

STATE OF ILLINOIS

DEPARTMENT OF REGISTRATION AND EDUCATION



STRIPPABLE COAL RESERVES OF ILLINOIS

**Part 5A—Fulton, Henry, Knox, Peoria,
Stark, Tazewell, and parts of Bureau,
Marshall, Mercer, and Warren Counties**

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ILLINOIS STATE GEOLOGICAL SURVEY
John C. Frye, Chief **URBANA**

CIRCULAR 348

1963

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ABSTRACT

Strippable coal reserves, defined as coal 18 inches or more thick and with overburden not exceeding 150 feet, are being evaluated in a series of reports covering the coal fields of Illinois. This report describes strippable coal reserves in a part of the fifth area being mapped. Part 5A includes all of six counties and parts of four counties in western Illinois. A subsequent report designated Part 5B will describe strippable reserves in a smaller area, west of Part 5A, where practically all of the reserves are in Rock Island (No. 1) Coal.

Maps included in this report have a scale of one-half inch to the mile and show coal outcrops, mined-out areas, coal thickness, and overburden thickness at intervals of 0 to 50, 50 to 100, and 100 to 150 feet. Strippable reserves were estimated and are mapped in detail for Rock Island (No. 1), Colchester (No. 2), Springfield (No. 5), Herrin (No. 6), and Danville (No. 7) Coals. Several non-persistent, but locally minable, coals are described, but no estimate of strippable reserves is made for them.

The geology and stratigraphy of all coal deposits in the area are described briefly and illustrated by cross section diagrams. The quantity of strippable coal, categorized by thickness of coal, thickness of overburden, and reliability of estimate, is tabulated by township for each county.

Nearly 8 billion tons of strippable coal reserves are estimated for the counties considered in this report: Rock Island (No. 1) Coal reserve totals 5 million tons; Colchester (No. 2) Coal, $2\frac{1}{2}$ billion tons; Springfield (No. 5) Coal, 2 billion tons; Herrin (No. 6) Coal, $2\frac{1}{2}$ billion tons; and Danville (No. 7) Coal, 750 million tons.

INTRODUCTION

This report is one of a series issued by the Illinois State Geological Survey summarizing the strippable coal reserves of Illinois. Figure 1 indicates the location of the area (5A) covered by this report. The area includes six counties and a part of four additional counties, incorporating the major part of the coal reserves in western Illinois. A subsequent report (Part 5B in the series) will describe strippable reserves, principally in the Rock Island (No. 1) Coal Member. The index map in three previous reports (Smith, 1957, 1958, 1961) shows area 5 as a single report area.

In this series of reports, coal more than 18 inches thick at depths of up to 150 feet is being mapped. Minable reserves are tabulated according to average coal thickness at depths of 0 to 50 feet, 50 to 100 feet, and 100 to 150 feet. The quantity of strippable coal (estimated according to coal thickness, overburden thickness, and reliability of estimate) is tabulated by township for each county.

This report contains three maps (pls. 1, 2, and 3) that show the extent of strippable coal for the five coals for which reserves are tabulated. These maps are on a scale of one-half inch to the mile. Three cross sections (pl. 4) show the succession of coals and associated strata.

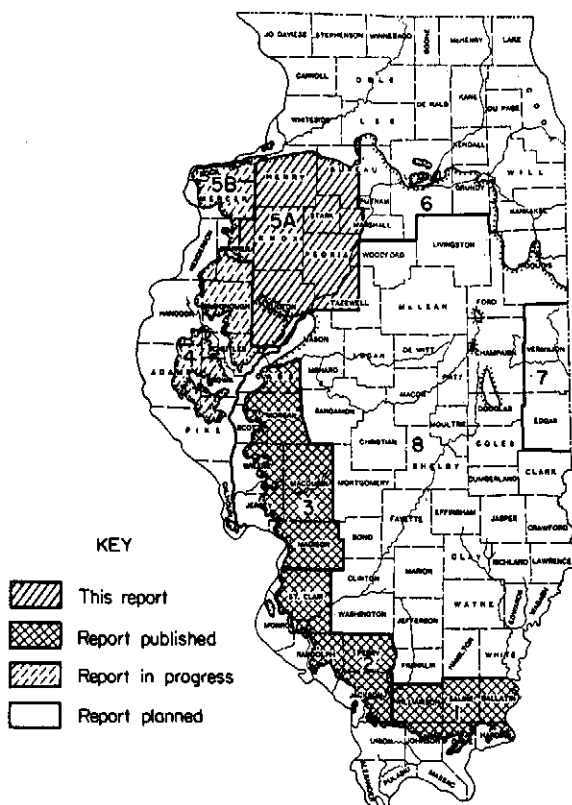


Fig. 1 - Index map showing boundary of the Pennsylvanian strata of Illinois, location of area of this report, reports in progress, previous reports, and reports planned to complete the mapping of strippable coal resources of the state.

Previous Investigations

Worthen et al. (1870) and Worthen et al. (1873) presented the first detailed descriptions of the geology and coal resources in the counties considered in this report. The geology and mineral resources of the Peoria Quadrangle were studied by Udden (1912), the Avon and Canton Quadrangles by Savage (1921), and the Alexis Quadrangle by Wanless (1929). Cady (1921) described the coal resources in an area that included a small part of Knox County, most of Fulton County, and all of Peoria County. Culver (1925) described the coal resources in an area that included the western part of this report.

Cady (1937) summarized information on areas possibly suitable for strip mining that included parts of the area mapped in this report. Later, Cady and others (1952) considered strippable reserves in a report on the minable coal reserves of Illinois, but he did not differentiate strippable reserves in computing the total minable coal reserves.

A recent report (Wanless, 1957) described the geology of the Beardstown, Havanna, Vermont, and Glasford Quadrangles, including parts of Fulton and Peoria Counties. The report contains detailed geologic maps of four quadrangles, which include parts of Fulton and Peoria Counties.

Additional publications relating to the geology and coal resources of the area that have been used in this investigation are listed at the end of this report.

Acknowledgments

The authors are indebted to the mining companies operating in the area studied. They have been most helpful in furnishing data resulting from exploration for coal in these counties.

Work on the report was supervised by Jack A. Simon, Head of the Coal Division of the Survey, who contributed much information from his personal knowledge of the area and offered many helpful suggestions in the preparation of the maps and the manuscript.

METHOD OF PREPARING RESERVE ESTIMATE

Sources of Information

Data for compiling the maps and coal reserve estimates were obtained principally from previous reports and maps relating to the area. Data from these reports were supplemented by the study of well logs and field notes in the Survey files collected by geologists who have previously worked in the area.

The reports by Wanless (1929, 1957) furnished much of the information used in mapping coal outcrops and coal thicknesses in those areas. In other areas work maps prepared by Cady (1952) for computation of coal reserves in Illinois furnished the principal source of information for coal outcrops and coal thicknesses. In a number of places, particularly in Knox, Peoria, and Stark Counties, the maps of Cady (1952) were considerably modified by new data assembled in this study.

Structure contour maps of each coal were prepared from mine, drill hole, and outcrop records in the Survey files and from previous structure mapping in parts of the area by Wanless (1957) and Savage (1921). Contour maps of the bedrock surface prepared by Horberg (1950) were used extensively in projecting the extent of coals concealed beneath glacial deposits.

Data regarding the extent of coal mined out were obtained from maps prepared for the report on coal reserves by Cady (1952) and subsequently revised to include all mining to July 1, 1959.

Selection of Mapping Areas

Illinois has been divided into eight areas for convenience in preparing reports and maps of strippable coal reserves. Figure 1 shows the areas covered by the separate parts of the study. The present report (Part 5A) describes strippable coal reserves in the northern portion of the western Illinois coal field with the exception of No. 1 Coal reserves in Warren, Mercer, and Rock Island Counties, which will be the subject of a forthcoming report (Part 5B). Areas 1 through 7 (fig. 1) incorporate the margins of the Eastern Region of the Interior Coal Province where the minable coals of the McCormick and Kewanee Groups crop out within the state. The eighth area embraces a large part of the deeper portion of the Illinois Basin where coals of the Kewanee Group lie at depths too great for strip mining. In the eighth area, strippable reserves are restricted to coals of the McLeansboro Group, which are known to attain minable thickness only locally.

Definition of Strippable Coal

Evaluation of strippable reserves is based principally upon thickness of coal and of overburden. In this report strippable coal reserves include coal seams that are 18 inches or more thick and have an overburden not more than 150 feet thick.

Certain of the reserves will not be recoverable because they lie beneath towns, cities, highways, or other limiting factors. However, the scale on which the coal is mapped does not permit the omission of such nonrecoverable coal from the estimate.

In this report, as in earlier reports on coal reserves in Illinois (Cady, 1952; Smith, 1957, 1958, 1961), the tonnage estimate is based on an assumption of 1800 tons of coal per acre foot. This conforms to the figure used by the United States Geological Survey in estimating reserves of high-volatile coal. However, a figure of 1770 tons per acre foot is probably more representative for coals in Illinois. The estimates are based on total coal in place, and no estimate of recoverable coal is presented.

Mapping of Coal Outcrops

The term outcrop is used broadly herein to describe the border of a coal whether it is exposed at the surface or concealed beneath unconsolidated surface materials.

The accuracy with which the outcrop boundaries of coal seams can be mapped depends on the number and distribution of visible outcrops and test holes, and on the nature of the topography and the amount of unconsolidated material covering the area. Faults and other structural features, erosional cutouts, and areas in which the coal is lenticular or lacks persistence also make it difficult to map the coal outcrop accurately.

In much of the area of this report, the bedrock is masked by varying thicknesses of glacial drift and loess (wind-blown silt). Wherever sufficient data were available, a provisional line was drawn representing the border of the coal beneath the unconsolidated deposits. These provisional outcrops have been derived from the contours of coal structure, bedrock surface, and surface topography. Additional drilling information will modify the provisional outcrops shown. These lines,

however, provide an opportunity to illustrate on the maps and to discuss in the text areas where coal may be found at strippable depths.

On the maps coal exposures and small mines near the outcrop illustrate in a general way areas of relatively close control. In contrast, question marks inserted along the outcrop line indicate areas where projections of the outcrop are based on secondary data.

Overburden Categories

Thickness of overburden is shown on the map by isopach lines representing 50-foot intervals. These lines divide the overburden into three thickness categories: 0 to 50, 50 to 100, and 100 to 150 feet. Reserves tabulated in tables 1 through 7 show the amount of strippable coal in each of these categories. Although 100 feet of overburden represents approximately the maximum limit of overburden in Illinois strip mining to date, it seemed advisable to project overburden thicknesses beyond this present economic limit. It is, however, beyond the scope of this report to predict future economic and technologic factors that may govern the ultimate recovery of coal reserves classified in this study.

Delineation of Strippable Coal

The isopach lines delineating the various categories of overburden thickness on the maps were constructed by interpreting intervals between contours of surface topography and contours of coal elevation. Surface topography was obtained from United States Geological Survey topographic maps on a scale of 1:62,500. Coal structure data for the No. 2 and No. 5 Coals in the Beardstown, Havana, Vermont, and Glasford Quadrangles were obtained by some revision, utilizing additional data, of the coal structure on maps prepared by Wanless (1957). For the remainder of the report area, structure maps for each of the coals were prepared by the writers from a wide variety of sources. These included logs of holes drilled for coal, oil, and water, plus a large number of unpublished maps and field notes in the Survey files. In some areas, structure maps from earlier Survey reports were used as a basis for the coal structure maps but often were modified considerably by additional data that have become available. These reports include those of Udden (1912), Savage (1921), Wanless (1929), and Poor (1935).

STRIPPABLE COAL RESERVES

Classification of Reserves

Coal reserves are divided into two classes to designate the reliability of the estimate. On the maps and the tables of this report, reserves are divided into primary and secondary reserve classes.

Class I - Primary Reserves

Class I reserves include coal in areas where there is enough information to establish its presence with reasonable certainty. This class ordinarily includes all coal within two miles of the last point of reliable information of coal thickness (mines, outcrops, diamond drill holes, and churn drill coal test holes). This is equivalent to the proved (Class I-A) and probable (Class I-B) categories for reserves in the statewide inventory of coal reserves compiled by Cady (1952). Where

available data suggest uncertainty regarding the persistence of the coal or marked variations in its thickness, the limits defined above have been reduced in making the appraisal.

Class II - Secondary Reserves

Class II reserve estimates are based on projection of geologic information from the Class I areas outward into areas in which only scattered information is available from records of test holes drilled for oil, gas, or water, and in which data on coal thickness are not reliable enough for classifying the coal as primary reserves. In areas adjacent to places where the coal is lenticular or erratic in its occurrence or where there is doubt regarding the continuity of the coal in the thickness indicated, the coal is included with the Class II reserves. This is done even though it lies within two miles of the last point of reliable information of thickness and ordinarily would be included with the Class I reserves.

The principal value in recognizing Class II reserves is to indicate areas where indirect evidence, plus geologic interpretation, suggests that coal may be present at the thickness indicated on the maps. In these places, prospecting for strippable coal might be conducted advantageously.

The Class II reserves of this report correspond to those classified by Cady (1952) as II-A (strongly indicated) and II-B (weakly indicated).

Thickness of Coal

Thickness of coal is indicated on the maps (pls. 1, 2, and 3) by isopach lines and average thickness categories. Where datum points were spaced closely enough to permit isopach lines to be drawn, they are shown. However, over most of the area it was not practical to construct isopach lines, and only estimated average coal thickness values are shown. These average thickness values have been divided along township lines wherever it was convenient to do so; elsewhere, the boundary between average thickness categories is indicated by line symbols. Average thickness values thus derived were used to calculate the coal tonnage within each of the overburden and reliability classifications delineated.

The average thickness values and isopach intervals used in this study coincide with those used by Cady (1952) for calculating the total minable coal reserves of Illinois with the exception of the lowest thickness limit, which generally was 28 inches in the earlier study.

For some areas on plates 1, 2, and 3, there are virtually no reliable data concerning the thickness of the coals. However, there is enough information from records of oil or water well drilling to permit making a coal structure map and classifying the coal into the various categories of overburden thickness outlined for this study. Such areas are designated by appropriate symbols on the maps.

Mined-out Coal

Mined-out coal areas shown on plates 1, 2, and 3 are taken from maps compiled by the Illinois State Geological Survey (Cady, 1952, p. 16), which were later revised to include all mining to July 1, 1959.

In certain areas, a large part of the geologic information relating to the distribution and thickness of the coal has come from observations at local mines. On the maps in this report, local mines for which there are available records are shown, except where they are too numerous to be shown conveniently. It was

necessary to generalize mined-out coal data for areas of extensive mining in order to represent this information at the scale of these maps. Therefore, individual small mines are not shown separately where mining has extended over large areas.

Quality of the Coals

The quality of the coals described in this report is summarized in table 8, which lists the county average values for the various analytical properties of each coal. Most of these values have been obtained from reports of analyses of Illinois coals by Cady (1935, 1948).

GEOLOGY AND STRATIGRAPHY OF THE COALS

In the area included in this report, sediments of Pennsylvanian age were deposited on an uneven surface that was developed by erosion and deformation of underlying Mississippian or older sediments before the beginning of Pennsylvanian deposition.

Structurally, the area is a part of a broad shelf lying northwest of the deeper part of the Illinois Basin and between the Lincoln Fold and the LaSalle Anticline (fig. 2). Earliest Pennsylvanian deposits in the area were laid down in valleys and lowlands formed by erosion of the pre-Pennsylvanian surface. Accumulation of Rock Island (No. 1) Coal and older rocks was restricted to the low-lying portions of the pre-Pennsylvanian topography. Early Pennsylvanian sedimentary units therefore accumulated in considerably variable thicknesses from place to place, depending upon local relief. These topographic differences were diminished as Pennsylvanian sedimentation continued, and, during the later part of the period of accumulation of sediments of the Spoon Formation, the depositional surface became progressively more level. Consequently, by the time of accumulation of Colchester (No. 2) Coal, deposition was quite uniform over the entire area.

Rocks of Pennsylvanian age in Illinois are classified into groups and formations on the basis of variations in their gross lithologic character (Kosanke et al., 1960). The principal geological features of the coal beds and associated strata in each geologic group found in this area are discussed below with emphasis on the nomenclature and correlation of the coals. A generalized geologic section (fig. 3) shows the sequence of strata encountered in the counties of this report.

McCormick Group

The McCormick Group includes the strata between the top of the pre-Pennsylvanian sediments and the top of the Bernadotte Sandstone Member. It is subdivided into the Caseyville and Abbott Formations (Kosanke et al., 1960). The Caseyville Formation, which includes the strata between the base of the Pennsylvanian and the top of the Pounds Sandstone Member, is not known to be represented in the area of this report.

Abbott Formation

Abbott Formation strata usually lie unconformably on pre-Pennsylvanian strata and constitute the oldest Pennsylvanian strata in the area. Thus the Abbott Formation includes all of the Pennsylvanian age rocks below the top of the Bernadotte Sandstone. In the area of this report, three coals have been named in the

Abbott Formation (Wanless, 1957, p. 69 and 179; Kosanke et al., 1960). These are the Pope Creek, Tarter, and Manley Coal Members. These coals are characteristically discontinuous and thin, and their extreme variability does not permit them to be mapped as the younger, more regularly occurring, coals are. Locally, however, these coals have been observed in thicknesses up to 3 feet or more (Wanless, 1957, p. 67). Although these coals are generally thin and lack persistence, they are likely to be found wherever the Abbott Formation is encountered in the area.

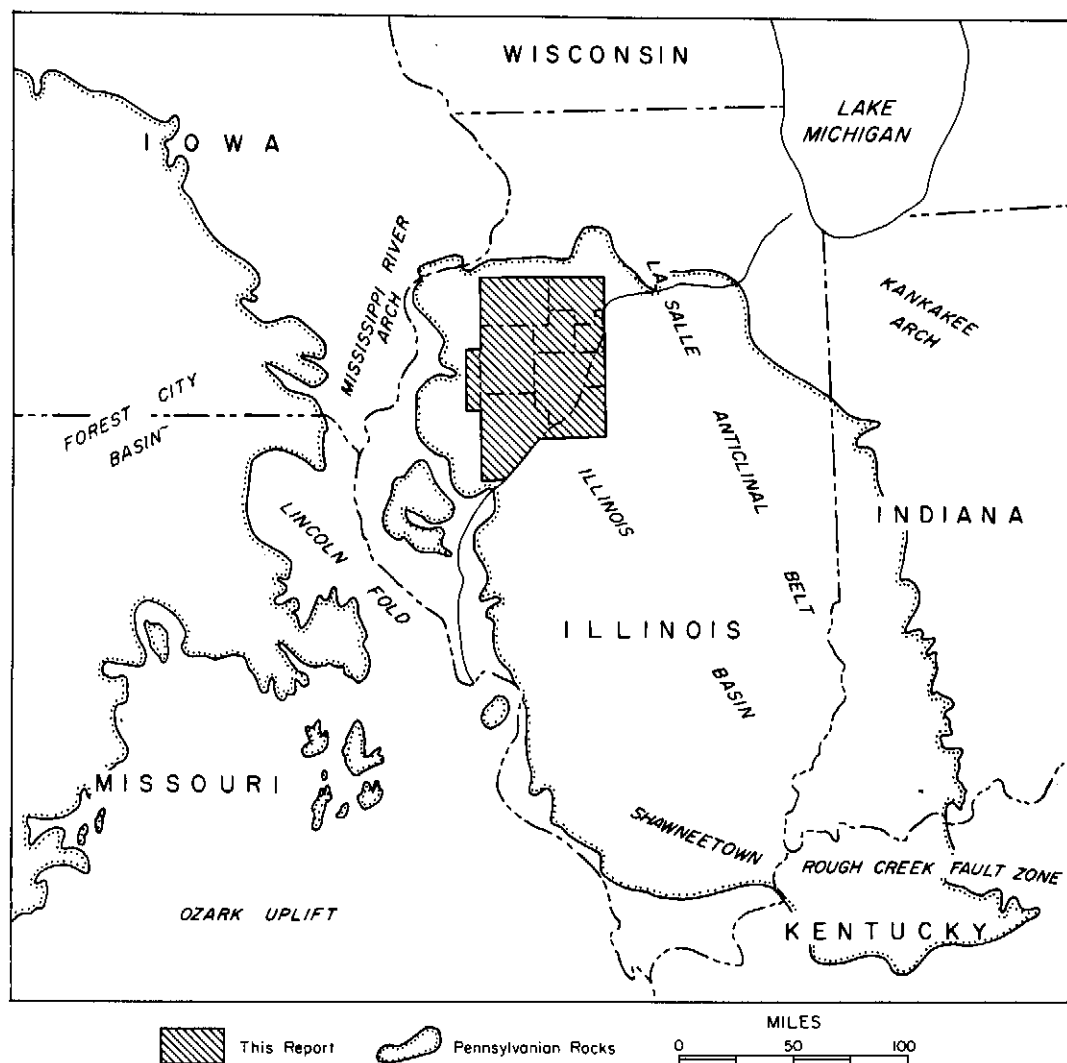


Fig. 2 - Tectonic map showing the relation of the report area to regional structural features.

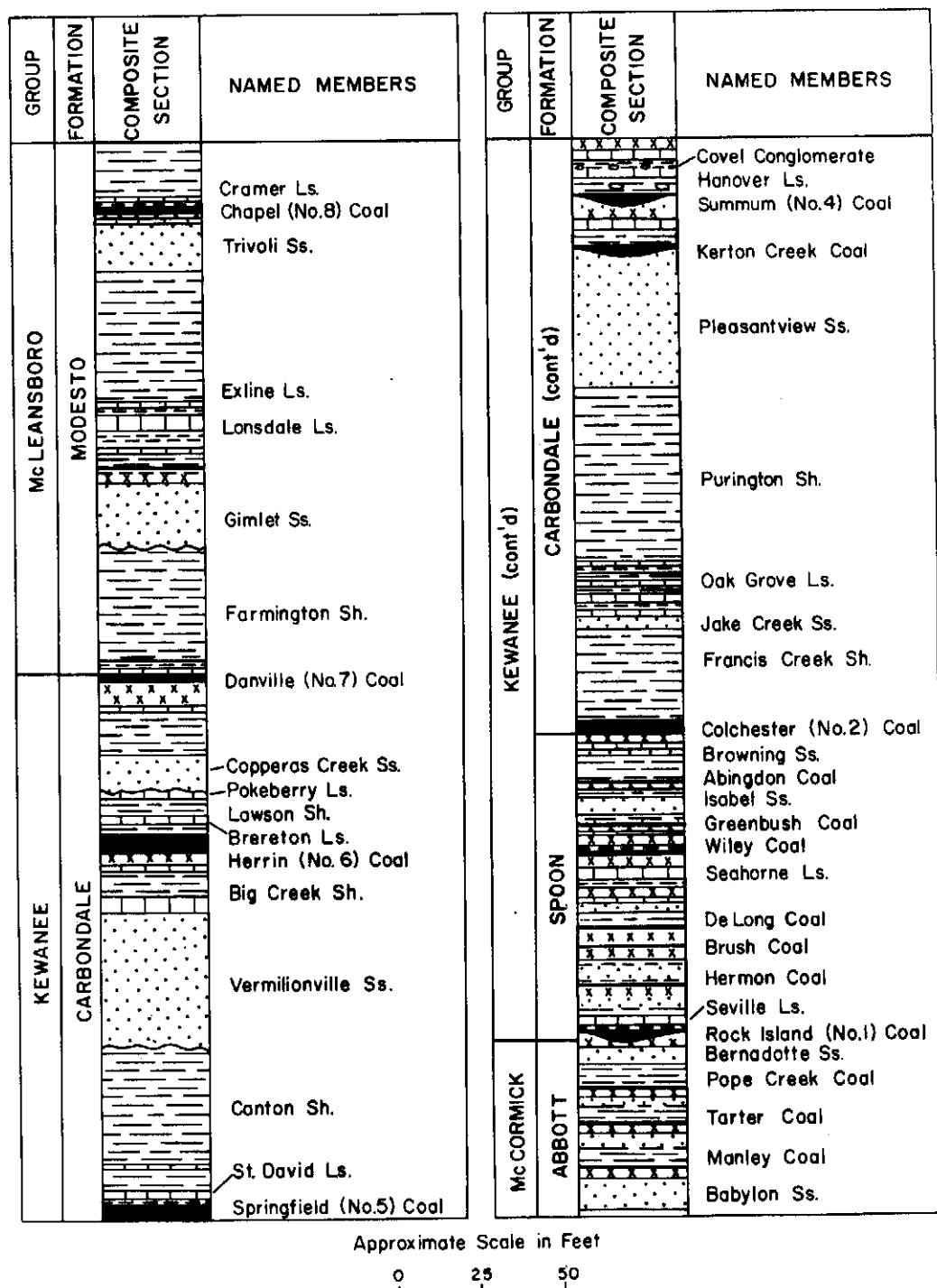


Fig. 3 - Composite section of Pennsylvanian strata in western Illinois (adapted from Wanless, 1957, p. 59-64).

Kewanee Group

The Kewanee Group includes all strata from the top of the Bernadotte Sandstone Member to the top of No. 7 Coal Member (Kosanke et al., 1960). The group is divided into the Spoon Formation, which contains the strata below the base of No. 2 Coal, and the Carbondale Formation, which includes the strata between the base of No. 2 Coal and the top of No. 7 Coal.

Spoon Formation

In the area of this report, the thickness of the Spoon Formation ranges from 40 to 120 feet. The greatest thicknesses are recorded in Henry and Peoria Counties. The least thicknesses occur in northwestern Fulton County and the adjacent parts of Knox and Warren Counties, and generally south and west of these places. The Spoon Formation's average thickness of about 70 feet is prevalent in central Knox County and in central and eastern Fulton Counties.

All of the exposures of the Spoon Formation and most of the drill holes and mines which penetrate it are found in the western half of the report area. In the eastern half of the area the Spoon Formation has seldom been penetrated by coal test borings.

The generalized geologic column (fig. 3) and the geologic cross sections (pl. 4) illustrate the sequence of members of the Spoon Formation and variations of their thicknesses and occurrence in the report area.

Rock Island (No. 1) Coal Member.—The Rock Island (No. 1) Coal is correlated with the Minshall Coal of western Indiana, the Bluejacket Coal of Missouri, and the Murphysboro Coal Member of southwestern Illinois (Kosanke et al., 1960, pl. 1). The No. 1 Coal is the only member of the Spoon Formation that commonly has been mined in the area and at present is mined only by Shuler Coal Company, two miles south of Alpha in Henry County.

Mineable deposits of No. 1 Coal are found in lenticular, usually elongate, bodies which seem to mark the location of stream valleys or structural depressions in the sediments older than the coal. The origin of these areas of locally thick No. 1 Coal accumulation have been described by Wanless (1957, p. 166) as follows:

These valleys were partially filled with the Bernadotte sandstone. Coal swamps formed in the unfilled valleys, and the valleys were nearly filled with plant debris. When the area was invaded by marine waters, long arms of the sea, like modern estuaries, occupied the valleys. The combined weight of the water and marine sediment compacted the plant debris to form the Rock Island (No. 1) Coal.

Compaction of the plant debris permitted the accumulation of limy muds as much as 30 feet thick locally. The limestone, the underlying black shales, and the coal, all thin and wedge out at the margin of the old unfilled valleys.

Hermon Coal Member.—Dark blue shales were deposited over the submerged valleys in which the Seville Limestone Member and No. 1 Coal had accumulated and over areas outside of these valleys as well. Further compaction of No. 1 Coal in the valleys formed depressions on the surface of the sediments covering the coal. When the seas withdrew from the area, some of these depressions were filled by vegetation, which formed the thickest beds of the Hermon Coal. Consequently, mineable thicknesses of the Hermon Coal are sometimes found above the thickest

deposits of No. 1 Coal. One example of such an occurrence has been recorded in Fulton County (NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 27, T. 7 N., R. 2 E.) where a shaft mine encountered 42 inches of Hermon Coal 10 feet above 42 inches of No. 1 Coal (pl. 3). A small amount of the Hermon Coal was mined before the shaft was abandoned.

Relatively little coal was deposited on slightly higher terrain between the ancient valley sites. In these areas No. 1 Coal is seldom more than 6 inches thick, and the Hermon Coal is usually less than 2 inches thick. Both coals may be missing in the inter-valley provinces, and only a smut streak or underclay commonly marks their position. The Hermon Coal is less persistent than No. 1 Coal.

Seahorne Limestone Member.—The Seahorne Limestone occurs in the upper part of the Spoon Formation and is an important marker bed in the southern part of the area. The limestone is dark blue-gray and may appear as any gradation between small nodules in a thin clay and a massive ledge several feet thick. Commonly, it is a bed of boulder-like limestone masses in a clay matrix. The massive facies of the limestone is persistent in southern Fulton County, and a thin nodular facies occurs sporadically in Knox and Warren Counties. Seahorne Limestone "boulders" washed out of their clay matrix are often conspicuous elements of the "float" debris noted in western Fulton County streams.

Wiley Coal Member.—The thin persistent Wiley Coal is one of the better stratigraphic markers in the Spoon Formation in the area. It occurs 20 to 30 feet below No. 2 Coal and lies close above the Seahorne Limestone. The thickness of the Wiley Coal ranges from 0-20 inches and probably averages about 10 inches in southern Warren and Knox Counties. In the northern parts of these counties and in Henry County, there is little data available for the Wiley Coal. The Wiley Coal appears to thicken northeastward from western Fulton County to eastern Fulton and Peoria Counties. Along this trend, the average thickness of the coal increases from 3 inches in southwestern Fulton County to 10 inches in the east central part (Wanless, 1957, p. 81). Thicknesses of 16 inches are reported in coal tests near St. David and Cuba. In the vicinity of Peoria, the Wiley Coal may attain minable thickness, but it has seldom been reached in coal test drilling because of its depth. One coal test hole near Peoria (pl. 4, Co. No. 179, NE $\frac{1}{4}$ sec. 16, T. 8 N., R. 7 E.) penetrated 23 inches of Wiley Coal at a depth of 29 feet below the No. 2 Coal. Test drilling for No. 2 Coal may be extended profitably to test possible occurrences of minable Wiley Coal.

Carbondale Formation

The Carbondale Formation includes all strata from the base of No. 2 Coal to the top of No. 7 Coal. In the area of this report, it averages about 230 feet in thickness and contains most of the coal reserves. The Carbondale Formation includes the following coal members in ascending order: Colchester (No. 2) Coal Member, Kerton Creek Coal, Sumnum (No. 4) Coal, Springfield (No. 5) Coal, Herrin (No. 6) Coal, and Danville (No. 7) Coal. The principal geologic features of each of these coals within the region, their stratigraphic relationships, and a brief description of the sediments in the intervals between the coal beds follows. Strip-pable reserves of these coals are described later in this report for each county in which they occur.

Colchester (No. 2) Coal Member.—The No. 2 Coal is the most widely distributed coal in the counties of this report and throughout the Eastern Region of

the Interior Coal Province. Wanless (1955) correlates it with the Whitebreast Coal of Iowa, the Croweburg Coal of Missouri, and tentatively with the Lower Kittanning Coal of the northern and central Appalachian Coal Province.

Throughout most of western Illinois, No. 2 Coal commonly averages from 24 to 30 inches in thickness. Several beds of limestone and shale overlie No. 2 Coal and contain diagnostic fossils or other features that make No. 2 Coal readily identifiable in drill holes and at outcrops. The correlation of No. 2 Coal and its stratigraphic relationships to other coals in the area is shown in the cross sections on plate 4.

In western Illinois, a number of the shale and limestone beds overlying No. 2 Coal have remarkably uniform characteristics over wide areas. These rocks have been studied extensively by Wanless (1957), and many of the characteristic individual beds in the area have been named by him. No. 2 Coal is directly overlain by either gray shale or black fissile shale. The Francis Creek Shale Member, where present, occurs between the black fissile shale and No. 2 Coal. However, the Francis Creek Shale is lenticular, and where it thins and wedges out, the black shale lies on the coal. The Francis Creek Shale has a maximum thickness of 40 to 45 feet near Lewistown (Wanless, 1957, p. 88), but its thickness seldom exceeds 5 feet north of there. The black fissile shale is one of the best stratigraphic markers in the lower part of the Carbondale Formation. Occasionally, it was cut out by channels occupied by the Pleasantview Sandstone Member, but it is persistent otherwise. A zone of small gray limestone concretions in the black shale gives sheets of it distinctive pimply surfaces that are characteristic of this member in western Illinois. It also contains large concretions of black limestone that may be up to 2 feet thick.

The Oak Grove Limestone Member consists of a series of 14 thin shale and limestone units named by Wanless (1931, 1957) that are geologically remarkable for their persistence, number, and individuality. However, drill hole records in the study area usually report only one or two of the thicker of these limestone beds. The Oak Grove Limestone is overlain by the Purington Shale Member. It is a rather uniform light-to medium-gray shale that contains flattened ironstone concretions, and over much of the area where the Pleasantview Sandstone is thin or is absent, it occupies the largest part of the interval from No. 2 Coal to No. 4 Coal. The Pleasantview Sandstone overlies the Purington Shale and is commonly from a few feet to as much as 20 feet thick except where the sandstone fills channels eroded into the Purington Shale. In such places, it may attain thicknesses of as much as 80 feet, and its base may rest on No. 2 Coal. Wanless (1957, p. 97) describes Pleasantview Sandstone channels in southeastern Fulton County and adjacent areas where they seem to be best developed.

Summum (No. 4) and Kerton Creek Coal Members.—The Summum (No. 4) Coal is widely distributed in western Illinois, but it seldom attains minable thickness. It was named for exposures in the NE $\frac{1}{4}$ sec. 3, T. 3 N., R. 2 E., near Summum, Fulton County (Wanless, 1931, 1957, p. 204).

A locally occurring coal that is sometimes present below the No. 4 Coal in areas where No. 4 Coal thickens was named Kerton Creek Coal from exposures on the north side of Kerton Creek in the NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 15, T. 3 N., R. 2 E., Fulton County (Searight, 1929).

In the counties of this report, the No. 4 Coal, except in a few areas where it is locally minable, generally is not more than a few inches thick and occurs 5 to 15 feet below the No. 5 Coal. In local areas where the underlying Pleasantview Sandstone occupies channels eroded into the Purington Shale, there are local



depressions that Wanless (1957) has interpreted as unfilled stream channels of Pleasantview age in which No. 4 Coal has accumulated occasionally in minable thickness. In these places, the interval between No. 4 Coal and No. 5 Coal increases to 15 feet or more, and No. 4 Coal may thicken to as much as three or four feet. Locally in these same unfilled channels, a slightly earlier period of coal accumulation resulted in the formation of the Kerton Creek Coal just beneath the No. 4 Coal. The occurrence of No. 4 Coal of minable thickness in the type of unfilled channels just described is known only at a few places each of which are described in detail in a subsequent section of this report.

In the major part of the area, No. 4 Coal, or its horizon, is found at an interval of 75 to 100 feet above No. 2 Coal and 5 to 15 feet below No. 5 Coal. Figure 4 illustrates the sediments typically occurring in the interval between No. 4 and No. 5 Coals. Although No. 4 Coal commonly is only a few inches thick, it generally is underlain by a well developed underclay 3 to 5 feet thick. Almost everywhere in the area, No. 4 Coal is overlain by several feet of rather soft black shale containing large, black limestone concretions (Wanless, 1957, p. 99).

The Hanover Limestone Member overlies this shale, and although it is a widely distributed marine limestone member in the counties of this report, it generally is less than one foot thick and sometimes is discontinuous. The limestone often has a conglomeratic appearance, and especially in the central and northern parts of the area; it is closely overlain by the Covell Conglomerate Member, (Willman, 1939; Wanless, 1957). The Covell Conglomerate consists of discontinuous lenticular deposits of well-rounded small pebbles of dark gray to black phosphatic limestone in a matrix of lighter gray limestone. Where the Covell Conglomerate is present, its distinctive lithology makes it a very useful bed for correlation.

Fig. 4 - Outcrop on Jubilee Creek near Jubilee College State Park. NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 26, T. 10 N., R. 6 E., Peoria County. At (A) is the hard black shale overlying No. 5 Coal (B). The coal (B) is about 3 feet thick and is underlain by about 2 feet of underclay. A bed of underclay limestone (C) 8 to 10 inches thick occurs near the bottom of the underclay. At (D) is the No. 4 Coal, which is less than one inch thick and is overlain by dark gray shale containing occasional flattened concretions. The Hanover Limestone and the Covell Conglomerate both occur between the top of this black shale and the underclay of No. 5 Coal but are thin and somewhat discontinuous here.

Springfield (No. 5) Coal Member.—The Springfield (No. 5) Coal occurs near the middle of the Carbondale Formation. For many years there has been a large mining industry based on No. 5 Coal in Fulton County and in southern Knox and Peoria Counties.

The No. 5 Coal is generally four to five feet thick in Fulton County and in the southernmost parts of Peoria and Knox Counties. It thins northward in Knox and Peoria Counties where it is commonly two to three feet thick. In the northernmost parts of Peoria and Knox Counties and extending northward across Stark, western Bureau, and Henry Counties, No. 5 Coal continues to thin. It is probably less than eighteen inches thick in Stark, Bureau, and Henry Counties although there are substantial areas in these counties where there are little or no data regarding No. 5 Coal thickness.

No. 5 Coal is overlain by a black shale that is commonly hard and sheeted in the lower part and often contains large dark limestone concretions which often are fossiliferous (Wanless, 1957, p. 104). The black shale may also contain thin phosphatic lenses and nodules. The characteristic black shale overlying No. 5 Coal persists almost unchanged from the area of thick coal in Fulton and Peoria and Knox Counties northward into areas where No. 5 Coal becomes less than one foot thick. In these thin coal areas, the black shale is a valuable guide to the recognition of No. 5 Coal in drilling records. The black shale is overlain by the St. David Limestone Member, which is very widespread in the area of this report although it exhibits considerable variation in thickness in various parts of the area. Where typically developed, the St. David Limestone consists of 1 to 2 feet of very fossiliferous blue-gray limestone that weathers yellowish brown (Wanless, 1957, p. 105).

The interval between No. 5 Coal and No. 6 Coal generally varies between 60 and 70 feet in the southern part of the area and increases gradually northward to a maximum of about 80 feet in the northern part. At most places, the Canton Shale Member is 40 to 60 feet thick. It commonly overlies the black shale and St. David Limestone and is overlain by the Vermilionville Sandstone Member, which commonly is 5 to 30 feet thick. In eastern Fulton County and over a large part of eastern Peoria County, the Vermilionville Sandstone often exhibits a channel facies, and in these places, it occupies most of the interval between No. 5 Coal and the overlying No. 6 Coal. In these areas, the Vermilionville Sandstone may attain thicknesses of 60 to 80 feet.

Herrin (No. 6) Coal Member.—The Herrin (No. 6) Coal contains the largest remaining strippable reserves of any of the coals in the area. It is most commonly 42 to 54 inches thick and does not thin northward as No. 5 Coal does. In contrast, No. 6 Coal is thinnest in southeastern Peoria County and in adjacent parts of Tazewell County where No. 5 Coal is nearly at its maximum thickness. The No. 6 Coal has an average thickness of about four feet over much of the area of this report. It is easily traceable because of the presence of a persistent blue-gray shale bed ("blue band") in the lower part of the seam and by the characteristic sequence of beds that generally overlie the coal.

The No. 6 Coal is normally overlain by gray shale that may be a few inches to several feet in thickness and commonly is overlain by the Brereton Limestone Member. The Brereton Limestone, a widespread marine limestone, overlies No. 6 Coal throughout much of Illinois. However, over a large part of the area of No. 6 Coal occurrence in the counties west of the Illinois River, the Brereton Limestone is quite irregular both in thickness and in lateral extent. In the counties of this report, it is a dense, medium gray, fossiliferous limestone commonly 1 to 4 feet thick. In some places, it may change from a few inches to several feet in thickness in a short distance.

A gray shale member occupies the interval between the Brereton Limestone and the Copperas Creek Sandstone Member where the sandstone is present. In other areas shale may occur throughout nearly the entire interval upward from the Brereton Limestone to No. 7 Coal, which lies 35 to 45 feet above No. 6 Coal. The Copperas Creek Sandstone occurs in varying thickness in different parts of the area. It occupies the same stratigraphic position that the Anvil Rock Sandstone Member does in southern Illinois. In a few places, the Copperas Creek Sandstone occurs in channel-like bodies where the underlying shale and occasionally the Brereton Limestone have been eroded. In at least one area, No. 6 Coal has been eroded. More generally, however, the Copperas Creek Sandstone is 10 to 15 feet thick and is overlain by shale that extends to the underclay of the No. 7 Coal.

Danville (No. 7) Coal Member.—The Danville (No. 7) Coal is the uppermost member of the Carbondale Group. In the southern part of Peoria County and adjacent parts of Fulton County, No. 7 Coal lies at an interval of 35 to 40 feet above No. 6 Coal and averages 18 inches in thickness over most of this area. The interval separating No. 6 and No. 7 Coals increases northward from Fulton County to as much as 50 feet in Stark and western Bureau Counties, where No. 7 Coal is commonly 24 to 30 inches thick. In the part of Marshall County lying west of the Illinois River, No. 7 Coal attains thicknesses of 42 to 48 inches, which is considerably thicker than No. 6 Coal in that area.

McLeansboro Group

The McLeansboro Group includes all strata above the Danville (No. 7) Coal. It is divided into three formations: Modesto, Bond, and Mattoon Formations. Only the lowermost Modesto Formation is represented in the area of this report. There are a few places where a maximum of 100 to 150 feet of strata in the Modesto Formation occur. The Trivoli (No. 8) Coal Member that occurs 80 to 100 feet above No. 7 Coal has been noted occasionally in thicknesses of 18 to 24 inches at a few outcrops and drill holes in Peoria County, and it constitutes the only coal known to attain minable thickness in the McLeansboro age rocks of the area. However, because of lack of data, it has not been possible to indicate strippable reserves of No. 8 Coal.

DESCRIPTION OF COALS AND STRIPPABLE RESERVES

Rock Island (No. 1) Coal

The Rock Island (No. 1) Coal was formerly mined at numerous places in Rock Island, Mercer, Warren, and western Henry Counties (Cady, 1952; Culver, 1952). Strippable reserves of No. 1 Coal in those counties will be described in a forthcoming report (Part 5B).

Within the counties included in the present report, the No. 1 Coal is currently being mined at only one locality—a shaft mine near Alpha in Henry County. It was mined formerly by shafts at several other localities in Henry County and was mined rather extensively by shafts east of Galesburg in Knox County.

Strippable reserves of No. 1 Coal have been mapped only in Fulton County in several separate, relatively small areas along the valley of Spoon River and its tributaries (pl. 3). Within each of these small areas, there are numerous mine and outcrop observations, and there are records of coal test drilling in some places.

Where sufficient data were available, variations in coal thickness are shown on the map and the thickness of overburden is contoured. Elsewhere on the map, all known mines and outcrops in No. 1 Coal are shown as a guide to prospecting, but no attempt is made to predict the extent of these deposits at the thickness indicated in the records of these mines and outcrops. No attempt was made either to connect these isolated observations with a line representing the approximate coal outcrop, as is shown for the other coal beds that have been mapped in this study, or to contour the thickness of overburden. There are probably additional areas of No. 1 Coal of minable thickness that may be discovered in this area.

Reserves of coal at strippable depth that have been calculated for No. 1 Coal in the area of this report are summarized in table 1 and are tabulated in more detail in table 7.

TABLE 1 - SUMMARY OF STRIPPABLE RESERVES OF NO. 1 COAL
(In thousands of tons)

County	Class I Reserves at overburden thickness (ft.)			Total	Mined out (square miles)
	0-50	50-100	100-150		
FULTON	2,600	1,625	1,233	5,458	.82
TOTAL	2,600	1,625	1,233	5,458	.82

Fulton County

All of the mines that operated in the No. 1 Coal in Fulton County are located in the Spoon River Valley region between Marietta and London Mills. This trend of exploitation is largely due to the shallow depth of No. 1 Coal in this part of the river valley and to an abundance of outcrops of relatively thick No. 1 Coal southeast of Marietta.

As mapped on plate 3, the area of No. 1 Coal southeast of Marietta contains less than two square miles in which the coal exceeds 18 inches in thickness. The coal attains a thickness of 54 inches or more at some places, but because it was deposited in trough-like depressions as described earlier (see *Geology and Stratigraphy of the Coals*), it thins rapidly at the borders of these depressions, and in the surrounding areas the available data (plate 3) indicate that the coal is less than one foot thick. The extreme local variability in thickness exhibited by No. 1 Coal and associated overlying members is illustrated in the type outcrop of the No. 1 Coal and Seville Limestone Members (Worthen et al., 1870, p. 94; Wanless, 1957, p. 70-73, 201). This exposure is located about a mile southeast of Marietta along Spoon River (SW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 23, T. 6 N., R. 1 E.). At the northern end of the outcrop, No. 1 Coal thickens to a maximum of 3 feet and is overlain by up to 3 feet of dark, blue-gray shale that is overlain, in turn, by four feet or more of Seville Limestone. South from this point on the outcrop, the Seville Limestone and the dark shale thin and finally pinch out; the No. 1 Coal also thins and rises 10 to 15 feet on the surface of the thickening Bernadotte Sandstone beneath.

Along Put Creek about 10 miles east of Marietta and 2 miles north of Cuba, there is another area where the No. 1 Coal has been mined and has been prospected by drilling. The coal apparently occupies a north-south trending depression of unknown linear extent. It was mined in the NE $\frac{1}{4}$ of section 7 (T. 6 N., R. 3 E.) at a depth of 135 feet (pl. 3). A nearby coal test hole (Section A-A', County No. 90)

records 52 inches of No. 1 Coal overlain by $6\frac{1}{2}$ feet of hard dark shale and 11 feet of Seville Limestone. In this hole, the Hermon Coal, 44 inches thick, lies just above the Seville Limestone. The extent of No. 1 Coal reserves at strippable depths in the Put Creek area is not large, and as shown on plate 3, most of it lies at depths of 100 feet or more.

Along the Spoon River between Marietta and London Mills there has been local mining in No. 1 Coal at several places (pl. 3). The largest of these is the area northeast of Ellisville (T. 8 N., R. 2 E.) where about one square mile of coal, averaging 4 to 5 feet in thickness, was mined. In the Ellisville area and in two smaller areas a few miles south and southwest of Ellisville, overburden contours have been drawn on plate 3 only for the immediate area where data were available. Since the coal is known to be present at minable thickness only in narrow trough-like depressions from which the coal may have been essentially all mined out by past mining (Cady, 1952, p. 64), overburden contours were not extended beyond the areas of local mining, and no attempt was made to tabulate reserves of strippable coal.

Along Cedar Creek west from London Mills across township 8 N., R. 1 E., there has been local mining in No. 1 Coal at a number of places. These are shown on plate 3 together with thickness and elevation of the coal, where known, but no attempt is made to estimate remaining strippable reserves.

Geologic reports, including geologic maps, for the Avon-Canton Quadrangle (Savage, 1921) and the Glasford Quadrangle (Wanless, 1957) contain much of the data on which the mapping of No. 1 Coal in this report is based. These reports contain additional information concerning individual mines and outcrop of No. 1 Coal in the area and also information on the geology of closely associated strata.

Other Counties

No. 1 Coal has been mined underground, generally at depths of more than 150 feet, in a number of places within the remaining counties of this report. The most important area of No. 1 Coal mining was in the vicinity of East Galesburg (Cady, 1952, p. 56; Poor, 1935, p. 99). It also was mined at a depth of 240 feet in one place near Peoria (Udden, 1912, p. 80). A shaft mine 260 feet deep at Alpha in southwestern Henry County (pl. 4, Sec. A-A') is the only place in the area that the No. 1 Coal presently is being mined. Except in the mapped area of Fulton County discussed above, significant areas of No. 1 Coal at strippable depth are known only in parts of western Henry County and in the portions of Warren and Mercer Counties that will be mapped in a separate report (Part 5B) in this series.

Colchester (No. 2) Coal

The No. 2 Coal is distributed more widely than any of the other coals described within this report. It contains estimated reserves of nearly $2\frac{1}{2}$ billion tons of strippable coal that are distributed among the counties of the area as shown in table 2. Table 7 lists the reserves in more detail for each county and township in the area.

Although the No. 2 Coal has been worked for many years in numerous small mines along its outcrop, it has not been sought for large scale mining because it seldom exceeds 30 inches in thickness. However, in recent years advances in the technique of strip mining have made the mining of this seam economically practical. Despite the relative thinness of the No. 2 Coal, it has a number of favorable

TABLE 2 - SUMMARY OF STRIPPABLE RESERVES OF NO. 2 COAL
(In thousands of tons)

County	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
BUREAU								7,062	7,062	
FULTON	210,162	522,316	261,870	994,348	20,935	30,580	58,922	110,437	1,104,785	
HENRY	26,599	25,200	67,143	118,942	3,448	58,121	62,441	124,010	242,952	4.11
KNOX	135,292	232,170	151,644	519,106	11,551	59,792	106,832	178,175	697,281	
MERCER	1,328	2,102	387	3,817	3,206	7,959		11,165	14,982	
PEORIA	9,781	23,400	26,314	59,495	84	15,216	32,984	48,284	107,779	.68
STARK			140	140			25,641	25,641	25,781	
TAZEWELL		7,342	4,904	12,246		9,360	17,486	26,846	39,092	
WARREN	50,622	42,194	45	92,861	10,896	41,205	13,989	66,090	158,951	
TOTAL	433,784	854,724	512,447	1,800,955	50,120	222,233	325,357	597,710	2,398,665	4.79

features that encourage exploitation. The coal has a very wide areal distribution. It lacks persistent partings or other bedded impurities, and it has relatively low ash.

The No. 2 Coal was first strip mined near Atkinson in Henry County, where there were extensive areas of the coal lying at relatively shallow depths. More recently, an area near Banner in Peoria County was opened for strip mining, and during 1962 large scale strip mining (fig. 5) was begun in the No. 2 Coal near Vermont in Fulton County.

Strippable reserves of No. 2 Coal are most extensive in western Fulton County and southern Knox County. These areas contain about three-fourths of the No. 2 Coal reserve computed in this report. In contrast, the No. 2 Coal in the eastern half of the report area is not often found at strippable depth because it dips eastward and is covered by a much greater overburden.

Fulton County

The No. 2 Coal in Fulton County is exposed prominently in the valleys of the numerous tributaries to the Illinois and Spoon Rivers. Because of the accessibility of this coal, it has been mined in many intermittent, seasonally operated local mines since the early 19th century. Most of these small drift and slope mines are found in the western half of Fulton County; a large number of these mines are shown on plate 1. Large scale commercial development of the county's coal resources has been restricted until recently to the thicker No. 1, No. 5, and No. 6 Coals. The recently opened strip mine near Vermont (T. 4 N., R. 1 E.) is the first large operation to be sustained by No. 2 Coal in Fulton County (see fig. 5).

The outcrop of No. 2 Coal has been fairly well established over most of the county by earlier studies, but in townships 7 and 8 N., R. 1 E., extensive pre-glacial erosion and subsequent burial by drift have dissected the coal and masked the outcrop over a rather large area. The outcrop of No. 2 Coal under the alluvium along the Illinois River from T. 5 N., R. 5 E., north to the Peoria County line also is questionable, but the projected outcrop line is believed to be reasonably accurate since it must be sub-parallel to the bluffs that form the western edge of the bed-rock valley of the Illinois River (Horberg, 1950).

The No. 2 Coal in Fulton County ranges in thickness from 10 to 36 inches, although its thickness averages 24 to 30 inches. The coal is commonly without partings, and in the northwestern part of the area, the strata overlying it are mostly shale. Southeast of a line between Vermont and Cuba, thick beds of the

Pleasantview Sandstone Member are found over No. 2 Coal, (Wanless, 1957, p. 95). The sandstone may lie immediately over the coal and is known to attain thicknesses up to 80 feet.

Tazewell County

The strippable reserves of No. 2 Coal in Tazewell County are found within the margins of the Mackinaw River and Illinois River floodplains in the vicinity of Pekin and southwest of Crescent. The No. 2 Coal does not crop out in the county, nor does it seem to be covered anywhere by less than 75 feet of overburden. No precise records of the thickness of No. 2 Coal in Tazewell County are available, but it is known to average 30 inches at several adjacent localities in Peoria and Fulton Counties.

Although the reserve of No. 2 Coal in the narrow river valley north of Pekin has been mapped and computed, its excessive depth and the industrial occupation of the valley flats will likely prohibit its exploitation. The more sparsely inhabited river valley southwest of Pekin is a more suitable area for stripping operations. Here the No. 2 Coal, which dips eastward, is closer to the surface because the

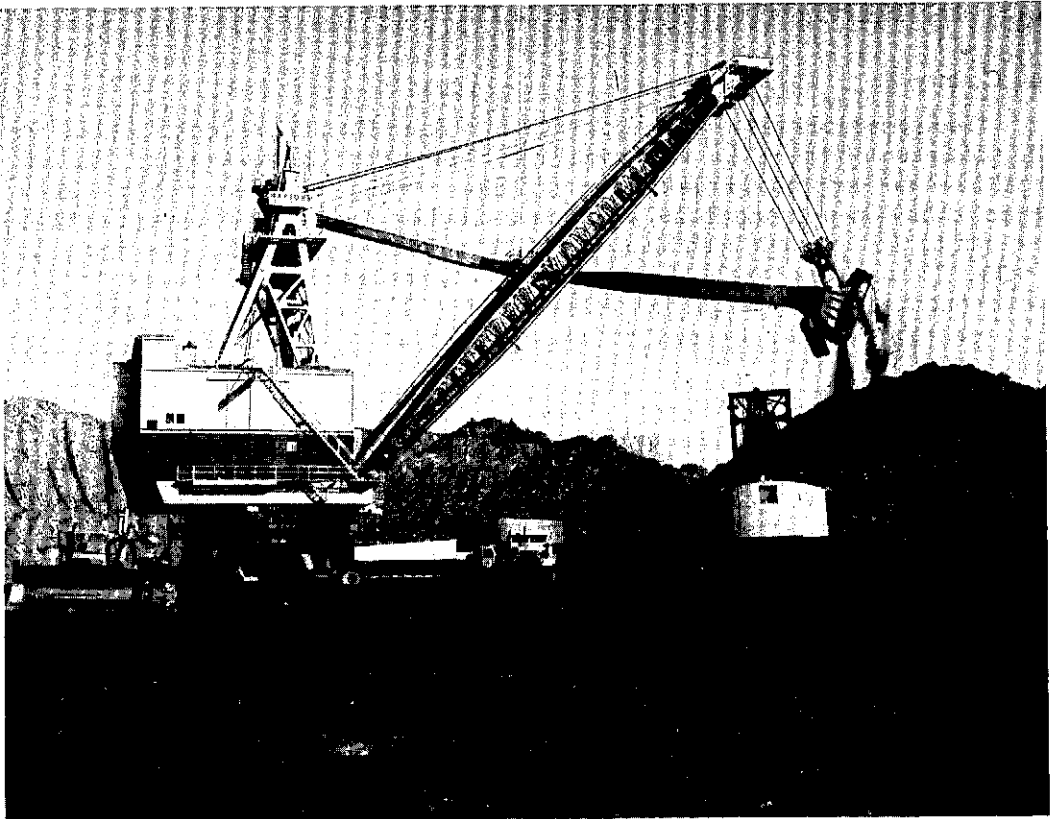


Fig. 5 - Strip mining in No. 2 Coal near Vermont, Fulton County.

Mackinaw and Illinois Rivers have excavated a wide valley at their confluence. However, much of the No. 2 Coal west of the Mackinaw River evidently has been removed by the pre-glacial Illinois River, which cut a broad, deep valley across the southwestern corner of Tazewell County.

Peoria County

The areas of strippable No. 2 Coal in Peoria County are limited to the valleys of Kiackapoo Creek and the Illinois River in the southeast and to the upper valley of Spoon River in the northwest. The single locality in which the coal is known to have less than 50 feet of overburden is at the southeastern corner of the county and includes parts of townships 6 N. and 7 N., R. 6 E. The preparation plant and loading dock of a large strip mine are located at Banner in sec. 7, T. 6 N., R. 6 E. The No. 2 Coal has been stripped in sections 32 and 33 in T. 7 N., R. 6 E., where the average thickness of the Coal is about 30 inches.

There are only two other places where No. 2 Coal is known to have been mined in Peoria County. One is a small abandoned mine in section 14, T. 7 N., R. 7 E. (pl. 1) where the coal was 165 feet deep and was reported to average 32 inches thick. The other is an abandoned mine in section 35, T. 9 N., R. 7 E. (pl. 1) where the coal was 107 feet deep and is reported to have averaged 30 inches thick. Two coal test holes in Peoria County, Nos. 179 and 718 on cross section B-B' (pl. 4), recorded the No. 2 Coal at thicknesses of 30 and 34 inches, respectively.

Stark County

The strippable reserves of No. 2 Coal in Stark County are located along the valley of Spoon River and its main tributaries, Walnut and Indian Creeks. The No. 2 Coal does not crop out in the county, nor has it been mined here. Only a few drill holes have penetrated it and these have provided the basis for classification. The depth of the coal has been mapped also from data relating to the No. 5 and No. 6 Coals. These coals lie about 100 and 185 feet, respectively, above the No. 2 Coal. Almost all of the classified reserves of No. 2 Coal are Class II, average 30 inches thick, and are covered by more than 100 feet of overburden.

Marshall County

The part of Marshall County west of the Illinois River is included in this report, and within this area the No. 2 Coal apparently was mined only from a shaft at Sparland (cen. S. line, sec. 11, T. 12 N., R. 9 E.). Now abandoned, this mine was last operated in 1915 and mined 30 inches of coal at a depth of 185 feet. Apparently the No. 2 Coal does not lie at a strippable depth, as currently defined, anywhere in the western part of Marshall County.

Bureau County

In western Bureau County, which is the only part of the county included in this report, the No. 2 Coal lies at strippable depth along its buried, northern outcrop south and southeast of Mineral in T. 16 N., R. 6 E. The only classified area is southeast of Mineral between the 100- and 150-foot overburden contours. Here, the data on which the coal is classified is derived from coal tests drilled west of Sheffield (pl. 4, Co. No. 21, cen. sec. 25, T. 16 N., R. 6 E.). The generalized trace of the No. 2 Coal outcrop on plate 1 is assumed to be roughly parallel to the

well-defined No. 6 Coal outcrop line and has been interpolated from sparsely controlled contours on the bedrock surface and structure contours on the top of the No. 2 Coal.

Knox County

The major part of the strippable reserves of No. 2 Coal in Knox County are found in the southern half of the county, where the largest amount of coal with less than 50 feet of overburden also is located. The average thickness of the No. 2 Coal over most of the county is 24 inches. Strippable areas of No. 2 Coal under deeper overburden are found on the flanks of the drainage divide that extends approximately through Galesburg, Wataga, and Oneida. The streams on the west side of the divide have seldom exposed the No. 2 Coal in surface outcrops. The large embayments shown in the outcrop along the west line of Knox County are very general outlines of pre-glacial bedrock valleys that drained to the west (Horberg, 1950).

The reserves of the No. 2 Coal are most thoroughly mapped in the southern half of the county on the east side of the stream divide described above. In this region, Spoon River and its tributaries, Haw and Cedar Creeks, have cut to bedrock and uncovered the coal in many places. Along this drainage, all of the mines in the No. 2 Coal and most of the coal outcrops are found. Three miles east of Knoxville (cen. sec. 19, T. 11 N., R. 3 E.) on the south bank of Court Creek, the outcrop line of the No. 2 Coal indicates a window cut in an otherwise continuous bed of coal. However, if the outcrop actually borders a buried pre-glacial stream valley, a much more extensive cutout exists. The No. 2 Coal outcrop on the east side of Spoon River north of Ellisville is buried almost everywhere beneath glacial deposits. The outcrop line on plate 1 is inferred from the No. 5 Coal outcrop and other data.

The No. 2 Coal does not crop out in the northern half of Knox County, and data used to map the coal there are derived from the records of water wells and coal tests. The reserves along the tributary stream of Walnut Creek in the northeastern corner of the county are classified by data based on a coal test hole (sec. 11, T. 13 N., R. 4 E., pl. 4, Co. No. 259, Sec. C-C') which reported 30 inches of No. 2 Coal at a depth of 216 feet.

In three places (T. 10 N., R. 1 E.; T. 11 N., R. 2 E.; and T. 12 N., R. 1 E.) the logs of exploratory drilling that sought No. 1 Coal, record the thickness of No. 2 Coal (Co. Nos. 302, 123, 236-238, Sec. A-A', pl. 4). The comparatively detailed No. 2 Coal thickness contours on the map at these three places show uncommon ranges of thickness. Near Knoxville in T. 11 N., R. 2 E., numerous holes drilled to test No. 1 Coal have recorded an atypical thickness range of 12 to 48 inches in No. 2 Coal. In the small area shown on plate 1 northwest of Henderson (T. 12 N., R. 1 E.) No. 2 Coal has a thickness range of 10 to 30 inches, and south of Galesburg in T. 10 N., R. 1 E. and R. 2 E., the coal's thickness ranges from 12 to 30 inches. The average thickness of No. 2 Coal in the county is 24 inches, but the coal's unusually variable thickness indicates that uniform thickness cannot be presumed between widely separated datum points in Knox County as it can in other counties.

Warren County

All of the No. 2 Coal reserves in Warren County (pl. 1) are at strippable depths, and most of the coal lies under less than 75 feet of overburden. North

and east of Monmouth, there are large tracts of coal that are covered with less than 50 feet of overburden. The average thickness of No. 2 Coal is 24 inches.

Reserves for No. 2 Coal in the portion of Warren County included in this report are summarized in table 7. There are additional small areas of No. 2 Coal in the southwestern part of Warren County that are outside the area of this report and will be included in another report currently in progress (Part 4 in this series).

Since most of the No. 2 Coal in Warren County mapped on plate 1 has been greatly dissected by pre-glacial drainage (Horberg, 1950) and, subsequently, covered by glacial deposits, much more data than is presently available will be required to accurately define the outcrop of No. 2 Coal.

The No. 2 Coal has been mined at its exposures along the tributaries of Henderson Creek in the southwestern part of T. 12 N., R. 1 W. (Wanless, 1929, p. 140; Green, 1870, p. 290). There have also been a number of drift mines along Cedar Creek in the vicinity of the outcrops shown on plate 1 in the area between Monmouth and Coldbrook. A shaft mine near the southeast corner of Monmouth (SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 33, T. 11 N., R. 2 W.) mined No. 2 Coal at a depth of about 60 feet. East of Berwick in Tps. 9 and 10 N., R. 1 W., the coal averages 24 inches in thickness and has been mined locally (pl. 1) at several places (Poor, 1935).

Mercer County

The total area of No. 2 Coal mapped in Mercer County in this report is about six square miles in the southeastern part of the county. The coal there is adjacent to the more extensive areas of No. 2 Coal mapped in Knox and Henry Counties. There are no surface outcrops of No. 2 Coal in the part of Mercer County mapped on plate 1 and very little drilling data are available; therefore, the classification of the coal reserves is based primarily on the extension of data relating to the coal in adjacent areas of Knox and Henry Counties. The very generalized and questionable outcrop line along the western margin of No. 2 Coal in Mercer County has been interpolated from contours of the bedrock surface (Horberg, 1950) and from generalized structure contours of No. 2 Coal. Consequently, classification of the coal reserves and of the outcrops on plate 1 is very provisional for the small area of No. 2 Coal mapped in Mercer County. A few small outliers of No. 2 Coal west of the area in Mercer County are included in this report. Some of these outliers have been mapped by Wanless (1929) and will be included in the Part 5B report.

Henry County

Large reserves of No. 2 Coal in Henry County are covered by thin overburden and most of the coal appears to be about 30 inches thick. The main outcrop is covered with drift, and primary coal datum points are found in isolated clusters that limit extension of classification or the mapping of well established outcrop lines. Pre-glacial streams and rivers have dissected the coal at its northern and western edges, and the provisional outcrop of the No. 2 Coal on plate 1 is drawn by interpolation between Horberg's contours of the pre-glacial bedrock surface and structure contours of No. 2 Coal.

The outlying body of coal 8 miles northwest of Cambridge (T. 17 N., R. 2 E.) contains the only surface outcrops of No. 2 Coal that have been found in this part of the report area. No complete coal thicknesses are reported for the outcrops, but the coal was thick enough to maintain at least one small drift mine (cen. S. line, sec. 34, T. 17 N., R. 2 E.). Apparently the outcrop lies only a

few feet under the drift. This outlier is separated from the main outcrop by a pre-glacial stream valley.

The hachured areas marked "no thickness data" on plate 1 north of Cambridge contain most of the shallow reserves of No. 2 Coal. The trace of the actual outcrop and the thickness of the coal will be determined only by additional exploratory drilling.

At the northernmost point of No. 2 Coal outcrop in this report area near Atkinson, the coal has been strip mined from an area of more than four square miles. Most of the coal in this mine averaged 30 inches in thickness and lay under less than 50 feet of overburden. This large strip mine and several small underground mines west of it (pl. 1) lie within an outlier of No. 2 Coal bounded on the north and south sides by the buried valleys of two pre-glacial streams (Horberg, 1950). The outcrop of the coal along the pre-glacial valleys is poorly delineated on plate 1 because bedrock and coal data south and west of this large outlier are chiefly derived from the records of scattered water wells.

The No. 2 Coal was mined by shafts near Cambridge. The mine shown on plate 1 near the southeast corner of section 6 (T. 15 N., R. 3 E.) was 133 feet deep and mined coal that averaged 32 inches in thickness. Presumably, the neighboring mine in section 5 mined No. 2 Coal, but nothing is known of this mine except its location.

Summum (No. 4) and Kerton Creek Coals

The Summum (No. 4) Coal is commonly not more than a few inches thick, and except in places where it is locally minable, it generally lies five to ten feet below No. 5 Coal in the counties of this report. Its relationship to No. 2 and No. 5 Coals and to other strata in the area is described in the section of the report describing geology and stratigraphy of the coals and is shown graphically on plate 4.

Occurrences of No. 4 Coal in minable thickness are found only in a few very local areas where it occurs at intervals of 15 to 25 feet or more below No. 5 Coal. Minal thicknesses of No. 4 Coal are thought to occur exclusively in areas of unfilled channels remaining in the top of the Pleasantview Sandstone at the end of sandstone deposition (Wanless, 1957). An even more locally occurring coal, the Kerton Creek Coal Member, sometimes occurs below the minable deposits of No. 4 Coal in these same channels, and at some places both of these coals have been mined from the same area.

None of the local areas where the No. 4 Coal or Kerton Creek Coal are of minable thickness contain sufficient detailed information to permit it to be mapped for strippable reserves in the manner that other coals are mapped. It is the nature of these deposits to vary greatly in thickness and to terminate abruptly near the edges of the channels; therefore, if any of these deposits were to be developed for strip mining, much closely spaced drilling would be required to assure that the coal is present in minable thickness over a sufficient area to be worthwhile.

Areas where No. 4 Coal has been mined locally, often by numerous small mines or prospect openings, are shown on figure 6. A brief description of No. 4 Coal in these areas, including information regarding some mines, outcrops, and drill holes, follows.

Fulton County

Near Ipava, No. 4 Coal reportedly was mined at a depth of 38 feet (19 feet below the top of No. 5 Coal) in the SE cor. sec. 6, T. 4 N., R. 2 E. Near the SW

cor. sec. 8, T. 4 N., R. 2 E., it was shaft mined at a depth of 22 feet below No. 5 Coal, which outcrops at the surface nearby. At both places, the coal was five feet or more thick and contained cannel coal in the top part of the seam.

In the area of the type locality of the Sumnum (No. 4) Coal in secs. 33 and 34, T. 4 N., R. 2 E., and extending into sec. 5, T. 3 N., R. 2 E., No. 4 Coal was strip mined to some extent in connection with stripping in No. 5 Coal (pl. 2). The No. 4 Coal in this area is about fifteen feet below No. 5 Coal. The Kerton Creek Coal also occurs locally below the No. 4 Coal, which is separated from it by a few feet of clay.

Along Kerton Creek (NE $\frac{1}{4}$ sec. 15, T. 3 N., R. 2 E.) both the No. 4 Coal and the Kerton Creek Coal occur. The No. 4 Coal is locally four feet or more thick, and the Kerton Creek Coal, separated from No. 4 Coal by a few feet of clay or shale, is locally as much as three feet thick. Both of these coals vary greatly in thickness and often show steep local dips because they overlie the irregular upper surface of the underlying sediments. Both the No. 4 Coal and the Kerton Creek Coal have been strip mined very locally in this area in connection with much more extensive strip mining of the No. 5 Coal.

Northeast of Lewistown in the NE $\frac{1}{4}$ sec. 13, T. 5 N., R. 3 E., the No. 4 Coal was mined locally in several small shaft mines in which it reportedly averaged about 42 inches in thickness. In the NW $\frac{1}{4}$ sec. 20, T. 5 N., R. 4 E., the coal has been worked at a number of places along a small valley and can occasionally be seen in outcrops. In one outcrop, more than five feet of No. 4 Coal was measured, but it can be seen to thin and pinch out in nearby outcrops. Although the depths are suitable for strip mining, the area of thick No. 4 Coal may be quite limited.

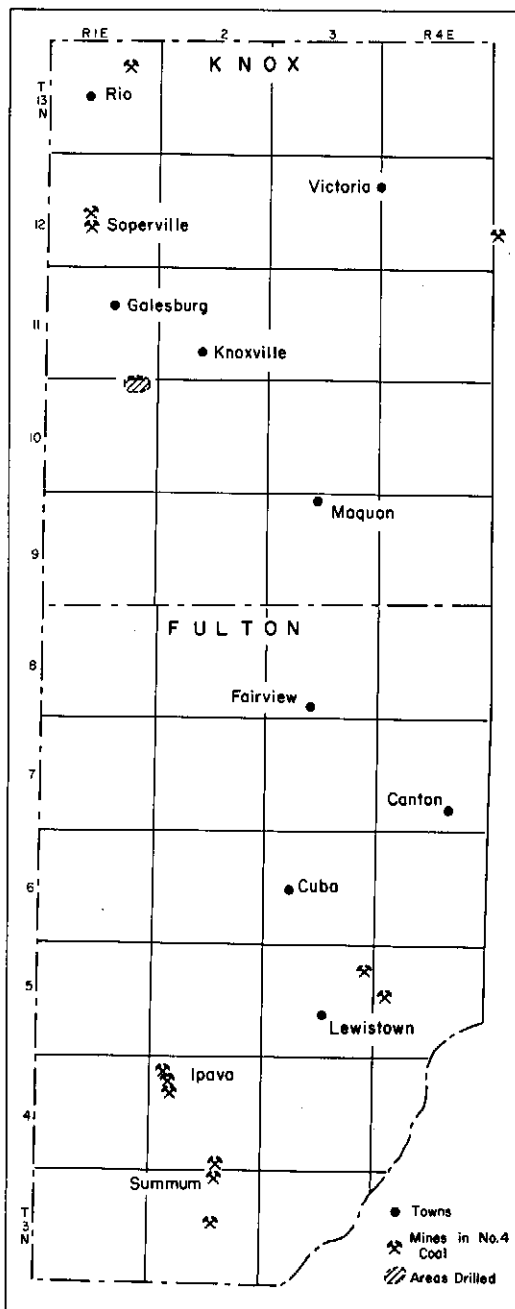


Fig. 6 - Areas where No. 4 Coal is known to attain minable thickness.

Knox County

Near the village of Soperville in the $W\frac{1}{2}$ sec. 21, T. 12 N., R. 1 E., about five miles northwest of Galesburg, No. 4 Coal is locally five to six feet thick. In the early part of this century, there were several mines near Soperville in which No. 4 Coal was worked. The coal lies ten to fifteen feet below the No. 5 Coal, which is less than two feet thick in this area. Culver (1925) states that in 1925 about half of the coal production of Knox County was from the Soperville field. The available information regarding the coal worked in the mines near Soperville suggests that this local occurrence of No. 4 Coal, with the Kerton Creek Coal occasionally occurring beneath it, is very similar to the deposits near Sumnum and Ipava in Fulton County.

A number of coal test holes were drilled in the area north of the Soperville mines, but most of these encountered no coal, or at most a few inches, at the stratigraphic position of the No. 4 Coal thus attesting to the very local nature of its occurrence.

About eight miles north of Soperville in the $NW\frac{1}{4}$ sec. 11, T. 13 N., R. 1 E., there is an abandoned drift mine that may have worked in the No. 4 Coal or Kerton Creek Coal. An outcrop exposure of coal 30 inches thick with sandstone overlying it has been noted nearby. This probably is the same as the coal worked in the local mine. A short distance south of this outcrop, sandstone is exposed through the interval where the coal described should be. This suggests that this mine and outcrop may be in a local deposit of the No. 4 or Kerton Creek Coal.

South of Galesburg in secs. 1 and 2, T. 10 N., R. 1 E., 4 to 5 feet of coal was reported in drilling (fig. 6) at depths of 50 to 60 feet. This is 15 to 25 feet below the No. 5 Coal, which is about 3 feet thick there. As nearly as can be determined from examination of the logs and outcrop data in this area, this unusually thick coal is a local thickening of the No. 4 Coal and perhaps also of the Kerton Creek Coal. This is similar to the local occurrences near Soperville and Sumnum. The extent of these deposits is not known, but is probably is not large. No. 5 Coal is at favorable depths for stripping in the area south of Knoxville and Galesburg, and there may be areas of No. 4 Coal that could be stripped concurrently with No. 5 Coal.

Stark County

On the west bank of Walnut Creek in sec. 19, T. 12 N., R. 5 E., there are records of drift mines in the No. 4 Coal (fig. 6). Green (1870, p. 329) describes a section containing 4 to 6 feet of coal, and in unpublished field notes, H. E. Culver noted 4 to $5\frac{1}{2}$ feet of coal in a local mine at the same location. Both describe the coal as being without partings and having an impure cannel coal up to 12 inches thick in the floor of the mines. The extent of this deposit is unknown since no other data are available concerning it.

Peoria County

In this county, No. 4 Coal is typically about 6 to 8 feet below the base of No. 5 Coal. No. 4 Coal is commonly very thin or represented only by a dark zone separating the underclay, which is generally 1 to 3 feet thick, from the overlying black shale that contains large rounded concretions. Over this black shale lies the Hanover Limestone, the Covell Conglomerate, an underclay limestone that generally is present in the base of the underclay of No. 5 Coal, and the underclay beneath No. 5 Coal (fig. 4).

Springfield (No. 5) Coal

The Springfield (No. 5) Coal has been mined very extensively in the southeastern part of the area included in this report. For many years, it was mined widely by underground operations in the vicinity of Peoria and to a considerable extent in the Canton area. In later years, very large areas of No. 5 Coal in Fulton County and in southeastern Knox County that lie at quite shallow depths (pl. 2) have supported a large strip mining industry.

Reserves totaling approximately 2 billion tons of coal at depths less than 150 feet have been mapped for No. 5 Coal in the area (table 3). Reserves are listed in more detail in table 7 for each county and township in which strippable reserves of No. 5 Coal have been estimated.

TABLE 3 - SUMMARY OF STRIPPABLE RESERVES OF NO. 5 COAL
(In thousands of tons)

County	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
FULTON	172,925	389,624	139,837	702,386					702,386	51.19
KNOX	176,543	233,719	55,960	466,222	23,282	77,659	57,346	158,287	626,509	5.50
PEORIA	45,712	173,645	248,778	468,135	28,489	117,689	111,236	257,414	725,549	17.83
TAZEWELL	1,211	5,851	21,085	28,147			8,928	8,928	37,075	1.35
WARREN	807			807					807	
TOTAL	399,198	802,839	465,660	1,667,697	51,771	195,348	177,510	424,629	2,092,326	75.87

No. 5 Coal contains no regular partings, but it often contains a few thin shale bands and varying amounts of pyrite as discontinuous thin partings or lenses and on joint faces. The coal contains irregularly shaped clay veins commonly called "horsebacks" at many places in these counties (Cady, 1921; Roe, 1934; Wanless, 1957, p. 103). The horsebacks are composed of sandy clay that may extend vertically through the entire coal seam or only a part of it. In the Springfield district that lies south of the area of this report, horsebacks are also very common (Savage, 1915). Clegg (1961) also has described their occurrence there and summarized information relating to their probable origin.

Tazewell County

In Tazewell County, there are only small areas along the east bluff of the Illinois River near Pekin where No. 5 Coal is less than 150 feet deep. There has been considerable underground mining in the Pekin area where No. 5 Coal is about 54 inches thick. The No. 5 Coal in Tazewell County would be continuous with the coal in Fulton and Peoria Counties had it not been removed by erosion along the Illinois River Valley.

The No. 5 Coal lies near the level of the floodplain of the Illinois River from East Peoria southward to the vicinity of Pekin, but its outcrop is largely concealed by loess deposits. The steepness of the topography in the east bluff of the Illinois River Valley allows only relatively small areas where No. 5 Coal is mapped at strip-pable depths.

Fulton County

This county contains large areas where No. 5 Coal is $4\frac{1}{2}$ to 5 feet thick and lies at relatively shallow depths. Strip mining commenced in Fulton County in 1924, and in the ensuing years a total of about 133 million tons has been strip mined, principally from No. 5 Coal.



Fig. 7 - Wheel excavator removing overburden from No. 5 Coal in Fulton County.

The large extent of No. 5 Coal favorable for strip mining in Fulton County has been responsible for the growth of several of the largest strip mining operations in Illinois. These include the United Electric Coal Companies mines at Canton and Cuba, the Truax-Traer Coal Company mines at Flatt, the Fairview Collieries Corporation mines at Fairview, and the Midland Electric Coal Corporation mines at Middle Grove and Farmington that extend into the southeast part of Knox County.

In Fulton County, No. 5 Coal is separated from the overlying No. 6 Coal by an interval of 65 to 75 feet. This interval consists mainly of shale. At many places where No. 5 Coal is mined in Fulton County, the upper 15 to 25 feet of overburden consists of unconsolidated glacial deposits that together with some of the shaly strata in the overburden are sometimes removed by large wheel excavators (fig. 7). These machines work in advance of the shovel excavators that remove the more indurated bedrock overlying the coal.

Although most of the No. 5 Coal in Fulton County with overburden of less than 50 to 60 feet has now been mined out, substantial areas remain in the thicker overburden categories.

Peoria County

In Peoria County, No. 5 Coal is less favorably situated for strip mining than it is in Fulton and Knox Counties because the eastward dip of the rocks carries the coal under thicker overburden.

In southeastern Peoria County, there are large areas from which No. 5 Coal has been largely mined out by underground mining. Also in this area, there are some places (pl. 2) where the coal is split into several benches separated by sandstone partings or where it has been removed entirely prior to or during the deposition of the overlying Vermilionville Sandstone (Udden, 1912; Cady, 1921). In the vicinity of Kingston Mines (sec. 25, T. 7 N., R. 6 E.), No. 5 Coal has been largely removed by underground methods also. There has been some small scale strip mining near

the outcrop adjoining these mines in recent years, but no large unmined areas remain. About one mile north of Kingston Mines, there is an area (pl. 2) where the coal is believed to be disturbed by partings or removed by sandstone channels. The prediction of an area of disturbed coal is based on the reported occurrences of these conditions in the northern part of several of the mines that worked the coal west of Kingston Mines.

About $2\frac{1}{2}$ miles northeast of Glasford, there is a nearly circular structural dome about 3 miles in diameter. Near its center (cen. sec. 11, T. 7 N., R. 6 E.), the Pennsylvanian strata have been elevated nearly 100 feet. The No. 5 Coal was eroded from this structural dome during pre-glacial time, and thus the large indentation in the No. 5 Coal outcrop shown on plate 2 was created. This erosion of No. 5 Coal from the area of the dome was accomplished by a stream that flowed west across the area toward a larger north-south trending pre-glacial stream valley. The pre-glacial stream had removed No. 5 Coal from a large part of the western half of the township in which the Glasford dome is located (T. 7 N., R. 6 E.).

In the central part of Peoria County along Kickapoo Creek and its tributaries, No. 5 Coal occurs at strippable depths. It has been mined underground at a number of places near Edwards and north of Kickapoo (pl. 2). In the east bank of Jubilee Creek just west of Jubilee College State Park, No. 5 Coal is well exposed (fig. 4). It is about three feet thick there and is overlain by black slaty shale containing spheroidal concretions a foot or more in diameter. Beneath the No. 5 Coal, there are excellent exposures of the rock sequence typically found in the interval from No. 5 Coal downward to No. 4 Coal.

In the northern half of Peoria County, No. 5 Coal lies about 75 feet below No. 6 Coal. North of the Jubilee-Brimfield area, there are only occasional holes that have been drilled to No. 5 Coal. These holes suggest that in Peoria County, as in Knox County to the west, No. 5 Coal undergoes a gradual but progressive thinning northward.

Knox County

The No. 5 Coal is widely distributed in Knox County. It is being strip mined in the southeasternmost townships of the county where it is $3\frac{1}{2}$ to 4 feet thick and has very favorable overburden conditions like those found further south in Fulton County. Over most of the remainder of the county, No. 5 Coal is commonly about two feet thick, but there are small areas where it becomes 3 to $3\frac{1}{2}$ feet thick.

In western Knox County, No. 5 Coal, although relatively thin, has been mined at many places in small mines along the outcrop. In the vicinity of Knoxville near East Galesburg and north of Galesburg, the map (pl. 2) shows rather extensive areas where No. 5 Coal is about two feet in average thickness and generally less than fifty feet deep.

North of Spoon River, especially in the area between Wataga and Victoria, No. 6 Coal is near the surface and has been strip mined at several places. The No. 5 Coal occurs about 75 feet lower than No. 6 Coal and is therefore more than 100 feet deep over much of the area. Because No. 5 Coal is generally not more than two feet thick, it has not been prospected to any extent. Since data on thickness are limited, much of the reserves in the central part of Knox County are placed in the Class II reserves category.

In the northernmost part of Knox County, although thickness data are limited, No. 5 Coal appears to be generally less than 18 inches thick. This results from the gradual but persistent northward thinning of No. 5 Coal, which continues from

northern Knox County into Henry County. In Henry County in exposures east of Cambridge, No. 5 Coal is reduced to a thin coaly or carbonaceous shale underlying 1 to 2 feet of hard black fissile shale that is only a few feet above the Covell Conglomerate and Hanover Limestone.

Throughout Knox County, No. 5 Coal is characteristically overlain by up to several feet of black slaty shale that somewhat resembles the black shale over No. 2 Coal and sometimes has been confused with it. This shale persists northward into the area where No. 5 Coal becomes quite thin and is a useful aid in identifying the No. 5 Coal position in drill holes there.

Stark County

No reserves of No. 5 Coal are classified in Stark County because it appears to be less than 18 inches thick throughout the county. On the map (pl. 2), a provisional outcrop is shown for only part of Stark County.

Herrin (No. 6) Coal

The Herrin (No. 6) Coal has not been mined extensively in Fulton or southern Peoria Counties because the thicker, better quality No. 5 Coal generally has been available at shallower depth. However, as the reserves of strippable No. 5 Coal in these areas are depleted, strip mining in the No. 6 Coal in western Illinois will undoubtedly increase because it contains larger reserves of strippable coal than any of the other coals described in this report.

In northern Peoria County, northeastern Knox County, and in Stark, Bureau, and Henry Counties, the No. 6 Coal constitutes the principal reserve. Small underground mines have operated in the No. 6 Coal at a great many places within these counties. These mines, which have supplied a large part of the available geologic information concerning the No. 6 Coal, are shown on plate 3. No. 6 Coal has been strip mined most extensively south and east of Victoria, Knox County; south of Mineral and west of Sheffield, Bureau County; and at a strip mine recently opened near Wyoming, Stark County.

As mapped in this report, No. 6 Coal contains a total of approximately $2\frac{1}{2}$ billion tons of strippable reserves. These reserves are summarized in table 4. More detailed summaries of the reserves are given in table 7.

TABLE 4 - SUMMARY OF STRIPPABLE RESERVES OF NO. 6 COAL
(In thousands of tons)

County	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
BUREAU	24,218	63,058	76,061	163,337	628	29,055	69,095	98,778	262,115	4.91
FULTON	42,556	126,588	80,142	249,286					249,286	4.93
HENRY	38,919	104,433	49,175	192,527	583	45,107	17,218	62,908	255,435	1.94
KNOX	124,723	128,050	4,293	257,066					257,066	11.28
PEORIA	204,817	404,294	272,710	881,821	5,173	46,873	124,504	176,550	1,058,371	1.85
STARK	41,700	158,412	42,949	243,061	2,107	89,329	107,970	199,406	442,467	2.25
TAZEWELL	6,097	16,377	35,163	57,637	140	7,034	4,875	12,049	69,686	
TOTAL	483,030	1,001,212	560,493	2,044,735	8,631	217,398	323,662	549,691	2,594,426	25.16

No. 6 Coal is predominantly 48 to 54 inches thick throughout all the counties of this report, except Knox County where 42 inches is the average thickness and Tazewell County where it is generally only 30 to 36 inches thick.

The quality of No. 6 Coal varies considerably from place to place in these counties and depends largely upon the extent to which deposits of light gray sandy clay or shale called "white-top" are encountered in the area. This light gray sandy clay apparently occurs most often in irregularly shaped linear bodies—somewhat resembling winding stream channels—or in depressions in the top of the coal. The white-top commonly cuts about 2 feet into the coal and very locally extends entirely through the coal seam.

The distribution of white-top is very irregular within an area where it is encountered. At a number of places, it has been so prevalent as to seriously reduce the quantity of clean coal recoverable in strip mining. The occurrence of white-top associated with No. 6 Coal appears to be present to some extent over most of the area of No. 6 Coal mapped in this report. Therefore, during exploration careful attention should be given to the extent to which white-top may affect the recovery of strippable reserves of No. 6 Coal.

The occurrence of white-top deposits in No. 6 Coal of western Illinois has been described by Udden (1912), Cady (1921), Culver (1925), and Wanless (1957). The genesis of the white-top deposits is by no means clear, and the views of the authors cited above differ considerably. Most of the people who have studied the white-top deposits, however, have concluded that the light gray sandy shale deposits, which mainly disrupt the upper portion of the coal, must have resulted from some sort of erosive forces that removed portions of the coal and allowed the white-top material to be deposited locally in the upper portion of the coal seam.

Cady (1921, pp. 176 and 183) described the white-top conditions and call attention to the problems they caused in mining No. 6 Coal in Peoria County.

...this material appears to be the sand and sandy mud filling of depressions existing in the original peat swamp, later covered along with the rest of the area, by the limestone cap-rock. Adjustments that were necessary because of the differential shrinkage during the change of the peat and sands to coal and rock destroyed the original structure of the sandy lens, "kneading" and crushing them until they now lack coherence and are very difficult to hold. Moreover, the adjustments commonly produced fractures in the coal and weakened the overlying limestone. The total result is a roof condition generally above thin coal that is extremely undesirable, as it is dangerous and costly to provide for. No system of distribution of the "white-top" has been discovered. It is usually present to some extent in any body of coal large enough to be worked, and mines have been worked until the poor roof conditions exist in half or more of the workings. Profitable mining is impossible, however, under these conditions.

The deposits of sandy clay material filling horsebacks in the coal, which were described previously in connection with No. 5 Coal, are commonly described as being similar to the material occurring in areas where white-top deposits occur. In some instances, horsebacks are reported as occurring in No. 6 Coal in the same areas that are affected by white-top (Cady, 1915, p. 79). Often the descriptions of these impurities in No. 6 Coal make no clear distinction between the terms white-top and horsebacks.

Tazewell County

In Tazewell County, all of the strippable reserves of No. 6 Coal mapped in this report lie in parts of five townships in the Pekin area. The coal outcrop follows

the eastern bluff of the Illinois River from the mouth of Farm Creek at East Peoria southward to the mouth of the Mackinaw River near Crescent.

The outcrop is concealed by loess deposits all along the bluff line except where the bluff is dissected by streams in which occasional surface outcrops occur. Steepness of the topography along the bluff results in only a rather narrow band of coal in the 0 to 50 and 50 to 100 foot overburden categories. These factors, plus the fact that most of the coal is only 30 inches thick here, make No. 6 Coal in Tazewell County considerably less suitable for strip mining than in the counties west of the Illinois River.

Fulton County

The northernmost part of Fulton County contains large areas of No. 6 Coal at favorable depths for strip mining. Most of this coal ranges from 48 to 54 inches in thickness, but it has not been strip mined to any extent because the No. 5 Coal in nearby areas is thicker, generally has less overburden, and is of better quality. There has been extensive strip mining of No. 6 Coal only near Middle Grove in the northwestern corner of the county. The large reserves of strippable No. 6 Coal in Fulton County undoubtedly will be strip mined more extensively as the more accessible reserves of No. 5 Coal are exhausted.

Peoria County

In southern Peoria County, No. 6 Coal is at strippable depth over most of the area south of Kickapoo Creek. The No. 6 Coal in this part of Peoria County is continuous with the large areas of strippable No. 6 Coal to the south in Fulton County and with No. 6 Coal in the southeastern corner of Knox County. Throughout these areas there are large quantities of strippable coal in the 0-50 and 50-100 foot categories. The coal thickness averages 48 to 54 inches throughout this area, but white-top deposits, similar to those previously described, are likely to affect the quality of the coal in some places.

In central and northern Peoria County, north of Kickapoo Creek, there are seven townships that are underlain in part by No. 6 Coal (pl. 3): all is at depths of less than 150 feet. In these areas, there has been local mining in No. 6 Coal at a number of places near the outcrop. In central and northern Peoria County, much of the area that is underlain by No. 6 Coal has been test drilled at one time or another; however, no large mines have been established there. This is undoubtedly in part due to the occasional presence of white-top in the coal. Probably, cut-out areas in the coal where the overlying Copperas Creek Sandstone has replaced the coal have also inhibited mining. One such cut-out seems to have eroded No. 6 Coal at places in the north central part of T. 10 N., R. 6 E., and possibly elsewhere to the north.

The easternmost margin of No. 6 Coal in central and northern Peoria County lies beneath thick glacial deposits, and data are insufficient to determine in what parts of the area the bedrock surface is at elevations high enough for No. 6 Coal to be present. For this reason, it was not possible to map No. 6 Coal east of a north-south line, roughly through the center of Tps. 10, 11, and 12 N., R. 7 E.

Knox County

Near the southeastern corner of Knox County, No. 6 Coal is being strip mined adjacent to mining in No. 5 Coal. The No. 6 Coal mined there constitutes

a small part of the large tract of No. 6 Coal in northern Fulton and southern Peoria Counties that has been described previously.

In north central Knox County, there is a large area of No. 6 Coal occupying parts of several townships in which most of the coal is less than 100 feet deep and has an average thickness of about 42 inches. The No. 6 Coal was formerly strip mined extensively in the southern part of T. 12 N., R. 3 E., and it is currently being stripped east of Victoria in sec. 15, T. 12 N., R. 4 E. Numerous small underground mines have worked in this coal, and information regarding these mines has furnished much of the data on which coal outcrops and thickness are mapped. Large areas of No. 6 Coal remain in north-central Knox County at strippable depth. Past mining in this area has recorded the presence of white-top material in No. 6 Coal in numerous places that affect the quality of the coal.

Stark County

Strippable reserves of No. 6 Coal in Stark County are principally in the area north of Wyoming in the north central part of the county. The coal is 48 to 54 inches in average thickness. It has been mined locally at a number of places and currently is being extensively strip mined in sec. 13, T. 13 N., R. 6 E.

In northeastern and east-central Stark County, there are areas shown on plate 3 where No. 6 Coal should be present at strippable depths; however, there are no outcrops in the area and very little drill hole data. Therefore, no strippable reserves have been classified for these areas although future drilling may establish the presence of some additional reserves in No. 6 Coal at depths of 100 to 150 feet.

There has been some local mining in No. 6 Coal near Elmira in secs. 15 and 16, T. 14 N., R. 6 E., but there are no other data regarding the coal in this township. In the next township east, there is a log of the Bradford shaft in sec. 28, T. 14 N., R. 7 E., reported by Green (1870, p. 327) where No. 6 Coal in the shaft was reported to be 3 to 5 feet thick. The depth to the coal there was 84 feet, and Green remarked that horsebacks or slips were numerous in the Bradford mine which made it quite expensive to work. This remark probably refers to occurrences of the white-top type of deposits that have been observed in the coal at the strip mine north of Wyoming and have been described elsewhere in the descriptions of the No. 6 Coal in these counties.

Henry County

There are important reserves of No. 6 Coal in the vicinity of Kewanee and Galva in southeastern Henry County. All No. 6 Coal occurring there is at strippable depths.

North of Kewanee the coal has been mined at many places in small underground mines. The thickness of No. 6 Coal averages 48 inches except in the northernmost part of the area where it averages 54 inches. South of Kewanee, there are less data relating to the thickness of the coal. Also, the position of the outcrop is uncertain along the southern and western margins of the area because glacial deposits are sufficiently thick that there are no surface outcrops of the coal.

In the vicinity of Galva in T. 14 N., R. 4 E., there is an outlying area of about 7 square miles where No. 6 Coal occurs. It has been mined locally at numerous places (pl. 3). The average thickness of the coal in this area is 42 inches,

but at the mine in the SW $\frac{1}{4}$ of sec. 26 (pl. 3) the average thickness of the coal was reported to be 48 inches. This is the only mine in the area for which detailed information regarding the character of the coal is available. The coal reportedly exhibited the usual character of No. 6 Coal and contained the "blue band" (a persistent clay band about 2 inches thick) in the lower part of the seam.

Light gray shale called white-top was reported in the mine near Galva as lenticular masses that sometimes cut the coal out completely and as the filling of vertical or inclined fissures that pass completely through the seam.

Study of the field notes on file at the Survey for mines in Henry County reveals that white-top and horseback conditions occurred in practically all of the mines in the Kewanee area. The most common form of interruption described (Culver, 1925, p. 66) consists of vertical or inclined cracks from less than 6 inches to several feet wide filled with light gray clay from the roof. White-top and horseback types of conditions are described as occurring together in areas where the normal black slate or limestone roof is replaced by gray shale (white-top). The light gray sandy clay material may intrude the coal along the horseback type of fissures, or it may occur in large masses that replace the upper part of the coal and occasionally may extend entirely through it.

Bureau County

Only the western half of Bureau County is included in the area of this report. Extensive reserves of No. 6 Coal are found at strippable depths in southwestern Bureau County in the vicinity of Sheffield, Buda, and Neponset. The coal is contiguous with No. 6 Coal in the vicinity of Kewanee, Henry County. Additional areas of No. 6 Coal occur in southeastern Bureau County and will be described in a future report in this series.

Most of the strippable reserves of No. 6 Coal in Bureau County are 54 inches in average thickness. The coal apparently contains horseback intrusions of clay and white-top throughout the area much the same as those described for Henry County.

South of Mineral, the coal has been strip mined extensively across the southern half of T. 6 N., R. 6 E., and was formerly mined underground in a number of mines in the vicinity of Sheffield (McClintock, 1959). It also has been mined at a few places east of Buda and near Tiskilwa (Shaw, 1873, p. 177-181).

At a number of places in Bureau County and in adjacent parts of Henry and Stark Counties, No. 7 Coal is reported to occur in thicknesses of 30 inches or more about 40 feet above the No. 6 Coal, and unless care is taken, it might be mistaken for No. 6 Coal in coal test drilling where both of these coals are present.

Danville (No. 7) Coal

The Danville (No. 7) Coal contains strippable reserves of coal in seams 18 inches or more thick throughout a large part of the area (pl. 1).

The No. 7 Coal attains thicknesses of 42 to 48 inches in the vicinity of Sparland, Marshall County, where it formerly was mined at many places along the western valley wall of the Illinois River. Elsewhere in the counties of this report, there has been practically no mining of No. 7 Coal except in small local mines near Tiskilwa and Buda in Bureau County.

Approximately three-quarters of a billion tons of No. 7 Coal have been

estimated for the counties in this report. The estimated strippable reserves are summarized in table 5. Table 7 lists the strippable reserves of No. 7 Coal for each township in which reserves were estimated.

TABLE 5 - SUMMARY OF STRIPPABLE RESERVES OF NO. 7 COAL
(In thousands of tons)

County	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
BUREAU	23,737	31,156	16,046	70,939	18,630	44,523	49,131	112,284	183,223	
FULTON	22,447	20,597	336	43,380	8,743	5,851	908	15,502	58,882	
HENRY	27,099	31,779		58,878					58,878	
KNOX	2,388	135		2,523					2,523	
MARSHALL	9,276	18,484	88,263	116,023					116,023	
PEORIA	98,285	119,543	23,406	241,234	9,612	23,003	8,688	41,303	282,537	
STARK	3,083			3,083	25,923	25,642	3,055	54,620	57,703	
TAZEWELL	2,152	1,681	319	4,152					4,152	
TOTAL	188,467	223,375	128,370	540,212	62,908	99,019	61,782	223,709	763,921	

The No. 7 Coal occurs 30 to 40 feet above No. 6 Coal in Fulton County and southern Peoria County, and the interval gradually thickens northward to nearly 50 feet at places in Stark, western Bureau, and Henry Counties. Similarly, the coal tends to thicken northward and eastward to the vicinity of Sparland on the Illinois River.

There is very little data relating to the chemical quality of No. 7 Coal. It may have a somewhat higher ash content than No. 5 Coal and No. 6 Coal (Cady, 1921, p. 51), but otherwise its quality is probably similar to that of No. 5 and 6 Coals of this same region.

Knox, Fulton, and Peoria Counties

There is a small amount of No. 7 Coal in the southeastern corner of Knox County and the northeasternmost townships of Fulton County (pl. 1). The largest reserves of No. 7 Coal, however, are in the adjacent areas of southern Peoria County. Throughout most of this area, No. 7 Coal averages about 18 inches in thickness and is considered quite uniform in thickness (Udden, 1912; Cady, 1921). North of Kickapoo Creek in Peoria County, there are less data relating to the thickness of No. 7 Coal, and in large parts of the area underlain by No. 7 Coal no strippable reserves were classified because coal thickness data were lacking.

East and northeast of Princeville, there is an area of No. 7 Coal classified as 30 inches average thickness. North of Chillicothe in the northeastern corner of Peoria County, No. 7 Coal has been mined at several places. There, No. 7 Coal is considerably thicker than elsewhere in Peoria County. It ranges up to 42 inches thick and is located at the southern end of the Sparland field of No. 7 Coal.

Marshall County

Only coal reserves in the part of Marshall County lying west of the Illinois River are included in this report. Within this area, No. 7 Coal attains a thickness of 42 to 48 inches and has been mined at many places along the western wall of the Illinois River Valley and along minor streams that flow eastward into the Illinois River Valley. Because the slopes are steep along the west side of the valley, there are relatively small areas of coal in the 0 to 50 and 50 to 100 foot categories,

compared to the much larger area beneath 100 to 150 feet of overburden. The coal between the 100 to 150 foot overburden contours lies beneath the relatively flat up-land surface while the coal under less than 100 feet of overburden lies beneath the steeper slopes along the valley wall.

Stark, Bureau, and Henry Counties

In Stark County, No. 7 Coal crops out along the valley of Spoon River from Wyoming northward; however, there is little information concerning the extent of the coal.

In northeastern Stark County near Lombardville, Green (1870, p. 326) records the log of a shaft near the north line of sec. 10, T. 14 N., R. 7 E., in which 31 inches of coal, apparently No. 7, was reached at a depth of 70 feet.

In Bureau County, only the coal in Rs. 7, 8, and 9 W. is included in this report; however, strippable reserves of No. 7 Coal are fairly extensive in these townships. In the vicinity of Tiskilwa, No. 7 Coal has been mined along Rocky Run and other tributaries where Cady (1915, p. 93) noted a thickness of 37 inches at one place and 39 inches at another. McClintock (1959) noted an average thickness of about 3 feet for No. 7 Coal there. An average thickness of 30 inches is given, however, for the coal in this area on plate 1 because the thickness of No. 7 Coal in the Tiskilwa area apparently varies between about 24 and 36 inches.

East of Buda in sec. 25, T. 16 N., R. 7 E., and sec. 32, T. 16 N., R. 8 E., No. 7 Coal has been mined. At these places, the thickness was reported to be 30 inches and the depth less than 50 feet (pl. 1).

In the vicinity of Neponset in western Bureau County and Kewanee in Henry County, there are extensive areas underlain by No. 7 Coal. Its average thickness is 24 to 30 inches and it is at depths of less than 100 feet. In the Kewanee area, thicknesses of as much as 36 inches of No. 7 Coal are recorded in drill holes. In this area, No. 6 Coal has been mined rather extensively (pl. 3), but no data are available to indicate that there has ever been mining in No. 7 Coal there.

SUMMARY

Within the counties covered by this report, a total of approximately 8 billion tons of coal has been estimated at strippable depths based on the accompanying maps. The approximate total strippable reserve of each of the principal minable coals in the area is: Rock Island (No. 1) Coal, 5 million tons; Colchester (No. 2) Coal, $2\frac{1}{2}$ billion tons; Springfield (No. 5) Coal, 2 billion tons; Herrin (No. 6) Coal, $2\frac{1}{2}$ billion tons; and Danville (No. 7) Coal, 750 million tons. The report also describes small areas of strippable coal in seams that generally are quite thin but locally attain minable thickness. Table 6 summarizes the distribution of these reserves by county and coal seam. Table 7 contains a more detailed summary in which reserves are tabulated by county, township, and thickness for each of the overburden and reliability categories shown on the accompanying maps.

Of the nearly 8 billion tons of strippable coal mapped in the report, approximately 6 billion tons is in the Class I category and approximately 2 billion tons is in the Class II category of reliability. Approximately 6 billion tons, or 78 percent, of the strippable coal mapped in this study is in seams 30 inches or more thick and 3 billion tons, or 42 percent, of the total coal mapped is in seams 48 or more inches thick. Of the coal reserves mapped 21 percent lies beneath overburden less than 50 feet thick, 46 percent beneath 50 to 100 feet, and 33 percent beneath 100 to 150 feet.

TABLE 6 - SUMMARY OF STRIPPABLE COAL RESERVES BY COUNTY, COAL BED, AND RELIABILITY CLASSIFICATION
(In thousands of tons)

Coal	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
BUREAU COUNTY										
NO. 7 COAL	23,737	31,156	16,046	70,939	18,630	44,523	49,131	112,284	183,223	
NO. 6 COAL	24,218	63,058	76,061	163,337	628	29,055	69,095	98,778	262,115	4.91
NO. 2 COAL							7,062	7,062	7,062	
TOTAL	47,955	94,214	92,107	234,276	19,258	73,578	125,288	218,124	452,400	4.91
FULTON COUNTY										
NO. 7 COAL	22,447	20,597	336	43,380	8,743	5,851	908	15,502	58,882	
NO. 6 COAL	42,556	126,588	80,142	249,286					249,286	4.93
NO. 5 COAL	172,925	389,624	139,837	702,386					702,386	51.19
NO. 2 COAL	210,162	522,316	261,870	994,348	20,935	30,580	58,922	110,437	1,104,785	
NO. 1 COAL	2,600	1,625	1,233	5,458					5,458	.82
TOTAL	450,690	1,060,750	483,418	1,994,858	29,678	36,431	59,830	125,939	2,120,797	56.94
HENRY COUNTY										
NO. 7 COAL	27,099	31,779		58,878					58,878	
NO. 6 COAL	38,919	104,433	49,175	192,527	583	45,107	17,218	62,908	255,435	1.94
NO. 2 COAL	26,599	25,200	67,143	118,942	3,448	58,121	62,441	124,010	242,952	4.11
TOTAL	92,617	161,412	116,318	370,347	4,031	103,228	79,659	186,918	557,265	6.05
KNOX COUNTY										
NO. 7 COAL	2,388	135		2,523					2,523	
NO. 6 COAL	124,723	128,050	4,293	257,066					257,066	11.28
NO. 5 COAL	178,543	233,719	55,960	468,222	23,282	77,659	57,346	158,287	626,509	5.50
NO. 2 COAL	135,292	232,170	151,644	519,106	11,551	59,792	106,832	178,175	697,281	
TOTAL	440,946	594,074	211,897	1,246,917	34,833	137,451	164,178	336,462	1,583,379	16.78
MARSHALL COUNTY										
NO. 7 COAL	9,276	18,484	88,263	116,023					116,023	
TOTAL	9,276	18,484	88,263	116,023					116,023	

TABLE 6 - Continued

MERCER COUNTY										
NO. 2 COAL	1,328	2,102	387	3,817	3,206	7,959		11,165	14,982	
TOTAL	<u>1,328</u>	<u>2,102</u>	<u>387</u>	<u>3,817</u>	<u>3,206</u>	<u>7,959</u>		<u>11,165</u>	<u>14,982</u>	
PEORIA COUNTY										
NO. 7 COAL	98,285	119,543	23,406	241,234	9,612	23,003	8,688	41,303	282,537	
NO. 6 COAL	204,817	404,294	272,710	881,821	5,173	46,873	124,504	176,550	1,058,371	1.85
NO. 5 COAL	45,712	173,645	248,778	468,135	28,489	117,689	111,236	257,414	725,549	17.83
NO. 2 COAL	9,781	23,400	26,314	59,495	84	15,216	32,984	48,284	107,779	.68
TOTAL	<u>358,595</u>	<u>720,882</u>	<u>571,208</u>	<u>1,650,685</u>	<u>43,358</u>	<u>202,781</u>	<u>277,412</u>	<u>523,551</u>	<u>2,174,236</u>	<u>20.36</u>
STARK COUNTY										
NO. 7 COAL	3,083			3,083	25,923	25,642	3,055	54,620	57,703	
NO. 6 COAL	41,700	158,412	42,949	243,061	2,107	89,329	107,970	199,406	442,467	.25
NO. 2 COAL			140	140			25,641	25,641	25,781	
TOTAL	<u>44,783</u>	<u>158,412</u>	<u>43,089</u>	<u>246,284</u>	<u>28,030</u>	<u>114,971</u>	<u>136,666</u>	<u>279,667</u>	<u>525,951</u>	<u>.25</u>
TAZEWELL COUNTY										
NO. 7 COAL	2,152	1,681	319	4,152					4,152	
NO. 6 COAL	6,097	16,377	35,163	57,637	140	7,034	4,875	12,049	69,686	
NO. 5 COAL	1,211	5,851	21,085	28,147			8,928	8,928	37,075	1.35
NO. 2 COAL		7,342	4,904	12,246		9,360	17,486	26,846	39,092	
TOTAL	<u>9,460</u>	<u>31,251</u>	<u>61,471</u>	<u>102,182</u>	<u>140</u>	<u>16,394</u>	<u>31,289</u>	<u>47,823</u>	<u>150,005</u>	<u>1.35</u>
WARREN COUNTY										
NO. 5 COAL	807			807					807	
NO. 2 COAL	50,622	42,194	45	92,861	10,896	41,205	13,989	66,090	158,951	
TOTAL	<u>51,429</u>	<u>42,194</u>	<u>45</u>	<u>93,668</u>	<u>10,896</u>	<u>41,205</u>	<u>13,989</u>	<u>66,090</u>	<u>159,758</u>	
GRAND TOTAL	<u>1,507,079</u>	<u>2,883,775</u>	<u>1,668,203</u>	<u>6,059,057</u>	<u>173,430</u>	<u>733,998</u>	<u>888,311</u>	<u>1,795,739</u>	<u>7,854,796</u>	<u>106.64</u>

TABLE 7 - DETAILED SUMMARY OF STRIPPABLE COAL RESERVES SHOWING THICKNESS OF OVERBURDEN,
THICKNESS OF COAL, AND RELIABILITY CLASSIFICATION, BY COUNTY AND TOWNSHIP
(In thousands of tons)

Coal, Township, Thickness (inches)	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
BUREAU COUNTY										
NO. 7 COAL										
15N-6E										
24					12.644	30.624	8.699	51.967	51.967	
30	10.677	9.668	532	20.877					20.877	
TOTAL	10.677	9.668	532	20.877	12.644	30.624	8.699	51.967	72.844	
15N-7E										
24					5.403	12.218	31.409	49.030	49.030	
30			645	645		1.681	4.876	6.557	7.202	
TOTAL			645	645	5.403	13.899	36.285	55.587	56.232	
15N-8E										
24							4.147	4.147	4.147	
30	3.027	14.600	11.462	29.089					29.089	
TOTAL	3.027	14.600	11.462	29.089			4.147	4.147	33.236	
16N-6E										
24	4.820	2.376	3.183	10.379					10.379	
TOTAL	4.820	2.376	3.183	10.379					10.379	
16N-7E										
24					583			583	583	
30	1.934	2.578	224	4.736					4.736	
TOTAL	1.934	2.578	224	4.736	583			583	5.319	
16N-8E										
30	3.279	1.934		5.213					5.213	
TOTAL	3.279	1.934		5.213					5.213	
COAL BED	23.737	31.156	16.046	70.939	18.630	44.523	49.131	112.284	183.223	
NO. 6 COAL										
15N-6E										
48					628	26.096	46.990	73.714	73.714	
54	1.564	19.773	39.244	60.581					60.581	
TOTAL	1.564	19.773	39.244	60.581	628	26.096	46.990	73.714	134.295	
15N-7E										
48						2.959	22.105	25.064	25.064	
54	353	9.483	2.774	12.610					12.610	
TOTAL	353	9.483	2.774	12.610		2.959	22.105	25.064	37.674	
15N-8E										
48	762	6.008	11.747	18.517					18.517	
54		454	8.777	9.231					9.231	
TOTAL	762	6.462	20.524	27.748					27.748	
16N-6E										
54	7.264	14.780	5.549	27.593					27.593	
TOTAL	7.264	14.780	5.549	27.593					27.593	4.74
16N-7E										
54	8.979	6.053	4.641	19.673					19.673	
TOTAL	8.979	6.053	4.641	19.673					19.673	.17
16N-8E										
54	5.296	6.507	3.329	15.132					15.132	
TOTAL	5.296	6.507	3.329	15.132					15.132	

TABLE 7 - Continued

Coal, Township, Thickness (inches)	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
COAL BED	24,218	63,058	76,061	163,337	628	29,055	69,095	98,778	262,115	4.91
NO. 2 COAL										
16N-6E										
30							7,062	7,062	7,062	
TOTAL							7,062	7,062	7,062	
COAL BED							7,062	7,062	7,062	
COUNTY	47,955	94,214	92,107	234,276	19,258	73,578	125,288	218,124	452,400	4.91
FULTON COUNTY										
NO. 7 COAL										
7N-4E										
18	9,416	185		9,601					9,601	
TOTAL	9,416	185		9,601					9,601	
7N-5E										
18	2,808	151		2,959					2,959	
TOTAL	2,808	151		2,959					2,959	
8N-4E										
18	10,223	20,261	336	30,820	8,743	5,851	908	15,502	46,322	
TOTAL	10,223	20,261	336	30,820	8,743	5,851	908	15,502	46,322	
COAL BED	22,447	20,597	336	43,380	8,743	5,851	908	15,502	58,882	
NO. 6 COAL										
7N-3E										
48	179	4,080		4,259					4,259	
TOTAL	179	4,080		4,259					4,259	
7N-4E										
48	8,743	26,006	1,300	36,049					36,049	
54	4,943	10,643		15,586					15,586	
TOTAL	13,686	36,649	1,300	51,635					51,635	
7N-5E										
36		2,186	303	2,489					2,489	
48	90	2,735		2,825					2,825	
54	5,448	6,911		12,359					12,359	
TOTAL	5,538	11,832	303	17,673					17,673	
8N-3E										
36	1,278			1,278					1,278	
48	14,079	14,931		29,010					29,010	
TOTAL	15,357	14,931		30,288					30,288	1.38
8N-4E										
48	583	17,935	15,335	33,853					33,853	
54	7,213	41,161	63,204	111,578					111,578	
TOTAL	7,796	59,096	78,539	145,431					145,431	3.58
COAL BED	42,556	126,588	80,142	249,286					249,286	4.93
NO. 5 COAL										
3N-1E										
60	3,587			3,587					3,587	
72	15,805			15,805					15,805	
TOTAL	19,392			19,392					19,392	.38
3N-2E										

TABLE 7 -- Continued

Coal, Township, Thickness (inches)	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
60	56			56					56	
66	5,672			5,672					5,672	
72	1,211			1,211					1,211	
TOTAL	6,939			6,939					6,939	1.07
4N-2E										
66	11,899			11,899					11,899	
TOTAL	11,899			11,899					11,899	.63
5N-1E										
60	3,027			3,027					3,027	
TOTAL	3,027			3,027					3,027	.12
5N-4E										
54	1,059	6,104		7,163					7,163	
60	953			953					953	
TOTAL	2,012	6,104		8,116					8,116	.19
5N-5E										
54	555	3,834		4,389					4,389	
TOTAL	555	3,834		4,389					4,389	.43
6N-2E										
54	2,522			2,522					2,522	
TOTAL	2,522			2,522					2,522	.10
6N-3E										
54	16,999	6,406		23,405					23,405	
60	4,204	14,572		18,776					18,776	
TOTAL	21,203	20,978		42,181					42,181	13.83
6N-4E										
54	1,211	9,584		10,795					10,795	
60	29,257	42,596		71,853					71,853	
TOTAL	30,468	52,180		82,648					82,648	14.53
6N-5E										
48	717	3,363	3,318	7,398					7,398	
54	1,362	4,489		5,851					5,851	
60	2,690	8,071		10,761					10,761	
TOTAL	4,769	15,923	3,318	24,010					24,010	1.24
7N-2E										
48		852		852					852	
TOTAL		852		852					852	.81
7N-3E										
48	6,771	37,798	8,743	53,312					53,312	
54	25,776	2,573		28,349					28,349	
TOTAL	32,547	40,371	8,743	81,661					81,661	4.11
7N-4E										
48		12,286	10,985	23,271					23,271	
54	5,801	89,586	16,545	111,932					111,932	
TOTAL	5,801	101,872	27,530	135,203					135,203	4.73
7N-5E										
48	583	1,749	1,345	3,677					3,677	
54	12,510	81,061	33,393	126,964					126,964	

TABLE 7 - Continued

Coal, Township, Thickness (inches)	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
TOTAL	13,093	82,810	34,738	130,641					130,641	.95
8N-2E										
48	314			314					314	
TOTAL	314			314					314	.24
8N-3E										
48	17,711	47,976	22,822	88,509					88,509	
TOTAL	17,711	47,976	22,822	88,509					88,509	3.84
8N-4E										
48	673	16,724	42,686	60,083					60,083	
TOTAL	673	16,724	42,686	60,083					60,083	3.99
COAL BED	172,925	369,624	139,837	702,386					702,386	51.19
NO. 2 COAL										
3N-1E										
30	16,814	55,767	16,310	88,891					88,891	
TOTAL	16,814	55,767	16,310	88,891					88,891	
3N-2E										
30	19,729	48,565	15,021	83,315					83,315	
TOTAL	19,729	48,565	15,021	83,315					83,315	
3N-3E										
30	7,006	11,378		18,384					18,384	
TOTAL	7,006	11,378		18,384					18,384	
4N-1E										
30	16,001	65,099	6,866	87,966					87,966	
TOTAL	16,001	65,099	6,866	87,966					87,966	
4N-2E										
30	17,851	57,532	6,417	81,800					81,800	
TOTAL	17,851	57,532	6,417	81,800					81,800	
4N-3E										
30	21,046	25,754		46,800					46,800	
TOTAL	21,046	25,754		46,800					46,800	
4N-4E										
30	392	336		728					728	
TOTAL	392	336		728					728	
5N-1E										
24	2,623	4,753	112	7,488					7,488	
30	13,283	41,335	4,540	59,158					59,158	
TOTAL	15,906	46,088	4,652	66,646					66,646	
5N-2E										
24	740	583		1,323					1,323	
30	10,229	16,029	364	26,622	252	757	364	1,373	27,995	
TOTAL	10,969	16,612	364	27,945	252	757	364	1,373	29,318	
5N-3E										
30	13,087	49,826	23,680	86,593					86,593	
TOTAL	13,087	49,826	23,680	86,593					86,593	
5N-4E										
30	8,043	34,861	15,301	58,205					58,205	
TOTAL	8,043	34,861	15,301	58,205					58,205	

TABLE 7 - Continued

Coal, Township, Thickness (inches)	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
5N-5E										
30	1,850	1,990	1,289	5,129					5,129	
TOTAL	1,850	1,990	1,289	5,129					5,129	
6N-1E										
30	23,960	26,763	196	50,919					50,919	
TOTAL	23,960	26,763	196	50,919					50,919	
6N-2E										
30	4,876	12,414	20,794	38,084					38,084	
TOTAL	4,876	12,414	20,794	38,084					38,084	
6N-3E										
30	4,288	14,068	45,735	64,091					64,091	
TOTAL	4,288	14,068	45,735	64,091					64,091	
6N-4E										
30	729	8,491	50,555	59,775		308	2,550	2,858	62,633	
TOTAL	729	8,491	50,555	59,775		308	2,550	2,858	62,633	
6N-5E										
30	3,951	2,410	5,128	11,489	17,235	10,032	11,209	38,476	49,965	
TOTAL	3,951	2,410	5,128	11,489	17,235	10,032	11,209	38,476	49,965	
7N-1E										
24	2,870	7,690		10,560	516	269		785	11,345	
30	1,261	2,186		3,447					3,447	
TOTAL	4,131	9,876		14,007	516	269		785	14,792	
7N-2E										
30	13,003	13,704	12,246	38,953	28	869	3,083	3,980	42,933	
TOTAL	13,003	13,704	12,246	38,953	28	869	3,083	3,980	42,933	
7N-3E										
24	852	4,641	26,275	31,768	157	1,278	14,953	16,388	48,156	
30		140	3,559	3,699					3,699	
TOTAL	852	4,781	29,834	35,467	157	1,278	14,953	16,388	51,855	
7N-4E										
30						168	2,214	2,382	2,382	
TOTAL						168	2,214	2,382	2,382	
7N-5E										
30		56	308	364		7,286	5,773	13,059	13,423	
TOTAL		56	308	364		7,286	5,773	13,059	13,423	
8N-1E										
24	2,623			2,623					2,623	
TOTAL	2,623			2,623					2,623	
8N-2E										
30	3,055	13,367	6,501	22,923	617	1,794	897	3,308	26,231	
TOTAL	3,055	13,367	6,501	22,923	617	1,794	897	3,308	26,231	
8N-3E										
30		2,578	673	3,251	2,130	7,819	17,879	27,828	31,079	
TOTAL		2,578	673	3,251	2,130	7,819	17,879	27,828	31,079	
COAL BED	210,162	522,316	261,870	994,348	20,935	30,580	58,922	110,437	1,104,785	

NO. 1 COAL

6N-1E

TABLE 7 - Continued

Coal, Township, Thickness (inches)	Class I Reserves at overburden thickness (ft.)			Total	Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150		0-50	50-100	100-150	Total		
24	1,457	852		2,309					2,309	
36	1,143	269		1,412					1,412	
TOTAL	2,600	1,121		3,721					3,721	
6N-3E										
24		67	381	448					448	
36		202	437	639					639	
48		179	359	538					538	
60		56	56	112					112	
TOTAL		504	1,233	1,737					1,737	.12
8N-2E										
COAL BED	2,600	1,625	1,233	5,458					5,458	.82
COUNTY	450,690	1,060,750	483,418	1,994,858	29,678	36,431	59,830	125,939	2,120,797	56.94
HENRY COUNTY										
NO. 7 COAL										
15N-5E										
30	27,099	31,779		58,878					58,878	
TOTAL	27,099	31,779		58,878					58,878	
COAL BED	27,099	31,779		58,878					58,878	
NO. 6 COAL										
14N-4E										
42	24,795	4,708		29,503					29,503	
TOTAL	24,795	4,708		29,503					29,503	.21
14N-5E										
42	3,727	28,248		31,975					31,975	
48		12,555	2,690	15,245	583	45,107	17,218	62,908	78,153	
TOTAL	3,727	40,803	2,690	47,220	583	45,107	17,218	62,908	110,128	
15N-5E										
48	6,412	35,870	36,901	79,183					79,183	
54	3,430	21,287	9,584	34,301					34,301	
TOTAL	9,842	57,157	46,485	113,484					113,484	1.58
16N-5E										
54	555	1,765		2,320					2,320	
TOTAL	555	1,765		2,320					2,320	.15
COAL BED	38,919	104,433	49,175	192,527	583	45,107	17,218	62,908	255,435	1.94
NO. 2 COAL										
14N-1E										
18	202	2,304	3,497	6,003					6,003	
24		1,457	11,747	13,204			179	179	13,383	
30		7,286	16,926	24,212					24,212	
TOTAL	202	11,047	32,170	43,419			179	179	43,598	
14N-2E										
24						448	12,241	12,689	12,689	
30			1,962	1,962					1,962	
TOTAL			1,962	1,962		448	12,241	12,689	14,651	
14N-4E										
30							588	588	588	
TOTAL							588	588	588	

TABLE 7. - Continued

[illegible]

TABLE 7 - Continued

Coal, Township, Thickness (inches)	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
42	942			942					942	
TOTAL	942			942					942	.06
12N-2E										
42	27,855	34,329	118	62,302					62,302	
TOTAL	27,855	34,329	118	62,302					62,302	.62
12N-3E										
42	36,369	32,563		68,932					68,932	
TOTAL	36,369	32,563		68,932					68,932	4.94
12N-4E										
42	30,053	23,422	3,923	57,398					57,398	
TOTAL	30,053	23,422	3,923	57,398					57,398	1.61
13N-2E										
42	2,668	10,004		12,672					12,672	
TOTAL	2,668	10,004		12,672					12,672	
13N-3E										
42	10,083	314		10,397					10,397	
TOTAL	10,083	314		10,397					10,397	
13N-4E										
42	1,334	78		1,412					1,412	
TOTAL	1,334	78		1,412					1,412	
COAL BED	124,723	128,050	4,293	257,066					257,066	11.28
NO. 5 COAL										
9N-1E										
36	4,170			4,170					4,170	
48	7,353			7,353					7,353	
TOTAL	11,523			11,523					11,523	
9N-3E										
48	4,035	10,851		14,886					14,886	
TOTAL	4,035	10,851		14,886					14,886	2.60
9N-4E										
42	21,931	26,365	118	48,414					48,414	
48	7,936	31,342	36,812	76,090					76,090	
TOTAL	29,867	57,707	36,930	124,504					124,504	2.90
10N-1E										
36	5,885			5,885					5,885	
TOTAL	5,885			5,885					5,885	
10N-2E										
30	448			448					448	
36	605			605					605	
TOTAL	1,053			1,053					1,053	
10N-3E										
30	6,782	2,074		8,856					8,856	
TOTAL	6,782	2,074		8,856					8,856	
10N-4E										
24	673	942		1,615	314	3,811	2,488	6,613	8,228	
30	14,320	14,712	3,055	32,087					32,087	
36	7,230	4,136		11,366	1,917	9,147		11,064	22,430	

TABLE 7 - Continued

[illegible]

TABLE 7 - Continued

Coal, Township, Thickness (inches)	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
24	3,565	5,246		8,811	90	1,031	1,009	2,130	10,941	
30	1,345	5,913	560	7,818	3,055	4,820	7,763	15,638	23,456	
TOTAL	4,910	11,159	560	16,629	3,145	5,851	8,772	17,768	34,397	
10N-1E										
24	21,589	32,956	3,609	58,154	1,076	6,408		4,484	62,638	
30		364	336	700					700	
TOTAL	21,589	33,320	3,945	58,854	1,076	6,408		4,484	63,338	
10N-2E										
24	22,598	31,207	7,645	61,450					61,450	
30	1,037	224		1,261					1,261	
TOTAL	23,635	31,431	7,645	62,711					62,711	
10N-3E										
24	13,810	34,861	8,631	57,302	3,004	5,717	1,928	10,649	67,951	
30	3,167	224		3,391					3,391	
TOTAL	16,977	35,085	8,631	60,693	3,004	5,717	1,928	10,649	71,342	
10N-4E										
24					1,211	4,103	6,972	12,286	12,286	
TOTAL					1,211	4,103	6,972	12,286	12,286	
11N-1E										
24		10,111	16,747	26,858	45	14,326	23,652	38,023	64,881	
30		56	280	336					336	
TOTAL		10,167	17,027	27,194	45	14,326	23,652	38,023	65,217	
11N-2E										
24	4,304	20,670	29,503	54,477		426	224	650	55,127	
36	135	1,715	1,984	3,834					3,834	
48		359	404	763					763	
TOTAL	4,439	22,744	31,891	59,074		426	224	650	59,724	
11N-3E										
24	8,385	18,765	25,401	52,551		6,004	6,412	9,416	61,967	
TOTAL	8,385	18,765	25,401	52,551		6,004	6,412	9,416	61,967	
11N-4E										
24	179	3,968	1,524	5,671	829	4,686	5,515	11,030	16,701	
TOTAL	179	3,968	1,524	5,671	829	4,686	5,515	11,030	16,701	
12N-1E										
24			2,601	2,601	1,255	2,264	8,586	12,105	14,706	
30	1,765	6,025	21,858	29,648					29,648	
TOTAL	1,765	6,025	24,459	32,249	1,255	2,264	8,586	12,105	44,354	
12N-2E										
24		381	2,219	2,600		2,242	3,430	5,672	8,272	
TOTAL		381	2,219	2,600		2,242	3,430	5,672	8,272	
12N-3E										
24						695	1,480	2,175	2,175	
TOTAL						695	1,480	2,175	2,175	
13N-1E										
18	874	773		1,647					1,647	
24	516	2,444	4,999	7,959	986	16,070	29,907	43,963	51,922	
30	280	3,391	9,444	13,115					13,115	

TABLE 7 - Continued

[illegible]

TABLE 7 - Continued

Coal, Township, Thickness (inches)	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
18	14,292	5,935	118	20,345					20,345	
TOTAL	14,292	5,935	118	20,345					20,345	
9N-6E										
18	11,013	4,086		15,099					15,099	
TOTAL	11,013	4,086		15,099					15,099	
9N-7E										
18	1,732	2,018	874	4,624	3,531	7,028		10,559	15,183	
24	3,139	807		3,946					3,946	
TOTAL	4,871	2,825	874	8,570	3,531	7,028		10,559	19,129	
10N-7E										
18					790	2,388		3,178	3,178	
24	471	224		695					695	
TOTAL	471	224		695	790	2,388		3,178	3,873	
11N-6E										
24					5,224	8,968	583	14,775	14,775	
30	1,065	1,457		2,522					2,522	
TOTAL	1,065	1,457		2,522	5,224	8,968	583	14,775	17,297	
11N-7E										
24						2,601	5,919	8,520	8,520	
30	9,920	14,937	813	25,670					25,670	
TOTAL	9,920	14,937	813	25,670		2,601	5,919	8,520	34,190	
11N-9E										
42	1,334	2,393	5,493	9,220					9,220	
TOTAL	1,334	2,393	5,493	9,220					9,220	
COAL BED	98,285	119,543	23,406	241,234	9,612	23,003	8,688	41,303	282,537	
NO. 6 COAL										
7N-6E										
36	2,959			2,959					2,959	
48	986	6,501		7,487					7,487	
54	757	13,670		14,427					14,427	
TOTAL	4,702	20,171		24,873					24,873	
7N-7E										
30	1,373	2,830		4,203					4,203	
36	1,412	4,540		5,952					5,952	
54	151	454		605					605	
TOTAL	2,936	7,824		10,760					10,760	
8N-5E										
36	269	2,018	4,506	6,793					6,793	
48	314	13,137	32,328	45,779		2,287	23,719	26,006	71,785	
54	252	5,196	47,819	53,267					53,267	
TOTAL	835	20,351	84,653	105,839		2,287	23,719	26,006	131,845	
8N-6E										
48	9,954	38,202	42,327	90,483	1,749	10,582	52,953	65,284	155,767	
TOTAL	9,954	38,202	42,327	90,483	1,749	10,582	52,953	65,284	155,767	
8N-7E										
36	2,858	14,561	2,455	19,874					19,874	
48	9,954	42,282	37,709	89,945					89,945	

TABLE 7 - Continued

Coal, Township, Thickness (inches)	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
TOTAL	12.812	56.843	40.164	109.819					109.819	
9N-5E										
48	26.813	19.415	6.053	52.281					52.281	
54	15.284	17.756	10.341	43.381					43.381	
TOTAL	42.097	37.171	16.394	95.662					95.662	
9N-6E										
48	31.924	27.082	10.178	69.184					69.184	
54		2.270		2.270					2.270	
TOTAL	31.924	29.352	10.178	71.454					71.454	
9N-7E										
48	3.183	4.170	5.291	12.644	717	5.650	11.434	17.801	30.445	
54	3.985	25.221	9.786	38.992					38.992	
TOTAL	7.168	29.391	15.077	51.636	717	5.650	11.434	17.801	69.437	.45
10N-5E										
42	8.671	1.962		10.633	275	11.103		11.378	22.011	
48	5.156	25.782		30.938					30.938	
TOTAL	13.827	27.744		41.571	275	11.103		11.378	52.949	.16
10N-6E										
48	17.532	38.112	2.870	58.514					58.514	
54	555			555					555	
TOTAL	18.087	38.112	2.870	59.069					59.069	.37
10N-7E										
48	5.560	12.241	6.771	24.572		1.749	15.514	17.263	41.835	
54	2.774	2.018	2.724	7.516					7.516	
TOTAL	8.334	14.259	9.495	32.088		1.749	15.514	17.263	49.351	.02
11N-5E										
42	22.991	36.761	196	59.948	2.432	9.181		11.613	71.561	
48		2.332		2.332					2.332	
TOTAL	22.991	39.093	196	62.280	2.432	9.181		11.613	73.893	.55
11N-6E										
18	740	488		1,228					1,228	
36						504	5.112	5.616	5.616	
42	22.127	22.324	24.874	69.325					69.325	
48	5.560	20.312	25.961	51.833					51.833	
TOTAL	28.427	43.124	50.835	122.386		504	5.112	5.616	128.002	.30
11N-7E										
18	723	2.657	521	3,901		1.782	3.565	5.347	9.248	
36						4.035	12.207	16.242	16.242	
TOTAL	723	2.657	521	3,901		5.817	15.772	21.589	25.490	
COAL BED	204.817	404.294	272.710	881.821	5.173	46.873	124.504	176.550	1,058.371	1.85
NO. 5 COAL										
7N-6E										
48	3.766	25.602	9.461	38.829					38.829	
54	353	3,733	2,926	7,012					7,012	
TOTAL	4.119	29.335	12.387	45.841					45.841	1.95
7N-7E										
48	135	448	1,390	1,973					1,973	

TABLE 7 - Continued

Coal, Township, Thickness (inches)	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
54	3,228	2,573	4,893	10,694					10,694	
TOTAL	3,363	3,021	6,283	12,667					12,667	9.27
8N-5E										
48			538	538			538	538	1,076	
54		1,160	11,753	12,913					12,913	
TOTAL		1,160	12,291	13,451			538	538	13,989	
8N-6E										
48		6,143	24,392	30,535					30,535	
TOTAL		6,143	24,392	30,535					30,535	.07
8N-7E										
48	404	1,524	3,408	5,336					5,336	
54	2,774	7,566	16,797	27,137					27,137	
TOTAL	3,178	9,090	20,205	32,473					32,473	4.06
9N-5E										
48		1,838	14,483	16,321	22,240	66,853	36,812	125,905	142,226	
TOTAL		1,838	14,483	16,321	22,240	66,853	36,812	125,905	142,226	.43
9N-6E										
30	925	1,429		2,354					2,354	
36	303	2,455	2,522	5,280					5,280	
48	12,644	42,686	39,278	94,608					94,608	
TOTAL	13,872	46,570	41,800	102,242					102,242	.81
9N-7E										
36		538	6,759	7,297					7,297	
48	11,972	23,540	36,722	72,234					72,234	
TOTAL	11,972	24,078	43,481	79,531					79,531	1.16
10N-5E										
30						9,584	29,901	39,485	39,485	
36					6,053	13,519		19,572	19,572	
TOTAL					6,053	23,103	29,901	59,057	59,057	
10N-6E										
30	5,240	35,058	22,475	62,773	112	1,373	11,322	12,807	75,580	
36	1,950	6,591	4,742	13,283					13,283	
TOTAL	7,190	41,649	27,217	76,056	112	1,373	11,322	12,807	88,863	.12
10N-7E										
30						617	6,529	7,146	7,146	
36	2,018	5,280	8,542	15,840					15,840	
TOTAL	2,018	5,280	8,542	15,840		617	6,529	7,146	22,986	.06
11N-5E										
30					84	21,438	16,842	38,364	38,364	
36		5,481	37,697	43,178					43,178	
TOTAL		5,481	37,697	43,178	84	21,438	16,842	38,364	81,542	
11N-6E										
24						3,296	5,425	8,721	8,721	
30						1,009	3,867	4,876	4,876	
TOTAL						4,305	9,292	13,597	13,597	
COAL BED	45,712	173,645	248,778	468,135	28,489	117,689	111,236	257,414	725,549	17.83

NO. 2 COAL

TABLE 7 - Continued

Coal, Township, Thickness (inches)	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
6N-6E										
30	5,381	280	84	5,745					5,745	
TOTAL	5,381	280	84	5,745					5,745	.02
7N-6E										
30	4,400	3,195	1,625	9,220	84	2,466	15,329	17,879	27,099	
TOTAL	4,400	3,195	1,625	9,220	84	2,466	15,329	17,879	27,099	.25
7N-7E										
30		12,078	5,437	17,515		9,640	4,316	13,956	31,471	
TOTAL		12,078	5,437	17,515		9,640	4,316	13,956	31,471	.41
8N-7E										
30		3,083	6,221	9,304			84	84	9,388	
TOTAL		3,083	6,221	9,304			84	84	9,388	
8N-8E										
30		3,587	8,015	11,602		1,373	3,447	4,820	16,422	
TOTAL		3,587	8,015	11,602		1,373	3,447	4,820	16,422	
9N-7E										
30		1,177	4,932	6,109		1,737	4,596	6,333	12,442	
TOTAL		1,177	4,932	6,109		1,737	4,596	6,333	12,442	
11N-8E										
30							4,848	4,848	4,848	
TOTAL							4,848	4,848	4,848	
11N-6E										
30							364	364	364	
TOTAL							364	364	364	
COAL BED	9,781	23,400	26,314	59,495	84	15,216	32,984	48,284	107,779	.68
COUNTY	356,595	720,882	571,208	1,650,685	43,358	202,781	277,412	523,551	2,174,236	20.36
STARK COUNTY										
NO. 7 COAL										
12N-7E										
30	3,083			3,083					3,083	
TOTAL	3,083			3,083					3,083	
13N-6E										
24					6,300	112		6,412	6,412	
TOTAL					6,300	112		6,412	6,412	
13N-7E										
24					10,918	6,950		17,868	17,868	
TOTAL					10,918	6,950		17,868	17,868	
14N-7E										
24					942			942	942	
30					7,763	18,580	3,055	29,398	29,398	
TOTAL					8,705	18,580	3,055	30,340	30,340	
COAL BED	3,083			3,083	25,923	25,642	3,055	54,620	57,703	
NO. 6 COAL										
12N-6E										
18	34			34					34	
42	1,962			1,962					1,962	
TOTAL	1,996			1,996					1,996	

TABLE 7 - Continued

Coal, Township, Thickness (inches)	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
12N-7E										
18	841	975		1,816		2,522		2,522	4,338	
TOTAL	841	975		1,816		2,522		2,522	4,338	
13N-5E										
42	3,139			3,139					3,139	
TOTAL	3,139			3,139					3,139	
13N-6E										
54	14,830	39,698	252	54,780					54,780	
TOTAL	14,830	39,698	252	54,780					54,780	.22
13N-7E										
48						15,559	27,710	43,269	43,269	
54	2,018	35,058	21,892	58,968					58,968	
TOTAL	2,018	35,058	21,892	58,968		15,559	27,710	43,269	102,237	
14N-6E										
48	16,769	62,100	1,704	80,573	2,107	55,106	22,733	79,946	160,519	
TOTAL	16,769	62,100	1,704	80,573	2,107	55,106	22,733	79,946	160,519	.03
14N-7E										
48	2,107	20,581	19,101	41,789		16,142	57,527	73,669	115,458	
TOTAL	2,107	20,581	19,101	41,789		16,142	57,527	73,669	115,458	
COAL BED	41,700	158,412	42,949	243,061	2,107	89,329	107,970	199,406	442,467	.25
NO. 2 COAL										
12N-5E										
30							21,186	21,186	21,186	
TOTAL							21,186	21,186	21,186	
12N-6E										
30							2,690	2,690	2,690	
TOTAL							2,690	2,690	2,690	
13N-5E										
30			140	140			1,765	1,765	1,905	
TOTAL			140	140			1,765	1,765	1,905	
COAL BED			140	140			25,641	25,641	25,781	
COUNTY	44,783	158,412	43,089	246,284	28,030	114,971	136,666	279,667	525,951	.25
TAZEWELL COUNTY										
NO. 7 COAL										
25N-4W										
18	2,152	1,681	319	4,152					4,152	
TOTAL	2,152	1,681	319	4,152					4,152	
COAL BED	2,152	1,681	319	4,152					4,152	
NO. 6 COAL										
24N-4W										
30		2,158	15,721	17,879		1,401	1,541	2,942	20,821	
TOTAL		2,158	15,721	17,879		1,401	1,541	2,942	20,821	
24N-5W										
30	1,513	2,662	4,540	8,715	140	4,204	1,653	5,997	14,712	
TOTAL	1,513	2,662	4,540	8,715	140	4,204	1,653	5,997	14,712	
25N-4W										
30	2,102	7,006	12,274	21,382		1,009	1,345	2,354	23,736	

TABLE 7 - Continued

Coal, Township, Thickness (inches)	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
36	336	1,480	1,177	2,993					2,993	
48	269	224	224	717					717	
TOTAL	2,707	8,710	13,675	25,092		1,009	1,345	2,354	27,446	
25N-5W										
30	1,429	1,233	420	3,082					3,082	
48	448	1,614	807	2,869					2,869	
TOTAL	1,877	2,847	1,227	5,951					5,951	
26N-4W										
30						420	336	756	756	
TOTAL						420	336	756	756	
COAL BED	6,097	16,377	35,163	57,637	140	7,034	4,875	12,049	69,686	
NO. 5 COAL										
24N-4W										
54			1,110	1,110			2,169	2,169	3,279	
TOTAL			1,110	1,110			2,169	2,169	3,279	
24N-5W										
54		353	6,154	6,507			6,759	6,759	13,266	
TOTAL		353	6,154	6,507			6,759	6,759	13,266	.12
25N-4W										
54	807	3,682	11,047	15,536					15,536	
TOTAL	807	3,682	11,047	15,536					15,536	.69
25N-5W										
54	404	1,816	2,774	4,994					4,994	
TOTAL	404	1,816	2,774	4,994					4,994	.54
COAL BED	1,211	5,851	21,085	28,147		8,928	8,928	37,075	1,35	
NO. 2 COAL										
24N-5W										
30		56		56	7,090	6,305	13,395	13,451	13,451	
TOTAL		56		56	7,090	6,305	13,395	13,451	13,451	
24N-6W										
30					392			392	392	
TOTAL					392			392	392	
25N-4W										
30						953		953	953	
TOTAL						953		953	953	
25N-5W										
30		7,286	4,904	12,190		7,538		7,538	19,728	
TOTAL		7,286	4,904	12,190		7,538		7,538	19,728	
26N-4W										
30					1,878	2,690	4,568	4,568	4,568	
TOTAL					1,878	2,690	4,568	4,568	4,568	
COAL BED		7,342	4,904	12,246		9,360	17,486	26,846	39,092	
COUNTY	9,460	31,251	61,471	102,182	140	16,394	31,289	47,623	180,005	1,35
WARREN COUNTY										
NO. 5 COAL										
12N-1W										
24	807			807					807	

TABLE 7 - Continued

Coal, Township, Thickness (inches)	Class I Reserves at overburden thickness (ft.)				Class II Reserves at overburden thickness (ft.)				Total I & II	Mined out (square miles)
	0-50	50-100	100-150	Total	0-50	50-100	100-150	Total		
TOTAL	807			807					807	
COAL BED	807			807					807	
NO. 2 COAL										
9N-1W										
24	6,367	471		6,838					6,838	
TOTAL	6,367	471		6,838					6,838	
10N-1W										
24	6,524	4,529		11,053	404	3,206		3,610	14,663	
TOTAL	6,524	4,529		11,053	404	3,206		3,610	14,663	
10N-2W										
24	516	11,972		12,488	986	14,998		15,984	28,472	
TOTAL	516	11,972		12,488	986	14,998		15,984	28,472	
11N-1W										
24	11,792	12,846		24,638	3,632	12,913	10,178	26,723	51,361	
TOTAL	11,792	12,846		24,638	3,632	12,913	10,178	26,723	51,361	
11N-2W										
24	13,048	4,417		17,465	112			112	17,577	
TOTAL	13,048	4,417		17,465	112			112	17,577	
12N-1W										
24	11,904	7,959	45	19,908	5,762	10,088	3,811	19,661	39,569	
TOTAL	11,904	7,959	45	19,908	5,762	10,088	3,811	19,661	39,569	
12N-2W										
24	471			471					471	
TOTAL	471			471					471	
COAL BED	50,622	42,194	45	92,861	10,896	41,205	13,989	66,090	158,951	
COUNTY	51,429	42,194	45	93,668	10,896	41,205	13,989	66,090	159,788	

TABLE 8 - COAL ANALYSES, COUNTY AVERAGES

Samples		Proximate					Heat Values			
County, Number of mines, Coal	Condition ^a	Moisture	Volatile Matter	Fixed Carbon	Ash	Sulfur	Calories	British Thermal Units	Rank Index	Unit Coal Index
Bureau (2 mines) ^d	1	18.9	34.8	38.0	8.4	3.2	5,660	10,190		
	2		42.9	46.8	10.4	3.9	6,980	12,570		
Herrin (No. 6) Coal	3		47.8	52.2		4.3	7,784	14,010		
	4	21.2	36.8	42.0			6,247	11,250	113	
	5		46.7	53.3			7,928	14,270		143
Fulton (1 mine) ^c	1	11.2	38.4	40.2	10.2	5.0	6,372	11,470		
	2		43.3	45.2	11.5	5.6	7,177	12,920		
Rock Island (No. 1)	3		48.9	51.1		6.3	8,109	14,600		
Coal	4	13.0	41.3	45.7			7,229	13,010	130	
	5		47.5	52.5			8,309	14,960		150
Fulton (14 mines) ^b	1	15.4	35.0	38.6	11.0	3.2	5,791	10,420		
	2		41.4	45.6	13.0	3.8	6,848	12,330		
Springfield (No. 5)	3		47.6	52.4		4.3	7,872	14,170		
Coal	4	17.9	38.0	44.1			6,602	11,880	119	
	5		46.3	53.7			8,039	14,470		145
Fulton (2 mines) ^d	1	16.2	33.4	41.6	8.9	3.0	5,859	10,550		
	2		39.9	49.6	10.6	3.5	6,989	12,580		
Herrin (No. 6) Coal	3		44.6	55.5		3.9	7,815	14,070		
	4	18.2	35.5	46.4			6,505	11,700	117	
	5		43.4	56.7			7,951	14,312		143
Henry (1 mine) ^c	1	14.5	37.0	38.6	9.9	3.5	5,896	10,610		
	2		43.3	45.1	11.6	4.0	6,897	12,420		
Colchester (No. 2)	3		49.0	51.0		4.6	7,805	14,050		
Coal	4	16.6	39.8	43.6			6,636	11,940	119	
	5		47.8	52.2			7,960	14,330		143
Henry (2 mines) ^b	1	18.3	32.1	37.9	11.7	3.8	5,414	9,750		
	2		39.3	46.4	14.3	4.7	6,625	11,930		
Herrin (No. 6) Coal	3		45.9	54.1		5.5	7,731	13,920		
	4	21.4	34.8	43.8			6,225	11,210	112	
	5		44.3	55.7			7,922	14,260		143
Knox (1 mine) ^c	1	15.0	38.0	39.3	7.7	3.9	6,234	11,220		
	2		44.7	46.2	9.1	4.6	7,333	13,220		
Sumnum (No. 4) Coal	3		49.1	50.9		5.0	8,066	14,520		
	4	16.7	40.0	43.3			6,844	12,320	123	
	5		48.0	52.0			8,219	14,790		148

TABLE 8 - Continued

Samples		Proximate						Heat Values			
		Condition ^a	Moisture	Volatile Matter	Fixed Carbon	Ash	Sulfur	Calories	British Thermal Units	Rank Index	Unit Coal Index
County, Number of mines, Coal											
Knox (2 mines) ^d Herrin (No. 6) Coal	1	18.4	33.8	38.4	9.5	3.0	5,626	10,130			
	2		41.4	47.0	11.7	3.7	6,889	12,400			
	3		46.8	53.3		4.2	7,798	13,040			
	4	20.9	36.1	43.1			6,296	11,330	113		
	5		45.6	54.5			7,948	14,305			143
Marshall (6 mines) ^c Danville (No. 7) Coal	1	15.3	35.3	35.3	14.1	3.5	5,585	10,050			
	2		41.6	41.7	16.7	4.1	6,591	11,870			
	3		50.0	50.0		5.0	7,912	14,240			
	4	18.5	39.5	42.0			6,625	11,920	119		
	5		48.5	51.5			8,126	14,630			146
Peoria (8 mines) ^c Springfield (No. 5) Coal	1	14.5	35.1	39.4	11.0	3.2	5,949	10,710			
	2		41.1	46.1	12.8	3.8	6,959	12,530			
	3		47.1	52.9		4.3	7,982	14,370			
	4	16.8	38.1	45.1			6,781	12,210	122		
	5		45.8	54.2			8,151	14,670			147
Stark (2 mines) ^d Herrin (No. 6) Coal	1	17.2	33.5	39.5	9.8	3.4	5,721	10,330			
	2		40.5	47.7	11.9	4.1	6,908	12,440			
	3		45.9	54.2		4.6	7,836	14,100			
	4	19.7	35.8	44.6			6,427	11,570	116		
	5		44.3	55.5			7,998	14,400			144
Tazewell (2 mines) ^c Springfield (No. 5) Coal	1	15.1	35.7	39.7	9.5	3.2	5,964	10,740			
	2		42.1	46.7	11.2	3.8	7,028	12,650			
	3		47.4	52.6		4.3	7,911	14,240			
	4	17.2	38.3	44.5			6,675	12,020	120		
	5		46.2	53.8			8,062	14,510			145

a/ Type of analysis is denoted as follows:

- 1 - sample as received at laboratory.
- 2 - moisture-free.
- 3 - moisture and ash-free.
- 4 - moist mineral-matter-free.
- 5 - dry mineral-matter-free (unit coal).

b/ Data from Cady (1948).

c/ Data from Cady (1935).

d/ Data modified from Cady (1935 and 1948) and from additional unpublished analyses in the Illinois Geol. Survey files.

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Illinois State Geological Survey Circular 348
59 p., 7 figs., 4 pls., 8 tables, 1963