STATE OF OHIO
FRANK J. LAUSCHE, Governor
DEPARTMENT OF NATURAL RESOURCES
A. W. MARION, Director
DIVISION OF GEOLOGICAL SURVEY
JOHN H. MELVIN, Chief

REPORT OF INVESTIGATIONS NO. 14

THE PITTSBURGH COAL OF THE FEDERAL CREEK FIELD

WITH NOTES ON THE SURFACE GEOLOGY OF AMES TOWNSHIP, ATHENS COUNTY, OHIO

By
GILBERT E. SMITH

COLUMBUS
1952

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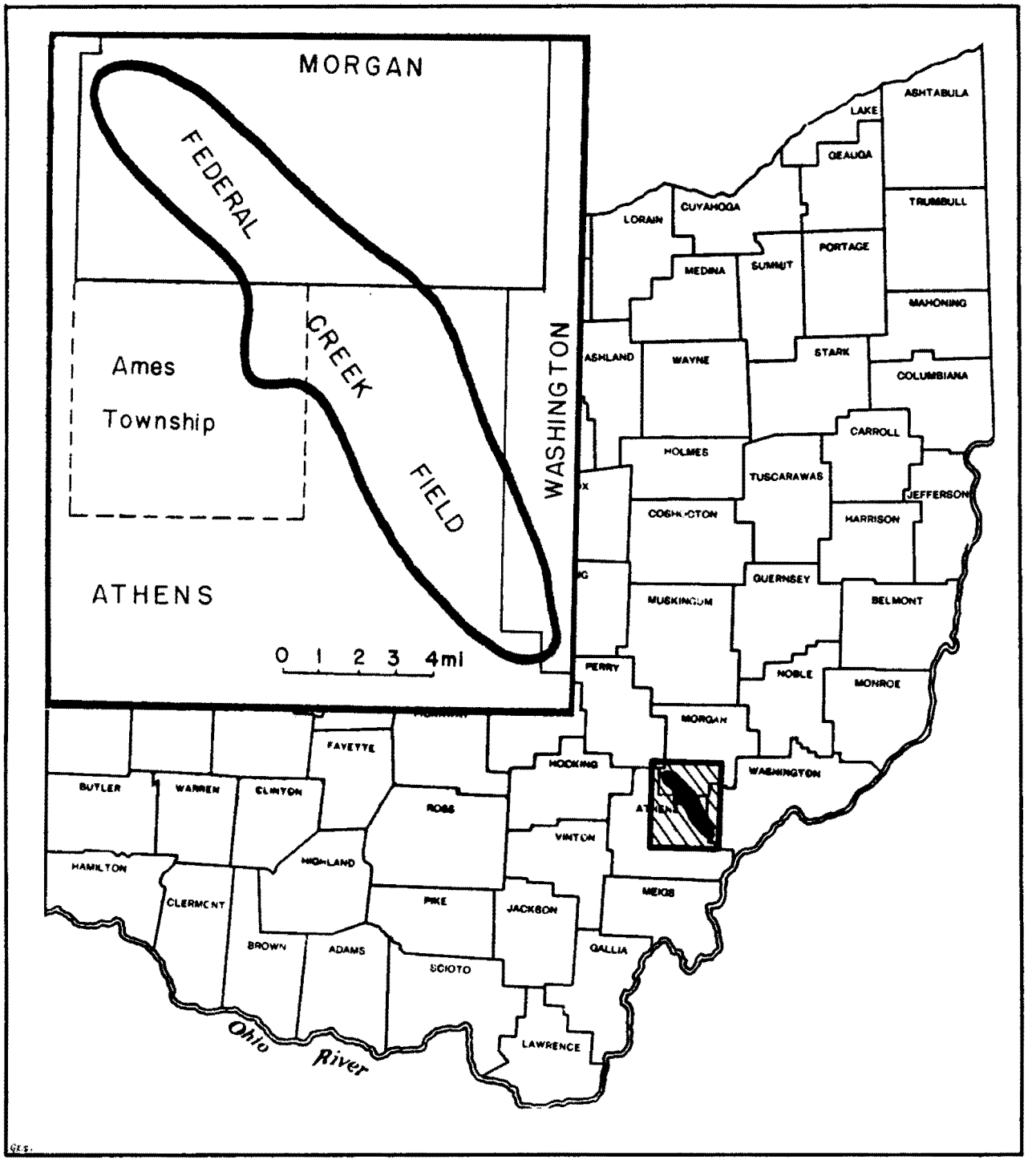

PLATE I

LOCATION OF AMES TOWNSHIP, ATHENS COUNTY AND THE FEDERAL CREEK FIELD IN SOUTHEASTERN OHIO

THE PITTSBURGH COAL OF THE FEDERAL CREEK FIELD IN SOUTHEASTERN OHIO: WITH NOTES ON THE SURFACE GEOLOGY OF AMES TOWNSHIP, ATHENS COUNTY, OHIO[1]

INTRODUCTION

The field work in the area was done during the summers of 1950 and 1951, as part of the summer mapping program of the Ohio Division of Geological Survey, and will ultimately become part of the Athens County Report, now being prepared by Dr. Myron T. Sturgeon of Ohio University. The study of the Federal Creek Field of the Pittsburgh coal was undertaken to re-evaluate the coal reserves there and was done in keeping with the project of computing the coal reserves of both the state and the nation.

THE GEOLOGY OF AMES TOWNSHIP

Location

In order to understand the general stratigraphy of the Pittsburgh coal and associated rocks, a detailed study of the exposed strata in Ames Township was first made. Ames Township, comprising an area of 36 square miles, is located in north-central Athens County, Ohio. The township is mapped on two United States Geological Survey topographic quadrangles; the western part on the Athens quadrangle and the eastern part on the Chesterhill quadrangle. The northeastern part of the township lies within the Federal Creek Field. The remainder is partially underlain by Pittsburgh coal of unmineable thickness.

General Stratigraphy

Geologically the area is important as the type area of the Ames marine limestone and for its proximity to the Federal Creek Field, one of Ohio's three important fields of Pittsburgh coal.

The regional dip of the strata is to the south and east at the rate of approximately 32 feet per mile. This dip accounts for the exposure of a greater geologic section than the relief would otherwise permit.

All the rocks exposed in Ames Township belong to the Pennsylvanian system and are principally Conemaugh and lower Monongahela in age, i. e., the later Pennsylvanian.

The Pennsylvanian system is the most important group of rocks in eastern United States, for it contains the vast deposits of coal and the rich clays used for building and refractory materials. The nodular limestones and scattered iron ores are commercially valuable locally. The buried sandstones are valuable as reservoirs for oil and gas.

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[1] A portion of a thesis submitted in partial fulfillment for the degree of Master of Science, West Virginia University, August, 1951.

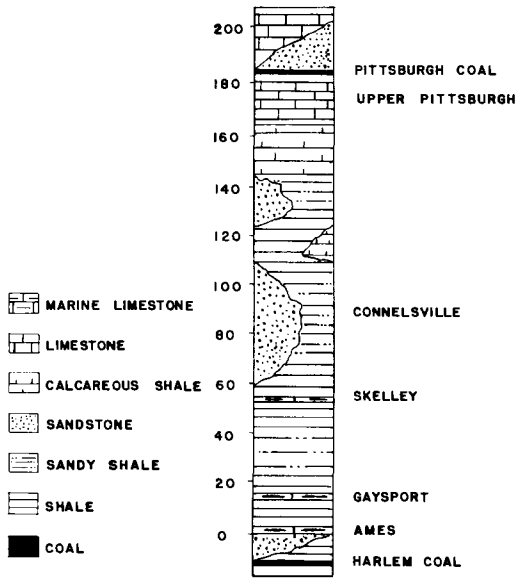


Figure 1. Generalized Section of Rocks Outcropping in Ames Township, Athens County

Conemaugh Series

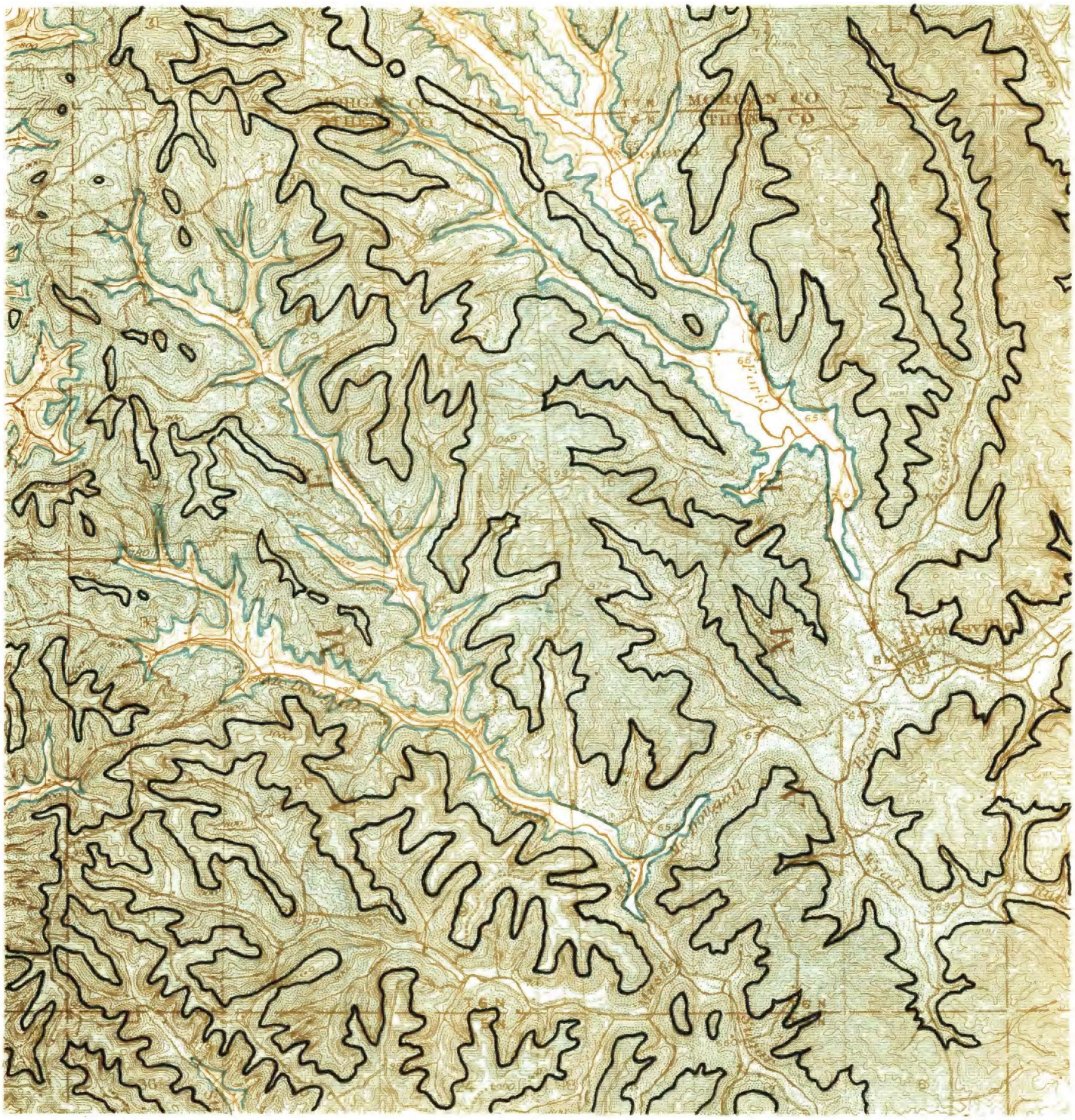
Lithologically the Conemaugh series contains sandy shale, clay-shale, sandstone, limestone, clay, and coal. The extent of the outcrop of this series is shown on the geologic map of Ames Township (Plate II).

Since the dip of the strata is to the south and east, the older rocks are exposed in the north-west corner of the area. The oldest named Conemaugh horizon observed in Ames Township is the Cow Run sandstone. It is exposed in the western sections and lies at sufficient depth in the eastern part to be a gas-producing horizon.

The Harlem coal, which occurs just below the Ames limestone, is a persistent stratigraphic marker but is too thin to be mineable.

The most important geologic horizon in the township is the Ames marine limestone, for which this is the type area. The name Ames limestone was first used by Prof. E. B. Andrews in 1873 in Volume I of the Ohio Geological Survey. Prior to that date the limestone was known as the "Crinoidal" or "Green Crinoidal". In Ames Township today it is referred to as the "Big Fossil" or "Fossil Lime", both being common drillers' terms. The names are adapted from the abundance of crinoid fragments, which can be observed on the weathered surfaces, and the greenish cast produced by the presence of fine glauconite flakes.

The original description of the type-section of the Ames limestone was inadequate and the exact location of it could not be determined at the present time, so other equivalent, accessible exposures of Ames limestone are here noted for observation. Near the type-section locality in the NE$\frac{1}{4}$, NE$\frac{1}{4}$, section 11, the Ames limestone outcrops along the east side of Ohio Route 280. This exposure is a prominent ledge in a roadcut about 2$\frac{1}{2}$ miles northwest of Amesville, and shows the shales above and the shale and sandstone below the limestones. Unfortunately no Harlem coal is seen in association with the limestone at this locality. To the southeast the Pittsburgh coal has been strip-mined around the hills. The interval between the Pittsburgh coal and the Ames limestone is about 160 feet in this area. Another good exposure of the Ames limestone is in the N$\frac{1}{2}$, SE$\frac{1}{4}$, SE$\frac{1}{4}$, section 27, about 50 yards from the main highway, U. S. Route 50A. To the north of this locality, on a gravel road, the limestone appears as a double bench with about 3 inches of calcareous, fossiliferous, clay-shale parting. Below the limestone



GEOLOGIC MAP OF AMES TOWNSHIP,
Athens County, Ohio

By
GILBERT E. SMITH

1951

PLATE II

Base from U. S. G. S.
Topographic Map

Scale $\frac{1}{62500}$

1 0 1

Contour interval 20 feet.

EXPLANATION

- MONONGAHELA
- CONEMAUGH **ABOVE AMES LIMESTONE**
- BASE OF PITTSBURGH COAL
- AMES LIMESTONE OUTCROP

Figure 2. Typical Ames Limestone Outcrop

Figure 3. A Close-up of a Block of Ames Limestone Showing the Weathered Crinoid Fragments on the Surface

may be seen a blossom of the Harlem coal, and up the road the Gaysport limestone may be seen as a 4-inch layer of impure, blue-green limestone about 8 feet above the Ames. This interval is shorter than usual and might be due to the greater-than-normal thickness of the Ames. The Ames is generally persistent throughout the township and usually appears as a massive ledge with many crinoid fragments on the weathered surfaces. The outcrop of the Ames limestone is shown by a blue line on the geologic map of Ames Township (Plate II).

The Gaysport and Skelley marine horizons are found in most localities and occur above the Ames at average intervals of 14 and 36 feet respectively. The Skelley is the highest recognized marine horizon of the Pennsylvanian system in this area of Ohio.

The only sandstone which is sufficiently persistent to be noted in this part of the section

is the Connellsville, found in the southwestern sections, which ranges up to 39 feet in thickness.

The uppermost member of the Conemaugh is the Upper Pittsburgh limestone which lies directly below the Pittsburgh coal. This nodular fresh-water limestone attains sufficient thickness in many places to be quarried, crushed, and used for road construction and maintenance. Some of the stone was used for agricultural lime, but it was too hard to be crushed fine enough economically.

Monongahela Series

The Monongahela series, the upper division of the Pennsylvanian system in the eastern United States, is exposed in the higher regions of Ames Township. The base of the Monongahela series is at the bottom of the Pittsburgh coal, a boundary fixed more by the economic importance of the coal seam than by natural lithologic or paleontologic changes. The most conspicuous beds in the series are the multi-colored beds of calcareous shales and the thick beds of fresh-water limestone. In Ames Township, only the lower units of the Monongahela series are exposed, that is, from the Pittsburgh coal to the Benwood limestone. The outcrop of the Pittsburgh coal and, where absent, its horizon are shown on the accompanying maps. This line also serves to show the division between the outcrop of the Conemaugh and the overlying Monongahela series. The Upper Pittsburgh sandstone, which is present in all sections of Ames Township, varies greatly in thickness locally. The Pomeroy coal is wanting over most of the area and a limestone, probably identical with the Fishpot of Pennsylvania, overlies the Upper Pittsburgh sandstone. The Fishpot coal is missing and the Meigs Creek coal is found at only two localities on the higher knobs in section 30. This coal was reported to have a thickness ranging up to two feet in some places and to have been mined, but the waste material at the old mine sites indicates that only small operations were ever attempted. The Benwood limestone which overlies the Meigs Creek coal is the highest stratigraphic unit observed in Ames Township and may be found capping the hills along the eastern edge of the area. Just to the north, in Morgan County, this limestone is being quarried and crushed.

Paleontology

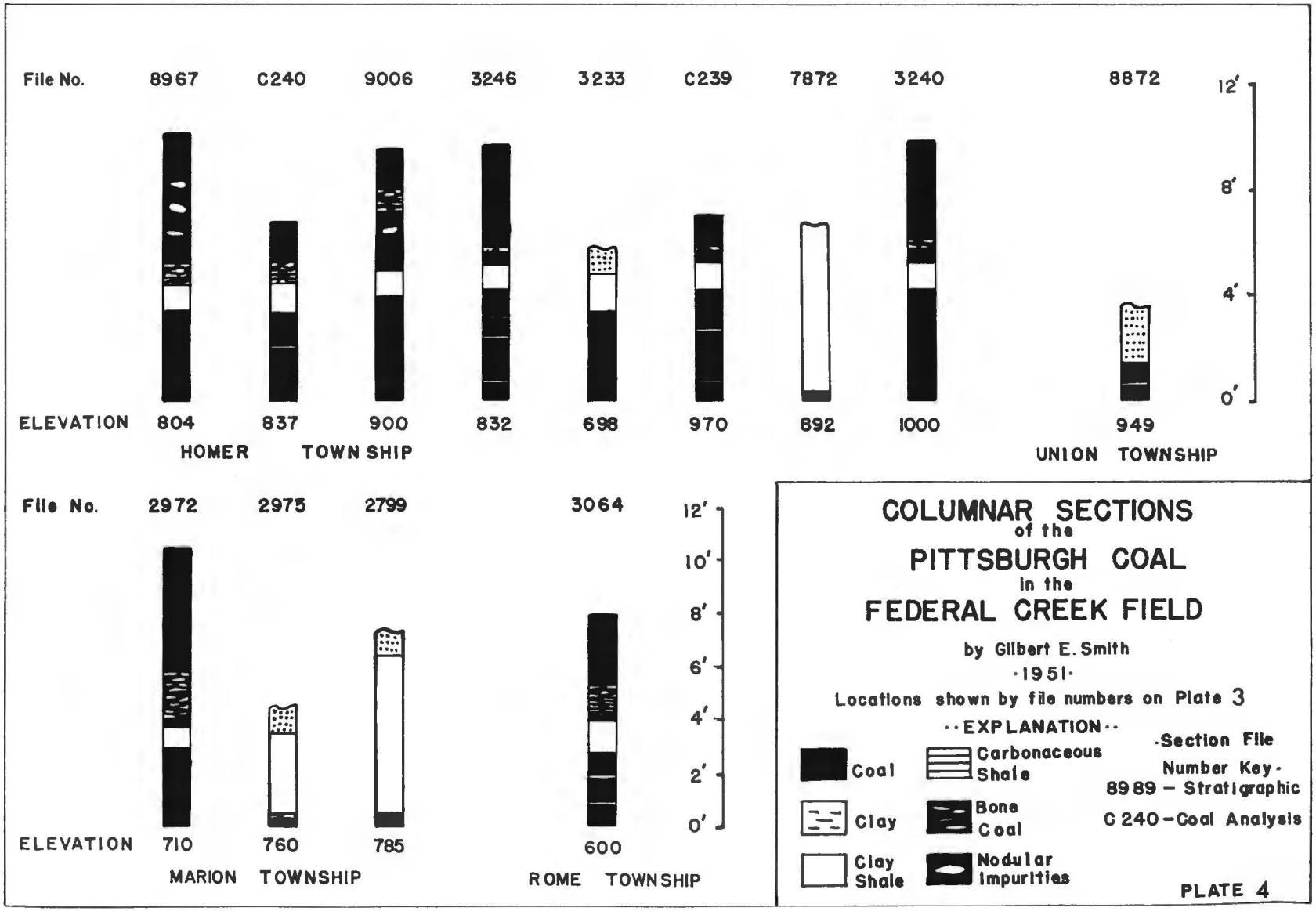
The last paleontological work in this area was done by Clara Gould Mark and included as Chapter V of Condit's report on the Conemaugh in Ohio, published by the Ohio Geological Survey in 1912. In attempting to use this work in the study of the area, it was discovered that most of the genera have been redescribed, renamed, or reassigned. From a limited collection it was learned that the faunas of the three marine horizons, Ames, Gaysport, and Skelley, could not be distinguished at this time. The lithologies of the Gaysport and Skelley are variable and so often similar to each other that they are distinguishable only on the basis of the interval above the Ames.

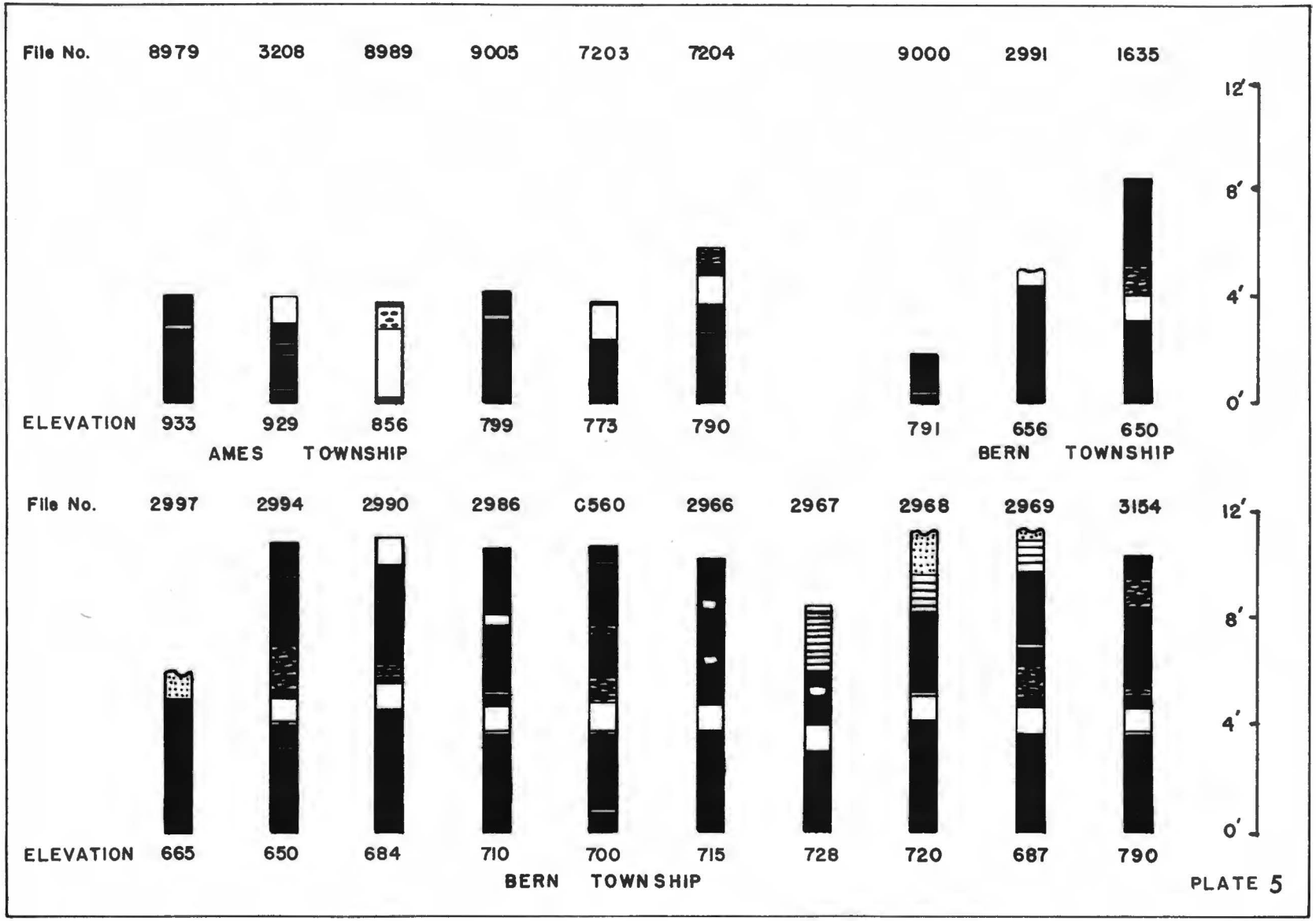
A cursory examination of the fossils from the three horizons indicates the most common forms to be Chonetes granulifer, Crurithyris planoconvexa, Neospirifer cameratus, Derbya crassa, Linoproductus sp., Dictyoclostus sp., and Juresania sp. The corals and fusulinids have been found sparingly. Recent field studies, principally by Professor Sturgeon, have revealed fusulinids in both the Gaysport and Skelley limestones. These may be of more importance in differentiation of the limestones than previously realized.

The fresh-water fauna of the several limestones in the area is comprised principally of annelid worm tubes, gastropods, pelecypods, some ostracode carapaces, and a few fish teeth.

Economic Resources

The greatest natural resource of Ames Township is the land itself. The broad fertile valleys and the rolling hills are ideal for farming and grazing. The abundance of scattered


File No.
8967
C240
9006
3246
3233
C239
7872
3240
8872
12'
8'
4'
0'
ELEVATION
804
837
900
832
698
970
892
1000
949
HOMER TOWN SHIP
UNION TOWNSHIP
File No.
2972
2975
2799
3064
12'
10'
8'
6'
4'
2'
0'
ELEVATION
710
760
785
600
MARION TOWNSHIP
ROME TOWNSHIP
COLUMNAR SECTIONS
of the
PITTSBURGH COAL
in the
FEDERAL CREEK FIELD
by Gilbert E. Smith
·1951·
Locations shown by file numbers on Plate 3
··EXPLANATION··
Coal
Clay
Clay Shale
Carbonaceous Shale
Bone Coal
Nodular Impurities
·Section File Number Key·
8989 – Stratigraphic
C240 – Coal Analysis
PLATE 4


File No. 8979 3208 8989 9005 7203 7204 9000 2991 1635
12′
8′
4′
0′
ELEVATION 933 929 856 799 773 790 791 656 650
AMES TOWNSHIP
BERN TOWNSHIP
File No. 2997 2994 2990 2986 C560 2966 2967 2968 2969 3154
12′
8′
4′
0′
ELEVATION 665 650 684 710 700 715 728 720 687 790
BERN TOWNSHIP
PLATE 5

limestones plays an important part in the fertility of the soil and the growth of grazing forage.

The principal coal in the area is the Pittsburgh or No. 8 seam. The bed lies high in the hills of the township in the northern sections. These areas have been mined by both underground and stripping operations. The coal is about 4 feet thick and is the bottom bench, as found to the east in Bern Township. Small openings have been made in the Meigs Creek seam, but little coal has been removed. The Harlem coal is thin; one exposure of 11 inches was apparently mined for home use. Thin coal streaks or carbonaceous shale horizons mark the position of other coals which are found better developed in other areas. The Upper Freeport or No. 7 coal is reported from well data to have a thickness of 3 to 4 feet at a depth of about 200 feet. The Middle Kittanning or No. 6 coal also is reported in records from some of these wells as being 2 to 5 feet thick at a depth of 300 feet. Both of these coals could be reached by shaft if the future needs for coal become great enough.

The sandstones of Ames Township are of little importance in the economic sense. They are usually too thin, the thicker deposits being of small areal extent. In the past some use has been made of local sandstone for foundations of homes and barns.

The marine limestones have become important stratigraphic markers for the drillers, but they are of little value for other purposes. Some marine limestones have been quarried and crushed, but they are usually too hard and too thin to support an economical operation.

There is some gas production in Ames Township, but no oil production at the present time. The first gas wells were drilled, shortly after the discovery of oil, to a depth of about 300 feet. This first producing horizon is reported as the Big Injun but is quite probably a sandstone of lower Allegheny age. The wells are short-lived at this depth and at the first indication of loss of production they are drilled to the Second Berea lying about 1500 feet below the surface of Ames Township. Production from this lower horizon lasts about 50 years. Deeper wells have failed to produce in the area. There are about 100 producing wells in Ames Township today and very little drilling is being carried on.

THE RESERVES OF THE FEDERAL CREEK COAL FIELD

Geography

The Federal Creek Field of the Pittsburgh coal is named from its location along Federal Creek and its tributaries. The system of streams comprising Federal Creek drains parts of Homer and Marion townships, Morgan County; parts of Ames, Bern, and Rome townships, Athens County; and parts of Decatur and Wesley townships, Washington County. The Pittsburgh coal, the basal member of the Monongahela series, outcrops along the creek and its major tributaries including Sharps Fork, Opossum Run, and Marietta Run. The coal follows the regional dip of the strata, about 32 feet per mile to the south and east, and passes below drainage east of the Federal Creek Valley and south of section 17 in Rome Township.

The geologic map, Plate III, shows the outcrop of the Pittsburgh coal and the areas of mineable coal in the field. The area of mineable coal lies in a northwest-southeast-trending oblong field, 17 miles long and 3½ miles wide.

Geology

The Pittsburgh coal within this field occurs in a double-benched seam separated by a persistent clay-shale parting about one foot in thickness. This parting is well shown in the columnar sections of Plates IV and V. The base of the coal follows the regional dip except for minor variations. The coal thins away rapidly in all directions from thick coal to a few inches of carbonaceous shale. The Pittsburgh horizon may be traced over the area surrounding the field

by the presence of this streak. Changes in the thickness of the mineable coal are great within a short horizontal distance due to the thinning or complete absence of the upper bench. These rapid changes are locally referred to as "faults", but they are due either to lack of deposition or to channeling and refilling by sand.

Figure 4. An Exposure of the Pittsburgh Coal in an Abandoned Strip Mine in Morgan County

The thicker coal deposits, which usually consist of both benches, are normally overlain by shales ranging up to 20 feet in thickness. The approach to one of the cut-out zones can be anticipated wherever these shales become thinner, for as the base of the overlying sandstones nears the top of the coal the shales separate from it, resulting in serious roof falls. In many of the old mines this sandstone was reported to form the roof of the coal and occasionally cut below the usual roof level. Where miners reported the presence of the sandstone at or below the normal roof level, consideration was given in drawing the isopachs for the thickness of the coal (PlateIII). The eastern edge of the field is apparently delimited in some places by such sandstone-filled cut-outs. The most recent workings indicate in this eastern portion a sudden thinning from 8 feet to 4 feet of coal. Records of gas wells located a little more to the east have indicated a complete loss of the coal. Detailed information on this eastern edge of the field is lacking, so the data contained in well logs was used by this author to indicate the apparent limit of the mineable coal. Records from the Black Diamond, Jennings, and Gilchrist mines tend to indicate some pattern in the sandstone-filled cut-outs, but insufficient information is available for mapping such channels.

History

The early settlers of the Federal Creek Valley soon learned of the coal deposits and began to make use of them. One of the larger coal-producing areas in Athens County developed from these simple mining operations. Originally called the Federal Creek coal, this bed is now correlated as being one of the three larger deposits of Pittsburgh coal in Ohio. Railroad connections were provided in 1885 and soon after that date the coal and coke industries began to increase rapidly in importance. Coke ovens were built at Utley and Lathrop, and this industry flourished for a time. The coal and coke were shipped to markets to the north over the old Marietta, Columbus, and Cleveland Railroad. The lack of special cars for transportation is given as the

reason for the abandonment of the coke ovens, but the loss of the market seems more probable. The report is that the coke was of limited use, but no chemical analyses of the product can be found.

For over forty years the coal was mined both in small mines operated by one or two men and in large company mines. The only record of the smaller mines is the piles of waste material along the outcrop. The largest operations were conducted by the Black Diamond Coal and Coke Company at Lathrop and by the Jennings Coal Company at Utley. The Jennings Company operated from a main tipple at Utley but brought much coal through a mile-long horizontal tunnel from Marietta Run. This company closed its mines in 1922, but the Black Diamond Company operated until 1944. Loss of market and labor troubles are said to have forced the closing. The only large mine open today is owned and operated by A. W. Gilchrist just east of Sharpsburg. This mine furnishes coal to the truck trade, much of which is hauled to outlying areas. The only other mine that operates in the field is located in the southeast corner of section 1, Homer Township, Morgan County. This is a smaller operation, owned by Wm. D. Stobart, which is worked mostly in the winter months as the local trade allows. Both of these mines are in areas where both benches of the coal are present. Strip mining in the area was begun in 1944 and has been carried out in sections 6, 11, and 30 of Ames Township; 28 and 36 of Bern Township; and 15, 28, and 29 of Homer Township. Approximately 30 feet of overburden appears to be the limit which could be removed economically by the equipment used. It seems that larger equipment would permit the economic recovery of a greater percent of the coal at some of the present sites. The only principal area of coal that has not been stripped is along Marietta Run, and this has been reportedly leased for such an operation. The coal stripped in this area was loaded from ramps at Lathrop and shipped on the New York Central Railroad.

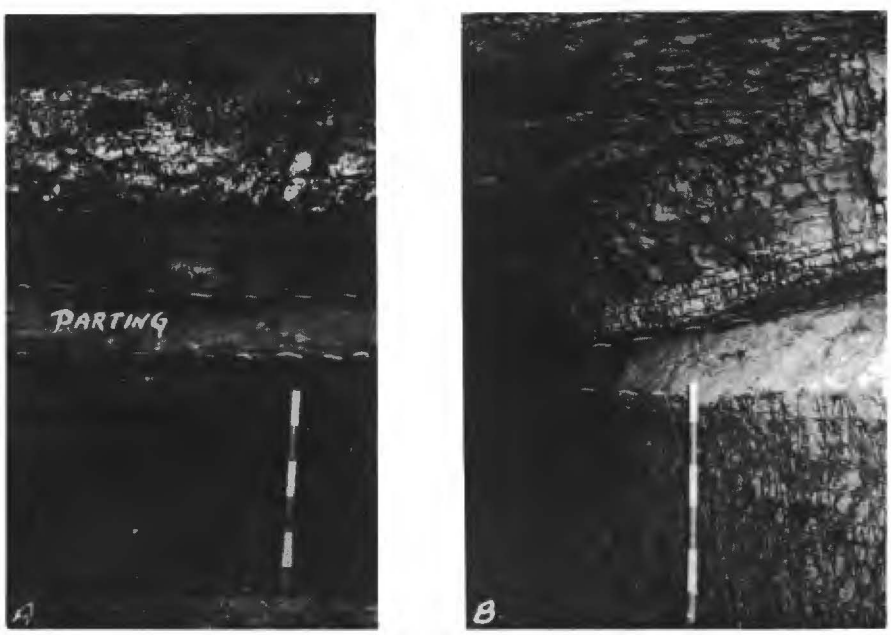


Figure 5. Two Exposures of the Pittsburgh Coal in the Mine of Wm. Stobart. A. Working Face B. Entrance to Mine

Coal Analyses

The lower of the two benches is the more persistent and better coal. It averages about $3\frac{1}{2}$ feet in thickness. Unfortunately it has numerous thin pyrite and shale partings. The interval between the benches is occupied by a light gray clay-shale which averages one foot in

thickness. This is known in the area as the "White Elephant". At the present time tests are being made to find an economic use for this clay. The upper bench of the coal is quite variable in thickness and quality. The amount of good coal depends largely upon the overlying sandstone, as previously discussed, and the presence or absence of large granular masses of impurities in the middle of the bench. Most of the miners leave these masses as roof support and therefore do not mine all the coal in the seam. Various chemical analyses have been made of the coal, and a few of these are presented here to show the variability of the coal over a small area.

TABLE 1

ANALYSES OF THE PITTSBURGH COAL FROM THE FEDERAL CREEK FIELD OF SOUTHEASTERN OHIO

Location	Form of Analyses	Percent by Weight					
		Moisture	Volatile Matter	Fixed Carbon	Ash	Sulfur	BTU
2990	A	2.7	42.04	48.94	6.32	2.34	13,541
	D		43.21	50.29	6.50		13,910
C239	A	6.87	40.55	44.39	8.19	4.22	12,100
	D		43.54	47.67	8.79	4.53	12,992
C240	A	4.80	42.22	43.03	9.95	5.19	11,880
	D		44.35	45.20	10.45	5.45	12,479
C560	A	3.62	44.84	44.69	6.85	3.74	12,564
	D		46.52	46.37	7.11	3.88	13,036
2967	A	6.31	43.16	42.95	7.58	3.75	12,383
Upper Bench	D		46.07	45.84	8.09	4.00	13,217
Lower Bench	A	5.87	41.93	43.39	8.81	4.01	12,251
	D		44.54	46.10	9.36	4.26	13,015

A - As received D - Moisture free

Coal Reserves

This investigation shows the estimated reserves, based on a minimum thickness of 14 inches and on 1,800 tons per acre-foot of coal in place, to be 218,504,289 tons as of January 1, 1951. Of this total, 170,088,143 tons are found where the coal is over 42 inches in thickness. 25,519,240 tons are found where the coal is 28 to 42 inches thick, and the remaining 22,896,906 tons are found where the coal is 14 to 28 inches thick.

Recoverable reserves are computed assuming 50 percent recovery of the remaining reserves and are therefore one-half of the above figures or a total of 109,252,144 tons.

The reserves of the Pittsburgh coal in this area were estimated by Clark in 1917 and again by Ray in 1927. Both of these estimates were made on a county-wide basis and thus include more than the Federal Creek Field. Clark's figures are considerable higher than those presented in this paper, and those of Ray give no Pittsburgh coal totals for either Morgan or

Washington County. The reserve totals given in this paper were made in accordance with recent standards and are based upon more detailed information than was available to Clark or Ray. The figures presented here are therefore believed to be more accurate than the reserve figures previously published for this coal field.

Computation of Coal Reserves

Before beginning a computation of the coal reserves in the Federal Creek Field, it became necessary to choose a set of standards by which the amounts of mineable coal calculated might be compared to those of other localitites.

The standards chosen for this work were set by the National Bituminous Coal Advisory Council and are currently being used by the U. S. Geological Survey in its work on coal reserves of the United States. By the use of these same standards the reserves of the Federal Creek Field may be compared with the results from other areas or integrated into state or national totals.

Thickness Range

The minimum thickness of coal considered for these estimates of reserves is 14 inches. Coal thicker than the minimum is divided into three thickness groups. These groups range in thickness from 14 to 28 inches, from 28 to 42 inches, and more than 42 inches. The estimates of the reserves are further divided into three categories, termed "measured", "indicated", and "inferred", according to the reliability of the data upon which the estimates are based.

Measured Reserves

Measured reserves include coal for which positive information as to thickness and extent is available from the surveys of the outcrop, mine workings, and drill records. Although the distances between measured sections will vary considerably, the outer limit of a block of coal considered within the category "measured" is about a quarter of a mile from the last point of definite information.

Indicated Reserves

Indicated reserves are computed partly from specific measurements of the coal and partly from the projection of visible data on geologic evidence. The distance of the projection is generally one mile, but may be as much as $1\frac{1}{2}$ miles for a bed of known continuity. Due to the irregularities of the Federal Creek Field the extent of the indicated coal was limited to one mile beyond any measured point.

Inferred Reserves

Inferred reserves are those for which estimates are based on knowledge of the geologic characteristics of the bed and supported by a few exposures or measurements. In general, inferred reserves lie outside the limits defined for measured and indicated reserves, but only in areas where there is good indication or evidence for believing the coal is actually present.

Classification of Reserves

The coal reserves are further classified as original reserves, remaining reserves, and recoverable reserves. Original reserves are reserves of coal in the ground before the

TABLE 2

COAL RESERVES IN THE FEDERAL CREEK FIELD

Recoverable Reserves January 1, 1951 Assuming 50% Recovery			7,273,202	50,170,217	20,375,055	15,574,574	8,211,717	7,647,379	109,252,144
TOTAL RESERVES	Total Remaining Reserves		14,546,404	100,340,435	40,750,110	31,149,148	16,423,434	15,294,758	218,504,289
	In All Categories	Over 42"	10,378,700	83,911,959	32,034,616	23,847,029	11,015,717	8,900,122	170,088,143
		28" to 42"	2,439,014	9,282,815	4,478,093	4,368,484	2,329,804	2,621,030	25,519,240
		14" to 28"	1,728,690	7,145,661	4,237,401	2,933,635	3,077,913	3,773,606	22,896,906
REMAINING RESERVES AS OF JANUARY 1, 1951	Inferred Reserves	Total	316,224	8,493,156	8,849,587	4,370,870	21,081	7,171,545	29,222,463
		Over 42"	———	2,827,929	5,953,536	2,158,156	———	2,083,737	13,023,358
		28" to 42"	———	3,094,272	1,019,789	1,092,096	———	1,820,160	7,026,317
		14" to 28"	316,224	2,570,955	1,876,262	1,120,618	21,081	3,267,648	9,172,788
	Indicated Reserves	Total	11,100,325	68,288,920	29,335,910	23,404,592	15,175,180	7,155,764	154,460,691
		Over 42"	8,707,046	58,081,395	23,516,467	18,679,219	9,897,753	5,848,936	124,730,816
		28" to 42"	1,528,934	5,970,124	3,458,304	2,912,356	2,220,595	800,870	16,891,183
		14" to 28"	864,345	4,237,401	2,361,139	1,813,017	3,056,832	505,958	12,838,692
	Measured Reserves	Total	3,129,855	23,558,359	2,564,613	3,373,686	1,227,173	967,449	34,821,135
		Over 42"	1,671,654	23,002,635	2,564,613	3,009,654	1,117,964	967,449	32,333,969
		28" to 42"	910,080	218,419	———	364,032	109,209	———	1,601,740
		14" to 28"	548,121	337,305	———	———	———	———	885,426
Mined and Lost in Mining		January 1, 1951 TONS	1,528,371	15,114,414	560,993	1,232,240	296,000	———	18,732,018
Original Reserves		TONS	16,074,775	115,454,849	41,311,103	32,381,388	16,719,434	15,294,758	237,236,307
		ACRES	1,977	12,326	4,876	3,815	2,316	2,380	27,690
		TOWNSHIP	AMES	BERN	ROME	HOMER	MARION	DECATUR	FEDERAL CREEK FIELD TOTALS
		COUNTY	ATHENS			MORGAN		WASHINGTON	

beginning of mining operations. Remaining reserves are the reserves in the ground at the time of the computation and are obtained by subtracting the amount of coal mined and lost in mining from the original reserves. Recoverable reserves are the reserves of coal in the ground that can actually be produced by future mining and are obtained by subtracting estimated future losses from the remaining reserves. Previous workings in the area indicate that in the past only about 50 percent of the coal was recovered in mining. This 50 percent loss figure was, therefore, used in the computation of the recoverable reserves in this field.

The first step in the estimating of the coal reserves was the preparation of the map on which all outcrops, drill holes, mines, and thicknesses were plotted. After this information was assembled, lines were drawn bounding the areas of the three categories, measured, indicated, and inferred coal. These areas were then divided into the three units of thickness, 14 to 28 inches, 28 to 42 inches, and over 42 inches. The area underlain by coal in each category and thickness was then measured by planimeter. The weight of the coal was taken as 1,800 tons per acre-foot. The average thickness used in calculating was an average of all thickness figures within the measured area, which were computed by taking the total thickness of the bed minus the thickness of all partings more than three-eighths of an inch thick.

The entire field was divided into the six township areas, which are unequal in size. Plate III shows the location of the measured sections used. Each section bears the file number by which it is registered with the Ohio Division of Geological Survey. The four digit numbers are from the stratigraphic file, and the three digit numbers preceeded by the letter "C" are from the coal sample file.

Sources of Information

Since most of the deep mines in the area have long been closed, it was impossible to obtain measurements of the coal in them. The records of the Division of Geological Survey and the Bureau of Mines of the State of Ohio were searched, and many of the measurements made at the time of operation were found. The strip pits are mostly abandoned, but here again measurements had been made when the entire thickness of the coal was exposed. Some of the information was gathered from many talks with the old miners of the area. Some of this material proved valuable as the bits were pieced together and checked with each other. Only that information which came from more than one source was considered to be reliable. Where the coal was deep and had not been mined, gas well records were used.

The eastern and southern limits of the field were outlined by the use of information from drill records. As the work in Athens County continues, it is hoped that it will be possible to establish a connection between the Federal Creek Field and the Shade Creek Field to the south.

Table 2 presents the reserves of the Pittsburgh coal divided into the various categories and areas as previously described. Since Federal Creek cuts below the level of the coal it was possible to mine directly into the thickest part of the bed. This means that the coal removed was from the "42 inches and over" category. The remaining reserves are therefore made up of nearly all the original coal under 42 inches and the balance of the thicker coal. The totals at the bottom of the table indicate that only a small part of the original coal reserves has been mined. The total recoverable reserves are only a little less than one-half the original reserves. This, of course, is due to the use of the high mining loss percentage in the computation of the recoverable reserves, i. e., half of the remaining reserves. It is reasonable to expect that improved mining procedure in which more than one-half the coal is extracted would raise the total of recoverable reserves.

The small section of the Federal Creek Field in Decatur Township, Washington County, is untouched as far as records reveal. The only operation appears to have been the digging of a 119 foot shaft down to the coal. No coal was removed, and the operation was colosed a short time after the digging was completed. The report from some of the older residents in the vicinity indicates about 8 feet of coal in the area. The property is owned by The Canadian National Railroad.

The greater part of the Federal Creek Field is in Athens County. Bern Township has the largest acreage and a computed coal reserve which is twice that of any other township in the field. This large reserve is due not only to the large acreage but also to the fact that the thickest coal is to be found in this township, as shown by the isopachs on Plate III. Most of the mineral rights in Bern Township were controlled by the Black Diamond and the Jennings Coal Companies. The properties of the Jennings Coal Company have been leased by many other companies during the past few years, but most of the Black Diamond property is still controlled by that company. Stripping of the coal in the northwestern sections of the township was done on land owned by the residents.

The two areas of mineable coal in Ames Township are not owned by large companies. The stripping was done through an agreement with the farm owners. The coal in Ames Township averages about 4 feet and is principally in the lower bench. This coal appears high in the hill tops and is therefore limited in areal extent. The stripped areas are in the northeastern and northwestern sections. For the Federal Creek Field as a whole, Ames Township has the smallest recoverable reserve.

Rome Township contains the southern end of the field. The two major mines in this township were located at Big Run and Kilvert in the northeast corner of the area. The coal is observed in its most southerly exposure a little to the north of Kilvert. The mine at Kilvert is a slope mine. The actual extent of the measureable coal is uncertain due to the lack of records, but gas well logs in sections 23, 30, and 35 show no thick coal. The western extent of the mineable coal is therefore delimited to the east of section 23.

The mineable coal in Morgan County is found in only two townships, Homer and Marion. Homer Township has the greatest recoverable reserves, over two-thirds of the total of the county. The Pittsburgh coal is limited to the high ridges between Federal Creek and Miners Fork. The thickest coal is in the southeast corner where it was mined near Joy. One deep mine, with a limited operation, is open just north of the Athens County line in section 1, as previously mentioned. The coal in Homer Township was stripped just north of Wrightstown and in an area to the east of Bishopville. This coal was loaded over a ramp at Bishopville and shipped via the New York Central Railroad.

The mineable reserves of Marion Township are limited to the southwest corner along Opossum Creek. The area is small, but the presence of both benches gives reasonably high reserve tonnage.

SPECIAL STUDIES

During the study of the reserves of the Federal Creek Field, the author collected samples of the nodular impurities from the upper bench of the Pittsburgh coal. Several of the previous workers in the area had noted these masses, which range from small nodules to those weighing a ton or more, and had referred to them as sandstone, sandstone and pyrite, or sulfur balls.

Careful examination of these impurities was not made until they were called to the attention of Dr. A. T. Cross, Coal Geologist and Paleobotanist. His examination of the hand sample disclosed that the small "sand grains" were actually individual fossil algal colonies and that the great masses were constituted of these bodies in pure concentrations in some layers and intermixed with various impurities including fossil wood in other layers.

At this writing detailed studies are being made by Dr. Cross and the author and will be published in the near future. This study will deal with both the biologic and economic aspects of these large algal masses which constitute a remarkable "bog-head" coal.

ACKNOWLEDGEMENTS

Appreciation is expressed to Dr. Myron T. Sturgeon, Department of Geography and Geology, Ohio University, for directing the field work in Ames Township and reading the thesis manuscript, and to Dr. A. T. Cross, of West Virginia University and Geological Survey, for directing the thesis study and the preparation of this report.

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FEDERAL CREEK FIELD
OF
PITTSBURGH COAL
IN SOUTHEASTERN OHIO

GILBERT E. SMITH

1951

Monongahela
← Base of Pittsburgh Coal

Conemaugh

8989 Section Numbers

28" Lines of equal thickness corresponding to boundaries between categories of coal thickness show in table of coal reserves.

56" Lines of equal thickness of Pittsburgh coal at intervals of 18 inches where coal is more than 42 inches thick.

Scale 1/62500

1 ½ 0 1 2

Contour interval 20 feet.
Datum is mean sea level.

PLATE X3