

HISTORY OF OIL AND GAS DEVELOPMENTS

Early Drilling. In about 1825 a well was drilled for brine along the South Fork of Cumberland River in what is now McCreary County, Kentucky, and less than three miles from the Scott County line. This well, commonly known as the "Beatty" well, was reported to have found considerable oil at about 200 feet, while another account gives the depth as 350-360 feet. Since there was no market for the oil the well was abandoned. So far as is known, the first well drilled for oil in the northern Cumberland Plateau area of Tennessee was drilled in 1871 by W. G. Swisher and others on the Board of Ad property (71st) about two miles west of Glenmary. This well encountered oil in the Mississippian at 123 feet, 552 feet below the base of the Pennsylvanian. Although this created some interest, the well was not pumped and it was soon abandoned.

Grave Hill Area (Fig. 4). During the 1890-1900 decade a considerable number of wells were drilled in south-central Kentucky and north-central Tennessee but the first commercial oil in the northern Plateau area of Tennessee was not found until 1915. The discovery well, Whitcomb Oil and Gas Company's Toomey No. 1 (208), was located about 4 1/2 miles northwest of Ocoee in what is known as the Grave Hill area. Oil was found in a "heavy gray limestone" at 945-960 feet, probably in the Gasper (See Table 3). According to Glenn¹ this well made 3 to 7 barrels of oil an hour on pumps. Three other wells were completed as small pumps. Little is known of the subsequent development in the Grave Hill area. About 1,000 barrels of oil were reported pumped from these wells. The small production together with the distance from transportation and a market have been given as reasons for abandoning the area. Recent attempts to develop the Grave Hill pool have been unsuccessful, although Brown, Cline and E. C. Terry No. 1 (118) was pumped a short time.

Glenmary Pool (Fig. 5). On August 31, 1914 oil was discovered along Black Wolf Creek just north of the village of Glenmary in Scott County. In the discovery well, the Russell Producing Company's Gatewood Farm No. 1 (61), oil was encountered at 1232-40 feet, 282 feet below the top of the "Big Limestone". The initial production was reported to be about 20 barrels. While no samples of the producing rock are available, the Russell record is of a gray sand and small pebbles. The "small pebbles" is undoubtedly an oolitic limestone and the production was probably from the St. Lawrence limestone. A considerable amount of interest was aroused by this discovery and drilling proceeded at a quickened pace. Thirty-six wells, 10 producers, have been drilled in the Glenmary pool. Most of the development took place between 1917 and 1919. One of the largest producers, the Russell Producing Company's Arce Farm No. 1 (140), gauged 340 barrels of oil per day several weeks after completion, for more than 30 days the well flowed regularly 17 1/2 barrels of oil per hour. The oil was accompanied by so much gas that after flowage had been cleared by pumping it was maintained by the gas pressure. A number of the earlier wells made varying amounts of gas. Probably the largest, the Russell Producing Company's Lee Smith No. 1 (74), was reported to have an open flow of 12,000 cubic feet. The gas was used in the vicinity and was later piped to Robbins where the gas was used to fire four boilers for about a year.

The maximum production in the Glenmary area was in 1919 when 15,350 barrels were marketed. There is no activity in this area at present and in 1944 only three wells were pumped with a total production of 4,902 barrels.

Boone Camp Pool (Fig. 6). In October 1924 the Russell Producing Company completed their Drake No. 1 (97) as a 30-barrel producer on the bank of Boone Camp Creek 4 1/2 miles northwest of Sunbriht in Morgan County. Considerable gas accompanied the oil at 1112-1425 feet. Based upon small studies of nearby wells the production is believed to come from the Fort Payne formation. Sixteen wells have been drilled in the Boone Camp pool, 13 of which produced oil and gas. Most of the gas is stored and consumed in Sunbriht and vicinity. The average annual production of gas ranges between 10 and 15 million cubic feet. The maximum oil production was in 1925 when 25,155 barrels were marketed. The production has slowly declined to approximately 1,000 barrels in 1944.

Sunbriht Gas Field (Fig. 7). In 1926 Johnson-Messer Oil Company's H. W. Summers No. 1 (133), drilled 2 1/2 miles southwest of Sunbriht, encountered a strong flow of gas at 1180 feet and other gas zones were found at lower depths. The reported initial volume was 3,400,000 cubic feet after 3 1/2 hours open flow. The gas was reported to be in a very porous limestone probably in the Gasper. A well 1,000 feet to the south, the Johnson-Messer Oil Company's Gilreath No. 1 (131), found gas at 1472 feet which gauged 2,240,000 cubic feet. In all 13 wells have been drilled in the area southwest of Sunbriht, 11 of which are considered as commercial although to date there has been no development. At present the wells are capped and used for water.

Coon Hollow Pool (Fig. 8). In 1928 the Grady Clark Oil Company's Jim Stribble No. 1 (113) drilled oil and gas at about 1400 feet in the Coon Hollow area. The well is approximately the same as in the Boone Camp area about two miles to the north. In the southern part of the field, the Rock Creek Oil Company's J. A. Bradford No. 1 (121) flowed 200 barrels per day from an oolitic limestone (St. Lawrence?) at 1159 feet. In a few days the well yielded 200 barrels per day and it has been a steady producer. Thirteen wells have been drilled in the Coon Hollow area, 7 of which produced oil and gas. One well, the Tenn-Oil Oil and Supply Company's H. K. Jones No. 1 (117) found gas at 1117 feet. The gas is used locally.

Glenn L. C. Recent oil developments in Scott County, Tennessee. Tennessee Geol. Survey, Reconn. Vol. 5, pp. 191-192, 1915.

PRODUCTION

Year	Scott County	Morgan County	Scott and Morgan Counties
1915	500		
1916	1,177		
1917	1,374		
1918	15,350		
1919	15,350		
1920	12,000		
1921	8,000		
1922	3,500		
1923	2,500	8,950	
1924	1,000	25,155	
1925	1,000	18,200	
1926	1,000	10,000	
1927	1,000	10,000	
1928	1,000	10,000	
1929	1,000	10,000	
1930	1,000	10,000	
1931	1,000	10,000	
1932	1,000	10,000	
1933	1,000	10,000	
1934	1,000	10,000	
1935	1,000	10,000	
1936	1,000	10,000	
1937	1,000	10,000	
1938	1,000	10,000	
1939	1,000	10,000	
1940	1,000	10,000	
1941	1,000	10,000	
1942	1,000	10,000	
1943	1,000	10,000	
1944	4,902		
1945	17,582		
Total	73,857	37,139	110,996

CARTER COORDINATE SYSTEM Applied to Tennessee

EXPLANATION

A coordinate system for giving the location of wells in Tennessee is needed because Tennessee as a State received and granted public lands before the Congressional Township System had been devised. There are certain areas in West Tennessee and in East Tennessee which are covered by local township and section systems but they are either so irregular or so little used as not to be generally recognized.

Certain modifications of the Carter System as used in Kentucky are required in Tennessee. The Kentucky system starts at Long, 89° 30' W. and Lat. 36° 30' N. as a zero point. Because of errors in original surveys, part of the north edge of Middle and East Tennessee is north of Lat. 36° 30' N. and is, therefore, in the Kentucky system. North of this base line townships are therefore designated A, B, C, as in Kentucky, while to the south they are called 15, 25, 35, etc. Tennessee extends farther west than the Kentucky zero point. Long, 89° 30' W. so it is necessary to use LW, 2W, 3W, etc., for ranges to the west and 1E, 2E, etc., for ranges to the east. This permits use of the same range numbers as in Kentucky with the additional "E".

The area within the coordinate is divided into 25 equal quadrangles. Following the Congressional Township System these quadrangles or "sections" are numbered starting with 1 in the northeast and ending with 25 in the southwest quadrant (see Fig. 7). In the northern Cumberland Plateau no attempt has been made to locate wells more definitely than by section.

Because this system is only a paper system, none of the coordinate points being marked on the ground, measurements of distances from side lines or townships are paper measurements and subject to the error of locating the well on the map and any error of the base line townships are therefore designated A, B, C, as in Kentucky, while to the south they are called 15, 25, 35, etc. Tennessee extends farther west than the Kentucky zero point. Long, 89° 30' W. so it is necessary to use LW, 2W, 3W, etc., for ranges to the west and 1E, 2E, etc., for ranges to the east. This permits use of the same range numbers as in Kentucky with the additional "E".

TABLE 3. ANALYSES OF PRODUCING HORIZONS IN GRAVE HILL POOL

Depth (feet)	1	2	3	4	5
14.00	16.00	9.00	3.00	9.00	9.00
14.00	4.25	4.25	4.25	4.25	4.25
14.00	8.49	8.49	8.49	8.49	8.49
14.00	16.24	16.24	16.24	16.24	16.24
14.00	1.20	0.01	1.20		

TABLE 4. ANALYSES OF PRODUCING HORIZONS IN GRAVE HILL POOL

Depth (feet)	1	2	3	4	5
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14.00	4.25	4.25	4.25	4.25	4.25
14.00	8.49	8.49	8.49	8.49	8.49
14.00	16.24	16.24	16.24	16.24	16.24
14.00	1.20	0.01	1.20		

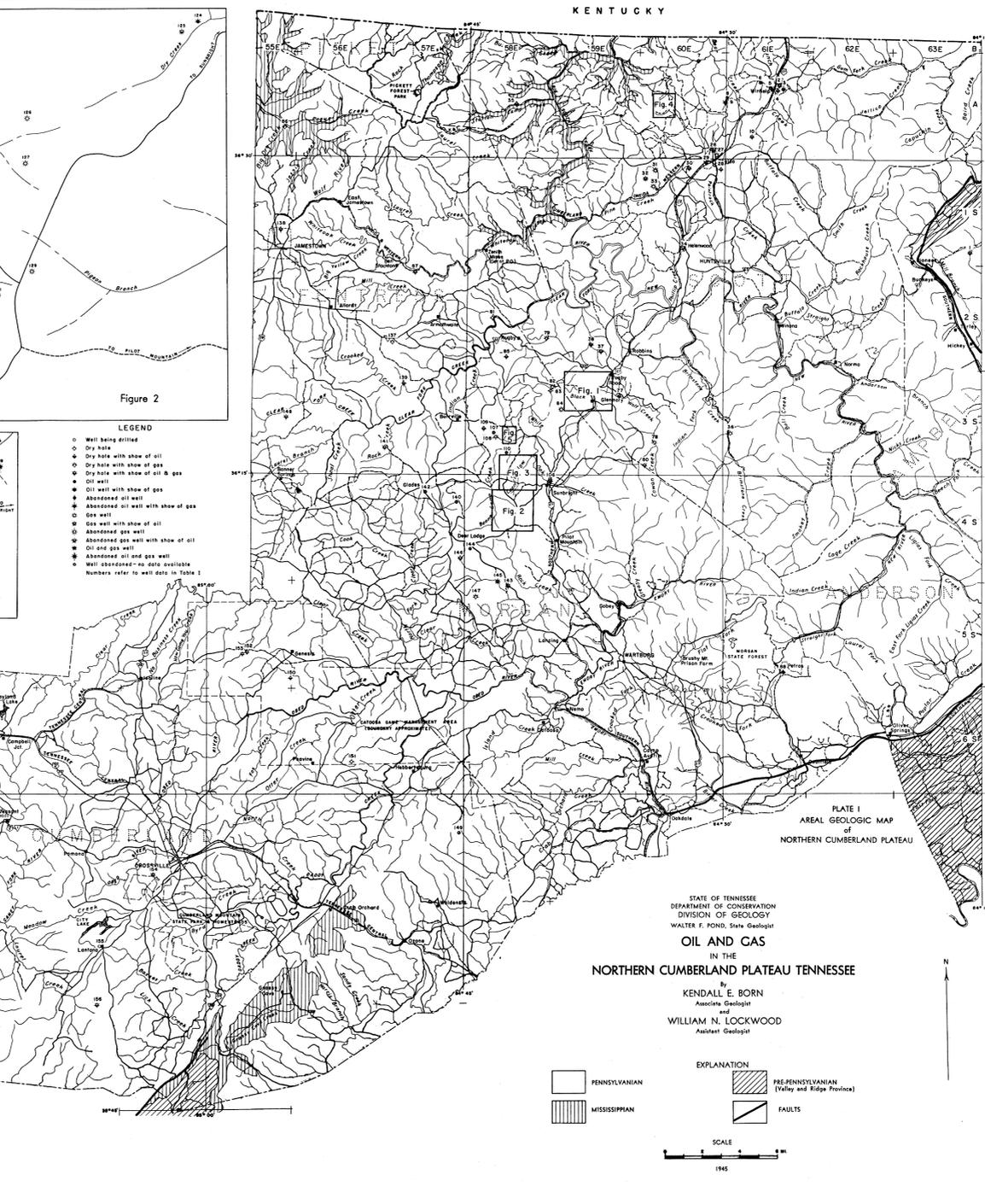
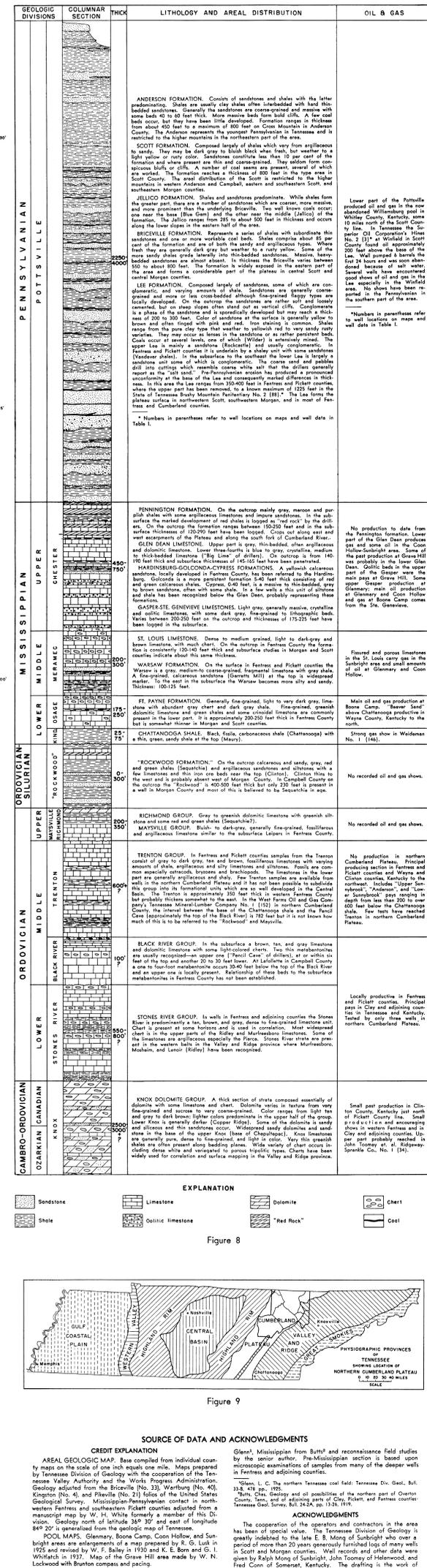


TABLE 1. SUMMARY OF DATA ON TEST WELLS DRILLED IN THE NORTHERN CUMBERLAND PLATEAU.

Well Name	Locality	County	Depth (feet)	Formation	Oil and Gas		Remarks
					Oil	Gas	
Boone Camp No. 1	Boone Camp	Morgan	1112-1425	Fort Payne	Yes	Yes	Produced 30 barrels per day
Glenmary No. 1	Glenmary	Scott	1232-40	St. Lawrence	Yes	Yes	Produced 20 barrels per day
Sunbriht No. 1	Sunbriht	Morgan	1180	Gasper	Yes	Yes	Produced 3,400,000 cubic feet
Coon Hollow No. 1	Coon Hollow	Morgan	1400	St. Lawrence	Yes	Yes	Produced 200 barrels per day
Grave Hill No. 1	Grave Hill	Scott	945-960	St. Lawrence	Yes	Yes	Produced 3 to 7 barrels per hour



SOURCE OF DATA AND ACKNOWLEDGMENTS

Geol. Mississippian from Butts' and reconnaissance field studies by the author. Paleozoic from the Mississippian and Ordovician microscopic examinations of samples from many of the deeper wells in Tennessee and adjoining counties.

Glenn L. C. The northern Tennessee coal field. Tennessee Geol. Surv. 31, 8, 472 pp., 1925.

Glenn L. C. The southern Tennessee coal field. Tennessee Geol. Surv. 31, 8, 472 pp., 1925.

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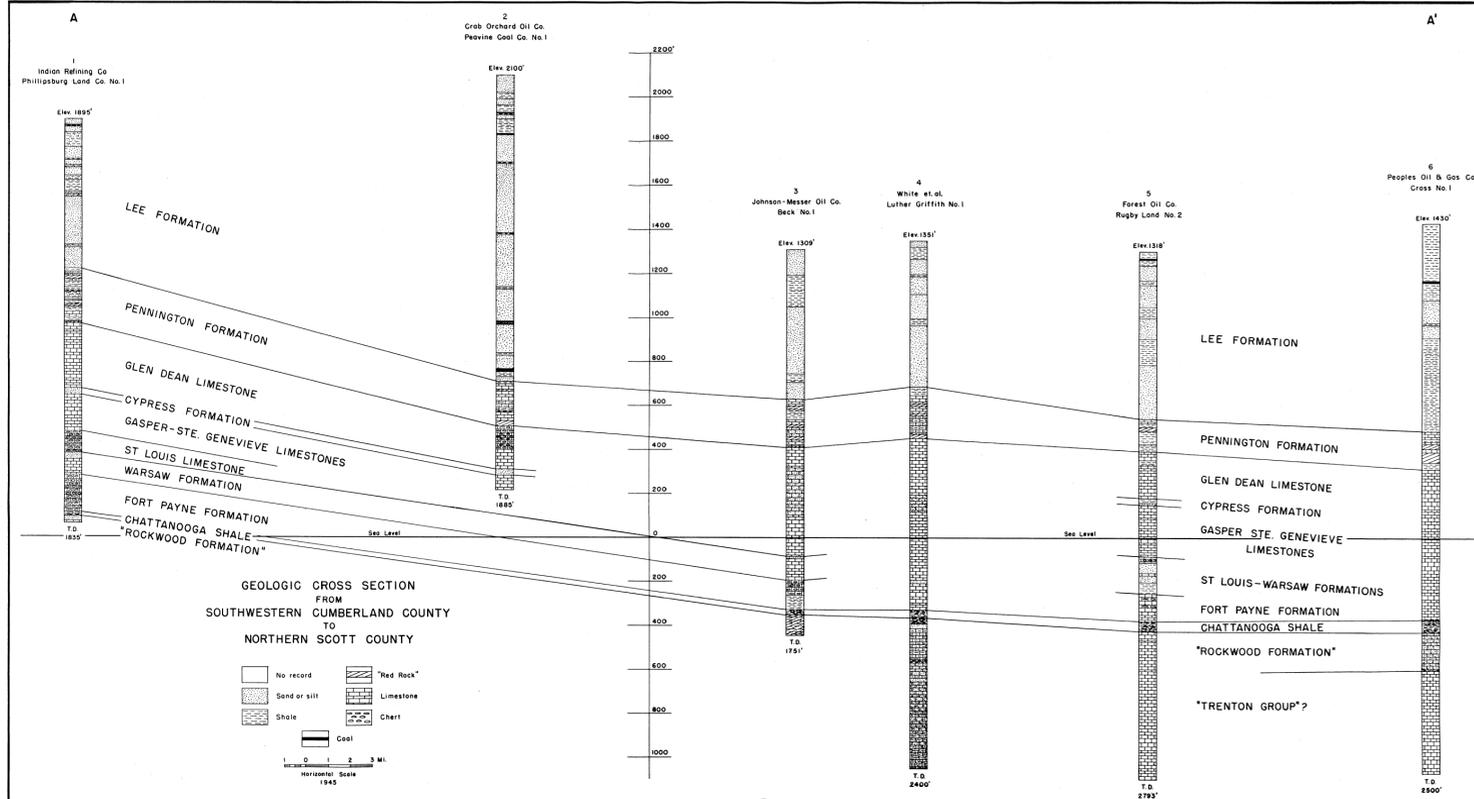


Figure 10

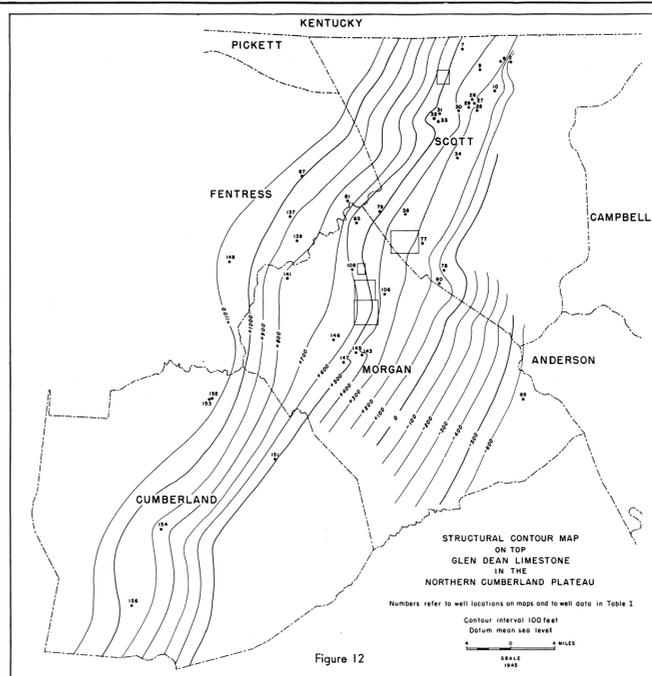


Figure 12

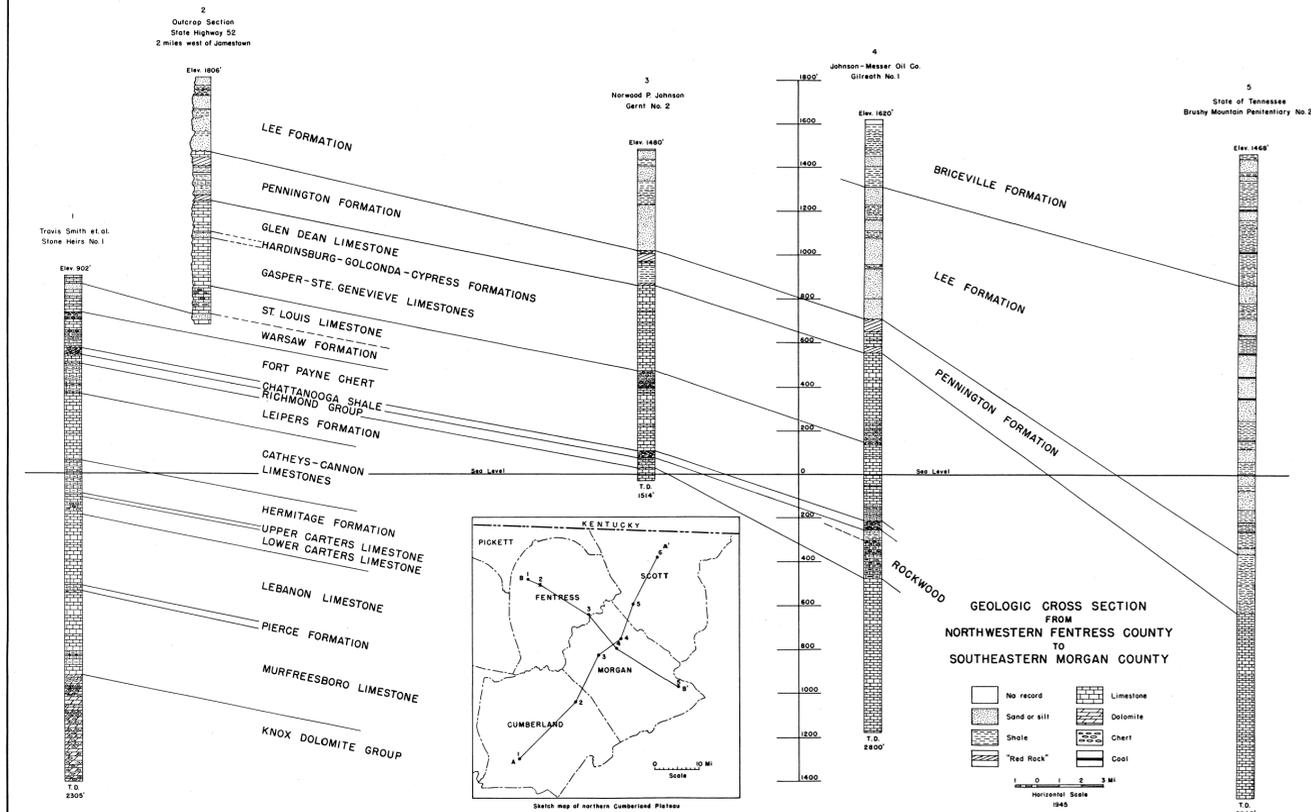


Figure 11

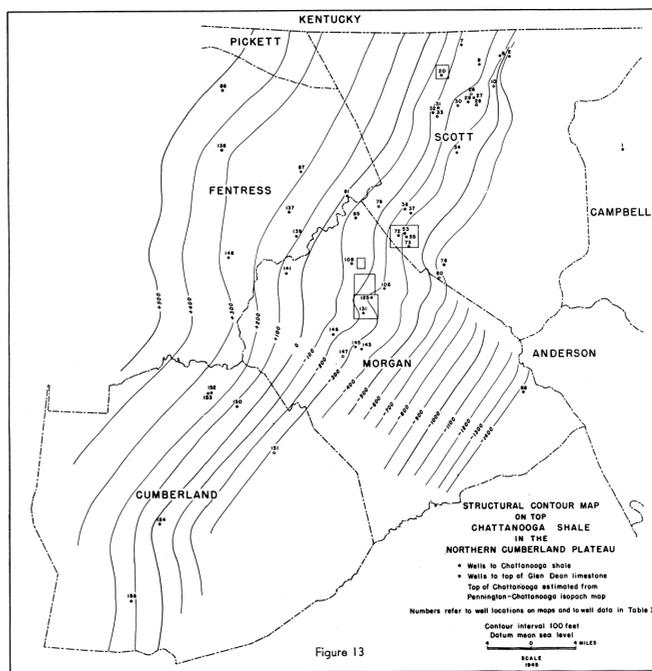


Figure 13

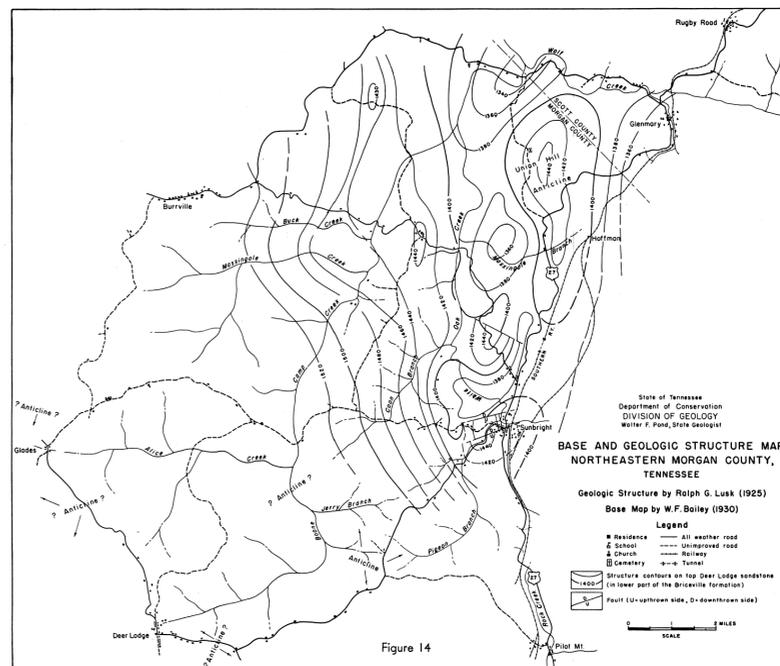


Figure 14

EXPLANATION FOR FIGURE 14.

In 1925 Ralph G. Lusk, temporary Geologist of the Tennessee Geological Survey, spent three months studying the structural conditions in northeastern Morgan and southern Scott counties. Approximately 35 miles were mapped north and west of Sunbright and southwest of Glenmary. At the time Lusk's map was released some 46 wells had been drilled in the area. During March and April 1930 two weeks were spent in the area by W. F. Bailey, Assistant Geologist of the Tennessee Division of Geology, to revise the base map and bring records of drilling up to date. The field work was accomplished by plane table stadia and telescopic alidade with the aid of a hand level, Brunton compass and altimeter barometer. No attempt was made to check or extend the structural mapping by Lusk.

Lusk used the plane table with stadia and telescopic alidade in combination with a hand level and aneroid. Plane table and stadia primary traverses were run along the road and, in the less wooded areas, between clearing on the hills. The miniature telescopic alidade was found best suited for general use. Along the primary traverses stations were marked every 1,000 or 2,000 feet. Secondary traverses were made directly to the outcrops through the woods or along the streams from primary traverse stations with pocket transit, pace and hand level or aneroid. When the aneroid was used established points were occupied generally at least one hour in order to determine the correction curve for the barometer.

The revised map issued in 1930 was on the scale of 2 inches equals one mile. The map here reproduced is a reduction of one half. In the time available no attempt has been made to revise the cultural features since 1930. Lusk's and Bailey's well locations which appear on the 1930 map have been omitted since they are included in Figures 1, 2, 3 and 5.

The Deer Lodge sandstone of the Briceville formation was used as a key bed in Lusk's structural mapping. This sandstone, well exposed in the vicinity of Deer Lodge in western Morgan County, is one of the more persistent horizons in the Briceville. The Deer Lodge sandstone is commonly 10 to 20 feet thick, but in places it is almost double the latter figure, and elsewhere it is very thin or absent.

In view of the difficulty in exactly correlating the various lensing beds of sandstone, and also in view of the approximate instead of precise determination of many of the stratigraphic intervals, the question naturally arises as to what is the probable degree of precision attained in the contouring. It is believed, after making allowances for each of the difficulties noted, that the limit of error is within 20 feet.

In Scott and Morgan counties it is likely that to a depth of 1500 feet the surface structure is indicative of the general nature of the subsurface structure. The fact that the Lee formation thins toward the southeast means that the dips shown on the structure map toward the southeast should be slightly increased, and the dips toward the northwest slightly decreased. The following structural descriptions have been taken from Lusk's unpublished manuscript:

Union Hill anticline: To the southwest of the Glenmary pool is the Union Hill anticline. The crest of this structure lies just south of Union Hill Cemetery. This upfold has an indicated closure of at least 40 feet. It has an extension to the south so that the entire length of the fold is about two and one-half miles. The width is about half the length. It has sufficient drainage area that it should be tested. The Glenmary pay should be reached at a depth of from 1325 to 1375 feet, and the Boone Camp pay at an additional depth of about 325 feet, with the Chattanooga shale about 75 feet lower.

Tunnel Hill anticline: One mile north of Sunbright, in a general line with the Union Hill and Glenmary anticlines, is the faulted Tunnel Hill anticline. This structure is less than one-fourth of a mile in diameter and has limited drainage area. It should be tested however, if other small structures in the area prove productive. A suggested location is about 1000 feet north along the paved highway and just to the east, measuring from the place where an old abandoned road leaves the main highway to continue nearly north over the hill. The old road is shown by dashed lines on the map.

Sunbright anticline: Next in line to the south in this row of anticlines is the Sunbright structure, the top of which includes most of the town of Sunbright west of the railroad. This little structure appears to be perched upon a larger fold, the outline of which cannot be drawn in to the south from the data now at hand. It is a little more than a fourth of a mile in diameter and appears to be cut by two faults. The sensible way

to explore the structure would be for leases to be given out to a single company and then the area laid into blocks of about five or ten acres each, upon each of which one well would be drilled and the royalties pro-rated among the land holders.

Boone Camp terrace: The Boone Camp terrace is a mile and a half west of the Union Hill anticline, and separated from it by a syncline. The contour map indicates that the terrace extends from the Boone Camp oil field half a mile toward the north and half a mile toward the southeast. It is probable that there would be an unproductive area for a quarter of a mile east of the present production, and then a chance for a few more wells. The terrace rises very slowly toward the south and the field may extend in that direction. The drainage area is fairly large.

Other anticlines: Five other possible anticlines are indicated on the structure map. The field work done in this part of the area was not sufficient in detail to warrant contouring. Only tentative correlations of the sandstone lenses could be made. It is suggested that additional field studies be made before drilling in these areas is carried out.

*Lusk, Ralph G., The Boone Camp Oil Field, Morgan County, Tennessee. Tennessee Geological Survey, Free Bulletin March 20, 1928, 7 pages, with blue print map.

†This structure was tested in 1932 by Carl Rexall's Rexall Land Company No. 1 (1941). Although it is a commercial gas well, no log or other data are available. It reached a reported total depth of 1186 feet and the producing zone is probably the Glenmary pay.