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MINERAL RESOURCE SURVEY
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A mineral resource survey of Texas is being conducted by the Works Progress Administration, the Bureau of Economic Geology of The University of Texas acting as sponsor. The purpose of the survey is to assemble information and make it available to the public. The mineral resource survey is helping in the location of mineral products, from some of which it is reasonable to suppose industries of value to the State may be developed. The following report is based on work done in Anderson County.

REPORT ON THE MINERAL RESOURCES OF ANDERSON COUNTY, TEXAS

by Bruce Whitcomb, Supervisor

The field work on which this report is based was done during October and November, 1936. It consisted of the mapping by reconnaissance methods of the areas of outcrop of the formations over as large a portion of the county as possible, followed by the detailed mapping of the area west of Elkhart with the plane table. This work was supplemented by coring with hand tools.

As the areal geology of Anderson County is very well illustrated on the geologic map of Texas published by the United States Geological Survey, no copy of the reconnaissance mapping is included in this report. A map showing the results of the plane table work is available for examination at the office of the Bureau of Economic Geology, Main Campus, Geology Building, UT-Austin.

TOPOGRAPHY

Anderson County is bounded by Trinity River on the west and Neches River on the east. The divide between the two rivers forms the chief topographic feature of the county. It is marked by a series of flat-topped, steep-sided, strongly eroded hills and plateaus running north from the Houston County line to Palestine. From Palestine northward the streams draining into the Neches have been able to cut through the hills and head to the west of them so that whie the higher hills are on the Neches slope, the divide is farther west in the sand hills country. The area occupied by the steep-sided, flat-topped hills swings from Palestine in a northeasterly direction to the Henderson County line near Frankston.

Two stages of erosion are shown in Anderson County. The drainage into the Trinity is from a terrain in maturity, though the river itself shows features of old age. On the other hand, the Neches watershed is youthful.

Though it is impossible, owing to the lack of complete topographic mapping and the limited visibility in a timbered country, to reconstruct accurately the topographic history of the area, it appears that the present terrain is the result of the rejuvenation and incision of an old topography on which peneplaination was almost complete. There are a few hills in the county whose tops are not timbered. From these it is possible to look across the summits to far horizons formed by the merging of the higher features. From these vantage points it is seen that the resulting horizon is almost sufficiently flat to be called a peneplain. But the peneplaination here was not as well developed as it was farther to the west. Occasional highs and lows break the flatness of the old surface.

The presence of gravels and other terrace deposits that appear to correlate with Pleistocene formations of other parts of the State, together with their relation to the present topography, suggests a pre-Pleistocene age for the older terrain. The probabilities are that the older topographic features now observable are of late Pliocene age.

The relief of Anderson County is estimated to be about 350 feet. The highest point found in the plane table work was 483 feet above sea level while the water in Trinity River at the highway bridge at Long Lake has an elevation of about 190 feet. As the plane table work was done on the Trinity slope in the southern part of the county, it is probable that the high points of the area, to the northeast of the mapped territory, have elevations nearly a hundred feet higher than that found.

STRATIGRAPHY

As the stratigraphic relations of the Tertiary formations of East Texas have been adequately discussed in the literature, they will be only listed here.

Around some of the salt domes in Anderson County strata as low in the geologic column as the Austin chalk have been raised to the surface. As these features have been well described, only passing mention of them will be given in this report.

Except around the salt domes, the lowest strata exposed in Anderson County are the sands, sandy clays, and brown coals of the Calvert Bluff member of the Rockdale of upper Wilcox. Immediately above these are the yellowish-brown sands of the Carrizo, the lowest member of the Claiborne. Their thickness in this area is about 60 feet. These sands are overlaid by 60 feet of greensands and shales of the Reklaw. Next above the Reklaw occur about 350 feet of sands of the Queen City. The Weches, directly above the Queen City, has a thickness at each locality measured in Anderson County of 50 feet and consists of marine greensands, usually very fossiliferous. About 325 feet of sand making up the Sparta overlies the Weches and is in turn covered by the greensands and shales of the Crockett. Only the lower part of the Crockett seems to occur in Anderson County. With the exception of the terrace and upland sands and gravels, thought to be Pleistocene, the Crockett is the highest formation exposed in this area. The total thickness of strata exposed is about 1200 feet. In passing it is interesting to note that no Sabinetown marine Wilcox was observed in Anderson County.

STRUCTURAL GEOLOGY

The trough of the East Texas geosyncline traverses Anderson County, its location being very nearly coincident with the area of outcrop of the Weches. This trough plunges toward the south. The average rate of regional dip is very slight, being not more and probably a great deal less than 50 feet to the mile. The southward rate of plunge of the trough is about 10 to 20 feet to the mile.

However, the structure of the area is not a simple plunging trough. A series of folds trending in a northeast-southwest direction are superimposed on this simple structure. These folds have distorted the strata into a series of anticlines and synclines. The Cayuga and Long Lake oil fields are on anticlines of this series.

In the synclines salt has pushed its way up to form domes, such as Palestine, Keechi, and Boggy Creek. Camp Hill is a salt dome where the structure is complicated by faulting.

In the southern part of the county, faulting is the prevailing type of structure disturbing the simple relations of the trough. Elkhart is situated in a graben between two faults that trend northeast and southwest. The down-dropped block plunges to the northeast enough to have some Crockett remaining in the vicinity of Elkhart, and the graben is itself crossed by a fault with a northwest-southeast trend. This fault is located toward the southwest end of the graben. It is downthrown to the southwest. The maximum displacement on the cross fault is about 100 feet. The displacement on the northwest side of the graben is sufficient to bring Sparta on the downthrown side against Queen City on the upthrown side. The exact amount of displacement could not be determined. It was also impossible to determine the displacement on the southeast side of the graben because of the scarcity of exposures, but it appears that here Crockett on the downthrown side is against Sparta upthrown.

ECONOMIC GEOLOGY

The most important mineral resources of Anderson County are oil and gas, salt, coal, clay, iron ore gravel, and greensand.