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MINERAL RESOURCE
RECORDS DIVISION

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ILLINOIS STATE
GEOLOGICAL SURVEY

GEOLOGY
of the
GRUNDY - WILL COUNTIES
COAL FIELD

by A.C. Roe

Geology
of the
Grundy-Will Counties Coal Field

I. Location (Plate 1)

The northeastern boundary of the Illinois-Indiana-West Kentucky coal field passes one mile south of Morris in an eastern direction, turns southeast four miles north of Coal City, and south two miles northeast of Braidwood.

From a point three miles west of the Elgin, Joliet, Eastern Railway to another one about one mile southeast of Braidwood, the edge of the coal basin is suitable for stripping and forms what is called in this report the Grundy-Will Counties field.

II. Topography

The land over the coal is flat with very slight differences in elevation except for sand dunes, which formed lake shore lines and moraines in the time of the glacial epoch. Most of the land is under cultivation, except for some pasture and wood land.

III. Drainage

This region is drained through the Clay Pool Ditch, which runs north of Braidwood and Coal City and connects with the Mazon Creek five miles southeast of Morris.

IV. Descriptive Geology and Structure of the Region

A line drawn between Chicago and Coal City (Plate 2) passes over different rock formations which crop out in places but are mostly covered with surface

soil, sand and gravel. They are:

(a) The Niagaran limestone, which overlies northeastern Illinois and extends ten miles southeast of Joliet as indicated on the map.

(b) The Maquoketa shales and limestones, which crop out along the Kankakee River. They are older than the Niagaran limestone, but come to the surface because both formations dip northeast towards Chicago and, therefore, crop out on the surface necessarily in a southwest direction.

(c) The Pennsylvanian formation or coal measures. Following the line drawn from Chicago to Coal City a new formation appears south of the Kankakee River, - the Pennsylvanian formation, also called the coal measures. These consist of coal seams, shale, clay, and sandstone and are much younger than the formations listed in (a) and (b), although they belong to very old formations in geologic history.

In this region the coal measures rest directly upon the Maquoketa shales because the intermediate formations have been eroded here before coal measure times. Below the Maquoketa shales lie the Galena-Plattville limestone and dolomites. These are called Trenton in other parts of the country and frequently contain petroleum pools. Below the Galena-Plattville follows the St. Peter sandstone, which comes to the surface near LaSalle and forms the rocks at Starved Rock and Deer Park

In this way we get the following formations

succeeding each other from top to bottom in the Grundy-Will Counties coal field:

surface (soil, sand, gravel)	10-40 feet
coal measures	about 100 feet
Maquoketa shales and limestone	" 100 "
Galena-Plattville(Trenton)	" " 300 "
St. Peter sandstone	" 100 "

Of these formations the coal measures are the most important and they alone will be considered in detail. They consist in this region of one coal seam of commercial value (No. 2 coal) and, below this, of several smaller seams which contain the so-called No. 1 coal and possibly also a split seam of No. 2 coal. Above the coal seams is soft blue shale (soapstone) and in very few instances, sandy shale. Below the coal is fire clay and below it in places, soft sandstone.

V. Structure of the Field

The No. 2 coal is the most extensive and evenly spread coal seam in Illinois. It lies very flat, having a dip of less than one-half of one percent towards the center of the state of Illinois. Its thickness varies little from 40 inches, and it is very uniform and homogeneous in appearance.

Slight irregularities in the coal field of northern Illinois are caused by the LaSalle anticline and its cross folds. The LaSalle anticline(Plate 3) is an upward folding of rocks and coal seams which begins

at LaSalle and runs southeast to Wabash County. Its lower end contains 90 percent of all known oil pools of Illinois. Such slight elevations, depressions and foldings in the Grundy-Will Counties coal field, which were caused by the uplifting of the LaSalle anticline, are the elevation recorded from the NW $\frac{1}{4}$ of Section 30, R9E, T33N, the depressions in the SW $\frac{1}{4}$ of Section 24, R8E, T33N, and in the SW $\frac{1}{4}$ of Section 29, R9E, T33N. An anticline which is two miles wide in the coal and probably at least four miles in the underlying rocks runs in a northeast-southwest-erly direction, with its crest passing through the center of Section 14, T33N, R8E. This anticline probably contains some petroleum along its eastern flank and it is recommended that test drilling for oil be made here.

There is some warping at the edge of the coal field, which was apparently caused by lateral pressure. Therefore, the coal seam forms some slight folds parallel to the edge instead of rising continuously from southwest to northeast to its border. But these irregularities are so slight as not to interfere with the stripping qualities of the coal, which are extremely favorable here because the dip of the coal is gentle enough to allow a wide stripping bed. The edge of the coal seam was formed by cutting off through glacial erosion and not by a gradual pinching out of the coal seam. Therefore the coal is evenly good to its boundary.

VI. Underclay

The under clay of the No. 2 coal, which also in-

cludes at the greater depths, several layers of No. 1 coal, contains some of the best-known and valued clays in Illinois and has been mined along the edge of the Illinois coal field, as illustrated on the map on Plate 4. The famous Cheltenham clay on the west side of Illinois and throughout LaSalle County is found below coal No. 2 in Grundy County and Will County in large quantities. In a report by C. W. Parmelee and C. R. Shroyer, entitled "Further Investigations of Illinois Fire Clays (Abstract from Bulletin 38, Illinois State Geological Survey - Urbana, 1921), its uses are suggested for, refractories, architectural terra cotta, stoneware, sanitary ware, and face brick.

The following has been reported about roof shale in Coal City and Wilmington (Coöperative Coal Mining Series, Illinois State Geological Survey, Bulletin 18). The roof shales vitrify at comparatively low temperatures, show a short heat range in burning, and overburn easily. These characteristics eliminate them as possibilities for the manufacture of vitrified wares such as paving brick. They may be used for more or less porous products such as common brick, front brick, and hollow ware, in case the molding and drying properties are satisfactory.

VII. Sand and Gravel

The overburden of coal No. 2 consists to a large extent of sand and gravel, which occasionally directly

overlies the coal, but in most instances is separated from the coal by a bluish shale usually called soapstone. The sand can be used for molding purposes and has an excellent commercial value and the gravel has shown to be in many cases of good commercial quality.

VIII. Oil and Gas

In the Grundy-Will Counties field are two formations which are known to furnish oil in commercial quantities. They are the Pennsylvanian sandstones and the Trenton dolomites. (The Trenton is usually called Galena and Platteville in northern Illinois.) There are various structures in the Grundy-Will Counties field which give promise to the production of oil in commercial quantities, one of which is the anticline whose crest lies in the northeast direction through the center of Section 14, T33N, R8E. This anticline, which is only about two miles wide on top but probably four miles in the deepest strata, should be dug on its east flank to a depth of possibly 700 feet in order to prove whether there is oil present or not.

Very few, if any, tests for oil have been made in this region, the nearest which has been reported being a few miles east of Minoka on the north branch of the DePage River. It gave a negative result. Oil in small quantities was found within the #7 mine of the Wilmington Star Mining Company, where a very small seepage was observed.

Some of the recent drill holes in Grundy County showed an escape of gas in quantities which probably did not exceed in individual cases an amount of a few thousand cubic feet a day. While it is possible that this gas may have been formed from decaying vegetation, it is more likely that it came off gas-containing layers of the Pennsylvanian system.

IX.

The reforesting of strip-land has been investigated by Professor W. B. McDougall of the University of Illinois. His observations were made in Vermillion County and he reports that sycamores, elms, maples and cottonwoods grow easily on strip land. (See Plate 5)