

**BRIEF HISTORY OF THE
BUREAU OF GEOLOGY
1850 - 1983**

by
WILLIAM A. GILLILAND



INFORMATION SERIES 84-2

MISSISSIPPI DEPARTMENT OF NATURAL RESOURCES
BUREAU OF GEOLOGY

ALVIN R. BICKER, JR.
Bureau Director

JACKSON, MISSISSIPPI

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CONTENTS

	Page
Brief History of the Bureau of Geology, 1850-1983.....	1

GEOLOGIC MAPS OF MISSISSIPPI

Figure 1. Lieber, 1854.....	3
Figure 2. Harper, 1857.....	5
Figure 3. Hilgard, 1860.....	7
Figure 4. Eckel and Crider, 1905.....	9
Figure 5. Crider, 1907.....	11
Figure 6. Stephenson et al., 1928.....	13
Figure 7. Mississippi Geological Society, 1945.....	15
Figure 8. Bicker, 1969.....	17

BRIEF HISTORY OF THE BUREAU OF GEOLOGY, 1850-1983

by
William A. Gilliland

The Mississippi State Legislature, March 5, 1850, approved an Act authorizing an Agricultural and Geological Survey of the State of Mississippi. Dr. John Millington, Professor of Chemistry and Natural Philosophy, University of Mississippi, was appointed by the trustees as Principal Professor of Geology and Agriculture. Due to his advanced years, 70, Millington was unable to do field investigations.

Oscar M. Lieber was appointed, July 15, 1851, to the position of Assistant Professor of Geology to conduct field investigations. He apparently made a number of reconnaissance trips in the gathering of geologic data about the State. Although no report of his findings is known to have been printed during his short tenure as Assistant Professor of Geology at the University, an article, "A Sketch of the Geology of the State of Mississippi," was published in the journal "Mining Magazine," 1854, vol. 3, p. 41-47, in which he identified four geological divisions and produced the first "Geological Map of Mississippi" (Figure 1). The divisions consist of: 1) Carboniferous limestone and Millstone Grit, both located in the northeastern corner (Paleozoic area) of the State; 2) Cretaceous green-sand and Cretaceous limestone, located in the northeastern part of the State; 3) Tertiary uplands of the central part of the State; and 4) alluvium of the Mississippi River.

Lieber resigned his position as Assistant Professor of Geology on January 14, 1852, thus serving in this

position for only a period of six months. For such a limited time of employment and the means of travel present in 1851, his accomplishment should not be considered anything but outstanding.

Upon the resignation of Lieber as Assistant Professor of Geology, B. L. C. Wailes was appointed to the vacated position. Professor Wailes, previously at Jefferson College, Washington, Adams County, Mississippi, had already made a considerable collection of rocks and fossils from southwestern Mississippi. Upon his appointment as Assistant Professor of Geology and Assistant State Geologist, he set about to investigate the remaining areas of the State. During the years 1852 and 1853 Wailes spent considerable time in the field, traveling more than seven thousand miles.

Millington, due to failing health, in 1853 resigned his position at the University and as head of the State Geological Survey. John C. Keeney was elected, that same year, to fill the vacated position as chair of Chemistry, Agriculture and Geology at the University of Mississippi. Although Keeney filled the position at the University, there is no indication that he had any connection with the Geological Survey. After serving only one year in this position Keeney resigned.

Wailes continued his work and in 1854 his work, "Report on the Agriculture and Geology of Mississippi" was published. Wailes' report consists of 371

pages, of which the first 116 pages are devoted to a historical outline of the State of Mississippi, 79 pages to agriculture, 90 pages to geology, 12 pages to meteorology, 32 pages to fauna of the State, 16 pages to flora of the State, and 15 pages to the appendix. A geologic map was not produced with this report.

After Keeney's resignation and with the resulting vacancy, Wailes assumed he would be appointed to the chair of Chemistry, Agriculture and Geology and Head of the Geological Survey. Much to Wailes' disappointment, Lewis Harper, LL.D., was appointed in February 1854 to fill the vacancy created by Keeney's resignation. Upon Harper's being appointed to the chair of Chemistry, Agriculture and Geology and Head of the Geological Survey, Wailes questioned if his works were receiving the official recognition deserved and shortly thereafter handed in his resignation.

Harper, upon accepting the position with the University, agreed to lecture in the University on Geology and Agriculture for six months of the academic year, make the analyses for the State, direct the Assistant Geologist, and for four months go to the field himself. Harper, after being appointed in February 1854, began field investigation of the State on October 24, 1854. After Wailes' resignation Dr. F. A. P. Bernard, Professor of Physics, University of Mississippi, while on a trip north was to seek someone to fill the vacant position of Assistant Geologist. While at a meeting of the AAAS in Providence, Rhode Island, he met and offered the position to Dr. Eugene W. Hilgard in August 1855. Hilgard accepted the position and arrived in Oxford, Mississippi, in September 1855. Harper and Hilgard began their first trip, together, to the field in October 1855. This trip carried them to Aberdeen, Monroe County, south of Leakesville, Greene

County, then west to Fort Adams, Wilkinson County, then by steamer north to Memphis, Tennessee, before returning to the University. Hilgard, April 1856, began detailed investigation of the northeastern part of the State. That same year in the fall and the beginning of the rainy season Hilgard traveled to Tuscaloosa, Alabama, to compare notes and to consult with the State Geologist of Alabama, Michael Tuomey.

Harper resigned his position at the University and as State Geologist in November 1856. John J. McRae, Governor of Mississippi, reappointed Harper, pay retroactive to November 1856, to the position of State Geologist effective as of March 1, 1857. During this tenure Harper's "Preliminary Report on the Geology and Agriculture of the State of Mississippi" was published. The publication consists of 350 pages, a "Geological Chart of Mississippi" (Figure 2), and seven tables. Harper resigned for the second time as State Geologist in late 1857.

Upon Harper's resignation work of the Survey was suspended and Hilgard returned to the Smithsonian Institution. Hilgard's stay with the Smithsonian was a short one as in early 1858 he was offered the position as State Geologist. Hilgard accepted the position, returned to Mississippi, and took to the field in April 1858. During this time, late spring through early fall, he investigated the Tertiary area of the State. Hilgard continued his investigation of the State during 1859. His publication "Report on the Geology and Agriculture of the State of Mississippi," published in 1860, was an outstanding contribution to the State and to geology. This publication contained 391 pages, a north-south cross-section, and a "Geological Map of Mississippi" (Figure 3). This report was divided into two major sections: 1) Geological Report and 2) Agricultural Report. This is the most outstanding of his publica-

FIGURE 1.

Geological Map of Mississippi, 1854, Oscar M. Lieber, Mining Magazine, vol. 3. Original: size 6x9 inches; black-on-white.

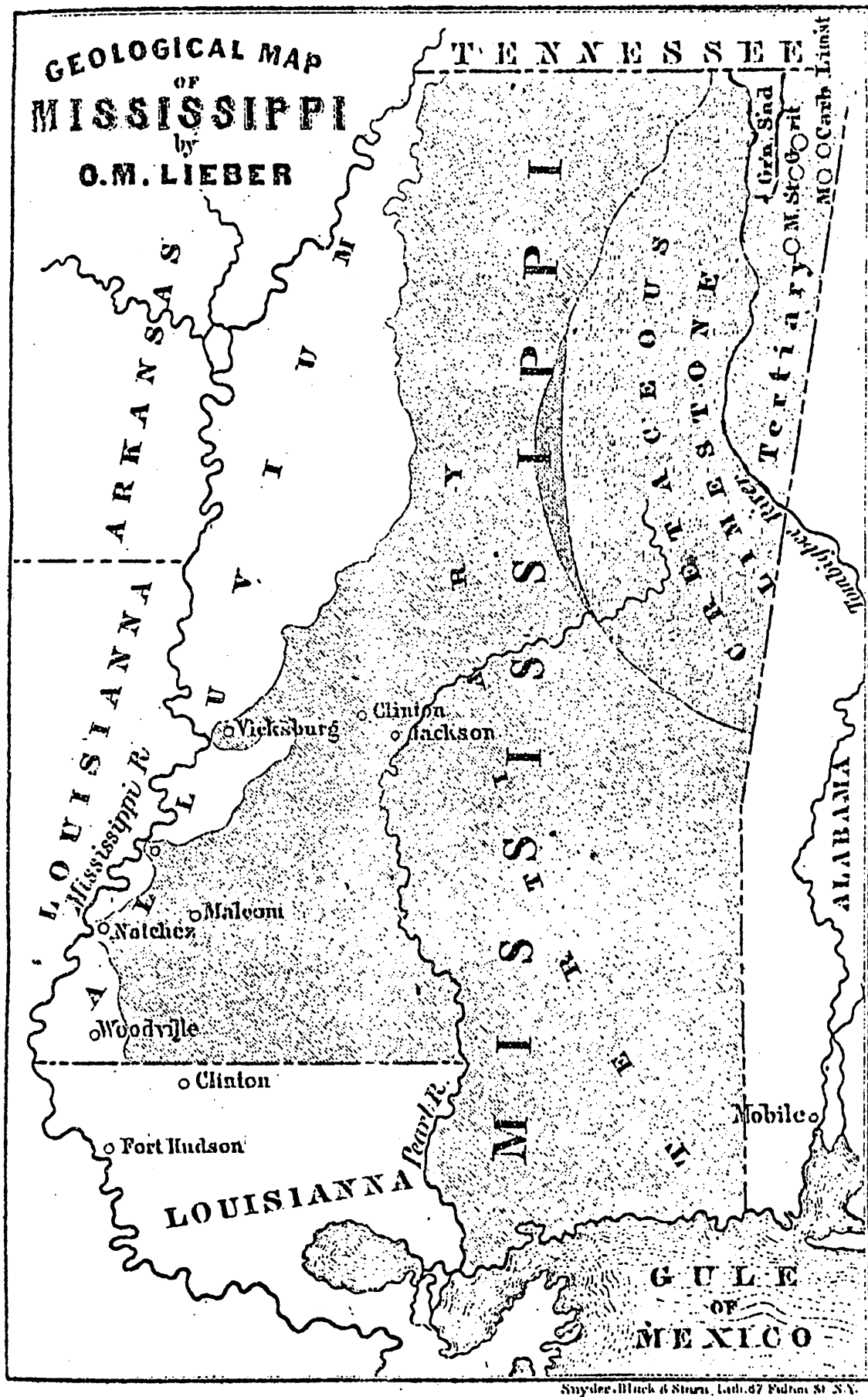


Figure 1.

tions and is referenced in numerous reports on Mississippi geology. Although Hilgard published numerous times the majority of the papers were published by organizations or journals outside the State.

Hilgard, from the time of his appointment as State Geologist in 1858 until July 1866, worked without an assistant geologist. In July 1866, Dr. George Little was appointed Assistant Geologist. Little quickly began detailed exploration of the loess region. Shortly thereafter, October 1866, Hilgard accepted the chair of Chemistry at the University of Mississippi, resigned as State Geologist, and recommended Little for the position of State Geologist. Little was appointed as State Geologist, a position he held until October 1870, at which time he resigned and accepted a position at the University as Professor of Geology and Natural History. During Little's tenure the State was fortunate in having the position of Assistant Geologist being filled, November 1868, by Dr. Eugene A. Smith.

Upon Little's resignation Hilgard once again accepted the position of State Geologist. Smith continued his investigation of the State until September 1871, at which time he resigned the position as Assistant State Geologist to take the chair of Geology and Mineralogy at the University of Alabama. R. H. Loughridge accepted the position as Assistant State Geologist and was preparing a report to cover the work done after 1860 when the State Auditor of Public Accounts withheld the appropriations for the Geological Survey in the fall of 1872; thus the Geological Survey became, and remained, inactive until 1906.

During the years of inactivity, 1872-1906, local investigators and geologists with the United States Geological Survey produced numerous reports on

the geology, mineral resources, and hydrology of the State.

In 1906 the Legislature passed a bill creating the Geological Survey of Mississippi. The person chosen to be Director was the very able Dr. Albert F. Crider, who previously was with the United States Geological Survey and had authored "Geology and Mineral Resources of Mississippi," 1906, and had co-authored "Underground-Water Resources of Mississippi," 1906. A "Preliminary Geologic Map of the State of Mississippi" (Figure 4) was published in Crider's U.S. Geological Survey publications, Bulletin 283 and Water-Supply and Irrigation Paper 159.

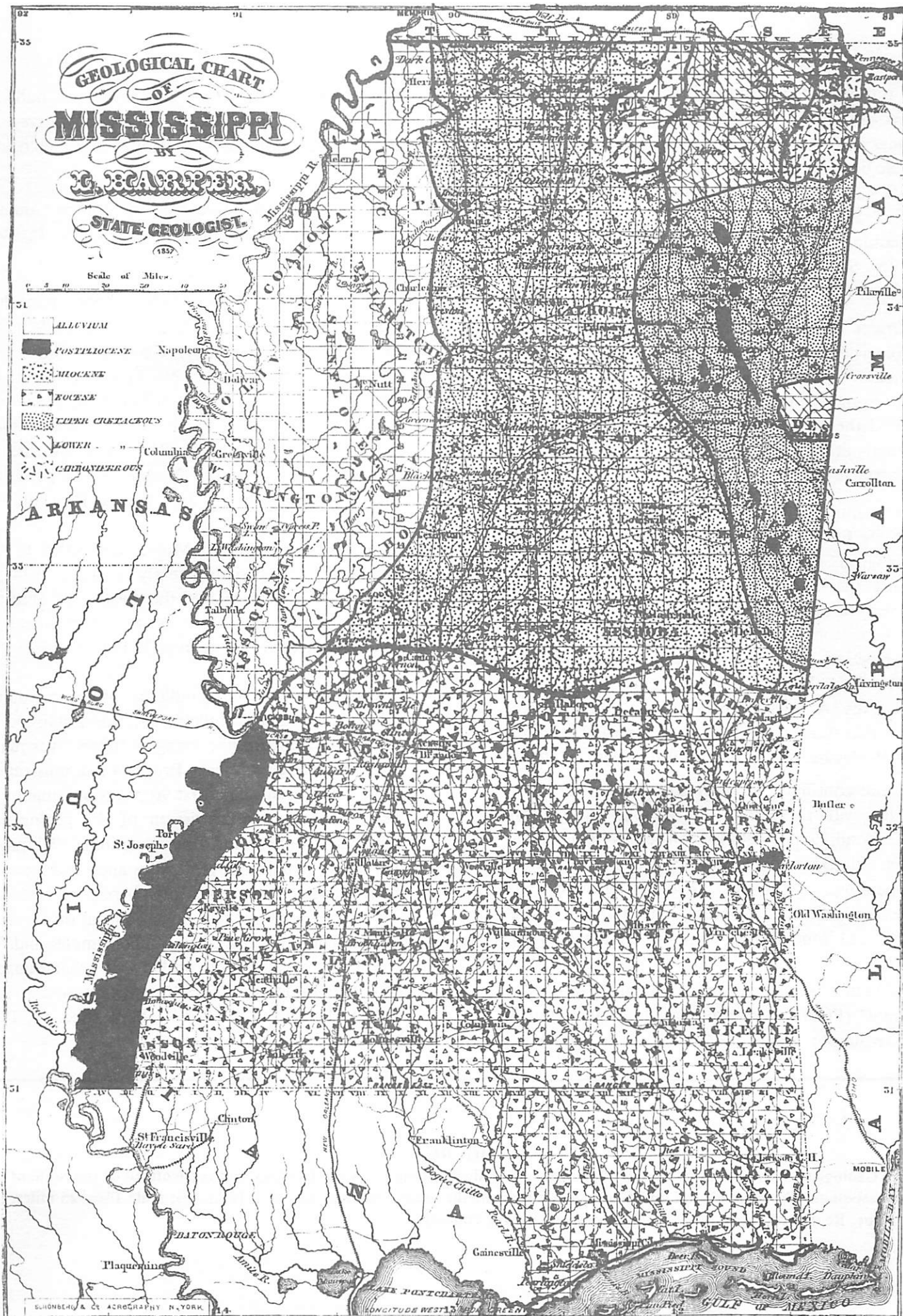
Crider accepted the position as Director of the Geological Survey of Mississippi in April 1906. Others accepting positions with the Survey were W. N. Logan of Mississippi Agricultural and Mechanical College and Calvin S. Brown with the University of Mississippi.

The Geological Survey of Mississippi in cooperation with the United States Geological Survey employed a survey party, on a limited basis, for mapping in the vicinity of Clarksdale. The purpose of this survey was to determine if the Delta could be drained, cleared, and developed for agriculture. Also, the State Survey cooperated with the U.S. Forest Service in making a study of the forests of part of the State.

During 1906 the Geological Survey published three bulletins: 1) "Cement and Portland Cement Materials of Mississippi," A. F. Crider; 2) "Clays of Mississippi. Part I, Brick Clays and Clay Industry of Northern Mississippi," W. N. Logan; and 3) "The Lignite of Mississippi," Calvin S. Brown. "A Provisional Geologic and Topographic Map of Mississip-

FIGURE 2.

Geological Chart of Mississippi, 1857, Lewis Harper, Preliminary Report on the Geology and Agriculture of the State of Mississippi, The Agricultural and Geological Survey of the State. Original: size 9½ x 14 inches; scale 1" = 25 miles; color. Patterned overlay used in copying.



pi" was published in Bulletins 1, 2, and 3 (Figure 5). Two additional bulletins were produced during Crider's tenure as Director of the Mississippi Geological Survey: 4) "Clays of Mississippi. Part II, Brick Clays and Clay Industry of Southern Mississippi," W. N. Logan; and 5) "A Study of Forest Conditions of Southwestern Mississippi," the United States Forest Service (cooperating), J. S. Holmes and J. H. Foster.

Crider resigned as Director of the Mississippi Geological Survey in May 1909. During this brief period of time he established the Geological Survey, was responsible for the publication of five bulletins, proved the Delta could be drained and developed for agriculture, and put the Survey on a positive and progressive route.

Ephraim N. Lowe, M.D., accepted the position as State Geologist and Director of the Mississippi Geological Survey in June 1909. Lowe had, in 1908, joined the Survey as Assistant Geologist. The Survey was moved from the University of Mississippi to Jackson at the time of Lowe's acceptance of the position of Director, where it remained until 1924 when the Survey was moved back to the University. After the Survey was moved back to the University Lowe served as Director of the Survey and Professor of Geology until his death in 1933.

Lowe continued the correspondence, started by Crider, with the Bureau of Soils at Washington, D.C., resulting in a detailed soil survey being undertaken in December 1909. Some of the other cooperative agreements involved ground-water investigations, study of the Coastal Plain formations, and topographic mapping of areas of the State.

In 1928 a "Reconnaissance Geologic Map of Mississippi" (Figure 6) was prepared for insertion in Water-Supply Paper 576, "The Ground-Water

Resources of Mississippi." This report was published by the United States Geological Survey in cooperation with the Mississippi State Geological Survey.

Natural gas was discovered in Monroe County, Amory Field, 1926, and Hinds County, Jackson Gas Field, 1930.

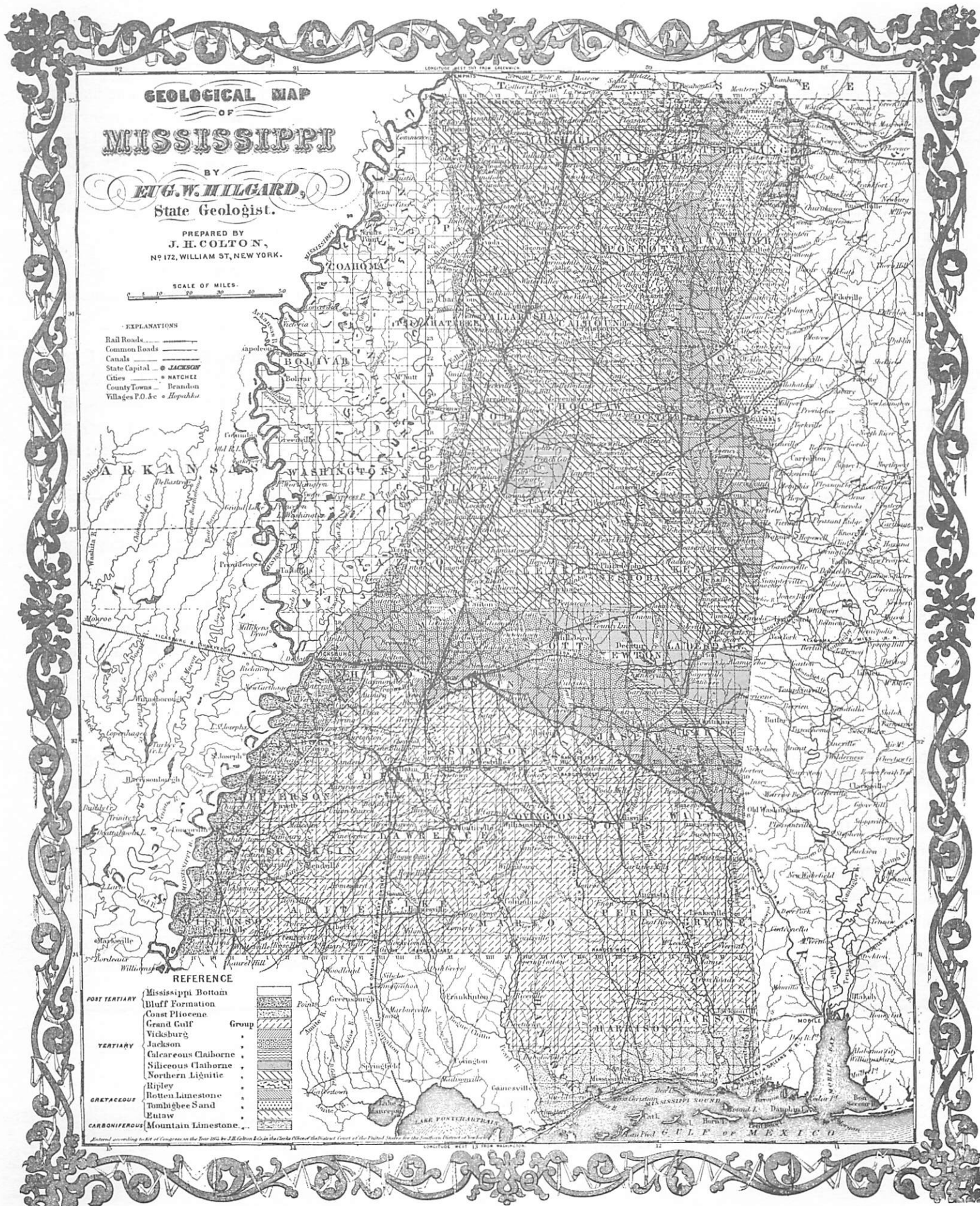
Some of the more outstanding reports published during Lowe's tenure as Director are: Bulletin 12, "Mississippi, Its Geology, Geography, Soils and Mineral Resources," E. N. Lowe; Bulletin 17, "Plants of Mississippi, a list of Flowering Plants and Ferns," E. N. Lowe; "Archeology of Mississippi," C. S. Brown; and Bulletin 23, "Paleozoic Rocks," W. C. Morse. A total of 21 reports was published during the years that Lowe served as Director.

Dr. William Clifford Morse was called to the University of Mississippi early in June 1934, at which time he was offered the position of Director of the Survey and Head of the Department of Geology, effective September 1, 1934.

The first of the county bulletins, Winston County Mineral Resources, Bulletin 38, was published in 1939. This bulletin, like many to follow, was made possible through a Works Progress Administration project and grant. The first 90 pages of Bulletin 38 were devoted to a discussion of the geology of Winston County and the remaining 79 pages discussed the many clays, lignites and sands present in the county. Numerous tests were performed on the samples, mainly clay, taken during this investigation. The holes drilled to obtain samples and for geologic knowledge were drilled with a hand auger. A maximum depth of 75.9 feet was reached in Test Hole 57 located in the NW¼, SE¼, Sec. 15, T.15 N., R.12 E.

FIGURE 3.

Geological Map of Mississippi, 1860, Eugene W. Hilgard, Report on the Geology and Agriculture of the State of Mississippi, The Agricultural and Geological Survey of the State. Original: size 13 x 16 inches; scale 1" = 25 miles; color. Reprinted copy, 1963, black-on-white used for copying.



The second county geological investigation conducted in cooperation with the WPA was Yazoo County. During the field investigation for Yazoo County Mineral Resources, Bulletin 39, Frederic F. Mellen, Assistant State Geologist, discovered the "Tinsley structure." Morse investigated the structure, considered it sufficiently important and on April 12, 1939, issued a press release to the papers in Mississippi and other papers in the South. This led to the discovery of Tinsley Field with the discovery well coming in on August 29, 1939.

A "Geologic Map of Mississippi," 1945, was published by the Mississippi Geological Society in cooperation with the United States Geological Survey (Figure 7).

Morse served as Director of the Mississippi Geological Survey until his retirement in June 1958. During Morse's time as Director a total of 60 reports was published. Also during Morse's tenure as Director, the Survey in 1953 acquired a George C. Failing 750 drill rig, thereby permitting the drilling of a greater number and deeper test holes. Also, a Widco Logger purchased that same year allowed for an electric log to be run in each hole drilled.

Tracy W. Lusk accepted the position as State Geologist and Director of the Survey effective July 1, 1958.

As Mississippi is an oil producing state the preservation of cuttings and cores donated by the oil companies to the Survey is of utmost importance. Space allotted for the sample library to provide for the storage of the cuttings and cores was filled to capacity. In December 1958 the request for additional space was presented to the Mississippi Building Commission. At this time it was concluded that to serve the oil industry to the maximum the sample library should be located in Jackson and not

at the University. The Building Commission agreed to provide the land and approximately one half of the needed finances with the stipulation being the balance required would be supplied by the oil companies. The sample library located at 2525 North West Street, Jackson, was first occupied by the Survey in June 1960 with the formal dedication being held in February 1961.

Lusk resigned as Director and State Geologist on June 30, 1962. During his tenure as Director nine bulletins were published.

Frederic F. Mellen accepted the position of Director and State Geologist effective July 1, 1962. The Survey was at this time located in two different and widely separated places. The new sample library was located in Jackson, while the Director and the majority of the staff remained at the University of Mississippi, separated by a distance of approximately 165 miles. The relocation of the Director and the entire Survey staff, to Jackson, was undertaken and completed in late 1962.

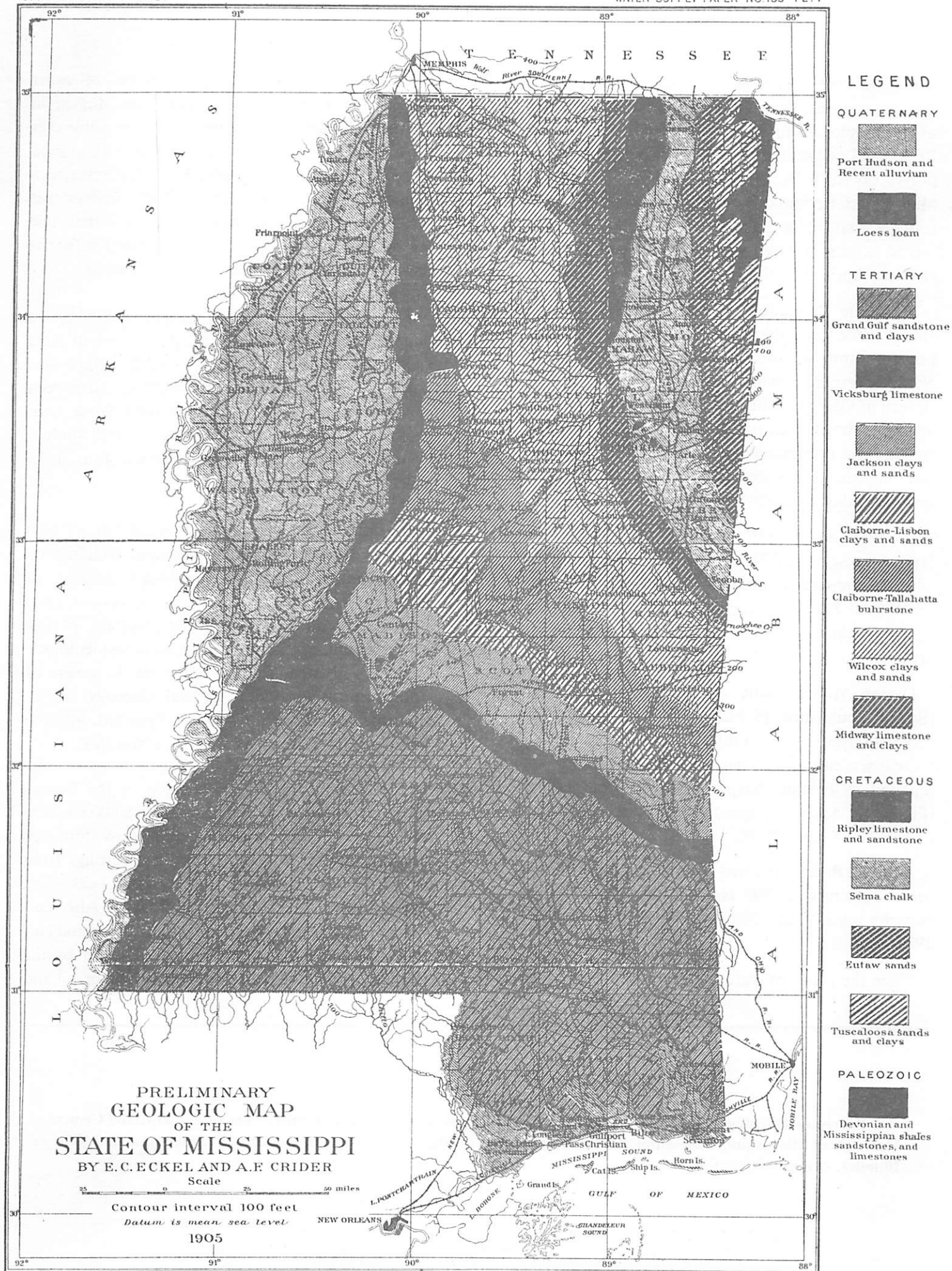
The relocation of the Survey also resulted in the study and geologic mapping of the counties in the southern part of the State. These counties had throughout the life of the Survey been the most distant and suddenly were those most conveniently located.

Mellen resigned as Director and State Geologist in May 1965. During Mellen's tenure as Director Bulletins 95 through 105 were published.

William H. Moore accepted the position of Director and State Geologist in May 1965. It was during Moore's tenure as Director that the Survey underwent a change in direction and in personnel. The Survey in 1966 began to stock and sell topographic maps. This was followed by an expansion of the

FIGURE 4.

Preliminary Geologic Map of the State of Mississippi, 1905, E. C. Eckel and A. F. Crider, Underground-Water Resources of Mississippi, A. F. Crider and L. C. Johnson, United States Geological Survey Water-Supply and Irrigation Paper 159. Original: size 8¾ x 12 inches; scale 1" = 38 miles; color; 100' contours.



Survey into the field of environmental geology and assisting the State Board of Health in the placement of landfill sites. A librarian was added to the staff in 1973. The Legislature of the State of Mississippi approved on April 14, 1977, the "Mississippi Surface Mining and Reclamation Act" for the purpose of regulating all surface mining in the State. This Act was to be administered by the Survey and became effective April 15, 1978.

The State Legislature passed an Act, effective July 1, 1979, combining several agencies of similar functions into the newly created Department of Natural Resources with the Survey becoming the Bureau of Geology. The Mineral Lease Division was added to the Bureau of Geology by the same law creating the Department of Natural Resources. By this time the authorized staff of the Bureau had been increased to thirty-two.

In 1978 the Survey began a site study and literature research of Tatum Dome, the salt dome in which two nuclear explosions were detonated during the 1960's. The study focused on possible nuclear contamination of ground-water in the immediate area.

During Moore's time as Director, the Survey (Bureau) published 15 bulletins, 3 environmental geology series reports, 9 information series reports, 5 cross-sections and 5 maps, of which one was an updated "Geologic Map of Mississippi," 1969 (Figure 8). Moore resigned as Director and State Geologist on January 31, 1980.

Alvin R. Bicker, Jr., was appointed Acting Director on February 1, 1980. He continued to act in this capacity until his appointment as Director, May 1, 1980.

Since the study of Tatum Dome the Bureau has

become involved in the investigation of other "nuclear" related studies. Three salt domes in Mississippi were on the original list of possible sites for a high-level nuclear waste repository (Lampton Dome, Marion County; Richton and Cypress Creek Domes, Perry County). In 1982 the Bureau was directed to be actively involved and since that time has become the leading geological consultant for the State in the nuclear waste repository studies.

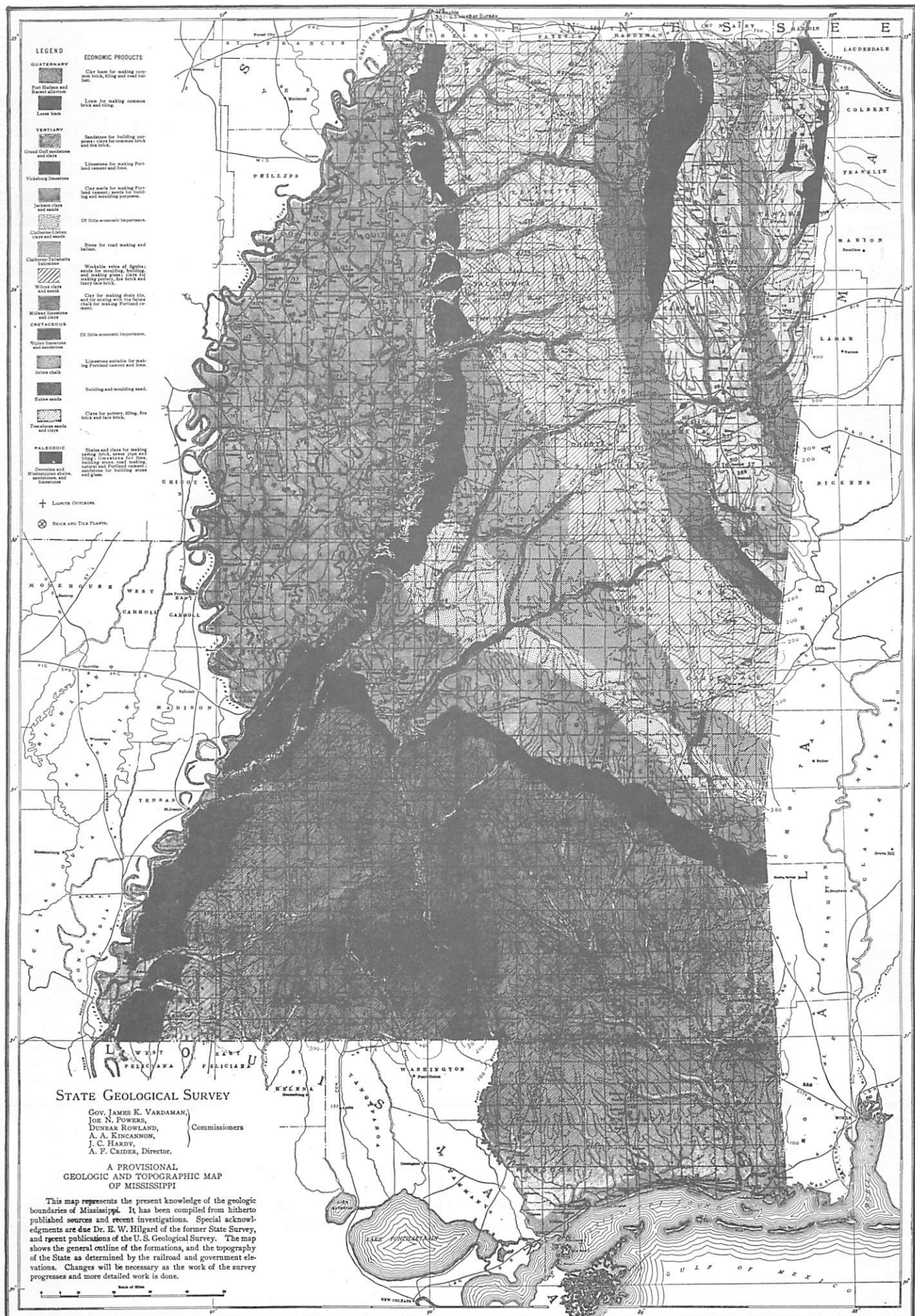
The first issue of "Mississippi Geology," a quarterly journal devoted to the publication of short articles concerning the geology of Mississippi, was published in September 1980. Articles have been contributed to the journal not only from local geologists but also from the national and international community. To date, through vol. 4, no. 1, 35 articles have been published.

The Bureau maintains a Geological Library having over 3,000 linear feet in shelving. Holdings include publications of: Mississippi Bureau of Geology, other state geological surveys, United States Geological Survey, trade journals, professional organizations, societies, Canadian Geological Survey, and other foreign countries. Coverage of Southeastern and Gulf Coastal Geology is emphasized. The library receives, at present, approximately 300 publications and maps monthly.

The Sample Library maintained by the Bureau has a floor area of approximately 80,000 square feet. Shelves, seven high, are utilized to store well cuttings and cores. The Bureau has cuttings from over 5,250 wells and cores from over 625 wells which have been donated by the oil companies. Also, cuttings donated by the water well contractors and cuttings and cores from test holes put down by the Bureau are retained. In the exploration for oil and

FIGURE 5.

A Provisional Geologic and Topographic Map of Mississippi, 1907, Albert F. Crider, Cement and Portland Cement Materials of Mississippi, Mississippi State Geological Survey, Bulletin 1. Original: size 20 x 28½ inches; scale 3/4" = 10 miles; color; 100' contours.



gas 21,136 holes (to January 1, 1983) have been drilled in Mississippi. On file are electric logs representing over 13,500 of these holes. Also, the Bureau has over 21,000 scout cards on file. In addition to the above the Bureau has over 5,400 electric logs from water wells and Bureau test holes.

During the fiscal year, July 1982-June 1983,

publication sales were 1,493 publications, 9,754 maps, cross-sections, etc., and 650 electric logs.

During the time that Bicker has been Director, to October 1983, the Bureau has published, in addition to "Mississippi Geology," 4 bulletins, 2 information series reports, 2 open file reports, 1 map, 1 chart of producing formations and 1 stratigraphic column.

FIGURE 6.

Reconnaissance Geologic Map of Mississippi, 1928, The Ground-Water Resources of Mississippi, L. W. Stephenson et al., United States Geological Survey Water-Supply Paper 576. Prepared in cooperation with the Mississippi State Geological Survey. Original: size 19 x 25 inches; scale 1:1,000,000; color.



Figure 6.

ACKNOWLEDGMENTS

The writer desires to express his appreciation to the numerous people who have made this publication possible.

A special thanks is extended to Frederic F. Mellen, Consulting Geologist, Jackson, Mississippi, for his discussions which were very informative and helpful.

Greatly appreciated is the assistance by the staff of the Bureau of Geology with this publication.

FIGURE 7.

Geologic Map of Mississippi, 1945, Mississippi Geological Society in cooperation with the United States Geological Survey. Original: size 35 x 47 inches; scale 1:500,000; color; major surface faults indicated.

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FIGURE 8.

Geologic Map of Mississippi, 1969, Alvin R. Bicker, Jr., Mississippi Geological Survey. Original: size 35 x 47 inches; scale 1:500,000; color; major surface faults indicated.

