CONTRIBUTIONS TO ECONOMIC GEOLOGY, 1931–32

PART II. MINERAL FUELS

THE JACKSON GAS FIELD, HINDS AND RANKIN COUNTIES, MISSISSIPPI

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ABSTRACT

The Jackson gas field, in Hinds and Rankin Counties, Miss., is in the eastern Gulf Coastal Plain, about 160 miles north of New Orleans and 40 miles east of the Mississippi River at Vicksburg. The gas is produced from a Cretaceous chalk from 2,088 to 2,236 feet below sea level. Overlying the chalk is the regular sequence of Tertiary rocks found in Mississippi. On the crest of the anticline in the city of Jackson the Cockfield formation of the Claiborne group is exposed, surrounded by the Jackson formation. Some Forest Hill sand of the Vicksburg group is exposed in the northwestern part of the area described. Overlapping these formations are Pliocene and Pleistocene terrace and alluvial deposits, and the entire area is covered by a blanket of loess of varying thickness.

The structure of the field is characterized by three geologically high producing areas surrounded by low barren areas. The producing areas are not connected and do not form a symmetrical structure. On April 1, 1931, 64 wells had been drilled, of which 42 are productive, giving a total daily open flow of more than 1,250,000,000 cubic feet. The most productive part of the field lies in Rankin County directly across the Pearl River from Jackson, although this area is not the highest structurally. In February, 1931, a daily average of approximately 13,000,000 cubic feet of gas was drawn from the field. The gas has a high calorific value and contains a large percentage of methane. No oil in commercial quantities had been discovered in April, 1931, although over 300 barrels of low-gravity oil was pumped from one well, and several wells have had shows of oil.

INTRODUCTION

Present investigation and acknowledgments.—This report on the Jackson gas field, in Hinds and Rankin Counties, Miss., embodies information that was gained by the writer in the course of his studies of the Jackson quadrangle in the fall of 1930. It describes the general structure of the field and the rocks down to and including the Cretaceous chalk and gives information on the development and production of the field. The rocks that have been encountered in wells below the chalk are not here described, but a report describing them and giving more complete information on other features of the geology will be published later.

The cooperation given by oil companies has greatly aided the work of the writer. Thanks are due especially to geologists of the United Gas Public Service Co., the Gulf Refining Co. of Louisiana, the Texas Co., and the Love Petroleum Co., and to Robert L. Steffey's Oil Scout Service. Many members of the United States Geological Survey staff have given invaluable assistance, especially H. D. Miser, L. W. Stephenson, and C. W. Cooke.

General relations of the area.—Jackson is the center of the development activity, for the producing areas, all of which are near by, lie to the south, southeast, east, and north of the city.

Jackson is in the Gulf Coastal Plain about 160 miles due north of New Orleans and 40 miles east of the Mississippi River at Vicksburg. It is not only the capital of the State but the State's largest city, having a population of 48,282 according to the census of 1930. Five railroads pass through the city—the Illinois Central; the Gulf, Mobile & Northern; the Alabama & Vicksburg; the Yazoo & Mississippi Valley; and the Gulf & Ship Island. Three Federal highways cross here—route 51 from north to south, route 80 from east to west, and route 49 from northwest to southeast.

In early Upper Cretaceous time the Mississippi Valley region was down-warped along a north-south axis, and the basin thus formed was inundated by the sea as far north as the southern part of Illinois. During Cretaceous and Cenozoic time this basin was filled by sediments brought in by streams from the surrounding higher lands. These sediments were deposited in part in the marine waters of the embayment itself and in part on low-lying plains bordering the embayment. The older sediments were compacted by the weight of the overlying younger ones, and there are interbedded some layers of hard limestone and sandstone which were consolidated by cementation. Since their deposition the rocks have been raised above sea level and at some places have been slightly folded and faulted.

TOPOGRAPHY

Drainage.—The Pearl River, the largest stream in the region, flows in a southwesterly direction past Jackson and thence in a southerly direction to the Gulf of Mexico. Near Jackson the river has a valley about 3 miles wide but the stream itself is confined in a narrow meandering channel about 20 feet deep which is marked here and there by horseshoe bends.

Tributary streams flowing into the Pearl River from the west are all short, ranging in length from 6 to 10 miles. The rainfall farther west reaches the Gulf of Mexico by way of the Big Black and Mississippi Rivers. Streams east of the Pearl River are longer and have much larger drainage basins than the western tributaries.

Relief.—The highest point in the area is at Red Hill, 5 miles east of Jackson, 460 feet above sea level, and the lowest is in the Pearl River channel at Jackson, 240 feet above sea level. The maximum topographic relief is therefore 220 feet. The hills around Jackson are gently rolling and are separated by broad, flat valleys. A noteworthy feature is that the northern hill slopes are steeper than the southern. The difference seems to be due to a blanket of loess which has been spread out to a greater thickness on the southern slopes than on the northern slopes, although it covers both hills and valleys. The hills that are broad and flat and have gentle slopes are underlain by clay, which creeps down the slopes when it is wet. There are, however, two relatively rugged areas—one in southern Madison County about 10 miles north of Jackson and the other at and near Red Hill, in Rankin County, about 5 miles east of the city. The rugged areas are underlain by bedded sand and clay or hard sand, both of which have been eroded into gullies with steep slopes.

STRATIGRAPHY

GENERAL CHARACTER AND AGE OF THE ROCKS

The rocks at the surface in the Jackson area and those penetrated in wells are of sedimentary origin down to and including the producing stratum, a chalk. In this area the top of the producing chalk has been found at different depths, ranging from 2,088 to 2,789 feet below sea level, although no gas has been found below 2,232 feet. Underlying the chalk is a series of igneous rocks and "red beds," the age and character of which are under investigation and will be set forth in a later report. These rocks have been penetrated by several wells, one of which passed through 1,035 feet of them to a depth of 3,802 feet below sea level.

The rocks from the base of the producing bed to the surface consist of chalk, clay, unconsolidated sand, and soft limestone, interbedded with somewhat harder shale, sandstone, and hard limestone. They range in age from Upper Cretaceous to Recent.

In most of the wells neither cuttings nor cores have been obtained until the drill has penetrated nearly to the producing chalk. Consequently conclusions as to the age of the beds above the chalk have been based on driller's logs, statements of geologists working in the area, and knowledge of the rocks as they crop out in northern Mississippi. These conclusions are thus tentative until cuttings or preferably cores are obtained from the upper formations.

ROCKS NOT EXPOSED

The lowest formation reached in most of the wells is the one that yields the gas. This is a white porous chalk, soft in some beds but

usually hard and cut by veins of calcite. The chalk is generally unfossiliferous, but a few Cretaceous Foraminifera, calcareous algae, and a Mesozoic coral have been found. The rock looks like the Selma chalk, which crops out in northern Mississippi, but it may also include representatives of the Eutaw and Ripley formations. Many geologists believe that the cap rock at the top of the chalk may be Midway, possibly the equivalent of the Clayton limestone, but this opinion is not generally held. There seems to be an impervious layer of limestone near the top, however, for the Maley No. 1 well, drilled by the Love Petroleum Co. in sec. 15, T. 5 N., R. 1 E., produced more than 300 barrels of oil from the top of the chalk before the well was drilled deeper, reaching gas and salt water. Some of the beds in the chalk, especially at the very top and near the base, are really hard limestones rather than chalk. The chalk is from 300 to 400 feet thick.

Overlying the chalk is a hard black platy shale in which Foraminifera and a punctate brachiopod have been found. At the contact of the chalk with the black shale the two formations seem to have been rather heterogeneously mixed. The resulting rock is hard and calcareous but dark gray or black. One geologist suggests that the erosion surface of the chalk was slightly cavernous and that the black shale when deposited filled these holes. The lower part of the shale is marine, but the upper part is not. Most geologists working in the area believe that the black shale belongs to the Porters Creek clay of Midway age. The shale at Jackson is about 100 feet thick, although elsewhere it is over 300 feet thick.

Above the black shale is 1,300 feet of sand, clay, shale, sandstone, and limestone, which are referred to the Wilcox formation, although they may include some Midway and some Claiborne. Only a few cores have been taken from these beds, and their exact age relationships have not been determined. Most, if not all, of these sediments are nonmarine. They contain much lignite in places and probably represent swamp conditions in Wilcox time.

Overlying the Wilcox is the Claiborne group. In the wells drilled at Jackson there are at the base about 300 feet of beds which are classed by the drillers as "gumbo," "gummy lime," sandy lime, broken lime, shale, and sand. At the top of this rather anomalous assemblage of rocks is a very persistent bed of hard rock about 5 feet thick. The beds may possibly include the Tallahatta formation and part of the Winona sand member of the Lisbon formation. Most of the petroleum geologists working in the area correlate these beds with the Cane River glauconitic member of the St. Maurice formation of Louisiana. Overlying the hard bed mentioned above is a stratum of white sand, which has a fairly constant thickness of about 350 feet. Some of the logs record beds of clay or shale interbedded with

the sand. This sand is probably the Kosciusko sandstone member of the Lisbon formation, although again the petroleum geologists in Jackson use a Louisiana name and call it the Sparta sand member of the St. Maurice formation. The sand has been recognized in nearly every well drilled at Jackson. Overlying the white sand are other beds of clay, shale, and sand, with a bed of hard rock about 40 feet from the bottom, having a total thickness of about 100 feet. The local geologists call these beds the Minden formation, correlating them with the Minden of Campbell and Miller [1] in Louisiana. They are probably a part of the Lisbon formation of Mississippi. These beds are overlain by the Cockfield formation, which consists of a little more than 200 feet of clay, sand, and lignite. This formation appears at the surface in the northern part of Jackson. The total thickness of the Claiborne group is about 950 feet.

Correlations by petroleum geologists for three of the wells drilled at Jackson are shown in the diagrammatic logs on Plate 2.

Mr. R. D. Norton, paleontologist of the Texas Co., Shreveport, La., has described cores and cuttings from the Lion Oil & Refining Co.'s Misterfeldt No. 1 well, in sec. 2, T. 4 N., R. 1 E., which was drilled in 1928 and 1929. Through the courtesy of Mr. Norton, selected parts of his report down to and including the chalk are given below.

Character of samples from Lion Oil & Refining Co.'s Misterfeldt No. 1 well, sec. 2, T. 4 N., R. 1 E.

[Descriptions by R. D. Norton]

Depth (feet)	Sample	
1,355–1,361	Core	Thin interbedded light-gray soft noncalcareous shale, containing much white mica and brown noncalcareous shale. Small amounts of lignite noted, and a very few dark-green grains of glauconite.
1,361–1,375	Cuttings	Gray fine-grained sandstone and shale. Fossils: Many gastropods, pelecypods, forams, and ostracodes from above, including *Haplophragmoides* sp. *a*. This fauna is a mixture of Claiborne and Jackson forms. The last-named foram suggests lower Claiborne, and I believe the well is in the lower Claiborne (Cane River of Louisiana) at this depth.
1,392–1,398	Core	Brown soft, partially bedded, highly glauconitic calcareous shale. Washed: Light and dark green medium to coarse, generally elongated glauconitic grains. Fossils: A small microfauna including *Ceratobulimina exima*, *Epistomina* sp., *Lamarckina* sp., *Robulus* sp., *Nodosaria* sp., *Saracemana* sp.?, *Eponides* sp., *Guttulina* sp., *Globigerina* sp. Age: Cane River.[a]
1,450–1,455	do	Brown, fairly hard, brittle, partially bedded noncalcareous shale, containing abundant lignite in places, partly pyritized. White mica present. No fossils noted. This sample resembles the chocolate-brown lignitic shales of the Hatchetigbee formation (upper Wilcox), and I believe it is from this horizon.
1,465–1,480	Cuttings	Brown shale, similar to above. Claiborne fossils from up the hole.
1,535–1,541	Core	Light-gray to white, fairly hard, poorly bedded calcareous shale containing much very fine sand. Washed: Very fine grained, poorly sorted quartz grains. Glauconite present in coarse to medium pale-green botryoidal grains. White mica in very small flakes noted. Fossils: A small fauna of forams including *Gyroidina* sp.? (common), *Siphonina* sp. (common), *Eponides* sp.? (few), *Globigerina* sp. (2 sp.) (few), shark teeth. This fauna appears to have lived in moderately deep to deep marine waters.[b]
1,572–1,582	Cuttings	Light-gray fine-grained calcareous sands and shales. Fossils from above.

[a] J. A. Cushman, in a letter, states that *Ceratobulimina exima* is a very characteristic Cane River fossil, and the other forms confirm the age.

[b] Cushman states that this fauna is probably Wilcox.

[1] Campbell, Ian, and Miller, A. D., Nepheline basalt in Richland Parish gas field, La.: Am. Assoc. Petroleum Geologists Bull., vol. 12, No. 10, fig. 2, p. 990, October, 1928.

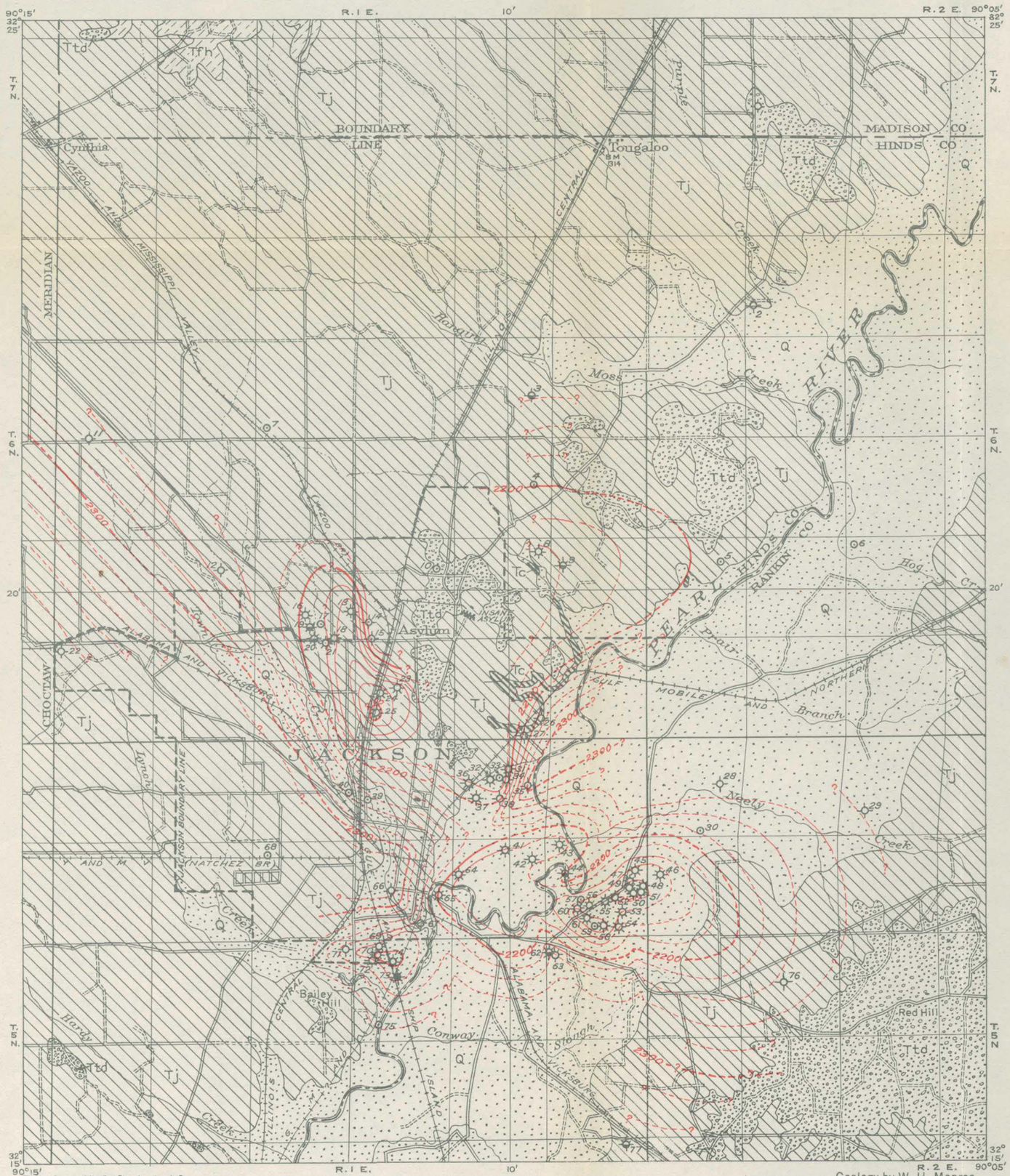
Character of samples from Lion Oil & Refining Co.'s Misterfeldt No. 1 well—Con.

Depth (feet)	Sample	
1,608–1,614	Core	Light-gray soft porous, very fine grained noncalcareous sandstone. Washed: Fine and very fine well-sorted subangular quartz grains. Considerable white mica present. Age: Wilcox.
1,773–1,795	Cuttings	Black soft lignite. The sample was composed entirely of this material.
1,855–1,868	do	Light-gray fine-grained calcareous sandy shale.
1,868–1,874	Core	Brown soft calcareous shale. Much white mica and considerable lignite present. Small amounts of brown mica noted. Nonmarine material.
2,054–2,060	Cuttings	Sample composed entirely of lignite. Nonmarine Wilcox.
2,072–2,078 (top)	Core	Dark-gray, very hard, compact, impervious fine-grained calcareous sandstone. The quartz grains are very fine and tend to be quartzitic. Considerable white mica present.
2,072–2,078 (middle and bottom)	do	Light-gray, soft, very fine grained calcareous sandy shale. Brown patches of material scattered throughout the material. This is probably due to oxidation. Much lignite, white mica, and brown mica present.
2,092–2,100	do	Light-gray soft, poorly bedded noncalcareous shale containing scattered flakes of lignite. A portion of the core contained a thick seam of lignite.
2,158–2,164	do	Light-gray soft, flaky, poorly bedded calcareous clayey shale, made up largely of very fine white mica flakes. Some lignite present. A very few pale-green glauconite grains noted.
2,284–2,292	do	Light-gray, very soft, powdery, fine-grained noncalcareous sandstone, composed of very fine quartz grains. Considerable lignite and white mica present.
2,308–2,323	Cuttings	Similar to above. Age: The last 300 feet of these samples may belong to the Ackerman formation of the Wilcox group.
2,418–2,424	Core	Light-gray sandstone, similar to above.
2,432–2,439	do	Light-gray soft, porous, fine-grained, slightly calcareous sandstone. Washed: Medium to fine well-sorted subangular quartz grains. White mica abundant and much pale-green chlorite(?) present. Glauconite present in small pale-green grains.
2,492–2,497	do	Light-gray soft, partially bedded noncalcareous shale. Much white mica and some pyrite present.
2,525–2,532	do	Light-gray to white, fairly soft thin-bedded noncalcareous shale, containing small isolated fragments of lignite.
2,532–2,560	Cuttings	Light-gray shale and sandy shale.
2,565–2,575	Core	White, very fine grained soft noncalcareous sandy shale.
2,600–2,612	Cuttings	Similar to above sample; fragments of gray glauconitic marl present.
2,710–2,716	Core?	Light-gray soft, very fine grained noncalcareous sandy shale.
2,750–2,757	Core	Light-gray sandy shale, similar to above sample. Some white soft medium-grained noncalcareous sandstone.
2,897–2,899	do	Light-gray and brown fine grained noncalcareous sandy shale. Small amounts of white and brown mica present.
2,960–2,969	do	Brown, poorly bedded, fairly hard noncalcareous shale. Washed: Much white mica present and lignite fragments abundant. A few flakes of brown mica noted. Age: Midway(?).
2,990–2,996	do	Black, poorly bedded, fairly hard noncalcareous shale. Some light-gray, very hard, impervious fine grained calcareous sandstone.
3,013–3,034	Cuttings	Black, fairly hard, bedded, slightly calcareous and noncalcareous shale. Age: Midway.
3,034–3,039	Core	Black shale similar to above. Fossils: A small rotalid form resembling *Lamarckina*.
3,064–3,069	do	White hard cryptocrystalline limestone, containing many pelecypod fragments. Some secondary calcite present. Fossils: A small microfauna including four cristellarian types, *Guttulina* sp.?, three species of ostracodes. Age: Upper Cretaceous.[c]
3,083–3,089	do	White hard limestone. Much of the sample is made up of the limestone in powdered form. Fossils: A few ostracodes.
3,179–3,187	do	Snow-white, fairly hard amorphous, highly calcareous material somewhat resembling the Monroe gas rock of Louisiana. No recognizable fossils found.
3,303–3,315	do	White soft, powdery, highly calcareous or chalky material containing some crystalline lime. This sample somewhat resembles the Monroe gas rock, although lithologically it is much softer. Fossils: A small microfauna including about 7 species of ostracodes, nodosarian fragments, other megascopic fragments. Age: Upper Cretaceous, probably Selma(?).
3,445–3,449	do	White hard crystalline limestone, containing considerable secondary calcite and quartz. Fossils: Pelecypod and gastropod casts and fragments, a small microfauna including *Guttulina* (2 or 3 species), *Lenticulina* sp.?, *Marginulina* sp.?, ostracode fragments. Age: Similar to above.[d]
3,449–3,453	do	White soft chalky material similar to core at 3,303–3,315 feet.
3,480–3,491	do	White and light-gray hard crystalline limestone. Small amounts of pyrite noted. Fossils: Pelecypods and gastropod casts and fragments. Orbitoid forams very abundant in portions of the sample; the genus is not known but it may be close to *Lepidorbitoides*. No microfauna noted. Age: Upper Cretaceous.[e]

[c] Mr. Norton first called this limestone Clayton but has since decided that it is Upper Cretaceous.

[d] Cushman states that in this core there were some poor specimens that are probably *Lenticulina rotulata* (Lamarck), which are characteristic of the chalk phase of the Cretaceous.

[e] Mr. Norton states: "Samples from the core at 3,480–3,491 feet were sent to Dr. T. Wayland Vaughan, of the Scripps Institution, for a study of the larger forams present. Doctor Vaughan writes under date of July 7, 1930, that the orbitoid certainly represented a new species and possibly a new genus. Associated with this foram was a species of *Hamulus*, possibly *H. onyx* Morton. Doctor Vaughan expressed the opinion that the horizon is definitely Cretaceous."



EXPLANATION

Quaternary

Q — Recent and Pleistocene alluvial terrace deposits

Tertiary

Pliocene

Ttd — High level terrace deposits and Citronelle (?) formation (*Red and yellow sand and gravel*)

Oligocene

Tfh — Forest Hill sand (*Laminated sand and clay*)

Eocene

Tj — Jackson formation (*Moodys marl (blue and gray fossiliferous marl) at base and Yazoo clay (greenish-yellow calcareous clay) at top*)

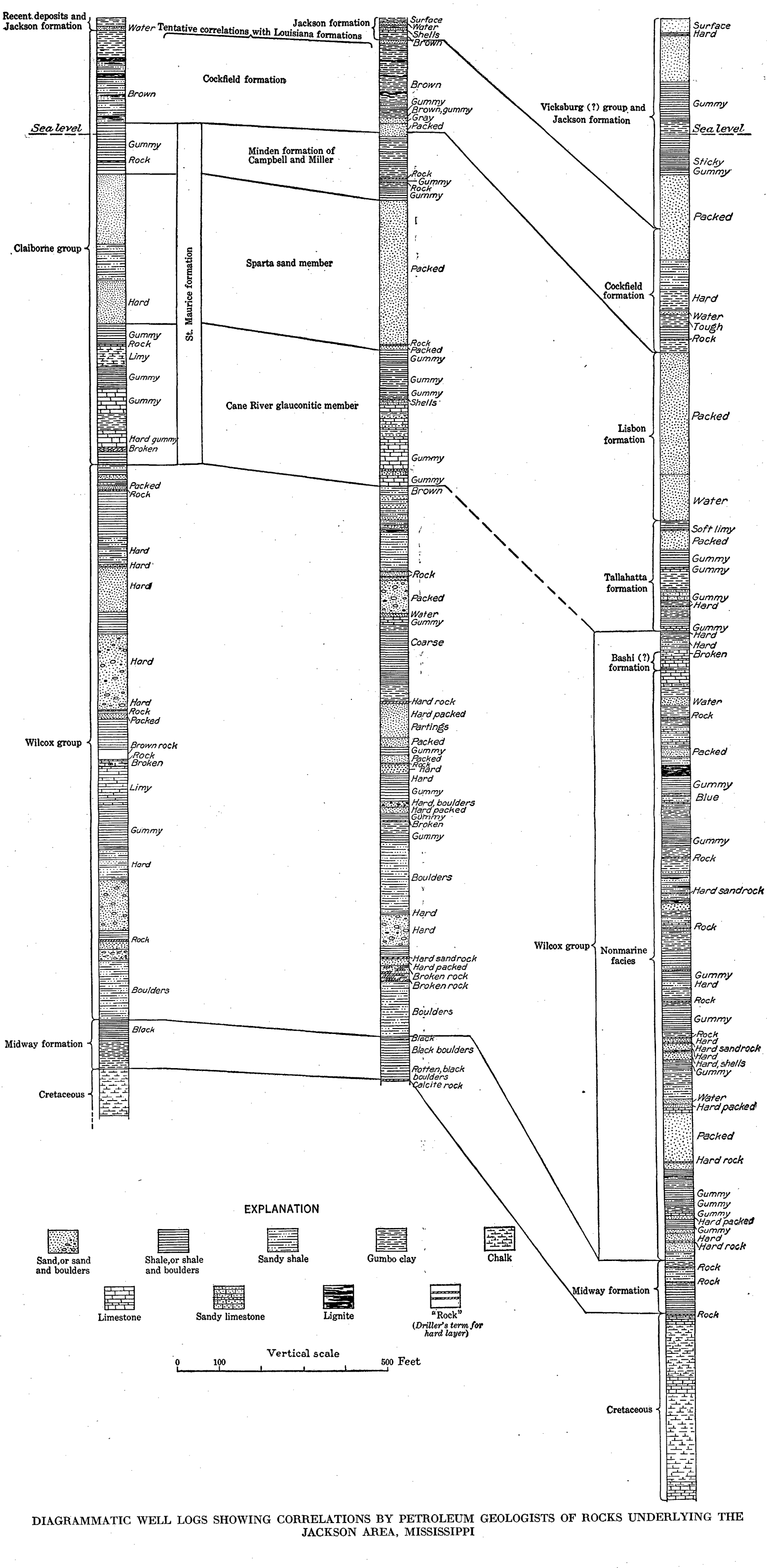
Vc — Cockfield formation (*Cross-bedded sand and clay containing plant remains and lignite*)

Pleistocene loess not shown on this map forms a thin blanket covering all other formations. Locations of boundaries are therefore only approximate

2200 — Structure contours on top of Cretaceous chalk; contour interval 20 feet; figures show depth below sea level; solid line, location essentially correct; broken line, location tentative

- Well being drilled
- Dry hole
- Dry hole with show of oil
- Dry hole with show of gas
- Dry hole with show of oil and gas
- Gas well
- Gas well with show of oil
- Abandoned oil and gas well

GEOLOGIC AND STRUCTURE MAP OF THE JACKSON GAS FIELD, MISSISSIPPI



DIAGRAMMATIC WELL LOGS SHOWING CORRELATIONS BY PETROLEUM GEOLOGISTS OF ROCKS UNDERLYING THE JACKSON AREA, MISSISSIPPI

ROCKS EXPOSED

The Cockfield, the oldest formation exposed at the surface in the Jackson area, crops out in secs. 25, 26, 35, and 36, T. 6 N., R. 1 E., and in sec. 30, T. 6 N., R. 2 E. It consists of cross-bedded sand and clay with some lignite and abundant plant remains and is the upper formation of the Claiborne group of this region. This formation is of nonmarine origin and, according to Berry,[2] represents palustrine deposits formed during an emergence of the Jackson area from beneath the sea near the end of Claiborne time. In a cut on the Gulf, Mobile & Northern Railroad, 500 feet southwest of the Jackson waterworks, in sec. 35, T. 6 N., R. 1 E., is exposed a bed of clay very rich in fossil plants. At the northeast end of this cut below the level of the track, there is a layer of black lignite approximately 1 foot thick. The best exposures of the Cockfield formation are along the bluff on the southwest side of Crane Creek in the NE. ¼ NW. ¼ sec. 36, T. 6 N., R. 1 E., where 29 feet of the formation is seen. A section measured at this point follows:

Section on Crane Creek in sec. 36, T. 6 N., R. 1 E.

	Feet
Concealed in upper part of slope	45
Moodys marl member of Jackson formation: Fossiliferous marl and highly argillaceous sand	25
Concealed	3
Cockfield formation:	
Fine laminated light-gray and tan sand 3 feet 2 inches thick, overlain by alternating beds of cross-bedded fine tan and gray sand and lignitic clay, to top of dry waterfall	11
Massive fine sand containing lignite, overlain by laminated sandy clay, passing upward into cross-bedded blue-gray sand; all containing comminuted plant remains	18

Overlying the Cockfield is the Jackson formation, which has been divided into two members, the Moodys marl below and the Yazoo clay, or "*Zeuglodon* beds," above, both of which are marine. The Moodys marl, which derives its name from Moodys Branch, in the northern part of Jackson, is present in many of the stream beds near Jackson. The best exposures are along the bluff on Crane Creek immediately overlying the Cockfield and at the mouth of Town Creek, in the southern part of the city. A more accessible and better-known locality is in the bluffs of Moodys Branch near the intersection of Poplar Boulevard and Peachtree Street. The member consists of about 25 feet of brownish-gray and blue-green glau-

[2] Berry, E. W., Erosion intervals in the Eocene of the Mississippi embayment: U. S. Geol. Survey Prof. Paper 95, p. 81, 1915.

conitic argillaceous sand which is very rich in perfectly preserved fossil shells. Whether the Moodys marl rests conformably on the Cockfield formation has not been determined. The cross-bedding in sand and clay of the underlying Cockfield formation should not be mistaken for dip. In this connection, however, mention should be made of an apparent unconformity exposed in a railroad cut near the waterworks, where the beds of the Cockfield formation exhibit an apparent dip of 11° SW., whereas the beds of the Jackson formation are horizontal, but there is some evidence of slumping here. Cross-bedding has been seen in the Cockfield formation on Crane Creek. The section at the type locality of the Moodys marl is as follows:

Section on bluff at Moodys Branch at extension of Peachtree Street, sec. 35, T. 6 N., R. 1 E.

	Feet
Yazoo clay (?) member: Light-yellow to cream-colored calcareous clay containing many casts of mollusks, sparingly glauconitic, very plastic and sticky when wet; creeps easily; to top of bluff	18
Moodys marl member: Yellow to gray glauconitic, slightly argillaceous sand containing abundant fossil shells. About 6 feet above base calcareous nodules are common. This bed grades up into the overlying clay	13
Unconformity (?).	
Cockfield formation: Dark-gray to black (when wet) carbonaceous clay containing streaks and small flat paddles of lignite. The upper 3 inches of this clay is broken up into blocks about 3 inches in diameter, surrounded by the overlying fossiliferous sand	3

Overlying the Moodys marl is the Yazoo clay, which, where unweathered, is a plastic greenish blue-gray clay, containing prints of fossils and breaking with a conchoidal fracture. Where weathered the Yazoo is a greenish-yellow to black plastic calcareous clay or gumbo, commonly called "pipe clay" by the local people. The Moodys marl passes upward into the Yazoo clay with no definite break, the sand gradually becoming more argillaceous and finally grading over into clay. The thickness of the Jackson formation penetrated in a shallow core boring made by the Gulf Refining Co. of Louisiana at Rocky Hill Church, in sec. 20, T. 7 N., R. 1 E., is 460 feet. Of this probably 20 feet is Moodys marl, making a total thickness of Yazoo clay of 440 feet. The best exposure yet seen of unweathered Yazoo clay is in the bottom of White Oak Creek about 100 feet north of its junction with Hanging Moss Creek, in the NE. ¼ sec. 18, T. 6 N., R. 2. E. The Yazoo clay is at least in part the cause of the rather flat, rolling hills that characterize the Jackson area, the so-called prairie land, for this clay is very plastic when it is wet and has a tendency to slump or creep, thus evening off the slopes of the hills

and partly filling up the valleys. This tendency to creep is noticeable in Jackson, which is largely built on the clay, by the many small hollows and bumps that have formed in the asphalt streets since they were laid.

The Jackson formation is overlain in the northern part of the area under consideration by the Forest Hill sand, of the Vicksburg group, of Oligocene age. This formation may be conformable with the Jackson and indeed is by many geologists considered of Jackson instead of Vicksburg age.[3] Berry [4] says of this formation:

> These sands undoubtedly represent littoral and continental deposits that mark the oscillation of the strand in this area between Jackson and Vicksburg time, and the thin bed of lignite, which usually intervenes between them and the marine Vicksburg, confirms the floral evidence that these sands are of Jackson age.

Cooke believes that the Forest Hill sand is of Vicksburg age, but he says:[5]

> Although the character of the sediments indicates a change at the end of Jackson time from marine to very shallow water or palustrine conditions, it is probable that the change was gradual and nearly continuous.

The Forest Hill sand consists of laminated beds of sand and clay containing poorly preserved plant remains. To the east it is overlain in succession by the Marianna limestone, the Glendon limestone, and the Byram marl, none of which crop out in the area under consideration.

In the vicinity of Jackson the Yazoo clay is overlain on some of the hills by red and yellow sand and gravel which are believed to be of Pliocene age. The best exposure near Jackson is at Red Hill, about 5 miles east of the city on the old abandoned Brandon road. These deposits attain a thickness of 60 feet. They may be northern remnants of the Citronelle formation, which has its main development farther south in Mississippi.

Blanketing all the formations in the area is a sheet of rather compact gray or yellow loam, classed by the United States Bureau of Soils as a loesslike material. It is probably the eastern extension of the loess that has its principal development between the Mississippi and Big Black Rivers. This loess covers hills and valleys but seems to be thicker on the southern slopes of the hills. In some road cuts it is at least 10 feet thick, but here and there the tops and frequently the northern slopes of the hills are bare. This uneven blanketing seems to indicate a wind-blown origin for the material. Lithologi-

[3] Lowe, E. N., Geology and mineral resources of Mississippi: Mississippi Geol. Survey Bull. 20, pp. 67–68, 1925.

[4] Berry, E. W., Middle and upper Eocene floras of southeastern North America: U. S. Geol. Survey Prof. Paper 92, p. 98, 1924.

[5] Cooke, C. W., The correlation of the Vicksburg group: U. S. Geol. Survey Prof. Paper 133, p. 1, 1923.

cally it is similar to the typical loess along the Mississippi River, except that it is harder, gullies easier, and is somewhat coarser. Like other loess, however, it stands in vertical walls.

The flat valley of the Pearl River is covered with alluvial terrace deposits. The valley is bounded on the east and west sides by well-marked escarpments, the western one of which may be seen typically developed at the fair grounds at Jackson. The altitude of the base of the escarpment here is 268 feet, according to measurements tied in with the city engineering department's level line. Cooke suggests that this terrace may be of the same age as the Hazelhurst terrace in Georgia,[6] which he recently[7] correlated with the Brandywine terrace in Maryland. The altitude of the shore line of the Hazelhurst terrace is about 265 feet. The terrace deposits in the Pearl River Valley are loose, cross-bedded sands. They are in part of Pleistocene and in part of Recent age but it is difficult to distinguish the Pleistocene sands from the Recent alluvial sands.

STRUCTURE

The rocks in south-central Mississippi have a low regional dip south by west, but in the vicinity of Jackson the strata dip away in all directions from the city, forming an anticline or dome. This reversal in the dip of the strata exposed at the surface in the Jackson area has been known since early geologic investigations were made in Mississippi,[8] and in 1915 Hopkins[9] showed that the reverse dips occur on a broad anticline, which he called the Jackson anticline. In mapping the structure of the area he used as a key horizon the top of the Glendon limestone of the Vicksburg group, and he found that the structure reflected in the attitude of this limestone is fairly regular, the limestone forming a crescent-shaped belt that encircles the Jackson area except for a gap on the northeast side. The belt lies for the most part outside the area that is shown on Plate 1, and in the absence of the present available well data Hopkins was unable to draw structure contours on the crest of the anticline. It is an interesting fact that the highest point thus far discovered on the anticline (well 25) is only one-fourth mile west of Hopkins's "supposed axis of Jackson anticline."

As seen in Plate 1, the structure is plainly expressed by the surface geology, as well as by borings to the top of the Cretaceous. The oldest bed exposed in the area is the Cockfield formation, of the

[6] Cooke, C. W., Physical geography of Georgia: Georgia Geol. Survey Bull. 42, p. 29, 1925.

[7] Cooke, C. W., Correlation of coastal terraces: Jour. Geology, vol. 38, No. 7, p. 538, October-November, 1930.

[8] Hilgard, E. W., Geology and agriculture of Mississippi, pp. 128–129, 1860.

[9] Hopkins, O. B., Structure of the Vicksburg-Jackson area, Mississippi: U. S. Geol. Survey Bull. 641, pp. 93–120, 1916.

Claiborne group, which crops out in the northern part of the city of Jackson. The exposures of this bed are surrounded on all sides by the Jackson formation, and according to the geologic map of Mississippi [10] the Cockfield does not crop out again nearer than the banks of the Pearl River in T. 8 N., R. 4 E., about 20 miles northeast of Jackson. Northwest of the outcrop of Cockfield in the city the entire thickness of the Jackson formation is exposed, overlain in the southern part of Madison County by the Forest Hill sand of the Vicksburg group.

Study of logs of holes drilled at Jackson corroborates the evidence derived from surface studies. From these logs have been drawn on Plate 1 the contour lines that represent the depth below sea level of the top of the Cretaceous chalk. These lines are shown from 2,100 to 2,380 feet below sea level. At most places their position is inferred from scattered wells, and they thus can not be accurately located until more well data are available. At such places the lines are dashed. As is shown by the map, there are three distinct high points—the highest in sec. 34, T. 6 N., R. 1 E., where one well reached the top of the chalk at 2,088 feet; the next highest in sec. 12 , T. 5 N., R. 1 E., which has two high points less than 2,120 feet below sea level; and the third in sec. 15, T. 5 N., R. 1 E., where the 2,200-foot contour is shown. It is probable that other high spots will be revealed by future drilling.

There are also several low spots in the Jackson area. A deep structural trough runs east-northeastward through secs. 9, 10, 2, and 1, T. 5 N., R. 1 E. The most striking difference in depth to the top of the chalk in this trough is shown by wells 34 and 35, in section 2. In well 35 it is 153 feet lower than in well 34, less than a quarter of a mile to the west. This difference in depth could be produced by a dip of less than 7°. Some geologists believe that this structural trough is a block that has been faulted down between the high areas to the northwest and southeast, but the writer believes that the evidence, as provided by wells, is as yet insufficient to warrant this conclusion. Another low spot was reached in well 44, in sec. 12, T. 5 N., R. 1 E., which reached the chalk at a depth of 2,205 feet below sea level, whereas the wells half a mile to the southeast regularly reach it at 2,140 feet or less.

Future drilling will probably show that several of the uncompleted contour lines should be closed to the north, making a true dome of the Jackson anticline.

Two main theories have been advanced to explain the origin of the Jackson anticline—the "buried hill" theory and the "crustal

[10] Stephenson, L. W., and others, The ground-water resources of Mississippi: U. S. Geol. Survey Water-Supply Paper 576, pl. 2, 1928.

disturbance" theory. These are both discussed by Grim.[11] The first theory postulates a hill or range of hills of pre-Cretaceous sedimentary or igneous rocks around and over which Cretaceous and younger deposits were laid down. The hill is believed to have risen at times above sea level while deposition was going on around it, thus making the thickness of rocks on top of the hill less than on the sides and in the synclines or structurally low areas. Subsequent consolidation of clay into shale would reflect this hill in the overlying rocks, for compaction of clay into shale would cause shrinkage in the thickness of the beds around and away from the hill, and this would result in a tilting of the beds on the immediate flanks of the hill. In support of this theory it may be mentioned, first, that Raymond A. Moore, consulting geologist at Jackson,[12] claims that the Winona sand member of the Lisbon formation is missing on top of the Jackson anticline, although present in the Lion Oil & Refining Co.'s Misterfeldt No. 1 well, 4½ miles south of Jackson, in Rankin County; second, that there is a great thickening of all formations, especially the Wilcox, shown by wells drilled off of the Jackson anticline; third, that some time prior to the deposition of the chalk there was igneous activity at Jackson which might have produced such a hill, for igneous rocks have been reached in several deep test holes.

The second theory, which is supported by Grim and explained in his report, implies that since the deposition of the Cretaceous and Tertiary beds the Jackson area has been raised in respect to the surrounding country or has remained stationary while the surrounding country has sunk. Grim believes that the structural terrace or nose of which the Jackson dome is the southern extremity is possibly a fault block bounded by two faults running north and northwest from a point in Simpson County, Miss.

OIL AND GAS

HISTORY OF DEVELOPMENT

In 1917 two fairly deep holes, both of which were dry, were drilled on the Jackson anticline north of the city of Jackson. One of these was the Benedum-Trees Co.'s Swearingen No. 2 in sec. 14, T. 6 N., R. 1 E., 4 miles north of the city, and the other the Atlas Oil Co.'s Garber No. 1, in sec. 18, T. 6 N., R. 1 E., 4 miles northwest of the city. They were, however, not adequate tests, for they were not drilled on the highest part of the anticline. In February, 1930, the Jackson

[11] Grim, R. E., Recent oil and gas prospecting in Mississippi, with a brief study of subsurface geology: Mississippi Geol. Survey Bull. 21, 1928.

[12] Oral communication.

Oil & Gas Co. completed its Mayes No. 1 well, in sec. 2, T. 5 N., R. 1 E., which had an initial daily flow of more than 2,000,000 cubic feet of gas with considerable salt water. From this time on there has been intensive drilling, and on April 1, 1931, there were 42 gas wells. A total daily open-flow capacity for all the wells in the Jackson field at that time was estimated at over 1,250,000,000 cubic feet.

PRODUCTION

As may be seen from Plate 1,[13] the productive wells are grouped around the three structurally high points above mentioned, with an additional group around the discovery well, in sec. 2, T. 5 N., R. 1 E. The area between the group in sec. 2 and the group in sec. 34, T. 6 N., R. 1 E., is in the residential part of the city and has not been explored but would probably be productive if wells were drilled there.

Oil in commercial quantities had not been found in the Jackson area up to April, 1931, although several wells have had favorable showings of oil, and a small quantity was swabbed from the Love Petroleum Co.'s Maley No. 1 well (No. 73, in sec. 15, T. 5 N., R. 1 E.) before excessive salt water forced the company to kill the well. An analysis of this oil is given below. In April, 1931, there was about 300 barrels of oil in the storage pits of this well.

The gas from the Jackson field is being distributed by the United Gas Public Service Co., the Mississippi Power & Light Co., and the Mississippi Industrial Gas Co. It is also used by the Gulf States Creosoting Co., which consumes the entire output of two wells that belong to the company. In February, 1931, approximately 13,000,000 cubic feet of gas was being drawn from the field daily, not counting a small amount used to operate drilling rigs.

The gas from a few wells has been analyzed by the United Gas Public Service Co. (Louisiana Gas & Fuel Co.). Analyses for two wells are given below. The average calorific value of the gas from 12 wells as determined by the same company is 940 British thermal units.

Edge water has been reached in all wells drilled off the main structural high areas, thus limiting the field on the south, east, and west sides.

[13] The location of some of the wells in Rankin County as shown in Plate 1 is not strictly accurate with reference to the roads. The topographic map that was used for the base was incorrect in some particulars and is now being revised.

Wells completed in the Jackson field

Year	Month	Dry	Gas	Total	Initial flow (millions of cubic feet)
1917	June	1		1	
	October	1		1	
1929	June	1		1	
	October	1		1	
1930	February		1	1	2
	May	1	1	2	28
	June	1		1	
	July	2	5	7	125
	August	6	5	11	124
	September	1	5	6	180
	October		6	6	235
	November	1	5	6	226
	December	3	3	6	142
1931	January	2	6	8	93
	February	1	3	4	90
	March		2	2	85
		22	42	64	1,330

Wells shut down or drilling April 1, 1931, 18; total operations, 82.

Analysis of crude oil from Love Petroleum Co.'s Maley No. 1 well, sec. 15, T. 5 N., R. 1 E.

[Analyzed at Lion Oil & Refining Co.'s refinery, El Dorado, Ark.]

Tests on crude: Gravity (A.P.I.) at 60°, 14.3; flash, open cup, 310° F.; fire, 340° F.; pour test, 30° F.; sulphur content, 1.60 per cent.

Fractionation: Initial boiling point, 497° F.; light gas oil, 20 per cent; heavy gas oil, 19 per cent; bottoms, 59 per cent; loss, 2 per cent.

Light: Gravity 25.5; flash 225° F.; fire, 250° F.

Heavy: Gravity, 20.8; flash, 260° F.; fire 330° F.; pour test, —30° F.; viscosity at 100° F., 161.

Bottoms: Gravity, 10; float at 122° F., 71 seconds; flash, 485° F.; fire, 550° F.

Analysis of gas from Love Petroleum Co.'s Mendoza Club No. 1 well, sec. 11, T. 5 N., R. 1 E.

[Analyzed by Louisiana Gas & Fuel Co.]

Rock pressure, 1,015 pounds. Specific gravity, 0.643. Methane, 64.45 per cent; ethane, 16.28 per cent; nitrogen, 19.27 per cent. British thermal units: Gross, 941; net, 885.

Analysis of gas from Louisiana Gas & Fuel Co.'s Toole No. 1 well, sec. 28, T. 6 N., R. 1 E.

[Analyzed by Louisiana Gas & Fuel Co.]

Specific gravity (calculated), 0.595. Carbon dioxide, 0.75 per cent; methane, 90.23 per cent, ethane, 0.67 per cent; nitrogen, 8.35 per cent. British thermal units, gross (calculated), 922.

Wells drilled in Jackson gas field, Mississippi

No. on map	Location				Operator	Lease and number	Date drilled	Present status or initial production [a]	Altitude (feet)	Depth to top of chalk (feet)	Total depth (feet)
	County	Sec.	T. N.	R.							
1	Madison	32	7	2 E.	Mississippi Petroleum Co	Raymond No. 1	Aug. 15–Dec. 15, 1930	Abandoned	375.9		706
2	Hinds	8	6	2 E.	Universal Gas Co	Holliday & Ross No. 1	May 26–Nov. 23, 1930	do	290.7		2,653
3	do	14	6	1 E.	Benedum-Trees Co	Swearingen No. 2	Mar. 31–Oct. 1, 1917	Dry	334.0	2,597	3,043
4	do	23	6	1 E.	Southern Petroleum Co	Wilson No. 1	Dec. 22, 1930	Shut down at 20 feet	313.6		
5	do	30	6	2 E.	Gulf Refining Co. of Louisiana.	S. L. McLaurin, Jr., No. A–1	Oct. 30, 1930	Being drilled	275.7	2,485	
6	Rankin	28	6	2 E.	Love Petroleum Co	Interior Lumber Co. No. 1	Apr. 14, 1930	Shut down at 869 feet	275.2		
7	Hinds	16	6	1 E.	Gulf Refining Co. of Louisiana.	School Land No. 1	Feb. 4, 1931	Shut down	335.0		
8	do	26	6	1 E.	do	Daisie Lawrence et al. No. 1 (Crane-Lawrence No. 1).	Aug. 19–Sept. 20, 1930	10,000,000/1,080	297.1	2,454	2,457
9	do	25	6	1 E.	Mrs. Ella Rawls Reader et al	State Lands No. 1	Mar. 23, 1925	Shut down	298.6	2,520	2,825
10	do	27	6	1 E.	Attkisson & Dyer	Downing & Rehfeldt No. 1		Being drilled	347.6		
11	do	18	6	1 E.	Atlas Oil Co	Garber No. 1	Mar. 8–June 7, 1917	Dry	342.5	2,610	3,079
12	do	29	6	1 P.	Jackson Oil & Gas Co	Capital Land & Investment Co. No. 1.	July 2–July 25, 1930	do	318.0	2,574	2,605
13	do	28	6	1 E.	Mississippi Petroleum Co	Baptist Orphanage No. 2	Jan. 14–Feb. 20, 1931	40,000,000–45,000,000 [b]	331.2	2,482	2,487
14	do	27	6	1 E.	E. B. Love et al	Payne No. 1	Jan. 27, 1931	Being drilled	308.6	2,533	
15	do				Pirtle & Flint	Frank Payne No. 1	Feb. 4, 1930	do	314.3	2,543	
16	do	28	6	1 E.	do	Negro Fair Association No. 1	Aug. 23, 1930–Jan. 4, 1931	6,000,000–8,000,000 [b]	307.0	2,502	2,507
17	do				Universal Gas Co	Sharbrough No. 1	July 27–Dec. 1, 1930	Abandoned	308.6		88
18	do				Mississippi Petroleum Co	Baptist Orphanage No. 1	Sept. 12–Nov. 25, 1930	30,000,000 [b]	318.7	2,481	2,486
19	do				Louisiana Gas & Fuel Co	Toole No. 1	June 7–July 10, 1930	20,993,480/1,050	304.0	2,500	2,503
20	do				Capital Oil & Gas Co	Brown No. 1	July 15–Aug. 18, 1930	6,000,000–8,000,000 [b]	302.3	2,499	2,503
21	do	33	6	1 E.	Attkisson & Dyer	Wiggins No. 1	Nov. 27, 1930–Jan. 27, 1931	7,000,000–10,000,000	307.8	2,490	2,493.5
22	do	31	6	1 E.	Marine Oil & Gas Co	Country Club No. 1	July 5–Aug. 16, 1930	Dry	318.4	2,710	3,063
23	do	34	6	1 E.	Love Petroleum Co	Homestead No. 1	Jan. 1–Jan. 22, 1931	5,000,000 [b]	314.0	2,450	2,455
24	do				do	Bob Taylor No. 1	Jan. 25–Feb. 17, 1931	35,000,000 [b]	311.2	2,418	2,423
25	do				do	Morton Lumber Co. No. 1	Nov. 1–Dec. 3, 1930	50,000,000 [b]	305.7	2,394	2,402
26	do	35	6	1 E.	Jackson Oil & Gas Co	Taylor No. 1	Mar. 11–June 23, 1930	Dry	289.9	2,545	3,232
27	do				Louisiana Gas & Fuel Co	Harris No. 1	Mar. 16–May 17, 1930	do	281.0	2,506	3,239
28	Rankin	6	5	2 E.	Sabine Oil & Gas Co	Rankinside Development Co. No. 1.	Nov. 11–Dec. 18, 1930	Abandoned	273.0	2,549	2,551
29	do	4	5	2 E.	Gulf Refining Co. of Louisiana.	Wm. S. Hamilton et al. No. 1	Oct. 3, 1930–Jan. 17, 1931	Dry	284.8	2,563	4,027
30	do	6	5	2 E.	Millstein Oil & Gas Corp	Gammill-Hartfield No. 1	Nov. 21, 1930	Shut down	273.7	2,496	2,502
31	Hinds	2	5	1 E.	Jackson Oil & Gas Co	Mayes No. 1	Dec. 4, 1929–Feb. 16, 1930	2,000,000–6,000,000 [b]/820	272.8	2,460	2,568
32	do				Feazel Oil & Gas Co	Garrett No. 1	Dec. 30, 1930–Feb. 8, 1931	15,000,000–20,000,000 [b]	274.3	2,438	2,443
33	do				Cleve Love et al	Ridgway & McGehee No. 2		Derrick	271.0		
34	do				Feazel Oil & Gas Co	Millstein No. 1	Aug. 11–Sept. 16, 1930	35,283,840/1,045	273.6	2,434	2,441

[a] Initial production given is daily open-flow capacity in cubic feet. Figures after production indicate rock pressure, in pounds to the square inch, when it has been measured.
[b] Estimated.

Wells drilled in Jackson gas field, Mississippi—Continued

No. on map	Location				Operator	Lease and number	Date drilled	Present status or initial production [a]	Altitude (feet)	Depth to top of chalk (feet)	Total depth (feet)
	County	Sec.	T. N.	R.							
35	do				Jackson Oil & Gas Co	Mayes No. 2	Aug. 1–Aug. 24, 1930	Dry	268.4	2,581.5	2,737
36	do				Love Production Co	Gordon No. 1	June 21–Aug. 1, 1930	17,857,140/1,060	282.9	2,467	2,482
37	do				do	Crisler No. 1	Aug. 27–Oct. 3, 1930	10,000,000–15,000,000 [b]	269.8	2,468	2,485.5
38	do				Cleve Love et al	Ridgway & McGehee No. 1	Aug. 23–Sept. 24, 1930	Dry	270.6	2,466	2,488
39	do	3	5	1 E.	Jackson Oil & Gas Co	Central Cotton Oil Co. No. 1		Derrick	298.6		
40	do	4	5	1 E.	Industrial Gas & Electric Co	Illinois Central R. R. No 1	Mar. 6, 1931–	Being drilled			
41	do	11	5	1 E.	Love Petroleum Co	Hutton No. 1	June 11–July 9, 1930	22,026,880/1,050	266.3	2,447	2,453
42	do				do	Mendoza Club No. 1	Mar. 22–May 2, 1930	28,569,920/1,050	272.0	2,444	2,447
43	do	12	5	1 E.	do	Mendoza Club No. 2	July 16–Aug. 2, 1930	40,194,960/1,050	263.0	2,437	2,442
44	Rankin				Pearl Valley Oil & Gas Co	Moter No. 1	June 28–Aug. 6, 1930	10,000,000–15,000,000 [b]	262.1	2,466	2,477
45	do				Ohio Oil Co	Payne No. 1	July 26–Aug. 25, 1930	50,000,000 [b]	268.8	2,391	2,394
46	do	7	5	2 E.	Gulf Refining Co. of Louisiana.	J. M. Hartfield "A" No. 1	Aug. 14–Sept. 10, 1930	50,000,000 [b]/1,040	268.4	2,396	2,398
47	do	12	5	1 E.	Pearl River Oil & Gas Co	Littlefield No. 1	May 19–July 13, 1930	50,000,000 [b]	270.1	2,389	2,393
48	do				Feazel Oil & Gas Co	Cox No. 1	Dec. 5–Dec. 23, 1930	40,768,000	269.0	2,388	2,391.5
49	do				Millstein Oil & Gas Co	Hartfield No. 1	Sept. 8–Oct. 16, 1930	35,000,000 [b]	269.3	2,387	2,392
50	do				Union Drilling Co	Cobb No. 1	Nov. 5–Nov. 30, 1930	48,552,034	269.6	2,375	2,378
51	do				Sabine Oil & Gas Co. (Jackson Royalties (Inc.).)	Pate No. 1	Oct. 5–Oct. 30, 1930	50,000,000 [b]	269.2	2,383	2,387.5
52	do				Southern Petroleum Co	Investment No. 1	Sept. 1–Oct. 4, 1930	do	269.5	2,385	2,390
53	do				Pearl River Oil & Gas Co	Pate No. 1	Aug. 21–Sept. 20, 1930	50,000,000 [b]/1,055	268.9	2,413.5	2,418.5
54	do				do	Pate No. 2	Oct. 8–Nov. 2, 1930	80,470,000/1,045	269.8	2,435	2,439
55	do				Cleve Love et al	Brown No. 1	Oct. 7–Oct. 30, 1930	50,000,000 [b]	269.0	2,402	2,407
56	do				Pioneer Oil & Gas Co	Graves No. 1	Oct. 24–Nov. 18, 1930	40,000,000–45,000,000 [b]	268.8	2,391	2,402
57	do				J. T. Hester et al	Ellis No. 1	Mar. 28, 1931–	Being drilled			
58	do				Pearl River Oil & Gas Co	Pate No. 3	Dec. 11, 1930–Jan. 11, 1931	63,798,345	269.7	2,371	2,375.5
59	do				Grandstaff et al	Carr No. 1	Apr. 5, 1931–	Being drilled			
60	do				Pioneer Oil & Gas Co	Ragland No. 1	Feb. 26–Mar. 22, 1931	45,000,000 [b]	270.2	2,385	2,393
61	do				Southern Petroleum Co	Ivy No. 1	Nov. 19–Dec. 13, 1930	51,721,406/1,010	270.0	2,389	2,393
62	do	13	5	1 E.	Gulf Refining Co. of Louisiana.	E. P. Rainey "A" No. 1	Feb. 19–July 13, 1930	15,000,000 [b]	267.0	2,501	3,607
63	do				Home Oil Producing Corp	Rainey No. 1	Sept. 19–Oct. 29, 1929	Dry	268.0	2,509	2,512.5
64	Hinds	11	5	1 E.	LeFleur Oil & Gas Co	Chadwick & Brown No. 1	Sept. 8–Oct. 9, 1930	40,000,000 [b]	259.5	2,436	2,449
65	Rankin	10	5	1 E.	Gulf Refining Co. of Louisiana.	City of Jackson No. 1	Aug. 23–Sept. 21, 1930	35,000,000 [b]	259.4	2,451	2,459
66	Hinds				Love Petroleum Co	Dreyfus No. 1	Aug. 9–Aug. 25, 1930	Dry	264.2	2,594	2,597
67	do				Capital Oil & Gas Co	Clarke No. 1	July 21–Aug. 18, 1930	do	266.3	2,500	2,628
68	do	9	5	1 E.	Howard Oil Co	Jackson College No. 1	Dec. 22, 1930–	Being drilled	320.5		
69	do	15	5	1 E.	Hawkeye Gas Co	Webster No. 1	Sept. 22–Nov. 16, 1930	27,144,000	269.6	2,474	2,478
70	do				Cane River Oil & Gas Co	Lufkin No. 1	May 30–July 24, 1930	16,667,000	267.2	2,465	2,468
71	do	16	5	1 E.	Ohio Oil Co	School Land No. 1	June 16–July 12, 1930	Dry	278.8	2,505	2,511
72	do	15	5	1 E.	Iowa Gas Co	Payne No. 1	Dec. 3, 1930–Jan. 17, 1931	2,000,000–5,000,000	268.2	2,500	2,504
73	do				Love Petroleum Co	Maley No. 1	Sept. 15, 1930–	10,000,000–15,000,000	267.5	2,487	2,495

74	do				do	Maley No. 2	Feb. 24–Mar. 18, 1931	40,000,000 [b]	267.0	2,445	2,449
75	do				Cane River Oil & Gas Co	Kabbes No. 1	Oct. 24, 1930–	Shut down 3,270 feet	262.1	2,542	
76	Rankin	17	5	2 E.	Jackson Oil & Gas Co	Patton No. 1	July 13–Aug. 11, 1930	Abandoned	294.1	2,546	2,549
77	do	25	5	1 E.	John H. Ganzel et al	Stallings No. 1	Jan. 7–Feb. 8, 1931	Dry	271.5	2,628	3,072
[c] 78	Hinds	14	5	1 W.	Mississippi Petroleum Co	Solvent Investment Co. No. 1.	Sept. 1, 1930–Jan. 15, 1931	do	388.2	3,069	3,075
[c] 79	Rankin	2	4	1 E.	Lion Oil & Refining Co	Misterfeldt No. 1	Sept. 29, 1928–June 2, 1929	do	275.4	3,064	4,075
[c] 80	Hinds	5	4	1 E.	Dome Oil & Gas Co	Elton Plantation No. 1	Apr. 9–Aug. 13, 1930	Abandoned	263.3		2,805

[a] Initial production given is daily open-flow capacity in cubic feet. Figures after production indicate rock pressure in pounds to the square inch, when it has been measured.
[b] Estimated.
[c] Not shown on map.