BASTROP COUNTY

E. H. SELLARDS

Bastrop County is located on the Colorado River near the west margin of the Gulf Coastal Plain. Its principal mineral resources are clay, lignite, sand and gravel, petroleum, and surface and underground water. The Missouri, Kansas, and Texas and the Southern Pacific railroads cross the county. Its public road system includes Highways Nos. 20 and 71, and lateral roads. The elevation on the Colorado River at the west county line approximates 375 feet, and at the east county line 275 feet. The elevation of the upland is from 350 to 600 feet.

STRATIGRAPHIC GEOLOGY

Bastrop County is chiefly in the belt of Tertiary formations, there being no more than a limited exposure of the uppermost Cretaceous. The Tertiary formations exposed are the Midway, Indio, Carrizo, Mt. Selman, Cook Mountain and Yegua. Each of these formations forms an outcropping belt across the county. The Midway belt, which is narrow, lacks but little coinciding with the west margin of the county. The Indio, Mt. Selman, and Cook Mountain formations lie at the surface in broad, approximately parallel, belts. The Carrizo forms a narrow belt passing through the central part of the county. The Yegua is at the surface at and beyond the east margin of the county. The surface distribution of the formations is roughly indicated on the accompanying sketch map (Fig. 2). Overlying the Tertiary formations are extensive accumulations of Pleistocene terrace gravel, sands, and loams. Alluvial deposits occupy the valley of Colorado River and tributary streams. Un-

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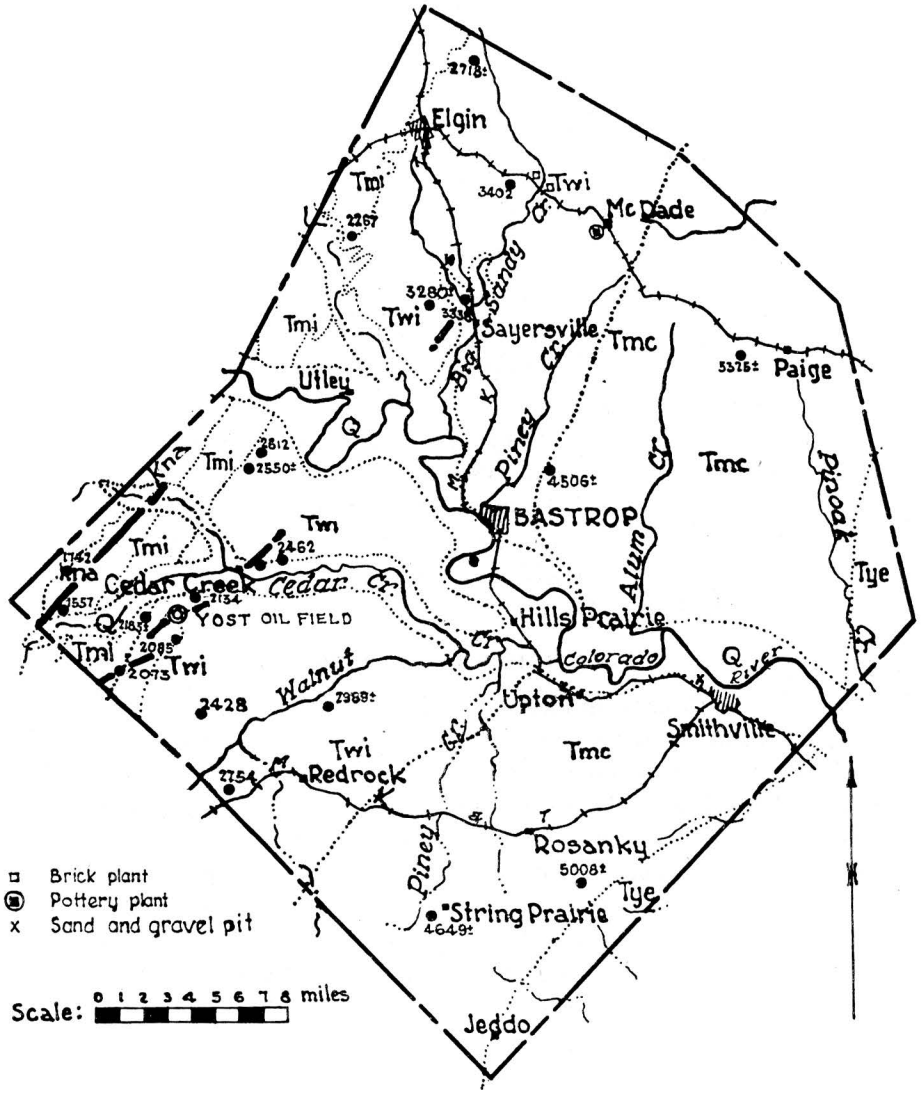

Fig. 2. Map of Bastrop County showing formation contacts and well locations. The contact between the Wilcox group (Twi) and the Mt. Selman–Cook Mountain formations (Tmc) is from notes supplied by Dr. E. Jablonski.

Map entries accompanying wells give depth to the Edwards. To obtain depth to other formations interpolate from table given on pages 20 and 23. Where the Edwards was not reached, the depth is estimated from other wells.

Key to wells, location of which is shown on map: 1557, Wolf; 1742, Starke; 2073, G. A. Smith; 2085, Trigg; 2134, Watts; 2185±, Barnett; 2267, Lane; 2428, Calloway; 2462, Litton; 2550±, Hicks; 2612, Garza; 2718±, Brundage; 2754, Doherty; 2989±, Lehman; 3280, Bell; 3402, Ramsey; 3338±, Evans; 4506±, Cherry; 4649±, Ott; 5008±, Freytag-Valenta; 5325±, Wichman.

derneath the Tertiary deposits are the Cretaceous formations which are encountered in well drilling. The uppermost Cretaceous formation, Navarro, is exposed at the west margin of the county.

Although not exposed at the surface, serpentine is known to occur at several places in the county. A serpentine plug is the reservoir holding the oil in the Yost field, and has been recognized in wells drilled on the Trigg ranch. The serpentine at both of these localities lies on the Austin chalk and is overlain by the Taylor.

The graphic logs of figure 3 afford a geologic section across the county. The location of the section is indicated on the small insert map, the section being taken from wells A to E. The extent to which the drillers' logs are supported by samples, cuttings, and cores, is shown by the entry at the side of each log.

FORMATION CHARACTERISTICS AND THICKNESSES

The surface formations in this county as already stated are those of the Tertiary and uppermost Cretaceous. Underneath these formations, well drilling has penetrated Cretaceous formations to the Edwards. In the table which follows, the formations are listed in order including their thickness in wells. The considerable variations listed are doubtless in part due to defective records, but are also in part actual. In general the formations thicken southeastward (down the dip) and northeastward (with the strike). To this rule, however, there are exceptions. The Buda, for instance, thins northward.

The Edwards formation, as indicated by cores, is porous and often dolomitic (Evans, Garza, Hicks, Lane, Litton, G. A. Smith, and Watts wells) and at some localities is bituminous (Garza well). Milliolinidæ are abundant fossils. Near the top of the formation are soft strata corresponding probably to the "dobie" of the Luling oil field (Lane and Watts wells). The color is white or brownish with some darker colored layers. Occasionally layers are found which are largely crystalline and compact (B. K. Smith well).

Table of formations

Yegua	Not fully exposed and thickness undetermined	Chiefly clay, some sand
Cook Mountain and Mt. Selman	Combined thickness about 2,000 feet, estimated from Freytag-Valenta and Ott wells	Shell marls, glauconitic sand and clays and iron Cemented sands
Wilcox group (Indio and Carrizo formations)	1,200 or 1,500 (Ott) 2,000± (Cherry)	Alternating sands and clays
Midway	282 + (Lane); 422? (McCall)	Clays and shell marl
Navarro	528 + (Ott); 557[1] (Litton)	Clay and marl
Taylor	885[2] (Litton); 1,055 (Lehman)	Clay, marl, and chalk
Austin	288 (Trigg); 336 (Barnett); 243 (Litton); 406 (Evans)	Limestone and chalk
Eagle Ford	37 Trigg; 25 (Lane); 37 (Hicks); 39 (Garza); 45 (Doherty); 54 (Ramsey)	Clay with hard ledges
Buda	65 (Trigg); 58 (Lane); 57 (Watts); 35 (Hicks); 31 (Ramsey); 51 (Hendricks)	Hard limestone
Del Rio	55 (Trigg); 53 (Watts); 34 (Hicks); 56 (Hendricks); 57 (Ramsey)	Clay with hard ledges
Georgetown	70 (Trigg); 98 (Watts); 96 (Litton); 90 + (Hicks); 95 (Doherty); 95 (Garza)	Limestone
Edwards	Thickness not determined in this county	

No wells having been drilled through the Edwards, its thickness in this county is unknown. In Travis County west of Bastrop where the formation outcrops it is about 300 feet thick. The Cretaceous formations below the Edwards in Bastrop County are probably between 2000 and 3000 feet thick, the whole Cretaceous being 4000 or 5000 feet thick.

Group Thicknesses.—Where individual formation thicknesses cannot be accurately determined, group thicknesses

[1]For records of wells, see pp. 29–37.

[2]May be in excess of this thickness. See individual records of wells.

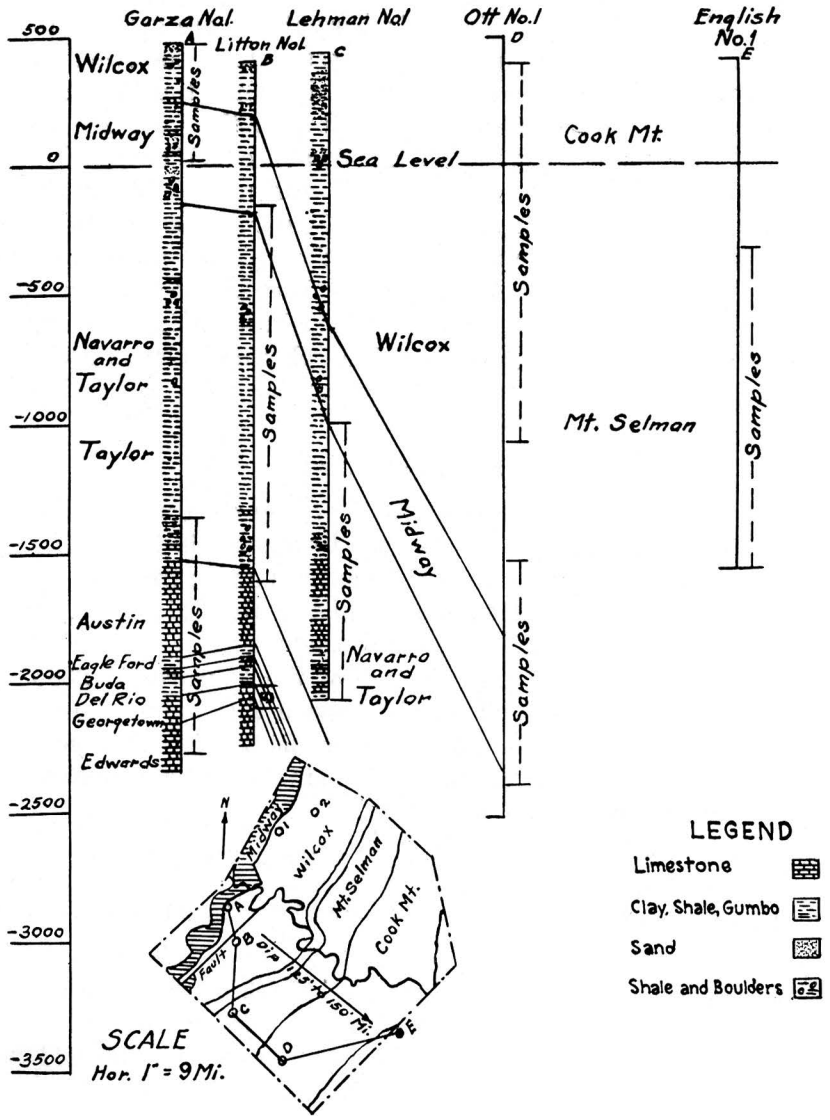

Fig. 3. Geologic section from northwest to southeast across Bastrop County. Location of wells indicated on the small insert map. Spacing of wells in the section is on the horizontal scale of 1 inch=9 miles; vertical scale, 1 inch=750 feet.

can often be used advantageously. In well records, the Mt. Selman and Cook Mountain formations are difficult to separate, although an approximate estimate of the two formations may occasionally be obtained. Thus the Freytag-Valenta well which starts near the top of the Cook Mountain formation reaches the Indio at or above 2057 feet. The Ott well which starts near the Mt. Selman-Cook Mountain contact is possibly through the Mt. Selman at 800 or 1075. The Mt. Selman, Carrizo, and Indio formations in this well have a thickness of 2340 feet. The Tertiary section from the base of the Yegua to the top of the Midway in the eastern part of this county south of the Colorado River is probably 3000 feet thick, or if the Midway be included, is 3300 feet more or less.

VARIATION IN THICKNESS

The formations, as already indicated, vary considerably in thickness. Usually where one formation is below the average in thickness, others of the series above the Georgetown will also show thinning. Thus in the Trigg well in the southwest part of the county, the entire interval from the base of the Wilcox to the top of the Edwards is 2085 feet. In the Evans well which shows a thickening of formations, the same interval is at least 2491 feet. The several formations so far as they can be individually compared in these two wells are as follows:

Midway, Navarro, Taylor: Trigg 1,570; Evans 1,708.
Austin: Trigg 288; Evans 406.
Eagle Ford, Buda, Del Rio, Georgetown: Trigg 227; Evans 367.

South of the Colorado River the Wilcox group is probably 1200 or 1500 feet thick (Ott well). North of the Colorado River this group is seemingly much thicker. Thus the Evans well near Sayersville which is located near the middle of the Wilcox belt contains 847 feet of Wilcox and the Cherry well located near the Wilcox-Mt. Selman contact apparently has about 2000 feet of the Wilcox.[3]

[3]There is some doubt as to the accuracy of samples from this well so that this estimate of the Wilcox lacks verification.

Other formation thicknesses in this county so far as they can be determined from drillers logs with the aid of such samples as have been seen are given in the following table. By comparing the location of the wells (Fig. 2) it will be seen that in general and with some exceptions formation groups thicken down the dip and northward along the strike.

Table of thickness of formation groups

Midway, Navarro, and Taylor: 1,570 (Trigg); 1,558 (Barnett); 1,708 (Evans); 1,785 (Ott).

Midway, Navarro, Taylor, and Austin: 1,858 (Trigg); 1,894 (Barnett); 1,997 (Lane); 2,071 (Garza); 2,114 (Evans).

Midway, Navarro, Taylor, Austin, and Eagle Ford: 1,890 (G. A. Smith); 1,895 (Trigg); 2,022 (Lane); 2,110 (Garza).

Midway to Buda, inclusive: 1,960 (Trigg); 2,080 (Lane).

Midway to Del Rio, inclusive: 2,015 (Trigg); 2,227 Garza); 2,090 (Barnett).

Midway to Georgetown, inclusive: 2,073 (G. A. Smith); 2,085 (Trigg); 2,267 (Lane); 2,322 (Garza); 2,481 (Evans).

Navarro and Taylor: 1,442 + (Litton); 1,390 + (Ott).

Navarro, Taylor, and Austin: 1,685 + (Litton); 1,715 (Lane).

Navarro to Del Rio, inclusive: 1,807 (Litton).

Navarro to Georgetown, inclusive: 1,904 (Litton); 1,742 (Starke).

Austin and Eagle Ford: 325 (Trigg); 386 (Ramsey).

Austin, Eagle Ford, and Buda: 390 (Trigg); 417 (Ramsey).

Austin to Del Rio, inclusive: 435 (Trigg); 365 (Litton); 474 (Ramsey).

Austin to Georgetown, inclusive: 505 (Trigg); 462 (Litton); 530 (Ramsey).

Eagle Ford and Buda: 102 (Trigg); 72 (Hicks).

Eagle Ford, Buda, and Del Rio: 157 (Trigg); 194 (Barnett); 122 (Litton); 106 (Hicks); 156 (Garza); 183 (Doherty).

Eagle Ford to Georgetown, inclusive: 227 (Trigg); 278 (Doherty); 196 + (Hicks); 251 (Garza); 367 (Evans).

Buda and Del Rio: 120 (Trigg); 100 (Watts); 138 (Doherty); 117 (Garza).

Buda, Del Rio, and Georgetown: 183 (G. A. Smith); 190 (Trigg); 198 (Watts); 233 (Doherty).

Del Rio and Georgetown: 125 (Trigg); 187 (Lane); 212 (Garza).

STRUCTURAL GEOLOGY

The regional dip in Bastrop County is in a southeasterly direction. The dip, although not uniform, amounts to 150 or 200 feet per mile. Thus the Midway formation which lies at the surface near the west margin of the county lies at a depth of 4000 feet or more in the eastern part of the county. That a similar rapid dip is found in the Cretaceous formations is indicated by well records.

Bastrop County lies within a zone of faulting which in general is parallel to the Balcones fault. One prominent zone enters the county near Lytton Springs and, continuing northeastward, passes near Cedar Creek Post Office. Faults probably associated with this one are seen on the Colorado River and at Sayersville. Associated with this line of faulting are other faults parallel with or trending at varying angles to it. The numerous faults found in the county cannot be described in this publication. So far as observed the faults of this belt are of the normal or gravity type. In some of these faults the upthrow is to the east while in others the upthrow is to the west.

A minor fault with downthrow to the east may be seen in an exposure on the right bank of Colorado River about one mile from the Travis-Bastrop county line. This fault trends N 25 E, the fault plane dips southeast and the downthrow, which is probably small, is to the southeast. The exposure at this locality is Midway. Complicated small faulting is seen in the Solomon farm about 5 miles southwest of Elgin. The faults are seen on Sullivan branch, the exposures being Midway and Wilcox. At this locality is a fault which trends N 30 E. The dip of the fault plane is northwest and is steep being in one place nearly vertical. The downthrow as indicated by the drag is to the northwest. Downstream a few hundred feet are three small faults all of which have downthrow to the southeast being thus opposite to that of the larger fault. Approximately a mile north of Sayersville a fault is seen exposed in the bed of Sandy Creek. These are only a few of the many faults found in the county.

The regional southeast dip is thus interrupted by faulting, being accentuated by faults having a downthrow to the southeast and locally reversed by the faults with downthrow to the northwest. In the sketch map (Fig. 2) depth to the Edwards as determined from well records is given at a number of localities in the county.

ECONOMIC GEOLOGY

Clay.—The clay bearing formations of Bastrop County are Navarro, Midway, Wilcox, Yegua, and the alluvial deposits of the river valleys. The clays of these several formations vary in composition and in usefulness for clay manufacturing and their adaptability for various purposes can be determined only by burning tests. The clays of the Lower Midway are probably high in calcium since they very generally contain shells. The uppermost Midway and the Wilcox are more nearly free of calcareous inclusions.

Three plants are now operating in Bastrop County. Two of these, the Elgin-Butler Brick and Tile Company and the Elgin Standard Brick Manufacturing Company, manufacture face brick and fire brick. The third plant, the McDade Pottery Company, makes pottery. Tests on brick made by the Elgin-Butler Brick Company and the Elgin Standard Brick Company are recorded in University of Texas Bulletin 365, page 61, 1914. Face brick are made in many varieties by these companies.

The clay now being used in brick manufacture in Bastrop County is obtained from the Indio formation.

Glauconite.—One or two glauconite strata are usually found at the base of the Midway. In the Cook Mountain are extensive glauconite beds. In both formations the glauconite occurs as glauconitic sand more or less mixed with other material as clay and silica sand.

Iron.—A considerable iron content is present in some strata of Mt. Selman and Cook Mountain formations. The iron is largely in the form of limonite.

Limestone.—No extensive limestone formation is found at the surface in Bastrop County. The Navarro and Midway

formations include local thin limestone or marl lenses or concretions. Some large limestone concretions occur also in the Wilcox formation.

Sand and Gravel.—Sand and gravel deposits are extensively developed and widespread in Bastrop County. The gravel is found in the river terraces, particularly the high terraces capping the hills and uplands. The gravel is often coarse and consists largely of worn flint and chert. In the low river terraces and stream beds are fine gravel and sand beds. Sands are found also in the Tertiary formations. The Carrizo formation in particular contains light colored fine sands. The gravel is extensively used on roads.

Sand for concrete and mortar and engine sand is produced in this county by M. E. Maney, Smithville.

Water.—The underground water of this county is obtained from the formations above the Midway, including the Indio, Carrizo, Mt. Selman, and Cook Mountain. Of these, the Carrizo contains the best and largest supplies. The sands of the Indio and Mt. Selman are in lenses and the water varies in quality and quantity.

The water supply of Elgin is obtained from wells on Sandy Creek about four miles east of the town. Two wells, each about 50 feet deep, afford an abundant supply. The sands are in the Wilcox group.

The water supply of Bastrop is obtained from wells in the Colorado River valley. One well, depth 56 feet, supplies an abundance of water from gravel beds. Two wells drilled at Bastrop into the Wilcox sands, 650 and 850 feet in depth, gave less desirable water and are not in use.

The water supply at Smithville is from wells at depth 600 feet. The water is possibly from the Carrizo sands or may be from sands in the Mt. Selman. When first drilled, these wells flowed at the surface. Water for the ice plant at Smithville is obtained at depth 260 feet.

On the Chatman farm on Alum Creek six miles east of Bastrop is a flowing well, depth 120 feet. This well has been flowing for some years and affords good water. The flow is from either the Carrizo sands of the Wilcox group

or from sands in the Mt. Selman formation. Throughout the county generally, shallow wells obtain water, although in some localities the water contains undesirable mineral salts. However, for most localities successful wells have been obtained.

The Midway formation and the underlying Upper Cretaceous in this county do not afford water. It is for this reason that Elgin, located near the Midway-Wilcox contact, found it necessary to go a few miles east to secure a water supply. The Lower Cretaceous, on the other hand, is deeply buried and has not been drilled into except in test wells for oil. The Edwards formation usually contains sulphur water. The basal Cretaceous sands in this county doubtless contain water, but probably not of good quality. These sands at the west side of the country are at a depth in excess of 3000 feet, and elsewhere at much greater depths.

Surface water is afforded by the Colorado River and tributaries.

Lignite.—Lignite in Bastrop County occurs in the Indio formation, and is found chiefly north of the Colorado River between Bastrop and McDade. Five companies were operating in this region in 1927 as follows: Bastrop Lignite Company, Belto Coal Company, Calvin Coal Company, Chalmers Lignite Company, and Denison Coal Company. The lignite veins are interbedded with the other strata and dip in a southeasterly direction. The rate of dip varies but may amount to as much as 150 or 200 feet per mile. The output of lignite for 1927 was 89,451 tons. The mining is by shaft.

Oil and Gas.—Oil is being produced in commercial quantities in Bastrop County in the Yost field located west of Cedar Creek Post Office. The production of this field is from serpentine. A structural map on the serpentine (Fig. 4) and the following tabulated data on wells and production in this field have been contributed by V. W. Woolsey and D. K. Mackay.

YOST FIELD—DATA UP TO JULY 1, 1929

Company—	Well No.	Elevation	Top of Serpentine	Total Depth	Initial Production (approximate)	July 31, 1929, approximate daily production
Amerada	1	471	1,523	1,770	dry hole	
Cranfill & Reynolds	1	500	1,484	1,710	150 bbls.	less than 100 bbls.
	2	485	1,528	1,536	125 bbls.	
	3	498	1,385	1,462	2,000 bbls.	
	4	487	1,369	1,466	300 bbls. approx.	
	5	489	1,330	1,467	400 bbls.	
	6	511	1,578	2,084	dry hole	
Texas	1	473	1,348	1,580	20 bbls. and S. W.	none
	2	476	1,365	1,500	200 bbls.	100
	3	490	1,368	1,478	250 bbls.	100
	4	511	1,377	1,491	200 bbls.	100
	5	512	1,394	1,490	200 bbls.	75
	6	512	1,409	1,490	150 bbls.	75
	7	502	1,430	1,917	dry hole	none
Atlantic	1	497	1,344	1,420	1,400 bbls.	65
	2	504	1,361	1,426	500 bbls.	120
	3	492	1,362	1,499	960 bbls.	150
	4	479	1,341	1,450	250 bbls.	100
	5	510	1,384	1,504	240 bbls.	100
	6	507	1,403	1,509	250 bbls.	100
	7	505	1,420	1,512	150 bbls.	125
Gulf	1	522	1,405	1,520	10 bbls. S. W.	10
	2	515	1,436	1,568	dry S. W.	none
Trinity Drillers	1	483	1,381	?	50 bbls.	125 bbls. approx.
	2	491	1,391	1,496	150 bbls.	
	3	496	1,442	1,496	100 bbls.	
Sun	1	522	1,492	1,588	26 bbls. S. W.	5

Discovery well drilled November, 1928.
Total production of field up to July 1, 1929, is as follows:

	Bbls.
Cranfills & Reynolds	56,710
Texas	63,815
Atlantic	154,245
Gulf and Trinity Drillers	3,480
Sun	530
Total	278,780

Oil in small quantities has been known for many years from shallow wells on the Bahn farm about five miles southwest of Elgin. The formation at the surface at this locality is the Midway and the oil horizon found at a depth of 250 to 300 feet is probably in the basal sands of the Midway formation. The oil is light grade. Numerous wells have been drilled at this locality from which small production has been obtained. In 1925 a well was drilled on the Lane farm adjacent to the Bahn farm to a depth of 2270 feet. In this well, which starts near the top of the Midway, the Austin is reported at a depth of 1564 feet. Samples received indicate Georgetown at 2267 feet and the Edwards formation at 2270 feet.

Ochre.—An occurrence of ochre is being reported by H. H. Duval on the Chapman farm on Alum Creek, six miles east of Bastrop. The quality and quantity is undetermined.

WELL RECORDS

Records of the following wells in this county will serve to indicate the formations penetrated and their depth. The sea level datum (S.L.D.) at the top of the Edwards formation, in so far as determinable, is given for each well. Where not recorded in the well this level is estimated by applying formation thickness given for this county, using the most nearly similarly located well. The list of wells given is representative, but not complete for the county. The elevations listed are those which accompany the logs or such as have been otherwise supplied from various sources. Abbreviations accompanying these records are as follows: P, plane table; T, from topographic map; A, aneroid. All elevations should be regarded as approximate, not exact.

Barnett 1, Sun Oil Co.; about 4 miles southwest of Cedar Creek Post Office. Elevation 494. Starts near Wilcox-Midway contact; ends in Edwards. T. D. 2214.

Formations identified from cores: 1578, Austin; 1929, Eagle Ford.

Interpretation from log and samples: Midway, Navarro, and Taylor, 0 to 1558; green shale probably serpentine, 1558 to 1560; Austin, 1560 to 1896 (336 feet); Eagle Ford, Buda, and Del Rio, 1896 to

2090 (194 feet); Georgetown and Edwards, 2090 to 2214. Top of Edwards est. 2185. S.L.D. —1691.

Bell 1, Gulf Production Co.; John Riley Surv., 8 miles south of Elgin. Elevation 466 P. Starts in Wilcox. T.D. 3003.

This well is represented by log only in which top of the Austin is recorded at 2750. Top of Edwards, Est. 3280; S.L.D. —2814.

Birmingham 1, Plateau Oil Co.; 2½ mi. from Caldwell Co. line and 2 or 3 mi. from Travis Co. line, James Stewart surv. Elevation 518 P. Starts in Midway or Navarro. T.D. 1964

Interpretation from log: Midway, Navarro and Taylor, 0 to 1372; Austin, 1372 to 1628 (256 feet); Eagle Ford, 1628 to 1655 (27 feet); Buda, 1655 to 1698 (43 feet); Del Rio, 1698 to 1769 (71 feet); Georgetown, 1769 to 1848 (79 feet); Edwards, 1848 to 1964. S.L.D. Edwards —1330.

Brundage 1, Dodwell and Andrews Petroleum Co.; Enoch Harris surv., 3½ miles northeast of Elgin. Elevation 497. Starts in basal Wilcox. Ends in Edwards.

Formations identified from cores: 2330, Austin; 2908, Georgetown.

Interpretation from log and samples: Wilcox (basal part), Midway, Navarro, and Taylor, 0 to 2188; base of Austin and lower formations not determinable from log. Top of Edwards est. 2718. S.L.D. —2221.

J. G. Burney 1, Reiter–Foster Oil Corp.; ½ mi. from Caldwell Co. line and 4 mi. from Travis Co. line, A. G. Moore surv. Elevation 533 P. Starts in Midway or Wilcox T.D. 1688.

Interpretation from log: Midway, Navarro, Taylor, 0 to 1630; serpentine, 1630 to 1638 (8 feet); Austin, 1638 to 1688.

Calloway 1, Fred Adams et al.; about 6 mi. west-northwest of Red Rock, J. B. Blalock surv. Elevation 460. Starts in Wilcox. T.D. 2483.

Interpretation from log: Wilcox, Midway, Navarro, and Taylor, 0 to 1897; Austin, 1897 to 2195 (298 feet); Eagle Ford, 2195 to 2220 (25 feet); Buda, 2220 to 2280 (60 feet); Del Rio, 2280 to 2350 (70 feet); Georgetown, 2350 to 2428 (78 feet); Edwards, 2428 to 2483. S.L.D. Edwards —2068.

Cherry 1, Gypsy Production Co. and Sun Oil Co.; 4½ miles northeast of Bastrop. Starts in basal Mt. Selman; Elevation 556 P.

Formations identified from cores: 1905, Wilcox; 2455 and 2514, Midway; 2565, Cretaceous. Top of Edwards Est. 4506; S.L.D. Edwards —4000.

Doherty 1, Simms Oil Co.; John Maximillion Surv., ½ mile southwest of Baten and about 3 miles northeast of Dale field. Elevation 500T. Starts in Wilcox; ends in Edwards; T.D. 2906.

Formations identified from cores: 2296 and 2302, Austin.

Interpretation from log and samples: Wilcox, Midway, Navarro, Taylor, and Austin, with some serpentine, 0 to 2476; Eagle Ford, 2476 to 2521 (45 feet); Buda and Del Rio, 2521 to 2659 (138 feet); Georgetown, 2659 to 2754 (95 feet); Edwards, dobie phase, 2754 to 2774; Edwards limestone, 2776 to 2906; sulphur water in Edwards; S.L.D. Edwards —2254.

Cordie Evans 1, Southern Exploration Co.; on Big Sandy Creek about 1 mile north of Sayersville. Elevation 440 P. Starts in Wilcox; ends in Austin. T.D. 2589.

Formations identified from cores: 2080 and successive samples to 2542, Taylor; 2542, Austin-Taylor contact.

Cordie Evans 2, Southern Exploration Co.; Big Sandy Creek about 1 mile north of Sayersville. Elevation 400 P. Starts in Wilcox; ends in Edwards. T.D. 3513

Formations identified from cores: 2079 and successive samples to 2320, Taylor; 2560 and successive samples to 2959, Austin; 2959, Austin-Eagle Ford contact; 3150, Del Rio; 3309 and 3338, Georgetown; 3390 and successive samples to 3434, Edwards.

The determination of formation thicknesses in this well is difficult owing to the imperfection of the driller's log. The following is approximate separation into formations: Wilcox, 0 to 847; Midway, Navarro, and Taylor, 847 to 2555 (1708 feet); Austin, 2555 to 2959 (406 feet); Eagle Ford, Buda, Del Rio, and Georgetown, 2971 to 3338 (367 feet); Edwards (3338?), 3390 to 3513;[4] S.L.D. —2938.

Sam Evans 1, Southern Exploration Co.; on Big Sandy Creek 1 mile north of Sayersville. Starts about middle Wilcox; ends in Wilcox. T.D. 787. Formation identified from cores: Wilcox.

These wells show maximum thicknesses for all the formations penetrated. See also the Cherry Well which shows a great thickness of Wilcox, possibly as much as 2000 feet.

Freytag-Valenta 1, Triangle Oil Syndicate; 2 miles east and 2½ miles south of Rosanky. Elevation 508P. Starts near top of Cook Mountain; ends in Wilcox. T.D. 2545.

Samples, mostly cuttings, from this well were received at various depths from 2057 to 2545 all of which were apparently Wilcox. The

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[4]The top of the Edwards is not determinable from the log, and may be above 3,390 but is below 3,338.

formations are scarcely separable from the log. Top of Edwards Est. 5008. S.L.D. —4500.

Linoa Garza 1, Midwest Texas Oil Co.; John Litton surv., 1½ miles south of Pope Bend of the Colorado River. Elevation 501. Starts in lower part of the Wilcox; ends in Edwards. T.D. 2820.

Formations identified from cores and cuttings: 1862, basal Taylor; 1948 and successive samples to 2196, Austin; 2364, 2374, 2376, and 2385, Eagle Ford; 2394, 2438, Buda (?); 2515, Del Rio; 2519 and successive samples to 2602, Georgetown; 2621 and successive samples to 2728, Edwards.

The formation thicknesses in this well as indicated by the log and samples are probably about as follows: Wilcox, 0 to 290; Midway, Navarro, Taylor, and Austin, 290 to 2361 (2071 feet); Eagle Ford, 2361 to 2400 (39 feet); Buda and Del Rio, 2400 to 2517 (117 feet); Georgetown, 2517 to 2612 (95 feet); Edwards, porous and with trace of bituminous material, 2612 to 2820. S.L.D. —2111.

Linoa Garza 2, Midwest Texas Oil Co.; 1000 feet due east of Linoa Garza 1. This is a shallow well, T.D. 450. Samples from this well indicate that the Midway formation was entered at or near 300. The well terminates in Midway at 450.

Hendricks 1, Cranfill–Reynolds, A. Litton surv.; about 1¼ miles southeast of Cedar Creek Post Office. Elevation 525; also given 457. Starts near Wilcox–Midway contact; ends in Edwards. T.D. 2460.

Formations identified from cores: 1720, Taylor; 1788, Austin, 2100, basal Austin; 2332, Georgetown; 2475, Edwards.

Interpretation from samples Hendricks 1 and log of Hendricks 2 (located 100 feet east of Hendricks 1): Midway, Navarro, Taylor, 0 to 1788; Austin and Eagle Ford, 1788 to 2137 (349 feet); Buda, 2137 to 2188 (51 feet); Del Rio, 2188 to 2244 (56 feet); Georgetown and Edwards 2244 to 2460.

Milly Hicks 1, Denver Producing and Refining Co. (Reiter-Foster); John Jones surv., 3200 varas east of the northwest corner, near the west line. Elevation 499. Starts near base of Wilcox; ends in Edwards. T.D. 2675.

Formations identified from cores: 2377, Buda; 2420, Del Rio; 2459, 2477, 2505, 2528, and 2546, Georgetown; 2568, Edwards (?); 2597, Edwards.[5]

Interpretation from log and samples: Wilcox (basal part), Midway, Navarro, Taylor, and Austin, 0 to 2340; Eagle Ford, 2340 to 2377 (37 feet); Buda, 2377 to 2412 (35 feet); Del Rio, 2412 to 2456

[5]Cuttings indicate Taylor, 1,700 to about 2,050; Austin from near 2,050 to 2,340; Eagle Ford 2,340 to 2,377.

(34 feet); Georgetown, 2456 to 2546 (90 + feet); Edwards (porous), 2569 or above to 2675. Top of Edwards Est. 2550. S.L.D. —2051.

Lane 1, Knox and Rycade Oil Co.; Standifer surv., 5 miles southwest of Elgin. Elevation 442P. Starts in Midway; ends in Edwards. T.D. 2315.

Formations identified from cores: 2267, Georgetown; 2270, Edwards.

Interpretation from log and samples: Midway, 0 to 282; Navarro, Taylor, and Austin, 282 to 1997 (1715 feet); Eagle Ford, 1997 to 2022 (25 feet); Buda, 2022 to 2080 (58 feet); Del Rio and Georgetown, 2080 to 2267 (187 feet); Edwards, 2267 to 2315. S.L.D. —1825.

John Lehman 1, D. S. Maxwell Oil Co.; Jacob G. Lentz surv., 3 miles north and somewhat east of Red Rock and about ¾ mile south of Walnut Creek. Elevation 471. Starts in Wilcox; ends in basal Taylor or top of Austin. T.D. 2504.

Formations identified from cuttings; 1450 and successive samples to 2504, Taylor.

Interpretation from log and samples: Wilcox, Midway, and Navarro, 0 to 1450; Taylor, 1450 to 2505 (1055 feet); Austin at about 2505 feet. Top of Edwards Est. 2989; S.L.D. —2518.

F. M. Litton 1, Dixie Oil Co.; A. Litton surv.; on Cedar Creek, 2 miles east of Cedar Creek Post Office. Elevation 408. Starts in Wilcox; ends in Edwards. T.D. 2629.

Formations identified: 558, cuttings, and successive samples to 1115, Navarro; 1115, core, to 1674, Taylor; 2000, core, Austin; 2363, basal Del Rio; 2365, contact Del Rio and Georgetown; 2370 and successive samples to 2462, Georgetown; 2469 to 2478, Edwards.

Formation thicknesses in this well determined from the samples and log as follows: Wilcox, basal part, and Midway, 0 to 558; Navarro, 558 to 1115 (557 feet); Taylor, 1115 to 2000 (885 feet); Austin, 2000 to 2243 (243 feet); Eagle Ford, Buda, and Del Rio, 2243 to 2365 (122 feet); Georgetown, 2365 to 2462 (97 feet); Edwards (2462?), 2469 to 2629. Top of Edwards 2462 Est.; S.L.D. —2064.

McCall 2, Mayfield et al., S. F. Austin surv., 1½ miles southwest of Bastrop. Elevation 386. Starts in Wilcox.

Formations identified as follows: 1627, 1920, 2049, Midway; 2300 and 2532, Navarro.

J. J. Ott 1, Cardinal Oil Co.; Wm. O'Connell surv. 8; northeast corner of W. O'Connell surv., ¼ mile southwest of String Prairie. Elevation 531. Starts in Cook Mountain; ends in Taylor. T.D. 4165.

Formations identified from cores as follows: 100, and successive samples to 699, Cook Mountain-Mt. Selman; 800 and successive samples to 1075, Mt. Selman or Carrizo; 1275 and successive samples to near 2340, Wilcox; 2380 and successive samples to 2603, Midway; 2775 and successive samples to 3303, Navarro; 3550 and successive cores to 4165, Taylor. The log which is indefinite affords no aid in determining the thickness of formations. The Tertiary extends to 2603 but does not extend to 2775. Of the Navarro 528 feet is indicated by cores with the top and bottom undetermined; of the Taylor 615 feet is similarly indicated. The Navarro and Taylor occupy at least 1390 with top not exactly placed and with base not reached. Top of Edwards, Est. 4649; S.L.D. —4118.

Ramsey 2, Elgin Oil Syndicate; on the McLaughlin surv., south of the H. & T. C. Railway, ½ mile west of Butler and 4 miles southeast of Elgin. Elevation 525. Starts in Wilcox; ends in Edwards. T.D. 3166.

Formations identified as follows: 2900, core, and successive samples to 3233, Austin; 3242, cuttings, and successive samples to 3264, Eagle Ford; 3287, cuttings and successive samples to 3318, Buda; 3318 and successive samples to 3375, Del Rio; 3375 and successive samples to 3421, Georgetown; 3421 to 3466, Edwards.

The driller's log of this well is of little aid in interpreting the record. Occasional cores and cuttings submitted from 2900 to 3466 feet permit the following approximate separation of formations: 0 to near 2900, Wilcox, Midway, Navarro, and Taylor. The log indicates considerable chalk in the Taylor. The top of Austin cannot be determined. The first Austin core is from 2900 and the formation probably extends to 3233 (332 feet). Eagle Ford is indicated by cuttings at 3242 and probably continues to near 3287 (54 feet). Buda is recognized at 3287 and probably extends to near 3318 (31 feet). Del Rio extends from near 3318 to 3375 (57 feet); Georgetown from 3375 to near 3421 (56 feet); Edwards is recognized in cuttings at depth 3402 to 3421. The measurements are apparently not by steel line. S.L.D. (Edwards) —2896.

E. E. Roberts 1, Fred I. Adams; about 6 miles west-northwest of Red Rock, J. D. Blalock surv. Drilled 1927. Starts in Wilcox. T.D. 2410.

Interpretation from log: Wilcox, Midway, Navarro, and Taylor, 0 to 1840; Austin, 1840 to 2142 (302 feet); Eagle Ford, 2142 to 2153 (11 feet); Buda, 2153 to 2206 (53 feet); Del Rio, 2206 to 2254 (48 feet); Georgetown, 2254 to 2345 (91 feet); Edwards, 2345 to 2410.

B. K. Smith 1, Simms Oil Co., A. Litton surv.; 1½ miles east of Cedar Creek Post Office. Elevation 429. Starts in Wilcox; ends in Edwards. T.D. 2742.

Formations identified from cores as follows: 1985 and 2050, Austin; 2402, probably Buda; 2725, Edwards.

Interpretation from log and samples: Wilcox (basal part), Midway, Navarro, Taylor, Austin, and Eagle Ford, 0 to 2402; Buda, 2402 to 2472 (70 feet); Del Rio, 2472 to 2527 (55 feet); Georgetown, 2527 to 2615 (88 feet); Edwards, 2615 to 2742.

G. A. Smith, Midwest Texas Co.; Braylock surv., 3½ miles northeast of Lytton Springs. Elevation 568P. Starts near Midway–Wilcox contact; ends in Edwards. T.D. 2202.

Formations identified as follows: 1550 and successive samples to 1694, Austin; 1882, Del Rio; 1890, Georgetown; 2073 and 2103, Edwards.

From the log and samples the record appears to be as follows: Midway, Navarro, Taylor, Austin, and Eagle Ford, 0 to 1890; Buda, Del Rio, and Georgetown, 1890 to near 2073 (183 feet); Edwards at 2073. Edwards, S.L.D. —1505.

Solomon 1, Big Bend Syndicate, Wm. Standifer surv.; 6 miles south of Elgin. Elevation 486. Starts in Wilcox; ends in Edwards. T.D. 3002. Formations identified from cuttings as follows: 2470, Del Rio. The log on this well is indefinite and scarcely affords aid in identifying the formations.

J. S. Spooner 1, Geo. W. Lyles; about 1½ miles east-southeast of Cedar Springs Post Office, L. Leverenz surv. Elevation 410. T.D. 2920. Starts in Wilcox.

Interpretation from log: Wilcox, Midway, Navarro, Taylor, Austin, and Eagle Ford, 0 to 2631; Buda, 2631 to 2688 (57 feet); Del Rio, 2688 to 2763 (75 feet); Georgetown, 2763 to 2851 (88 feet); Edwards, 2851 to 2920.

Spooner 1, Abernathy et al., L. Leverenz surv. Elevation 437.

Formations identified from cores as follows: Austin at 2340 and 2360. This well is 150 feet from Spooner 1, Alexander and Lyles drilled in 1927 which made a show of oil and gas.

Ernest Starke, E. B. Germany, et al.; James Stewart surv., 1700 varas from the west and 1500 from north line; 2½ miles from south and ¾ mile from west county line. Elevation 604P. Starts near Midway–Navarro contact.

Formations identified as follows: 1375, Austin.

Interpretation from log and samples: Navarro and Taylor, 0 to 1299; Austin, 1299 to 1558 (259 feet); Eagle Ford, 1558 to 1568 (10

feet); Buda, 1568 to 1618 (50 feet); Del Rio, 1618 to 1658 (40 feet); Georgetown, 1658 to 1742 (84 feet); Edwards, 1742 to 1800. S.L.D. Edwards. —1138.

G. W. Strous 1, Condron, C. A. West surv.; 6 miles south of Elgin. Formations identified from cores as follows: 583 and 615, Midway.

John S. Storey, Ideal Oil Co. and Jones; about 4 miles south-southwest of Cedar Creek, James B. Cassidy surv. Starts in Wilcox. Drilled 1926. Elevation 464. T.D. 2370.

Interpretation from log: Wilcox, Navarro, Taylor, Austin, and Eagle Ford, 0 to 2121; Buda, 2121 to 2183 (62 feet); Del Rio, 2183 to 2240 (57 feet); Georgetown, 2240 to 2320 (80 feet); Edwards, 2320 to 2370. S.L.D. Edwards. —1856.

Trigg 1, Johnson Bros., James Stewart Surv., 5 miles northwest of Lytton Springs. Elevation 543. Starts near Midway–Wilcox contact; ends in Edwards, T.D. 2189.

Formations identified as follows: 2080, Georgetown; 2092, Edwards.

Interpretation from log and samples as follows: Midway, Navarro, and Taylor, 0 to 1570; Austin, 1570 to 1858 (288 feet); Eagle Ford, 1858 to 1895 (37 feet); Buda, 1895 to 1960 (65 feet); Del Rio, 1960 to 2015 (55 feet); Georgetown, 2015 to 2085 (70 feet); Edwards, 2085 to 2189 (104 feet). Edwards, S.L.D. —1550.

Trigg 2, Johnson Bros.; tract 17, Jas. Stewart surv. Elevation 571P. Starts in Wilcox; ends in Austin. T.D. 1650.

Trigg 3, Johnson Bros.; tract 14, Jas. Stewart surv. Elevation 493P. Starts in Wilcox; ends in Austin. T.D. 1792.

W. P. Watts, Denver Producing and Refining Co. (Reiter-Foster Well Corp.); John Bunton surv., 2 miles southwest of Cedar Creek Post Office. Elevation 506P. Starts in Wilcox; ends in Edwards. T.D. 2236.

Formations identified as follows: 1681, uppermost Buda; 1850, Austin; 1914, Eagle Ford; 2024, Del Rio; 2036, Del Rio; 2100, Del Rio-Georgetown contact; 2149 and successive samples to 2236, Edwards.

Interpretation from log and samples as follows: Wilcox (basal part), Midway, Navarro, Taylor, and Austin, and Eagle Ford, 0 to 1926; Buda, 1926 to 1983 (57 feet); Del Rio, 1983 to 2036 (53 feet); Georgetown, 2036 to 2134 (98 feet); Edwards, 2134 to 2236. Edwards, S.L.D., —1628.

J. P. Williams, Johnson Bros.; 1⅛ mile from Caldwell Co. line and 5.5 miles from Travis Co. line, James B. Blalock (or Cassidy) surv. Elevation 576P. Starts in Wilcox. T.D. 1660.

Interpretation from log: Wilcox, Midway, Navarro, Taylor, 0 to 1569; serpentine, 1569 to 1610 (41 feet); Austin, 1610 to 1660.

Chas. Wolf 1, Gulf Production Co.; 1½ mile from Caldwell County line and 1¼ mile from Travis County line, James Doyle surv. Starts in Midway or Navarro. Elevation 570T. T.D. 1588.

Interpretation from log: Navarro and Taylor, 0 to 1045; Austin, 1045 to 1348 (308 feet); Eagle Ford, 1348 to 1365 (17 feet); Buda, 1365 to 1418 (53 feet); Del Rio, 1418 to 1473 (55 feet); Georgetown, 1473 to 1557 (84 feet); Edwards, 1557 to 1588. S.L.D., Edwards, —987.

Available Literature and Maps:—Professional paper No. 126 of the United States Geological Survey contains a geologic map of the Coastal Plain west of the Brazos River including Bastrop County. Fossil leaves found in the Wilcox formation in this county are described in Professional Paper No. 132, 1924. Topographic maps of the United States Geological Survey relating to this county are Austin, San Marcos, Bastrop and Flatonia sheets.

DRILLING CONDITIONS

Drilling conditions in the county are illustrated by the two following logs. Of the two wells, the first given, the Freytag-Valenta, is located near the east county line and starting near the top of the Cook Mountain formation terminates in the Wilcox. The second well located in the western part of the county starting in basal Wilcox terminates in the Edwards. A third well is added, English 3. This well located across the line in Fayette County gives the section at that locality to the Wilcox.

FREYTAG-VALENTA, TRIANGLE OIL SYNDICATE

(For location of well and interpretation of log, see page 31)

	Depth in feet
Clay	10
Soft crystallized gyp rock	12
Soft yellow clay	35
Yellow clay	39
Blue water sand	106
Sand and gravel, blue sand	140
Yellow clay	144
Water sand	230
Sand rock	231
Yellow shale	240
Hard sand rock	243
Mixed shale and boulders	250
Hard sand and shale and boulders	285
Hard packed sand	308
Hard sandy shale and shells	312
Sand rock	313
Soft clay and boulders	331
Water gravel	340
Hard mixed yellow and brown shale	354
Dark blue soapstone	360
Dark blue gumbo	369
Blue shale	439
Blue gumbo	443
Blue shale, soft	500
Blue shale with thin streaks of gumbo	564
Soft lime rock	565
Gray shale and shell. Fossils, thin layers dark blue gumbo	632
Hard blue black gumbo	637
Lignite, very hard and brown	640
Pale blue shale	677
Blue shale, thin layers shell, gumbo, coal, and sulphur	743
Hard black blue gumbo	768
Very hard sandy shale showing both oil and gas at	768
Brown water sand	846
Pyrites of iron rock	847
Gray water sand and gravel	1018
Soft brown gumbo	1020
Sandy brown shale, showing of lignite	1032
Brown gumbo	1038
Pyrites of iron, loose bed	1060
Water gravel, showing considerable pyrites of iron	1078

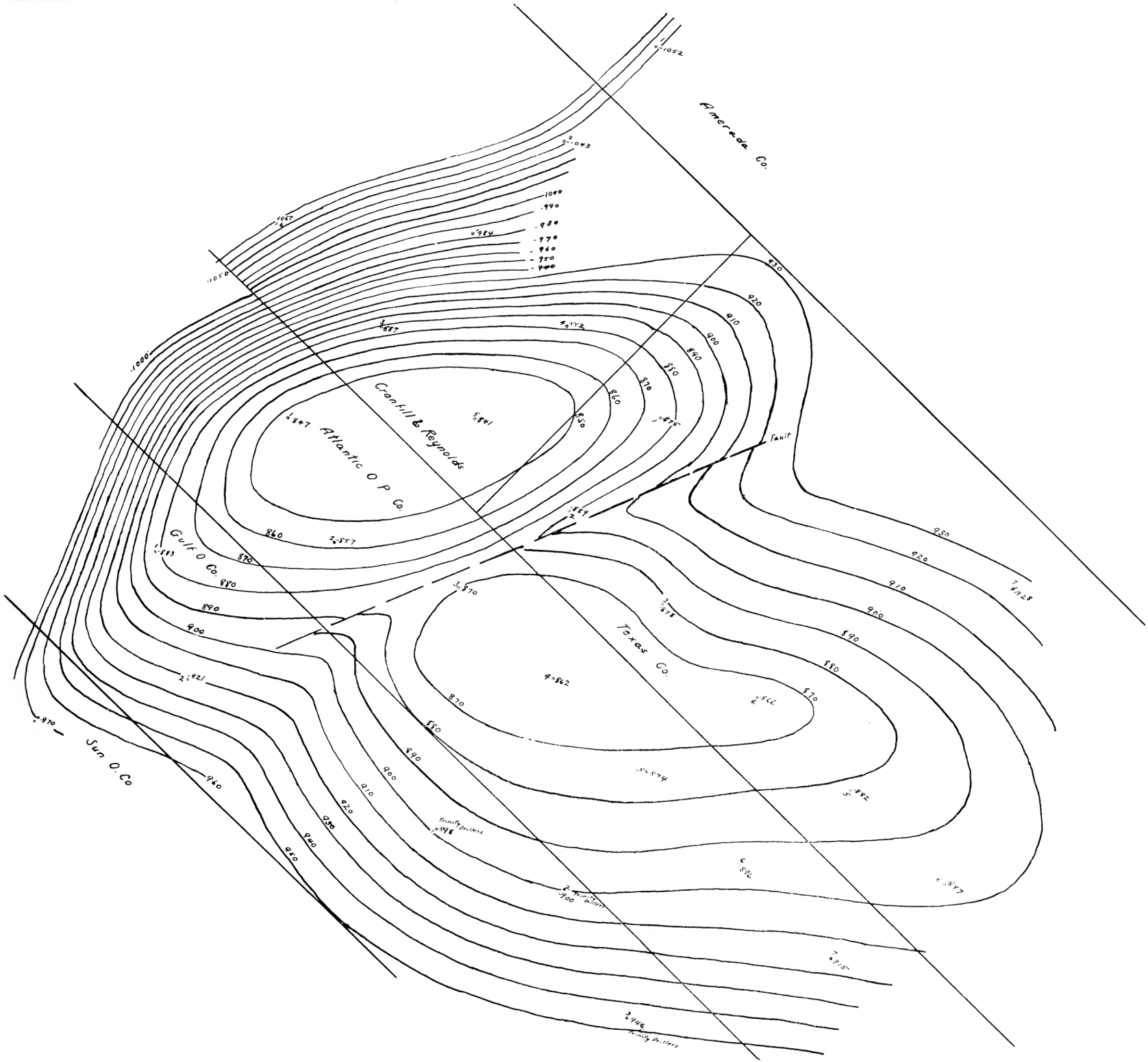

Fig. 4. The Yost Oil Field. Contours on the Serpentine. By Vernon Woolsey and D. K. Mackay.

	Depth in feet
Blue shale and blue and black shale mixed	1091
Hard packed gray sand	1110
Brown gumbo	1116
Blue gumbo, showing of green sand	1137
Packed sand, gray and hard	1182
Blue black gumbo, showing streaks of gyp	1188
Very coarse gray water sand	1235
Hard packed blue sand	1247
Hard blue shale	1290
Very light blue shale	1310
Hard pyrites of iron rock	1315
Sticky blue shale	1333
Hard rock, core test	1335
Hard packed sand	1346
Soft blue shale and boulders	1365
Hard blue shale and shells	1414
Hard and very tough gumbo	1422
Hard sand rock	1427
Blue gumbo	1458
Gray sand, very fine, core test	1465
Brown shale and gumbo	1502
Gray sand	1512
Brown shale	1565
Gumbo	1567
Hard gumbo	1575
Soft dark brown shale	1608
Shale and gumbo and boulders	1640
Sandy blue shale	1663
Hard packed gray sand	1688
Hard blue gumbo	1693
Hard blue shale, probably some boulders	1705
Hard blue gumbo	1722
Blue limestone rock	1725
Blue limestone	1728
Hard deep blue shale	1745
Lignite, very soft and very brown	1752
Hard blue shale	1778
Hard blue shale and shell fossils	1805
Hard dry black lignite	1810
Hard and soft blue shale and shell fossils	1845
Sand rock	1849
Hard gumbo, sandy blue shale, thin layers of pyrites of iron	1865
Hard blue gumbo	1910
Blue shale	1920
Rock	1922
Blue shale	1945
Blue shale with thin layers of rock	1965
Pyrites of iron rock	1967
Hard blue shale	1981
Hard blue sandy shale	2020
Hard sandy shale	2033
Rock	2035
Blue shale and streaks of gumbo	2087
Gray sand showing oil and gas	2115
Light brown shale	2130
Lignite	2137
Hard crystallized gray sand	2148
Light brown shale and lignite	2161
Lignite	2168
Sandstone	2180
Gumbo	2270
Sandstone	2275
Log incomplete, total depth	2545

LINOA GARZA 1, MIDWEST-TEXAS COMPANY

(For location and interpretation of log, see page 32)

	Depth in feet
Sandy soil	3
Red clay	28
Clay and boulders	71
Dry sand	76
Blue shale	113
Rock	114
Blue shale	172
Rock	173
Dry hard sand	190
Gumbo and boulders	220
Rock	221
Sand	240
Gumbo	268
Gumbo and boulders	290
Gummy shale	350
Gumbo	395
Gummy shale	470
Gumbo and boulders	478
Gummy shale and boulders	600
Gummy shale	714
Rock	715
Blue shale	737
Sand rock	741
Gumbo	746
Blue shale and boulders	810
Sand rock	814
Shale	925
Shale and boulders	1020
Gumbo	1035
Shale and boulders	1100
Shale	1133
Shale and boulders	1224
Gumbo	1380
Gummy shale and boulders	1500
Lime, boulders and gumbo	1724
Lime rock	1754
Lime boulders and gumbo	1914
Chalk rock	1918
Hard shale	1940
Hard chalky shale, lime	1960
Gas	1975
Austin chalk	2361
Eagle Ford shale	2384
Gas Eagle Ford (?)	2400
Buda lime (iron)	2430
Del Rio clay	2517
Georgetown lime (iron)	2612
Edwards lime (slight traces bituminous substances)	2820

ENGLISH 3, BRISTOL OIL AND GAS COMPANY

McAllister League, 7 miles south of Smithville, Fayette County

	Depth in feet
Surface	5
Clay	55
Clay and boulders	70
Shale	78
Gumbo	88
Shale	92
Gumbo	95
Sticky shale	135
Shale and boulders	225
Shale	325
Sand	340
Shale and shells	430
Shale	450
Sticky shale, gumbo	520
Hard rock	521
Shale	538
Rock	540
Shale	590
Hard rock	594
Soft rock	601
Hard rock	602
Hard gumbo	621
Shale and boulders	653
Shale	673
Shale and boulders	820
Rock	823
Gumbo	838
Shale	945
Shale and boulders	965
Gumbo	968
Shale and boulders	977
Hard gumbo	997
Shale	1004
Gumbo	1030
Shale	1065
Gumbo	1075
Rock	1077
Shale	1097
Gumbo	1135
Shale, boulders, gumbo	1160
Sand and boulders	1195
Shale	1230
Gumbo	1235
Shale and boulders	1245
Rock	1257
Shale and shells; cored at 1290	1290
Sandy shale	1295
Shale	1365
Sand	1375
Sand and boulders	1407
Sand	1417
Sand and boulders	1437
Rock	1439
Sandy shale and boulders	1442
Sand	1448
Rock	1452
Hard sand	1467
Rock	1469
Sand	1475
Sand rock	1480
Shale and boulders	1483
Hard rock	1489
Shale	1494
Rock	1500
Shale	1510
Rock and pyrites	1516
Rock and hard shale	1520
Hard sand rock	1522
Sand; cored at 1527	1532
Rock	1534
Sandy shale	1554
Water sand	1564
Broken sand rock, sand and shale	1626
Gumbo	1641
Shale	1647
Rock	1648
Sand, streaks gumbo; cored at 1650	1655
Sandy lime	1657
Sand shale; cored at 1658	1662
Rock	1666
Sandy shale	1670
Soft sand; cored at 1670	1690
Broken sand, shale, and gumbo	1710
Shale and boulders	1712
Hard rock	1714
Hard shale and boulders	1728
Shale, scattered boulders	1772
Hard rock	1775
Sticky shale, gumbo	1790
Shale, few boulders	1821
Crusty sand	1839
Sand	1845
Sand and shale	1875
Gumbo	1887
Shale, gumbo, and sand	1905
Sand, hard	1935
Gumbo and boulders	1940
Gumbo	1960
Shale and sand	1970
Hard rock	1972
Gumbo and shale	1990
Gumbo and sand, boulders	2020
Hard sandy lime	2025
Sandy shale	2045
Rock	2050
Shale	2065
(Measurements of the drill stem at 2000 feet showed an error of fifteen inches.)	
Rock	2070
Shale	2074
Gumbo	2085
Rock	2087
Gumbo and rock	2097
Rock	2106
Gumbo	2112
Gumbo and boulders	2126
Rock	2128
Sandy shale; cored at 2133	2143
Gumbo	2151
Gumbo and boulders	2160
Sand rock	2165
Hard rock	2170
Sand rock	2172
Gumbo and boulders	2187
Shale and boulders	2195
Hard sand	2212
Sandy lime	2223
Hard lime rock	2225
Hard sand; cored at 2224	2229
Shale	2232
Gumbo	2239
Broken lime	2270
Rock lime	2285
Broken rock and shale	2290
Hard shale	2319
Rock	2322
Gumbo	2327
Rock	2329
Gumbo	2331
Shale, gumbo, boulders	2347
Hard rock	2348
Gumbo	2358
Shale	2369
Rock	2391
Hard shale	2396

	Depth in feet
Rock	2399
Gumbo	2409
Hard sticky shale	2424
Gumbo	2436
Rock	2439
Shale	2454
Rock	2456
Shale	2459
Gumbo	2465
Rock	2474
Sandy shale	2479
Rock	2482
Shale	2489
Gumbo	2495
Gumbo	2509
Shale	2514
Gumbo and rock	2518
Gumbo	2528
Rock	2531
Shale	2536
Gumbo	2542
Rock	2546
Shale and boulders	2550
Sandy shale	2565
Rock	2568
Very hard rock and pyrites	2574
Sandy gumbo	2578
Gumbo	2589
Shale and boulders	2594
Hard gumbo	2605
Shale and boulders	2617

	Depth in feet
Rock	2623
Gumbo	2635
Hard sand and lignite; cored at 2638	2648
Rock	2653
Hard gumbo	2660
Rock	2665
Hard sand	2666
Hard rock	2672
Gumbo	2674
Shale and gumbo	2680
Rock	2681
Shale and gumbo	2688
Rock	2690
Gumbo	2696
Rock	2697
Broken lime, gumbo	2703
Lime rock	2711
Sandy lime	2721
Gumbo	2724
Shale	2726
Shale, lime, gumbo	2736
Gumbo	2743
Shale and lignite	2749
Shale	2753
Shells and lignite	2759
Rock	2761
Gumbo	2768
Shale	2776
Rock	2781
Shale, gumbo, boulders	2800
Rock	2805