MISSISSIPPI
State Geological Survey

E. N. LOWE, Director

BULLETIN No. 21

Recent Oil and Gas Prospecting in Mississippi
With a Brief Study of Subsurface Geology

By Ralph E. Grim

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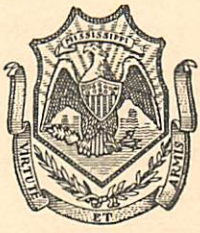

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STATE GEOLOGICAL COMMISSION

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LETTER OF TRANSMITTAL

Office of State Geological Survey

University, Mississippi,

January 25, 1928.

To His Excellency, Governor Theodore G. Bilbo, Chairman, and Members of the Geological Commission:

Gentlemen:

In the Ninth Biennial Report (1921-1923) of this Department was given rather fully results of petroleum prospecting in Mississippi up to the date of its publication in January, 1924. Since that date additional prospecting has been in progress, and very important results have been attained.

In October, 1926, the Carter No. 1 Well, of the Amory Petroleum Company, of Amory, Monroe County, at a depth of about 2402 feet struck a gas sand which blew in with volume of about five million cubic feet of gas per day, and has steadily maintained that pressure up till the present time. About a year later another well in the same field, the Rye No. 1, of the Arkansas Natural Gas and Fuel Company, located 15 miles southeast of the Carter No. 1 well, was brought in with a capacity of several million cubic feet of gas.

These two wells definitely put Mississippi in the class of states in producing territory, so far as concerns natural gas. As yet commercial oil has not been discovered, but there seems good reason to expect that it will be. The oil fraternity generally has manifested renewed and augmented optimism in Mississippi as a probable future source of oil. Accordingly, many locations have been made in different parts of the state, and a good many new wells have been drilled, or are now drilling. So largely have these developments directed attention to this state that the Geological Survey is daily receiving inquiries as to these activities.

In order to be able more satisfactorily to meet these inquiries, both from citizens of the state and from those of other states, it has seemed desirable to assemble and publish the data which developing

companies have kindly furnished us of their own free will, since there is no State Law requiring them to do so. This Bulletin, then, is in some measure a supplement to our Ninth Biennial Report.

During the past year Mr. Ralph E. Grim, the Assistant State Geologist, has prosecuted a very careful and thorough microscopic study of well cuttings and cores in possession of the Geological Survey, as well as of outcrop material from type localities of the various Coastal Plain formations within the state. As a result of this study, he has prepared a preliminary paper on subsurface correlations of formations, which brings to light new facts that will prove important in future drillings in Mississippi. His work in this direction has just begun, and we may expect much additional information as the work progresses. Mr. Grim's paper forms an important part of this bulletin.

This manuscript is presented for your approval, to be published as Bulletin No. 21, of the Mississippi Geological Survey.

Respectfully submitted,

E. N. LOWE, Director.

CONTENTS

NOTES OF SUBSURFACE STRATIGRAPHY OF MISSISSIPPI

Introduction

The Mississippi Geological Survey has in its possession the cores and cuttings from many of the deep wells put down in the state prospecting for oil. Some time ago the writer undertook a careful study of this material, and as some of the results appear to be of sufficient importance both scientifically and economically in the future prospecting for oil, it is deemed wise to present them at this time.

The correlation of the well material has been on the basis of their foraminiferal content. When there has been any doubt concerning the correlation, the writer has had his determinations checked by other micropaleontologists in the employ of oil companies, and hence the determinations are believed to be accurate. In a few cases the cuttings have been so poor, and entirely unfossiliferous that an accurate correlation has been impossible. This is especially true of the Wilcox-Claiborne contact. Much of the Claiborne, especially the lower part, and the Wilcox, contain no fossils and it is often impossible to exactly draw the line separating them. When the boundary is tentative it is so stated. It is planned at a later time to carry on heavy mineral analysis of this unfossiliferous material with the hope that some data for accurate correlation may be obtained.

Acknowledgment

The writer wishes to acknowledge the constant aid and assistance rendered by Dr. Lowe, Director of the Miss. Geol. Survey in carrying out the work, and in preparing the paper. Thanks are also due to the Paleontologists of the various oil companies, who have kindly examined samples from some of the wells.

Classification

Previous workers in the field have been unable to wholly agree on the detailed correlation of the Eocene formations in Mississippi.

FIG. 1

EOCENE FORMATIONS OF MISSISSIPPI

	Eocene of Lowe		Eocene of Cooke
Jackson	Forrest Hill sand (Cooke places this in the Vicksburg.)		
	Yazoo Clay Member		Yazoo Clay Member
	Moody's Branch Marl		Moody's Branch Marl
Claiborne	Lisbon	Cocksfield	Yegus
		Wautubbee	
		Decatur	Lisbon Kosiusko sand
		Enterprise	Winona sand
	Tallahatta	Winona sand of W. Miss. Basic Claystohe of E. Miss.	Tallahatta
Wilcox	Grenada		Grenada
	Woods Bluff		absent
	Holly Springs sand		Holly Springs
	Ackerman		Ackerman
Midway	Tippah sandstone		Tippah ss
	Porter's Creek		Porter's Creek
	Clayton ls.		Clayton ls.

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The correlations of Lowe and Cooke, who have done the most work in the field, are shown together in Fig. I, so that their differences may be noticed. The correlation of the upper Cretaceous in Mississippi, as worked out by Stevenson and others, is shown in Fig. II. The data to be presented at this time will only concern the Selma and Ripley at the top of the Cretaceous as most of the wells have not penetrated deep enough into the Cretaceous to yield appreciable data about the lower formations. These correlations are here presented, not for the purpose of discussing their relative merits, but for the sake of clearness in the stratigraphic discussion that is to follow. This nomenclature is entirely the result of surface studies, and the writer wishes to point out the relation of the subsurface section to it.

Characteristics of the Subsurface Material

Selma-Ripley

These equivalent formations occupying the top of the Cretaceous will be the only Cretaceous formations considered. Stephenson[1] has shown that the Ripley, typically composed of green glauconitic limy sands and marls, is the lateral equivalent of the uppermost Selma chalk. The material of Ripley age encountered in the wells is usually a gray chalky or limy shale. Any sandy phase comparable to the outcrop material is rare, and when there is such a facies present, it is almost invariably limited to the top of the section.

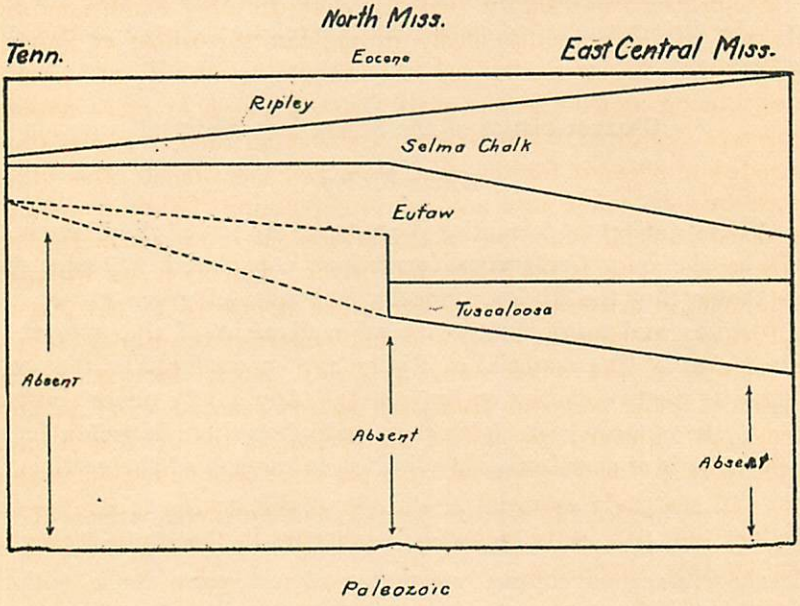
A very noticeable feature brought out by a comparison of the well logs is that the wells drilled at a distance from the present Eocene-Cretaceous contact encounter almost pure chalk without any clastic material at the top of the Cretaceous. In other words the non-chalky clastic phase of the uppermost Cretaceous is limited to a narrow zone roughly parallel to the present outcrop. The boundaries of this zone are not sharp, the material gradually losing the non-chalky content away from the contact. This zone of non-chalky material is wider to the north than to the south and east. North of the region of Attala County, the non-chalky material gradually makes up a larger and larger percentage of the total formation. In this area the gradation away from the contact is much more gradual,

[1]Stephenson, L. W., Cretaceous Deposits of the Eastern Gulf Region. U. S. G. S. Prof. Paper 81.

and the non-chalky material is found at a greater distance from it. As far north as the Tennessee line, the material is almost entirely clastic, and rarely is there pure chalk present. South of Attala County the clastic zone becomes narrow, and the amount of clastic material in the chalk decreases rapidly. Many wells in this area penetrate nothing but chalk from the top of the Cretaceous until the Eutaw is reached.

Fig. II

CRETACEOUS FORMATIONS OF MISSISSIPPI —[a]



a. Stephenson, L. W. U.S.G.S. p.p. 81—

The clastic material occurs in two ways. It may occur as an impurity in the chalk or as a lens of limy shale. There is usually a gradation from one to the other. The Hensley No. 1 well of the Cumberland Oil Co. in Webster County, illustrates very well the typical section at the top of the Cretaceous, close to the contact, in the northern part of the state. For 350 feet after the top of the Cretaceous was penetrated the drill went through a limy shale gradually becoming more and more limy and less shaly with greater depth. There was no sharp change from the shale to the chalk phase which was present in the middle portion of the section.

Toward the base of the Selma the material again became shaly, and had an occasional thin lens of limy sand in it. The clastic material became dominant as the Eutaw was approached. A very similar section was encountered in the Bardwell No. 2 well in Tallahatchie County. Here, however, after the main chalk facies was reached it was found to contain lenses of limy shale.

This shaly material is probably the westward extension of the sandy Ripley material outcropping in North Mississippi. The foraminiferal evidence bears this out, and also points to its equivalence with the Arkadelphia of Louisiana and Arkansas.

Stephenson[2] has shown that the chalk-forming conditions did not exist off shore continuously throughout the whole of Selma/Ripley time. Minor oscillations and changes occurred at several times, during which the non-chalky clastic phase or more impure chalk was deposited. The writer feels that no further explanation is needed to account for the characters just mentioned. One other factor must be taken into account in explaining the abundance of the shaly material at the top of the Cretaceous in the northern part of the state. This is the Mississippi River. This area lies where it would receive material carried down, and deposited by the Mississippi River. During the lower and middle part of the Ripley/Selma, the mouth of the river was probably much farther north, and hence little material from this source reached what is now Mississippi. Toward the end of the period, as the delta was built south, more and more material from the river was deposited in this area, and the shaly material at the top of the section is the result. The fact that this shaly material dissappears to the south seems to bear out this conclusion.

With few exceptions, the wells put down in the state have not gone through the uppermost Cretaceous into the Eutaw beneath. It is therefore, manifestly impossible to discuss the relations and features at the base of the Selma. Where the drill has gone entirely through the Ripley/Selma, a surprising thickness of the material is shown. For example, the Graham No. 1 well in Scott County penetrated 1200 feet of chalk at the top of the Cretaceous before encountering the Eutaw. In the northern part of the state the thick-

[2]Stephenson, L. W.; Cretaceous Deposits of the Eastern Gulf Region U. S. G. S. Prof. Paper 81.

ness of the Ripley/Selma member ranges from 1200 to 1400 feet. This is slightly more than has usually been considered as the thickness of these formations.

Midway.

The Midway, the basal Eocene formation, is composed chiefly of a blue gray to black soapy shale. This material has no grit and is not limy. The cuttings usually break into thin slabs. Very rarely are there any fossils present. In some wells unusual thicknesses of the material are encountered. For example, in the Trolio No. 1 well in Madison County at least 700 feet of the material was penetrated. This phase is comparable to the Porters Creek member of the Midway. At times this thick shale section is broken by interstratified lenses of limy sand. These lenses are usually thin, rarely exceeding 25 feet, and the wells in which they occur appear to be limited to the region close to the outcrop. Sandy lenses are much less common than in the underlying Ripley/Selma. This shale section also often contains very thin interlaminated layers of hard limy sandstone. The sandstone, usually only a foot or two in thickness, occurs at intervals of from 25 to 50 feet throughout the whole Midway.

At the base of the Midway there are occasionally present several thin layers of limestone which no doubt are the equivalent of the Clayton member. It is rarely possible to note the presence of this Clayton material from the logs and cuttings, and it is probable that it is not everywhere continuous at the base of the Midway. The material at the base of the Midway where it is not typical Clayton limestone is usually somewhat limy and sparingly fossiliferous. This material is either a limy shale or a marl and from the scant fossils appears to be the equivalent of the Clayton. This member is thin, rarely being as much as 25 feet thick.

This basal Midway material shows abundant evidence of reworking of the Cretaceous. Reworked fossils are commonly found in the lower part of the Midway. The character of the material is also dependent on the material at the top of the Cretaceous. Where the Cretaceous is sandy, the basal Midway is also sandy, and where the Cretaceous is not sandy, the basal Midway is not sandy. The reworked zone is thin, rarely exceeding 10 feet.

In northern Mississippi and in parts of Alabama a sandy member outcrops at the top of the Midway. This member is known as the Tippah sandstone in Mississippi and the Naheola of Alabama. Cooke[3] expresses the opinion that detailed mapping would show a continuous sand member to be present at the top of the Midway. The wells do not show the presence of a sandy member at the top of the Midway. In many wells the Midway-Wilcox boundary is tentative and there, of course, the proof is not conclusive. Where, however, the exact contact can be determined there is no sandy phase present. This sandy member therefore appears to be limited to a position close to the outcrop and the old shore line.

Variations in the character of the material can be noted as the formation is traced to the southwest. It loses entirely any sandy phase, and at a few places far from the outcrop takes on a pronounced limy character. In the Garber No. 1 and the Swearingen No. 1 wells, in Hinds County, the formation is limy throughout. This increase in lime content is only noted in wells drilled in the southern and western parts of the state. Wells at a considerable distance from the outcrop in northern Mississippi do not show any limy content.

The Free Run No. 2 well in Yazoo County encountered unusual material in the lower part of the Midway. The cuttings contain fragments of a black porous stony material, in which the pores are filled with a viscous asphalt. These fragments are small and have not been noted elsewhere. A thin section of the material revealed it to be considerably altered volcanic ash. Parts of the Porter's Creek have been considered to be bentonitic[4], and the finding of decomposing volcanic ash in the formation may strengthen this view. Veatch[5] also has pointed out that volcanic activity occurred in Louisiana at the end of the Cretaceous. This material in the base

[3]Cooke, Wythe; Correlation of the Eocene Formations of Mississippi and Alabama. U. S. G. S. Prof. Paper 140-E.

[4]Burchard, E. F.; Bauxite in Northeast Mississippi. U. S. G. S. Bul. 750-G.

[5]Veatch. A. C.; Geology and Underground Water Resources of Northern Louisiana and Southern Arkansas, U. S. G. S. Prof. Paper 46.

of the Midway indicates that the activity was either felt in Mississippi, or Mississippi was the site of volcanic activity itself, and that it continued at least into the early Midway.

The average thickness of the Midway is perhaps 600 feet with a maximum of 800 feet. This is larger than has previously been considered an average thickness. The thickness of the Midway is more constant than that of the younger formations. The cross sections shown in Figs. V and VI bring out this fact.

Throughout the Coastal Plain of the Gulf Region the Midway is usually limy and fossiliferous, and therefore considered to have been deposited under marine conditions. As a portion of the Midway in Kentucky is marine, marine conditions must have extended that far up the Mississippi Embayment. One would naturally expect, therefore, that the Midway of Mississippi would be largely marine. With the exception of the thin Clayton member occasionally present at the base of the formation, the material is non-limy and non-fossiliferous. The wells in Hinds County far removed from the outcrop penetrated a limy Midway section, and are therefore exceptions. All wells drilled closer to the outcrop than this show the Midway to be lacking in lime and fossils. Just why this material, which is usually a very fine dark gray shale without any lime, fossils, or glauconite, and reaches a thickness of from 600 to 800 feet, should occur in the midst of apparently marine conditions is a problem worthy of mention.

If the material was deposited in marine waters, and yet has no fossils or lime, the accumulation of material must have been very rapid, causing the waters to be muddy and unfavorable for the growth of organisms. The sea was no doubt shallow and gradually subsiding as the material was being deposited. The former is shown by the character of the material and the great distance that it occurs from the present outcrop and therefore from the old shore line. The latter will be shown later.

The problem then resolves itself into an explanation for this rapid accumulation. Several explanations suggest themselves. In the first place, the Mississippi River may have been carrying down and depositing at its mouth an increased amount of material at this time. The occurrence of the marine Midway in Kentucky practically eliminates this theory.

If the Porters Creek is considered bentonitic, another explanation is possible. If the material is an altered volcanic ash, the ash falls may have eliminated organic life by rendering conditions unfavorable or by accumulating very rapidly. The finding of ash in the Free Run Well and the character of the material especially at the outcrop seem to indicate the presence of bentonite. However, the examination of the Midway from many deep wells shows it is not a pure bentonite although the material at some places may be a bentonitic clay.

Another explanation, which is perhaps the simplest, is that the material was deposited as a delta at the mouth of a stream or streams, other than the Mississippi River, which flowed directly into the Gulf from the northeast. Uplift of the land mass to the northeast at the end of Cretaceous time quickened these streams and caused them to carry enormous loads of material to their mouths, where it was rapidly built out seaward into thick accumulations of fine material. The rapid deposition at the mouths of rivers such as these would adequately explain the thick beds of non-limy, fossiliferous shales found in the Midway of Mississippi. The character of the material, and the fact that far from the old shore line the Midway takes on a limy character, all can be added as evidence to this view point.

Wilcox

As already stated, the upper part of the Midway is usually not fossiliferous, and as the lower part of the Wilcox is also non-fossiliferous, the boundary must often be placed on lithologic grounds. The pronounced difference in the character of the material of the formations fortunately permits this to be done without much trouble. With respect to the Wilcox-Claiborne boundary the task is not so easy. Here again both formations are non-fossiliferous, and where the lithologic characteristics are similar only a tentative correlation can be made.

The typical Wilcox material is a gray to brown sandy shale interbedded with beds of rather pure quartz sand, and also with beds of pure shale. With few exceptions the material is not limy and contains no fossils except vegetal remains. It is characterized by the presence of lignite. Another feature common to several of the wells is the presence of thin beds of hard sandstone, (or pos-

sibly iron carbonate). As many as a dozen of these beds only a foot or two in thickness may occur at intervals of from 10 to 50 feet through the section.

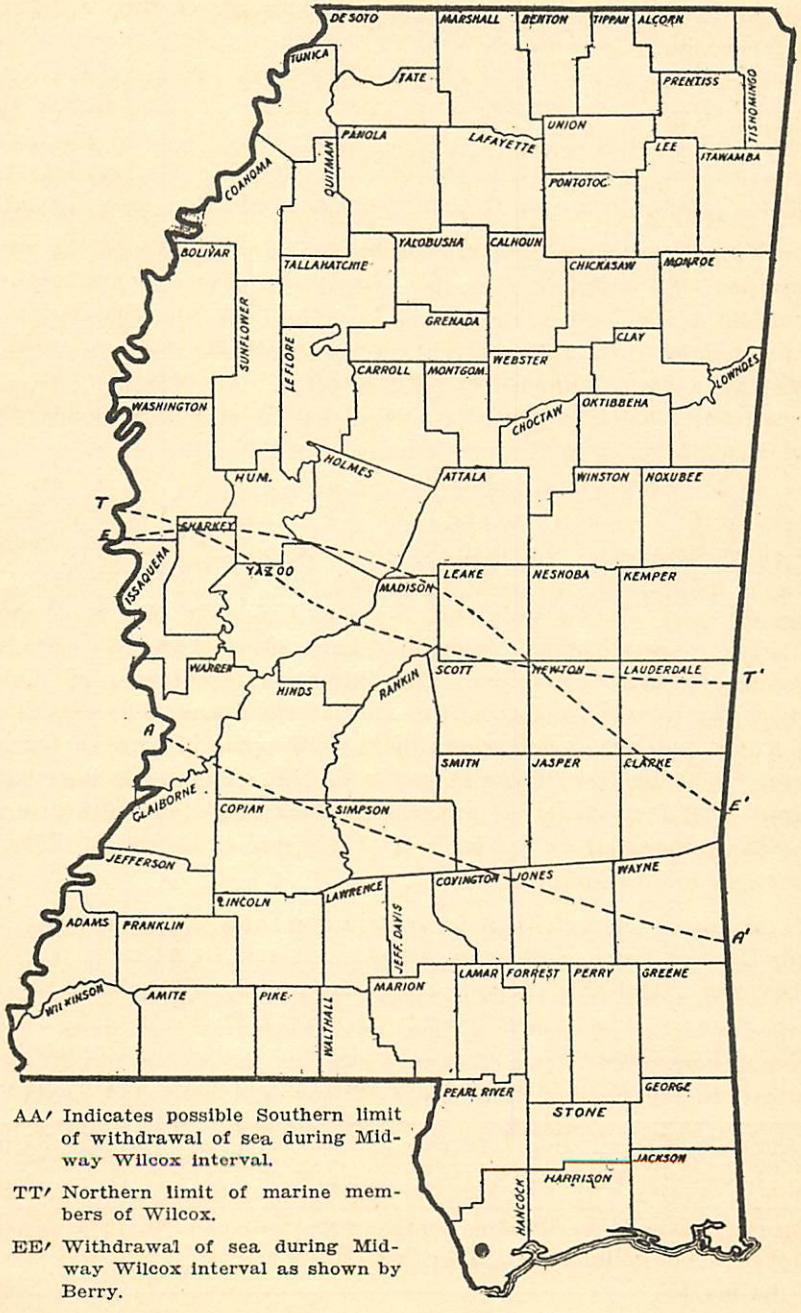
One character of the Wilcox, even more pronounced at the outcrop than in the cuttings, is the extreme irregularity of the material. At the outcrop it is cross-bedded throughout and appears as if it had been deposited in bucket loads by a giant steam shovel. This character, especially the cross-bedding, is very apt to confuse one with regard to structural conditions. In many cases cross- bedding has been confused with real dips, and a reversal of dip taken to indicate a structure has proved to be nothing but cross-bedding. No doubt some of the so-called structures in the state on which wells have been drilled were determined by this sort of evidence. Great care must be exercised in using any Wilcox dips in working out structures.

It has been found impossible to subdivide the Wilcox on the basis of the well cuttings and cores. The material varies so much in short distances, both vertically and horizontally, that no divisions can be made with any accuracy. One well may pass through 150 feet of sand while a well close by will not show any such sand member. An added difficulty in this connection are the cuttings themselves. The writer feels that cuttings from rotary drill holes where the formation is as soft as the Wilcox cannot be safely used in a detailed correlation where there is an entire absence of fossils. Cores yield accurate material, but few of the wells in the state have been cored extensively. Unfortunately, therefore, both because of the character of the material, and of the data available, the formation can not be subdivided.

An analysis of the logs presents a few facts of importance. In only one or two of the wells has any of the material been limy. This limy material invariably comes from about the middle of the formation. All wells showing marine Wilcox are South of TT' (Fig. III). The Graham No. 1 Well in Scott County and the Greaves No. 1 Well in Hinds County show the most pronounced marine phase.

The Wilcox contains much lignitic material. This lignitic material north and east of TT' (Fig. III) is found throughout the whole Wilcox section. In wells to the south and west of this line, the lignitic material is limited to the upper and lower part of the section. The middle Wilcox in this region has no lignite and is apt to be marine.

FIG. III



AA′ Indicates possible Southern limit of withdrawal of sea during Midway Wilcox interval.

TT′ Northern limit of marine members of Wilcox.

EE′ Withdrawal of sea during Midway Wilcox interval as shown by Berry.

The presence of lignitic material at the base of the Wilcox manifestly indicates non-marine conditions. From this it is evident that at the end of the Midway the sea retreated to a point at least to the south of Hinds and Scott counties. None of the wells farther south have penetrated the base of the Wilcox and so the limit of the withdrawal can not be determined. Berry[6] on floral evidence has indicated this withdrawal, but the sea apparently retreated farther to the south than Berry has indicated (See Fig. III).

Following this retreat the sea gradually advanced during Wilcox time, the maximum being reached about the middle of the period. As the limy phase is found no farther to the north than is indicated by TT' on Fig. III, it appears unlikely that the Wilcox sea ever advanced much beyond this point. Any further advance to the north and east must have been shallow and short lived. The presence of lignite to the north and east of TT' bears out this point.

The end of the Wilcox saw another withdrawal of the sea to a point south and west of Hinds County. The presence of lignite in the wells in this area indicates this. Lack of information makes it impossible to mark the exact southern limit of the retreat.

The Wilcox varies in thickness from 800 to 1800 feet with an average of about 1200 feet. The formation is thinnest in Hinds and Yazoo counties on top of the Jackson structure, to be explained later. It reaches its maximum thickness in wells just off the structure. In wells outside the influence of this structure it is usually about 1200 feet thick. It appears to thicken to the southwest as would be expected on the basis of the physical history of Wilcox time.

Berry[7] has shown that the floras of the Wilcox indicate strand and estuarine deposition. The writer agrees with that conclusion. The Wilcox material no doubt was deposited along the broad flat strand which contained local lagoons and estuaries, and over which streams meandered from the northeast, as the sea gradually advanced to the northeast in lower Wilcox and retreated again in

[6]Berry, E. W.: Erosion Intervals in the Eocene of Mississippi Embayment. U. S. G. S. Prof. Paper 95-F.

[7]Berry, E. W.; Lower Eocene Floras of Southeastern North America. U. S. G. S. Prof. Paper 91.

upper Wilcox time. The extremely varying lithological conditions, plus the presence of lignite, agree with the floral evidence for this type of deposition. The absence of lime and of any appreciable fauna indicate that in Mississippi most of the material was deposited in the non-marine portion of the strand.

Claiborne

The cuttings and cores of Claiborne material show the formation to be made up chiefly of sands, sandy shales, and shales that are perhaps more usually limy than not. Sandy material makes up a greater proportion of the formation than does the shale. The sand is usually limy, and contains a little glauconite. Fossils in the cuttings are rather scarce. They are not present in sufficient abundance to permit a subdivision to be based on them. Several of the wells, notably the Swearingen No. 1, Trolio No. 1, and Mildred No. 1, show the presence of lignite at the top of the formation. The lignitic member is usually thin, rarely reaching 100 feet.

A generalized Claiborne section based on an analysis of many plotted logs would be as follows: In wells drilled close to the contact there is usually found at the base of the formation a zone of non-limy sandy shale reaching a thickness of several hundred feet. Farther from the contact this zone becomes slightly limy, and cannot be accurately differentiated from the overlying material because of similar lithological character and scanty fossils. The few fossils present, and the character of the material, seem to indicate equivalence of this zone with the Tallahatta. It is stratigraphically in the proper place, and indicates the change of the Tallahatta to a more marine character to the southwest.

Overlying this lower zone there is a thick zone of varying limy material. It is usually sandy, but varies all the way from a rather coarse sandy shale to a fine sandy marl. This member is more fossiliferous than the lower part, but the fossils are still not abundant. This zone is the Lisbon, but its characters are so variable that it is not yet possible to subdivide it accurately. Toward the top of this member there is often encountered, especially in the wells in Hinds and Madison counties, a sandy bed several hundred feet in thickness that is in the stratigraphic position of the Kosciusko sand of Cooke, and may be equivalent to it. Positive evidence is lacking. This bed varies in thickness from 200 to 300

feet. It reaches a maximum thickness on top of the Jackson structure, and reaches a minimum in the Mildred No. 1 well in Warren County. The Claiborne in the Mildred No. 1 well, in addition to its thickness, is unique because of the relatively large amount of non-limy material that it contains. This well is farther removed from the contact than any other well mentioned. This unexpected material is apparently the result of local conditions of deposition or structure. The exact nature of the conditions can not be worked out until more data is available.

This zone just mentioned appears to continue all the way to the top of the formation in many of the wells. In a few, as already noted, there is present a lignitic zone at the top. This lignitic zone is probably the equivalent of the Yegua. The presence of this lignite indicates a withdrawal of the Claiborne sea at the end of Claiborne time. Berry[8] has pointed out the floral evidence for this erosion interval, and the well material bears out his conclusion. The presence of lignite in Warren and Hinds counties shows that the retreat was at least this far to the southwest.

Evidence has already been brought forward to indicate an erosion interval between Wilcox and Claiborne time. It appears, therefore, from our discussion that Claiborne time saw another gradual advance of the sea during which the Tallahatta was deposited. The advance appears to have reached its maximum extent towards the end of Lisbon time after which it retreated probably more rapidly, and was followed by the erosion just mentioned. It is possible, that during this larger Claiborne cycle of marine invasion, there were minor advances and retreats. Berry[9] again on floral evidence reaches this conclusion. The well material yields no positive evidence for these minor oscillations, and it is probable that any variations of this kind were limited in extent and were not felt at any distance from the shoreline.

[8]Berry, E. W.; Erosion Intervals in the Eocene of the Mississippi Embayment. U. S. G. S. Prof. Paper 95-F.

[9]Berry, E. W.; Middle and Upper Eocene Flora of Southeastern North America. U. S. G. S. Prof. Paper 92.

Jackson

The Jackson formation, occupying a position at the top of the Eocene, is composed of marls and limy shales. The material is very fossiliferous, and contains a high percentage of lime throughout. It is typically a green to brownish color.

The lower part of the formation is slightly more sandy than the upper half. This lower part is the equivalent of the Moody's Branch marl, and the upper part the equivalent of the Yazoo Clay. The foraminifera offer abundant evidence for this subdivision in the material examined. The formation ranges in thickness from 500 to 700 feet. The average thickness is perhaps in the neighborhood of 600 feet.

Unfortunately, all the wells studied are located close to the outcrop, and hence no data are available for the presentation of the characteristics of the formation elsewhere. Many wells have been drilled farther south in the state, but it has been impossible to obtain any very accurate information from them.

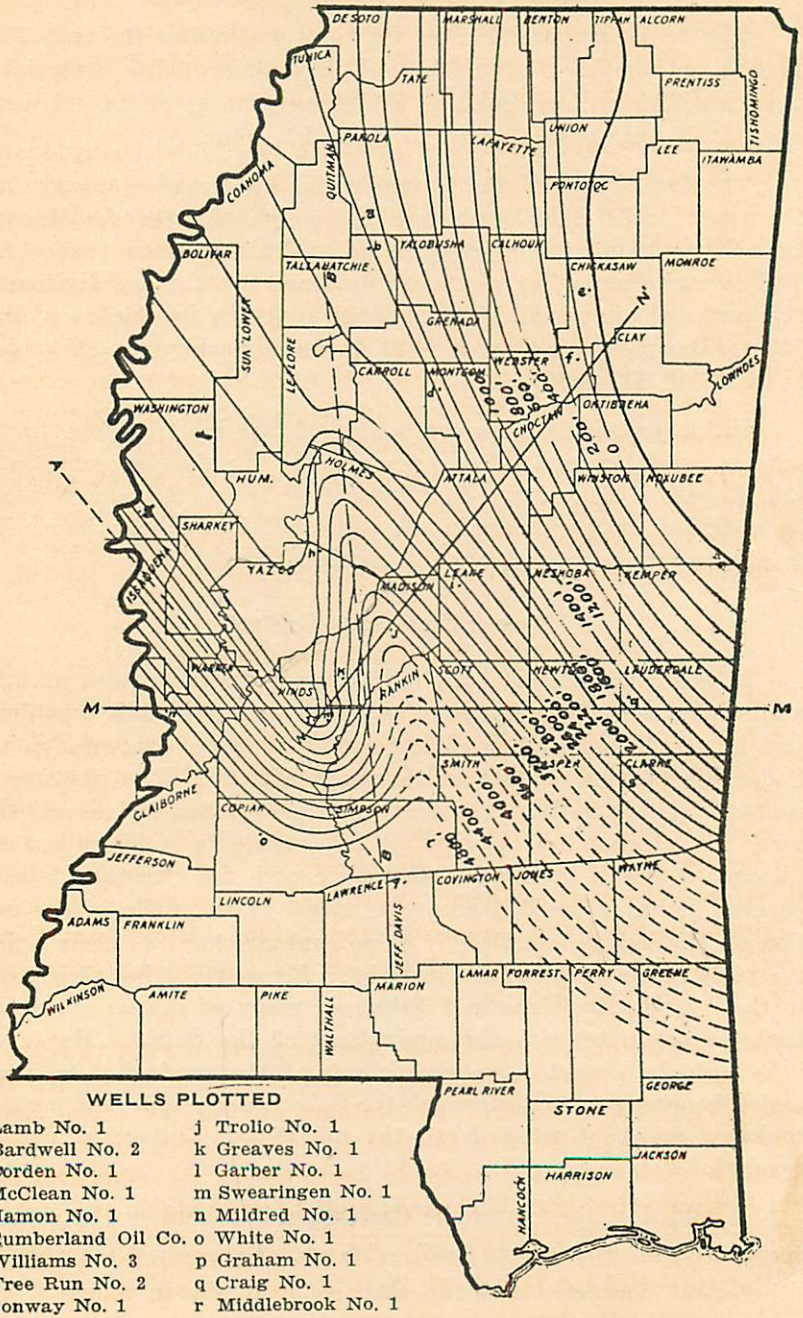
Eocene-Cretaceous Contact

In the course of this study it has been found important to make a special study of the Eocene-Cretaceous contact. This was done, and it was then found possible to plot structure contours on the Eocene-Cretaceous contact as shown in Fig. IV. The plotting of contours at this horizon was deemed of importance for several reasons. In addition to its scientific importance in working out the history of the Mississippi Embayment and the Coastal Plain in general, it has a decided economic value. Deep wells in the portion of Mississippi included by these contours have as their object the penetration of the Selma material. Across the Mississippi River to the west in Louisiana and Arkansas, many of the oil producing horizons occur beneath the equivalents of the Selma. Hence, as it is wished to reach these equivalents of the producing horizons, and it is necessary to go through the Selma to do so, it is important to know at about what depth the top of the Cretaceous can be reached.

In addition, the top of the Cretaceous is a horizon that can be accurately determined on fossil evidence. Because of the varying lithological character and the absence of fossils in much of the

FIG. IV

Structure Contours on top of the Cretaceous



WELLS PLOTTED

a Lamb No. 1	j Trolio No. 1
b Bardwell No. 2	k Greaves No. 1
c Borden No. 1	l Garber No. 1
d McClean No. 1	m Swearingen No. 1
e Hamon No. 1	n Mildred No. 1
f Cumberland Oil Co.	o White No. 1
g Williams No. 3	p Graham No. 1
h Free Run No. 2	q Craig No. 1
i Conway No. 1	r Middlebrook No. 1

material in the Eocene, no other datum plane would prove satisfactory. This surface will also show, in a general way, the subsurface structure of a portion of the Coastal Plain in Mississippi. This is an added reason for its presentation.

The map is published as a tentative one to be changed and added to as more information comes to light. The scantiness of the data makes it impossible to show any but the larger and broader trends of structure. Some of these larger features appear to be of sufficient importance to be worthy of mention. In a few cases where the drill did not go deep enough to penetrate the top of the Cretaceous, the total depth has been estimated on the basis of neighboring wells. In every case these wells are of lesser importance, and do not in any way influence the larger trends of structure.

Contours on the map are lacking from the southern third of the state. The top of the Cretaceous normally lies at too great a depth in this region to have been penetrated by the numerous wells that have been drilled. For this reason information is lacking, and no contours could be plotted at depths greater than the 4800 feet line.

Character of Material at the Contact

In a general way the formations above and below this contact have been discussed. It is proposed now to note the material at the contact itself. No indication of any conglomeratic material was found. There is however a pronounced oxidized zone in which the material is a rusty red color. The glauconite present has been broken and is extremely disintegrated. This zone is thin, but its presence is of sufficient importance to indicate an interval of erosion between the Cretaceous and Eocene. Stephenson[10] on faunal evidence gained from studies of the outcrop material has shown the break to be a big one.

It is impossible to say exactly how far south the sea retreated at the end of Cretaceous time, but it did retreat at least farther south than the area covered by contours on Fig. IV. The consideration of the presence of this break, which at the outcrop is a marked unconformity and probably continues to the southwest as such, has too often been neglected in oil prospecting in the state.

[10]Stephenson, L. W.; The Cretaceous-Eocene Contact in the Atlantic and Gulf Coastal Plain. U. S. G. S. Prof. Paper 90.

As the most probable producing horizon lies beneath the Selma chalk, the fact is evident that structural conditions are necessary in the Cretaceous to produce oil. Partly because of this unconformity it is misleading and often impossible to determine any structure in the Cretaceous from an examination of the soft outcrop Eocene material, unless such structures are post-Cretaceous in age. Any structures formed during or at the end of Cretaceous time were subject to the long period of erosion before the beginning of the Midway deposition. In soft limy material such as existed at the top of the Cretaceous, erosion was no doubt rapid and any structural irregularities would soon be worn down. At the same time other irregularities would undoubtedly be formed by the erosion, which would have little relation to the structure. It appears very likely, therefore, that by the beginning of Midway time the surface on which the Midway was deposited had been greatly changed from its original character at the end of the Cretaceous. With the burial of the fine Midway and later Eocene sediments, it appears very unlikely that there should be any reflection of the original pre-erosional Cretaceous structures in the Eocene beds. Any reflected structures would more likely be erosional ones which would mislead the wildcatter into the belief that he had a bona fide structure in the Cretaceous material. It is the writer's opinion that several wells put down on supposed structures in Mississippi, which have failed to produce oil, have been drilled on reflected erosional Cretaceous irregularities.

Structure of the Cretaceous-Eocene Surface

As previously stated it has been found possible and desirable to draw structure contours on the Cretaceous-Eocene surface. Naturally on a map constructed on so small a scale, it is impossible to determine anything but the larger trends of structure. The map with the contours is shown in Fig. IV. A few of the characteristics of the top of the Cretaceous seem to be sufficiently large and important to stand out in Fig. IV. These seem to be well worthy of mention.

One noticeable feature occurs in the eastern half of the state. Here the dip between the 200 ft. and 1600 ft. contours is almost uniform with an average dip of perhaps 35 feet to the mile. This dip is fairly constant for the area between these contours all the way north to the Tennessee line, and is rather steeper than has previously

been considered to be the case. There is, however, a slight decrease to the north, when an average dip close to the Tennessee line would be approximately 30 feet to the mile. Beyond the 1600 ft. contour in the south, perhaps because of the increased distance from the shore line, the dip becomes slightly greater reaching 50 to 60 feet to the mile.

The most striking feature is the pronounced terrace-like structure in the north and west quarter of the state, ending abruptly to the southeast in a nose-like protuberance in the region of Hinds and Rankin counties. On the terrace proper the dip of the Cretaceous surface flattens very noticeably between the 1600 ft. and 2600 ft. contours. The average dip before the flattened area is reached is about 30 feet per mile. In the region between the 1600 ft. and 2600 ft. contours, which includes the flattened part, the dip is no more than 10 to 15 feet per mile. On the inner edge of the terrace in Quitman, Tallahatchie, and Carroll counties, the change from the steep to the gentle dip appears to be rather abrupt. At the outside edge of the terrace in the vicinity of Washington and Issaquena counties the change back from the gentle to the steep dip is very abrupt. In passing beyond the 2600 ft. contour the dip obtained is at least 70 feet to the mile. Just how far to the southwest this dip continues, it is impossible to say because of the lack of information.

The abrupt ending of the terrace in Hinds and Rankin is perhaps the most striking feature of the map. In this region the dip becomes very steep at greater depths than 2600 feet, and instead of the usual dip to the southwest, dips away to the east. This abnormal dip continues as far north as Holmes County, where again after a sharp turn the normal direction of the dip is resumed. The result is the nose-like protuberance pointing almost due south in Hinds, Rankin, Yazoo, and Madison counties. It is composed of a narrow gently sloping top which widens to the north, and with steeply dipping sides to the east, west, and south. There is some slight suggestion in the log of the Greaves No. 1 well that the lower part of the nose may be cut off from the main terrace, and separated from it by a saddle. Aside from this log there appears to be no positive evidence that any of the contours are closed to the north as would be necessary if a dome and saddle were present. The writer is of the opinion that the evidence of closure to the

Fig V

CROSS-SECTION ALONG MM' of FIG. IV

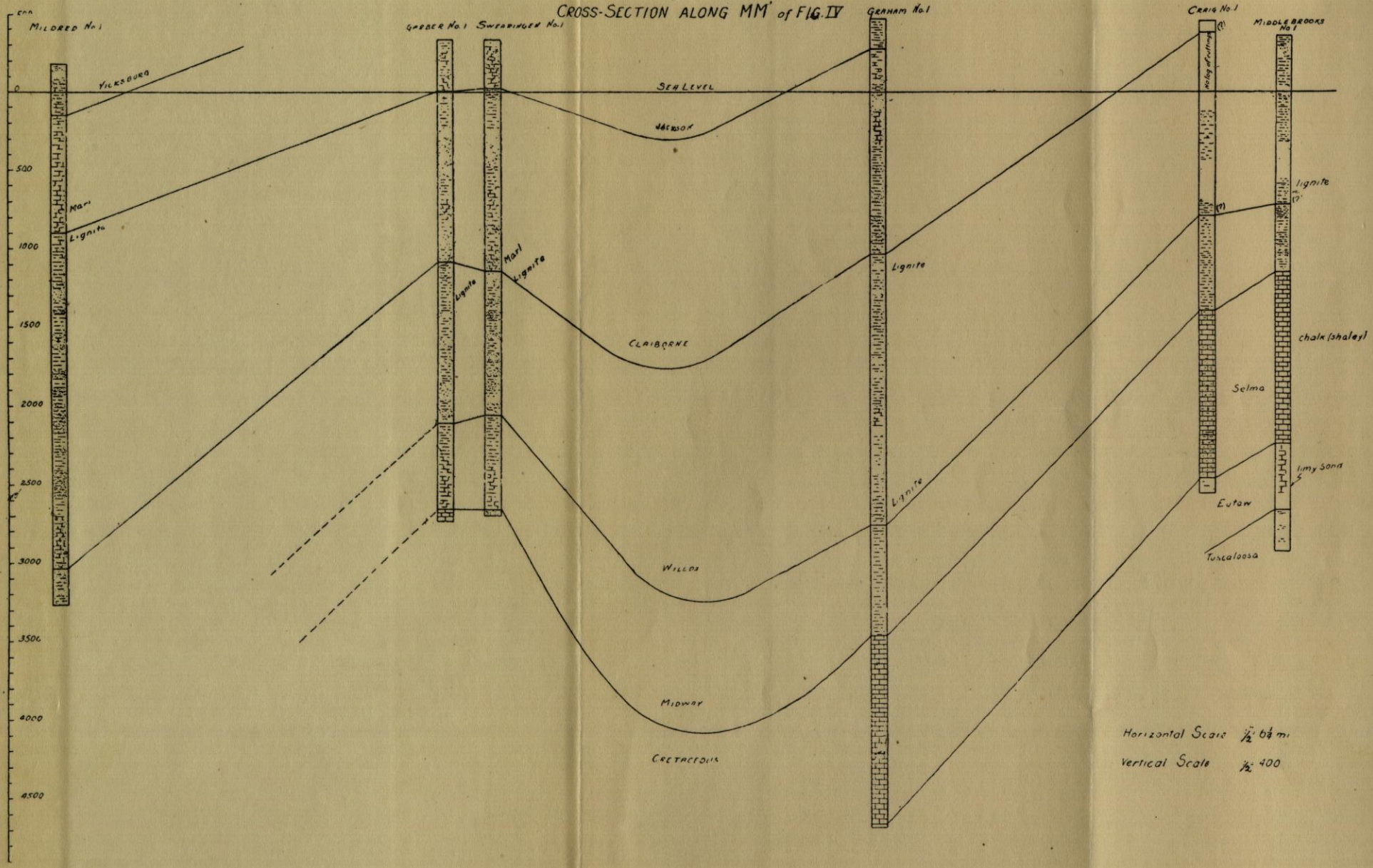
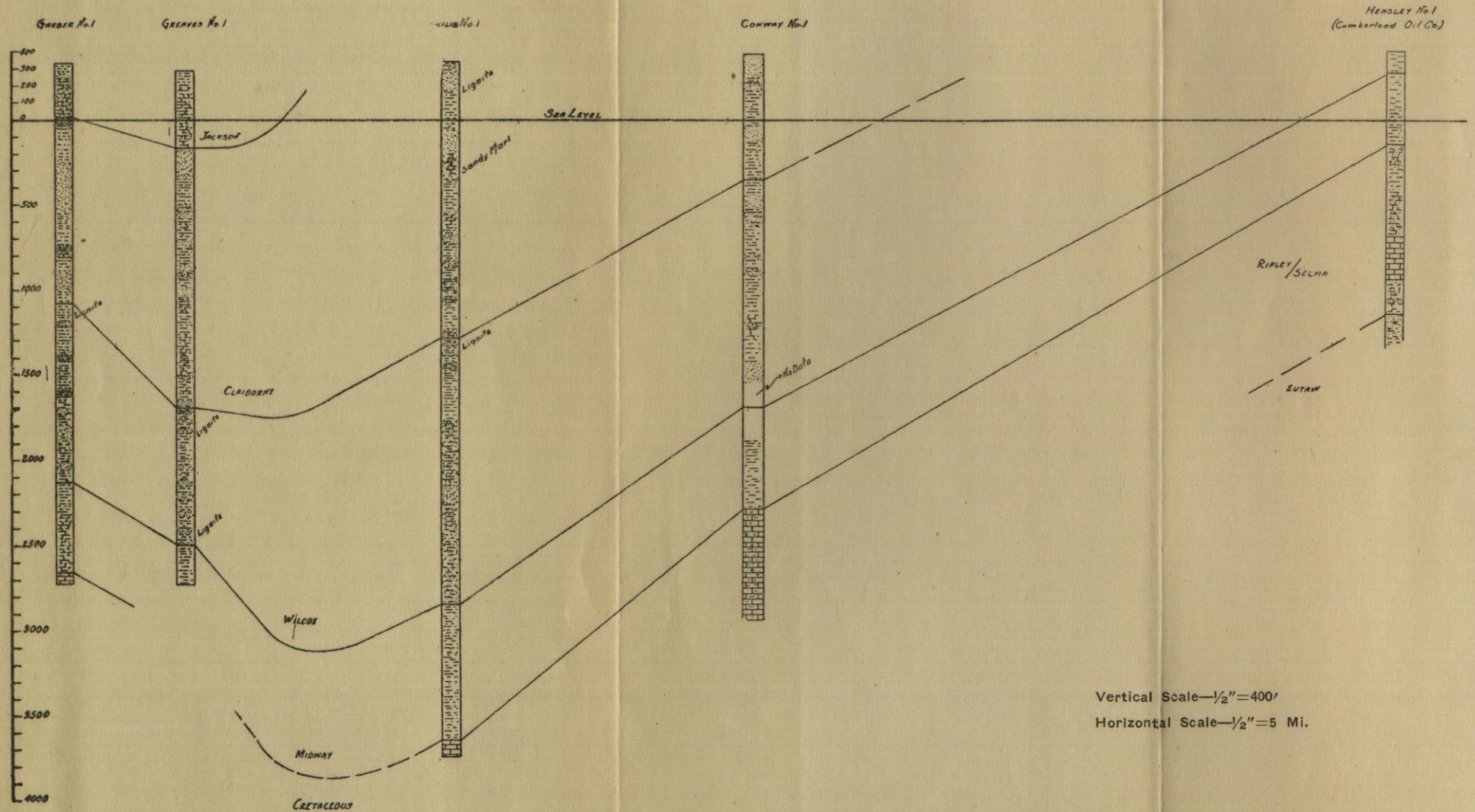


Fig. 27

CROSS SECTION ALONG NN' (Fig. XII)



Vertical Scale—½"=400'

Horizontal Scale—½"=5 Mi.

north so far obtained is insufficient, and hence no dome and saddle are shown on the map. Future drilling, necessary to determine this point, may, however, prove the presence of such a structure.

This large structural feature is comparable in many ways with the Sabine Uplift[11] of western Louisiana. It is comparable in size and its trend is roughly parallel to the Sabine Uplift, which according to Powers is also a terrace. They both trend in a northwest-southeast direction. In age and with regard to sections across them they are also similar. The likeness, which is too pronounced to be fortuitous, suggests a similarity of origin and history. Further data is needed before this point can be considered in detail.

Cross-Sections

Figures V and VI, two cross-sections drawn from plotted well logs, show the character of the material across the Jackson structure. The change in the lithological character of the material in these wells has already been discussed, and will not be repeated at this time. The change and variation, especially in the thickness of the material, has an important bearing on the history and origin of the structural feature, and merits discussion at this time. In the construction of these cross-sections the information was so scant that only the larger features can be shown.

Fig. V shows a section drawn almost due east and west across the state along the line MM′ of Fig. IV. This section cuts across the top of the Jackson structure, and shows the changes in the dip and thickness of the material on and off the structure. As shown in Fig. IV, this section in the east half of the state cuts diagonally across the strike of the formations. Because of this fact, i.e. the cross-section not being at right angles to the strike—the dip as represented on the map is less than the true dip. In the western part of the section conditions are the same, and therefore in the area west of the Garber No. 1 well the dip as shown in the map is less than the true dip.

From the Swearingen No. 1 well in Hinds County to the eastern line of Rankin County, the formations dip to the east. In this area the cross-sections cut across the strike at about right angles, and therefore show the true dip of the formations. These conditions must be taken into account in interpreting the sections.

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[11]Powers, Sidney; The Sabine Uplift of Louisiana. A. A. P. G. Vol. 4, No. 2, 1920.

As only the wells in the eastern part of the state have gone through the Selma chalk, there is little information concerning it. The increasing thickness of the chalk and the decrease in amount of clastic material away from the shore line is brought out in this eastern region. Wells in the western part of the state have been abandoned either before reaching the top of the Cretaceous, or in the very top of the Cretaceous, so that the change westward is not known.

The Midway formation shows a more constant thickness and uniform character than do the other formations. From east to west there is a small but noticeable thickening down the dip. Starting from 450 feet, a maximum of 700 feet is reached in the Graham No. 1 well. On the top of the Jackson structure, the thickness is slightly reduced, and a thickness of 600 feet is obtained. Beyond this point westward no wells have reached the Midway.

The thickness of the Wilcox material shows the greatest variation. The wells in Lauderdale County show the formation to have a thickness of 1200 feet. It increases rapidly down the dip until the Graham No. 1 well is reached where 1800 feet of Wilcox has been penetrated. On top of the Jackson structure a decided reversal of conditions is met with. The thickness here is reduced to less than 1000 feet, or almost half that of the Graham No. 1 well. Beyond this it can not be traced.

The Claiborne also varies greatly in thickness. Encountering 1300 feet of material in the Graham No. 1 well there is a slight reduction to the west on top of the Jackson structure, where it has an average thickness of about 1100 feet. From this point down the dip a very noticeable thickening is found. The logs of the wells in Warren County show a possible thickness of 2000 feet. This thickness is not absolute, as the Wilcox-Claiborne contact can not be accurately placed in the Mildred No. 1 well.

Two main points are then brought out by Fig. V. In the first place there is a pronounced thickening down the dip causing the formations to have a greater thickness than previously considered. In the second place, there is a pronounced thinning on top of the Jackson structure, although all the formations appear to be represented. This thinning is most pronounced in the Wilcox.

Fig. VI shows a cross-section running northeast and southwest from close to the outcrop of the Cretaceous to the top of the Jackson structure. Until the Jackson structure is reached in Madison County, as indicated by the Trolio No. 1 well, the section crosses the strike of the formations at right angles, and therefore correctly represents the dip. This is not the case on the Jackson structure where, because the strike is intersected at an angle, the dip as shown is less than the actual dip.

In no case, except in Webster County, has the Cretaceous been penetrated as far as the Eutaw. Unfortunately, most of the wells encountered the top of the Cretaceous at too deep a level to attempt to drill through it into the possibly producing Eutaw below. For this reason, it is impossible to consider any features in the Cretaceous.

The Midway again is fairly constant in lithology and thickness. There is, however, a noticeable increase in the thickness of the Midway down the dip as is shown by the maximum of 800 feet in the Trolio No. 1 well as compared with the 500 feet in the Hensley No. 1 well. The wells on the Jackson structure show that the formation has thinned to an average of perhaps a little over 500 feet.

The Wilcox again shows a maximum amount of variability. The Trolio well with the unusual thickness of 1800 feet shows an increase of 300 feet over the Conway well, which is farther up the dip. The most striking feature is the amount of thinning on top of the Jackson structure. The two wells on top of the structure show a thickness of not more than 1000 feet, or slightly more than half that of the Trolio well.

Wells to the northeast of the Trolio well began too low in the Claiborne to yield any information concerning its variability. The Trolio drilled about 10 miles northeast of the Jackson-Claiborne contact probably passed through all but several hundred feet of the Claiborne. As 1800 feet of actual Claiborne was encountered, the total thickness must be great, perhaps in the neighborhood of 2000 feet. On top of the Jackson structure again a pronounced thinning is shown. In the Greaves No. 1 well, drilled slightly off the top of the terrace on the eastern slope of the nose, a thickness of 1500 feet is shown. The Garber No. 1 well drilled on top of the structure shows a thickness of 1100 feet or about one half that shown in the Trolio well.

The general features of this section bring out the same facts as shown in Fig. V. A pronounced thickening of the formations is shown down the dip before the Jackson structure is reached. On top of the structure there is a pronounced thinning, although no formations are absent. The variation appears to have reached a maximum in Wilcox time and continued into Claiborne time without much change.

The knowledge of the presence of a structural feature in the vicinity of Jackson is not new. Hilgard[12], in his early report, recognized from outcrop evidence the presence of a high near Jackson. More recently Hopkins[13] has found it possible to plot the structure. Hopkins used the hard Glendon limestone of Vicksburg age in plotting the structure from outcrop elevations. The fact that the Oligocene limestone, a member of the youngest formation present at this point, shows this structure, is important in considering the history and origin of the Jackson structure. Mention is made of it here for that reason. Hopkins in his report mentions structural features to the west of Jackson in the vicinity of Vicksburg. The few wells that have been drilled in this area do not yield sufficient information to warrant the consideration of these features. Also because of the great depth of possible Cretaceous producing horizons, this area has not been considered very favorable for wildcatting.

Origin of the Jackson Structure

In considering the ways by which this feature could have been formed, several suggest themselves. The amount of information at hand is not sufficient to definitely prove or disprove any of the theories, but it appears that the evidence is sufficient to make one of the ideas seem vastly more probable than the others. It is hoped that further drillings in the state will be able to add more light to this problem.

[12]E. W. Hilgard, Geology & Agri. of Miss., Miss. Geol. Survey 1860

[13]Hopkins, O. B.; Structure of the Vicksburg-Jackson Area in Mississippi. U. S. G. S. Bul. 641-D.

Buried Hill Theory

This theory simply implies that the high area in the vicinity of Jackson is the reflection of an original high on the old sea floor which has been buried under the Cretaceous and Tertiary sediments. Certainly there were irregularities on the old sea floor, and it is not impossible that one or more of them may have been large enough to still have been reflected at least as late as Oligocene time. While this means of origin is entirely possible, there does not appear to be any direct line of evidence pointing to this conclusion. On the other hand there is much evidence against this theory, and pointing to another method of origin.

Some of the lines of evidence which make this idea very improbable are as follows:

1. No indication, whatsoever, of any large underlying buried mass has ever been found. As no wells on top of the Jackson structure have drilled through the Cretaceous, this point is not yet conclusive.

2. As has already been pointed out the Glendon limestone of Vicksburg age conforms to this structure. There was, therefore, deposited in this region from Cretaceous to Oligocene time a thickness of at least 6000 feet of sedimentary material. Much of this material, being deposited at some distance from the shore line was very fine grained, and therefore deposited in a position very nearly horizontal. It would seem on the basis of this data that there must have been a large irregularity to have been reflected through such a thickness of fine material. Further, an irregularity of sufficient size would almost certainly have stood as an island at some periods in the history of the structure. The cross-sections show that there is no break in the depositional record, at least in sediments younger than the Cretaceous, such as would be expected if the area stood as an island at some periods in its history.

3. If a large high area were the only explanation for this structure, it would apparently necessarily follow that the oldest sediments should show the maximum reflection of the buried mass. Successively younger sediments burying the original irregularity deeper and deeper would more and more approach a constant thickness and a constant dip in the area of the structure. As is shown

by the cross-sections this is not the case. The Midway, for example, is more uniform in thickness than the younger formations on top of it, the Wilcox and the Claiborne.

From the foregoing and from data to be mentioned later, it appears very unlikely that the Jackson structure is the result of an original irregularity on the old sea floor now heavily buried.

Crustal Movement Theory

It seems to the writer to be more probable, that this structural feature has been largely the result of differential crustal movements in the area. That much of the crust of the earth now occupied by the Coastal Plain was a relatively unstable area during this period in the earth's history seems beyond reasonable doubt. The oscillations of the strand line give abundant proof of this instability. In addition to these major oscillations, Veatch[14] has shown that an east and west tilting took place during Cretaceous time. In addition, the same author has shown in the same publication that at the end of the Cretaceous, the Coastal Plain sediments of the Gulf region west of the Mississippi River were subjected to crustal movements causing the formation of domelike uplifts. The presence of igneous rocks, and other evidence of igneous activity at the end of the Cretaceous, and during the lower Eocene, point to further crustal activity. Williams[15] has shown the presence of Eleolite-Syenite dikes, and Peridotite dikes surrounded by Tertiary sediments, and at places cutting across Cretaceous material. Hill[16] has shown similar phenomena from Texas.

In Mississippi the presence of bentonite[17] in the Eutaw, and also the occurrence of bentonitic material in the Lower Eocene, chiefly the Porters Creek of the Midway, is an indication of the presence of a not too distant source of volcanic material. The particles of volcanic ash in the Free Run well add further evidence.

[14]Veatch, A. C.: Geology and Underground Water Resources of Northern Louisiana and Arkansas. U. S. G. S. Prof. Paper 46.

[15]Williams, J. F.: The Igneous Rocks of Arkansas. Ann. Rep. Geol. of Ark. for 1890, 1891 vol. 2.

[16]Hill, R. T. Eighteenth Ann. Rep. of the U. S. G. S. pt. 2 1898

[17]Bentonite; A recent discovery. Paper in preparation.

On the basis of the foregoing evidence there appears to be no doubt that the region now occupied by the Coastal Plain material in Mississippi and farther west was unstable, and was subjected to crustal movements during the upper part of the Cretaceous which continued on into the lower part of the Tertiary.

According to this conception, the area in the vicinity of Jackson has been the scene of crustal activity whereby it has been elevated with respect to the surrounding country. Whether this movement has been one largely of uplifting the Jackson area above the surrounding country, or whether the Jackson area has remained stationary while the surrounding country sank, it is impossible to say. Powers[18] favors this latter idea for the origin of the Sabine Uplift, which we have seen so closely resembles the Jackson structure. While the writer is inclined to the latter view no positive evidence can be brought forward to prove this point.

It is possible that the Jackson structure, consisting of a terrace terminating in a nose-like extension to the south, may be partly depositional in character. In other words, the area relatively uplifted may have been limitied to the southern part of the structure in the vicinity of Hinds County. Behind this upraised portion sediments could have been deposited to an unusual thickness, decreasing the normal dip and building the broad terrace. The other alternative is that the uplift was carried as far to the north as the structure goes, and has been responsible for the terrace as well as the nose-like protuberance. Undoubtedly a varying rate of deposition has affected the shape of the structure, but it is very likely a small and relatively unimportant factor. No wells have been drilled in the area occupied by the flat top of the terrace to yield any data concerning the thickness and characteristics of the formations. In the absence of such information it is impossible to determine how much of a part deposition has played in shaping the structure.

The shape of the structure and other factors suggest that perhaps crustal movement has found expression in faults along which the relative displacement took place. If the block between AA′ and BB′ (Fig. IV) was elevated, or remained stationary while the surrounding country was depressed, and the amount of differential

[18]Powers. Sidney; The Sabine Uplift. A. A. P. G. Vol 4 No. 2, 1920

movement was greater to the south than to the north, such a structure would be the natural result. The movement along BB′ would have reached a maximum to the south gradually decreasing to the north. The maximum displacement of 1400 feet would have been reached in Hinds County. The fault would therefore be of the hinge variety. Along the fault line AA′ the amount of movement very probably remained more constant to the northwest as no evidence of hinging appears. If this is the true conception the movement has been pivotal with the pivot, or point of no movement, to the northwest along BB′.

It appears to the writer that this conception of faulting is, perhaps, the simplest way of explaining the crustal action. Several indications of faulting have been brought to light in the area, but whether they are of sufficient size and importance to be significant with regard to the structure is not known.

H. D. Easton[19] states that there is evidence of faulting in Tallahatchie County. This is in a position about in line with the northern extension of BB′. In addition, Hopkins[20] mentions the presence of several small faults in the vicinity of Jackson.

History of the Jackson Area on the Basis of the Crustal Theory

In considering the history of the area, it makes little difference whether the movement has been principally uplift of the area, or whether the Jackson area has remained stationary and the surrounding country has been depressed. It is sufficient for our purpose to consider the movement to be differential.

As to the exact time when this movement started and this structure began to appear, we have no information. This can not be determined until deep drilling into the Cretaceous is carried out on top of the structure, preferably in the vicinity of the town of Jackson. The cross-sections shown in Fig. V and VI, of the Midway show that this formation is thinned on top of the structure. The movement, therefore, began at least as early as the Midway. As wells on top of the structure have not penetrated through the Selma,

[19]Easton, H. D.: Personal Communication.

[20]Hopkins, O. B.: Structure of the Jackson-Vicksburg Area, Mississippi. U. S. G. S. Bul. 641-D.

it is impossible to determine whether there was any activity in the region during Cretaceous time or not. The evidence already presented to show volcanic activity and crustal instability in the Mississippi Embayment during Cretaceous time would suggest that the movement began during the Cretaceous. At least it is as early as the lowermost Midway.

During the Wilcox and the Claiborne the movement continued and perhaps the maximum was reached at this time. Deposits of this age show the maximum amount of variation in the thickness of the formations on and off the structure, and therefore the maximum amount of movement at this time. The Wilcox formation in the Trolio No. 1 well is almost twice the thickness of that on top of the structure. The Claiborne variation is not quite as great. This suggests that the Wilcox was the period of maximum activity, with only a slight decrease during the Claiborne.

Well logs furnish us with no information concerning the later history. As already mentioned, Hopkins[21] has shown that the structure is reflected in the Glendon limestone of Vicksburg age. This shows that the activity was carried on into the Oligocene. The Vicksburg beds are the youngest beds occurring in the region, and so it is impossible to determine whether or not the activity in the vicinity of Jackson continued after that. The oscillation of the strand continued all through the Tertiary, and it is possible that movement in this area also continued after Vicksburg time.

The cross-sections (Fig. V and Fig. VI) show that no formation is missing from the top of the Jackson structure. There is no evidence of any erosion interval in any of the formations as found in the wells. For this reason, it appears, that the structure did not stand as an island in any of the Eocene seas that covered this area. The relative difference in elevation was produced intermittently and gradually throughout the Eocene and Lower Oligocene, so that at no time was the area high enough to stand up above the sealevel.

[21]Hopkins, O. B.; Structure of the Jackson-Vicksburg Area, Mississippi. U. S. G. S. Bul. 641-D.

Well Logs

The State Geological Survey makes an earnest effort to keep in touch with all deep drilling projects in the state. It is the desire of the Survey to keep a complete file of the logs of all wells drilled. As there is no law in Mississippi compelling the parties concerned to file copies of well logs, the Survey must depend on the kindness and courtesy of the operators in obtaining them. In this way the logs of many of the wells drilled in the state have been obtained. It is to be regretted that in a few cases, the Survey has found it impossible to obtain information concerning wells, and thus much valuable information has been lost.

In the Ninth Biennial Report of the Mississippi Geological Survey published in 1923, there was included a list of all available logs of wells drilled up to that time. The logs published at the present time are supplementary to that list, and thus make available all the logs in the files of the Survey of wells drilled up to the present time. Unless otherwise stated, the correlations of the logs are by the author.

LOGS OF SOME WELLS RECENTLY DRILLED IN MISSISSIPPI

CALHOUN COUNTY

WATER WELL OF E. L. BRUCE CO.

LOCATION—NW¼ of Sec. 6, Twp. 13, R. 1W., Calhoun Co., Miss.
DRILLED BY—The Company.
ELEVATION—200 Feet.

Wilcox:

	Feet
Brown soft clay	0— 40
Loose white sand	40— 50
Hard brown clay	50— 52
Loose white sand	52— 60
Rock (hard sandstone)	60— 61

Midway:

Dark blue-gray shale	61— 104
Hard sandstone	104— 105
Green-blue shale	105— 200
Blue-black clay, slightly limy	200— 602

Cretaceous: Selma.

Very fine limy sand; shale cavings	602— 620
Light gray shaly limestone	620— 800
Gray silty limestone	800— 850
Soft, light gray limy shale	850—1135
Rock (hard limy sand)	1135—1136
Gray limy shale	1136—1210
Hard limestone, slightly sandy	1210—1212
Gray limy shale	1212—1292
Hard limestone; sandy	1292—1293
Hard limy shale	1293—1302
Hard limestone; sandy	1302—1303
Gray-green limy shale	1303—1505
Gray limy shale; slightly sandy	1505—1600
Gray limy shale, and thin interbedded layers of hard limestone	1600—1717

Eutaw:

Green limy sand, shaly. Abundant water	1717—1723

The above log partially from driller; but based chiefly on cuttings furnished the State Geological Survey by Mr. R. L. Tyson, Supt. Correlation on basis of cuttings, by R. E. Grim.

COPIAH COUNTY

DIDLAKE No. 1 WELL.

LOCATION—NE¼ of NE¼ of Sec. 6, Twp. 2N., R. 1W, near County Line Church, Copiah County, Miss.
DRILLED BY—Olympic Oil & Gas Company, Knoxville, Tenn.
DRILLING COMMENCED—October 11, 1926.
DRILLING COMPLETED—February, 1927 (Abandoned).
DRILLER—W. M. Young (Contracting); and A. J. Pollock.

	Feet
Surface clay and sand	00— 20
Soft sand rock	20— 60
Water sand	60— 80
Gumbo and boulders	80— 110
Gummy shale	110— 120
Packed sand	120— 160
Gumbo	160— 163
Sand and boulders	163— 200
Sandy shale	200— 265
Hard rock	265— 268
Packed sand	268— 308
Hard rock	308— 310
Packed sand	310— 320
Gumbo	320— 325
Broken sand rock	325— 330
Slate and shells	330— 390
Hard sand rock	390— 395
Gumbo	395— 430
Broken chalk rock	430— 486
Gumbo	486— 597
Shale and shells	597— 640
Gumbo	640— 895
Sand rock	895— 907
Shale and shells	907— 940
Gumbo and boulders	940— 976
Soft rock	976— 985
Gumbo	985—1200
Shale	1200—1240
Gumbo	1240—1365
Water sand	1365—1387
Blue shale	1387—1451
Soft lime rock	1451—1457
Gumbo	1457—1508
Soft lime rock	1508—1600
Shale and shells	1600—1640
Hard lime	1640—1645
Sandy shale, shells and pyrites	1645—1781
Gumbo	1781—2100
Sandy shale and shells	2100—2127
Cap rock	2127—2130

"On Dec. 6th the cap rock was penetrated and a show staged for visitors. Considerable oil flowed from the hole, but doubts were expressed as to whether the oil was natural. The well stood idle for several weeks and was then reamed down to the cap, and the drill was sunk as a rat hole for 30 feet more. Failed to produce, and the hole was abandoned and junked."

(Note by R. S. Withers)

GRENADA COUNTY

BORDEN NO. 1 WELL.

LOCATION—278 ft. W., and 99 ft. N of SE cor. of NE¼ of SE¼ of Sec. 19, Twp. 22N., R. 7E., on land of Mrs. B. L. Haile, Grenada County, Mississippi.

DRILLED BY—The L. B. Mawk Drilling Co.

DRILLING COMMENCED—October 20, 1923.

DRILLING COMPLETED—January 31, 1924.

DRILLER—Hardy Roberts, Shreveport, La.

ELEVATION—293 feet (Bar.)

CASING—12 in. 169 ft., 8½ in. 1991 ft.

Wilcox:

	Feet
Sandy clay	0— 55
Water sand	55— 64
Clay	64— 85
Sandy clay	85— 169
Sandy shale	169— 220
Hard sand	220— 232
Clay	232— 242
Hard sand	242— 252
Sand rock	252— 258
Sticky shale	258— 320
Packed sand	320— 407
Sand rock	407— 408
Packed sand	408— 430
Sandy gray lime	430— 432
Hard sand	432— 484
Gumbo	484— 490
Gummy shale	490— 501
Shale	501— 595
Hard sand	595— 604
Sticky shale	604— 646
Tough gumbo	646— 658
Sandy shale	658— 665
Gumbo	665— 714

Midway:

	Feet
Gummy shale	714— 928
Gumbo	928— 946
Sticky shale and boulders	946—1010
Hard shale and boulders	1010—1040
Boulders	1040—1044
Shale and boulders	1044—1235
Gumbo	1235—1270
Gummy shale	1270—1348
Shale and chalk	1348—1391
Soft sandy shale	1391—1399
Dark shale with sand crystals	1399—1420

Selma:

Chalk and shale	1420—1519
Chalk and sandy shale	1519—1539
Slate shale, with lime streaks	1539—1553
Hard chalk	1553—1580
Broken sand, and lime shale	1580—1591
Chalk, sandy	1591—1710
Hard chalk	1710—1772
Chalk and sandy shale	1772—1806
Hard chalk	1806—1825
Chalk and shale	1825—1842
Shale, dark, with crystals	1842—1860
Limy shale, sandy	1860—1870
Hard limy shale	1870—1922
Soft lime, sandy	1922—1927
Gray clay; shale, sandy	1927—1937
Limy clay, with soft streaks	1937—1963
Sandy shale	1963—2012
Hard shale, lime spots	2012—2022
Hard limy shale, sandy	2022—2107

Eutaw:

Gray sandy shale	2107—2164
Gray sand, shale streaks	2164—2175
Green sand	2175—2183
Soft gray sand	2183—2186
Hard limy sand	2186—2189
Hard lime, dark	2189—2192
Sandy shale	2192—2194
Sand & shale, with crystals	2194—2204
Sandy shale	2204—2227
Limy shale, fine sand	2227—2243
Limy shale, sandy	2243—2256
Gray sand	2256—2265

	Feet
Sandy shale, limy	2265—2288
Dark shale, limy	2288—2312
Sand and shale	2312—2328
Hard dark sand, limy	2328—2339
Fine gray sand	2339—2350
Hard sand, limy	2350—2365
Gray sand, coarse	2365—2400
Gray sand, shale streaks	2400—2412
Gray shale, lime streaks	2412—2435
Sandy shale, hard streaks	2435—2450

Tuscaloosa:

Red gumbo	2450—2469
Lime shale, sandy, soft	2469—2495
Chalky gumbo	2495—2549
Reddish sandy shale	2549—2561
Red sand, shaly	2561—2582
Reddish sand and shale	2582—2600
Hard red sand and shell rock	2600—2605
Red gumbo, with gravel	2605—2624
Clay, sand, and gravel (brown)	2624—2645
Clay, sand and crystals (brown)	2645—2657
Hard rock, brown; shells	2657—2659
Sand with shells, brown	2659—2669
Hard red sand, crystals and clay	2669—2689
Chalk and red gravel	2689—2703
Cherty gravel	2703—2715

Total depth—2715 feet.

No water, either fresh or salt, was encountered below 169 feet.

Correlation made in the office of the State Geological Survey on basis of driller's log by R. E. Grim.

HINDS COUNTY

LEWIS NO. 1 WELL.

LOCATION—NE¼ of Sec. 12, Twp. 15, R. 5E., Hinds County, Miss.

DRILLED BY—Big Black Oil Company.

DRILLING COMMENCED—January 5, 1927.

DRILLING COMPLETED—March 24, 1927.

MANAGER—R. J. Becker.

Clay	0— 45
Clay and gravel	45— 75
Rock	75— 79
Sandy shale	79— 150
Gumbo	150— 300

	Feet
Rock	300— 305
Gray sandy shale	305— 540
Sand; gas show	540— 550
Gumbo	550— 700
Rock	700— 703
Gumbo	703— 780
Sand; good gas show	780— 790
Tough gumbo	790— 913
Lime rock	913— 916
Green shale	916— 921
White sand; gas show	921— 926
Oil sand	926— 933
Rock	933— 934
Sand	934— 939
Sandy shale	939— 990
Sandy shale, streaks of lignite	990—1080
Packed white sand	1080—1205
Packed sand	1205—1290
Gray-white sand, shale in streaks	1290—1390
Packed sand; streaks of brown gumbo	1390—1490
Gummy lime	1400—1500
Blue shale	1500—1535
Green limy shale	1535—1600
Hard lime	1600—1605
Gray shale	1605—1620
Soft shale	1620—1798
Rock	1798—1799
Gray-white sand; little gas show	1799—1802
Soft shale	1802—1810
Gumbo	1810—1825
Shale	1825—1880
Sand	1880—1884
Rock	1884—1885
Shale	1885—1920
Hard sandy shale	1920—1950
Shale	1950—1980
Gumbo	1980—2000
Sand	2000—2068
Gumbo	2068—2088
Sandy shale	2088—2150
Sand	2150—2180
Gumbo	2180—2182
White sand	2182—2190
(Formation from 933′ to 1950′ has had shell and streaks of lignite.)	
Sand	2190—2220
Sand and shale	2220—2265

	Feet
Sand, shale and streaks of lignite	2265—2280
Hard white sand	2280—2300
Sand and shale	2300—2325
Lignite	2325—2330
Sand rock	2330—2350
Hard packed sand	2350—2400
Packed sand	2400—2445
Gumbo	2445—2450
Sand and gumbo	2450—2463
Lime rock	2463—2468
Sand, a little gas show	2468—2473
Gummy shale	2473—2490
Hard shale	2490—2525

(Abandoned at 2575 in sand and shale)

HOLMES COUNTY

PARTIAL LOG OF FREE RUN NO. 1 WELL.

LOCATION—NW¼ of NW¼ of Sec. 18, Twp. 13, R. 1E, Near the village of Free Run, Holmes County, Mississippi.

DRILLING COMMENCED—January 6, 1925.

DRILLED BY—Free Run Oil Company.

DRILLER—D. L. Boggs.

MANAGER—Wm. E. Willis.

(Report on Examination of cuttings furnished the State Geological Survey by Mr. Wm. E. Willis, March 31, 1925, et seq.)

Dark gray gumbo, with white mottlings of CaCo3, (Wilcox) Core	1430
Dark gray plastic gumbo, noncalcareous, off bit; (Wilcox?)	1510
Gray sand, firm and porous, calcareous; good gas sand (Wilcox)	1600
Greenish gray (bentonitic?) clay, slightly calcareous; nonfossiliferous (Wilcox)	1640
Very slightly glauconitic and sandy clay; obscure fossil fragments Core	1730
Gray, slightly glauconitic sandy clay, and coarse gray sand	1750
Like the above	1830
Gray sandy shale, glauconitic; firm, nonfossiliferous (Midway)	1874
Bluish-gray sticky gumbo (slightly calcareous and pyritic; off bit)	1912

Possibly all is marine; but at least Nos. 14 to 18, inclusive, seem to be marine material (Midway)?

Continuation of Report on Cuttings:

Fine sand, slightly limy; slightly petroliferous	2060—2095
Coarse gray sand	2095—2103
Sandy gray glauconitic lime; porous (Set 8" casing at 2108)	2103—2108
Gray sand, traces of lignite (slight oil show)	2120—2140
Fine brown sand (very slight oil show)	2140—2155
Brown sand; same as above	2155—2167

	Feet
Coarse brown sand and black shale	2207—2245
Gray sand and lignite (slightly petroliferous)	2245—2247
(Small bottle not numbered, coming between 2245′ and 2247′, consisting of brownish sand and shale, distinctly petroliferous).	
Dark gray gumbo and a little shale	2247 —2265
Sand and gumbo	2265 —2279
Sand, shale and gumbo	2279 —2301
Black shale, hard, flinty, gray to black	2301 —2302½
Black shale and sand, slightly glauconitic	2302½—2306
Gumbo and shale	2306 —2316
Sand	2316 —2318
Gumbo and shale	2318 —2336
A black sticky mass, looking like black gumbo, in small plastic masses; some sand; highly petroliferous. Possibly may be asphaltic residue	2336 —2340
(No more cuttings received).	

JEFFERSON DAVIS COUNTY

BURKETT NO. 1 WELL.

LOCATION—Sec. 14, Twp. 6N., R. 18W., on Farm of L. C. Burkett, Jefferson Davis County, Mississippi.

DRILLED BY—Standard Drilling Company, Bassfield, Miss.

DRILLING COMMENCED—October 1927.

DRILLER—R. C. Dorsett.

Driller's Log.

Sand and clay	0— 40
Sand and gravel	40— 70
Hard clay	70— 85
Sand	85— 91
Hard yellow clay	91— 136
Sand and gravel	136— 185
Hard yellow clay	185— 265
Sandy clay and gravel	265— 290
Sand and gravel	290— 386
Soft lime rock	386— 389
Sand and gravel	389— 462
Hard clay	462— 471
Sandy clay and gravel	471—486
Sand rock	486— 493
Sandy clay and gravel	493— 564
Gumbo	564— 570
Sticky shale	570— 620
Pink and green shale	620— 630
Sand	630— 634
Shale	634— 650

	Feet
Pink and green shale	650— 706
Pink shale and sand	706— 726
Sticky shale	726— 739
Lime rock	739— 745
Water sand	745— 786
Hard gumbo	786— 792
Sand and shale	792— 824
Hard gumbo	824— 840
Water sand	840— 857
Sticky shale	857— 861
Sand and shale	861— 882
Broken lime	882— 886
Gumbo	886— 905
Lime rock	905— 907
Sandy lime shale	907— 913
Hard gumbo	913— 930
Lime rock	930— 932
Sandy lime, shale and shell	932— 967
Hard lime	967— 969
Hard gumbo	969—1013
Blue slaty shale	1013—1015
Chalk rock	1015—1019
Sand and shale	1019—1024
Broken lime, white	1024—1040
Gumbo	1040—1074
Sand and shale	1074—1077
Sandy shale	1077—1105
Gumbo	1105—1114
Green sticky shale	1114—1138
Sandy shale, lime and shell	1138—1154
Hard lime	1154—1166
Gumbo	1166—1200
Broken lime	1200—1214
Water sand	1214—1232
Gumbo	1232—1252
Water sand	1252—1260
Packed sand	1260—1266
Hard lime	1266—1296
Sandy lime	1296—1302
Gumbo—Oil showing	1302—1366
Sticky shale	1366—1372
Lime rock	1372—1385
Sandy lime	1385—1390
Gumbo	1390—1430
Sticky shale	1430—1436
Shale, gumbo	1436—1498
Sandy lime and shell	1498—1510

	Feet
Broken lime	1510—1527
Sticky shale and lime	1527—1555
Gumbo and lime	1555—1556
Shale and gumbo	1556—1621
Lime rock	1621—1625
Gumbo	1625—1702
Soft lime	1702—1704
Sand and shale	1704—1710
Gumbo	1710—1730
Shale and gumbo	1730—1948
Sandy lime and shale	1948—1950
(Cored)	1950—1952
Shale and gumbo	1952—1963
Sandy lime and shale	1963—1968
Gumbo	1968—1982
Sandy lime and lignite	1982—2005
Gumbo	2005—2018
Brown sandy shale	2018—2041
Sand and shale	2041—2050
Gumbo	2050—2076
Black sandy lime	2076—2078
Sandy shale and gumbo	2078—2115
Sandy lime	2115—2122
Gumbo—in brown gumbo	2122—2140
Gumbo	2140—2176
Sandy lime shale	2176—2195
Lime rock	2195—2197
Gummy shale and lime	2197—2230
Gumbo	2230—2265
Hard sandy shale	2265—2300
Gumbo	2300—2320
Hard sandy lime	2320—2335
Gumbo	2335—2400
Sandy lime and shale	2400—2440
Lime rock	2440—2448
Shale and lime	2448—2510
Gumbo	2510—2565
Lime rock	2565—2572
Gumbo	2572—2610
Sandy lime	2610—2620
Sandy shale and lime	2620—2695
Lime rock	2695—2700
Sand and gravel	2700—2730
Rock	2730—2732
Sandy shale	2732—2750
Gumbo	2750—2765
Lime rock	2765—2768

	Feet
Sand; oil show	2752—2760
Sandy shale	2760—2770
Sandy shale—gas	2770—2782
Shale and gumbo	2782—2802
Sandy shale	2802—2822
Rock	2822—2823
Shale and gumbo	2823—2833
Shale	2833—2872
Sandy shale—cored	2872—2875
Sandy shale and gumbo	2875—2905
Shale and gumbo	2905—2925
Gummy shale and boulders	2925—2955
Gummy shale—cored	2955—2975
Shale	2975—2990
Broken lime rock—cored	2990—3005
Sandy shale and lime	3005—3035
Shale and gumbo	3035—3065
Broken lime and shale—cored	3065—3085
Broken sandy lime (Run steel tape line)	3085—3106
Lime and shale	3106—3126
Lime rock	3126—3134
Some oil sand—cored	3134—3137

December 14, 1927.

(From 2752 to 3137 is copied from a driller's log furnished the Geological Survey by Mr. R. C. Dorsett, Driller.)

LAUDERDALE COUNTY

GUNN NO. 1 WELL.

LOCATION—NE¼ of NE¼ of Section 13, Twp. 7N., R 16E., 1 mile S of Topton, Lauderdale Co., Miss.
DRILLED BY—Lauderdale Oil & Gas Company,
DRILLING COMMENCED—August 15, 1927,
DRILLING COMPLETED—Still Drilling, 1/4/28,
DRILLER—J. H. Ellis,
ELEVATION—406.1 feet above sea level.

Driller's Log

Wilcox:

Soil	0— 6
Red clay	6— 14
Shale and lignite	14— 124
Gumbo	124— 132
Water sand and lignite	132— 374
Gumbo	374— 385
Sand and shale	385— 441
Shale	441— 486
Gumbo	486— 549
Shale and lignite (gas show)	549— 639

Midway:

	Feet
Gumbo and boulders	639— 807
Shale and boulders	807— 866
Gumbo and boulders	866— 926
Shale and boulders	926— 958
Gumbo and boulders	958—1178
Shale and boulders (gas show)	1178—1190

Selma:

Hard shale and chalk	1190—1202
Chalk (cored at 1300 & 1930)	1202—1930
Shale, gray	1930—1990
Chalk	1990—1996
Shale, gray, (cored at 2040)	1996—2040
Shale and broken chalk	2040—2097

Eutaw:

Packed sand (cored)	2097—2137
Shale	2137—2158
Gumbo	2158—2167
Shale	2167—2178
Hard sand; strong gas show	2178—2180
Soft sand, green (cored at 2180 and 2203)	2180—2215
Hard sand, green (cored at 2210)	2215—2222
Sandy shale and sulphur; cored	2222—2230
(Tested salt water with tester)	
Hard green sand	2230—2315
Soft white sand	2315—2370
Shale, sand, gravel & lignite; cored 2370-2376	2370—2408
Sand and gravel	2408—2414
Gumbo, gravel and shale	2414—2425
Shale	2425—2445
Gumbo	2445—2451
Shale	2451—2471
Gumbo	2471—2485
Shale	2485—2493
Sand (cored)	2493—2494
Shale	2494—2545
Gumbo	2545—2565
Shale	2565—2576
Packed sand (cored); water	2576—2584
Gumbo	2584—2599
Shale	2599—2611
Packed sand	2611—2614

Tuscaloosa:

	Feet
Red shale	2614—2620
Packed sand	2620—2628
Red gumbo	2628—2650
Packed sand (cored); water	2650—2668
Red gumbo	2668—2676
Sand	2676—2684
Red shale	2684—2692
Red gumbo	2692—2708
Sand	2708—2718
Red gumbo	2718—2733
Packed sand (cored)	2733—2735
Red gumbo (cored)	2735—2742
Packed sand (cored)	2742—2754
Red gumbo (cored)	2754—2768
Packed sand, soft	2768—2776
Red gumbo	2776—2779
Gray shale	2779—2800
Packed sand (cored)	2800—2804
Lime rock, very hard	2804—2812
Packed sand (cored), showed oil and gas; very hard	2812—2814
Packed sand (cored; but failed to pick up core. Soft)	2814—2816
Packed sand (cored; very hard; did not show oil)	2816—2817

Rand Johnson, Sand Tester, here, and after showing gas, salt water (very salty) came in drill stem together with sand.

Mr. Jos. A. Baker, of Meridian, furnished the above Driller's Log. The correlations are based upon a partial set of cores and cuttings, also furnished by Mr. Baker to the Geological Survey.

KNOX FEE NO. 1 WELL.

LOCATION—Sec. 27, Twp. 7N., R. 17E., 2 miles west of Toomsuba, Lauderdale County, Miss.
DRILLED BY—Meridian Oil & Gas Company, Meridian, Miss.
DRILLING COMMENCED—Fall of 1915,
DRILLING COMPLETED—Abandoned, January, 1916,
DRILLERS—Wm. L. Henning and L. A. Rogers,
ELEVATION—300 feet (approximately).

Driller's Log

Soil and sandy clay	0— 80
Water sand	80— 90
Sandy shale	90— 125
Sand and shale	125— 215
Lignite	215— 219
Sand and shale	219— 329
Water sand	329— 429
Brown shale	429— 455

	Feet
Sand and shale	455— 487
Sticky shale, gumbo and sand	487— 532
Shale and gumbo	532— 548
Rock	548— 549
Shale	549— 557
Flint boulders	557— 560
Shale	560— 579
Shale and gumbo	579— 622
Rock	622— 623
Shale and gumbo	623— 688
Gumbo	688— 753
Shale	753— 802
Shale and gumbo	802— 915
Shale and boulders	915— 937
Soft shale	937— 958
Sand and shale	958— 989
Hard rock	989— 990
Shale	990— 999
Shale and gumbo	999—1037
Solid chalk	1037—1473
Chalk and light shale	1473—1680
Packed sand	1680—1700
Shale and sand	1700—1741
Brown shale and sand	1741—1863
Light shale and sand	1863—1926
Rock	1926—1927
Water sand	1927—1931
Rock and sand	1931—1949
Rock	1949—1950
Shale and sand	1950—1953
Rock	1953—1954
Water sand	1954—1962
Sandy shale	1962—1989
Light shale and sand	1989—2031
Salt water and sand	2031—2036
Sandy shale	2036—2052
Sand and shale	2052—2092
Rock	2092—2093
Sandy shale	2093—2103
Sand and boulders	2103—2196
Sandy shale	2196—2233
Shale and gumbo	2233—2240
Sand and shale	2240—2252
Blue shale	2252—2263
Salt water sand	2263—2266
Shale	2266—2304
Salt water sand	2304—2328

	Feet
Rock	2328—2329
Shell rock	2329—2331
Salt water sand	2331—2341
Shale and boulders	2341—2347
Sandy shale	2347—2355
Pink shale	2355—2361
Salt water sand	2361—2378
	Bottom of Hole

"Four wells were drilled on the Knox Farm, located 2 miles west of Toomsuba, Lauderdale County, Miss., one of which is the well represented by this log. One or more of the others were drilled by the Pioneer Oil & Gas Company, of Toomsuba.

All four wells were drilled on an area of not exceeding 10 acres, and were practically offsets to this No. 1 well of the Meridian Oil & Gas Company."

This log was furnished Mr. R. S. Withers by Mr. Joseph A. Baker, who got it direct from the driller of the well. He vouches for the accuracy of the copy from the original.

LEAKE COUNTY

STOLL NO. 1 WELL.

LOCATION—Section 32, Twp. 17, R. 7, Leake County, Miss.
DRILLED BY—Pittsburgh Oil Development Co.,
DRILLING COMMENCED—February 12, 1927.
DRILLING COMPLETED—May 1, 1927 (Abandoned),
ELEVATION—400 feet.

Claiborne:

Surface sand	0— 30
Sand	30— 130
Sand and sandy gumbo	130— 160
Quicksand	160— 170
Gravel	170— 180
Soft sand	180— 190
Red sand; shale	190— 255
Red and blue shale	255— 300
Casing set at 280 feet	
12½ inches blue formation	
Gumbo and boulders	300— 415
Blue shale, sand and shells	415— 505
Sandy lime	505— 570
Gumbo	570— 578
Gumbo	578— 600
Sticky shale; boulders	600— 747
Lime rock	747— 748
Hard lime rock	748— 751

Wilcox:

	Feet
Tough blue gumbo	751— 800
Gumbo	800— 815
Soft sand	815— 880
Gumbo	880— 905
Sand, shale	905— 915
Streaks of sand and gumbo	915— 995
Sticky shale and gumbo	995—1060
Stiff gumbo	1060—1116
Sticky shale	1165—1216
Sand	1216—1233
Hard sand rock	1233—1236
Sandy lime	1236—1242
Tough gumbo	1242—1310
Sandy shale	1310—1317
Sticky shale	1317—1375
Sandy shale	1375—1385
Sandy shale	1385—1405
Hard sandy shale	1405—1410
Gumbo	1410—1428
Limy shale	1428—1495
Limy shale	1495—1510
Tough gumbo	1510—1545
Sticky shale; gumbo	1545—1600
Broken lime sand	1600—1670
Sticky shale; gumbo	1670—1720
Hard lime rock	1720—1723
Shale	1723—1750
Lime rock	1750—1754
Sticky shale	1754—1768
Broken sand; gumbo	1768—1793
Hard sand	1793—1805
Hard sandy lime	1805—1810
Hard sand rock and sandy shale	1810—1825
Hard sand rock	1825—1851
Hard sand	1851—1870
Gumbo	1870—1880
Hard broken sand	1880—1913
Hard sand rock	1913—1938
Sand rock	1938—1943
Hard sand rock	1943—1953
Sand rock	1953—1963
Gumbo, lime, and shells	1963—1985

(Log missing from 1885 ft. to 2300 ft.) Continuation of log made from cuttings in possession of the Geological Survey.

Wilcox-Midway contact tentatively placed at 2100 ft.

Midway:

	Feet
Black soap shale	2300—2700

Selma:

Hard gray limestone	2700—2745
Light gray shaly limestone	2745—3050
Hard gray shaly limestone	3050—3226
Dark gray, hard limy shale	3226—3339

Abandoned at 3502 feet.

Correlations made by R. E. Grim, chiefly from driller's log, checked, however, in most cases by study of cores and cuttings in the possession of the Survey.

MADISON COUNTY

McCRACKEN NO. 1 WELL.

LOCATION—NW cor. NW¼ Sec. 23, Twp. 10N., R 3E., Madison County, Mississippi.
DRILLED BY—Roxana Petroleum Corporation,
DRILLING COMMENCED—August 16, 1926,
DRILLING COMPLETED—December 18, 1926,
ELEVATION—270.5 feet.

Claiborne:

Clay	0— 22
Sand	22— 42
Blue sand	42— 48
Coarse gray sand	48— 105
Light colored clay	105— 124
Clay	124— 130
Sand	130— 136
Clay	136— 140
Sand	140— 185
Clay and lignite	185— 196
Clay	196— 208
Sandy shale	208— 218
Sand	218— 230
Clay	230— 270
Shale	270— 275
Clay	275— 308
Broken rock	308— 312
Sand	312— 330
Clay, and streaks of sand	330— 376
Sandy clay	376— 386
Rock	386— 387
Clay	387— 400
Sand streaks and boulders	400— 415
Sand	415— 424

	Feet
Clay	424— 430
Shale	430— 456
Sand and gravel	456— 473
Clay and sand	473— 490
Sand and gravel	490— 500
Shale and boulders	500— 528
Sand and gravel	528— 620
Gumbo	620— 635
Sand and Gravel	635— 658
Gumbo	658— 668
Sand	668— 672
Hard sand	672— 675
Gummy shale	675— 695
Rock	695— 700
Sand and boulders	700— 710
Hard sand	710— 741
Sand rock	741— 746
Hard sand	746— 755
Sand	755— 772
Sand and gravel	772— 818
Shale	818— 825
Gumbo	825— 835
Shale	835— 886
Shale; streaks of gumbo	886— 986
Shale; streaks of tough gumbo	986—1021
Hard sand	1021—1026
Sticky shale	1026—1033
Shale; streaks of tough gumbo	1033—1073
Broken rock	1073—1079
Sand	1079—1085
Gumbo	1085—1107
Rock	1107—1108
Hard sand	1108—1123
Shale	1123—1134
Hard sand	1134—1160
Sticky shale	1160—1175
Hard sand	1175—1198
Gumbo	1198—1215
Hard shale; streaks of hard sand	1215—1243
Hard shale	1243—1253
Hard sand	1253—1275
Sandy shale	1275—1285
Hard sand	1285—1297
Sticky shale	1297—1320
Sand and boulders	1320—1345
Shale and gumbo	1345—1380
Sand and boulders	1380—1398

	Feet
Gumbo	1398—1406
Sand	1406—1412
Sand; hard streaks	1412—1460
Sand, streaks of shale and gumbo	1460—1585
Sticky shale	1585—1595
Packed sand	1595—1605
Shale and sand	1605—1625
Gumbo	1625—1645
Hard tough gumbo	1645—1648
Wilcox:	
Shale and boulders; streaks of sand	1648—1692
Sandy shale and boulders	1692—1700
Sand and boulders; sand very green	1700—1716
Gummy shale and lignite	1716—1733
Sand and boulders; green sand	1733—1744
Gumbo	1744—1760
Sandy shale	1760—1769
Sand	1769—1780
Sand, green; (cored, 1780-1798)	1780—1800
Sand, soft	1800—1804
Shale and boulders; streaks of sand	1804—1830
Gumbo	1830—1838
Shale	1838—1846
Hard shell	1846—1847
Gray sandy shale (cored)	1847—1856
Sandy shale	1856—1867
Tough gumbo and lignite	1867—1883
Gumbo	1883—1915
Shale and streaks of sand	1915—1945
Sticky shale (cored)	1945—1956
Sticky shale	1956—1958
Sandy shale	1958—1962
Sand, soft	1962—1966
Sand (cored)	1968—
Shale and sand	1968—1973
Hard shell	1973—1976
Sandy shale	1976—2008
Sticky shale	2008—2010
Sand	2010—2038
Sandy shale	2038—2048
Sand rock	2048—2050
Sandy shale	2050—2062
Sand rock	2062—2065
Sand	2065—2067
Sand and shale (cored)	2067—2073
Green sandy shale	2073—2081

	Feet
Gummy shale	2081—2110
Soft sand; little streaks of shale	2110—2115
Soft sand (cored)	2121—
Shale (cored)	2124—
Shale	2124—2130
Gumbo	2130—2135
Soft gray sand	2135—2160
Shale	2160—2176
Hard rock (cored)	2176—2180
Brown shale (cored); streaks of gray sand	2180—2186
Shale	2186—2209
Sand rock	2209—2210
Gumbo	2210—2218
Sand rock	2218—2220
Shale, streaks of sand	2220—2223
Sandy shale (cored)	2227—
Gray sandy shale; a little lignite	2227—2231
Dark gray shale; lots of lignite (cored)	2231—2241
Shale	2241—2248
Gumbo	2248—2255
Shale	2255—2261
Gumbo	2261—2271
Shale	2271—2276
Sand	2276—2281
Shale	2281—2285
Sand	2285—2298
Sand rock (SLM equals 2298)	2298—2299
Sand rock	2299—2300
Brown shale	2300—
Dark brown shale	2300—2302
Dark brown sandy shale, fine gray sand	2302—2306
Light green sticky shale (cored)	2306—2308
Sticky shale	2308—2314
Hard sand	2314—2316
Sandy shale	2316—2320
Sticky shale	2320—2330
Hard shale	2330—2340
Shale, with streaks of sand	2340—2346
Shale and sand	2346—2361
Gumbo	2361—2368
Hard brown sand; some shale	2368—2370
Hard brown sandy shale (cored)	2370—2378
Hard sandy shale	2378—2386
Sticky shale	2386—2395
Hard shale	2395—2417
Sandy shale and lignite	2417—2432
Hard shale, with streaks of sand	2432—2461

	Feet
Sticky shale	2461—2475
Tough gumbo	2475—2482
Rock	2482—2483
Brown micaceous sandy shale, streaks gray sand (cored 2483-89)	2483—2489
Sandy shale	2489—2500
Sticky shale	2500—2531
Sandy shale and boulders	2531—2550
Hard shale	2550—2565
Sticky shale	2565—2590
Rock	2590—2592
Gray sandy shale (cored)	2592—2597
Fine sandy shale (cored)	2592—2600
Sand with hard streaks	2600—2616
Shale, with streaks of sand	2616—2627
Hard brown shale; streaks of packed sand	2627—2660
Brown lignitic shale (cored)	2660—2666
Sticky shale	2666—2681
Sandy shale	2681—2725
Hard sand	2725—2727
Fine gray sand	2727—2730
Lignitic shale (cored)	2730—2732
Sticky brown shale (cored)	2732—2739
Hard rock	2739—2740
Soft gray sand (cored)	2740—2743
Gray sand	2743—2746
Shale, streaks of hard sand	2746—2753
Lignitic shale	2753—2760
Sticky brown shale	2760—2776

End of log at 2776 feet.

The above log was furnished the State Geological Survey by the Company. The Survey also has in its possession many cores and cuttings from this well. Unfortunately the material is almost entirely unfossiliferous, and hence the correlations must be regarded as tentative.

TROLIO NO. 1 WELL.

LOCATION—NW cor. of NW¼ of Sec. 29, Twp. 10, R. 4E., Madison County, Mississippi.
DRILLED BY—Transcontinal Oil Company.
DRILLING COMMENCED—April, 1926.
DRILLING COMPLETED—May, 1927 (Abandoned).
DRILLER—Wm. Dossier.
ELEVATION—258.5′
GEOLOGIST—E. A. Becker in Charge.

Claiborne:

Surface clay	0— 14
Sand and gravel	14— 30
Clay, white	30— 40

	Feet
Sand	40— 55
Lignite	55— 59
Sand, white	59— 70
Sand and gravel	70— 164
Shale, soft	164— 173
Shale	173— 185
Sand	185— 220
Lignite	220— 224
Shale and boulders	224— 312
Rock	312— 315
Gumbo	315— 331
Sand	331— 353
Shale and shell	353— 380
Sand	380— 408
Gumbo	408— 430
Sand and gravel	430— 576
Gravel	576— 587
Sand	587— 608
Sand, gravel and shells	608— 730
Shale, gummy; fossil shells at 772 feet	730— 773
Sand and gravel	773— 807
Rock	807— 809
Gumbo	809— 830
Shale	830— 850
Gumbo	850— 885
Shale, gummy	885— 970
Lignite and sand	970— 985
Gumbo, lignite, and sand with shells	985— 987
Lignite and sand	987— 999
Hard sand; Artesian water at 1016 ft.	999—1014
Sand	1014—1018
Hard sand and shells	1018—1024
Hard packed sand	1024—1032
Gumbo	1032—1038
Packed sand; shells, with streaks of gummy shale	1038—1088
Sand and shale	1088—1104
Green gumbo	1104—1107
Hard pack sand—show of gas	1107—1120
Hard sand; shale, with streaks of lime	1120—1134
Shale, hard, sandy, with streaks of lime	1134—1154
Shale, hard; lime and sand	1154—1170
Shale, gummy, green	1170—1179
Lime, broken	1179—1191
Hard sand and lime	1191—1201
Hard green sand, and shale	1201—1206
Hard sand and shale	1206—1214
Shale, gummy	1214—1216

	Feet
Shale, gummy and brown	1216—1220
Gumbo	1220—1233
Shale, brown and green sand	1233—1250
Shale, blue, with streaks of gummy shale	1250—1263
Shale, sandy	1263—1290
Shale, hard, sandy, with streaks of lime	1290—1313
Shale, hard, sandy; green mica	1313—1366
Shale, hard, sandy, green	1366—1420
Shale, gummy in streaks	1420—1439
Shale, gummy	1439—1449
Shale, brown, gummy	1449—1479
Gumbo	1479—1490
Shale, sticky, broken	1490—1533
Shale, with streaks, salt and pepper sand	1533—1555
Shale, brown	1555—1612
Gumbo	1612—1621
Core, showing sandy shale	1621—1623
Gumbo with streaks of hard sand and shale	1623—1655
Wilcox:	
Hard sand and shale; streaks of lignite	1655—1657
Shale, gummy and sandy	1657—1680
Shale and hard streaks of sand	1680—1703
Soft sandy shale; green sand	1703—1719
Shale, gummy, green; fossils	1719—1727
Shale, soft, sandy	1727—1759
Sand, green; blue shale	1759—1790
Shale, hard and chalky; sand	1790—1803
Gumbo	1803—1823
Shale, gummy	1823—1841
Lime rock, hard	1841—1848
Soft sand and shale	1848—1850
Hard sand	1850—1851
Gummy shale	1851—1858
Gummy shale	1858—1874
Black shale, gummy (cored)	1874—1876
Shale, gummy	1876—1896
Shale, gummy; lignite	1896—1900
Shale, soft, limy with streaks of gumbo	1900—1960
Shale, limy with streaks of tough gumbo	1960—1967
Shale, limy with streaks of gumbo	1967—1999
Lime rock, hard; fossils	1999—2001
Lime, soft, and gummy shale	2001—2010
Shale with shells, lime and gumbo; lignite, thin streaks	2010—2065
Shale with shells; streaks of gumbo	2065—2095
Shale, blue; with shells	2095—2110
Gumbo, tough	2110—2115

	Feet
Lime rock, hard	2115—2118
Shale, gummy	2118—2125
Thin streaks of lime and shale, gummy	2125—2127
Shale, gummy	2127—2137
Shale, sandy	2137—2143
Shale and streaks of hard sand, fine	2143—2170
Shale, gummy	2170—2208
Lime rock	2208—2210
Shale, sandy with streaks of gumbo	2210—2233
Shale, sandy, with streaks of lignite	2233—2268
Shale, sandy, gummy; streaks of lignite	2268—2290
Shale, gummy	2290—2309
Shale, sandy, streaks of lignite	2309—2340
Lime rock	2340—2344
Gumbo	2344—2345
Shale, sandy, with streaks of gumbo and lignite	2345—2386
Shale, sticky, with streaks of sticky lignite	2386—2395
Shale, and streaks of sand	2395—2410
Shale, and streaks of lime	2410—2420
Lignite, and sandy shale	2420—2430
Shale, streaks of lignite, gumbo and green sand	2430—2466
Gummy lignite; shale, with streaks of sand	2466—2489
Shale, gumbo and streaks of lignite	2489—2520
Shale and boulders	2520—2537
Shale, hard, sandy; lignite, and fossils	2537—2556
Sand, green; shale and lignite	2556—2560
Sand, hard; shale and lignite	2560—2570
Shale, hard, green, sandy; lignite	2570—2696
Shale, gummy; streaks of green sand	2696—2706
Shale, hard, sandy	2706—2714
Shale and sand; green fossil shells	2714—2731
Sand, hard, white; fresh water	2731—2751
Shale, hard, white; (Cored)	2751—2754
Shale, green, sandy	2754—2774
Shale, green, hard	2774—2788
Sand, white	2788—2792
Lime, white, hard	2792—2794
Sand, white, water	2794—2810
Lime, white, hard; pyrites	2810—2812
Lime rock, hard, with streaks of pyrites	2812—2815
Sand, gray	2815—2816
Sand, gray; hard sandy shale	2816—2834
Shale, sandy	2834—2855
Shale, sandy, with hard and soft streaks	2855—2883
Shale, sandy	2883—2890
Shale, gummy	2890—2979
Shell rock	2979—2980
Shale, gummy	2980—3000

	Feet
Gumbo	3000—3010
Shale, gummy, streaks of lignite	3010—3018
Shale, sandy	3018—3050
Lime, sandy, hard	3050—3052
Lime rock, sandy	3052—3055
Sand	3055—3067
Shale, gummy	3067—3092
Gumbo	3092—3094
Shale, sandy, lignitic	3094—3097
Sand, shale; fossil shell at 3107	3097—3106
Lime rock	3106—3108
Shale, sandy	3108—3114
Shale, soft	3114—3141
Lime rock	3141—3142
Sand, hard, green	3142—3144
Shale, sandy	3144—3174
Shale—trace of oil at 3175—3180	3174—3180
Sand, coarse, dark	3180—3182
Sand, brown, dark gray	3182—3189
Lime rock	3189—3193
Green sand and shale (Cored)	3193—3194
Shale, gummy	3194—3198
Gumbo, tough	3198—3201
Shale, sandy	3201—3217
Midway:	
Shale, gummy	3217—3248
Shale, hard, gummy	3248—3256
Shale, gummy	3256—3369
Gumbo	3369—3398
Shale	3398—3408
Sand rock	3408—3410
Shale, gummy, boulders	3410—3465
Shale and boulders	3465—3497
Gumbo	3497—3510
Shale and boulders	3510—3530
Gumbo	3530—3538
Shale, hard and gummy; boulders	3538—3563
Shale, gummy	3563—3567
Shale, gummy, and boulders	3567—3582
Cuttings missing	3582—3602
Rock	3602—3605
Shale, gummy, and boulders	3605—3653
Shale and boulders	3653—3677
Shale, gummy, and green boulders	3677—3722
Shale and boulders	3722—3764
Gummy shale and boulders	3764—3800

	Feet
Shale, gummy, and tough, and boulders	3800—3830
Gummy shale and boulders	3830—3892
Shale, hard and sandy	3892—3895
Shale, hard, with boulders	3895—3903
Shale, hard; boulders with streaks of hard gummy shale	3903—3942
Gummy shale and boulders	3942—3964
Gummy shale and boulders	3964—4010
Gummy shale	4010—4020
Shale, hard and gummy, with chalk showing in the cuttings	4020—4028
Core, soft, and all washed away	4028—4036
Shale	4036—4037
Limy shale	4037—4040
Gumbo	4040—4051
Shale, with chalk showing in the cuttings	4051—4063
Shale; broken chalk rock	4063—4069
Chalk, with streaks of shale	4069—4082
Chalk rock, broken	4082—4100
Chalk rock, hard	4100—4113

Selma:

Chalk rock, hard and streaks of pyrites	4113—4123
	Total Depth

The above Log was furnished the State Geological Survey by Mr. Ray V. Hennen, Chief Geologist of the Company.

Correlations made by R. E. Grim in the office of the Survey from cuttings sent by Mr. Hennen and Mr. Becker.

MARSHALL COUNTY

HUFFMAN NO. 1 WELL.

LOCATION—Sec. 33, Twp. 3, R. 2W., Marshall County, Mississippi.
DRILLED BY—Thomas B. Slick.
DRILLING COMMENCED—April 14, 1925.
DRILLING COMPLETED—Sept. 24, 1925 (Abandoned).

Surface sand	0— 60
White glass sand	60— 80
Chalk	80— 100
Pack sand	100— 150
Hard sandy chalk	150— 330
Soft sand	330— 365
Lignite	365— 367
Sand, hard	367— 400
Gray shale	400— 450
Green brown shale	450— 540
Brown shale tough	540— 590
Brown shale rotten	590— 675
Blue shale	675— 685
Dark shale	685— 805

	Feet
Blue shale	805— 810
Black shale soft	810— 980
Black shale tough	980—1000
Sticky shale	1000—1106
Lime rock	1106—1180
Lime rock gray	1180—1118
Lime rock	1118—1128
Blue sand	1128—1208
Sticky shale	1208—1214
White lime	1214—1226
Lime shells, shale	1226—1241
Blue shale	1241—1281
Lime rock	1281—1285
Soft light shale	1285—1305
Soft blue sand	1305—1312
Sticky black shale	1312—1317
White lime	1317—1321
Soft gray shale	1321—1348
Lime shells	1348—1352
Sharp sand rock	1352—1355
Sand rock	1355—1368
Sand shells	1368—1400
Gumbo	1400—1412
Soft blue shale	1412—1420
Rock lime	1420—1424
Gumbo	1424—1430
Sand	1430—1434
Sticky gray shale	1434—1438
Hard black shale	1438—1440
Soft gray shale	1440—1450
Sticky shale	1450—1497
Gumbo	1497—1559
Shale	1559—1656
Gumbo	1656—1676
White shale	1676—1706
Gumbo	1706—1717
Rock	1717—1725
Mixed shale	1725—1741
Blue Shale	1741—1755
Rock	1755—1756
Gumbo	1756—1787
Shale black, with sandy fossil shell	1787—1840
Blue shale with sandy fossil shell	1840—1857
Soft blue shale	1857—1940
Sea shells	1940—1943
Hard sharp sand rock	1943—1946
Blue shale	1946—1956
Shale and shell	1956—2000

	Feet
Shale and shells	2000—2034
Soft blue shale	2034—2064
Blue pack sand	2064—2084
Blue shale	2084—2090
Sand rock	2090—2094
Black shale	2094—2110
Sand rock	2110—2113
Sandy shale	2113—2118
Sand shell	2118—2120
Chalky shale	2120—2122
Soft shale	2122—2125
Sand and shells	2125—2130
Soft gray shale	2130—2150
Shells and shale	2150—2168
Black lime	2168—2170
Black crystal lime very hard and sharp	2170—2175
Sea shell	2175—2176
Sea shell with sea shells and sand rock	2176—2180
Boulders	2180—2182
Boulders with sea shells and sand rock	2182—2186
Sand rock; boulders; sea shells set in sand rock	2186—2192
Lime or chalk rock	2192—2195
Hard rock	2195—2196
Lost returns	2196—

HUFFMAN NO. 2 WELL.

LOCATION—Sec. 33, Twp. 3, R. 2W., Marshall County, Mississippi.
DRILLED BY—Thomas B. Slick,
DRILLING COMMENCED—October 31, 1925,
DRILLING COMPLETED—March 18, 1926 (Abandoned).

Red sand clay	0— 20
White sand	20— 360
Lignite	360— 365
Sand chalky	365— 400
Rock sand	400— 403
Lignite	403— 408
Mixed shale	408— 430
Mixed shale	430— 591
Mixed and soft shale	591—1026
Shale with lignite breaks	1026—1112
Streaky shale with sand and sea shell	1112—1130
Shells	1130—1138
Shells	1138—1154
White lime	1154—1156
Sand blue pack	1156—1212
Shale and shells	1212—1227
White lime	1227—1230

	Feet
Shale and shells	1230—1250
Sand soft and porous	1250—1287
Lime	1287—1290
Shale	1290—1327
Lime and shell	1327—1330
Shale and shell	1330—1340
Sandy lime	1340—1343
Shale and shell	1343—1369
Sandy lime	1369—1373
Shale and shell	1373—1376
Sand rock	1376—1381
Sand shale	1381—1425
Shale sticky	1425—1435
Sandy lime	1435—1445
Sticky shale	1445—1518
Sticky shale	1518—1523
Gumbo	1523—1600
Gumbo	1600—1610
Black shale	1610—1625
Shale and broken chalk	1625—1700
Chalk	1700—1755
Tough gumbo	1755—1885
Blue pack sand	1885—1926
Shale and sand shell	1926—1952
Hard sharp sand rock	1952—1959
Shale and shell	1959—2041
Shale soft blue	2041—2070
Sand rock and sea shells	2070—2080
Shale and shell	2080—2120
Shell rock and shale	2120—2140
Shale soft light	2140—2160
Shale rock and shell	2160—2170
Hard flinty gravel formation; rock and sand very hard	2170—2173
Sand rock	2173—2176
Gravel	2176—2178
Hard rock and gravel	2178—2180
Hard rock	2180—2184
Hard rock	2184—2190
Soft sand lost returns	2190—2197
Sandy lime rock	2197—2198
Quick sand	2198—2199
Sandy lime rock	2199—2200

H. C. FORTE NO. 1 WELL.

LOCATION—Sec. 36, Twp. 3, R. 3W., Marshall County, Mississippi
DRILLED BY—Thomas B. Slick,
DRILLING COMMENCED—April 30, 1926,
DRILLING COMPLETED—Sept. 8. 1926 (Abandoned).

	Feet
Sandy clay	0— 10
Sand, soft white	10— 220
Sand, soft white	220— 430
Sandy shale	430— 450
Shale	450— 465
Sand, blue	465— 489
Sand rock	489— 490
Sand rock	490— 492
Sand, white	492— 502
Lignite	502— 512
Blue shale, sticky	512— 532
Sandy shale	532— 570
White sand, coarse	570— 805
Shale, sticky	805— 831
Sandy shale	831— 835
Gray dark shale	835— 867
Shale, green sticky	867— 922
Sticky shale	922— 952
Shale, dark green-brown	952—1037
Shale, soft	1037—1167
Shale, black	1167—1242
Water sand	1242—1254
Lime, sandy, fine, green	1254—1279
Pack sand	1279—1297
Sandy lime rock	1297—1301
Shale, black	1301—1336
Shale, gray	1336—1371
Lime rock	1371—1379
Shale, sandy	1379—1404
Shale and shell	1404—1418
Lime rock, white	1418—1426
Sticky shale	1426—1446
Sticky shale	1446—1453
Shale, light gray	1453—1468
Sandy shale and shell	1468—1505
Sandy lime rock, hard	1505—1510
Sandy lime rock	1510—1512
Soft green shale	1512—1516
Lime rock	1516—1574
Gumbo	1574—1615
Gumbo	1615—1633
Sandy shale	1633—1639
Blue shale, sticky	1639—1658

	Feet
Blue shale, fine	1658—1680
Shale, gray sticky	1680—1689
Gumbo	1689—1762
Shale and shell, black	1762—1802
Shale, white chalky	1802—1812
Shale, black, green and gray and sea shell	1812—1843
Shale, black	1843—1853
Shale, black	1853—1863
Shale and sea shell	1863—1888
Gumbo	1888—1893
Shale, light sticky	1893—1956
Shale and shell	1956—1962
Shale, black	1962—1975
Gumbo	1975—1979
Sand, soft blue, fresh water	1979—1985
Sand. soft blue	1985—1990
Conglomerate	1990—2026
Sandy shale and shell	2026—2036
Shale, soft and black	2036—2044
Shale and shell, sandy	2044—2084
Conglomerate	2084—2115
Shale, sandy	2115—2120
Sand, very fine	2120—2136
Shale, sticky	2136—2140
Pack sand	2140—2147
Black shale	2147—2154
Lime	2154—2159
Shale, blue and shells	2159—2189
Conglomerate	2189—2199
Sand, soft, fine	2199—2219
Sandy lime rock	2219—2225
Sandy lime—sea shell	2225—2237
Shale, black	2237—2244
Sandy lime rock	2244—2248
Lime, white, chalky	2248—2262
Lime rock, sandy	2262—2267
Shale, sticky	2267—2274
Conglomerate	2274—2295
Clay, white and red	2295—2300
Lime rock	2300—2316
Lignite	2316—2322
Conglomerate	2322—2372
Lime and sea shells	2372—2378
Sand rock, very hard	2378—2385
Sandy lime	2385—2392
Lime and hard chalk	2392—2398
Crystalized lime	2398—2406
Crystalized lime	2406—2414

	Feet
Lime rock or granite	2414—2417
Lime and flint rock	2417—2424
Lime and chalk rock	2424—2427
Lime rock	2427—2441
Lime rock, white-yellow	2441—2470
Lime rock, light red-yellow	2470—2483
Lime rock, white-yellow	2483—2487
Lime rock	2487—2493
Lime rock, white—some gray	2493—2495
Lime rock, white and gray	2495—2544
Lime rock, yellow-red	2544—2563
Lime rock, very hard	2563—2565
Lime rock, yellow, brown	2565—2592
Sandy lime, light red	2592—2612
Sandy lime, pink and brown	2612—2637
Lime rock, pink and brown	2637—2648
Lime rock, gray and yellow	2648—2666
Lime rock, pink, yellow and red, much harder	2666—2679
Lime rock, yellow—red softer	2679—2703
White lime rock	2703—2713
Lime rock, pink and yellow	2713—2726
Lime rock	2726—2732
Lime rock, gray and white	2732—2745
Lime rock, gray	2745—2759
Lime, gray, brown and white; streaks of black shale	2759—2788
Lime, gray and brown	2788—2804
Lime rock, brown and gray with breaks of black shale	2804—2845
Lime rock, gray and brown	2845—2867
Lime rock, white gray-brown	2867—2897
Lime rock, brown, gray	2897—2915
Lime rock with streaks of shale	2915—2935
Lime rock, brown; very hard	2935—2938
Sandy lime, lost returns	2938—2940
Sandy lime	2940—2942
Sandy lime	2942—2944
Lime or granite	2944—2948
Sandy lime	2948—2960
Lime rock, brown-gray	2960—2996
Sandy lime, light gray; hard	2996—3017
Conglomerate; lost returns	3017—3024
Lime rock, gray-brown	3024—3173
Shale, very fine	3173—3177
Hard lime	3177—3190
Sandy lime	3190—3205
Soft shale	3205—3208
Sand and shale	3208—3238
Pack sand	3238—3245
Sticky shale; total depth. Quit on hard rock	3245—3248

MONROE COUNTY

DURRETT WELL NO. 1.

LOCATION—NE¼, Sec. 29-13S-17W, Record of Well No. 1 on the T. F. Durrett Farm, Monroe County, Miss.
DRILLING COMMENCED—February 7, 1927,
DRILLING COMPLETED—May 7, 1927 (Dry hole),
OWNER OF WELL—Quincy Oil Company,
DRILLERS—E. H. Bish and C. E. Ramsey,
TOOL DRESSERS—A. A. Hurley and H. A. Wallace, Jr.

Casing Record		Water Record
Size		Fresh water at surface;
13"	426	Salt water at 1912;
10	545	2462, enough to drill with;
8 1/4	1764	3065, hole filled up.
6 5/8	2110	
5 3/16	2314—None left in hole.	

	Feet
Quicksand	0— 20
Blue gumbo	20— 90
White Gumbo	90— 140
Blue gumbo	140— 180
Red gumbo	140— 233
Black gumbo	233— 245
Soft sand (water)	245— 263
Gravel	263— 302
Quicksand	302— 330
Gravel	330— 341
Pink Gumbo	341— 376
Red gumbo	376— 407
Brown water sand	407— 412
Blue gumbo	412— 421
Gray sand	421— 431
Blue gumbo, mixed with gravel	431— 440
Blue sand, hard	440— 449
Blue gumbo	449— 474
Sand	474— 486
Gumbo and sand	486— 517
Sand	517— 634
Slate	634— 637
Sand	637— 655
Broken sand and slate	655— 667
Sand	667— 700
Black slate	700— 710
White slate	710— 720
Sand	720— 738
Blue slate and shells	738— 828
Sand	828— 858
Blue slate and shells	858— 950

	Feet
Sand	950— 964
Slate	964— 997
Sand	997—1045
Slate	1045—1049
Sand	1049—1056
Slate	1056—1100
Sand	1100—1160
Slate	1160—1174
Sand	1174—1184
Slate	1184—1192
Sand	1192—1312
Sandy lime	1312—1349
Sand	1349—1385
Sandy lime	1385—1500
Slate and lime shells	1500—1564
Sand	1564—1605
Slate and shells	1605—1656
Sand	1656—1721
Slate	1721—1728
Black lime	1728—1750
Broken lime	1750—1850
Slate	1850—1864
Sandy shale	1864—1910
Sand	1910—1958
Slate	1958—2027
White lime, sandy	2027—2048
Rotten, limy sand	2048—2070
Slate	2070—2090
Pink slate	2090—2100
Black lime	2100—2121
Black slate	2121—2219
Lime shells	2219—2222
Black slate	2222—2252
Lime shells	2252—2256
Slate	2256—2268
Lime	2268—2287
Pink slate	2287—2294
Green slate	2294—2307
White lime	2307—2321
Slate	2321—2329
Red rock	2329—2334
White lime	2334—2345
Green slate	2345—2350
Sand	2350—2353
Black slate	2353—2404
Lime shells	2404—2406
Black slate	2406—2410

	Feet
Lime shells	2410—2421
Black slate	2421—2443
Sand	2443—2502
Black sandy shale	2502—2555
Black slate	2555—2855
Sand	2855—2933
Slate	2933—3018
Lime	3018—3040
Sand	3040—3075
Total depth	3075

CARTER NO. 1 WELL.

LOCATION—855 ft. N., and 50 ft. E. of SW cor. SW SE, Sec.7,Twp. 13S, R. 17W, near Amory, Monroe County, Miss.
DRILLING COMMENCED—February 15, 1926,
DRILLING COMPLETED—October 6, 1926,
DRILLED BY—The Amory Petroleum Company,
DRILLER—William Steinhoff,
ELEVATION—448 ft. (Bar.)

Sand clay	0— 103
Brown quicksand	103— 118
Brown clay and sand	118— 140
White clay and sand	140— 180
Quicksand	180— 194
White clay	194— 238
Quicksand	238— 281
White slate and sand	281— 301
Green slate	301— 320
Pink slate	320— 325
Gray sand	325— 345
Gravel	345— 360
Sandstone	360— 394
Brown quicksand	394— 413
Coarse gravel	413— 434
Pink sand and gravel	434— 462
Red slate	462— 472
Brown water sand	472— 508
Pink slate	508— 557
Brown sandy shale	557— 579
Brown sandstone	579— 597
Conglomerate	597— 601
Water; sandstone	601— 615

Water rose over 400 feet in hole; each bailer from 615 to 655 brought up light shows of oil. Cuttings at 615 show clear quartz sand, and cuttings at 650 show brick-red quartz sand.

Conglomerate	650— 704
Red slate	704— 710
Bangor lime	710— 716

	Feet
White slate	716— 770
Broken lime	770— 782
Cuttings show very fine blue sand	782— 885
Mixed lime and shale	885— 967
Water sand	967— 968
Brown slate	968—1022
Mixed lime and sand	1022—1034
Brown slate	1034—1140
Lime and sand	1140—1158
Black lime	1158—1190
White shale	1190—1212
White sand; hole filled with water	1212—1252
Black lime	1252—1286
White lime	1286—1298
Lime and shale	1298—1328
Brown slate	1328—1336
White sand	1336—1374
Black lime	1374—1398
Lime and sand mixed	1398—1440
Black lime	1440—1455
Black slate	1455—1462
White sand	1462—1475
Black lime	1475—1505
White sand	1505—1520
Black slate	1520—1540
Black lime	1540—1570
White lime	1570—1700
Black shale	1700—1735
White lime	1735—1750
Broken lime; very small seepage of strong salt water	1750—1780
Brown shale	1780—1810
White sand	1810—1870
Green slate	1870—1908
White sand	1908—1925
White lime	1925—1940
Broken lime	1940—1970
White slate	1970—2005
Black slate (Devonian)	2005—2090
White slate; show of gas	2090—2120
Black slate	2120—2160
Green slate (caving)	2160—2200
Green slate	2200—2240
Pink slate	2240—2250

	Feet
Green slate	2250—2356
Missing (probably green slate)	2356—2400
Gas sand (producing about five million cubic feet)	2402
Total depth	2412

Mr. H. D. Miser, of the United States Geological Survey, has expressed an opinion, from examination of the cuttings, that the well has not gone through the Carboniferous.

The Amory Petroleum Companny grew out of the reorganization of the Amory Oil & Gas Company and the Amory Syndicate. The Company's No. 1 Carter was drilled on a 16,000 acre block, centering around Section 7-13-17; it has a 6,000 acre block west of Amory, and a 12,000 acre block also. Each block calls for a 4,000 ft. test, unless commercial oil is found at a higher depth.

RYE NO. 1 WELL.

LOCATION—NW cor. NE¼ NW¼ of Sec. 22, Twp. 15, R. 17W., on farm of F. L. Rye, Monroe County, Mississippi
DRILLED BY—Natural Gas & Fuel Corporation,
DRILLING COMMENCED—March 30, 1927,
DRILLING COMPLETED—January 11, 1928,
Gas formation, 2691 to 2705 feet.
Est. prod. 5 mi. gas.

Surface sand and clay	0— 18
Sand and gravel	18— 55
Gumbo	55— 90
Water sand	90— 108
Gumbo and gravel	108— 148
Water sand	148— 178
Gumbo	178— 205
Water sand	205— 240
Sand and gravel	240— 265
Gumbo and gravel	265— 320
Water sand	320— 356
Red gumbo and gravel	356— 405
Rock	405— 406
Red and gray gumbo and gravel	406— 467
Sand and gravel	467— 555
Red gumbo; streaks of gravel	555— 580
Pink gumbo and gravel	580— 605
Gray lime rock; streaks of hard gray shale	605— 652
White lime rock	652—1141
Hard sandy lime	1141—1144
Sandy slate	1144—1154
Shells	1154—1155
Sand and shale in streaks	1155—1165

	Feet
Hard sandy slate; few shells	1165—1185
Hard sand	1185—1193
Dark slate; very little sand	1193—1204
Dark slate	1204—1261
Dark sandy slate	1261—1294
Hard coarse sand	1294—1308
Sandy; very little slate	1308—1328
Sandy slate and shale	1328—1486
Broken sand and slate	1486—1508
Slate	1508—1564
Sandy shale	1564—1627
Sand (cored, 1645; hard sand)	1627—1645
Fine hard sand, carrying a little salt water	1645—1651
Hard sharp sand	1651—1665
Hard sand	1665—1684
Water sand	1684—1693
Sand	1693—1725
Sandy slate	1725—1730
Sand	1730—1745
Sandy slate	1745—1777
Sandy slate; hard sand and shells	1777—1793
Shale; trace of sand	1793—1813
Sandy slate and shale	1813—1838
Slate	1838—1885
Sand	1885—1895
Slate	1895—1930
Sand	1930—2020
Slate	2020—2112
Hard sand	2112—2122
Slate	2122—2133
Slate, hard sand and shells	2133—2163
Sand and hard shells	2163—2192
Dark gray sand	2192—2215
Very hard sand—gas show	2215—2234
Hard dark sand; gray sandstone	2234—2275
Hard fine gray sand; water sand	2275—2287
Hard fine gray sand	2287—2305
Hard sandstone	2305—2318
Hard gray sand	2318—2348
Hard gray sand, dark	2348—2356
Hard gray sand, light	2356—2362
Hard dark gray sandstone; a little lime	2362—2375
Hard dark gray sand and lime	2375—2387
Hard sand	2387—2398
Hard sand, grayish brown	2398—2404
Hard gray sand	2404—2409
Sandy shale	2409—2422
Sandy slate	2422—2428

	Feet
Sandy slate and shale	2428—2432
Hard sandy slate—gas show	2432—2437
Sandy slate—gas show	2437—2447
Sandy slate	2447—2532
Hard sand	2532—2590
Salt water sand	2590—2603
Hard limy sand	2603—2612
Sand	2612—2622
Sandy lime	2622—2631
Dark slate	2631—2693
(Gas sand—est. 5 mi. gas)	2693—2705

The company kindly furnished this driller's log to the Survey.

RANKIN COUNTY

LIVINGSTON NO. 1 WELL.

LOCATION—SE¼ of NW¼ of Sec. 34, Twp. 3N., R. 3E., Near Belle Pine, Rankin County, Miss.
DRILLED BY—D'Lo Oil Corporation, D'Lo, Miss.
DRILLING COMMENCED—Nov. 8, 1926,
DRILLING COMPLETED—June, 1927,
DRILLER—Marlin Metz. Bowman Livingston in charge.

Driller's Log

Red sandy clay	0— 10
Water sand	10— 30
Green shale	30— 70
Hard sand	70— 85
Broken lime	85— 120
Sand and limy shale	120— 170
Water sand	170— 205
Shale	205— 225
Broken lime	225— 290
Water sand	290— 340
Lime with shells	340— 361
Shale	361— 390
Lignite, shale and water sand	390— 515
Lime shells	515— 525
Shale	525— 560
Shale and boulders	560—675
Green shale	675— 800
Streaks of chalk and shale	800— 820
Hard sand	820— 825
Gumbo	825— 845
Shale, with streaks of gumbo	845— 960
Same as above	960— 965
Sandy shale	965— 995
Shale, shell and sand	995—1020

	Feet
Same as above	1020—1120
Hard sand—cored	1120—1130
Hard sand	1130—1140
Lignite and sand	1140—1175
Sand and shale	1175—1216
Gumbo	1216—1290
Sand—cored; 14 ft. chalk	1290—1300
Some gas showing	1300—1314
Brown sandy shale	1314—1325
Sand, shell, shale—cored	1325—1345
Broken sand and shells	1345—1385
Sand and shale	1385—1400
Sticky shale	1400—1420
Sand	1420—1440
Gumbo	1440—1445
Lignite, sand, streaks of pyrite (Cored)	1455—1465
Same as above	1465—1475
Gumbo streaked with sand	1475—1485
Sand and shale	1485—1535
Sand and lignite	1535—1550
Red shale	1550—1570
Sand, lignite and pyrite (Cored)	1570—1580
Sand, lignite and pyrite	1580—1600
Red gumbo	1600—1620
Rock	1620—1621
Brown sand (Cored)	1621—1629
Sand	1629—1800
Gumbo	1800—1805
Sandy shale	1805—1810
Brown gumbo	1810—1900
Sandy shale (Cored)	1900—1950
Hard sandy shale	1950—1990
Fine brown sand (Cored)	1990—2000
Sandy shale	2000—2020
Sandy chalk (Cored)	2020—2021
Chalk	2021—2030
Brown gumbo	2030—2045
Sandy shale	2045—2050
Broken lime	2050—2055
Broken lime, sand, lignite and pyrites (Cored)	2055—2070
Brown gumbo	2070—2075
Lime, sand and pyrites (Cored)	2075—2080
Broken lime	2080—2083
Brown gumbo	2083—2090
Lime	2090—2091
Lime, sand, pyrites (Cored)	2091—2100
Brown gumbo	2100—2150

	Feet
Shale and boulders	2150—2166
Gumbo	2166—2195
Shale and boulders	2195—2210
Sandy shale	2210—2220
Shale and gumbo	2220—2260
Gumbo	2260—2275
Sandy shale	2275—2300
Hard chalk	2300—2303
Hard sandy chalk	2303—2325
Chalk and sandy shale	2325—2335
Chalk	2335—2340
Shale and gumbo	2340—2350
Packed sand	2350—2352
Hard sandy chalk, pyrites (Cored)	2352—2361
Broken chalk	2361—2375
Shale and gumbo	2375—2385
Broken chalk	2385—2400
Shale	2400—2410
Took core of lime	2410—2420
Broken lime and sand (Cored)	2420—2428
Broken lime	2428—2450
Hard shale	2450—2470
Green sand and pyrites, hard (Cored)	2470—2472
Green sand and pyrites (Cored)	2472—2481
White sand and pyrites	2481—2491
Sandy shale	2491—2515
Gumbo	2515—2530
Hard shale, streaks of sand	2530—2550
Hard sandy shale (Cored)	2550—2556
Shale and gumbo	2556—2580
Hard shale and sand	2580—2595
Hard sand (Cored) sand and pyrites	2595—2605
Hard sand and pyrites	2605—2623
Sandy shale	2623—2440
Shale and sand (Cored)	2640—2642
Shale, with streaks of sand	2642—2670
Blue shale	2670—2700
Sandy shale	2700—2725
Sand, lignite and pyrites (Cored)	2725—2735
Blue shale and gumbo	2735—2785
Hard sand and pyrites	2785—2799
Sand	2799—2810
Gumbo	2810—2820
Shale	2820—2830
Hard green sand, lignite and pyrites (Cored)	2830—2842
Same as above	2842—2850
Sandy shale	2850—2860

	Feet
Gumbo	2860—2872
Shale and sand	2872—2880
Hard sand and pyrites (Cored)	2880—2892
Green sand and pyrites (Cored)	2892—2898
Sand	2898—2910
Gumbo	2910—2920
Sandy shale	2920—2938
White sand	2938—2944
Lignite	2944—2964
Hard sand and shells	2964—2995
Brown sand and shells (Cored)	2995—3001
Same as above (Cored)	3001—3010
Shale	3010—3040
Rock	3040—3042
Hard lime and sand (Cored)	3042—3050
Gumbo	3050—3060
Sandy shale	3060—3070
Streaked lime, shale and sand	3070—3110
Blue shale	3110—3170
Gumbo	3170—3190
Hard sand and shale	3190—3214
Hard gray sand (Cored) 6 in. Oil sand	3214—3222
Green sand; shells (Cored); white sand and shale	3222—3230
Sand	3230—3236
Rock	3236—3237
White and green sand (Cored)	3237—3247
Sandy shale	3247—3260
Sand rock and pyrites	3260—3261
Sand and coarse shale (Cored)	3261—3270
Sandy shale	3270—3290
Rock	3290—3291
Hard shells and sand (Cored)	3291—3300
Sand	3300—3310
Sandy shale	3310—3358
Hard sand	3358—3360
Sand, lignite and pyrites	3360—3370
Slate shale	3370—3395
Gumbo	3395—3400
Hard rock	3400—3401
Hard sand and shale (Cored)	3401—3410
Shale	3410—3430
Hard sand and lignite (Cored)	3430—3442
Sandy shale	3442—3475
Broken lime	3475—3480
Sand, lignite and shale (Cored)	3480—3489
Sandy shale	3489—3510
Hard green sand (Cored)	3510—3519

	Feet
Sandy shale	3519—3550
Rock	3550—3551
Hard sand and lignite (Cored)	3551—3564
Sand and lignite	3564—3575
Shale	3575—3580
Sand rock	3580—3582
Hard sand and shale (Cored)	3582—3590
Hard sand and lignite (Cored)	3590—3609
Hard sandy shale	3609—3620
Lime	3620—3621
Hard gray sand (Cored)	3621—3625
Gray sand and shale (Cored)	3625—3633
Sandy shale	3633—3645
Shale and rock	3645—3655
Hard brown sand (Cored)	3655—3673
Brown sandy shale	3673—3700
Hard sand and shale (Cored)	3700—3715
Hard sand rock	3715—3718
Hard gray sand (Cored)	3718—3725
Broken sand	3725—3750
Lime rock	3750—3753
Sand and shells (Cored)	3753—3783
Shale, chalk and broken sand	3783—3845
Lime boulders, sand (Cored)	3845—3875
Sand, shells and lignite (Cored)	3875—3881
Shale, gumbo, some chalk	3881—3925
Shale	3925—3940
Broken sandy lime and shale	3940—3954
Lime and hard sand	3954—3956
Hard shell and sand	3956—3961
Sandy shale and gumbo	3961—3980
Broken sand	3980—4010
Sandy shale	4010—4020
Hard sand and shale	4020—4050
Hard sand and lime	4050—4055
Gumbo	4055—4070
Hard sand	4070—4074
Hard sand and shale (Cored)	4074—4080

Hole drilled to 4300′—bottom not available; no results. Hole junked.

SCOTT COUNTY

GRAHAM NO. 1 WELL.

LOCATION—NE¼ of SE¼, Sec. 21, Twp. 6, R. 8E., In Scott Co., Miss., 1 Mile S. of Forest.
DRILLED BY—Miss. Oil and Gas Trust Company.
DRILLING COMMENCED—December 13. 1923.
DRILLING COMPLETED—Summer of 1924.
DRILLER—D. T. Ellison.
ELEVATION—480 feet.

Jackson:

	Feet
Yellow clay	00— 40
Black gumbo	40— 75
Blue gumbo	75— 90
Sticky shale, sand and gumbo	90— 150
Sandy gumbo	150— 200
Blue gumbo	200— 240

Claiborne:

Sand, shells and lignite	340— 270
Sandy gumbo	270— 285
Hard sand and shells	285— 340
Sandy shale, shells and mica	340— 395
Packed sand, pyrites of iron	395— 430
Sandy gumbo	430— 472
Hard sand and green shale	472— 502
Sandy lime rock	502— 503
Gumbo	503— 515
Sand and boulders	515— 525
Loose sand, with fresh water	525— 575
Packed sand	575— 610
Hard sand and pyrites	610— 630
Loose sand and shale	630— 642
Hard sand, shells and pyrites	642— 700
Hard sandy lime and pyrites	700— 825
Green and brown sand—showing of gas	825— 837
Gumbo	837— 848
Rock	848— 849
Sandy gumbo	849— 895
Rock—showing gas	895— 896
Brown sticky shale	896— 915
Tough gumbo	915— 980
Sand and shells; core showed dark gray sand, full of shells	980— 988
Sand and rock	988— 991
Hard brown and green shale	991— 994
Hard rock, sand and pyrites	994— 997
Shale and boulders	997—1035

	Feet
Brown and green sand	1035—1042
Packed sand and boulders	1042—1074
Shale and decomposed shells	1074—1082
Hard sand and boulders	1082—1120
Gumbo	1120—1128
Shale, boulders and hard green sand	1128—1171
Green sand and boulders, cored	1171—1172
Hard sand and shells	1172—1208
Gummy shale	1208—1235
Cored shale and sand	1235—1236
White sand and shale	1236—1300
Soft shale	1300—1350
Gumbo	1350—1360
Sandy shale	1360—1490
Gumbo	1490—1500

Wilcox:

Fine sand, shale and lignite	1500—1520
Cored shale, sand and lignite	1520—1521
Soft shale, sand and lignite	1521—1580
Gumbo	1580—1592
Sandy shale	1592—1620
Hard sand and shale	1620—1645
Gumbo	1645—1660
Sand and shells	1660—1666
Cored soft sand	1666—1667
Sand, shale and shells	1667—1700
Gumbo and boulders	1700—1715
Brown sand and shale	1715—1745
Sand, shale and shells	1745—1766
Gumbo	1766—1788
Sand	1788—1792
Cored soft sand	1792—1793
Hard sand	1793—1803
Cored sand and lime; showing gas and oil	1803—1804
(Set 1800′ of 8¼ in. casing; 2-5-24)	
Sandy shale	1804—1819
*Gray slightly arenaceous and micaceous clay; a little lignite	1805—
Gumbo	1819—1834
Lignite, black, arenaceous, argillaceous	1834—1842
Gumbo	1842—1850
Gummy shale	1850—1864
*Lignite, arenaceous, argillaceous	1864—1866
Lignite	1865—1869
Soft shale	1869—1874
Hard lime rock	1874—1876
Sticky shale and gumbo	1876—1892

	Feet
Sticky shale	1892—1908
Soft lignite	1908—1911
Soft brown shale	1911—1930
Soft shale and lignite	1930—1950
Gumbo	1950—1970
Soft shale	1970—2025
Lignite	2025—2029
Shale	2029—2036
Gumbo	2036—2048
Brown shale	2048—2056
Hard sandy lime	2056—2060
Soft shale	2060—2074
Gumbo	2074—2078
Shale	2089—2094
Gumbo	2094—2114
Shale	2114—2135
Lime rock	2135—2137
Sticky shale	2137—2142
Rock	2142—2143
Shale	2143—2153
Gumbo	2153—2205
Sandy shale	2205—2232
Gumbo	2232—2260
Shale	2260—2266
Shale and boulders	2266—2270
Sand	2270—2274
Cored; sand showing fresh water	2274—2278
Loose sand	2278—2305
Sand and boulders	2305—2310
Sand, brown and green	2310—2315
Sand; cored	2315—2316
Hard sand	2316—2335
Gumbo	2335—2346
Sandy shale and shells	2346—2356
Gumbo and gypsum	2356—2376
Sandy shale	2376—2390
Gumbo	2390—2405
Sand and shells	2405—2422
Gumbo and boulders, showing mica	2422—2432
Tough gumbo	2432—2475
Packed sand	2475—2481
Gumbo	2481—2516
Hard sand, shale and boulders	2516—2525
Hard lime, with shells	2525—2550
Gummy shale	2550—2566
Hard sandy shale	2566—2576
Hard sandy chalk, gumbo and lignite	2576—2587
Cored; gumbo, sand and chalk	2587—2588

	Feet
Hard sand	2588—2620
Shale	2620—2625
Hard white sand (water sand?)	2625—2655
Hard white sand, sharp	2655—2714
Chalk ?	2714—2735
Gumbo, chalk and shale (gray, blue and black) (as given)	2714—2740
Soft chalk and lignite	2740—2750
Hard sand	2750—2765
Soft brown chalk, shale and lignite	2765—2769
Cored; brown shale, chalk and lignite	2769—2770
*Chalk, shale and lignite	2770—2792
Sand, shale and lignite (chalky)	2792—2855
Fine gray sand	2855—2870
Brown and gray sand	2870—2890
Hard white sand	2890—2930
Chalky sand, shale and lignite	2930—2948
Fine gray sand and lignite	2948—2960
Hard gray sand	2960—2988
Lignite	2988—2992
Gumbo and boulders	2992—3004
Gumbo	3004—3012
Shale, lignite and sand	3012—3034
Sand rock	3034—3035
Shale and chalk	3035—3047
Gumbo	3047—3058
Shale	3058—3074
Lignite	3074—3080
Sandy shale	3080—3094
Shale, sand and lignite	3094—3110
Hard sand	3110—3126
Lignite	3126—3130
Hard sandy shale	3130—3148
Hard lime rock	3148—3150
Rock	3150—3155
Shale and lignite	3155—3168
Gumbo	3168—3176
Hard sandy shale	3176—3228
Sand	3228—3234
Shale and lignite	3234—3242

Midway:

Hard shells and lime	3242—3247
*Shale and shells	3247—3250
*Hard rock	3250—3258
Lime rock, showing shells	3258—3264

	Feet
Shale, showing shells	3264—3276
Tough gumbo	3276—3296
Gummy shale	3296—3320
Lime rock, very hard	3320—3322
At 3320 the drill struck very hard rock, going down only 4" in 8 hours.	
Gumbo	3322—3330
Gummy shale	3330—3336
Tough gumbo	3336—3360
Lime shells and gumbo	3360—3366
Gumbo	3366—3376
Gummy shale	3376—3380
Lime rock	3380—3381
Light, bluish-gray limy shale	3381—3386
Lime rock	3386—3387
Gumbo	3387—3410
Gumbo and boulders	3410—3430
Shale and shells	3430—3447
Tough gumbo	3447—3455
Gumbo and gypsum	3455—3460
Shale and fine shells	3460—3490
*Hard shale, dark gray, noncalcareous	3480—
Gumbo	3490—3497
Shale	3497—3535
Hard dark gray shale	3535—3545
Lime rock	3545—3559
Shale	3559—3565
Shale and boulders	3565—3590
Shale, lime shells, and boulders	3590—3680
Soft fine black shale	3680—3690
Broken lime rock	3690—3693
Shale and boulders	3693—3698
Shale	3698—3720
Shale and boulders	3720—3740
Soft, coarse shale, lime and boulders	3740—3804
Lime rock	3804—3805
Coarse shale, lime and boulders	3805—3880
Gummy shale	3880—3890
Very soft shale (June 26/24)	3890—3910
Selma:	
Shale, lime, pyrites	3915—3935
Chalk (Selma)	3935—4270
(Still in chalk, 12-13-24; closed down; showing gas)	

*At 4050′ strong odor of gas, as at 1800′.

The following data were given to the Survey by C. H. Dorchester, of the Gulf Refining Co.

	Feet
Top of chalk	3935—4140
Hard chalk	4140—4270
Hard gray chalk	4270—4425
Shale, chalk (core)	4425—
Shaley chalk	4425—4440
Blue chalk (core)	4440—
Blue, shaley, sticky chalk; no sand	4460—
Hard chalk	4460—4505
Hard chalk (core)	4505—
Hard chalk	4505—4550
Shaly chalk, shells and shale	4550—4650
Shaly chalk (core)	4650—
Hard gray chalk	4650—4750
Hard gray chalk (core)	4750—
Limy shale and shells	4750—4840
Hard chalk	4840—4900
Limy shale (small per cent. of sand	4900—4960
Hard dark gray shaly chalk	4960—5041
Hard dark gray shaly chalk (core)	5041—
Selma Chalk	5041—5100

Eutaw:

Hard sands, with streaks of soft, light-colored sands	5100—5240

"Core at 5110, dark gray, fine-grained sand, cemented by a gray calcareous clay. Washed gray, fairly well sorted; mostly fine, sub-angular, polished quartz; mica abundant; glauconite and pyrite common; age indeterminable."

Total Depth ..... **5240 feet.**

*These are inserted from letters received from the manager of the drilling during the progress of the work.

The above log is the drillers log. The few cores and cuttings in the possession of the Survey were used in the correlation.

(Notes on study of some cores from the above well made by the State Geologist, at the office of the State Geological Survey).

Core at 4325′: Chalk, Selma; sandy, slightly darker.

Core at 4460′: Hard, medium gray; argillaceous, a few fossil casts and traces of shell; pyrite.

Core at 4525′: Hard, rather light-gray chalky shale; forams fairly abundant; Selma.

Core at 4650′: Softer, dark gray gumbo.

Core at 5041′: Chalk (?), darker; slight reaction for petroleum.

The following determinations by A. L. Selig, of Shreveport, La., furnished to the Survey by Mr. W. C. Eastland of Forest, Miss., have also been used in making the above correlations.

4140′ Core. Consisting of soft white chalk. Washed-chalk particles containing disseminated pyrites with a few inocerami prisms, and a fair-sized fauna of foraminifera.

Textularia globulosa.
T. striata.
Verneuillina sp.
Bulimina obliqua.
B. murchisoniana.
Cristellaria sp.
Uvigerina cristata.
Globigerina cretacea.
Orbulina universa.
Truncatulina nitida.
Anomalina ammonoides.
Pulvinulina voltziana.
Rotalia umbilicata.

Age—Middle Selma, approximately equivalent to the Marlbrook of Louisiana and Arkansas.

4278′ Core. Sample consists of a small core and bit sample (?) of hard, white granular chalk. Washed. A few inocerami prisms, small ostracods, echinoid fragments, and a small fauna of foraminifera.

Textularia globulosa Ehrenberg.
T. striata Ehrenberg.
Bolivina incrassata Reuss.
Bulimina obesa Reuss.
N. murchisoniana d' Orbigny.
Gaudryina crassa var. trochoides.
Cristellaria sp.
Nodosaria cf. filiformis d'Orbigny.
Globigerina cretacea d'Orbigny.
Pullenia quinqueloba Reuss.
Truncatulina ungeriana d'Orbigny.
Truncatulina sp.
Anomalina grosserugosa Gumbel.
Pulvinulina micheliniana d'Orbigny.
Rotalia exsculpta Reuss.
R. umbilicata d'Orbigny.

Age—Middle Selma Chalk, equivalent to the Annona of Louisiana and the middle Taylor marl of Texas.

4325′ Core. Sample consists of a core of fairly hard, medium gray argillaceous chalk containing a few fragmentary fossils. The washed residue consists of large numbers of inocerami prisms, ostracods, and foraminifera. The microfuna is rather unusual, in that Textularia globulosa Ehrenberg and T. striata Ehrenberg are quite rare, although usually very abundant in this formation.

Textularia globulosa Ehrenberg.

Bolivina incrassata Reuss.
Guadryina crassa Marsson.
Verneullina sp.
Clavulina tricarinata d'Orbigny.
Bulimina obesa Reuss.
Allomorphina cf. contraria Reuss.
Lagena globosa Montagu.
Lagena sp.
Nodosaria zippei Reuss.
Cristellaria orbicula Reuss.
Frondicularia sp.
Globigerina cretacea d'Orbigny.
Truncatulina falcata Reuss.
T. ungeriana d'Orbigny.
Anomalina ammonoides Reuss.
A. grosserugosa Gumbel.
Pulvinulina voltziana d'Orbigny.
P. micheliniana d'Orbigny.
Rotalia exsculpta Reuss.
R. umbilicata d'Orbigny.
R. cf nitida d'Orbigny.

Age—Middle to lower Selma Chalk, lower Annona of La., and middle Taylor of Texas.

4750′ Core. Sample consists of hard, medium gray, somewhat chalky shale having a roughly conchoidal fracture. Washed—A few ostracods, inocerami prisms, and many foraminifera.

Textularia globulosa Ehrenberg.
T. striata Ehrenberg.
T. badouiniana d'Orbigny.
Gaudryiana sp.
G. cf. rugosa d'Orbigny.
Clavulina parisiensis d'Orbigny.
C. tricarinata d'Orbigny.
Bulimina obesa Reuss.
B. obliqua d'Orbigny.
Lagena acuticosta Reuss.
Cristllaria cultrata Monfort.
C. cf. Italica deFrance.
Sagraina cretae Ehrenberg.
Globigerina cretacea d'Orbigny.
Truncatulina ungeriana d'Orbigny.
Truncatulina sp.
Pulvinulina micheliniana d'Orbigny.
P. voltziana d'Orbigny.
Rotalia umbilicata d'Orbigny.

Age—Lower Selma, from 150′ to 200′ above the Tombigbee Sand.

TALLAHATCHIE COUNTY

BARDWELL NO. 2. WELL.

LOCATION—SW¼ of SW¼ of Sec. 32, T. 26, R. 3E., about ¼ mile NE of Bardwell No. 1 (6 mi. NE of Charleston)
DRILLING COMMENCED—Sept. 23, 1926,
DRILLING COMPLETED—Feb. 21, 1927 (Abandoned).
DRILLED BY—Tallahatchie Oil Company, Tallahatchie Co. Miss.,
ELEVATION—300 feet.
CASING—10" Casing 139'
— 8" Casing 2167'

Wilcox:

	Feet
Red clay	0 — 25
Sand and gravel	25 — 50
Clay	50 — 65
Blue clay	65 — 88
Gumbo	88 — 98
Blue clay	98 — 112
Gummy shale	112 — 160
Rock	160 — 160½
Shale	160½— 300
Sand and boulders	300 — 320
Shale and boulders	320 — 400
Sand and boulders	400 — 424
Sand	424 — 445
Shale and boulders	445 — 480
Gumbo	480 — 500
Sand	500 — 530
Gumbo	530 — 536
Sand	536 — 596
Shale	596 — 645
Shale, gummy	645 — 655
Gumbo	655 — 675
Shale	675 — 715
Shale, gummy	715 — 755
Shale	755 — 780
Shale and sand	780 — 800
Packsand and gumbo or soapstone	800 — 810
Streaks of shale and sand	810 — 836
Shale	836 — 900
Shale, gummy	900 — 920
Shale, sandy	920 — 933
Shale, gummy	933 — 965
Shale and boulders	965 —1005
Shale, gummy	1005 —1015
Shale	1015 —1035
Gumbo	1035 —1080

	Feet	
Shale	1080	—1110
Shale and sand	1110	—1160
Shale, gummy	1160	—1168
Gumbo	1168	—1189
Shale and boulders	1189	—1250
Gumbo	1250	—1280
Rock	1280	—1282
Shale	1282	—1320
Midway:		
Sandy shale	1320	—1330
Rock	1330	—1331
Gumbo	1331	—1349
Rock	1349	—1350
Gumbo	1350	—1459
Rock	1459	—1460
Gumbo	1460	—1504
Rock	1504	—1505
Shale, gummy	1505	—1515
Rock	1515	—1516
Shale, gummy	1516	—1546
Rock	1546	—1547
Gumbo	1547	—1568
Rock	1568	—1570
Shale, gummy	1570	—1650
Gumbo	1650	—1705
Rock	1705	—1707
Shale, hard and gummy, with streaks of sand	1707	—1738
Gumbo, hard	1738	—1791
Shale, hard and gummy; boulders	1791	—1820
Gummy shale, and boulders	1820	—1835
Gumbo	1835	—1880
Shale; gas show; limy shale	1880	—1890
Gumbo	1890	—1915
(Some glauconite, about 1900')		
Shale	1915	—1920
Rock, thin	1920	—1921
(Some bentonite at 1900')		
Shale	1921	—1930
Gumbo; black-gray shale	1930	—1978
Cretaceous Selma		
Sandy lime (core)	1992	
Lime	1992	—2000
Chalk rock (core; Arkadelphia)	2000	—2005
Lime	2005	—2088
Gumbo	2088	—2096
Hard lime and shale	2096	—2124
Shale, sandy, and gas	2124	—2131

		Feet
Sandy lime	2131	—2145
Sandy shale	2145	—2155
Sandy lime	2155	—2160
Sand, soft and white	2160	—2161
Sand and shale in streaks	2161	—2165
Hard lime rock	2165	—2167
Hard black, limy, sandy shale	2167	—2180
Hard sandy shale, with Gas and Oil showing	2180	—2219

(Note: Set 8" casing at 2167'; bailed dry, Dec. 1, 1926, without any showing of gas or oil. Had 90' of liner in the hole.)

Sandy shale, with streaks of lime	2219	—2221
Sand, with streaks of lime	2221	—2236
Sand, very fine-grained; bailed dry	2236	—2238
Sand and lime; Oil show	2238	—2255
Sand; more Oil and Gas; 6' of paraffin. Mr. Easton has core	2255	—2261
Black wax—oil residue at	2264	
Lime, gummy	2264	—2273
Hard sand	2273	—2275
Sand and wax	2275	—2291
Sandy shale, or marl	2291	—2311
Gumbo	2311	—2339
Hard Selma Chalk	2355	—2357
Sandy shale	2357	—2389
Chalk, gummy	2389	—2399
Selma Chalk; drills like sandy shale	2399	—2486
Chalk, tough and gummy	2486	—2516
Chalk	2516	—2590
Chalk and pyrites	2590	—2596
Hard chalk	2596	—2631
Hard sandy shale, and sandy lime	2631	—2652
Sandy lime	2652	—2676
Dry sand	2676	—2719
Gummy lime	2719	—2734

Abandoned at 2734'—Total depth.

February 21, 1927.

Mr. H. D. Easton, of Shreveport kindly furnished the Geological Survey with the above log, and a few cuttings from the well. The Survey also has in its files the determinations made by Miss Elisor, of the Humble Oil Company, on some of the cuttings from the well. This information has been used in working up the correlation of the log. As the data were very meager, the correlation is only a tentative one.

WASHINGTON COUNTY

SOLITAIRE NO. 1 WELL.

LOCATION—100 yards south of Williams No. 3 Well, near Glen Allan, Washington County, Miss.
DRILLER—Charles Perkins,
ELEVATION—120 ft. (approximately).

	Feet
Soft gumbo, sand	0— 30
Sand	30— 65
Sand and logs	65— 90
Sand	90— 190
Soft gumbo	190— 200
Sand	200— 230
Sand and lignite	230— 300
Light blue shale	300— 315
Sand and lignite	315— 440
Shale and boulders	440— 456
Brown gumbo and boulders	456— 500
Sand and boulders	500— 510
Soft brown gumbo	510— 600
Gumbo and boulders	600— 680
Water sand; artesian flow	680— 760
Soft mud	760— 780
Water sand; artesian flow	780— 865
Brown gumbo; boulders	865— 880
Sand and boulders	880— 905
Gumbo	905— 960
Sand	960—1025
Sandy gumbo	1025—1100
Packed mud	1100—1132
Sand and rock	1132—1135
Blue gumbo	1135—1190
Sand and shale	1190—1214
Soft gray shale	1214—1222
Sand and boulders	1222—1238
Sand rock	1238—1247
Broken sand rock	1247—1265
Brown sand rock	1265—1272
Blue gumbo	1272—1285
Sand rock	1285—1288
Blue sandy gumbo	1288—1376
Gumbo and boulders	1376—1412
Brown rock	1412—1414
Gumbo and boulders	1414—1510
Chalk rock	1510—1540
Chalky shale	1540—1580
Chalky shale with hard streaks of shale	1580—1600

	Feet
Tough gumbo, sandy	1600—1630
Hard gray shale, with hard streaks of sand	1630—1655
Sandy gumbo	1655—1690
Hard sand rock	1690—1693
Sandy gumbo	1693—1720
Sandy gumbo and boulders	1720—1745
Packed sand	1745—1768
Shale and pyrites	1768—1833

Drilling down to 2,200 feet, but log completed only to above depth.

WEBSTER COUNTY

HENSLEY NO. 1 WELL.

LOCATION—NW¼ of Sec. 15, Twp. 21N., R. 11E., Webster County, Mississippi.

DRILLED BY—The Cumberland Oil Company,

Wilcox:

Yellow sandy surface clay	0— 30
Gray micaceous sandy shale	30— 125
Loose yellow sand	125— 127

Midway:

Shale, dark gray, slightly sandy	127— 450
Shale, gray, very sandy	450— 468
Shale, gray, micaceous, very fine grains	468— 530

Cretaceous

Ripley/Selma:

Gray micaceous sandy shale, slightly limy	530— 545
Hard gray limy shale	545— 575
Sandy limy shale	575— 600
Loose gray, limy, sandy shale, glauconitic	600— 690
Gray, limy silty sand	690— 704
Gray, limy, very silty sand	704— 725
Gray, limy, shaly sand	725— 890
Gray, limy, sandy shale	890— 950
Gray, limy, silty shale	950— 990
Gray silty marl	990—1020
Gray, slightly silty marl	1020—1050
Soft, chalky, gray shale, slightly silty	1050—1100
Gray chalk, shaly	1100—1330
Gray, limy, silty sand	1330—1350
Gray shale, limy, silty	1350—1440

	Feet
Gray, non-limy, silty sand	1440—1460
Gray, limy sand	1460—1467
Gray, limy shale	1467—1485
Eutaw:	
Gray, limy, silty sand	1485—1495
Gray, limy, silty sand	1495—1512
Green-gray, limy, silty sand	1512—1600
Non-limy gray shale	1600—1606
Gray, non-limy shale and green sand	1606—1650
Gray shale; loose sand, partly limy. (Eutaw)	1650—1670
Hard quartzite; fragments of pyrite and limy shale	1680

(Well still drilling, March 16, 1928)

Log constructed on basis of cuttings in possessions of the Geological Survey. These cuttings kindly furnished by Mr. F. B. Bays, Woodland, Miss.

YAZOO COUNTY

FREE RUN NO. 2 WELL.

LOCATION—Farm of I. S. Reed, in SE¼ of NE¼ of Sec. 25, Twp. 13N., R. 1W., Yazoo County, Miss.
DRILLED BY—The Free Run Oil Company,
DRILLING COMMENCED—May, 1926,
DRILLER—W. M. Young,

Surface loam	0— 20
Blue sand	20— 40
Soft yellow clay	40— 50
Sand and gravel	50— 348
Coarse water sand	348— 380
Gravelly clay	380— 392
Tough gumbo	392— 750
(Set 8" casing 403 ft. in gumbo)	
Good water sand	750— 770
Blue shale	770—1020
Soft lime rock	1020—1022
Tough gumbo	1022—1300
Blue shale	1300—1340
Soft lime rock	1340—1348
Very tough gumbo	1348—1400
Wilcox:	
Limy sand rock—formation looks promising	1400—1440
Hard sandy shale	1440—1500
Gumbo	1500—1540
Blue shale	1540—1680

	Feet
Water sand—artesian flow	1680—1740
Blue Shale	1740—1750
Water sand, very coarse	1750—1800
Hard shale	1800—1810
Water sand, almost artesian flow	1810—1860
Blue shale, soft	1860—1980
Lime rock, very hard	1980—1981
Black shale	1981—2020
Very coarse water sand, Artesian flow; muddied off	2020—2100
Green shale	2100—2160
Lignite	2160—2170
Blue shale	2170—2210
Hard sand rock	2210—2212
Lime rock	2212—2252
Hard lime and pyrites rock	2252—2254
Hard shale, with chalk and boulders	2254—2400
Midway:	
Chalk rock	2400—2420
Hard sandy shale	2420—2440
Chalk rock	2440—2442
Hard limy shale	2442—2452
Chalk rock	2452—2455
Limy shale, very hard	2455—2461
Chalk rock	2461—2466
Hard shale and boulders	2466—2495
Shale that was full of lime	2495—2521
Chalk rock	2521—2524
(Sulphur cuttings)	
Very hard sandy shale	2524—2544
Chalk rock	2544—2585
Hard shale	2585—2595
Hard chalk and pyrites	2595—2600
Gas rock	2600—2602
Chalk rock, streaked with asphalt	2602—2655
Gummy shale and boulders	2655—2700
Hard sand, showing rainbow of oil	2700—2714
Greenish-gray, sandy shale	2714—2720
Hard green sand (Aug. 10, 1926)	2720—2721

The above driller's log was furnished the State Geologist by Mr. I. S. Reed, who also furnished several cuttings from the well. These cuttings were used in correlating the log by R. E. Grim.

For a more complete discussion of the material contained in these cuttings, see page 13.

N. B. The Geological Survey is indebted to Mr. R. S. Withers who kindly supplied some of the drillers' logs herein given. The correlations are made by R. E. Grim.

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