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HOSSTON AND SLIGO FORMATIONS IN SOUTH MISSISSIPPI

Dora M. Devery
Mississippi Bureau of Geology

The Hosston and Sligo Formations are of Early Cretaceous age and lie stratigraphically above the Jurassic-age Cotton Valley Group and below the Lower Cretaceous Pine Island Formation. In Mississippi, the Hosston/Sligo beds dip generally to the southwest and increase in thickness within the Mississippi Interior Salt Basin. The up-dip limit of recognition of the Hosston is found in the northern part of the Salt Basin near the vicinity of Dollar Lake field in southern Leflore County at depths of 6500 feet (Fig. 1). North of this field the Hosston is difficult to identify because the entire Lower Cretaceous section grades into an undifferentiated sequence of discontinuous sands and shales. Within the Interior Salt Basin, where virtually all of the Hosston/Sligo oil and gas production is found, the Hosston and Sligo Formations consist of approximately 3500 feet of alternating sands and shales found at depths of 10,000 - 17,000 feet. The sandstones are pink and white to gray in color and are associated with maroon, gray, or mottled mudstones as well as occasional limestone nodules and traces of lignite. These deposits have attributes of fluvial-deltaic sediments: fining upward sequences evident in sandstones and anomalous thickening of sands as seen on sand isopach maps (Reese, 1977, Thomson, 1978). Down dip from the fluvial-deltaic deposits, the clastic rocks of the Hosston give way to a carbonate facies. The Sligo Formation represents the down-dip marine facies equivalent of the Hosston (Nichols, 1958, Todd and Mitchum, 1977). Throughout most of Mississippi the Sligo is a distinct unit which conformably overlies the Hosston; the contact between the two formations is transitional. Up dip in central and north-central Mississippi the Sligo interfingers with the Hosston.

Since Bassfield field was discovered in 1974, twenty of the last twenty-nine Hosston/Sligo discoveries have been made in Marion, Jefferson Davis, and Covington Counties. In this three-county area, the Hosston and Sligo are part of a

(Continued on page 2.)

Figure 1. Location map showing the counties where there is current Hosston/Sligo production.

(Continued from page 1.)

Lower Cretaceous wedge of sediments that thickens toward the south-southwest. Cross-section D-D' (Fig. 2), extending from Pike County northeast to Clarke County, shows the regional geology in this part of Mississippi. Along this line of section are wells from Newsom, Bowie Creek, and Seminary fields. These fields were chosen for the section because they are representative of many of the recent gas discoveries. Each is currently producing from one well, with subsequent drilling resulting in dry holes. This problematic field development indicates that detailed stratigraphic work is essential because the Hosston and Sligo producing sands are subject to changes in thickness and permeability within a field as well as across the Salt Basin.

Newsom field (Fla. Gas Expl. Co. - No. 1 Ivy et al.; Sec. 5-T4N-R19W) in Marion County was discovered in 1977 and has been producing from the Hosston-Ivy gas pool. The producing depth of the Ivy sand is 16,912 - 16,974 feet with porosities varying from 7.6% to 13% and permeabilities ranging from 0 to 169 millidarcies (md). The formation resistivity ranges from 8 to 45 ohms (Scherer, 1980, 1981). Cumulative production for this field exceeds 15,000 barrels of 53.8 gravity condensate and 300 million cubic feet of gas. The hydrocarbon trap is a faulted anticline.

Bowie Creek field (So. La. Prod. Co., Inc. - No. 1 Aultman; Sec. 2-T6N-R16W) in Covington County has been producing from an Upper Hosston gas pool since 1976. Production is obtained from sands at depths of 15,175 - 15,225 feet, having average porosity of 14% and average permeability of 15 md. Within the past four years the field has produced more than 27,000 barrels of 48 gravity condensate and 2.2 billion cubic feet of gas. A faulted anticline provides closure for this reservoir.

Seminary field (Fla. Gas Expl. Co. - No. 1 Kelly et al.; Sec. 14-T7N-R15W) in Covington County produces from a Hosston gas pool at depths of 14,462 - 14,480 feet. Production is from the Hosston-Kelly sand, which has an average porosity of 13% and permeabilities ranging from 2.3 to 55.6 md. Cumulative production for the field since its discovery in 1975 exceeds 205,000 barrels of 52 gravity condensate and 3.2 billion cubic feet of gas. The entire Hosston section in this field consists of red and gray, finely micaceous shales interbedded with fine- to medium-grained, white and gray sandstones and minor amounts of gray limestone. The closure for this reservoir is a simple, broad anticline.

In contrast to the Hosston/Sligo discoveries made in the last six years, older Hosston/Sligo fields such as Bryan (Tenneco Oil Co. - No. 1 Satcher; Sec. 15-T10N-R10W) in Jasper County produce from oil pools that are found at shallower depths and from reservoirs having coarser sands. The Hosston producing sands are found at depths of 10,086 - 11,796 feet and have average porosity of 19% and permeabilities varying from 20 to 1000 md. One of the main differences between the Hosston in Jasper County and the Hosston farther down dip is the marked increase in chert fragments. Since its discovery in 1959, the Hosston oil pool has produced from five wells roughly 1,100,000 barrels of 25 to 27 gravity oil and 26 million cubic feet of gas. The Sligo oil pool has been producing since 1958 from seven wells for cumulative production of 10,500,000 barrels of 38 to 40 gravity oil and 1.3 billion cubic feet of gas. The Sligo producing sands occur at depths of 10,700 - 10,920 feet and have porosities varying from 12% to 23% and permeabilities ranging from 20 to 1000 md. Dark red, micaceous shales and some gray shales interbedded with gray and white fine-grained sandstones characterize the Sligo in this field. Chert is also found in the Sligo but decreases toward the upper boundary of the formation. The closure for this field is a sediment - cored anticline or turtleback structure (Oxley and Herlihy, 1972).

Most Hosston/Sligo fields in south Mississippi produce from one to four wells. Average annual gas production is 1.635 billion cubic feet of gas while annual condensate production frequently falls within the range of 1000 - 9,800 barrels per year. The two largest gas producers in 1979 were Bassfield, which produced from 11 wells more than 11 billion cubic feet of gas and 199,320 barrels of condensate from just the Booth gas pool, and Oakvale, which produced from 7 wells 12 billion cubic feet of gas and 102,873 barrels of condensate production from just the Harper gas pool; each field produces from a total of two sand horizons. Scherer (1980, 1981) estimated the expected recovery for a typical Hosston sand (one sand within the entire Hosston section) averaging twenty feet in thickness to be 5-9 billion cubic feet of gas and 103-180 thousand barrels of condensate.

To find Hosston and Sligo reserves, explorationists look for interdomal highs, salt ridges, and turtle structures between salt domes (Weaver and Smitherman, 1978). These structural features are best identified by mapping the base of the Ferry Lake Anhydrite seismic reflector - and/or using shallower subsurface control, e.g. Upper Cretaceous Tuscaloosa. The Ferry Lake Anhydrite and Tuscaloosa are preferred mapping horizons because they have regional continuity and fairly sharp formation boundaries. In conjunction with structural considerations explorationists should also keep in mind the Hazlehurst, Collins, and Richton deltaic complexes outlined by Reese (1977). If these deltas are well-defined and many of the fields discovered in Jefferson and Covington Counties are situated along the Collins delta margin, then viable prospects remain to be found along the margins of the Hazlehurst delta in Lincoln and Copiah Counties as well as along the margins of the Richton delta in Forrest and Perry Counties. Neither of these areas have been fully explored for Hosston/Sligo objectives.

REFERENCES

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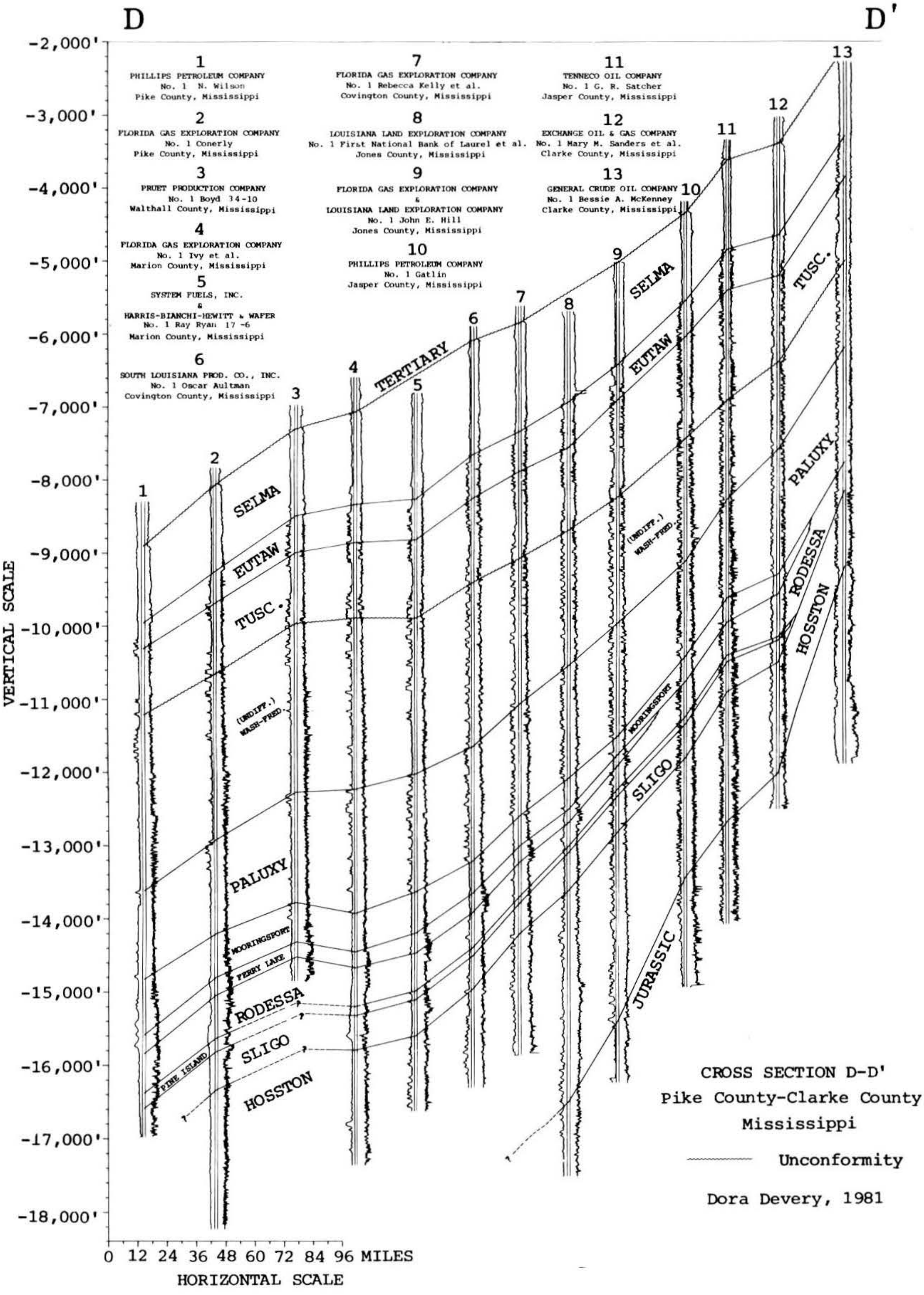
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D'
1
PHILLIPS PETROLEUM COMPANY
No. 1 N. Wilson
Pike County, Mississippi
2
FLORIDA GAS EXPLORATION COMPANY
No. 1 Conerly
Pike County, Mississippi
3
PRUET PRODUCTION COMPANY
No. 1 Boyd 34-10
Walthall County, Mississippi
4
FLORIDA GAS EXPLORATION COMPANY
No. 1 Ivy et al.
Marion County, Mississippi
5
SYSTEM FUELS, INC.
&
HARRIS-BIANCHI-HEWITT & WAFER
No. 1 Ray Ryan 17-6
Marion County, Mississippi
6
SOUTH LOUISIANA PROD. CO., INC.
No. 1 Oscar Aultman
Covington County, Mississippi
7
FLORIDA GAS EXPLORATION COMPANY
No. 1 Rebecca Kelly et al.
Covington County, Mississippi
8
LOUISIANA LAND EXPLORATION COMPANY
No. 1 First National Bank of Laurel et al.
Jones County, Mississippi
9
FLORIDA GAS EXPLORATION COMPANY
&
LOUISIANA LAND EXPLORATION COMPANY
No. 1 John E. Hill
Jones County, Mississippi
10
PHILLIPS PETROLEUM COMPANY
No. 1 Gatlin
Jasper County, Mississippi
11
TENNECO OIL COMPANY
No. 1 G. R. Satcher
Jasper County, Mississippi
12
EXCHANGE OIL & GAS COMPANY
No. 1 Mary M. Sanders et al.
Clarke County, Mississippi
13
GENERAL CRUDE OIL COMPANY
No. 1 Bessie A. McKenney
Clarke County, Mississippi
-2,000'
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VERTICAL SCALE
0 12 24 36 48 60 72 84 96 MILES
HORIZONTAL SCALE
TERTIARY
SELMA
EUTAW
TUSC.
(UNDIFF.) WASH-FRED.
PALUXY
MOORINGSPORT
FERRY LAKE
RODESSA
PINE ISLAND
SLIGO
HOSSTON
JURASSIC
CROSS SECTION D-D'
Pike County-Clarke County, Mississippi
Unconformity
Dora Devery, 1981

EARTHQUAKES IN

Michael B. E. Bograd
Mississippi Bureau of Geology

Mississippi has a history of earthquake activity spanning almost three centuries. The earliest earthquake report in the area dates from Christmas Day, 1699, and was made by a French missionary who was camped in the vicinity of the present site of Memphis. This shock was probably felt in what is now the State of Mississippi. In the succeeding years numerous earthquakes of varying intensities have been reported in Mississippi and neighboring states; this article will describe only those with epicenters within Mississippi. In light of past earthquake activity in this region, a reasonable assumption would be that future activity can be expected. The purpose of this article is to show that Mississippi has an earthquake history, albeit less spectacular than that of California.

Sixteen earthquakes with epicenters in Mississippi have been recorded. Most have been minor, but some have caused damage. The two strongest shocks were the Batesville earthquake of December 16, 1931, and the June 4, 1967, earthquake near Greenville. Scientific measurements from calibrated seismographs are available only for the events that have occurred in the last two decades. These earthquakes have all been of shallow focal depth and of magnitude 3.8 or less. As can be seen in Figure 1, the earthquake epicenters are scattered throughout the state; however, the most significant activity has been in the northwest quadrant.

Approximately 50 earthquakes with epicenters in neighboring (or more distant) states have been felt in one part of Mississippi or another. Earthquakes to the north, south, east, and west of Mississippi have been felt here. Most of these out-of-state earthquakes have been associated with the active New Madrid seismic area of southeastern Missouri, northeastern Arkansas, and western Tennessee. The most notable was the New Madrid earthquake series of 1811-1812; three of the hundreds of associated shocks are the most severe known from the central and eastern United States and were felt throughout what is now Mississippi. Memphis, just north of Mississippi's northwestern corner, is a center of earthquake activity and was the site of a very severe shock in 1843. The Charleston, South Carolina, earthquake of 1886 was felt in Mississippi. Even the Anchorage, Alaska, earthquake of March 27, 1964, had some minor effects in Mississippi.

The following list of Mississippi earthquakes is a compilation of information in the published geologic literature. The intensities are based on the Modified Mercalli intensity scale and are written in roman numerals. The intensities given here are the maximum felt in each earthquake; intensity values decrease with increasing distance from the epicenter. The given magnitudes are from the Richter magnitude scale and are written in arabic numerals; an earthquake has only one magnitude value. A more complete report on the earthquake history of Mississippi is in progress and will include complete referencing of sources.

1923, March 27 Wyatte, Tate County
This intensity IV earthquake was felt by many of the people at Wyatte in eastern Tate County.

1927, November 13 Jackson, Hinds County
An earthquake of intensity IV rattled dishes at Jackson and shook houses at Meridian. It was also reported from Jefferson Davis, Rankin, and Simpson counties.

1931, December 16 Batesville, Panola County (also called the Charleston, Miss., earthquake)
With an intensity of VI - VII, this is the strongest earthquake in the recorded history of Mississippi. It was felt over an area of 65,000 square miles, including the northern two-thirds of Mississippi and parts of Alabama, Arkansas, and Tennessee. The earthquake cracked walls and foundations and toppled chimneys in several towns. The epicenter was probably located south of Panola County.

1941, June 28 Vicksburg, Warren County
A light shock of intensity III - IV was felt at Vicksburg.

1955, February 1 Gulfport, Harrison County
This earthquake was felt by and alarmed residents along the Coast from Bay St. Louis to Biloxi. Houses shook, windows and dishes rattled, and deep rumbling sounds were heard; intensity V.

1967, June 4 Greenville, Washington County
This intensity VI earthquake, centered about 18 miles northeast of Greenville, was felt over an area of 25,000 square miles in Mississippi, Arkansas, and

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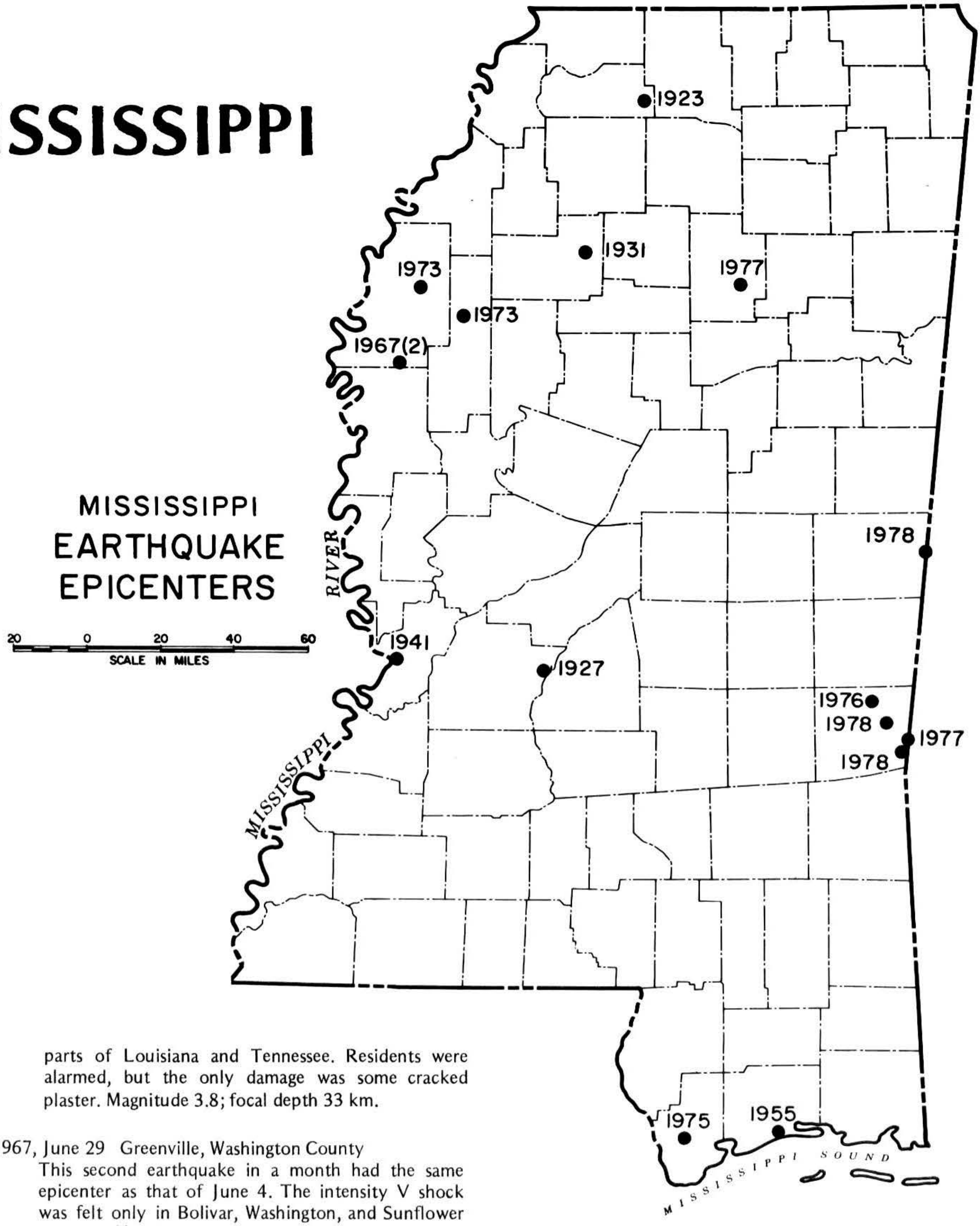

MISSISSIPPI
EARTHQUAKE
EPICENTERS

parts of Louisiana and Tennessee. Residents were alarmed, but the only damage was some cracked plaster. Magnitude 3.8; focal depth 33 km.

1967, June 29 Greenville, Washington County
This second earthquake in a month had the same epicenter as that of June 4. The intensity V shock was felt only in Bolivar, Washington, and Sunflower counties. Magnitude 3.4.

1973, January 8 northern Sunflower County
A minor earthquake occurred in northern Sunflower County. Magnitude 3.5; focal depth 7 km.

1973, May 25 Bolivar County
A minor earthquake was felt at Bolivar, Cleveland, and Merigold. Focal depth 6 km.

1975, September 9 Hancock County
This intensity IV earthquake shook railroad boxcars at Pearlington and was felt at Bay St. Louis. Magnitude 2.9, focal depth 5 km.

1976, October 23 northern Clarke County
This small earthquake might not have been felt at the surface. Magnitude 3.0; focal depth 5 km.

1977, May 3 southeastern Clarke County - Alabama border
The earthquake was felt in both states, with intensity V at Melvin, Alabama. Magnitude 3.6; focal depth 5 km.

1977, November 4 Vardaman, Calhoun County
An intensity V - VI earthquake was felt in the vicinity of Vardaman. Magnitude 3.4; focal depth 5 km.

1978, January 8 Kemper County - Alabama border
This small earthquake might not have been felt at the surface. Magnitude 3.0; focal depth 5 km.

1978, June 9 east-central Clarke County
This small earthquake might not have been felt at the surface. Magnitude 3.3; focal depth 10 km.

1978, December 10 southeastern Clarke County - Alabama border
An earthquake with a maximum intensity of V was felt at Carmichael, Mississippi, and at Gilbertown and Melvin, Alabama. Magnitude 3.5; focal depth 5 km.

Upper Eocene Carcharodons in Mississippi

David T. Dockery III

Carcharodon is the genus of shark to which the great white shark *Carcharodon carcharias* belongs. Teeth and vertebral disks of species within this genus occur frequently in marine sediments of Tertiary age. Possibly the largest shark that ever lived is the Miocene species *Carcharodon megalodon* Agassiz.

The first large *Charcharodon* teeth in the Gulf Coastal Plain occur in the Jackson Group of the Upper Eocene. Large *Carcharodon* teeth have been found in the Moodys Branch Formation at Jackson, Mississippi, and near Midway in Yazoo County, Mississippi. The specimen illustrated here is one of the largest found in the Eocene. It measures 3.7 inches (95 mm) along its edge and was found in the Yazoo Formation near Yazoo City.

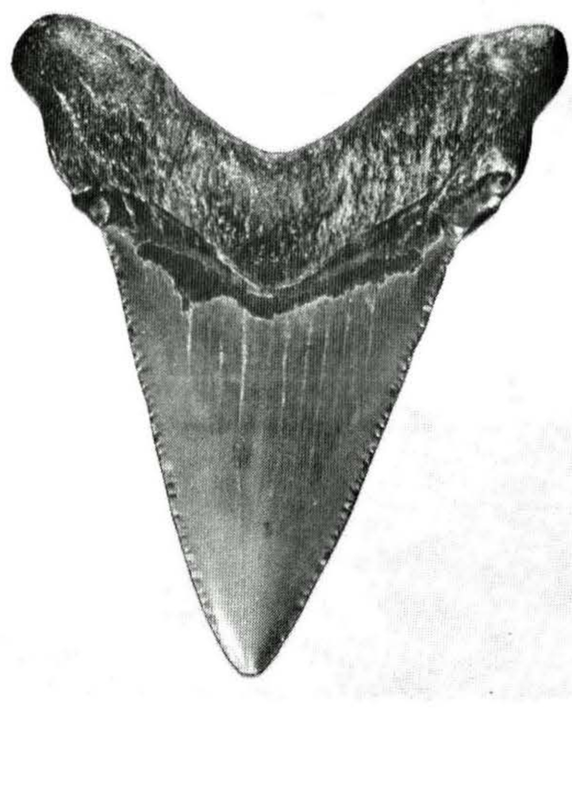

Figure 1. *Carcharodon* sp. from the Yazoo Formation near Yazoo City, Mississippi, illustrated at actual size.

IGNEOUS ROCKS OF THE JACKSON DOME, HINDS-RANKIN COUNTIES, MISSISSIPPI

Danny W. Harrelson
Mississippi Bureau of Geology

Introduction

The Jackson Dome, with a diameter of approximately 25 miles, is one of the larger structural features of Mississippi. Structurally the dome is a high-relief asymmetrical feature which is slightly elongated along its northwest and northeast axes. Pronounced magnetic and gravity maxima outline the dome, and show it to have greater structural magnitude than many features in the northern Gulf province.

Hilgard (1860) first recognized the Jackson Dome and postulated a "local upheaval" to account for the anticlinal feature. Later investigations by Lowe (1919a, 1919b) and Hopkins (1916) positively identified the "Jackson anticline" and suggested this feature might be favorable for oil exploration. In 1917 two unsuccessful test wells were drilled on the flanks of the dome. Geologic interest in the feature continued, and in 1930 the Jackson Oil & Gas No. 1 Mayes well was completed as the first commercial gas well in the Jackson gas field (Fig. 1). Rapid development of the gas field ensued with approximately 224 wells drilled on the feature by 1940. Ultimate production of the gas field was approximately 125,000,000,000 cubic feet of natural gas and 25,000 barrels of heavy crude oil (13.6° API).

Geologic History

The geologic history of the dome began in Jurassic time with crustal upwarping as the result of emplacement of an undersaturated plutonic mass. Doming as the result of plutonism continued through early and middle Cretaceous time until it climaxed with the opening of several volcanic vents forming a volcanic complex in middle Cretaceous time. Explosive volcanism blew ash and dust into the air, and lava flowed from the volcanic vents. Accompanying this volcanism, intrusive dikes and sills baked some Cotton Valley sands and clays causing contact metamorphism.

This volcanic complex projected as an island from a Tuscaloosa sea; erosion through Eutaw time removed the top of the volcanic complex, creating volcaniclastic deposits and irregular topography on top of the feature. In late Selma time the volcano subsided to a maximum depth of approximately 300 feet below sea level. Carbonate reef deposits, consisting of bryozoans, forams and corals, capped the eroded volcanic complex and formed the reservoir rock, now known as the Jackson Gas Rock. The gas rock has a maximum thickness of 1,657 ft. (503 m) in the Texaco No. 1 Federal Land Bank, Sec. 36, T.8 N., R.1 E., Madison County, Mississippi, but is about 350 ft. (106 m) thick on the apex of the eroded volcanic complex.

During Tertiary and Quaternary time the reef-capped volcanic complex gradually subsided and was covered by approximately 2900 ft. (881 m) of successive transgressive-regressive deposits. These deposits thin over the apex of the buried feature and thicken (drape) on its flanks creating the domal effect (Fig. 2). Erosion during late Quaternary time on top of the dome has exposed strata as old as the Cockfield Formation.

Igneous Rocks

Abundant data in the form of cuttings, cores, electric logs, and drillers logs were gathered from the Jackson Dome during the drilling boom of the 1930's. Igneous rocks associated with the dome were first reported by Monroe (1932, 1933, 1954), Monroe and Toler (1937), McGlothlin (1944), Moody (1949), and Kidwell (1949). Later writers such as Harned (1960) and Harrelson and Bicker (1979, 1980) expanded upon previous work with detailed photomicrographs, classification, and petrographic examination of the igneous rocks from the Jackson Dome.

Igneous rocks were probably encountered in the first two wells drilled in 1917 on the flanks of the Jackson Dome although none were reported. The Atlas Oil Company No. 1 Garber (Sec. 18, T.6 N., R.1 E.) and the Benedum and Trees No. 2 Swearingen (Sec. 14, T.6 N., R.1 E.) drilled through the gas rock and then several hundred feet into the underlying volcanic feature (Fig. 1). No samples or electric logs from the wells are available, but the location and depth of these two wells indicate they penetrated volcanic and volcaniclastic material on the northern flank of the volcanic complex.

Reviewing existing drilling records from all wells completed in the Jackson Gas Field indicates that nine wells were drilled through the gas rock into the igneous material below (Fig. 1). Thirty-six thin sections were prepared

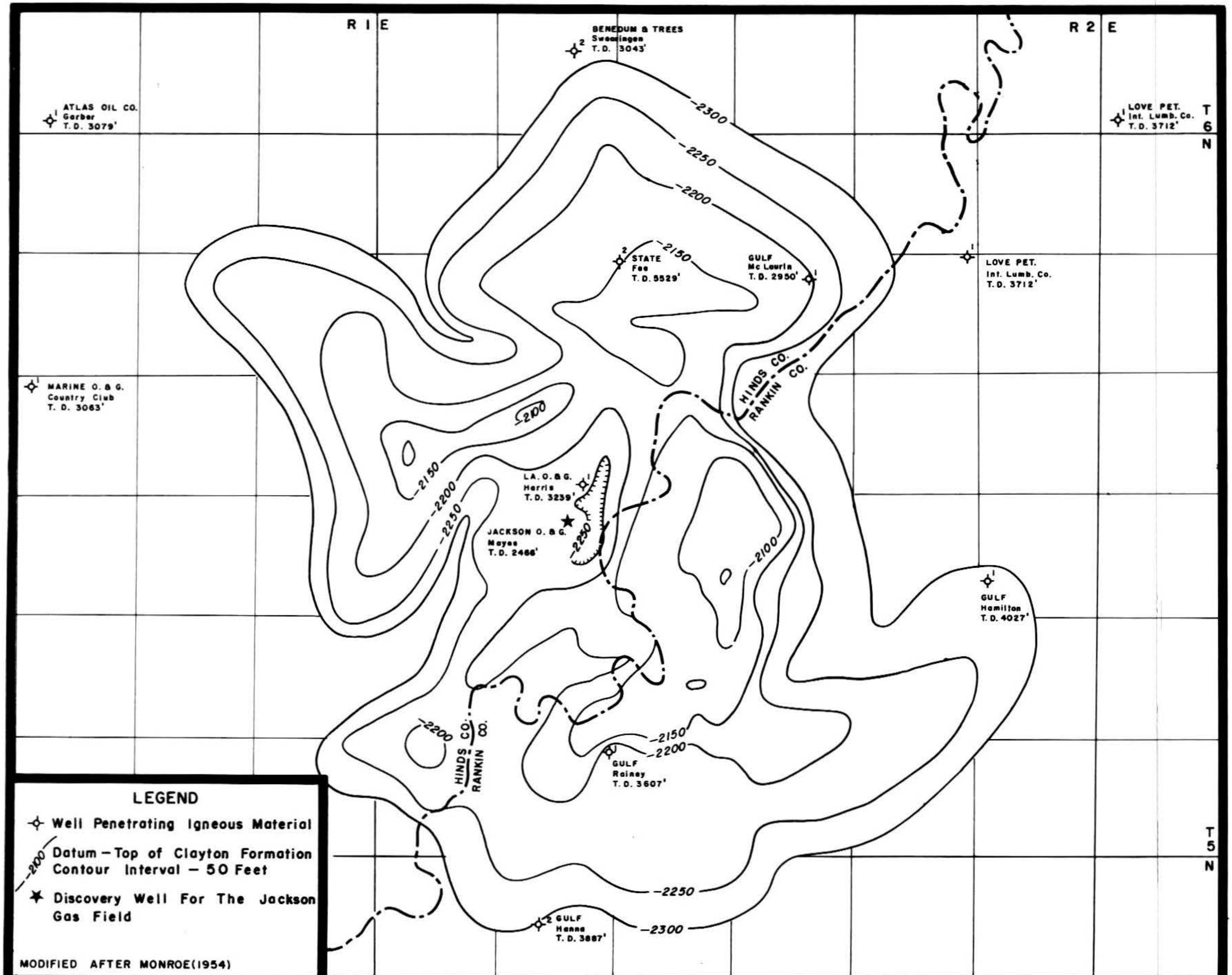

FIG. I STRUCTURE MAP OF THE TOP OF THE CLAYTON FORMATION IN THE JACKSON GAS FIELD, MISSISSIPPI.

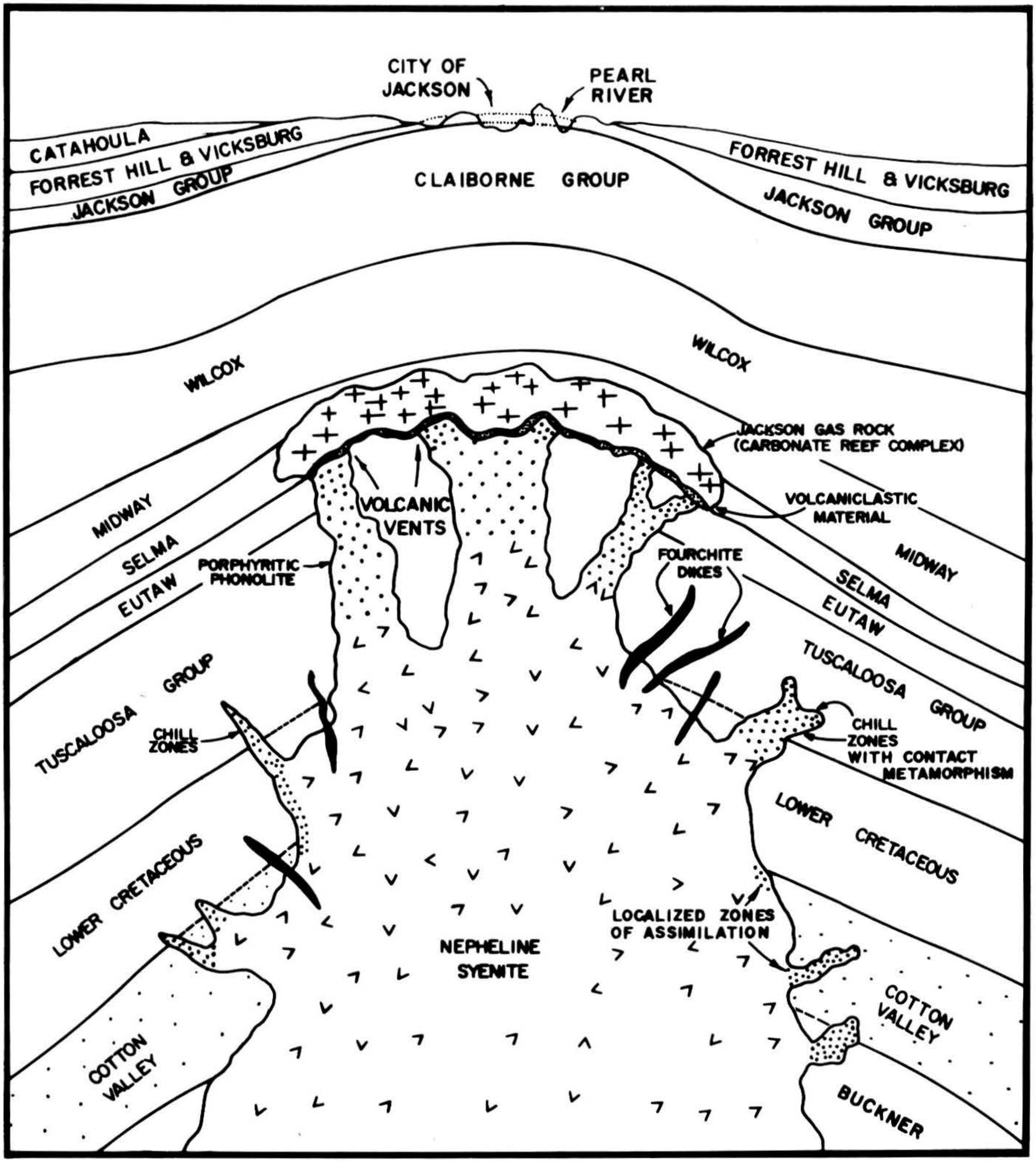

FIG. 2 GENERALIZED INTERPRETATION OF THE JACKSON DOME, HINDS-RANKIN CO., MISS. HARRELSON(1981)

from cuttings and cores from six of the nine wells, and examined petrographically (Table 1). The igneous rocks from the Jackson Dome examined in this study were classified after Hyndman (1972), Streckeisen (1967, 1979), and Rock (1977) and are divided into nepheline syenite, phonolite, volcaniclastic and alkaline lamprophyre "suites." Igneous material occurring from 4075-4076 ft. (1238 m) in the Gulf No. 1 Hamilton well is a representative of the nepheline syenite suite (Fig. 3). Megascopically the nepheline syenite suite consists of medium-grained, moderately

Table 1. **SUMMARY OF WELL DATA**

Well Name/Operator	Location	Interval Sampled(ft.)	Rock Type
Gulf No. 1 Rainey	13 - 5N - 1E	2859-2868	Calcareous siltstone
		3600-3604	Phonolite
		3604-3607	Phonolite
Gulf No. 1 Hamilton	4 - 5N - 2E	4054-4059	Altered phonolite
		4069-4072	Altered phonolite
		4075-4076	Nepheline syenite
Gulf No. 1 McLaurin	30 - 6N - 2E	2942-2950	Fourchite
Louisiana Oil & Gas No. 1 Harris	35 - 6N - 1E	3078-3092	Volcaniclastic
Love Petroleum Company No. 1 Interior Lumber Co.	28 - 6N - 2E	3374-3384	Altered phonolite
		3389-3395	Altered phonolite
		3434-3441	Altered phonolite
		3712	Altered phonolite
State No. 2 Fee	25 - 6N - 1E	2988-2994	Volcaniclastic
		3165-3167	Fourchite
		3179-3183	Porphyritic phonolite
		3199-3205	Phonolite
		5305-5317	Fourchite

altered, massive plutonic rocks. Microscopically the suite is composed of moderate to severely altered anhedral to euhedral phenocrysts of nepheline, plagioclase and sphene. Nepheline phenocrysts account for 75% of the total mineralogy of the rock, and display low first order gray birefringence and inclined extinctions. Most nepheline phenocrysts from the nepheline syenite suite are at least partially altered to the zeolites natrolite and wavellite.

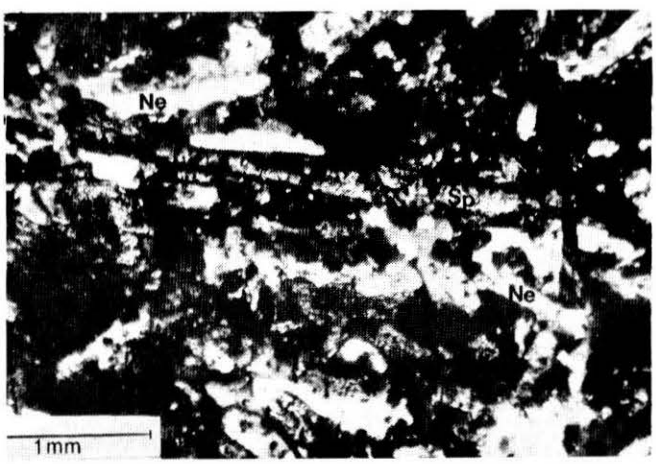

Figure 3. Gulf No. 1 Hamilton 4075-4076 ft. (1238 m) Sec. 4, T.8 N., R.2 E., Rankin Co., Mississippi. Photomicrograph of nepheline (Ne) and sphene (Sp) from a nepheline syenite.

An extrusive phonolite is the most common igneous rock identified from the Jackson Dome. The phonolite suite contains a fine-grained extrusive variety that reached the surface and flowed out through volcanic vents (Fig. 4) and a porphyritic variety that represents a hypabyssal phase (Fig. 5). Megascopically the phonolite suite occurs as a light gray, fine- to coarse-grained, moderate to severely altered volcanic rock. Microscopically the phonolites

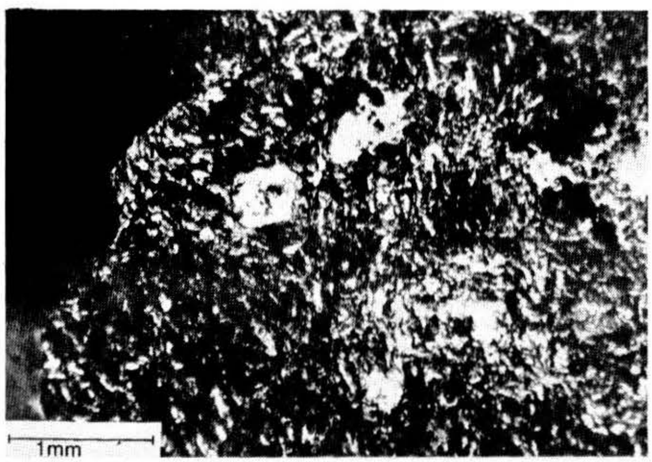

Figure 4. State No. 2 Fee 5305-5317 ft. (1612-1616 m) Sec. 25, T.6 N., R.1 E., Hinds Co., Mississippi. Photomicrograph of nepheline (Ne) microlites with flow texture in a phonolite.

are composed of subhedral to euhedral nepheline and augite. The nepheline phenocrysts display low first order gray birefringence and are arranged in a "flow-texture." Most nepheline phenocrysts from the phonolites are at least partially altered to zeolites and in some samples they completely replace the original mineralogy creating relict flow texture (Fig. 6). The severe alteration of the phonolite suite is thought to be due to extrusion of phonolite lava from a volcanic vent and subsequent aerial erosion (Fig. 7).

Associated with the unsaturated extrusive-intrusive complex are abundant alkaline lamprophyre dikes (Fig. 8). Mineralogically this suite consists primarily of the clinopyroxene titanaugite and minor amounts of feldspars, feldspathoids, amphiboles and biotite. The alkaline lamprophyre dikes are thought to represent crystallization of the final fluid phase from an undersaturated magma. Textural evidence for this is indicated by abundant pyroxenes which group together to form "clots" (Fig. 9). Megascopically this suite consists of severely altered green to black pyroxenes and minor amounts of biotite. Calcite veinlets are commonly associated with the more severely altered dike rocks. Microscopically the suite consists of major amounts of subhedral to euhedral titanaugite and minor amounts of altered feldspars, amphiboles, feldspathoids and biotite. Titanaugite comprises 80% of the total mineralogy, and occurs as stubby subhedral to euhedral phenocrysts with continuous zoning, moderate

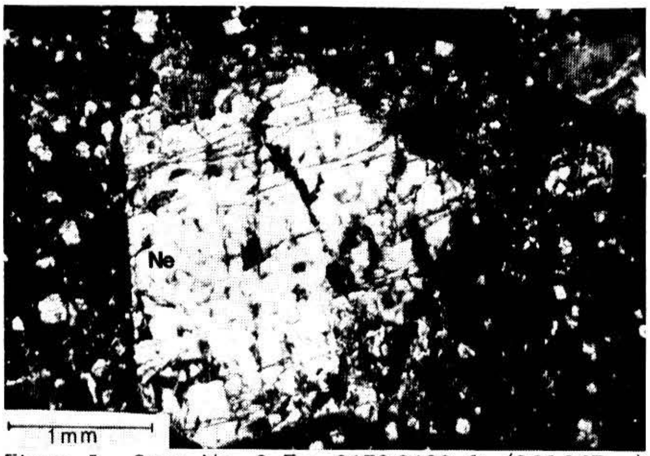

Figure 5. State No. 2 Fee 3179-3183 ft. (966-967 m) Sec. 25, T.6 N., R.1 E., Hinds Co., Mississippi. Photomicrograph of a porphyritic phonolite with large euhedral phenocrysts of nepheline (Ne).

Figure 6. Gulf No. 1 Rainey 3604-3607 ft. (1095-1096 m) Sec. 13, T.5 N., R.1 E., Rankin Co., Mississippi. Photomicrograph of a phonolite with severe zeolite (Ze) alteration. Note relict flow texture.

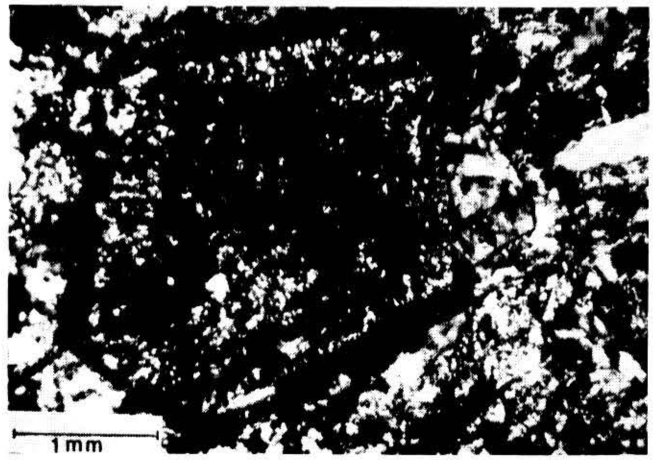

Figure 7. Love Petroleum Co. No. 1 Int. Lumber Co. 3374-3384 ft. (1025-1028 m) Sec. 28, T.6 N., R.2 E., Rankin Co., Mississippi. Photomicrograph of a severely altered phonolite. Note completely altered hexagonal phenocryst.

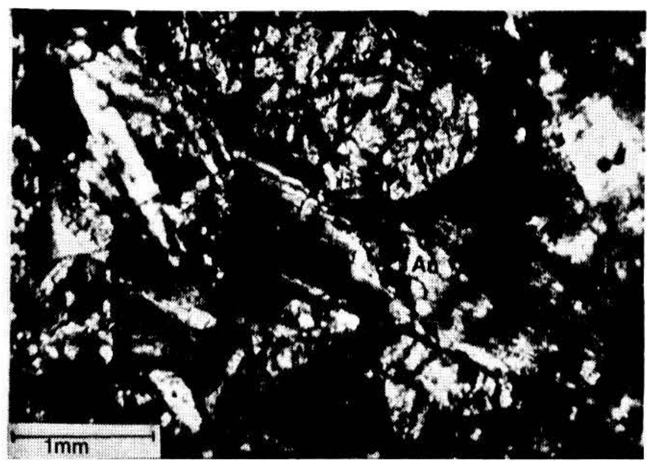

Figure 8. State No. 2 Fee 3165-3167 ft. (962 m) Sec. 25, T.6 N., R.1 E., Hinds Co., Mississippi. Photomicrograph of augite (Au) from an ultramafic dike.

to severe alteration to chlorite, and a light purple pleochroism.

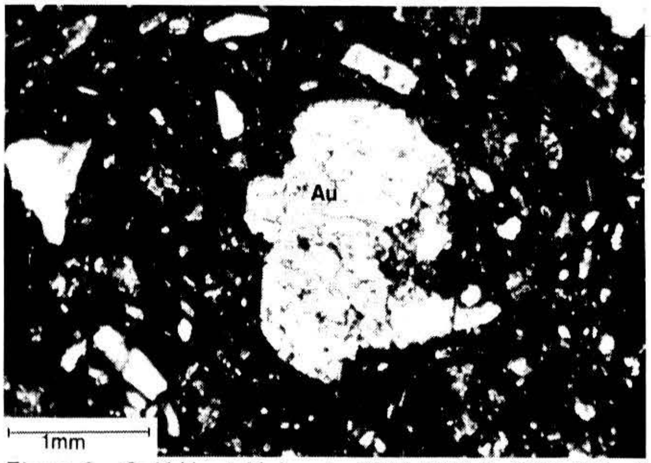

Figure 9. Gulf No. 1 McLaurin 2942-2950 ft. (894-896 m) Sec. 30, T.6 N., R.2 E., Hinds Co., Mississippi. Photomicrograph of a fourchite with euhedral augite (Au) and "clot" texture.

The removal of the top of the Jackson Dome by erosion was accompanied by deposition of a suite of weathered igneous material known as volcaniclastic deposits (Fig. 10). This volcaniclastic suite was laid down on an irregularly eroded topography on top of the volcano, which explains the variation in thickness and location of the deposits. Most of these volcaniclastic deposits observed in thin-section represent weathered extrusive material composed of phonolite fragments.

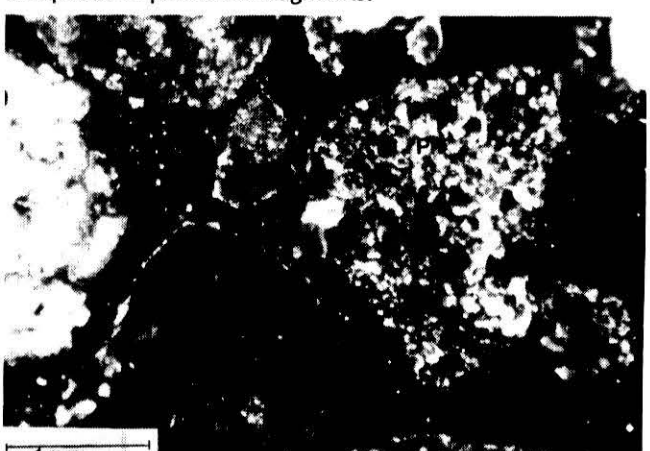

Figure 10. Louisiana Oil & Gas No. 1 Harris 3078-3092 ft. (935-939 m) Sec. 35, T.6 N., R.1 E., Hinds Co., Mississippi. Photomicrograph of a volcaniclastic rock with phonolite (Ph) fragments.

Summary

1. Jurassic sediments were uplifted and tilted (domed) as the result of the emplacement of an undersaturated plutonic mass. Localized assimilation of water saturated quartz sediments by the undersaturated melt will produce a magma of more intermediate composition.

2. Uplift continued until middle Cretaceous time when volcanic vents opened on the domed feature forming a volcanic complex. Explosive volcanism and phonolite lava flows accompanied the opening of these volcanic vents.

3. Erosion beginning in Tuscaloosa and continuing through Eutaw time removed the top of the volcanic complex and created abundant volcaniclastic deposits.

4. By late Selma time the volcanic complex subsided and was covered by about 300 feet of water creating conditions for reef deposits. These reef deposits capped the eroded volcanic complex and formed the Jackson Gas Rock. The Woodruff Sand forms the reservoir rock for Tinsley field in Yazoo County, Mississippi, and some geologists consider it the partial equivalent of the lower part of the Jackson Gas Rock.

5. In Tertiary and Quaternary time the reef-capped volcanic complex gradually subsided and was covered by at least 2900 feet of sediments. These sediments thin over the dome, and drape (thicken) on the flank of the buried feature creating the domal feature.

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CALENDAR OF EVENTS

1981 June - October

August 1-9 - Modern and ancient carbonates, field seminar, snorkel and scuba diving, Florida Keys and St. Croix. (Robert F. Dill, West Indies Laboratory, Fairleigh Dickinson University, Box 4010, Christiansted, St. Croix, Virgin Islands 00820. Phone: 809/773-3339)

October 13-15 - Fifth Conference on Geopressured-Geothermal Energy, U. S. Gulf Coast, Louisiana State University, Baton Rouge, Louisiana; Conference Chairman: Don Bebout, Louisiana Geological Survey. Subject: Results of well tests of the Gulf Coast geopressured resource; results of research concerning geology, salinity determination from logs, controls on methane content, reservoir mechanics, technology, economics of development, legal, institutional and environmental issues. Sponsors: Louisiana Geological Survey, Department of Natural Resources; Energy Programs Office, Louisiana State University; U. S. Department of Energy. For further information contact Ann Bachman Conference Coordinator, Energy Programs Office, 105 Hill Memorial, Louisiana State University, Baton Rouge, Louisiana 70803; 504/388-6816. For pre-registration materials contact Short Courses and Conferences, Division of Continuing Education, Louisiana State University, Baton Rouge, Louisiana 70803; 504/388-6621.

October 20-23 - Gulf Coast Section, American Association of Petroleum Geologists, ann. mtg., Corpus Christi, Texas. (Wilson Humphrey, Border Exploration Co., 310 Meldo Park, Corpus Christi, Texas 78411. Phone: 512/883-1470)

October 25-29 - Geothermal Resources Council, ann. mtg., Houston. (Sheila Roberts, Geothermal Resources Council, Box 98, Davis, California 95616. Phone: 916/758-2360)

Abstracts Volume for Research Conference
on the Geology of the Woodbine and
Tuscaloosa Formations

(see March issue of *Mississippi Geology*)

A limited number of the abstracts volume printed for the GCS/SEPM First Annual Research Conference (Nov. 30 to Dec. 3, 1980), on the geology of the Woodbine and Tuscaloosa formations, is available for the price of $3.00. Please note: because the price of the publication is so low an additional charge of $1.00 is required for postage and handling. Send orders to R. P. Zingula, Exxon Co., USA, P. O. Box 4279, Houston, Texas 77001.

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REPORT ON THE ANNUAL MEETING OF THE GEOLOGICAL SOCIETY OF AMERICA SOUTHEASTERN SECTION

by

Daniel A. Sundeen

Department of Geology, University of Southern Mississippi
Southern Station Box 8196
Hattiesburg, MS 39401

This year's annual meeting of the Southeastern section of the Geological Society of America was held on the campus of the University of Southern Mississippi. The section is represented by eleven states, from Virginia, West Virginia and Kentucky in the north to Louisiana and Florida in the south along the Gulf Coast. This meeting was the first held in Mississippi during the 30-year history of the section. The local membership saw this as an opportunity not only to serve as a host for the meeting, but also to provide a showcase for our state and its institutions of higher learning.

Major components of the convention included a welcoming party, sessions and symposia, exhibits, and field trips. The welcoming party held on the evening of registration was a smashing success and set a positive mood for the rest of the convention. Credit for this unforgettable welcoming party goes to Data-Log for its generous sponsorship, and to Cash McCools for providing space, excellent food, beverages, and atmosphere.

The sessions and symposia were well received. Most of the papers were given at the convention facility rooms in the University Union. The symposia attracted many people to the convention. On Thursday, the Geology of the Talladega Slate Belt Symposium (arranged by Alabama participants), and the Coastal Plain Molluscs Symposium (arranged by Ole Miss and Mississippi State staff) were presented. On Friday, the Salt Dome Structure and Genesis Symposium (arranged by the Louisiana State University staff) was presented. There were many Mississippi authors of papers given in the various sessions, including Ernie Russell from Mississippi State; Art Cleaves, Daniel Cooper, Patricia Kelly, Barbara Madlinger, and Tsean-Shu Lee from Ole Miss; Franz Froelicher, David Hardin, Lin Jones, Oscar Paulson, Frank Pescatore, Isadore Sonnier, and Dan Sundeen from USM; James May, David Patrick, Lawson Smith, and Charles Whitten from the Waterways Experiment Station (WES); David Dockery and Danny Harrelson from the Bureau of Geology; Earl Grissinger and Joe Murphy from the USDA Sedimentation Laboratory in Oxford; and Ervin Otvos from the Gulf Coast Research Lab. Altogether, over 130 papers were presented by authors from 20 states and Panama.

Exhibits were displayed in the Reed Green Coliseum and were a big part of the convention. There were 45 companies represented at this meeting, more than at any other meeting in the history of the Southeastern section. I was pleased that many Mississippi organizations were represented. In addition to the exhibits, a number of the companies were conducting job interviews.

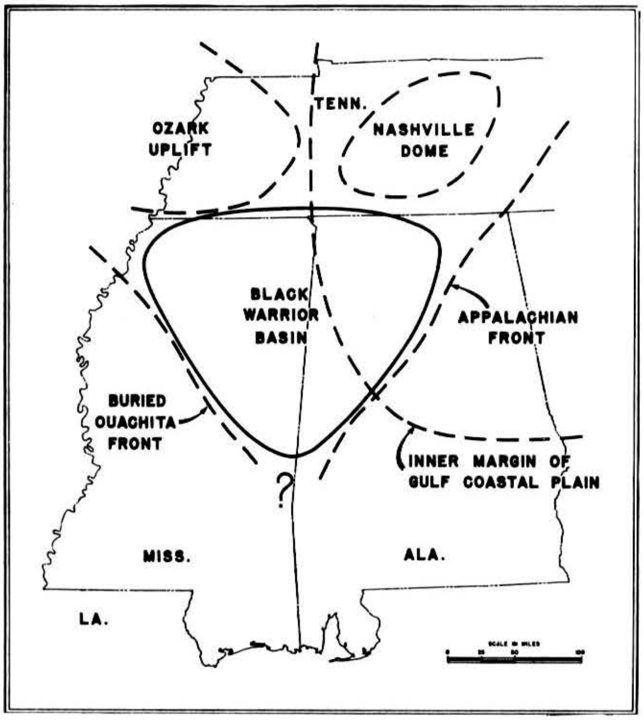
Field trips traditionally have been a major part of sectional and national GSA conventions. Richard Bowen, Ervin Otvos, Wayne Isphording, Lin Jones, Dan Sundeen, Jim May, David Dockery, Maurice Meylan, and Frank Pescatore were contributing authors to the road logs and manuscripts about the geology of southeastern Mississippi - - from the coast to Meridian. Dave Patrick and Jim May at WES, together with Paul Dooley, Charlie Spiers, and Phil Cook, edited and assembled the five field trips for the meeting and guidebook. The Southern Geological Society took care of printing the 160-page publication. *Field Trip Guidebook for Southern Mississippi* is Publication No. 2 of the Southern Geological Society (SGS). It is available from SGS, Southern Station Box 5044, Hattiesburg, MS 39402, at a cost of $12.50 plus $1.25 postage per field book.

The major segments of the convention were supplemented with a spouses program, annual banquet, and various business meetings and workshops. A 5-kilometer run and golf tournament were new additions to the program this year.

Many people put forth a great deal of effort to bring about a successful meeting. We all owe a debt of gratitude to student volunteers, secretaries, the Department of Conferences and Workshops, and other University personnel, as well as those previously mentioned. Data-Log and Schlumberger assisted with major financial contributions. Many other friends contributed as well and we gratefully acknowledge this.

Comments about the meeting were numerous, complimentary, and invariably included a statement such as, "I have never been to Mississippi before, and was suprised to find such excellent facilities and how nice it is here. . . ."

I personally feel that the meeting was a success not only because it was a logistically-smooth operation, but also because the 400-plus attendees left with a feeling that Mississippi institutions are quite capable of stimulating and sustaining programs in geological research and have the facilities to present the results in a convention format.



Taken from Pike (1968)
Geologic and geographic setting of Black Warrior Basin.

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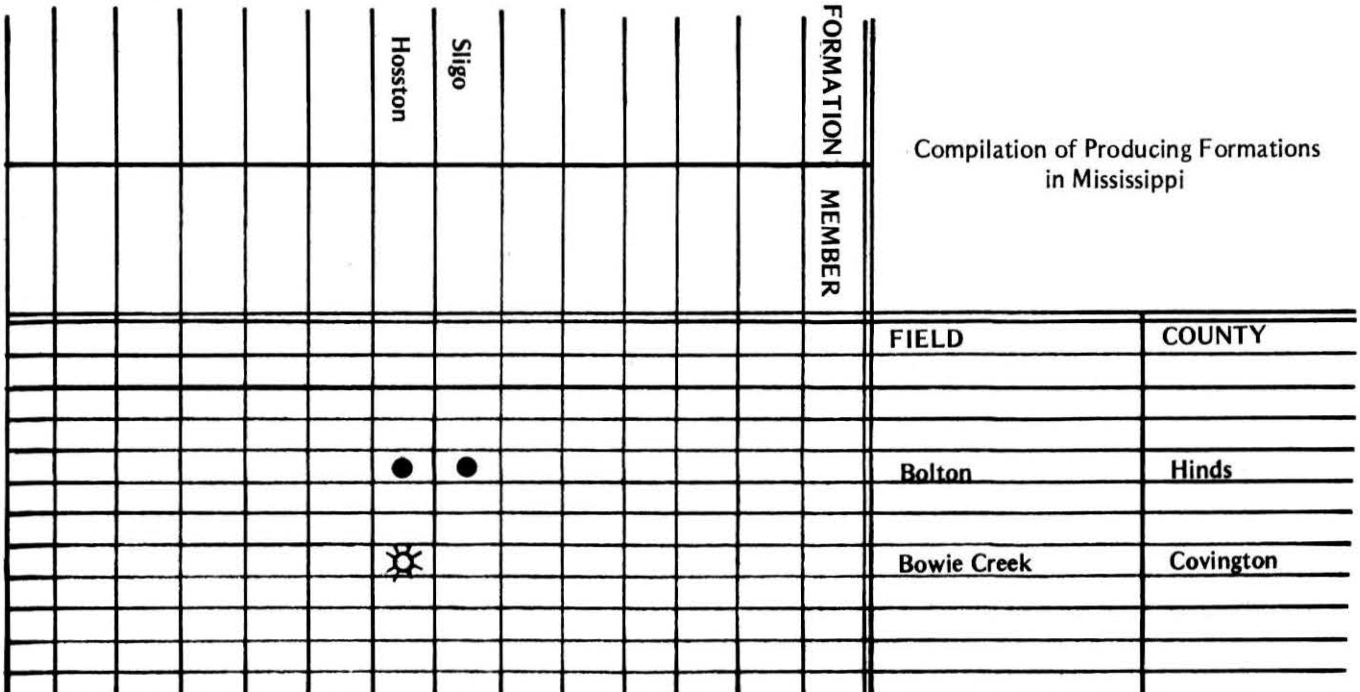

Figure 1. Schematic showing the type of information provided on the chart "Compilation of Producing Formations in Mississippi."

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