1
**RABUN COUNTY,** *see also* Georgia, and Georgia—Blue Ridge
*Economic geology*
corundum: Holmes, J. A., 1; Shepard, C. U., 12
gold: Peck, J., 1
kyanite: Furcron, A. S., 26; Smith, R. W., 9
monazite: Sterrett, D. B., 1
olivine: Hunter, C. E., 3
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*Maps*
Economic
kyanite: Prindle, L. M., 1
mineral resources: Teague, K. H., 3
Geologic: Teague, K. H., 3
*Mineralogy*
alum: Grant, W. H., 1
corundum: Genth, F. A., 4; Shepard, C. U., 12
feldspar: Chatard, T. M., 1
*Petrology*
dunite: Hunter, C. E., 3
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Brantley Co., soil: Broecker, W. S., 1
DeKalb Co.: Grunenfelder, M. H., 1; Herzog, L. F., 2d, 1; Hurst, V. J., 30; Mass. Inst. Tech., 1
Elbert Co.: Grunenfelder, M. H., 1; Mass. Inst. Tech., 1
Fulton Co.: Hurst, V. J., 30; Mass. Inst. Tech., 1
Hall Co.: Libby, W. F., 1
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Altamaha River area: Cathcart, J. B., 1
Cretaceous: Dryden, A. L., Jr., 1
Georgia: Butler, A. P., Jr., 1; Hurst, V. J., 25; Johnson, H. S., Jr., 1
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*Economic geology*
bauxite, Springvale Dist.: Beck, W. A., 5; Clark, L. D., 1
*Historical geology*
Paleocene-Oligocene: Erwin, J. W., 1
*Maps*
Geologic
northern: Erwin, J. W., 1
Springvale Bauxite Dist.: Clark, L. D., 1
*Petrology*
grain size analyses, Eocene: Erwin, J. W., 2
**REEFS**
Dade Co., Mississippian: Owen, V., Jr., 1
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dinosaur, Cretaceous, Coastal Plain: Cope, E. D., 3
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snake, Bartow Co., Pleistocene: Brattstrom, B. H., 1; Gilmore, C. W., 1
turtle
Chatham Co., Pleistocene: Habersham, J. C., 1; Hay, O. P., 1, 2
Coastal Plain
Cretaceous: Cope, E. D., 3
Paleocene: Cope, E. D., 3
Glynn Co., Pleistocene: Couper, J. H., 1; Harlan, R., 2
Macon Co.
Eocene: Cope, E. D., 2
Paleocene: Hay, O. P., 2
Stewart Co., Cretaceous: Hay, O. P., 2
**RICHMOND COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Areas described*
Richmond Co.: Cotting, J. R., 2
*Economic geology*
iron: Lewis, H. C., 1
kaolin, analyses: Stokes, H. N., 1
mineral resources: Cotting, J. R., 2
*Ground water*
radioactive waste disposal: Theis, C. V., 1
*Historical geology*
Oligocene, iron ore: Lewis, H. C., 1
Tertiary: Cotting, J. R., 2
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clay, analyses: Clarke, F. W., 4; Cotting, J. R., 1
*Paleontology*
Foraminifera, Eocene: Cushman, J. A., 8
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Ostracoda, Eocene: Murray, G. E., Jr., 1
*Physiographic geology*
Augusta area: Phillips, W. E., 3
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Georgia: Furcron, A. S., 3
**ROCKDALE COUNTY,** *see also* Georgia, and Georgia—Piedmont
*Areas described*
Stone Mountain-Lithonia Dist.: Herrmann, L. A., 1

*Economic geology*
stone, Stone Mountain-Lithonia Dist.: Herrmann, L. A., 1
*Historical geology*
Precambrian-Triassic, Stone Mountain-Lithonia Dist.: Herrmann, L. A., 1
*Maps*
Economic, Stone Mountain-Lithonia area: Herrmann, L. A., 1
Geologic, Stone Mountain-Lithonia area: Herrmann, L. A., 1
Structure, Stone Mountain-Lithonia area: Herrmann, L. A., 1
*Petrology*
crystalline rocks, Stone Mountain-Lithonia area: Herrmann, L. A., 1
pegmatites: Walter, K. G., 2
**RUTILE**, *see also* Minerals
Lincoln Co.: Bement, C. S., 1; Haidinger, W. K. von, 2; Muegge, O., 2, 3; Rose, G., 1; Watson, T. L., 18, 22
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Bartow Co.: Burchard, E. F., 4
Chatham Co., beaches: Wilbur, R. O., 1
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Albany area: Munyan, A. C., 10
Macon area: Maynard, T. P., 4
Savannah River area: Burchard, E. F., 1
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Floyd Co.: Furcron, A. S., 52
Fulton Co., Chattahoochee River natural levees: Pound, J. H., Jr., 2
Georgia: Teas, L. P., 1
Greene Co.: Parizek, E. J., 10
Hancock Co.: Fortson, C. W., Jr., 3
Lamar Co., Thomaston Quad.: Clarke, J. W., 1
Muscogee Co.: Burchard, E. F., 4
northwestern Ga.: Butts, C., 4
Piedmont, Macon area: Maynard, T. P., 4
Pike Co., Thomaston Quad.: Clarke, J. W., 1
Talbot Co., Thomaston Quad.: Clarke, J. W., 1
Upson Co.
singing: Teas, L. P., 3
Thomaston Quad.: Clarke, J. W., 1
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Ware Co., singing: Hurst, V. J., 11
**SANDSTONE**, *see also* Stone
Dade Co., Pennsylvanian: Renshaw, E. W., 2
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**SANDSTONE DIKES**
Muscogee Co., Cretaceous: McCallie, S. W., 12
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Cherokee Co.: Alger, F., 1
Dougherty Co.: Hurst, V. J., 21
**SAXONITE**, *see also* Igneous rocks
Rabun-Towns Cos.: Hunter, C. E., 3
**SCHEELITE**, *see also* Minerals
Piedmont: Espenshade, G. H., 1
**SCHIST**, *see also* Metamorphic rocks
Lumpkin Co.: Watson, T. L., 1
Pickens Co.: Shearer, H. K., 3; Wells, R. C., 1
**SCHLEY COUNTY**, *see also* Georgia, and Georgia—Coastal Plain
*Areas described*
Andersonville Bauxite Dist.: Zapp, A. D., 2
*Economic geology*
bauxite: Beck, W. A., 3; Grumbles, G. R., 2; Watkins, J. H., 2; Zapp, A. D., 2
kaolin: Beck, W. A., 3
*Historical geology*
Eocene, Andersonville area: Grumbles, G. R., 2
Paleocene-Eocene, Andersonville area: Zapp, A. D., 2
*Maps*
Economic, bauxite, Andersonville area: Zapp, A. D., 1, 2
Geologic, Andersonville area: Grumbles, G. R., 2; Zapp, A. D., 1, 2
**SCREVEN COUNTY**, *see also* Georgia, and Georgia—Coastal Plain
*Historical geology*
Eocene: Lyell, C., Jr., 4
*Paleontology*
Anthozoa, Eocene: Lonsdale, W., 1; Milne-Edwards, H., 1; Vaughan, T. W., 1
**SEDIMENTARY STRUCTURES**, *see also* individual features
Bartow Co.: Wright, D. C., 1
coal fragments in sandstone: Wardroper, D. L., 1
cross bedding, northwestern: Morehead, M. B., 1
Fannin Co., Precambrian: Mellen, J. V., 1
graded bedding, Gordon Co.: Smith, J. W., 1
laminae, Ordovician limestone, northwestern Ga.: Rosenfeld, S. J., 2
mud cracks, Dade Co.: Crisler, R. M., Jr., 1
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Pennsylvanian: Albritton, J. A., 1
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Ordovician red beds, grain size, Whitfield Co.: Armstrong, C. H., Jr., 1
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Bartow Co., pond: Perry, E. C., Jr., 1; Wright, D. C., 1
Chatham Co., Savannah Harbor: Trask, P. D., 1
Cherokee Co., stream gravel: Grumbles, G. R., 1
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beach sands: Bershad, S. F., 1
Cretaceous: Turner, P. A., 1
Ripley Formation: Vest, E. L., Jr., 2
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DeKalb Co., streams: Gould, J. C., 2; Holland, W. A., Jr., 3; Smith, W. L., 1; Pound, J. H., Jr., 1; Walter, K. G., 1
igneous rock influence: King, J. A., 5th, 2
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Chattahoochee River: Cazeau, C. J., 1, 2
colluvium: Veatch, J. O., 1
continental shelf: Gorsline, D. S., 1
Jasper Co.
Lloyd Shoals Reservoir, silting rates: Brown, C. B., 1

Randolph Co., Eocene, grain size analyses: Erwin, J. W., 2
Stewart Co., Providence Formation, Cretaceous: Goodell, H. G., 1
Walker Co., Red Mountain Formation, Silurian: Truxes, L. S., 1
**SEMINOLE COUNTY**, *see also* Georgia, and Georgia—Coastal Plain
*Areas described*
Jim Woodruff Reservoir area: Hendry, C. W., Jr., 1
*Historical geology*
Eocene-Miocene, Jim Woodruff Reservoir area: Hendry, C. W., Jr., 1
*Maps*
Geologic, Jim Woodruff Reservoir area: Hendry, C. W., Jr., 1
*Physical geology*
insoluble residue, Eocene-Miocene: Hendry, C. W., Jr., 1
**SERPENTINE**, *see also* Metamorphic rocks, and Mineral resources, and Minerals
Blue Ridge: Pratt, J. H., 2
Columbia Co.: Furcron, A. S., 5
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Piedmont: Furcron, A S., 12, 26; Hudson, W. C., 1; Teague, K. H., 5
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**SILURIAN**, *see also* Paleozoic
Blue Ridge: Bradley, F. H., 2
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Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
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Cedar Grove Quad.: Dicus, J. M., 1
Clinton iron ore: Foerste, A. F., 2
Durham Quad.: Darling, R. W., 1
western: Clement, W. G., 1
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
Floyd Co.
Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
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Ringgold Quad.: Hayes, C. W., 7
Rome Quad.: Hayes, C. W., 18
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Durham Quad.: Darling, R. W., 1
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Blue Ridge, early account: LeMoyne de Morgues, J., 1
Gwinnett Co.: Tenney, W. J., 2
**SINKHOLES**, *see also* Karst topography, and Physiography
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Bartow Co.: Dale, T. N., 1; Maynard, T. P., 5; McCallie, S. W., 34; Maynard, T. P., 3; Shearer, H. K., 3
Gordon Co.: Maynard, T. P., 3; Shearer, H. K., 3
Rome Quad.: Hayes, C. W., 18
Murray Co.: Shearer, H. K., 3
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Polk Co.: Dale, T. N., 1; Eckel, E. C., 6; Shearer, H. K., 3
New Bangor Quarry: Shepard, C. U., 6
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**SOAPSTONE**, *see also* Metamorphic rocks, and Mineral resources
Blue Ridge: Hopkins, O. B., 2
Piedmont: Hopkins, O. B., 2; Stuckey, J. L., 2
Whitfield Co.: Mell, P. H., Jr., 3
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Brantley Co., radioactive dating: Broecker, W. S., 1
Catoosa Co., weathering: Taylor, A. E., 1
Coastal Plain, eastern: White, J. E., 2
Dade Co., weathering: Taylor, A. E., 2
DeKalb Co., color: White, W. A., 1
Georgia: Cotting, J. R., 3
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clay content: England, C. B., 1
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Piedmont, eastern: White, J. E., 2
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tetradymite: Genth, F. A., 5
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Cherokee Co., Canton Mine: Genth, F. A., 1
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Blowing: McCallie, S. W., 18
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Cobb Co.
mineral spring: Fuller, M. L., 2
salty: Furcron, A. S., 30
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Blue Spring: Hall, M. R., 1, 2
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salty: Furcron, A. S., 30
Floyd Co.: Callahan, J. T., 2
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Jenkins Co., Magnolia Spring: Paulsen, C. G., 1
Meriwether Co.
North Spring: Grover, N. C., 2
Warm Springs: Hall, M. R., 2; Salomon-Calvi, W., 1; Stearns, N. D., 1; Watson, T. L., 24; Weed, W. H., 2
northwestern Ga.: Callahan, J. T., 3; Grover, N. C., 1; Hall, B. M., 2
Piedmont, mineral: Morris, C. E., 1
Pike Co., Warm Springs: Stearns, N. D., 1; Watson, T. L., 24
Upson Co., Warm Springs: Stearns, N. D., 1; Watson, T. L., 24

**STAUROLITE,** *see also* Minerals
Blue Ridge: Furcron, A. S., 19
Cherokee Co.: Genth, F. A., 3
Fannin Co.: Dana, E. S., 1; Hurst, V. J., 5; Shepard, C. U., 13
Mineral Bluff Quad.: Hurst, V. J., 15
popular: Scroggs, F. O., 1
twinning: Hurst, V. J., 22
Upson Co.: Ingram, W. F., 1

**STEPHENS COUNTY,** *see also* Georgia, and Georgia—Piedmont
*Areas described*
Davidson-Panther Creek area: Pruitt, R. G., Jr., 1
*Historical geology*
Precambrian, Toccoa Quartzite: Brent, W. B., 1
*Maps*
Geologic, Davidson-Panther Creek area: Pruitt, R. G., Jr., 1

**STEWART COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Areas described*
Lumpkin SW Quad.: Kirkpatrick, S. R., 2
*Economic geology*
iron: Furcron, A. S., 48
petroleum and gas: St. John, F. B., Jr., 1
*Historical geology*
Cretaceous
*Exogyra cancellata* zone: Stephenson, L. W., 13
Providence Formation: Goodell, H. G., 1
Providence-Ripley Formation contact: Smallwood, J. K., 1
Ripley Formation: Vest, E. L., Jr., 2
Cretaceous-Paleocene, Lumpkin SW Quad.: Kirkpatrick, S. R., 2
*Maps*
Economic, iron: Furcron, A. S., 48
Geologic, Lumpkin SW Quad.: Kirkpatrick, S. R., 2
*Paleontology*
Anthozoa, Cretaceous: Wells, J. W., 1
Crustacea, Cretaceous: Rathbun, M. J., 1
Pelecypoda, Cretaceous: Gabb, W. M., 1
Reptilia, Cretaceous: Hay, O. P., 2
*Petrology*
meteorites: Ahrens, L. H., 1; Flight, W., 1; Pinson, W. H., Jr., 2; Saltpeter, E. W., 1; Smith, J. L., 2; Willet, J. E., 2
Providence Formation, Cretaceous: Goodell, H. G., 1
Providence-Ripley Formations: Smallwood, J. K., Jr., 1
*Physiographic geology*
Providence Canyons: Barge, E. M., 3; Sisk, L. J., 1; Smith, P. C., 1

**STIBNITE,** *see also* Minerals
Dawson Co.: Hurst, V. J., 34

**STILBITE,** *see also* Minerals
Lamar Co.: Hurst, V. J., 13

**STONE,** *see also* individual types, and Mineral resources
Blue Ridge: Spain, E. L., Jr., 1
Dade Co.: New England Company, 1
DeKalb Co., Stone Mountain-Lithonia area: Herrmann, L. A., 1
Fannin Co., Mineral Bluff Quad.: Hurst, V. J., 15
Georgia: Bowles, O., 1; Burchard, E. F., 5; Eckel, E. C., 7; Woollard, G. P., 1
Gwinnett Co., Stone Mountain-Lithonia area: Herrmann, L. A., 1
Hancock Co.: Fortson, C. W., Jr., 3
northwestern Ga.: Spain, E. L., Jr., 1; Sullivan, J. W., 1
Rockdale Co., Stone Mountain-Lithonia area: Herrmann, L. A., 1

**STRUCTURAL GEOLOGY,** *see also* Faults and faulting
Blue Ridge: Furcron, A. S., 29; King, P. B., 1, 5; Lombard, A. E., 1; Stille, H., 1
Catoosa Co., Houston Valley: Callahan, J. E., 2
Coastal Plain: Baum, R. B., 2; Patton, J. L., 1; Richards, H. G., 8; Stephenson, L. W., 9; Toler, H. N., 1
Chattahoochee Anticline: Stephenson, L. W., 11
Paleozoic structural controls: Murray, G. E., Jr., 5
structural features: Stephenson, L. W., 12
Fannin Co., marble belt: LaForge, L., 1

Georgia: Rodgers, J., 2
history: King, P. B., 6
tectonic provinces: King, P. B., 2
Gilmer Co., stretched pebbles: McCallie, S. W., 17
Haralson Co., northern: Webb, J. E., 2
northwestern Ga.: King, P. B., 1, 5; Lombard, A. E., 1; Rogers, W. B., 1; Schottenloher, R., 1; Spain, E. L., Jr., 1; Willis, B., 3
Paulding Co., Rockmart area: Pruitt, R. G., Jr., 2
Piedmont: King, P. B., 1, 5; Lombard, A. E., 1; Stille, H., 1
Brevard Belt: Furcron, A. S., 24; Prouty, W. F., 1
folded faults: Stose, G. W., 10
Polk Co.
Rockmart area: Pruitt, R. G., Jr., 2
southern: Webb, J. E., 2
Whitfield Co., Ordovician: Moore, J. B., Jr., 1

**SUBMARINE CANYONS**
Coastal Plain, shelf: Spencer, J. W. W., 7

**SUMTER COUNTY**, *see also* Georgia, and Georgia—Coastal Plain
*Areas described*
Andersonville Bauxite Dist.: Zapp, A. D., 2
*Economic geology*
bauxite
Andersonville Dist.: Beck, W. A., 3; Grumbles, G. R., 2; Munyan, A. C., 2; Watkins, J. H., 2; Zapp, A. D., 2
relation to topography: Cofer, H. E., Jr., 8
*Ground water*
Sumter Co.: Owen, V., Jr., 4
*Historical geology*
Cretaceous-Cenozoic: Owen, V., Jr., 4
Eocene, Andersonville area: Grumbles, G. R., 2
Paleocene-Eocene, Andersonville area: Zapp, A. D., 2
*Maps*
Economic, bauxite, Andersonville area: Zapp, A. D., 1, 2
Geologic, Andersonville area: Grumbles, G. R., 2; Zapp, A. D., 1, 2
*Physiographic geology*
gully formation: Morris, F. G., 1
topography, related to bauxite: Cofer, H. E., Jr., 8

**SWAMPS**
Coastal Plain, drainage patterns: Ragotzkie, R. A., 1
Georgia: Brantly, J. E., 2; McCallie, S. W., 30
Glynn Co., popular: Gibson, C. D., 1
northwestern Ga.: Shaler, N. S., 2
Okefenokee Swamp, popular: Harper, R. M., 9

**TALBOT COUNTY**, *see also* Georgia, and Georgia—Piedmont
*Areas described*
Thomaston Quad.: Clarke, J. W., 1
Warm Springs Quad.: Hewett, D. F., 1
*Economic geology*
kyanite: Crickmay, G. W., 12
mineral resources, Thomaston Quad.: Clarke, J. W., 1
*Ground water*
Warm Springs Quad.: Hewett, D. F., 1
*Historical geology*
Paleozoic, Hollis Quartzite: Adams, G. I., 5
Precambrian, Thomaston Quad.: Clarke, J. W., 1
Precambrian-Cenozoic, Warm Springs Quad.: Hewett, D. F., 1
*Maps*
Geologic
Thomaston Quad.: Clarke, J. W., 1
Warm Springs Quad.: Hewett, D. F., 1
*Physiographic geology*
Pine Mountain: Adams, G. I., 5
Talbot Co.: Delony, E., 1

**TALC**, *see also* Metamorphic rocks, Mineral resources, and Minerals
Blue Ridge: Hopkins, O. B., 2
Fannin Co., Mineral Bluff Quad.: Hurst, V. J., 15
Murray Co.: Brewer, W. M., 8; Furcron, A. S., 13; Teague, K. H., 2, 4
popular: Crickmay, G. W., 21
Piedmont: Hopkins, O. B., 2; Stuckey, J. L., 2

**TEKTITES**
Coastal Plain: Sentfle, F. E., 1
spectral analyses: Stair, R., 1
Dodge Co.: Barnes, V. E., 1; Cohen, A. J., 1, 2
popular: Bruce, G. A., 1
Irwin Co.: Barnes, V. E., 1; Cohen, A. J., 2
popular: Bruce, G. A., 1

**TELFAIR COUNTY**, *see also* Georgia, and Georgia—Coastal Plain
*Economic geology*
petroleum: Hull, J. P. D., 1

**TERRACES**, *see also* Physiography, and Pleistocene
Coastal Plain: Antevs, E. V., 1, 2; Cooke, C. W., 9, 11, 12, 14, 15, 17; Flint, R. F., 1, 2; Howard, A. D., 1; Johnson, D. W., 7; MacNeill, F. S., 7; Price, W. A., 1; Richards, H. G., 19, 21; Rosenfeld, S. J., 3; Trowbridge, A. C., 2

**TELLURBISMUTH**, *see also* Minerals
Lumpkin Co.: Jackson, C. T., 3
Piedmont, with gold: Credner, H., 1

**TENNESSEEAN SYSTEM**
northwestern Ga.: Ulrich, E. O., 2

**TERTIARY**, *see also* Cenozoic, and individual epochs
Burke Co.: Cotting, J. R., 2
Catoosa Co., Dalton Quad.: Munyan, A. C., 17
Coastal Plain: Applin, P. L., 4; Berry, E. W., 3, 11; Brantly, J. E., 1, 3; Braunstein, J., 1; Carroll, D. L., 1; Carsey, J. B., 1; Conrad, T. A., 1; Cooke, C. W., 18, 23; Faircloth, W. R., 1; Finch, J., 1; Hilgard, E. W., 1, 2; Jones, J., 11; Johnston, J. E., 1; Langdon, D. W., Jr., 2; LeGrand, H. E., 2; Lyell, C., Jr., 5; McClain, D. S., Jr., 2; MacNeill, F. S., 3; Monroe, W. H., 3; Peyton, G., 5; Richards, H. G., 3; Stefanini, G., 2; Smith, E. A., 6; Stephenson, L. W., 11; Todd, J. D., 1; Vaughan, T. W., 8, 9, 11

Appomattox Formation: McGee, W J, 4
coral reefs: Vaughan, T. W., 4
floral zones: Barghoorn, E. S., 1
Lafayette Formation: McGee, W J, 5, 6
Decatur Co., Grand Gulf Formation: Smith, E. A., 3
Georgia: Matthew, W. D., 1
peneplains: Shaw, E. W., 1
plant migration: McVaugh, R., 1
Harris Co., Warm Springs Quad.: Hewett, D. F., 1
Meriwether Co., Warm Springs Quad.: Hewett, D. F., 1
Murray Co., Dalton Quad.: Munyan, A. C., 17
Pike Co., Warm Springs Quad.: Hewett, D. F., 1
Richmond Co.: Cotting, J. R., 2
Talbot Co., Warm Springs Quad.: Hewett, D. F., 1
Upson Co., Warm Springs Quad.: Hewett, D. F., 1
Whitfield Co., Dalton Quad.: Munyan, A. C., 17

**TETRADYMITE,** *see also* Minerals
Lumpkin Co.: Blake, W. P., 5; Jackson, C. T., 3, 8; Shepard, C. U., 8
Spaulding (error for Paulding?) Co.: Genth, F. A., 5

**THOMAS COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Economic geology*
phosphate: Spencer, J. W. W., 5
*Ground water*
blowing wells: McCallie, S. W., 18

**TIFT COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Geophysical investigations*
seismic: Woollard, G. P., 4

**TITANITE,** *see also* Heavy Minerals, and Minerals
Cobb Co.: Rogers, W. S., 1, 2

**TITANIUM,** *see also* titanium-bearing minerals, Heavy minerals, and Mineral resources
Coastal Plain: Youngman, E. P., 1
Lincoln Co.: Youngman, E. P., 1

**TOURMALINE,** *see also* Minerals
Dawson Co.: Hurst, V. J., 31
DeKalb Co.: Watson, T. L., 6

**TOWNS COUNTY,** *see also* Georgia, and Georgia—Blue Ridge
*Economic geology*
chromite: Hunter, C. E., 2
corundum, Hog Creek Mine: Ballard, T. J., 1
olivine: Hunter, C. E., 3
sillimanite: Hash, L. J., 1
vermiculite: Hunter, C. E., 1
*Mineralogy*
corundum: Genth, F. A., 4, 6
garnet, radioactive: Furcron, A. S., 28
hornblende: Grant, W. H., 3
*Petrology*
ultra basic rocks: Hunter, C. E., 3; Kellberg, J. M., 1
*Physical geology*
earthquakes: Crickmay, G. W., 14

**TRACKS AND TRAILS,** *see also* Paleontology, and Vertebrata
Ordovician, Catoosa Co.: Allen, A. T., Jr., 2

**TRIASSIC,** *see also* Mesozoic
Coastal Plain: Applin, P. L., 3; McKee, E. D., 1; Milton, C., 1
DeKalb Co., Stone Mountain-Lithonia area: Herrmann, L. A., 1
Early Co.: Jordan, L., 3
Gwinnett Co., Stone Mountain-Lithonia area: Herrmann, L. A., 1
Harris Co., Warm Springs Quad.: Hewett, D. F., 1
Meriwether Co., Warm Springs Quad.: Hewett, D. F., 1
Mitchell Co.: Richards, H. G., 7
Pike Co., Warm Springs Quad.: Hewett, D. F., 1
Rockdale Co., Stone Mountain-Lithonia area: Herrmann, L. A., 1
Talbot Co., Warm Springs Quad.: Hewett, D. F., 1
Upson Co., Warm Springs Quad.: Hewett, D. F., 1

**TRILOBITIMORPHA,** *see also* Crustacea, and Invertebrata
Bartow Co., Cambrian: Resser, C. E., 5; Walcott, C. D., 8
Catoosa Co., Silurian: Foerste, A. F., 1; Vogdes, A. W., 2, 3
Floyd Co., Cambrian: Resser, C. E., 2; Walcott, C. D., 10, 11
northwestern Ga., Cambrian: Salter, J. W., 1; Resser, C. E., 3
Walker Co., Silurian: Foerste, A. F., 1; Vogdes, A. W., 2
Whitfield Co., Cambrian: Walcott, C. D., 10

**TRIPOLI,** *see also* Mineral resources
Floyd Co.: Furcron, A. S., 52
Murray Co., Dalton Quad.: Munyan, A. C., 17
northwestern Ga.: Butts, C., 4
popular: Crickmay, G. W., 22
Whitfield Co., Dalton Quad.: Munyan, A. C., 17

**TROUP COUNTY,** *see also* Georgia, and Georgia—Piedmont
*Economic geology*
chromite, Louise Mine: Ballard, T. J., 3
minerals: Smith, L. P., 2
*Mineralogy*
aquamarine: Furcron, A. S., 43
beryl: Furcron, A. S., 43
columbite: Furcron, A. S., 54
minerals: Smith, L. P., 2
*Petrology*
diabase, altered: Brokaw, A. D., 1
graphite-bearing quartz: Veatch, J. O., 8

**TUNGSTEN,** *see also* tungsten-bearing minerals, and Mineral resources
Piedmont: Espenshade, G. H., 1

**TWIGGS COUNTY,** *see also* Georgia, and Georgia—Coastal Plain
*Economic geology*
clay: Tingle, W. W., 1
kaolin: Mitchell, L., 8; Veatch, J. O., 2, 5
*Geochemical investigations*
kaolin, sand and silt fraction: McLaughlin, R. J. W., 1
*Maps*
Economic, clay: Thompson, R. M., 1
Geologic: Thompson, R. M., 1
*Mineralogy*
clay: Grim, R. E., 1

kaolin: Glass, H. D., 1
kaolinite
reference: Kerr, P. F., 3
electron photomicrographs: Bates, T. F., 1, 2
montmorillonite: Brindley, G. W., 1
*Paleontology*
Pisces, Eocene: Dunkle, D. R., 1
**TYPE SECTIONS** of formations named from Georgia locations
Acworth Gneiss, Precambrian, Cobb Co.: Hayes, C. W., 16
Altamaha Grit, Miocene, Wayne Co.: Dall, W. H., 3
Amicolola Gneiss, Precambrian, Dawson Co.: Furcron, A. S., 12
Armuchee Chert, Devonian, Floyd Co.: Hayes, C. W., 18
Atkinson Formation, Cretaceous, Atkinson Co.: Applin, P. L., 2
Austell Granite, Precambrian?, Cobb Co.: Crickmay, G. W., 25
Bainbridge Marl, Eocene, Decatur Co.: Foerste, A. F., 4
Bainbridge residual beds, Oligocene, Decatur Co.: Dall, W. H., 4
Blufftown Formation, Cretaceous, Stewart Co.: Veatch, J. O., 7
Brier Creek Marl, Oligocene-Miocene, Screven Co.: Sloan, E., 2
Canton Schist, Cambrian or Precambrian, Cherokee Co.: Bayley, W. S., 1
Cartersville Formation, Cambrian, Bartow Co.: Shearer, H. K., 3
Charlton Formation, Pliocene, Charlton Co.: Veatch, J. O., 9
Cohutta Conglomerate, Cambrian, Gilmer-Fannin Cos.: Hayes, C. W., 1
Cohutta Schist, Precambrian, Murray Co.: Furcron, A. S., 13
Conasauga Shale, Cambrian, Whitfield-Murray Cos.: Hayes, C. W., 1
Corbin Granite, Precambrian, Bartow Co.: Hayes, C. W., 16
Cunningham Granite, Precambrian, Talbot Co.: Hewett, D. F., 1
Cusseta Sand Member (of Ripley Formation), Cretaceous, Chattahoochee Co.: Veatch, J. O., 7
Dean Formation, Precambrian?, Fannin Co.: Hurst, V. J., 15
Deaton Formation, *see* Deaton Iron Ore Series
Deaton Iron Ore Series, Ordovician, Polk Co.: Spencer, J. W. W., 6
Deaton Series, *see* Deaton Iron Ore Series
Fairmount Slate, Cambrian, Gordon Co.: Shearer, H. K., 3
Flint River Formation, Oligocene, Coastal Plain: Cooke, C. W., 16
Flint River [Formation], lower zones, Oligocene, Coastal Plain: Maury, C. J., 1
Flint River [Formation], upper zones, Oligocene, Coastal Plain: Maury, C. J., 1
Fort Mountain Gneiss, Precambrian, Murray Co.: Furcron, A. S., 13
Griffin Bed (in Chattahoochee Formation), Miocene, Decatur Co.: Foerste, A. F., 4
Hightower Granite, Cambrian?, Forsyth Co.: Bailey, W. S., 1
Hothouse Formation, Precambrian, Fannin Co.: Hurst, V. J., 15
Hughes Gap Formation, Precambrian?, Fannin Co.: Hurst, V. J., 15
Irwinton Sand Member (of Barnwell Formation), Eocene, Wilkinson Co.: LaMoreaux, P. E., 2
Jacksonboro Limestone, Miocene, Screven Co.: Dall, W. H., 3
Jeff Davis Granite, Precambrian?, Upson Co.: Clarke, J. W., 1
Keg Creek Sand, Eocene, Washington Co.: McCallie, S. W., 35
Lavender Shale Member (of Fort Payne Chert), Mississippian, Floyd Co.: Butts, C., 4
Lithonia Granite-gneiss, Precambrian?, DeKalb Co.: Watson, T. L., 8
Little River Series, Paleozoic?, Piedmont: Peyton, A. L., 2
Lookout Mountain Sandstone, *see* Lookout Sandstone
Lookout Sandstone, Pennsylvanian, northwestern Ga.: Hayes, C. W., 2
McBean Formation, Eocene, Richmond Co.: Veatch, J. O., 9
Manchester Schist, Precambrian, Meriwether Co.: Hewett, D. F., 1
Marks Head Marl, Miocene, Effingham Co.: Sloan, E., 2
Mineral Bluff Formation, Cambrian, Fannin Co.: Hurst, V. J., 15
Oglethorpe Formation, Precambrian, Dawson Co.: Furcron, A. S., 12
Okefenokee Formation, Pleistocene, Charlton Co.: Veatch, J. O., 9
Oostanaula Series, Cambrian, northwestern Ga.: Spencer, J. W. W., 6
Oostanaula Shale, *see* Oostanaula Series
Palmetto type granite, Paleozoic, Piedmont: Crickmay, G. W., 25
Panola Granite, age unknown, DeKalb Co.: Herrmann, L. A., 1
Parachucla Shale, Miocene, Effingham Co.: Sloan, E., 2
Penhaloway Formation, Pleistocene, Coastal Plain: Cooke, C. W., *in* LaForge, L., 3
Pine Mountain Formation, Cambrian or Precambrian, Pike and Harris Cos.: Galpin, S. L., 1
Pinelog Conglomerate, Cambrian, northwestern Ga.: Hull, J. P. D., 2
Providence Sand Member (of Ripley Formation), Cretaceous, Stewart Co.: Veatch, J. O., 7
Renfroes Marl, Cretaceous, Chattahoochee Co.: Veatch, J. O., 7
Rockmart Slate, Ordovician, Polk Co.: Hayes, C. W., 1
Rockwood Sandstone, Silurian, Chattooga Co.: Hayes, C. W., 7
Rome Formation, Cambrian, Floyd Co.: Hayes, C. W., 1
Rome Sandstone, *see* Rome Formation
Salem Church Granite, Cambrian, Pickens Co.: Bayley, W. S., 1
Sandersville Limestone Member (of Barnwell Formation), Eocene, Washington Co.: Cooke, C. W., 23
Satilla Formation, Pleistocene, Charlton Co.: Veatch, J. O., 9

Shell Bluff Group (in Barnwell Formation), Eocene, Burke Co.: Conrad, T. A., 6
Shell Bluff Marl, *see* Shell Bluff Group
Snelson Granite, Precambrian, Meriwether Co.: Hewett, D. F., 1
Sparks Schist, Precambrian, Meriwether Co.: Hewett, D. F., 1
Stone Mountain Granite, Permian?, DeKalb Co.: Watson, T. L., 8
Tallulah Falls Quartzite, Cambrian or Precambrian, Rabun Co.: Galpin, S. L., 1
Taylors Ridge [Formation], Silurian, northwestern Ga.: Little, G., 2
Tivola Tongue (of Ocala Limestone), Eocene, Houston Co.: Cooke, C. W., 2
Toccoa Quartzite, Cambrian or Precambrian, Stephens Co.: Galpin, S. L., 1
Twiggs Clay Member (of Barnwell Formation), Eocene, Twiggs Co.: Shearer, H. K., 1
Willys Landing Bed (in Chattahoochee Formation), Miocene, Decatur Co.: Foerste, A. F., 4
Woodland Gneiss, Precambrian, Talbot Co.: Hewett, D. F., 1

**UNCONFORMITIES**
Coastal Plain
Cretaceous-Eocene: Stephenson, L. W., 5
Eocene-Miocene: Pumpelly, R., 2
northwestern Ga., Ordovician-Silurian: Ulrich, E. O., 3
Polk Co., Cambrian-Devonian: Hayes, C. W., 6

**UNION COUNTY,** *see also* Georgia, and Georgia—Blue Ridge
*Areas described*
Ellijay Quad.: Furcron, A. S., 41; LaForge, L., 2
Nottely damsite: Moneymaker, B. C., 2
*Economic geology*
corundum, Track Rock Mine: Ballard, T. J., 4
mineral resources, Ellijay Quad.: LaForge, L., 2
*Engineering geology*
Nottely damsite: Kellberg, J. M., 2; Moneymaker, B. C., 2, 4
*Ground water*
Ellijay Quad.: LaForge, L., 2
*Historical geology*
Precambrian-Cambrian, Ellijay Quad.: LaForge, L., 2
*Maps*
Economic, mineral resources, Ellijay Quad.: LaForge, L., 2
Geologic, Ellijay Quad.: LaForge, L., 2
*Mineralogy*
amethyst, Hightower Bald: Furcron, A. S., 15
gold: Watson, T. L., 17
picrolite: Grant, W. H., 4
sillimanite: Watson, T. L., 17
*Petrology*
metamorphic rocks, Ellijay Quad.: Furcron, A. S., 41
meteorites: Buchner, C. L. O., 1, 2; Coulson, A. L., 1; Dana, E. S., 2; Harris, E. P., 1; Meunier, S., 1, 2; Paris Museum, 1; Reichenbach, K. F. von, 2; Rose, G., 2, 3; Saltpeter, E. W., 1; Shepard, C. U., 4
mylonite: Crickmay, G. W., 4

**UPSON COUNTY,** *see also* Georgia, and Georgia—Piedmont
*Areas described*
Thomaston Quad.: Clarke, J. W., 1
Warm Springs Quad.: Hewett, D. F., 1
*Economic geology*
kyanite: Crickmay, G. W., 12; Petar, A. V., 1
mica: Beck, W. A., 2; Olson, J. C., 1
Thomaston-Barnesville Dist.: Heinrich, E. W., 2
mineral resources, Thomaston Quad.: Clarke, J. W., 1
*Ground water*
hot springs: Stearns, N. D., 1; Watson, T. L., 24
Warm Springs Quad.: Hewett, D. F., 1
*Historical geology*
Precambrian, Thomaston Quad.: Clarke, J. W., 1
Precambrian-Cenozoic, Warm Springs Quad.: Hewett, D. F., 1
*Maps*
Economic, mica: Olson, J. C., 1
Geologic
Thomaston Quad.: Clarke, J. W., 1
Warm Springs Quad.: Hewett, D. F., 1
*Mineralogy*
calcite: Grant, W. H., 11
garnet: Ingram, W. F., 1
kyanite: Ingram, W. F., 1
mica, inclusions: Lester, J. G., 3
staurolite: Ingram, W. F., 1
*Physical geology*
singing sand: Teas, L. P., 3

**URANINITE,** *see also* Minerals, and Radioactive minerals
Fulton-Hart Cos.: Hurst, V. J., 29

**URANIUM,** *see also* uranium-bearing minerals, Minerals, and Radioactive minerals
Georgia: Furcron, A. S., 46
northwestern Ga.: Glover, L., 2; Gott, G. B., 1; Swanson, V. E., 1

**URANOPHANE,** *see also* Minerals, and Radioactive minerals
DeKalb Co.: Watson, T. L., 7

**VERMICULITE,** *see also* Mica, and Mineral resources, and Minerals
Blue Ridge: Hunter, C. E., 5; Smith, R. W., 3
Piedmont: Hunter, C. E., 5
Towns Co.: Hunter, C. E., 1

**VERTEBRATA,** *see also* individual types
Chatham Co., Pleistocene: Mitchell, L., 2
Coastal Plain
Cenozoic: Veatch, J. O., 9
Cretaceous: Veatch, J. O., 9
Pleistocene: Hurst, V. J., 27
Georgia, Pleistocene, relict: Blair, W. F., 1

**VOLCANIC ROCKS,** *see also* Igneous rocks, and Metamorphic rocks
Blue Ridge: Williams, G. H., 1
Clinch Co., welded tuff: Ross, C. S., 4
northwestern Ga., Ordovician: Kay, G. M., 1
Piedmont: Hurst, V. J., 8; Williams, G. H., 1

WALKER COUNTY, *see also* Georgia, and Georgia—Northwestern
*Areas described*
Cedar Grove Quad.: Dicus, J. M., 1
Durham Quad., eastern: Darling, R. W., 1
Kensington Quad., southern: Traylor, H. G., 1
Ringgold Quad.: Hayes, C. W., 7
Stevenson Quad.: Hayes, C. W., 8
*Economic geology*
argon: Furcron, A. S., 55
bentonite: Bay, H. X., 1; Gildersleeve, B., 2
coal: Gildersleeve, B., 2; Harr, L., 1; Johnson, V. H., 1; McCallie, S. W., 14; Porter, J. B., 2; Troxell, J. R., 1
analyses: Fieldner, A. C., 1, 2; Pope, G. S., 1
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