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CARDITAMERA WILLIAMSI, A NEW SPECIES FROM THE LATE EOCENE OF MISSISSIPPI

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INTRODUCTION

The molluscan biostratigraphy of Lamarck for Europe's Paris Basin played an important role in Lyell's division of Tertiary time into epochs. Successively younger epochs were characterized by higher percentages of extant species (those species still living) than the older ones. Today, these epochs are subdivided into the Paleogene or "ancient beginning," which contains the Paleocene, Eocene, and Oligocene epochs, and the Neogene or "recent beginning," which contains the Miocene and Pliocene epochs. *Carditamera* is a bivalve genus that is common in Neogene deposits but is rare in those of Paleogene age. For this reason, the discovery of a new *Carditamera* species in the late Eocene of Mississippi is of particular interest.

The first appearance of *Carditamera* is in the middle Eocene (Lutetian and Bartonian stages) of France. LeRenard and Pacaud (1995) list four species from the Paris Basin, which are figured in Cossmann and Pissarro (1906, pl. 32). These species are small (less than 1 cm in length) and include *C. aspersa* (Lamarck, 1805) and *C. squamatina* (Deshayes, 1858), which have expanded posterior margins, and *C. valmondoisiensis* (Morellet and Morellet, 1931) and *C. aequicostata* (Cossmann, 1887), which have elevated beaks.

The right valve of a new *Carditamera* species, *C. williamsi*, was collected by Michael E. Williams in the summer of 1997 from

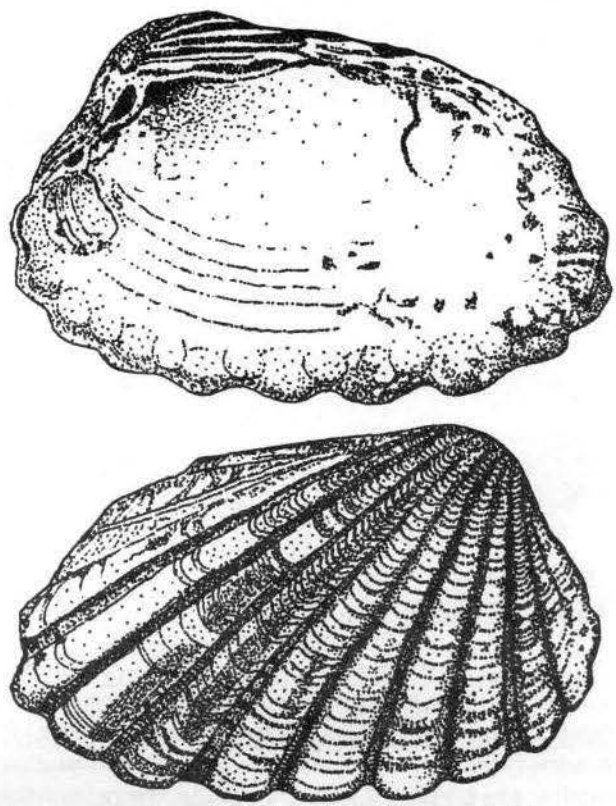


Figure 1. *Carditamera williamsi* n. sp. (enlarged x3) as drawn by its collector, Michael E. Williams.

the surface of the Moodys Branch Formation (Late Eocene) at Techeva Creek near the Davis Road bridge west of Highway 433 in Yazoo County north of Midway, Mississippi (Williams, 1997; Dockery and Williams, 1998). Such was the surprise at this find, that the writer wondered if the outcrop had not been accidently salted with a specimen from the Miocene of Florida (a collector from Florida had recently collected from the Chipola Formation of Florida and then at Techeva Creek). However, the Techeva Creek specimen was only about half the size of *Carditamera apotegea* Gardner, 1926, the common *Carditamera* species of the Chipola Formation. It had 16 imbricated, radial ribs as did *C. apotegea*, but only 11 were strong. The other Chipola species *C. defuniak* Gardner, 1926, is quite different with closely-spaced, radial ribs, lacking strong imbrications.

Carditamera williamsi differs from *C. tegea* Dall, 1903, from the late Oligocene Tampa Limestone at Ballast Point, Florida, in the same ways it differs *C. apotegea*. Dall originally included the Chipola species within his definition of the Tampa species. Gardner noted that the *C. tegea* is smaller than *C. apotegea* and has 17 or 18 radial ribs rather than 16. Though smaller than the Chipola species, the type of *C. tegea* is 33 mm in length and 16 mm in height and is about a third larger than *C. williamsi*.

Carditamera is represented in the Gulf of Mexico by the extant species *C. floridana* Conrad of southern Florida and eastern Mexico and *C. gracilis* (Shuttleworth) of Mexico and Puerto Rico (see Abbott, 1974, p. 476, pl. 21). In the eastern Pacific, the genus is represented by *C. radiata* (Sowerby) (see Keen, 1971, p. 107, fig. 238), *C. affinis* (Sowerby), and *C. tricolor* (Sowerby), all found from Baja California to Ecuador (see Abbott, 1974, p. 476-477, pl. 21). Of these species, *C. williamsi* most closely resembles the Gulf of Mexico species *C. floridana*.

Though only half the size (25 mm rather than 50 mm in length), *Carditamera williamsi* resembles the type species *C. arata* as illustrated by Campbell (1993, pl. 11, fig. 102) for a hypotype specimen (U.S. National Museum 265798) from the Yorktown Formation of Chesapeake, Virginia.

SYSTEMATICS

Citations and references for the higher bivalve taxa below are from Carvie, 1996.

Class BIVALVIA
Subclass HETERODONTA Neumayr, 1883
Order VENEROIDA H. Adams & A. Adams, 1858
Superfamily CARDITOIDEA Fleming, 1820
Family CARDITIDAE Fleming, 1820
Subfamily CARDITAMERINAE Chavan, 1969

CARDITAMERA Conrad, 1838

Type species by original designation: *Cypricardia arata* Conrad, 1832, p. 20, pl. 5, fig. 1, Academy of Natural Sciences of Philadelphia holotype 20022 (Campbell, 1993, p. 163) from the Pliocene Yorktown? Formation of Newbern, North Carolina.

Carditamera williamsi n. sp.

Description: This species is known from a single *Carditamera* right valve, which resembles the type species. The shell is heavy, elongate, and has 16 radial ribs, which are beaded or imbricated between the intersections of faint growth lines. The first anterior rib is small, and the next 11 are thick and broadly spaced. These are followed by one thin, one modest, and one thin, marginal posterior rib. The anterior and posterior margins are rounded, giving the shell a less quadrate outline than the type. The hinge, teeth, muscle scars, and pallial line are like that of the type species. The ventral interior margin is crenate with 13 notches opposite the stronger radial ribs; the anterior- and posterior-most notches are less distinct.

Dimensions: Height 14.7 mm, Length 24.7 mm, inflation 6.4 mm.

Type: Holotype PRI45488 Paleontological Research Institution, Ithaca, New York.

Etymology: Named for the collector, Michael Eric Williams.

Occurrence: Moodys Branch Formation, Techeva Creek at Davis Road, Yazoo County, Mississippi.

REFERENCES CITED

Abbott, R. T., 1974, American seashells, The marine Mollusca of the Atlantic and Pacific coasts of North America: Van Nostrand Reinhold Company, New York, 663 p., 24 pl.

Adams, H., and A. Adams, 1858, The genera of recent Mollusca arranged according to their organization: London, v. 3, p. 541-661, pl. 129-138.

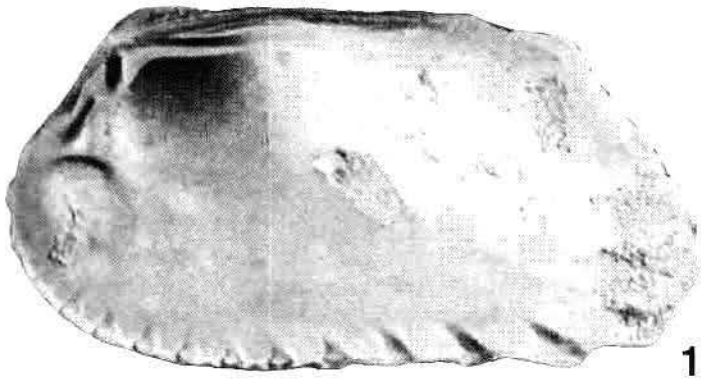
Campbell, L. D., 1993, Pliocene molluscs from the Yorktown and Chowan River formations in Virginia: Virginia Division of Mineral Resources, Publication 127, 259 p., 43 pl.

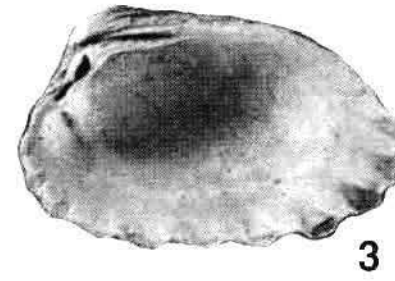
Chavan, A., 1969, Subfamily CARDITAMERINAE Chavan, new subfamily, *in* R. C. Moore, ed., Treatise on Invertebrate Paleontology, pt. N, v. 2 of 3, Mollusca 6, Bivalvia, p. N548-N553.

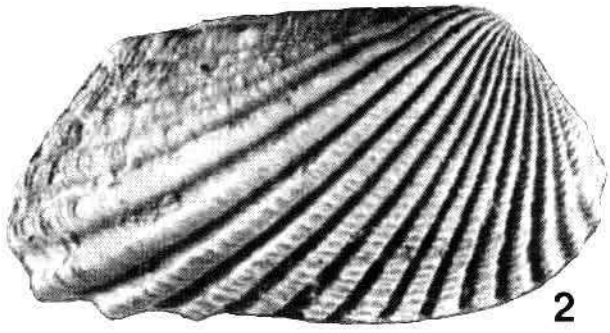
Conrad, T. A., 1832, Fossil shells of the Tertiary formations of North America, Illustrated by figures drawn on stone, from nature: Philadelphia, v. 1, no. 1, p. 1-20, pl. 1-6. Republished by G. D. Harris (Rufus H. Darby, Washington, printer) in 1893 and by the Paleontological Research Institution, Ithaca, New York, in 1963.

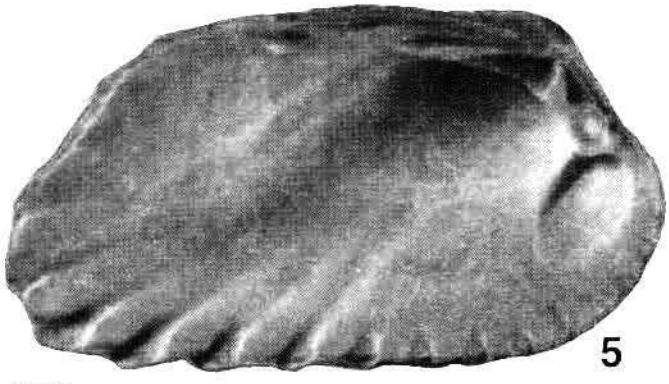
Conrad, T. A., 1838, Fossils of the Medial Tertiary of the United States, Illustrated by figures, drawn from nature: Philadelphia, part 1, p. 1-32, pl. 1-17 (Dall reprint, 1893, p. 1-52, pl. 1-17).

Cossmann, M., 1887, Catalogue illustré des coquilles fossiles de l'Eocène de environs de Paris (2ème fasicule): Annales









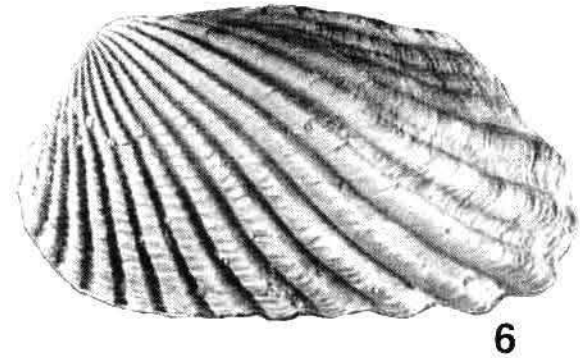


PLATE I

Figures **1-2, 5-6**: *Carditamera apotegea* Gardner, 1926, from the early Miocene Chipola Formation along Tenmile Creek, Calhoun County, Florida; **1-2**, right valve enlarged x2, height 24.0 mm, length 45.4 mm, inflation 10.5 mm; **5-6**, left valve enlarged x2, height 23.7 mm, length 42.5 mm, inflation 11.0 mm. Figures **3-4**: *Carditamera williamsi* n. sp. from the late Eocene Moodys Branch Formation along Techeva Creek at Davis Road, Yazoo County, Mississippi; right valve enlarged x2, height 14.7 mm, length 24.7 mm, inflation 6.2 mm.

de la Société Royale Malacologique de Belgique, tome 22, p. 1-218, pl. 1-8.
Cossmann, M., and G. Pissarro, 1906, Iconographie Complète des Coquilles Fossiles de l'Éocène des Environs de Paris. Tome 1: Pélécypodes: Paris (Hermann), pl. 17-45.
Dall, W. H., 1903, The Tertiary Fauna of Florida ...: Transactions of the Wagner Free Institute of Science of Philadelphia, v. 3, part 6, p. 1219-1654, pl. 48-66.
Deshayes, G.-P., 1858, Description des animaux sans vertèbres découverts dans le bassin de Paris. Tome II. Livraisons 39-40: Paris (Baillière), p. 921-968.
Dockery, D. T., III, and M. E. Williams, 1998, The first report of *Carditamera* (Mollusca: Bivalvia) from the Eocene of the U.S. Gulf Coastal Plain: Journal of the Mississippi Academy of Sciences, v. 43, no. 1, p. 36.
Fleming, J., 1820, *in* D. Brewster, ed., New Edinburgh Encyclopaedia: Philadelphia, p. 668 (v. 1-18 text, v. 19-20 pl., 1813-1831).
Gardner, J., 1926, The Molluscan fauna of the Alum Bluff Group of Florida. Part II. Astartacea, Carditacea, Chamacea: U.S. Geological Survey, Professional Paper 142-B, p. 81-99, pl. 16-17.
Garvie, C. L., 1996, The molluscan macrofauna of the Reklaw Formation, Marquez Member (Eocene: Lower Claibornian), in Texas: Bulletins of American Paleontology, v. 111, no. 352, 177 p., 23 pl.
Keen, A. M., 1971, Sea shells of tropical West America. Marine mollusks from Baja California to Peru: Stanford University Press, Stanford, California, second edition, 1064 p., 22 pl.
Lamarck, J.-B., 1805, Mémoires sur les fossiles des environs de Paris (suite 5): Annales du Muséum d'Histoire Naturelle, tome VI, p. 117-126, 214-228, 337-345, 407-415, pl. 43-46 (=pl. I-IV).
LeRenard, J., and J.-M. Pacaud, 1995, Révision des Mollusques Paléogènes du Bassin de Paris. II - List des Références Primaires des Espèces: Cossmanniana, v. 3, no. 3, p. 65-132.
Morellet, L., and J. Morellet, 1931, Contribution à l'étude de la fauna des sables moyens d'Auvers: Bulletin du Muséum Royal d'Histoire Naturelle, 2ème séries, v. 3, p. 702-705.
Neumayr, M., 1883, Zur Morphology des Bivalvenschlosses. Sitzungsberichte der Kaiserlichen Akademie der Wissenschaften: Mathematische-Naturwissenschaftlichen Klasse, Abh. 1, v. 88, no. 1, p. 385-418, 2 pls.
Williams, M. E., 1997, The finding of a new fossil species in Tcheava (sic) Creek: Rocky Echoes, Bulletin of the Mississippi Gem & Mineral Society, Jackson, Mississippi, v. 38, no. 4, December 1997, p. 8-9.

MISSISSIPPI OFFICE OF GEOLOGY PUBLICATION SALES FOR FISCAL YEAR 1997

Margaret Allen and Michael B. E. Bograd
Mississippi Office of Geology

The Map and Publication Sales office is the means used by the Office of Geology to fulfill its mandate to distribute the publications resulting from its various research projects. This article is a tabulation and brief analysis of the maps and publications sold by the Map and Publication Sales office of the Office of Geology during Fiscal Year 1997, which ended June 30, 1997. The following tabulation helps identify those publications and areas of research found most useful by industry and the public.

FY 1997 Sales

Maps	12,447
Bulletins	566
Circulars	243
Cross Sections	16
Environmental Geology Series	1
Information Series	19
Open-File Reports	69
Reports of Investigations	20

The Office of Geology has several series of publications. The Bulletin series, the original and still the flagship series, was begun in 1907. Of the 130 titles in the series, 101 are still in print and available for sale; all but 13 of these had sales of at least one copy during the year. The top sellers in the Bulletin series (with abbreviated titles) were B115, Rankin County geology, 38 copies; B105, Hinds County geology, 36 copies; B113, water resources of Mississippi, 30 copies; B40, Upper Cretaceous deposits, 22 copies; B124, Vicksburg Group gastropods, 21 copies; B88, Madison County geology, 19 copies; and B83, fresh water strata on electrical logs, 19 copies. The new title in the Circular series, C6, *Windows into Mississippi's Geologic Past*, was the top-selling Circular at 198 copies. C4, the Frankstown vertebrate fossil locality, remained a good seller in FY97 with 24 copies. The three titles in the Reports of Investigations series sold 20 copies. Sales of Open-File Reports were spread over many of the titles, with the top seller being OF15, the current index to *Mississippi Geology*. The new title in the series, OF17, *Geologic Map of the DeKalb Quadrangle, Kemper County, Mississippi*, is the first of a new series of geologic quadrangles created in a geographic information system and printed on an inkjet plotter at 1:24,000. The biggest seller among the maps and charts again was the Geologic Map of Mississippi, with 122 copies. Other titles include the economic minerals map, structural features map, stratigraphic column, chart of producing formations, and Mississippi Sound lease block maps.

In addition to the geological reports published by the Office of Geology, Map and Publication Sales stocks all of the topographic maps available for the State of Mississippi. These excellent maps are produced by the U.S. Geological Survey, and are made conveniently available by the Office of Geology as a public service. The majority of the "Maps" in the tabulation above are topographic maps, mostly 7.5-minute quadrangles (scale 1:24,000) with some 15-minute quadrangles (scale 1:62,500), with total sales of 10,809 maps. Also sold during FY97 were 995 copies of the 1:100,000-scale topographic maps, 106 copies of the 1:250,000-scale topographic maps, and 211 copies of the state topographic map at 1:500,000.

The Map and Publication Sales office also handles the distribution of back issues of the Office of Geology's quarterly journal *Mississippi Geology*. This publication contains technical and popular articles dealing with the geology, paleontology, and mineral resources of Mississippi. Some of the articles are useful for educational purposes. There is no charge for a subscription or for back issues of the journal so it is not included in the publication sales tabulation. The circulation is nearly 1000, and approximately 200 additional copies are distributed to staff and visitors in the office. Volume 18 of *Mississippi Geology* will be published during calendar year 1997. An index to *Mississippi Geology*, updated after each issue is published, is available as Open-File Report 15, "Current Index to *Mississippi Geology*," for $2.00 ($4.00 by mail).

The figures presented here were compiled by Margaret Allen and analyzed by Michael B. E. Bograd. They represent only a partial report on the map and publication sales activities of the Office of Geology. Many other items not mentioned in this brief overview are available as well. For additional information about the available publications of the Mississippi Geological Survey / Office of Geology, please visit our Map and Publication Sales office at Southport Center, intersection of Highway 80 and Ellis Avenue, Jackson, Mississippi, weekdays from 8 a.m. to 5 p.m. You may call the Office of Geology for information at (601) 961-5500. The direct number for Map and Publication Sales is (601) 961-5523. Our fax number is (601) 961-5521. The mailing address is:

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Virginia H. Kline's Clay County Foraminifera Slides Donated to the Smithsonian

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Early in 1995, Brian Huber of the Department of Paleobiology, U.S. National Museum, requested the type specimen *Guembelina morsei* Kline, 1943, for photography. This species, named for a previous Director of the Mississip¡ i Geological Survey, William Clifford Morse, was stated by Kline (1943, p. 45) to be "common in the Porters Creek and transitional beds, but is not known from typical Clayton beds." The type is from Mississippi Geological Survey test hole M49 2 ½ miles north of Pheba in Clay County, surface to 8.7 feet.

Huber wanted to compare the type with numerous other specimens attributed to this species, which has become a biostratigraphic guide fossil. Kline's slides 1-7 for her plates 1-7 (1943) were located, and slide 7 was sent to the U.S. National Museum on May 16, 1995. Receipt of the slide was acknowledged by Museum Specialist Dan Levin on June 30, 1995, as the museum was "in the process of accessioning the specimens." A "Deed of Gift" form was sent to the Mississippi Office of Geology at this time to enable the U.S. National Museum to "document that you are the legal donor of the specimens."

In a June 9, 1995, letter, Huber noted concerning *G. morsei* that "There has been a fair bit of confusion regarding the taxonomic concept of this species, I think largely because the holotype has not been restudied since its original description." He also noted that "The Kline collection includes several other species that are widely used, but poorly understood."

It was decided that Kline's Clay County figured-specimen slides 1-7 would best be placed in the U.S. National Museum Foraminifera collection, which according to Huber's letter "is the largest and most heavily visited in the World." Slides 1-6 were sent to the U.S. National Museum along with a completed "Deed of Gift" form for all 7 slides on July 26, 1995.

On January 3, 1997, Huber sent a list of holotype specimens found on Kline's slides and their catalog numbers. These are:

Species	Catalog Number
Guembelina morsei	487301
Robulus pseudo-costatus var. *inornatus*	491600
Bullapora laevis var. *hispida*	491601
Bullapora chapmani var. *hispida*	491602

Scanning electron microscope (SEM) images of the holotype of *Guembelina morsei* and others in the U.S. National Museum Foraminifera collection can be viewed at the following web site: <http://www.nmnh.si.edu/paleo/foram>.

REFERENCE CITED

Kline, Virginia Harriett, 1943, Clay County Fossils. Midway Foraminifera and Ostracoda: Mississippi Geological Survey, Bulletin 53-F, 98 p., 8 pl.

REVIEW OF *ROADSIDE GEOLOGY OF LOUISIANA*

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Roadside Geology of Louisiana, by Darwin Spearing: Mountain Press Publishing Company, Missoula, Montana, 1995, 225 p. (see end of review for ordering instructions)

Roadside Geology of Louisiana is a useful and informative guide to the geological sights along Louisiana's highways. Its purpose is to explain the geology that can be seen from the car window; it is not a guide to the "best" geologic sites, which may be in remote areas or locations difficult to visit. The book also has concise descriptions of geological features and processes to be found in Louisiana. The text is well illustrated, largely with reader-friendly diagrams in black and red and with landscape photography. Photographs of outcropping formations are less frequent as photogenic rock and sediment exposures are not common in the state. Diagrams include details of deeply buried formations and structures that affect the surface geology. In short, this book serves as a proxy for a "Geology of Louisiana." It is written for the lay and professional reader. Mississippians will find this book useful because our state has many similar geological features, and we can use it to better enjoy the scenery as we visit our neighboring state.

The book begins with a geologic overview. Topics covered include geologic time, geologic history of Louisiana, structure below, salt domes, oil and gas, minerals, rivers in motion, dynamic deltas, Mississippi fan, how the Mississippi River grew, and wetlands loss. These concepts are well explained in clear, understandable terms.

Five chapters comprise the bulk of the book; they cover the roadside geology in five regions of the state. The regions are described in the Preface as "coherent package[s] of land and rocks." The titles of the chapters are:

Southeastern Louisiana—Uneasy Rivers, Marshes, and Deltas;
Eastern Louisiana—Red Hills Above Pontchartrain;
Southwestern Louisiana—Marsh to the Sea;
Central Louisiana—Great Rocks and Great Rivers; and
Northern Louisiana—Oldest Rocks, Highest Hills.

Each of these chapters begins with a sketch geologic map of the region. The opening pages of each regional chapter describe the geologic background of the region, concentrating on a few key features. For example, the Southeastern Louisiana chapter, which covers the area south of a line from Lafayette to Baton Rouge to Slidell, describes the geologic setting and geologic history of the Atchafalaya Basin, New Orleans, and Lake Pontchartrain. Then follow descriptions, with photographs and diagrams, of the geologic sights along selected stretches of road. Stretches of the Interstate and U.S. highways are included, then smaller state highways that lead to interesting localities such as Avery Island and Grand Isle.

The book is rounded out by a five-page glossary (with brief definitions of geological terms), a list of references, a list of sources of geological maps and information, and an index to the places, processes, and principles mentioned in the text.

The book contains a lot of interesting information, presented in a user-friendly manner. I particularly enjoyed several tidbits of information. On page 34, I read that another term for a yazoo stream (interesting to me because of the Mississippi origin of that term) is "rim-swamp bayou." Pages 197-198 cover Louisiana 1 from Shreveport to Oil City to Arkansas and tell about the history of the oil industry in the area. "The world's first offshore, or at least overwater, oil well was drilled in Caddo Lake in 1911." There is a photograph of a replica of the first drill rig in the Caddo Lake area, taken at the Caddo Pine Island Oil and Historical Society Museum in Oil City. The derrick looks a lot like the one at the Agriculture and Forestry Museum in Jackson, Mississippi.

Much of Louisiana is covered by geologically young alluvial and deltaic sediments associated with the Mississippi and Red rivers and fossil localities are not common. Only one fossiliferous outcrop is illustrated in the book. However, for those looking for hard rocks and fossils, Spearing makes even mundane, barren sediments of Recent age interesting with his discussion of river morphologies, sedimentation, and flood control. As Spearing notes in his Preface, "Louisiana is an excellent place to watch geologic processes that go on around us every day...."

Mountain Press informs me that they have a *Roadside Geology of Mississippi* in the works. I look forward to announcing its availability on the pages of this journal.

Copies of *Roadside Geology of Louisiana* (price $15, shipping $3) are available from

Mountain Press Publishing Company
P.O. Box 2399
Missoula, MT 59806

1-800-234-5308

For information about this publisher's other titles in the *Roadside Geology* series, visit their Web site at **<http://www.montana.com/mtnpress>.**

TWO INTERESTING CORES IN ATTALA COUNTY, MISSISSIPPI, AND THE MID-JURASSIC SURFACE

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It is hard to imagine that Mississippi, a coastal plain state, was once an arid, rocky terrain like that of North America's Basin and Range Province. However, this was the case during the breakup of the ancient supercontinent called Pangea. The breakup of Pangea led to the creation of the Gulf of Mexico, the Atlantic Ocean, and the formation of the seven continents. This split began in the Triassic Period and continued in the Gulf Region until the middle of the Jurassic Period (the Atlantic Ocean is still growing today).

A buried land surface called the Mid-Jurassic Surface or the MJS for short (Buffler and Thomas, 1994) covers this ancient terrain. This surface can be recognized as an angular unconformity throughout the Gulf region on seismic lines and in deep wells. It cuts across rocks of Paleozoic age as well as Triassic basin-fill sediments of the La Boca Formation in Mexico, the Eagle Mills Formation of the northern Gulf, and the Newark Group of the Atlantic margin and the South Georgia Basin.

Overlying the MJS in the Mississippi Interior Salt Basin of southern Mississippi are the evaporites of the Werner Formation and Louann Salt. In southern Mississippi, these formations are seldom penetrated by exploratory oil wells, and the MJS is poorly known from core data. The Louann Salt is bounded to the north in central Mississippi by the Pickens-Gilbertown Fault Zone. Overlying the Louann Salt are the late Jurassic clastic and carbonate sediments of the Norphlet, Smackover, and Haynesville formations, which encroach on the basin walls. However, though these combined formations may be several hundred feet thick, they did not completely fill in the rift basins of the Mid-Jurassic Surface. This was accomplished only by a flood of late Jurassic desert clastics (known as red beds) in the Cotton Valley Group.

Buffler and Thomas (1994, fig. 19) gave a cross section of late Jurassic formations onlapping faulted blocks along the northern margin of the Mississippi Interior Salt Basin in east-central Mississippi. Here the Norphlet, Smackover, and Haynesville formations overlap the Louann Salt. The rugged terrain north of the updip limit of the Smackover/Haynesville sequence is infilled by Cotton Valley clastics, including carbonate-clast conglomerates. The upper contact of the Cotton Valley is smooth compared to its base. The stratigraphy of Jurassic units onlapping the basin margin is also shown in the cross section of Fischer (1974), which extends across Newton and Jasper counties (the same area as the Buffler and Thomas cross section).

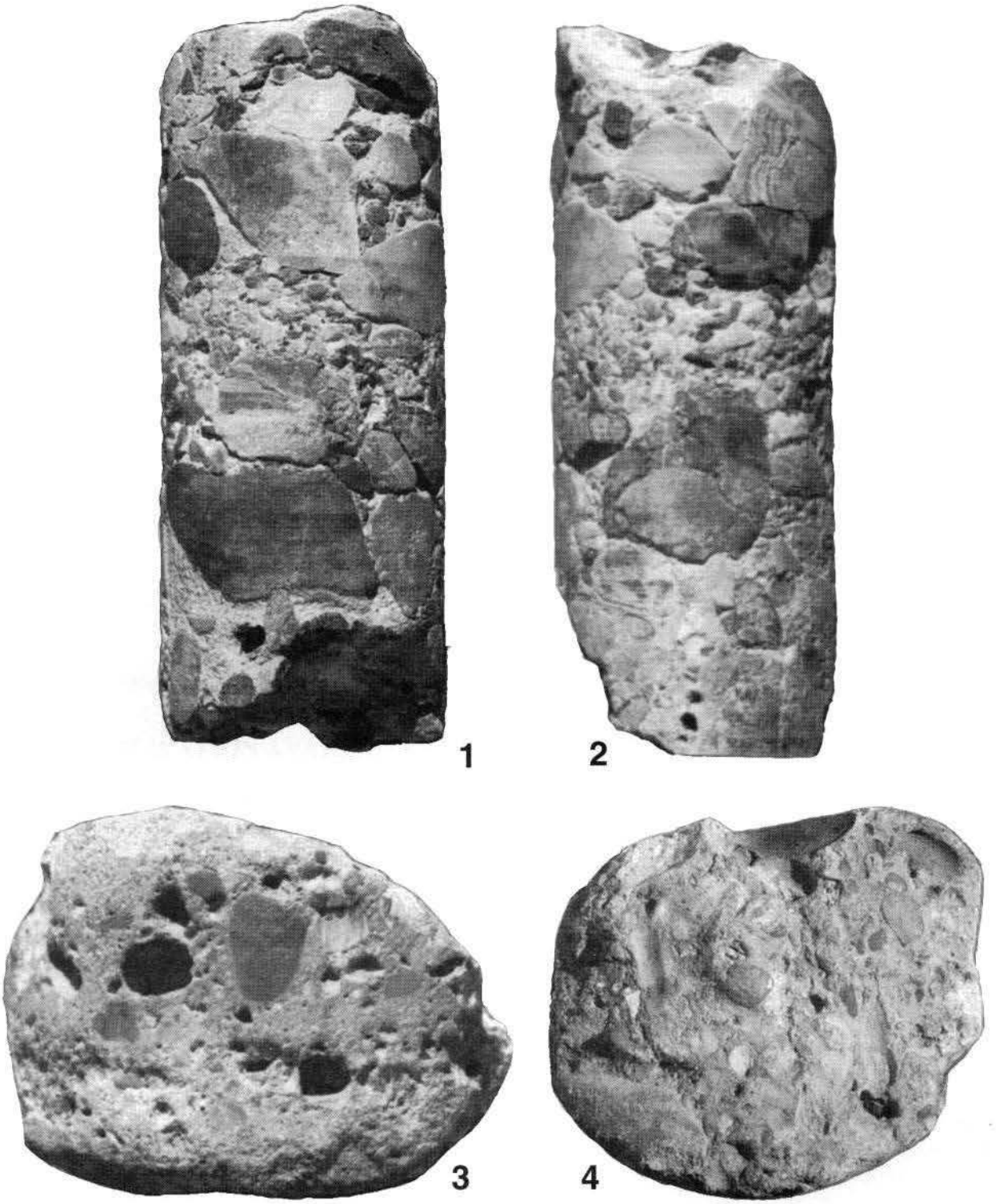
In north-central Mississippi, Cotton Valley clastics overlap the faulted Mid-Jurassic Surface at Pickens in Madison County (Pickens-Gilbertown Fault Zone) and continue into Attala County where they overlie Paleozoic shales. Here the Cotton Valley contains felsitic lava flows as well as clastic sediments.

Cores from two Attala County exploratory wells that penetrated the MJS, the Continental Oil Company #1 Millard Sudduth and the Stanolind #1 C. E. Steed, give a rare look at the coarse clastic sediments that overlie that surface. They attest to the rugged desert environment that covered this state in the late Jurassic some 150 million years ago.

The base of the Cotton Valley Group in the Stanolind #1 Steed is shown in the 5.5-inch core illustrated in figures 3-4. This core is a chert- and quartz-pebble conglomerate with a calcareous quartz sand matrix that looks like concrete. Pebbles of carbonate have been dissolved, leaving holes. This core section was found stored separately from those catalogued in the Mississippi Office of Geology warehouse at 2525 North West Street in Jackson, Mississippi. A label on the bottom reads "Stanolind #1 C. E. Steed core cut by Robishearly basket 6373-74½ basal Mesozoic." This core is mentioned by Moore (1963, p. 130) in his work on the "Subsurface geology of Attala County."

Moore (1963) also cited gravels at the base of the Mesozoic section in the Continental #1 Sudduth. The core descriptions on the geophysical log show the lower Cotton Valley in this well to contain a 166-foot interval of fractured "felsite," some of which is laminated and other sections are porphyritic. This igneous extrusive interval rests above Pennsylvanian black shale, the top of which is at 7,249 feet (Moore, 1963, p. 126). King (1961) recognized this Cotton Valley section as an altered porphyry in which lath-shaped feldspar phenocrysts were altered to clay.

William H. Moore (personal communication, 1998) identified an unlabeled core (figures 1-2) in the Office of Geology collection as basal Cotton Valley from the #1 Sudduth core and cited Fred Mellen, former director of the Mississippi Geological Survey, as having said that it was the last Mesozoic rock in the core barrel before the Paleozoic black shale. This core contains a conglomerate with large subangular clasts of pink to dark-



Figures 1-2: opposite sides of a 3.5-inch core of basal Cotton Valley (late Jurassic) conglomerate overlying Paleozoic shale at 7,248-7,249 feet in the Continental #1 Millard Sudduth in Section 28, T. 13 N., R. 6 E., Attala County, Mississippi. Figures 3-4: side (3) and top (4) views of a 5.5-inch core of basal Cotton Valley conglomerate from 6,673-6,674.5 feet in the Stanolind #1 Steed in Section 4, T. 13 N., R. 6 E., Attala County. Top of the Pennsylvanian shale in the well is at 6,690 feet according to a Trowbridge sample log.

gray limestone and calcareous sandstone and pebbles of chert and quartz. These clasts are contained within a highly calcareous, poorly sorted, silt to coarse-grained sand (quartz sand) matrix.

The presence of such a colorful variety of clasts overlying the MJS in Attala County indicates the geologic diversity of Mississippi's ancient Jurassic terrain. These cores also provide an uncommon view of the gravels overlying a basin-wide angular unconformity at the Mid-Jurassic Surface.

ACKNOWLEDGMENTS

The writer is thankful for the assistance of William H. Moore, who identified the Continental #1 Sudduth core; Jack Henderson, who helped with geophysical and sample log information; and Delbert E. Gann, who examined rock clasts in the #1 Sudduth conglomerate.

REFERENCES CITED

Buffler, R. T., and W. A. Thomas, 1994, Crustal structure and evolution of the southeastern margin of North America and the Gulf of Mexico Basin. Chapter 4, *in* DNAG Continent-Ocean Transect Volume. Phanerozoic Evolution of North America Continent-Ocean Transitions: The Geological Society of America, 504 p.

Fischer, V. N., 1974, Northeast-southwest stratigraphic cross section of the Jurassic sediments, Newton County to Jasper County, Mississippi: Mississippi Bureau of Geology, CS-3.

King, P. B., 1961, Summary Reports on selected wells penetrating Paleozoic rocks in the Southeastern States, *in* The Ouachita System: Bureau of Economic Geology, The University of Texas Publication No. 6120, 353 p.

Moore, W. H., 1963, Subsurface geology of Attala County, p. 123-138, *in* W. S. Parks, W. H. Moore, and B. E. Wasson, Attala County Mineral Resources: Mississippi Geological Survey, Bulletin 99, 192 p.

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