

WEST VIRGINIA  
GEOLOGICAL SURVEY



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PLATE I.—Falls of Gladly Creek, at Duffy, Lewis County, over Lower Freeport Sandstone.

WEST VIRGINIA  
GEOLOGICAL SURVEY



Lewis and Gilmer Counties

By

DAVID B. REGER, Assistant Geologist,

---

I. C. WHITE, State Geologist.



WHEELING NEWS LITHO. CO.  
WHEELING, W. VA.  
1916

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## LETTER OF TRANSMITTAL.

*To His Excellency, Hon. Henry D. Hatfield, Governor of West Virginia, and President of the West Virginia Geological Survey Commission:*

SIR:

I have the honor to transmit herewith the Detailed Report and the Topographic and Economic Maps covering the Counties of Lewis and Gilmer.

This important Report has been prepared by Assistant Geologist David B. Reger who has for several years been associated with and trained by Assistant Ray V. Hennen in the best methods of geologic work. The Report and Economic Map speak for themselves as to the high character of the geologic results attained by Mr. Reger in covering these two counties with his first separate Report for the State. The Soil Report and Map of Lewis and Gilmer have been completed in cooperation with the U. S. Bureau of Soils, and are now in preparation by the U. S. Department of Agriculture. This Soil Report, however, can not be issued for probably a year or more in the future, and it was deemed best not to withhold the State's Geologic Report from publication to await the former's appearance, but to distribute the same when it does appear to all who have received or purchased copies of the State's Geologic Report on these two counties. The State Survey has now perfected arrangements with the Public Printer of the United States by which West Virginia can procure a separate edition of 2,500 copies of the Soil Reports and Maps covering the same areas as our geologic reports at a price considerably under what it would cost the State to republish the same as was formerly done. This policy was adopted when our geologic work got ahead of the Government's cooperative Soil work, and will be continued with future publications, since there are now 6 counties (Barbour, Braxton and Clay, and Jefferson, Berkeley and Morgan) whose geologic studies have been completed, and upon which the Reports and geologic maps are under preparation, but which have not yet been taken up for Soil study by the U. S. Bureau of Soils.



The mineral riches of Gilmer and Lewis consist largely of oil, gas and coal deposits, aside from the ordinary clays, and shales for brick making, and sandstone for building purposes. There is some limestone in Gilmer County, and much more of it in Lewis, so that this important element of soil fertility, often distributed only in nodules through the red shales, is one of the factors which have made both counties famous as agricultural, horticultural, and grazing districts. The economic geology map shows that both counties lie within the great Appalachian oil and gas belt which passes entirely across West Virginia from Hancock County on the north to Wayne and Mingo on the Kentucky border, a distance of more than 200 miles, just west of and rudely parallel to the trend of the most western ridge of the Alleghany Mountains. Many people fail to comprehend why oil and gas do not exist in commercial quantity in the Alleghany Mountain regions of the State, or eastward, and considerable money has been wasted in prospecting for these minerals where the quest is hopeless. The reason of their absence from old mountain regions like the Alleghanies and the areas to the eastward is that the rocks of those counties, like Preston, Tucker, Grant, Mineral, Hardy, Randolph, Pocahontas, Greenbrier, Summers, Monroe, Mercer, etc., etc., have been fractured and faulted by the great folding to which they have been subjected so that practically all the natural gas and petroleum that they may once have held have escaped into the air, during the ages that have elapsed since the process of folding and mountain making began, and hence unless one were to drill to depths of 6,000 to 10,000 feet in such mountain regions as those of the counties mentioned, and others east of them, there is no chance whatever of finding either oil or gas in commercial volume. It is barely possible that deep down several thousand feet below the surface in these mountainous regions of the State the shaly beds of the stratified rock series may have so shingled over the cracks and crevices which penetrate all non-plastic beds like sandstones, limestones, etc., as yet to imprison commercial quantities of these hydro-carbons, so abundant in most of the counties of West Virginia lying west of the mountain region of the State, but even this slight possibility is extremely doubtful, and should not be relied upon with any degree of confidence whatever.

The coal area of Gilmer is not large, since it comes within the belt where the great Pittsburgh seam disappears westward, and with it practically all of the others, so that the western half of Gilmer has practically no commercial coal. Nature, however, as if to make up for this deficiency, has given her large deposits of oil and gas, while to Lewis she has given much coal and oil, and one of the greatest gas fields in the State. In fact from Lewis County hundreds of millions of cubic feet of gas go daily to the States of Ohio, Indiana, Michigan, Pennsylvania, and Maryland through the pipe line systems and pumping stations of several great gas producing and marketing corporations. Some of the largest gas wells (36 million cubic feet daily) ever measured in the Appalachian field have been found in or near Lewis County. The accompanying economic and structural geologic map shows the coal areas of the two counties as also the anticlinal and synclinal folds which have given origin to the oil and gas pools indicated as already developed.

I. C. WHITE,  
*State Geologist.*

Morgantown, W. Va., March 1, 1916.

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## AUTHOR'S PREFACE.

This book contains a short historical and industrial sketch, a chapter on Physiography, seven chapters on Geology, three chapters on Mineral Resources, and a chapter on Paleontology.

In order to describe the several coals and the oil and gas sands in their proper stratigraphic sequence, it was necessary to make an exhaustive study of the entire rock system, both surface and underground as far as possible, and to embody a large part of this research in the text in the form of geologic sections and detailed descriptions. This matter may not be of interest to the casual reader but its value to professional men conducting future coal, oil and gas operations in the two counties can not be questioned.

Two maps accompany the Report in a separate atlas. Map I consists of the topographic sheets of the U. S. Geological Survey assembled in convenient form to make a complete surface map of the two counties. Map II, showing General and Economic Geology, gives not only the structure contours based on the bottom of the Pittsburgh Coal, but also the accurate location of all the oil and gas wells and coal test borings, of which 807 are listed by number both on the map and in the text, and the accurate location by number of the 284 coal openings examined and described. Besides these separate maps, 12 figures appear in the text, of which Nos. 4 to 11, inclusive, are intended to show at a glance where the several coal seams are of minable thickness and purity. Since these coals are too thin or impure to be minable in certain regions, it has been necessary in most of the figures to make **Approximate Lines of Disappearance**, in referring to which it must be remembered that there are probably a few patches of good coal on the barren side and corresponding areas where the coal is worthless on the side where coal is shown. Wherever possible, detailed information should be secured from openings or borings published in the text.

The author spent the field season of 1914 making the necessary researches for this volume, and is responsible for all the data contained in Parts I, II and III, but was helpful in the office



work by Field Assistants R. M. Gawthrop and D. D. Teets, Jr., who made the maps and prepared a large part of the tabulated matter.

Part IV, treating of the Paleontology, is the exclusive work of Dr. W. Armstrong Price, Paleontologist, who made the necessary collections in the field, and described the fossil forms.

The chemical analyses and calorific tests, except a few taken from previous Reports of the Survey, were made by J. Berghius Krak, Assistant Chemist, working under the direction and with the assistance of B. H. Hite, Chief Chemist. In addition to the analyses published in the text, nineteen other samples of coal, limestone and clays were collected in the field and would have appeared in print had not the reduced appropriation of the last State Legislature caused retrenchment in all the activities of the Survey, making it impossible to complete these analyses, as well as eliminating many valuable well records that might have been published.

Special acknowledgment is here made of the hearty manner in which many oil and gas companies, and independent operators, cooperated in furnishing valuable well records, secured at private expense, without the inclusion of which this volume would be incomplete. Credit for all such material furnished is given in the text.

Finally, the author expresses his obligation to Dr. I. C. White, State Geologist, without whose careful supervision and valuable suggestions this Report would lack much of whatever merit it may have.

DAVID B. REGER.

Morgantown, W. Va., July 23, 1915.

## ERRATA.

Page 13, 3rd line of description of Jane Lew, for "most," read "midst."

Page 32, line 2 from top, for "thin," read "three."

Page 37, line 16 from bottom, for "2375," read "2475."

Page 51, line 17 from bottom, for "No. 81," read "73."

Page 75, under Lower Kittanning Coal at depth of 360 feet, change Nimrod Lake Mine No. 272 to 276.

Page 118, No. 33 on Map II, change "Opeinng" to "Opening."

Page 125, end of first paragraph, add the words "were based" (which occur under foot-notes).

Page 165, line 10 from top, for "ragged," read "rugged."

Page 176, line 5 from top, the word "Buffalo)" should follow "First Cow Run (Little Dunkard) Sand" (Buffalo).

Page 236, line 1, for "F. C. Farinash," read "F. C. Forinash."

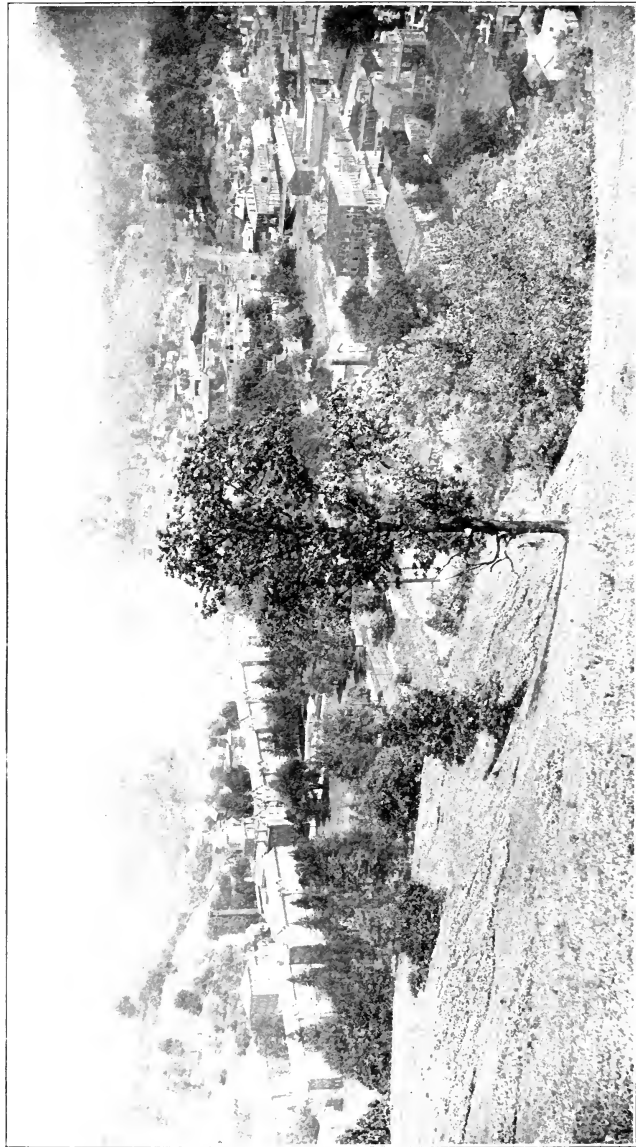


PLATE II.—View of Weston; showing State Hospital at left; Topography of the Monongahela and Conemaugh Series.





# PART I.

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## History and Physiography.

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### CHAPTER I.

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#### HISTORICAL AND INDUSTRIAL DEVELOPMENT.

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##### LOCATION.

Lewis and Gilmer Counties, comprising the area treated in this Report, are situated in the central part of West Virginia, being included within the parallels of  $39^{\circ} 11'$  and  $38^{\circ} 43'$  North Latitude, and  $80^{\circ} 18'$  and  $81^{\circ} 04'$  West Longitude from Greenwich. They lie within the watersheds of the West Fork of the Monongahela and the Little Kanawha Rivers, the waters of which reach the Gulf of Mexico through the Ohio and Mississippi Rivers. Lewis, the more eastern of the two counties, is bounded on the north by Doddridge and Harrison, on the east by Upshur, on the south by Webster, Braxton and Gilmer, and on the west by Braxton, Gilmer and Doddridge Counties. Gilmer is bounded on the north by Ritchie, Doddridge and Lewis, on the east by Lewis and Braxton, on the south by Braxton, and on the west by Calhoun and Ritchie Counties.

Their geographical position may be observed in detail from Figures 1 and 2 in this Volume and from Maps I and II, enclosed in a separate atlas accompanying this Report.

## TRANSPORTATION.

### Water Ways.

**West Fork River.**—The West Fork River, the largest watercourse in Lewis County, which flows in a northerly direction across the same, meeting the Tygart Valley River at Fairmont to form the Monongahela, is apparently too small to be made navigable. The river is sluggish, the rate of fall from Weston to slackwater at Fairmont, 66 miles, being only 2.1 feet per mile, but the scarcity of any considerable volume of water, especially during the summers, places the stream outside the navigable class.

**Little Kanawha River.**—The Little Kanawha River, which flows across Gilmer County in a westerly direction, has long been an important artery of commerce between Parkersburg and the central counties of the State. A system of locks and dams makes the river navigable throughout the year from Parkersburg to Creston, Wirt County. From the upper lock, situated 1.5 miles above Burning Springs, to the Gilmer County Line at Mussel Shoals, the distance is 48 miles and from Mussel Shoals to Glenville it is 14 miles, making a total of 62 miles from Glenville to the upper lock. From Glenville to the Coal & Coke Railway at Gilmer Station just below the Braxton County Line the distance is 12 miles, making a total distance between Gilmer Station and the Burning Springs lock of 74 miles. In this portion of the river, there is a total fall of 110 feet, or 1.5 feet per mile. At the present time, the river is navigable between these points only during the spring and winter months when there is a considerable traffic on gasoline boats. Since the counties of Gilmer and Calhoun have no railroads passing across them, all supplies during the summer and autumn must be hauled by wagon either from Creston at the head of navigation on the Little Kanawha or from the Coal and Coke Railway which only touches the eastern edge of Gilmer, or from the Baltimore and Ohio Railroad at Weston, distant 27 miles from Glenville. It is apparent, therefore, that the improvement of the Little Kanawha River from Burning Springs to Gilmer Station, requiring the construction of ten

locks, would be of great benefit to the citizens of these two counties.

Many investigations have been made by the U. S. War Department regarding the improvement of this portion of the river, most of which have been unfavorable. The last report by a board of engineers reached the following conclusions and recommendations:<sup>1</sup>

"This river is so narrow and in places so tortuous that even if improved by locks and dams a steamboat and one barge would have difficulty in moving. A tow of such size as is used on the Monongahela or Kanawha Rivers could not be operated. If a coal mine were operated on the river, the plant about the tipple and the necessary operations at that point would almost block the river. Due to the width of the river, locks would have to be built smaller than on the Kanawha or Monongahela Rivers. Even if the river were improved, it is not believed coal from here could be brought out cheaply enough to compete with coal from either the Monongahela or Kanawha Rivers. There is practically no trade that could be supplied, except where such competition would exist. The valley itself is undeveloped and sparsely settled, has a generous supply of oil and gas, and would afford no market for coal. In fact there seems to be no demand for a new field in this vicinity as the other near by tributaries of the Ohio can readily supply the available markets with more coal than they do at present.

"Should the effort be made to improve the river, the scarcity of water would entail extra expenditure.

"It is believed that this river is unworthy of improvement at this time, and it is recommended that no survey be made."

It would seem from this Report that there is little hope of any immediate improvement of the Little Kanawha River and that transportation must be provided in some other manner.

### Steam Railroads.

**Richwood Branch, B. & O. R. R.**—The Richwood Branch of the Baltimore and Ohio Railroad, which extends in a north and south direction from Clarksburg to Richwood, Nicholas County, a distance of 121 miles, passing entirely across Lewis County in its course, had its origin from a narrow gauge road chartered and built by Hon. J. N. Camden and others under the name of the Clarksburg, Weston and Glenville Transportation Company, and extended from Clarksburg to Weston. That portion of the line between Weston and Clarksburg, according to Capt. Thomas Smith, a veteran conductor of the

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<sup>1</sup> House of Representatives, Doc. No. 12, 63rd Congress, 1st Session, 1913, page 9.

road, was completed in July, 1879, and to Buckhannon in June, 1883. In 1891 and 1892, the West Virginia and Pittsburgh Railroad Company took possession of the line and changed it to standard gauge.

The same company extended the road as a standard gauge from Weston to Flatwoods in 1890 and 1891, and to Camden-on-Gauley in 1891 and 1892, and finally completed it to Richwood in 1899.

The road was sold to the Baltimore and Ohio Railroad in September, 1899.

**Pickens Branch, B. & O. R. R.**—The Pickens Branch of the Baltimore and Ohio Railroad, extending from Weston to Pickens, Randolph County, 49.3 miles, had its beginning in a narrow gauge line built from Weston to Buckhannon in 1883, under the name of Weston and Buckhannon Railroad Company. This line was taken over by the West Virginia and Pittsburgh Railroad Company and made a standard gauge in 1891 and 1892, and in the same years was extended to Pickens. It was sold to the Baltimore and Ohio Railroad Company in September, 1899. Both the Richwood and Pickens Branches are parts of the Monongah Division of the road. The branches through Lewis County total 55 miles.

**Coal and Coke Railway.**—The Coal and Coke Railway, which extends in an east and west direction from Elkins to Charleston, a distance of 175 miles, and, as shown by Maps I and II, passes through portions of both Lewis and Gilmer, was completed in 1906. Of this road 15 miles is in Lewis but only 1.5 miles is in Gilmer.

**Elk and Little Kanawha Railroad.**—The Elk and Little Kanawha Railroad, which is of narrow gauge construction, extends from Gassaway, Braxton County, to Stumptown, in Gilmer, a distance of 36 miles. It carries passengers and commercial freight as far as Shock Station on Right Fork of Steer Creek, but from Shock to its terminus at Stumptown, is operated only as a private lumber railroad. It was completed to its present terminus in 1913, and is an important feeder for the Coal and Coke Railway.

**Walkersville and Ireland Railroad.**—The Walkersville and Ireland Railroad extending from Walkersville, Lewis County,

southward to the head of Trace Run of Little Kanawha River, east of Bablin, is another narrow gauge feeder of the Coal and Coke. This road, which carries freight only, was built from Walkersville to Ireland in 1907, and completed to its present terminus in 1914.

### Electric Railroads.

**Monongahela Valley Traction Company.**—The Monongahela Valley Traction Company operates an electric line between Clarksburg and Weston which does a general passenger, freight and express business. The line, which closely parallels the B. & O. Railroad, was completed in 1913.

### Highways.

**Parkersburg and Staunton Turnpike.**—The Parkersburg and Staunton Turnpike, which extends in an east and west direction across both Lewis and Gilmer, passing through Weston, Camden, Vadis, Troy, and Coxs Mills, had its beginning by act of the Virginia General Assembly passed in 1823, but was not completed until after 1853, when the final appropriation for macadamizing the road was made. The original macadam has long since disappeared but the excellent grade remains.

**Buckhannon and Little Kanawha Turnpike.**—The Buckhannon and Little Kanawha Turnpike, which was authorized by act of the Virginia General Assembly March 15, 1849, to extend from Buckhannon by way of Haymond's Mill, Braxton County, to an intersection with the Weston and Sutton road, crosses the southern end of Lewis, passing through Crawford, Walkersville and Jacksonville. According to W. B. Cutright<sup>2</sup>, it was completed in the early fifties.

**Weston and West Union Turnpike.**—The Weston and West Union Turnpike branches from the Parkersburg and Staunton Turnpike at Dry Fork of Polk Creek, four miles west of Weston, and is built through Churchville, Coldwater and New Milton to West Union.

**Ravenswood, Spencer and Glenville Turnpike.**—The Ra-

<sup>2</sup>History of Upshur County, p. 322; 1907.

venswood, Spencer and Glenville Turnpike extends from the Ohio River at Ravenswood, Jackson County, through Spencer, Arnoldsburg, Millstone, Stumptown, Lockney, Normantown and Lettergap to Glenville. Since it passes through a region where there is little railroad transportation, it has long been an important artery of travel.

**Clarksburg and Weston Turnpike.**—The Clarksburg and Weston Turnpike extends from Clarksburg through Byron, Lost Creek, McWhorter and Jane Lew to Weston, being closely parallel to the Baltimore and Ohio Railroad. Since its route is mostly over a red clay soil and it is not macadamized, it is usually not fit for travel in winter, but in the summer months is a good road.

**Ordinary County Roads.**—Aside from the few turnpikes mentioned above, the highways of Lewis and Gilmer are mostly unimproved dirt roads, many of which become impassable in the winter months on account of the heavy hauling to the oil and gas fields. No attempt has been made in either county to macadamize or pave them. According to Hon. A. D. Williams, State Road Engineer, there are 650 miles of wagon roads in Lewis and 575 in Gilmer.

## GENERAL DESCRIPTION, LEWIS COUNTY.

### *Miscellaneous Items.*

**Formation.**—The following account of the formation of Lewis County is given by Hon. Virgil A. Lewis<sup>5</sup>:

“Lewis County was formed from Harrison by an Act of Assembly passed December 18, 1816, by which the boundaries were defined to be: ‘Beginning at the head of the left hand fork of Jesse’s run; thence a straight line to the mouth of Kincheloe’s creek; thence up said creek to the dividing ridge; thence a west course to the Wood County line; thence to include all the south part of Harrison down to the mouth of the Buckhannon River; thence a straight line to the beginning.’ The Act directed that the first court should be held at Westfield, and appointed the following named commissioners to locate the county seat: Edward Jackson, Elias Lowther, John McCoy, Lewis Maxwell and Daniel Stringer.

“The county was named in memory of Colonel Charles Lewis, who was killed at the battle of Point Pleasant. He was the youngest son of John Lewis, the pioneer settler of Augusta County, and a brother of General Andrew Lewis, who commanded the Virginians at Point Pleasant.”

<sup>5</sup> History of West Virginia, p. 636; 1889.

The area of Lewis County, as enumerated above, has been greatly reduced by the formation of Barbour, Doddridge, Gilmer, Ritchie and Upshur Counties, all of which secured a section of its original territory.

**Area.**—The area of Lewis County, as determined with planimeter by Gawthrop from the topographic sheets of the U. S. Geological Survey, is as follows:

Districts.	Square Miles.
Hackers Creek.....	62.08
Freemans Creek.....	114.53
Courthouse .....	84.64
Skin Creek.....	40.47
Collins Settlement.....	89.63
Total for County.....	391.35

**Relief.**—The surface of Lewis County varies in elevation from 760 feet above sea level, at the point where Leading Creek crosses the Lewis-Gilmer Line at Linn, to 1950 feet at the summit of a high knob 1.8 miles northwest of Cleveland, in the southern panhandle, making a maximum variation of 1190 feet, and thus rendering climatic conditions much the same over the entire county.

**Population.**—The following table, taken from the U. S. Census returns for 1910, shows the population of Lewis County by magisterial districts for the last three enumerations:

#### Population of Lewis County.

Minor Civil Division.	1910	1900	1890
Collins Settlement District.....	3,068	3,200	3,015
Court House District, including parts of Wards 1 to 4 of Weston town.....	5,177	4,721	2,629
Weston town (part of).....	950	1,931	.....
Total for Weston town in Court House, Freemans Creek and Hackers Creek Districts.....	2,213	2,560	2,143
Ward 1 .....	756	.....	.....
Ward 2 .....	443	.....	.....
Ward 3 .....	492	.....	.....
Ward 4 .....	522	.....	.....
Freemans Creek District, including parts of Wards 1 and 2 of Weston town.....	5,283	4,564	4,122
Weston town (part of).....	633	253	.....
Hackers Creek District, including Jane Lew town and parts of Wards 2 and 4 of West- ton town.....	3,522	2,951	4,533
Jane Lew town.....	327	.....	.....
Weston town (part of).....	630	376	2,143
Skin Creek District.....	1,231	1,544	1,596
Totals for County.....	18,281	16,980	15,895

**Products.**—The principal animal products of Lewis are cattle, horses, sheep, hogs, poultry and mules, in the order named.

The principal agricultural products are corn, potatoes, hay, apples, wheat, and oats. The soil of the county is especially adapted to forage crops, most of it being known as blue grass land.

The principal mineral and manufactured products are natural gas, oil, coal, brick, clay, building stone, glassware, and carbon black.

**Property Valuation.**—According to Hon. J. S. Darst, State Auditor, the following table shows the property valuation for the two years ending with 1914:

	1913	1914
Real Estate.....	\$11,676,600	\$11,908,905
Personal Property.....	5,860,410	6,280,460
Totals .....	\$17,537,010	\$18,189,365

According to the above figures, Lewis ranks seventeenth in the State in point of wealth.

**Postal Service.**—As is true in many other counties of the State, the reorganization of the Post-Office Department and the establishment of rural free delivery routes has caused many of the small post-offices of the county to be abandoned. The following table compiled from information supplied by Assistant Postmaster Reger, at Weston, shows the post-offices and rural routes now (November 11, 1914) in existence in the county:

#### Lewis County Post-Offices.

Post Offices.	Number of R. F. D. Routes.	Post Offices.	Number of R. F. D. Routes.
Alum Bridge.....		Ireland .....	
Bablin .....		Jane Lew.....	2
Camden .....	2	Jewel .....	
Crawford .....	1	Kemper .....	
Fink .....		Orlando .....	2
Freemansburg .....	1	Roanoke .....	3
Horner .....	2	Vadis .....	
Hurst .....		Walkersville .....	1
Ingo .....		Weston .....	6



From the above information, it will be seen that Lewis County has 18 post-offices and 20 rural free delivery routes.

### *Towns and Industries.*

There are only two incorporated towns in Lewis County, but there are numerous thriving villages that have no town charters.

#### **Weston.**

Weston, the county seat of Lewis, is located on the West Fork River, at the point where it receives the tributary streams of Stonecoal and Polk Creeks. The following account by Lewis<sup>4</sup> gives the early history of the town:

“Weston, the county seat, was established a town under the name of ‘Preston,’ January, 1818, on lands of Daniel Stringer and Lewis Maxwell; Henry McWhorter, William Peterson, James M. Camp and Robert Collins were appointed trustees. By an Act of February 20, 1819, the name of the town was changed to ‘Fleshersville.’ This, however, does not appear to have been satisfactory, for on the 19th of the following December, it was enacted that the town established in the county of Lewis, by the name of ‘Preston,’ afterward changed to ‘Fleshersville,’ shall hereafter be known by the name of ‘Weston.’”

Weston is built principally on the flood plain of the West Fork River, its general elevation being about 1025 feet above sea level. It owes its existence principally to the county business and partly to the unsurpassed agricultural region which entirely surrounds it and for which it is the natural supply point. In addition to these features, it has one of the largest eleemosynary institutions in the State, and has also an important glass manufacturing industry. One of its largest sources of income and growth is the great natural gas industry that surrounds it and for which it handles most of the supplies. It is not unusual on Monday mornings to see one hundred heavy wagons loaded with pipe and gas well supplies starting for the various fields.

The town is served by the Baltimore and Ohio Railroad, the branches of which, as previously described, extend in three directions and offer good facilities for distribution and supply.

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<sup>4</sup> Virgil A. Lewis, History of West Virginia, p. 636; 1889.

In addition to the steam railroad, the Monongahela Valley Traction Company provides handy passenger service to Clarksburg.

**Weston State Hospital.**—The Weston State Hospital, formerly known as the West Virginia Hospital for the Insane, which is located at Weston, is the second largest public institution of any sort within the State. It is devoted entirely to the treatment of insane patients, having 1,035 of these unfortunates on July 1, 1914. It is supported by State appropriations, the annual expense being about \$140,000. The pay roll shows that, including the Superintendent, Dr. C. W. Halterman, and three other physicians, 146 persons are employed, the annual amount of salaries for 1914 totaling \$53,782.61. The following facts taken from the State Board of Control Report<sup>5</sup> shows the scope and character of the institution:

#### "Historical.

"This is the oldest public institution of the State. It was established by the State of Virginia by an act of the legislature passed in 1858, the first appropriation being \$25,000.00. The first building, a one-story structure, was ready for occupancy in September, 1859, and the first patients were admitted in October, 1859. Nine patients had been maintained in a hospital at Columbus, Ohio, pending the erection of the hospital at Weston.

"Dr. R. Hills, of Columbus, Ohio, was the first superintendent, and the succeeding ones have been Dr. W. J. Bland in 1882, Dr. John H. Lewis in 1886, Dr. W. P. Crumbacker in 1892, Dr. W. E. Stathers in 1896, Dr. A. H. Kunst in 1900, Dr. S. M. Steele in 1906, Dr. Chas. W. Halterman in 1914.

"The institution was taken over by the State of West Virginia upon its admission into the Union, and in 1866 a number of insane patients were removed to it from the hospitals at Williamsburg and Staunton, and the State of Virginia was paid \$23,700.00 for their support while in those institutions.

#### "Grounds.

"The grounds belonging to the Hospital contain about 335 acres; the property fronts about 2,000 feet on the West Fork River opposite the town of Weston and extends back over the hills to the north to a depth sufficient for this acreage. With the exception of the ground on which the buildings are located, extending back from the river about 800 feet, the land is very steep and entirely unsuitable for tillage. A very small portion is used for gardening, but in the main it is used only for grazing.

<sup>5</sup> Third Annual Report, State Board of Control, pp. 57-58; Part I; 1914.

**"Buildings.**

"The general Hospital building has a frontage of 1290 feet, consisting of a central portion—the Administration Building—with wings extending on either side north and south. The corridors connect all the wards with one another and with the central building. In the rear of the main building are the following:

"(1) The Atkinson Building; erected in 1897, three stories, containing three wards, all used for male patients.

"(2) Building for colored patients; three-story brick, containing two wards, one for male and the other for female patients.

"(3) Laundry Building; occupied by the laundry, with a plumbing shop and power in the basement.

"(4) Electric Power House; one-story brick building, containing the electric light machinery, ice plant and three cold storage rooms. These cold storage rooms should be torn down and rebuilt at once, as they are ill-smelling and insanitary.

"(5) Patients' Kitchen; 45x75, equipped with the necessary outfit for the cooking which must be done on a large scale for such an institution.

"(6) Sick Patients' Kitchen.

"(7) Bake Shop; one-story brick building, containing oven, dough mixer, engine and other necessary utensils.

"(8) Store Room; two-story brick building, the lower floor containing the main store room, clothes-cutting and sewing room; the upper floor is used as an attendants' dining room, with kitchen and dining room attached. This building is in bad condition.

"(9) Morgue; a stone building used to prepare for burial or shipment the bodies of patients who die in the hospital.

"(10) Hose house, small frame building containing all the hose and fire-fighting apparatus.

"(11) Greenhouses.

"(12) Cow Barn and Horse Barn; two old, large frame structures; both out of date and unsanitary."

**Crescent Window Glass Company.**—The Crescent Window Glass Company, established in 1903, with head office and works along the B. & O. R. R. at the south end of Weston, manufactures window glass exclusively, the annual capacity being 200,000 boxes. There are two 24 blower tanks and at the time the factory was inspected (June 24, 1914) all glass was blown by hand, but according to J. B. Fads, office man, it was the intention to use the Healy blowing machine in one-half the factory after January 1, 1915. The product is shipped in all directions. The plant uses sand from Ten Mile, W. Va., lime from Martinsburg, soda ash from Wyandotte, Mich., and salt cake from Cleveland, Ohio. The average monthly consumption of gas is 45,000,000 cu. ft., at a cost of 4 cents per thousand. The plant runs 8½ months annually, having 290

men employed, of which 175 are skilled workmen and 115 laborers, the monthly pay roll amounting to \$22,000.

**Travis Glass Company.**—The Travis Glass Company, with head office at Clarksburg, W. Va., has a branch plant at Weston, located on the West Fork River, along the B. & O. R. R., at the south end of the town, operating under a lease from the Lewis County Glass Company, the owner of the plant. The factory was first established under the name of the Bendale Lighting Glass Company, but was later sold to the Bastow Manufacturing Company, and finally came into the hands of its present owners. According to Charles Bassford, Superintendent, the plant manufactures milk bottles, with an output of 12 tons daily, the total capacity of the tank being 90 tons. The O'Neil semi-automatic machine is used for blowing the product. Natural gas is used for fuel at a cost of 4½ cents per thousand cubic feet. The plant runs 11½ months annually, the list of employees totaling 65, of which 47 are men and 18 boys, 26 of the men being classed as skilled labor.

**Weston Brick Works.**—The Weston Brick Works, with its head office at Weston and works at the south end of the town, will be fully described in Chapter XII, under the subject of "Clay".

**Danser Manufacturing and Supply Company.**—The Danser Manufacturing and Supply Company, with head office at Weston, the works being one-eighth mile north of the B. & O. R. R. station, was established in 1905. According to W. C. Danser, President and General Manager, the concern manufactures heating stoves, oil well tools, gray iron castings, and does a general repair and jobbing business. Twenty-five men, of whom 10 are skilled workmen, are employed, with an average weekly pay roll of \$400.

**B. & O. R. R. Shops.**—The Baltimore and Ohio Railroad Company has maintained general repair shops at the north end of Weston since 1889. According to G. A. Schafer, General Foreman, 85 men are employed, of whom 30 are skilled workmen.

**Bennett Bros. Post Factory.**—Bennett Brothers operate a small factory, located on the Pickens Branch of the B. & O.

Railroad at the east end of Weston. This plant, which was first established as the Monarch Tile Works, according to one of the workmen, now makes cement posts, pillar blocks, and all kinds of cement blocks. Buckhannon River sand from Silica, W. Va., is used in connection with limestone screenings for the aggregate material. The plant does not run all the time and is a small concern, only two men being employed when visited (June 30, 1914).

The **Bennett and Garrett Stone Quarry**, located at the mouth of Stonecoal Creek, will be described in Chapter VII, under the description of the Lower Connellsville Sandstone.

### **Jane Lew.**

Jane Lew, the second town of Lewis County, is situated at the point where the Baltimore and Ohio Railroad crosses Hackers Creek, being in the most of what is perhaps the richest agricultural and stock grazing region of the State. Its name is derived jointly from that of Lewis Maxwell and Jane Maxwell, his wife, early settlers of the community. Besides being the supply point for a large farming community, Jane Lew is surrounded with numerous producing gas wells that add largely to its prosperity. It was incorporated as a town in 1907, with a population, in 1910, of 327, according to the U. S. Census returns, but its growth has been rapid, and Burkett Hall, Mayor, estimates the population in 1914 at 400 to 500 persons.

The **Jane Lew Brick and Drain Tile Works** will be fully described in Chapter XII under the subject of "Clay".

### ***Villages.***

There are numerous unincorporated villages situated throughout Lewis County, of which the following list gives the principal ones with their populations, most of which are by actual count made in the presence of the writer:

## Lewis County Villages.

Village.	Population 1914.	Village.	Population 1914.
Berlin .....	70(A)	Horner .....	64(A)
Camden .....	64(A)	Ireland .....	123(A)
Churchville .....	122(E)	Jacksonville .....	27(A)
Copley .....	75(E)	Orlando .....	250(E)
Crawford .....	90(A)	Roanoke .....	123(A)
Freemansburg .....	27(A)	Vadis .....	115(A)
Gaston .....	40(A)	Walkersville .....	196(A)

A—Actual count by Postmaster or other responsible person in 1914.

E—Estimate by Postmaster or other responsible person in 1914.

## GENERAL DESCRIPTION GILMER COUNTY.

*Miscellaneous Items.*

**Formation.**—Gilmer County was created by Act of the Virginia General Assembly February 3, 1845, from parts of Lewis and Kanawha Counties, and was named after Thomas Walker Gilmer, a former Governor of Virginia.

**Area.**—The area of Gilmer County, as determined with planimeter by Gawthrop from the topographic sheets of the United States Geological Survey, is as follows:

Districts.	Square Miles.
Troy .....	69.06
Dekalb .....	73.05
Glenville .....	78.65
Center .....	121.64
Total for County.....	342.40

**Relief.**—The surface of Gilmer County varies from 690' above sea level at Stumptown on Steer Creek to 1600' at Locust Knob, three miles east of Stouts Mills, a variation of 910 feet. There is no marked change in climatic conditions in different parts of the County.

**Population.**—The following table, taken from the U. S. Census returns for 1910, shows the population of Gilmer County by magisterial districts for the last three enumerations:

## Population of Gilmer County.

Minor Civil Division.	1910	1900	1890
Center District.....	3,347	3,193	2,476
Dekalb District.....	2,145	2,336	1,974
Glenville District, including Glenville and Layopolis towns.....	3,617	3,591	2,794
Glenville town.....	336	398	329
Layopolis town.....	156	.....	.....
Troy District, including Troy town.....	2,270	2,642	2,502
Troy town.....	144	148	.....
Totals for County.....	11,379	11,762	9,746

**Products.**—The principal animal products of Gilmer County are cattle, horses, sheep, poultry, hogs and mules.

The principal agricultural products are corn, potatoes, hay, apples, wheat, and oats. The soil of the county, like that of Lewis, is especially adapted to forage crops, being natural blue grass land.

The principal mineral products are coal, oil and gas. There is no manufacturing industry in the County.

**Property Valuation.**—According to Hon. J. S. Darst, State Auditor, the following table shows the property valuation for the two years ending with 1914:

	1913	1914
Real Estate.....	\$6,156,981	\$6,240,254
Personal Property.....	2,088,368	2,329,060
Totals .....	\$8,245,349	\$8,569,314

A comparison of the above figures with those for other counties in the Auditor's Report shows that Gilmer ranks 40th in point of wealth in the State.

**Postal Service.**—As noted in Lewis County, the establishment of rural free delivery routes has caused many former post-offices to be abandoned. Since there are only a few miles of railroad in the County, almost the entire postal service depends on automobile, wagon, or horseback service, thus causing considerable inconvenience and delay. The following table shows the post-offices and rural routes now (October 5, 1914) in existence in the County:

Post-Offices.	Number of R. F. D. Routes.	Post-Offices	Number of R. F. D. Routes.
Arbela .....		Newberne .....	
Baldwin .....		Normantown .....	
Cedarville .....		Orton .....	
Conings .....		Perkins .....	
Coxs Mills.....	1	Revel .....	
Dekalb .....		Revere .....	
Dora .....		Rudkin .....	
Dusk .....		Sand Fork.....	
Gilmer .....		Shoal .....	
Glenville .....		Stouts Mills.....	
Hardman .....		Stumptown .....	
Index .....		Tanner .....	
Lettergap .....		Troy .....	
Linn .....	1	Valley .....	
		Withers .....	

### *Towns and Industries.*

There are four incorporated towns in Gilmer County, all of them being small and devoted principally to the supply of their respective country trades.

#### **Glenville.**

Glenville, the county seat of Gilmer, is located on the Little Kanawha River, 12 miles from the Coal and Coke Railway at Gilmer Station, and 27 miles from Weston. Supplies are hauled principally from Gilmer Station, but there is a daily mail service both to Gilmer and Weston and in summer automobile hack lines furnish fairly convenient communication with both places. It was incorporated March 10, 1856, the first town election being held by B. Conrad, George E. Ball and Preston Pew. The present population (Census of 1910) is 336. The town lies in the midst of a good farming community, and also has the county business, as well as one of the State Normal Schools.

**Glenville State Normal School.**—The State of West Virginia maintains a Normal School in Glenville that adds materially to the business prosperity and educational welfare of the community. The institution employs, in addition to the Principal, Prof. S. O. Bond, sixteen instructors and has an



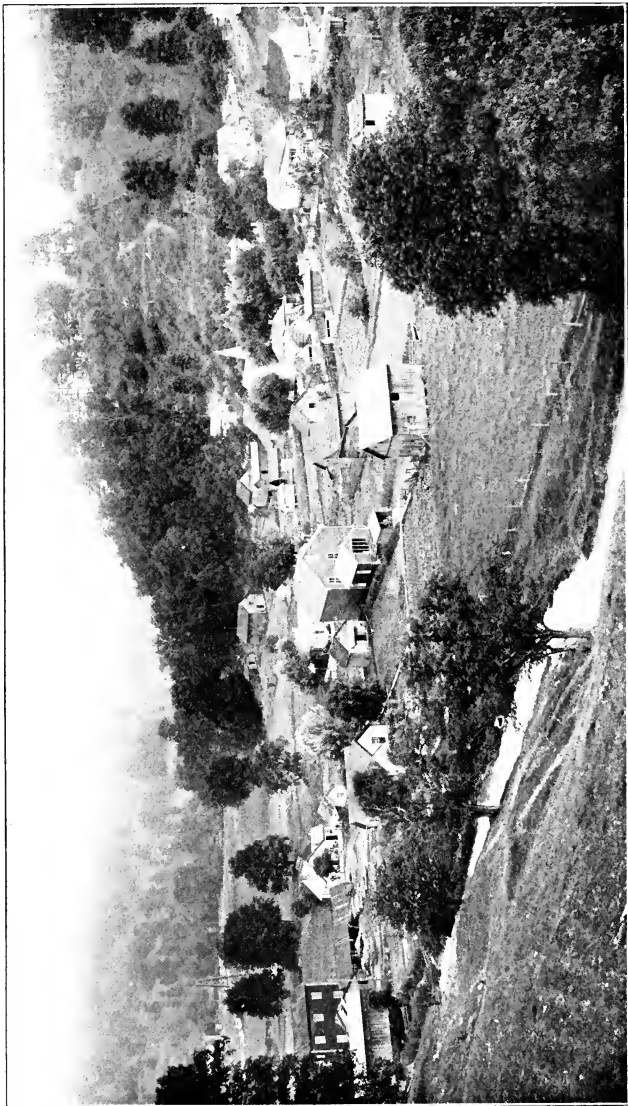


PLATE III.—View of Berlin, Lewis County; Hackers Creek in foreground; Topography of the Monongahela and Conemaugh Series.



annual expenditure for all purposes of about \$19,000. The total enrollment of students is 406. The following statements taken from the State Board of Control Report<sup>6</sup> show the scope and character of the institution :

#### "Glenville State Normal School.

##### "Historical.

"The Glenville Normal owes its existence to an act of the Legislature, passed February 19, 1872, which provided as a condition of its establishment that the citizens of the town provide suitable grounds and buildings. This condition was soon met, but pending the purchase of a building, the school was opened in the old court house on the 24th of January, 1873. Later a two-story frame dwelling house was acquired and remodeled, and for several years the school was carried on in this building. In 1885 the Legislature appropriated \$5,000 for a new building and a neat brick structure was erected on the site of the old dwelling house. In 1893 another appropriation was secured and the building enlarged to its present dimensions. In 1909, as the attendance of the school had increased about three-fold during the preceding four years, the old accommodations were found to be inadequate; so an appropriation of \$35,000.00 was made for a new building, which was completed and ready for occupancy in March, 1912.

##### "Grounds.

"The site on which these buildings is located consists of about four acres of ground lying on the hillside north of the town of Glenville, and within the corporate limits of the town. A part of this land was acquired in 1885, when the first building was erected, and the remainder was purchased in 1909 by the citizens of Glenville as a site for the building then about to be erected. This purchase was made with the expectation that the purchasers would ultimately be reimbursed by the State for their expenditure. This was done subsequently, and the State Board of Control paid \$2,361.75 for the lot, which is 88½ feet front and 321 feet depth.

##### "Buildings.

"There are two buildings, both used for school purposes. Both are two-story bricks with basements. The equipment of the old building is more or less worn and out of date, but the new building is well furnished with modern appliances. The chemical and physical laboratories, library and auditorium are in the new building.

"In accordance with the appropriation of \$37,000, made by the Acts of 1913, for buildings and land, it being understood that the building to be erected out of this appropriation would be a dormitory, the State Board of Control has, after several months spent in negotiations, secured a site for the new building, which adjoins the present property. This site consists of the Craddock property and the Lynn lot immediately behind it. It was so late in this year before the site could be secured that there has been no time to begin the construction

<sup>6</sup>Third Annual Report, State Board of Control, pp. 689-690 and 696, Part II; 1914.

of the building. Besides that, it is not believed that the appropriation made will be sufficient to erect the kind of building needed, and it hoped that the Legislature will consider the propriety of increasing the amount."

"Statistical Tables, 1912-1914.

"Table No. 1

"Enrollment 1912-13—Students in Regular Work.

	Grad.	Senior	Junior	Soph.	Fresh.	Prep.	Males	Females	Totals
Normal .....		29	35	50	199	40	204	149	353
Academic .....		1	3	5	10	6	14	11	25
Totals .....		30	38	55	209	46	218	160	378

"Departments.

	Males	Females	Totals
Pupils in Model School.....	32	38	70
Students in Instrumental Music.....	6	33	39
Total Enrollment.....	258	200	458

"Table No. 2.

"Enrollment 1913-14—Students in Regular Work.

	Grad.	Senior	Junior	Soph.	Fresh.	Prep.	Males	Females	Totals
Normal .....	1	26	30	45	198	30	170	130	300
Academic .....		8	10	5	9	4	27	9	36
Totals .....	1	34	40	50	207	34	197	139	336

## "Departments.

	Males	Females	Totals
Pupils in Model School.....	28	33	61
Students in Instrumental Music.....	10	47	57
Total Enrollment.....	285	181	406

The **Whiting and West Brick Plant**, near Glenville, will be described in Chapter XII under the subject of "Clay".

## Layopolis (Sand Fork).

The town of Layopolis, usually known as Sand Fork, the name of the post-office, is located at the mouth of Sand Fork of Little Kanawha River. It was incorporated in 1901 and its population in 1914, by actual count, was 177, making it the third town of the County. It owes its growth principally to the oil development along the Grassland Syncline which crosses the Little Kanawha River just east of the town, but like many other oil villages the population has declined in recent years. The presence of a large amount of Pittsburgh Coal on both sides of the river leads to the belief that the village will eventually become the scene of an extensive mining industry. The **Eureka Pipe Line Company** maintains an oil pumping plant at Layopolis.

**Cedarville.**—Cedarville, the fourth town in point of size in the County, is located on Cedar Creek  $2\frac{1}{2}$  miles northwest of the Gilmer-Braxton County Line. Its population in 1914, by actual count, was 175. Its existence and growth depend entirely on the farming community in which it is situated. It is at the western edge of the great Pittsburgh Coal belt.

**Troy.**—Troy, the fifth town of the County, is located on Leading Creek in the northeastern end of the County. According to G. B. Heckert, Mayor, it was incorporated October 13, 1887, and its population in 1914 was, by actual count 130. It is located in a good farming community, for which it is the supply point.

*Villages.*

The following list gives the population of the unincorporated villages of Gilmer County, small settlements of only a few houses not being listed:

**Gilmer County Villages.**

Villages.	Population 1914.	Villages.	Population 1914.
Alice .....	50(A)	Normantown .....	70(A)
Coxs Mills.....	47(A)	Stouts Mills.....	43(A)
Gilmer .....	300(E)	Stumptown .....	50(A)
Newberne .....	47(A)	Tanner .....	80(A)

A—Actual count by Postmaster or other responsible person.

E—Estimate by Postmaster or other responsible person.

# CHAPTER II.

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## PHYSIOGRAPHY

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### PHYSIOGRAPHIC CHANGES.

The surface features of Lewis and Gilmer present nothing essentially different from other counties in the central and western parts of the State. The hills and ridges that form the present sky line of the topography are the remains of the old peneplain that existed in Cretaceous time and that almost reached base level. Subsequent elevation of the general surface has revised this old peneplain to a much greater height than it formerly occupied and consequent stream erosion has cut great valleys through its surface until little of the original smooth plateau is left. There is a gradual southeastward increase in the height of these tops indicating that the land elevation in late Cretaceous time was more pronounced in this region next to the Alleghany Mountains than in the north-western region.

The stream erosion that followed the Cretaceous epoch has been long continued and shows that the cycle is well advanced. Most of the streams have nearly reached base level as is indicated by the fact that they have little fall even near their headwaters and by the further fact that many of them have courses that meander through broad valleys, showing that the streams developed this phase during the present cycle.

Exceptions to this general condition may be noticed in the Little Kanawha River which has a tortuous course entirely out of harmony with the comparatively narrow valley through which it flows and which evidently developed these meanders in the time of the Cretaceous peneplain and preserved them throughout its subsequent erosion down to its present level.

Along the headwaters of the Little Kanawha in Lewis and Upshur, there is a further deviation from the usual condition caused by the fact that the river and its tributaries in this region are still swift streams, not nearly so far advanced in the erosive cycle as in the western part of the territory, this being caused not alone by the greater elevation of the rocky folds of the crust, but by their greater hardness through which the streams cut more slowly.

There are numerous instances of stream capture. In Freemans Creek District, Lewis, the topographic map shows that the Left Fork of Freemans Creek once was a continuous stream from the Doddridge County Line,  $1\frac{1}{2}$  miles south of Coldwater, to Freemansburg as all the tributary streams along this valley point at the proper angle to prove that this hypothesis is true. In late years, however, Fink Creek, which belongs to the Little Kanawha River basin and lies at a level approximately 200 feet lower than that of West Fork River of which Freemans Creek is a part, cut through the dividing watershed that once existed across the present valley of Fink Creek about  $2\frac{1}{2}$  miles northwest of Churchville, and gradually absorbed the drainage of the Left Fork to the low divide one mile east of Churchville. It is evident that this portion of the valley was once at a much higher level than at present, as the low divide east of Churchville represents the old valley floor, being 220 feet higher than the present drainage at Churchville.

Another striking instance of stream capture is evident in Skin Creek District, Lewis, and Buckhannon District, Upshur, where the Right Fork of Stonecoal Creek has cut its way through the soft shales of the Conemaugh Series, securing the drainage from Wolfpen Run, Straight Run, Pringle Fork, Brushlick Run, Bear Run, Spruce Fork and Gladly Fork, all of which, from their direction, evidently once flowed eastward through Brushy Fork of Fink Run to the Buckhannon River. It is plain from the topographic map that the watershed between Brushy Fork and Right Fork of Stonecoal was once located in Lewis County, a short distance west of Wolfpen Run.

The West Fork River, in the region southwest of Frenchton, has robbed French Creek of much of its drainage, includ-



ing Fall Run, Straight Fork, Crooked Run, and Whites Camp Fork. The divide between the parent streams must have been at one time less than one-half mile east of Jewell Station.

In Gilmer County, a marked change is noticeable in the valley of the Little Kanawha River one-half mile south of Sand Fork where it appears that the river once flowed from the mouth of Duskamp Run northward through the present valley of Lick Run.

Geologic structure does not appear to have influenced the direction of stream flow to any marked degree. The formation of the anticlines and synclines must have been so gradual that the streams preserved their channels intact.

### DRAINAGE BASINS.

The following table, prepared by Gawthrop, gives a list of the principal streams of both counties, their lengths being divided into sections, usually between large tributaries, and the rate of fall and length, both actual stream measurement and air line distances, being determined. The last column shows the ratio between the total distance (T. D.) and the air line distance (A. L. D.). Those having the greatest ratio are usually streams that have the more nearly reached base level:

Table of Stream Data.

Streams.	Total Dis- tance, Miles	Total Fall, Feet	Rate of Fall per Mile, Feet	Air Line Dis- tance, Miles	Ratio T. D. to A. L. D.
West Fork River, Fall Run to Walkersville..	5.7	150	26.3	4.5	1.27
West Fork River, Walkersville to Roanoke...	10.5	35	3.3	4.6	2.29
West Fork River, Roanoke to Weston.....	14.0	40	2.9	7.6	1.84
West Fork River, Weston to Hackers Creek..	13.0	35	2.7	7.8	1.67
Hackers Creek, Ruraldale to Berlin.....	8.0	85	10.6	6.7	1.19
Hackers Creek, Berlin to mouth.....	13.5	60	4.4	7.9	1.71
Jesse Run, Upshur Co. Line to mouth.	5.8	190	32.7	5.0	1.16
Kincheloe Creek, Benson to mouth.....	6.0	70	11.6	5.4	1.11
Freemans Creek, Freemansburg to mouth.	6.2	40	6.4	3.4	1.82
Right Fork, Smoky Fork to Free- mansburg .....	3.1	30	9.7	2.9	1.07

Streams.	Total Dis- tance, Miles	Total Fall, Feet	Rate of Fall per mile, Feet	Air Line Dis- tance, Miles	Ratio T. D. to A. L. D.
Left Fork, upper road fork to Free- mansburg .....	4.3	60	13.9	3.8	1.13
Stoncoal Creek, Snyder Run to mouth...	8.2	80	9.7	6.7	1.24
Right Fork, Gladly Park to Horner...	7.1	220	31.0	5.6	1.26
Polk Creek, Camden to mouth.....	6.0	90	15.0	5.4	1.11
Murphy Creek, Jacks Hollow to mouth...	4.5	80	17.7	3.9	1.16
Skin Creek, Wheeler Fork to Little Skin Creek .....	5.9	45	7.6	4.9	1.20
Skin Creek, Little Skin Creek to mouth..	3.1	35	11.3	2.7	1.16
Little Skin Creek, Hershman Run to mouth .....	3.8	35	9.2	3.5	1.03
Sand Fork, Marsh School to mouth.....	6.0	90	15.0	5.5	1.09
Right Fork, Ireland to Walkersville.....	4.5	55	12.2	3.7	1.21
Little Kanawha River, Arlington to Ingo....	5.0	500	100.0	4.2	1.19
Little Kanawha River, Ingo to Wildcat.....	4.0	90	22.5	3.0	1.33
Little Kanawha River, Wildcat to Burnsville.	22.7	180	7.9	13.5	1.67
Little Kanawha River, Burnsville to Glenville.	17.9	60	3.4	11.1	1.60
Little Kanawha River, Glenville to Russet....	20.6	30	1.5	12.4	1.66
Steer Creek, Forks to mouth.....	5.8	30	5.2	4.0	1.54
Bear Fork, Trace Fork to mouth.....	5.3	100	18.9	3.7	1.43
Left Fork, German to Steer Run.....	13.0	150	11.5	7.5	1.73
Left Fork, Steer Run to mouth.....	5.9	30	5.1	3.7	1.70
Steer Run, Mark Run to mouth.....	3.4	150	44.4	3.1	1.09
Right Fork, Rosedale to Crooked Fork...	7.0	65	9.3	4.4	1.60
Right Fork, Crooked Fork to mouth.....	5.7	20	3.5	3.4	1.68
Crooked Fork, Progress to mouth....	7.2	130	18.4	6.4	1.12
Tanner Creek, Shanty Run to Tanner....	6.4	150	23.4	5.8	1.10
Tanner Creek, Tanner to mouth.....	5.6	55	9.8	4.2	1.33
Grass Run, Lettergap to mouth.....	5.2	140	27.0	4.4	1.18
Cedar Creek, Cutlips to Cedarville.....	8.2	70	8.5	5.1	1.61
Cedar Creek, Cedarville to Grandcamp Run...	10.4	70	6.7	5.8	1.79
Cedar Creek, Grandcamp Run to mouth.....	5.0	15	3.0	3.2	1.56
Sinking Creek, Garfield Run to mouth.....	5.7	135	23.7	4.6	1.24
Leading Creek, 80°35' meridian to Alum Fork.	5.7	200	35.1	4.3	1.32
Leading Creek, Alum Fork to Cove Creek....	8.0	75	9.3	6.0	1.33
Leading Creek, Cove Creek to Alice.....	6.0	10	1.7	3.0	2.00
Leading Creek, Alice to mouth.....	8.2	30	3.7	4.7	1.75
Horn Creek, Coxs Mills to mouth.....	4.1	55	13.4	3.1	1.32
Cove Creek, Leopold to Big Run.....	4.6	80	17.4	3.7	1.24
Cove Creek, Big Run to mouth.....	4.7	35	7.4	3.7	1.27
Little Cove Creek, Lewis Co. Line to mouth.....	4.4	190	43.2	4.0	1.10
Fink Creek, Churchville to Dry Fork....	3.9	75	19.2	3.2	1.22
Fink Creek, Dry Fork to Vadis.....	8.0	80	10.0	5.4	1.48
Fink Creek, Vadis to mouth.....	4.1	30	7.3	2.6	1.59
Stewart Creek, Baldwin to mouth.....	5.3	105	19.8	4.2	1.26
Sand Fork, Wolfpen Run to Copley.....	7.1	140	19.7	5.7	1.24
Sand Fork, Copley to Indian Fork.....	6.1	60	9.8	3.9	1.56
Sand Fork, Indian Fork to mouth.....	5.0	20	4.0	3.1	1.61
Ellis Creek, Right Fork to mouth.....	2.8	100	35.6	2.0	1.40
Indian Fork, Goosepen Run to mouth.....	9.0	170	18.9	7.0	1.28

Streams.	Total Dis- tance, Miles	Total Fall, Feet	Rate of Fall per mile, Feet	Air Line Dis- tance, Miles	Ratio T. D. to A. L. D.
Copen Run, Bull Fork to mouth.....	4.2	130	31.0	3.0	1.40
Oil Creek, Twolick Run to Orlando.....	4.4	100	22.6	3.9	1.13
Oil Creek, Orlando to mouth.....	3.6	15	4.2	3.5	1.03
Clover Fork, First road fork to Orlando..	5.2	200	38.4	4.0	1.30
Right Fork, Cleveland to Wildcat.....	5.2	335	64.4	3.8	1.39
Glady Creek, First road fork to Duffy.....	3.1	65	21.0	2.6	1.19
Glady Creek, Duffy to mouth.....	2.2	210	95.4	1.9	1.16
Cherry Fork, First fork to mouth.....	2.1	220	104.9	1.9	1.11

The following table, prepared by Gawthrop, gives a planimetric determination of the areas of the different drainage basins of the two counties, the U. S. topographic sheets being used for authority:

### Areas of Drainage Basins.

Streams.	Square Miles.
<b>West Fork River, including Hackers Creek.....</b>	<b>298.00</b>
Hackers Creek, total above mouth.....	54.40
Jesse Run.....	10.74
Kincheloe Creek.....	21.30
Freemans Creek.....	31.00
Stonecoal Creek.....	49.95
Polk Creek.....	11.30
Murphy Creek.....	6.50
Rush Run.....	6.75
Skin Creek, total above mouth.....	33.00
Little Skin Creek.....	9.10
Sand Fork.....	12.35
Right Fork.....	11.50
<b>Little Kanawha River, including Steer Creek.....</b>	<b>915.00</b>
Steer Creek, total above mouth.....	209.30
Bear Fork.....	18.00
Right Fork, total above mouth.....	92.20
Crooked Fork.....	16.35
Left Fork, total above mouth.....	50.40
Steer Run.....	8.10
Tanner Creek.....	36.70
Grass Run.....	12.50
Cedar Creek.....	81.55
Sinking Creek.....	10.30
Leading Creek, total above mouth.....	146.65
Horn Creek.....	20.20
Cove Creek.....	32.20
Fink Creek.....	42.95

Streams.	Square Miles.
Stewart Creek.....	9.40
Sand Fork, total above mouth.....	79.45
Ellis Creek.....	7.50
Indian Fork.....	22.50
Duskcamp Run.....	8.60
Copen Run.....	9.65
Oil Creek, total above mouth.....	31.90
Clover Fork.....	9.25
Right Fork.....	37.50
Glady Creek.....	8.50
Cherry Fork.....	4.20

### West Fork River.

The West Fork River, which forms the principal drainage basin of Lewis, is a northward flowing stream, being one of the constituent branches of the Monongahela at Fairmont. Its source is in Upshur County, three miles southwest of Rock Cave. The elevation at its source is 1700' and at the Lewis-Harrison Line is 975' above sea level, and at Fairmont 880', a total fall of 820'; and its length from head to mouth is 100 miles. Its course is through a farming region, most of the land being cleared, the result being that the river has torrential floods in winter and spring, and its flow is reduced to a minimum in the summer and autumn when water is most needed. The total area of its drainage basin is 843 square miles, and of that portion above and including Hackers Creek is 298 square miles.

The principal tributaries of the West Fork in Lewis County are Hackers Creek, Kincheloe Creek, Freemans Creek, Stonecoal Creek, Polk Creek, Murphy Creek, Rush Run, Skin Creek, Sand Fork, and Right Fork.

**Hackers Creek** rises in Upshur County at an elevation of about 1750' and flows westward entirely across Lewis, emptying into the West Fork in Harrison County. the elevation of its mouth being 980', making a total fall of 770 feet. Its course from the head to Berlin is nearly straight but from Berlin to its mouth the valley is wide and the creek has a meandering course, showing that it has nearly reached base level. The area of its drainage basin is 54.4 square miles.

**Kincheloe Creek** rises at the corner of Lewis, Harrison and Doddridge, at an elevation of 1500', and flows eastward to

the West Fork, a distance of 8.5 miles, the elevation of its mouth being 980', making a total fall of 520 feet. The area of its drainage basin is 21.3 square miles.

**Freemans Creek** rises at the Lewis-Doddridge Line and flows eastward to the West Fork, the tidal elevation of its source being 1500' and its mouth 1000', making a total fall of 500' in a length of 12.5 miles. The area of its drainage basin is 31 square miles.

**Stonecoal Creek** rises in Upshur County at an elevation of 1700', flows northwestward to the West Fork at Weston, a distance of 15.5 miles, the elevation of its mouth being 1000', making a total fall of 700 feet. The area of its drainage basin is 49.95 square miles.

**Polk Creek** rises along the Freemans Creek-Courthouse District Line, at an elevation of 1550', flows eastward 7.5 miles to the West Fork at Weston where its elevation is 1000', making a total fall of 550 feet. The area of its drainage basin is 11.3 square miles.

**Murphy Creek** rises in Courthouse District, near Edmis-ton, at an elevation of 1550'. flows northeastward a distance of 5.5 miles to the West Fork, where its elevation is 1010' making a total fall of 490 feet. The area of its drainage basin is 6.5 square miles.

**Rush Run** rises in Courthouse District at an elevation of 1525', flows nearly north and almost parallel to the West Fork until it joins the latter stream. Its total length is 5 miles and the elevation at its mouth is 1015', the total fall being 510 feet. The area of its drainage basin is 6.75 square miles.

**Skin Creek** rises at the Lewis-Upshur Line near Abbott, at an elevation of 1700', flows northwestward a distance of 11 miles to the West Fork where its elevation is 1015', making a total fall of 685 feet. The area of its drainage basin is 33 square miles.

**Sand Fork** rises in Upshur County, near Frenhton, at an elevation of 1800', flows northwestward a distance of 8.5 miles to the West Fork at Roanoke, where its elevation is 1040', making a total fall of 760 feet. The area of its drainage basin is 12.35 square miles.

**Right Fork** rises at the Lewis-Braxton Line, near Letch.

at an elevation of 1750', flows northward 6 miles to its junction with the West Fork at Walkersville where its elevation is 1080', making a total fall of 670 feet. The area of its drainage basin is 11.5 square miles.

### Little Kanawha River.

The Little Kanawha River, which flows across the southern end of Lewis and entirely across Gilmer, has its rise near Craddock in Upshur, at an elevation of 2765 feet. Its elevation at the western edge of Lewis is 950'; at the western edge of Gilmer, 680'; and at its junction with the Ohio River at Parkersburg, 564', making a total fall of 2201 feet. Except at the headwaters where there is a considerable forest area, most of its course is through a cleared region and it is subject to floods in winter and spring. Several careful hand leveled measurements show that its flood plain has a height of 28 feet at Hattie, 31 feet at Millseat Run, 31 feet at Glenville, 27 feet at Sand Fork, and 26 feet at Stouts Mills. Its general course is northwestward at right angles to the mountain folds. Its length is 145 miles and its drainage basin has an area of about 2150 square miles.

Its principal tributaries in Gilmer are Steer Creek, Tanner Creek, Grass Run, Cedar Creek, Sinking Creek, Leading Creek, Sand Fork, Duskcamp Run and Copen Run. Its tributaries in Lewis include Oil Creek, Right Fork, Glady Creek and Cherry Fork.

**Steer Creek** rises in Braxton near Dessie, at an elevation of 1500', and flows northward 28.5 miles to Russet in Calhoun where it empties into the Little Kanawha at an elevation of 675', making a total fall of 825 feet. Its total drainage basin has an area of 209.3 square miles. In comparison to its length, the drainage basin seems large, but this is due to the fact that the creek has several unusually large tributaries, making a wide fan-shaped basin.

**Tanner Creek** rises at the Ritchie-Gilmer Line north of Newberne at an elevation of 1340', and flows southwestward 14 miles to the Little Kanawha at Latonia, where its elevation is 685', making a total fall of 655 feet. The area of its drainage basin is 36.7 square miles.

**Grass Run** rises near Lettergap at an elevation of about 1400', and flows northwestward 6.5 miles to the Little Kanawha, where its mouth is 685' above sea level, making a total fall of 715 feet. Its drainage basin has an area of 12.5 square miles.

**Cedar Creek** rises in Braxton, near Flatwoods, at an elevation of 1650', and flows northwestward 32 miles to the Little Kanawha, where its elevation is 690', making a total fall of 960 feet. The area of its drainage basin is 81.55 square miles. This area is less than half that of Steer Creek, although the length of Cedar Creek is the greater of the two.

**Sinking Creek** rises in Gilmer northeast of Newberne, at an elevation of 1380', and flows southward 7.6 miles to the Little Kanawha, where its elevation is 695', making a total fall of 685 feet. Its drainage basin has an area of 10.3 square miles.

**Leading Creek** rises in Lewis just east of Camden Gas Station at an elevation of 1500', and flows southwestward 28.5 miles to Revel where it joins the Little Kanawha, at an elevation of 695', making a total fall of 805 feet. The area of its drainage basin is 146.65 square miles. It has three large tributaries, Horn Creek, Cove Creek and Fink Creek.

**Stewart Creek** rises in Troy District, Gilmer, near Linn, at an elevation of about 1300', and flows southwestward 7 miles to the Little Kanawha above Glenville, the elevation of its mouth being 705', making a total fall of 595 feet. The area of its drainage basin is 9.4 square miles.

**Sand Fork** rises in Courthouse District, Lewis, 2½ miles east of Gillooly, at an elevation of 1500', and flows southwestward 19.5 miles to Layopolis, where it empties into the Little Kanawha, the elevation of its mouth being 720', making a total fall of 780 feet. The area of its drainage basin is 79.45 square miles. Its principal tributaries are Ellis Creek, Indian Creek and Butchers Fork.

**Duskcamp Run** rises in Gilmer along the Center-Glenville District Line. at an elevation of 1500' and flows northward 4 miles to the Little Kanawha River above Layopolis, the elevation at its mouth being 725', making a fall of 775 feet. Its drainage basin has an area of 8.6 square miles.

**Copen Run** rises in Braxton County, near Delta, at an elevation of 1500', and flows northward 6.4 miles to Gilmer Station, where it empties into the Little Kanawha, at an elevation of 730' making a fall of 770 feet. The area of its drainage basin is 9.65 square miles.

**Oil Creek** rises in Lewis near Arnold Station, at an elevation of 1300' and flows southwestward 9.5 miles to Burnsville, Braxton County, where it empties into the Little Kanawha, the elevation at its mouth being 740', making at total fall of 560 feet. The area of its drainage basin is 31.9 square miles. Clover Fork, its principal tributary, empties into it from the south at Orlando.

**Right Fork** of Little Kanawha River rises at the common corner of Upshur, Lewis and Webster, at an elevation of 2765', flows northwestward 12 miles to the Little Kanawha at Wildcat, where its elevation is 940', making a total fall of 1825 feet. The area of its drainage basin is 37.5 square miles. Most of the territory through which it flows is wooded, and the flow is more constant than along the lower portion of the Little Kanawha. For most of its length, Right Fork is a rapid, shallow stream.

**Gladly Creek** rises at Boyd along the Upshur-Lewis Line, at an elevation of about 1750', and flows southwestward 6 miles to Bablin, where it empties into the Little Kanawha, at an elevation of 995', making a total fall of 755 feet. The area of its drainage basin is 8.5 square miles. The stream owes its name to the fact that above Duffy for several miles there is little fall, since the valley is in the soft shales of the Conemaugh and the bottoms are gladly. Below Duffy, however, the creek has a tumultuous course over the hard rocks of the lower Allegheny and Upper Pottsville Series.

**Cherry Fork** of Little Kanawha River rises in Upshur at an elevation of 1750' and flows southwestward 3.5 miles to the Little Kanawha at Ingo, where its elevation is 1035', making a total fall of 715 feet. The area of its drainage basin is 4.2 square miles. Like the other tributaries along the headwaters of the Little Kanawha, Cherry Fork is a rapid, turbulent stream.



## TOPOGRAPHIC FEATURES.

Lewis and Gilmer offer little that is striking or unusual in their topographic forms. The surface features of both counties show a regular succession of ridges separated by long creeks, with frequent high tops reaching from 100 to 200 feet above the general ridge levels and occasional low divides where the creeks on both sides have sawed notches into the ridges. The ridges vary from about 300 feet in the northern part of the area to about 700 feet in the southern part, or panhandle, of Lewis.

An exception to the general topographic succession is visible in eastern Lewis, where Stonecoal Creek, Big and Little Skin Creeks, Sand Fork and West Fork have cut their way nearly to base level against the high plateau that exists just across the Upshur County Line, the level of which is about 400 feet above that of the main tributary streams of the West Fork Valley in Lewis.

The erosive work of these streams tends to increase, year by year, the drainage basin of West Fork, and decrease that of the Buckhannon River.

## RIVER TERRACES.

Terrace clays were observed both along the West Fork River and along the Little Kanawha and some of its tributaries.

The following table shows the locality and elevation above the stream level of the top of the terrace deposits noted along West Fork River :

Locality.	Tidal Elevation Top.	Height of Top of Deposits Above Drainage.
Mouth of McCann Run.....	1090' B.	110' B.
Mouth of Maxwell Run.....	1060' B.	60' B.
Mouth of Carrion Run.....	1070' B.	40' B.
Arnold Station.....	1102' L.	50' B.

At McCann Run, in northern Lewis, thick deposits of loose sand are visible on both sides of the river. The elevation of these deposits seems to indicate that they belong to the

third Ohio River terrace, as described by White.<sup>1</sup> The last thin deposits noted, which occur at a lower level, probably represent the first terrace. These deposits are plainly visible in the cuts along the Monongahela Valley Traction Company line opposite Maxwell Run, where a thickness of 15 feet was noted, the top being 1060' above sea level.

Along the Little Kanawha River and its tributaries, deposits were noted at the following localities:

Locality.	Tidal Elevation, Top.	Height of Top of Deposits Above Drainage.
Cedar Creek, one mile above Paddy Run.....	825' B.	125' B.
Glenville .....	820' B.	120' B.
Sand Fork.....	810' B.	90' B.
Stouts Mills.....	830' B.	105' B.
Andy Run, one-half mile above (near Cleveland).....	1320' B.	145' B.
Jerry Run (near Cleveland).....	1320' B.	135' B.

These deposits all evidently represent the third Ohio River terrace, showing a remarkable continuation of this terrace up the Little Kanawha, the last two deposits noted being within six or seven miles of the source of the stream and about 140 miles from its mouth.

<sup>1</sup>Sec. Geol. Survey of Penna., Report Q, p. 10.

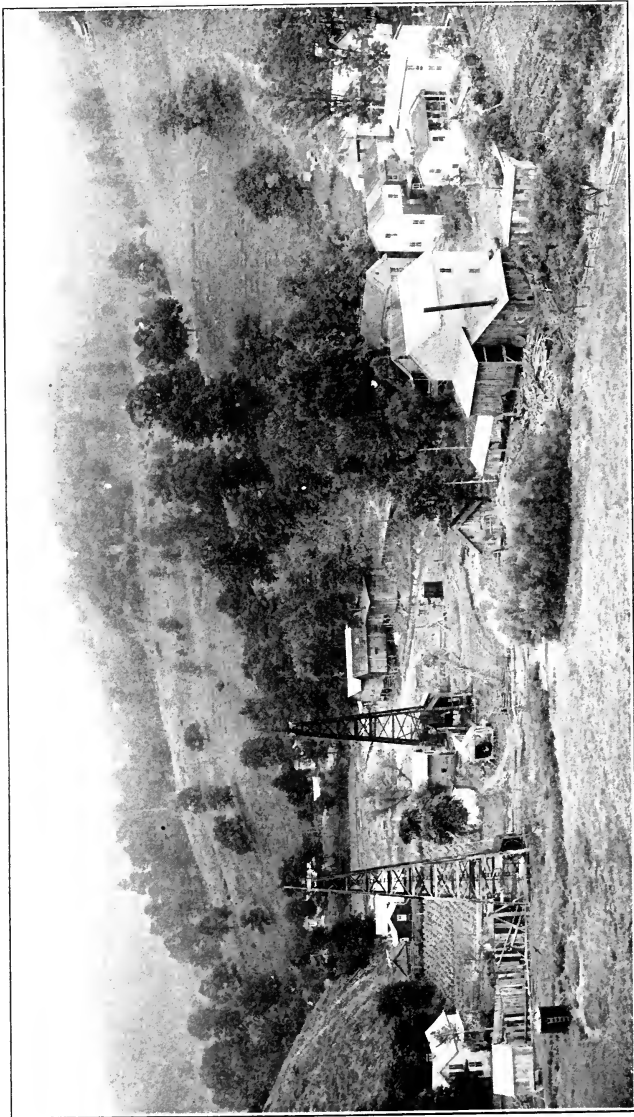


PLATE IV.—View of Churchville, Lewis County; showing oil wells and Topography of the Dunkard and Monongahela Series; the Uniontown Sandstone appears in the central upper portion.



# PART II.

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## Geology.

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### CHAPTER III.

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#### STRUCTURE.

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##### Description of Terms.

Geologic structure, which is that branch of geology treating of the pitch of the stratified rocks, has been discussed at length in previous Reports of the Survey. Since these Reports are available, the discussion will not be repeated here, but the following paragraph, taken from a former Report,<sup>1</sup> gives a definite idea of simple scientific terms that will benefit the general reader:

"In the discussion of these structural forms on subsequent pages, the upward bending arch is known as an **anticline**; the downward bending trough, a **syncline**; the line joining the highest points of an anticline or the lowest points of a syncline, the **axis** of the fold; the direction of the horizontal edges of dipping strata, the **strike**; and the structural form resulting from the sudden rise or fall of the axis of an anticline, the **nose** of the fold."

##### Method of Representing Structure.

The contour method of representing structure has been used in the Lewis and Gilmer area. By this method of representation, a single coal bed or other prominent and easily

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<sup>1</sup>Ray V. Hennen, Monongalia-Marion-Taylor Report, W. Va. Geol. Survey, p. 76; 1913.

recognized geological horizon is used as a "key" rock, and its elevation above sea level is determined either by observations made directly upon it or by its interval being computed from other known horizons above or below it in the rock column. The **Pittsburgh Coal** is the most important as well as one of the most easily recognized horizons in the Lewis and Gilmer area, and has therefore been used as the key rock for determining structure. The elevation of the base of this coal above sea level is shown on Map II, which accompanies this Report in a separate atlas, by means of green structure contour lines, each of which is plainly marked with figures, to show the height above sea level, in feet, that it represents. Each contour line is a line of strike showing that the Pittsburgh Coal is at the same height above sea level at all points through which the line passes. The contour interval is 25 feet, making it possible to know, with reasonable certainty, not only the elevation of the Pittsburgh Coal, but also that of any other formation desired in the rock column at any given point, by merely adding or subtracting its known interval from the Pittsburgh Coal, depending upon whether it is above or below the coal. These elevations were obtained, where possible, by hand level from known points on the topographic map, made directly on the coal. In other cases the aneroid was used and carefully checked at numerous times during the day on spirit level determinations recorded on the map. In western Gilmer, as well as in some other parts of the area, the Pittsburgh Coal was found to be absent, but its horizon makes a broad bench that can usually be followed without much difficulty, thus aiding greatly in securing observations for the structure map. In regions where this coal was found to be under drainage, its position was often obtained from the records of oil and gas wells. In regions where direct information could not be had on the horizon of the coal itself observations were made on whatever other coals or formations could be found above drainage and recognized, and the position of the Pittsburgh determined from these. There is no large variation in the thickness of the several formations; viz, Monongahela, Cone-maugh and Allegheny. in this area, but in order to secure the best possible results numerous vertical sections were made at

different points. From these sections the following table is compiled showing the approximate distance in feet of the most important formations above and below the Pittsburgh Coal, at points where such information is available, and the table was used in making the structure map as well as in cropping the coals on Map II. In this table some of the lower oil and gas sands are included, but no formations below the Big Lime were used in making the structure map. The intervals to these latter formations are given for the convenience of the reader when studying the oil and gas well records of Chapter X.

The sections from which the following table was made, as well as many other sections, are published in Chapter IV and should be carefully studied by those who desire to make local investigations of any coal or other formation, since they contain much detailed information that can not be shown in the table of intervals or on Map II. In order to find the approximate elevation of any coal, its interval from the Pittsburgh should first be obtained from the following table or from the local section given for the nearest point. With the structure contours as a guide, the coal should then be easily found:

## Intervals Above and Below the Pittsburgh Coal.

Formation.	Berlin.	Jane Lew.	Weston.	Fremansburg	Hurst.	Copley.	Gaston.	Vandalia.	Roanoke.	Orlando.	Crawford.	Cleveland.	Newberne.	Tanner.	Glenville.	Stouts Mills.	Stumptown.	Rosedale.
Washington Coal.....	.....	.....	.....	.....	575	600	500	.....	.....	.....	.....	.....	.....	525	.....	.....	.....	.....
Waynesburg Coal.....	350	350	375	.....	375	385	340	350	375	375	.....	.....	375	375	350	400	375	375
Uniontown Coal.....	250	250	290	.....	285	285	250	250	285	260	.....	.....	285	285	250	290	275	265
Sewickley Coal.....	100	100	125	.....	125	125	110	120	125	125	.....	.....	.....	140	100	125	125	110
Redstone Coal.....	40	40	50	40	50	50	40	40	50	50	.....	.....	.....	.....	40	.....	.....	50
<b>Pittsburgh Coal.....</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
Little Clarksburg Coal.....	110	100	100	110	.....	100	100	100	100	100	100	.....	.....	.....	100	.....	100	100
E k Lick Coal.....	225	225	.....	210	.....	220	225	225	225	200	200	.....	.....	.....	.....	250	.....	.....
Harlem Coal.....	275	275	.....	265	.....	.....	.....	275	.....	250	275	.....	.....	.....	.....	310	.....	300
Bakerstown Coal.....	.....	375	.....	.....	.....	.....	.....	375	.....	400	375	375	375	400	450	450	.....	450
Brush Creek Coal.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	450	.....	.....	.....	.....	.....	.....	.....
Upper Freeport Coal.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	550	550	.....	.....	.....	600	.....	650
Upper Kittanning Coal.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	650	675	.....	.....	.....	.....	.....	750
Lower Kittanning Coal.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	765	.....	.....	.....	770	.....	.....
Homewood Sandstone, top.....	800	700	800	.....	750	800	.....	.....	775	800	775	775	.....	775	750	775	800	900
Salt Sand, base.....	1200	1150	1300	.....	1150	1400	.....	.....	1350	1525	.....	1500	1200	1200	1375	1375	1550	1700
Big Lime, top.....	1600	1550	1600	1500	1450	1650	.....	.....	1725	1700	.....	2100	1375	1450	1575	1600	1600	1800
Berea Sand, top.....	1950	1900	2000	.....	1825	2100	.....	.....	2125	1900	.....	2625	1850	1775	.....	.....	.....	.....
Gordon Sand, top.....	2250	2250	2300	2200	.....	2300	.....	.....	2425	2250	.....	.....	2150	2125	.....	2400	.....	.....
Fifth Sand, top.....	2425	2425	2450	2380	.....	2475	.....	.....	2550	.....	.....	.....	2300	.....	.....	2550	.....	.....



## DETAILED STRUCTURE.

### General Features.

As shown by Map II, the structure of Lewis and Gilmer has been only slightly disturbed by upward or lateral movements of the earth's crust.

There is a gradual rise from the northwest to the southeast, accentuated by the Chestnut Ridge Anticline and interrupted by the Grassland Syncline, structural features, both of which pass entirely across the area. The pitch of the rocks is nowhere excessive, being usually hardly perceptible to the eye, careful levels on the coals being necessary to determine the nature and rate of change. The lowest point of structure found in either county was near Spurgeon, in northeastern Gilmer, where the Pittsburgh Coal descends to less than 425 feet above sea level, along the Robinson Syncline. The highest structural level is at Cleveland, at the common corner of Lewis, Upshur and Webster, where the Pittsburgh Coal horizon belongs above the top of the mountains, and would have an elevation of 2375 feet above sea level. The general direction of most of the anticlines and synclines is, roughly, northeast and southwest, corresponding closely to the trend of the Appalachian Mountain System. Only one anticline and one syncline extend entirely across the two counties. There are no features of unusual interest or occurrence.

The structure map, on the whole, harmonizes closely with those previously issued by the Survey, contiguous to this area, one for Calhoun, Roane and Wirt, one for Ritchie, and one for Doddridge and Harrison. The maps for Calhoun and Ritchie are based on the Washington Coal, 500 to 600 feet above the Pittsburgh, so that being on different strata, the contours of the two maps do not join with that for Gilmer, but when the proper interval is allowed there is little discrepancy. The map for Doddridge and Harrison is based on the Pittsburgh Coal, and the contours join exactly along the most of this line.

### Anticlines.

Four anticlines, the Arches Fork, Wolf Summit, Chestnut Ridge, and Orlando, appear on the structure map.

**Arches Fork Anticline.**—The Arches Fork Anticline of Hennen<sup>2</sup> has been previously traced across southern Wetzel, Doddridge, and a corner of Ritchie County, intersecting the Gilmer Line two miles east of Auburn. A supposed continuation of this anticline was also traced across Calhoun, on the west, entering Gilmer one-fourth mile southeast of Nobe. The studies carried on by the writer in Gilmer County indicate that the Arches Fork Anticline apparently flattens out against the gradual slope of the Chestnut Ridge Anticline near where it crosses the Gilmer Line from the north and that the anticline on the west, supposed to be the same one, can be traced only about three miles into the county from Nobe, apparently dying out. The connection that may exist between these two ends of the fold is so slight in Gilmer County that it can not be shown on the map.

Where the short extension of the Arches Fork Anticline enters Gilmer from the west, the Pittsburgh Coal horizon has an elevation of 550 feet and is dipping slightly along the axis toward the northeast.

**Wolf Summit Anticline.**—The Wolf Summit Anticline of White, described by Hennen in the Doddridge-Harrison Report, page 56, enters Lewis County one mile east of the West Fork River, extends southward three and one-half miles to a point one-half mile southeast of Jackson Mill, where it joins the Chestnut Ridge Anticline almost at right angles. At the Lewis-Harrison Line the Pittsburgh Coal has an elevation of 1400 feet on the axis of the arch, and at the junction of the two anticlines, the elevation is the same, but there is an intervening saddle east of Lightburn, where the coal is only 1375 feet. The fold is decidedly unsymmetrical about its axis, as the coal dips rapidly on the west toward the Robinson Syncline, while on the east there is only a slight dip toward the south end of

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<sup>2</sup>Ray V. Hennen, Marshall-Wetzel-Tyler Report, W. Va. Geol. Survey, p. 454; 1909.

the Shinnston Syncline. The surface geology along the fold in Lewis is principally that of the Conemaugh Series, as the Monongahela touches only the high ridges.

**Chestnut Ridge Anticline.**—The Chestnut Ridge Anticline, first designated by J. J. Stevenson from a ridge of the same name in Fayette County, Pennsylvania, is the most important structural uplift in Lewis and Gilmer. It crosses the Lewis-Harrison Line 1.5 miles west of the common corner of Lewis, Harrison and Upshur, extends in a general southwestward direction through Jacksons Mill and Camden, passes about one mile southeast of Alum Bridge and Linn, extends through Baldwin, crosses the Little Kanawha River at Glenville, passes about one mile eastward from Lettergap and Normantown, crosses Steer Creek at the mouth of Crooked Fork and reaches the Calhoun Line at a point one mile east of the common corner of Lee, Washington and Center Districts. Along most of its length, the fold is symmetrical about its axis, the dip being usually about the same on the northwest and southeast sides.

The surface geology along the axis is principally that of the Monongahela and Conemaugh Series. The Pittsburgh Coal is above drainage at all the principal stream crossings. At the Lewis-Harrison Line the coal has an elevation of 1400 feet, but descends to a saddle at Hackers Creek where it is only 1350, rises again to a dome with an elevation of 1400 feet at Jacksons Mill, where it intersects with the Wolf Summit Anticline, dips continuously at the average rate of 30 feet to the mile throughout the next fifteen miles to the Gilmer Line, where the elevation is 950 feet, rises to a low dome with an elevation of 1000 feet on Stewart Creek near Baldwin, dips again to a saddle between the Little Kanawha and Cedar Creek, where its elevation is only 925 feet, rises again to a dome near Lettergap, with an elevation of 975 feet, and descends gradually to the Calhoun Line, where it is 900 feet above sea level. There is a total southwestward dip of 500 feet along the axis between the Harrison-Lewis and the Gilmer-Calhoun Lines, the distance being 46 miles, making an average dip of about 11 feet per mile.

**Orlando Anticline.**—The Orlando Anticline, not previously named or described, is an arch in southern Lewis between the Grassland and Roanoke Synclines, having its northern terminus along Rush Run,  $1\frac{1}{2}$  miles southwest of Brownsville, and extending southwest, 11 miles, to the Coal and Coke Railway, which it crosses at the mouth of Road Run, three-fourths mile west of Orlando, beyond which it has not been traced. It crosses the Lewis-Braxton Line one mile north of Orlando. This anticline is almost straight and nearly symmetrical about its axis, the dip being slightly more rapid on the western side.

The surface geology along the arch is principally that of the Monongahela and Conemaugh Series. At its northern terminus the Pittsburgh Coal has an elevation of 925 feet, but rises rapidly southwestward until it has an elevation of 1075 feet along the Courthouse-Collins Settlement District Line near Rush Knob, and descends to about 1050 feet at Orlando.

### Synclines.

Four synclines, the Robinson, Shinnston, Grassland, and Roanoke, appear on the structure map.

**Robinson Syncline.**—The Robinson Syncline of Hennen<sup>4</sup> enters Gilmer County from Doddridge one mile east of Spurgeon and can be definitely traced southwestward for a distance of four miles to a point near Coxs Mill, when it merges into the general monoclinical slope west of the Chestnut Ridge Anticline for the next ten miles, but again assumes a distinct synclinal form one mile northeast of Revere, and extends southwestward four miles to the Gilmer-Calhoun Line. The two portions of the fold shown in Gilmer are lacking in symmetry, the rise of the southeast side being much more rapid at both ends than on the northwest side.

The surface geology along the syncline is principally that of the Dunkard Series. At the Doddridge-Gilmer Line the Pittsburgh Coal horizon has an elevation of slightly over 400 feet, but rises rapidly along the axis to about 550 feet at the

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<sup>4</sup>Ray V. Hennen, Marshall-Wetzel-Tyler Report, W. Va. Geol. Survey, p. 69; 1909.

point where the fold becomes monoclinial. At the Gilmer-Calhoun Line, its elevation is 500 feet.

**Shinnston Syncline.**—The Shinnston Syncline of Hennen<sup>b</sup> enters Lewis County from Harrison one mile and a half north-west of Jane Lew, but dies out against the slope of the Chestnut Ridge Anticline, in a shallow, fan-shaped basin in the region of Jane Lew, hardly more than a mile from the county line. The surface geology is that of the Monongahela and Conemaugh Series, the Pittsburgh Coal having an elevation of 1350 feet at the county line.

**Grassland Syncline.**—The Grassland Syncline of Hennen<sup>c</sup> is the longest structural feature of the two counties, passing entirely across them in a northeast-southwest direction. At the northeast it crosses the Upshur-Lewis Line one-half mile southeast of Aberdeen, Stonecoal Creek at Hilly Upland Run, the West Fork River at Stonelick Run, about two miles south of Weston, passes through Edmiston and Copley, crosses Indian Fork one-half mile above its mouth, the Little Kanawha River at Duskcamp Run, about midway between Sand Fork and Stouts Mills, passes through Cedarville, veers southward and crosses Crooked Fork one-fourth mile north of the Braxton Line, turns westward, crossing Right Fork of Steer Creek at Big Laurel Run, finally ending against the slope of the Chestnut Ridge Anticline at Bear Fork, two miles south of the mouth of Standingstone. During most of its length, the fold is symmetrical about its axis, having about the same rate of rise on either side.

The surface geology along this axis is principally that of the Dunkard and Monongahela Series, the upper part of the Conemaugh cropping only in northeastern Lewis, on Stonecoal and Hackers Creek waters. At the Upshur-Lewis Line, the Pittsburgh Coal is 1225 feet above sea level, but dips steadily southwestward for the next 18 miles until at the point where the basin crosses Sand Fork, near Copley, it is only 625 feet, the dip being 33 feet to the mile. For the next nine miles of

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<sup>a</sup>Ray V. Hennen, Doddridge-Harrison Report, W. Va. Geol. Survey, p. 63; 1912.

<sup>b</sup>Ray V. Hennen, Doddridge-Harrison Report, W. Va. Geol. Survey, p. 65; 1912.

its length between Copley and the Little Kanawha River, the axis forms the bottom of a great structural canoe-shaped depression, of almost perfect symmetry from every angle. In the northeastern end of this basin is located the greatest oil well ever drilled in West Virginia, the Copley Heirs No. 1 (363), which gushed oil at a rate of 10,000 to 12,000 barrels daily. From the Kanawha River, the Pittsburgh Coal rises continuously for 12 miles, until, at Crooked Fork, it has an elevation of 900 feet, the rate of rise being 26 feet per mile. Between Crooked Fork and Road Run, there is a high structural saddle where the coal horizon remains at 900 feet, for more than two miles.

**Rosedale Basin.**—At the extreme western end of the Grassland Syncline, where it ends against the slope of the Chestnut Ridge Anticline, the Pittsburgh Coal horizon dips to a low structural basin that is the most noticeable feature on the structure map. The basin is almost symmetrical in form, four miles long and two and one-half miles wide across the axis of the syncline. At the outer rim, the coal has an elevation of 900 feet, but at the bottom, beneath Tanner Fork, it is only 725 feet, making a total dip of 175 feet. For convenience this structural feature will be called the **Rosedale Basin**. It seems evident that the basin was formed by a structural eddy developed at the intersection of two dynamic forces, one acting upward to form the Chestnut Ridge Anticline, while the other was acting downward to form the Grassland Syncline.

**Roanoke Syncline.**—The Roanoke Syncline, not previously named or described, is a structural trough in southern Lewis that branches from the Grassland Syncline three-fourths mile northward from Brownsville, and extends southwestward, 11 miles, to the Braxton Line, beyond which it has not been traced. Its course from Brownsville is almost south for five miles, following closely the valley of the West Fork River to a point one-half mile northwest of Roanoke, where it veers toward the southwest, crossing the Baltimore and Ohio Railroad at Peterson, and the Coal and Coke at the mouth of Meadow Run, formerly known as Blake post-office. This syncline is almost symmetrical about its axis, the rise of the rocks being slightly faster on the east than on the western side.

On the eastern side of the basin, the rocks rise continuously southeastward at a rapidly increasing rate all the way to the southeastern corner of Lewis County.

The surface geology is principally that of the Dunkard and Monongahela Series, the Conemaugh cropping only along Oil Creek and Clover Fork. The Pittsburgh Coal horizon is almost level along the axis of the basin. At the north end it is 925 feet above sea level, but rises to 975 at Canoe Run, where there is a structural saddle at this level. Along the axis on Oil Creek and Clover Fork, the coal is slightly less than 975 feet.

### Unconformities and Faults.

There are no unconformities of consequence visible in the surface rocks of the two counties. Some of the geological series, as will be explained later, do not reach their maximum development as compared to other portions of the State, but the principal features are represented and the intervals are fairly constant. Underground, however, the records of borings reveal the usual unconformity, known to exist generally throughout the Appalachian region, between the base of the Pennsylvanian and the top of the Mississippian. Along the western edge of Gilmer almost the entire Mauch Chunk Series is found to have been eroded before the deposition of the Pottsville above it, the thickness of the former in some places being less than 100 feet, while in eastern Lewis it sometimes exceeds 400. The erosion that took place along the eastern edge, where the maximum thickness of Mauch Chunk sediments is found, is a matter of speculation entirely, as, so far as is known, no facts are obtainable on which to base an estimate. The sharp lithologic change, however, from red shale to coarse conglomeratic gray sandstones, indicates a long lapse of time as well as a marked contrast in conditions of sedimentation.

So far as known there are no faults in either county. None was observed and the structural slopes are too gentle to favor their occurrence.

# CHAPTER IV.

## STRATIGRAPHY--GENERAL SECTIONS.

### INTRODUCTION.

The surface rocks of Lewis and Gilmer, with the exception of Quaternary sands and gravels along the streams, are all of Paleozoic Age, only the Pennsylvanian Period being represented. The upper series, or Dunkard, of this period is generally conceded to be of Permo-Carboniferous age, representing a transitional stage between the Permian and Pennsylvanian. Some evidence, however, is available, through numerous oil and gas well borings scattered throughout the area, of the thickness and character of the underground rocks, including those of the Mississippian and upper Devonian beds.

The following classification of the rocks available for study shows their succession in convenient form, arranged in descending order :

Age.	Period.	Series.
Quaternary.....	{ Recent	{ Present Formation
	{ Pleistocene	{ River Terrace Deposits
Paleozoic.....	{ Permo-Carboniferous...	{ Dunkard (550')
		{ Monongahela (350-400')
	{ Pennsylvanian .....	{ Conemaugh (500-650')
		{ Allegheny (200-275')
		{ Pottsville (400-800')
	{ Mississippian .....	{ Mauch Chunk (75-400')
		{ Greenbrier Limestone (50-200')
		{ Pocono Sandstones (200-450')
	{ Devonian .....	{ Catskill } .....
		{ Chemung }

The Quaternary rocks, in Lewis and Gilmer, are represented by clays, gravels and sand beds, present only along the



river and creek bottoms, and also by Pleistocene river terrace deposits occurring at higher levels along the valleys of the West Fork and Little Kanawha Rivers and some of their tributaries. These terrace deposits have been described in Chapter II.

The Permo-Carboniferous rocks, or Dunkard Series, as indicated on Map II, cap the ridges of northwestern Lewis and are present also in the Grassland and Roanoke Synclines through the center of the county, and in Gilmer they cover the high summits generally throughout the county.

The rocks of the Pennsylvanian Period, however, constitute the great bulk of surface formations. The upper four series; viz, the Monongahela, Conemaugh, Allegheny and Pottsville, crop to the surface successively from the northwestern to southeastern part of the territory of this Report. The Allegheny and Pottsville are found only in the southern panhandle of Lewis.

Numerous geologic sections, consisting usually of careful hand level surface measurements combined with the records of oil and gas and coal test borings, and showing the stratigraphic succession from the Permo-Carboniferous to the Devonian, will be given in the following pages.

## LEWIS COUNTY SECTIONS.

### *Hackers Creek District.*

In the following section, arranged in descending order, the surface portion was measured with hand level up a hill three-fourths mile southeast of McWhorter, at the Harrison-Lewis Line. The lower portion is the record of the E. S. McWhorter No. 907 (11) gas well, drilled by the Hope Natural Gas Company:

#### McWhorter Section, Hackers Creek District.

	Thickness Feet.	Total Feet.	
<b>Monongahela Series (158')</b>			
Sandstone, brown, flaggy, micaceous, from top of knob, Sewickley.....	50	50	50'
Concealed and shale.....	16	66	
Concealed.....	45	111	

	Thickness Feet.	Total Feet.	
Sandstone, shaly, Cedarville.....	10	121	
Draw slate.....	3	124	
Coal, clean, Redstone (Kroger Gas Coal Co. Mine No. 43 on Map II).....	6	130	
Concealed, with boulders of limestone, Red- stone.....	23	153	
Coal, bony, roof..0' 6" } Pittsburgh			
Coal, good.....2 1 } (5' 2") (1348' B.)			
Slate .....0 0¼ } (Kroger Gas Coal	5	158	108'
Coal, good.....2 6¾ } Co. Mine No. 126 on Map II.)			
<b>Conemaugh Series (548')</b>			
Slate and concealed.....	238	396	
Sandstone, shaly, Morgantown.....	15	411	
Fire clay spring, Elk Lick Coal horizon.....	..	411	253'
Concealed .....	55	466	
Continued by E. S. McWhorter No. 907 (11) Well Record (1040' B.):			
Conductor .....	12	478	
Unrecorded (water 30').....	123	601	
Sand, Little Dunkard.....	10	611	
Unrecorded .....	63	674	
Sand, Big Dunkard.....	32	706	295'
<b>Allegheny Series (270')</b>			
Unrecorded .....	20	726	
Lime .....	95	821	
Sand, Lower Freeport.....	60	881	
Unrecorded .....	95	976	
<b>Pottsville Series (460')</b>			
Sand, Homewood.....	90	1063	
Unrecorded .....	13	1079	
Sand, Salt .....	177	1256	
Unrecorded .....	10	1266	
Sand, Salt.....	30	1296	
Unrecorded .....	102	1398	
Sand, Salt.....	38	1436	
<b>Mauch Chunk Series (230')</b>			
Red rock.....	55	1491	
Unrecorded .....	35	1526	
Red rock.....	80	1606	
Unrecorded .....	60	1666	960'
<b>Greenbrier Limestone (90')</b>			
Big Lime (gas, 1232').....	80	1746	
Unrecorded .....	10	1756	
<b>Pocono Sandstones (360')</b>			
Sand, Big Injun.....	130	1886	
Unrecorded .....	80	1966	
Sand and shells.....	10	1976	
Unrecorded .....	15	1991	
Sand, Squaw.....	55	2046	
Unrecorded .....	55	2101	
Sand Berea (gas, 1645').....	15	2116	450'
<b>Catskill Series (379')</b>			
Unrecorded .....	50	2166	
Sand, Gantz.....	84	2250	
Unrecorded .....	6	2256	

	Thickness Feet.	Total Feet.	
Sand, red, Fifty-Foot.....	40	2296	
Unrecorded .....	10	2306	
Red rock.....	10	2316	
Sand, red, Thirty-Foot.....	130	2446	
Unrecorded .....	10	2456	
Sand, Gordon Stray (gas, 1895').....	22	2478	
Unrecorded .....	4	2482	366'
Sand, Gordon, to bottom (gas, 2020').....	13	2495	
Well completed April 25, 1907.			

The following section, the surface portion of which was measured by hand level, is located  $2\frac{1}{2}$  miles southwest of Jane Lew, on a branch of Sycamore Lick. The portion below the Bakerstown Coal is from the record of the Porter Maxwell No. 1 (92) gas well by the West Virginia Central Gas Company:

#### Jane Lew Section, Hackers Creek District.

	Thickness Feet.	Total Feet.	
<b>Monongahela Series (79')</b>			
Sandstone, brown, fine grained, shaly, from top of knob to level of Porter Maxwell No. 1 gas well (92).....	20	20	
Concealed .....	19	39	
Coal blossom, reported when field was plowed, Redstone .....	..	39	39'
Concealed .....	35.5	74.5	
Coal, abandoned opening, Pittsburgh (Porter Maxwell Mine No. 129 on Map II, 1358' B.), reported .....	4.5	79	40'
<b>Conemaugh Series (482')</b>			
Concealed .....	25	104	
Fire clay spring, Little Pittsburgh Coal horizon ...		104	
Concealed .....	11	115	
Sandstone, shaly, Connellsville.....	38	153	
Fire clay spring, Little Clarksburg Coal horizon .....		153	
Concealed in bluff.....	45	198	
Concealed in slope, mostly shale.....	62	260	
Sandstone, shaly, Morgantown.....	8.5	268.5	
Coal blossom, Elk Lick, reported.....	2.5	271	192'
Concealed, mostly shale.....	72	343	
Shale, green, with marine shells, thickness concealed, Ames.....	..	343	72'
Concealed, shale, variegated, and concealed..	73.5	416.5	
Sandstone, gray, massive, Saltsburg.....	15	431.5	
Shale, sandy.....	5	436.5	
Coal, good (1' 5"), Bakerstown (A. J. Hardman Mine No. 228A on Map II).....	1.5	438	95'
Fire clay to run.....	2	440	

	Thickness Feet.	Total Feet.	
Continued by Porter Maxwell No. 1 (92)			
Well Record:			
Unrecorded.....	23	463	
Sand, Little Dunkard.....	15	478	
Unrecorded .....	43	521	
Sand, Big Dunkard.....	40	561	123'
<b>Allegheny Series (196')</b>			
Unrecorded.....	26	587	
Sand, Upper Freeport.....	84	671	
Unrecorded .....	17	688	
Gas Sand, Lower Freeport.....	30	718	
Unrecorded .....	39	757	
<b>Pottsville Series (461')</b>			
Sand, First Salt, Homewood.....	86	843	
Unrecorded.....	66	909	
Sand, Salt.....	36	945	
Unrecorded .....	28	973	
Sand, Salt.....	49	1022	
Unrecorded .....	111	1133	
Sand, Salt.....	85	1218	
<b>Mauch Chunk Series (414')</b>			
Unrecorded .....	370	1588	
Little Lime.....	20	1608	
Pencil Cave.....	24	1632	1071'
<b>Greenbrier Limestone (60')</b>			
Big Lime.....	60	1692	
<b>Pocono Sandstones (321')</b>			
Big Injun Sand.....	131	1823	
Unrecorded .....	5	1828	
Sand, Squaw.....	45	1873	
Unrecorded .....	115	1988	356'
Sand, Berea.....	25	2013	
<b>Catskill Series (113')</b>			
Unrecorded .....	85	2098	
Sand, Fifty-Foot (gas, 9' in).....	28	2126	
Conductor, 16'; 10" Casing, 154'; 8¼" Casing, 912'; 6⅝" Casing, 1689'; Pressure, first minute, 180 lbs.; Rock pressure, 800 lbs.; Volume, 2,750,000 cu. ft.			

The following section, the surface portion of which was measured with hand level, starts at the top of a high knob ½ mile southwest of Berlin, and includes in its lower portion the record of the J. B. Swisher No. 1 (36) gas well by the West Virginia Central Gas Company, which was furnished the Survey by W. A. Williams, Superintendent:

#### Berlin Section, Hackers Creek District.

	Thickness Feet.	Total Feet.
<b>Monongahela Series (305')</b>		
Sandstone, flaggy, green, fine grained, mica- ceous, partly concealed, capping knob, Gilboy .....	18	18
Conceal'd in slope, red soil.....	20	38

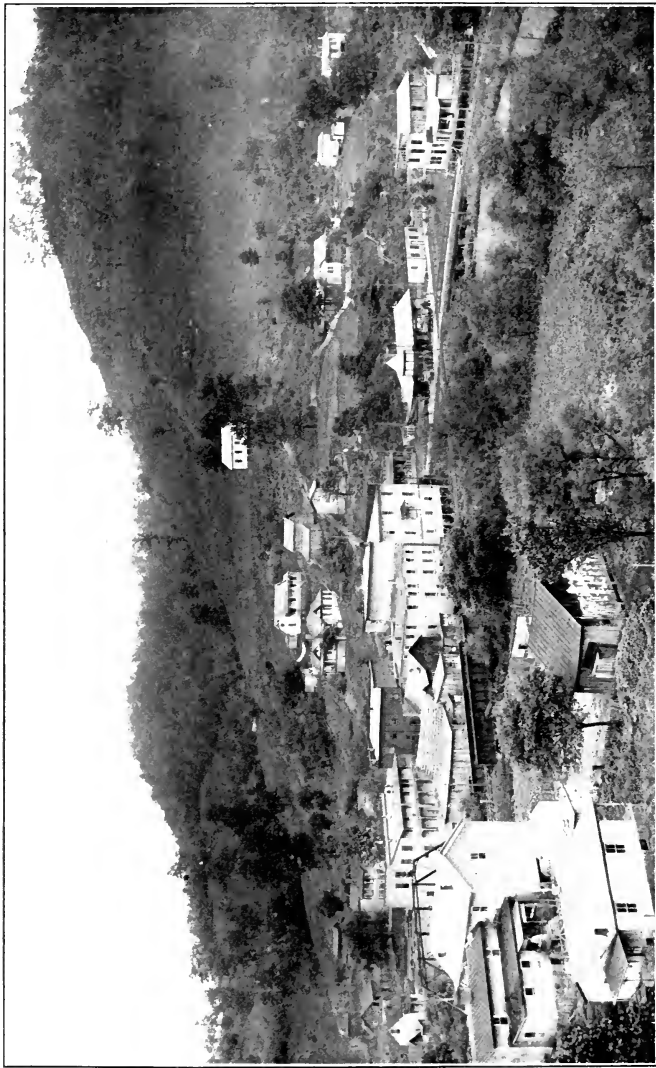


PLATE V.—View of Orlando; showing junction of Baltimore & Ohio and Coal & Coke Railroads; Topography of the Monongahela and Conemaugh Series.

The following section was measured with aneroid descending a steep hill road at the head of the right hand fork of Buckhannon Run, two miles northwest of Lorentz. The section shows a large amount of red shale where sandstones are frequently found. The position of the Pittsburgh Coal is somewhat doubtful as the exposure seems too far below the Redstone and may have been a slip:

### Lorentz Section, Hackers Creek District.

	Thickness Feet.	Total Feet.	
<b>Dunkard Series (215')</b>			
Unrecorded from top of knob.....	200	200	
Sandstone, flaggy, <b>Waynesburg</b> .....	15	215	215'
<b>Monongahela Series (425')</b>			
Shale, red.....	30	245	
Sandstone, shaly.....	5	250	
Shale, red.....	5	255	
Sandstone, massive, <b>Gilboy</b> .....	5	260	
Shale, red.....	30	290	
Sandstone, shaly, <b>Uniontown</b> .....	20	310	95'
Shale, red.....	20	330	
Sandstone, shaly.....	5	335	
Shale, red.....	50	385	
Sandstone, flaggy, <b>Arnoldsburg</b> .....	20	405	
Shale, red and variegated.....	50	455	
Sandstone, flaggy, <b>Sewickley</b> .....	40	495	185'
Shale, variegated.....	30	525	
Sandstone, shaly, <b>Cedarville</b> .....	41	566	
Coal opening, <b>Redstone</b> (Ira Queen Mine No. 59 on Map II, 1270' B.), estimated.....	4	570	75
Shale and concealed.....	35	605	
Shale, sandy.....	35	640	
Coal blossom (in place?) <b>Pittsburgh</b> .....	..	640	
<b>Conemaugh Series (115')</b>			
Shale, sandy, with shaly sandstone.....	29.5	669.5	
<b>Coal (0' 6")</b> , <b>Little Pittsburgh</b> (1170' B.).....	0.5	670	100'
Fire clay shale and shale, variegated.....	20	690	
Sandstone, shaly, <b>Connellsville</b> .....	15	705	
Shale, red, with sandy streaks, to road forks at foot of hill.....	50	755	

The following section, arranged in descending order, was made with hand level at Gaston, and starts at the top of Purgatory Knob, one mile northeast of the town. Being in the Grassland Syncline, the section shows a considerable thickness of the Dunkard Series, its basal member, the Waynesburg Sandstone, being easily recognized by its pebbly structure:

## Gaston Section, Hackers Creek Section.

	Thickness Feet.	Total Feet.	
<b>Dunkard Series (202')</b>			
Shale, brown, sandy, with thin sandstone, from top of Purgatory Knob.....	48	48	
Sandstone, flaggy, fine grained, micaceous, greenish gray, <b>Lower Marietta</b> .....	27	75	75'
Concealed, mostly shale.....	50	125	
Sandstone, coarse, buff, medium hard, <b>Mannington</b> .....	35	160	
Shale, brown and concealed.....	10	170	
Sandstone, massive, coarse, soft, brown, with numerous quartz pebbles, <b>Waynesburg</b> ...	32	202	127'
<b>Monongahela and Conemaugh Series (501')</b>			
Shale and concealed.....	24	226	
Sandstone, <b>Gilboy</b> .....	15	241	
Shale, partly concealed.....	44	285	
Sandstone, green, flaggy, micaceous, fine, <b>Uniontown</b> .....	16	301	99'
Shale, mostly red.....	33	334	
Sandstone, green, fine.....	5	339	
Shale, mostly red.....	72	411	
Sandstone, fine, green, flaggy, micaceous, <b>Arnoldsburg</b> .....	17	428	
Concealed and red shale.....	32	460	
Shale, brown.....	22	482	
Sandstone, green, fine, flaggy, micaceous, <b>Se-wickley</b> .....	22	504	203'
Concealed.....	28	532	
Sandstone, shaly, <b>Cedarville</b> .....	23	555	
Shale and concealed.....	10	565	
<b>Coal, Redstone (4' 10")</b> , (Nathaniel Bush Mine No. 81 on Map II, 1153' L.).....	5	570	66'
Concealed to Stonecoal Creek.....	133	703	

In the following section the surface portion was measured with hand level at Deanville about one mile north of Weston, and, as arranged in descending order, starts at the top of a high knob one-half mile southeast of the former place. The lower portion is the record of the Sarah J. Bennett No. 2757 (134) gas well drilled by the Hope Natural Gas Company just across the West Fork River opposite Deanville:

## Deanville Section, Hackers Creek District.

	Thickness Feet.	Total Feet.	
<b>Monongahela Series (361')</b>			
Shale, sandv from top of knob, ½ mile southeast of Deanville.....	11	11	
Sandstone, fine, green, flaggy, <b>Gilboy</b> .....	20	31	
Shale, red.....	5	36	
Sandstone, brown, fine, flaggy, <b>Uniontown</b> ....	17	53	53'

	Thickness Feet.	Total Feet.	
Concealed in slope, mostly red shale.....	50	103	
Sandstone, flaggy, <b>Arnoldsburg</b> .....	10	113	
Concealed in slope, red shale at top.....	50	163	
Concealed in steep bluff.....	141	304	
<b>Coal opening, abandoned, reported 4 to 5', Redstone</b> (Wallace Parsley Mine No. 65 on Map II, 1324' L.).....	5	309	256'
Concealed .....	50.5	359.5	
<b>Coal opening, abandoned, reported 1' 6", Pittsburgh</b> (Wallace Parsley Mine No. 131 on Map II, 1272' L.).....	1.5	361	52'
<b>Conemaugh Series (572')</b>			
Concealed in bluff.....	33	394	
Concealed in slope.....	27	421	
Concealed in bluff.....	50	471	
Shale, red, <b>Clarksburg</b> .....	45	516	
Concealed .....	30	546	
Sandstone, gray, quarry rock, <b>Morgantown</b> ...	18	564	203'
Concealed to well.....	34	598	
Continued by Sarah J. Bennett No. 2757 (134) Well Record (1035' B.)			
Unrecorded .....	190	788	
Sand, Little Dunkard.....	25	813	
Unrecorded.....	70	883	
Sand, Big Dunkard.....	50	933	369'
<b>Allegheny Series (190')</b>			
Unrecorded .....	75	1008	
Gas Sand, Lower Freeport.....	85	1093	
Unrecorded .....	30	1123	
<b>Pottsville Series (450')</b>			
Sand, Salt, Homewood (water, 535-600').....	75	1198	
Unrecorded .....	145	1343	
Sand, Salt.....	17	1360	
Unrecorded (water 790-980').....	213	1573	
<b>Mauch Chunk Series (328')</b>			
Sand, Maxton, and unrecorded.....	280	1853	
Little Lime.....	25	1878	
Pencil Cave.....	23	1901	968'
<b>Greenbrier Limestone (52')</b>			
Big Lime.....	52	1953	
<b>Pocono Sandstones (290')</b>			
Sand .....135' } Unrecorded ..... 15 } Big Injun.....	165	2118	
Sand ..... 15 } Unrecorded .....	23	2141	
Sand, Squaw.....	15	2156	
Unrecorded .....	72	2228	327'
Sand, Berea.....	15	2243	
<b>Catskill Series (526')</b>			
Unrecorded .....	66	2309	
Sand, Fifty-foot.....	34	2343	
Unrecorded (Thirty-foot Sand broken).....	147	2490	
Sand, Gordon <del>Stray</del> .....	91	2581	
Unrecorded .....	3	2584	356'
Sand, Gordon.....	16	2600	
Unrecorded .....	40	2640	



	Thickness Feet.	Total Feet.	
Sand, Fourth.....	8	2648	
Unrecorded .....	104	2752	168'
<b>Sand, Fifth (gas, 2160')</b> .....	17	2769	
<b>Chemung Series (829')</b>			
Unrecorded to bottom.....	829	3598	
Well completed March 8, 1913.			

### *Freemans Creek District.*

In the following section, the top portion was measured with aneroid and arranged in descending order starting at the top of a hill just west of the B. & O. R. R. shops at Weston. The section is continued by the record of the E. M. Vandervort No. 1 (135) gas well drilled by the West Virginia Central Gas Company:

#### Weston Section, Freemans Creek District.

	Thickness Feet.	Total Feet.	
<b>Monongahela Series (135')</b>			
Concealed from top of knob.....	71	71	
Coal opening, abandoned, thickness concealed, Redstone (1265' L.).....	..	71	71'
Concealed .....	64	135	
<b>Conemaugh Series (582')</b>			
Limestone, gray, hard, Upper Pittsburgh.....	1	136	
Concealed .....	25	161	
Sandstone, flaggy, Connellsville.....	18	179	
Concealed .....	17	196	
Fire clay spring, Little Clarksburg Coal horizon ..	..	196	125
Concealed .....	17	213	
Sandstone, massive, Lower Connellsville.....	10	223	
Concealed to level of well.....	14	237	
Continued by E. M. Vandervort No. 1 (135) Well Record (1099' L.)			
Slate and shells (water, 245').....	340	577	
Sand, Little Dunkard.....	20	597	401'
Unrecorded .....	120	717	
<b>Allegheny Series (210')</b>			
Sand, Upper Freeport.....	80	797	
Unrecorded .....	50	847	
Gas Sand, Lower Freeport.....	65	912	
Unrecorded .....	15	927	330'
<b>Pottsville Series (485')</b>			
First Salt (Homewood) Sand (water, 740')..	80	1007	
Unrecorded .....	20	1027	
Second Salt (Upper Connoquenessing) Sand..	42	1069	
Unrecorded.....	218	1287	
Sand, Third Salt.....	125	1412	485'
<b>Mauch Chunk Series (325')</b>			
Unrecorded .....	295	1707	

	Thickness Feet.	Total Feet.	
Little Lime.....	20	1727	
Unrecorded .....	10	1737	325'
<b>Greenbrier Limestone (87')</b>			
Big Lime.....	87	1824	
<b>Pocono Sandstones (368')</b>			
Big Injun Sand.....	101	1925	
Unrecorded .....	32	1957	
Squaw Sand.....	60	2017	
Unrecorded .....	145	2162	425'
Berea Sand.....	30	2192	
<b>Catskill Sandstones (375')</b>			
Unrecorded .....	125	2317	
Fifty-foot and Thirty-foot Sands.....	55	2372	
Gordon Stray Sand.....	10	2382	
Unrecorded .....	5	2387	225'
Gordon Sand (small gas, 2162').....	20	2407	
Unrecorded.....	28	2435	
Fourth Sand (gas, 2201-2205').....	8	2443	
Unrecorded .....	107	2550	163'
Fifth Sand.....	17	2567	
"Conductor, 16'; 10" casing, 280'; 8¼" casing, 940'; 6⅝" casing, 1590'; Rock pressure, 570 lbs.; showed 711,000 cu. ft. from Fourth Sand but blew down to 260,640 ft. after 4 days. Fifth Sand shot with 40 quarts but was not improved. Completed April 26, 1913."			

In the following section, arranged in descending order, the surface portion was measured at Freemansburg, up the point immediately northeast of the village. The Ames Limestone appears at the base of the measured section, but is not found at any other point so far northwest in Lewis County. The lower portion is the record of the Hannah Kemper No. 237 (158) gas well drilled by the Reserve Gas Company. The stratigraphic level of the well mouth is about 45' higher than the base of the measured section, and this interval is subtracted from the top of the well record to make the section continuous. The total depth of the hole was 2186 feet:

#### Freemansburg Section, Freemans Creek District.

	Thickness Feet.	Total Feet.	
<b>Monongahela Series (149')</b>			
Sandstone, fine, green, flaggy, from top of knob....	20'		} Sewickley... 56      56
Concealed .....	8		
Sandstone, massive, greenish-gray, micaceous, medium coarse.....	28		
Steep bluff, mostly sandstone and sandy shale	53	109'	
Coal blossom, Redstone, reported.....	5	114	114'

	Thickness Feet.	Total Feet.	
Concealed in slope.....	31	145	
<b>Coal opening, abandoned, Pittsburgh (Mine No. 135 on Map II, 1311' B.) reported....</b>	<b>4</b>	<b>149</b>	<b>35'</b>
<b>Conemaugh Series (651')</b>			
Concealed .....	38	187	
Shales, brown and variegated with streaks of red.....	60	247	
Sandstone, massive, brown, mottled, partly concealed, <b>Connellsville</b> .....	15	262	113'
Concealed .....	60	322	
Sandstone, massive, grayish brown, <b>Morgan- town</b> .....	30	352	
Shale, gray.....	5	357	
Concealed and variegated shale.....	46	403	
Sandstone, shaly, <b>Grafton</b> .....	10	413	
Shale, green, fossiliferous, <b>Ames to Creek</b> .....	7	420	158'
<b>Continued in Hannah Kemper No. 237 (158) Well Record:</b>			
Unrecorded .....	330	750	
Sand, Big Dunkard.....	50	800	380'
<b>Allegheny Series (285')</b>			
Unrecorded .....	15	815	
Sand, Upper Freeport.....	85	900	
Unrecorded .....	5	905	
Gas Sand, Lower Freeport.....	110	1015	
Unrecorded.....	10	1025	
<b>Pottsville Series (425')</b>			
Sand, First Salt, Homewood.....	100	1125	
Unrecorded .....	25	1150	
Sand, Second Salt.....	125	1275	
Unrecorded .....	175	1450	
<b>Mauch Chunk Series (235')</b>			
Sand, Maxton.....	25	1475	
Unrecorded .....	160	1635	
Little Lime.....	20	1655	
Unrecorded .....	25	1680	
Pencil Cave.....	5	1685	885'
<b>Greenbrier Limestone (70')</b>			
<b>Big Lime</b> .....	70	1755	
<b>Pocono and Catskill Series (806')</b>			
Big Injun Sand.....	132	1887	
Unrecorded .....	3	1890	
Sand, Squaw.....	20	1910	
Unrecorded .....	345	2255	
Sand, Fifty-foot.....	15	2270	
Unrecorded .....	20	2290	
Sand, Thirty-foot.....	27	2317	
Unrecorded .....	3	2320	
<b>Sand, Gordon Stray (gas, 7' in)</b> .....	23	2343	
Unrecorded .....	6	2349	664
Sand, Gordon.....	43	2392	
Unrecorded.....	143	2535	186.
<b>Sand, Fifth (gas, 1 to 20' in)</b> .....	20	2555	
Unrecorded to bottom.....	6	2561	

Well completed April 5, 1910.

The following section arranged in descending order was measured with hand level along a branch of Fink Creek, 2½ miles northwest of Churchville:

### Churchville Section, Freemans Creek District.

	Thickness Feet.	Total Feet.	
<b>Dunkard Series (265')</b>			
Shale, sandy, brown, from top of knob.....	40	40	
Sandstone, concealed, and sandstone, coarse, soft, buff, with small pebbles, <b>Mannington</b>	45	85	85'
Concealed and shale to level of Joseph Gum gas well (224) (1260' B.).....	33	118	
Sandstone, massive, brown, coarse.....	21	139	
Concealed and variegated shale.....	39	178	
Sandstone, flaggy.....	10	188	
Concealed .....	27	215	
Spring, with coal blossom (?).....	..	215	
Concealed, with yellow shale.....	30	245	
Sandstone, massive, buff, coarse, cliff rock, <b>Waynesburg</b> .....	20	265	180'
<b>Monongahela Series (193')</b>			
Concealed .....	88	353	
Sandstone, massive, buff, pebbly, cliff rock, <b>Uniontown</b> .....	30	383	
Concealed, with shale.....	30	413	
Sandstone, shaly.....	5	418	
<b>Coal, Uniontown</b> (Joseph Gum Mine No. 19 on Map II).....	2	420	155'
Concealed to level of Joseph Gum Core Test (223).....	38	458	

The following section, arranged in descending order, is located on Camp Run, 1½ miles northwest of Hurst, and near the common corner of Lewis, Gilmer and Doddridge, the upper portion being measured with hand level along the hill road, while the lower portion is from the records of the J. C. Marsh Core Test (280) and the J. C. Marsh No. 1 (281) oil test well drilled by Hiner and Bartlett:

### Hurst Section, Freemans Creek District.

	Thickness Feet.	Total Feet.	
<b>Dunkard and Monongahela Series (929.5')</b>			
Sandstone, soft, capping knob, <b>Rush Run</b> ....	40	40	
Shaly, sandy and red.....	12	52	
Sandstone, massive, brown, <b>Jollytown</b> .....	28	80	80'
Shale, variegated and sandy.....	17	97	
Sandstone, flaggy.....	5	102	
Shale, variegated.....	8	110	
Sandstone flaggy.....	12	122	
Shale, red.....	12	134	

	Thickness Feet.	Total Feet.	
Sandstone, massive, coarse, soft, brown, <b>Hun-</b> <b>dred</b> .....	30	164	84'
Fire clay.....	1	165	
Shale, sandy, brown.....	15	180	
Sandstone, massive, coarse, gray, soft, <b>Upper</b> <b>Marietta</b> .....	30	210	160'
Shale, sandy.....	28	238	
Sandstone, shaly.....	6	244	
Shale, red, <b>Creston</b> .....	24	268	
Sandstone, shaly, <b>Lower Marietta</b> .....	20	288	
Shale, sandy.....	34	322	
<b>Coal, Washington</b> (1023' B.).....	2	324	
Fire clay shale, yellow, <b>Washington</b> .....	27	351	
Shale, red.....	3	354	
Sandstone, shaly.....	5	359	
Shale, variegated.....	34	393	
Sandstone, massive, <b>Mannington</b> .....	14	407	
Shale, variegated and sandy.....	39	446	
Sandstone, massive.....	14	460	
Red shale and sandstones, interlaminated to Core Test.....	52	512	
Continued by J. C. Marsh Core Test (No. 280 on Map II, elevation, 835' B.):			
Surface and soapstone.....	70	582	318'
Sandstone, <b>Gilboy</b> .....	30	612	
Soapstone.....	20	632	
Sandstone, <b>Uniontown</b> .....	10	642	
Slate.....	20	662	
Red rock.....	30	692	
Blue slate and shale.....	20	712	
Sandstone, gray, <b>Arnoldsburg</b> .....	20	732	
Shale, red.....	20	752	
Sandstone, gray, <b>Sewickley</b> .....	28	780	
Shale.....	22	802	
Slate.....	30	832	
Sandstone, <b>Cedarville</b> .....	20	852	
Soapstone.....	12	864	
<b>Coal, Redstone</b> , thickness unrecorded.....	..	864	
Fire clay.....	8	872	
Sandstone, blue, 25' } <b>Pittsburgh Sandstone</b> ..	50.5	922.5	
Cap rock..... 25½ }			
<b>Coal, Pittsburgh</b> .....	7	929.5	287.5'
Continued in J. C. Marsh No. 1 (281) Oil Well Record ((960' B.):			
<b>Conemaugh Series (427.5')</b>			
Unrecorded.....	379.5	1309	
Sand, Little Dunkard.....	50	1359	
Unrecorded.....	39	1398	
Sand, Big Dunkard.....	4	1402	
<b>Allegheny, Pottsville and Mauch Chunk Series (983')</b>			
Unrecorded.....	522	1924	
Salt Sand.....	30	1954	
Unrecorded.....	250	2204	
Maxton Sand.....	8	2212	
Unrecorded.....	127	2339	
Little Lime (oil show, 15' in).....	28	2367	

	Thickness Feet.	Total Feet.
Pencil Cave.....	18	2385
<b>Greenbrier Limestone (29')</b>		
Big Lime.....	29	2414
<b>Pocono Sandstones (376')</b>		
Big Injun Sand.....	100	2514
Unrecorded .....	15	2529
Squaw Sand.....	150	2679
Unrecorded (no sands).....	83	2762
Berea Sand.....	28	2790
<b>Catskill Series (484')</b>		
Slate and shell to bottom.....	484	3274

Well completed Feb. 2, 1914; dry hole; 10" casing, 163'; 8¼" casing, 954'; 6¾" casing, 1851'; total depth, 2830'.

In the following section and surface portion was measured with hand level along the western slope of Sugarloaf Knob, 1½ miles south of Camden. Measurements were made along the strike and the intervals are correct. The lower portion is the record of the F. C. Jarvis No. 1 (476) gas well, drilled by the West Virginia Central Gas Company, which starts at the level of the Pittsburgh Coal:

#### Camden Section, Freemans Creek District.

	Thickness Feet.	Total Feet.	
<b>Dunkard Series (145')</b>			
Sandstone, brown, soft, partly concealed, from top of knob, <b>Mannington</b> .....	50	50	
Shale, sandy.....	17	67	
Concealed in slope, mostly shale.....	55	122	
Sandstone, massive, coarse, pebbly, buff, cliff rock, <b>Waynesburg</b> .....	23	145	145'
<b>Monongahela Series (381')</b>			
Concealed in steep bank.....	39	184	
Sandstone, massive, buff, soft, some pebbles..	8	192	
Concealed in steep bank.....	32	224	
Concealed in bank.....	5	229	
Concealed in steep bank.....	17	246	
Concealed in slope.....	44	290	
Shael, sandy and variegated, partly concealed	82	372	
Sandstone, fine, micaceous.....	5	377	
Concealed, with red shale.....	11	388	
Sandstone, shaly, <b>Sewickley</b> .....	28	416	271'
Concealed, with some variegated and sandy shale.....	55	471	
Coal opening, thickness concealed, <b>Redstone</b> (1189' L.).....	..	471	55'
Shale, brown, sandy.....	17	488	
Shale, variegated.....	10	498	
Concealed and shale, with boulders of limestone, <b>Redstone</b> .....	28	526	

	Thickness Feet.	Total Feet.	
Coal blossom, Pittsburgh (1134' L.).....		526	55'
<b>Conemaugh Series (620')</b>			
Continued by F. C. Jarvis No. 1 (476)			
Well Record:			
Unrecorded .....	440	966	
Sand, Saltsburg.....	30	996	
Unrecorded .....	47	1043	
Sand, Little Dunkard.....	23	1066	
Unrecorded .....	55	1121	
Sand, Big Dunkard.....	25	1146	620'
<b>Allegheny Series (215')</b>			
Unrecorded .....	55	1201	
Sand, Lower Freeport.....	35	1236	
Coal, Upper Kittanning.....	6	1242	96
Unrecorded .....	64	1306	
Sand, Clarion.....	55	1361	
<b>Pottsville Series (390')</b>			
Unrecorded .....	105	1466	
Sand, Second Salt.....	48	1514	
Unrecorded .....	176	1690	
Sand, Third Salt.....	61	1751	
<b>Mauch Chunk Series (390')</b>			
Unrecorded .....	15	1766	
Sand, Maxton.....	25	1791	
Unrecorded .....	307	2098	
Little Lime.....	18	2116	
Pencil Cave.....	25	2141	899'
<b>Greenbrier Limestone (70')</b>			
Big Lime .....	70	2211	
<b>Pocono and Catskill Series (789')</b>			
Big Injun Sand.....	170	2381	
Unrecorded .....	376	2757	
Sand, Gordon Stray (gas, 2244-2254').....	25	2782	
Unrecorded .....	10	2792	651'
Sand, Gordon.....	42	2834	
Unrecorded .....	6	2840	
Sand, Fourth.....	11	2851	
Unrecorded .....	128	2979	187'
Sand, Fifth (gas, 2455') and unrecorded to bot- tom .....	21	3000	

Well completed Oct. 21, 1909; 13" casing, 16'; 10" casing, 153'; 8¼" casing, 788'; 6½" casing, 1711'; volume, 4,000,000 cu. ft. daily.

The following section, arranged in descending order, was measured with hand level at Vadis, starting at the creek and measuring southwestward along the strike to the top of the first knob, and then starting with the same formations farther south at the foot of the higher knob three-fourths mile south of Vadis, thus avoiding the intervening dip of the measures:

## Vadis Section, Freemans Creek District.

	Thickness	Total	
	Feet.	Feet.	
<b>Dunkard Series (45')</b>			
Concealed, with red shale, from top of knob..	17	17	
Sandstone, massive, pebbly, buff, <b>Waynesburg</b>	28	45	45'
<b>Monongahela Series (371')</b>			
Concealed .....	53	98	
Sandstone, flaggy, green, <b>Uniontown</b> .....	25	123	
Concealed .....	15	138	
Spring, <b>Uniontown Coal horizon</b> .....	..	138	93'
Concealed, with red shale, nodules of lime and fragments of red hematite.....	60	198	
Sandstone, greenish, fine.....	10	208	
Concealed in slope, mostly red soil.....	78	286	
Sandstone, massive, coarse, gray, <b>Sewickley</b> ..	10	296	158'
Concealed .....	11	307	
Steep bluff, mostly sandstone.....	94	401	
Sandstone, massive, visible.....	3	404	
Shale, sandy.....	7	411	
<b>Coal</b> .....1' 7" } <b>Pittsburgh (5' 1") (836' L.)</b>			
<b>Bone</b> .....0 1 } (Claude F. Griggs Mine..	5	416	120'
<b>Coal</b> .....3 5 } No. 143 on Map II)			
<b>Conemaugh Series (65')</b>			
Concealed .....	35	451	
Sandstone, massive, gray, to Fink Creek, <b>Lower Pittsburgh</b> .....	30	481	

In the following section, the surface portion was measured with aneroid, starting at a high knob 2 miles southeast of Alum Bridge and descending to Leading Creek. Owing to the northwestward rise of the rocks, these intervals are somewhat smaller than true vertical measurement would show. The lower portion is from the record of the R. Gissy No. 158 (342) gas well drilled by the Reserve Gas Company, 65 feet being omitted from the top of the record to make the stratigraphic succession complete. The total depth of the hole was 2675 feet:

## Alum Bridge Section, Freemans Creek District.

	Thickness	Total	
	Feet.	Feet.	
<b>Monongahela Series (300')</b>			
Sandstone, massive, coarse, pebbly, soft, great cliff rock, capping knob, <b>Uniontown</b> .....	40	40	40'
Concealed in slope, with sandy shale.....	35	75	
Concealed in bluff.....	20	95	
Concealed, mostly red shale.....	65	160	
Sandstone, massive, buff, pebbly, soft, cliff rock, <b>Sewickley</b> .....	50	210	
Shale, sandy, with streaks of sandstone.....	53.5	263.5	
<b>Coal (1' 6") Redstone</b> .....	1.5	265	225'



	Thickness Feet.	Total Feet.	
Shale, sandy.....	10	275	
Sandstone, shaly.....	5	280	
Concealed, with sandstone.....	20	300	
<b>Coal, opening abandoned, thickness concealed,</b> <b>Pittsburgh (1065' B.).....</b>	..	300	35'
<b>Conemaugh Series (654')</b>			
Concealed with shale.....	20	320	
Limestone .....	2	322	
Shale and concealed.....	23	345	
<b>Coal blossom, Little Pittsburgh.....</b>	..	345	45'
Concealed .....	25	370	
Sandstone, <b>Connellsville</b> .....	15	385	
Shale, sandy.....	20	405	
Sandstone, massive.....	10	415	
Concealed, mostly red shale.....	30	445	
Sandstone, shaly, <b>Lower Connellsville</b> .....	20	465	
Shale, red, to Leading Creek.....	20	485	
<b>Continued in R. Gissy No. 158 (342) Well</b>			
<b>Record:</b>			
Unrecorded .....	270	755	
Sand, Little Dunkard.....	40	795	
Unrecorded .....	125	920	
Sand, Big Dunkard.....	34	954	609'
<b>Allegheny Series (213')</b>			
Unrecorded .....	66	1020	
Gas Sand, Lower Freeport.....	35	1055	
Unrecorded .....	72	1127	
Sand, Clarion.....	32	1159	
Unrecorded .....	8	1167	
<b>Pottsville Series (433')</b>			
Sand, Homewood.....	86	1253	
Unrecorded .....	212	1465	
Sand, Salt (gas, 30' in).....	125	1590	
<b>Maunch Chunk Series (198')</b>			
Unrecorded .....	171	1761	
Little Lime.....	15	1776	
Pencil Cave.....	12	1788	
<b>Greenbrier Limestone (102')</b>			
Big Lime.....	102	1890	
<b>Pocono Sandstones (380')</b>			
Big Injun Sand (gas, 10' in).....	110	2000	
Unrecorded .....	100	2100	
Shells .....	20	2120	
Unrecorded .....	130	2250	
Sand, Berea.....	20	2270	
<b>Catskill and Chemung Series (825')</b>			
Unrecorded .....	20	2290	
Sand, Fifty-foot.....	50	2340	
Unrecorded .....	50	2390	
Sand, Thirty-foot.....	15	2405	
Unrecorded .....	55	2460	
Sand, Gordon Stray.....	10	2470	
Unrecorded .....	101	2571	
Sand, Gordon (gas, 1' in).....	18	2589	
Unrecorded, no sands, to bottom.....	506	3095	

We'l completed June 24, 1909.

*Courthouse District.*

In the following section, the surface portion was measured with hand level, and the lower portion, below the Sewickley Sandstone, is from the record of the J. C. Collins No. 1 (428) oil well, by the Crude Oil Company:

**Bealls Mills Section, Courthouse District.**

	Thickness Feet.	Total Feet.	
<b>Dunkard Series (220')</b>			
Concealed from top of knob.....	20	20	
Sandstone, flaggy, <b>Lower Marietta</b> .....	30	50	50'
Concealed to level of J. C. Collins No. 1 (428) Well (1146' L.).....	25	75	
Concealed, mostly reds.....	90	165	
Steep bluff, with sandstone, <b>Waynesburg</b> ....	55	220	170'
<b>Monongahela Series (385')</b>			
Concealed in slope.....	25	245	
Sandstone, massive, <b>Gilboy</b> .....	30	275	
Concealed .....	25	300	
Sandstone, flaggy, <b>Uniontown</b> .....	20	320	
Concealed, with reds.....	65	385	
Sandstone, massive, coarse, gray, pebbly, great cliff, rock, 10' visible above creek, total thickness supplied from outcrop ½ mile east, <b>Sewickley</b> .....	35	420	200'
Unrecorded .....	185	605	
Section Continued in J. C. Collins No. 1 (428) Well Record:			
<b>Pittsburgh Coal</b> .....	..	605	185'
<b>Conemaugh Series (540')</b>			
Unrecorded .....	480	1085	
Big Dunkard Sand.....	60	1145	
<b>Allegheny, Pottsville and Mauch Chunk Series (1070')</b>			
Unrecorded.....	40	1185	
Sand, Lower Freeport.....	80	1265	
Unrecorded .....	920	2185	
Little Lime.....	15	2200	
Pencil Cave.....	15	2215	1610'
<b>Greenbrier Limestone (110')</b>			
Big Lime.....	110	2325	
<b>Pocono and Catskill Series (782')</b>			
Big Injun Sand.....	150	2475	
Unrecorded .....	394	2869	
Gordon Stray Sand.....	17	2886	
Unrecorded .....	15	2901	686'
Gordon Sand.....	9	2910	
Unrecorded.....	175	3085	184'
Fifth Sand.....	7	3092	
Unrecorded to bottom.....	15	3107	
Total depth of well, 3032 feet.			

The following section was measured with aneroid from a high knob, three-fourths mile southeast of Copley, northward down to Sand Fork. Being on the dip of the measures, the intervals are larger than true vertical measurement would show:

### Copley Section, Courthouse District.

	Thickness Feet.	Total Feet.	
<b>Dunkard Series (385')</b>			
Sandstone, massive, pebbly, soft, capping knob, <b>Upper Marietta</b> .....	35	35	
Concealed, mostly shale.....	30	65	
Sandstone, flaggy, brown, <b>Lower Marietta</b> ....	35	100	
Shale, sandy, partly concealed.....	45	145	
<b>Coal blossom, Washington (1215' B.)</b> .....	..	145	145'
Shale, yellow, <b>Washington Fire Clay</b> .....	45	190	
Sandstone, shaly at base, <b>Mannington</b> .....	50	240	
Concealed, with reds.....	75	315	
Sandstone, massive, pebbly, great cliff, <b>Waynesburg (975' B.)</b> .....	70	385	240'
<b>Monongahela Series (175')</b>			
Concealed .....	15	400	
Sandstone, <b>Gilboy</b> .....	10	410	
Shale, variegated, partly concealed, to Sand Fork .....	150	560	

The following section was measured with aneroid down a steep hill road, 1½ miles southwest of Gillooly:

### Gillooly Section, Courthouse District.

	Thickness Feet.	Total Feet.	
<b>Dunkard Series (290')</b>			
Sandstone, massive, brown, capping knob.....30' } <b>Lower</b>			
Concealed .....10 } <b>Marietta ...</b>	55	55	
Sandstone, flaggy.....15 }			
Concealed .....	15	70	70'
Fire clay shale, green at top, <b>Washington</b> ....	20	90	
Sandstone, shaly.....	25	115	
Shale, variegated.....	40	155	
Sandstone, shaly, <b>Mannington</b> .....	20	175	
Concealed, with red shale and thin sandstones	75	250	
Sandstone, massive, <b>Waynesburg</b> .....	40	290	220
<b>Monongahela Series (270')</b>			
Concealed, mostly reds.....	45	335	
Sandstone, <b>Gilboy</b> .....	15	350	
Shale, red, with thin sandstones.....	60	410	
Sandstone, green, <b>Uniontown</b> .....	10	420	130'
Shale, red, partly concealed.....	40	460	
Sandstone, shaly, <b>Arnoldsburg</b> .....	25	485	
Shale, variegated, with sandstone.....	30	515	
Sandstone, flaggy, <b>Sewickley</b> .....	15	530	110'
Shale, red and variegated, to creek (850' B.)..	30	560	

In the following section, arranged in descending order, the upper portion was measured with hand level up the steep hill east of the West Fork River peninsula, one mile north of Brownsville. The lower portion is the record of the Louis Bennett No. 1 (526) gas well, drilled by Guffey and Galey:

### Brownsville Section, Courthouse District.

	Thickness Feet.	Total Feet.	
<b>Dunkard Series (117')</b>			
Concealed, with sandstone fragments, from top of knob.....	17	17	
Sandstone, massive, soft, brown.....45'	} <b>Waynesburg.</b> 100	117	117'
Concealed.....5			
Sandstone, massive, coarse, brown, with a few pebbles.....50			
<b>Monongahela and Conemaugh Series (991')</b>			
Concealed.....	40	157	
Sandstone, flaggy, <b>Gilboy</b> .....	20	177	
Shale, sandy.....	26	203	
Sandstone, shaly, <b>Uniontown</b> .....	18	221	104'
Concealed, with reds.....	17	238	
Sandstone, shaly.....	11	249	
Shale, variegated.....	33	282	
Sandstone, brown.....15'	} <b>Arnoldsburg</b> . 41	323	
Sandstone, greenish, fine grained.....16			
Shale, variegated.....10			
Concealed.....	17	340	
Sandstone, flaggy.....20'	} <b>Sewickley</b> .... 58	398	177'
Concealed.....23			
Sandstone, flaggy.....15			
Concealed.....	48	446	
Sandstone, massive, <b>Cedarville</b> .....	17	463	
Shale, sandy.....	5	468	
<b>Coal, Redstone</b> (Louis Bennett Mine No. 93 on Map II, 1055' B.) partly shut, about Continued by Louis Bennett No. 1 (526) Well Record (1055' B.):	5	473	75'
Clay.....	9	482	
Lime.....	80	562	
Slate.....	11	573	
Lime.....	25	598	
<b>Coal, Little Pittsburgh</b> .....	2	600	127'
Sand, white, <b>Connellsville</b> .....	12	612	
Slate.....	10	622	
Red rock.....	16	638	
Sand, white, <b>Lower Connellsville</b> .....	15	653	
Red rock.....	80	733	
Lime.....	30	763	
Slate.....	15	778	
Red rock.....	35	813	

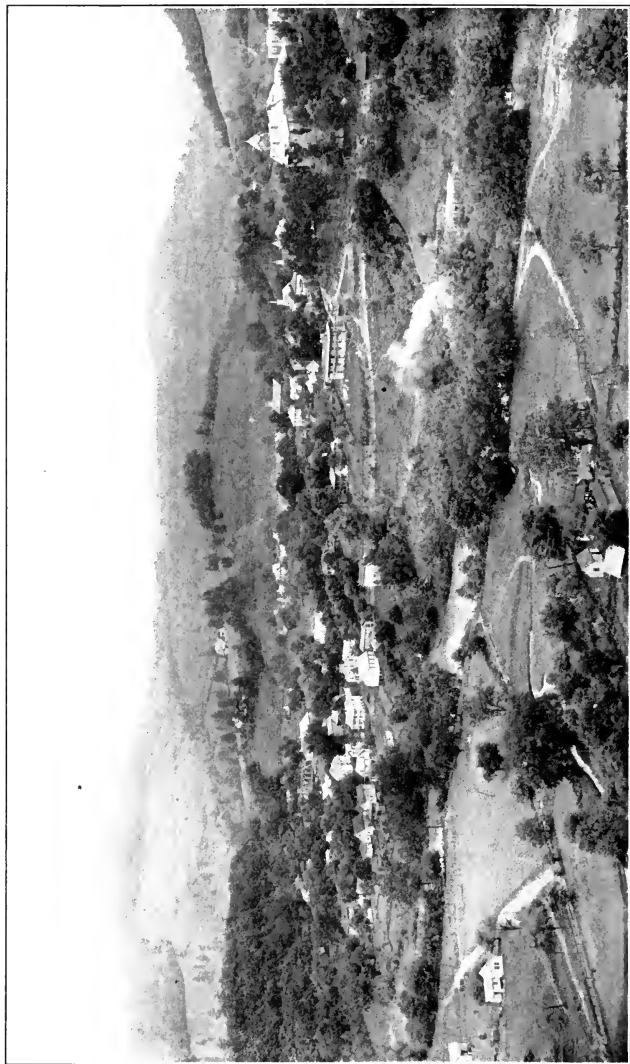


PLATE VI.—View of Glenville; Little Kanawha River in foreground; State Normal School at right; Topography of the Dunkard, Monongahela and Conemaugh Series.



	Thickness Feet.	Total Feet.	
Sand, hard, Grafton.....	30	843	
Slate .....	25	868	
Lime .....	40	908	
Red rock.....	50	958	
Slate .....	35	993	
Lime .....	20	1013	
Slate .....	20	1033	
Sand, gray... 25' }			
Sand, white... 50' } Big Dunkard, Mahoning ...	75	1108	508'
<b>Allegheny Series (260')</b>			
Slate .....	10	1118	
Lime .....	35	1153	
Slate .....	15	1168	
Lime .....	45	1213	
Coal, Upper Kittanning.....	3	1216	108'
Slate .....	12	1228	
Lime .....	75	1303	
Coal, Lower Kittanning.....	3	1306	90'
Slate .....	32	1338	
Lime .....	30	1368	62'
<b>Pottsville Series (470')</b>			
Sand, gray... 25' }			
Sand, white... 100' } Homewood .....	135	1503	
Sand, dark... 10' }			
Slate .....	5	1508	
Lime .....	10	1518	
Slate .....	100	1618	
Lime .....	40	1658	
Slate .....	20	1678	
Lime .....	35	1713	
Sand, gray, Salt.....	35	1748	
Slate .....	5	1753	
Lime .....	50	1803	
Sand, white, Salt.....	35	1838	470'
<b>Mauch Chunk Series (300')</b>			
Slate .....	5	1843	
Lime .....	35	1878	
Red rock.....	185	2063	
Lime .....	65	2128	
Slate .....	10	2138	300'
<b>Greenbrier Limestone (90')</b>			
Big Lime.....	90	2228	
<b>Pocono Sandstones (390')</b>			
Sand, Big Injun.....	60	2288	
Sand and lime.....	45	2333	
Slate .....	10	2343	
Sand and lime, Squaw.....	40	2383	
Slate and shells.....	175	2558	
Sand, white, Berea.....	60	2618	475'
<b>Catskill Series (473')</b>			
Slate and shells, Gantz.....	65	2683	
Red rock.....	5	2688	
Slate and shells.....	130	2818	200'
Gordon Sand (gas).....	27	2845	
Slate and shells.....	90	2935	

	Thickness Feet.	Total Feet.	
Slate .....	126	3061	243'
<b>Fifth (Bayard?) Sand</b> .....	14	3075	
Unrecorded to bottom.....	16	3091	

### *Skin Creek District.*

The following section, arranged in descending order, was measured with hand level up a steep hill west of Pringle Fork of Stonecoal Creek, 1.2 miles north of Snyder Schoolhouse:

#### Stonecoal Section, Skin Creek District.

	Thickness Feet.	Total Feet.	
<b>Monongahela Series (133')</b>			
Concealed from top of knob.....	20	20	
Sandstone, coarse, partly concealed, <b>Sewickley</b>	40	60	60'
Concealed .....	38	98	
Bench, <b>Redstone Coal horizon</b> .....	..	98	
Concealed .....	35	133	
Bench, <b>Pittsburgh Coal horizon (1519' L.)</b> ....	..	133	73'
<b>Conemaugh Series (387')</b>			
Concealed .....	38	171	
Sandstone, shaly, <b>Lower Pittsburgh</b> .....	20	191	
Concealed, mostly variegated shale.....	77	268	
Sandstone, shaly, <b>Lower Connellsville</b> .....	17	285	152'
Concealed, with variegated shale.....	55	340	
Sandstone, <b>Morgantown</b> .....	20	360	
Shale, sandy, and concealed.....	35	395	
<b>Coal, opening abandoned, thickness concealed,</b> <b>Elk Lick (1257' L.)</b> .....	..	395	110'
Concealed .....	5	400	
Sandstone .....	5	405	
Concealed and shale.....	35	440	
Sandstone, <b>Grafton</b> .....	10	450	55'
Concealed, mostly green shale, with plant fossils at top.....	55	505	
Sandstone, massive, <b>Saltsburg, to Pringle Fork</b>	15	520	

The following section, arranged in descending order, was measured along the strike of the measures, northeastward up a high hill, starting 1.5 miles northwest of Vandalia:

#### Vandalia Section, Skin Creek District.

	Thickness Feet.	Total Feet.	
<b>Monongahela Series (297')</b>			
Concealed, with sandstone fragments, from top of knob.....	35	35	
Sandstone, greenish brown, flaggy, <b>Uniontown</b>	38	73	73'
Concealed along slope.....	12	85	
Sandstone, green, fine, <b>Arnoldsburg</b> .....	11	96	



	Thickness Feet.	Total Feet.	
Concealed in gentle slope.....	70	166	
Sandstone in bluff, shaly, <b>Sewickley</b> .....	38	204	131'
Concealed .....	55	259	
<b>Coal opening, thickness concealed, Redstone</b> (1395' B.) (M. L. Bruffy Mine No. 116 on Map II).....	..	259	55'
Concealed .....	38	297	
<b>Slate, black, Pittsburgh Coal (1357' B.)</b> .....	..	297	38'
<b>Conemaugh Series (243')</b>			
Concealed, with sandstone and sandy shale, in bluff.....	27	324	
Bench, <b>Little Pittsburgh Coal horizon</b> .....	5	329	
Concealed in bluff, with sandstone fragments, <b>Connellsville</b> .....	28	357	
Concealed with reds.....	33	390	
Fire clay spring, <b>Little Clarksburg Coal hori- zon</b> .....	..	390	93'
Concealed.....	20	410	
Sandstone, brown, medium coarse, <b>Lower Con- nellsville</b> .....	17	427	
Concealed .....	33	460	
Sandstone, massive, concealed, and sandstone, massive, <b>Morgantown</b> .....	35	495	
Shale, sandy.....	15	510	
Coal, partly concealed, thickness supplied, <b>Elk Lick</b> .....	5	515	125'
Shale, gray, limy.....	10	525	
Concealed to Skin Creek.....	15	540	

### *Collins Settlement District.*

In the following section, arranged in descending order, the surface portion was measured with hand level up a hill immediately northeast of Roanoke. The lower portion is from the record of the C. W. Watson No. 2554 (570) oil test well drilled by the Hope Natural Gas Company, 95 feet being omitted from the top of the record to make the stratigraphic succession complete. The total depth of the hole was 3200 feet:

#### Roanoke Section, Collins Settlement District.

	Thickness Feet.	Total Feet.	
<b>Dunkard Series (38')</b>			
Sandstone, coarse, brown, capping knob, <b>Waynesburg</b> .....	38	38	38'
<b>Monongahela and Conemaugh Series (928')</b>			
Concealed, mostly sandy and variegated shale	17	55	
Sandstone, flaggy, medium coarse, <b>Gilboy</b> ....	40	95	
Concealed, with reds.....	5	100	
Sandstone, fine grained, green, flaggy, <b>Union- town</b> .....	12	112	74'

	Thickness Feet.	Total Feet.	
Concealed, with reds and fragments of sandstone .....	52	164	
Sandstone, brown and flaggy, <b>Arnoldsburg</b> ...	14	178	
Concealed, mostly reds.....	20	198	
Sandstone .....	5	203	
Concealed in slope, mostly reds.....	50	253	
Sandstone, shaly, partly concealed, <b>Sewickley</b>	30	283	171'
Concealed .....	78	361	
Sandstone, gray, coarse, <b>Cedarville</b> .....	5	366	
Coal opening (No. 117 on Map II), abandoned, <b>Redstone</b> , thickness concealed (1045' L.) ...		366	83'
Concealed to West Fork River.....	5	371	
<b>Continued in C. W. Watson No. 2554 (570)</b>			
<b>Well Record:</b>			
Unrecorded .....	495	866	
Sand, Little Dunkard.....	10	876	
Unrecorded .....	75	951	
Sand, Big Dunkard.....	15	966	600'
<b>Allegheny Series (230')</b>			
Unrecorded .....	190	1156	
Gas Sand.....	40	1196	
<b>Pottsville Series (560')</b>			
Unrecorded .....	105	1301	
Sand, First Salt.....	75	1376	
Unrecorded .....	120	1496	
Sand, Second Salt.....	260	1756	
<b>Mauch Chunk Series (390')</b>			
Unrecorded .....	180	1936	
Sand, Maxton.....	20	1956	
Unrecorded .....	135	2091	
Little Lime.....	20	2111	
Pencil Cave.....	35	2146	1180'
<b>Greenbrier Limestone (55')</b>			
Big Lime.....	55	2201	
<b>Pocono Sandstones (365')</b>			
Big Injun Sand.....	165	2366	
Unrecorded .....	20	2386	
Sand, Squaw.....	50	2436	
Unrecorded .....	105	2541	395'
Sand, Berea.....	25	2566	
<b>Catskill and Chemung Series (910')</b>			
Unrecorded .....	50	2616	
Sand, Fifty-foot.....	30	2646	
Unrecorded .....	95	2741	
Sand, Gordon Stray.....	18	2759	
Unrecorded .....	93	2852	311'
Sand, Gordon.....	10	2862	
Unrecorded .....	92	2954	102'
Sand, Fifth.....	12	2966	
Unrecorded to bottom.....	510	3476	

Well completed July 7, 1912; dry hole.

In the following section, the upper portion was measured with hand level up a steep hill just east of Orlando Station on

the Coal and Coke Railway. The lower portion is taken from the record of the Waters Heirs No. 4 well (585), drilled by Snaith and Wilson, to whom the Survey is indebted for the record. The well is located two miles north of Orlando, but as there was no doubt about the surface formations at either place, there was no difficulty in connecting the surface measurements at Orlando with the record of the well:

### Orlando Section, Collins Settlement District.

	Thickness Feet.	Total Feet.	
<b>Monongahela Series (338')</b>			
Sandstone, partly concealed, capping knob, <b>Gilboy (1345' L.)</b> .....	30	30	30'
Concealed .....	54	84	
Sandstone, flaggy, green, <b>Uniontown</b> .....	6	90	
Shale, red, partly concealed.....	56	146	
Sandstone, shaly, <b>Arnoldsburg</b> .....	10	156	
Concealed, with reds, along slope.....	27	183	
Sandstone, massive, pebbly, cliff rock, <b>Sewick-</b> <b>ley (1190' L.)</b> .....	25	208	178'
Steep bluff with thin sandstones and varie-			
gated shale.....	80	288	
Concealed in bench, <b>Redstone Coal horizon</b> ....	5	293	
Concealed and sandstone in bluff.....	45	338	
Spring, <b>Pittsburg Coal horizon, (1037' L.)</b> ....	...	338	130'
<b>Conemaugh Series (540')</b>			
Concealed .....	28	366	
Sandstone, shaly, <b>Lower Pittsburgh</b> .....	20	386	
Shale, sandy.....	38	424	
Sandstone, gray, medium grained, <b>Connell-</b> <b>ville</b> .....	12	436	
Shale, red, partly concealed.....	57	493	
Sandstone, massive, <b>Lower Connellsville</b> .....	15	508	
Shale, red.....	30	538	
<b>Coal, slaty, Normantown</b> .....	1	539	201'
Fire clay shale.....	3	542	
Sandstone, shaly, <b>Morgantown</b> .....	15	557	
Shale, red.....	6	563	
Shale, sandy.....	2	565	
<b>Shale, greenish, sandy, with small fossil shells</b>	6	571	
Slate, dark (0' 2").....	..	571	
<b>Limestone, shaly, Orlando</b> .....	3	574	
Shale .....	3.5	577.5	
<b>Coal, Elk Lick (0' 6")</b> .....	0.5	578	39'
Shale, variegated, to Coal & Coke Ry. grade.	15	593	
Concealed to Oil Creek.....	10	603	
Continued in Waters Heirs No. 4 (585)			
Well Record:			
Unrecorded .....	135	738	
<b>Coal, Bakerstown</b> .....	5	743	
Unrecorded .....	20	763	
Sand, Little Dunkard.....	25	788	

	Thickness Feet.	Total Feet.
Unrecorded .....	50	838
Sand, Big Dunkard.....	40	878
<b>Allegheny and Pottsville Series (810')</b>		
Unrecorded .....	810	1688
<b>Mauch Chunk Series (180')</b>		
Sand, Maxton (gas, 75' in).....	150	1838
Unrecorded .....	20	1858
Little Lime.....	10	1868
<b>Greenbrier Limestone (70')</b>		
Big Lime.....	70	1938
<b>Pocono Sandstones (325')</b>		
Big Injun Sand.....	235	2173
Unrecorded .....	90	2263
<b>Catskill Series (370')</b>		
Unrecorded .....	250	2513
Sand, Thirty-foot.....	25	2538
Unrecorded .....	13	2551
Sand, Gordon Stray (gas, 6' in).....	11	2562
Unrecorded.....	15	2577
Sand, Gordon.....	30	2607
Unrecorded to bottom.....	26	2633
"Gas test, 65/10 mercury in 2" opening; volume 1,400,000 cu. ft. daily. Total depth of hole, 2195 feet."		

In the above section the thickness of the Pocono Sandstones is supplied from the record of a well on the same tract (Waters Heirs No. 3, No. 586 on Map II) which records the Berea Sand.

The following section, arranged in descending order, was measured with hand level along the north side of West Fork River, one-half mile east of Jewell Station, on the Coal and Coke Railway, and about one-eighth mile west of the Upshur Line:

#### Jewell Section, Collins Settlement District.

	Thickness Feet.	Total Feet.
<b>Conemaugh Series (438')</b>		
Concealed from top of knob, mostly sandy shale	9	9
Sandstone, flaggy, <b>Lower Connellsville</b> .....	30	39
Concealed, with reds.....	28	67
Shale, variegated.....	90	157
Sandstone, shaly, <b>Grafton</b> .....	16	173
Shale, greenish-red, with plant and marine (?) fossils, <b>Ames</b> .....	17	190
Dark shale and fire clay, <b>Harlem Coal horizon</b> , (1493' L.).....	1	191
Shale, variegated, <b>Pittsburgh Reds</b> .....	70	261
Coal, streak.....	—	261
Concealed, mostly shale.....	17	278
Sandstone, massive, gray, <b>Saltsburg</b> .....	10	288

	Thickness Feet.	Total Feet.	
<b>Coal opening, Bakerstown (Mine No. 239 on Map II, 1394' L.) hole full of water, about</b>	2	290	99'
Concealed.....	10	300	
Sandstone, massive, gray, <b>Buffalo</b> .....	28	328	
Shale, sandy.....	10	338	
Shale, dark, <b>Brush Creek</b> .....	5	343	
<b>Coal</b> .....0' 5" } 1' 5" <b>Brush Creek</b>			
<b>Shale, gray</b> .....0 8 }			
<b>Coal</b> .....0 4 } (1340' L.)... 1		344	54'
Shale, gray, limy.....	10	354	
Sandstone, massive, gray, <b>Upper Mahoning</b> ...	30	384	
Shale, sandy, and concealed.....	20	404	
Sandstone, massive, gray, <b>Lower Mahoning</b> ...	14	418	
Shale, ferriferous.....	3	421	
Sandstone, massive.....	7	428	
Shale, gray, sandy.....	10	438	
<b>Allegheny Series (47')</b>			
Slate, dark streak, <b>Upper Freeport Coal</b> (1246' L.).....	—	438	94'
Shale, gray.....	2	440	
Limestone, yellow, hard, <b>Upper Freeport</b> .....	1	441	
Shale, limy.....	4	445	
Shale, sandy.....	12	457	
Sandstone, massive, gray, <b>Upper Freeport, to West Fork River</b> .....	28	485	

In the southern end of Collins Settlement District, the southeastward rise of the rocks brings both the Allegheny and Pottsville Series to the surface. In the following section the surface portion was measured with hand level along the steep hillside east of Gladly Creek, about one mile north of Bablin. The lower portion is the record of the A. K. Wilson No. 2 oil well (597), drilled by Wilson and Butcher near the Little Kanawha River, one mile east of Bablin. Between the bottom of the measured section and the top of the oil well there is an interval of about 200 feet of Pottsville sediments on which observations were not obtained. At other points this interval showed gray sandstones and sandy shales separated by horizons of black slate and one or two thin coal seams:

#### Bablin Section, Collins Settlement District.

	Thickness Feet.	Total Feet.
<b>Conemaugh Series (145')</b>		
<b>Coal blossom, on top of knob, Bakerstown</b> (1580' B.).....	—	—
Concealed, with ferriferous nodules.....	5	5
Shale, sandy, greenish, with plant fossils.....	15	20
Concealed, mostly shale.....	115	135

	Thickness Feet.	Total Feet.	
Concealed in bench.....	10	145	
<b>Allegheny Series (185')</b>			
Concealed in steep bluff, with sandstone, <b>Upper Freeport</b> .....	75	220	
Shale, gray, with plant fossils.....	10	230	
Concealed .....	36	266	
Slate, black, <b>Upper Kittanning Coal horizon</b> ..	—	266	
Concealed.....	35	301	
Sandstone, massive, <b>Lower Freeport</b> , lower di- vision.....	20	321	
Coal.....2' 0" } <b>Lower Kittanning</b>			
Slate, black.....0 4 } (3' 11") (1255' B.)	4	325	325'
Coal, visible....1 7 } (Mine 257, Map II.)			
Concealed .....	5	330	
<b>Pottsville Series (811')</b>			
Sandstone, massive, <b>Homewood</b> .....	25	355	
Concealed.....	95	450	
Sandstone, shaly.....	20	470	
Concealed.....	15	485	
Shale, dark, with ferriferous limestone nodules and marine fossils.....	10	495	
Shale, dark, bony, with marine fossils, 0' 6", <b>Kanawha Black Flint (1085' B.)</b> .....	0.5	495.5	170.5'
Slate, black, bony.....	0.5	496	
Shale, gray (0' 8").....	1	497	
Coal (0' 4"), <b>Stockton</b> .....	—	497	
Fire clay shale.....	10	507	
Sandstone, massive, to creek.....	13	520	
Interval.....	200	720	
Continued by A. K. Wilson No. 2 (597) Well Record (1010' B.):			
Conductor.....	16	736	
Sand.....	10	746	
Shale, black.....	49	795	
Sand, white.....	55	850	
Shale, black.....	110	960	
Sand, gray.....	17	977	
Shale, black.....	45	1022	526.5'
Oil Sand, Salt.....	52	1074	
Shale, black.....	52	1126	
Oil sand, and gas, Salt.....	15	1141	119'
<b>Mauch Chunk Series (344')</b>			
Shale, blue.....	8	1149	
Shale, red.....	256	1405	
Shale, blue.....	30	1435	
Lime rock.....	20	1455	
Sand, gray, and gas, <b>Maxton</b> .....	30	1485	344'
<b>Greenbrier Limestone (230')</b>			
"Trenton rock," <b>Big Lime</b> .....	230	1715	
<b>Pocono Sandstones (181')</b>			
Shale, blue.....	70	1785	
Sand, blue, <b>Big Injun</b> .....	25	1810	
Shale, blue.....	86	1896	
<b>Catskill Series (594')</b>			
<b>Red rock</b> .....	124	2020	
Sand, white.....	20	2040	

	Thickness Feet.	Total Feet.	
Shale, blue.....	155	2195	710'
Sand rock, oil sand, Gordon.....	45	2240	
Shale, blue.....	150	2390	195'
Sand, black, oil smell, Fifth.....	15	2405	
Shale, blue.....	25	2430	60'
Sand shale, blue, Bayard.....	60	2490	
<b>Chemung Series (244')</b>			
Shale, blue, mixed, to bottom.....	244	2734	

In the above section the correlation of the sands in the Mississippian and Devonian are open to question since the nearest well record toward the north where wells have been generally drilled and correlations are more certain is the Chas. M. Hyre well (563) at Frenchton, which shows the Pocono Sandstones to be 300 feet thick, and the interval between the top of the Big Lime and the Gordon Sand to be 724 feet, as compared to 710 in the Bablin Section.

The formation at 495 feet is identified as the Kanawha Black Flint from the abundance of marine fossils, of a striking similarity to those found in the same horizon at its type locality in the Kanawha Valley. The resemblance is so close that Dr. W. A. Price did not hesitate to pronounce it the Black Flint when the writer called his attention to the exposure. The finding of this deposit is a most important link in the chain of evidence necessary to correlate the Pottsville of northern West Virginia and Pennsylvania with the greatly expanded measures of the same series in southwestern West Virginia. The formation will be discussed further in Chapters IX and XIII.

The following section, arranged in descending order, was measured with hand level up the steep hill northeast of Wildcat, at the corner of Lewis, Braxton and Webster. The Lower Kittanning Coal was concealed, but belongs just over the Homewood Sandstone:

#### Wildcat Section. Collins Settlement District.

	Thickness. Feet.	Total. Feet.	
<b>Conemaugh Series (162')</b>			
Shale, sandy, from top of knob.....	35	35	
Sandstone, shaly.....	5	40	
Sandy shale and concealed.....	50	90	
Slate, black, bony, fragments, Brush Creek			
Coal, (1420' L.).....	—	90	90'

	Thickness Feet.	Total Feet.	
Concealed, mostly shale.....	33	123	
Sandstone, massive, pinkish gray, cliff rock, Mahoning .....	22	145	
Concealed.....	17	162	
<b>Allegheny Series (238')</b>			
Sandstone, massive, pebbly, partly concealed, Upper Freeport.....	70	232	142'
Concealed in bench.....	23	255	
Sandstone, massive, gray, Lower Freeport....	32	287	
Concealed in steep slope.....	88	375	
Concealed along bench.....	25	400	168'
<b>Pottsville Series (175')</b>			
Sandstone, gray, Homewood.....	30	430	
Concealed .....	125	555	155'
Sandstone, massive, to Little Kanawha River.	20	575	

The following section, which is the result of considerable painstaking labor, was made near Cleveland. First a careful hand level measurement was made from Cleveland northward up the mountain to the Buffalo Sandstone which caps it. This measurement included the Upper Kittanning and the coal at 450 feet. Afterward, another hand level section was measured, starting at the Upshur-Lewis Line about one mile northwest of Cleveland, and measuring up to the same opening in the Upper Kittanning Coal. This section included the Middle Kittanning and Lower Kittanning Coals and the Kanawha Black Flint horizon. By compiling the two measurements a section 775 feet long is obtained that includes all the important formations found in this locality. A careful search was made on both sides of the river for fossils at the Black Flint horizon by both Dr. Price and the writer, without success, but its place does not seem subject to much doubt since its interval below the Lower Kittanning Coal is about the same as at Bablin, a few miles away.

The lower part of the section is the record of the Vandervort and Pickens No. 1 (606) oil well, drilled by Meade Bros. for the Haddix and Leading Creek Oil and Gas Company, previously published by the Survey<sup>1</sup>.

Additional evidence in the form of other records secured subsequent to the first publication of this log has caused a change to be made in some of the correlations. The well evidently did not reach the Gordon or Fifth Sands in which

<sup>1</sup>Vol. I(A), W. Va. Geological Survey, page 393; 1904.



oil shows were found at Bablin. By determining the rise of the rocks between two openings in the Lower Kittanning Coal on either side, the well mouth was found to be about 460 feet below this horizon :

**Cleveland Section, Corner of Lewis, Upshur and Webster Counties.**

	Thickness. Feet.	Total. Feet.	
<b>Conemaugh Series (143')</b>			
Sandstone, massive, gray, pebbly, capping knob, <b>Buffalo</b> .....	60	60	
Fire clay along bench, <b>Brush Creek Coal horizon</b> .....	—	60	60'
Shale, gray, sandy, with plant fossils and iron ore.....	55	115	
Sandstone, shaly, <b>Mahoning</b> .....	28	143	
<b>Allegheny Series (217')</b>			
Concealed in bench.....	22	165	
Sandstone, partly concealed in bluff, <b>Upper Freeport</b> .....	35	200	
Concealed.....	15	215	
Shale, gray, sandy, with plant fossils.....	11	226	
<b>Coal</b> .....0' 4" } <b>Upper Kittanning</b>			
<b>Shale, dark</b> .....0 7 } (3' 7") (1780' L.)	4	230	170'
<b>Coal</b> .....2 8 } (John Beverage Mine, 255, Map II.)			
Concealed.....	35	265	
Sandstone, massive, pebbly, cliff rock, upper division of <b>Lower Freeport</b> .....	30	295	
Concealed.....	9	304	
<b>Coal blossom, Middle Kittanning</b> .....	1	305	75'
Concealed.....	12	317	
Sandstone, massive, cliff rock, with numerous plant fossils at base, lower division of <b>Lower Freeport</b> .....	35	352	
<b>Coal</b> .....3' 8" } <b>Lower Kittanning</b>			
<b>Slate, black</b> .....1 0 } (8' 4") (1665' B.)			
<b>Coal</b> .....0 11 } (Nimrod Lake Mine No. 272 on Map II.)	8	360	55'
<b>Slate, black</b> .....0 1 }			
<b>Coal, visible</b> .....2 8 }			
<b>Pottsville Series (845')</b>			
Steep slope with massive sandstone, <b>Home-wood</b> .....	90	450	
<b>Coal opening, thickness concealed, not much found</b> (Mine No. 281 on Map II) (1590' L.)	—	450	90'
Concealed in steep slope.....	85	535	
Fire clay spring, <b>Kanawha Black Flint horizon</b>	—	535	85'
Concealed in bench.....	10	545	
Concealed in slope.....	45	590	
Sandstone, massive, cliff rock.....	50	640	
Concealed.....	90	730	
Sandstone, massive, partly concealed, to <b>Little Kanawha River, Cleveland</b> .....	45	775	
Interval.....	45	820	

	Thickness Feet.	Total Feet.	
<b>Continued by Record of Vandervort and Pickens No. 1 (606) Well, (1220' B.):</b>			
Quicksand.....	25	845	
Sand, white, hard (conductor, 35').....	25	870	
Lime and slate.....	75	945	
Sand, hard and poor.....	33	978	
Lime.....	25	1003	
Shale and lime.....	89	1092	
Lime, sandy.....	93	1185	
Shale, white.....	20	1205	
<b>Mauch Chunk Series (575')</b>			
Lime, sandy, shale and red rock.....	515	1720	1185'
Sand, Maxton.....	25	1745	
Lime, sandy.....	25	1770	
Shale, black.....	10	1780	60'
<b>Greenbrier Limestone (165')</b>			
Big Lime.....	165	1945	
<b>Pocono Sandstones (425')</b>			
Sand (cave, 1200'; salt water, 1225').....100' } Big Injun	140	2085	
Sand and lime (cased 6 $\frac{5}{8}$ " )... 40 }			
Red rock.....	20	2105	
Lime, sandy.....	215	2320	540'
Sand, gray, Berea.....	50	2370	
<b>Catskill Series (257')</b>			
Shells, sandy, and slate.....	50	2420	
Lime, shells and slate.....	100	2520	
Lime, sandy.....	50	2570	
Lime, shells, and slate, to bottom.....	57	2627	

## GILMER COUNTY SECTIONS.

### *Troy District.*

In the following section, the upper portion was made by hand level up the hill immediately north of Troy. The lower portion is the record of the E. M. Talbott No. 1 (610) Gas Well, drilled by the Troy Oil and Gas Company, the record being furnished the Survey by W. W. Heckert, of Troy. The well is located one mile east of Troy, but as the **Pittsburgh Coal** is above drainage both at the well and at the point where the surface measurements were made, there was no doubt about correctly joining the two:

## Troy Section, Troy District.

	Thickness. Feet.	Total. Feet.	
<b>Dunkard Series (20')</b>			
Sandstone, fragments from top of knob, Waynesburg .....	20	20	20'
<b>Monongahela Series (363')</b>			
Concealed, with red shale.....	63	83	
Sandstone, green, fine grained, Uniontown...	25	108	88'
Concealed, with red shale.....	30	138	
Sandstone, massive, coarse, brown, Arnolds- burg.....	20	158	
Red shale, partly concealed.....	77	235	
Sandstone, massive, coarse, partly concealed, Sewickley.....	27	262	154'
Concealed.....	60	322	
Sandstone and shale, interlaminated, Weston	56	378	
Shale, sandy.....	5	383	
Coal, (0' 4"), Pittsburgh (808' L.).....	—	383	121'
<b>Conemaugh Series (527')</b>			
Shale, sandy, partly concealed.....	35	418	
Sandstone, massive, gray, Lower Pittsburgh..	17	435	
Shale, variegated.....	5	440	
Concealed to Leading Creek.....	5	445	
Interval.....	20	465	
Continued by E. M. Talbott No. 1 (610) Well Record (753' L.)			
Unrecorded .....	329	794	
Sand, Little Dunkard.....	19	813	
Unrecorded.....	62	875	
Sand, Big Dunkard.....	35	910	527'
<b>Allegheny Series (301')</b>			
Unrecorded.....	200	1110	
Gas Sand, Lower Freeport.....	36	1146	
Unrecorded.....	65	1211	
<b>Pottsville Series (408')</b>			
Sand, First Salt, Homewood.....	46	1257	
Unrecorded .....	15	1272	
Sand, Second Salt.....	60	1332	
Unrecorded.....	195	1527	
Sand, Third Salt, (show of gas and water, 1112')	92	1619	
<b>Mauch Chunk Series (226')</b>			
Unrecorded.....	71	1690	
Sand, Maxton.....	22	1712	
Unrecorded.....	113	1825	
Little Lime.....	17	1842	
Unrecorded.....	5	1847	937'
<b>Greenbrier Limestone (118')</b>			
Big Lime (gas and oil show in bottom).....	118	1965	
<b>Pocono Sandstones (38')</b>			
Big Injun (gas, 1533-1538') to bottom.....	38	2003	
"Considerable oil show. Total depth, 1538'. 13" drain pipe, 52'; 10" casing, 204'; 8¼" casing, 380'; 6½" casing, 1399'."			

The following section, arranged in descending order, was measured up a high hill on the west side of Cove Creek, one-

fourth mile north of Conings. Being situated in the Robinson Syncline, it includes more of the Dunkard Series than any other section in either County:

### Conings Section, Troy District.

	Thickness Feet.	Total Feet.	
<b>Dunkard Series (476')</b>			
Sandstone, flaggy, micaceous, from top of knob, <b>Rush Run</b> .....	40	40	40'
Concealed.....	18	58	
Sandstone, partly concealed, <b>Jollytown</b> .....	15	73	33'
Concealed, mostly shale.....	39	112	
Sandstone, massive, coarse, soft, brown, friable, <b>Hundred</b> .....	55	167	94'
Concealed and shale.....	17	184	
Sandstone, flaggy, micaceous, <b>Upper Marietta</b> .	45	229	62
Shale and concealed.....	30	259	
Sandstone, flaggy, partly concealed, <b>Lower Marietta</b> .....	30	289	
Concealed.....	10	299	
<b>Coal blossom, Washington, (1047' L.)</b> .....	—	299	70'
Fire clay shale, yellow, <b>Washington</b> .....	32	331	
Sandstone, flaggy, micaceous, <b>Mannington</b> ....	22	353	
Shale, partly concealed.....	33	386	
Concealed, with fragments of sandstone, <b>Waynesburg</b> .....	90	476	
<b>Monongahela Series (86')</b>			
Sandstone, massive, light brown, medium coarse, small pebbles, <b>Gilboy</b> .....	40	516	217'
Concealed and sandy shale.....	20	536	
Sandstone, shaly, <b>Uniontown</b> .....	20	556	
Shale, green, <b>Annabelle</b> .....	4	560	
<b>Coal, streak, Uniontown (784' L.)</b> .....	—	560	44'
Fire clay shale to Cove Creek.....	2	562	

In the following section, arranged in descending order, the upper portion was measured with hand level along the strike of the rocks up a high hill east of Horn Creek, one mile southeast of Coxs Mills. The lower portion is the record of the Peter Cole No. 1 (617) Well, drilled by the Crude Oil Company. The well was completed September 25, 1905, and was a dry hole:

## Coxs Mills Section, Troy District.

	Thickness Feet.	Total Feet.	
<b>Dunkard Series (345')</b>			
Sandstone, soft, brown, massive, from top of knob, <b>Hundred</b> .....	23	23	
Concealed.....	45	68	
Sandstone, flaggy, <b>Upper Marietta</b> .....	27	95	
Shale, yellow.....	28	123	
Sandstone, flaggy, partly concealed, <b>Lower Marietta</b> .....	55	178	
Bench, <b>Washington Coal horizon (1147' B.)</b> ...	..	178	178'
Concealed .....	132	310	
Sandstone, massive, pebbly, cliff rock, <b>Waynesburg (980' B.)</b> .....	35	345	167'
<b>Monongahela, Conemaugh and Allegheny Series (1040')</b>			
Concealed .....	34	379	
Sandstone, flaggy, <b>Gilboy</b> .....	27	406	
Concealed .....	10.5	416.5	
Sandstone, flaggy, <b>Uniontown</b> .....	10	426.5	
<b>Coal, Uniontown (897' B.)</b> , reported.....	1.5	428	83'
Concealed, mostly red shale.....	92	520	
Sandstone, massive, <b>Sewickley</b> , to well.....	30	550	122'
Continued by Peter Cole No. 1 (617) Well Record (775' B.)			
Unrecorded (water, 195'; 10" casing, 200')...	525	1075	
<b>Coal, Bakerstown</b> .....	8	1083	533'
Unrecorded (8¼" casing, 791').....	302	1385	
<b>Pottsville Series (480')</b>			
Sand, <b>Homewood</b> .....	110	1495	412'
Unrecorded .....	80	1575	
Sand, <b>Salt</b> .....	45	1620	
Unrecorded .....	35	1655	
Sand, <b>Salt</b> .....	50	1705	
Unrecorded .....	35	1740	
Sand, <b>Salt</b> .....	65	1805	
Unrecorded .....	15	1820	
Sand, <b>Salt</b> .....	45	1865	
<b>Mauch Chunk Series (265')</b>			
Unrecorded .....	197	2062	
Sand, <b>Maxton</b> .....	10	2072	
Unrecorded .....	18	2090	
<b>Little Lime</b> .....	15	2105	
Unrecorded ( <b>Pencil Cave</b> ).....	25	2130	635'
<b>Greenbrier Limestone (48')</b>			
<b>Big Lime (6⅝" casing, 1608'; gas, 1646')</b> .....	48	2178	
<b>Pocono Sandstones (322')</b>			
<b>Big Injun Sand</b> .....	112	2290	
Unrecorded .....	210	2500	
Shells, thickness unrecorded, <b>Berea?</b> .....	—	2500	
<b>Catskill Series (598')</b>			
Unrecorded (no sands).....	430	2930	
Red rock, thickness unrecorded.....	—	2930	
Unrecorded (no sands).....	160	3090	960
<b>Fifth Sand</b> .....	8	3098	

In the following section, arranged in descending order, the upper portion was measured with hand level, up a hill road on the east side of Tanner Creek, one-half mile south of Newberne. The lower portion is the record of the G. A. Kemper No. 1 (635) oil well, drilled by the Crude Oil Company, who furnished the record to the Survey. The well, which produced oil from the Berea Sand, is located at the foot of the hill where the section was measured:

### Newberne Section, Troy District.

	Thickness. Feet.	Total. Feet.	
<b>Dunkard Series (412')</b>			
Concealed, with red shale, from top of hill...	30	30	
Sandstone, shaly, <b>Hundred</b> .....	30	60	60
Shale, sandy.....	17	77	
Sandstone, shaly.....	5	82	
Shale, sandy.....	17	99	
Sandstone, massive, soft, brown, <b>Upper Marietta</b> .....	47	146	
Shale, variegated, <b>Creston Reds</b> .....	61	207	
Sandstone, brown, micaceous, <b>Lower Marietta</b>	38	245	
Shale, dark, streak, <b>Washington Coal (1104' L.)</b>	—	245	185
Fire clay shale, yellow, <b>Washington</b> .....	17	262	
Sandstone, massive, light brown, micaceous, <b>Mannington</b> .....	38	300	
Shale, variegated, partly concealed.....	82	382	
Sandstone, massive, coarse, <b>Waynesburg</b> .....	30	412	167'
<b>Monongahela and Conemaugh Series (951')</b>			
Concealed .....	15	427	
Sandstone, massive.....	23	450	
Shale, sandy, and concealed.....	26	476	
Sandstone, massive, <b>Uniontown</b> .....	10	486	
Shale, sandy, <b>Annabelle</b> .....	7	493	
Coal, thickness concealed, <b>Uniontown (855' L.)</b>	—	493	81'
Continued by G. A. Kemper No. 1 (635) Well Record (855' L.):			
Slate and red rock (water, 10').....	670	1163	
Coal, <b>Bakerstown</b> .....	5	1168	675'
Unrecorded .....	95	1263	
Sand, Buffalo.....	20	1283	
Unrecorded .....	10	1293	
Lime .....	20	1313	
Red rock.....	30	1343	
Unrecorded .....	20	1363	
<b>Allegheny Series (230')</b>			
Sand, Upper Freeport.....	95	1458	
Unrecorded .....	46	1504	
Sand, Lower Freeport.....	34	1538	370'
Unrecorded .....	55	1593	
<b>Pottsville Series (430')</b>			
Sand, Homewood, (little water).....	60	1653	
Unrecorded .....	75	1728	

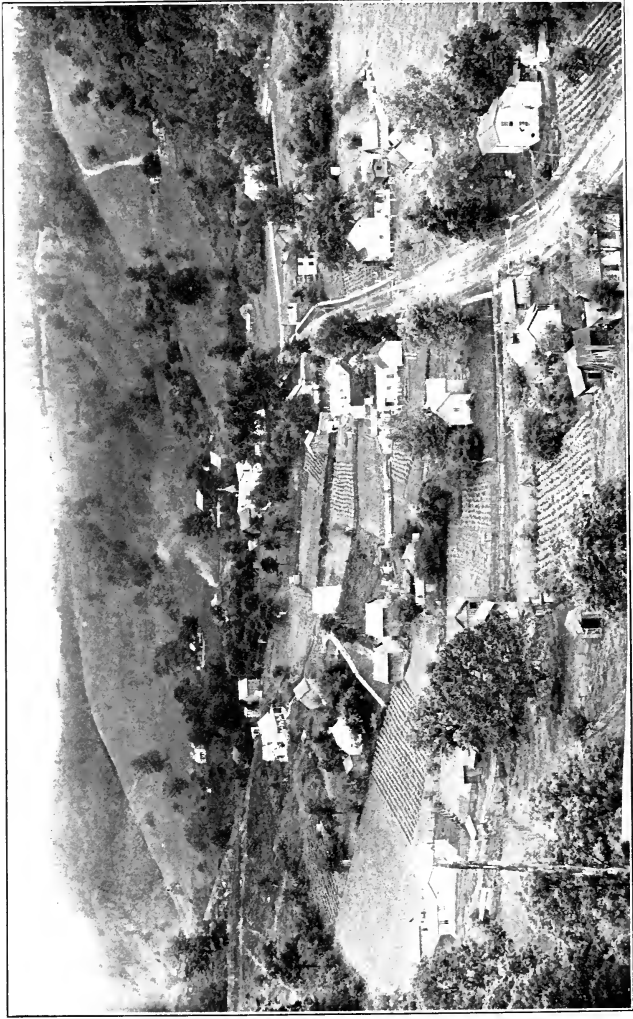


PLATE VII.—View of Troy, Gilmer County, looking up Leading Creek; Topography of the Monongahela and Conemaugh Series.





	Thickness Feet.	Total Feet.	
Lime .....	25	1753	
Unrecorded .....	65	1818	
Salt Sand (little gas, 40' in).....	125	1943	
Slate, black.....	40	1983	
Unrecorded .....	25	2008	
Salt Sand.....	15	2023	
<b>Mauch Chunk Series (130')</b>			
Unrecorded .....	35	2058	
Sand, Maxton (oil and gas, 5-12' in).....	35	2093	
Lime .....	8	2101	
Red rock.....	32	2133	
Slate, white.....	8	2141	
Little Lime.....	5	2146	
Pencil Cave.....	7	2153	615'
<b>Greenbrier Limestone (80')</b>			
Big Lime.....	80	2233	
<b>Pocono Sandstones (416')</b>			
Big Injun Sand.....	100	2333	
Unrecorded .....	120	2453	
Sand, blue (oil show, 70' in) Squaw.....	90	2543	
Unrecorded .....	82	2625	472'
Berea Sand (oil, 9-14' and 16-23' in; water, 24' in).....	24	2649	

### *Dekalb District.*

In the following section, arranged in descending order, the surface portion was measured with hand level up the hill immediately south of Tanner. The lower portion is from the record of the G. M. Fisher No. 1 (653) gas well, located on Mitchell Run, 1.7 miles north of Tanner, now owned by the Tanner Oil and Gas Company. This well, the record of which appears in a former volume of the Survey<sup>2</sup>, starts 25 feet, by hand level, below the Uniontown Coal. In the section, an interval of 118 feet is omitted from the top of the record as the southward rise of the rocks brings this portion of the measures to the surface at Tanner, where it could be observed:

#### Tanner Section, Dekalb District.

	Thickness Feet.	Total Feet.
<b>Dunkard Series (270')</b>		
Sandstone, brown, micaceous, from top of knob, Upper Marietta.....	22	22
Concealed.....	57	79
Sandstone, in bluff, mostly concealed, Lower Marietta.....	20	99

<sup>2</sup> Vol. I(A), W. Va. Geological Survey, page 386; 1904.

	Thickness Feet.	Total Feet.	
Concealed.....	17	116	
Coal blossom, Washington (1109' L.).....	..	116	116'
Shale, sandy and yellow, Washington.....	60	176	
Sandstone, shaly, Mannington.....	38	214	
Concealed in bench.....	32	246	
Sandstone, flaggy, Waynesburg.....	24	270	154'
<b>Monongahela Series (348')</b>			
Concealed.....	25	295	
Sandstone, massive, cliff rock, greenish gray, medium coarse, Uniontown.....	35	330	
Concealed.....	21	351	
Coal opening, fallen shut (No. 33 on Map II), Uniontown (872' L.), Thos. Hardman Heirs Farm, reported.....	2	353	83'
Concealed.....	12	365	
Sandstone, Arnoldsburg.....	10	375	
Concealed.....	81	456	
Sandstone, massive, Sewickley.....	15	471	
Shale, sandy.....	9.5	480.5	
Coal.....0' 5" } 1' 7" Sewickley			
Shale, dark gray..0 11 } (753' L.).....	1.5	482	129'
Coal.....0 3 } (No. 39 on Map II.)			
Shale, concealed, and sandstone to Tanner Creek.....	14	496	
Continued in G. M. Fisher No. 1 (653) Well Record:			
Blue limestone, with red and blue shale and sand shells.....	14	510	
Red rock.....	46	556	
Sand, hard, blue.....	20	576	
Shale, red and gray.....	42	618	
<b>Conemaugh Series (548')</b>			
Shale, red and blue, with blue sand shells.....	58	676	
Red rock.....	23	699	
Sand, gray, Connellsville.....	14	713	
Fire clay, white.....	9	722	
Shale, red and white (cased, 7 $\frac{5}{8}$ " at 359')....	68	790	
Sand, blue, Lower Connellsville.....	10	800	
Red rock.....	78	878	
Limestone and shale, white.....	26	904	
Red rock.....	24	928	
Sand, black, Grafton.....	15	943	
Shale, white.....	27	970	
Red rock.....	33	1003	
Shale, white.....	25	1028	
Red rock, with white clay at bottom.....	10	1038	
Sand, gray, hard, Saltsburg.....	2	1040	
Coal, Bakerstown.....	1	1041	559'
Shale, white.....	57	1098	
Sand, hard, sharp.....25' } Mahoning,			
Shale, dark gray (cased, 6 $\frac{1}{4}$ " at 778').....23 } Big Dunkard....	68	1166	125'
Sand, hard, white, blue at bottom.....20 }			
<b>Allegheny Series (218')</b>			
Limestone.....	57	1223	

	Thickness Feet.	Total Feet.	
Sandstone, white, Gas Sand.....	90	1313	
Slate, white.....	71	1384	
<b>Pottsville Series (424')</b>			
Sandstone, hard, white, Homewood.....	46	1430	
Shale, black.....	8	1438	
Slate and sand, shale and lime.....	36	1474	
Shale, sandy.....	44	1518	
<b>Coal, Upper Mercer.....</b>	..	1518	352'
Shale, soft.....	25	1543	
Shales, sandy.....	70	1613	
Sandstone, fine, gray, and limestone.....	45	1658	
Shale, white and black, with limestone nuggets.....	106	1764	
Sandstone, very hard and white, Salt.....	44	1808	
<b>Mauch Chunk Series (195')</b>			
Shale, black and white.....	10	1818	
Sand, dark gray.....	30	1848	
Shale, with sand, and limestone, hard.....	50	1898	
Limestone.....	20	1918	
Shale and limestone (4 $\frac{7}{8}$ " casing).....	70	1988	
Sand, hard and limy, Maxton.....	55	2043	528'
<b>Greenbrier Limestone (65')</b>			
Big Lime (gas at bottom).....	65	2108	
<b>Pocono Sandstones (320')</b>			
Sand, white, Big Injun (gas and little oil)....	63	2171	
Slate, with shells.....	217	2388	
Sand, Berea (some oil).....	40	2428	
<b>Catskill and Chemung Series (650')</b>			
Slate, blue.....	305	2733	690'
Sand, Gordon.....	6	2739	
Slate.....	69	2808	
Hard, sandy pebble, Fourth Sand.....	1	2809	
Slate to bottom.....	209	3078	

The following section, arranged in descending order, was measured with hand level up a private road on the east side of Tanner Creek, 0.6 mile northwest of Latonia. The Washington Coal belongs at the top of the Washington Fire Clay Shale, but its blossom could not be found:

#### Latonia Section, Dekalb District.

	Thickness. Feet.	Total. Feet.	
<b>Dunkard Series (207')</b>			
Concealed from top of hill.....	58	58	58'
Fire clay shale, yellow, Washington (top, 1116' L.).....	28	86	
Sandstone, massive, Mannington.....	38	124	
Concealed and sandy shale.....	27	151	
Concealed, mostly shale.....	39	190	
Sandstone, shaly, Waynesburg.....	17	207	149'

	Thickness Feet.	Total Feet.	
<b>Monongahela Series (270')</b>			
Concealed.....	39	246	
Sandstone, massive, <b>Uniontown (872' L.)</b> .....	55	301	94'
Concealed, with fire clay.....	13	314	
Sandstone, shaly, <b>Arnoldsburg</b> .....	20	334	
Shale, sandy.....	38	372	
Shale, red, with limestone nodules.....	34	406	
Sandstone, shaly, <b>Upper Sewickley</b> .....	14	420	
Shale, sandy.....	29	449	
Sandstone, shaly, <b>Lower Sewickley</b> .....	10	459	158'
Concealed to Tanner Creek.....	18	477	

### *Glenville District.*

The following section was measured with aneroid descending a high hill on the Troy-Glenville District Line to Collins Run, 1.8 miles west of Baldwin. The section is a little too far west to have the Pittsburgh Coal:

#### Baldwin Section, Glenville District.

	Thickness. Feet.	Total. Feet.	
<b>Dunkard Series (95')</b>			
Concealed from top of knob.....	35	35	
Sandstone, partly concealed, <b>Waynesburg</b> (1275' B.).....	60	95	95'
<b>Monongahela Series (310')</b>			
Concealed.....	35	130	
Shale, red.....	35	165	
Sandstone, shaly, <b>Uniontown</b> .....	5	170	75'
Shale, red.....	40	210	
Sandstone, massive, coarse, with small pebbles, <b>Sewickley</b> .....	40	250	
Shale, sandy.....	10	260	
Sandstone, shaly.....	5	265	
Shale, red.....	9	274	
Limestone, hard, ferriferous, <b>Sewickley</b> .....	1	275	105'
Shale, red.....	15	290	
Shale, sandy, and sandstone, shaly, interlaminated, in steep bluff.....	100	390	
Concealed in bench, <b>Pittsburgh Coal horizon</b> , (965' B.).....	15	405	130
<b>Conemaugh Series (150')</b>			
Shale, sandy.....	5	410	
Sandstone, shaly, with sandy shale, <b>Lower Pittsburgh Sandstone</b> .....	35	445	
Shale, variegated.....	20	465	
Sandstone, shaly.....	10	475	
Shale, red and concealed.....	55	530	
Sandstone, massive, <b>Connellsville</b> .....	10	540	135'
Shale, red and concealed, to Collins Run.....	15	555	

In the following section, arranged in descending order, the surface portion was measured with hand level up a private road immediately south of Glenville to the top of a high knob at the Glenville-Center District Line. The Pittsburgh Coal does not appear in the section, but the place for it is certain, since it was once mined in the river hill one mile northeastward, and its bench is easily followed. The lower part of the section is from the record of the Milton Norris No. 1 (689) well, drilled in 1892 by Harris, Caldwell and others, and previously published by the Survey.<sup>3</sup> Since the well starts 180 feet by hand level below the horizon of the Pittsburgh Coal. 29 feet of the top portion is omitted as this interval appears in the measured section. The well is located at the north edge of Glenville:

### Glenville Section, Glenville District.

	Thickness.	Total.	
	Feet.	Feet.	
<b>Dunkard Series (80')</b>			
Sandstone, capping knob 1 mile south of Glenville.....	5	5	
Concealed.....	30	35	
Sandstone, massive, brown, pebbly, <b>Waynes-</b> <b>burg</b> (1262' L.).....	45	80	80'
<b>Monongahela Series (353')</b>			
Concealed.....	22	102	
Sandstone, green, flaggy, fine, <b>Gilboy</b> .....	45	147	
Concealed, mostly red shale.....	37	184	
Sandstone, shaly, <b>Uniontown</b> .....	7	191	111'
Shale, red, with nodules of limestone and red hematite.....	100	291	
Sandstone, massive.....10' } Shale, sandy..... 6 } <b>Sewickley</b> ....	40	331	140'
Sandstone, massive.....24 }			
Shale, red.....	8	339	
Sandstone, shaly, <b>Cedarville</b> .....	28	367	
Concealed, mostly shale.....	15	382	
Slate, dark, streak, <b>Redstone Coal horizon</b> ....	..	382	
Shale, sandy.....	7	389	
Sandstone, shaly.....	5	394	
Shale, variegated.....	11	405	
Sandstone, massive, <b>Weston</b> .....	17	422	
Shale, sandy.....	11	433	
Broad bench, <b>Pittsburgh Coal horizon</b> (909' L.) ...	..	433	101'
<b>Conemaugh Series (534')</b>			
Shale, variegated.....	44	477	

<sup>3</sup>Vol. I, W. Va. Geological Survey, page 259; 1899.

	Thickness Feet.	Total Feet.	
sandstone, shaly..... 6' }			Lower Pittsburgh..
Shale, sandy.....10 }		26	
Sandstone, massive...10 }			
Shale, red.....	28	531	
sandstone, shaly, quarry rock, Connellsville..	12	543	
Shale, red.....	26	569	
Sandstone, shaly, Lower Connellsville.....	17	586	
Shale, red.....	28	614	
Concealed to river.....	28	642	
Continued in Milton Norris No. 1 (689) Well Record:			
Shale, red.....	14	656	
Sand, blue, Morgantown.....	7	663	
Shale, red.....	110	773	
Shale, blue (cased 7 $\frac{5}{8}$ " at 170').....	50	823	
Shale, white.....	20	843	
Sand, blue, Saltsburg.....	10	853	
Shale, blue.....	24	877	
Coal, Bakerstown.....	6	883	450'
Shale, blue.....	45	928	
Sand, white, with showing of oil, smell, Dunkard.....	39	967	
<b>Allegheny Series (226')</b>			
Shale, blue, and lime shells.....	126	1093	
Gas Sand, white.....	80	1173	
Shale, blue.....	20	1193	
<b>Pottsville Series (610')</b>			
Sand, gray, Homewood.....	70	1263	
Shale, sandy.....	23	1286	
Coal, Upper Mercer.....	14	1300	417'
Shale, black (good flow of gas).....	8	1308	
Sand, fine, white (gas).....	18	1326	
Coal, Lower Mercer.....	3	1329	
Shale, black.....	8	1337	
Sand, gray.....	11	1348	
Shale, black.....	235	1583	
Sand, white, Salt (gas).....	164	1747	
Slate, black and blue.....	32	1779	
Sand, white, Salt (oil in bottom).....	24	1803	503'
<b>Mauch Chunk Series (214')</b>			
Shale, black.....	50	1853	
Shale, blue.....	25	1878	
Red rock.....	30	1908	
Shale, blue and hard, lime shells.....	15	1923	
Red rock.....	20	1943	
Lime and sand shells.....	6	1949	
Red rock.....	39	1988	
Limestone, black, very hard, Little Lime.....	23	2011	
Pencil Cave.....	6	2017	214'
<b>Greenbrier Limestone (57')</b>			
Big Lime, blue (break at bottom with gas and oil).....	57	2074	
<b>Pocono and Catskill Series (951')</b>			
Big Injun Sand, broken and limy (some black oil and gas at top).....	..	2074	

	Thickness Feet.	Total Feet.
Unrecorded .....	629	2703
Shale, red.....	15	2718
Shale, blue, with an occasional sandy shell, to bottom of hole.....	307	3025

The record reveals a complete absence of porous oil sands below the Pennsylvanian Measures, which doubtless accounts for the well having been unproductive.

In the following section, arranged in descending order, the surface portion was measured with hand level up a high hill immediately southwest of Sand Fork. The lower portion is the record of the J. W. Killingsworth No. 1 (690) well, drilled by Guffey and Galey on Lynch Run, 1.4 miles northwest of Sand Fork. Owing to the northwestward rise of the rocks between Sand Fork and Lynch Run, the well starts at a lower stratigraphic level than the bottom of the measured section, but allowance is made for this interval. The well starts 80 feet below the Pittsburgh Coal horizon, while the measured section shows that the coal should underlie the Little Kanawha River at Sand Fork by about 33 feet:

### Sand Fork Section, Glenville District.

	Thickness Feet.	Total Feet.	
<b>Dunkard Series (220')</b>			
Concealed from top of knob.....	15	15	
Sandstone, partly concealed in bluff, <b>Lower</b> <b>Marietta</b> .....	36	51	
Concealed along slope.....	17	68	68'
Shale, yellow, <b>Washington</b> .....	22	90	
Steep bluff, mostly sandstone, with bench near middle, <b>Mannington Sandstone</b> .....	66	156	
Concealed along slope, mostly red shale.....	50	206	
Concealed in bluff, with some sandstone, <b>Waynesburg</b> .....	14	220	152'
<b>Monongahela Series (373')</b>			
Shale, red.....	75	295	
Sandstone, green, flaggy, fine, <b>Uniontown</b> .....	5	300	80'
Concealed, mostly red shale.....	46	346	
Sandstone, greenish gray, flaggy, <b>Arnoldsburg</b> .....	44	390	
Concealed in slope, mostly red shale.....	45	435	
Sandstone, gray, cliff rock, with shaly streak and a few pebbles, <b>Sewickley (790' B.)</b> .....	50	485	185'
Shale, sandy, with thin sandstones.....	30	515	
Sandstone, shaly, <b>Cedarville</b> .....	28	543	
Concealed to Little Kanawha River.....	17	560	
Interval to supposed place for <b>Pittsburgh Coal</b>	33	593	108"

	Thickness Feet.	Total Feet.
<b>Conemaugh Series (500')</b>		
Interval to stratigraphic level of Well No. 690	80	673
Continued by J. W. Killingsworth No. 1 (690) Well Record:		
13-inch casing.....	42	715
Slate, black.....	33	748
Sand, gray, Lower Connellsville.....	35	783
Lime, gray.....	60	843
Slate, white.....	40	883
Sand, white, Grafton.....	30	913
Lime, white.....	124	1037
Coal, Bakerstown.....	6	1043
Sand, black (10" casing, 374').....	4	1047
Sand, white, Big Dunkard.....	46	1093
<b>Allegheny Series (290')</b>		
Red rock.....	170	1263
Sand, Lower Freeport.....	40	1303
Sand, white, Clarion.....	80	1383
<b>Pottsville Series (590')</b>		
Sand, Homewood.....	280	1663
Slate.....	100	1763
Sand, Salt.....	210	1973
<b>Mauch Chunk Series (245')</b>		
Slate, white.....	20	1993
Lime, gray.....	100	2093
Slate, red.....	75	2168
Sand and pebbles.....	15	2183
Sand, black, Maxton (6 5/8" casing, 1545').....	35	2218
<b>Greenbrier Limestone (111')</b>		
Big Lime (light gas).....	40	2258
Lime.....	71	2329
<b>Pocono Sandstones (272')</b>		
Sand, Keener (light oil).....	4	2333
Slate and shells.....	40	2373
Big Injun Sand.....	38	2411
Slate, white.....	20	2431
Sand, gray, Squaw.....	40	2471
Slate.....	5	2476
Sand, Berea.....	125	2601
<b>Catskill and Chemung Series (726')</b>		
Sand, black.....	80	2681
"No change in drilling to bottom" (probably gray shales).....	646	3327

In the following section, arranged in descending order, the surface portion was measured with hand level up the steep river hill one-fourth mile north of Stouts Mills. The interval to the Pittsburgh Coal and its thickness are given on the authority of William Crennell, Civil Engineer, of Uniontown, Pa., one of the parties interested in having a core test (754)



made on the T. M. Marshall farm at the mouth of Slidinghill Run, in the town of Stouts Mills. Unfortunately, the complete record of the test is not available. That portion of the section below the Pittsburgh Coal is from the record of the C. S. Hudnall No. 1 (752) well, drilled by Guffey and Galey and previously published by the Survey.\* The well, which is located on Slidinghill Run, one-half mile east of Stouts Mills, was a dry hole except for a show of oil in the Fifth Sand. The total depth was 2672 feet, of which the upper 101 feet is omitted from its record as published in the section below. This well also recorded the Pittsburgh Coal, with a thickness of 9 feet, which is probably too great by two or three feet:

### Stouts Mills Section, Glenville District.

	Thickness Feet.	Total Feet.	
<b>Dunkard Series (190')</b>			
Concealed, with red and sandy shale, from top of knob.....	20	20	
Sandstone, flaggy.....	15	35	
Concealed, along slope.....	110	145	
Sandstone, massive, cliff rock, shaly at base, <b>Waynesburg</b> .....	45	190	190'
<b>Monongahela Series (422')</b>			
Concealed .....	60	250	
Sandstone, brown, medium coarse, somewhat shaly, <b>Uniontown</b> .....	50	300	110'
Concealed .....	27	327	
Sandstone, flaggy, green, fine. 20' } Shale, red.....10 } <b>Arnoldsburg</b>	55	382	
Sandstone, shaly.....25 }			
Shale, red, with limestone nuggets.....	55	437	
Sandstone, shaly, <b>Sewickley (730' L.)</b> .....	50	487	187'
Shale, gray.....	1	488	
Limestone, red and shaly, <b>Sewickley</b> .....	2	490	
Concealed to Little Kanawha River.....	2	492	
Unrecorded .....	112	604	
<b>Pittsburgh Coal</b> , reported, in T. M. Marshall No. 2 Coal Test (754) (7' 8").....	8	612	125'
Continued in C. S. Hudnall No. 1 (752) <b>Well Record:</b>			
<b>Conemaugh Series (614')</b>			
Limestone .....	29	641	
Slate .....	2	643	
Sand, <b>Lower Pittsburgh</b> .....	68	711	
Red rock.....	7	718	
Slate .....	5	723	
Limestone .....	33	756	

\*Vol. I(A), W. Va. Geological Survey, page 378; 1904.

	Thickness Feet.	Total Feet.	
Red rock.....	10	766	
Slate .....	5	771	
Red rock.....	30	801	
Sand, Morgantown.....	65	866	
Slate, break.....	2	868	
Sand, hard.....	18	886	
Slate .....	5	891	
Limestone .....	5	896	
Sand, hard, Grafton.....	31	927	
Slate .....	10	937	
Coal, Harlem.....	3	940	328'
Limestone .....	17	957	
Red rock.....	4	961	
Slate .....	5	966	
Red rock.....	40	1006	
Limestone .....	15	1021	
Slate .....	10	1031	
Pink rock.. ..	35	1066	
Limestone .....	15	1081	
Sand, Buffalo.....	20	1101	
Slate .....	30	1131	
Pink rock.....	20	1151	
Slate .....	10	1161	
Dunkard Sand (Mahoning).....	65	1226	286'
<b>Allegheny Series (268')</b>			
Limestone .....	15	1241	
Sand, Upper Freeport.....	65	1306	
Sand and shell.....	45	1351	
Sand, Lower Freeport.....	35	1386	
Coal, Lower Kittanning.....	5	1391	165'
Sand .....	30		
Slate, break..... 2			
Sand .....	68		
Slate .....	3	1494	103'
<b>Pottsville Series (673')</b>			
Sand .....	24		
Slate, break..... 3			
Sand .....	42		
Slate, shell.....	48	1611	
Slate, black.....	20	1631	
Slate and shell.....	26	1657	
Sand and shell.....	9	1666	
Limestone, blue.....	20	1686	
Sand, Salt.....	12	1698	
Slate and shell.....	136	1834	
Sand, black.....	6	1840	
Sand, gray, Salt.....	87	1927	
Slate, black.....	112	2039	
Sand, white, Salt.....	10	2049	
Slate, black.....	50	2099	
Sand, white, Salt.....	68	2167	673'
<b>Mauch Chunk Series (149')</b>			
Slate, white.....	10	2177	
Red rock.....	12	2189	
Slate and shell.....	10	2199	
Red rock.....	10	2209	

	Thickness Feet.	Total Feet.	
Limestone, hard.....	10	2219	
Slate and shell.....	10	2229	
Limestone .....	10	2239	
Slate and shell.....	30	2269	
Limestone .....	12	2281	
Limestone, sandy.....	10	2291	
Sand, Maxton.....	20	2311	
Slate, black.....	5	2316	149'
<b>Greenbrier Limestone (60')</b>			
<b>Big Lime.....</b>	60	2376	
<b>Pocono Sandstones (375')</b>			
Keener Sand.....	10	2386	
Limestone, hard.....	10	2396	
<b>Big Injun Sand.....</b>	105	2501	
Slate, break.....	7	2508	
Sand, Squaw.....	53	2561	
Limestone, sand.....	30	2591	
Slate and shell.....	70	2661	
Slate, black.....	25	2686	
Sand shell.....	5	2691	
Slate, dark.....	40	2731	415'
<b>Sand, black, Berea.....</b>	20	2751	
<b>Catskill Series (432')</b>			
Slate and shell.....	165	2916	
Red rock.....	5	2921	
Slate and shell.....	85	3006	275'
<b>Sand, Gordon.....</b>	7	3013	
Slate and shell.....	83	3096	
Red rock.....	10	3106	
Slate and shell.....	60	3166	
<b>Fifth Sand (oil).....</b>	12	3178	172'
Unrecorded to bottom.....	5	3183	

In the following section, arranged in descending order, the surface portion was measured with hand level, from the mouth of Shreve Run, at Burnsville, Braxton County, southward to the top of a high hill. The Orlando Limestone, with a few fossil shells, perhaps of brackish water origin, crops a few feet above the Little Kanawha River and is included in the section. The lower portion of the section is from the record of the Marshall No. 1 well (not listed on Map II), drilled by Guffey and Galey in July, 1895, along Saltlick Creek, opposite the Baltimore & Ohio Railroad Station at Burnsville and previously published by the Survey<sup>5</sup>. Owing to the northwestward dip of the rocks, the well starts at a higher stratigraphic level than the bottom of the measured section, so that, in the section below, an interval of 31 feet is omitted from the top of the record:

<sup>5</sup>Vol. I(A), W. Va. Geological Survey, page 391; 1904.

## Burnsville Section, Saltlick District, Braxton County.

	Thickness Feet.	Total Feet.	
<b>Dunkard Series (135')</b>			
Sandstone, brown, micaceous, capping knob,			
<b>Mannington</b> .....	15	15	
Shale, variegated.....	20	35	
Shale, sandy.....	15	50	
Sandstone, brown, pebbly,			
cliff rock.....27'			} <b>Waynesburg</b> (1350' B.)
Concealed, with sandy shale.33			
Sandstone, massive, brown,			
pebbly, cliff rock.....25	85	135	135'
<b>Monongahela Series (340')</b>			
Concealed .....	22	157	
Sandstone, flaggy, <b>Gilboy</b> .....	16	173	
Concealed .....	22	195	
Concealed in steep bank, <b>Uniontown Sand-</b>			
<b>stone</b> horizon.....	17	212	77'
Concealed along slope, mostly reds.....	16	228	
Concealed in steep bank.....	22	250	
Concealed along slope, mostly reds.....	45	295	
Sandstone, pebbly, <b>Upper Sewickley</b> .....	25	320	
Concealed and sandy shale.....	5	325	
Sandstone, massive, pebbly, <b>Lower Sewickley</b>	30	355	143'
Concealed, mostly sandy shale.....	32	387	
Sandstone, flaggy, <b>Cedarville</b> .....	28	415	
Concealed .....	5	420	
Bench, <b>Redstone Coal</b> horizon.....		420	
Concealed .....	15	435	
Sandstone, flaggy, <b>Weston</b> .....	30	465	
Concealed .....	10	475	
Fire clay spring on bench, <b>Pittsburgh Coal</b>			
horizon (1010' B.).....		475	120'
<b>Conemaugh and Allegheny Series (949')</b>			
Concealed along steep slope.....	45	520	
Sandstone, shaly, in steep bluff, <b>Connellsville</b>	37	557	
Concealed along slope, with reds.....	33	590	
Sandstone, shaly, makes cliff along hill, <b>Lower</b>			
<b>Connellsville</b> .....	18	608	
Concealed in slope, mostly red shale.....	30	638	
Concealed in steep bluff.....	25	663	
Concealed in slope.....	35	698	
Sandstone, shaly, <b>Morgantown</b> .....	15	713	
Shale, reddish green, with plant and marine			
(?) fossil shells.....	10	723	248'
Dark slate.....		723	
Shale, sandy.....	3	726	
Limestone, hard, <b>Orlando</b> .....	1	727	
Shale, variegated.....	3	730	
Concealed to river.....	10	740	
<b>Continued in Marshall No. 1 Well Record:</b>			
Sand, white, hard, <b>Grafton</b> (water).....	40	780	
Red rock, soft.....	10	790	
Slate, blue, soft.....	10	800	

	Thickness Feet.	Total Feet.	
Red rock, soft (cave).....	30	830	
Lime, hard.....	24	854	
Slate, red rock and shell (water and cased)..	365	1219	
Sand, white and soft, coarse, with pebbles....	40	1259	
Lime, blue, hard.....	15	1274	
Sand, gray.....	25	1299	
Slate and shells, white and soft.....	25	1324	
Lime, gray, hard.....	25	1349	
Slate and shells, white and soft.....	75	1424	701'
<b>Pottsville Series (710')</b>			
Sand, white, hard.....115' } Homewood....	165	1589	
Sand, gray, hard..... 50 }			
Lime, shells and slate.....	120	1709	
Sand, white, hard, Salt.....	50	1759	
Slate and shells.....	70	1829	
Lime, white.....	20	1849	
Slate and shells, blue, hard.....	50	1899	
Lime, white, hard.....	25	1924	
Sandstone, white, Salt (oil and gas, 192' in)..	210	2134	
<b>Mauch Chunk Series (210')</b>			
Slate, black, soft.....	25	2159	
Sand, white, hard.....	40	2199	
Lime.....	50	2249	
Red rock, soft.....	95	2344	920'
<b>Greenbrier Limestone (40')</b>			
Big Lime, gray, hard.....	40	2384	
<b>Pocono Sandstones (317')</b>			
Sand, Big Injun, grayish white and hard (show of oil and gas).....	42	2426	
Limestone? gray.....	200	2626	
Slate and shells, blue, soft.....	20	2646	
Sand, gray, hard.....	30	2676	
Slate, black, soft.....	20	2696	
Sand, white, hard, Berea (little oil).....	5	2701	352'
<b>Catskill Series (290')</b>			
Slate and shells, blue and soft, to bottom.....	290	2991	

### *Center District.*

The following section, arranged in descending order, was measured with hand level up a high hill immediately north-east of Cedarville. This section shows for the first time the typical character of the **Cedarville Sandstone**, a formation lying just over the horizon of the Redstone Coal and not noted in previous Reports. It will be described fully under the Monongahela Series in Chapter VI:

## Cedarville Section, Center District.

	Thickness Feet.	Total Feet.	
<b>Dunkard Series (253')</b>			
Sandstone, fragments, at top of knob, <b>Upper</b>			
<b>Marietta</b> .....			
Shale, variegated and sandy, <b>Creston Reds</b> ...	47	47	
Concealed and sandstone, brown, flaggy, <b>Lower</b>			
<b>Marietta (1363' L.)</b> .....	30	77	77'
Fire clay shale, yellow, <b>Washington</b> .....	25	102	
Shale, sandy.....	8	110	
Sandstone, flaggy, brown, with shale break in lower half, <b>Mannington</b> .....	60	170	
Concealed, with red shale.....	33	203	
Sandstone, brown and massive at top, partly concealed in bluff, <b>Waynesburg, (1187' L.)</b>	50	253	176'
<b>Monongehela Series (374')</b>			
Concealed, with red shale.....	42	295	
Sandstone, massive, with streaks of shale, medi- um hard, medium coarse, (sma'l quarry here) <b>Gilboy</b> .....	18	313	
Concealed and red shale.....	35	348	
Sandstone, flaggy, <b>Uniontown</b> .....	12	360	107'
Concealed and red shale.....	28	388	
Sandstone .....	8	396	
Shale, red, with limestone nodules near top, and iron ore nodules in lower portion....	73	469	
Shale, sandy and variegated.....	28	497	
<b>Limestone, red, shaly, Sewickley</b> .....	2	499	139'
Shale, variegated, with thin sandstones.....	38	537	
Sandstone, shaly.....	9	546	
Shale, sandy.....	8	554	
Sandstone, massive, greenish gray, medium coarse, medium hard, with mica flakes and some peroxide of iron, <b>Cedarville</b> .....	32	586	
Shale, sandy, with dark streak of slate near middle, <b>Redstone Coal horizon</b> .....	5	591	
Sandstone, massive, coarse, soft, <b>Weston</b> .....	27	618	
Shale, sandy.....	3	621	
Slate, black.....	3	624	
Coal .....0' 6" }			
Shale, dark.1 10 } (2' 8") <b>Pittsburgh (810' L.)</b>	3	627	128'
Coal .....0 4 } (Mine No. 185 on Map II).			
<b>Conemaugh Series (33')</b>			
Shale, sandy.....	18	645	
Sandstone, massive, cliff rock, to Cedar Creek, <b>Lower Pittsburgh</b> .....	15	660	

In the following section, arranged in descending order, the surface portion was measured with hand level up a high hill on the north side of Left Fork of Steer Creek, one-half mile southeast of Bennett, and just west of Spring Run. The measured section connects directly with the record of the

J. O. McCoy No. 1 (769) well, drilled by the South Penn Oil Company, which furnishes 2802 feet of additional stratigraphic evidence, making a grand total of 3505 feet. The place for the Washington Coal is at the bottom of the Lower Marietta Sandstone, although its blossom was not observed:

### Bennett Section, Center District.

	Thickness Feet.	Total Feet.	
<b>Dunkard Series (242')</b>			
Shale, variegated, on top of knob.....	5	5	
Sandstone, coarse, soft, brown, massive, <b>Upper Marietta</b> .....	20	25	
Concealed, with reds, <b>Creston</b> .....	35	60	
Sandstone, flaggy, partly concealed in bluff, <b>Lower Marietta</b> .....	30	90	90'
Fire clay shale, yellow, fine and greenish at top, <b>Washington</b> (top 1388' L.).....	27	117	
Sandstone, coarse, brown, <b>Mannington</b> .....	30	147	
Concealed, with red shale.....	75	222	
Sandstone, massive, coarse, pebbly, brown, cliff rock, <b>Waynesburg</b> (1236' L.).....	20	242	152'
<b>Monongahela Series (386')</b>			
Concealed, with shale.....	14	256	
Sandstone, brown, flaggy, fine, <b>Gilboy</b> .....	30	286	
Shales, red and sandy, along gentle slope....	77	363	
Fire clay shale, <b>Uniontown Coal horizon</b> (1125' L.).....	...	363	121'
Shale, red.....	22	385	
Sandstone, coarse, massive, <b>Arnoldsburg</b> .....	11	396	
Shale, red.....	28	424	
Sandstone, partly concealed in bluff, <b>Sewickley</b> .....	60	484	
Concealed in slope, with red shale.....	38	522	
Sandstone, flaggy, partly concealed, <b>Cedarville</b> .....	40	562	
Concealed in bench, <b>Redstone Coal horizon</b> ...	7	569	
Sandstone, massive, medium coarse, gray, micaceous, cliff rock, <b>Weston</b> .....	35	604	
Concealed in slope.....	24	628	
Bench, <b>Pittsburgh</b> (860' L.).....	...	628	265'
<b>Conemaugh and Allegheny Series (875')</b>			
Concealed in bench.....	12	640	
Sandstone, massive, cliff rock, <b>Lower Pittsburgh</b> .....	30	670	
Concealed and sandy shale.....	23	693	
Concealed to well.....	10	703	
Continued by J. O. McCoy No. 1 (769) Well Record (785' L.):			
Unrecorded.....	790	1493	
Coal, <b>Lower Kittanning</b> .....	10	1503	875'
<b>Pottsville Series (775')</b>			
Lime.....	25	1528	
Unrecorded.....	15	1543	
Lime.....	60	1603	

	Thickness Feet.	Total Feet.	
Unrecorded .....	370	1973	
Sand, Salt.....	55	2028	
Unrecorded .....	25	2053	
Blue Monday.....	30	2083	
Sand, Salt.....	50	2133	
Unrecorded .....	70	2203	
Lime .....	25	2228	
Sand, Salt.....	50	2278	
<b>Mauch Chunk Series (35')</b>			
Unrecorded .....	10	2288	
Red rock.....	15	2303	
Unrecorded .....	10	2313	810'
<b>Greenbrier Limestone (105')</b>			
Big Lime.....	105	2418	
<b>Pocono and Catskill Series (882')</b>			
Big Injun Sand (gas show, 1820'; oil show, 1850') .....	139	2557	
Unrecorded .....	396	2953	
Sand, Thirty-foot.....	10	2963	
Unrecorded .....	5	2968	
Red rock.....	5	2973	
Sand, Gordon Stray.....	10	2983	
Unrecorded .....	75	3058	
Sand shells, Gordon.....	...	3058	745'
Unrecorded .....	108	3166	
Sand, Fifth.....	7	3173	115'
Unrecorded .....	80	3253	
Sand shells.....	...	3253	
Unrecorded .....	40	3293	
Sand, Bayard.....	7	3300	127'
<b>Chemung Series (205')</b>			
Sand shells to bottom.....	205	3505	

The following section was made with aneroid descending a steep hill immediately southeast of Normantown:

#### Normantown Section, Center District.

	Thickness Feet.	Total Feet.	
<b>Monongahela Series (280')</b>			
Concealed, with red shale, from top of hill....	45	45	
Sandstone, shaly, <b>Arnoldsburg</b> .....	30	75	
Concealed in bench.....	15	90	
Sandstone, massive, coarse, gray, pebbly, cliff rock, <b>Sewickley</b> .....	50	140	140'
Concealed in slope.....	25	165	
Sandstone, greenish gray, fine grained, somewhat flaggy, cliff rock, <b>Cedarville</b> .....	50	215	
Shale, sandy.....	4	219	
Shale, dark, <b>Redstone Coal horizon</b> .....	1	220	
Shale, variegated.....	5	225	
Sandstone, shaly, <b>Weston</b> .....	40	265	





PLATE VIII.—View of Newberne, Gilmer County, looking up Tanner Creek; showing oil wells and Topography of the Dunkard and Monongahela Series.



	Thickness Feet.	Total Feet.	
Concealed in bench.....	15	280	
<b>Slate, black, Pittsburgh Coal horizon (930' B.) ...</b>		280	<b>140'</b>
<b>Conemaugh Series (200')</b>			
Shale, variegated.....	25	305	
Sandstone, massive, medium coarse, cliff rock, <b>Lower Pittsburgh</b> .....	40	345	
Shale, variegated, and sandstone, in slope...	80	425	
Sandstone, greenish gray, micaceous, <b>Lower Connellsville</b> .....	40	465	<b>185'</b>
Concealed to Steer Creek.....	15	480	

In the following section, arranged in descending order, the upper portion was measured with hand level up the hill immediately north of Stumptown. The lower portion is the record of the Katie Stump No. 1 (780) well, drilled by the Stumptown Oil and Gas Company, and located at the western end of Stumptown, in Calhoun County, just west of the Gilmer Line:

#### Stumptown Section, Center District.

	Thickness Feet.	Total Feet.	
<b>Monongahela Series (365')</b>			
Concealed, with reds, from top of knob.....	28	28	
Sandstone, massive, brown, <b>Gilboy</b> .....	25	53	
Shale, sandy and variegated.....	25	78	
<b>Sandstone, massive, greenish brown, medium coarse, micaceous, cliff rock, Uniontown (1054' L.)</b> .....	25	103	<b>103'</b>
Concealed in slope.....	22	125	
Steep bank, with sandstone.....	17	142	
Concealed in slope, mostly red shale.....	78	220	
<b>Sandstone, massive, coarse, pebbly, cliff rock, Sewickley, (917' L.)</b> .....	20	240	<b>137'</b>
Concealed, mostly sandy shale at top.....	125	365	
Bench, <b>Pittsburgh</b> , with fire clay (792' L.)....	...	365	<b>125'</b>
<b>Conemaugh and Allegheny Series (811')</b>			
Concealed .....	13	378	
Sandstone, massive, <b>Lower Pittsburgh</b> .....	20	398	
Concealed and shale.....	27	425	
Sandstone, <b>Connellsville</b> .....	17	442	
Concealed to well mouth.....	14	456	
<b>Continued by Katie Stump No. 1 (780) Well Record (701' L.)</b>			
Unrecorded (10" casing, 69').....	520	976	
Sand, (6½" casing, 584'), Lower Freeport....	120	1096	
Unrecorded .....	35	1131	
Sand, Clarion.....	45	1176	<b>811</b>
<b>Pottsville Series (771')</b>			
Unrecorded .....	540	1716	
Sand, Salt.....	62	1778	
Unrecorded .....	73	1851	

	Thickness Feet.	Total Feet.	
Sand, Salt.....	22	1873	
Unrecorded .....	13	1886	
Sand Salt, (light gas and show of oil about 20' in) .....	61	1947	771'

The following section was measured with aneroid, descending a high hill on the south side of Standingstone Run of Bear Fork of Steer Creek, one mile northeast of the common corner of Center, Lee and Washington Districts, and 3.2 miles west of Shock:

### Standingstone Run Section, Center District.

	Thickness Feet.	Total Feet.	
<b>Dunkard Series (85')</b>			
Concealed in slope.....	35	35	
Steep bluff, with fragments of sandstone, <b>Waynesburg</b> .....	50	85	85'
<b>Monongahela Series (360')</b>			
Concealed with shale, in steep slope.....	15	100	
Sandstone, coarse, broken, <b>Gilboy</b> .....	50	150	
Shale, sandy, and sandstone, shaly.....	45	195	
<b>Sandstone, massive, cliff rock, Uniontown</b> (1115' B.).....	50	245	160'
Concealed, mostly reds, in gentle slope.....	60	305	
Sandstone, fragments, with some small pebbles, <b>Sewickley</b> .....	40	345	100'
Shale, sandy, and concealed.....	80	425	
Sandstone, fine grained, and shaly, <b>Weston</b> ...	20	445	100'
<b>Conemaugh Series (35')</b>			
Concealed, with sandstone, to run.....	35	480	

In the following section, arranged in descending order, the surface portion was measured with hand level up the high hill along the Gilmer-Braxton Line, immediately northeast of Rosedale, Braxton County. The lower portion is the record of the J. W. Twyman No. 1 (794) well, a dry hole drilled by the South Penn Oil Company at the southern edge of Rosedale. The section shows the complete absence of the Pittsburgh Coal, but its horizon is plain since there is a broad bench along the hillsides about 100 feet below the great pebbly Sewickley Sandstone cliff and the coal itself has been opened and mined southwestward along Mill Fork, the nearest opening being at the mouth of Anthony Fork, 1.7 miles southwest of Rosedale:

## Rosedale Section, Birch District, Braxton County.

	Thickness Feet.	Total Feet.	
<b>Monongahela Series (380')</b>			
Shale, red and sandy, from top of knob.....	50	50	
Concealed in bluff.....	34	84	
Sandstone, massive, brown, coarse, <b>Gilboy</b> ...	16	100	
Concealed in bench.....	12	112	
Sandstone, partly concealed in bluff, <b>Union-</b> <b>town</b> .....	28	140	140'
Shale, red, partly concealed.....	35	175	
Sandstone, partly concealed, <b>Arnoldsburg</b> .....	17	192	
<b>Spring, Lower Uniontown Coal horizon</b> .....	...	192	
Concealed in slope.....	26	218	
<b>Sandstone, massive, gray, pebbly, great cliff</b> <b>rock, Sewickley</b> .....	57	275	135'
Shale, sandy.....	26	301	
Sandstone, flaggy and shaly, <b>Cedarville</b> .....	12	313	
Concealed and sandy shale.....	12	325	
Sandstone, shaly, <b>Weston</b> .....	40	365	
Shale, variegated, and sandy.....	15	380	
<b>Fire clay streak, Pittsburgh Coal horizon</b> <b>(935' L.) (reported 0' 8" thick on opposite</b> <b>hill)</b> .....	...	380	105'
<b>Conemaugh Series (654')</b>			
Shale, variegated.....	12	392	
Sandstone, massive, gray, coarse, <b>Lower Pitts-</b> <b>burgh</b> .....	28	420	
Shale, variegated and sandy.....	22	442	
Sandstone, greenish gray, shaly, <b>Connellsville</b>	16	458	
Red shale, partly concealed, <b>Clarksburg</b> .....	22	480	
Sandstone, shaly, <b>Lower Connellsville</b> .....	20	500	
Concealed, mostly red shale, to well mouth...	19	519	
<b>Continued by J. W. Twyman No. 1 (794)</b> <b>Well Record (796' L.):</b>			
Clay and gravel.....	30	549	
Lime (13" casing, 40' 3"; water, 45').....	15	564	
Red rock and lime shells.....	115	679	
Slate .....	20	699	
Red rock (10" casing, 184').....	12	711	
Sandstone, soft (water, 195'), <b>Grafton</b> .....	18	729	
Red rock.....	50	779	
Slate .....	15	794	
Red rock.....	10	804	
Slate, white.....	45	849	
<b>Coal, Bakerstown</b> .....	5	854	474
Slate .....	5	859	
Sand, <b>Buffalo</b> .....	35	894	
White slate and lime.....	75	969	
Sand, <b>Mahoning</b> .....	65	1034	
<b>Allegheny Series (250')</b>			
<b>Coal, Upper Freeport (water, 520'=1039' of</b> <b>section)</b> .....	5	1039	185'
Slate .....	25	1064	
Sand, <b>Upper Freeport</b> .....	29	1093	
Slate .....	51	1144	

	Thickness Feet.	Total Feet.	
<b>Coal, Upper Kittanning</b> .....	2	1146	107'
<b>Slate and shells (8¼" casing, 663')</b> .....	40	1186	
<b>Sand, lower division of Lower Freeport</b> .....	57	1243	
<b>Slate</b> .....	12	1255	
<b>Sand, Clarion</b> .....	29	1284	
<b>Pottsville Series (782')</b>			
<b>Slate and shells</b> .....	409	1693	
<b>Sand, Salt (oil show, 1200'; gas, 1240')</b> .....	101	1794	
<b>Slate and shells</b> .....	99	1893	
<b>Sand, Salt, (gas, 1406'; oil, 1434')</b> .....	70	1963	
<b>Slate and shells (6⅝" casing, 1464')</b> .....	41	2004	
<b>Sand, Salt, (gas, 1495')</b> .....	15	2019	
<b>Slate and shells</b> .....	25	2044	
<b>Sand, Salt</b> .....	22	2066	920
<b>Mauch Chunk Series (72')</b>			
<b>Slate and shells</b> .....	18	2084	
<b>Red rock</b> .....	15	2099	
<b>Slate and shells to bottom</b> .....	39	2138	

## SUMMARY.

For convenience of reference, the thickness of the stratified rocks in Lewis and Gilmer, as determined by the sections in this Chapter, is compiled in the following table, which shows not only the thickness of the various Series but also gives the totals for the Pennsylvanian, Mississippian and Devonian Rocks. A line of dots under a series indicates that the series was not exposed where the section was made. A question mark indicates that the series was present but the line of division between it and the one overlying or underlying it could not be obtained. In some instances, a section shows a thickness of a series either too great or too small, owing to the dip of the measures where it was made, but these discrepancies are slight because great care was exercised to make sections on the strike, if possible. In many cases the sections show only part of a series where the remainder was not exposed. An explanation accompanies each section, where published in full, that gives the peculiar conditions under which it was made:

Table Showing Thickness in Feet of Stratified Rocks in Lewis and Gilmer Counties.

Pace Measured.	PENNSYLVANIAN.						MISSISSIPPIAN.					DEVONIAN.			Total Section
	Dunkard	Monongahela	Coneaugh	Allegheny	Pottsville	Total	Mauch Chunk	Greenbrier Limestone	Pocono Sandstones	Total	Catskill	Chemung	Total		
Alum Bridge.....	300	654	213	433	1590	198	102	380	680	(?)	(?)	825	3095		
Babin .....	145	185	811	1141	344	230	181	755	594	244	858	2754			
Baldwin .....	95	150	555	555	(?)	(?)	(?)	(?)	(?)	(?)	(?)	555			
Bealls Mills.....	220	540	(?)	(?)	2278	35	105	(?)	(?)	(?)	205	(?)	3107		
Bennett .....	242	386	(?)	775	2278	35	105	(?)	(?)	(?)	205	(?)	3505		
Berlin .....	305	(?)	(?)	360	1487	400	65	445	845	433	433	433	2765		
Brownsville .....	117	(?)	260	470	1838	300	90	390	780	473	473	473	3091		
Burnsville .....	135	340	(?)	710	2110	210	40	317	567	290	290	290	2991		
Camden .....	145	381	215	390	1751	390	70	(?)	(?)	(?)	(?)	(?)	3000		
Cedarville .....	253	374	660	660	660	660	660	660	660	660	660	660	660		
Churchville .....	265	193	458	458	458	458	458	458	458	458	458	458	458		
Cleveland .....	476	86	217	845	1205	575	165	425	1165	257	257	257	2627		
Conings .....	385	175	562	562	562	562	562	562	562	562	562	562	562		
Copley .....	345	(?)	480	480	1865	265	48	322	635	598	598	598	560		
Coxs Mills.....	361	572	190	450	1573	328	52	290	670	526	829	1355	3098		
Deanville .....	149	651	225	425	1450	235	70	(?)	(?)	(?)	(?)	(?)	3598		
Freemansburg .....	202	(?)	703	703	703	703	703	703	703	703	703	703	2561		
Gaston .....	290	270	560	560	560	560	560	560	560	560	560	560	703		
Gillooly .....	80	353	226	610	1803	214	57	(?)	(?)	(?)	(?)	(?)	560		
Glenville .....	(?)	472½	(?)	(?)	(?)	(?)	29	376	(?)	484	484	(?)	3025		
Hurst .....	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	(?)	484	3274	





# CHAPTER V.

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## STRATIGRAPHY—THE DUNKARD SERIES.

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### GENERAL ACCOUNT AND SECTION.

The Dunkard Series, which, except for the alluvium deposited along the streams, contains the most recent formations found in the Lewis and Gilmer area, is the highest division of the Upper Carboniferous, or Pennsylvanian Rocks found in West Virginia. It was first described by I. C. White<sup>1</sup> from its occurrence along Dunkard Creek in Monongalia County, West Virginia, and Greene County, Pennsylvania. It has been classed by him as of Permo-Carboniferous age, representing a transitional stage between the Permian and Carboniferous. It has been described at length in previous Reports of the West Virginia Geological Survey, in those counties where it has its best development, to the most recent of which, the one for Monongalia, Marion and Taylor, the reader is referred for a general section covering the entire series.<sup>2</sup>

In Lewis and Gilmer the Dunkard Series covers the hills generally along a wide strip at the northwestern edge, west of the Chestnut Ridge Anticline. Southeast of the anticline it is of much more scanty occurrence, being found generally in the tops of the hills along the Grassland and Roanoke Synclines and gradually disappearing above their summits along the rapid southeastward rise of the rocks.

In these counties the series consists mainly of alternating beds of brown, micaceous sandstones, sometimes massive and sometimes flaggy, and red and sandy shales. No limestones

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<sup>1</sup>Bulletin 65, U. S. Geological Survey, p. 20; 1891.

<sup>2</sup>Ray V. Hennen, Monongalia-Marion-Taylor Report, W. Va. Geol. Survey, p. 165; 1913.

were observed, and the only coal of general occurrence, the Washington, is thin and slaty, seldom being more than two feet. Only 500 to 600 feet of the basal portion of the series is found in Lewis and Gilmer, in contrast to the maximum thickness of 1180 feet occurring in Wetzel and Monongalia. The series in Lewis and Gilmer contains fewer coals and a proportionately larger amount of sandy and red shales than in the more northern counties, thus showing that its presence represents a somewhat decadent phase. The series appears to be of fresh water origin and contains abundant plant fossils, but has little evidence of animal life. Mineralogically it is of little economic importance in the two counties, no oil or gas being found in its sands and only one impure coal. Some of the red shale beds, however, could be used for brick, and the best sandstone ledges for building stone.

The following general section, compiled from many observations, represents the character of the Dunkard Series known to occur in Lewis and Gilmer:

#### General Section of the Dunkard Series for Lewis and Gilmer.

	Thickness Feet.	Total Feet.
Sandstone, soft, brown, micaceous, <b>Rush Run</b>	40	40
Shale, sandy and red.....	10	50
Sandstone, massive, brown, <b>Jollytown</b> .....	30	80
Shales, sandy and variegated, with thin sandstones .....	30	110
Sandstone, coarse, soft, brown, <b>Hundred</b> .....	40	150
Shale, sandy.....	50	200
Sandstone, massive or flaggy, micaceous, <b>Upper Marietta</b> .....	50	250
Shale, sandy and red, <b>Creston</b> .....	48	298
Sandstone, massive or flaggy, micaceous, <b>Lower Marietta</b> .....	50	348
<b>Coal, Washington</b> .....	2	350
Fire clay shale, yellow, <b>Washington</b> .....	30	380
Shales, red and sandy.....	20	400
Sandstone, massive, soft, brown, coarse, <b>Mannington</b> .....	50	450
Shale, variegated and sandy.....	30	480
Sandstone, massive, coarse, brown, pebbly, <b>Waynesburg</b> .....	60	540
Shale, sandy, <b>Cassville</b> .....	10	550
<b>Coal, Waynesburg, (top of Monongahela Series)</b>		

## LOCAL SECTIONS, DUNKARD SERIES.

The following section of the Dunkard Series was measured with aneroid descending the hill road at the head of Dry Fork of Fink Creek, two miles northward from Dry Fork town. It includes all the Dunkard formations found in the two counties except those below the Mannington Sandstone:

## Dry Fork Section, Courthouse District.

	Thickness Feet.	Total Feet.	
<b>Dunkard Series (425')</b>			
Sandstone, greenish brown, medium coarse, capping knob. 20' }			
Concealed ..... 5 }	<b>Rush Run</b> 40	40	40'
Sandstone, brown, micaceous, medium coarse, hard.....15 }			
Shale, mostly red.....	60	100	
Sandstone, flaggy, <b>Jollytown</b> .....	5	105	
Shale, variegated.....	20	125	
Sandstone, shaly, <b>Hundred</b> .....	10	135	
Shale, variegated.....	45	180	
Sandstone, buff, massive, soft, <b>Upper Marietta</b>	40	220	180'
Shale, red, concealed, and variegated shale, <b>Creston Reds</b> .....	110	330	
Sandstone, massive, brown, <b>Lower Marietta</b> ..	25	355	
Concealed .....	10	365	
<b>Coal blossom, Washington (1045' B.)</b> .....	...	365	145'
Fire clay shale, yellow, <b>Washington</b> .....	30	395	
Sandstone, massive, <b>Mannington</b> .....	30	425	

Numerous sections, showing the Dunkard Series, are published in Chapter IV. The following list gives the thickness of the series, in feet, as it is revealed in those sections:

Baldwin (95'), Bealls Mills (220'), Bennett (242'), Brownsville (117'), Burnsville (135'), Camden (145'), Cedarville (253'), Churchville (265'), Conings (476'), Copley (385'), Coxs Mills (345'), Gaston (202'), Gillooly (290'), Glenville (80'), Hurst (550'?), Latonia (207'), Lorentz (215'), Newberne (412'), Roanoke (38'), Sand Fork (220'), Standingstone Run (85'), Stouts Mills (190'), Tanner (270'), Troy (20'), Vadis (45').

In the section for Hurst the line of separation between the Dunkard and Monongahela is uncertain.

## DESCRIPTION OF FORMATIONS.

### RUSH RUN SANDSTONE.

The **Rush Run Sandstone** of Hennen<sup>1</sup>, the highest formation of the Dunkard Series definitely recognized in Lewis and Gilmer, appears only in a few of the highest knobs along the northwestern border. It is usually soft, massive, greenish brown and micaceous. In Chapter IV its thickness and position are noted in the sections for Hurst and Conings, and in the present Chapter it is noted in the Dry Fork Section. So far as observed it has not been quarried.

### JOLLYTOWN SANDSTONE.

The **Jollytown Sandstone** of Hennen<sup>3</sup> appears in some of the high hills along the northwestern border. It is usually soft, massive and brown. In Chapter IV its position and thickness were noted in the sections for Hurst and Conings, and in the present Chapter it appears in the Dry Fork Section. No quarries were observed.

### HUNDRED SANDSTONE.

The **Hundred Sandstone** of Hennen<sup>2</sup> occurs in some of the high knobs along the northwestern border. At Racket, on the Ritchie-Gilmer Line, it forms a prominent cliff, 1210' above sea level. In Chapter IV it is noted in the sections for Conings, Hurst and Newberne, and in the present Chapter it is recorded in the Dry Fork Section. At Conings it was being quarried locally for chimney blocks and stove pipe fittings but its soft character would usually make it unfit for building stone.

### UPPER MARIETTA SANDSTONE.

The **Upper Marietta Sandstone**, a member of the group first described by White<sup>4</sup> as the Marietta Sandstones, and later

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<sup>1</sup>Ray V. Hennen, Marshall-Wetzel-Tyler Rept., W. Va. G. S., p. 191; 1909.

<sup>2</sup>Ray V. Hennen, Marshall-Wetzel-Tyler Rept., W. Va. G. S., p. 196; 1909.

<sup>3</sup>Ray V. Hennen, Marshall-Wetzel-Tyler Rept., W. Va. G. S., p. 214; 1909.

<sup>4</sup>I. C. White, Bull. 65, U. S. G. S., p. 35-36; 1891.

subdivided by Hennen<sup>5</sup> into the Upper and Lower Marietta Sandstones, is the next definite sandstone horizon below the Hundred. It is usually light brown in color, flaggy and micaceous. Along the Ritchie-Gilmer Line, however, it is frequently a massive cliff rock, brown and soft, varying from 30 to 50 feet thick. It was noted at the head of Tanner Creek, at 1125 feet, at the head of Bushcamp Run at 1175 feet, and at the head of Laurel Fork at 1165 feet. In Chapter IV it is noted in the sections for Bennett, Cedarville, Conings, Copley, Coxs Mills, Hurst, Newberne, and Tanner, and in the present Chapter, it appears in the section for Dry Fork. No quarries were observed.

#### CRESTON RED SHALE.

The **Creston Red Shale** of Hennen<sup>6</sup> was noted occasionally but its red character is not so conspicuous as at Creston, Wirt County, where it was named. In Lewis County it was noted along the ridge road at the head of Walnut Fork of Fink Creek where it is 30' thick at an elevation of 1195' B. In Chapter IV the shale is noted in the sections for Cedarville, Hurst and Newberne, and in the present Chapter it appears in that for Dry Fork.

#### LOWER MARIETTA SANDSTONE.

The **Lower Marietta Sandstone**, a member of the Marietta Sandstone group first described by White<sup>7</sup> and later classified by its present title by Hennen<sup>8</sup>, is of frequent occurrence in the Dunkard Measures of Lewis and Gilmer. It is usually light brown, micaceous and flaggy. In Lewis County it was noted at the head of Right Fork of Freemans Creek, cropping flush with the Annie Joyce No. 1 (206) well, at an elevation of 1140' B. In Gilmer it was noted on Sand Fork, one mile northeast of Blackburn, in an old oil well road, at an elevation of 1215' B. In Chapter IV it is noted in the sections for Bealls

<sup>5</sup>Ray V. Hennen, Marshall-Wetzel-Tyler Rept., W. Va. G. S., p. 215; 1909.

<sup>6</sup>Ray V. Hennen, Wirt-Roane-Calhoun Rept., W. Va. G. S., p. 154; 1911.

<sup>7</sup>I. C. White, Bull. 65, U. S. G. S., p. 35-36; 1891.

<sup>8</sup>Ray V. Hennen, Marshall-Wetzel-Tyler Rept., W. Va. G. S., p. 217; 1909.

Mills, Bennett, Cedarville, Conings, Copley, Coxs Mills, Gaston, Gillooly, Hurst, Newberne, Sand Fork and Tanner, and in the present Chapter it appears in that for Dry Fork. No quarries were observed.

#### WASHINGTON COAL.

The **Washington Coal**, first described by White<sup>9</sup> as the **Brownsville Coal** from a town of that name in Monongalia County, and later given its present title by White and J. J. Stevenson, from the town of Washington, Pa., occurs generally throughout the region previously outlined for the outcrop of the Dunkard Series, being usually about two feet thick, of which the upper portion is slaty. Its occurrence and distribution will be discussed in detail in Chapter XI, under the subject of "Coal." Its outcrop is shown on Map II.

#### WASHINGTON FIRE CLAY SHALE.

The **Washington Fire Clay Shale** of Hennen<sup>10</sup>, lying between the Washington Coal and the Mannington Sandstone, is of general occurrence throughout the Dunkard area of Lewis and Gilmer. It is usually about 30 feet thick, yellow and somewhat sandy in the lower portion, but having a decidedly greenish tinge at the top, just below the Washington Coal, making a valuable marker in searching for the latter horizon. In Chapter IV it is noted in the sections for Bennett, Cedarville, Conings, Copley, Gaston, Gillooly, Hurst, Latonia, Newberne, Sand Fork and Tanner, and in the present Chapter in that for Dry Fork.

#### MANNINGTON SANDSTONE.

The **Mannington Sandstone** of Grimsley<sup>11</sup> does not have such a prominent character in Lewis and Gilmer as in some of the neighboring counties on the north and west. It is usually present in the measures but is often shaly, lacking the

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<sup>9</sup>I. C. White, *Annals of the Lyceum of Natural History, New York*, Vol. XI, pp. 47-55; July, 1874—"Notes on the Upper Coal Measures of West Virginia and Pennsylvania," read May 25, 1874.

<sup>10</sup>Ray V. Hennen, *Wirt-Roane-Calhoun Rept., W. Va. G. S.*, pp. 163-164; 1911.

<sup>11</sup>G. P. Grimsley, *Vol. IV, W. Va. G. S.*, p. 440; 1909.

massive, pebbly, cliff-forming quality of other regions. It is usually light brown in color and often directly underlies the Washington Fire Clay Shale. In Chapter IV the Mannington Sandstone is noted in the sections for Bennett, Burnsville, Camden, Cedarville, Churchville, Conings, Copley, Gaston, Gillooly, Hurst, Latonia, Newberne, Sand Fork, and Tanner, and in the present Chapter in that for Dry Fork. No quarries were observed.

#### WAYNESBURG SANDSTONE.

**The Waynesburg Sandstone**, first named and described by the First Geological Survey of Pennsylvania from its occurrence at Waynesburg, Pa., is the most conspicuous sandstone member of the Dunkard Series in Lewis and Gilmer. It is usually massive, buff in color, frequently carrying quartz pebbles as large as marbles and about half rounded by attrition, and often forms great cliffs easily followed by the eye. It occurs at nearly all points where the Dunkard Series is found and its place may be readily obtained on Map II from the crop of the base of the Series which is seldom more than 10 feet below the sandstone. It was noted frequently along the northwestern border of the two counties where the Dunkard has its maximum thickness and also along the Grassland and Roanoke Synclines farther to the southeast. At Glenville, Gilmer County, it forms a cliff in the hills south of the Little Kanawha River, and is particularly noticeable along the Dekalb-Center District Line, one mile and a half southwest of the town where it forms great stone pillars, or "rock cities," capping some of the hill tops, as illustrated by Plates XI and XII.

In Chapter IV the Waynesburg Sandstone is noted in the sections for Baldwin, Bealls Mills, Bennett, Brownsville, Burnsville, Camden, Cedarville, Churchville, Conings, Copley, Coxs Mills, Gaston, Gillooly, Glenville, Latonia, Lorentz, Newberne, Roanoke, Sand Fork, Stouts Mills, Standingstone Run, Tanner, Troy and Vadis.

The Waynesburg Sandstone was once quarried on the land of **A. N. West**, at the Glenville-Center District Line, 1.3 miles southward from Glenville. Here the ledge is massive,

buff, with small quartz pebbles and makes a prominent cliff 30' high in the hilltop, at an elevation of 1290' B. Stone from this quarry was used in the retaining wall at the State Normal School in Glenville.

#### CASSVILLE PLANT SHALE.

The Cassville Plant Shale of White and Fontaine<sup>12</sup> that contains numerous plant fossils in Marion and Monongalia Counties was not definitely recognized in Lewis and Gilmer. The Waynesburg Sandstone is usually separated from the Gilboy next below it by 10 to 20 feet of shale, but the almost total absence of Waynesburg Coal, and consequent lack of diggings, and the great amount of talus from the cliff above, combined to make the examination of this horizon fruitless.

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<sup>12</sup>I. C. White and Wm. M. Fontaine, Vol. II, W. Va. G. S., pp. 119-123; 1903.



# CHAPTER VI.

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## STRATIGRAPHY—THE MONONGAHELA SERIES.

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### GENERAL DESCRIPTION AND SECTION.

The **Monongahela Series** of the Pennsylvanian Rocks, first named and described by H. D. Rogers from its abundant outcrop along the Monongahela River in the State of Pennsylvania, and later described in more detail by Jno. J. Stevenson, I. C. White, and others, includes a large portion of the outcropping rocks of Lewis and Gilmer. Portions of it are found in every magisterial district. Along the northwestern edge of the two counties, it goes under drainage and in the southern end of Lewis, in portions of Skin Creek and Collins Settlement Districts, the southeastward rise of the rocks elevates it above the hilltops, but between these limits its outcrop is continuous.

In Lewis and Gilmer the series consists mainly of sandstone beds, greenish or gray in color, alternating with red or sandy shales, and contains two important coal seams as well as some that are not of commercial rank. The abundant limestone horizons of northern West Virginia and western Pennsylvania are almost wholly lacking, being represented by only one stratum of importance. Three important coal beds, the Waynesburg, Uniontown, and Sewickley, that are of minable thickness elsewhere, are too thin in Lewis and Gilmer to have commercial importance. Taken as a whole, the series lacks many of the economic features found in the more northern counties, while its thickness remains essentially the same, having a larger percentage of sandstone and red beds.

The following general section, compiled from the detailed sections of Chapter IV, and from numerous special observa-

tions, represents the maximum number and thickness of Monongahela sediments noted in Lewis and Gilmer. The series as observed varies in thickness from 340 to 400 feet, being usually about 350:

### General Section of the Monongahela Series for Lewis and Gilmer.

	Thickness Feet.	Total Feet.
<b>Coal, Waynesburg</b> .....	1	1
Shale .....	9	10
Sandstone, greenish brown, <b>Gilboy</b> .....	25	35
Shale .....	15	50
Sandstone, green, micaceous, flaggy, gray and massive in western Gilmer, <b>Uniontown</b> ...	40	90
Shale, greenish brown, <b>Annabelle</b> .....	8	98
<b>Coal, Uniontown</b> .....	2	100
Shale .....	4	104
Limestone, shaly, <b>Uniontown</b> .....	1	105
Shale, red, with limestone nuggets.....	30	135
Sandstone, green, flaggy, <b>Arnoldsburg</b> .....	25	160
Shale, red, with limestone nuggets.....	49	209
Sandstone, massive, gray, pebbly, great cliff rock, <b>Upper Sewickley</b> .....	50	259
<b>Coal, Sewickley</b> .....	1	260
Shale .....	5	265
Sandstone, gray, <b>Lower Sewickley</b> .....	30	295
Limestone, red, ferriferous and shaly, <b>Sewickley</b> .....	2	297
Shale .....	7	304
Sandstone, gray, massive, <b>Cedarville</b> .....	40	344
<b>Coal, Redstone</b> .....	6	350
Shale .....	5	355
Sandstone, gray, massive, <b>Weston</b> .....	20	375
Limestone, <b>Redstone</b> .....	5	380
Shale, <b>Weston</b> .....	10	390
<b>Coal, Pittsburgh</b> .....	8	398

## DESCRIPTION OF FORMATIONS.

### THE WAYNESBURG COAL.

The Waynesburg Coal, first named and described by H. D. Rogers from its outcrop at Waynesburg, Pa., is of little importance in Lewis and Gilmer. Usually it is not found at all but sometimes a black slate appears a few feet below the Waynesburg Sandstone that represents it. In Courthouse District, Lewis, the blossom of the coal was observed at several points along the headwaters of various branches of Sand Fork

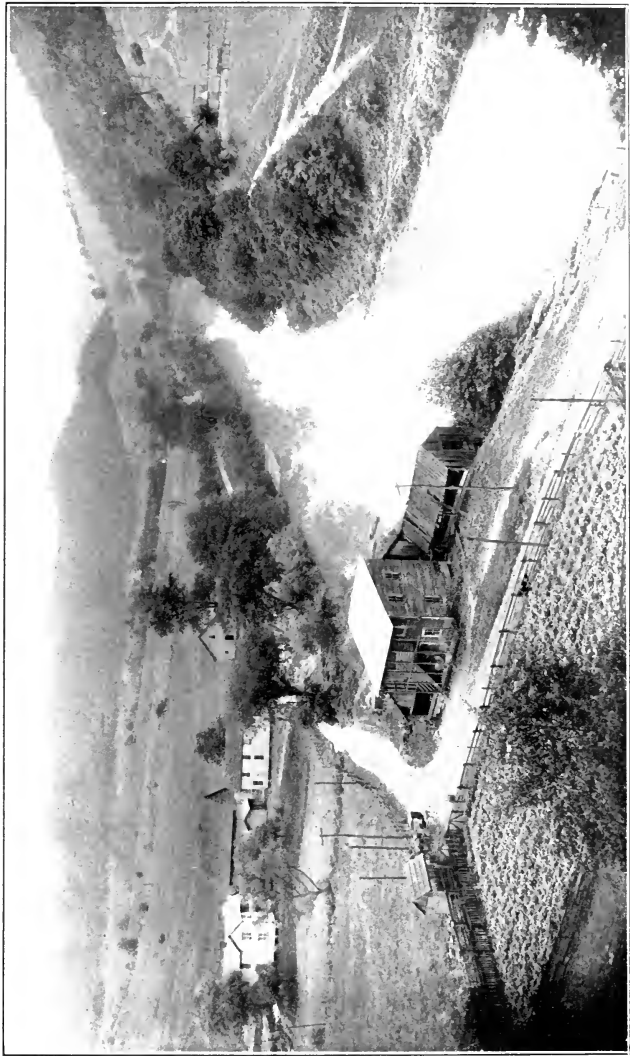


PLATE IX.—View at Dekalb, Gilmer County, looking up Little Kanawha River; Topography of the Monongahela and Conemaugh Series.



west of Edmiston. On Rock Run, 1.8 miles northeast of Bealls Mills, an abandoned coal digging, at an elevation of 1055' B., represents the Waynesburg, but little coal seems to have been found there.

#### THE GILBOY SANDSTONE.

The **Gilboy Sandstone** of White<sup>1</sup>, usually appearing 5 to 10 feet below the Waynesburg Coal horizon, and 15 to 20 feet below the Waynesburg Sandstone, is found frequently in Lewis and Gilmer but is generally shaly and inconspicuous. It contains no typical physical characteristics in the two counties, varying in color from gray to green or brown, and being flaggy, shaly or massive. A good exposure of the Gilboy Sandstone was noted at the mouth of Chestnut Run of Upper Big Run of Horn Creek, 1.3 miles southwest of Coxs Mills, Troy District, Gilmer, where three massive cliffs appear, the middle one of which is the Gilboy, being 15 feet thick, 952' B. above tide, 55 feet below the base of the Waynesburg and 92 feet above the base of the Arnoldsburg Sandstone by hand level measurements. The Gilboy Sandstone has been quarried locally in the hill northeast of Cedarville, Center District, Gilmer, where, as shown by the Cedarville Section published in Chapter IV, it is massive, with streaks of shale, medium hard and coarse, and 18 feet thick. The quarry is small, extending only about 10 feet into the hill. This sandstone is noted frequently in the detailed sections of Chapter IV.

#### UNIONTOWN SANDSTONE.

The **Uniontown Sandstone** of White<sup>2</sup> occurs generally throughout both counties. As observed in Lewis and eastern Gilmer it is usually green, micaceous and flaggy, varying in thickness from 5 to 30 feet, and being usually 75 to 100 feet below the Waynesburg Coal. In Dekalb District, western Gilmer, however, it undergoes a remarkable change, becoming a great, massive, coarse, gray cliff rock, and making a marked topographic feature along the Little Kanawha River

<sup>1</sup>I. C. White, Vol. II, W. Va. G. S., p. 150; 1903.

<sup>2</sup>I. C. White, Bull. 65, U. S. G. S., p. 58; 1891.

and along Tanner Creek and several of its tributary streams. The presence of the Washington, Uniontown and Sewickley Coals in the Tanner region, leaves no doubt as to the identification of this cliff. It preserves the same character westward to the Calhoun Line, and remains a prominent feature along the Little Kanawha River as far west as Grantsville, Calhoun County. The uniformly massive and firm character of the Uniontown Sandstone in western Dekalb District makes it especially suitable for bridge piers and abutments and for other purposes where massive masonry is desired. So far as known, it has not been used for such purposes as no quarries were observed in either county.

#### THE ANNABELLE SHALE.

The **Annabelle Shale** of the writer<sup>3</sup>, named for its occurrence at Annabelle, Marion County, where it is used for brick manufacture, separating the Uniontown Sandstone from the Uniontown Coal, is not prominent in Lewis and Gilmer. It was observed along Crane Run in Troy District, Gilmer, 0.8 mile southwest of Conings, where it occurs between the Uniontown Sandstone and the Uniontown Coal, being green in color and 5 feet thick. In Dekalb District it was observed on Richbottom Run, 0.8 mile northeast of Lucerne, along a hill road where the following section was made:

	Feet.
Sandstone, flaggy, Uniontown.....	10
Shale, sandy, green, Annabelle.....	5
Coal, streak, Uniontown (1020' B.).....	
Fire clay shale.....	

The Annabelle Shale was observed also on Trace Fork of Tanner Creek, 0.7 mile southeast of Revere, where it is 10 feet thick underlying the massive Uniontown cliff rock.

#### THE UNIONTOWN COAL.

The **Uniontown Coal**, originally named and described by the First Geological Survey of Pennsylvania, is present in portions of western Lewis and northern Gilmer. It has been

<sup>3</sup>Monongalia-Marion-Taylor Report, W. Va. G. S., p. 250; 1913.

opened in many places for farm use, but as it usually carries heavy slate partings and is seldom more than one or two feet thick, if not absent from the measures entirely, it must be regarded as of no commercial value. The samples obtained for analysis show that it is unusually high in volatile matter, but also high in sulphur, making it unfit for smithing but fairly good for domestic or steam coal. Such information as was obtained from various openings is assembled in the following pages, grouped by magisterial districts:

**Freemans Creek District, Lewis.**—Several openings were observed in Freemans Creek District, one of which is as follows:

**Coal Opening—No. 17 on Map II.**

On Isaacs Branch of Fink Creek, 1.4 miles southwest of Churchville; **Uniontown Coal**; elevation, 1080' B.

	Ft.	In.
Sandstone, massive, <b>Uniontown</b> .....		
Shale, gray.....	1	6
<b>Coal</b> .....	2	0
Slate .....		

**P. R. Woofter Farm Mine—No. 18 on Map II.**

On a branch of Fink Creek, 1.5 miles northwest of Churchville; **Uniontown Coal**; elevation, 955' B.

	Ft.	In.
Sandstone, massive, coarse, buff, pebbly.....	30	0
Shale, concealed, and sandstone, shaly.....	20	0
Shale, gray.....	5	0
<b>Coal</b> .....1' 6½" }		
Slate, dark.....0 0½" }	2	6
<b>Coal</b> .....0 11" }		

**The Joseph Gum Farm Mine—No. 19 on Map II**—situated on the same branch as the Woofter opening, was noted under the section for Churchville, published in Chapter IV.

**The Domineck Sweeney Prospect—No. 20 on Map II**—located on Fink Creek, 0.6 mile northeast of Dry Fork, at an elevation of 850' B., had fallen shut but was reported by Mr. Sweeney to have been 22" thick.

**Coal Prospect—No. 21 on Map II.**

On Fink Creek, at Dry Fork; **Uniontown Coal**; elevation, 840' B.

			Ft.	In.
Coal (sandy shale roof).....	0'	5"	}	3
Slate, black.....	0	3		
Coal, 0" to.....	0	4		
Shale, gray.....	0	6		
Coal, (concealed floor).....	2	0		
				6

The following exposure was noted along the public road:

**Coal Exposure—No. 22 on Map II.**

On Fink Creek, 1.4 miles northeast of Hurst; **Uniontown Coal**; elevation, 825' B.

			Ft.	In.
Shale, gray.....				
Coal .....	0'	4"	}	1
Shale, gray.....	0	1		
Coal .....	0	8		
Fire clay shale and concealed to creek.....			15	0

**N. C. Lattea Farm Mine—No. 23 on Map II.**

On a branch of Straight Run, 1.2 miles northeast of Hurst; **Uniontown Coal**; elevation, 890' B.

			Ft.	In.
Sandstone, shaly.....			3	0
Shale gray.....			4	0
Coal .....	0'	10"	}	2
Shale, gray.....	0	9		
Coal .....	1	0		
Slate pavement.....				7

**John Hines Farm Mine—No. 24 on Map II.**

On Alum Fork of Fink Creek, 3.2 miles southwest of Churchville; **Uniontown Coal**; elevation, 1045' B.

			Ft.	In.
1. Shale, gray.....				
2. Slate, black.....			1	0
3. Coal .....	0'	5"	}	3
4. Slate, black.....	0	5		
5. Coal .....	1	0		
6. Slate, gray.....	0	1		
7. Coal .....	1	7		
8. Slate, pavement.....				6

A sample was collected from Nos. 5 and 7 of section, the composition of which is published under **No. 24** in the table of coal analyses at the end of Chapter XI.



The **John Fallon Farm Mine—No. 25 on Map II**—located on Alum Fork of Fink Creek, 1.9 miles southwest of Churchville, at an elevation of 1105' B., had fallen shut but was reported to have been about 3 feet thick.

**Courthouse District, Lewis**—In Courthouse District, few openings were found but the two following indicate that the Uniontown Coal is present in a small portion of it:

**Matthews Heirs Exposure—No. 26 on Map II.**

On Middle Run, 2 miles northwest of Brownsville; **Uniontown Coal**; elevation, 1171' B.

	Ft.	In.
Shale, sandy.....		
Coal .....	2	0
Shale, gray.....		

The **William McBride Opening—No. 27 on Map II**—located on Middle Run, 2.8 miles northwest of Brownsville, at an elevation of 1175' B., had fallen shut, but the coal was reported by Mr. McBride to have been 2' 6" thick.

**Troy District, Gilmer**.—In Troy District, the Uniontown Coal frequently appears in the measures but is seldom more than a few inches thick. At Conings, in the northeastern corner, a thin coal lying a few feet above drainage represents this horizon but it is too thin for use. Farther west the coal is better, as the following openings will show:

The **John Lang Opening, No. 28 on Map II**, located on Upper Big Run of Horn Creek, 1 mile southwest of Coxs Mills, at an elevation of 910' B., had fallen shut but was reported by Mr. Lang to have shown 1' 6" of Coal.

**Andrew Reed Heirs Opening—No. 29 on Map II.**

On Garfield Run of Sinking Creek, 1.2 miles southeast of Newberne; **Uniontown Coal**; elevation, 930' B.

	Ft.	In.
Sandstone, massive, <b>Uniontown</b> .....	15	0
Shale and concealed.....	10	0
Coal, reported.....	1	6

### W. C. Snodgrass Farm Mine—No. 30 on Map II.

At the mouth of Pennsylvania Run of Tanner Creek, 1 mile southwest of Newberne; **Uniontown Coal**; elevation, 850' L.

	Ft.	In.
1. Sandstone, massive, <b>Uniontown</b> .....	10	0
2. <b>Coal</b> .....	1	6
3. Slate, pavement.....		

A sample was collected from No. 2 of section, the composition of which is given under **No. 30** in the table of analyses at the end of Chapter XI.

**Dekalb District, Gilmer.**—In Dekalb District, the **Uniontown Coal** has been opened at various points, but many of the prospects have fallen shut.

At **Opening No. 31 on Map II**, located on Brushy Run of Tanner Creek, 1.6 miles southwest of Newberne, at an elevation of 905' B., considerable coal has been taken out by open cut, but the place has been abandoned and the thickness of the seam was not obtained.

Farther down Tanner Creek at **Opening No. 32 on Map II**, 2.7 miles northeast of Tanner, the coal had once been mined at an elevation of 865' B., but the opening had fallen shut.

At the **Thos. Hardman Heirs Opening—No. 33 on Map II**, located on the hill just south of Tanner, at an elevation of 872' L., the place had fallen shut, but the coal was reported to have been 2 feet thick, as already noted in the section for Tanner in Chapter IV.

Two openings were found on Sinking Creek, as follows:

### James A. Bush Prospect—No. 34 on Map II.

On a branch of Sinking Creek, 1 mile northwest of Lucerne; **Uniontown Coal**; elevation, 955' B.

	Ft.	In.
1. Sandstone, massive, cliff rock, <b>Uniontown</b> ....	20	0
2. Shale, gray, sandy, with a few limestone nodules .....	8	0
3. Limestone, hard, lenticular, silicious, 0" to..	1	0
4. Shale, gray.....	0	4
5. <b>Coal</b> , 0' 6" to.....1' 0" }		
6. Shale, gray.....3 6 }	5	9
7. <b>Coal</b> .....1 3 }		
8. Slate, pavement.....		

Owing to the presence of water in the prospect, a sample was collected from a freshly mined stock pile, the composition of which is given under **No. 34** in the table of analyses at the end of Chapter XI. The analysis shows a high percentage of volatile matter, but ash, sulphur and phosphorus are also high.

### J. S. Shaffer Prospect—No. 35 on Map II.

On a branch of Sinking Creek, 1.1 miles northwest of Lucerne; **Uniontown Coal**; elevation, 945' B.

	Ft.	In.
Sandstone, massive, cliff, <b>Uniontown</b> .....		
Concealed and shale.....	10	0
<b>Coal</b> .....	0'	2"
Shale, gray.....	0	10
<b>Coal</b> , 0' 4" to.....	0	7
Shale, gray.....	0	3
<b>Coal</b> .....	0	2
Fire clay shale, visible.....	3	0

**Glenville District, Gilmer.**—In Glenville District, the Uniontown Coal is apparently almost lacking in the measures as its horizon is occupied by red shale. Only one exposure of any importance was noted, as follows:

### Coal Exposure—No. 36 on Map II.

On Indian Fork, 0.9 mile northeast of Blackburn; **Uniontown Coal**; elevation, 925' B.

	Ft.	In.
Shale .....		
<b>Coal</b> .....	0'	5"
Shale, gray.....	1	0
<b>Coal</b> .....	0	6
Fire clay shale.....		

In **Otter District, Braxton County**, 1.3 miles from the Gilmer Line, the following opening was observed:

### Smith Marks Farm Mine—No. 37 on Map II.

On Piper Fork of Crooked Fork of Left Fork of Steer Creek, 0.5 mile north of Progress; **Uniontown Coal**; elevation, 1225' B.

	Ft.	In.
Shale, gray, visible.....	3	0
Slate, black, bony.....	0	6
<b>Coal, slaty</b> .....	1	6
Slate, pavement.....		

### THE UNIONTOWN LIMESTONE.

The **Uniontown Limestone**, a subdivision made by J. J. Stevenson from the Great Limestone of the First Geological Survey of Pennsylvania, is almost wholly lacking in Lewis and Gilmer, its horizon being usually occupied by red shale or lenticular sandstones. On Rush Run, Courthouse District, Lewis, nuggets of shaly lime were observed 2 miles south-east of Edmiston, at an elevation of 1100' B., and on another branch of the same run, 1.5 miles east of Edmiston, 1 foot of brecciated limestone was noted at 1115' B., both of which seem to represent the Uniontown.

On a branch of Fink Creek, Freemans Creek District, Lewis, one mile east of Hurst, the following relationship was observed at the N. C. Lattea Coal Opening, No. 23 on Map II, previously described:

	Feet.
Coal, Uniontown.....	2½
Shale, variegated.....	14
Limestone, silicious, Uniontown.....	1
Shale, sandy, and concealed, to run.....	30

### THE ARNOLDSBURG SANDSTONE.

The **Arnoldsburg Sandstone** of Hennen<sup>4</sup> is present generally throughout Lewis and Gilmer where the Monongahela Series outcrops, but lacks the massive character noted at its type locality. It is usually green and flaggy, varying in thickness from 5 to 30 feet, and often being separated into two ledges by a shale bed. It has been noted in numerous sections published in Chapter IV. No quarries were observed on this ledge.

### THE UPPER SEWICKLEY SANDSTONE.

The **Sewickley Sandstone** of White<sup>5</sup>, later termed the **Upper Sewickley** by Hennen<sup>6</sup>, is one of the most persistent and easily recognized sandstone horizons of the two counties. It is usually a great massive cliff rock, gray in color, and having large quartz pebbles slightly rounded by attrition, often reach-

<sup>4</sup>Ray V. Hennen, Wirt-Roane-Calhoun Rept., W. Va. G. S., p. 202; 1911.

<sup>5</sup>I. C. White, Bull. 65, U. S. G. S., p. 60; 1891.

<sup>6</sup>Ray V. Hennen, Doddridge-Harrison Rept., W. Va. G. S., p. 199; 1912.

ing a thickness of 50 to 60 feet, and influencing the topography to a marked extent. In physical character it much resembles the Waynesburg, belonging more than 200 feet above, and the two have often been confused in these two counties.

In Hackers Creek, Skin Creek and eastern Freemans Creek Districts, Lewis, it is not prominent, as it lacks its massive and pebbly character, but in western Freemans Creek, Courthouse and Collins Settlement Districts, Lewis, and in most of Gilmer, it is a great cliff rock readily traced by the eye along the hillsides. In Lewis this stratum makes a great cliff along Sand Fork and its branches in the region of Copley and Bealls Mills. and also along Indian Fork. At Orlando it makes a huge cliff half way up the hillside northwest of the town. In Gilmer it makes a cliff, just above drainage, along Sand Fork in the vicinity of Ellis. In Center District, it makes a prominent cliff along Steer Creek and its branches, being a conspicuous landmark at Rosedale where it is well up on the hillsides.

**The Upper Sewickley Sandstone** has been quarried on the Stokes Tunstill farm on Polk Creek, Freemans Creek District, Lewis, 1.5 miles northwest of Weston. Here the sandstone is massive, coarse, buff, soft and friable, with small quartz pebbles, only 20 feet of the upper portion of the ledge being quarried and exposed. The quarry, which is 90 feet by hand level above an opening in the Redstone Coal, is about 30 feet long and extends about 20 feet into the hill. The stone seems too friable here to have much value for building purposes. This sandstone has also been quarried on the Andrew Edmiston farm on a branch of Middle Run, Courthouse District, Lewis, 2.3 miles northwest of Brownsville, only the upper 15 feet of the ledge being exposed and worked. Here the sandstone is massive, coarse, gray, soft and friable, the tidal elevation of its top being 1120' B. The quarry is about 60 feet long and extends into the hill about 20 feet. The stone seems too soft here to be of durable character.

#### THE SEWICKLEY COAL.

**The Sewickley Coal**, originally described by the First Geological Survey of Pennsylvania, belonging just under the Up-

per Sewickley Sandstone, and from 90 to 140 feet above the base of the Monongahela Series, has little areal extent or thickness in Lewis and Gilmer. In Lewis it is almost wholly absent, only one opening being observed, as follows:

### Conrad Heirs Prospect—No. 38 on Map II.

On Canoe Run, 0.6 mile northwest of Roanoke, Collins Settlement District; **Sewickley Coal**; elevation, 1110' B.

	Ft.	In.
Sandstone, massive, pebbly, <b>Sewickley</b> .....	10	0
Shale, sandy.....	10	0
<b>Coal, thickness concealed, reported</b> .....	2	6

In Gilmer there is a small quantity of Sewickley Coal in the vicinity of Tanner, Dekalb District, but it is too thin and slaty to be of value. One of these outcrops, **Exposure No. 39 on Map II**, in the public road at Tanner, has already been noted in the section for Tanner, published in Chapter IV. The following was noted along the public road farther down the creek:

### Coal Exposure—No. 40 on Map II.

On Tanner Creek, 1 mile northwest of Latonia; **Sewickley Coal**; elevation, 730' B.

	Ft.	In.
Sandstone, massive, <b>Sewickley</b> .....		
Shale, sandy.....	10	0
<b>Coal</b> .....	0'	4"
Slate, gray.....	0	2
<b>Coal</b> .....	0	4
Slate, gray.....		

At **Prospect No. 41 on Map II**, 0.3 mile west of Latonia, the Sewickley Coal had once been opened at an elevation of 785' B., but apparently not much coal was found, the blossom which appears in the road at the same level being only 0' 8" thick.

In Center District at the **Sylvester Maxwell Prospect, No. 42 on Map II**, on Road Run, 2.2 miles northwest of Norman-town, now fallen shut, the Sewickley Coal was reported 1 foot thick, being at an elevation of 1000' B.

### THE LOWER SEWICKLEY SANDSTONE.

The Lower Sewickley Sandstone of Hennen<sup>1</sup> occurs frequently as a separate ledge in Lewis and Gilmer, but it is often apparently consolidated with the Upper Sewickley above to form the great massive stratum previously described. When occurring as a separate ledge it is usually flaggy or shaly and preserves no distinct type. Its thickness and character have been noted in numerous sections in Chapter IV.

### THE SEWICKLEY LIMESTONE.

The Sewickley Limestone of J. J. Stevenson, coming just below the Lower Sewickley Sandstone, appears in the measures in portions of Lewis and Gilmer, but is usually poorly represented or absent entirely. It is generally ferriferous and shaly, and red in color, having little resemblance to its appearance in the northern counties of the State. In Lewis the Sewickley Limestone was noted at several points along the Roanoke Syncline in the neighborhood of Rohrbough and Roanoke, in Courthouse and Collins Settlement Districts. Here it is shaly, red and impure, being usually less than one foot thick.

In Gilmer it is found at various points in Glenville and Center Districts. At Stouts Mills it appears in the Little Kanawha River bank under the highway bridge, being 2 feet thick, red and shaly, as noted in the section for Stouts Mills in Chapter IV, and only 2 feet above drainage.

The shaly and impure character of the Sewickley Limestone in Lewis and Gilmer makes it unfit for any economic use, either for road material or agricultural lime, but it enriches the soil appreciably in the region where it outcrops, thereby having a distinct value. As a stratigraphic horizon, it proved to be a very convenient horizon with which to trace geologic structure in those regions where the Pittsburgh Coal was underground or absent from the measures. In parts of Gilmer, however, it closely resembles the Redstone Limestone which belongs about 100 feet below it, sometimes causing confusion.

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<sup>1</sup>Ray V. Hennen, Doddridge-Harrison Rept., W. Va. G. S., p. 201; 1912.

### THE CEDARVILLE SANDSTONE.

In Lewis and Gilmer the Monongahela Series often contains a considerable sandstone stratum just above the Redstone Coal. It is noticeable in many localities but in southwestern Gilmer it attains massive proportions. At Cedarville, Center District, it forms a prominent cliff at the eastern end of the town, being 41 feet by hand level above the Pittsburgh Coal, which crops in the public road, and 74 feet above drainage. Here the sandstone is massive, greenish gray, medium coarse and hard, with flakes of mica and occasional spots of iron peroxide, being 32 feet thick, as shown by the section for Cedarville published in Chapter IV. As this sandstone has not previously been noted or named, it will hereafter be called the **Cedarville Sandstone** in this Report.

### THE REDSTONE COAL.

**The Redstone Coal** of H. D. Rogers, named from its outcrop along Redstone Creek in Fayette County, Pa., occurs generally throughout Lewis County, being usually free from slate partings and varying in thickness from 3 to 6 feet, and coming 35 to 50 feet above the **Pittsburgh Coal** which it rivals closely in commercial value. In Gilmer it is seldom present and is apparently of little value there. The outcrop of the Redstone Coal is shown on Map II in those regions where it has minable thickness. Its thickness, character, chemical composition, and extent, together with many measured sections, will be discussed in Chapter XI.

### THE WESTON SANDSTONE.

In Hackers Creek, Freemans Creek, Courthouse and Skin Creek Districts of northeastern Lewis, where the Redstone Coal, Redstone Limestone, and Pittsburgh Coal all appear in conjunction, having been traced directly up the Monongahela and West Fork Rivers by the geologists of Pennsylvania and West Virginia, leaving no doubt as to their correlation, a sandstone is usually found lying between the Redstone Coal and the Redstone Limestone. So far as known no sandstone member



has previously been noted or named in this interval. I. C. White states that in the Morgantown and Fairmont region few outcrops have been found where the Redstone Coal, Redstone Limestone, and Pittsburgh Sandstone, which directly overlies the Pittsburgh Coal, occur in the same locality.<sup>8</sup> Later studies by Ray V. Hennen and the writer show that this condition is general throughout the region where the Monongahela Series outcrops in Monongalia. Marion and Harrison, but in one Report<sup>9</sup>, the writer observed near Monongah, Marion County, the occurrence of the Redstone Coal, Redstone Limestone, Upper Pittsburgh Sandstone and Pittsburgh Coal in the same hillside, leaving little doubt as to their relationship in that region, thus affording direct evidence on which the general sections of Hennen<sup>10</sup> for the Monongahela Series

There seems little doubt, therefore, that the sandstone which crops in northeastern Lewis, between the Redstone and Pittsburgh Coals, and **above**, instead of **below**, the Redstone Limestone is a new horizon, distinct from the Upper Pittsburgh Sandstone of the Fairmont and Morgantown region, and it will consequently be called the **Weston Sandstone** in this Report. The position of the Weston Sandstone is well illustrated by the short section published on page 127, describing an occurrence of the Redstone Limestone on the Tierney Brothers property, along Town Run at the southeastern edge of Weston. Here the Weston Sandstone consists of two sand layers, each 10 feet thick, separated by a shale interval of 7 feet, making a total of 27 feet, the upper lens being shaly while the lower one is greenish gray and harder. It has been quarried here on a small scale but proved to be too shaly to make durable building stone.

In Lewis County, the Weston Sandstone is found frequently throughout the region where the Monongahela Series outcrops, usually having a somewhat soft and shaly nature. At Vadis, Freemans Creek District, it has been quarried along Fink Creek, one-eighth mile west of the town, and used for

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<sup>8</sup>I. C. White, Vol. II, W. Va. G. S., p. 163; 1903.

<sup>9</sup>Monongalia-Marion-Taylor Rept., W. Va. G. S., p. 142; 1913.

<sup>10</sup>Ray V. Hennen, Doddridge-Harrison Rept., W. Va. G. S., p. 179; 1912; and Monongalia-Marion-Taylor Rept., W. Va. G. S., p. 216; 1913. were based.

bridge piers. The bridge at Vadis, where the stone was used, was built in 1903, but the rock had disintegrated badly when examined in 1914. Here the stone is massive, readily splitting into large blocks, and considering the ease with which it may be handled, its use would perhaps be justified where rough masonry is desired.

In Gilmer the Weston Sandstone becomes a much more prominent horizon, being frequently hard and massive and making a steep bluff a short distance above the Pittsburgh Coal horizon, but sometimes having a flaggy nature and a greenish gray color. Its occurrence is general along the outcrop of the Monongahela Series. Numerous sections in Chapter IV show its thickness and character.

#### THE REDSTONE LIMESTONE.

The **Redstone Limestone** of J. J. Stevenson, named from its relation to the Redstone Coal, and belonging a few feet below this coal, is frequently found in Lewis and Gilmer, being the only outcropping limestone in the two counties that can be put to possible economic use, but being far inferior in thickness to the same horizon as it appears in the more northern counties of the State. Its best development is found in Hackers Creek, Freemans Creek, Courthouse and Skin Creek Districts, Lewis. In Gilmer it is poorly represented, being often entirely absent from the measures. As observed in northeastern Lewis, it varies from 2 to 4 feet in thickness, being gray and hard on fresh fracture, but weathering to a yellow color. It proved to be an important stratigraphic horizon, coming as it does between the Redstone and Pittsburgh Coals so that its presence in conjunction with an exposure of either coal removed all doubt as to the correlation, because no other limestone occurs in these two counties near either of these coals, the only exception noted being an exposure of the Upper Pittsburgh Limestone published in the Weston Section in Chapter IV.

The following exposure of the Redstone Limestone was observed on the **Perry White Farm** in Freemans Creek District, Lewis, on Left Fork of Freemans Creek, 1.3 miles southeast of Churchville:

	Feet.
1. <b>Coal, Redstone (1120' B.)</b> .....	2
2. Concealed .....	10
3. Sandstone and sandy shale, <b>Weston</b> .....	10
4. <b>Limestone, hard, yellow, with fresh water fossils, Redstone</b> .....	4
5. Shale .....	

A sample of this limestone was collected, the analysis of which is reported by Krak as follows:

	Per cent.
Silica (SiO <sub>2</sub> ).....	9.77
Ferric Iron (Fe <sub>2</sub> O <sub>3</sub> ).....	1.59
Alumina (Al <sub>2</sub> O <sub>3</sub> ).....	3.20
Calcium Carbonate (CaCO <sub>3</sub> ).....	78.47
Magnesium Carbonate (MgCO <sub>3</sub> ).....	6.30
Phosphoric Acid (P <sub>2</sub> O <sub>5</sub> ).....	0.24
<b>Total</b> .....	<u>99.57</u>

The analysis shows that this limestone would readily burn into agricultural lime, and its physical character is such that it would make excellent road material.

Along Town Run at the southeast edge of Weston, in Courthouse District. Lewis, the following exposure was observed on the **Tierney Brothers Property**:

	Feet.
1. <b>Coal opening, fallen shut, Redstone</b> .....	
2. Concealed .....	8
3. Sandstone, shaly.....10'	} <b>Weston</b> ....
4. Shale, gray, with fire clay..... 7	
5. Sandstone, harder, greenish gray..10	
6. <b>Limestone, hard, Redstone</b> .....	4
7. Shale, limy, <b>Weston</b> .....	10
8. <b>Coal, Pittsburgh (1110' B.)</b> .....	1
9. Fire clay.....	

A sample was collected from the Redstone Limestone, No. 6 of section, the analysis of which is reported by Krak as follows:

	Per cent.
Silica (SiO <sub>2</sub> ).....	2.98
Ferric Iron (Fe <sub>2</sub> O <sub>3</sub> ).....	0.99
Alumina (Al <sub>2</sub> O <sub>3</sub> ).....	0.20
Calcium Carbonate (CaCO <sub>3</sub> ).....	93.08
Magnesium Carbonate (MgCO <sub>3</sub> ).....	1.09
Phosphoric Acid (P <sub>2</sub> O <sub>5</sub> ).....	0.17
Moisture } .....	0.77
Loss on ignition }	
<b>Total</b> .....	<u>99.28</u>

The analysis shows that this stratum would make excellent lime for agricultural purposes, as the percentage of inert matter is small, the carbonates of Calcium and Magnesium and the Phosphoric Acid all being of value to the soil. Its physical character indicates that it would make fine road-metal.

Another exposure of the Redstone Limestone in Court-house District, Lewis, is the following, secured on the **Grace Butcher Farm**, one-fourth mile east of Alkires Mills, on Skin Creek:

	Thickness Feet.	Total Feet.
1. Sandstone, massive, <b>Cedarville</b> .....	15	15
2. Concealed .....	5	20
3. <b>Coal opening</b> , fallen shut, thickness concealed, <b>Redstone</b> .....	...	20
4. Concealed .....	12	32
5. Sandstone, <b>Weston</b> .....	10	42
6. Shale, sandy.....	20	62
7. Concealed, partly, with large boulders of limestone, <b>Redstone</b> .....	14	76
8. <b>Coal blossom</b> , thickness concealed, <b>Pittsburgh</b> (1085' B.).....	...	76

In Glenville District, Gilmer, the following exposure was observed on Schoolhouse Run, 1.3 miles southward from Blackburn, on the **Benjamin Bartlett Farm**:

	Feet.
1. Sandstone, shaly, <b>Cedarville</b> .....	
2. Shale, sandy, and concealed.....	10
3. Limestone, hard, yellow, to run, <b>Redstone</b> (885' B.)..	3

#### THE WESTON SHALE.

In the vicinity of Weston, Lewis County, the Redstone Limestone is separated from the Pittsburgh Coal by a bed of gray shale, usually about 10 feet thick, that is worthy of notice because it is being used for brick-making purposes. Its position in the measures is shown by the following section made at the shale pit of the **Weston Brick Works**, along the West Fork River, one mile south of Weston:

	Feet.
Limestone, hard, <b>Redstone</b> .....	2
Shale, gray, <b>Weston</b> .....	10
Coal, <b>Pittsburgh</b> (1020' B.).....	1

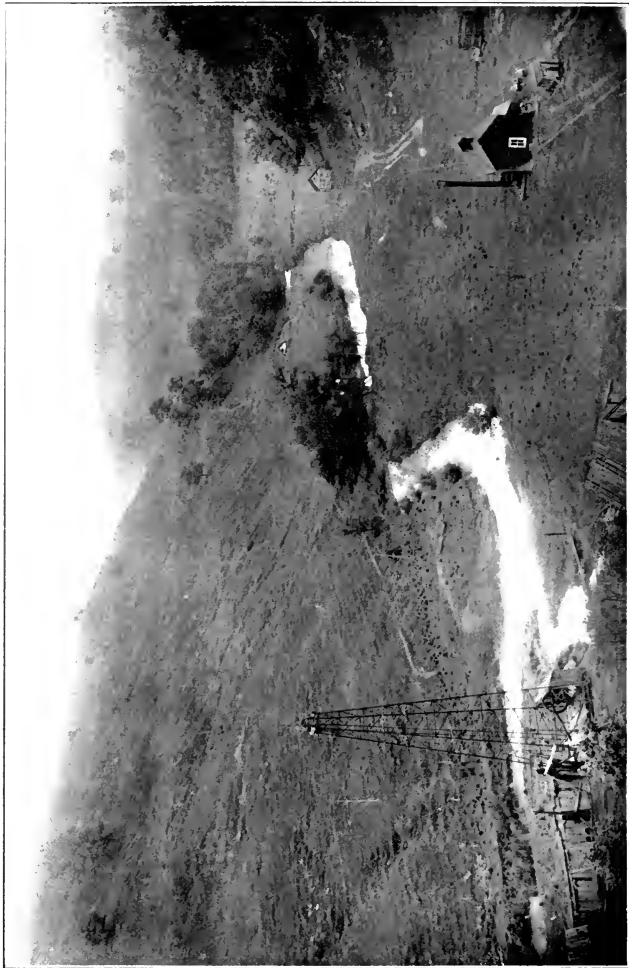


PLATE X.—Looking down Fink Creek from the mouth of Big Buck Run, 1 mile north of Hurst, Lewis County; the derrick in the foreground is that of the John Rastle No. 1 (273) well, which was the first drilled in the Fink Oil Pool; Topography of the Dunkard and Monongahela Series.



Since this shale has not been previously described or named, it will be called the **Weston Shale** in this Report. A sample collected from this horizon shows the following analysis, according to Krak:

	Per cent.
Silica (SiO <sub>2</sub> ).....	50.65
Ferric Iron (Fe <sub>2</sub> O <sub>3</sub> ).....	8.08
Alumina (Al <sub>2</sub> O <sub>3</sub> ).....	13.93
Lime (CaO).....	8.62
Magnesia (MgO).....	2.11
Potassium Oxide (K <sub>2</sub> O).....	3.28
Sodium Oxide (Na <sub>2</sub> O).....	0.78
Titanium Oxide (TiO <sub>2</sub> ).....	0.31
Phosphoric Acid (P <sub>2</sub> O <sub>5</sub> ).....	0.67
Moisture .....	2.60
Loss on ignition.....	8.60
Total .....	99.63

The Weston Shale is prominent along the public road north of the Crescent Glass Factory, appearing between the Redstone Limestone and the Pittsburgh Coal. It was noted, also, in the short section, published on page 127, describing the Redstone Limestone on the Tierney Brothers property along Town Run at the southeast edge of Weston, being 10 feet thick and limy.

A barrel of this shale was shipped by George I. Keener, owner of the works, to State Road Engineer A. D. Williams, at Morgantown, who has had a test made of it for brick, the result of which, with a further description of the plant, will appear in Chapter XII.

#### THE PITTSBURGH COAL.

The **Pittsburgh Coal**, first named and described by J. P. Lesley in 1856 at the city of Pittsburgh, Pa., is the most valuable economic horizon of the Monongahela Series. In Lewis and Gilmer, it is somewhat patchy in its occurrence, lacking the uniform thickness and character that distinguish it in western Pennsylvania and northern West Virginia, but there is a broad belt extending across both counties where it will furnish a large amount of good coal.

This bed reaches its best development in the region of Gilmer Station, Gilmer County, where it has the following general section:

		Ft.	In.
Draw slate.....			
Coal, good.....	3' 5"		
Cannel bone.....	0 1		
Coal, good.....	3 6	7	0
Slate pavement.....			

The cannel bone, coming at the middle of the seam, represents the three bands of bony coal usually found throughout northern West Virginia and western Pennsylvania. Not only have two of these bands disappeared in Gilmer, but also the one remaining is pure enough to burn as freely as the remainder of the seam, and hence is not separated in mining.

The outcrop of the coal, in those regions where it has minable thickness, is shown on Map II. In other regions where its horizon outcrops, but has little or no thickness, it is not shown as a coal outcrop, but its position may readily be noted on the map by the base of the Monongahela Series, with which it coincides.

The thickness, chemical quality and distribution, together with numerous detailed sections of mines examined, will be presented in detail in Chapter XI, under the subject of "Coal."



# CHAPTER VII.

## STRATIGRAPHY—THE CONEMAUGH SERIES.

### GENERAL DESCRIPTION AND SECTION.

The Conemaugh Series of the Pennsylvanian Rocks, first named by Franklin Platt, in 1878, from its outcrop along the Conemaugh River in Pennsylvania, includes a large portion of the surface rocks of Lewis and Gilmer, as its areal limits on Map II will show. The series has been described thoroughly by White in a former volume of the Survey<sup>1</sup> and in Lewis and Gilmer differs but little from that description in its general features. It consists of numerous sandstone beds, usually separated by red or sandy shales, and has several coal seams of which two have minable thickness in some localities. It is further distinguished by the presence of two distinct fossiliferous marine limestone horizons, one of which, the Ames, is one of the most recent formations known to contain them in the State. All of its limestone horizons are shaly and impure, being unfit for any economic use. The thickness of the Conemaugh varies from 450 to 650 feet. The following general section, compiled from numerous detailed sections in Chapter IV, as well as from many local observations, shows the characteristic features of the series in Lewis and Gilmer:

#### General Section of the Conemaugh Series for Lewis and Gilmer.

	Thickness Feet.	Total Feet.
Fire clay and shale.....	5	5
Sandstone, massive, gray, <b>Lower Pittsburgh</b> ..	40	45
Shale, gray.....	3	48
Limestone, <b>Upper Pittsburgh</b> , (seldom found)..	1	49
<b>Coal, Little Pittsburgh</b> .....	1	50

<sup>1</sup>I. C. White, Vol. II, W. Va. G. S., pp. 225-230; 1903.

	Thickness Feet.	Total Feet.
Shale, variegated and sandy.....	24	74
Sandstone, massive, gray or brown, <b>Connellsville</b> .....	25	99
Coal, <b>Little Clarksburg</b> .....	1	100
Fire clay shale, <b>Clarksburg</b> .....	1	101
Shale, red.....	23	124
Sandstone, massive, gray, <b>Lower Connellsville</b>	35	159
Coal, <b>Normantown</b> .....	1	160
Shale, red, <b>Clarksburg Reds</b> .....	42	202
Sandstone, massive or flaggy, gray or brown, <b>Morgantown</b> .....	30	232
Shale, sandy.....	10	242
Limestone, shaly, <b>Orlando</b> .....	3	245
Coal, <b>Elk Lick</b> .....	5	250
Fire clay and shale.....	4	254
Limestone, shaly, <b>Elk Lick</b> .....	1	255
Shale, sandy and red, <b>Birmingham</b> .....	10	265
Sandstone, massive or shaly, brown, <b>Grafton</b> .	20	285
Limestone, shaly, with marine fossils, <b>Upper Ames</b> .....	1	286
Shale, dark green, with marine fossils, <b>Ames</b> ..	12	298
Limestone, shaly, with marine fossils, <b>Lower Ames</b> .....	1	299
Coal, <b>Harlem</b> .....	1	300
Shale, red and variegated, <b>Pittsburgh Reds</b> ..	15	315
Sandstone, greenish gray, massive or shaly, <b>Jane Lew</b> .....	10	325
Shale, red, <b>Pittsburgh</b> .....	42	367
Sandstone, massive, gray or brown, <b>Saltsburg</b>	30	397
Coal, <b>Bakerstown</b> .....	3	400
Shale, gray and variegated.....	34	434
Limestone, shaly, lenticular, no marine fossils found, <b>Pine Creek</b> .....	1	435
Shale, sandy.....	5	440
Sandstone, massive, gray, <b>Buffalo</b> .....	25	465
Limestone, with marine fossils, <b>Brush Creek</b>	1	466
Shale, black, with plant and marine fossils, <b>Brush Creek</b> .....	8	474
Coal, <b>Brush Creek</b> .....	1	475
Shale, gray.....	10	485
Sandstone, massive, gray, <b>Upper Mahoning</b> ...	30	515
Shale, gray and sandy.....	20	535
Sandstone, massive, gray, <b>Lower Mahoning</b> ...	25	560
Shale, dark, sandy, with plant fossils, <b>Uffing- ton</b> .....	15	575
Coal, <b>Upper Freeport</b> , (top of Allegheny Series) ...	...	....

The section as given above shows a total thickness somewhat greater than the average for the two counties, since many of the formations are lenticular, being absent in many localities. Numerous measured sections, giving detailed exposures in different places, are published in Chapter IV.

## LOCAL SECTIONS, CONEMAUGH SERIES.

Besides the long sections in Chapter IV, embracing the rocks of the several series, many of which show the Conemaugh, three local sections were made in Lewis giving additional exposures of this series.

The following section was made with aneroid descending the steep hillside east of the West Fork River at Jackson Mill. Since the strata below the trolley grade were obscured by the fill, formations 10-13, inclusive, of the section were supplied from outcrops one-fourth mile southward, checked by a measured interval from the Ames Shale in the hill above:

## Jackson Mill Section, Hackers Creek District.

	Thickness Feet.	Total Feet.
1. Shale, green, fossiliferous, <b>Ames</b> (1125' B.)	10	10
2. Concealed and shale.....	40	50
3. Sandstone, massive, <b>Jane Lew</b> .....	10	60
4. Shale, variegated.....	14	74
5. Shale, dark, bituminous.....	1	75
6. Shale, sandy.....	9	84
7. Sandstone, massive.....	4	88
8. Shale, to trolley grade.....	2	90
9. Concealed .....	17	107
10. Shale, sandy .....	20	127
11. Shale, dark.....	10	137
12. <b>Coal</b> , (1' 10") <b>Bakerstown</b> .....	2	139
13. Shale, gray.....	1	140
14. Sandstone, <b>Buffalo</b> , to West Fork River..	5	145

The following section was made descending a hill road, west of Leading Creek, and about midway between Alum Bridge and Camden:

## Section 2.5 Miles Northeast of Alum Bridge, Freemans Creek District.

	Thickness Feet.	Total Feet.
<b>Monongahela Series (180')</b>		
Sandstone, massive, buff.....	30	30
Shale, red.....	10	40
Sandstone, massive, <b>Sewickley</b> .....	40	80
Shale and concealed.....	45½	125½
<b>Coal</b> , 4' 6" visible, <b>Redstone</b> .....	4½	130
Shale and concealed.....	50	180
Fire clay, <b>Pittsburgh Coal horizon</b> (1050' B.)..	...	180

	Thickness Feet.	Total Feet.
<b>Conemaugh Series (145')</b>		
Concealed and sandy shale.....	50	230
Fire clay, <b>Little Pittsburgh Coal horizon</b> .....	1	231
Shale, sandy.....	19	250
Sandstone, shaly, <b>Connellsville</b> .....	25	275
Shale, red.....	25	300
Concealed to <b>Leading Creek</b> .....	25	325

The following section, arranged in descending order, was measured with hand level up the hill immediately south of Ireland:

### Ireland Section, Collins Settlement District.

	Thickness Feet.	Total Feet.	
Concealed on hill top, mostly red shale, <b>Clarksburg</b> .....	35	35	
Sandstone, with conglomerate streaks, partly concealed in bluff, <b>Morgantown</b> .....	50	85	
<b>Coal blossom, at opening, Elk Lick, (1376' L.)</b> ...		85	85'
Shale, gray, sandy.....	10	95	
Concealed, with sandstone fragments, <b>Grafton</b> Shale, greenish and sandy, partly concealed, <b>Ames</b> .....	50	145	
<b>Coal opening, fallen shut, (P. H. Crawford Mine No. 226 on Map II, 1303' L.), Harlem, reported</b> .....	10	155	
Concealed .....	3	158	73'
Concealed .....	32	190	
Sandstone, partly concealed, <b>Jane Lew</b> .....	10	200	
Concealed .....	78	278	
<b>Coal opening, Bakerstown, (1181' L.), thickness concealed, supplied from opposite side</b> .....	2	280	122'
Concealed .....	28	308	
Sandstone .....	6	314	
Concealed .....	5	319	
<b>Coal blossom, streak</b> .....		319	
Concealed to <b>Right Fork</b> .....	16	335	

## DESCRIPTION OF FORMATIONS.

### THE LOWER PITTSBURGH SANDSTONE.

The Lower Pittsburgh Sandstone of White<sup>2</sup>, usually separated by a thin bed of shale from the overlying Pittsburgh Coal, is present generally throughout Lewis and Gilmer. It is usually massive, gray, medium grained and medium hard. In

<sup>2</sup>I. C. White, Vol. II, W. Va. G. S., p. 244; 1903.

eastern Lewis it is not prominent but in southwestern Freemans Creek District, it becomes a great massive gray cliff, often 50 feet thick. It is prominent along Alum Fork of Leading Creek, north of Alum Bridge. This stream derives its name from an alum spring located on the land of Charles Stark, 0.7 mile north of Alum Bridge. At this spring the following sequence occurs:

	Feet.
Sandstone, massive, gray, great cliff, <b>Lower Pittsburgh</b> (875' B.).....	50
Shale, gray, with incrustations of white alum, <b>Little Pittsburgh Coal horizon</b> .....	0½
Shale, sandy.....	5

The water, which has a strong alum taste, flows out of a crevice in the sandstone, about one foot above its base, its volume being estimated at 30 to 40 gallons daily in extremely dry weather. The immediate source of this water seems without doubt to be in the sandstone ledge, its alum content being probably a mineral of secondary formation resulting from the infiltration of sulphate of iron from the Pittsburgh Coal seam, which lies just above, acting upon the aluminous material contained in the body of the sandstone.

In Gilmer the Lower Pittsburgh Sandstone is usually present in massive form. In western Troy, western Glenville, Dekalb and Center Districts, where the Pittsburgh Coal is seldom found, this sandstone proved to be a valuable aid in tracing the latter's horizon for structural purposes, since it usually is resistant enough to make a broad shoulder, the top of which, approximately coinciding with the coal horizon, can be readily followed by eye. In portions of Center District, the Lower Pittsburgh Sandstone coalesces with the Connellsville below it to form a huge single cliff. At the mouth of Steer Run, one mile southeast of Normantown, this cliff is 75 feet thick, with a tidal elevation of 870' B. No quarries were observed on this sandstone but it would make good material for bridge abutments and other structures where large blocks are desired.

## THE UPPER PITTSBURGH LIMESTONE.

The Upper Pittsburgh Limestone of White<sup>3</sup> seems almost entirely lacking in Lewis and Gilmer. In the hill just west of the Baltimore and Ohio Railroad shops at Weston a gray limestone, one foot thick, was observed 65 feet below the Redstone Coal that seems to represent it, as shown by the Weston Section in Chapter IV.

## THE LITTLE PITTSBURGH COAL.

The Little Pittsburgh Coal of White<sup>4</sup> is frequently present in the measures in Lewis and Gilmer. It is seldom more than one foot thick and often entirely absent, being useful for stratigraphic purposes only. It is usually found about 50 feet below the Pittsburgh Coal. The following section, measured just south of the electric light plant at Weston, shows its position:

	Thickness Feet.	Total Feet.
Coal digging, abandoned, Redstone.....	...	....
Concealed, with limestone and sandstone.....	45	45
Coal blossom, Pittsburgh, (1118' B.).....	...	45
Concealed .....	22	67
Sandstone, massive, Lower Pittsburgh.....	14	81
Shale, gray.....	5	86
Coal, (1' 10"), Little Pittsburgh, (Exposure No. 198 on Map II).....	2	88
Shale, gray, limy.....	15	103
Sandstone, shaly, to road.....	10	113

In Hackers Creek District, Lewis, the following exposure was noted:

## M. M. Reger Coal Exposure—No. 199 on Map II.

On a branch of Hackers Creek, 1 mile northeast of Berlin; Little Pittsburgh Coal; elevation, 1235' B.

	Ft.	In.
Concealed .....		
Coal .....	0'	10"
Shale, gray.....	0	10
Coal (slate floor).....	0	6
	2	2

<sup>3</sup>I. C. White, Vol. II, W. Va. G. S., p. 245; 1903.

<sup>4</sup>I. C. White, Vol. II, W. Va. G. S., p. 245; 1903.

Other exposures noted in northeastern Lewis, where the coal is best developed, showed a much thinner section than the two noted above. In Gilmer, the blossom was sometimes observed but seldom any coal.

#### THE CONNELLSVILLE SANDSTONE.

The **Connellsville Sandstone** of J. J. Stevenson, named from its outcrop at Connellsville, Pennsylvania, is generally present in Lewis and Gilmer. Its physical appearance varies considerably but it is usually gray and massive, but is sometimes light brown and is often shaly or flaggy. In Lewis it is not prominent but numerous exposures were observed and it has been quarried.

The **W. G. Bennett Quarry**, located on Stonecoal Creek, about one-half mile east of Weston, shows the following section:

	Feet.
Soil cover.....	15
<b>Sandstone, massive, gray, Connellsville.....</b>	<b>18</b>
Concealed .....	

Here the sandstone is massive, greenish gray, medium coarse and medium hard, and weathers to a greenish brown. When blasted it shows irregular fracture lines, but careful handling should produce large blocks. The quarry is about 100 feet long and has been worked into the hill about 50 feet. The stone was used for macadam, bridge abutments and general building purposes. A large portion of the stone used in the Weston State Hospital came from this quarry.

In Gilmer the sandstone assumes more massive proportions, often making a cliff along the hillsides, and should eventually furnish a large amount of material for bridge piers and general construction work.

The **Whiting and West Quarry**, located on the south side of the Little Kanawha River at the west end of Glenville, furnished the following exposure:

	Feet.
<b>Sandstone, massive, quarry rock (base</b> } 806' L.).....40' } <b>Connellsville.</b>	48
<b>Sandstone, shaly.....</b> 8 }	
Interval to Little Kanawha River.....	98

Here the upper portion of the sandstone is quarried, being massive, coarse, gray, medium hard, weathering to brown, and splitting readily into large blocks. The quarry is about 100 feet long and extends about 30 feet into the hill. The stone has been used for the basement beneath the auditorium of the Glenville Normal School, and for general building purposes.

At the **Fred Lewis Quarry**, located north of the river and just east of the mouth of Sycamore Run, at Glenville, the upper 20 feet of the Connellsville has been quarried, being hard, light brown and medium coarse, the top of the sandstone having an elevation of 840' B. The quarry is 50 feet long and extends 20 feet into the hill. This stone was used for the basement and lintels of the Glenville Normal School.

The Connellsville Sandstone has also been quarried on the property of **Mrs. C. J. Collins**, on the west side of Sycamore Run, opposite the Lewis quarry, having much the same character as at the two places mentioned above.

#### THE LITTLE CLARKSBURG COAL.

The **Little Clarksburg Coal** of White<sup>5</sup>, belonging just under the Connellsville Sandstone, has little extent or thickness in Lewis and Gilmer. It is usually not found at all and when present is too thin and impure for any economic use. In Lewis a coal blossom was noted on a branch of Millstone Run in Freemans Creek District, two miles northwest of Jackson Mill, at an elevation of 1225' B., that represents it. In Gilmer, its blossom was noted at a few points in Center District. It shows under the Connellsville Sandstone on Grandcamp Run of Cedar Creek, 0.6 mile above the run mouth, 1½ miles southwest of Glenville. Another exposure noted was as follows:

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<sup>5</sup>I. C. White, Bulletin 65, U. S. G. S., p. 88; 1891.



## Coal Exposure—No. 200 on Map II.

On Cedar Creek, 2.5 miles southwest of Glenville; Little Clarksburg Coal; elevation, 735' B.

	Ft.	In.
Sandstone, massive, <b>Connellsville</b> .....	.....	.....
Concealed .....	5	0
<b>Coal</b> .....	0	10
Shale, gray.....	5	0

At the **Marcellus Stump Prospect, No. 201 on Map II**, on Right Fork of Steer Creek, 0.8 mile southeast of Stumptown, the place had fallen shut but the coal was reported 0' 8" thick by Mr. Stump. Its elevation there is 770' B., being 90 feet below the Pittsburgh Coal bench.

## THE CLARKSBURG FIRE CLAY SHALE.

The **Clarksburg Fire Clay Shale** of Hennen<sup>6</sup>, belonging just under the Little Clarksburg Coal, is of scanty occurrence in the two counties, being too thin in most places to have any economic value. In Gilmer, at the northeast edge of Glenville, **Elmore Wolfe** reports the occurrence of a clay 2 to 5 feet thick, found in the bottom of his water well, 18 to 20 feet under ground. It would have an elevation of 815' B., and would represent the Clarksburg Clay. A sample furnished by Mr. Wolfe appeared soft and plastic, having a pinkish gray color. Its chemical composition, as reported by Krak, is as follows:

	Per cent.
Silica (SiO <sub>2</sub> ).....	61.15
Ferric Iron (Fe <sub>2</sub> O <sub>3</sub> ).....	4.63
Alumina (Al <sub>2</sub> O <sub>3</sub> ).....	20.19
Lime (CaO).....	0.63
Magnesia (MgO).....	1.08
Potassium Oxide (K <sub>2</sub> O).....	3.20
Sodium Oxide (Na <sub>2</sub> O).....	0.51
Titanium Oxide (TiO <sub>2</sub> ).....	0.61
Phosphoric Acid (P <sub>2</sub> O <sub>5</sub> ).....	0.18
Moisture .....	1.40
Loss on ignition.....	6.23
<b>Total</b> .....	<b>99.81</b>

<sup>6</sup>Ray V. Hennen, Doddridge-Harrison Report, W. Va. G. S., p. 236; 1912.

The analysis shows the clay to be somewhat similar to the same horizon at Bridgeport, Harrison County, where Hennen<sup>7</sup> reports that it has been used for the manufacture of stoneware and brick. The ferric iron content indicates that the product would burn red. There are too many fluxing elements for it to be classed as a fire clay.

#### THE LOWER CONNELLSVILLE SANDSTONE.

The Lower Connellsville Sandstone of Hennen<sup>8</sup>, belonging between the Clarksburg Fire Clay and the Clarksburg Limestone, is widely prevalent in Lewis and Gilmer, being found in most regions where the Conemaugh Series outcrops. It is usually massive and gray, often forming a cliff 50 to 60 feet below the Connellsville Sandstone. It is more prominent in Gilmer than in Lewis, but has been quarried in both counties.

The West Virginia Central Gas Company Quarry, located in Hackers Creek District, Lewis, at its Foreman Station on Hackers Creek, two miles northwest of Berlin, seems to be on the Lower Connellsville ledge. The following section was secured at this quarry:

	Feet.
Shale, sandy.....	2
Sandstone, shaly.... 8' } Lower Connellsville (1114' B.)	22
Sandstone, massive..14 }	
Concealed .....	65
Sandstone, flaggy.....	4
Shale, greenish, sandy.....	5
Shale, black, bituminous, (0' 1"), Elk Lick Coal?.....	...
Shale, gray, to creek.....	12

The correlation of this sandstone is subject to some doubt. Its physical appearance resembles closely that of the Morgantown, but its interval below the Pittsburgh Coal, as shown by the structure contours on Map II, is only about 175 feet, making it correspond more closely to the Lower Connellsville. No fossils were observed above the coaly horizon at 12 feet from the creek, thus indicating that it is the Elk Lick

<sup>7</sup>Ray V. Hennen, Doddridge-Harrison Report, W. Va. G. S., p. 237; 1912.

<sup>8</sup>Ray V. Hennen, Monongalia-Marion-Taylor Rept., W. Va. G. S., p. 277; 1913.

instead of the Harlem. The lower portion, only, of the sandstone is quarried. It is greenish gray, weathering to brown, coarse and soft, disintegrating badly. The quarry is about 100 feet long and extends 30 feet into the hill. This stone was used for concrete aggregate at the Foreman Station. It seems too soft for general building purposes.

The **William E. Donlan Quarry**, operated by **Bennett and Garrett**, just northeast of the mouth of Stonecoal Creek, at Weston, shows the following section:

	Feet.
1. Shale, sandy.....	15
2. Sandstone, greenish gray, very hard, Lower Connellsville .....	20
3. Shale, red, Clarksburg.....	35
4. Sandstone, shaly..... 5'	} Morgantown (1018' L.) 20
5. Sandstone, gray, hard, to base of quarry.....15	

Both the Lower Connellsville and the Morgantown Sandstones have been quarried here, only the lower formation being used at present. The Lower Connellsville appears very hard and durable. The Morgantown is hard, greenish gray and durable, having a smooth uniform appearance. Stone from this quarry is used for general building purposes in Weston, and some of it was used in the construction of the Weston State Hospital. The quarry is about 225 feet long and extends into the hill about 60 feet. A previous Report of the Survey by Grimsley<sup>9</sup> gives a more detailed report of this quarry.

A sample of the Lower Connellsville Sandstone from the Donlan Quarry was analyzed in the Survey laboratory with the following results, as published on page 470 of Volume IV:

	Per cent.
Silica and insoluble.....	93.45
Iron and alumina.....	3.73
Lime oxide.....	0.53
Magnesium oxide.....	0.46
Moisture and loss.....	1.88

The **W. D. Garrett Quarry** on the **Tom Hale Property**, located in Weston just north of the Baltimore and Ohio passenger station, shows the following section:

<sup>9</sup>G. P. Grimsley, Vol. IV, W. Va. G. S., pp. 468-470; 1909.

	Feet.
Shale, variegated and sandy.....	10
Sandstone, hard, gray, to bed of quarry, Lower Connellsville, (1025' L.).....	15

The stone is gray, weathering to brown, hard, medium grained, massive, but much broken up, having shale streaks. The quarry is about 100 feet long and extends into the hill 30 feet. More details concerning this stone may be found in a previous description by Grimsley.<sup>10</sup>

At the **Bessie McDaniel Quarry**, located in Freemans Creek District, Lewis, on Polk Creek, 3 miles west of Weston, the Lower Connellsville has been worked for macadam. Here about 20 feet of sandstone is exposed, being gray, weathering to brown, medium hard and medium grained. The quarry is about 75 feet long and extends into the hill about 30 feet.

The **A. L. Holt Quarry**, located in Glenville District, Gilmer, on Sycamore Run, 0.7 mile northwest of Glenville, shows the following section:

	Feet.
<b>Pittsburgh Coal bench</b> .....	..
Concealed .....	55
Sandstone, hard, gray, partly concealed in bluff, Connellsville .....	38
Concealed and sandy shale.....	37
Sandstone, massive, Lower Connellsville, (747' B.)....	18
Shale, red, Clarksburg.....	..

The Lower Connellsville here is gray and hard, with a few small quartz pebbles, and quarries into large blocks. The quarry is about 150 feet long and extends into the hill 30 feet. This stone was used in the Wiant and Whiting building in Glenville and for the piers of the highway bridge across the Little Kanawha River in the same town.

**C. G. Davis** has quarried the Lower Connellsville Sandstone in Center District, Gilmer, along Crooked Run, 2.7 miles southwest of Glenville. Here the stone is massive, greenish gray, being 30 feet thick, weathering to brown, and has a few small quartz pebbles, its elevation being 765' B. It was used for the construction of a cellar and appears to be good building stone.

<sup>10</sup>G. P. Grimsley, Vol. IV, W. Va. G. S., p. 470; 1909.

## THE NORMANTOWN COAL.

In portions of Lewis and Gilmer a thin coal that has not been previously named or described occasionally occurs just below the Lower Connellsville Sandstone, and from 150 to 180 feet below the Pittsburgh Coal horizon. As a rule, it is not found in the measures and does not exceed one foot in thickness, but its presence 50 to 60 feet below the Little Clarksburg Coal, unless definitely classified, would cause confusion and it will therefore be called the **Normantown Coal** in this report, from its occurrence along Steer Creek near that village in Center District, Gilmer County. The following section will show its position in the measures:

## Coal Exposure—No. 202 on Map II.

On Steer Creek, 0.3 mile west of Normantown; **Normantown Coal**; elevation, 725' B.

	Ft.	In.
Interval from <b>Pittsburgh Coal</b> bench.....	150	0
Sandstone, massive, <b>Lower Connellsville</b> .....	25	0
Shale, sandy.....	6	0
<b>Coal, Normantown</b> .....	0	9
Fire clay shale to road.....	2	0

Another exposure shows the following:

## Coal Exposure—No. 203 on Map II.

On Steer Creek, 0.6 mile east of Lockney; **Normantown Coal**; elevation, 730' B.

	Ft.	In.
Interval from <b>Pittsburgh Coal</b> bench.....	150	0
Sandstone, massive, thickness unrecorded, <b>Lower Connellsville</b> .....	..	..
<b>Coal, Normantown</b> .....	0	6
Fire clay shale.....	4	0

At Glenville a coal 0' 8" thick is reported to have been found on the south side of the river about one-eighth mile west of the highway bridge, at an elevation of 740 feet and approximately 160 feet below the Pittsburgh Coal horizon, that would represent the Normantown Coal. Its horizon was concealed by debris.

In Collins Settlement District, Lewis, a dark shale, 0' 6" thick, coming at an elevation of 1075' B., and 145 feet below

the Pittsburgh Coal bench, was observed on Mudlick Run, 0.2 mile northeast of Jacksonville, that represents the Normantown Coal. It has also been opened in the edge of Braxton County, about one-half mile northwest of Orlando, where, as shown by the section for that place on page 69, it is about one foot thick.

#### THE CLARKSBURG RED SHALE.

The Clarksburg Red Shale of Hennen and the writer<sup>11</sup> occurs generally throughout Lewis and Gilmer. This shale is often 40 to 50 feet thick, belonging just under the Normantown Coal, being usually a deep red color, with occasional nuggets of lime. Another red bed similar to this one also occurs between the Little Clarksburg Coal and the Lower Connellsville Sandstone that possibly represents the upper portion of the Clarksburg Reds as originally described at Clarksburg, since the Lower Connellsville Sandstone appears to be a lenticular formation occurring in the body of the reds.

The following exposure of the Clarksburg Red Shale was noted on the property of B. J. Life, along the Baltimore and Ohio Railroad cut at Fisher Summit, Hackers Creek District, Lewis:

	Feet.
1. Interval from Redstone Coal.....	150
2. Sandstone, shaly, Lower Connellsville.....	25
3. Shale, red, to railroad grade, Clarksburg Red Shale, (1235' L.).....	25

A sample was collected from No. 3, the analysis of which is reported as follows by Krak:

	Per cent.
Silica (SiO <sub>2</sub> ).....	55.01
Ferric Iron (Fe <sub>2</sub> O <sub>3</sub> ).....	8.20
Alumina (Al <sub>2</sub> O <sub>3</sub> ).....	20.61
Lime (CaO).....	1.10
Magnesia (MgO).....	1.53
Potassium Oxide (K <sub>2</sub> O).....	3.28
Sodium Oxide (Na <sub>2</sub> O).....	0.33
Titanium Oxide (TiO <sub>2</sub> ).....	0.47
Phosphoric Acid (P <sub>2</sub> O <sub>5</sub> ).....	0.48
Moisture .....	1.77
Loss on ignition.....	7.03
<b>Total.....</b>	<b>99.81</b>

<sup>11</sup>Doddridge-Harrison Report, W. Va. G. S., p. 240; 1912.

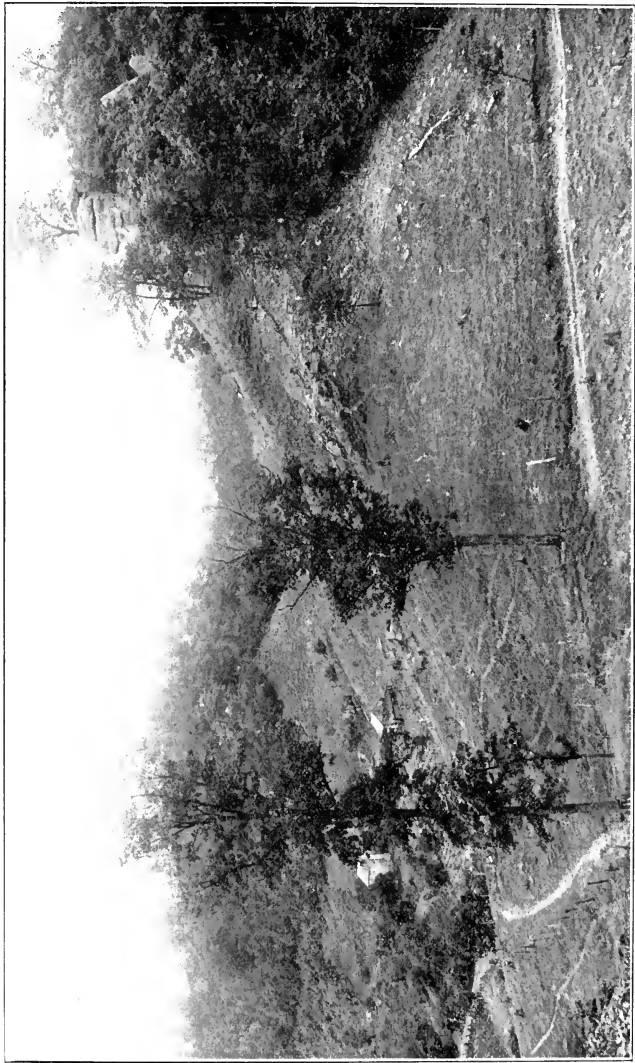


PLATE XI.—Hill Summits capped by the Waynesburg Sandstone along DeKalb-Center District Line, 1.3 miles southwest of Glenville; Topography of the Dunkard and Monongahela Series.





The Clarksburg Red Shale is well exposed at the William E. Donlan stone quarry at Weston, a section of which is published under the Lower Connellsville Sandstone, on page 141. Here the shale, No. 3 of section, is 35 feet thick, coming immediately under the Lower Connellsville. A sample collected from this exposure shows the following, according to Krak:

	Per cent.
Silica ( $\text{SiO}_2$ ).....	58.42
Ferric Iron ( $\text{Fe}_2\text{O}_3$ ).....	7.47
Alumina ( $\text{Al}_2\text{O}_3$ ).....	19.57
Lime ( $\text{CaO}$ ).....	0.88
Magnesia ( $\text{MgO}$ ).....	1.01
Potassium Oxide ( $\text{K}_2\text{O}$ ).....	2.94
Sodium Oxide ( $\text{Na}_2\text{O}$ ).....	0.44
Titanium Oxide ( $\text{TiO}_2$ ).....	0.54
Phosphoric Acid ( $\text{P}_2\text{O}_5$ ).....	0.34
Moisture .....	2.22
Loss on ignition.....	6.22
Total.....	100.05

In Gilmer, the following section of the upper stratum of reds was made at the road fork at the northeast end of Glenville, on the property of **Mrs. John McGinnis**:

	Feet.
Sandstone and concealed in bluff, <b>Connellsville</b> .....	..
<b>Shale, red, Clarksburg, (upper portion), (798' L.)</b> .....	25
Sandstone, shaly, <b>Lower Connellsville</b> .....	..

The widespread distribution of these Clarksburg Red Shales throughout both counties and their general character indicate that they will prove to be useful for making brick, both for paving and general building purposes.

#### THE MORGANTOWN SANDSTONE.

The **Morgantown Sandstone** of J. J. Stevenson, named from its occurrence at Morgantown, West Virginia, occurs generally throughout Lewis, where it crops, but its physical appearance preserves no distinct type by which it may be recognized, except as it appears in conjunction with other known strata. Usually it is massive, gray, medium coarse and medium hard, weathering to brown, but it is often flaggy or shaly, and in southern Lewis frequently carries quartz pebbles. It has been quarried at several points in Lewis as the following data will show:

The **William E. Donlan Quarry**, operated by **Bennett and Garrett**, in Hackers Creek District, at the north edge of Weston, a section of which is published on page 141, under the Lower Connellsville Sandstone, shows the Morgantown Sandstone to be at least 20 feet thick, the lower 15 feet of which is quarried. Here the stone is hard; massive and firm and appears to be of durable character. Plate XVIII shows this quarry.

The **T. B. Williams Quarry**, located at Deanville, Hackers Creek District, where the Morgantown Sandstone is 18 feet thick, as noted in the Deanville Section published in Chapter IV, has been operated in a small way for use on the county roads. The stone is gray and massive, having much the same appearance as at Weston. The quarry is 15 feet long and extends into the hill about the same distance.

The **West Virginia Central Gas Company Quarry**, located on the west side of the West Fork River at its Thomas Station, in Freemans Creek District,  $2\frac{1}{2}$  miles north of Weston, shows the following section:

	Feet.
Shale, red.....	10
Sandstone, massive, Morgantown, (1145' B.).....	15
Shale .....	..

Here the stone is hard, massive and greenish gray, weathering to buff. It was quarried for concrete aggregate for the foundations of the gas pumping station.

The **Eli Bennett Quarry**, located in Freemans Creek District, on the west side of West Fork River, 1 mile north of Weston, shows the following:

	Feet.
Shale, sandy, brown and variegated.....	15
Sandstone, massive, Morgantown.....	15
Shale, gray.....	5
Coal, (0' 8"), Elk Lick, (1070' B.).....	1
Shale, gray.....	10
Shale, variegated and limy.....	10
Sandstone, gray, massive, to trolley grade, Grafton....	5

Here the Morgantown Sandstone has been quarried extensively. It is hard, greenish gray, massive and fine grained. The quarry extends along the bluff nearly 200 feet and into the hill about 30 feet.

The **Pittsburgh and West Virginia Gas Company Quarry**, located in Freemans Creek District, at its Reed Pumping Station, on Left Fork of Freemans Creek, 1.3 miles northeast of Freemansburg, shows the Morgantown Sandstone to be 25 feet thick, at an elevation of 1050' B. The stone is gray, weathering to brown, medium hard and medium coarse. The quarry is about 100 feet long and extends into the hill 30 feet. This stone was used for concrete aggregate in the foundations of the pump station.

The **Granville Radabaugh Quarry**, located on Skin Creek, in Skin Creek District, 1.5 miles northwest of Vandalia, shows the following section:

	Feet.
Sandstone, massive, brown, conglomerate .....	10'
Concealed and greenish yellow, sandy shale .....	15
Sandstone, shaly.....	15
Shale, sandy.....	16
Coal, Elk Lick, (1090' B.).....	4
	Morgantown.. 40

The shale parting appearing here in the middle of the sandstone was frequently observed in southern Lewis, that portion of the stone lying above it being frequently conglomeratic. At this place the upper ledge has been quarried on a small scale for bridge abutments.

#### THE ORLANDO LIMESTONE.

Along the Coal and Coke Railway between Orlando and Burnsville a shaly impure limestone occurs just above the Elk Lick Coal that the writer was at first inclined to consider the Ames, although in physical appearance and fossil forms it lacked many of the characteristic features of the latter formation. The limestone is thicker than the Ames and does not have its dark, carbonaceous appearance, and the fossil forms were pronounced by Dr. White and Dr. Price to be of probable brackish or fresh water origin, some small shells and a few fish teeth being the only ones found. The limestone is usually about three feet thick, gray in color and somewhat shaly. All doubt as to the true position of the Ames in this region has been removed by the studies of Ray V. Hennen in 1915, who

reports in a personal communication that it is present in typical marine development along the Little Kanawha River, 1.1 miles southeast of Burnsville, where it is 85 feet below the Elk Lick Coal. Since the limestone at Orlando might deceive others as well as the writer, if left unclassified, it will be named the **Orlando Limestone** in this Report. It has later been found by the writer at Buckhannon, Upshur County, where it directly overlies the Elk Lick Coal, and comes 60 to 70 feet above the fossiliferous Ames. Plate XX illustrates its typical appearance at Orlando.

#### THE ELK LICK COAL.

The **Elk Lick Coal** of the First Geological Survey of Pennsylvania, belonging just under the Morgantown Sandstone, is absent or poorly represented in most of the two counties, but in southern Lewis it thickens to a seam of commercial size. Its areal extent and character, together with detailed sections, will be presented in Chapter XI, under the subject of "Coal."

#### THE ELK LICK LIMESTONE.

The **Elk Lick Limestone** of Messrs. Pratt<sup>12</sup> is but poorly represented in Lewis and Gilmer, only a few exposures being observed. Its occurrence is too infrequent to make it of economic importance. In Hackers Creek District, Lewis, boulders of this limestone were observed on a branch of Maxwell Run, 0.8 mile northeast of Deanville, at an elevation of 1080' B. At the Reed Pumping Station on Left Fork of Freemans Creek in Freemans Creek District, a hard gray limestone one foot thick was observed 10 feet below the Morgantown Sandstone, at an elevation of 1023' L. In the same district, it was observed on a branch of Dry Fork of Polk Creek, 2.2 miles south of Freemansburg, where it is hard and gray, coming 9 feet below the Morgantown Sandstone, and having an elevation of 1100' B. In Gilmer it was observed at Valley Post-Office on Right Fork of Steer Creek, Center District, where it is 6 inches thick, bedded in red shale, at an elevation of 730' B.

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<sup>12</sup>Report HHH, Second Geological Survey of Pennsylvania

## THE BIRMINGHAM SHALE.

The **Birmingham Shale** of Stevenson<sup>13</sup>, consisting of red, sandy and variegated shales, and apparently lying between the Elk Lick Limestone and the Upper Ames Limestone, is present in Lewis and Gilmer but not conspicuous, a portion of its horizon being occupied by the Grafton Sandstone. Plate XIX shows its typical appearance.

## THE GRAFTON SANDSTONE.

The **Grafton Sandstone** of White<sup>14</sup>, named from its occurrence at Grafton, West Virginia, is frequently present in Lewis, where it crops but is not always prominent. It is usually massive and gray or brown in color, but frequently becomes shaly. In the neighborhood of Vandalia, Skin Creek District, it carries quartz pebbles.

The **Flesher Heirs Quarry**, located at the south end of Jane Lew, Hackers Creek District, shows the following section:

	Feet.
Shale, red, <b>Birmingham</b> .....	5
<b>Sandstone, shaly</b> ..... 5' }	
<b>Sandstone, massive, to bed of quarry</b> .....10' }	} Grafton (1095' B.).. 15
Concealed to <b>Ames Shale</b> .....	30

The stone is gray, weathering to brown. medium coarse, medium hard and micaceous, with numerous joint and bedding planes, making it impossible to quarry large blocks. The quarry is about 50 feet long and extends 30 feet into the hill.

The **Henry Rittenhouse Heirs Quarry**, located in Collins Settlement District, on Abrams Run, 0.7 mile southwest of Emmart, shows the following section:

	Feet.
Shale, sandy.....	
<b>Sandstone, massive, Grafton, (1120' B.)</b> .....	30
Concealed .....	

The stone is greenish gray and hard and has some small quartz pebbles. The quarry is about 60 feet long and extends

<sup>13</sup>J. J. Stevenson, Report K, Sec. Geol. Sur. of Pa., pp. 79 and 309-310.

<sup>14</sup>I. C. White, Vol. II, W. Va. G. S., p. 255; 1903.

30 feet into the hill. The joint and bedding planes are irregular but far enough apart so that the stone quarries into large blocks. The Coal and Coke Railway used this stone for bridge abutments.

#### THE AMES LIMESTONE AND SHALE.

The **Ames Limestone**, first named and described by Andrews of the Ohio Geological Survey, and later subdivided by Hennen<sup>15</sup> into the **Upper Ames Limestone**, **Ames Shale** and **Lower Ames Limestone**, all of which carry marine fossil shells in West Virginia, occurs frequently in Lewis but is entirely below drainage in Gilmer. The group does not preserve its type appearance as found in Harrison and other northern counties, but the two hard limestone strata are usually absent, only the green shale between them being found. This generally occurs at 250 feet to 275 feet below the Pittsburgh Coal. In Hackers Creek and Freemans Creek Districts, the shale is mostly dark green and carries abundant marine shells, being 10 to 20 feet thick. The following exposure, observed along the west side of the West Fork River, one-half mile north of Lightburn, shows its typical appearance in these districts:

	Feet.
Shale, red.....	
Sandstone, shaly, <b>Grafton</b> .....	3
<b>Shale, green, with streaks of limestone and many marine fossils at base, Ames</b> .....	15
Coal, streak, <b>Harlem</b> , (1055' B.).....	

On Jesse Run, one-fourth mile below the mouth of Bills Lick, and 3.8 miles eastward from Jane Lew, a hard limestone, carrying abundant marine fossils, was observed at the Ames horizon at an elevation of 1070' B.

The following section was obtained in the trolley cut just south of Bennett Stop at the Fair Grounds, north of Weston:

<sup>15</sup>Ray V. Hennen, *Doddridge-Harrison Rept.*, W. Va. G. S., p. 250; 1912.

	Feet.
Sandstone, shaly.....	2
Shale, brown, sandy.....	20
<b>Shale, reddish green, with marine fossils, Ames</b> (1050' B.).....	10
Shale, gray, to grade.....	8

Plate XIX shows its appearance on Maxwell Run, 0.9 mile northeast of Deanville.

In Skin Creek and Collins Settlement Districts, the Ames Shale has a somewhat different character, being often dark red in color and frequently carrying ferns and other plant fossils, the marine life being much less noticeable.

The following exposure in Collins Settlement District was noted along the public road at the mouth of Sammy Run of Sand Fork, 2.1 miles southwest of Vandalia:

	Feet.
<b>Coal, Elk Lick.....</b>	5
Shale, variegated and sandy, <b>Birmingham.....</b>	27
Concealed, with sandstone fragments, <b>Grafton.....</b>	20
<b>Shale, reddish green, with abundant marine fossils,</b> <b>Ames .....</b>	15
Slate, black, streak, <b>Harlem Coal (1112' L.).....</b>	

A further description of the Ames Limestone and Shale, with a discussion of their fossils, by Dr. Price, will be found in Chapter XIII.

#### THE HARLEM COAL.

The **Harlem Coal** of Newberry<sup>16</sup>, belonging just under the Ames Limestone, is frequently found in the region of its outcrop in Lewis, but it is often absent and is too thin and patchy to have any commercial value. Its best development is in northeastern Hackers Creek District along Jesse Run. At **Coal Exposure No. 221 on Map II**, 3 miles east of Jane Lew, it is 2' 6" thick, coming just under the fossiliferous Ames Shale at an elevation of 1080' B. At **Coal Exposure No. 222 on Map II**, on a branch of Jesse Run, 3.3 miles east of Jane Lew, the coal is 2' 5" thick, coming just below the Ames, at an elevation of 1110' B.

In southeastern Skin Creek District, the following sequence was noted along the public road on Pringle Fork of

<sup>16</sup>J. S. Newberry, Bull. Geol. Soc. of America, Vol. 17, p. 156; 1906..

Stonecoal Creek, 0.9 mile north of Snyder School, measurements being made by hand level:

### Coal Exposure No. 223 on Map II.

	Feet.
Coal blossom, Elk Lick.....	
Concealed .....	49
Shale, green, with fossil shells, Ames.....	5
Coal, Harlem, (1200' B.).....	1
Shale, limy and variegated, Pittsburgh Reds.....	20
Sandstone, shaly, Jane Lew.....	10

The following section, made at the mouth of an abandoned opening, shows the greatest thickness of the coal found in the county:

### Luther Casto Farm Mine—No. 224 on Map II.

On Wheeler Fork, 3 miles northeast of Vandalia; Harlem Coal; elevation, 1300' B.

	Ft.	In.
Sandstone, shaly, Grafton.....	15	0
Shale, sandy.....	10	0
Coal, Harlem.....	3	2
Slate, pavement.....		

The following outcrop was noted in the western part of Collins Settlement District, along the public road:

### Coal Exposure—No. 225 on Map II.

On Abrams Run, 2.6 miles southwest of Walkersville; Harlem Coal; elevation 1170' B.

	Ft.	In.
Sandstone, massive, soft, Grafton.....		
Shale, dark green, fossiliferous, Ames.....	10	0
Coal, Harlem.....	1	6
Shale, gray.....		

### THE PITTSBURGH RED SHALE.

The Pittsburgh Red Shale of White<sup>17</sup> is generally prevalent throughout Lewis in the region of its outcrop, but is everywhere underground in Gilmer. It is composed, usually, of 30 to 60 feet of red and variegated shale, frequently divided

<sup>17</sup>I. C. White, Bull. 65, U. S. G. S., p. 92; 1891.



into two separate beds by the Jane Lew Sandstone. It is the largest red shale horizon of the Conemaugh Series and is distinguished further by the fact that the next red beds of consequence appearing in the measures are about 1000 feet below it, there being only occasional streaks of red below the Bakers-town and Brush Creek Coals. This shale is frequently used for building and paving brick manufacture in other counties and should furnish a large amount of good material for this purpose in Lewis.

The **Jane Lew Brick and Drain Tile Works** has recently opened a cut in this shale at the south end of Jane Lew, Hackers Creek District, where the following section was secured:

	Feet.
Shale, green, with marine fossils, <b>Ames</b> (1065' B.).....	10
<b>Shale, variegated, Pittsburgh Reds</b> .....	25
Sandstone, <b>Jane Lew</b> .....	

A sample from the Pittsburgh Reds shows the following analysis, according to Krak:

	Per cent.
Silica ( $\text{SiO}_2$ ).....	57.99
Ferric Iron ( $\text{Fe}_2\text{O}_3$ ).....	7.13
Alumina ( $\text{Al}_2\text{O}_3$ ).....	17.32
Lime ( $\text{CaO}$ ).....	2.49
Magnesia ( $\text{MgO}$ ).....	1.73
Potassium Oxide ( $\text{K}_2\text{O}$ ).....	2.95
Sodium Oxide ( $\text{Na}_2\text{O}$ ).....	0.87
Titanium Oxide ( $\text{TiO}_2$ ).....	0.79
Phosphoric Acid ( $\text{P}_2\text{O}_5$ ).....	0.20
Moisture .....	2.38
Loss on ignition.....	6.74
Total .....	100.59

Mr. Fred Flesher, Manager of the Brick Company, shipped a barrel of this shale to State Road Engineer A. D. Williams at Morgantown, who has had a test made of it for brick, the results of which are given in Chapter XII.

#### THE JANE LEW SANDSTONE.

At 15 to 25 feet below the top of the Pittsburgh Red Shale a sandstone frequently occurs in Lewis County that has not been previously described or named. Since its presence in the measures would lead to confusion unless definitely rec-

ognized, it will hereafter be called the **Jane Lew Sandstone** in this Report. The following section, obtained from exposures on Hackers Creek just east of Jane Lew will show its relative position:

	Feet.
Shale, green, fossiliferous, <b>Ames</b> .....	15
<b>Coal, Harlem</b> .....	1
Shale, greenish gray, <b>Pittsburgh Reds</b> .....	15
<b>Sandstone, massive, Jane Lew</b> .....	10
Shale, red and variegated, with limestone nodules, <b>Pittsburgh Reds</b> .....	25

The Jane Lew Sandstone, as it occurs along Hackers Creek and Jesse Run east of Jane Lew, is massive, greenish gray, weathering to dark brown, fine grained, micaceous, and somewhat inclined to be shaly. It makes a line of bluffs between Jane Lew and the mouth of Jesse Run, being about 35 feet above drainage at the former place.

The section for Jackson Mill, published on a previous page in this Chapter, shows the Jane Lew Sandstone 10 feet thick, coming 50 feet below the Ames Shale. At Westfield Stop, three-fourths mile northeast of Jackson Mill, the following succession was noted:

	Feet.
Shale .....	10
<b>Sandstone, massive, Jane Lew, (1065' B.)</b> .....	20
Shale .....	15
<b>Sandstone, massive, gray, hard, to grade, Saltsburg</b> ....	15

The Jane Lew Sandstone was noted frequently along the West Fork River in Collins Settlement District. The following exposure was seen along a hill road, 0.7 mile southwest of Walkersville:

	Feet.
Shale, green, with small fossil forms, <b>Ames (1225' B.)</b> .....	10
Shale, limy and variegated, <b>Pittsburgh</b> .....	20
<b>Sandstone, massive, Jane Lew</b> .....	15
Shale, variegated, <b>Pittsburgh</b> .....	60
<b>Sandstone, Saltsburg</b> .....	10
Concealed .....	10
<b>Coal blossom, Bakerstown</b> .....	10

So far as known, this sandstone has not been quarried. In most places it seems too shaly to be of value for building purposes.

### THE SALTSBURG SANDSTONE.

The Saltsburg Sandstone of J. J. Stevenson, belonging below the Pittsburgh Reds and just above the Bakerstown Coal, occurs usually in Lewis County in the region of its outcrop, being massive and gray, weathering to brown, coarse grained and sometimes carrying quartz pebbles. In the northern end of the county, it crops along the Chestnut Ridge and Wolf Summit Anticlines in the neighborhood of Jackson Mill, making prominent bluffs along the West Fork River between Jackson Mill and Lightburn. The outcrop of the Bakerstown Coal occurring just beneath it is shown on Map II and from this horizon, the position of the Saltsburg may be found.

At the **Wilson Arnold Quarry**, located on a branch of West Fork River, one-half mile south of Jackson Mill, the Saltsburg has been quarried on both sides of the run, showing a thickness of about 20 feet to the bed of the quarry, and having an elevation of 1060' B. The stone is gray, weathering to brown, medium hard and medium coarse, and having irregular joint planes. The north quarry is about 75 feet long and extends 25 feet into the hill. The south quarry is somewhat smaller. The stone appears to be of only medium quality for building material.

In southern Lewis the Saltsburg Sandstone may be frequently observed above the Bakerstown Coal.

### THE BAKERSTOWN COAL.

The Bakerstown Coal of White<sup>18</sup> is a persistent and valuable horizon in Lewis where it crops and is frequently noted in well records in Gilmer where it is underground. As shown by its line of outcrop on Map II it is above drainage in northern Lewis along the West Fork River north of Jackson Mill. In Southern Lewis it crops generally throughout Collins Settlement District and has been frequently mined for domestic fuel, being usually about two feet thick. Its areal extent, thickness and quality, together with detailed mine sections, will be presented in Chapter XI, under the subject of "Coal."

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<sup>18</sup>I. C. White, Report Q, Sec. Geol. Survey of Penna.

## THE PINE CREEK LIMESTONE.

The Pine Creek Limestone of White<sup>19</sup>, coming from 30 to 40 feet below the Bakerstown Coal, and frequently having abundant marine fossil forms in the northern part of the State, is almost entirely absent in Lewis where it should crop, and in the few exposures noted no marine fossils were observed by either Dr. Price or the writer. In Collins Settlement District, it is exposed along the hill road 0.7 mile southwest of Duffy, where it is 0' 6" thick, coming 20 feet below the Saltsburg Sandstone, at an elevation of 1430' B. In Buckhannon District, Upshur, it was noted on Right Fork of Stonecoal Creek, 1.2 miles southwest of Atlas, where the following section was made:

	Feet.
Sandstone, flaggy, <b>Saltsburg</b> .....	3
Shale, sandy.....	3
Coal, slaty, <b>Bakerstown</b> (1210' B.).....	1
Concealed .....	20
Shale, variegated.....	19
<b>Limestone, ferriferous and sandy, Pine Creek</b> .....	1
Shale, gray, to creek.....	5

The following exposure was noted in Banks District, Upshur, along the Coal and Coke Railway grade, 0.8 mile southwest of Frenchton:

	Ft.	In.
Sandstone, <b>Saltsburg</b> .....	10	0
Slate, dark.....	3	0
Coal, <b>Bakerstown</b> (1460' B.).....	1	6
Shale, limy and variegated.....	15	0
<b>Limestone, silicious, Pine Creek</b> .....	0	6
Shale, limy and variegated, to grade.....	10	0

The Cleveland Section, published in Chapter IV, shows the horizon of the Pine Creek Limestone occupied by sandy shales, having numerous plant fossils but no animal remains.

## THE BUFFALO SANDSTONE.

The Buffalo Sandstone of White<sup>20</sup>, having its base 60 to 70 feet below the Bakerstown Coal, occurs generally throughout Lewis in the region of its outcrop, and is noted

<sup>19</sup>I. C. White, Report Q, Sec. Geol. Survey of Penna.

<sup>20</sup>I. C. White, Report Q, Sec. Geol. Survey of Penna.

generally throughout both counties in oil well records where it is called the "**Little Dunkard Sand**" by the drillers. In northern Lewis it crops only at Jackson Mill where 5 feet of its top is exposed above drainage, as shown by the section for that place published in this Chapter. In southern Lewis it crops generally throughout Collins Settlement District. In this region it is usually gray, hard, massive and coarse.

The **Morgan Galford Quarry**, located on Right Fork of West Fork River, 1.2 miles south of Walkersville, shows the following section:

	Feet.
Sandstone, shaly..... 5' } <b>Buffalo</b> (1100' B.).....	20
Sandstone, massive..... 15 }	
Shale, variegated.....	10

Here the stone is coarse, and only medium hard, massive and gray, having irregular joint and bedding planes. The quarry is 50 feet long and extends into the hill 30 feet, its product having been used for bridge abutments.

The **Buffalo Sandstone** is a prominent feature along the Coal and Coke Railway grade between Wymer and Frenchton, the railroad grade and the eastward rise of the strata being almost equal. The numerous cuts reveal good exposures of the sandstone and the underlying Brush Creek Limestone and Coal.

#### THE BRUSH CREEK LIMESTONE AND SHALE.

The **Brush Creek Limestone** of White<sup>21</sup> and the **Brush Creek Shale** of Hennen<sup>22</sup>, occupying about 10 feet of the measures between the Buffalo Sandstone and the Brush Creek Coal, crop only in the eastern part of Collins Settlement District, Lewis, where they are of frequent occurrence, most of the exposures revealing only shale. This shale, which is dark gray or black, usually carries marine fossils, crinoids being much in evidence. It is well exposed along the Coal and Coke Railway grade between Wymer and the Frenchton Tunnel. The following section, measured 0.8 mile east of Wymer, shows the succession:

<sup>21</sup>I. C. White, Report Q, Sec. Geol. Sur. of Penna.

<sup>22</sup>Ray V. Hennen, Monongalia-Marion-Taylor Rept., W. Va. G. S., p. 310; 1913.

	Feet.
Sandstone, coarse, <b>Buffalo</b> .....	10
Shale, sandy.....	10
<b>Shale, dark gray, with crinoid stems at base, Brush Creek</b> .....	10
<b>Coal, (0' 2"), Brush Creek, (1245' B.)</b> .....	15
Shale, limy, ferriferous.....	20
Sandstone, massive, to grade, <b>Mahoning</b> .....	20

Plate XXI shows another exposure  $\frac{1}{4}$  mile east of Jewell.

The following exposure was noted in Banks District, Upshur, on the head of Whites Camp Fork, 0.5 mile southwest of Beverage Knob and 1.5 miles south of Boyd:

	Feet.
Sandstone, massive, <b>Buffalo, 40' to</b> .....	50
<b>Shale, dark, very fossiliferous at base, Brush Creek, (1620' B.)</b> .....	15
Concealed in run.....	

A further description, containing a discussion of the fossil forms found in this horizon, by Dr. Price, will be found in Chapter XIII.

#### THE BRUSH CREEK COAL.

The **Brush Creek Coal** of White<sup>23</sup>, belonging directly under the Brush Creek Limestone and Shale, occurs frequently along the eastern edge of Collins Settlement District, Lewis. It is a thin seam, usually less than one foot thick, and has no economic importance. This coal is well exposed along the Coal and Coke Railway grade, within the limits mentioned for the Brush Creek Shale above. The section published for Jewell in Chapter IV shows its position in the measures.

#### THE MAHONING SANDSTONES.

The **Mahoning Sandstones** of H. D. Rogers and White<sup>24</sup>, occurring between the Brush Creek and Upper Freeport Coals, sometimes being consolidated into one great ledge 50 to 80 feet thick, but often being separated into two cliffs, with an intervening coal and fire clay, are exposed along the eastern edge of Collins Settlement District, Lewis. They are usually

<sup>23</sup>I. C. White, Report Q, Sec. Geol. Sur. of Penna.

<sup>24</sup>I. C. White, Vol. II, W. Va. G. S., p. 305; 1903.

hard, gray and massive, sometimes carrying quartz pebbles. The Jewell Section, published in Chapter IV, shows them both. **The Mahoning Coal** and **Thornton Fire Clay**, which frequently appear between them in the northern part of the State, were not observed in Lewis. The crop line of the Upper Freeport Coal, shown on Map II, indicates the region in which they may be found, as it underlies them by only a few feet. The Mahoning Sandstone is noted in many well records in both counties, being called the "**Big Dunkard**" by the drillers.

#### THE UFFINGTON SHALE.

**The Uffington Shale** of White<sup>25</sup>, occurring between the Lower Mahoning Sandstone and the Upper Freeport Coal, usually being dark gray and sometimes carrying marine fossils, is not conspicuous in Lewis where it crops. The Jewell Section, published in Chapter IV, shows a ferriferous shale, 3 feet thick, occurring just under the Lower Mahoning Sandstone, that seems to represent it.

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<sup>25</sup>I. C. White, Vol. II, W. Va. G. S., p. 323; 1903.

# CHAPTER VIII.

## STRATIGRAPHY—THE ALLEGHENY SERIES.

### GENERAL DESCRIPTION AND SECTION.

The Allegheny Series of the Pennsylvanian Rocks, described and named by the First Geological Survey of Pennsylvania from its occurrence along the river of the same name in that State, outcrops over a considerable area in Collins Settlement District, Lewis, its areal extent being shown on Map II by a colored symbol. This series, which begins at the top with the Upper Freeport Coal horizon and extends downward to the top of the Homewood Sandstone of the Pottsville, having an average thickness of about 250 feet, is composed largely of gray sandstones and gray, sandy shales, making an entirely different type of soil from that originating from the Conemaugh beds described in the previous Chapter. The series contains no limestones of importance, but has three coal seams of minable thickness, one of which is persistent throughout the region of its outcrop. The fire clays that are of considerable economic value in the northern counties, are almost wholly lacking in Lewis.

The following general section, compiled from the sections published in Chapter IV, as well as from other detailed observations, shows the Allegheny Series for this area:

#### General Section of the Allegheny Series for Lewis and Gilmer.

	Thickness, Feet.	Total, Feet.
Coal, Upper Freeport.....	1	1
Shale .....	8	9
Limestone, Upper Freeport.....	1	10
Shale .....	5	15
Sandstone, massive, gray, Upper Freeport.....	30	45
Shale, sandy.....	4	49
Coal, Lower Freeport.....	1	50



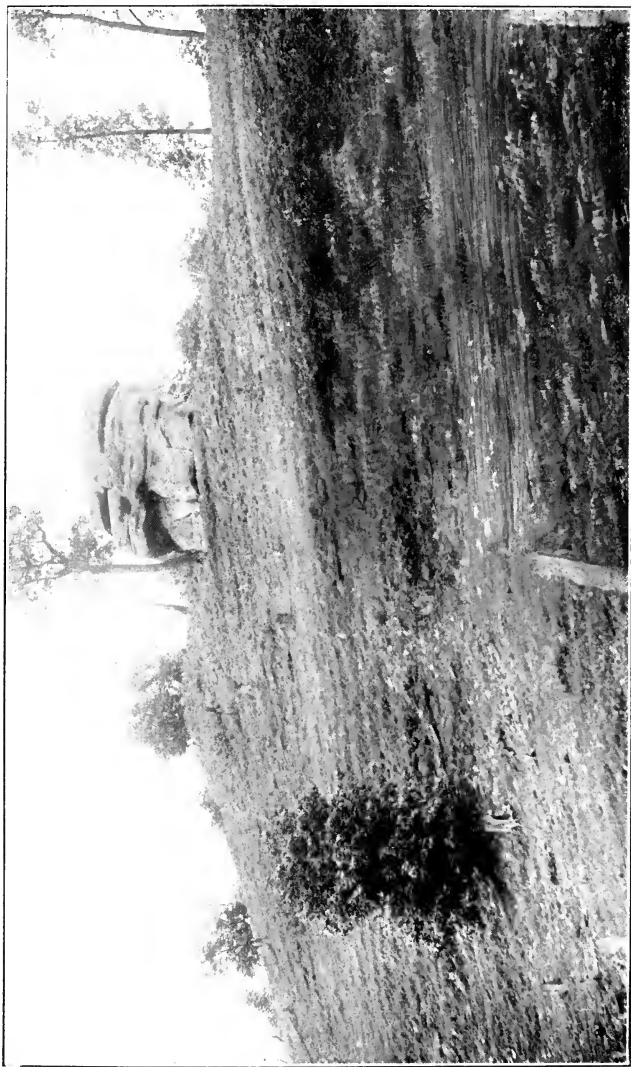


PLATE XII.—Closer view of Waynesburg Sandstone at same point noted in Plate XI.



	Thickness Feet.	Total Feet.
Fire clay and shale.....	15	65
Sandstone, massive, coarse, gray, <b>Lower Freeport, upper division</b> .....	30	95
<b>Coal, Upper Kittanning</b> .....	5	100
Fire clay and shale.....	10	110
Sandstone, massive, coarse, gray, <b>Lower Freeport, lower division</b> .....	60	170
Shale, sandy.....	22	192
<b>Coal, Lower Kittanning</b> .....	8	200
Fire clay and shale.....	10	210
Sandstone, massive, <b>Clarion</b> .....	30	240
Fire clay and shale.....	10	250
Sandstone, massive, <b>Homewood (top of Pottsville)</b> ..	..	..

The three lower formations of the series are lenticular and often fail to appear in the measures, leaving the Lower Kittanning Coal directly above the Homewood Sandstone.

## DESCRIPTION OF FORMATIONS.

### THE UPPER FREEPORT COAL.

The **Upper Freeport Coal** of the First Geological Survey of Pennsylvania, lying at the top of the Allegheny Series, and being an abundant source of fuel in some of the northern counties of the State, where it has a persistent and easily recognized bed-structure, fails to reach a corresponding development in Lewis. In the region of its outcrop, it is frequently represented only by a blossom, and in those places where it occurs in minable thickness has little resemblance to that noted in previous Reports, usually lacking the big slate and the lower bench of coal. Its areal extent, character and thickness, together with such mining sections as are available, will appear in Chapter XI, under the subject of "Coal."

### THE UPPER FREEPORT LIMESTONE.

The **Upper Freeport Limestone**, named by the First Geological Survey of Pennsylvania from its occurrence in the same locality as the Upper Freeport Coal, is almost wholly absent in Lewis. Its presence is noticed in the Jewell Section, published in Chapter IV, where it is one foot thick. At other points where its horizon is exposed, it was not observed.

### THE UPPER FREEPORT SANDSTONE.

The **Upper Freeport Sandstone**, named by Pennsylvania geologists from its occurrence in that State, occupies a considerable portion of the interval between the Upper and Lower Freeport Coals. It is usually a hard, massive, gray stratum, often making cliffs. In Chapter IV its presence is noted in numerous sections.

### THE LOWER FREEPORT COAL.

The **Lower Freeport Coal**, of the First Geological Survey of Pennsylvania, belonging about 50 feet below the Upper Freeport, is of scanty occurrence in southern Lewis, where its horizon crops, having been noted at only a few localities. It may be disregarded entirely as a commercial coal.

The Lower Freeport Coal was opened at **Prospect No. 248 on Map II**, on Glady Creek, 2.9 miles northeast of Duffy, at an elevation of 1290' B., but this place had fallen shut and the coal could not be measured.

At **Prospect No. 249 on Map II**, on Glady Creek, 3.2 miles northeast of Duffy, the coal was opened at an elevation of 1310' B., but the place had fallen shut.

Another opening was made at **Prospect No. 250 on Map II**, on Glady Creek, 0.5 mile northeast of Duffy, at an elevation of 1305' B., but apparently little coal was found.

Another attempt was made to mine this coal at **Prospect No. 251 on Map II**, on Glady Creek, 0.3 mile northwest of Duffy, at an elevation of 1240' B., but the digging had fallen shut.

### THE LOWER FREEPORT SANDSTONES.

The **Lower Freeport Sandstone**, named by Lesley from its occurrence in Pennsylvania, where it is described as being composed of two separate divisions, the Upper and Lower, separated by the Upper Kittanning Coal, and belonging only a few feet below the Lower Freeport Coal horizon, is of general occurrence in southern Lewis where it crops. In this region it is everywhere divided into the two ledges, having the Upper Kittanning Coal between them.

The Upper Division of the Lower Freeport is usually a massive, gray sandstone, somewhat resistant to erosion. It appears frequently along the Little Kanawha and its tributaries in southern Lewis. In Chapter IV, it is noted in many of the sections published for both counties, as recorded in oil well borings.

The Lower Division of the Lower Freeport is the most important single ledge of the Allegheny Series in Lewis. It is a great massive, gray cliff rock, making a line of bluffs, 50 to 75 feet thick, along the Little Kanawha and its tributaries, and being an important marker for the Upper Kittanning Coal, which lies just above it. Its position may be readily determined by the outcrop line for the Upper Kittanning Coal shown on Map II. In Chapter IV numerous sections published for both counties show this sandstone recorded in oil well borings. It is usually noted as the "Gas Sand" by the drillers. No quarries were observed on this ledge, but it would make good material for bridge piers and abutments and other work of similar character. The section for Cleveland shows it to be a massive cliff rock, 35 feet thick and containing abundant plant fossils in its base, identified by David White, Chief Geologist of the U. S. Geological Survey, as *Sigillaria* of the *Rhytidolepis* group, photographs of which by Dr. Price are shown in Plates XXIII(a) and XXIII(b). No quarries were observed, but it could be utilized for rough masonry. It is also a conspicuous feature just south of Duffy, where it forms the falls of Gladly Creek at the mill, being a great cliff rock, 40' thick, as shown by Plate I.

#### THE UPPER KITTANNING COAL.

The Upper Kittanning Coal, named by Messrs. Platt and Lesley from its occurrence in Pennsylvania, and belonging just above the Lower Division of the Lower Freeport Sandstone, is one of the most persistent seams found in the Allegheny Series in Lewis, being present in considerable thickness at nearly all points along its outcrops as shown on Map II. The bed section is usually about 4' thick and nearly always contains one slate parting near the middle. In Chapter IV,

the coal is shown in the Cleveland Section, being 3' 7" thick. In Chapter XI, a discussion of its areal extent, thickness and character, together with numerous detailed sections, will be presented, under the subject of "Coal."

#### THE LOWER KITTANNING COAL.

The Lower Kittanning Coal, named "Kittanning" by the First Geological Survey of Pennsylvania, and later termed the "Lower Kittanning" by Prof. Lesley, belonging under the Lower Division of the Lower Freeport Sandstone, and about 100 feet below the Upper Kittanning Coal, is the most persistent seam in southern Lewis and contains a large amount of coal, but its section is variable, having frequent slate and shale partings that impair its value greatly. Its outcrop is shown on Map II. A discussion of its areal extent, thickness and character, together with such detailed mining sections as are available, will be presented in Chapter XI, under the subject of "Coal."

#### THE CLARION SANDSTONE.

The Clarion Sandstone of the Pennsylvania geologists was not definitely recognized above drainage in southern Lewis where its horizon outcrops, and it seems to be absent in that region as the Lower Kittanning Coal comes almost directly above the Homewood Sandstone. In Chapter IV, however, the Clarion is recorded in the sections for Alum Bridge, Camden, Rosedale, Sand Fork, Stouts Mills and Stumptown, showing that it is evidently present in some portions of the two counties.

## CHAPTER IX.

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### STRATIGRAPHY—THE POTTSVILLE SERIES.

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#### GENERAL DESCRIPTION AND SECTION.

The Pottsville Series, or Pottsville Conglomerate, as it is often called, which is the basal member of the Pennsylvanian, named from its occurrence at Pottsville, Pennsylvania, where many of the sandstone members are masses of huge quartz pebbles cemented together, appears above drainage in Lewis only in the extreme southern end along the waters of the Little Kanawha River. Here it has not the extremely pebbly character of its type locality, but the sandstones are massive and form cliffs that are resistant to erosion and make ragged topographic forms, a condition that prevails along the outcrop of the series wherever it appears in the State. The hills are high and steep and the valleys narrow and V-shaped. The series consists principally of gray sandstones, separated by gray sandy shales, with a few thin seams of coal intervening. No limestones or fire clays of economic importance occur. Only about 325 feet of these measures are above drainage at Cleveland, where the lower horizons are exposed. The total thickness, however, is determined by a great number of wells drilled for oil and gas, not only in the region where the series crops, but also in all the other districts in both counties. The sections published in Chapter IV show that there is a gradual thickening of these rocks from the northern end of both counties, where they total about 400 feet, to the southern boundaries where they are about twice as thick, being 845 feet at Cleveland in the extreme southeastern end of Lewis and 782 feet at Rosedale, just south of the Gilmer Line. Compared to other counties of the State, the series has a medium thickness, as it is about 300 feet in Preston County at the

Pennsylvania State Line, but expands to a total thickness of nearly 4000 feet along the Virginia Line in McDowell County. This great expansion of the measures from the north to the south presents problems of correlation that cannot be solved in the present Report. In the northern end of the State, the identity of the several Pottsville formations is known in Preston and Taylor Counties, where detailed studies have been made. In the southern counties, where the Pottsville reaches its maximum expansion, the coals have been studied and named as far northeast as Kanawha. A glance at Figure 1 will show that this leaves Clay and Braxton on the southwest and Upshur and Barbour on the northeast of Lewis, where detailed work has not been done. Until these counties have been investigated, the problem of correlating the several members of the Pottsville of northern West Virginia with their greatly expanded equivalents in the southern counties must remain unsolved for the present. In Lewis the several members of the Pottsville above drainage, with one exception, have no common resemblance either to formations in the north or the south that is sufficient to correlate them definitely. The one exception noted is that of the **Kanawha Black Flint**, a dark, silicious horizon, carrying marine fossils, that occurs in the Great Kanawha Valley. In Lewis this formation was definitely recognized at one point and the fossils it contains there are the same as those of its type locality. The presence of marine fossils in abundance at this place leads to the belief that the formation can be traced southwestward through Braxton and Clay to a connection with the southern counties, and possibly northeastward for a considerable distance. Below the Black Flint, the correlation of the Pottsville of southern Lewis must, for the present, remain unsettled.

This series in Lewis contains no coals of importance above drainage, although a few thin seams appear. Several wells have been drilled for oil in the region between Bablin and Cleveland, penetrating the entire Pottsville, but the most of these do not show coals of importance, so that it seems probable that the coals of this series in Lewis lack the necessary thickness and continuity to make them of value for commercial mining. In other portions of Lewis, as well as in Gil-



mer, hundreds of wells drilled for oil and gas, the records of many of which are available, show that coal is found only at infrequent points, thus making it sure that neither county contains Pottsville coal of any considerable value.

The following section, the upper portion of which is general, being made up of observations made at various points along the Little Kanawha near Bablin, and the lower part of which is the record of the W. T. Wilson No. 2 (596 on Map II) oil well, drilled by Wilson and Butcher along the Little Kanawha River, 0.8 mile east of Bablin, furnished the Survey by W. T. Wilson, of Bablin, being one of the few records of this region that show coal, will give some idea of the Pottsville of Lewis, and also presents a possible correlation, hypothetical of course, between the northern and southern areas of Pottsville previously described. Names of formations appearing first refer to northern correlations while those following in parentheses show possible southern identifications with the Kanawha and New River Groups:

### Pottsville Series Section, Lewis County.

	Thickness Total.	
	Feet.	Feet.
<b>Pottsville Series (700')</b>		
Sandstone, massive, gray, <b>Homewood</b> , ( <b>Homewood</b> )	60	60
Shale, dark, with ferriferous limestone nodules and marine fossils.....	0.5	60.5
Shale, dark, bony and silicious, with marine fossils, ( <b>Kanawha Black Flint</b> ).....	0.5	61
Slate, black, bony.....	0.5	61.5
Coal, <b>Mercer</b> , ( <b>Stockton</b> ).....	0.5	62
Fire clay and shale.....	8	70
Sandstone, massive, gray, ( <b>Upper Coalburg</b> ).....	70	140
Slate, black, ( <b>Coalburg Coal horizon</b> ).....	1	141
Shales, sandy and sandstone, ( <b>Lower Coalburg</b> )..	98	239
Coal, <b>Winifrede</b> .....	1	240
Shale, sandy, and sandstone, massive, <b>Cleveland</b> , ( <b>Upper Chilton</b> ).....	53	293
Slate, black, ( <b>Chilton Coal horizon</b> ).....	7	300
Continued by W. T. Wilson No. 2 (596) Well Record (1015' B.):		
Conductor .....	32	332
Shale, black, ( <b>Cedar Grove Coal horizon</b> ).....	6	338
Sand, gray, hard..... 20' } (Peerless) .....	65	403
Sand, gray, finer..... 40 }		
Sand, gray..... 5 }		
Coal, ( <b>Campbell Creek, No. 2 Gas</b> ).....	2	405
Shale, blue.....	13	418
Coal, soft, ( <b>Powellton</b> ).....	4	422

	Thickness Feet.	Total Feet.
Shale, blue.....	6	428
Sand, white, very hard ( <b>Eagle</b> ).....	25	453
Dark sandstone and Coal, ( <b>Eagle</b> ).....	3	456
Sand, white..... 22' } ( <b>Decota</b> ) .....	30	486
Sand, gray..... 8 }		
Shale, (reported black in Well No. 597), ( <b>Eagle</b> )..	108	594
Coal, soft, ( <b>Lower War Eagle</b> ).....	4	598
Oil sand ( <b>Upper Gilbert</b> ).....	5	603
Shale, mixed.....	65	668
Coal, soft, ( <b>Gilbert</b> ).....	4	672
Sand, gray, <b>Lower Connoquenessing</b> , ( <b>Nuttall</b> , top of <b>New River Group</b> ).....	20	692
Coal, <b>Sharon</b> ( <b>Hughes Ferry</b> , <b>Lower Douglas</b> )....	8	700
<b>Mauch Chunk Series (102')</b>		
Sand shale, very hard, limy nature.....	33	733
Shale, red.....	10	743
Lime, blue.....	6	749
Oil sand, <b>Maxton</b> ( <b>fine flow of gas</b> ).....	21	770
Sand, blue.....	8	778
Shale, red.....	6	784
Shale, blue.....	9	793
Shale, red and blue.....	9	802

The correlation of the Sharon Coal in the section above is founded on the hypothesis of I. C. White and David White<sup>1</sup>, that the expansion of the Upper Pottsville, or Kanawha Group, takes place in the Mercer Group of coals, lying between the Homewood and Lower Connoquenessing Sandstones, based upon the presence of plant fossils in the roof shales of the Sharon in Pennsylvania and eastern Ohio similar to those found above the Hughes Ferry Coal in Nicholas County, West Virginia. According to Hennen<sup>2</sup>, this view is strengthened by the fact that *Lingulae*, a type of marine fossils, are common in the roof shales of the Lower Douglas or Hughes Ferry Coal, in McDowell County, a form that is reported common in the roof shales of the Sharon in Maryland by Dr. Price. As stated before, the isolated position of the Lewis County panhandle makes the correlations of the above section only provisional and subject to correction when further work is done in the adjoining counties.

<sup>1</sup>I. C. White, Vol. II(A), W. Va. G. S., p. 252; 1908.

<sup>2</sup>Ray V. Hennen, Wyoming-McDowell Rept., W. Va. G. S., pp. 184-5; 1915.

## DESCRIPTION OF FORMATIONS.

## THE HOMEWOOD SANDSTONE.

**The Homewood Sandstone**, named by I. C. White from its outcrop in Beaver County, Pennsylvania, occurs above drainage along the Little Kanawha in southern Lewis, but good exposures of it are not frequent. It is usually gray and massive, with shaly streaks. In Chapter IV, its presence is noted above drainage in the section for Bablin, where it is 25 feet thick, and in that for Wildcat, where 30 feet of it is exposed. It is also noted in numerous other sections of the same Chapter, compiled from oil well records in the regions where it lies underground.

## THE KANAWHA BLACK FLINT.

**The Kanawha Black Flint** of Rogers,\* named from its occurrence in the Great Kanawha Valley, was definitely located in southern Lewis along Gladys Creek, 1.1 miles north of Bablin, where it occurs along the east bank of the creek at the ford and is about 20 feet above drainage. Its position in the measures is shown by the section for Bablin, published in Chapter IV, and it is illustrated by Plate XXIV. At this point, it is 0' 6" thick, dark, silicious, and contains minute crystals of gypsum. It has an abundant marine fauna, containing **Orbiculoidea**, **Spirifer**, and several other forms common to the same horizon in the Great Kanawha Valley. Dr. Price has made a collection from this place and the results of his studies are published in Chapter XIII.

Fossils were not observed at any other point where the Flint horizon occurs above drainage, although diligent search was made both by Dr. Price and the writer. The position of the Flint is noted in the section for Cleveland, published in Chapter IV, where some dark shale was found at a fire clay spring, 175 feet below the Lower Kittanning Coal.

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\*W. B. Rogers, Fifth Annual Report of Virginia; 1839.

## THE MERCER (STOCKTON) COAL.

The Mercer Coal, of the Second Geological Survey of Pennsylvania, apparently correlating with the Stockton Coal of White,<sup>3</sup> occurring in the Kanawha Group of the southern counties, was noted at a few points in southern Lewis, but appears to be too thin and slaty for commercial mining. In the section for Bablin, published in Chapter IV, this coal is 0' 4" thick. Another prospect in the same region shows the following:

## Coal Prospect—No. 283 on Map II.

On Cherry Fork of Little Kanawha River, 0.9 mile north of Ingo; Mercer (Stockton) Coal; elevation, 1245' B.

	Ft.	In.
Sandstone, shaly.....	..	..
Slate, black, Kanawha Flint.....	0	6
Coal, bony.....0' 6"		
Coal, good.....1 10 .....	2	4
—————		
Slate, black, mixed with coal.....	4	0
Coal opening, fallen shut, thickness concealed..		

It is possible that this coal may be an intermediate seam between the Lower Kittanning and the Mercer, as its interval below the former seems too small.

The blossom of the Stockton Coal was also observed on a branch of the Little Kanawha, 0.8 mile northwest of Cleveland, at an elevation of 1460' B. A further description of this coal appears in Chapter XI.

## THE UPPER COALBURG SANDSTONE.

The Upper Coalburg Sandstone, first named the Coalburg by White,<sup>4</sup> but later given its present title by Hennen and the writer,<sup>5</sup> to distinguish it from the Lower Coalburg, is above drainage along both forks of the Little Kanawha, but is not prominent. So far as observed, it does not make any conspicuous cliffs.

<sup>3</sup>I. C. White, Vol. II(A), W. Va. G. S., p. 469; 1908.

<sup>4</sup>I. C. White, Vol. II(A), W. Va. G. S., p. 468; 1908.

<sup>5</sup>Logan-Mingo Report, W. Va. G. S., p. 137; 1914.

## THE COALBURG COAL.

The Coalburg Coal of White<sup>6</sup>, belonging about 140 feet below the top of the Pottsville, is not of minable thickness in Lewis, where it crops, and was not definitely recognized in borings where its horizon is underground. A black slate was observed at this horizon on Fallen Timber Run, one-half mile east of Bablin, at an elevation of 1135' B. It was also observed on the Right Fork of the Little Kanawha, 0.6 mile southeast of Wildcat, at an elevation of 1085' B.

The following exposure, which seems to represent the Coalburg Coal, but which may be the Mercer, was observed along the Upshur Line:

## Coal Exposure—No. 284 on Map II.

On Cherry Fork of Little Kanawha, 0.5 mile north of Ingo; Coalburg Coal, elevation, 1145' B.

	Ft.	In.
Sandstone, shaly.....10' } Upper Coalburg.	21	0
Shale, dark..... 3		
Sandstone, shaly..... 8		
Limestone, hard, silicious.....	2	0
Shale, black.....	5	0
Coal, Coalburg.....	0	8
Fire clay shale.....	2	6
Sandstone, shaly.....	10	0
Concealed, with sandy shale, to creek.....	52	0

## THE LOWER COALBURG SANDSTONE.

The Lower Coalburg Sandstone of Hennen and the writer,<sup>7</sup> which is a great cliff rock in Logan and Mingo, coming between the Coalburg and Winifrede Coals, is not prominent in southern Lewis in the region of its crop. At the Bablin road fork, a massive sandstone appears at an elevation of 1000' B. that may represent it.

## THE WINIFREDE COAL.

The Winifrede Coal of White,<sup>8</sup> which underlies the Coal-

<sup>6</sup>I. C. White, Vol. II, W. Va. G. S., p. 548; 1903.

<sup>7</sup>Logan-Mingo Report, W. Va. G. S., p. 141; 1914.

<sup>8</sup>I. C. White, Bull. 65, U. S. G. S., p. 162; 1891; and Vol. II, W. Va. G. S., p. 556; 1903.

burg Coal by 75 to 100 feet in the Great Kanawha Valley, and is 150 to 200 feet below the Black Flint, should crop above drainage in southern Lewis. At the mouth of Fallen Timber Run, one-half mile east of Bablin, the blossom of a coal was noted at an elevation of 1040' B., coming 175 feet below the blossom of the Stockton, which represents practically the same level as the Flint, and this lower blossom should be the Wini-frede. At other points it was not observed and it was not noted in well records where its horizon lies underground, so it may be disregarded as an economic deposit.

#### THE UPPER CHILTON? OR CLEVELAND SANDSTONE.

Along the north bank of the Little Kanawha River at Cleveland, a massive gray sandstone cliff occurs, the base of which is concealed below drainage, 45 feet being exposed above water level. The Upper Kittanning Coal is opened in the hill north of Cleveland, 500 feet above river level, as shown by the Cleveland Section, published in Chapter IV, showing that the stone along the river, allowing for the southeastward rise, must be at least 400 feet below the top of the Pottsville. It is possible that this may represent the Upper Chilton Sandstone of Hennen and the writer,<sup>9</sup> but there is no certainty that this is the fact. This sandstone makes bluffs down the river below Cleveland. Opposite the mouth of Williams Camp Run at Bois, it makes a great cliff, 55 feet of it being visible, with its top at 1135' B. One-half mile west of Bois, it makes a cliff, 30 feet thick, north of the river, illustrated by Plate XXVI, its base being 1065' B. Since there can be no assurance that this ledge extends through to the region of the expanded Kanawha Group, it will be called the **Cleveland Sandstone** until further work has shown its true place in the measures.

The Cleveland Sandstone is the lowest outcropping formation definitely recognized in either Lewis or Gilmer. A few feet of the measures are exposed below it along the Right Fork of the Little Kanawha, but their nature was not well ex-

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<sup>9</sup>Logan-Mingo Report, W. Va. G. S., p. 147; 1914.

posed. It is probable that this interval is occupied by the sandy shales that frequently appear between the several sandstone ledges of the Pottsville.

A black slate horizon, 7 feet thick, coming at an elevation of 1020' B., was observed along the Little Kanawha River, 0.7 mile east of Bablin, that may represent the **Chilton Coal horizon** of the Kanawha Group.

# PART III.

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## Mineral Resources.

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### CHAPTER X.

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#### PETROLEUM AND NATURAL GAS.

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##### OIL AND GAS HORIZONS.

Lewis and Gilmer, like many other counties in the central and western parts of the State, have been prolific in their yield of natural gas and high grade petroleum. Of the two, Lewis has been more developed and has produced the more, both of oil and gas, but in Gilmer a considerable quantity of both has been found and there are still large untested areas that offer favorable fields for drilling. In both counties, the oil is of the famous Pennsylvania grade, having a paraffine base and being high in volatile oils. The reservoirs that contain it, as well as the gas, which accompanies the same, are the sandstone members of the Pennsylvanian, Mississippian and Devonian Rocks. So far as known no oil or gas has been found in the Dunkard Series above, or the Chemung below these producing limits, although the Dunkard has been often drilled through and the Chemung has frequently been penetrated several hundred feet. The Big Lime, or Greenbrier Limestone, often contains shows of oil and gas, but has seldom produced it in commercial quantities, and no other limestone of importance is encountered in drilling.



The wells range in depth from 1500 to 3000 feet, and drilling is done entirely by the plunger type of bit. Salt water is encountered often in the Salt Sands of the Pottsville Series and frequently in other sands as low as the Fifty-foot of the Upper Devonian, and in rare instances in some of the lower sands, being much more abundant along the synclines than along the anticlines. Three strings of casing are generally used, 10-inch, 8 $\frac{1}{4}$ -inch and 6 $\frac{5}{8}$ -inch, the latter being set in the Big Lime, but sometimes a string of 5  $\frac{3}{16}$ -inch is necessary when water or caving shale is found below the Big Injun Sand.

The oil and gas fields of Lewis and Gilmer offer a fine illustration of the general application of the structural theory of gravity separation, as first definitely advanced by White.<sup>1</sup> Nearly all the oil pools of consequence in the lower, or non-water-bearing sands, are found along the troughs of the synclines or at the foot of steep structural terraces, while those in the water-bearing sands are found farther up the structural slopes above the water zone. The most important gas fields are located either along the principal anticlines or in shallow synclines that have a much higher general level than the structure shows farther west. The few exceptions to these general occurrences are apparently accounted for by special conditions.

The following classification of the various oil and gas sands, taken from a previous Report of the Survey,<sup>2</sup> shows not only the producing sands of Lewis and Gilmer, but also those of other counties in the State, those known to be productive in the two counties of this Report being printed in **black type**:

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<sup>1</sup>I. C. White, "Science," June 26, 1885, and Vol. I(A), W. Va. G. S., p. 48; 1904; and Vol. I, W. Va. G. S., pp. 159-187; 1899.

<sup>2</sup>Ray V. Hennen, Monongalia-Marion-Taylor Rept., W. Va. G. S., p. 388; 1913.

## The Oil and Gas Horizons of West Virginia.

Monongahela Series	Carroll Sand (Uniontown)
Conemaugh Series	{ Minshall Sand (Connellsville)
	{ Murphy (Morgantown)
	{ Moundsville Sand (Saltsburg) (Buffalo)
	{ First Cow Run (Little Dunkard) Sand Big Dunkard Sand (Mahoning)
Allegheny Series	{ Burning Springs (Upper Freeport)
	{ Gas Sand (Lower Freeport)
Pottsville Series	{ Gas Sand of Marion and Monongalia Counties (Homewood), Second Cow Run of Ohio
	{ Gas Sand of Cairo
	{ Salt Sand of Cairo
	{ Cairo?
	{ Gas Sand of Rosedale Salt Sand of Rosedale
Mauch Chunk Red Shale	{ Maxton, Dawson, Cairo
	{ Little Lime
Greenbrier Limestone	"Big Lime," not generally productive
Pocono Sandstones	{ Keener Sand and Beckett Sand of Mil- ton
	{ Big Injun Sand
	{ Squaw Sand
	{ Weir Sand
	{ Berea Sand
Catskill Red Beds	{ Gantz Sand
	{ Fifty-foot Sand
	{ Thirty-foot Sand
	{ Gordon Stray Sand
	{ Gordon Sand
	{ Fourth Sand
	{ McDonald or Fifth Sand
{ Bayard or Sixth Sand	
Chemung and Portage Beds	{ Elizabeth or Seventh Sand
	{ Warren First or Second Tiona, Speech- ley Sand. No well defined oil or gas horizons yet discovered in West Va.

To this classification as originally given by Hennen in the Report mentioned, the writer has added the Gas and Salt Sands of Rosedale, the Little Lime and the Weir Sand of the Pocono Series, described by Krebs as being productive in the Blue Creek Field of Kanawha County.<sup>3</sup> In Lewis and Gilmer,

<sup>3</sup>C. E. Krebs, Kanawha Report, W. Va. G. S., p. 302; 1914.



PLATE XIII.—Looking northwest along West Fork River Valley,  $\frac{1}{2}$  mile south of Jackson Mill, Lewis County;  
River flood plain in foreground; Topography of the Monongahela and Conemaugh Series.



oil and gas have been found in many of the sands ranging between the **Little Dunkard** and the **Sixth**. The others above and below these horizons are not known to have been productive.

For the relative distances of the principal producing sands of the two counties below the Pittsburgh Coal, the reader is referred to the table of intervals published in Chapter III, page 36.

### DESCRIPTION OF PRODUCTIVE SANDS.

**Little Dunkard Sand.**—The Little Dunkard Sand is not generally productive, but made gas in the O. Cheuvront No. 4087 (243) well in Freemans Creek District, Lewis. The sand occurs 350 to 400 feet below the Pittsburgh Coal.

**Big Dunkard Sand.**—The Big Dunkard Sand, which in some of the western counties yields considerable oil, is not generally productive in Lewis and Gilmer. In Dekalb District, Gilmer, it showed oil and gas in the Nancy Nicholas No. 1 (668) and oil in the W. H. Ayers No. 1 (670) wells. The sand ranges in thickness from 10 to 50 feet, and is usually found 450 to 500 feet below the Pittsburgh Coal.

**Burning Springs Sand.**—The Burning Springs Sand, occurring about 650 feet below the Pittsburgh Coal, is not generally productive, but made gas in the A. B. Ayers No. 3130 (667) well, in Dekalb District, Gilmer.

**Gas Sand.**—The name "Gas Sand" has been applied by drillers to various members of the Allegheny and Pottsville beds, but the highest formation that has been given this title is the sand that correlates with the Lower Freeport Sandstone of the Allegheny. It is usually 20 to 50 feet thick, coming about 700 feet below the Pittsburgh Coal. In Lewis and Gilmer, it is not generally productive, but it showed gas in the Perry White No. 497 (236), and B. L. Kraus No. 242 (353) in Freemans Creek District, and Waters Heirs No. 4 (585) in Collins Settlement District, Lewis.

**Second Cow Run Sand.**—The Second Cow Run Sand, named from Cow Run, in Ohio, where it produces oil, and often called the First Salt or sometimes the Gas Sand, is the highest formation in the Pottsville Series, belonging 750 to

800 feet below the Pittsburgh Coal, and being from 25 to 75 feet thick. It has not produced oil or gas in quantity anywhere in the two counties, but shows of both, as well as abundant salt water, are sometimes found.

**Gas Sand of Rosedale.**—At Rosedale, Braxton County, just south of the Gilmer Line, several wells have been drilled that show gas in commercial quantity in a sand that comes 1500 to 1525 feet below the Pittsburgh Coal horizon and which has been called the "Gas Sand" by the drillers in that locality. This sand is the next to the lowest sandstone member of the Pottsville Series, which is expanded in that region to a total thickness of nearly 800 feet. Sufficient evidence is not available to show whether this sand correlates with any definitely named formation of the Pottsville in northern West Virginia, and it will be referred to as the "**Gas Sand of Rosedale.**"

**Salt Sand of Rosedale.**—The Salt Sand of Rosedale, which is a prolific oil horizon in that locality, coming about 1625 feet below the Pittsburgh Coal, and being the lowest sandstone formation of the Pottsville, seems to correlate with the lower Salt Sand of northern Lewis. This sand produces a considerable quantity of oil at Rosedale and also in Courthouse District, Lewis, where a small pool has been found on Murphy Creek. It is the gas horizon of the Stumptown region in Gilmer and at various other points has produced oil and gas. Along the synclines it is nearly always barren of oil and gas, owing to the great amount of water that it contains.

**Maxton Sand.**—The Maxton Sand, belonging in the Mauch Chunk reds, has produced oil and gas in considerable quantity at numerous points in the two counties, but because of its lenticular character, must be classed as an uncertain economic horizon.

**Little Lime.**—The Little Lime, which occurs near the base of the Mauch Chunk Series, 1375 to 1775 feet below the Pittsburgh Coal, depending on the locality, and being 10 to 30 feet thick, is not generally productive, but made an oil show in the J. C. Marsh No. 1 (281) in Freemans Creek District, and flowed oil in the M. O. Edwards No. 996 (473) in Courthouse District, Lewis.

**Big Lime.**—The Big Lime, or Greenbrier Limestone, be-

longing 1400 to 1800 feet below the Pittsburgh Coal, and being 50 to 100 feet thick, has produced little oil or gas of commercial quantity in the two counties. Numerous shows of black oil and pockets of gas are frequently found, but seldom last long.

**Keener Sand.**—The Keener Sand, resting directly under the Big Lime and representing the upper member of the Pocono, sometimes being 20 to 50 feet thick when separated from the underlying Big Injun with which it is usually joined without any slate parting, has not produced oil or gas in commercial quantity in either county. It showed oil in the J. W. Killingsworth No. 1 (690) well in Glenville District, Gilmer.

**Big Injun Sand.**—The Big Injun Sand, sometimes coming directly under the Big Lime, and sometimes being separated from it by the Keener Sand and accompanying slate, and attaining 50 to 150 feet in thickness, long recognized as one of the most prolific oil and gas horizons in the State, has produced only a small quantity of either in Lewis and Gilmer. It often shows oil or gas when drilled through, but has not been generally productive.

**Squaw Sand.**—The Squaw Sand, belonging in the Pocono Series and being usually regarded as a split off the Big Injun, from which it is sometimes not separated, has produced gas in a few wells and has also showed small quantities of oil, but like the Big Injun above it, offers little hope of any extensive production. Its thickness is variable, being usually not more than 50 feet.

**Weir Sand.**—The Weir Sand, belonging 275 to 400 feet below the top of the Big Lime, being frequently absent and seldom more than 50 feet thick, is not generally productive, but showed oil in the Hazen Phillips No. 2658 (561), in Banks District, Upshur, near the Lewis Line, and made gas in the John G. Radabaugh No. 2588 (571) in Collins Settlement District, Lewis.

**Berea Sand.**—The Berea Sand, which is the bottom member of the Pocono Series, being 300 to 500 feet below the top of the Big Lime and usually 10 to 30 feet thick, has produced a large amount of oil and gas in the two counties. In Lewis it is the oil producing stratum of the Fink field in Freemans

Creek District, and is frequently gas-bearing in Freemans Creek, Hackers Creek, Courthouse and Collins Settlement Districts. In Gilmer, it produces oil at Newberne and in the extreme western corner of Dekalb District and gas at other localities. This sand was formerly believed to be the Gantz of the Catskill Series and has been so termed generally by the drillers, but studies by Hennen and the writer in Calhoun and Doddridge show that the Berea Sand of the Yellow Creek field in Calhoun and the oil sand of the Fink region are the same, and since the identity of the Yellow Creek Sand has never been subject to question, the oil sand of Fink Creek must be called the Berea instead of the Gantz.

**Gantz Sand.**—The Gantz Sand, which is the uppermost sandstone member of the Catskill Series, belonging 400 to 500 feet below the top of the Big Lime, and being usually 10 to 30 feet thick, has produced a little gas in northern Lewis, but is not generally productive.

**Fifty-foot Sand.**—The Fifty-foot Sand, belonging next under the Gantz, and coming 450 to 550 feet below the top of the Big Lime, and being 20 to 50 feet thick, is an occasional producer of gas in northern Lewis. It frequently contains large quantities of salt water and some good wells have been completely drowned out by drilling too deep in the sand. No productive wells in this horizon were noted in Gilmer.

**Thirty-foot Sand.**—The Thirty-foot Sand, coming 500 to 600 feet below the top of the Lime, and much resembling the Fifty-foot in thickness and character, is not generally productive, but has furnished gas at a few wells in northern Lewis.

**Gordon Stray Sand.**—The Gordon Stray Sand, coming 600 to 650 feet below the top of the Lime and seldom being more than 20 feet thick, produces gas at scattered points in Lewis and at one or two wells in Glenville District, Gilmer, near the Lewis Line. It has also furnished oil at a few wells in the Copley region, Courthouse District, Lewis. Like all the other sands of the Catskill Series, it is lenticular, making its correlation somewhat uncertain.

**Gordon Sand.**—The Gordon Sand, coming 600 to 700 feet below the top of the Lime, and being usually 5 to 30 feet thick, is one of the most prolific oil and gas horizons of the two



counties. It is the principal oil stratum of the famous Cople pool in Courthouse District, Lewis, and has also produced gas generally throughout the county. In Gilmer it is an important gas horizon, but has not furnished much oil.

**Fourth Sand.**—The Fourth Sand, belonging next under the Gordon, and much resembling it in thickness and character, is not generally productive in either county. In northern Lewis, it has furnished gas in several wells and has showed oil in a few cases.

**Fifth Sand.**—The Fifth, or McDonald, Sand, belonging 150 to 175 feet below the top of the Gordon, and much resembling the Gordon and Fourth in thickness and character, is the great gas producing stratum of northern Lewis. Along the anticlines in Hackers Creek, Freemans Creek and Courthouse Districts, it is generally productive, and its great depth below the surface, ranging usually from 2000 to 2500 feet, insures a rock pressure that is often several times as large as the heavy line pressures, 300 to 400 pounds, often carried by the trunk gas lines. It is the oil stratum of the Benson Pool in Freemans Creek District. In Gilmer it is not generally productive, but along the Grassland Syncline in eastern Glenville District, it furnishes a considerable oil pool at the mouth of Indian Fork of Sand Fork.

**Sixth Sand.**—The Sixth, or Bayard, Sand, coming 175 to 250 feet below the top of the Gordon, and having the lenticular characteristics and general features of all the Catskill Sands, is the lowest producing stratum in either county. Its thickness ranges from 5 to 20 feet. In Lewis gas was secured at this horizon in the S. D. Camden No. 27 (145) well in Freemans Creek District.

## WELL RECORDS AND PROSPECTIVE AREAS, LEWIS COUNTY.

### EARLY HISTORY.

According to a former Report of the Survey,<sup>4</sup> oil development began in Lewis in 1894, when the South Penn Oil Com-

<sup>4</sup>I. C. White, Vol. I(A), W. Va. G. S., p. 354; 1904.

pany drilled the **John Rastle No. 1 (273)** well on Fink Creek, 1.2 miles north of Hurst, Freemans Creek District, which produced oil from the Berea Sand at the rate of 15 barrels daily. Twenty years later it was still producing  $2\frac{1}{2}$  barrels. The first gas well was the **A. W. Woodford No. 1 (93)**, drilled by the Federal Oil Company along the West Fork River, in Hackers Creek District, opposite Butchersville. Neither of these wells was spectacular, and it was not until the **S. D. Camden No. 1 (145)**, located on Polk Creek, Freemans Creek District, was drilled by Fred S. Rich and the Southern Oil Company and flowed oil from the Big Injun Sand at the rate of 500 barrels daily that general interest was aroused in the oil and gas possibilities of Lewis County. Since that time development has been rapid and more than 1,000 wells have been drilled for oil and gas.

#### SUMMARIZED RECORDS.

The following table, compiled with great care from the detailed records of Lewis County wells, is intended to furnish a means of obtaining at a glance the most important data regarding all wells listed in the county, giving not only the serial number by which its position is fixed on Map II, but also the tidal elevation, depth to the Pittsburgh Coal, principal sands, total depth and producing horizons. The detailed records of many of these wells are published in succeeding pages and the index should be consulted to find the record of any particular well desired. In regions where wells are numerous no attempt was made to secure the records of all wells drilled, but representative wells were selected. In regions where wells are infrequent they have all been tabulated by name and number, but in some cases the records could not be secured. Throughout the text all wells when mentioned are accompanied by the serial numbers in parentheses so that their positions on Map II may be readily found. In the column naming the owner an attempt has been made to secure the names of the present owners of the wells rather than the original drillers, as many of the wells have been acquired by the large gas companies from small operators and have been given serial

numbers shown in the farm name column, which could not have been used in this Report had the original owners been named. The following abbreviations of company names have been used in the table:

Ahner .....	William Ahner, Dr. S. M. Steele et al.
Alexander .....	Alexander Oil and Gas Company.
American Carbon.....	American Carbon Company.
Brannon et al.....	Edward Brannon et al.
Brown .....	Brown Oil and Gas Company.
B. R. O. & G.....	Buckhannon Relief Oil and Gas Company.
Carnegie.....	Carnegie Natural Gas Company.
Carbon Black.....	Carbon Black Manufacturing Company.
Clarksburg .....	Clarksburg Light and Heat Company.
Columbia .....	Columbia Gas Company.
Columbian .....	Columbian Carbon Company.
Crude .....	Crude Oil Company.
Deanville .....	Deanville Gas Company.
Federal .....	Federal Oil Company.
Frenchton .....	Frenchton Oil and Gas Company.
N. D. Goe.....	N. D. Goe et al.
Reed Goe .....	Reed Goe et al.
Griffiths .....	C. E. Griffiths.
Guffey .....	Guffey and Galey.
Gum et al.....	A. F. Gum, Detamore et al.
Hackers Creek.....	Hackers Creek Oil and Gas Company.
Haddix .....	Haddix and Leading Creek Oil and Gas Co.
Hatzell et al.....	George Hatzell, Andrew Edmiston et al.
Hiner et al.....	Hiner, Dayton and Arnold.
Hope .....	Hope Natural Gas Company.
Jesse Run.....	Jesse Run Oil and Gas Company.
King .....	J. M. King Gas Company.
Mandell .....	Mandell Oil Company.
Morgan .....	Morgan and Rinehart.
Pa. O. & G.....	Pennsylvania Oil and Gas Company.
Pgh. & W. Va.....	Pittsburgh and West Virginia Gas Company.
Raven .....	Raven Carbon Company.
Reserve .....	Reserve Gas Company.
Smith et al.....	Thomas Smith et al.
South Penn.....	South Penn Oil Company.
Sparling .....	George C. Sparling and Company.
Steele & Allman.....	Steele and Allman Oil and Gas Company.
Steele et al.....	Dr. S. M. Steele, Collins et al.
Stewart .....	Stewart United Oil Company.
Swisher et al.....	W. H. Swisher et al.
Trippett.....	Trippett Oil and Gas Company.
U. S. Oil.....	United States Oil Company.
Weston Carbon.....	Weston Carbon Company.
Weston Electric.....	Weston Electric Light, Power and Water Co.
W. Va. Central.....	West Virginia Central Gas Company.
W. Va. State.....	West Virginia State.

## Summarized Record of Oil and

No. on Map II	FARM NAME AND NUMBER	Magisterial District	OWNER	Elevation Above Tide
1	E. W. Post No. 1.....	Elk (Harrison).....	Guffey .....	(1060)
2	L. Nathan Lewis No. 1.....	Elk (Harrison).....	Mandell .....	1080B
3	I. S. Reger No. 1.....	Warren (Upshur).....	Hope .....	1080B
4	John Foster No. 1.....	Warren (Upshur).....	Pa. O. & G.....	1060L
5	W. F. Post No. 1.....	Hackers Creek.....	Jesse Run.....	1365B
6	W. F. Post No. 2.....	Hackers Creek.....	Jesse Run.....	1280B
7	G. G. Cookman No. 2164.....	Hackers Creek.....	Hope .....	1115L
8	Abram S. Holbert No. 2852.....	Hackers Creek.....	Hope .....	1190B
9	Presley Edmonds No. 2216.....	Hackers Creek.....	Hope .....	1170B
10	Levi Smith.....	Hackers Creek.....	Hiner et al.....	.....
11	E. S. McWhorter No. 907.....	Grant (Harrison).....	Hope .....	1040B
12	E. R. Davis No. 587.....	Hackers Creek.....	Hope .....	1020B
13	Wade E. McWhorter No. 1.....	Hackers Creek.....	Raven .....	1025B
14	J. D. Boylen No. 1.....	Hackers Creek.....	Trippett .....	.....
15	Joe Boylen No. 1.....	Hackers Creek.....	Morgan .....	1020B
16	Edith Goodwin Hrs. No. 3.....	Hackers Creek.....	Waggoner & Snyder.....	1125B
17	Post & Hall No. 1.....	Hackers Creek.....	King .....	1115B
18	C. J. Post No. 1.....	Hackers Creek.....	Brown .....	1140B
19	Edith Goodwin Hrs. No. 2.....	Hackers Creek.....	Waggoner & Snyder.....	1200R
20	Edith Goodwin Hrs. No. 1.....	Hackers Creek.....	Waggoner & Snyder.....	1120B
21	Artemisa Alkire No.1.....	Hackers Creek.....	Hope .....	1150B
22	Chas. Swisher No. 1.....	Hackers Creek.....	Hope .....	1030B
23	M. L. Law No. 1.....	Hackers Creek.....	Hope .....	.....
24	M. L. Law No. 2.....	Hackers Creek.....	Hope .....	1065B
25	Hall & Gaston No. 2477.....	Hackers Creek.....	Hope .....	1115B
26	Allman Bros No. 2.....	Hackers Creek.....	Hackers Creek.....	1150B
27	J. C. Allman No. 2673.....	Hackers Creek.....	Hope .....	1145B
28	Allman Bros No. 1.....	Hackers Creek.....	Hackers Creek.....	1145B
29	Hall & Gaston No. 2433.....	Hackers Creek.....	Hope .....	1125B
30	Sarah Batton No. 1.....	Hackers Creek.....	Steele & Allman.....	1180B
31	Geo. W. Starcher No. 1298.....	Hackers Creek.....	Hope .....	1230B
32	W. H. Kelley No. 2134.....	Hackers Creek.....	Hope .....	1170B
33	James D. Allman No. 2.....	Hackers Creek.....	Alexander .....	.....
34	James D. Allman No. 1.....	Hackers Creek.....	Alexander .....	.....
35	W. B. Lawson No. 3481.....	Hackers Creek.....	Hope .....	1042L
36	J. B. Swisher No. 1.....	Hackers Creek.....	W. Va. Central.....	1050B
37	W. S. Starcher No. 1.....	Hackers Creek.....	W. Va. Central.....	1025R
38	M. M. Reger No. 2907.....	Hackers Creek.....	Hope .....	1195B
38A	S. H. Luzader No. 1.....	Hackers Creek.....	Swisher et al.....	1135B
39	J. Goodloe Swisher No. 1.....	Hackers Creek.....	Hope .....	1050B
40	W. S. Starcher No. 2571.....	Hackers Creek.....	Hope .....	1205B
41	Mark Hersman No. 1.....	Hackers Creek.....	N. D. Goe.....	1055B
42	W. S. Starcher No. 1.....	Hackers Creek.....	Hope .....	1205B
43	J. L. Swisher No. 2446.....	Hackers Creek.....	Hope .....	1030B
44	W. G. Hinzman No. 3283.....	Hackers Creek.....	Hope .....	1045L
45	W. G. Hinzman No. 375.....	Hackers Creek.....	Hope .....	1050B
46	A. S. Starcher No. 1.....	Hackers Creek.....	Hope .....	1115B
47	Mrs. Amrose Swisher No. 1.....	Hackers Creek.....	Hope .....	1172L
48	May McWhorter No. 2593.....	Hackers Creek.....	Hope .....	1245L
49	T. S. Stalnaker No. 2619.....	Hackers Creek.....	Hope .....	1100B
50	T. A. Smith No. 1.....	Hackers Creek.....	W. Va. Central.....	1155B
51	C. S. Taylor No. 2620.....	Hackers Creek.....	Hope .....	1165B
52	Nathaniel Bush No. 1.....	Hackers Creek.....	N. D. Goe.....	1220L
53	Celia Bonnett No. 1.....	Hackers Creek.....	N. D. Goe.....	1018L
54	Clara Peterson No. 3542.....	Hackers Creek.....	Hope .....	1140L
54A	Layton Darnall No. 1.....	Hackers Creek.....	Hope .....	1160B
55	W. E. Rhodes No. 3514.....	Hackers Creek.....	Hope .....	1201L
56	D. B. Lawson No. 2060.....	Hackers Creek.....	Hope .....	1090B
57	Elizabeth Lawson No. 3286.....	Hackers Creek.....	Hope .....	1492B
58	Andrew Lunsford No. 2049.....	Hackers Creek.....	Pgh. & W. Va.....	1122L
59	Wm. Woodyard No. 2048.....	Hackers Creek.....	Pgh. & W. Va.....	1255R
60	Richard N. Norman No. 1.....	Hackers Creek.....	W. Va. Central.....	1165B
61	W. M. Harrison No. 4088.....	Hackers Creek.....	Pgh. & W. Va.....	1210B
62	Wm. Reger No. 2045.....	Hackers Creek.....	Pgh. & W. Va.....	1060B

## Gas Wells in Lewis County

PITTSBURGH COAL		Big Lime. Top	Big Injnn Sand. Top	Berea Sand. Top	Gordon Sand. Top	Fifth Sand. Top	Total Depth	PRODUCING SAND AND REMARKS	No. on Map II
Depth Top	Thickness Feet								
.....	.....	1390	1505	.....	2110	2260	2481	Max., B. I., 6th gas show.....	1
.....	.....	1477	1554	.....	2220	.....	2612½	Squaw.....	2
.....	.....	1525	1595	1867	2205	2345	.....	Dry hole.....	3
82	5	1608	1709	1955	.....	2541	2568	5th gas.....	4
.....	.....	1567	1650	1917	2330	2511	2582	Gantz & Gord. gas show.....	5
.....	.....	1425	1534	1770	.....	2276	2753	5th gas.....	6
.....	.....	1130	1185	1556	.....	2024	2513	Berea and 5th gas.....	7
.....	.....	1358	1421	1770	2137	.....	2163	B. Lm., Gord. gas.....	8
.....	.....	1430	1495	.....	2040	.....	2332	4th gas.....	9
.....	.....	1200	1290	1635	2016	.....	2029	B. Lm., Berea, G. Stray & Gord. gas.....	10
.....	.....	1190	1260	1580	1980	.....	2352	B. I. & 4th light gas.....	11
.....	.....	1190	1240	.....	1930	2063	2109	B. I. oil show; Gantz, 50', Gord. and 5th gas show.....	12
.....	.....	1280	1360	1640	2038	.....	2200	B. I. gas & oil; Gantz & Gord. gas.....	13
.....	.....	.....	.....	.....	.....	.....	.....	.....	14
.....	.....	.....	.....	.....	.....	.....	.....	.....	15
.....	.....	.....	.....	.....	.....	.....	.....	.....	16
.....	.....	1250?	1340	1665	.....	.....	1725½	50' gas.....	17
.....	.....	1280	1365	1700	2084	2215	2230	50' gas.....	18
.....	.....	.....	.....	.....	.....	.....	2365	.....	19
.....	.....	.....	.....	.....	.....	.....	.....	Dry hole.....	20
.....	.....	.....	.....	.....	.....	.....	.....	.....	21
.....	.....	.....	.....	.....	.....	.....	.....	.....	22
.....	.....	.....	.....	.....	.....	.....	.....	.....	23
.....	.....	.....	.....	.....	.....	.....	.....	.....	24
.....	.....	1374	1444	1732	1996	2270	2602	Berea, 50', 4th & 5th gas.....	25
.....	.....	.....	1475	.....	.....	.....	1828	50' gas.....	26
.....	.....	1370	1440	1736	.....	.....	1812	50' gas.....	27
.....	.....	.....	1470	.....	.....	.....	.....	50' gas.....	28
.....	.....	1388	1448	1728	.....	.....	1819	B. I., Berea & 50' gas.....	29
.....	.....	.....	.....	.....	.....	.....	.....	.....	30
.....	.....	1425	1500	1790	2160	2347	2416	Berea, 50' & 5th gas.....	31
.....	.....	1500	1572	1865	.....	2322	2422	5th gas.....	32
.....	.....	.....	.....	.....	.....	.....	2400?	50' gas.....	33
.....	.....	1653	1709	.....	2337	2490	2527	50' & 5th gas.....	34
.....	.....	1395	1469	1730	.....	.....	1816	Berea, 50' & 30' gas.....	35
.....	.....	1410	1475	1788	2100	2264	2288	Berea, 50' & 5th gas.....	36
.....	.....	.....	.....	.....	.....	.....	.....	.....	37
.....	.....	1548	1595	1936	2245	2404	2414	B. I., 4th & 5th gas.....	38
.....	.....	.....	.....	.....	.....	.....	.....	Dry hole.....	38A
.....	.....	.....	.....	.....	.....	.....	.....	.....	39
.....	.....	1632	1714	1980	2356	2435	2551	5th gas.....	40
.....	.....	1466	1526	1773	.....	.....	2426	Gantz, gas show.....	41
.....	.....	.....	.....	.....	.....	.....	.....	Dry hole.....	42
.....	.....	1535	1860	.....	.....	.....	1988	50' gas.....	43
.....	.....	1437	1500	1755	2112	2280	2307	5th gas.....	44
.....	.....	1456	1505	1840	2185	2293	2326	B. I., oil & gas; 5th gas.....	45
.....	.....	.....	.....	.....	.....	.....	.....	Dry hole.....	46
.....	.....	.....	.....	.....	.....	.....	.....	Dry hole.....	47
.....	.....	1755	1815	2055	2396	2470	3001	50' gas show.....	48
.....	.....	1580	1660	1940	.....	.....	2635	Dry hole.....	49
.....	.....	1600	1690	1995	2283	2403	2602	Berea gas show.....	50
.....	.....	1685	1745	2005	2340	2505	2712	B. Lm., Squaw & 5th gas.....	51
.....	.....	.....	.....	.....	.....	.....	.....	Dry hole.....	52
.....	.....	.....	.....	.....	.....	.....	.....	Dry hole.....	53
.....	.....	.....	.....	.....	.....	.....	.....	.....	54
.....	.....	.....	.....	.....	.....	.....	.....	.....	54A
.....	.....	1672	1730	1968	2369	2519	2680	Maxton, 50' gas.....	55
.....	.....	1514	1590	1830	.....	.....	1949	50' gas.....	56
.....	.....	1880	1910	2205	2583	2730	2989	B. Lm., 50' & 5th gas.....	57
.....	.....	1520	1600	.....	2090	.....	2450	4th gas.....	58
.....	.....	1653	1750	.....	2235	2487	2530	50', 30', 4th & 5th gas.....	59
.....	.....	1590	1685	1930	2254	2436	2645	B. I. & 4th gas.....	60
.....	.....	1650	1710	2025	2357	2509	2675	B. I. gas.....	61
.....	.....	1370	1494	1680	1960	.....	2272	B. I., 4th & 5th gas.....	62

## Summarized Record of Oil and Gas

No. on Map II	FARM NAME AND NUMBER	Magisterial District	OWNER	Elevation Above Tide
63	John Rombach No. 1.....	Hackers Creek.....	Roane & Smith.....	1055B
64	Edwin Maxwell No. 3.....	Hackers Creek.....	American Carbon.....	1020B
65	M. W. Harrison No. 1923.....	Hackers Creek.....	Pgh. & W. Va.....	1050B
66	R. H. Harrison No. 1905.....	Hackers Creek.....	Pgh. & W. Va.....	1025B
67	A. M. Smith No. 1911.....	Hackers Creek.....	Pgh. & W. Va.....	1020B
68	Elias Lawson No. 1.....	Hackers Creek.....	South Penn.....	1100B
69	D. T. Peterson No. 1.....	Hackers Creek.....	Crude Oil.....	1020B
70	James Peterson No. 1.....	Hackers Creek.....	Matych & Wilkins.....	1025B
71	John Peterson No. 1.....	Hackers Creek.....	Hope.....	1105B
72	John P. Peterson No. 3422.....	Hackers Creek.....	Hope.....	1025B
73	Edwin Maxwell No. 1.....	Hackers Creek.....	American Carbon.....	1005B
74	W. B. McGary No. 1.....	Hackers Creek.....	Clarksburg.....	1030B
75	Wm. Donlan No. 2077.....	Hackers Creek.....	Pgh. & W. Va.....	1220L
76	Mrs. Samuel Hardman No. 1.....	Hackers Creek.....	Deanville.....	1030L
77	J. C. Roane No. 1.....	Hackers Creek.....	Deanville.....	1037L
78	Thos. Smith.....	Hackers Creek.....	Smith et al.....	1045B
79	E. W. Smith, Jr. No. 4113.....	Hackers Creek.....	Pgh. & W. Va.....	1150B
80	W. G. Bennett No. 2363.....	Hackers Creek.....	Hope.....	1028L
81	Isaac Anglin No. 4009.....	Hackers Creek.....	Pgh. & W. Va.....	1092L
82	Andrew Edmiston No. 2805.....	Hackers Creek.....	Hope.....	1070B
83	F. C. Forinash No. 2055.....	Hackers Creek.....	Pgh. & W. Va.....	1390B
84	Noah Life No. 4063.....	Hackers Creek.....	Pgh. & W. Va.....	1360B
85	G. J. Sutton No. 4055.....	Hackers Creek.....	Pgh. & W. Va.....	1110B
86	John C. Strahley No. 1.....	Hackers Creek.....	W. Va. Central.....	1295B
87	Noah Life No. 2051.....	Hackers Creek.....	Pgh. & W. Va.....	1050B
88	W. G. Taylor No. 2056.....	Hackers Creek.....	Pgh. & W. Va.....	1245B
89	Flesher Hrs. No. 2718.....	Hackers Creek.....	Hope.....	1111L
90	Flesher Hrs. No. 1.....	Hackers Creek.....	Hope.....	1070L
91	S. J. Waggoner No. 1.....	Hackers Creek.....	W. Va. Central.....	1015L
92	Porter Maxwell No. 1.....	Hackers Creek.....	W. Va. Central.....	1415B
93	A. W. Woodford No. 1.....	Hackers Creek.....	Federal.....	1030B
94	W. A. Arnold No. 6.....	Hackers Creek.....	W. Va. Central.....	1110B
95	Hays Hrs. No. 243.....	Hackers Creek.....	Reserve.....	1250B
96	A. J. Hardman No. 1.....	Hackers Creek.....	Brannon et al.....	1020B
97	W. W. Smith No. 1.....	Hackers Creek.....	Hope.....	1190B
98	Hebron Church No. 1.....	Hackers Creek.....	Raven.....	1130R
99	J. H. Ramsburg No. 3515.....	Hackers Creek.....	Hope.....	1065B
100	M. O. Brown No. 403.....	Hackers Creek.....	Carnegie.....	1030B
101	L. M. Allman No. 3057.....	Hackers Creek.....	Hope.....	1050B
102	L. M. Allman No. 2855.....	Hackers Creek.....	Hope.....	1060R
103	C. A. Bailey No. 405.....	Hackers Creek.....	Carnegie.....	1050B
104	J. A. J. Lightburn No. 300.....	Hackers Creek.....	Reserve.....	1000B
105	W. W. Wimer No. 369.....	Hackers Creek.....	Reserve.....	1030B
106	Samuel G. Hall No. 3456.....	Hackers Creek.....	Hope.....	1195B
107	Samuel G. Hall No. 2074.....	Hackers Creek.....	Hope.....	1155B
108	Richard Beeghley No. 448.....	Hackers Creek.....	Reserve.....	1025B
109	A. W. Rhodes No. 1554.....	Union (Harrison).....	Hope.....	.....
110	Wm. Beeghley No. 442.....	Freemans Creek.....	Reserve.....	1215B
111	J. M. Beeghley No. 436.....	Freemans Creek.....	Reserve.....	1215B
112	Wm. Beeghley No. 1.....	Freemans Creek.....	Rinehart & Beeghley.....	1020B
113	Sarah E. Hinzman No. 263.....	Freemans Creek.....	Reserve.....	1075B
114	Katy Wimer No. 337.....	Freemans Creek.....	Reserve.....	1000B
115	Anna C. Barb No. 380.....	Freemans Creek.....	Reserve.....	1005B
116	Jane Thrash.....	Union (Harrison).....	Hope.....	1095B
117	H. L. Frashuer No. 484.....	Freemans Creek.....	Reserve.....	1210B
118	Geo. & Spillman Norris No. 1.....	Freemans Creek.....	Reed Goe.....	1125B
118A	J. S. Norris No. 2.....	Freemans Creek.....	Reserve.....	1055B
119	Peter C. Allman No. 278.....	Freemans Creek.....	Reserve.....	1225B
120	McKinley-Barth No. 488.....	Freemans Creek.....	Reserve.....	1145B
121	Ella Clifton No. 1.....	Freemans Creek.....	Raven.....	1015B
122	B. S. Jackson No. 1.....	Freemans Creek.....	Pgh. & W. Va.....	1035B



## Summarized Record of Oil and Gas

No. on Map II	FARM NAME AND NUMBER	Magisterial District	OWNER	Elevation Above Tide
123	S. A. Butcher No. 383.	Freemans Creek.	Reserve	1065B
124	John W. Norris No. 40.	Freemans Creek.	Reserve	1135B
125	Burd Keister No. 1.	Freemans Creek.	Raven	1045B
126	E. S. Butcher No. 1.	Freemans Creek.	W. Va. Central.	1010B
127	J. B. Lovett No. 21.	Freemans Creek.	Reserve	1015B
128	J. B. Lovett No. 2.	Freemans Creek.	W. Va. Central.	1010B
129	Geo. N. Butcher No. 285.	Freemans Creek.	Reserve	1060B
130	Gee Lick Church No. 1.	Freemans Creek.	Steele et al.	1010B
131	M. H. Lough No. 217.	Freemans Creek.	Reserve	1020B
132	Newton Shaw No. 1.	Freemans Creek.	Clarksburg	1025B
133	G. A. Butcher No. 359.	Freemans Creek.	Reserve	1110B
134	Sarah J. Bennett No. 2757.	Freemans Creek.	Hope	1035B
135	E. M. Vandervort No. 1.	Freemans Creek.	W. Va. Central.	1099L
136	Stokes Tunstill No. 1.	Freemans Creek.	Carbon Black.	1220B
137	Stokes Tunstill No. 2.	Freemans Creek.	Carbon Black.	1175B
138	J. P. & H. Snyder No. 36.	Freemans Creek.	Reserve	1020B
139	C. H. Lovett No. 105.	Freemans Creek.	Reserve	1057L
140	J. V. Waldeck No. 81.	Freemans Creek.	Reserve	1070B
141	Georgia Fisher No. 1.	Freemans Creek.	Reserve	1040B
142	Chas. A. Taylor No. 2.	Freemans Creek.	Columbian	1040B
143	Chas. A. Taylor No. 1.	Freemans Creek.	Columbian	1090B
144	S. D. Camden No. 4.	Freemans Creek.	Reserve	1075B
145	S. D. Camden No. 27.	Freemans Creek.	Reserve	1050L
146	James Jarvis No. 238.	Freemans Creek.	Reserve	1325B
147	Solomon Jarvis No. 393.	Freemans Creek.	Reserve	1380B
148	Will Jarvis No. 1.	Freemans Creek.	Juffey	1358B
149	M. L. Butcher No. 57.	Freemans Creek.	Reserve	1135B
150	M. L. Butcher No. 412.	Freemans Creek.	Reserve	1195B
151	A. N. Dodson No. 295.	Freemans Creek.	Reserve	1198L
152	Alvin Douglass No. 161.	Freemans Creek.	Reserve	1135B
153	Stark A. White No. 2.	Freemans Creek.	Weston Carbon.	1285B
154	Stark A. White No. 1.	Freemans Creek.	Weston Carbon.	1145B
155	Thos. Lovett No. 1.	Freemans Creek.	Columbian	1138L
156	S. A. Kemper No. 417.	Freemans Creek.	Reserve	1155B
157	C. E. Wofter No. 1946.	Freemans Creek.	Pgh. & W. Va.	1056B
158	Hannah Kemper No. 237.	Freemans Creek.	Reserve	1110B
159	F. M. McKinley No. 1.	Freemans Creek.	W. Va. Central.	1115B
160	T. G. Wright No. 186.	Freemans Creek.	Reserve	1124L
161	Jas. R. Bailey No. 49.	Freemans Creek.	Reserve	1185B
162	C. N. Robinson No. 311.	Freemans Creek.	Reserve	1095B
163	Clark White No. 13.	Freemans Creek.	Reserve	1022L
164	Blaine Kershner No. 115.	Freemans Creek.	Reserve	1025B
165	M. C. Burnside No. 1914.	Freemans Creek.	Pgh. & W. Va.	1075B
166	J. S. Hall No. 352.	Freemans Creek.	Reserve	1185B
167	A. J. Riley No. 4269.	Freemans Creek.	Pgh. & W. Va.	1185B
168	H. Bailey No. 1917.	Freemans Creek.	Pgh. & W. Va.	1400B
169	W. G. Bailey No. 1913.	Freemans Creek.	Pgh. & W. Va.	1260B
170	H. W. Romine No. 1.	Freemans Creek.	Reserve	1070B
171	A. Armstrong No. 196.	Freemans Creek.	Reserve	1030B
172	Lloyd Talbot No. 1.	Freemans Creek.	Reserve	1060B
172A	Virginia Hughes No. 201.	Freemans Creek.	Reserve	1104B
173	Cottrill Hrs. No. 17.	Freemans Creek.	Reserve	1095B
174	Chas. W. Rhodes No. 468.	Freemans Creek.	Reserve	1215B
175	J. M. Hall No. 2.	Freemans Creek.	Crude	1065B
176	W. L. Hall No. 4.	Freemans Creek.	Crude	1070B
178	J. S. Burnside No. 1909.	Freemans Creek.	Pgh. & W. Va.	1085B
179	T. Clemans No. 1.	Freemans Creek.	South Penn.	1125P
180	T. Clemans No. 1.	Freemans Creek.	South Penn.	1095B
181	Davis Hrs. No. 1.	Freemans Creek.	South Penn.	1100B
181A	J. B. Coffindaffer No. 945.	Union (Harrison).	Hope	1125B
183	W. B. Maxwell.	Freemans Creek.	South Penn.	1140B
184	W. B. Maxwell No. 3.	Freemans Creek.	Hope	1254L





## Summarized Record of Oil and Gas

No. on Map II	FARM NAME AND NUMBER	Magisterial District	OWNER	Elevation Above Tide
185	Mary J. Small No. 3479.....	Greenbrier (Dodd'ge)	Hope .....	1149L
186	J. R. Dennison No. 3508.....	Greenbrier (Dodd'ge)	Hope .....	1225B
187	L. G. Garrett No. 2529.....	Freemans Creek.....	Hope .....	1226L
188	M. L. Sutton No 4046.....	Freemans Creek.....	Pgh. & W. Va.....	1240B
189	Ella Bennett No. 1927.....	Freemans Creek.....	Pgh. & W. Va.....	1205B
190	M. T. Law No. 1926.....	Freemans Creek.....	Pgh. & W. Va.....	1105B
191	C. A. Straley No. 1.....	Freemans Creek.....	South Penn.....	1085B
192	G. W. Waggoner No. 4144.....	Freemans Creek.....	Pgh. & W. Va.....	1220B
193	Clark White No. 54.....	Freemans Creek.....	Reserve .....	1035B
194	Caroline Minter No. 4052.....	Freemans Creek.....	Pgh. & W. Va.....	1090B
195	Caroline Minter No. 2472.....	Freemans Creek.....	Pgh. & W. Va.....	1160B
196	F. M. McKinley No. 1.....	Freemans Creek.....	Crude .....	1115B
198	Geo. C. Francis No. 2.....	Freemans Creek.....	Pgh. & W. Va.....	1180B
199	Geo. C. Francis No. 1919.....	Freemans Creek.....	Pgh. & W. Va.....	1190B
200	J. L. Gall No. 1.....	Freemans Creek.....	Crude .....	1130B
201	F. M. McKinley No. 3.....	Freemans Creek.....	Crude .....	1230B
202	J. W. Chandler No. 1963.....	Freemans Creek.....	Pgh. & W. Va.....	1270B
203	A. H. Kemper No. 1906.....	Freemans Creek.....	Pgh. & W. Va.....	1075B
203A	A. H. Kemper No. 4200.....	Freemans Creek.....	Pgh. & W. Va.....	1250B
204	R. S. Kemper No. 1636.....	Freemans Creek.....	Hope .....	1110B
205	Michael Fahey No. 1.....	Freemans Creek.....	South Penn.....	1140B
206	Annie Joyce No. 1.....	Freemans Creek.....	Hope .....	1140B
207	Ellen Joyce No. 471.....	Freemans Creek.....	South Penn.....	1330B
208	Patrick Faherty No. 1.....	Freemans Creek.....	South Penn.....	1200B
209	Timothy Joyce No. 2.....	Freemans Creek.....	South Penn.....	1265B
210	Timothy Joyce No. 1.....	Freemans Creek.....	South Penn.....	1165B
211	Thos. Fahey No. 4.....	Freemans Creek.....	South Penn.....	1305B
212	John Leyden No. 2.....	Freemans Creek.....	South Penn.....	1135B
213	John Leyden No. 1.....	Freemans Creek.....	South Penn.....	935B
214	Mary A. Fahey No. 3.....	Freemans Creek.....	South Penn.....	1060B
215	Grant Gum No. 2.....	Freemans Creek.....	South Penn.....	1005B
216	Theresa Gum No. 3.....	Freemans Creek.....	South Penn.....	1195B
217	Pat Walsh No. 3.....	Freemans Creek.....	South Penn.....	1175B
218	Pat Walsh No. 2.....	Freemans Creek.....	South Penn.....	985B
219	Pat Walsh No. 1.....	Freemans Creek.....	South Penn.....	960B
220	Theresa A. Gum No. 1.....	Freemans Creek.....	South Penn.....	980B
221	Theresa A. Gum No. 2.....	Freemans Creek.....	South Penn.....	1175B
222	John Leyden Hrs. No. 41.....	Freemans Creek.....	Hope .....	880B
224	Joseph Gum No. 1.....	Freemans Creek.....	Hope .....	1260B
225	A. F. Gum No. 1.....	Freemans Creek.....	Hope .....	880B
226	Wm. Woofter No. 4229.....	Freemans Creek.....	Pittsburgh & W. Va.....	1025B
227	Leeman Chevront No. 4142.....	Freemans Creek.....	Pittsburgh & W. Va.....	975B
228	A. F. Gum No. 1.....	Freemans Creek.....	Gum et al.....	980L
229	J. M. McCluster No. 1874.....	Freemans Creek.....	Hope .....	908L
230	C. W. Gum No. 3476.....	Freemans Creek.....	Hope .....	985B
231	Henry Snyder No. 932.....	Freemans Creek.....	Hope .....	1185B
232	Peter L. Hull No. 3697.....	Freemans Creek.....	Hope .....	1045B
233	Wm. Winans No. 19.....	Freemans Creek.....	Reserve .....	1180B
233A	W. M. Woofter No. 4270.....	Freemans Creek.....	Pittsburgh & W. Va.....	1045B
234	I. Simmons No. 96.....	Freemans Creek.....	Reserve .....	1075B
235	Crit White No. 210.....	Freemans Creek.....	Reserve .....	1228L
236	Perry White No. 497.....	Freemans Creek.....	Reserve .....	1290L
237	A. A. Rohrbaugh No. 3507.....	Freemans Creek.....	Hope .....	1275R
238	W. B. Maxwell No. 1.....	Freemans Creek.....	Hope .....	955B
239	Hoy Wiseman No. 1.....	Freemans Creek.....	Crit White.....	1100B
240	Hoy Wiseman.....	Freemans Creek.....	Hope .....	1230B
241	Addison Puffenbarger No. 1289.....	Freemans Creek.....	Hope .....	1110B
243	O. Chevront No. 4087.....	Freemans Creek.....	Pittsburgh & W. Va.....	1005B
244	Ira Simmons No. 1.....	Freemans Creek.....	Gum et al.....	1290B
245	M. G. Woofter No. 4228.....	Freemans Creek.....	Pittsburgh & W. Va.....	1200L
246	M. B. Riley No. 1930.....	Freemans Creek.....	Pittsburgh & W. Va.....	1200L

## Wells in Lewis County—Continued

PITTSBURGH COAL		Big Lime. Top	Big Injun Sand. Top	Berea Sand. Top	Gordon Sand. Top	Fifth Sand. Top	Total Depth	PRODUCING SAND AND REMARKS	No. on Map II
Depth Top	Thickness Feet								
707	3	2114	2184	2500	2800	2975	3136	II Cow R., B. I., 30', & Gord. gas	185
		2163	2229				2252	B. I. oil and gas	186
725	7	2112	2177				2209	Salt gas and oil; B. I. gas	187
730	10	2155	2220		2814		2835	II Cow Run, B. I., Gord. gas; Gantz oil	188
608	7	1990	2105	2420	2668		3000	B. Lm. oil; B. I. and Berea gas	189
475	1	1898	1974	2275	2551		3045	B. Lime, B. I. and Fourth gas	190
283	4	1740	1802		2395	2600	2613	Berea gas	191
260	3	1725	1815		2355		2421	Salt oil; G. Stray and Gord. gas	192
		1320	1404			2193	2227	Gordon and Fifth gas	193
		1635	1715	1980	2318		2395	B. I. and Berea gas	194
230	4	1690	1765	2025	2355	2577	2633	Salt oil & gas; Berea & 5th gas	195
									196
		1845	1908	2215			2215	Gas	198
								B. I. and Berea gas	199
									200
									201
602	8	2055	2115		2691		2724	Gordon gas	202
									203
608	4	2080	2142	2450	2734		3047	Berea and Gordon gas	203A
									204
760	5	2160	2220	2543					205
									206
820	6	2250	2325	2619			2640	Berea gas	207
695	5	2120	2180	2490	2800	3027	3033	Gas	208
		2180	2245	2555			2609	Berea oil	209
650	7	2040	2120	2451			2474	Berea oil	210
		2244	2310	2609			2647	Big Lime and Berea oil	211
610	5	2045	2105	2412	2725	2915	3010		212
			1900				2025	Dry hole	213
542	5	1955	2006	2344			2371	Berea oil	214
		1920	1985	2296			2316	Berea oil	215
687	5	2110	2190	2504			2531	Berea oil	216
670	7	2110	2165	2481			2506	Berea oil	217
									218
452	8	1850	1925	2233	2530	2710	2836	Gordon oil show	219
445	6	1831	1970	2257			2281	Berea oil	220
652	7	2100	2150	2458			2481	Berea oil	221
		1710	1765	2075			2095	Berea gas	222
									224
									225
		1770	1830	2124			2672	B. Lm. oil; B. I. and Berea gas	226
248	6	1725	1775	2080			2382	Berea, 30' gas	227
									228
		1545	1634		2202	2432	2651	B. I. oil show; Gord. gas; Fifth oil and gas	229
									230
		1878	1933	2237			2265	Big Lime oil show; Berea gas	231
		1790	1860	2144	2459		2479	B. Lm., Berea, G. Stray & Gord. gas	232
180		1690	1800		2315	2536	2558	Gordon and Fifth gas	233
616	6	2077	2131	2420	2723		2810	Big Injun, Berea and Gord. gas	233A
		1276	1326	1644	1953	2159	2183	B. I., G. Stray and Gord. gas	234
		1495	1545	1820	2158		2203	Gordon Stray and Gordon gas	235
230	6	1695	1745		2375		2430	Gas, Salt and Gordon gas	236
293	6	1770	1820	2194	2496		2576	B. I., Squaw, 30', G. Stray and Gordon gas	237
									238
		1592	1634			2472	2517	Fifth gas	239
									240
		1920	1980	2303			2637	Berea and Gordon Stray gas	241
		1835	1890	2210	2517		2703	L. D., Berea, G. Stray and Gord. gas	243
									244
		2168	2228	2510			2990	B. I. oil; Berea and G. Stray gas	245
		2065	2125	2426			2475	Big Injun and Berea gas	246

## Summarized Record of Oil and Gas

No. on Map II	FARM NAME AND NUMBER	Magisterial District	OWNER	Elevation Above Tide
247	Maxwell Hrs. No. 9.....	Freemans Creek.....	South Penn.....	850 B
248	Alkire Bros. No. 9.....	Freemans Creek.....	Crude.....	850 B
249	Alkire Bros No. 2.....	Freemans Creek.....	Crude.....	845 B
250	M. & B. McDonnell No. 5.....	Freemans Creek.....	South Penn.....	.....
251	G. A. Brown No. 1.....	Freemans Creek.....	South Penn.....	945 B
252	Elizabeth Boyle No. 1.....	Freemans Creek.....	South Penn.....	845 L
253	M. & B. McDonnell No. 2.....	Freemans Creek.....	South Penn.....	840 B
254	M. & B. McDonnell No. 6.....	Freemans Creek.....	South Penn.....	890 B
255	Dennis Conroy No. 6.....	Freemans Creek.....	South Penn.....	940 B
256	Dennis Conroy No. 4.....	Freemans Creek.....	South Penn.....	860 B
257	Dennis Conroy No. 3.....	Freemans Creek.....	South Penn.....	925 B
258	Wm. Walsh No. 5.....	Freemans Creek.....	South Penn.....	905 B
259	Wm. Walsh No. 1.....	Freemans Creek.....	South Penn.....	930 B
260	Wm. Walsh No. 2.....	Freemans Creek.....	South Penn.....	925 B
261	Wm. Walsh No. 3.....	Freemans Creek.....	South Penn.....	810 B
262	John Gamp No. 1.....	Cove (Doddridge).....	South Penn.....	835 B
263	John Tierney No. 1.....	Freemans Creek.....	South Penn.....	830 B
264	John Tierney No. 2.....	Freemans Creek.....	South Penn.....	825 B
265	John Hushion No. 1.....	Freemans Creek.....	South Penn.....	925 B
266	John T. Keely No. 1.....	Freemans Creek.....	South Penn.....	905 B
267	John Kenney No. 1.....	Freemans Creek.....	South Penn.....	910 B
268	Leopold Stadler No. 2.....	Freemans Creek.....	South Penn.....	1040 B
269	T. M. Bode No. 1.....	Freemans Creek.....	South Penn.....	900 B
270	Leopold Stadler No. 1.....	Freemans Creek.....	South Penn.....	805 B
271	Conrad Rastle No. 2.....	Freemans Creek.....	South Penn.....	805 B
272	Conrad Rastle No. 1.....	Freemans Creek.....	South Penn.....	800 L
273	John Rastle No. 1.....	Freemans Creek.....	South Penn.....	805 L
274	Mary Albers No. 1.....	Cove (Doddridge).....	South Penn.....	810 B
275	Christian Albers No. 1.....	Cove (Doddridge).....	South Penn.....	1038 L
276	Mary Albers No. 2.....	Freemans Creek.....	South Penn.....	1050 L
277	John Rastle No. 2.....	Freemans Creek.....	South Penn.....	807 L
278	Chas. Fisher No. 1.....	Freemans Creek.....	South Penn.....	905 B
279	S. H. Lowther No. 3.....	Freemans Creek.....	South Penn.....	1030 B
281	J. C. Marsh No. 1.....	Freemans Creek.....	Hiner & Bartlett.....	802 L
282	Mary E. Hall No. 2.....	Freemans Creek.....	South Penn.....	1085 B
282A	Henry Hurst No. 1.....	Freemans Creek.....	Hope.....	1110 B
283	M. J. Lovett No. 2.....	Freemans Creek.....	South Penn.....	800 B
284	M. J. Lovett No. 1.....	Freemans Creek.....	South Penn.....	790 B
285	F. O. Hudkins No. 1.....	Freemans Creek.....	Hope.....	840 B
287	W. S. & I. C. Means No. 1.....	Freemans Creek.....	South Penn.....	920 B
287A	Otho Means No. 1.....	Freemans Creek.....	South Penn.....	965 B
288	A. T. Goodwin No. 7.....	Freemans Creek.....	South Penn.....	865 B
289	A. T. Goodwin No. 1.....	Freemans Creek.....	South Penn.....	1000 B
290	A. T. Goodwin No. 3.....	Freemans Creek.....	South Penn.....	960 B
291	A. T. Goodwin No. 4.....	Freemans Creek.....	South Penn.....	990 B
292	G. E. Lowther No. 2.....	Freemans Creek.....	South Penn.....	1040 B
293	Emma Jones No. 1.....	Freemans Creek.....	South Penn.....	1005 B
294	J. R. Lowther No. 2.....	Freemans Creek.....	South Penn.....	1075 B
295	J. R. Lowther No. 1.....	Freemans Creek.....	South Penn.....	980 B
296	M. C. Marsh No. 90.....	Freemans Creek.....	Hope.....	1075 B
297	W. H. Hurst No. 183.....	Freemans Creek.....	Hope.....	1185 B
298	J. C. Waggoner No. 1.....	Freemans Creek.....	Stewart.....	1000 B
299	J. C. Waggoner No. 4.....	Freemans Creek.....	Stewart.....	1090 B
300	Joseph Krenn No. 5.....	Freemans Creek.....	South Penn.....	1195 B
301	Joseph Krenn No. 3.....	Freemans Creek.....	South Penn.....	1195 B
302	Joseph Krenn No. 7.....	Freemans Creek.....	South Penn.....	1145 B
303	J. C. Starcher No. 2.....	Freemans Creek.....	South Penn.....	1160 B
304	U. F. Starcher No. 4.....	Freemans Creek.....	Hope.....	1090 B
305	U. F. Starcher No. 3.....	Freemans Creek.....	South Penn.....	1240 B
306	Maxwell Hrs. No. 4.....	Freemans Creek.....	South Penn.....	1175 B
307	U. F. Starcher No. 230.....	Freemans Creek.....	Hope.....	1020 B
308	U. F. Starcher No. 188.....	Freemans Creek.....	Hope.....	1125 B
309	C. K. Gibson No. 73.....	Freemans Creek.....	Hope.....	960 B
310	C. K. Gibson No. 2424.....	Freemans Creek.....	Hope.....	1000 B
311	L. O. Bailey No. 3506.....	Freemans Creek.....	Hope.....	905 B
312	S. P. Leggett No. 1.....	Freemans Creek.....	South Penn.....	.....

## Wells in Lewis County—Continued

PITTSBURGH COAL		Big Lime. Top	Big Injun Sand. Top	Berea Sand. Top	Gordon Sand. Top	Fifth Sand. Top	Total Depth	PRODUCING SAND AND REMARKS	No. on Map II
Depth Top	Thickness Feet								
545	5	2000	2050	2375			2395	Berea gas.	247
									248
									249
330	7		1720	2166			2189	Berea oil.	250
655	5	2108	2150	2468	2780		3088	Big Injun oil show.	251
453	5	1885	1940	2272			2305	Berea oil.	252
									253
									254
			1885	2228			2274	Berea oil.	255
450	5	1850	1950	2280			2300	Berea oil.	256
									257
									258
427		1910	1950	2323			2375	Big Injun gas; Berea oil.	259
									260
			1730	2165			2200	Berea oil.	262
385	5		1840	2210			2266	Berea oil.	263
									264
									265
498	6	1908	1960	2332			2387	Berea oil.	266
445	7	1870	1920	2277			2302	Berea oil.	267
447	7	1835	1910	2280			2308	Berea oil.	268
570	10	2061	2077	2403			2430	Berea oil.	269
450	5	1880	1950	2285			2316	Berea oil.	270
315	8	1760	1810	2160			2191	Berea oil.	271
									272
294	8	1700	1735	2153			2703	Berea oil and gas.	273
306	7	1738	1808	2154			2185	B. Lm. gas; Gantz oil.	274
324			1738	2171			2307	Big Injun and Gantz oil.	275
551	5	2025	2060	2405			2430	Berea oil.	276
		2045	2087	2427			2454	Berea oil.	277
315			1710	2160			2186	Berea oil.	278
425	6	1860	1920	2268			2311	Berea oil.	279
		1941	1970	2318			2830	Little Lime oil show.	281
300	8		1800	2145			2177	Berea oil.	282
									282A
567	8	1990	2050	2426			2462	Dry hole.	283
240	5	1677	1735	2102			2690	Berea oil show.	284
									285
									287
			2010	2330			2384	Berea oil.	287A
									288
336	4		1895	2190				Berea oil.	289
480	6	1920	1965	2350			2385	Berea oil.	290
									291
479	8	1942	2002	2347			2382	Berea oil.	292
575	6	1975	2080	2422			2490	Berea oil.	293
535	7	1940	2000	2380			2410	Berea oil.	294
600	6		2140	2446			2477	Berea oil.	295
445	6	1905	1955	2299			2319	Berea gas.	296
554	6		2040	2404			2420	Berea gas.	297
				2531			2555	Berea oil.	298
				2323			2355	Berea oil.	299
									300
			2205	2572	2893	3023	3058	Dry hole.	301
660		2120	2200	2507			2574	Berea oil.	302
656	6		2010	2501			2535	Berea oil.	303
									304
575	5	2025	2075	2418			2449	Berea oil.	305
751	7		2240	2598			2623	Berea oil.	306
		2108	2153	2490			2520	Berea gas.	307
			1965	2320			2335	Keckner oil show; Berea gas.	308
570	8	2040	2085	2437			2452	Berea gas.	309
378	8	1767	1872	2221		2700	2882	Big Injun oil; Berea gas.	310
365	5	1840	1895	2229			2889	Gordon Stray gas show.	311
224	6	1700	1715	2104	2414		2680	Dry hole.	312

## Summarized Record of Oil and Gas

No. on Map II	FARM NAME AND NUMBER	Magisterial District	OWNER	Elevation Above Tide
313	Isaac M. Hinzman No. 729.....	Freemans Creek.....	Hope .....	885 L
313A	Osborne Hrs. No. 3536.....	Freemans Creek.....	Hope .....	1105R
314	Jesse Brown Hrs. No. 1261.....	Freemans Creek.....	Hope .....	865B
316	John Hines No. 3475.....	Freemans Creek.....	Hope .....	950B
317	Isaac Rexroad No. 3586.....	Freemans Creek.....	Hope .....	940B
318	M. B. Rife No. 2.....	Freemans Creek.....	Pittsburgh & W. Va.....	1300B
319	Sarah Puffenbarger No. 2864.....	Freemans Creek.....	Hope .....	900B
320	Joseph Fallon No. 1.....	Freemans Creek.....	Guffey .....	1010B
321	John Fallon No. 973.....	Freemans Creek.....	Hope .....	1315R
322	Wm. Fallon No. 2471.....	Freemans Creek.....	Pittsburgh & W. Va.....	1315B
323	P. M. Lohan No. 486.....	Freemans Creek.....	Carnegie .....	980L
324	Peter M. Dorsey No. 1260.....	Freemans Creek.....	Hope .....	930B
325	John W. Dorsey No. 1.....	Freemans Creek.....	Hope .....	1030B
326	John Casey No. 9.....	Freemans Creek.....	Reserve .....	1015B
327	M. L. Waldeck No. 2482.....	Freemans Creek.....	Hope .....	980B
328	Waldeck & Casey No. 3472.....	Freemans Creek.....	Hope .....	1010B
329	Thomas Casey No. 1.....	Freemans Creek.....	Hope .....	1015B
330	Timothy Kerrigan No. 230.....	Freemans Creek.....	Reserve .....	975B
331	John Gum No. 228.....	Freemans Creek.....	Reserve .....	952L
332	C. Z. Grant No. 143.....	Freemans Creek.....	Reserve .....	1010B
333	Samuel Jarvis No. 273.....	Freemans Creek.....	Reserve .....	1215B
334	O. P. Baker No. 56.....	Freemans Creek.....	Reserve .....	1098L
335	Daniel Casto No. 16.....	Freemans Creek.....	Reserve .....	1120B
336	Mary Casey No. 12.....	Freemans Creek.....	Reserve .....	925B
337	Amanda Butcher No. 251.....	Freemans Creek.....	Reserve .....	937L
338	O. C. Woofter No. 1803.....	Freemans Creek.....	Hope .....	905L
339	F. A. Mertz No. 156.....	Freemans Creek.....	Reserve .....	900L
340	Perry T. Woofter No. 229.....	Freemans Creek.....	Reserve .....	1190B
341	Jacob Gissy No. 1802.....	Freemans Creek.....	Hope .....	877L
342	R. Gissy No. 158.....	Freemans Creek.....	Reserve .....	945B
343	J. J. Kenny No. 1245.....	Freemans Creek.....	Hope .....	875B
344	John Alkire No. 1.....	Freemans Creek.....	Hope .....	960P
345	Peter Allman No. 1.....	Freemans Creek.....	Pittsburgh & W. Va.....	.....
346	J. M. Jarvis No. 3462.....	Freemans Creek.....	Hope .....	952L
347	J. B. Bohr No. 471.....	Freemans Creek.....	Carnegie .....	985B
348	Lydia Allman No. 4266.....	Freemans Creek.....	Pittsburgh & W. Va.....	845B
349	W. B. Maxwell No. 2008.....	Freemans Creek.....	Pittsburgh & W. Va.....	830B
350	Erma Woofter No. 472.....	Freemans Creek.....	Carnegie .....	797L
350A	Wesley Knapp No. 1.....	Freemans Creek.....	South Penn.....	825B
351	Robert A. Kraus No. 1.....	Freemans Creek.....	Hope .....	1000B
352	Martin Kenny No. 1244.....	Freemans Creek.....	Hope .....	945L
353	B. L. Kraus No. 242.....	Freemans Creek.....	Hope .....	915B
354	Henry Stark No. 3503.....	Freemans Creek.....	Hope .....	1010L
355	Edith Stark No. 3504.....	Freemans Creek.....	Hope .....	985B
356	John Dempsey No. 472.....	Freemans Creek.....	Reserve .....	1030B
357	Kasper Kraus No. 1.....	Freemans Creek.....	Reserve .....	1145B
360	James Bennington No. 1.....	Courthouse.....	.....	.....
361	Wm. E. Donlan No. 2.....	Courthouse.....	South Penn.....	895B
362	B. F. Clayton No. 1.....	Courthouse.....	South Penn.....	990B
363	Michael Copley Hrs. No. 1.....	Courthouse.....	South Penn.....	790B
364	Michael Copley Hrs. No. 2.....	Courthouse.....	South Penn.....	880B
365	John Copley No. 1.....	Courthouse.....	South Penn.....	885R
366	J. H. McCray No. 1.....	Courthouse.....	Guffey .....	1070B
367	C. Turner No. 4.....	Courthouse.....	Guffey .....	1170B
368	T. McLaughlin No. 2012.....	Courthouse.....	Pittsburgh & W. Va.....	1055B
369	R. F. Romine No. 1.....	Courthouse.....	South Penn.....	1180P
370	Barney Bohlen No. 1.....	Courthouse.....	U. S. Oil.....	1200B
371	Barney Bohlen No. 3.....	Courthouse.....	U. S. Oil.....	880B
372	Barney Bohlen No. 5.....	Courthouse.....	U. S. Oil.....	847L
373	Timothy Rafferty No. 3495.....	Courthouse.....	Hope .....	860B
374	Michael Mullady No. 1901.....	Courthouse.....	Pittsburgh & W. Va.....	885B
375	T. G. Smith No. 1.....	Courthouse.....	Crude .....	815B



## Summarized Record of Oil and Gas

No. on Map II	FARM NAME AND NUMBER	Magisterial District	OWNER	Elevation Above Tide
376	N. J. Westfall No. 167.....	Courthouse.....	Hope.....	940B
377	Owen McAnaney No. 1.....	Courthouse.....	South Penn.....	840B
378	George Mertz No. 4181.....	Courthouse.....	Pittsburgh & W. Va.....	1088L
379	Joseph Mertz No. 363 (or 393).....	Courthouse.....	Reserve.....	1187L
380	J. H. Mertz No. 11.....	Courthouse.....	Reserve.....	890B
381	Quigg-Canton No. 483.....	Courthouse.....	Reserve.....	965B
382	McDonald Murray No. 491.....	Courthouse.....	Reserve.....	945L
383	Murray Hrs. No. 322.....	Courthouse.....	Reserve.....	1010B
384	Thomas Murray No. 1.....	Courthouse.....	Reserve.....	985B
385	Thomas Murray No. 474.....	Courthouse.....	Reserve.....	1145B
386	Henry McCall No. 1539.....	Courthouse.....	Hope.....	1190B
387	John Murray No. 72.....	Courthouse.....	Reserve.....	995B
388	Bridget Cummings No. 24.....	Courthouse.....	Reserve.....	910B
389	Patrick Farrell No. 436.....	Courthouse.....	Hope.....	910B
390	T. J. White No. 2002.....	Courthouse.....	Pittsburgh & W. Va.....	1030B
391	F. J. Matthews No. 2455.....	Courthouse.....	Pittsburgh & W. Va.....	1090B
392	John Hayden.....	Courthouse.....	Hatzell et al.....	1055B
393	Luke White No. 1604.....	Courthouse.....	Hope.....	1070B
394	Luke White No. 812.....	Courthouse.....	Hope.....	1030B
395	Luke White No. 1446.....	Courthouse.....	Hope.....	1295B
396	T. J. White No. 1983.....	Courthouse.....	Pittsburgh & W. Va.....	930B
397	J. W. Cox No. 1.....	Courthouse.....	Guffey.....	870B
398	J. W. Cox No. 2.....	Courthouse.....	Guffey.....	1030B
400	T. R. Reynolds No. 1.....	Courthouse.....	South Penn.....	830L
401	James Mullady No. 13.....	Courthouse.....	Guffey.....	825B
402	Pat Mullady No. 2.....	Courthouse.....	Guffey.....	1120B
403	M. M. Summers No. 7.....	Courthouse.....	South Penn.....	1190B
404	James Mullady No. 2.....	Courthouse.....	Guffey.....	.....
405	James Mullady No. 1.....	Courthouse.....	Guffey.....	.....
406	James Mullady No. 11.....	Courthouse.....	Guffey.....	.....
407	Clarissa Turner No. 1.....	Courthouse.....	Guffey.....	1115B
408	Clarissa Turner No. 2.....	Courthouse.....	Guffey.....	820B
409	C. W. McCutcheon No. 1.....	Courthouse.....	South Penn.....	1080B
410	William Griggs No. 1.....	Courthouse.....	South Penn.....	1315B
411	C. W. McCutcheon No. 6.....	Courthouse.....	South Penn.....	1185B
412	I. N. Means No. 1.....	Courthouse.....	South Penn.....	1200B
413	John Livingston No. 1.....	Courthouse.....	South Penn.....	1210B
414	W. H. Dent No. 1.....	Courthouse.....	South Penn.....	1195B
415	L. L. D. Peters No. 1.....	Courthouse.....	South Penn.....	1115B
416	James Murphy No. 2.....	Courthouse.....	Guffey.....	920B
417	James Murphy No. 1903.....	Courthouse.....	South Penn.....	1210B
418	M. J. Casey No. 1.....	Courthouse.....	Pittsburgh & W. Va.....	890B
419	John Collins No. 4.....	Courthouse.....	South Penn.....	1160B
420	John Collins No. 4016.....	Courthouse.....	South Penn.....	1220B
421	Peter Gilooly No. 1986.....	Courthouse.....	Pittsburgh & W. Va.....	960B
422	Anne Connell No. 2075.....	Courthouse.....	Pittsburgh & W. Va.....	1035B
423	James Hall No. 1.....	Courthouse.....	Pittsburgh & W. Va.....	1215B
424	John Gilooly No. 2.....	Courthouse.....	Guffey.....	845B
425	R. B. Shouldis No. 1.....	Courthouse.....	South Penn.....	1130B
426	Beall Hrs. No. 1.....	Courthouse.....	South Penn.....	825B
427	J. C. Collins No. 2.....	Courthouse.....	Southern.....	.....
428	J. C. Collins No. 1.....	Courthouse.....	Crude.....	816L
429	J. C. Collins No. 5.....	Courthouse.....	Crude.....	1164L
430	John Finster No. 1921.....	Courthouse.....	Crude.....	1220L
431	John Finster No. 1969.....	Courthouse.....	Pittsburgh & W. Va.....	995B
432	T. T. Dolan No. 7005.....	Courthouse.....	Pittsburgh & W. Va.....	915L
433	Ed. Kelley No. 4132.....	Courthouse.....	Pittsburgh & W. Va.....	925B
434	Henry Pumphrey No. 1999.....	Courthouse.....	Pittsburgh & W. Va.....	860B
435	W. C. Mick No. 2018.....	Courthouse.....	Pittsburgh & W. Va.....	825B
436	C. C. Heath No. 2.....	Courthouse.....	Pittsburgh & W. Va.....	.....
437	Granville Meeks No. 4014.....	Courthouse.....	Hope.....	1010B
438	W. J. Ryan No. 7011.....	Courthouse.....	Pittsburgh & W. Va.....	1060B
			Pittsburgh & W. Va.....	1150B



## Wells in Lewis County—Continued

PITTSBURGH COAL		Big Lime. Top	Big Injun Sand. Top	Berea Sand. Top	Gordon Sand. Top	Fifth Sand, Top	Total Depth	PRODUCING SAND AND REMARKS	No. on Map II
Depth Top	Thickness Feet								
120		1780	1940		2597	2771	2789	Gord. gas.	376
		1920	1840		2450	2652	2680	Gord. gas; 5th oil.	377
			1995		2608		2630	Gord. gas.	378
									379
		1709	1760		2406	2582	2608	Gord. & 5th gas.	380
			1756				2380	Salt, B. I., G. Stray gas; B. Lm. oil & gas.	381
		1660	1710	2125	2325		1574	Maxton oil & gas.	382
							2390	Salt, B. Lm., B. I., G. Stray, Gord. gas.	383
									384
		1887	1993			2670	2716	Salt, B. Lm., 30', G. Stray, Gord. & 5th gas.	385
		1813	1903	2206	2483		2520	Salt & Gord. gas.	386
		1800	1860	2190	2507		2533	Gord. gas.	387
					2448	2642	2644	Gord. 5th gas.	388
		1840	1930		2490	2661	2679	5th gas.	389
356	8	1914	2030	2311	2618	2800	2818	B. I., Gord. & 5th gas.	390
		1895	1973		2533	2736	2774	B. I., Gord. gas.	391
									392
		1905	1955				2543	G. Stray gas.	393
231	5	1800	1880		2478	2663	2683	Salt 4th oil; G. Stray, Gord. 5th gas	394
		2082	2132		2740		2763	B. I. & Gord. gas.	395
232	5	1845	1905	2225	2506		2536	B. I. & G. Stray gas.	396
227	5	1850	1930	2230	2512	2696			397
					2721	2898	2925		398
210		1825	1870		2492	2673	2701	5th oil.	400
									401
									402
445	4	2110	2180		2819		2861	Gord. oil.	403
155					2531½		2533	Gord. oil.	404
					2714			G. Stray, Gord. oil; Gord. gas.	405
									406
					2561			Gord. oil.	407
					2827				408
630	4	2300	2340		2990		3015	Gord. oil.	409
525	4	2215	2265		2910		2920	G. Stray & Gord. oil.	410
									411
525	3	2212	2288		2913	3075	3097	B. I. oil & gas; G. Stray oil.	412
									413
		2090	2180		2838		3052		414
									415
580	3	2200	2280		2904	3070	3127	B. I. gas; Stray oil and gas.	416
		1897				2750	2827	G. Stray gas.	417
									418
528		2198	2268		2871	3061	3078	Gord. oil.	419
		1912	1970	2250	2555	2742	2795	G. Stray, Gord. gas; 5th oil.	420
		1950	2005		2587		2597	B. I., G. Stray gas.	421
		2070	2135		2742	2940	3081	G. Stray, Gord., 5th gas.	422
					2440	2631	2678	Gord. gas.	423
480	3	2117	2172		2766	2940	2965	30', G. Stray, Gord. gas; 5th oil.	424
		1760	1782				2480	G. Stray oil.	425
460		2020	2125		2745	2940	2956	Gord. oil.	426
									427
530		2140	2250		2826	3010	3032		428
600		2200			2888		2909	Gord. oil.	429
		1740	1838	2180		2558	2755	B. I., 30' gas; Berea oil.	430
		1625	1690			2461	2533	B. I., 5th gas.	431
		1745	1833				2355	G. Stray gas.	432
									433
		1760	1900		2430	2585	2725	Gord. oil.	434
		1987	2036		2619	2798	2914	Squaw oil show.	435
									436
		1940	2030		2630		2655	G. Stray, Gord. gas.	437
		1765	1850		2430	2620	2680	Maxton, B. I. gas.	438

## Summarized Record of Oil and Gas

No. on Map II	FARM NAME AND NUMBER	Magisterial District	OWNER	Elevation Above Tide
439	John Kelley No. 4003	Courthouse	Pittsburgh & W. Va.	1130B
440	Luke Fitzpatrick No. 1853	Courthouse	Hope	1315B
441	Peter Rush No. 4004	Courthouse	Pittsburgh & W. Va.	1350B
442	C. J. Nolan No. 1988	Courthouse	Pittsburgh & W. Va.	1045B
443	Annie Keegan No. 1	Courthouse	Pittsburgh & W. Va.	1040B
444	Annie Keegan No. 2	Courthouse	Pittsburgh & W. Va.	1005B
445	W. I. Cunningham No. 4001	Courthouse	Pittsburgh & W. Va.	1335L
446	John A. McCauley No. 3026	Courthouse	Hope	1335B
447	C. J. Nolan No. 1988	Courthouse	Pittsburgh & W. Va.	930B
448	Pat Maley No 2074	Courthouse	Pittsburgh & W. Va.	1130B
449	John Devancy No. 1902	Courthouse	Pittsburgh & W. Va.	870B
450	Ellen Mulvaney No. 4176	Courthouse	Pittsburgh & W. Va.	1005B
451	John Collins No. 2208	Courthouse	Hope	1000B
452	Martha Hall No. 1	Courthouse	Columbia	1020B
453	D. A. McCray No. 2034	Courthouse	Pittsburgh & W. Va.	905B
454	John Brannon No. 1	Courthouse	Guffey	950B
455	P. Flesher No. 2072	Courthouse	Pittsburgh & W. Va.	995B
456	Margaret Riley No. 1985	Courthouse	Pittsburgh & W. Va.	875B
457	Wm. McCudden No. 2831	Courthouse	Hope	1190B
458	Michael Hoar No. 358	Courthouse	Reserve	1140B
459	Peter Doonan Hrs. No. 40	Courthouse	Hope	900B
459A	Ora Bailey No. 2956	Courthouse	Hope	1035B
460	John Copley No. 4036	Courthouse	Pittsburgh & W. Va.	880B
461	Kinley McCudden No. 1307	Courthouse	Hope	910L
462	John Bohan No. 1937	Courthouse	Hope	1187B
463	Luke White No. 4081	Courthouse	Pittsburgh & W. Va.	1300B
464	Luke White No. 2072	Courthouse	Pittsburgh & W. Va.	1390B
465	James Hamrick No. 1	Courthouse	Hope	1035B
466	Marcellus Turner No. 1	Courthouse	Hope	970B
467	John Turner No. 3	Courthouse	Crude	958L
468	J. S. Turner No. 1967	Courthouse	Pittsburgh & W. Va.	920B
469	F. M. Ballard No. 1592	Courthouse	Hope	1111L
470	S. E. Harrison No. 2401	Courthouse	Pittsburgh & W. Va.	1310B
471	David Teter No. 1214	Courthouse	Hope	1120B
472	E. C. Fisher No. 501	Courthouse	Reserve	1130B
473	M. O. Edwards No. 996	Courthouse	Hope	1245B
474	M. O. Edwards No. 813	Courthouse	Hope	1115B
475	M. O. Edwards No. 2	Courthouse	Guffey	
476	F. C. Jarvis No. 1	Courthouse	W. Va. Central	1150B
477	Henry Brannon No. 8	Courthouse	Reserve	1330L
478	Geo. Fisher No. 60	Courthouse	Reserve	1070B
479	H. B. Henry No. 431	Courthouse	Reserve	1195B
480	Elias Fisher No. 1	Courthouse	Reserve	1200B
481	A. S. Fisher No. 1	Courthouse	Southern	1290B
482	A. S. Fisher No. 2	Courthouse	Hatzell & Wilson	1335B
483	A. S. Fisher No. 1	Courthouse	Hatzell & Wilson	1360B
484	A. S. Fisher No. 3	Courthouse	Hatzell & Wilson	1395B
485	A. S. Fisher No. 4	Courthouse	Hatzell & Wilson	1300B
486	C. M. L. Butcher No. 1	Courthouse	Southern	1420B
487	H. M. Turner No. 1	Courthouse	Southern	1265B
488	H. M. Turner No. 2	Courthouse	Southern	1215B
489	C. A. Taylor No. 1	Courthouse	Hatzell & Wilson	1215B
490	Ralph McDonald No. 1	Courthouse	Hatzell & Wilson	1200B
491	S. P. Fisher No. 153	Courthouse	Reserve	1095B
492	O. B. Wheeler No. 1904	Courthouse	Pittsburgh & W. Va.	1135B
493	J. J. Turner No. 368	Courthouse	Reserve	1070B
494	Wm. S. Woodall No. 3492	Courthouse	Hope	1085B
495	J. M. Lancaster No. 188	Courthouse	Reserve	1125B
496	Mary E. Lawson No. 1	Courthouse	Weston Electric	1260B
497	Weston State Hospital No. 1	Courthouse	W. Va. State	1180B
498	Weston State Hospital No. 2	Courthouse	W. Va. State	1175B
499	Weston State Hospital No. 3	Courthouse	W. Va. State	1150B
500	Matthews Hrs. No. 1	Courthouse	W. Va. Central	1145B
501	Andrew Edmiston No. 1974	Courthouse	Pittsburgh & W. Va.	1115B

Wells in Lewis County—Continued

PITTSBURGH COAL		Big Lime. Top	Big Injun Sand. Top	Berea Sand. Top	Gordon Sand. Top	Fifth Sand. Top	Total Depth	PRODUCING SAND AND REMARKS	No. on Map
Depth Top	Thickness Feet								
		1780	1895	2200	2450	.....	2698	.....	439
		1940	2052	2380	2640	2767	2833	B. I., Gord., 5th gas.....	440
		1915	2002	.....	2628	.....	3024	Dry hole.....	441
		1610	1700	.....	.....	2445	2858	Salt, 30' gas.....	442
		.....	.....	.....	.....	.....	.....	.....	443
		1972	2032	2395	.....	2789	2825	B. I. gas.....	444
		2005	2100	2410	2621	2800	2835	B. I. & 5th gas.....	445
		1610	1700	.....	.....	2445	2858	Gas, G. Stray gas.....	446
		1955	2015	.....	.....	.....	2789	G. Stray, 4th gas.....	447
		1693	1773	.....	.....	.....	2522	30' gas.....	448
		1898	1958	.....	.....	2729	2749	30', G. Stray, 5th gas.....	449
		.....	.....	.....	.....	.....	.....	.....	450
		1680	1790	.....	2325	.....	2355	G. Stray gas.....	451
		.....	1777	2047	2333	2514	2753	G. Stray gas.....	452
		1864	1919	2230	.....	2727	2833	30' gas.....	453
		1730	1792	2135	2383	2575	2602	G. Stray, 5th gas.....	454
		2007	2146	2463	2731	.....	2759	B. Lm., G. Stray & Gord. gas.....	455
		2060	2105	.....	2723	2881	2913	B. I. & 5th oil; B. I. & G. Stray gas.....	456
		.....	.....	.....	.....	2656	2680	5th gas.....	457
		1973	2030	.....	2616	2804	2825	B. Lm., G. Stray, Gord. & 5th gas.....	458
158	2	1790	1853	2122	2423	.....	2412	G. Stray & Gord. gas.....	459
		1761	1871	2187	2448	.....	2476	Gord. gas.....	460
		2075	2144	.....	2736	.....	2756 1/2	B. I., G. Stray & Gord. gas.....	461
431	20	2000	2115	.....	2717	.....	2760	G. Stray & Gord. gas.....	462
455	8	2005	2110	.....	2713	.....	2740	B. I. & Gord. gas.....	463
		.....	.....	.....	.....	.....	.....	.....	464
		.....	.....	.....	.....	.....	.....	.....	465
		.....	.....	.....	.....	.....	.....	.....	466
140	5	1750	1850	2170	2410	2608	2730	B. I. oil & gas.....	467
		1925	1980	2330	2589	2783	2794	B. I. oil & gas; G. Stray, Gord., 5th gas.....	468
		2063	2131	.....	.....	.....	2790	Squaw, G. Stray gas.....	469
		1780	1892	2175	2456	2664	2678	Maxton, Gord., 5th gas.....	470
		1715	1814	2110	.....	2576	2603	G. Stray, 5th gas.....	471
		1803	1870	2280	2485	2706	2723	Lit. Lm. oil; Gord., 5th gas.....	472
		1605	1695	.....	2255	2392	2454	Gord. gas.....	473
		.....	.....	.....	.....	.....	1992	.....	474
		1615	1685	.....	2266	2453	2474	G. Stray, 5th gas.....	475
		.....	.....	.....	.....	.....	.....	.....	476
		1485	1545	.....	.....	.....	2297	B. Lm. oil; G. Stray, 4th gas.....	477
		1641	1701	2028	2326	2496	2543	Maxten, G. Stray, 5th gas.....	478
100		.....	.....	.....	.....	.....	1403 1/2	Salt oil.....	479
		.....	.....	.....	.....	.....	.....	.....	480
		.....	.....	.....	.....	.....	.....	.....	481
		.....	.....	.....	.....	.....	.....	.....	482
		.....	.....	.....	.....	.....	.....	.....	483
		.....	.....	.....	.....	.....	.....	.....	484
		.....	.....	.....	.....	.....	1524	Salt oil.....	485
		.....	.....	.....	.....	.....	1358	Salt oil & gas.....	486
		.....	.....	.....	.....	.....	1299	Salt oil.....	487
		.....	.....	.....	.....	.....	.....	.....	488
		.....	.....	.....	.....	.....	.....	.....	489
		.....	.....	.....	.....	.....	.....	.....	490
		1585	1645	1970	2270	2433	2553	B. I., G. Stray, 5th gas.....	491
		1613	1639	2040	.....	2435	2465	G. Stray, 5th gas.....	492
		2070	2130	.....	2744	2967	3018	Maxton, B. I., 4th gas.....	493
		1640	1713	2060	2321	2512	3000	B. I. & 5th gas.....	494
		1570	1680	1900	2265	2456	2510	B. I. & 5th gas.....	495
		.....	.....	.....	.....	.....	.....	.....	496
		1680	1843	2066	.....	.....	2477	B. I. oil; Berea, 4th gas.....	497
18		1620	1685	2070	2335	2472	2484	5th gas.....	498
		1623	1685	2060	2345	2460	2479	5th gas; B. I. oil.....	499
		1820	1899	.....	.....	2671	2700	30' & 5th gas.....	500
		1780	1840	2200	.....	2615	2768	30' gas.....	501

## Summarized Record of Oil and Gas

No. on Map II	FARM NAME AND NUMBER	Magisterial District	OWNER	Elevation Above Tide
502	W. H. Hawkins No. 1310	Courthouse	Hope	1255B
503	Wm. McBride No. 1964	Courthouse	Pittsburgh & W. Va.	1175B
504	Flora Matthews No. 1952	Courthouse	Pittsburgh & W. Va.	1340B
505	Flora Matthews No. 2455	Courthouse	Pittsburgh & W. Va.	1175B
506	Rose Jennings Compton No. 1	Courthouse	W. Va. Central	1130B
507	John T. Yates No. 1	Courthouse	John Chittum	1245B
508	Jacob Flesher No. 4119	Courthouse	Pittsburgh & W. Va.	1300B
509	Edward Priest No. 2	Courthouse	Louis Bennett	1290B
510	Edward Priest No. 1	Courthouse	Louis Bennett	1315B
511	C. H. Skinner No. 3601	Courthouse	Hope	1285B
512	N. Peterson No. 1984	Courthouse	Pittsburgh & W. Va.	1145B
513	W. J. Ward No. 2015	Courthouse	Pittsburgh & W. Va.	1140B
515	T. W. Matthews No. 1970	Courthouse	Pittsburgh & W. Va.	1030B
516	John H. Hammer No. 1	Courthouse	Pittsburgh & W. Va.	1170B
518	Taylor Sandy No. 1	Courthouse	Hope	1140B
519	Z. T. Sandy No. 2694	Courthouse	Hope	1390B
520	John Shay Hrs. No. 1	Courthouse	Ahner et al.	1050B
521	Michael Tims No. 1	Courthouse	Guffey	1050B
522	Rachel Cutright No. 1993	Courthouse	Pittsburgh & W. Va.	1205B
524	Sarah Platt No. 2423	Courthouse	Hope	1050L
525	Thos. Barnes No. 2456	Courthouse	Pittsburgh & W. Va.	1225B
526	Louis Bennett No. 1	Courthouse	Guffey	1055B
527	P. J. Dyer No. 2281	Courthouse	Hope	1130B
528	P. J. Dyer No. 1897	Courthouse	Hope	1090B
529	Louis Bennett No. 4	Courthouse	Louis Bennett	
530	Louis Bennett No. 3	Courthouse	Louis Bennett	1035B
531	John Dennison No. 4054	Courthouse	Pittsburgh & W. Va.	1278B
532	Jackson Arnold No. 3198	Courthouse	Hope	1290B
533	Weston Electric Co. No. 1	Courthouse	Weston Electric	1075B
534	W. G. Bennett No. 1	Courthouse	Harris Bros.	1230B
535	A. B. Brannon No. 4002	Courthouse	Pittsburgh & W. Va.	1110B
535A	L. L. Wilson No. 4047	Courthouse	Pittsburgh & W. Va.	1255B
536	L. L. Wilson No. 1948	Courthouse	Pittsburgh & W. Va.	1185B
537	W. G. Bennett No. 2033	Courthouse	Pittsburgh & W. Va.	1145B
538	E. A. Bennett No. 2011	Courthouse	Pittsburgh & W. Va.	1040B
539	E. A. Bennett No. 2071	Courthouse	Pittsburgh & W. Va.	1255B
540	E. M. Stalnaker No. 1	Courthouse	Pittsburgh & W. Va.	1110B
541	S. O. Rittenhouse No. 2601	Courthouse	Hope	1170B
542	J. L. Fox No. 1	Courthouse	Hope	
543	W. R. Jewel No. 1	Courthouse	White & Chidister	1060B
544	G. C. Spaur No. 2493	Skin Creek	Hope	1055B
545	W. R. Jewel No. 4070	Skin Creek	Pittsburgh & W. Va.	1310B
546	Albert Gould No. 1	Skin Creek	Hope	1070B
547	John R. Francis No. 3287	Skin Creek	Hope	1230B
548	J. D. Butcher No. 1	Skin Creek	Pittsburgh & W. Va.	1050B
549	George Simons No. 1	Skin Creek	South Penn.	1135B
550	Perry Summers No. 1	Skin Creek	Griffiths	1060B
551	J. E. Green No. 1	Buckhannon (Upshur)	B. R. O. & G.	1445B
552	Jas. R. White No. 1	Buckhannon (Upshur)	B. R. O. & G.	1150L
553	Jacob Krise No. 1	Buckhannon (Upshur)	B. R. O. & G.	1255B
554	John Smith No. 1	Buckhannon (Upshur)	B. R. O. & G.	1365B
555	Lee J. Lewis No. 1	Buckhannon (Upshur)	B. R. O. & G.	
556	Louvina Linger No. 1	Buckhannon (Upshur)	B. R. O. & G.	1380B
557	John Morrison No. 1	Buckhannon (Upshur)	Crites & Allen	1250L
558	J. F. Gould No. 1	Buckhannon (Upshur)	B. R. O. & G.	1220B
559	James Duncan No. 1	Meade (Upshur)	B. R. O. & G.	1365B
560	Hazen Phillips No. 2659	Banks (Upshur)	Hope	1550B
561	Hazen Phillips No. 2658	Banks (Upshur)	Hope	1525B
562	I. S. Douglass No. 1	Banks (Upshur)	Frenchton	1520B
563	Chas. M. Hvre No. 2656	Banks (Upshur)	Hope	1520L
564	Gordon B. Talbott No. 2657	Banks (Upshur)	Hope	1545L
565	George P. Talbott No. 3416	Banks (Upshur)	Hope	1576B
567	G. W. Smith No. 2574	Collins Settlement	Hope	1056B
569	Watson No. 1	Collins Settlement	Hope	



## Summarized Record of Oil and Gas

No. on Map II	FARM NAME AND NUMBER	Magisterial District	OWNER	Elevation Above Tide
570	C. W. Watson No. 2554.....	Collins Settlement...	Hope .....	1140L
571	John G. Rohrbaugh No. 2588.....	Collins Settlement...	Hope .....	1150B
572	T. F. Mullooly No. 2575.....	Collins Settlement...	Hope .....	1060L
574	Mary McDonald No. 2595.....	Collins Settlement...	Hope .....	1270B
575	Susan Swecker No. 2623.....	Collins Settlement...	Hope .....	1285B
576	Geo. W. Hall No. 2592.....	Collins Settlement...	Hope .....	1165B
577	Maud Arnold No. 1.....	Collins Settlement...	Hope .....	1070B
578	George Arnold No. 2766.....	Collins Settlement...	Hope .....	1280B
579	George Arnold No. 3225.....	Collins Settlement...	Hope .....	995B
580	Louis Bennett No. 1.....	Collins Settlement...	Guffey .....	880B
581	Louis Bennett No. 2616.....	Collins Settlement...	Hope .....	1110B
582	J. H. Groves No. 2733.....	Collins Settlement...	Hope .....	810B
583	Louis Bennett No. 2671.....	Collins Settlement...	Hope .....	1280B
584	Patrick Dolan Hrs. No. 1.....	Collins Settlement...	Hope .....	1050B
585	Waters Hrs. No. 4.....	Collins Settlement...	Snath & Wilson.....	885B
586	Waters Hrs. No. 3.....	Collins Settlement...	Snath & Wilson.....	995B
587	Waters Hrs. No. 2.....	Collins Settlement...	Snath & Wilson.....	1060B
588	Waters Hrs. No. 1.....	Collins Settlement...	Snath & Wilson.....	1240B
589	Michael C. Gallagher No. 1.....	Collins Settlement...	Hope .....	940B
590	E. G. Davisson No. 1.....	Collins Settlement...	E. G. Davisson.....	1090B
592	G. D. Walton No. 1.....	Salt Lick (Braxton).....	E. G. Davisson.....	935B
593	Samuel Cunningham No. 1.....	Salt Lick (Braxton).....	John Farner.....	930B
594	John Ware No. 1.....	Salt Lick (Braxton).....	John Farner.....	1020B
595	W. T. Wilson No. 1.....	Collins Settlement...	Wilson & Butcher.....	992L
596	W. T. Wilson No. 2.....	Collins Settlement...	Wilson & Butcher.....	1015B
597	A. K. Wilson No. 2.....	Collins Settlement...	Wilson & Butcher.....	1010B
598	A. K. Wilson No. 1.....	Collins Settlement...	Wilson & Butcher.....	1010B
599	S. M. Holt No. 1.....	Collins Settlement...	John Farner.....	1020B
600	S. M. Holt No. 3.....	Collins Settlement...	Sparling .....	.....
601	S. M. Holt No. 2.....	Collins Settlement...	John Farner.....	1060B
602	John Snyder No. 1.....	Banks (Upshur).....	Sparling & Neely.....	1120B
603	Wm. Mearns No. 1.....	Banks (Upshur).....	Sparling .....	1075B
603A	V. S. Lynch No. 1.....	Collins Settlement...	Sparling & Neely.....	1035B
604	G. G. Butcher No. 1.....	Collins Settlement...	Sparling .....	1107L
605	J. W. Lake No. 1.....	Collins Settlement...	Hague .....	1250B
606	Vandervort & Pickens No. 1.....	Hacker (Webster).....	Haddix .....	1220B
607	Wm. Mullins No. 1.....	Hacker (Webster).....	Story & O'Hara.....	1'205B



In the elevation column the letter "B" indicates an aneroid barometer determination checked on the nearest spirit level point, and the letter "L" indicates a hand level determination from a near by point, all elevations being expressed in feet above sea level. All depths to the Pittsburgh Coal and the oil sands are expressed in feet. Under the producing sand column, the following abbreviations are used:

L. D.....	Little Dunkard.
B. D.....	Big Dunkard.
Gas Ss.....	Gas Sand.
II Cow Run.....	Second Cow Run.
Max.....	Maxton.
L. Lm.....	Little Lime.
B. Lm.....	Big Lime.
Knr.....	Keener.
B. I.....	Big Injun.
Gnz.....	Gantz.
50-ft.....	Fifty-foot.
30-ft.....	Thirty-foot.
Stray.....	Gordon Stray.
Gord.....	Gordon.
4th.....	Fourth.
5th.....	Fifth.
6th.....	Sixth or Bayard.

In addition to the abbreviated records of the table, numerous detailed logs will be given in the following pages, showing, as far as obtained, all the sands and formations encountered, as well as coal seams, water horizons, casing and pressure records. The records of some of these wells are defective, lacking many important horizons that should have been noted, but most of them have been well kept and are good. The large number of complete records available has made it possible to correct many local errors of correlation, and numerous changes of names of the sands and coals have been made.

### *Detailed Well Records, Hackers Creek District.*

Hackers Creek District is situated in the northeastern part of Lewis, next to Harrison, and is traversed by both the Wolf Summit and Chestnut Ridge Anticlines, causing it to be a great gas region. No oil of paying quantity has been found except at the extreme southern end along the Grassland Syncline. The production is not confined to one stratum, but



ranges almost through the entire column, from the Maxton to the Fifth Sand, the most prolific horizons being the Big Injun, Berea, Fifty-foot and Fifth.

The following well was drilled in Harrison County, one mile and a half northeast of the Lewis County Corner. An imperfect record was published in the Doddridge-Harrison Report of the Survey, page 557, but the following gives many important details that have a bearing on the surrounding territory. The well showed some gas, but was abandoned:

### E. W. Post No. 1 Well Record (1).

Elk District, Harrison County; on Rooting Creek,  $\frac{1}{2}$  mile south of Johnstown; authority, Guffey & Galey; elevation, 1060' B.

	Top. Feet.	Bottom. Feet.
Unrecorded (water, 50').....	0	130
<b>Coal, Bakerstown</b> .....	130	135
Sand, Big Dunkard.....	320	340
Gas Sand.....	470	485
Sand, Second Cow Run.....	575	615
Sand, Salt, (hole full water).....	770	820
<b>Sand, Maxton</b> , (little gas in top).....	970	1060
<b>Big Lime</b> (reduced hole to 6 $\frac{1}{8}$ " at 1450').....	1390	1465
Limestone and sand, Keener.....	1465	1475
Red rock.....	1500	1505
Limestone and sand little gas and water.....45' } <b>Big Injun</b> .....	1505	1560
Sandstone .....10		
Sand, Squaw, (hole full of salt water at 1720', flowing) (reamed hole to 8 $\frac{1}{4}$ " from 1450 to 1844') .....	1710	1844
Sand, Gordon Stray.....	2090	2095
Sand, Gordon.....	2110	2120
Red rock and red sandstone, Fourth.....	2120	2185
Sand, Fifth.....	2260	2275
<b>Sand, Bayard</b> , (little gas).....	2290	2298
Sand, white, pebbles in bottom, Elizabeth.....	2310	2330
Slate, with white pebbles, to bottom.....	2475	2481

10" casing, 118'; 8 $\frac{1}{4}$ " casing, 828'; 6 $\frac{1}{8}$ " casing, 1844'.

The **L. Nathan Lewis No. 1 (2) well**, also in the edge of Harrison County, has been reported dry, but no record of it has ever been obtained by the Survey. The **Isaac S. Reger No. 1 (3)**, located on Hackers Creek, in Warren District, Upshur, two miles east of the Lewis Line, showed about 5 barrels in the Squaw Sand, but was abandoned. Its record is published in the Doddridge-Harrison Report, page 558.

The following well, drilled in the edge of Upshur, about one-tenth mile east of the Lewis Line and along the axis of the Grassland Syncline, appears to have been dry in all sands and was abandoned:

### John Foster No. 1 Well Record (4).

Warren District, Upshur County; on Hackers Creek, 0.6 mile northwest of Aberdeen; authority, Pa. Oil & Gas Co.; elevation, 1060' L.

	Top. Feet.	Bottom. Feet.
Coal, Bakerstown.....	195	197
Sand, Little Dunkard.....	310	345
Sand, Big Dunkard.....	385	415
Sand, Gas.....	450	470
Sand, Second Cow Run.....	552	610
Sand, Salt.....	780	940
Sand, Maxton.....	1130	1185
Little Lime.....	1485	1505
Pencil Cave.....	1505	1525
Big Lime.....	1525	1595
Sand, Big Injun.....	1595	1750
Sand, Squaw.....	1750	1785
Sand, Weir.....	1820	1860
Sand, Berea.....	1867	1920
Sand, 50-foot.....	1930	2030
Sand, 30-foot.....	2030	2060
Sand, Gordon Stray.....	2180	2200
Sand, Gordon.....	2205	2225
Sand, Fourth.....	2260	2285
Sand, Fifth (thickness not recorded).....	2345	....

Three wells have been drilled along Jesse Run east of the Chestnut Ridge Anticline, two of which produce gas. In the following the pay was encountered in the Fifth Sand, the well showing a volume of 750,000 cubic feet daily and a rock pressure of 820 pounds, according to A. B. Post. The Redstone Coal crops in the hill about 15 feet above the level of the well, and it seems probable that the Pittsburgh is incorrectly recorded, as it should have been encountered under 35 feet. If the record is true, then the coal at 82 feet represents the Little Pittsburgh, which has no such thickness elsewhere in the county:

## W. F. Post No. 1 Well Record (5).

Hackers Creek District; on Jesse Run, 2.5 miles southwest of Johnstown; authority, Jesse Run Oil & Gas Co.; elevation, 1365' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh?	82	87
Coal, Bakerstown	386	390
Sand, Little Dunkard	463	548
Sand, Big Dunkard	603	638
Sand, Gas	772	776
Coal, Lower Kittanning	814	818
Sand, Second Cow Run	818	823
Sand, Salt	970	1183
Sand, Maxton	1250	1325
Little Lime	1568	1588
Pencil Cave	1588	1608
Big Lime	1608	1709
Sand, Big Injun	1709	1800
Sand, Squaw	1830	1900
Sand, Berea, (big water and gas)	1955	2034
Sand, Gantz	2057½	2128
Sand, Fifty-foot	2148	2178
Sand, Thirty-foot	2182	2207
Shells, Gordon	2312	2324
Sand (gas)	2479	2481
Sand, Fourth (water, 2503')	2491	2506
Sand, Fifth (gas pay)	2541	2548
Total depth		2568

10" casing, 161'; 8¼" casing, 975'; 6⅝" casing, 1809'; 5⅝" casing, 2018'.

The following well, drilled on the same farm, showed both oil and gas, but was abandoned as a dry hole:

## W. F. Post No. 2 Well Record (6).

Hackers Creek District, on Jesse Run, 2.6 miles southwest of Johnstown; authority, Jesse Run Oil & Gas Co.; elevation, 1280' B.

	Top. Feet.	Bottom. Feet.
Unrecorded (water, 275')	0	316
Coal, Bakerstown	316	319
Sand, Little Dunkard	400	426
Sand, Big Dunkard	510	550
Sand, Gas	677	687
Coal, Lower Kittanning	751	756
Sand, Second Cow Run	840	875
Sand, Salt	915	1115
Sand, Salt	1173	1268
Sand, Maxton	1378	1423
Little Lime	1520	1540
Pencil Cave	1540	1567

	Top. Feet.	Bottom. Feet.
Big Lime.....	1567	1650
Sand, Big Injun (water, 1665').....	1650	1765
Sand, Squaw.....	1835	1845
Sand, Berea (water and gas, 1919').....	1917	1999
Sand, Fifty-foot.....	2023	2118
Sand, Thirty-foot.....	2135	2150
Red rock and unrecorded.....	2165	2250
Sand, Gordon Stray.....	2250	2288
Sand, Gordon (gas, 2352').....	2330	2400
Sand, Fourth.....	2430	2438
Sand, Fifth (shell).....	2511	2516
Shell .....	2530	2582
10" casing, 159'; 8¼" casing, 979'; 6⅝" casing, 1964½'.		

The two following wells are producers from the Fifth Sand, but their volumes were not learned:

#### G. G. Cookman No. 2164 Well Record (7).

Hackers Creek District; on Bull Lick; 1.4 miles north of Aberdeen; authority, Hope Natural Gas Co.; rig completed May 15, 1911; elevation, 1115' L.

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard.....	400	430
Gas Sand.....	620	640
Sand, Second Cow Run.....	690	775
Sand, Salt (water, 950').....	785	975
Maxton Sand.....	1015	1120
Little Lime.....	1385	1400
Pencil Cave.....	1400	1425
Big Lime.....	1425	1534
Big Injun Sand.....	1534	1649
Squaw Sand.....	1649	1712
Berea Sand.....	1770	1812
Fifty-foot Sand.....	1855	1900
Thirty-foot Sand.....	1905	1970
Gordon Stray Sand.....	2095	2106
Fifth Sand (gas, 2276').....	2276	2301
Bayard Sand.....	2380	2390
Total depth.....		2753

#### Abram S. Holbert No. 2852 Well Record (8).

Hackers Creek District; on branch of Jesse Run, 3.5 miles east of Jane Lew; authority, Hope Natural Gas Co.; completed, April 7, 1913; elevation, 1190' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	295	330
Gas Sand.....	505	630
First Salt Sand.....	670	815

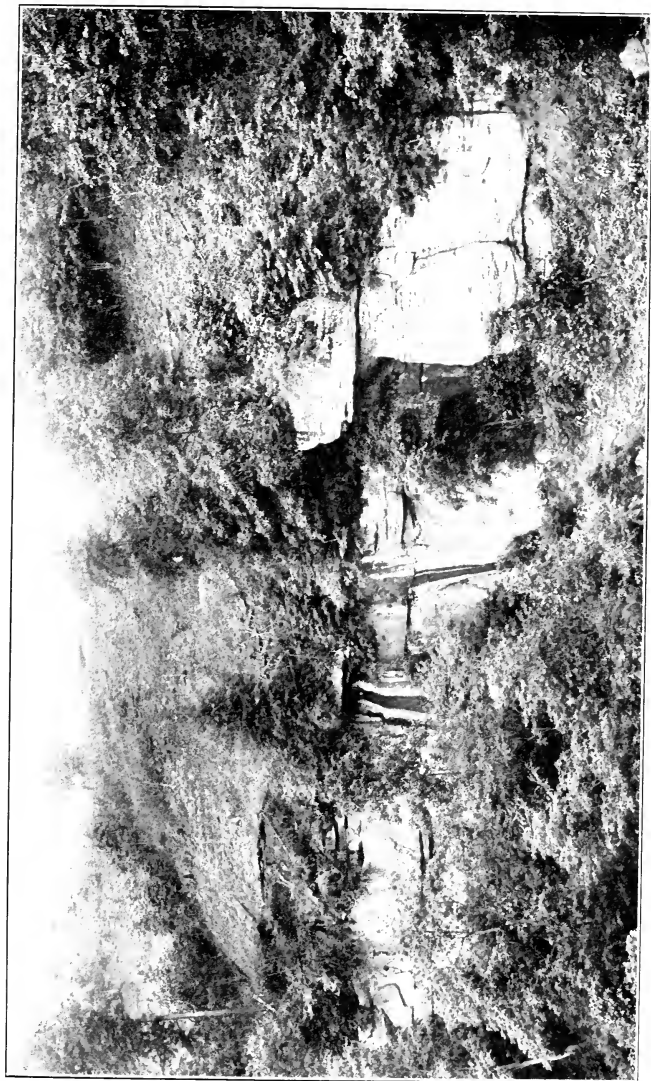


PLATE XIV.—Uniontown Sandstone cliff on Laurel Fork, 1.5 miles west of Taumer, Gilmer County, Georgia, of the Dunkard and Monongahela Series.



	Top. Feet.	Bottom. Feet.
Little Lime.....	1112	1120
Pencil Cave.....	1120	1130
<b>Big Lime</b> .....	1130	1185
Big Injun Sand.....	1185	1340
<b>Berea Sand</b> (gas, 1560').....	1556	1590
Fifty-foot Sand.....	1705	1753
Thirty-foot Sand.....	1820	1838
Gordon Stray Sand.....	1903	1918
<b>Fifth Sand</b> (gas, 2032').....	2024	2043
Total depth.....		2513

The following well, located in the flat structural terrace near the south end of the Shinnston Syncline, flowed oil over the derrick when drilled, and was pumped for a short time:

#### Presley Edmonds No. 2216 Well Record (9).

Hackers Creek District; 1.7 miles northeast of Jane Lew; authority, Hope Natural Gas Co.; completed, July 5, 1911; elevation, 1170' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	260	325
Big Dunkard Sand.....	355	380
Gas Sand.....	480	585
Second Cow Run Sand.....	600	800
Salt Sand.....	810	1000
Maxton Sand.....	1155	1185
Little Lime (water, 1308').....	1305	1345
Pencil Cave.....	1345	1358
<b>Big Lime</b> (water, 1380'; gas, 1385').....	1358	1421
Big Injun Sand.....	1421	1546
Squaw Sand.....	1560	1700
Berea Sand.....	1770	1790
Gantz Sand.....	1800	1815
Fifty-foot Sand.....	1840	1910
Thirty-foot Sand.....	1936	1970
Gordon Stray Sand.....	2100	2130
<b>Gordon Sand</b> (oil and gas, 2151').....	2137	2160
Total depth.....		2163

The following was a gas producer from the Fifth Sand:

#### Levi Smith No. 1 Well Record (10).

Hackers Creek District; on McKinney Run, 1.6 miles northeast of Jane Lew; authority, Hiner, Dayton and Arnold; completed, April 16, 1912.

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard.....	420	450
Sand, Gas.....	580	630

	Top. Feet.	Bottom. Feet.
Sand, Second Cow Run.....	700	780
Sand, Salt.....	825	940
Sand, Salt.....	940	995
Sand .....	1005	1075
Sand, Maxton.....	1220	1245
<b>Big Lime</b> .....	1430	1495
Sand, Big Injun.....	1495	1625
Sand, Berea.....	1900	1930
Sand, Fifty-foot.....	1940	1970
Sand, Thirty-foot.....	1990	2015
Sand, Gordon Stray.....	2040	2055
<b>Sand, Fifth (gas, 2318'-2322')</b> .....	2300	2332

Shot with 20 qts.; tubed with 2", 4½ lbs., 2332'; 6½" casing, 1480'.

The **E. S. McWhorter No. 907 (11)**, drilled by the Hope Natural Gas Company, in Grant District, Harrison County, just north of the Lewis Line, produced gas from the Berea, Gordon Stray and Gordon Sands. Its record is published in connection with the McWhorter Section, page 45.

The following well, drilled near the end of the Shinnston Syncline, was only a light gasser:

#### E. R. Davis No. 587 Well Record (12).

Hackers Creek District; on McKinney Run, 1.0 mile northeast of Jane Lew; authority, Hope Natural Gas Co.; completed August 13, 1904; elevation, 1020' B.

	Top. Feet.	Bottom. Feet.
Conductor .....		16
Sand .....	130	145
Sand (water, 390').....	365	390
Sand .....	400	460
Gas Sand.....	480	530
Salt Sand.....	600	710
Maxton Sand.....	900	950
Little Lime.....	1145	1155
Pencil Cave.....	1165	1190
<b>Big Lime</b> .....	1190	1260
<b>Big Injun Sand (light gas, 1340', exhausted)</b> ...	1260	1360
Sand, Berea.....	1580	1600
Thirty-foot Sand.....	1660	1675
Gordon Stray Sand.....	1940	1955
Gordon Sand.....	1980	2005
<b>Fourth Sand (light gas)</b> .....	2096	2101
Total depth.....		2352

The following well made several shows of gas and a little oil, but was abandoned as a dry hole:



## Wade E. McWhorter No. 1 Well Record (13).

Hackers Creek District; on McKinney Run, 0.9 mile northeast of Jane Lew; authority, Raven Carbon Co.; elevation, 1025' B.

	Top. Feet.	Bottom. Feet.
Conductor .....		15
Unrecorded (water, 60').....	15	120
Lime .....	120	140
Sand .....	250	300
Sand, Big Dunkard (water).....	350	386
Coal, Lower Freeport.....	450	457
Sand, Gas.....	534	570
Sand, Second Cow Run.....	645	685
Lime .....	688	765
Sand, Salt (gas).....	765	805
Sand, Salt.....	825	874
Lime .....	992	1024
Sand, Maxton.....	1088	1138
Little Lime.....	1138	1160
Big Lime.....	1190	1240
Sand, Big Injun (oil, 1270').....	1240	1360
Sand, Berea (gas).....	1550	1560
Sand, Fifty-foot (light gas).....	1630	1670
Sand, Thirty-foot.....	1714	1736
Sand, Gordon Stray.....	1883	1913
Sand, Gordon (light gas, 1932').....	1930	1965
Sand, Fifth (gas, 2070').....	2063	2078
Total depth.....		2109

3" tubing, 2109'; 10" casing, 170'; 8¼" casing, 825'; 6⅝" casing, 1205'.

The following well, also drilled in the semi-circular terrace at the south end of the Shinnston Syncline, showed considerable oil as well as being a good gasser:

## J. D. Boylen No. 1 Well Record (14).

Hackers Creek District; on Jesse Run, 1.2 miles southeast of Jane Lew; authority, Trippett Oil & Gas Co.

	Top. Feet.	Bottom. Feet.
Sand, Gas (water, 495').....	425	500
Sand, Salt.....	600	800
Big Lime.....	1280	1360
Sand, Big Injun (oil, 10 to 15 bbls. 1365'; little gas, 1435').....	1360	1480
Sand, Berea (gas, 1 million feet, 1645').....	1640	1650
Sand, Gordon Stray.....	2014	2028
Break .....	2028	2038
Sand, Gordon, (gas, 2 million feet, 2041'; gas, 2058-2069') (tubed at 2085').....	2038	2200

In the two following wells, according to Dr. J. M. King and Eugene Brown, of Buckhannon, W. Va., a good supply of gas was struck in the top of the Fifty-foot Sand, but an attempt to drill deeper into the pay in both wells resulted in disastrous flows of salt water that drowned out the gas:

### Post and Hall No. 1 Well Record (17).

Hackers Creek District; on branch of Jesse Run, 2 miles southeast of Jane Lew; authority, J. M. King Gas Co.; elevation, 1115' B.

	Top. Feet.	Bottom. Feet.
Sand, Salt.....	730	755
Sand, Big Injun.....	1250	1450
Sand, Gantz, and unrecorded.....	1665	1725
Sand, Fifty-foot (gas, 1725'), to bottom.....	1725	1725½

### C. J. Post No. 1 Well Record (18).

Hackers Creek District; on branch of Jesse Run, 2.2 miles southeast of Jane Lew; authority, Brown Oil & Gas Co.; elevation, 1140' B.

	Top. Feet.	Bottom. Feet.
Unrecorded and Little Dunkard Sand.....	0	300
Sand, Gas.....	475	525
Sand, Second Cow Run, (water 560-610').....	560	600
Sand, Salt (water to drill, 750').....	600	800
Big Lime.....	1280	1360
Sand, Big Injun.....	1365	1510
Sand, Gantz.....	1700	1735
Sand, Fifty-foot (gas, 1758-1765'; water, 1768')....	1755	1843
Sand, Thirty-foot.....	1853	1900
Sand, Gordon Stray.....	2044	2074
Sand, Gordon.....	2084	2115
Sand, Fifth, to bottom.....	2115	2230

No records were obtained of the Edith Goodwin Heirs No. 3 (16), and Edith Goodwin Heirs No. 1 (20), but both wells showed gas, according to local information, being evidently too light for use, as both were plugged. According to G. G. Waggoner, of Jane Lew, the Edith Goodwin Heirs No. 2 (19) was drilled to the Bayard Sand at 2365 feet. The well supplies gas for household use. It is probable that there was too much salt water in the Fifty-foot Sand for these wells to have gas in paying quantity.

About fifty wells have been drilled along Hackers Creek and its tributaries in the neighborhood of Berlin. Nearly all that are situated along the slope of the Chestnut Ridge Anticline are good gas wells, but those located along the axis of the Grassland Syncline have all been too light for commercial use. The producing sands are the Berea, Fifty-foot, Fourth and Fifth. Several records of these wells are given on the following pages:

### Hall and Gaston No. 2477 Well Record (25).

Hackers Creek District; on Stony Run, 2.1 miles north of Berlin; authority, Hope Natural Gas Co.; completed, June 8, 1912; elevation, 1115' B.

	Top. Feet.	Bottom. Feet.
Moundsville Sand.....	120	145
Big Dunkard Sand.....	350	368
Gas Sand.....	513	630
Second Cow Run Sand.....	695	810
Salt Sand.....	830	900
Maxton Sand.....	1305	1323
Little Lime.....	1346	1365
Pencil Cave.....	1365	1374
Big Lime.....	1374	1444
Big Injun Sand.....	1444	1579
Squaw Sand.....	1606	1616
Berea Sand (gas, 1734').....	1732	1770
Fifty-foot Sand (gas, 1800').....	1790	1819
Thirty-foot Sand.....	1912	1930
Gordon Stray Sand.....	1975	1991
Gordon Sand.....	1996	2105
Fourth Sand (gas, 2241').....	2239	2243
Fifth Sand (gas, 2273').....	2270	2282
Total depth (filled up to 2322').....		2602

### Allman Bros. No. 2 Well Record (26).

Hackers Creek District; on Stony Run, 2.2 miles N. 10° W. of Berlin; authority, Hackers Creek Oil & Gas Co.; elevation, 1150' B.

	Top. Feet.	Bottom. Feet.
Unrecorded (5 bailers water, 250').....	0	700
Sand, Salt.....	700	930
Sand, Big Injun (little gas, 1565').....	1475	1575
Sand, Berea (gas, 1755').....	1750	1785
Slate.....	1785	1795
Sand, Fifty-foot (gas, 6 millions, 1810-24').....	1800	1828
Packer set, 1540'; 6½" casing, 1375'.		

### J. C. Allman No. 2673 Well Record (27).

Hackers Creek District, on Stony Run, 2.2 miles north of Berlin; authority, Hope Natural Gas Co.; completed, Jan. 1, 1913; elevation, 1145' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	370	400
Gas Sand.....	480	534
Second Cow Run Sand.....	680	783
Salt Sand.....	818	850
Salt Sand.....	855	930
Maxton Sand.....	1250	1272
Little Lime.....	1350	1365
Pencil Cave.....	1365	1370
<b>Big Lime.....</b>	<b>1370</b>	<b>1440</b>
Big Injun Sand.....	1440	1525
Squaw Sand.....	1530	1550
Weir Sand.....	1630	1650
Berea Sand.....	1736	1768
<b>Fifty-foot Sand (gas, 1795').....</b>	<b>1785</b>	<b>1807</b>
Total depth.....		1812

### Allman Bros. No. 1 Well Record (28).

Hackers Creek District; on Stony Run, 2.1 miles N. 10° W. of Berlin; authority, Hackers Creek Oil & Gas Co.; completed, November 11, 1911; elevation, 1145' B.

	Top. Feet.	Bottom. Feet.
Sand, Salt.....	700	920
Unrecorded (small gas in <b>Big Lime</b> , 1460', blew out) .....	920	1470
Sand, Big Injun.....	1470	1580
Sand, Berea, to bottom.....	1790	....

Gas, 1806'-1818'; packer set at 1528'; 10" casing, 110'; rock pressure, 820 lbs.; mercury gauge when drilled, 19/10 in 6 5/8" (6,500,000 ft.); mercury gauge when tubed, 50/10 in 3" (2,800,000 ft.)

### Hall and Gaston No. 2433 Well Record (29).

Hackers Creek District; on Stony Run, 2.0 miles north of Berlin; authority, Hope Natural Gas Co.; completed March 28, 1912; elevation, 1125' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	395	425
Gas Sand.....	525	650
Second Cow Run Sand.....	690	750
Salt Sand.....	825	900
Maxton Sand.....	1313	1325
Little Lime.....	1363	1378

	Top. Feet.	Bottom. Feet.
Pencil Cave.....	1378	1388
Big Lime.....	1388	1448
Big Injun Sand (gas, 1530').....	1448	1590
Berea Sand (gas, 1732').....	1728	1755
Fifty-foot Sand (gas, 1800').....	1784	1815
Total depth.....		1819

### Geo. W. Starcher No. 1298 Well Record (31).

Hackers Creek District; 1.8 miles north of Berlin; authority, Hope Natural Gas Co.; completed April 20, 1910; elevation, 1230' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	375	400
Big Dunkard Sand (oil and water, 610').....	500	540
Gas Sand.....	735	795
Second Cow Run Sand.....	825	915
Salt Sand.....	950	990
Maxton Sand.....	1075	1135
Little Lime.....	1375	1424
Big Lime.....	1425	1500
Big Injun Sand (gas, 1610').....	1500	1660
Berea Sand (gas, 1798').....	1790	1805
Fifty-foot Sand (gas, 1875').....	1865	1925
Thirty-foot Sand.....	1930	1970
Gordon Stray Sand.....	2145	2152
Gordon Sand.....	2160	2192
Fourth Sand, broken.....	2225	2240
Fifth Sand, (gas, 2347').....	2347	2352
Total depth.....		2416

### W. H. Kelley No. 2134 Well Record (32).

Hackers Creek District; 1.8 miles northeast of Berlin; authority, Hope Natural Gas Co.; completed, April 8, 1911; elevation, 1170' B.

	Top. Feet.	Bottom. Feet.
Gas Sand (water, 615').....	605	635
Second Cow Run Sand.....	740	760
Salt Sand.....	800	825
Salt Sand.....	830	1040
Salt Sand (water, 1175').....	1120	1190
Maxton Sand.....	1410	1435
Little Lime.....	1460	1470
Pencil Cave.....	1470	1480
Big Lime.....	1500	1572
Big Injun Sand.....	1572	1706
Squaw Sand.....	1720	1760
Berea Sand.....	1865	1875
Fifty-foot Sand.....	1905	1997

	Top. Feet.	Bottom. Feet.
Thirty-foot Sand.....	2007	2037
Gordon Stray Sand.....	2165	2232
Fourth Sand.....	2246	2265
Fifth Sand (gas, 2323-72').....	2322	2387
Total depth .....		2422

The full record of the **James D. Allman No. 2 (33) Well**, located on Hackers Creek, one-half mile northwest of Berlin, and drilled by the Alexander Oil and Gas Company, was not secured, but according to J. F. Keough, of Clarksburg, contractor, it was drilled about 2400 feet deep and made 4,000,000 cubic feet in the Fifty-foot Sand. On July 13, 1914, it showed a rock pressure of 550 pounds. The other well on the same farm has the following record:

#### James D. Allman No. 1 Well Record (34).

Hackers Creek District; on Hackers Creek, 0.4 mile northwest of Berlin; authority, Alexander Oil & Gas Co.; completed, Nov. 18, 1912.

	Top. Feet.	Bottom. Feet.
Sand, Salt.....	1005	1045
Big Lime.....	1653	1709
Big Injun Sand.....	1709	1819
Sand, Berea (gas, 2035'; water, 2045').....	2025	2055
Sand, Gordon.....	2337	2352
Sand, Fifth, (gas, 2495').....	2490	2505
Total depth.....		2527
5 $\frac{1}{8}$ " casing, 2340'; rock pressure July 13, 1914, 570 lbs.		

#### W. B. Lawson No. 3481 Well Record (35).

Hackers Creek District; on Hackers Creek, 0.4 mile northwest of Berlin; authority, Hope Natural Gas Co.; completed, June 19, 1914; elevation, 1042' L.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand (water, 307').....	295	350
Big Dunkard Sand.....	385	420
Gas Sand.....	614	667
Second Cow Run Sand.....	733	782
Salt Sand.....	896	948
Little Lime.....	1357	1375
Pencil Cave.....	1375	1395
Big Lime.....	1395	1462
Big Injun Sand.....	1469	1589
Berea Sand (gas, 1734').....	1730	1758
Fifty-foot Sand (gas, 1788').....	1783	1811
Thirty-foot Sand, to bottom.....	1816	1816

The record of the **J. B. Swisher No. 1 (36)**, drilled by the West Virginia Central Gas Company, is published in the Berlin Section, on page 48. It produced gas from the Berea, Fifty-foot and Fifth Sands.

### W. S. Starcher No. 1 Well Record (37).

Hackers Creek District; on Hackers Creek, at Berlin; authority, W. Va. Central Gas Co.; elevation, 1025' B.

	Top. Feet.	Bottom. Feet.
Slate and shells.....	0	300
Sand, Little Dunkard.....	300	320
Sand, Big Dunkard.....	380	425
Sand, Gas (water, 618').....	580	625
Sand, Salt (water, 785').....	750	803
Sand, Salt.....	805	900
Sand, Salt.....	935	1035
Little Lime.....	1393	1406
Pencil Cave.....	1409	1421
<b>Big Lime</b> .....	1421	1476
Big Injun Sand.....	1476	1616
Sand, Squaw.....	1616	1654
Sand, Weir.....	1670	1705
Sand, Berea.....	1720	1785
Sand, Fifty-foot.....	1800	1890
Sand, Thirty-foot.....	1928	1967
Sand, Gordon.....	2097	2136
Sand, Fourth.....	2168	2184
<b>Sand, Fifth (gas, 2253-5')</b> .....	2252	2256
Slate.....	2256	2275
<b>Sand, Fifth (gas 2281-5')</b> .....	2275	2287
Lime.....	2287	2297
Slate.....	2297	2303

Conductor, 27'; 10" casing, 171'; 8¼" casing, 1060'; 6⅝" casing, 1516'; no Maxton Sand; volume, 2,000,000 cu. ft.

### M. M. Reger No. 2907 Well Record (38).

Hackers Creek District; 0.9 mile northeast of Berlin; authority, Hope Natural Gas Co.; completed, April 7, 1913; elevation, 1195' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	365	380
Big Dunkard Sand.....	390	425
Unrecorded (water, 532').....	425	705
Gas Sand.....	705	715
First Salt Sand.....	860	933
Second Salt Sand.....	1091	1120
Maxton Sand.....	1445	1490
<b>Big Lime</b> .....	1548	1595
<b>Big Injun Sand (gas, 1708')</b> .....	1595	1716

	Top. Feet.	Bottom. Feet.
Squaw Sand.....	1736	1775
Weir Sand.....	1865	1910
Berea Sand.....	1936	1951
Unrecorded (water, 1953'; 11 bbl. per hour).....	1951	1954
Fifty-foot Sand.....	1954	2005
Thirty-foot Sand.....	2100	2117
Gordon Stray Sand.....	2225	2238
Gordon Sand.....	2245	2251
Fourth Sand.....	2279	2289
Unrecorded (gas, 2357'; 10/10 water in 2").....	2289	2404
Fifth Sand (gas, 2408' and 2410', 48/10 mercury in 2").....	2404	2414
Total depth.....		2456
Rock pressure, 900 lbs.; volume, 1,900,000 cu. ft.		

### W. S. Starcher No. 2571 Well Record (40).

Hackers Creek District; on Hackers Creek, 1.0 mile east of Berlin; authority, Hope Natural Gas Co.; completed, June 19, 1912; elevation, 1205' B.

	Top. Feet.	Bottom. Feet.
Unrecorded (water, 160').....	0	456
Little Dunkard Sand.....	456	475
Gas Sand.....	710	757
Sand .....	760	785
Second Cow Run Sand.....	886	897
Salt Sand.....	929	964
Salt Sand.....	971	1093
Salt Sand.....	1103	1322
Maxton Sand.....	1406	1460
Little Lime.....	1579	1620
Pencil Cave.....	1620	1632
Big Lime.....	1632	1714
Big Injun Sand.....	1714	1815
Squaw Sand.....	1819	1848
Sand .....	1920	1963
Berea Sand.....	1989	2049
Gantz Sand.....	2054	2113
Fifty-foot Sand.....	2136	2164
Thirty-foot Sand.....	2178	2192
Gordon Stray Sand.....	2325	2333
Gordon Sand.....	2356	2370
Fourth Sand.....	2379	2385
Fifth Sand (gas, 2440-2').....	2435	2451
Total depth (filled up to 2498').....		2551

The following well showed gas in the Berea and Fourth Sands, but was abandoned as a dry hole. It comes in the unproductive belt along the Grassland Syncline:



### Mark Hersman No. 1 Well Record (41).

Hackers Creek District; on Buckhannon River, 1.2 miles southeast of Berlin; authority, N. D. Goe & Co.; elevation, 1055' B.

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard.....	372	401
Sand, Salt.....	914	1000
Sand, Salt.....	1002	1244
Red rock.....	1260	1400
Sand, Maxton.....	1400	1432
<b>Big Lime</b> .....	1466	1526
Sand, Big Injun.....	1526	1684
Sand, Squaw.....	1684	1727
<b>Sand, Berea</b> (gas, 1775').....	1773	1827
Sand, Fifty-foot.....	1851	1996
Sand, Gordon Stray.....	2151	2166
Shell (gas) <b>Fourth</b> .....	2264	2274
<b>Sand, Fourth</b> .....	2274	2291
Sand, <b>Fifth</b> .....	2318	2330
Total depth.....		2426

10" casing, 197'; 8" casing, 965'; 6", 1565'; dry hole.

### J. L. Swisher No. 2446 Well Record (43).

Hackers Creek District; on branch of Laurel Lick, 0.7 mile south-east of Berlin; authority, Hope Natural Gas Co.; completed March 25, 1912; elevation, 1080' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	365	375
Big Dunkard Sand.....	465	485
Gas Sand.....	645	675
Second Cow Run Sand.....	785	825
Salt Sand.....	845	1005
Maxton Sand.....	1100	1175
Little Lime.....	1515	1525
Pencil Cave.....	1525	1535
<b>Big Lime</b> .....	1535	1610
Big Injun Sand.....	1610	1750
Squaw Sand.....	1760	1775
Berea Sand.....	1860	1935
<b>Fifty-foot Sand</b> (gas, 1957').....	1950	....
Total depth.....		1988

### W. G. Hinzman No. 3283 Well Record (44).

Hackers Creek District; on Laurel Lick, 0.3 mile south of Berlin; authority, Hope Natural Gas Co.; elevation, 1045' L.

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard.....	368	405
Sand, Gas.....	550	595
Sand, Second Cow Run.....	655	685

	Top. Feet.	Bottom. Feet.
Sand, Salt.....	700	730
Sand, Salt.....	935	970
Red rock.....	1180	1390
Big Lime.....	1437	1500
Sand, Big Injun.....	1500	1615
Sand, Berea.....	1755	1775
Sand, Gantz.....	1801	1855
Sand, Fifty-foot.....	1860	1900
Sand, Thirty-foot.....	1923	1955
Red shale.....	2035	2100
Sand, Gordon Stray.....	2100	2109
Sand, Gordon.....	2112	2130
Sand, Fourth.....	2166	2185
Sand, Fifth (gas, 2282-8').....	2280	2290
Slate.....	2290	2296
Sand, Bayard.....	2296	2303
Slate to bottom.....	2303	2307

The following well, which was the first drilled in the Berlin region, was completed 8 to 10 years ago, far ahead of the later development:

#### W. G. Hinzman No. 375 Well Record (45).

Hackers Creek District; on Laurel Lick, 0.5 mile south of Berlin; authority, Hope Natural Gas Co.; elevation, 1050' B.

	Top. Feet.	Bottom. Feet.
Conductor.....	0	16
Little Dunkard Sand.....	350	370
Big Dunkard Sand.....	400	440
Water and Sand.....	590	....
Gas Sand.....	725	740
Salt Sand.....	795	910
Sand.....	1050	1085
Maxton Sand.....	1200	1235
Little Lime.....	1425	1440
Pencil Cave.....	1440	1456
Big Lime.....	1456	1505
Big Injun Sand (oil and gas, 1620').....	1505	1640
Berea Sand.....	1840	1874
Gordon Stray Sand.....	2145	2160
Gordon Sand.....	2185	2195
Fifth Sand (nice) (gas, 2315').....	2293	2320
Total depth.....		2326

The **Foreman Gas Station**, of the West Virginia Central Gas Company, located on Hackers Creek, 1.7 miles northwest of Berlin, was built in 1911, according to J. F. Cowan, Chief Engineer, and has an equipment consisting of three 1350 horse-

power Snow twin tandem gas engines and two 60 horse-power Westinghouse 3-cylinder vertical gas engines, making a total of 4170 horse-power. The station pumps gas across the Alleghany Mountains to Cumberland, Md., the pressure in the line being 375 pounds in winter and 300 pounds in summer. The gas enters the compressors at a temperature of 68 degrees, Fahrenheit, becomes heated to 225, but is cooled to 94 degrees before going into the line.

Five dry holes have been drilled along Laurel Lick, south of Berlin, being located on the south side of the Grassland Syncline. The three following records are from this locality:

#### May McWhorter No. 2593 Well Record (48).

Hackers Creek District; on Laurel Lick, 1.7 miles south of Berlin; authority, Hope Natural Gas Co.; completed, July 11, 1912; elevation, 1245' L.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	540	555
Big Dunkard Sand.....	655	675
Gas Sand.....	820	835
Second Cow Run Sand.....	965	1040
Salt Sand.....	1050	1125
Maxton Sand.....	1270	1460
Little Lime.....	1730	1740
Pencil Cave.....	1740	1755
<b>Big Lime.....</b>	<b>1755</b>	<b>1815</b>
Big Injun Sand.....	1815	1950
Squaw Sand.....	1955	1968
Berea Sand.....	2055	2075
<b>Fifty-foot Sand (gas, 2102'; water, 2112').....</b>	<b>2100</b>	<b>2190</b>
Thirty-foot Sand.....	2225	2260
Gordon Stray Sand.....	2340	2375
Gordon Sand.....	2396	2420
Fourth Sand.....	2459	2464
Fifth Sand.....	2470	2488
Total depth.....		3001

#### T. S. Stalnaker No. 2619 Well Record (49).

Hackers Creek District; on Laurel Lick, 2.2 miles south of Berlin; authority, Hope Natural Gas Co.; completed, July 29, 1912; elevation, 1100' B.

	Top. Feet.	Bottom. Feet.
Unrecorded (water, 406').....	0	696
Gas Sand.....	696	714
Second Cow Run Sand.....	775	1022
Salt Sand.....	1088	1190

	Top. Feet.	Bottom. Feet.
Salt Sand.....	1224	1263
Salt Sand.....	1272	1331
Maxton Sand.....	1522	1553
Little Lime.....	1553	1573
Pencil Cave.....	1573	1580
Big Lime.....	1580	1660
Big Injun Sand.....	1660	1785
Weir Sand.....	1940	1978
Berea Sand.....	2015	2040
Fifty-foot Sand.....	2048	2068
30-Ft., Stray, Gordon, 4th and 5th Sands—Shells.		
Total depth (dry hole).....		2635

### T. A. Smith No. 1 Well Record (50).

Hackers Creek District; on Laurel Lick, 2.6 miles south of Berlin; authority, W. Va. Central Gas Co.; elevation, 1155' B.

	Top. Feet.	Bottom. Feet.
Slate, red rock, and sand.....	0	195
Coal, Elk Lick.....	195	200
Sand, Little Dnukard (water, 350').....	340	380
Slate and shells (water, 545').....	380	600
Sand, Gas.....	700	760
Sand, Second Cow Run.....	795	840
Sand, Salt.....	900	1040
Sand, Salt.....	1085	1300
Sand and shells.....	1300	1600
Big Lime.....	1600	1690
Sand, Big Injun.....	1690	1830
Sand, Weir (small gas show, 1955').....	1930	1990
Sand, Berea (poor and broken).....	1995	2104
Red rock.....	2104	2250
Sand, Gordon Stray.....	2250	2283
Sand, Gordon.....	2283	2293
Sand, fine, hard, broken, Fifth.....	2403	2470
Slate and shells to bottom.....	2508	2602
No Bayard Sand; conductor, 16'; 10" casing, 204'; 8¼", 1055'; 6½", 1734'.		

The following well is located on the waters of Stonecoal Creek and is a producer, although there are several dry holes both to the northeast and southwest:

## C. S. Taylor No. 2620 Well Record (51).

Hackers Creek District; on Grass Run, 1.1 miles northeast of Gaston; authority, Hope Natural Gas Co.; completed, Aug. 13, 1912; elevation, 1165' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	550	575
Burning Springs Sand.....	600	650
Gas Sand.....	700	760
Second Cow Run Sand.....	800	885
Salt Sand.....	915	1040
Salt Sand.....	1260	1310
Maxton Sand.....	1600	1660
Little Lime.....	1660	1670
Pencil Cave.....	1670	1685
Big Lime (gas, 1700').....	1685	1745
Big Injun Sand.....	1745	1900
Squaw Sand (gas, 1970').....	1960	1975
Berea Sand (water, 2050').....	2005	2065
Fifty-foot Sand.....	2085	2115
Thirty-foot Sand.....	2135	2180
Gordon Stray Sand.....	2280	2335
Gordon Sand.....	2340	2360
Fourth Sand.....	2390	2410
Fifth Sand (gas, 2507').....	2505	2512
Bayard Sand.....	2655	2680
Total depth (filled up to 2565').....		2712

Two dry holes were drilled just west of Gaston, the records of which could not be obtained. According to W. E. Patterson, a resident, the Nathaniel Bush No. 1 (52) was a deep well and made a show of gas, and the Celia Bonnett No. 1 (53) was drilled 2600 feet or more and made enough gas to make a small flame at the top of the hole.

The following is the record of a well that was just being rigged up for drilling when visited. The record shows no gas horizons, indicating that the well was dry:

## Clara Peterson No. 3542 Well Record (54).

Hackers Creek District; on Hilly Upland Run, 1.7 miles northwest of Gaston; authority, Hope Natural Gas Co.; completed, Sept. 22, 1914; elevation, 1140' L.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	463	484
Big Dunkard Sand.....	586	643
Gas Sand.....	726	807
Second Cow Run Sand.....	843	1054
Salt Sand.....	1312	1515

	Top. Feet.	Bottom. Feet.
Maxton Sand.....	1657	1670
Little Lime.....	1676	1681
Pencil Cave.....	1681	1685
Big Lime.....	1685	1737
Big Injun Sand.....	1737	1859
Squaw Sand.....	1987	2003
Berea Sand.....	2064	2100
Gordon Stray Sand.....	2318	2326
Gordon Sand.....	2328	2386
Fifth Sand.....	2544	2547
Total depth.....		2644

The following was reported a light gas well by M. M. Reger of Berlin. It starts 7 feet below an abandoned opening in the Redstone Coal, and that shown at 45 feet in the record is the Pittsburgh:

#### W. E. Rhodes No. 3514 Well Record (55).

Hackers Creek District; 1.4 miles southwest of Berlin; authority, Hope Natural Gas Co.; completed, Aug. 22, 1914; elevation, 1201' L.

	Top. Feet.	Bottom. Feet.
<b>Coal, Pittsburgh.....</b>	42	45
Sand .....	265	280
Sand .....	330	365
Sand, Big Dunkard.....	592	610
Sand, Gas.....	643	708
Sand, Second Cow Run.....	765	873
<b>Sand, Maxton (gas, 1550').....</b>	1550	1672
<b>Big Lime.....</b>	1672	1730
Big Injun Sand.....	1730	1845
<b>Sand, Berea, (gas, 1976') and unrecorded.....</b>	1968	2138
Fifty-foot Sand, thickness unrecorded.....		2138
Sand, Thirty-foot.....	2149	2173
Sand, Gordon Stray.....	2351	2365
Sand, Gordon.....	2369	2407
Sand, Fourth.....	2478	2485
Sand, Fifth.....	2519	2531
Sand, Bayard.....	2611	2614
Total depth.....		2680

#### D. B. Lawson No. 2060 Well Record (56).

Hackers Creek District; 1.1 miles southwest of Berlin; authority, Hope Natural Gas Co.; completed, Dec. 28, 1910; elevation, 1090' B.

	Top. Feet.	Bottom. Feet.
<b>Coal, Harlem.....</b>		220
Sand, Big Dunkard.....	450	510
Sand, Gas.....	600	705

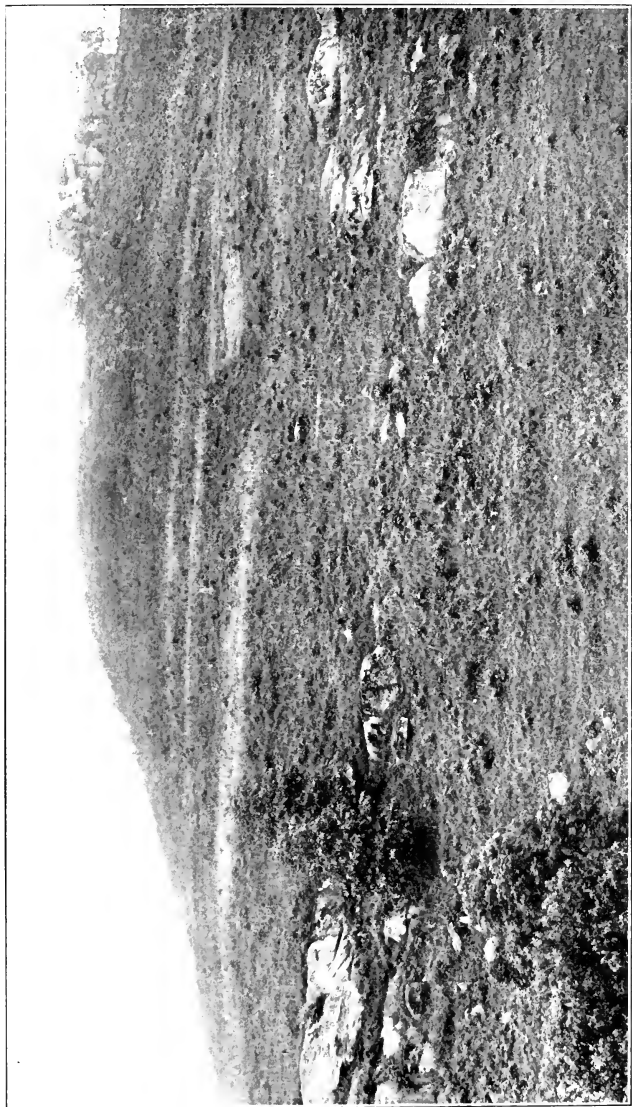


PLATE XV.—View on Alum Fork, 1 mile north of Alum Bridge, Lewis County, Sewickley Sandstone on ridge is eroded into "Haystack Rocks;" Lower Pittsburgh Sandstone in foreground; Topography of the Monongahela and Conemaugh Series.





	Top. Feet.	Bottom. Feet.
Sand, Second Cow Run.....	770	815
Sand, Salt.....	850	905
Sand, Salt.....	950	1045
Sand, Maxton.....	1385	1495
Little Lime.....	1506	1510
Pencil Cave.....	1510	1514
Big Lime.....	1514	1590
Big Injun Sand.....	1590	1715
Sand, Berea.....	1830	....
Sand, Fifty-foot (gas, 1899').....		1875
Total depth.....		1949

10" casing, 334'; 8¼", 1045'; 6½", 1590'.

### Elizabeth Lawson No. 3268 Well Record (57).

Hackers Creek District; 1.1 miles N. 80° W. of Berlin; authority, Hope Natural Gas Co.; completed, July 10, 1914; elevation, 1492' B.

	Top. Feet.	Bottom. Feet.
Coal, Redstone.....	260	264
Coal, streak, Little Pittsburgh.....		350
Sand, Moundsville.....	620	640
Sand, Big Dunkard.....	844	872
Sand, Gas.....	1020	1105
Sand, Second Cow Run (water, 1140').....	1134	1164
Sand, Salt (water, 1480').....	1190	1600
Little Lime.....	1330	1840
Pencil Cave.....	1840	1860
Big Lime (gas show, 1908').....	1861	1910
Big Injun Sand.....	1910	2090
Sand, Squaw.....	2110	2135
Sand, Weir.....	2137	2180
Sand, Berea.....	2205	2262
Sand, Fifty-foot (little gas, 2300'; water to drill, 2305') .....	2285	2375
Sand, Thirty-foot.....	2390	2447
Sand, Gordon Stray.....	2555	2565
Sand, Gordon.....	2583	2600
Sand, Fifth (some gas).....	2730	2745
Sand, Bayard.....	2807	2817
Total depth.....		2989

40/10 in 2" casing; 10" casing, 196'; 8¼", 1209'; 6½", 1919"; light gas well.

### Andrew Lunsford No. 2049 Well Record (58).

Hackers Creek District; on Lifes Run, 2.4 miles west of Berlin; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1122' L.

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard (water).....	420	480
Sand, Gas.....	550	630

	Top. Feet.	Bottom. Feet.
Sand, Second Cow Run.....	645	690
Sand, Salt.....	730	770
Sand, Salt.....	810	920
Sand, Maxton.....	1035	1050
Big Lime.....	1520	1600
Sand, Big Injun.....	1600	1690
Sand, Squaw.....	1740	1920
Sand, Thirty-foot.....	2060	2080
Sand, Gordon Stray.....	2090	2150
Sand, Gordon (gas).....	2205	2230
Total depth.....		2450

Several good gas wells have been drilled along Smith Run, with production in various sands, ranging from the Big Injun to the Fifth. The four following records are from this region:

#### Wm. Woodyard No. 2048 Well Record (59).

Hackers Creek District; on Smith Run, 3.3 miles northeast of Weston; authority, Pittsburgh & W. Va. Gas Co.; completed, Dec. 8, 1910; elevation, 1255' B.

	Top. Feet.	Bottom. Feet.
Sand, Maxton, and unrecorded.....	1530	1653
Big Lime.....	1653	1750
Sand, Big Injun.....	1750	1834
Sand, Fifty-foot, and unrecorded (gas).....	2050	2145
Sand, Thirty-foot (gas).....	2145	2160
Sand, Gordon Stray.....	2180	2195
Sand, Gordon.....	2235	2310
Sand, Fourth (gas).....	2360	2387
Sand, Fifth (gas).....	2487	2490
Total depth.....		2530

#### Richard N. Norman No. 1 Well Record (60).

Hackers Creek District; on Smith Run, 3.0 miles east of Weston; authority, W. Va. Central Gas Co.; completed, July 14, 1914; elevation, 1165' B.

	Top. Feet.	Bottom. Feet.
Slate and shells (water, 100').....	0	530
Sand, Big Dunkard.....	530	632
Sand, Burning Springs.....	640	655
Sand, Gas.....	750	800
Sand, Second Cow Run.....	825	865
Sand, Salt.....	950	1025
Sand, Salt.....	1190	1274
Sand, Maxton.....	1300	1416
Little Lime.....	1530	1570
Pencil Cave.....	1570	1580

	Top. Feet.	Bottom. Feet.
<b>Big Lime</b> .....	1590	1685
<b>Sand, Big Injun (gas, 1705')</b> .....	1685	1755
Shells .....	1755	1930
Sand, Berea.....	1930	1945
Sand, Fifty-foot.....	2005	2045
Sand, Thirty-foot.....	2060	2075
Sand, Gordon Stray.....	2238	2250
Sand, Gordon.....	2254	2297
<b>Sand, Fourth (gas, 2317-42')</b> .....	2312	2342
Sand, Fifth (broken, no gas).....	2436	2450
Slate to bottom.....	2450	2645
Conductor, 16'; 10" casing, 303'; 8¼", 908'; 6⅝", 1628'; volume, 500,000 cu. ft.		

The following well starts about 10 feet above the level of the Redstone Coal, making that found at 150 feet the Little Clarksburg. The thickness is probably exaggerated in the record:

#### W. M. Harrison No. 4088 Well Record (61).

Hackers Creek District; 2.7 miles east of Weston; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1210' B.

	Top. Feet.	Bottom. Feet.
<b>Coal, Little Clarksburg</b> .....	150	155
Sand, Big Dunkard.....	620	690
Sand, Gas.....	720	740
Sand, Second Cow Run.....	845	960
Sand, Salt.....	1008	1118
Sand, Salt.....	1255	1300
<b>Big Lime</b> .....	1650	1710
<b>Sand, Big Injun (gas)</b> .....	1710	1865
<b>Sand, Berea (gas)</b> .....	2025	2053
Sand, Fifty-foot.....	2105	2140
Sand, Thirty-foot.....	2156	2172
Sand, Gordon.....	2357	2376
Sand, Fifth.....	2509	2514
Sand, Bayard.....	2590	2600
Total depth.....		2675

#### Wm. Reger No. 2045 Well Record (62).

Hackers Creek District; on Smith Run, 2.3 miles northeast of Weston; authority, Pittsburgh & W. Va. Gas Co.; completed, Jan. 10, 1911; elevation, 1060' B.

	Top. Feet.	Bottom. Feet.
Sand .....	12	62
Sand, Little Dunkard.....	300	340
Sand, Gas.....	640	685

	Top. Feet.	Bottom. Feet.
Sand, Second Cow Run.....	760	845
Sand, Salt.....	895	935
Sand, Salt.....	965	1100
Sand, Maxton.....	1320	1345
Big Lime.....	1370	1494
Sand, Big Injun (gas).....	1494	1583
Sand, Squaw.....	1613	1653
Sand, Berea.....	1680	1720
Sand, Fifty-foot.....	1833	1857
Sand, Thirty-foot.....	1875	1900
Sand, Gordon Stray.....	1930	1945
Sand, Gordon.....	1960	1990
Sand, Fourth (gas) and unrecorded.....	2015	2236
Sand, Fifth (gas).....	2236	2249
Total depth.....		2272

The John Rombach No. 1 (63) was drilled to the Fifth Sand, which, according to J. C. Roane, was dry, but made 650,000 cubic feet of gas in the Fifty-foot.

The three following wells were drilled along Stonecoal Creek, above Smith Run:

### Edwin Maxwell No. 3 Well Record (64).

Hackers Creek District; on Stonecoal Creek; 1.2 miles southeast of Weston; authority, American Carbon Co.; elevation, 1020' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand and unrecorded (water, 400')	350	655
Gas Sand and unrecorded.....	655	720
Coal, Lower Kittanning, and unrecorded.....	720	735
Second Cow Run Sand and unrecorded.....	735	810
Coal, Mercer, and unrecorded.....	810	950
Salt Sand and unrecorded.....	950	1170
Red rock and unrecorded.....	1170	1385
Maxton Sand and unrecorded.....	1385	1435
Little Lime and unrecorded.....	1435	1480
Big Lime and unrecorded.....	1480	1530
Big Injun Sand and unrecorded.....	1530	1760
Squaw Sand and unrecorded.....	1760	1872
Berea Sand and unrecorded.....	1872	1945
Fifty-foot Sand and unrecorded.....	1945	1995
Thirty-foot Sand and unrecorded.....	1995	2100
Gordon Stray Sand and unrecorded.....	2100	2276
Fifth Sand and unrecorded to bottom.....	2276	2303
Conductor, 16"; 10" casing, 190'; 8¼", 566' 8"; 6⅝", 1644' 8".		

## M. W. Harrison No. 1923 Well Record (65).

Hackers Creek District; on Stonecoal Creek, 1.5 miles southeast of Weston; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1050' B.

	Top. Feet.	Bottom. Feet.
Coal, Bakerstown.....	330	335
Coal, Lower Kittanning.....	...	684
Sand, Second Cow Run.....	715	787
Sand, Salt.....	1035	1175
Sand, Salt.....	1255	1312
Sand, Salt.....	1422	1445
Big Lime.....	1490	1540
Sand, Big Injun.....	1540	1668
Sand, Berea (gas).....	1900	1940
Sand, 30-Ft. (gas).....	1995	2020
Sand, Gordon Stray.....	2035	2065
Sand, Gordon.....	2090	2140
Sand, Fifth.....	.....	2316
Total depth.....	.....	2402

## A. M. Smith No. 1911 Well Record (67).

Hackers Creek District; on Stonecoal Creek, 2.5 miles southeast of Weston; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1020' B.

	Top. Feet.	Bottom. Feet.
Coal, Bakerstown.....	320	326
Big Lime.....	1462	1540
Sand, Big Injun.....	1540	1665
Sand, Berea.....	1860	1915
Sand, Fifty-foot.....	1974	1982
Sand, Thirty-foot.....	2020	2063
Sand, Gordon Stray.....	2089	2127
Sand, Gordon (gas).....	2160	2220
Sand, Fourth.....	2295	2304
Sand, Fifth.....	2378	2390
Total depth.....	.....	2402

Several wells have been drilled along Stonecoal Creek near the point where the Grassland Syncline crosses the stream, some of which have produced oil. The **Elias Lawson No. 1 (68)** was abandoned as a dry hole.

The following well showed both gas and oil, but was abandoned:

## D. T. Peterson No. 1 Well Record (69).

Hackers Creek District; on Stonecoal Creek, 2.5 miles southeast of Weston; authority, Crude Oil Co.; completed, Jan. 13, 1913; elevation, 1020' B.

	Top. Feet.	Bottom. Feet.
Unrecorded (water, 47').....	0	200
<b>Coal, Harlem</b> .....	200	207
Unrecorded (water, 7 bailers, 240').....	207	450
Sand, Big Dunkard (hole full water, 457').....	450	540
<b>Sand, Gas</b> , (gas and oil, 652').....	645	690
Sand, Second Cow Run (water).....	720	780
Sand, Salt.....	793	922
Sand, Salt.....	978	1040
Sand, Salt.....	1088	1259
Sand, Maxton.....	1450	1464
Little Lime.....	1472	1485
<b>Big Lime</b> .....	1488	1575
<b>Big Injun Sand</b> (oil show, 1655'; gas, 1665').....	1575	1668
Sand, Squaw.....	1673	1733
Sand, Berea.....	1848	1875
Sand, Gantz.....	1945	1970
Sand, Fifty-foot.....	2025	2040
Red rock.....	2070	2075
Sand, Thirty-foot.....	2120	2135
Sand, Gordon Stray.....	2145	2165
Sand, Gordon.....	2178	2210
Sand, Fourth.....	2223	2253
Sand, Fifth.....	2263	2368
Total depth.....		2481

10" casing, 149'; 8¼", 803'; 6⅝", 1576'.

The **James Peterson No. 1 (70)**, completed in December, 1913 made 25 to 30 barrels of oil in the Big Injun Sand and six months later was making 2 to 3 barrels. The **John Peterson No. 1 (71)** made about 3 barrels when drilled, but had declined to 1 barrel July 1, 1914. The following well, drilled only a few hundred feet from the others, made no oil and showed only a little gas, being abandoned as a dry hole:

## John Peterson No. 1 Well Record (72).

Hackers Creek District; on Stonecoal Creek, 2.7 miles southeast of Weston; authority, Hope Natural Gas Co.; elevation, 1025' B.

	Top. Feet.	Bottom. Feet.
Unrecorded (water, 18' and 70').....	0	400
Sand, Little Dunkard.....	400	430
Sand, Big Dunkard.....	474	518
Sand, Second Cow Run.....	679	799

	Top. Feet.	Bottom. Feet.
Sand, Salt.....	861	950
Sand, Salt.....	1110	1190
Sand, Salt.....	1215	1255
Sand, Maxton (little water, 1496', 3 bailers per hour) .....	1486	1508
Little Lime.....	1547	1563
Pencil Cave.....	1563	1570
<b>Big Lime</b> .....	1570	1624
<b>Sand, Big Injun</b> (gas, 1633'; show, 1688-90').....	1624	1753
<b>Sand, Weir</b> (gas, 1900').....	1880	1904
Sand, Berea.....	1950	1990
Slate .....	1990	2006
Sand, Fifty-foot.....	2006	2020
Sand, Gordon Stray.....	2180	2211
Sand, Gordon.....	2252	2272
Total depth.....		2684
Conductor, 16"; 10" casing, 190"; 8¼", 828"; 6½", 1686"; no Fifth Sand, only shells; dry hole.		

The following well was drilled several years ago and was a large producer from the Berea Sand, not only supplying fuel for all Weston, but also running a carbon black factory, according to Karl Hoskins, Superintendent of the Columbian Carbon Company, of Weston:

### Edwin Maxwell No. 1 Well Record (73).

Hackers Creek District; on Stonecoal Creek, 0.8 mile east of Weston; authority, American Carbon Co.; elevation, 1005' B.

	Thickness Feet.	Total Feet.
Conductor .....	15	15
Rock .....	5	20
Slate .....	50	70
Sand, Murphy.....	15	85
Red rock.....	45	130
Slate .....	50	180
Red rock.....	50	230
Slate .....	35	265
Red shale.....	75	340
Slate .....	25	365
<b>Coal, Brush Creek</b> .....	2	367
Slate .....	13	380
Sand, Big Dunkard and Burning Springs.....	210	590
Shale, black.....	8	598
Sand, Gas.....	28	626
<b>Coal, Lower Kittanning</b> .....	6	632
Sand, Second Cow Run.....	163	795
Slate .....	45	840
Sand, Salt.....	284	1124
Red rock.....	180	1204

	Top. Feet.	Bottom. Feet.
Sand .....	30	1234
Red rock.....	11	1245
Lime .....	8	1253
Red rock.....	11	1264
Lime .....	41	1305
Sand, Maxton.....	58	1363
Red rock.....	5	1368
Sand .....	8	1376
Lime .....	14	1390
Slate, Pencil.....	32	1422
Big Lime.....	88	1510
Sand, Big Injun.....	72	1582
Slate .....	5	1587
Sand, Squaw.....	28	1615
Slate .....	175	1790
Lime shell.....	20	1810
Slate .....	36	1846
Sand, Berea (gas) to bottom.....	41	1887
(Drilled deeper, Dec. 2, 1912):		
Sand, Berea.....	13	1900
Unrecorded.....	40	1940
Sand, Fifty-foot.....	45	1985
Unrecorded .....	15	2000
Sand, Gordon.....	160	2160
Unrecorded .....	110	2270
Sand, Fifth (light gas, 2275') to bottom.....	14	2284
10" casing, 165'; 8", 735"; 6 5/8", 1485'; 3" tubing, 1887'.		

The two following wells were drilled along Stonecoal Creek opposite Weston:

#### W. N. McGary No. 1 Well Record (74).

Hackers Creek District; on Stonecoal Creek, 1/2 mile northeast of Weston Station; authority, Clarksburg Light & Heat Co.; completed in 1901; elevation, 1030' B.

	Top. Feet.	Bottom. Feet.
Sand .....	15	27
Slate .....	27	45
Red rock.....	205	220
Slate and shells and unrecorded.....	220	370
Red rock.....	370	470
Sand, Big Dunkard.....	470	493
Sand, Second Cow Run (water).....	708	793
Sand, Salt.....	793	883
Sand, Salt.....	1013	1033
Sand, Maxton.....	1225	1412
Little Lime.....	1412	1532
Big Lime.....	1532	1634
Sand, Berea, (little gas).....	1845	1888
Slate, shells and sand.....	1888	2110
Sand, Gordon Stray.....	2110	2143



	Top. Feet.	Bottom. Feet.
Sand, Gordon.....	2143	2262
Sand, Fifth.....	2262	2268
Total depth.....		2274

"This is an old well and records kept at that time were not accurate." Conductor, 12'; 10" casing, 215'; 8", 715'; 6 $\frac{5}{8}$ ", 1490'; 3" tubing, 2274'; well made 498,0000 cu. ft. of gas.

### Wm. Donlan No. 2077 Well Record (75).

Hackers Creek District; 0.7 mile northeast of Weston; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1220' L.

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard.....	550	620
Coal, Lower Kittanning.....	775	778
Sand, Salt (oil).....	1100	1290
Sand, Maxton.....	1470	1510
Big Lime.....	1548	1628
Sand, Big Injun.....	1628	1850
Sand, Berea.....	1870	1910
Sand, Fifty-foot (gas).....	2000	2020
Sand, Thirty-foot.....	2120	2150
Sand, Gordon Stray.....	2160	2200
Sand, Gordon (gas).....	2206	2318
Sand, Fourth.....	2328	2355
Sand, Fifth (gas).....	2463	2469
Total depth.....		2497

The Samuel Hardman No. 1 (76), at Deanville, made 1,000,000 cubic feet of gas in the Fifth Sand, according to J. C. Roane.

The following is a detailed record of another well near by:

### J. C. Roane No. 1 Well Record (77).

Hackers Creek District; on West Fork River, at Deanville; authority, Deanville Gas Co.; elevation, 1037' L.

	Top. Feet.	Bottom. Feet.
Coal, Bakerstown.....	185	188
Sand, Big Dunkard.....	300	340
Sand, Gas (some gas and oil, 503-5'; water 547')..	355	570
Sand, Salt.....	572	628
Sand, Salt (water, 649').....	635	670
Coal.....	730	734
Sand, Salt.....	811	875
Sand, Salt.....	885	1008
Sand, Maxton.....	1272	....
Little Lime.....	1304	1328
Big Lime.....	1328	1400
Sand, Big Injun.....	1400	1530
Sand, Berea.....	1605	1623

	Top. Feet.	Bottom. Feet.
Sand, Fifty-foot.....	1777	1810
Sand, Thirty-foot.....	1903	....
Sand, Gordon Stray.....	1988	2000
Sand, Gordon.....	2012	2040
Sand, Fourth.....	2060	2068
Sand, Fifth (gas, 1,250,000 cu. ft.; rock pressure, 590 lbs.).....	2169	2193
10" casing, 225'; 8¼", 815'; 6⅝", 1400'.		

Numerous gas wells have been drilled along Maxwell Run, located well up toward the axis of the Chestnut Ridge Anticline, and all have been producers, from sands ranging from the Big Injun to the Fifth. The five following records are from this territory:

#### E. W. Smith, Jr., No. 4113 Well Record (79).

Hackers Creek District; 0.7 mile east of Deanville; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1150' B.

	Top. Feet.	Bottom. Feet.
Sand .....	...	110
Sand, Gas.....	535	612
Sand, Second Cow Run.....	650	710
Sand, Salt (gas).....	893	1100
Sand, Maxton.....	1352	1366
Big Lime.....	1390	1454
Sand, Big Injun (gas).....	1454	1675
Sand, Fifty-foot (gas).....	1890	1922
Sand, Gordon Stray.....	2008	2054
Sand, Fourth.....	2130	2200
Sand, Fifth (gas).....	2291	2308
Total depth.....		2481

#### W. G. Bennett No. 2363 Well Record (80).

Hackers Creek District; on West Fork River, 0.7 mile northeast of Deanville; authority, Hope Natural Gas Co.; completed, Jan. 9, 1912; elevation, 1028' L.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	225	275
Burning Springs Sand.....	325	420
Gas Sand (water, 460').....	455	555
Second Cow Run Sand.....	570	625
Salt Sand.....	750	925
Maxton Sand (water, 1190').....	1170	1272
Pencil Cave.....	1272	1280
Big Lime.....	1280	1335
Big Injun Sand (gas, 1440').....	1335	1465

	Top. Feet.	Bottom. Feet.
Fifty-foot Sand.....	1710	1731
Thirty-foot Sand.....	1815	1866
Gordon Stray Sand.....	1895	1990
<b>Fourth Sand</b> (gas, 2021').....	2006	2031
<b>Fifth Sand</b> (gas, 2126').....	2122	2140
Total depth.....		2154

### Isaac Anglin No. 4009 Well Record (81).

Hackers Creek District; on West Fork River, 2.0 miles northeast of Weston; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1092' L.

	Top. Feet.	Bottom. Feet.
Sand, Maxton.....	1240	1330
<b>Big Lime</b> (oil show).....	1360	1410
<b>Sand, Big Injun</b> (gas show).....	1410	1555
Sand, Berea.....	1800	1815
<b>Sand, Fifty-foot</b> (gas).....	1900	1945
Sand, Thirty-foot.....	1948	?
<b>Sand, Fourth</b> (gas).....	2187	2204
Total depth.....		2218

### Andrew Edmiston No. 2805 Well Record (82).

Hackers Creek District; on Maxwell Run, 1.5 miles northeast of Deanville; authority, Hope Natural Gas Co.; completed, Apr. 8, 1913; elevation, 1070' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	342	360
Burning Springs Sand.....	475	525
Gas Sand.....	540	595
Salt Sand.....	635	700
Salt Sand.....	740	978
Maxton Sand.....	1150	1245
Little Lime.....	1255	
Pencil Cave.....		Breaks
<b>Big Lime</b> .....		1350
Big Injun Sand.....	1350	1425
Squaw Sand.....	1540	1585
Berea Sand.....	1600	1622
Fifty-foot Sand.....	1665	1705
Thirty-foot Sand.....	1774	1806
Gordon Stray Sand.....	1830	1930
Gordon Sand.....	1930	1950
Fourth Sand.....	1960	1974
<b>Fifth Sand</b> (gas, 2115').....	2110	2133
Total depth.....		2505

## F. C. Farinash No. 2055 Well Record (83).

Hackers Creek District; on Maxwell Run, 2.3 miles northeast of Deanville; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1390' B.

	Top. Feet.	Bottom. Feet.
Sand, Burning Springs.....	520	625
Sand, Gas.....	637	677
Sand, Salt.....	793	883
Big Lime.....	1518	1598
Sand, Big Injun.....	1598	1740
Sand, Fifty-foot (gas show).....	1960	2000
Sand, Thirty-foot (gas).....	2010	2050
Sand, Gordon Stray (gas).....	2100	2115
Sand, Fourth.....	2267	2275
Total depth.....		2582

The four following records are of wells drilled along Lifes Run of Hackers Creek, where all the farms seem to be good gas territory. Production ranges from the Berea to the Fifth Sand:

## Noah Life No. 4063 Well Record (84).

Hackers Creek District; on Lifes Run, 2.5 miles S. 10° W. of Jane Lew; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1360' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	20	25
Coal, Bakerstown.....	429	432
Sand, Big Dunkard.....	510	568
Sand, Gas.....	735	778
Sand, Second Cow Run.....	830	845
Sand, Salt.....	927	984
Sand, Salt.....	1075	1142
Big Lime.....	1583	1639
Sand, Big Injun.....	1639	1797
Sand, Berea (gas).....	1965	1972
Sand, Fifty-foot.....	2078	2089
Sand, Thirty-foot (gas).....	2124	2139
Sand, Gordon Stray.....	2285	2311
Sand, Gordon (gas).....	2349	2367
Sand, Fourth.....	2347	2446
Sand, Fifth (gas).....	2455	2475
Total depth.....		2518

## G. J. Sutton No. 4055 Well Record (85).

Hackers Creek District; on Lifes Run, 2.6 miles northwest of Berlin; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1110' B.

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard.....	358	395
Sand, Gas.....	470	515
Sand, Second Cow Run.....	530	600
Sand, Salt.....	634	740
Sand, Salt.....	760	905
Sand, Maxton.....	1305	1380
Big Lime.....	1412	1465
Sand, Big Injun.....	1465	1596
Sand, Berea.....	1763	1798
Sand, Fifty-foot (gas show).....	1820	1845
Sand, Thirty-foot (gas).....	1911	1935
Sand, Gordon Stray.....	2088	2100
Sand, Gordon.....	2128	2163
Sand, Fourth.....	2203	2205
Sand, Fifth.....	2325	2331
Total depth.....		2349

## John C. Strahley No. 1 Well Record (86).

Hackers Creek District; on Lifes Run, 2.7 miles northwest of Berlin; authority, W. Va. Central Gas Co.; completed, Aug. 29, 1914; elevation, 1295' B.

	Top. Feet.	Bottom. Feet.
Slate and shells.....	0	515
Sand, Big Dunkard.....	515	555
Sand, Gas.....	695	740
Sand, Second Cow Run.....	800	840
Sand, Salt.....	890	945
Sand, Salt.....	970	1110
Sand, Salt.....	1170	1225
Sand, Maxton.....	1470	1515
Little Lime.....	1520	1540
Pencil Cave.....	1540	1555
Big Lime.....	1555	1610
Sand, Big Injun.....	1610	1710
Sand, Squaw.....	1710	1755
Sand, Berea (gas, 1938-50').....	1936	1962
Sand, Thirty-foot (gas, 2091-6').....	2080	2100
Sand, Gordon Stray.....	2170	2185
Sand, Gordon.....	2220	2235
Sand, Fourth (gas, 2323-7').....	2305	2332
Sand, Fifth, to bottom.....	2425	2439
10" casing, 330'; 8¼", 1035'; 6½", 1598'; volume,		2,750,000
cu. ft.		

## Noah Life No. 2051 Well Record (87).

Hackers Creek District; on Lifes Run, 2.5 miles south of Jane Lew; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1050' B.

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard.....	300	350
Sand, Burning Springs.....	375	410
Sand, Gas.....	415	475
Sand, Second Cow Run.....	625	705
Sand, Salt.....	710	855
Sand, Salt.....	870	930
Sand, Maxton.....	1205	1245
<b>Big Lime</b> .....	1294	1336
Sand, Big Injun.....	1336	1472
Sand, Berea.....	1635	1674
Sand, Fifty-foot.....	1715	1765
Sand, Thirty-foot.....	1795	1825
Sand, Gordon.....	1997	2035
Sand, Fourth.....	2071	2108
<b>Sand, Fifth (gas)</b> .....	2144	2148
Total depth.....		2178

Several good gas wells have been drilled along West Run south of Jane Lew, where the territory all seems good on account of its proximity to the Chestnut Ridge Anticline. The two following records are from this locality:

## W. G. Taylor No. 2056 Well Record (88).

Hackers Creek District; 1.8 miles S. 30° W. of Jane Lew; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1245' B.

	Top. Feet.	Bottom. Feet.
Sand, Salt.....	995	1060
Sand, Maxton.....	1290	1305
<b>Big Lime</b> .....	1400	1445
Sand, Big Injun.....	1445	1525
Sand, Berea.....	1765	1800
Sand, Gantz.....	1845	1870
Sand, Fifty-foot.....	1880	1900
<b>Sand, Thirty-foot (gas)</b> .....	1935	1958
Sand, Gordon.....	2130	2145
Sand, Fourth.....	2165	2177
Total depth.....		2691

## S. J. Waggoner No. 1 Well Record (91).

Hackers Creek District; on West Run, 0.3 mile south of Jane Lew; authority, W. Va. Central Gas Co.; completed, May 11, 1914; elevation, 1015' L.

	Thickness Feet.	Total Feet.
Gravel, slate and sand.....	120	120
Sand, Little Dunkard (water, 145').....	60	180
Unrecorded .....	125	305
Sand, Big Dunkard.....	20	325
Slate ... ..	8	333
Unrecorded .....	5	338
Sand, Gas.....	25	363
Coal, Lower Kittanning.....	3	366
Slate and red rock.....	99	465
Sand, Second Cow Run (water, 475').....	70	535
Slate .....	85	620
Sand, Salt.....	65	685
Slate and shells.....	105	790
Sand, Salt.....	38	828
Slate and red rock.....	317	1145
Little Lime.....	23	1168
Pencil Cave.....	6	1174
Big Lime.....	51	1225
Sand, Big Injun.....	102	1345
Slate and shells.....	190	1535
Sand, Berea (small gas, 1540').....	25	1560
Slate .....	50	1610
Sand, Fifty-foot.....	50	1660
Shells .....	35	1695
Sand, Thirty-foot.....	12	1707
Slate .....	129	1836
Sand, Gordon Stray.....	74	1910
Slate, black .....	5	1915
Sand, Gordon (gas, 1954').....	43	1958
Slate and shells.....	89	2047
Sand, Fifth.....	9	2056
Unrecorded to bottom.....	19	2075

Conductor, 16"; 10" casing, 297'; 8¼", 727'; 6½", 1263'; volume, 1,000,000 cu. ft.

The record of the Porter Maxwell No. 1 (92) gas well, located on a branch of Sycamore Lick, is published in the Jane Lew Section, page 47. It made gas from the Fifty-foot Sand. The following is the record of the first large gas well drilled in the county. It was previously published in Volume I(A) of the Survey, page 354. Some changes in correlation have been made to harmonize with the evidence offered by the great number of wells drilled since this record was published:

## A. W. Woodford No. 1 Well Record (93).

Hackers Creek District; on West Fork River, 1.0 mile south of Jackson Mill; authority, Federal Oil Co.; elevation, 1030' B.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	16
Coal, <b>Brush Creek</b> .....	135	141
Coal, <b>Upper Kittanning</b> .....	380	388
Sand, Gas (gas and water).....	400	480
Unrecorded, lime, hard slate and unrecorded.....	480	780
Sand, hard, Salt.....	780	960
Slate and lime.....	960	1000
Red rock.....	1000	1010
Slate .....	1010	1100
Shells, hard, slate, red and black, and lime, hard..	1100	1290
Unrecorded .....	1290	1320
<b>Big Lime</b> .....	1320	1370
Sand, Keener.....	1370	1380
Sand, Big Injun.....	1380	1460
Unrecorded, slate and shells.....	1460	1680
Sand, <b>Berea</b> (little gas).....	1680	1700
Slate and shells.....	1700	1790
Sand, Fifty-foot.....	1790	1805
Sand, Gordon Stray.....	1880	1900
Red rock.....	1930	1935
Unrecorded and sand, <b>Gordon</b> (little gas).....	1935	2036
Sand, Fourth.....	2036	2056
Slate .....	2056	2127
Sand, <b>Fifth</b> (gas).....	2127	2142
"Good gas well from Fifth Sand."		

The two following wells are located near the point where the Wolf Summit and Chestnut Ridge Anticlines intersect, at Jackson Mill:

## W. A. Arnold No. 6 Well Record (94).

Hackers Creek District; on West Fork River, 0.2 mile southeast of Jackson Mill; authority, W. Va. Central Gas Co.; completed, Jan. 7, 1914; elevation, 1110' B.

	Top. Feet.	Bottom. Feet.
Slate and shells.....	0	64
Coal, <b>Bakerstown</b> .....	64	68
Sand, Big Dunkard.....	160	210
Sand, Burning Springs.....	270	318
Sand, Gas (water, 380-9').....	370	400
Sand, Salt.....	545	580
Sand, Salt (water, 864-80').....	752	890
Sand, Maxton.....	948	997
Little Lime.....	1193	1209
Pencil Cave.....	1209	1232



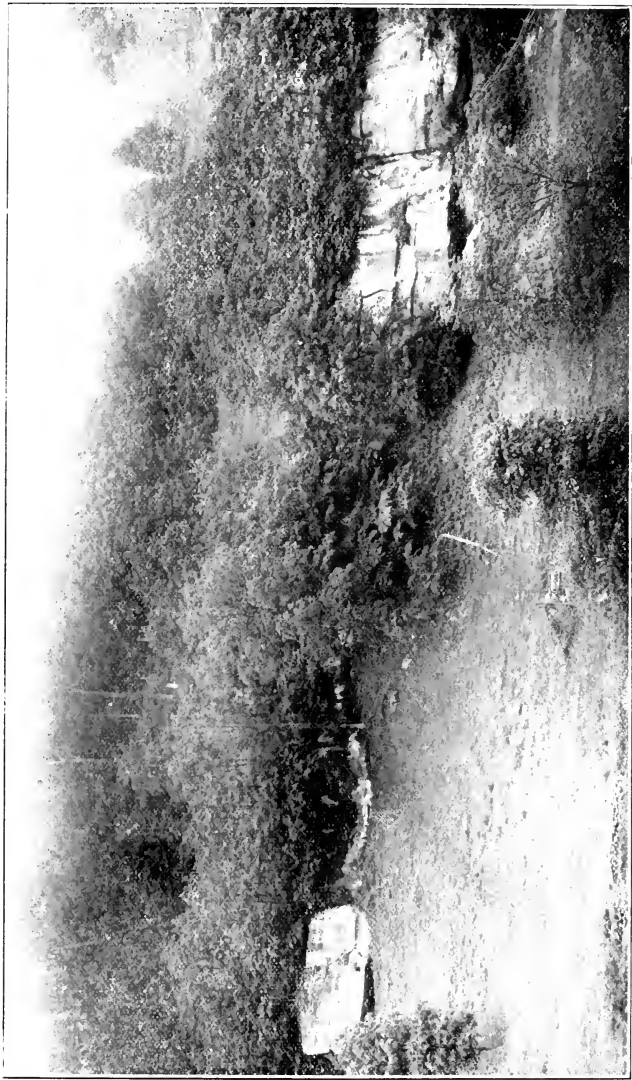


PLATE XVI.—Lower Pittsburgh Sandstone, on Alum Fork, 0.7 mile north of Alum Bridge; the alum spring is located beneath the ledge at the right; Topography of the Monongahela and Conemaugh Series.



	Top. Feet.	Bottom. Feet.
Big Lime.....	1232	1291
Sand, Big Injun (small gas, 1390').....	1291	1410
Sand, Squaw.....	1478	1492
Sand, Berea.....	1608	1633
Sand, Fifty-foot.....	1681	1719
Sand, Gordon Stray.....	1821	1845
Sand, Gordon.....	1853	1952
Sand, Fourth.....	1995	2005
Sand, Fifth (gas).....	2078	2098
Total depth.....		2111
Conductor, 16; 8 $\frac{1}{4}$ " casing, 911'; 6 $\frac{3}{8}$ ", 1374'; volume, 1,000,000 cu. ft.		

### Hays Heirs No. 243 Well Record (95).

Hackers Creek District; on West Fork River, 0.4 mile east of Jackson Mill; authority, Reserve Gas Co.; completed, May 4, 1910; elevation, 1250' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	320	350
Big Dunkard Sand.....	390	470
Gas Sand.....	510	565
Second Cow Run Sand.....	615	640
Salt Sand.....	660	780
Maxton Sand.....	1100	1135
Big Lime.....	1362	1426
Big Injun Sand (gas, 1526').....	1426	1551
Squaw Sand.....	1554	1660
Berea Sand.....	1800	1830
Gordon Stray Sand.....	1960	2000
Gordon Sand.....	2040	
Fourth Sand.....		2145
Fifth Sand (gas, 2224-32').....	2223	2253
Total depth.....		2257

The two following records present the stratigraphic succession along Sycamore Lick, where numerous wells have been drilled:

### A. J. Hardman No. 1 Well Record (96).

Hackers Creek District; on Sycamore Lick, 1.6 miles northeast of Jackson Mill; authority, Brannon et al.; elevation, 1020' B.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	13
Unrecorded (2 bailers water, 58').....	13	59
Coal, Bakerstown.....	59	61
Sand, Little Dunkard.....	85	116
Sand, Big Dunkard.....	140	238
Sand, Gas (3 bailers water, 475').....	250	490

	Top. Feet.	Bottom. Feet.
Sand, Salt.....	506	725
Sand, Salt.....	756	861
Sand, Salt.....	880	993
Red rock.....	993	1143
Little Lime.....	1143	1173
Pencil Cave.....	1173	1188
Big Lime.....	1188	1248
Big Injun Sand.....	1248	1371
Berea Sand.....	1648	1670
Fifty-foot Sand.....	1796	1826
Gordon Sand.....	1923	1958
Fifth Sand (gas).....	2068	2085
Total depth.....		2093

### Hebron Church No. 1 Well Record (98).

Hackers Creek District; 0.8 mile southwest of Jane Lew; authority, Raven Carbon Co.; elevation, 1130' B.

	Top. Feet.	Bottom. Feet.
Coal, Bakerstown.....	160	164
Sand, Little Dunkard.....	190	210
Sand, Big Dunkard.....	233	320
Sand, Burning Springs.....	420	475
Sand, Gas (water, 9 bailers, 560').....	517	590
Sand, Second Cow Run.....	590	670
Sand, Salt.....	850	870
Sand, Salt.....	875	910
Sand, Salt.....	960	975
Sand, Maxton (water, 1240', 2 bailers; gas, 1205-25').....	1200	1260
Little Lime.....	1262	1268
Pencil Cave.....	1275	1282
Big Lime.....	1282	1338
Sand, Big Injun (little gas, 1372').....	1338	1440
Sand, Squaw.....	1445	1480
Sand, Weir.....	1670	1675
Sand, Berea.....	1685	1700
Sand, Fifty-foot.....	1790	1796
Sand, Thirty-foot.....	1913	1928
Sand, Gordon.....	2000	2010
Sand, Fifth (gas, 2165-70').....	2160	2178
Total depth.....		2200
Conductor, 16'; 10" casing, 140'; 8¼", 808'; 6⅝", 1368' 6"; shot 5th Sand with 60 qts.		

A large number of wells have been drilled in the extreme northwestern part of the district, along the Wolf Summit Anticline. All have produced gas in various sands, ranging from the Salt to the Fifth. The nine following records are from this locality:

## J. H. Ramsburg No. 3515 Well Record (99).

Hackers Creek District; on West Fork River, 0.5 mile southeast of Lightburn; authority, Hope Natural Gas Co.; completed, Aug. 8, 1914; elevation, 1065' B.

	Top. Feet.	Bottom. Feet.
Coal, Bakerstown.....	69	70
Little Dunkard Sand.....	165	200
Big Dunkard Sand.....	345	394
Gas Sand.....	435	475
Second Cow Run Sand (water, 525').....	519	541
Salt Sand (water, 845').....	825	885
Maxton Sand.....	1051	1100
Little Lime.....	1125	1144
Pencil Cave.....	1144	1166
Big Lime.....	1166	1220
Big Injun Sand.....	1220	1325
Squaw Sand.....	1353	1368
Weir Sand.....	1370	1400
Berea Sand.....	1535	1540
Gantz Sand.....	1632	1669
Fifty-foot Sand.....	1716	1725
Thirty-foot Sand.....	1765	1775
Gordon Stray Sand.....	1778	1815
Gordon Sand.....	1875	1915
Fifth Sand (gas, 2031-53').....	2028	2056
Slate.....	2056	2315
Sand, Warren? or Speechley?.....	2345	2359
Sand.....	2414	2435
Total depth.....		2807

## M. O. Brown No. 403 Well Record (100).

Hackers Creek District; on Broad Run, 1.0 mile southeast of Lightburn; authority, Carnegie Natural Gas Co.; completed, Aug. 28, 1913; elevation, 1080' B.

	Top. Feet.	Bottom. Feet.
Unrecorded (water, 1215').....	0	1220
Pencil Cave.....	1220	1232
Big Lime.....	1232	1296
Sand, Keener.....	1296	1318
Sand, Big Injun.....	1318	1338
Sand, Berea and Fifty-foot (gas, 1691'; water, 1694').....	1600	1743
Sand, Gordon Stray.....	1938	1947
Sand, Gordon.....	1947	1990
Sand, Fourth.....	2036	2053
Sand, Fifth (gas).....	2110	2130
Total depth.....		2144

Conductor, 13'; 10" casing, 160"; 6 $\frac{5}{8}$ "<sup>2</sup>, 1348' 10"; 5 $\frac{1}{8}$ "<sup>2</sup>, 1714'; 3" tubing, 2144'.

## L. M. Allman No. 3057 Well Record (101).

Hackers Creek District; on Broad Run, 0.8 mile southeast of Lightburn; authority, Hope Natural Gas Co.; elevation, 1050' B.

	Thickness, Total.	
	Feet.	Feet.
Conductor .....	10	10
Sand .....	10	20
Slate .....	5	25
Sand, Moundsville (water).....	20	45
Unrecorded .....	25	70
Coal, Bakerstown.....	2	72
Slate and unrecorded.....	70	142
Coal, Brush Creek .....	4	146
Slate .....	9	155
Sand, Big Dunkard.....	80	235
Slate and lime.....	130	365
Sand, Burning Springs (water, 385').....	30	395
Slate .....	25	420
Lime .....	10	430
Sand, Gas.....	40	470
Slate .....	10	480
Lime .....	15	495
Sand, Second Cow Run.....	45	540
Slate .....	5	545
Lime sand, Salt.....	70	615
Black lime.....	280	895
Sand, Salt, (gas, 900').....	45	940
Red rock.....	65	1005
Lime .....	20	1025
Red rock.....	30	1055
Sand, Maxton.....	62	1117
Slate .....	4	1121
Little Lime.....	54	1175
Pencil Cave.....	10	1185
Big Lime.....	90	1275
Sand, Big Injun.....	100	1375
Slate and shale.....	110	1485
Lime .....	55	1540
Sand, Berea.....	15	1555
Shells .....	90	1645
Sand, Fifty-foot.....	30	1675
Slate .....	10	1685
Sand (salt water, 1687').....	15	1700
Slate .....	35	1735
Sand, Thirty-foot.....	10	1745
Slate .....	20	1765
Lime .....	20	1785
Red rock.....	5	1790
Lime .....	10	1800
Sand .....	10	1810
Slate .....	5	1815
Sand, Gordon Stray, broken.....	20	1835
Red rock and sand shells.....	60	1895
Sand, Gordon.....	37	1932
Slate .....	8	1940

	Thickness. Total	
	Feet.	Feet.
Sand, Fourth.....	30	1970
Slate .....	85	2055
Sand, Fifth (gas, 2058-70').....	18	2073
Slate to bottom.....	89	2162
10" casing, 232'; 8", 821'; 6 $\frac{5}{8}$ ", 1295'; 5 3-16", 1675'; shot with 40 qts.		

## L. M. Allman No. 2855 Well Record (102).

Hackers Creek District; on Broad Run, 0.6 mile east of Lightburn; authority, Hope Natural Gas Co.; elevation, 1060' B.

	Thickness. Total	
	Feet.	Feet.
Conductor .....	16	16
Unrecorded .....	59	75
Slate .....	5	80
Coal, Bakerstown.....	2	82
Lime .....	33	115
Sand, Little Dunkard.....	25	140
Slate .....	10	150
Coal, Brush Creek.....	2	152
Slate .....	13	165
Sand .....	40	205
Slate .....	7	212
Sand, Big Dunkard.....	38	250
Lime .....	30	280
Slate .....	10	290
Lime .....	10	300
Sand, Burning Springs.....	50	350
Slate .....	5	355
Lime .....	20	375
Sand, Gas.....	20	395
Slate, black (little water, 398').....	5	400
Lime .....	25	425
Slate .....	25	450
Sand .....	30	480
Slate .....	35	515
Sand, Second Cow Run.....	35	550
Slate, black.....	70	620
Sand, Salt.....	30	650
Slate .....	25	675
Lime .....	10	685
Slate .....	5	690
Lime .....	20	710
Sand, Salt.....	30	740
Unrecorded .....	115	855
Sand, Salt.....	20	875
Slate .....	45	920
Lime, sandy (gas, 922').....	15	935
Slate .....	10	945
Red rock.....	55	1000
Lime .....	20	1020
Red rock.....	10	1030

	Thickness. Total.	
	Feet.	Feet.
Lime .....	45	1075
Sand, Maxton.....	65	1140
Slate .....	2	1142
Little Lime.....	8	1150
Pencil Cave.....	25	1175
<b>Big Lime.....</b>	<b>125</b>	<b>1300</b>
Sand, Big Injun (gas, 1348').....	75	1375
Lime shells.....	65	1440
Slate and shells.....	45	1485
Lime .....	60	1545
Slate .....	5	1550
Sand, Berea.....	10	1560
Slate .....	90	1650
Sand, Fifty-foot (hole full water, 1650').....	35	1685
Slate .....	5	1690
Shells .....	55	1745
Sand, Thirty-foot (gas, 1750').....	9	1754
Slate .....	36	1790
Red rock.....	5	1795
Slate and shells.....	15	1810
Red rock.....	2	1812
Sand, Gordon Stray.....	10	1822
Red rock and sand shells.....	88	1910
Sand and slate, broken.....	8	1918
Sand, Gordon.....	12	1930
Slate .....	5	1935
Sand, Fourth.....	5	1940
Slate .....	35	1975
Lime .....	15	1990
Slate .....	76	2066
Sand, Fifth (gas, 2067-75').....	16	2082
Slate to bottom.....	117	2199
10" casing, 210'; 8", 823'; 6 5/8", 1310'; 5 3/16", 1686'.		

### C. A. Bailey No. 405 Well Record (103).

Hackers Creek District; on Broad Run, 0.7 mile east of Lightburn; authority, Carnegie Natural Gas Co.; elevation, 1050' B.

	Top. Feet.	Bottom. Feet.
Unrecorded (water, 725').....	0	1185
Pencil Cave.....	1185	1195
<b>Big Lime.....</b>	<b>1195</b>	<b>1280</b>
Sand, Big Injun.....	1295	1385
Sand, Berea.....	1605	1615
Unrecorded (hole full water, 1654').....	1615	1654
Sand, Fifty-foot.....	1654	1721
Sand, Gordon Stray.....	1900	1910
Sand, Gordon.....	1930	1945
Sand, Fourth.....	1945	2005
Sand, Fifth (gas).....	2062	2082
Total depth.....		2097

Conductor, 16"; 8 1/4" casing, 860'; 6 5/8", 1715'; 3" tubing, 2097'.



## J. A. J. Lightburn No. 300 Well Record (104).

Hackers Creek District; on Broad Run, 0.2 mile east of Lightburn; authority, Reserve Gas Co.; completed, Sept. 20, 1910; elevation, 1000' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	145	182
Big Dunkard and Burning Springs Sands, (fresh water, 340').....	202	369
Gas Sand (fresh water, 400').....	390	450
Salt Sand.....	590	700
Maxton Sand.....	1000	1030
Little Lime.....	1070	1080
Pencil Cave.....	1080	1100
<b>Big Lime</b> .....	1100	1190
Big Injun Sand.....	1190	1250
Squaw Sand.....	1285	1300
Berea Sand.....	1460	1485
<b>Fifty-foot Sand</b> (gas, 1580').....	1575	1620
Gordon Stray Sand.....	1715	1825
<b>Fifth Sand</b> (gas, 1974-80').....	1973	1996
Total depth.....		2015

## W. W. Wimer No. 369 Well Record (105).

Hackers Creek District; on West Fork River, 0.3 mile northeast of Lightburn; authority, Reserve Gas Co.; elevation, 1030' B.

	Thickness Feet.	Total Feet.
Clay .....	20	20
Quicksand .....	8	28
Slate and red rock.....	47	75
Sand, Moundsville.....	10	85
<b>Coal, Bakerstown</b> .....	2	87
Lime .....	73	160
Slate .....	20	180
Sand, Little Dunkard.....	30	210
Slate .....	25	235
Sand, Big Dunkard.....	35	270
Unrecorded .....	3	273
Slate .....	7	280
Lime .....	10	290
Slate .....	10	300
Sand, Burning Springs.....	55	355
Lime .....	50	405
<b>Coal, Lower Kittanning</b> .....	3	408
Sand .....	8	416
Lime .....	44	460
Sand .....	50	510
Slate .....	10	520
Sand, Second Cow Run.....	30	550
Slate .....	25	575
Sand, Salt.....	10	585

	Thickness. Total.	
	Feet.	Feet.
Slate .....	35	620
Sand, Salt.....	15	635
Lime .....	30	665
Sand, Salt.....	60	725
Slate .....	35	760
Lime .....	20	780
Slate .....	15	795
Lime, sandy.....	20	815
Slate .....	5	820
Lime, sandy.....	40	860
Slate .....	35	895
Lime .....	15	910
Slate .....	10	920
Red rock.....	25	945
Slate .....	40	985
Sand, Maxton.....	30	1015
Red rock, slate and sand shells.....	100	1115
Little Lime, broken.....	25	1140
Pencil Cave.....	10	1150
<b>Big Lime</b> .....	95	1245
Red rock.....	25	1270
Sand, Big Injun.....	70	1340
Slate .....	15	1355
Lime .....	10	1365
Slate .....	95	1460
Lime .....	30	1490
Slate .....	15	1505
<b>Sand, Berea (gas, 1510-28')</b> .....	30	1535
Slate and shells.....	80	1615
Sand, Fifty-foot.....	35	1650
Slate .....	5	1655
Sand, Thirty-foot.....	10	1665
Sand shells.....	83	1748
Sand .....	16	1764
Break .....	22	1786
Sand, Gordon Stray.....	9	1795
Red rock.....	5	1800
Sand, Gordon.....	95	1895
Slate .....	5	1900
Sand, Fourth.....	25	1925
Slate .....	5	1930
Lime .....	25	1955
Slate .....	60	2015
<b>Sand, Fifth (gas, 2017-25')</b> .....	15	2030
Slate and shells to bottom.....	53	2083
13" pipe, 28'; 10" casing, 273'; 8¼", 810'; 6⅝", 1280'; 5 3/16", 1796'.		

## Samuel G. Hall No. 3456 Well Record (106).

Hackers Creek District; 1.1 miles northeast of Lightburn; authority, Hope Natural Gas Co.; completed, July 16, 1914; elevation, 1195' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	235	300
Big Dunkard Sand.....	320	445
Gas Sand.....	474	525
Second Cow Run Sand (gas, 580').....	538	700
Salt Sand.....	910	1030
Maxton Sand (gas, 1276').....	1220	1283
Little Lime.....	1285	1295
Pencil Cave.....	1295	1300
Big Lime.....	1300	1355
Big Injun Sand (gas, 1433').....	1520?	1535
Sandy shells.....		
Berea Sand (gas, 1700-6').....	1695	1723
Gantz Sand.....	1808½	1838
Fifty-foot Sand (gas, 1902').....	1893	1905
Thirty-foot Sand.....	1946	1961
Gordon Stray Sand.....	1970	1995
Gordon Sand.....	2005	2045
Fifth Sand (gas, 2230').....	2215	2235
Total depth.....		2324

## Richard Beeghley No. 448 Well Record (108).

Hackers Creek District; on West Fork River, 0.7 mile north of Lightburn; authority, Reserve Gas Co.; elevation, 1025' B.

	Thickness Feet.	Total Feet.
Conductor .....	16	16
Unrecorded .....	4	20
Clay .....	2	22
Slate .....	48	70
Sand, Moundsville (hole full water, 80').....	30	100
Coal, Bakerstown.....	1	101
Blue limestone.....	34	135
Slate .....	25	160
Lime .....	40	200
Sand, Little Dunkard.....	35	235
Slate .....	51	286
Sand, Big Dunkard.....	21	307
Slate .....	42	349
Lime .....	7	356
Sand, Gas (hole full water, 357').....	15	371
Lime .....	9	380
Slate .....	53	433
Sand, Second Cow Run.....	127	560
Slate .....	5	565
Lime .....	26	581
Sand, Salt.....	10	591

	Thickness. Total.	
	Feet.	Feet.
Lime .....	9	600
Slate .....	36	636
Sand, Salt.....	106	742
Lime .....	83	825
Sand .....	53	878
Lime .....	39	917
Slate .....	72	989
Sand, Maxton.....	13	1002
Red rock.....	90	1092
Little Lime.....	7	1099
Pencil Cave.....	13	1112
Big Lime.....	82	1194
Sand, Big Injun (some gas, 1275').....	151	1345
Slate .....	1	1346
Sand, Squaw.....	54	1400
Slate .....	16	1416
Lime .....	24	1440
Slate .....	55	1495
Lime .....	24	1519
Sand, Berea (gas, 1544-8').....	37	1556
Slate .....	67	1623
Sand, Gantz (2 bailers water, 1630').....	35	1658
Slate .....	10	1668
Sand, Fifty-foot.....	12	1680
Slate .....	30	1710
Sand, Thirty-foot (gas, 1714-7').....	17	1727
Slate .....	23	1750
Lime, pink.....	5	1755
Red lime and sand.....	55	1810
Sand, Gordon Stray.....	42	1852
Slate .....	1	1853
Sand, Gordon.....	47	1900
Slate .....	6	1906
Sand .....	14	1920
Slate .....	5	1925
Sand, Fourth.....	16	1941
Slate .....	4	1945
Sand .....	22	1967
Slate .....	46	2013
Sand, Fifth (gas, 2033-7').....	25	2038
Unrecorded to bottom.....	38	2076

10" casing, 329'; 8", 787'; 6 $\frac{1}{2}$ ", 1227'; 5  $\frac{3}{16}$ ", 1647'.

**Prospective Oil and Gas Areas, Hackers Creek District.**—Hackers Creek District has been thoroughly tested, with the result that nearly all of its area is known to be good gas territory except that portion lying along the axis of the Grassland Syncline, where few gas wells of any value have been secured, while several dry holes have been drilled. Outside of this particular belt, the entire district may be considered safe gas territory. Attention is called to the following localities:

(1), that portion of the Hackers Creek Valley northwest and east of Jane Lew, which seems good for gas in sands ranging from the Berea to the Fifth, and possibly for oil in the Big Injun or Gordon Sands; (2), a strip of territory about one mile wide and four miles long lying immediately southeast of the Chestnut Ridge Anticline, and extending from the Harrison Line to Hackers Creek, apparently good for gas in sands ranging from the Berea to the Fifth; (3), along the Grassland Syncline near Stonecoal Creek, where there is a possibility of oil in the Big Injun on both branches of Mud Run, and along the axis of the syncline east of Hilly Upland Run.

### *Detailed Well Records, Freemans Creek District.*

Freemans Creek District is situated in northwestern Lewis, next to Harrison and Doddridge, and extends from the West Fork River, on the east, to the Gilmer Line, on the west. The Chestnut Ridge Anticline crosses it, making a large part of it ideal territory for gas, as the development shown on Map II will prove. The northwestern part of the district, next to the Doddridge Line, where the measures dip to a comparatively low level in a gentle monocline, has proved to be rich in oil from the Berea Sand. Drilling has been done in nearly all parts of the district, but numerous farms remain untested and the number of wells will ultimately be nearly twice as great as at the present time. Production of gas ranges from the Salt to the Fifth Sand, while oil has been found in the Salt, Big Injun, Berea and Fifth, and in a few other sands in minor quantities. For the benefit of future operators, a large number of records from this district will be published in the succeeding pages.

The northeast corner of the district, next to the Wolf Summit Anticline, has produced a large amount of gas from the Berea and other sands down to the Fifth. The four following records are from this region:

## Wm. Beeghley No. 442 Well Record (110).

Freemans Creek District; 1.1 miles northwest of Lightburn; authority, Reserve Gas Co.; elevation, 1215' B.

	Thickness Total.	
	Feet.	Feet.
Clay (conductor).....	12	12
Red rock and slate.....	100	112
Sand .....	53	165
Slate .....	78	243
Rock, pink.....	42	285
Slate .....	7	292
Coal, Bakerstown.....	3	295
Slate .....	20	315
Sand (2 bailers water, 325').....	40	355
Slate .....	18	373
Sand, Little Dunkard.....	25	398
Slate .....	47	445
Lime .....	55	500
Slate .....	30	530
Sand, Big Dunkard.....	15	545
Slate .....	30	575
Lime .....	20	595
Shells .....	45	640
Slate, black.....	15	655
Lime, sandy.....	15	670
Slate .....	20	690
Sand, Gas.....	100	790
Slate .....	35	825
Lime .....	10	835
Slate .....	42	877
Lime .....	13	890
Sand, Second Cow Run.....	145	1035
Shells .....	22	1057
Sand, Salt.....	48	1105
Slate .....	5	1110
Lime .....	15	1125
Slate .....	53	1178
Sand, Salt.....	47	1225
Red rock.....	90	1315
Sand, Maxton.....	5	1320
Slate .....	22	1342
Little Lime.....	13	1355
Pencil Cave.....	22	1377
Big Lime .....	64	1441
Sand, Big Injun (little gas, 1460'; oil and water, 1498') .....	133	1574
Slate .....	20	1594
Sand, Squaw.....	44	1638
Slate .....	92	1730
Lime .....	15	1745
Slate .....	5	1750
Sand, Berea (gas, 1765-9').....	27	1777
Slate .....	38	1815
Sand, Fifty-foot (gas, 1855-75').....	60	1875
Slate .....	91	1966

	Thickness. Feet.	Total. Feet.
Lime, red.....	2	1968
Slate .....	2	1970
<b>Sand, Thirty-foot</b> (gas, 1990').....	22	1992
Red rock.....	18	2010
Sand, Gordon Stray.....	5	2015
Red rock.....	4	2019
<b>Sand, Gordon</b> (little gas, 2068').....	103	2122
Slate .....	3	2125
Sand, Fourth.....	10	2135
Shells .....	15	2150
Slate .....	10	2160
Lime .....	10	2170
Unrecorded .....	70	2240
<b>Sand, Fifth</b> (gas, 2252-60').....	28	2268
Slate to bottom.....	15	2283
8¼" casing, 832'; 6⅝", 1463'; 5⅜", 1863'.		

### J. M. Beeghley No. 436 Well Record (111).

Freemans Creek District; 1.1 miles northwest of Lightburn; authority, Reserve Gas Co.; elevation, 1215' B.

	Thickness Feet.	Total. Feet.
Red mud (conductor, 16').....	50	50
Slate .....	65	115
Sand (little water, 125').....	48	163
Slate .....	82	245
Rock, pink.....	40	285
Slate .....	13	298
<b>Coal, Bakerstown</b> .....	2	300
Slate .....	15	315
Sand .....	45	360
Slate .....	5	365
Rock, pink.....	10	375
Sand, Little Dunkard.....	25	400
Slate .....	65	465
Lime .....	10	475
Slate .....	30	505
Lime .....	45	550
Sand, Big Dunkard.....	15	565
Slate .....	10	575
Lime .....	10	585
Slate .....	65	650
Slate, black.....	24	674
Sand .....	6	680
Slate .....	13	693
Sand, Gas.....	92	785
Unrecorded .....	4	789
Sand, Second Cow Run.....	21	810
Slate .....	10	820
Lime .....	20	840
Slate .....	15	855
Lime .....	25	880
Slate .....	5	885

	Thickness. Feet.	Total. Feet.
Lime .....	35	920
Sand, Salt.....	75	995
Lime .....	10	1005
Sand, Salt.....	25	1030
Slate .....	8	1038
Lime .....	12	1050
Slate .....	10	1060
Sand, Salt.....	60	1120
Slate .....	75	1195
Sand, Maxton.....	47	1242
Red rock, very hard.....	108	1350
Little Lime.....	15	1365
Pencil Cave.....	30	1395
Big Lime.....	57	1452
Sand, Big Injun (gas, 1479'; water, 2 bailers, 1512') .....	130	1582
Slate .....	15	1597
Sand, Squaw.....	43	1640
Slate .....	70	1710
Lime .....	35	1745
Slate .....	10	1755
Sand, Berea (gas, 1768-71').....	27	1782
Slate .....	43	1825
Sand, broken, Fifty-foot.....	60	1885
Shells and slate.....	88	1973
Red rock.....	2	1975
Slate .....	10	1985
Sand, Thirty-foot (gas, 1989-91').....	11	1996
Red rock.....	26	2022
Sand, Gordon Stray.....	8	2030
Red rock.....	5	2035
Sand, Gordon (little gas, 2063' and 2110').....	98	2133
Slate .....	2	2135
Sand, Fourth.....	15	2150
Slate .....	97	2247
Sand, Fifth (gas, 2248½-2268').....	32	2279
Slate to bottom.....	10	2289
10" casing, 165'; 8", 833'; 6½", 1470'; 5⅜", 2035'.		

### Sarah E. Hinzman No. 263 Well Record (113).

Freemans Creek District; on West Fork River, 1.0 mile northwest of Lightburn; authority, Reserve Gas Co.; completed, May 5, 1910; elevation, 1075' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	280	310
Burning Springs Sand.....	370	420
Gas Sand (water, 570').....	517	605
Second Cow Run Sand.....	675	720
Salt Sand.....	725	830
Maxton Sand.....	1125	1135
Little Lime.....	1150	1163
Pencil Cave.....	1163	1170



	Top. Feet.	Bottom. Feet.
Big Lime.....	1190	1266
Big Injun Sand (gas, 1290').....	1266	1375
Squaw Sand.....	1400	1430
Berea Sand (gas, 1588').....	1578	
Total depth.....		1603

### Anna C. Barb No. 380 Well Record (115).

Freemans Creek District; on West Fork River,  $\frac{1}{2}$  mile north of Lightburn; authority, Reserve Gas Co.; elevation, 1005' B.

	Thickness Feet.	Total. Feet.
Clay .....	18	18
Sand .....	20	38
Slate .....	5	43
Coal, Bakerstown.....	2	45
Slate .....	10	55
Sand .....	20	75
Red rock.....	5	80
Lime .....	10	90
Sand, Little Dunkard.....	20	110
Slate .....	8	118
Coal, Brush Creek.....	2	120
Unrecorded .....	30	150
Sand .....	20	170
Slate .....	5	175
Sand, Big Dunkard.....	40	215
Lime .....	15	230
Slate .....	35	265
Sand .....	20	285
Lime .....	15	300
Slate .....	10	310
Lime .....	20	330
Sand, Gas.....	44	374
Slate .....	6	380
Coal, Lower Kittanning (little gas and 2 bailers of water).....	2	382
Shells .....	39	421
Sand, Second Cow Run.....	79	500
Slate, black.....	10	510
Sand, Salt.....	23	533
Slate .....	29	562
Coal, Mercer.....	3	565
Lime .....	10	575
Slate .....	5	580
Lime .....	20	600
Sand, Salt.....	95	695
Slate .....	15	710
Lime .....	30	740
Slate .....	25	765
Lime .....	35	800
Sand, Salt.....	40	840
Slate .....	7	847

	Thickness.	Total.
	Feet.	Feet.
Sand shells.....	3	850
Slate .....	50	900
Lime .....	60	960
Red rock.....	5	965
Lime .....	20	985
Red rock.....	70	1055
Lime .....	5	1060
Slate .....	20	1080
Lime .....	15	1095
Slate .....	15	1110
Red rock.....	7	1117
<b>Big Lime (oil, 1152')</b> .....	103	1220
Slate .....	5	1225
Red rock.....	3	1228
<b>Sand, Big Injun (gas, 1253-9')</b> .....	87	1315
Slate .....	15	1330
Lime .....	20	1350
Sand, Squaw.....	20	1370
Slate and shells.....	90	1460
Lime .....	10	1470
Slate .....	15	1485
Lime .....	10	1495
<b>Sand, Berea (gas, 1500-10')</b> .....	20	1515
Unrecorded .....	60	1575
Slate .....	25	1600
Sand, Gantz.....	25	1625
Slate .....	10	1635
Sand, Fifty-foot.....	10	1645
Sand shell.....	30	1675
<b>Sand, Thirty-foot (gas, 1680-3')</b> .....	18	1693
Slate .....	22	1715
Red rock.....	3	1718
Slate and shells.....	7	1725
Sand .....	9	1734
Sand shells.....	50	1784
Sand, Gordon Stray.....	11	1795
Slate .....	5	1800
Sand, Gordon.....	35	1835
Slate .....	5	1840
Sand, Fourth.....	50	1890
Slate .....	110	2000
<b>Sand, Fifth (gas, 2003-10')</b> .....	25	2025
Slate to bottom.....	50	2075

10" casing, 183'; 8", 770'; 6 $\frac{5}{8}$ ", 1240'; 5 $\frac{3}{8}$ ", 1795'.

The **Hoe Lick Gas Station**, of Rinehart and Beeghley, located on Hoe Lick Run, 1 mile northwest of Lightburn, designed to pump the production of this firm into the main lines of the Pittsburgh and West Virginia Gas Company, is equipped with one Bessemer 165 horse-power engine, and delivers gas into the line at 220 pounds pressure.

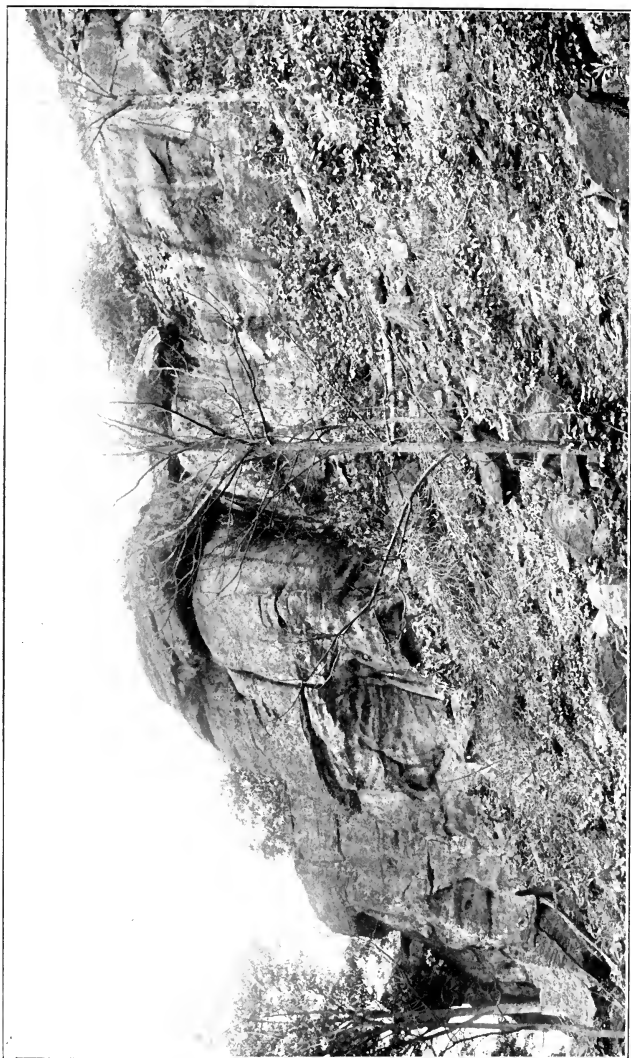


PLATE XVII.—Sewickley Sandstone cliff in hill just northwest of Orlando.



Three wells have been drilled along Turkeypen Creek, the record of one of which is as follows:

### H. L. Frashuer No. 484 Well Record (117).

Freemans Creek District; on Turkeypen Creek, 1.1 miles south-east of Mineral; authority, Reserve Gas Co.; elevation, 1210' B.

	Top. Feet.	Bottom. Feet.
Coal, Redstone.....	80	84
Coal, Pittsburgh.....	137	142
Coal, Bakerstown.....	560	568
Lime .....	635	720
Sand, Gas.....	720	930
Sand, Second Cow Run.....	965	1010
Sand, Salt.....	1040	1215
Sand, Salt.....	1330	1350
Sand, Maxton.....	1410	1440
Little Lime.....	1560	1580
Pencil Cave.....	1580	1600
Big Lime.....	1600	1675
Sand, Big Injun.....	1675	1790
Sand, Berea (gas, 1986').....	1878	2002
Sand, Fifty-foot.....	2070	2090
Sand, Thirty-foot.....	2155	2195
Sand, Gordon Stray.....	2200	2230
Red rock.....	2230	2237
Sand, Gordon (set packer, 2262').....	2237	2312
Sand, Fourth (gas, 2317').....	2317	2325
Total depth.....		2349

Conductor, 16'; 10" casing, 162'; 8", 1042'; 6", 1681'; 5", 2162'.

Some gas wells have been drilled along Millstone Run of Freemans Creek, of which the two following records are available:

### Geo. and Spillman Norris No. 1 Well Record (118).

Freemans Creek District; on Millstone Run, 2.0 miles northwest of Jackson Mill; authority, Reed Goe et al.; completed, 1914; elevation, 1125' B.

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard.....	380	427
Sand, Burning Springs.....	450	500
Sand, Gas.....	525	608
Sand, Second Cow Run.....	630	800
Sand, Salt.....	830	960
Sand, Salt (gas, 1060').....	1055	1078
Sand, Maxton.....	1250	1280
Little Lime.....	1325	1348
Pencil Cave.....	1348	1375

	Top. Feet.	Bottom. Feet
Big Lime.....	1375	1433
Sand, Big Injun.....	1433	1527
Sand, Berea (gas, 1720').....	1715	1733
Sand, Fifty-foot.....	1800	1827
Sand, Thirty-foot.....	1870	1912
Sand, Gordon Stray.....	1957	1983
Sand, Gordon.....	2000	2074
Sand, Fifth (gas, 2203' and 2209').....	2201	2217
Total depth.....		2228

### J. S. Norris No. 2 Well Record (118A).

Freemans Creek District; on Millstone Run, 2.1 miles northwest of Jackson Mill; authority, Reserve Gas Co.; completed, March 11, 1910; elevation, 1055' B.

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard.....	340	390
Sand, Salt.....	750	830
Big Lime.....	1300	1370
Sand, Big Injun.....	1370	1460
Sand, Berea (strong gas pressure, 1630' and 1645') .....	1630	
Total depth.....		1675
10" casing, 327'; 8½", 810'; 6⅝", 1408'; rock pressure, 1125 lbs.		

The record of the above well was published in Volume I(A) of the Survey Reports, page 359, together with a discussion of its extraordinary rock pressure by I. C. White.

The **Kennedy Gas Station**, of the Reserve Gas Company, located on Freemans Creek, 1.8 miles northwest of Jackson Mill, according to Charles Linsey, Chief Engineer, has an equipment including 3 Westinghouse 1350 H. P., and two 675 H. P. tandem gas engines, making a total of 5400 horse-power. The gas is pumped to Wheeler and Sugar Grove, Ohio, through several lines of various sizes. The discharge pressure in winter is 425 pounds and in summer 250 to 300 pounds.

The **Reed Gas Station**, of the Pittsburgh and West Virginia Gas Company, located on Freemans Creek, 1.3 miles northeast of Freemansburg, according to H. P. Huff, Engineer, was built in 1910 and has an equipment that includes two 1500 H. P. Nordberg-Corliss cross compound steam engines, making a total of 3000 horse-power. The gas is pumped to Pittsburgh, Pa., the discharge pressure varying from 175 to 350 pounds. The suction temperature is about 73 degrees

Fahrenheit and the discharge 200, the hot discharge gas being cooled by running the lines through a pond of water.

The two following records represent the formations encountered along McCann Run:

### Peter C. Allman No. 278 Well Record (119).

Freemans Creek District; on McCann Run, 1.5 miles west of Lightburn; authority, Reserve Gas Co.; completed, June 4, 1910; elevation, 1225' B.

	Top. Feet.	Bottom. Feet.
Moundville Sand.....	130	180
Little Dunkard Sand.....	285	330
Burning Springs Sand.....	520	545
Second Cow Run Sand.....	600	920
Salt Sand.....	930	1000
Little Lime.....	1355	1363
Pencil Cave.....	1363	1370
<b>Big Lime.....</b>	<b>1370</b>	<b>1481</b>
Big Injun Sand.....	1481	1590
<b>Berea Sand (gas, 1772').....</b>	<b>1770</b>	
Total depth.....		1778

### McKinley-Barth No. 488 Well Record (120).

Freemans Creek District; on McCann Run, 0.9 mile west of Lightburn; authority, Reserve Gas Co.; completed, July 2, 1914; elevation, 1145' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	290	315
Big Dunkard Sand.....	450	485
Gas Sand.....	590	725
<b>Second Cow Run Sand (gas, 850').....</b>	<b>815</b>	<b>900</b>
Salt Sand.....	985	1038
Maxton Sand.....	1100	1130
Little Lime.....	1290	1305
Pencil Cave.....	1305	1310
<b>Big Lime.....</b>	<b>1310</b>	<b>1370</b>
Big Injun Sand.....	1370	1510
Squaw Sand.....	1530	1560
<b>Berea Sand (gas, 1695').....</b>	<b>1693</b>	<b>1723</b>
Fifty-foot Sand.....	1786	1806
Thirty-foot Sand.....	1904	1918
Gordon Stray Sand.....	1960	1980
Gordon Sand.....	1990	2050
Fourth Sand.....	2055	2060
<b>Fifth Sand (gas, 2172-86').....</b>	<b>2169</b>	<b>2202</b>
Total depth.....		2207

The following well is near the intersection of the Wolf Summit and Chestnut Ridge Anticlines:

## Ella Clifton No. 1 Well Record (121).

Freemans Creek District; on West Fork River at Jackson Mill; authority, Raven Carbon Co.; elevation, 1015' B.

	Top. Feet.	Bottom. Feet.
Sand .....	8	50
Sand, Little Dunkard.....	100	135
Sand, Big Dunkard (water, 150').....	180	225
Sand, Gas.....	238	300
Sand, Second Cow Run (water, flowed, 380').....	345	394
Sand, Salt.....	414	530
Sand, Salt.....	650	805
Sand, Maxton.....	841	870
Little Lime.....	1075	1095
Big Lime.....	1120	1178
Sand, Big Injun.....	1178	1312
Sand, Squaw.....	1320	1340
Sand, Weir.....	1440	1470
Sand, Berea.....	1480	1505
Sand, Gantz.....	1510	1540
Sand, Fifty-foot.....	1575	1628
Sand, Thirty-foot.....	1720	1744
Sand, Gordon Stray.....	1749	1753
Sand, Gordon.....	1793	1818
Sand, Fourth.....	1863	1883
Sand, Fifth (gas, 1975').....	1973	1988
Total depth.....		2000

Conductor, 8'; 10" casing, 185'; 8¼", 766'; 6⅝", 1225'; shot, Sept. 14, 1912.

Near the mouth of Freemans Creek and along Geelick Run, a large number of gas wells have been drilled, with production ranging from the Maxton to the Fifth Sand. The eight following records are from this locality:

## Sophia A. Butcher No. 383 Well Record (123).

Freemans Creek District; on Freemans Creek, 0.7 mile west of Jackson Mill; authority, Reserve Gas Co.; completed, Jan. 26, 1913; elevation, 1065' B.

	Top. Feet.	Bottom. Feet.
Burning Springs Sand.....	320	400
Gas Sand.....	420	500
Second Cow Run Sand.....	610	750
Salt Sand.....	850	895
Maxton Sand (gas, 1123').....	1115	1185
Pencil Cave.....	1185	1190
Big Lime.....	1190	1250
Big Injun Sand.....	1250	1385
Squaw Sand.....	1395	1410
Berea Sand.....	1540	1565



	Top. Feet.	Bottom. Feet.
Gantz Sand.....	1631	1675
Fifty-foot and Thirty-foot Sands.....Shells		
Gordon Stray Sand.....	1780	1800
Gordon Sand.....	1840	1875
Fourth Sand (gas, 1950').....	1925	1950
Fifth Sand (gas, 2054').....	2050	2080
Total depth.....		2121

### John W. Norris No. 40 Well Record (124).

Freemans Creek District; on Freemans Creek, 1 mile southwest of Jackson Mill; authority, Reserve Gas Co.; completed, Feb. 6, 1909; elevation, 1135' B.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	16
Sand, Moundsville.....	180	200
Big Dunkard Sand.....	350	370
Sand, Gas.....	504	585
Second Cow Run Sand.....	660	700
Salt Sand.....	785	964
Black slate.....	964	984
Blue slate.....	984	1035
Red rock.....	1035	1100
Lime .....	1100	1184
Maxton Sand (gas at 1187') to bottom.....	1184	1198

### E. S. Butcher No. 1 Well Record (126).

Freemans Creek District; on Geelick Run, 1 mile southwest of Jackson Mill; authority, W. Va. Central Gas Co.; elevation, 1010' B.

	Top. Feet.	Bottom Feet.
Coal, Upper Kittanning.....	306	318
Unrecorded (water, 4-8 bailers, 410').....	318	555
Coal, Mercer.....	555	560
Unrecorded (salt water, 790').....	560	910
Red rock.....	910	930
Lime .....	930	940
Lime, red.....	940	960
Unrecorded (little gas, 1100').....	960	1135
Big Lime.....	1135	1200
Big Injun Sand (gas, 1245').....	1200	1320
Sand, Berea (gas, 1600').....	1580	1632
Red rock.....	1712	1722
Sand, Thirty-foot.....	1722	1772
Red rock.....	1772	1782
Sand, Gordon Stray.....	1785	1825
Sand, Gordon, show.....		1855
Sand, Fifth (big gas, 1992') to bottom.....	1988	2004

10" casing, 233'; 8¼", 770'; 6⅝", 1320'; first minute pressure, 280 lbs.; rock pressure, 1050 lbs.; volume, 2,500,000 cu. ft.; completed, June 14, 1903.

### J. B. Lovett No. 21 Well Record (127).

Freemans Creek District; 1.4 miles southwest of Jackson Mill; authority, Reserve Gas Co.; elevation, 1015' B.

	Top. Feet.	Bottom. Feet.
Sand, Salt, and unrecorded.....	780	1235
Big Lime and unrecorded.....	1235	1318
Sand, Big Injun.....	1318	1420
Sand, Thirty-foot.....	1808	1860
Sand, Gordon Stray.....	1870	1880
Sand, Gordon.....	1900	1950
Sand, Fifth (gas).....	2100	2115
Total depth.....		2130

The record above was published in Volume I(A), page 358, of the Survey Reports. A few changes in correlation have been made to suit the more extensive knowledge of the measures now available.

### J. B. Lovett No. 2 Well Record (128).

Freemans Creek District; on Geelick Run, 1.2 miles southwest of Jackson Mill; authority, W. Va. Central Gas Co.; elevation, 1010' B.

	Top. Feet.	Bottom. Feet.
Sand, Burning Springs.....	360	380
Sand, Gas and Second Cow Run (water, 5 bail- ers per hour, 590').....	410	625
Sand, Salt.....	640	855
Sand, Salt.....	875	1108
Sand, Maxton (gas, 1314') (10 bailers water, 1344').....	1244	1349
Big Lime.....	1349	1399
Big Injun Sand.....	1399	1545
Sand, Squaw.....	1556	1564
Sand, Thirty-foot.....	1940	1995
Sand, Gordon.....	2068	2094
Sand, Fifth.....	2190	2200
Total depth.....		2203
13" casing, 13'; 10", 168'; 8¼", 866'; 6⅝", 1375'; completed, Feb. 25, 1909; volume, 11,000,000 cu. ft. in Maxton.		

### Geo. N. Butcher No. 285 Well Record (129).

Freemans Creek District; on Geelick Run, 1.4 miles southwest of Jackson Mill; authority, Reserve Gas Co.; completed, June 2, 1910; elevation, 1060' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	285	305
Burning Springs Sand.....	362	375
Gas Sand.....	403	434

	Top. Feet.	Bottom. Feet.
Second Cow Run Sand.....	481	512
Salt Sand.....	516	785
Maxton Sand (gas, 1149').....	1132	1163
Total depth.....		1170

### M. H. Lough No. 217 Well Record (131).

Freemans Creek District; on Geelick Run, 1.6 miles northwest of Deanville; authority, Reserve Gas Co.; completed, March 3, 1910; elevation, 1020' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	149	166
Big Dunkard and Burning Springs Sands.....	278	365
Gas Sand.....	368	437
Second Cow Run Sand.....	462	517
Salt Sand.....	586	630
Maxton Sand.....	1055	1065
Little Lime.....	1165	1190
Pencil Cave.....	1190	1200
Big Lime (gas, 1214').....	1210	1263
Big Injun Sand.....	1263	1412
Squaw Sand.....	1420	1440
Fifty-foot Sand.....	1600	1638
Thirty-foot Sand.....	1656	1686
Gordon Stray Sand.....	1808	1824
Gordon Sand.....	1827	1942
Fifth Sand (gas, 2075').....	2066	2080
Total depth.....		2082

### Newton Shaw No. 1 Well Record (132).

Freemans Creek District; on Geelick Run, 1.3 miles northwest of Deanville; authority, Clarksburg Light & Heat Co.; completed, Nov. 17, 1905; elevation, 1025' B.

	Top. Feet.	Bottom. Feet.
Coal, Bakerstown (water, 40' and 148').....		148
Sand, Big Dunkard (water, 300').....	285	326
Sand, Burning Springs (oil show, 358').....	348	375
Coal, Upper Kittanning.....	440	444
Sand.....	444	460
Sand, Gas.....	475	530
Sand, Second Cow Run.....	575	640
Sand, Salt.....	735	840
Sand, Salt.....	875	910
Little Lime.....	1175	1190
Big Lime.....	1212	1265
Sand, Big Injun.....	1265	1408
Sand, Fifty-foot (gas, 1683').....	1680	1690
Sand, Thirty-foot.....	1700	1750

	Top. Feet.	Bottom. Feet.
Sand, Gordon.....	1885	1895
Sand, Fifth (gas, 2083').....	2075	2096
Total depth.....		2102
Conductor, 12'; 10" casing, 326'; 8¼", 797' 2"; 6½", 1550' 9"		

The following is the record of a well drilled farther down the structural slope, where water is more abundant:

### G. A. Butcher No. 359 Well Record (133).

Freemans Creek District; on Polk Creek, 1.3 miles northwest of Weston; authority, Reserve Gas Co.; completed, Sept. 19, 1912; elevation, 1110' B.

	Top. Feet.	Bottom. Feet.
Unrecorded (water, 148').....	0	487
Burning Springs Sand.....	487	546
Gas Sand.....	593	652
Second Cow Run Sand (water, 685').....	676	762
Salt Sand.....	793	874
Salt Sand (water, 974').....	925	1082
Maxton Sand.....	1298	1330
Little Lime.....	1380	1398
Pencil Cave.....	1398	1406
Big Lime.....	1406	1472
Big Injun Sand.....	1472	1590
Squaw Sand.....	1590	1625
Berea Sand.....	1707	1724
Fifty-foot Sand (gas, 1882').....	1877	1902
Thirty-foot Sand.....	shells	
Gordon Stray Sand.....	2022	2034
Gordon Sand.....	2037	2054
Fourth Sand.....	2076	2123
Fifth Sand (gas, 2274-89').....	2266	2291
Total depth.....		2461

The record of the **Sarah J. Bennett No. 2757 (134)** is published in Chapter IV, page 51, in the section for Deanville, and that of the **E. M. Vandervort No. 1 (135)** is published in the same Chapter, page 53, in the Weston Section, both being producing gas wells.

The **Thomas Gas Station**, of the West Virginia Central Gas Company, located along the West Fork River at Butchersville, 2½ miles north of Weston, completed November 1, 1914, according to C. G. Wise, Engineer in Charge, was designed by Geo. W. Schell, the well known gas expert, as a booster plant to supplement the work of the Foreman Station of the

same company on Hackers Creek. The equipment includes three 450 horse-power Snow single tandem gas engines, with cylinders 20"x36" and compressors 18½"x36", the plant being designed to add a fourth unit of the same size, making a total of 1800 horse-power. The suction pressure is 50 pounds, and discharge pressure 150 pounds, the suction temperature being 50° Fahrenheit, discharge temperature at engine, 200°, and discharge into line ahead of cooler, 55°. The cooling device consists of 4 header pipes with seven joints of 4" pipe extending from each header through which the gas is passed while water is sprayed over the entire group in a manner similar to ammonia cooling systems, the device being one that is employed at only one other pumping plant in the State, but has been used in California.

The auxiliary plant contains one Bruce McBeth 40 H. P. gas engine, direct connected with a General Electric 125 volt, 240 ampere D. C. Generator for lighting and auxiliary pump; one 10 H. P. motor, driving a twin cylinder Clayton air compressor which produces 125 pounds of pressure for starting the large engines; one 10 H. P. motor to drive the auxiliary pump; 3 sets of 150 ampere hour storage cells, 5 cells to the battery, for ignition service for pumping engines; one 4 cell battery for auxiliary ignition, used only for starting the auxiliary engine or for an emergency; one 9/10 K. W. Peerless generator set used to charge storage cells; one 3 panel switch-board with mercury mountings.

Each large engine pumps its own water, the auxiliary plant being run only at night for lighting and charging storage cells. The entire plant is heated by a closed coil hot water system that obtains its hot water from the engine exhausts where no cold water is used to cool the exhaust gases except in summer, when the heating plant is not needed, and when it is cut out with a by-pass. The plant uses 10 cubic feet of gas per horse-power hour.

There is a large group of wells along Polk Creek, a few miles west of Weston, a few of which produced oil, but most of them being gassers. The seven following records are from this vicinity:

## J. P. &amp; H. Snyder No. 36 Well Record (138).

Freemans Creek District; on Polk Creek, 1.6 miles northwest of Weston; authority, Reserve Gas Co.; completed, July 31, 1903; elevation, 1020' B.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	16
Sand, Big Dunkard.....	300	340
Sand, Burning Springs.....	514	544
Second Cow Run Sand.....	638	710
Salt Sand.....	775	820
Maxton Sand.....	954	1018
Little Lime.....	1380	1400
<b>Big Lime</b> .....	1422	1480
<b>Big Injun Sand</b> (light gas show).....	1480	1630
Sand, Squaw.....	1720	1788
Sand, Berea.....	1795	1803
Sand, Gantz.....	1850	1865
Sand, Fifty-foot (break, 2000-2005').....	1885	2030
Sand, Thirty-foot.....	2040	2054
Sand, Gordon Stray.....	2060	2073
Sand, Gordon.....	2077	2089
<b>Fourth Sand</b> (oil, 2139').....	2135	2145
<b>Fifth Sand</b> (gas, 2272').....	2275	2283
Total depth.....		2294

## C. H. Lovett No. 105 Well Record (139).

Freemans Creek District; on Polk Creek, 2.5 miles west of Weston; authority, Reserve Gas Co.; completed, March 28, 1906; elevation, 1057' L.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	16
Unrecorded (water, 100').....	16	445
Big Dunkard Sand.....	445	477
Burning Springs Sand.....	522	555
Gas Sand.....	602	695
Second Cow Run Sand.....	710	765
Salt Sand.....	800	830
Salt Sand.....	850	910
<b>Salt Sand</b> (light gas, 1070').....	1000	1088
Sand .....	1113	1151
<b>Maxton Sand</b> (light gas, 1268').....	1265	1288
Red rock.....	1290	1365
Little Lime.....	1389	1414
<b>Big Lime</b> (light gas, 1475').....	1435	1490
Big Injun Sand.....	1490	1668
Berea Sand.....	1815	1830
Fifty-foot Sand.....	1923	1943
Thirty-foot Sand.....	2014	2034
<b>Gordon Stray Sand</b> (gas, 2080').....	2078	2108
<b>Gordon Sand</b> (gas, 2124'; gas, strong, 2149').....	2115	2163
Total depth.....		2170

## J. V. Waldeck No. 81 Well Record (140).

Freemans Creek District; on Keith Fork, 2.6 miles northwest of Weston; authority, Reserve Gas Co.; completed, March 13, 1905; elevation, 1070' B.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	16
Big Dunkard Sand.....	387	....
Little Lime.....	1280	1300
<b>Big Lime</b> .....	1340	1416
Big Injun Sand.....	1420	1530
Berea Sand.....	1680	1690
Gordon Stray Sand.....	1975	1986
<b>Gordon Sand</b> (gas, 1990').....	1988	2000
Fourth Sand.....	2065	2095
<b>Fifth Sand</b> (light gas).....	2212	2226
Total depth.....		2230

## S. D. Camden No. 27 Well Record (145).

Freemans Creek District; on Polk Creek, 1.7 miles southeast of Camden; authority, Reserve Gas Co.; elevation, 1050' L.

	Thickness Feet.	Total Feet.
Conductor .....	16	16
Rock .....	8	24
Blue sand and lime.....	16	40
Red rock.....	25	65
Lime and slate.....	30	95
Red rock.....	35	130
Slate .....	35	165
Lime .....	10	175
Sand (water, 180'), Moundsville.....	25	200
<b>Coal, Bakerstown</b> .....	5	205
Slate .....	25	230
<b>Lime and sand</b> (water and gas, 300').....	70	300
Break (slate).....	5	305
Sand, Little Dunkard.....	45	350
Slate .....	20	370
Sand, Big Dunkard.....	80	450
Black slate, Uffington Shale.....	20	470
Sand, Burning Springs and Gas.....	130	600
Black shale.....	30	630
Sand, Second Cow Run (water, 650').....	40	670
Cave, black.....	80	750
Sand, Salt.....	40	790
Slate .....	30	820
Lime .....	20	840
Slate .....	45	885
<b>Sand, Salt</b> (strong gas, 1030-50').....	165	1050
Break (slate).....	15	1065
Sand, Salt.....	85	1150
Red rock.....	20	1170
<b>Sand, Maxton</b> (oil, 10-15 bbl.).....	38	1208

	Thickness. Total.	
	Feet.	Feet.
Slate .....	22	1230
Red rock.....	20	1250
Sand .....	50	1300
<b>Big Lime</b> .....	110	1410
Sand and lime.....	10	1420
White lime.....	50	1470
<b>Quit in lime at 1483'; Sand, Big Injun (oil)</b> .....	13	1483
Unrecorded .....	757	2240
<b>Sand, Fifth (Bayard) to bottom, (gas)</b> .....	22	2262

"Estimated production from 1483' about 3000 barrels. After oil was exhausted, the well was drilled to the Fifth Sand and a test taken in April, 1902, showed a volume of 2,800,000 cu. ft. of gas."

The record above was previously published in Volume I(A), page 356, of the Survey, but is reproduced here because of its historical value. As previously mentioned, it was this well that started oil development in Lewis County. The flow of oil from the Big Injun lasted only a few days, but the well still produces gas from the lower sand, which is clearly the Bayard instead of the Fifth, as the latter is only about 850 feet below the top of the Big Lime in this locality, while the producing sand of the Camden well is 940 feet below that stratum. The oil in the Injun seems to be only an isolated deposit, as other wells in the same neighborhood did not find it.

### James Jarvis No. 238 Well Record (146).

Freemans Creek District; on branch of Polk Creek, 1.8 miles south-east of Camden; authority, Reserve Gas Co.; completed, June 4, 1910; elevation, 1325' B.

	Top.	Bottom.
	Feet.	Feet.
Little Dunkard Sand.....	630	650
Big Dunkard Sand.....	740	765
Gas and Second Cow Run Sands.....	896	1030
Salt Sand.....	1040	1065
Salt Sand.....	1332	1372
Maxton Sand.....	1465	1475
Little Lime.....	1708	1730
Pencil Cave.....	1730	1748
<b>Big Lime (gas, 1785')</b> .....	1748	1810
Big Injun Sand.....	1810	2005
Squaw Sand.....	2020	2045
Berea Sand.....	2135	2160
Gantz Sand.....	2200	2210
Fifty-foot Sand.....	2228	2240
Thirty-foot Sand.....	2313	2326
Gordon Stray Sand.....	2370	2381



	Top. Feet.	Bottom. Feet.
<b>Gordon Sand</b> (gas, 2396').....	2386	2461
<b>Fourth Sand</b> .....	2494	2507
<b>Fifth Sand</b> (gas, 2604½') to bottom.....	2603½	2624
Rock pressure, 210 lbs.		

### Solomon Jarvis No. 393 Well Record (147).

Freemans Creek District; on branch of Polk Creek, 1.8 miles south-east of Camden; authority, Reserve Gas Co.; completed, Aug. 14, 1913; elevation, 1380' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	580	705
Big Dunkard Sand.....	754	810?
Burning Springs Sand.....	840	880
Gas Sand.....	905	983
Second Cow Run Sand.....	995	1088
<b>Big Lime</b> .....	1845	1900
Big Injun Sand.....	1900	2060
Squaw Sand.....	2093	2109
Berea Sand.....	2243	2252
Fifty-foot Sand.....	2310	2336
Thirty-foot Sand..... shells.		
Gordon Stray Sand.....	2438	2454
<b>Gordon Sand</b> (gas, 2468').....	2454	2494
<b>Fifth Sand</b> (gas, 2677').....	2676	2688
Total depth.....		2696

### Will Jarvis No. 1 Well Record (148).

Freemans Creek District; 1.7 miles southeast of Camden; authority, Guffey; elevation, 1358' B.

	Thickness. Feet.	Total. Feet.
Clay, brown, soft.....	19	19
Sand, white, hard.....	104	123
<b>Coal, Redstone</b> .....	5	128
Sandstone, white, hard.....	60	188
Shale, white, soft.....	10	198
Red rock.....	214	412
Lime, blue, hard.....	10	422
Red rock and lime, soft.....	80	502
Lime, blue, hard.....	30	532
Red rock and shale, soft.....	381	913
Sand, gray, hard.....	100	1013
Slate, white, soft.....	20	1033
Lime, blue, hard.....	6	1039
Slate and shells, soft.....	25	1064
Sand, white, hard, Salt.....	81	1145
Slate and lime, white, soft.....	100	1245
Sand, Salt, and lime, hard.....	100	1345
Slate and lime, soft.....	119	1464
Red rock and lime, soft.....	61	1525

	Thickness.	Total.
	Feet.	Feet.
Sand, white, hard.....	24	1549
Red rock, soft.....	86	1635
Little Lime, blue, hard.....	39	1674
Pencil Cave, soft.....	10	1684
<b>Big Lime</b> , gray, hard.....	106	1790
Big Injun Sand.....	90	1880
<b>Sand, Squaw</b> (little oil at 1890') and lime, blue..	20	1900
<b>Lime</b> (little oil at 1900').....	40	1940
Sand, Weir, and lime.....	32	1972
10" casing, 420'; 8¼", 1060'; 6¾", 1779'.		

Along the axis of the Chestnut Ridge Anticline and on its northwestern slope, numerous wells have been drilled on the branches of Polk Creek, represented by the seven following records:

#### M. L. Butcher No. 57 Well Record (149).

Freemans Creek District; 1.9 miles northeast of Camden; authority, Reserve Gas Co.; completed, June 4, 1904; elevation, 1135' B.

	Top.	Bottom.
	Feet.	Feet.
Conductor .....	0	14
Big Dunkard Sand.....	360	400
<b>Gas Sand</b> (show of oil, 600').....	485	605
Second Cow Run Sand.....	620	640
Sand, Salt.....	810	900
Maxton Sand.....	950	1030
Little Lime.....	1295	1310
Pencil Cave.....	1310	1315
<b>Big Lime</b> (light gas and oil, 1360').....	1315	1375
<b>Big Injun Sand</b> (light gas, 1422').....	1375	1535
Thirty-foot Sand.....	1905	1925
<b>Gordon Stray Sand</b> (gas, 1987').....	1983	2001
Gordon Sand.....	2011	2055
Fifth Sand (gas, 2199') to bottom.....	2196	2206

#### M. L. Butcher No. 412 Well Record (150).

Freemans Creek District; 1.9 miles northeast of Camden; authority, Reserve Gas Co.; completed, June 6, 1913; elevation, 1195' B.

	Top.	Bottom.
	Feet.	Feet.
Gas Sand.....	431	517
Second Cow Run Sand.....	528	645
<b>Salt Sand</b> (oil, 680').....	670	736
Salt Sand.....	848	908
Salt Sand.....	988	1029
Maxton Sand.....	1150	1220

	Top. Feet.	Bottom. Feet.
Little Lime.....	1360	1385
Pencil Cave.....	1385	1390
<b>Big Lime</b> .....	1390	1460
Big Injun Sand.....	1460	1587
Squaw Sand.....	1592	1661
Berea Sand.....	1769	1792
Fifty-foot Sand.....	1826	1859
Thirty-foot Sand.....	1970	1983
Gordon Stray Sand.....	2019	2023
<b>Gordon Sand</b> (gas, 2048').....	2039	2072
Fourth Sand.....	2075	2116
<b>Fifth Sand</b> (gas, 2263').....	2255	2281
Total depth.....		2304

### A. N. Dodson No. 295 Well Record (151).

Freemans Creek District; 0.4 mile west of Camden; authority, Reserve Gas Co.; completed, Aug. 15, 1910; elevation, 1198' L.

	Top. Feet.	Bottom. Feet.
Moundville Sand.....	240	290
Little Dunkard Sand.....	480	525
Burning Springs Sand.....	645	700
Second Cow Run Sand.....	815	908
Salt Sand.....	935	980
Maxton Sand.....	1470	1485
Little Lime.....	1490	1530
Pencil Cave.....	1530	1550
<b>Big Lime</b> .....	1550	1615
<b>Big Injun Sand</b> (gas, 1708').....	1615	1789
Squaw Sand.....	1820	1845
Fifty-foot Sand.....	2148	2165
<b>Gordon Sand</b> (gas, 2222') to bottom.....	2221	2225

### Alvin Douglas No. 161 Well Record (152).

Freemans Creek District; 0.7 mile northwest of Camden; authority, Reserve Gas Co.; completed, June 15, 1909; elevation, 1135' B.

	Top. Feet.	Bottom. Feet.
Unrecorded (water, 40').....	0	530
Big Dunkard Sand.....	530	565
Second Cow Run Sand.....	775	826
Salt Sand.....	860	915
<b>Sand, Maxton</b> (gas show, 1350').....	1350	1358
Little Lime.....	1436	1451
Pencil Cave.....	1451	1458
<b>Big Lime</b> .....	1458	1505
Big Injun Sand.....	1505	1642
Squaw Sand.....	1660	1720
Berea Sand.....	1850	1870
Thirty-foot Sand.....	2045	2057
Gordon Stray Sand.....	2085	2095
<b>Gordon Sand</b> (gas, 2117-26') to bottom.....	2115	2126

## Stark A. White No. 2 Well Record (153).

Freemans Creek District; on Dry Fork, 1.1 miles N. 10° E. of Camden; authority, Weston Carbon Co.; elevation, 1285' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	..	70
Coal, Bakerstown.....	500	505
Sand, Little Dunkard and unrecorded.....	540	700
Sand, Burning Springs.....	700	740
Coal, Upper Kittanning.....	740	748
Sand, Gas.....	815	865
Sand, Second Cow Run.....	916	968
Coal, Mercer.....	970	976
Sand, Salt.....	990	1040
Sand, Salt.....	1140	1170
Sand, Salt (gas, 1310').....	1247	1327
Sand.....	1406	1431
Sand, Maxton (gas, 1 million, 1520').....	1510	1530
Little Lime.....	1577	1582
Pencil Cave.....	1582	1592
Big Lime.....	1592	1660
Big Injun Sand.....	1660	1770
Sand, Squaw.....	1785	1830
Sand, Berea.....	1984	1995
Sand, Thirty-foot.....	2191	2204
Sand, Gordon Stray.....	2231	2250
Sand, Gordon (gas).....	2262	2282

10" casing, 245'; 8", 945'; 6 $\frac{5}{8}$ ", 1650'; 5 $\frac{3}{8}$ ", 2194'; 84/10" mercury in 5 3/16" casing; 60 min. pressure, 725 lbs.; shut in, Oct. 18, 1910.

## Stark A. White No. 1 Well Record (154).

Freemans Creek District; on Dry Fork, 1.1 miles N. 10° E. of Camden; authority, Weston Carbon Co.; elevation, 1145' B.

	Top. Feet.	Bottom. Feet.
Coal, Elk Lick.....	..	92
Sand, Burning Springs, and unrecorded.....	468	655
Sand, Gas.....	655	687
Sand, Salt (water, 834').....	820	870
Sand, Salt, and unrecorded (water).....	1040	1560
Pencil Cave.....	1560	1565
Big Lime and Big Injun Sand.....	1565	1805
Sand, Gordon Stray.....	2194	2210
Sand, Gordon, to bottom (gas, 2273').....	2272	2284

According to Karl Hoskins, Superintendent of the Columbian Carbon Company, this well was a large producer, probably making 12 or 13 millions daily.



PLATE XVIII.—Donlan Quarry in Morgantown Sandstone, at Weston; the Lower Connellsville appears in poor focus at the right upper corner.



## Thos. Lovett No. 1 Well Record (155).

Freemans Creek District; on Dry Fork, 1.2 miles northeast of Camden; authority, Columbian Carbon Co.; elevation, 1138' L.

	Thickness. Total.	
	Feet.	Feet.
Conductor .....	11	11
Lime, hard (water, 30').....	54	65
Slate, white.....	65	130
Red rock.....	40	170
Slate .....	20	190
Sand, Moundsville (gas).....	10	200
Slate and shells.....	200	400
Sand, Big Dunkard, and unrecorded (gas, 400'; gas, and oil, black, 450').....	200	600
Slate and shells.....	65	665
Coal, Lower Kittanning.....	10	675
Slate and shells.....	80	755
Sand, Second Cow Run.....	25	780
Lime .....	30	810
Slate .....	30	840
Sand, Salt, and unrecorded (gas, 840'; oil, 1010')..	210	1050
Shale, black.....	50	1100
Slate and shells.....	30	1130
Lime .....	25	1155
Sand, Maxton.....	20	1175
Red rock.....	5	1180
Lime .....	40	1220
Red rock.....	5	1225
Lime .....	175	1400
Sand .....	50	1450
Big Lime.....	60	1510
Sand, Big Injun (oil).....	90	1600
Slate and shells.....	300	1900
Sand, Berea.....	30	1930
Slate and shells.....	60	1990
Sand, Thirty-foot (gas, 2000' and 2030').....	90	2080
Slate and shells.....	135	2215
Sand, Fourth (gas) to bottom.....	25	2240

8¼" casing, 110'; 6⅝", 773'.

In the neighborhood of Freemansburg, along the north-western slope of the Chestnut Ridge Anticline, numerous wells have been drilled, all of which have produced gas from sands ranging principally from the Maxton to the Fifth. The record of the **Hannah Kemper No. 237 (158)** was published in the Freemansburg Section in Chapter IV, page 54. The eight following records are from this region:

## S. A. Kemper No. 417 Well Record (156).

Freemans Creek District; on Rush Run, 1.0 mile southwest of Freemansburg; authority, Reserve Gas Co.; elevation, 1155' B.

	Thickness. Total.	
	Feet.	Feet.
Conductor .....	10	10
Sand .....	30	40
Slate .....	155	195
Lime .....	105	300
<b>Coal, Brush Creek</b> .....	4	304
Lime .....	36	330
Sand .....	25	355
Slate .....	5	360
Lime .....	25	385
Unrecorded (water).....	5	390
Slate .....	35	425
Lime .....	20	445
Slate .....	25	470
Sand, Burning Springs.....	40	510
Lime .....	5	515
Sand, Gas.....	80	595
Slate .....	10	605
Sand, Second Cow Run (water, 630').....	65	670
Slate .....	5	675
Lime .....	45	720
Slate, black.....	10	730
Sand, Salt.....	20	750
Lime .....	10	760
Slate .....	5	765
Lime .....	15	780
<b>Sand, Salt (gas, 860')</b> .....	100	880
Slate, black.....	5	885
Lime .....	30	915
Slate, black.....	25	940
Lime .....	20	960
Shells .....	45	1005
Sand, Salt.....	50	1055
Slate and lime.....	85	1140
Sand, Maxton.....	10	1150
Red rock.....	130	1280
Slate .....	10	1290
Little Lime.....	15	1305
Pencil Cave.....	23	1328
<b>Big Lime</b> .....	57	1385
<b>Big Injun Sand</b> .....	122	1507
Slate .....	5	1512
Sand, Squaw.....	33	1545
Slate .....	5	1550
Lime, sandy.....	30	1580
Slate .....	45	1625
Sand, Weir.....	10	1635
Slate .....	75	1710
Sand, Berea.....	20	1730
Slate .....	15	1745
Sand, Gantz.....	15	1760



	Thickness, Feet.	Total, Feet.
Slate .....	30	1790
<b>Sand, Fifty-foot (gas, 1805')</b> .....	18	1808
Slate .....	100	1908
<b>Sand, Thirty-foot</b> .....	12	1920
Slate .....	14	1934
Sand, Gordon Stray.....	14	1948
Slate .....	30	1978
<b>Sand, Gordon (gas, 2003-5')</b> .....	29	2007
Slate .....	3	2010
<b>Sand, Fourth (gas, 2042-5')</b> .....	45	2055
Slate .....	147	2202
<b>Sand, Fifth (gas, 2204-15')</b> .....	21	2223
Slate to bottom.....	18	2241
10" casing, 210'; 8", 795'; 6 $\frac{5}{8}$ ", 1389'; 5 $\frac{3}{16}$ ", 1939'.		

### F. M. McKinley No. 1 Well Record (159).

Freemans Creek District; on Horse Run, 0.7 mile east of Freemansburg; authority, W. Va. Central Gas Co.; completed, May 18, 1905; elevation, 1115' B.

	Top, Feet.	Bottom, Feet.
Sand, Big Dunkard.....	380	410
Sand, Gas.....	418	552
Sand, Second Cow Run (large water, 616').....	590	700
Sand, Salt.....	780	790
Sand, Salt.....	970	1100
Red rock.....	1106	1136
Sand, Maxton.....	1136	1246
Little Lime.....	1246	1265
<b>Big Lime</b> .....	1272	1344
<b>Sand, Big Injun (light gas, 1445')</b> .....	1344	1452
Sand, Squaw.....	1524	1549
Sand, Berea.....	1688	1710
Sand, Fifty-foot and Thirty-foot.....	1760	1914
Sand, Gordon Stray.....	1928	1988
Sand, Gordon.....	1988	2005
<b>Sand, Fifth (gas)</b> .....	2150	2165
Total depth.....		2175

Conductor, 16'; 10" casing, 200'; 8 $\frac{1}{4}$ ", 713'; 6 $\frac{5}{8}$ ", 1325'; volume, 6,000,000 cu. ft.; tested 10/10" mercury in 6 $\frac{5}{8}$ " casing.

### Thomas G. Wright No. 186 Well Record (160).

Freemans Creek District; on Horse Run, 1 mile east of Freemansburg; authority, Reserve Gas Co.; completed, Sept. 1, 1909; elevation, 1124' L.

	Top, Feet.	Bottom, Feet.
Moundsville Sand.....	190	210
Big Dunkard Sand.....	370	420
Sand, Burning Springs.....	430	470
Gas Sand.....	480	550

	Top. Feet.	Bottom. Feet.
Salt Sand.....	646	700
Salt Sand.....	980	1010
Maxton Sand.....	1070	1100
Little Lime.....	1195	1225
Pencil Cave.....	1270	1275
<b>Big Lime</b> .....	1275	1325
<b>Big Injun Sand</b> (gas, 1337').....	1325	1442
Berea Sand.....	1685	1703
Fifty-foot Sand.....	1760	1780
Thirty-foot Sand.....	1860	1875
Gordon Stray Sand.....	1905	1920
Gordon Sand.....	1923	1953
<b>Fifth Sand</b> (gas, 2155-8' and 2160').....	2151	2162
Total depth.....		2173

### James R. Bailey No. 49 Well Record (161).

Freemans Creek District; on Horse Run, 1.2 miles southeast of Freemansburg; authority, Reserve Gas Co.; completed, Feb. 26, 1904; elevation, 1185' B.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	10
Big Dunkard Sand.....	435	460
Burnings Springs Sand.....	480	520
<b>Gas Sand</b> (small gas, 620'; water, 650').....	590	675
<b>Sand, Salt</b> (small gas, 955').....	950	
Sand, Salt.....	1020	1050
Maxton Sand (gas, 1270').....	1260	1275
Total depth.....		1293

### Blaine Kershner No. 115 Well Record (164).

Freemans Creek District; on Freemans Creek, 0.9 mile northeast of Freemansburg; authority, Reserve Gas Co.; completed, Aug. 15, 1907; elevation, 1025' B.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	16
Sand, Burning Springs (water at 500').....	500	
Slate and red rock.....		604
Salt Sand.....	721	765
Salt Sand.....	863	890
Salt Sand.....	964	1080
Red rock.....	1082	1105
Maxton Sand.....	1120	1163
Little Lime.....	1205	1220
<b>Big Lime</b> .....	1231	1299
<b>Big Injun Sand</b> .....	1299	1411
Fifty-foot Sand.....	1723	1741
Thirty-foot Sand.....	1828	1884
<b>Gordon Stray and Gordon Sands</b> (gas, 1890')....	1890	1962
<b>Fifth Sand</b> (gas, 2130') to bottom.....	2125	2145

## M. C. Burnside No. 1914 Well Record (165).

Freemans Creek District; 1.5 miles northeast of Freemansburg; authority, Pittsburgh and West Virginia Gas Co.; elevation, 1075' B.

	Top. Feet.	Bottom. Feet.
Coal, Elk Lick.....	85	93
Sand, Burning Springs.....	522	575
Sand, Second Cow Run.....	663	730
Sand, Salt (gas show).....	873	933
Sand, Maxton.....	1100	1140
Sand, Berea (gas).....	1808	1823
Sand, Gordon.....	2025	2125
Sand, Fourth (gas).....		2186
Total depth.....		2220

## J. S. Hall No. 352 Well Record (166).

Freemans Creek District; on branch of Freemans Creek, 1.9 miles northeast of Freemansburg; authority, Reserve Gas Co.; completed, Sept. 3, 1912; elevation, 1185' B.

	Top. Feet.	Bottom. Feet.
Moundsville Sand.....	400	440
Little Dunkard Sand.....	500	550
Burning Springs Sand.....	700	738
Gas Sand.....	745	900
Second Cow Run Sand.....	912	963
Salt Sand.....	1130	1175
Little Lime.....	1519	1534
Pencil Cave.....	1534	1554
Big Lime.....	1554	1614
Big Injun Sand.....	1614	1735
Squaw Sand.....	1745	1765
Berea Sand (gas, 1910-18').....	1905	1935
Total depth.....		1949

## A. J. Riley No. 4269 Well Record (167).

Freemans Creek District; 2.1 miles southeast of Benson; authority, Pittsburgh & W. Va. Gas Co.; completed, July 6, 1914.

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard.....	920	990
Sand, Burning Springs.....	1075	1125
Sand, Gas.....	1170	1255
Sand, Second Cow Run.....	1280	1320
Sand, Salt.....	1375	1500
Sand, Salt (oil show, 1580').....	1525	1730
Sand, Maxton.....	1840	1860
Big Lime.....	1912	1980

	Top. Feet.	Bottom. Feet.
Sand, Big Injun (oil show, 1982').....	1980	2114
Sand, Berea (gas, 2284').....	2280	2300
Sand, Fifty-foot.....	2455	2485
Sand, Thirty-foot (gas, 2565').....	2535	2575
Sand, Gordon Stray (gas, 2585').....	2577	2620
Sand, Fourth.....	2724	2729
Sand, Fifth (gas, 2781').....	2779	2790
Total depth.....		2800

Several wells have been drilled along Hog Camp near the Harrison County Line, all of which are gassers, although they are five miles northwest of the Chestnut Ridge Anticline and on the edge of the Benson oil pool. The record of the **Cottrill Heirs No. 17 (173)**, published in Volume I(A), page 367, of the Survey, was a Fifth Sand producer. The five following records are from this locality:

#### H. Bailey No. 1917 Well Record (168).

Freemans Creek District; 2.0 miles southeast of Benson; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1400' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	440	445
Sand, Little Dunkard.....	880	900
Sand, Big Dunkard.....	960	975
Sand, Gas.....	1080	1200
Sand, Salt.....	1525	1660
Big Lime.....	1920	1978
Sand, Big Injun.....	1978	2093
Sand, Berea.....		2320
Sand, Thirty-foot.....	2500	2540
Sand, Gordon Stray (gas).....	2552	2580
Sand, Gordon.....	2592	2680
Sand, Fifth, to bottom.....	2786	2806

#### W. G. Bailey No. 1913 Well Record (169).

Freemans Creek District; on Hog Camp Run, 2.0 miles southeast of Benson; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1260' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	300	304
Sand, Little Dunkard.....	730	795
Sand, Big Dunkard.....	837	855
Sand, Burning Springs and Gas.....	900	1105
Sand, Second Cow Run.....	1120	1140
Sand, Salt (water).....	1180	1325

	Top. Feet.	Bottom. Feet.
Big Lime.....	1768	1836
Sand, Big Injun.....	1836	1952
Sand, Fifty-foot.....	2309	2324
Sand, Thirty-foot.....	2345	2370
Sand, Gordon Stray (gas).....	2376	2413
Sand, Gordon.....	2423	2471
Sand, Fifth, to bottom.....	2615	2638

### A. Armstrong No. 196 Well Record (171).

Freemans Creek District; on Hog Camp Run, 1.0 mile southwest of Mineral; authority, Reserve Gas Co.; completed, July 30, 1909; elevation, 1030' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	475	525
Big Dunkard Sand.....	575	675
Gas Sand.....	780	824
Second Cow Run Sand.....	930	1105
Salt Sand.....	1110	1230
Maxton Sand.....	1430	1435
Big Lime (oil and gas show, 1505').....	1500	1558
Big Injun Sand.....	1558	1720
Berea Sand.....	1875	1910
Fifty-foot Sand.....	2050	2103
Thirty-foot Sand.....	2105	2140
Gordon Stray Sand.....	2150	2170
Gordon Sand.....	2190	2200
Fourth Sand.....	2240	2250
Fifth Sand (gas, 2363').....	2361	2382
Total depth.....		2384

### Virginia Hughes No. 201 Well Record (172A).

Freemans Creek District; on Elk Lick, 0.5 mile south of Mineral; authority, Reserve Gas Co.; completed, Aug. 23, 1909; elevation, 1104' B.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	16
Little Dunkard Sand.....	525	550
Sand, Burning Springs.....	725	800
Sand, Second Cow Run.....	850	975
Salt Sand.....	1100	1280
Maxton Sand.....	1395	1420
Little Lime.....	1500	1515
Pencil Cave.....	1515	1525
Big Lime.....	1525	1590
Big Injun Sand.....	1590	1720
Berea Sand (showing gas, 1902') (little water, 1915').....	1900	1920
Fifty-foot Sand.....	1990	2030
Thirty-foot Sand.....	2100	2120

	Top. Feet.	Bottom. Feet.
Gordon Stray Sand.....	2155	2190
Gordon Sand.....	2210	2235
Fourth Sand.....	2255	2275
Fifth Sand (gas, 2412' and 2416').....	2410	2428
Total depth.....		2430

### Chas. W. Rhodes No. 468 Well Record (174).

Freemans Creek District; 1.7 miles southeast of Benson; authority, Reserve Gas Co.; completed, July 27, 1914; elevation, 1215' B.

	Top. Feet.	Bottom. Feet.
Moundsville Sand.....	650	700
Little Dunkard Sand.....	730	765
Sand .....	780	795
Sand, Big Dunkard.....	875	935
Second Cow Run and Salt Sands (water, 1175')..	1020	1340
Maxton Sand.....	1615	1640
Little Lime.....	1740	1760
Pencil Cave.....	1760	1780
Big Lime.....	1780	1860
Big Injun Sand (gas, 1872'; oil, 1908').....	1860	1980
Berea Sand (gas, 2126').....	2125	2135
Thirty-foot Sand.....	2305	2330
Gordon Stray Sand (gas, 2404').....	2400	2410
Gordon Sand.....	2412	2473
Fourth Sand.....	2495	2510
Fifth Sand (gas, 2626').....	2622	2638
Total depth.....		2689

The Benson Oil Pool, lying south of Benson, and extending southwestward along the strike  $2\frac{1}{2}$  miles from Kincheloe Creek to Smoky Fork of Freemans Creek, is apparently an extension of the Wolf Summit Fifth Sand Pool of Harrison County. The oil is found in a narrow belt, only about one-half mile wide, the wells both to the northwest and southeast of this oil streak having been gassers, so that the pool is well defined. About fifty wells have been drilled on the Lewis County side of the line. The following is a record of one of them:

### J. M. Hall No. 2 Well Record (175).

Freemans Creek District; on Kincheloe Creek, 1.1 miles southeast of Benson; authority, Crude Oil Co.; elevation, 1065' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	210	215
Coal, Elk Lick.....	465	470

	Top. Feet.	Bottom. Feet.
Coal, Bakerstown.....	625	637
Sand, Big Dunkard.....	735	795
Sand, Burning Springs (water, 850').....	830	860
Sand, Gas and Second Cow Run (water, 1050')... ..	900	1075
Sand, Salt.....	1100	1175
Slate .....	1175	1275
Sand, Salt.....	1275	1325
Sand, Maxton (gas, 1390').....	1350	1390
Red rock.....	1480	1630
Little Lime.....	1630	1645
Pencil Cave.....	1645	1654
Big Lime.....	1654	1704
Sand, Big Injun (gas, 1705' and 1740').....	1704	1825
Sand, Fifty-foot.....	2125	2137
Sand, Thirty-foot.....	2210	2220
Sand, Gordon Stray.....	2265	2310
Break (gas, 2317').....	2310	2317
Sand, Gordon (gas, 2330-40') (hard, 2340-8'; broken, 2348-64').....	2317	2364
Sand, Fifth (good oil, 2518-43').....	2514	2543

Along the head of Kincheloe Creek, above Benson, several wells have been drilled and most of them have produced gas. The **T. Clemans No. 1** (179) showed both oil and gas, but was abandoned as a dry hole. The **T. Clemans No. 1** (180) and the **Davis Heirs No. 1** (181) were both reported to have made a little oil. The following is the record of a well drilled on the Harrison County side of Kincheloe Creek in this locality:

### J. B. Coffindaffer No. 945 Well Record (181A).

Union District, Harrison County; on Kincheloe Creek, 0.9 mile northwest of Benson; authority, Hope Natural Gas Co.; completed, March 16, 1907; elevation, 1125' B.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	16
Big Dunkard Sand.....	1085	1125
Gas Sand.....	1280	1325
Unrecorded (water, 1372').....	1325	1395
Second Cow Run and Salt Sands.....	1395	1720
Maxton Sand.....	1835	1857
Little Lime.....	1940	1955
Pencil Cave.....	1958	1965
Big Lime.....	1965	2015
Big Injun Sand.....	2015	2164
Berea Sand.....	2360	2374
Fifty-foot Sand.....	2435	2457
Thirty-foot Sand.....	2533	2555
Gordon Stray Sand.....	2580	2612

	Top. Feet.	Bottom. Feet.
Gordon Sand.....	2624	2664
Fourth Sand.....	2672	2682
Fifth Sand (gas) to bottom.....	2845	2851½

The following is the record of a well drilled on the head of Kincheloe and previously published in Volume I(A), page 368, of the Survey. It is a valuable record because of the coals noted:

### W. B. Maxwell No. 3 Well Record (184).

Freemans Creek District; on Kincheloe Creek, 2.2 miles northwest of Benson; authority, Hope Natural Gas Co.; elevation, 1254' L.

	Top. Feet.	Bottom. Feet.
Coal, Washington, and unrecorded.....	251	525
Coal, Uniontown.....	525	535
Coal, Pittsburgh.....	819	824
Sand, Little Dunkard.....	1250	1303
Sand, Big Dunkard.....	1335	1365
Sand, Gas.....	1500	1665
Sand, Maxton.....	2125	2155
Little Lime.....	2180	2195
Big Lime.....	2227	2280
Sand, Big Injun (gas, 2309' and 2315').....	2290	2346

The two following wells were drilled in 1914 in Doddridge County along the Lewis Line:

### Mary J. Small No. 3479 Well Record (185).

Greenbrier District, Doddridge County; 0.7 miles southeast of Hillebert; authority, Hope Natural Gas Co.; elevation, 1149' L.

	Top. Feet.	Bottom. Feet.
Coal, Washington.....	135	137
Coal, Pittsburgh.....	707	710
Sand, Big Dunkard.....	1135	1185
Sand, Gas.....	1395	1415
Sand, Second Cow Run (gas, 1528').....	1490	1550
Sand, Salt.....	1610	1650
Sand, Maxton.....	2040	2050
Little Lime.....	2070	2085
Pencil Cave.....	2085	2114
Big Lime.....	2114	2184
Sand, Big Injun.....	2184	2280
Sand, Squaw.....	2285	2360
Sand, Berea.....	2500	2525



	Top. Feet.	Bottom. Feet.
Sand, Fifty-foot.....	2584	2640
<b>Sand, Thirty-foot</b> (gas, 2710').....	2692	2711
Slate .....	2711	2763
Sand, Gordon Stray.....	2763	2773
<b>Sand, Gordon</b> (gas, 2803').....	2800	2819
Sand, Fifth.....	2975	2978
Total depth.....		3136

### J. R. Dennison No. 3508 Well Record (186).

Greenbrier District, Doddridge County; at head of Beech Lick, 0.4 mile south of Hillebert; authority, Hope Natural Gas Co.; completed, Aug. 6, 1914; elevation, 1225' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	1200	1255
Big Dunkard Sand.....	1300	1350
Gas Sand.....	1442	1462
Second Cow Run Sand, (water, 1530' and 1540')...	1500	1587
Salt Sand.....	1615	1650
Maxton Sand.....	2090	2110
Little Lime.....	2130	2140
Pencil Cave.....	2140	2163
<b>Big Lime</b> .....	2163	2229
<b>Big Injun Sand</b> (oil, 2239', 2245' and 2251'; gas, 2245' and 2251') to bottom.....	2229	2252

The five following wells were drilled along Smoky Fork of Freemans Creek:

### L. G. Garrett No. 2529 Well Record (187).

Freemans Creek District; on Smoky Fork, 2.2 miles southwest of Benson; authority, Hope Natural Gas Co.; elevation, 1226' L.

	Top. Feet.	Bottom. Feet.
Sand, Uniontown.....	316	391
Pencil Cave (slate).....	725	732
Lime .....	740	840
Red rock cave.....	840	880
Red rock cave.....	1080	1085
Lime .....	1092	1116
Cave .....	1119	1134
Sand, Little Dunkard.....	1134	1226
Lime cave.....	1226	1241
Sand, Big Dunkard.....	1241	1304
Lime .....	1319	1340
Sand, Burning Springs.....	1376	1400
Sand, Gas.....	1474	1510
Sand, Second Cow Run (water, 1545').....	1512	1647

	Top. Feet.	Bottom. Feet.
Sand, Salt (gas, 1630'; oil, 1784').....	1655	1835
Red rock cave.....	1982	2050
Shell cave (marine shells).....	2050	2080
Little Lime.....	2080	2100
Pencil Cave.....	2100	2112
Big Lime.....	2112	2177
Sand, Big Injun, to bottom (gas, 2206').....	2177	2209
Volume, 12,800,000 cu. ft. in Big Injun; rock pressure, 840 lbs.		

### M. L. Sutton No. 4046 Well Record (188).

Freemans Creek District; on Smoky Fork, 2.4 miles southwest of Benson; authority, Pittsburgh and W. Va. Gas Co.; elevation, 1240' B.

	Top. Feet.	Bottom. Feet.
Coal, native.....	146	151
Coal, Uniontown.....	424	427
Coal, Pittsburgh.....	730	740
Sand, Little Dunkard.....	1148	1220
Sand, Big Dunkard.....	1283	1343
Sand, Burning Springs.....	1413	1428
Sand, Gas.....	1493	1553
Sand, Second Cow Run (water and gas).....	1555	1610
Sand, Maxton.....	1955	1995
Big Lime.....	2155	2220
Sand, Big Injun (gas show).....	2220	2325
Sand, Squaw.....	2325	2400
Sand, Gantz (oil show).....	2515	2545
Sand, Gordon (gas).....	2814	2832
Total depth.....		2835

The following well showed both oil and gas, but was abandoned as a dry hole:

### Ella Bennett No. 1927 Well Record (189).

Freemans Creek District; on branch of Smoky Fork, 2.0 miles southwest of Benson; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1205' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	608	615
Sand, Moundsville.....	960	976
Sand, Burning Springs.....	1328	1346
Sand, Maxton.....	1867	1890
Big Lime (oil).....	1990	2105
Sand, Big Injun (gas).....	2105	2235
Sand, Berea (gas show).....	2420	2435
Sand, Fifty-foot.....	2523	2540
Sand, Gordon Stray.....	2620	2640

	Top. Feet.	Bottom. Feet.
Sand, Gordon.....	2668	2690
Sand, Fourth.....	2711	2742
Total depth.....		3000

### M. T. Law No. 1926 Well Record (190).

Freemans Creek District; on Smoky Fork, 2.2 miles southwest of Benson; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1105' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	475	476
Sand, Little Dunkard.....	900	965
Sand, Gas.....	1205	1229
Sand, Second Cow Run.....	1248	1311
Sand, Salt.....	1450	1490
Big Lime (gas show).....	1898	1974
Sand, Big Injun (gas).....	1974	2106
Sand, Berea.....	2275	2292
Sand, Fifty-foot.....	2370	2385
Sand, Thirty-foot.....	2475	2487
Sand, Gordon Stray.....	2512	2526
Sand, Gordon.....	2551	2570
Sand, Fourth (gas).....	2590	2621
Sand, Elizabeth.....	2960	2965
Total depth.....		3045

### C. A. Straley No. 1 Well Record (191).

Freemans Creek District; on Smoky Fork, 2.2 miles northeast of Churchville; authority, South Penn Oil Co.; elevation, 1085' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	283	287
Sand, Gas.....	1000	1140
Sand, Salt.....	1160	1530
Big Lime.....	1740	1802
Sand, Big Injun.....	1802	1975
Unrecorded (gas, 2100', in Berea Sand).....	1975	2275
Sand, Thirty-foot.....	2275	2295
Sand, Gordon Stray.....	2358	2390
Sand, Gordon.....	2395	2443
Sand, Fifth, to bottom.....	2600	2613

The following well made a considerable show of oil in the Salt Sand. According to G. W. Waggoner, it filled up 700 feet in the 8-inch casing, and several tanks of oil were pumped from it before drilling was continued to the lower sands, from which it now produces gas:

### G. W. Waggoner No. 4144 Well Record (192).

Freemans Creek District; on Right Fork, 2.0 miles northwest of Freemansburg; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1220' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	260	263
Sand, Big Dunkard.....	830	880
Sand, Gas.....	940	1040
Sand, Second Cow Run.....	1050	1130
Sand, Salt.....	1150	1280
Sand, Salt (oil).....	1435	1471
Big Lime.....	1725	1815
Sand, Big Injun.....	1815	1915
Sand, Fifty-foot.....	2245	2260
Sand, Thirty-foot.....	2295	2320
Sand, Gordon Stray (gas).....	2325	2345
Sand, Gordon (gas).....	2355	2420
Total depth.....		2421

The following well was drilled farther down Freemans Creek, where the Pittsburgh Coal is above drainage:

### Clark White No. 54 Well Record (193).

Freemans Creek District; on Right Fork, 0.8 mile northwest of Freemansburg; authority, Reserve Gas Co.; completed, June 12, 1904; elevation, 1035' B.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	16
Gas Sand.....	640	675
Salt Sand.....	930	995
Big Lime.....	1320	1404
Big Injun Sand.....	1404	1550
Gordon Stray Sand.....	1930	1936
Gordon Sand (light gas, 2030'; gas, 2043').....		2048
Fifth Sand (gas, 2203').....	2193	2225
Total depth.....		2227

The three following records are from a group of wells drilled on a branch of Freemans Creek around the southern extremity of the Benson oil pool:

### Caroline Minter No. 4052 Well Record (194).

Freemans Creek District; on branch of Right Fork, 2.5 miles south of Benson; authority, Pittsburgh & W. Va. Gas Co; completed, July 1, 1912; elevation, 1090' B.

	Top. Feet.	Bottom. Feet.
Sand, Maxton.....	1525	1560
<b>Big Lime</b> .....	1635	1715
Sand, <b>Big Injun</b> (little oil and gas).....	1715	1835
Sand, <b>Berea</b> (gas).....	1980	2010
Sand, <b>Thirty-foot</b> .....	2256	2270
Sand, <b>Gordon Stray</b> .....	2285	2314
Sand, <b>Gordon</b> .....	2318	2333
Total depth.....		2395

### Caroline Minter No. 2472 Well Record (195).

Freemans Creek District; 2.2 miles S. 10° E. of Benson; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1160' B.

	Top. Feet.	Bottom. Feet.
<b>Coal, Pittsburgh</b> .....	230	234
Sand, <b>Big Dunkard</b> .....	760	820
Sand, <b>Gas</b> .....	925	995
Sand, <b>Second Cow Run</b> .....	1000	1095
Sand, <b>Salt</b> .....	1140	1275
Sand, <b>Salt</b> (gas show).....	1310	1570
<b>Big Lime</b> .....	1690	1765
Sand, <b>Big Injun</b> .....	1765	1900
Sand, <b>Berea</b> (gas).....	2025	2050
Sand, <b>Fifty-foot</b> .....	2255	2272
Sand, <b>Thirty-foot</b> .....	2295	2315
Sand, <b>Gordon Stray</b> .....	2325	2351
Sand, <b>Gordon</b> .....	2355	2415
Sand, <b>Fifth</b> (gas).....	2577	2585
Total depth.....		2633

### J. W. Chandler No. 1963 Well Record (202).

Freemans Creek District; 1.3 miles southwest of Benson; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1270' B.

	Top. Feet.	Bottom. Feet.
<b>Coal, Pittsburgh</b> .....	602	610
Sand, <b>Big Dunkard</b> .....	1050	1105
Sand, <b>Gas</b> .....	1325	1390
Sand, <b>Second Cow Run</b> (water).....	1424	1480
<b>Big Lime</b> .....	2055	2115
Sand, <b>Big Injun</b> .....	2115	2280
Sand, <b>Gordon Stray</b> and unrecorded.....	2658	2691
Sand, <b>Gordon</b> , to bottom (gas).....	2691	2724

The following well was drilled farther up Freemans Creek:

**A. H. Kemper No. 4200 Well Record (203A).**

Freemans Creek District; on branch of Right Fork, 1.5 miles N. 5° W. of Churchville; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1250' B.

	Top. Feet.	Bottom. Feet.
Coal, native, Uniontown.....	295	298
Coal, Pittsburgh.....	608	612
Sand, Moundsville.....	990	1000
Sand, Little Dunkard.....	1072	1131
Sand, Big Dunkard.....	1148	1200
Sand, Second Cow Run.....	1415	1490
Sand, Salt.....	1505	1610
Sand, Maxton.....	1800	1905
Big Lime.....	2080	2142
Sand, Big Injun.....	2142	2250
Sand, Squaw.....	2260	2305
Sand, Berea (show gas).....	2450	2490
Sand, Fifty-foot.....	2508	2528
Sand, Thirty-foot.....	2628	2642
Slate and shells.....	2642	2734
Sand, Gordon (gas).....	2734	2752
Slate and unrecorded to bottom.....	2752	3047

The five following wells were drilled on the head of Freemans Creek, and some of them reach far enough west, down the structural slope, to be in the edge of the Fink Oil Pool. Their records, except that of well No. 209, were formerly published in Volume I(A) of the Survey:

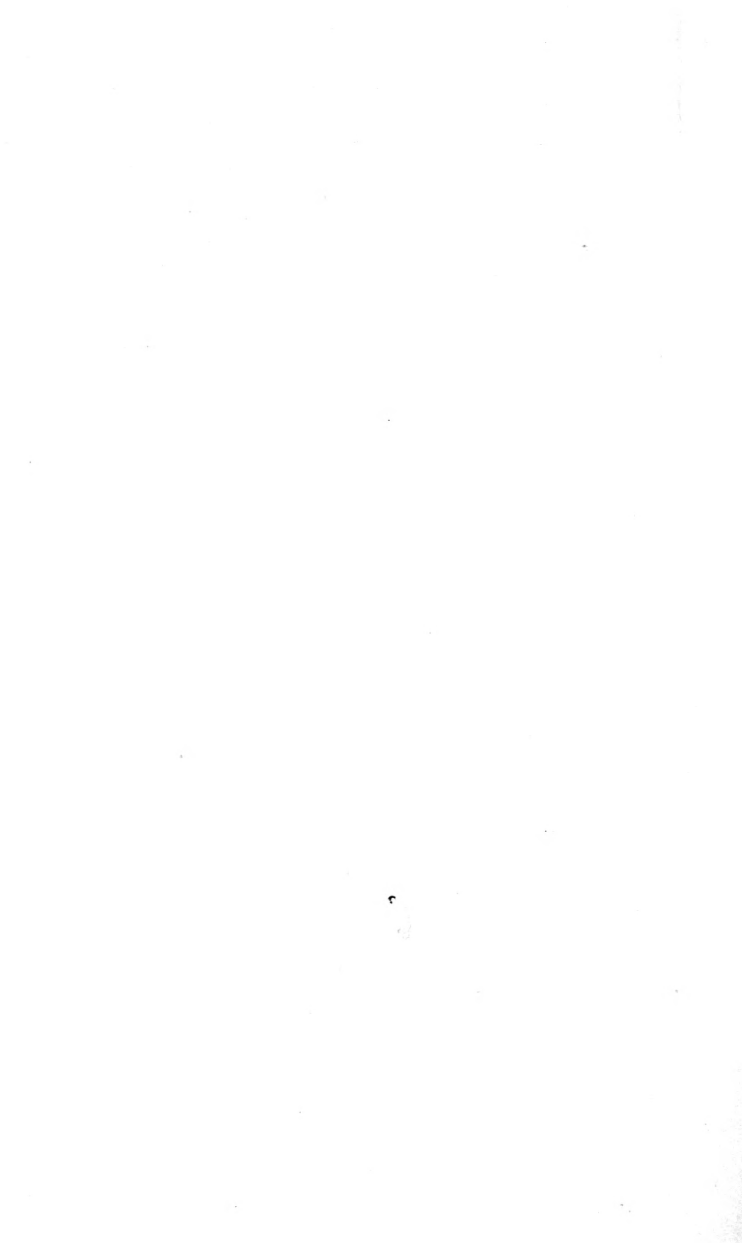
**Michael Fahey No. 1 Well Record (205).**

Freemans Creek District; on Right Fork, 2.0 miles southeast of Coldwater; authority, South Penn Oil Co.; elevation, 1140' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	760	765
Sand, Big Dunkard.....	1290	1365
Sand, Salt.....	1785	1850
Big Lime.....	2160	2220
Sand, Big Injun.....	2220	2380
Sand, Berea.....	2543	2562



PLATE XIX.—Ames Limestone and Birmingham Shale in B. & O. R. cut on Maxwell Run, 0.9 mile northeast of Deanville, Lewis County; the 1-foot rule shows the limestone, the shale is above it, and fragments of the Grafton Sandstone appear near sky line.





This well was reported to have made gas, but was drowned out by water.

### Ellen Joyce No. 471 Well Record (207).

Freemans Creek District; on Right Fork, 1.8 miles southeast of Coldwater; authority, South Penn Oil Co.; elevation, 1330' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	820	826
Sand, Big Dunkard.....	1340	1380
Sand, Second Cow Run.....	1620	1710
Sand, Maxton.....	2020	2040
Big Lime.....	2250	2325
Sand, Big Injun.....	2325	2405
Sand, Berea (gas, 2625-31').....	2619	2637
Total depth.....		2640

### Patrick Faherty No. 1 Well Record (208).

Freemans Creek District; on Right Fork, 1.5 miles southeast of Coldwater; authority, South Penn Oil Co.; elevation, 1200' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	695	700
Sand, Big Dunkard.....	1220	1300
Sand, Salt.....	1775	1850
Big Lime.....	2120	2175
Sand, Big Injun.....	2180	2335
Sand, Berea.....	2490	2510
Sand, Thirty-foot.....	2700	2720
Sand, Gordon.....	2800	2815
Sand, Fifth.....	3027	3033

This well was a light gasser, but was abandoned.

### Timothy Joyce No. 2 Well Record (209).

Freemans Creek District; on Right Fork, 1.3 miles southeast of Coldwater; authority, South Penn Oil Co.; elevation, 1265' B.

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard.....	1300	1375
Sand, Salt.....	1810	1875
Big Lime.....	2180	2245
Sand, Big Injun.....	2245	2335
Sand, Berea (oil, 2568').....	2555	2585
Total depth.....		2609

### Timothy Joyce No. 1 Well Record (210).

Freemans Creek District; on Right Fork, 1.3 miles southeast of Coldwater; authority, South Penn Oil Co.; elevation, 1165' B.

	Top. Feet.	Bottom. Feet.
Coal, Washington.....	82	85
Coal, Pittsburgh.....	650	657
Sand, Gas.....	1361	1440
Big Lime.....	2040	2120
Sand, Big Injun.....	2120	2200
Sand, Berea (oil, 2451').....	2451	2471
Total depth.....		2474

The **Fink Oil Pool**, extending from the divide between Freemans Creek and Fink, one mile southeast of Coldwater, southwestward along the strike of the measures for 6 miles to Hurst, is the largest oil field in Lewis and Gilmer. It has an average width of about one mile, being roughly parallel to the valley of Fink Creek, and having its center along the 500-foot contour of the Pittsburgh Coal. The contours on Map II show that this pool is located at the foot of a long structural slope west of the Chestnut Ridge Anticline, the dip on the west side of the pool being much less rapid than on the east, and thus making a terrace structure that is especially favorable for the segregation of oil. The producing sand has been correlated by the drillers as the Gantz, but the detailed studies in the counties to the northwest show that it is the Berea Sand, being about 400 feet below the top of the Big Lime. The daily initial production of the wells has not been large, ranging from 10 to 200 barrels, but a steady production for many years has made the field a profitable one. Drilling began in 1894 with the John Rastle No. 1 (273), which is still pumping, and many other wells have had a similar long life. The ten following records are of wells drilled along the most northern branch of Fink Creek:

### Thomas Fahey No. 4 Well Record (211).

Freemans Creek District; 1.8 miles S. 10° E. of Coldwater; authority, South Penn Oil Co.; elevation, 1305' B.

	Top. Feet.	Bottom. Feet.
Sand, Little Dunkard.....	1250	1298
Big Lime (oil, 2285').....	2244	2310

	Top. Feet.	Bottom. Feet.
Sand, Big Injun.....	2310	2390
Sand, Berea (oil, 2624').....	2609	2642
Total depth.....		2647

The following record was published in Volume I(A), page 367, the well being dry:

### John Leyden No. 2 Well Record (212).

Freemans Creek District; on branch of Fink Creek, 2.1 miles northeast of Dry Fork; authority, South Penn Oil Co.; elevation, 1135' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	610	615
Sand, Big Dunkard.....	1110	1170
Sand, Salt.....	1675	1735
Big Lime.....	2045	2105
Sand, Big Injun.....	2105	2260
Sand, Berea.....	2412	2430
Sand, Thirty-foot.....	2620	2650
Sand, Gordon.....	2725	2735
Sand, Fifth.....	2915	2920
Total depth.....		3010

### John Leyden No. 1 Well Record (213).

Freemans Creek District; on branch of Fink Creek, 2.3 miles northeast of Dry Fork; authority, South Penn Oil Co.; elevation, 935' B.

	Top. Feet.	Bottom. Feet.
Coal, Uniontown.....	48	52
Coal, Upper Mercer.....	1274	1279
Coal, Lower Mercer.....	1316	1320
Coal.....	1325	1327
Sand, white, Big Injun.....	1900	1960
Slate, black.....	1960	1975
Lime and sand.....	1975	2000
White lime sand to bottom.....	2000	2025

Drilling in the above well stopped about 225 feet above the Berea Sand and was therefore not a test. The three lower coals noted are in the Pottsville Series.

The following record was published in Volume I(A), page 361:

**Mary A. Fahey No. 3 Well Record (214).**

Freemans Creek District; 2.0 miles northeast of Dry Fork; authority, South Penn Oil Co.; elevation, 1060' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	542	547
Sand, Little Dunkard.....	975	1045
Sand, Second Cow Run.....	1390	1411
Sand, Maxton.....	1715	1745
Little Lime.....	1860	1890
Big Lime.....	1955	2006
Sand, Big Injun.....	2006	2140
Sand, Berea (oil, 2353').....	2344	2370
Total depth.....		2371

**Grant Gum No. 2 Well Record (215).**

Freemans Creek District; on branch of Fink Creek, 1.9 miles north-east of Dry Fork; authority, South Penn Oil Co.; elevation, 1005' B.

	Top. Feet.	Bottom. Feet.
Sand, Little Dunkard.....	1015	1020
Sand, Salt.....	1350	1475
Sand, Maxton.....	1675	1690
Big Lime.....	1920	1985
Sand, Big Injun.....	1985	2053
Sand, Berea (oil, 2308'; 30 bbl. well).....	2296	2316

The following record was published in Volume I(A), page 360:

**Theresa Gum No. 3 Well Record (216).**

Freemans Creek District; 1.7 miles northeast of Dry Fork; authority, South Penn Oil Co.; elevation, 1195' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	687	692
Sand, Little Dunkard.....	1120	1180
Sand, Big Dunkard.....	1230	1245
Sand, Gas.....	1465	1500
Sand, Second Cow Run.....	1550	1630
Sand, Maxton.....	1880	1890
Little Lime.....	2030	2090
Big Lime.....	2110	2180
Sand, Big Injun.....	2190	2260
Sand, Berea (oil, 2516').....	2504	2529
Total depth.....		2531

The following record was published in Volume I(A), page 361:

## Pat Walsh No. 3 Well Record (217).

Freemans Creek District; 1.6 miles northeast of Dry Fork; authority, South Penn Oil Co.; elevation, 1175' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	670	677
Sand, Little Dunkard.....	1010	1175
Sand, Big Dunkard.....	1210	1245
Sand, Gas.....	1450	1475
Sand, Second Cow Run.....	1540	1600
Sand, Maxton.....	1875	1880
Little Lime.....	2050	2075
Pencil Cave.....	2103	2110
Big Lime.....	2110	2160
Sand, Keener.....	2160	2165
Sand, Big Injun.....	2165	2290
Sand, Berea (oil, 2491'; 50-bbl. well).....	2481	2506

## Pat Walsh No. 1 Well Record (219).

Freemans Creek District; on branch of Fink Creek, 1.8 miles northeast of Dry Fork; authority, South Penn Oil Co.; elevation, 960' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	452	460
Big Lime.....	1850	1925
Sand, Big Injun.....	1925	2025
Sand, Berea.....	2233	2258
Sand, Thirty-foot.....	2430	2440
Sand, Gordon (show, 2535').....	2530	2545
Sand, Fifth.....	2710	2720
Total depth.....		2836

## Theresa A. Gum No. 1 Well Record (220).

Freemans Creek District; on branch of Fink Creek, 1.8 miles northeast of Dry Fork; authority South Penn Oil Co.; elevation, 980' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	445	451
Sand, Little Dunkard.....	900	948
Sand, Big Dunkard.....	971	1005
Sand, Gas.....	1245	1255
Sand, Salt.....	1334	1400
Sand, Maxton.....	1655	1665
Little Lime.....	1718	1810
Big Lime.....	1831	1926
Sand, Keener.....	1926	1930
Sand, Big Injun.....	1970	2020
Sand, Berea (oil, 2269').....	2257	2280
Total depth.....		2281

The following record was published in Volume 1(A), page 360:

### Theresa A. Gum No. 2 Well Record (221).

Freemans Creek District; 1.8 miles northeast of Dry Fork; authority, South Penn Oil Co.; elevation, 1175' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	652	659
Sand, Little Dunkard.....	1110	1175
Sand, Big Dunkard.....	1210	1245
Sand, Gas.....	1446	1486
Sand, Salt.....	1530	1610
Sand, Maxton.....	1860	1870
Big Lime.....	2100	2145
Sand, Keener.....	2145	2150
Sand, Big Injun.....	2150	2275
Sand, Berea (oil, 2470') (45-bbl. well).....	2458	2479
Total depth.....		2481

Numerous wells have been drilled along Fink Creek between the Fink Oil Pool and Churchville, most of which have been gassers, but a few of which have produced some oil. The six following wells are from this locality:

### John Leyden Heirs No. 41 Well Record (222).

Freemans Creek District; on Fink Creek, 2.0 miles northeast of Dry Fork; authority, Hope Natural Gas Co.; completed, April 5, 1902; elevation, 880' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	780	800
Second Cow Run Sand.....	1078	1185
Salt Sand.....	1195	1225
Maxton Sand.....	1375	1465
Little Lime.....	1675	1690
Pencil Cave.....	1702	1710
Big Lime.....	1710	1765
Big Injun Sand.....	1765	1885
Berea Sand (gas, 2080' and 2087') to bottom.....	2075	2095

### Wm. Woofter No. 4229 Well Record (226).

Freemans Creek District; on Fink Creek, 0.7 mile northwest of Churchville; authority, Pittsburgh and W. Va. Gas Co.; elevation, 1025' B.

	Top. Feet.	Bottom. Feet.
Coal, Normantown.....	400	406
Sand, Little Dunkard.....	685	720

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard.....	810	870
Sand, Gas.....	970	1035
Sand, Second Cow Run.....	1075	1185
Sand, Salt.....	1200	1395
Sand, Salt.....	1430	1520
Big Lime (oil).....	1770	1830
Sand, Big Injun (gas).....	1830	1940
Sand, Squaw.....	1960	1980
Sand, Berea (gas).....	2124	2139
Slate and shells.....	2139	2355
Sand, Thirty-foot.....	2355	2375
Sand, Gordon Stray.....	2400	2430
Slate and shells.....	2430	2595
Sand, Fourth.....	2595	2600
Slate and shells to bottom.....	2600	2672

### Leeman Cheuvront No. 4142 Well Record (227).

Freemans Creek District; on Fink Creek, 0.7 mile northwest of Churchville; authority, Pittsburgh & W. Va. Gas Co.; completed, June 1, 1913; elevation, 975' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	248	254
Sand, Little Dunkard.....	735	750
Sand, Big Dunkard.....	825	876
Sand, Burning Springs.....	896	975
Sand, Gas.....	1046	1094
Sand, Second Cow Run.....	1130	1205
Sand, Salt.....	1280	1320
Big Lime.....	1725	1775
Sand, Big Injun.....	1775	1900
Sand, Berea (gas).....	2080	2158
Sand, Fifty-foot.....	2280	2295
Sand, Thirty-foot (gas).....	2330	2340
Sand, Gordon Stray.....	2358	2374
Total depth.....		2382

The A. F. Gum No. 1 (228), drilled at Churchville, was reported to have made gas in the Gordon Stray Sand and oil from the Fifth, flowing 5 barrels daily. The following well also is reported to have made about the same amount of oil from the Fifth Sand, besides gas in the Gordon:

### J. M. McCluster No. 1874 Well Record (229).

Freemans Creek District; on Isaacs Fork at Churchville; authority, Hope Natural Gas Co.; completed, Sept. 13, 1910; elevation, 908' L.

	Top. Feet.	Bottom. Feet.
Moundsville Sand.....	330	343
Little Dunkard Sand.....	487	527

	Top. Feet.	Bottom. Feet.
Burning Springs Sand.....	676	728
Second Cow Run Sand.....	788	1009
Salt Sand.....	1096	1149
Maxton Sand.....	1347	1400
Little Lime.....	1508	1530
Pencil Cave.....	1530	1545
Big Lime.....	1545	1634
Big Injun Sand (oil show, 1690').....	1634	1735
Squaw Sand.....	1735	1765
Fifty-foot Sand.....	1953	1988
Thirty-foot Sand.....	2114	2134
Gordon Stray Sand.....	2168	2176
Gordon Sand (gas, 2207' and 2237').....	2202	2253
Fifth Sand (oil, 2432'; gas, 2437').....	2432	2451
Total depth.....		2651

### Henry Snyder No. 932 Well Record (231).

Freemans Creek District; 0.9 mile northeast of Churchville; authority, Hope Natural Gas Co.; completed, June 28, 1907; elevation, 1185' B.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	16
Little Dunkard Sand.....	810	840
Big Dunkard Sand.....	870	910
Gas Sand.....	1085	1185
Sand, Second Cow Run (water).....	1210	1260
Salt Sand.....	1325	1515
Red rock.....	1680	1800
Maxton Sand.....	1800	1808
Little Lime.....	1828	1844
Big Lime (show of oil).....	1878	1933
Big Injun Sand.....	1933	2108
Berea Sand (gas, 2250').....	2237	2263
Total depth.....		2265

### Peter L. Hull No. 3697 Well Record (232).

Freemans Creek District, 1.3 miles east of Churchville; authority, Hope Natural Gas Co.; completed, Feb. 26, 1915; elevation, 1045' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	740	805
Burning Springs Sand.....	910	940
Gas Sand.....	1005	1065
Second Cow Run Sand (water, 1140').....	1090	1200
Salt Sand.....	1210	1460
Maxton Sand.....	1575	1610
Little Lime.....	1745	1770
Pencil Cave.....	1770	1790



	Top. Feet.	Bottom. Feet.
Big Lime (gas, 1810'; oil, 1825').....	1790	1860
Big Injun Sand (oil, 1941').....	1860	2005
Berea Sand (gas, 2148').....	2144	2175
Fifty-foot Sand.....	Shells	
Thirty-foot Sand.....	2342	2360
Gordon Stray Sand (gas, 2438').....	2422	2445
Gordon Sand (gas, 2463' and 2471').....	2459	2478
Total depth.....		2479

On the Left Fork of Freemans Creek, west of Freemansburg, numerous gas wells have been drilled, from which the seven following records are taken. Well No. 233 was published in Volume I(A), page 358, of the Survey:

#### Wm. Winans No. 19 Well Record (233).

Freemans Creek District; on branch of Left Fork, 1.6 miles east of Churchville; authority, Reserve Gas Co.; elevation, 1180' B.

	Top. Feet.	Bottom. Feet.
Coal, Redstone, and unrecorded.....	150	180
Coal, Pittsburgh, and unrecorded.....	180	1475
Sand, Salt.....	1475	1490
Little Lime.....	1670	1680
Pencil Cave.....	1680	1690
Big Lime.....	1690	1800
Sand, Big Injun.....	1800	1900
Sand, Gordon.....	2315	2395
Sand, Fifth, to bottom.....	2536	2558
"Brown sand and pebble top of Fifth Sand; sand close, hard and glassy."		

#### W. M. Woofter No. 4270 Well Record (233A).

Freemans Creek District; on branch of Left Fork, 2.0 miles east of Churchville; authority, Pittsburgh and W. Va. Gas Co.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	616	622
Sand, Moundsville.....	1005	1017
Sand, Little Dunkard.....	1110	1145
Sand, Gas.....	1330	1420
Sand, Second Cow Run (water, 10 bailers, 1430').....	1424	1510
Sand, Salt.....	1535	1565
Sand, Salt.....	1688	1750
Sand, Salt (oil, 1791'; gas, 1798').....	1788	1832
Little Lime.....	2037	2057
Big Lime.....	2077	2131
Sand, Big Injun (little gas, 2189').....	2131	2278

	Top. Feet.	Bottom. Feet.
Sand, Berea (gas, 2420-30').....	2420	2440
Sand, Thirty-foot.....	2621	2641
Sand, Gordon Stray.....	2687	2709
Sand, Gordon (gas, 2747').....	2723	2752
Total depth.....		2810
Conductor, 16'; 10" casing, 475'; 8¼", 1531'; 6⅝", 2135'; 5 3/16", 2693'.		

### I. Simmons No. 96 Well Record (234).

Freemans Creek District; on Isaacs Fork, 0.6 mile west of Freemansburg; authority, Reserve Gas Co.; completed, Sept. 4, 1905; elevation, 1045' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	400	420
Burning Springs Sand.....	440	465
Little Lime.....	1195	1255
Pencil Cave.....	1255	1276
Big Lime.....	1276	1326
Big Injun Sand (gas, 1345').....	1326	1485
Berea Sand.....	1644	1658
Thirty-foot Sand.....	1848	1860
Gordon Stray Sand (gas, 1937').....	1926	1948
Gordon Sand (gas, 1955').....	1953	2003
Fifth Sand (gas, 2160-72').....	2159	2177
Total depth.....		2183

### Crit White No. 210 Well Record (235).

Freemans Creek District; on Left Fork, 2.0 miles west of Freemansburg; authority, Reserve Gas Co.; completed, Jan. 15, 1910; elevation, 1075' B.

	Top. Feet.	Bottom. Feet.
Moundsville Sand.....	400	
Little Dunkard Sand.....	445	
Burning Springs Sand.....	570	640
Gas Sand.....	680	780
Salt Sand.....	876	975
Maxton Sand.....	1210	1240
Little Lime.....	1450	1475
Pencil Cave.....	1475	1495
Big Lime.....	1495	1545
Big Injun Sand.....	1545	1740
Berea Sand.....	1820	1840
Thirty-foot Sand.....	2015	2035
Gordon Stray Sand (gas, 2122').....	2122	2150
Gordon Sand (gas, 2181', 2190', 2196').....	2158	2200
Total depth.....		2203

## Perry White No. 497 Well Record (236).

Freemans Creek District; on Left Fork, 1.0 mile southeast of Churchville; authority, Reserve Gas Co.; completed in 1914; elevation, 1228' L.

	Top. Feet.	Bottom. Feet.
Coal, Redstone.....	149	152
Coal, Pittsburgh.....	230	236
Sand, Little Dunkard.....	680	730
Sand, Big Dunkard.....	760	880
Sand, Gas (gas, 980').....	885	985
Sand, Second Cow Run.....	1050	1125
Sand, Salt (water, 1055').....	1130	1380
Sand, Salt (gas, 1485').....	1400	1490
Little Lime.....	1660	1685
Pencil Cave.....	1685	1695
Big Lime.....	1695	1745
Sand, Big Injun.....	1745	1900
Sand, Squaw.....	1910	1970
Sand, Berea.....	2030	2050
Sand, Fifty-foot.....	2235	2257
Sand, Thirty-foot.....	2301	2320
Sand, Gordon (gas, 2379' and 2405').....	2375	2405
Total depth.....		2430

Conductor, 16'; 10" casing, 180'; 8", 1045'; 6 $\frac{5}{8}$ ", 1751'; 5 3/16", 2306'; 21/10" mercury in 5 3/16" casing, 2306'; rock pressure too much for 500 lb. gauge in 12 hours; volume, 7,500,000.

## A. A. Rohrbaugh No. 3507 Well Record (237).

Freemans Creek District; 1.0 mile south of Churchville; authority, Hope Natural Gas Co.; completed, Aug. 20, 1914; elevation, 1290' L.

	Top. Feet.	Bottom. Feet.
Redstone Coal.....	262	267
Pittsburgh Coal.....	293	299
Little Dunkard Sand.....	720	770
Big Dunkard Sand.....	790	900
Gas Sand.....	912	1115
Second Cow Run Sand.....	1120	1240
Salt Sand.....	1445	1575
Maxton Sand.....	1590	1620
Little Lime.....	1741	1765
Pencil Cave.....	1765	1770
Big Lime.....	1770	1820
Big Injun Sand (oil and gas, 1925' and 1931').....	1820	2004
Squaw Sand.....	2012	2080
Berea Sand.....	2194	2212
Fifty-foot Sand.....	2313	2332
Thirty-foot Sand (gas, 2398').....	2390	2409
Gordon Stray Sand (gas, 2467' and 2482').....	2465	2493
Gordon Sand (gas, 2508-14').....	2496	2515
Total depth.....		2516

The four following wells are located along Isaacs Fork of Fink Creek, west of Churchville:

### Hoy Wiseman No. 1 Well Record (239).

Freemans Creek District; on Isaacs Fork, 0.3 mile west of Churchville; authority, Crit White; elevation, 955' B.

	Top. Feet.	Bottom. Feet.
Sand, Little Dunkard.....	323	390
Sand, Big Dunkard.....	522	562
Sand, Gas.....	632	720
Sand, Second Cow Run.....	828	1057
Sand, Salt.....	1059	1146
Sand, Salt.....	1265	1395
Little Lime.....	1558	1572
Pencil Cave.....	1572	1592
Big Lime.....	1592	1634
Sand, Big Injun.....	1634	1822
Sand, Squaw.....	1828	1845
Sand, Thirty-foot.....	2203	2253
Sand, Gordon Stray.....	2272	2302
Sand, Fifth (gas, 2474' and 2486').....	2472	2490
Total depth.....		2517

### Addison Puffenbarger No. 1289 Well Record (241).

Freemans Creek District; 1.2 miles west of Churchville; authority, Hope Natural Gas Co.; completed, Sept. 3, 1909; elevation, 1230' B.

	Top. Feet.	Bottom. Feet.
Conductor.....	0	8
Little Dunkard Sand (gas, 825').....	815	842
Big Dunkard Sand.....	890	950
Burning Springs Sand.....	1000	1094
Second Cow Run Sand.....	1250	1350
Salt Sand.....	1436	1506
Salt Sand.....	1560	1645
Little Lime.....	1885	1900
Pencil Cave.....	1900	1920
Big Lime (gas, 1940').....	1920	1980
Big Injun Sand.....	1980	2088
Squaw Sand.....	2105	2175
Berea Sand (gas, 2305').....	2303	2316
Thirty-foot Sand.....	2495	2510
Gordon Stray Sand (gas, 2609-12').....	2606	2624
Total depth.....		2637

## O. Chevront No. 4087 Well Record (243).

Freemans Creek District; on branch of Isaacs Fork, 1.5 miles west of Churchville; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1110' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	312	314
Sand, Moundsville.....	710	725
Sand, Little Dunkard (show gas).....	775	805
Sand, Big Dunkard.....	820	875
Sand, Gas.....	940	1040
Sand, Second Cow Run.....	1080	1155
Sand, Salt.....	1210	1285
Sand, Maxton.....	1545	1635
Big Lime.....	1835	1890
Sand, Big Injun.....	1890	2010
Sand, Squaw.....	2015	2040
Sand, Berea (gas).....	2210	2225
Sand, Thirty-foot.....	2408	2426
Sand, Gordon Stray (gas show).....	2487	2498
Sand, Gordon (gas).....	2517	2537
Sand, Fourth.....	2561	2568
Sand, Fifth.....	2672	2677
Total depth.....		2703

## M. G. Woofter No. 4228 Well Record (245).

Freemans Creek District; on Isaacs Fork, 1.5 miles northwest of Churchville; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1290' B.

	Top. Feet.	Bottom. Feet.
Coal, Uniontown.....	375	377
Coal, Pittsburgh.....	680	682
Sand, Little Dunkard.....	1030	1100
Unrecorded and shale.....	1100	1350
Sand, Gas.....	1350	1430
Sand, Second Cow Run.....	1430	1610
Unrecorded and shale.....	1610	1810
Sand, Maxton.....	1810	2010
Big Lime.....	2168	2228
Sand, Big Injun (oil show).....	2228	2401
Sand, Berea (gas).....	2510	2535
Sand, Fifty-foot.....	2700	2720
Unrecorded and slate.....	2720	2815
Sand, Gordon Stray (gas).....	2815	2830
Sand, Fourth.....	2971	2976
Total depth.....		2990

The following well was drilled farther west, near the Fink Oil Pool:

**M. B. Riley No. 1930 Well Record (246).**

Freemans Creek District; on branch of Alum Fork, 1.0 mile east of Dry Fork; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1200' L

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard.....	1035	1115
Sand, Burning Springs.....	1170	1230
Sand, Gas.....	1240	1300
Sand, Salt.....	1522	1557
Sand, Maxton.....	1735	1855
Big Lime.....	2065	2125
Sand, Big Injun (gas).....	2125	2260
Sand, Berea (gas).....	2426	2444
Total depth.....		2475

The eight following wells are located in the neighborhood of Dry Fork village and are in the heart of the Fink Oil Pool. Most of them have been oil producers from the Berea Sand:

**Maxwell Heirs No. 9 Well Record (247).**

Freemans Creek District; on Fink Creek, 0.4 mile northeast of Dry Fork; authority, South Penn Oil Co.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	545	550
Sand, Big Dunkard.....	1115	1200
Sand, Second Cow Run.....	1450	1525
Sand, Salt.....	1700	1780
Big Lime.....	2000	2050
Sand, Big Injun.....	2050	2180
Sand, Berea (gas, 2376-86').....	2375	2392
Slate to bottom.....	2392	2395

The above record was formerly published in Volume I(A), page 365, of the Survey Reports.

**M. and B. McDonnell No. 5 Well Record (250).**

Freemans Creek District; on Fink Creek, at Dry Fork; authority, South Penn Oil Co.; elevation, 845' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	330	337
Sand, Big Dunkard.....	890	930
Sand, Second Cow Run.....	1240	1340
Sand, Big Injun.....	1720	1820
Slate.....	1920	2166
Sand, Berea (oil, 2173').....	2166	2183
Slate to bottom.....	2183	2189

**G. A. Brown No. 1 Well Record (251).**

Freemans Creek District; on branch of Fink Creek, 1.2 miles north-east of Dry Fork; authority, South Penn Oil Co.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	655	660
Sand, Little Dunkard.....	1090	1155
Sand, Second Cow Run.....	1520	1615
Big Lime.....	2108	2150
Sand, Big Injun (oil show, 2154').....	2150	2300
Sand, Berea.....	2468	2490
Sand, Gordon Stray.....	2680	2695
Sand, Gordon.....	2780	2794
Sand, Bayard.....	2975	2976
Total depth.....		3088

The above well, the record of which was previously published in Volume I(A), page 366, of the Survey, made no oil in the Berea and only a show in the Big Injun Sand, being classed as a dry hole.

**Elizabeth Boyle No. 1 Well Record (252).**

Freemans Creek District; 1.0 mile N. 15° E. of Dry Fork; authority, South Penn Oil Co.; elevation, 945' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	453	458
Big Dunkard Sand.....	1000	1050
Second Cow Run Sand.....	1355	1408
Big Lime.....	1885	1940
Big Injun Sand.....	1940	2090
Berea Sand (oil, 2282').....	2272	2299
Slate to bottom.....	2299	2305

**Dennis Conroy No. 6 Well Record (255).**

Freemans Creek District; on Fink Creek, 0.2 mile northeast of Fink; authority, South Penn Oil Co.; elevation, 890' B.

	Top. Feet.	Bottom. Feet.
Coal, Normantown.....	575	580
Big Dunkard Sand.....	920	965
Salt Sand.....	1315	1370
Salt Sand.....	1510	1610
Big Injun Sand.....	1885	2010
Berea Sand (oil, 2238').....	2228	
Total depth.....		2274

**Dennis Conroy No. 4 Well Record (256).**

Freemans Creek District; on Fink Creek, 0.2 mile west of Dry Fork; authority, South Penn Oil Co.; elevation, 940' B.

	Top. Feet.	Bottom. Feet.
<b>Coal, Pittsburgh</b> .....	450	455
<b>Sand, Big Dunkard</b> .....	960	1000
<b>Big Lime</b> .....	1850	1925
<b>Sand, Keener</b> .....	1925	1950
<b>Sand, Big Injun</b> .....	1950	2000
<b>Sand, Berea (oil, 2290')</b> .....	2280	2300

The above record was formerly published in Volume I(A), page 367. of the Survey.

**Wm. Walsh No. 1 Well Record (259).**

Freemans Creek District; on Fink Creek, 0.2 mile northwest of Fink; authority, South Penn Oil Co.; elevation, 905' B.

	Top. Feet.	Bottom. Feet.
<b>Coal, Pittsburgh</b> .....	427	
<b>Second Cow Run Sand</b> .....	1261	
<b>Big Lime</b> .....	1910	
<b>Big Injun Sand (gas, 2027')</b> .....	1950	
<b>Berea Sand (gas, 2332')</b> .....	2323	
<b>Total depth</b> .....		2375

**John Tierney No. 1 Well Record (263).**

Freemans Creek District; on Fink Creek, 0.7 mile southwest of Fink; authority, South Penn Oil Co.; elevation, 835' B.

	Top. Feet.	Bottom. Feet.
<b>Coal, Pittsburgh</b> .....	385	390
<b>Big Injun Sand</b> .....	1840	1966
<b>Squaw Sand</b> .....	1984	2080
<b>Berea Sand (oil and water, 2220')</b> .....	2210	
<b>Total depth</b> .....		2266

The following well was drilled on a branch of Fink Creek about one mile northwest of the main oil belt, and has no other well near it. According to John T. Keely, it made 40 barrels the first day, 20 barrels the second, and averaged 1 barrel daily for the next 10 years, when it was abandoned:



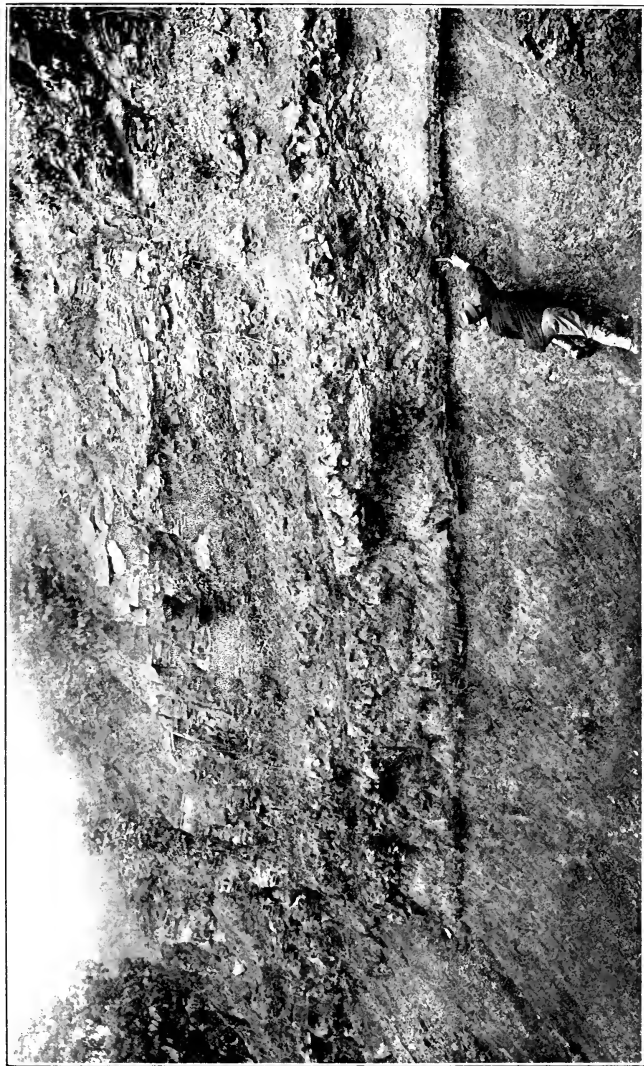


PLATE XX.—View along Coal & Coke Railway, one-half mile west of Orlando, showing Morgantown Sandstone, Orlando Limestone, and Elk Lick Coal. The 6-inch rule is held on the coal.



**John T. Keely No. 1 Well Record (266).**

Freemans Creek District; 1.0 mile N. 5° W. of Fink; authority, South Penn Oil Co.; elevation, 920' B.

	Top. Feet.	Bottom. Feet.
<b>Pittsburgh Coal</b> .....	498	504
Big Dunkard Sand.....	1025	
Gas Sand.....	1310	
Second Cow Run Sand.....	1396	1451
Salt Sand.....	1675	1690
<b>Big Lime</b> .....	1908	1960
Big Injun Sand.....	1960	2090
<b>Berea Sand</b> (oil, 2350-60').....	2332	
Total depth.....		2387

The eleven following records are from the most western portion of the Fink Oil Pool, near the corner of Lewis, Gilmer and Doddridge. The pool extends a short distance up Big Buck Run into Doddridge:

**John Kenney No. 1 Well Record (267).**

Freemans Creek District; on Fink Creek, 1.6 miles southwest of Fink; authority, South Penn Oil Co.; elevation, 905' B.

	Top. Feet.	Bottom. Feet.
<b>Pittsburgh Coal</b> .....	445	452
Little Dunkard Sand.....	845	880
Big Dunkard Sand.....	900	970
Gas Sand.....	1190	1230
Second Cow Run Sand.....	1295	1340
Salt Sand.....	1400	1500
<b>Big Lime</b> .....	1870	1920
Big Injun Sand.....	1920	2037
<b>Berea Sand</b> (oil, 2282-92').....	2277	2301
Total depth.....		2302

**Leopold Stadler No. 2 Well Record (268).**

Freemans Creek District; on Fink Creek, 1.6 miles southwest of Fink; authority, South Penn Oil Co.; elevation, 910' B.

	Top. Feet.	Bottom. Feet.
<b>Pittsburgh Coal</b> .....	447	454
Little Dunkard Sand.....	805	850
Big Dunkard Sand.....	902	957
Gas Sand.....	1080	1160
Second Cow Run Sand.....	1290	1350
Salt Sand.....	1615	1650
Little Lime.....	1795	1815

	Top. Feet.	Bottom. Feet.
Big Lime.....	1835	1910
Big Injun Sand.....	1910	2010
Squaw Sand.....	2026	2136
Berea Sand (oil, 2292').....	2280	2307
Total depth.....		2308

### T. M. Bode No. 1 Well Record (269).

Freemans Creek District; on Fink Creek, 1.8 miles southwest of Fink; authority, South Penn Oil Co.; elevation, 1040' B.

	Top. Feet.	Bottom. Feet.
Pittsburgh Coal.....	570	580
Moundsville Sand.....	958	1008
Little Dunkard Sand .....	1055	1085
Big Dunkard Sand.....	1135	1188
Second Cow Run Sand.....	1400	1460
Salt Sand.....	1490	1510
Maxton Sand.....	1832	1882
Little Lime.....	1940	1965
Blue Monday Sand.....	1965	2061
Big Lime.....	2061	2077
Big Injun Sand.....	2077	2193
Squaw Sand.....	2200	2333
Berea Sand (oil, 2414').....	2403	2428
Total depth.....		2430

### Leopold Stadler No. 1 Well Record (270).

Freemans Creek District; on Fink Creek, 1.6 miles northeast of Hurst; authority, South Penn Oil Co.; elevation, 900' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	450	455
Sand, Big Dunkard.....	965	985
Sand, Second Cow Run.....	1245	1290
Sand, Salt.....	1300	1350
Little Lime.....	1820	1870
Big Lime.....	1870	1950
Sand, Big Injun.....	1950	2070
Sand, Berea (oil, 2290').....	2285	2311
Total depth.....		2316

The above record was previously published in Volume I(A). page 365, of the Survey.

## Conrad Rastle No. 2 Well Record (271).

Freemans Creek District; on Fink Creek, 1.1 miles northeast of Hurst; authority, South Penn Oil Co.; elevation, 805' B.

	Top. Feet.	Bottom. Feet.
Pittsburgh Coal.....	315	323
Big Dunkard Sand.....	790	900
Salt Sand.....	1210	1300
Big Lime.....	1760	1810
Big Injun Sand.....	1810	1925
Berea Sand (oil, 2167').....	2160	2177
Total depth.....		2191

## John Rastle No. 1 Well Record (273).

Freemans Creek District; on Fink Creek, 1.0 mile north of Hurst; authority, South Penn Oil Co.; elevation, 800' L.

	Thickness, Feet.	Total, Feet.
Conductor .....	31	31
Sand .....	12	43
Red rock.....	76	119
Limestone .....	71	190
Slate .....	30	220
Limestone .....	20	240
Slate .....	15	255
Limestone .....	10	265
Slate .....	29	294
Coal, Pittsburgh.....	8	302
Slate .....	36	338
Sand, Connellsville.....	65	403
Red rock.....	125	528
Sand, Grafton.....	89	617
Slate .....	47	664
Red rock.....	38	702
Sand, Moundsville.....	30	732
Slate .....	21	753
Sand, Little Dunkard.....	39	792
Slate .....	23	815
Limestone .....	70	885
Limestone and shells.....	55	940
Slate .....	25	965
Limestone .....	32	997
Slate .....	20	1017
Gas Sand.....	83	1100
Slate .....	25	1125
Limestone .....	15	1140
Slate .....	30	1170
Sand, Salt.....	20	1190
Slate .....	7	1197
Sand, Salt.....	18	1215
Slate .....	45	1260
Sand, Salt.....	80	1340
Slate .....	67	1407

	Thickness. Total	
	Feet.	Feet.
Sand, Salt.....	53	1460
Slate .....	10	1470
Limestone .....	20	1490
Slate .....	30	1520
Limestone .....	20	1540
Slate .....	75	1615
Sand, Maxton.....	15	1630
Limestone .....	30	1660
Red rock.....	2	1662
Limestone .....	18	1680
Sand .....	15	1695
Red rock.....	5	1700
<b>Big Lime</b> .....	35	1735
Big Injun Sand.....	196	1931
Slate .....	15	1946
Sand, Squaw.....	114	2060
Slate .....	93	2153
<b>Sand, Berea</b> (oil, gas and water).....	49	2202
Slate .....	5	2207
Limestone .....	33	2240
Slate and shells.....	463	2703

The above well, which was the first in the Fink Oil Pool, was drilled in 1894, its initial production being 15 barrels daily. In 1914 it was still producing 2½ barrels. This record was published in Volume I, page 257, of the Survey.

The following well, the record of which was previously published in Volume I(A), page 366, of the Survey, made 15 to 20 barrels when drilled, but had declined to 1½ barrels daily in 1914. It starts 2 feet below the Washington Coal:

### Mary Albers No. 2 Well Record (276).

Freemans Creek District; on Fink Creek, 1.1 miles north of Hurst; authority, South Penn Oil Co.; elevation, 1038' L.

	Top.	Bottom.
	Feet.	Feet.
<b>Coal, Pittsburgh</b> .....	551	556
Sand, Little Dunkard.....	1005	1050
Sand, Big Dunkard.....	1070	1205
Sand, Second Cow Run.....	1415	1455
Sand, Salt.....	1550	1630
Pencil Cave.....	1995	2000
<b>Big Lime</b> .....	2025	2060
Sand, Big Injun.....	2060	2180
<b>Sand, Berea</b> (oil, 2410'; water, 2415').....	2405	2430

**John Rastle No. 2 Well Record (277).**

Freemans Creek District; on Fink Creek, 1.0 mile north of Hurst; authority, South Penn Oil Co.; elevation, 1050' L.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	1103	1130
Salt Sand.....	1450	1484
Salt Sand.....	1580	1650
Big Lime.....	2045	2087
Big Injun Sand.....	2087	2190
Berea Sand (oil, light, 2434') to bottom.....	2427	2454

This record was published in the Doddridge-Harrison Report, page 385, of the Survey.

**Charles Fisher No. 1 Well Record (278).**

Freemans Creek District; on Sycamore Creek, 1.1 miles N. 10° W. of Hurst; authority, South Penn Oil Co.; elevation, 807' L.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh, and unrecorded.....	315	700
Sand, Moundsville, and unrecorded.....	700	845
Sand, Little Dunkard, and unrecorded.....	845	1710
Sand, Big Injun.....	1710	1915
Sand, Berea (oil and water, 2165').....	2160	2186

The above record was published in Volume I(A), page 298, of the Survey.

**S. H. Lowther No. 3 Well Record (279).**

Freemans Creek District; on Fink Creek, 1.1 miles northwest of Hurst; authority, South Penn Oil Co.; elevation, 905' B.

	Top. Feet.	Bottom. Feet.
Pittsburgh Coal.....	425	431
Moundsville Sand.....	810	850
Little Dunkard Sand.....	935	960
Second Cow Run Sand.....	1268	1305
Salt Sand.....	1425	1700
Maxton Sand.....	1830	1860
Big Lime.....	1860	1920
Big Injun Sand.....	1920	2015
Berea Sand.....	2268	2302
Total depth.....		2311

### Mary E. Hall No. 2 Well Record (282).

Freemans Creek District; on Fink Creek, 0.8 mile northwest of Hurst; authority, South Penn Oil Co.; elevation, 802' L.

	Top.	Bottom.
	Feet.	Feet.
Coal, Pittsburgh.....	300	308
Sand, Big Dunkard.....	900	950
Sand, Second Cow Run.....	1210	1280
Sand, Salt.....	1420	1430
Sand, Big Injun.....	1800	1920
Sand, Berea (oil, 2155').....	2145	2175
Total depth.....		2177

This well, the record of which was published in Volume I(A), page 363, of the Survey, has a present production of 1 barrel daily.

The record of the J. C. Marsh No. 1 (281), which was a dry hole, is published in the Hurst Section in Chapter IV, page 56.

Efforts to extend the Fink Pool southward in the region of Hurst have, so far, proved unsuccessful. The **Henry Hurst No. 1 (282A)**, located on a branch of Little Cove Creek, 1.3 miles westward from Hurst, made a show of oil, but was abandoned as a dry hole. The following well made a show of oil:

### M. J. Lovett No. 2 Well Record (283).

Freemans Creek District; 0.9 mile northwest of Hurst; authority, South Penn Oil Co.; elevation, 1110' B.

	Top.	Bottom.
	Feet.	Feet.
Pittsburgh Coal.....	567	575
Big Dunkard Sand.....	1088	1175
Gas Sand.....	1310	1390
Salt Sand.....	1580	1675
Salt Sand.....	1695	1775
Maxton Sand.....	1862	1920
Little Lime.....	1950	1965
Pencil Cave.....	1965	1990
Big Lime.....	1990	2050
Big Injun Sand.....	2050	2173
Berea Sand (oil, 2440') to bottom.....	2426	2462

The following well, the record of which was published in Volume I(A), page 364, of the Survey, was another dry hole in the same locality. The record shows no oil:



**M. J. Lovett No. 1 Well Record (284).**

Freemans Creek District; on Fink Creek, at Hurst; authority, South Penn Oil Co.; elevation, 800' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	240	245
Sand, Big Dunkard.....	780	825
Sand, Second Cow Run.....	1105	1135
Big Lime.....	1677	1735
Sand, Big Injun.....	1735	1835
Sand, Berea.....	2102	2110
Slate to bottom.....	2110	2690

The **F. O. Hudkins No. 1 (285)**, drilled by the Hope Natural Gas Company, one-fourth mile south of Hurst, was reported to have made a show of gas, but its record was not secured.

The **W. S. and I. C. Means No. 1 (287)**, located 0.8 mile northeast of Hurst, made a show of oil, but was not shot or pumped. The following well was a producer from the Berea Sand:

**Otho Means No. 1 Well Record (287A).**

Freemans Creek District; on Straight Run, 0.9 mile N. 40° E. of Hurst; authority, South Penn Oil Co.; elevation, 920' B.

	Top. Feet.	Bottom. Feet.
Coal, Little Clarksburg.....	474	480
Sand, Burning Springs.....	1000	1075
Second Cow Run Sand.....	1280	1300
Salt Sand.....	1400	1450
Keener Sand.....	1650	1665
Big Injun Sand.....	2010	2125
Berea Sand to bottom.....	2330	2384

The ten following wells, drilled along Straight Run, are along the edge of the oil producing zone of the Fink Pool, some of them on the south side being gas wells:

**A. T. Goodwin No. 1 Well Record (289).**

Freemans Creek District; on Straight Run, 1.4 miles northeast of Hurst; authority, South Penn Oil Co.; elevation, 865' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	336	340
Sand, Big Dunkard.....	850	890

	Top. Feet.	Bottom. Feet.
Sand, Gas.....	1100	1150
Sand, Salt.....	1220	1340
Sand, Keener.....	1875	1895
Sand, Big Injun.....	1895	2050
Sand, Berea.....	2190	

This record was published in Volume I(A), page 362.  
The well produced oil from the Berea Sand.

#### A. T. Goodwin No. 3 Well Record (290).

Freemans Creek District; on Straight Run, 1.6 miles N. 50° E. of Hurst; authority, South Penn Oil Co.; elevation, 1000' B.

	Top. Feet.	Bottom. Feet.
Pittsburgh Coal.....	480	486
Big Dunkard Sand.....	1025	1040
Salt Sand.....	1365	1392
Salt Sand.....	1625	1650
Big Lime.....	1920	1965
Big Injun Sand (oil, 2077').....	1965	2085
Berea Sand (oil, 2362').....	2350	2380
Total depth.....		2385

#### G. E. Lowther No. 2 Well Record (292).

Freemans Creek District; on Straight Run, 1.6 miles northeast of Hurst; authority, South Penn Oil Co.; elevation, 990' B.

	Top. Feet.	Bottom. Feet.
Pittsburgh Coal.....	479	487
Big Dunkard Sand.....	1003	1018
Salt Sand.....	1358	1383
Salt Sand.....	1590	1640
Big Lime.....	1942	2002
Big Injun Sand.....	2002	2104
Berea Sand (oil, 2357').....	2347	2372
Total depth.....		2382

Present production, 10 barrels weekly.

#### Emma Jones No. 1 Well Record (293).

Freemans Creek District; 1.5 miles northeast of Hurst; authority, South Penn Oil Co.; elevation, 1040' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	575	581
Sand, Little Dunkard.....	1000	1050
Sand, Salt.....	1550	1650

	Top. Feet.	Bottom. Feet.
Sand, Salt.....	1700	1750
<b>Big Lime</b> .....	1975	2050
Sand, Big Injun.....	2080	2180
<b>Sand, Berea</b> (oil, 2423').....	2422	2447
Total depth.....		2490
Present production, 3 barrels weekly.		

This record was published in Volume I(A), page 363, of the Survey.

### J. R. Lowther No. 2 Well Record (294).

Freemans Creek District; 1.7 miles northeast of Hurst; authority, South Penn Oil Co.; elevation, 1005' B.

	Top. Feet.	Bottom. Feet.
<b>Coal, Pittsburgh</b> .....	535	542
Sand, Salt.....	1450	1550
<b>Big Lime</b> .....	1940	2000
Sand, Big Injun.....	2000	2060
<b>Sand, Berea</b> (oil, 2390').....	2380	2400
Total depth.....		2410
Present production, 1 barrel daily.		

This record was published in Volume I(A), page 364, of the Survey.

### J. R. Lowther No. 1 Well Record (295).

Freemans Creek District; on Straight Run, 1.8 miles northeast of Hurst; authority, South Penn Oil Co.; elevation, 1075' B.

	Top. Feet.	Bottom. Feet.
<b>Pittsburgh Coal</b> .....	600	606
Salt Sand.....	1475	1530
Big Injun Sand.....	2140	2210
<b>Berea Sand</b> (oil, 2461').....	2446	2462
Total depth.....		2477
Present production, 1 barrel daily.		

### M. C. Marsh No. 90 Well Record (296).

Freemans Creek District; on Straight Run, 1.8 miles northeast of Hurst; authority, Hope Natural Gas Co.; elevation, 980' B.

	Top. Feet.	Bottom. Feet.
<b>Coal, Pittsburgh</b> .....	445	451
Sand, Little Dunkard.....	900	925
Sand, Second Cow Run.....	1225	1290

	Top. Feet.	Bottom. Feet.
Sand, Salt.....	1325	1355
Sand, Salt.....	1570	1600
Pencil Cave.....	1895	1905
Big Lime.....	1905	1955
Sand, Big Injun.....	1955	2075
Sand, Berea (gas, 2312').....	2299	2319

The above record was published in Volume I(A), page 365, of the Survey.

### W. H. Hurst No. 183 Well Record (297).

Freemans Creek District; 2.3 miles northeast of Hurst; authority, South Penn Oil Co.; elevation, 1075' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	554	560
Sand, Big Dunkard.....	1100	1145
Sand, Gas.....	1360	1380
Sand, Salt.....	1480	1550
Sand, Salt.....	1725	1740
Sand, Big Injun.....	2040	2150
Sand, Berea.....	2404	2420

The above well, the record of which was published in Volume I(A), page 363, of the Survey, was a gas well, presumably in the Berea Sand.

### Joseph Krenn No. 3 Well Record (301).

Freemans Creek District; 2.1 miles northeast of Hurst; authority, South Penn Oil Co.; elevation, 1195' B.

	Top. Feet.	Bottom. Feet.
Coal, Washington.....	150	155
Sand, Big Dunkard.....	1260	1320
Sand, Salt.....	1650	1675
Sand, Big Injun.....	2205	2330
Sand, Berea.....	2572	2596
Sand, Gordon.....	2893	2897
Sand, Fifth, and unrecorded, to bottom.....	3023	3058

The above well, the record of which was published in Volume I(A), page 364, of the Survey, was reported to have been a dry hole.

**Joseph Krenn No. 7 Well Record (302).**

Freemans Creek District; on Straight Run, 2.3 miles northeast of Hurst; authority, South Penn Oil Co.; elevation, 1195' B.

	Top. Feet.	Bottom. Feet.
<b>Pittsburgh Coal</b> .....	660	
Big Dunkard Sand.....	1220	1265
Gas Sand.....	1385	1415
Sand, Salt.....	1715	1755
Sand, Salt.....	1840	1890
Unrecorded (oil, 1920').....	1890	2120
<b>Big Lime</b> .....	2120	2185
Big Injun Sand.....	2200	2310
Berea Sand.....	2507	2527
Unrecorded (oil, 2558') to bottom.....	2527	2574

The four following wells were drilled along the ridge between Fink Creek and the waters of Leading Creek, and are in the edge of the Fink Pool:

**J. C. Starcher No. 2 Well Record (303).**

Freemans Creek District; 2.5 miles northeast of Hurst; authority, South Penn Oil Co.; elevation, 1145' B.

	Top. Feet.	Bottom. Feet.
<b>Coal, Pittsburgh</b> .....	656	662
Sand, Big Dunkard.....	1150	1175
Sand, Gas.....	1310	1410
Sand, Salt.....	1535	1685
Sand, Keener.....	1965	1985
Sand, Big Injun.....	2010	2110
Sand, Berea (oil, 2511').....	2501	2535

The above well was published in Volume I(A), page 365, of the Survey.

**U. F. Starcher No. 3 Well Record (305).**

Freemans Creek District; 0.6 mile southwest of Fink; authority, South Penn Oil Co.; elevation, 1090' B.

	Top. Feet.	Bottom Feet.
<b>Pittsburgh Coal</b> .....	575	580
Big Dunkard Sand.....	1120	1145
Salt Sand.....	1425	1465
Salt Sand.....	1620	1650
Pencil Cave.....	2015	2025
<b>Big Lime</b> .....	2025	2070
Big Injun Sand.....	2075	2185
Berea Sand (oil, 2430') to bottom.....	2418	2449

**Maxwell Heirs No. 4 Well Record (306).**

Freemans Creek District; 0.4 mile southwest of Fink; authority, South Penn Oil Co.; completed in 1900; elevation, 1240' B.

	Top. Feet.	Bottom. Feet.
Pittsburgh Coal.....	751	758
Big Dunkard Sand.....	1315	1325
Second Cow Run Sand.....	1560	1575
Salt Sand.....	1675	1750
Maxton Sand.....	1930	1940
Big Injun Sand.....	2240	2365
Berea Sand (oil, 2610').....	2598	
Total depth.....		2623

Initial production, 200 barrels; present production, 2½ barrels daily.

**U. F. Starcher No. 230 Well Record (307).**

Freemans Creek District; on Walnut Fork, 0.6 mile southwest of Fink; authority, Hope Natural Gas Co.; completed, Nov. 29, 1901; elevation, 1175' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	1135	1145
Gas Sand.....	1435	1460
Second Cow Run Sand.....	1525	1585
Little Lime.....	2062	2090
Pencil Cave.....	2103	2108
Big Lime.....	2108	2153
Big Injun Sand.....	2153	2265
Berea Sand (gas, 2500').....	2490	
Total depth.....		2520

The seven following wells were drilled along Walnut Fork of Leading Creek, too far south to be in the oil zone, most of them being gas wells and some being dry holes:

**U. F. Starcher No. 188 Well Record (308).**

Freemans Creek District; on Walnut Fork, 0.7 mile south of Fink; authority, Hope Natural Gas Co.; completed, Dec. 18, 1900; elevation, 1020' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	1012	1065
Gas Sand.....	1200	1240
Salt Sand.....	1360	1400
Maxton Sand (show of oil).....	1700	1720
Big Injun Sand.....	1965	2075
Berea Sand (gas, 2332') to bottom.....	2320	2335

According to U. F. Starcher, the above well was a heavy gasser, with a rock pressure of 700 pounds.

### C. K. Gibson No. 73 Well Record (309).

Freemans Creek District; on Walnut Fork, 2.4 miles northeast of Hurst; authority, Hope Natural Gas Co.; elevation, 1125' B.

	Top. Feet.	Bottom. Feet.
<b>Coal, Pittsburgh</b> .....	570	578
Unrecorded (cave, 980').....	578	1065
Sand, Little Dunkard.....	1065	1090
Sand, Big Dunkard.....	1130	1175
Sand, Salt.....	1505	1880
Red rock.....	1976	
<b>Big Lime</b> .....	2040	2085
Sand, Big Injun.....	2085	2190
<b>Sand, Berea, to bottom (gas, 2438')</b> .....	2437	2452

The above record was published in Volume I(A), page 362, of the Survey.

### C. K. Gibson No. 2424 Well Record (310).

Freemans Creek District; on Walnut Fork, 2.5 miles northeast of Hurst; authority, Hope Natural Gas Co.; elevation, 960' B.

	Top. Feet.	Bottom. Feet.
<b>Coal, Pittsburgh</b> .....	378	386
Sand, Connellsville.....	406	472
Sand, Little Dunkard (water, 490').....	835	865
Sand, Big Dunkard.....	898	945
Sand, Second Cow Run.....	1221	1269
<b>Coal</b> .....	1269	1273
Sand, Salt (salt water, 1250-5').....	1273	1304
Sand, Salt.....	1560	1595
Red rock.....	1673	1753
Little Lime.....	1753	1759
Pencil Cave.....	1759	1767
<b>Big Lime</b> .....	1767	1812
Sand, Big Injun (oil, 1980').....	1872	1997
Sand, Squaw.....	2000	2140
<b>Sand, Berea (gas, 2229-35')</b> .....	2221	2240
Sand, Gordon Stray.....	2533	2535
Sand, Fifth.....	2700	2706
Total depth.....		2882

### L. O. Bailey No. 3506 Well Record (311).

Freemans Creek District; on Walnut Fork, 2.7 miles northeast of Hurst; authority, Hope Natural Gas Co.; elevation, 1000' B.

	Top. Feet.	Bottom. Feet.
<b>Coal, Pittsburgh</b> .....	365	370
Unrecorded (no Little Dunkard Sand).....	370	900
Sand, Big Dunkard.....	900	955

	Top. Feet.	Bottom. Feet.
Sand, Burning Springs.....	1005	1050
Sand, Second Cow Run.....	1210	1355
Sand, Salt.....	1390	1412
Sand, Salt.....	1498	1505
Sand, Maxton.....	1805	1815
Little Lime.....	1820	1828
Pencil Cave.....	1828	1840
Big Lime.....	1840	1895
Sand, Big Injun.....	1895	2000
Sand, Squaw.....	2005	2140
Sand, Berea.....	2229	2239
Sand, Gordon Stray (gas show, 2509').....	2508	2510
Unrecorded to bottom (no Fifth Sand).....	2510	2889

10" casing, 190'; 8¼", 902'; 6⅝", 1914'; well was shot in  
Gordon Stray, without improvement; considered a dry hole.

### S. P. Leggett No. 1 Well Record (312).

Freemans Creek District; on Walnut Fork, 2.2 miles east of Hurst; authority, South Penn Oil Co.; elevation, 905' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	224	230
Sand, Little Dunkard.....	680	720
Sand, Big Dunkard.....	765	825
Sand, Second Cow Run.....	1100	1113
Sand, Salt.....	1118	1134
Little Lime.....	1658	1673
Pencil Cave.....	1673	1683
Big Lime.....	1700	1715
Sand, Big Injun.....	1715	1860
Sand, Berea.....	2104	2124
Sand, Gordon.....	2414	2421
Total depth.....		2680

The above well, the record of which was published in Volume I(A), page 364, of the Survey, was a dry hole, making only a show of gas.

### Isaac M. Hinzman No. 729 Well Record (313).

Freemans Creek District; on Walnut Fork, 2.0 miles east of Hurst; authority, Hope Natural Gas Co.; completed, June 19, 1905; elevation, 885' L.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	16
Sand, Connellsville.....	175	215
Big Dunkard Sand (water, 710').....	688	735
Salt Sand.....	1070	1100



	Top. Feet.	Bottom. Feet.
Salt Sand.....	1185	1210
Salt Sand.....	1316	1340
<b>Big Lime</b> (water, 1632'; oil show, 1659').....	1617	1679
Big Injun Sand.....	1679	1783
Berea Sand.....	2038	2048
Unrecorded (light gas, 2250') and shell.....	2048	2352
<b>Gordon Sand</b> (gas, 2355').....	2352	2360
Total depth.....		2645

### Osborne Heirs No. 3536 Well Record (313A).

Freemans Creek District; on Walnut Fork, 1.7 miles east of Hurst; authority, Hope Natural Gas Co.; completed, Aug. 31, 1914; elevation, 1105' B.

	Top. Feet.	Bottom. Feet.
<b>Coal, Uniontown</b> .....	151	154
<b>Pittsburgh Coal</b> .....	480	485
Moundville Sand.....	830	850
Little Dunkard Sand.....	930	950
Big Dunkard Sand.....	994	1035
Second Cow Run Sand (water, 1420').....	1302	1440
Salt Sand.....	1595	1710
Salt Sand.....	1765	1845
Little Lime.....	1921	1931
Pencil Cave.....	1931	1936
<b>Big Lime</b> .....	1936	2005
<b>Big Injun Sand</b> (oil, 2½ bailers, 2065').....	2005	2115
Squaw Sand.....	2138	2236
Berea Sand.....	2345	2362
<b>Gordon Stray Sand</b> (gas, 2558').....	2553	2562
Gordon Sand.....	2582	2592
<b>Fourth Sand</b> (gas, 2655').....	2654	2665
Total depth.....		3076

The ten following records represent a large group of wells drilled along the various branches of Alum Fork, all of which have been gas wells, with production ranging from the Salt to the Fifth Sand. They are all located along the western slope of the Chestnut Ridge Anticline:

### Jesse Brown Heirs No. 1261 Well Record (314).

Freemans Creek District; on Alum Fork, 1.8 miles northeast of Alum Bridge; authority, Hope Natural Gas Co.; completed, July 7, 1909; elevation, 865' B.

	Top. Feet.	Bottom. Feet.
Moundville Sand.....	300	330
<b>Big Dunkard Sand</b> (oil show).....	400	555

	Top. Feet.	Bottom. Feet.
Gas Sand.....	679	709
Second Cow Run Sand.....	770	840
Salt Sand.....	865	906
Salt Sand.....	1055	1122
Salt Sand (gas, 1195'; oil, 1205').....	1195	1217
Little Lime.....	1355	1373
Pencil Cave.....	1373	1380
<b>Big Lime</b> .....	1380	1445
Big Injun Sand.....	1445	1598
Squaw Sand.....	1640	1738
Gordon Sand.....	2063	2084
<b>Fourth Sand</b> (gas, 2174').....	2172	2179
Sand, Elizabeth.....	2424	2438
Total depth.....		2665
Conductor, 16'; 8¼" casing, 821'; 6¾", 1506'; 5 <sup>3</sup> / <sub>16</sub> ", 2067'.		

In the above record, the sand at 2424 feet comes 1044 feet below the top of the Big Lime, and about 200 feet below where the Fifth Sand belongs, and therefore probably represents the Seventh or Elizabeth Sand.

### John Hines No. 3475 Well Record (316).

Freemans Creek District; on Alum Fork, 1.6 miles southeast of Dry Fork; authority, Hope Natural Gas Co.; completed, July 15, 1914; elevation, 950' B.

	Top. Feet.	Bottom. Feet.
Moundsville Sand.....	520	555
Big Dunkard Sand.....	675	730
Burning Springs Sand.....	800	850
Gas Sand.....	930	990
Salt Sand.....	1045	1190
Maxton Sand.....	1565	1605
Little Lime.....	1672	1682
Pencil Cave.....	1682	1702
<b>Big Lime</b> .....	1702	1753
Big Injun Sand.....	1753	1875
Squaw Sand.....	1880	1940
Weir Sand.....	1980	2010
Berea Sand.....	2090	2105
Thirty-foot Sand.....	2300	2316
Gordon Sand (gas, 2407').....	2405	2420
<b>Fourth Sand</b> (gas, 2458').....	2453	2465
Total depth.....		2785

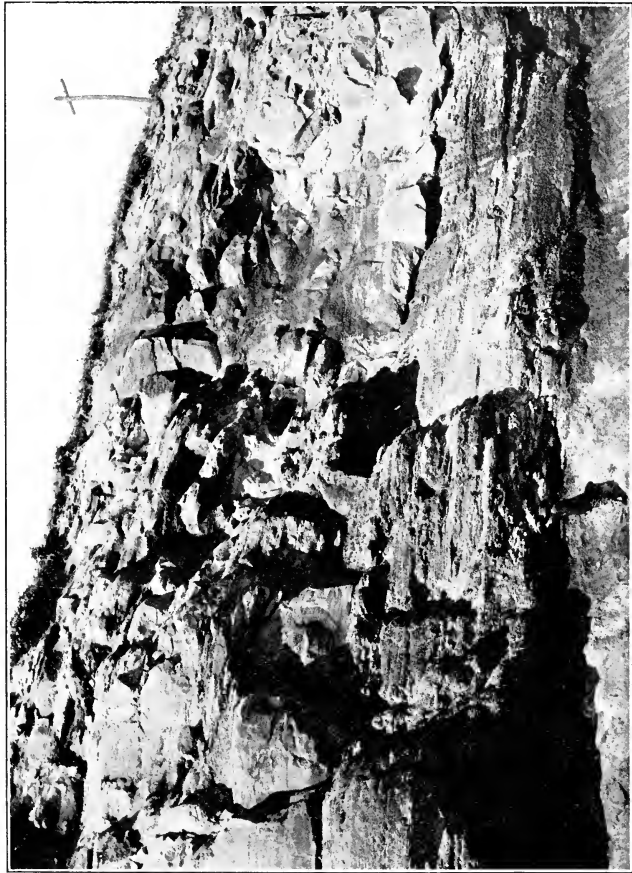


PLATE XXI.—Buffalo Sandstone, Brush Creek Shale, Brush Creek Limestone and Brush Creek Coal, in Coal & Coke Ry. cut,  $\frac{1}{4}$  mile east of Jewell, Lewis County; the rule is held on the coal and the fossil zone is just above it.



## Joseph Fallon No. 1 Well Record (320).

Freemans Creek District; 1.7 miles S. 60° W. of Churchville; authority, Guffey and Galey; elevation, 1010' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	140	147
Sand, Grafton, and unrecorded.....	440	695
Sand, Big Dunkard.....	695	711
Coal, Upper Freeport.....	711	718
Sand, Burning Springs.....	718	730
Coal, Mercer.....	1001	1007
Little Lime.....	1660	1690
Pencil Cave.....	1690	1700
Big Lime.....	1760	1830
Sand, Fifty-foot, and unrecorded.....	2285	2352
Sand, Thirty-foot.....	2352	2356
Sand, Gordon Stray (gas, 2369').....	2369	2387
Unrecorded to bottom (no Fifth Sand).....	2387	2646
10" casing, 174'; 8¼", 695'; 6⅝", 1830'; 2" 4½ lb. tubing, 2390'; top of plug, 2390'.		

## John Fallon No. 973 Well Record (321).

Freemans Creek District; at head of Alum Fork, 1.6 miles southwest of Churchville; authority, Hope Natural Gas Co.; completed, Nov. 6, 1907; elevation, 1315' B.

	Top. Feet.	Bottom. Feet.
Conductor.....	0	13
Little Dunkard Sand.....	900	906
Big Dunkard Sand.....	985	1014
Gas Sand.....	1230	1245
Second Cow Run Sand.....	1345	1442
Salt Sand.....	1445	1608
Salt Sand.....	1664	1694
Salt Sand (show of oil).....	1755	1784
Maxton Sand.....	1810	1860
Little Lime.....	1955	1963
Pencil Cave.....	1963	1968
Big Lime.....	1978	2051
Big Injun Sand.....	2051	2160
Squaw Sand.....	2165	2210
Weir Sand.....	2210	2240
Slate.....	2294	2304
Sand shell.....	2304	2308
Berea Sand.....	2360	2380
Thirty-foot Sand.....	2560	2572
Gordon Stray Sand.....	2664	2670
Gordon Sand.....	2687	2704
Total depth.....		2705

**Wm. Fallon No. 2471 Well Record (322).**

Freemans Creek District; 1.5 miles southwest of Churchville; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1315' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	449	452
Sand, Big Dunkard.....	960	1010
Sand, Burning Springs.....	1060	1085
Sand, Gas.....	1130	1170
Sand, Salt.....	1315	1402
Sand, Salt.....	1508	1580
Sand, Salt (oil show).....	1717	1765
Big Lime.....	1972	2035
Sand, Big Injun (gas).....	2035	2192
Sand, Berea.....	2367	2382
Sand, Thirty-foot.....	2559	2576
Sand, Gordon Stray.....	2643	2650
Sand, Gordon (gas).....	2668	2685
Sand, Fifth.....	2878	2880
Total depth.....		2921

**P. M. Lohan No. 486 Well Record (323).**

Freemans Creek District; on Alum Fork, 2.2 miles northeast of Alum Bridge; authority, Carnegie Natural Gas Co.; completed, Nov. 26, 1914; elevation, 980' L.

	Top. Feet.	Bottom. Feet.
Sand, Salt (gas, 1280-9').....	1280	1289
Pencil Cave.....	1481	1496
Big Lime.....	1515	1586
Sand, Big Injun (gas, 1660-5').....	1586	1690
Sand, Thirty-foot.....	2145	2162
Sand, Gordon.....	2252	2272
Total depth.....		2278
Conductor, 16'; 8¼" casing, 878' 8"; 6⅝", 1543'; 3" tubing, 2278'.		

**Peter M. Dorsey No. 1260 Well Record (324).**

Freemans Creek District; on branch of Alum Fork, 2.7 miles north-east of Alum Bridge; authority, Hope Natural Gas Co.; completed, July 7, 1909; elevation, 930' B.

	Top. Feet.	Bottom. Feet.
Water, hole full.....		218
Little Dunkard Sand.....	445	455
Big Dunkard Sand (water, 565').....	545	585
Burning Springs and Gas Sands.....	598	732
Salt Sand.....	865	940
Salt Sand.....	950	1050
Salt Sand (oil show).....	1200	1210
Little Lime.....	1400	1422

	Top. Feet.	Bottom. Feet.
Pencil Cave.....	1422	1427
<b>Big Lime</b> .....	1427	1505
<b>Big Injun Sand</b> (gas, 1546').....	1505	1570
Squaw Sand.....	1570	1670
Weir Sand.....	1725	1735
Berea Sand.....	1840	1900
Thirty-foot Sand.....	2120	2150
Gordon Stray Sand.....	2155	2165
<b>Gordon Sand</b> (gas, 2182').....	2180	2190
Fifth Sand.....	2370	
Total depth.....		2505
Conductor, 16'; 8¼" casing, 642'; 6⅝", 1510'; 5⅜", 2180'.		

### John Casey No. 9 Well Record (326).

Freemans Creek District; 2.3 miles N. 75° W. of Camden; authority, Reserve Gas Co.; elevation, 1015' B.

	Top. Feet.	Bottom. Feet.
Unrecorded (no Pittsburgh Coal).....	0	425
Sand, Little Dunkard.....	425	480
Sand, Burning Springs.....	590	640
Sand, Second Cow Run.....	790	930
Sand, Salt.....	1230	1260
<b>Sand, Maxton</b> (gas, 1422').....	1420	1440
Little Lime.....	1440	1450
Pencil Cave.....	1450	1460
<b>Big Lime</b> .....	1460	1560
Sand, Big Injun.....	1560	1670
Sand, Gordon Stray.....	2195	2224
Sand, Gordon.....	2224	2236
<b>Sand, Fifth</b> (gas, 2410').....	2410	2435
Total depth.....		2458

The above record was published in Volume I(A), page 367, of the Survey.

### M. L. Waldeck No. 2482 Well Record (327).

Freemans Creek District; 1.5 miles northeast of Alum Bridge; authority, Hope Natural Gas Co.; completed, May 5, 1912; elevation, 980' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	455	533
Big Dunkard Sand.....	572	620
Gas Sand.....	777	805
Second Cow Run Sand.....	Shells.	
Salt Sand.....	855	912
Unrecorded (gas, 1200').....	912	1355
Maxton Sand.....	1355	1383

	Top. Feet.	Bottom. Feet.
Little Lime.....	1470	1500
Pencil Cave.....	1500	1513
Big Lime .....	1513	1558
Big Injun Sand (gas, 1560').....	1558	1705
Squaw Sand (gas, 1780').....	1745	1820
Thirty-foot Sand.....	2142	2156
Gordon Sand (gas, 2254-60') to bottom.....	2250	2270

### Thomas Casey No. 1 Well Record (329).

Freemans Creek District; 1.8 miles northeast of Alum Bridge; authority, Hope Natural Gas Co.; completed, June 20, 1914; elevation, 1015' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	465	525
Big Dunkard Sand.....	555	625
Gas Sand.....	800	830
Second Cow Run Sand (gas, 925').....	865	930
Salt Sand.....	960	995
Maxton Sand (gas, 1289').....	1287	1313
Total depth.....		1319

The **Camden Gas Station**, of the Reserve Gas Company, located on Leading Creek, two miles west of Camden, completed about January 1, 1915, contains two 1350 H. P. Snow tandem gas engines, making a total of 2700 horse-power, and is designed to pump gas to Sugar Grove, Ohio.

The eleven following wells were drilled along Leading Creek and its tributaries, all of them being located near the crest of the Chestnut Ridge Anticline and all being gas producers from sands ranging from the Salt to the Fifth:

### Timothy Kerrigan No. 230 Well Record (330).

Freemans Creek District; on Leading Creek, 2.5 miles west of Camden; authority, Reserve Gas Co.; completed, Apr. 20, 1910; elevation, 975' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	350	365
Big Dunkard Sand.....	415	450
Burning Springs Sand.....	490	560
Gas Sand.....	565	735
Second Cow Run Sand.....	747	955
Little Lime.....	1428	1453
Pencil Cave.....	1453	1465
Big Lime.....	1465	1510



	Top. Feet.	Bottom. Feet.
Big Injun Sand.....	1510	1640
Squaw Sand.....	1680	1760
Berea Sand.....	1795	1810
Fifty-foot Sand.....	1900	1912
Thirty-foot Sand.....	1980	2010
Gordon Stray Sand.....	2075	2089
Gordon Sand (gas, 2184').....	2182	2197
Fourth Sand (gas, 2213').....	2212	2214
Fifth Sand (gas, 2377').....	2375	2385
Total depth.....		2388

### C. Z. Grant No. 143 Well Record (332).

Freemans Creek District; on Leading Creek, 0.9 mile west of Camden; authority, Reserve Gas Co.; completed, Apr. 15, 1909; elevation, 1010' B.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	16
Sand, Grafton.....	80	125
Big Dunkard Sand.....	336	390
Gas Sand.....	426	544
Second Cow Run Sand.....	590	632
Salt Sand.....	784	830
Salt Sand.....	940	960
Salt Sand.....	1005	1025
Maxton Sand.....	1230	1265
Little Lime.....	1367	1382
Big Lime.....	1405	1465
Big Injun Sand.....	1465	1612
Squaw Sand.....	1620	1665
Berea Sand.....	1795	1815
Thirty-foot Sand.....	1860	1916
Gordon Stray Sand.....	2013	2033
Gordon Sand (gas, 2095' and 2106').....	2085	2112
Total depth.....		2115

### Samuel Jarvis No. 273 Well Record (333).

Freemans Creek District; 1.1 miles south of Camden; authority, Reserve Gas Co.; completed, June 10, 1910; elevation, 1215' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	512	547
Big Dunkard Sand.....	580	620
Burning Springs Sand.....	650	680
Gas Sand.....	710	760
Second Cow Run Sand.....	780	860
Maxton Sand.....	1510	1540
Little Lime.....	1570	1600
Pencil Cave.....	1600	1620

	Top. Feet.	Bottom. Feet.
Big Lime.....	1620	1680
Big Injun Sand (gas, 1776').....	1680	1820
Squaw Sand.....	1820	1861
Thirty-foot Sand.....	2235	2245
Gordon Stray Sand (gas, 2248').....	2245	2275
Gordon Sand (gas, 2298').....	2280	2330
Fifth Sand to bottom (gas, 2475' and 2485').....	2475	2500

### Daniel Casto No. 16 Well Record (335).

Freemans Creek District; on Sassafra Run, 1.6 miles S. 10° W. of Camden; authority, Reserve Gas Co.; elevation, 1120' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	20	
Little Lime.....	1500	
Big Lime.....	1520	1675
Sand, Big Injun.....	1675	1755
Sand, Gordon (gas, 2226-32').....	2212	2292
Sand, Bayard.....	2451	2455

"Did 8,000,000 feet from Gordon while drilling through."

The above record was published in Volume I(A), page 357, of the Survey.

### Mary Casev No. 12 Well Record (336).

Freemans Creek District; on Leading Creek, 2.0 miles west of Camden; authority, Reserve Gas Co.; completed, Dec. 22, 1901; elevation, 925' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	325	380
Burning Springs Sand.....	490	540
Second Cow Run Sand.....	680	820
Maxton Sand.....	1330	1340
Big Lime (small show of oil, 1401').....	1360	1450
Big Injun Sand.....	1450	1560
Sand, Gordon Stray (gas, 2090').....	2080	2100
Gordon Sand (gas, 2120').....	2120	2135
Fourth Sand (gas, 2140').....	2135	2155
Total depth.....		2275

### Amanda Butcher No. 251 Well Record (337).

Freemans Creek District; on Leading Creek, 2.6 miles west of Camden; authority, Reserve Gas Co.; completed, May 5, 1910; elevation, 937' L.

	Top. Feet.	Bottom Feet.
Little Dunkard Sand.....	355	375
Big Dunkard Sand.....	420	460

	Top. Feet.	Bottom. Feet.
Burning Springs Sand.....	600	620
Gas Sand.....	640	660
Second Cow Run Sand (gas, 820').....	760	830
Maxton Sand (gas, 1328').....	1327	1332
Total depth.....		1360

### O. C. Woofter No. 1803 Well Record (338).

Freemans Creek District; on Leading Creek, 2.5 miles northeast of Alum Bridge; authority, Hope Natural Gas Co.; elevation, 905' L.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	310	350
Burning Springs Sand.....	465	500
Gas Sand.....	610	630
Second Cow Run Sand (gas, 735').....	640	740
Salt Sand (gas, 765').....	750	790
Salt Sand.....	980	1130
Little Lime.....	1345	1360
Big Lime (gas, 1390').....	1380	1445
Big Injun Sand.....	1445	1565
Squaw Sand.....	1600	1690
Berea Sand.....	1790	1820
Fifty-foot Sand.....	Shells.	
Thirty-foot Sand.....	1985	2005
Gordon Stray Sand.....	2075	2091
Gordon Sand (gas, 2110-15').....	2105	2125
Fourth Sand.....	Shells.	
Fifth Sand (gas, 2280-95').....	2280	2295
Total depth.....		2300

### Frank A. Mertz No. 156 Well Record (339).

Freemans Creek District; on Leading Creek, 2.8 miles southwest of Camden; authority, Reserve Gas Co.; completed, June 2, 1909; elevation, 900' L.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	290	338
Burning Springs Sand.....	456	489
Gas Sand.....	550	578
Second Cow Run Sand.....	620	645
Salt Sand (hole full water, 661'; showing gas, 805').....	651	805
Salt Sand, (gas, 955').....	925	955
Salt Sand.....	967	1123
Maxton Sand (gas, 1209').....	1184	1211
Little Lime.....	1335	1353
Pencil Cave.....	1353	1380
Big Lime (showing of oil, 1405').....	1380	1435
Big Injun Sand.....	1435	1559
Squaw Sand.....	1585	1694

	Top. Feet.	Bottom. Feet.
Berea Sand.....	1780	1805
Thirty-foot Sand.....	1976	1995
Gordon Stray Sand.....	2078	2087
Gordon Sand (gas, 2108-10').....	2105	2121
Total depth.....		2127

### Perry T. Woofter No. 229 Well Record (340).

Freemans Creek District; on Leading Creek, 2.2 miles east of Alum Bridge; authority, Reserve Gas Co.; completed, May 2, 1910; elevation, 1190' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	575	590
Big Dunkard Sand.....	645	700
Gas Sand.....	810	847
Salt Sand.....	990	1133
Salt Sand.....	1188	1308
Maxton Sand.....	1535	1610
Little Lime.....	1670	1700
Pencil Cave.....	1700	1717
Big Lime.....	1717	1772
Big Injun Sand (gas, 1772½').....	1772½	1900
Squaw Sand.....	1928	1980
Berea and Gantz Sands.....	Shells.	
Fifty-foot Sand.....	2206	2240
Thirty-foot Sand.....	2315	2340
Gordon Stray Sand (gas, 2445').....	2439	2453
Gordon Sand (gas, 2465').....	2463	2468
Fourth Sand.....	2515	2525
Fifth Sand (gas, 2625').....	2615	2630
Total depth.....		2652

### Jacob Gissy No. 1802 Well Record (341).

Freemans Creek District; on Leading Creek, 2.2 miles southeast of Alum Bridge; authority, Hope Natural Gas Co.; elevation, 877' L.

	Top. Feet.	Bottom. Feet.
Moundsville Sand, soft.....	240	260
Big Dunkard Sand, soft.....	320	440
Second Cow Run Sand, hard.....	640	720
Salt Sand.....	740	830
Salt Sand, hard.....	865	950
Salt Sand, hard (a little gas, 1080').....	1020	1140
Sand, black, hard, Salt.....	1190	1140
Red rock.....	1310	1340
Little Lime.....	1406	1418
Big Lime (a little gas and oil, 1436').....	1428	1495
Big Injun Sand (a little gas and oil, 1506').....	1495	1600

	Top. Feet.	Bottom. Feet.
<b>Gordon Stray Sand</b> (gas and slight show of oil, 2126').....	2125	2140
Gordon Sand.....	2150	2166
<b>Fifth Sand</b> (gas, 2315-25').....	2315	2325
Total depth.....		2329

### J. J. Kenny No. 1245 Well Record (343).

Freemans Creek District; on Leading Creek, 0.9 mile southeast of Alum Bridge; authority, Hope Natural Gas Co.; elevation, 875' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand (hole full water, 345').....	315	380
Burning Springs Sand.....	505	532
Gas Sand.....	570	640
Second Cow Run Sand.....	645	698
Salt Sand.....	707	740
Salt Sand.....	950	1076
Salt Sand.....	1100	1130
Little Lime.....	1264	1300
Pencil Cave.....	1300	1315
<b>Big Lime</b> (oil—exhausted, 1362-5').....	1315	1368
<b>Big Injun Sand</b> (gas, 1450').....	1368	1490
Squaw Sand.....	1495	1685
Berea Sand.....	1725	1775
Thirty-foot Sand.....	1940	1960
Gordon Sand.....	2047	2054
<b>Fourth Sand</b> (gas, 2248').....	2245	2251
Shell and slate.....	2251	3004
Conductor, 16'; 8¼" casing, 776'; 6⅝", 1374'; 5⅜", 1946'.		

The record of the **R. Gissy No. 158 (342)** is published in the section for Alum Bridge, page 60. It made gas from the Salt, Big Injun and Gordon Sands.

The five following wells represent a considerable number that have been recently drilled in the vicinity of Alum Bridge:

### Peter Allman No. 1 Well Record (345).

Freemans Creek District; 1.0 mile northeast of Alum Bridge; authority, Pittsburgh & W. Va. Gas Co.

	Top. Feet.	Bottom. Feet.
Sand, Grafton.....	540	570
Sand, Moundsville.....	600	690
Sand, Little Dunkard.....	715	745
Sand, Big Dunkard.....	800	830
Sand, Gas.....	860	1050
Sand.....	1700	1725

	Top. Feet.	Bottom. Feet.
Sand, Maxton, shells.....	1725	1765
Little Lime.....	1765	1785
Pencil Cave.....	1785	1805
<b>Big Lime</b> .....	1805	1880
Sand, Big Injun.....	1880	1973
Sand, Squaw.....	2035	2140
Sand, Berea, shells.....	2250	2262
Sand, Fifty-foot, shells.....	2248	2360
Sand, Thirty-foot.....	2425	2450
Sand, Gordon Stray.....	2480	2520
Slate.....	2520	2539
<b>Sand, Gordon (gas, 2543-7')</b> .....		
Conductor, 14'; 10" casing, 155'; 8¼", 985'; 6½", 1825'; 7/10" water in 6½" casing; volume, 1,380,000 cu. ft. daily.		

### J. M. Jarvis No. 3462 Well Record (346).

Freemans Creek District; 0.1 mile north of Alum Bridge; authority, Hope Natural Gas Co.; completed, June 15, 1914; elevation, 953' L.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	400	450
Big Dunkard Sand (water, 550').....	475	590
Burning Springs Sand.....	620	665
Gas Sand.....	680	800
Second Cow Run Sand.....	805	925
Maxton Sand.....	1360	1390
Little Lime.....	1415	1445
Pencil Cave.....	1445	1458
<b>Big Lime (gas, 1475')</b> .....	1458	1518
Big Injun Sand.....	1518	1655
Squaw Sand.....	1705	1735
Gordon Sand (gas, 2222').....	2220	2236
Fifth Sand, shell.....	2360	
Bayard Sand, shell.....	2475	
Total depth.....		2528

### J. B. Rohr No. 471 Well Record (347).

Freemans Creek District; on Alum Fork, 0.4 mile north of Alum Bridge; authority, Carnegie Natural Gas Co.; elevation, 985' B.

	Top. Feet.	Bottom. Feet.
Pencil Cave.....	1520	1525
<b>Big Lime</b> .....	1525	1595
<b>Sand, Big Injun (little gas, 1660')</b> .....	1595	1705
Sand, Berea.....	1800	1825
Sand, Fifty-foot.....	1960	2000
Sand, Gordon Stray.....	2252	2265
<b>Sand, Gordon (gas, 2282-7')</b> .....	2279	2294
Total depth.....		2302

Conductor, 11'; 6½" casing, 1575'; 2" tubing, 2302'; well completed, Aug. 31, 1914.

## W. B. Maxwell No. 2008 Well Record (349).

Freemans Creek District; on Leading Creek, 0.6 mile west of Alum Bridge; authority, Pittsburgh & W. Va. Gas Co.; elevation, 830' B.

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard.....	480	500
Sand, Burning Springs.....	510	540
Sand, Gas.....	600	660
Sand, Salt.....	840	860
Sand, Salt.....	1040	1200
Sand, Salt.....	1230	1270
Sand, Maxton.....	1340	1350
Big Lime.....	1410	1480
Sand, Big Injun (gas).....	1480	1580
Sand, Squaw.....	1690	1720
Total depth.....		2695

## Erma Woofter No. 472 Well Record (350).

Freemans Creek District; on Leading Creek, 1 mile southwest of Alum Bridge; authority, Carnegie Natural Gas Co.; elevation, 797' L.

	Thickness. Feet.	Total. Feet.
16" pipe .....	32	32
Lime, white.....	20	52
Red rock.....	100	152
Lime .....	15	167
Red rock.....	20	187
Slate, white.....	63	250
Coal, Bakerstown.....	3	253
Slate and shells, white.....	140	393
Sand, Big Dunkard.....	55	448
Lime .....	15	463
Slate, black.....	20	483
Lime .....	40	523
Slate and lime shells, white.....	57	580
Gas and Second Cow Run Sands.....	200	780
Slate, black.....	40	820
Sand, Salt, broken, black.....	125	945
Unrecorded .....	608	1353
Big Lime.....	70	1423
Sand, Big Injun (little gas).....	100	1523
Slate, white (water, 1545').....	32	1555
Lime, white.....	20	1575
Sand, Squaw and Berea.....	185	1760
Slate and shells.....	323	2083
Sand, Gordon (soft and broken; not enough gas to see).....	10	2093
Unrecorded to bottom.....	237	2330
10" casing, 194'; 8", 928' 11".		

The above well was abandoned as a dry hole. †

The **Wesley Knapp No. 1 (350A)** well, drilled by the South Penn Oil Company one-half mile southeast of Leading Creek, was reported to have made a show of gas, but was abandoned as a dry hole. It starts 145 feet, by hand level, below the bench of the Pittsburgh Coal. The **Robert A. Kraus No. 1 (351)**, drilled by the Hope Natural Gas Company, on Crooked Run, 1.3 miles southward from Alum Bridge, was a light gas well, but was abandoned. It still supplies gas for domestic purposes in the Kraus farmhouse. The five following wells are located along Crooked Run just east of the Chestnut Ridge Anticline. The broken and uncertain character of the sands of the Catskill Series has made drilling a precarious proposition in this locality:

#### Martin Kenny No. 1244 Well Record (352).

Freemans Creek District; on Crooked Run, 1.2 miles southeast of Alum Bridge; authority, Hope Natural Gas Co.; completed, Aug. 31, 1909; elevation, 945' L.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	16
Little Dunkard Sand.....	400	450
Big Dunkard and Burning Springs Sands.....	455	625
Gas Sand.....	660	686
Second Cow Run Sand.....	694	786
Salt Sand.....	790	928
Salt Sand (gas, 1132').....	1068	1180
Big Lime.....	1390	1500
Big Injun Sand (gas, 1573').....	1500	1630
Squaw Sand.....	1680	1810
Total depth (no more sands found).....		2778

The above well was abandoned as a dry hole.

#### B. L. Kraus No. 242 Well Record (353).

Freemans Creek District; on Crooked Run, 1.5 miles south of Alum Bridge; authority, Hope Natural Gas Co.; completed, Oct. 18, 1901; elevation, 915' B.

	Top. Feet.	Bottom. Feet.
Little and Big Dunkard Sands.....	390	500
Unrecorded (gas, 695-800').....	500	815
Second Cow Run Sand.....	815	920
Salt Sand.....	1020	1180
Big Injun Sand.....	1470	1580
Gordon Stray Sand.....	2165	2170
Gordon Sand.....	2190	2195
Fifth Sand (gas, 2350').....	2343	2349
Total depth.....		2419



The above well made only a small amount of gas from the Fifth Sand. The casing was pulled, but the gas is used for domestic purposes.

### Henry Stark No. 3503 Well Record (354).

Freemans Creek District; on Crooked Run, 1.6 miles southeast of Alum Bridge; authority, Hope Natural Gas Co.; completed, Aug. 12, 1914; elevation, 1010' L.

	Top. Feet.	Bottom. Feet.
Moundsville Sand.....	370	400
Little Dunkard Sand.....	490	530
Big Dunkard Sand.....	540	610
Second Cow Run Sand.....	850	995
Salt Sand.....	1085	1312
Maxton Sand (gas, 1482').....	1480	1510
Little Lime.....	1530	1560
Pencil Cave.....	1560	1570
Big Lime.....	1570	1606
Big Injun Sand (oil, ¼ barrel daily, 1631'; gas, 1631' and 1660').....	1606	1691
Squaw Sand.....	1750	1805
Berea Sand.....	2005	2020
Fifty-foot Sand.....	2148	2156
Thirty-foot Sand, shells.....		2215
Fifth Sand (gas, 2448').....	2447	2452
Total depth.....		2745

20/10" water in 2" casing; volume, 212,000 cu. ft. daily.

### Edith Stark No. 3504 Well Record (355).

Freemans Creek District; 1.8 miles southeast of Alum Bridge; authority, Hope Natural Gas Co.; completed, Aug. 15, 1914; elevation, 985' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	388	435
Big Dunkard Sand.....	485	527
Gas Sand.....	584	638
First Salt Sand.....	678	720
Second Salt Sand.....	837	1028
Salt Sand (smell of oil and gas, 1260').....	1180	1348
Maxton Sand.....	1447	1515
Little Lime.....	1564	1583
Pencil Cave.....	1583	1608
Big Lime.....	1608	1670
Big Injun Sand (gas, 1680').....	1670	1752
Sand.....	1806	1890
Berea Sand.....	1990	2002
Total depth.....		3014

This well was abandoned as a dry hole.

### John Dempsey No. 472 Well Record (356).

Freemans Creek District; on Crooked Run, 1.7 miles southeast of Alum Bridge; authority, Reserve Gas Co.; completed, July 7, 1914; elevation, 1030' B.

	Top. Feet.	Bottom. Feet.
Unrecorded (water, 90').....	0	605
Big Dunkard Sand.....	605	625
Gas Sand.....	765	785
Second Cow Run Sand.....	875	1040
Salt Sand (gas, 1331'; oil, 1355').....	1173	1367
Total depth.....		1376

The above well made about 12 barrels of oil daily from the Salt Sand.

#### Prospective Oil and Gas Areas, Freemans Creek District.

—In Freemans Creek District, almost the entire area has been tested and found good either for oil or gas, making it probable that most of the good wells in the future will be drilled on farms which are already surrounded by good gas producers, but which have not yet been drilled. There is room for a large number of wells of this class where the financial risk would be smaller and the returns more certain than in wildcat territory. Some small areas still remain untested, however, and the following are named as being favorable for new development: (1) A strip of territory, about one mile wide and three miles long, extending in a southwesterly direction from Lightburn toward Freemansburg, which, owing to its favorable location near the Wolf Summit Anticline, should produce a large number of good gas wells in sands ranging from the Big Injun to the Fifth; (2) A strip of territory, 1 mile wide and 3 miles long, lying next to the Doddridge Line, between Dry Fork and St. Clara, where the prospect seems favorable for an extension of the Fink Oil Pool in the Berea Sand; (3), In the western part of the district, a section about 3 miles square surrounding the town of Vadis, which, owing to its location against the slope of the Chestnut Ridge Anticline, looks favorable for gas in sands ranging from the Berea to the Fifth; (4), the southwest corner of the district, along the Chestnut Ridge Anticline, is favorably located from a structural standpoint for good gas wells and should not be condemned by the

presence of only one dry hole (350A), as these often occur in the midst of good producers.

### *Detailed Well Records, Courthouse District.*

Courthouse District occupies the central western portion of Lewis next to Gilmer. The Grassland Syncline crosses it in a northeast-southwest direction a few miles north of its center, and along the southern border the Orlando Anticline and the Roanoke Syncline also cross it, the three structural features affording a considerable variation of underground conditions that favor the accumulation of oil and gas. Oil has been found in large quantity along the axis of the Grassland Syncline, and also at scattered localities along the rising structure to the north, the principal producing sands being the Salt, Maxton, Gordon Stray, and Gordon, the latter sand having furnished more oil than all the others. Gas has been found along both sides of the Grassland Syncline, and also along the Orlando Anticline and the Roanoke Syncline, the axis of which occupies a much higher structural level than that of the Grassland Syncline, toward which the oil seems to have gravitated. The producing gas horizons range from the Salt to the Fifth Sand, much the greater portion of it being from the Catskill Series. Development has gone so far that almost the entire district may be considered good for either oil or gas, depending on structural conditions. Numerous farms still remain untested and a large number of gas wells will eventually be drilled.

**The Copley Oil Pool.**—One of the most spectacular discoveries of oil in the State was made along Sand Fork of the Little Kanawha River in the fall of 1900, when the South Penn Oil Company drilled the **Michael Copley Heirs No. 1 (363) Well**<sup>5</sup> where the present village of Copley now stands. According to common report, the well had been drilled into the top of the Gordon Sand, the soft character of which led the drillers to believe that it might produce oil, and opera-

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<sup>5</sup>Through erroneous information supplied to the State Geologist, the original well of this pool was described in Volume I(A), page 369, of the Survey, as the John Copley No. 1, instead of the Michael Copley. The two wells stand within a few hundred feet of each other.

tions were suspended for the night. Early the next morning residents of the Copley farmhouse were awakened by noise from the well, which had drilled itself in during the night and was pouring a great stream of oil through the six-inch casing, the pressure being sufficient to throw the oil far above the top of the 84-foot derrick. Since this well was in wildcat territory, no tankage or pipelines were ready to receive the oil, and it flowed into the bed of Sand Fork Creek, which fortunately was almost empty of water on account of a protracted drought, and much of it was saved by making dams across the stream until pipelines could be laid. The most vigorous precautions were taken to prevent this lake of oil from catching fire, armed guards being stationed along the highways to warn people against lighting matches within the zone of the gaseous vapor. Accurate information is not available regarding the original production of this well, but employees of the South Penn Oil Company now living at Copley and those of the Eureka Pipe Line Company who laid the line to the well estimate it from 10,000 to 12,000 barrels daily, which makes it probably larger than any other well ever drilled in the State. The Copley Pool is situated along both sides of the axis of the Grassland Syncline, which at this point reaches its lowest structural level within the two counties, having a gradual downward slope along its axis from the Upshur Line 17 miles eastward. Production is entirely from the lower sands, the Gordon being by far the most prolific. The producing limits of the pool embrace an area of six or eight square miles, within which 125 to 150 wells have been drilled. The following record, taken from Volume I(A), page 369, is that of the Copley gusher, which still produces 3 barrels of oil daily:

#### Michael Copley Heirs No. 1 Well Record (363).

Courthouse District; 2.2 miles northwest of Bealls Mills; authority, South Penn Oil Co.; elevation, 790' B.

	Top. Feet.	Bottom. Feet.
Pittsburgh Coal.....	140	
Pencil Cave.....	1775	1800
Big Lime.....	1800	1895
Big Injun Sand.....	1895	2025
Gordon Stray Sand (oil, 2519').....	2512	2524
Gordon Sand (oil) to bottom.....	2530	2530

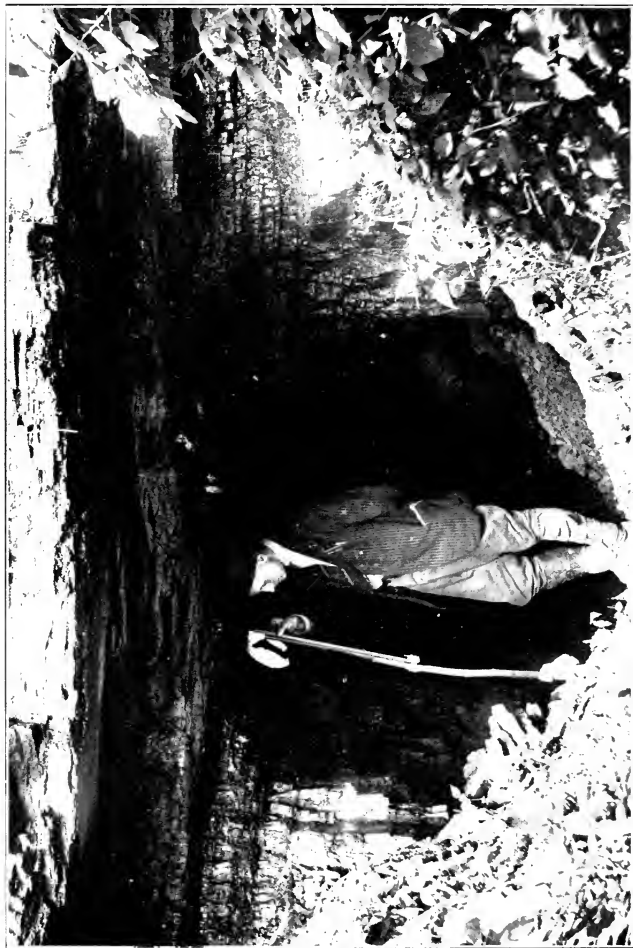


PLATE XXII.—B. C. Powers Mine (No. 275 on Map II) in Lower Kittanning Coal, 1.1 miles northwest of Cleveland; cloths tied on pole are 2 feet apart; part of seam concealed; total coal and shale, 11 feet 8 inches.



The following well, taken from Volume I(A), page 373, which failed to find the Gordon Sand, and was a dry hole, shows a reason for the abrupt western termination of the pool:

### Wm. E. Donlan No. 2 Well Record (361).

Courthouse District; on Sand Fork, 0.6 mile southwest of Copley; authority, South Penn Oil Co.; elevation, 895' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	325	329
Sand, Big Dunkard.....	900	950
Pencil Cave.....	2000	2010
Big Lime.....	2010	2060
Sand, Big Injun.....	2060	2250
Sand, Gordon Stray.....	2681	2686
"No Gordon or Fifth Sands."		

Volume I(A), page 370, of the Survey, gives the record of the B. F. Clayton No. 1 Well (362), located near the Copley gusher, 0.2 mile southeast of Copley, at an elevation of 990' B., by South Penn Oil Co.

The seven following wells were drilled along Cove Lick and its lower branches, being located north of the Copley gusher:

### John Copley No. 1 Well Record (365).

Courthouse District; on Cove Lick, 0.3 mile north of Copley; authority, South Penn Oil Co.; elevation, 885' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	250	
Sand, Big Dunkard.....	850	910
Sand, Second Cow Run.....	1040	1400
Pencil Cave.....	1895	1920
Sand, Big Injun.....	1975	2200
Sand, Gordon Stray.....	2609	2620
Sand, Gordon.....	2629	2645

The above well, the record of which is taken from Volume I(A), page 369, is located only a few hundred feet from the Copley gusher, but was only a light producer from the Gordon Sand.

### J. H. McCray No. 1 Well Record (366).

Courthouse District; on Cove Lick, 0.4 mile north of Copley; authority, Guffey and Galey; elevation, 1070' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	455	
Sand, Gordon Stray.....	2811	2822
Sand, Gordon.....	2838	2850
Total depth.....		2853
"Well filled up about 200' with oil from Stray Sand. Thought it would make 20 bbls. from Stray."		
Conductor, 16'; 10" casing, 300'; 8¼", 1110'; 6½", 2224'.		

### T. McLaughlin No. 2012 Well Record (368).

Courthouse District; on branch of Cove Lick, 2.2 miles northwest of Bealls Mills; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1055' B.

	Top. Feet.	Bottom. Feet.
Sand, Grafton.....	620	652
Sand, Big Dunkard.....	890	910
Sand, Burning Springs.....	1000	1035
Sand, Second Cow Run.....	1158	1200
Sand, Salt.....	1210	1295
Sand, Salt.....	1520	1560
Sand, Maxton.....	1808	1870
Big Lime.....	1984	2040
Sand, Big Injun.....	2040	2270
Sand, Squaw.....	2270	2300
Sand, Gordon Stray.....	2675	2685
Sand, Fifth (gas) and unrecorded to bottom.....	2880	2909

### R. F. Romine No. 1 Well Record (369).

Courthouse District; on Cove Lick, 0.9 mile northeast of Copley; authority, South Penn Oil Co.; elevation, 1180' B.

	Top. Feet.	Bottom. Feet.
Pittsburgh Coal.....	500	505
Burning Springs Sand.....	1100	1190
Big Lime.....	2210	2330
Big Injun Sand.....	2330	2480
Gordon Stray Sand (oil, 2893').....	2883	2898
Total depth.....		3098



**Barney Bohem No. 1 Well Record (370).**

Courthouse District; on Cove Lick, 1.0 mile northeast of Copley; authority, United States Oil Co.; elevation, 1200' B.

	Top. Feet.	Bottom. Feet.
First Coal, Uniontown.....	275	
Second Coal, Lower Uniontown.....	356	
Coal, Pittsburgh.....	550	
Big Lime.....	2275	2380
Sand, Big Injun (gas, 2450-2475').....	2380	2480
Slate and shells.....	2480	2800
Sand, Gordon Stray (oil, 2907').....	2905	2915
Sand, Gordon.....	2930	2936

The above well, the record of which is taken from Volume I(A), page 374, of the Survey, shows three coals, of which the Uniontown and Lower Uniontown are unusual in this locality.

**Barney Bohem No. 3 Well Record (371).**

Courthouse District; on Cove Lick, 1.1 miles northeast of Copley; authority, United States Oil Co.; elevation, 830' B.

	Top. Feet.	Bottom. Feet.
First Coal, Sewickley.....	75	
Second Coal, (Redstone).....	105	
Pittsburgh Coal .....	140	
Little Lime.....	1765	
Pencil Cave.....	1795	1805
Big Lime.....	1805	
Big Injun Sand (gas, 1920').....	1895	2105
Black slate.....	2105	2165
Sand, Squaw.....	2165	2190
Hard lime.....	2190	2215
White Sand, Berea.....	2215	2240
Hard lime and "boulders" (nuggets).....	2240	2250
Slate .....	2250	2270
Hard lime.....	2270	2295
Slate .....	2295	2315
Hard and blue lime.....	2315	2365
Sandy lime.....	2365	2375
Black slate.....	2375	2405
Hard lime.....	2405	2415
Black slate.....	2415	2425
Red rock.....	2425	2435
Lime, shells and slate.....	2435	2460
Black slate.....	2460	2485
Gordon Stray Sand (oil).....	2485	2495
Slate .....	2495	2505
Gordon Sand.....	2505	2517

Concerning this record, Dr. I. C. White says the following in Volume I(A), page 374:

"This is an important record, since its details show the presence of Red beds at 530 feet below the top of the Big Injun Sand, at the horizon where they are so often found above the Gordon Stray in Wetzel, Harrison and Doddridge Counties to the west, thus tending to confirm the identification of the 'Stray' and Gordon Sands in the Sand Fork Pool, notwithstanding their much greater interval below the Pittsburgh Coal."

### Timothy Rafferty No. 3495 Well Record (373).

Courthouse District; on Raccoon Run, 1.5 miles north of Copley; authority, Hope Natural Gas Co.; completed, July 20, 1914; elevation, 860' B.

	Top. Feet.	Bottom. Feet.
Unrecorded (water, 160' and 200').....	0	596
Little Dunkard Sand.....	596	628
Big Dunkard Sand.....	700	743
Gas Sand.....	826	894
Second Cow Run Sand.....	950	1012
Salt Sand.....	1165	1300
Unrecorded (gas, 1435').....	1300	1460
Salt Sand.....	1460	1490
Maxton Sand.....	1670	1689
Little Lime.....	1694	1723
Pencil Cave.....	1723	1743
Big Lime.....	1743	1795
Big Injun Sand (small show of oil).....	1795	1935
Squaw Sand.....	1937	1974
Thirty-foot Sand.....	2335	2347
Gordon Stray Sand.....	2439	2447
Gordon Sand.....	2461	2472
Total depth.....		2766

The above well was abandoned as a dry hole.

The following well, now the property of the Pittsburgh and West Virginia Gas Co., but drilled by Guffey and Galey, who furnished the record to the Survey, gives a complete stratigraphic record, but the driller has evidently mistaken shale for lime, as few limestones of any consequence except the Big Lime are found in this region. The well produces gas from the Fifth Sand:

### Michael Mullady No. 1901 Well Record (374).

Courthouse District; on Stonepot Run, 2.0 miles northwest of Bealls Mills; authority, Pittsburgh & W. Va. Gas Co.; elevation, 885' B.

	Thickness. Total.	
	Feet.	Feet.
Conductor .....	6	6
Sand, Sewickley.....	40	46
Lime .....	20	66

	Thickness. Total.	
	Feet.	Feet.
Slate .....	10	76
Lime .....	20	96
Slate .....	5	101
Lime .....	10	111
Sand, Weston.....	5	116
Slate .....	10	126
Lime .....	20	146
Slate .....	40	186
Lime .....	30	216
Slate .....	25	241
Sand, Lower Connellsville (water).....	40	281
Red rock.....	50	331
Lime .....	20	351
Slate .....	10	361
Lime .....	30	391
Sand, Grafton.....	52	443
Red rock.....	30	473
Lime .....	20	493
Slate .....	50	543
Lime .....	15	558
Slate .....	10	568
Sand, Moundsville.....	25	593
Red rock.....	15	608
Slate .....	20	628
Lime .....	10	638
Slate .....	15	653
Lime .....	40	693
Slate .....	30	723
Sand, Big Dunkard.....	20	743
Slate .....	20	763
Sand, Gas.....	120	883
Slate .....	30	913
Lime .....	20	933
Slate .....	20	953
Lime .....	20	973
Slate .....	27	1000
Sand, Second Cow Run.....	115	1115
Slate .....	40	1155
Slate and shell.....	60	1215
Sand, Salt.....	20	1235
Slate .....	10	1245
Lime .....	20	1265
Slate and shell.....	60	1325
Sand, Salt.....	10	1335
Lime .....	20	1355
Slate .....	30	1385
Shell .....	60	1445
Sand, Salt.....	50	1495
Slate .....	20	1515
Lime .....	40	1555
Sand .....	30	1585
Slate .....	10	1595
Lime .....	20	1615
Sand, Maxton.....	30	1645
Slate .....	20	1665

	Thickness. Feet.	Total. Feet.
Sand .....	10	1675
Slate and shell.....	20	1695
Red rock.....	15	1710
Lime .....	60	1770
Slate .....	10	1780
<b>Big Lime</b> .....	60	1840
Sand, Big Injun.....	75	1915
Lime .....	95	2010
Slate .....	5	2015
Sand, Squaw.....	30	2045
Lime .....	40	2085
Slate .....	10	2095
Lime .....	25	2120
Slate .....	30	2150
Lime .....	60	2210
Slate .....	15	2225
Sand, Berea.....	20	2245
Slate .....	25	2270
Shell .....	50	2320
Slate .....	15	2335
Lime .....	20	2355
Shell .....	30	2385
Slate .....	25	2410
Shell .....	20	2430
<b>Red rock</b> .....	10	2440
Lime .....	20	2460
Slate .....	10	2470
Shell .....	20	2490
<b>Sand, Gordon (gas)</b> .....	15	2505
Slate .....	25	2530
Sand and shell, Fourth.....	5	2535
Shell .....	30	2565
Slate .....	40	2605
Shell .....	20	2625
Slate .....	25	2650
Shell .....	16	2666
<b>Sand, Fifth (gas)</b> .....	15	2681
Slate .....	22	2703

10" casing, 457'; 8¼", 1111'; 6½", 1960'.

The following well produced oil from the Fifth Sand:

### Owen McAnainey No. 1 Well Record (377).

Courthouse District; on Cove Lick, 1.4 miles north of Bealls Mills; authority, South Penn Oil Co.; elevation, 840' B.

	Top. Feet.	Bottom. Feet.
<b>Pittsburgh Coal</b> .....	120	
<b>Big Dunkard Sand</b> .....	740	790
<b>Big Lime</b> .....	1780	1840
<b>Big Injun Sand</b> .....	1840	1990

	Top. Feet.	Bottom. Feet.
Gordon Stray Sand.....	2435	2444
Gordon Sand (gas, 2454').....	2450	2460
Fifth Sand (oil, 2652').....	2652	2658
Total depth.....		2680

The Cove Lick Gas Station, of the Hope Natural Gas Company, located on Cove Lick at the mouth of Laurel Run, 1.5 miles north of Bealls Mills, completed in the fall of 1914, according to W. H. Pethtel, Chief Engineer, has an equipment consisting of two 500 horse-power and two 400 horse-power National Transit Engines, making a total of 1800 horse-power, and was designed to pump gas to the Hastings, Wetzel County, Station, of the same company.

Several wells have been drilled along Laurel Run of Cove Lick, most of which seem to be too far north to be within the oil zone, but have been gas wells. The six following records are from this locality:

#### J. H. Mertz No. 11 Well Record (380).

Courthouse District; on Laurel Run, 2.4 miles north of Bealls Mills; authority, Reserve Gas Co.; completed, Sept. 17, 1910; elevation, 890' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	685	730
Second Cow Run Sand.....	940	1010
Big Injun Sand.....	1760	1930
Gordon Stray Sand.....	2366	2376
Gordon Sand (light gas).....	2406	2421
Fifth Sand (strong gas, 2584').....	2582	2590
Total depth.....		2608

#### Quigg-Canton No. 483 Well Record (381).

Courthouse District; on Laurel Run, 3.1 miles north of Bealls Mills; authority, Reserve Gas Co.; completed, June 20, 1914; elevation, 965' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	595	657
Burning Springs Sand.....	690	812
Gas Sand.....	822	895
Second Cow Run Sand.....	943	1160
Salt Sand.....	1288	1463
Maxton Sand (gas, 1630').....	1617	1639
Little Lime.....	1663	1697

	Top. Feet.	Bottom. Feet.
Pencil Cave.....	1697	1709
Big Lime (oil and gas, 1733').....	1709	1756
Big Injun Sand (gas, 1790').....	1756	1793
Gordon Stray Sand (gas, 2363-76').....	2363	2376
Total depth.....		2380

### McDonald Murray No. 491 Well Record (382).

Courthouse District; on Laurel Run, 2.8 miles northwest of Edmiston; authority, Reserve Gas Co.; completed, June 9, 1914; elevation, 945' L.

	Top. Feet.	Bottom. Feet.
Grafton Sand.....	290	320
Little Dunkard Sand.....	540	580
Burning Springs Sand.....	690	738
Salt Sand.....	1224	1320
Salt Sand.....	1340	1390
Maxton Sand (oil and gas, 1567') to bottom.....	1564	1574

The above well had an initial daily flow of 30 barrels of oil from the Maxton Sand.

### Murray Heirs No. 322 Well Record (383).

Courthouse District; on branch of Laurel Run, 2.1 miles northwest of Edmiston; authority, Reserve Gas Co.; completed, June 7, 1911; elevation, 1010' B.

	Top. Feet.	Bottom. Feet.
Grafton Sand.....	325	364
Little Dunkard Sand.....	560	605
Big Dunkard and Burning Springs Sands.....	655	756
Gas Sand.....	765	860
Second Cow Run Sand.....	885	960
Salt Sand (gas, 1300').....	1100	1330
Salt Sand.....	1435	1445
Little Lime.....	1625	1640
Pencil Cave.....	1640	1660
Big Lime (gas, 1685').....	1660	1710
Big Injun Sand (gas, 1725').....	1710	1870
Squaw Sand.....	1885	1935
Berea Sand.....	2125	2137
Fifty-foot Sand.....	2175	2180
Thirty-foot Sand.....	2240	2255
Gordon Stray Sand (gas, 2305').....	2302	2310
Gordon Sand (gas, 2366-90') to bottom.....	2325	2390

## Thomas Murray No. 474 Well Record (385).

Courthouse District; on Laurel Run, 1.6 miles northwest of Edmiston; authority, Reserve Gas Co.; completed, May 23, 1914; elevation, 1145' B.

	Top. Feet.	Bottom. Feet.
Grafton Sand.....	504	527
Little Dunkard Sand.....	680	758
Big Dunkard Sand.....	795	848
Gas and Second Cow Run Sands.....	872	1058
Salt Sand.....	1065	1177
Unrecorded (gas, 1185'; water, 1310'; gas, 1416')..	1177	1480
Salt Sand.....	1480	1562
Little Lime.....	1782	1802
Pencil Cave.....	1802	1807
Big Lime (gas, 1903').....	1887	1990
Big Injun Sand.....	1993	2055
Fifty-foot Sand (gas, 2380').....	2376	2387
Thirty-foot Sand (gas, 2455').....	2453	2477
Gordon Stray Sand (gas, 2486').....	2481	2523
Fifth Sand (gas, 2672').....	2670	2683
Total depth.....		2716

## Henry McCall No. 1539 Well Record (386).

Courthouse District; 1.5 miles northwest of Edmiston; authority, Hope Natural Gas Co.; completed, March 31, 1910; elevation, 1190' B.

	Top. Feet.	Bottom Feet.
Grafton Sand.....	515	550
Little Dunkard Sand.....	723	770
Big Dunkard Sand.....	810	862
Gas Sand.....	919	1056
Salt Sand.....	1162	1200
Salt Sand (gas, 1420').....	1362	1510
Little Lime.....	1795	1810
Pencil Cave.....	1810	1813
Big Lime.....	1813	1903
Big Injun Sand.....	1903	2078
Squaw Sand.....	2085	2095
Berea Sand.....	2206	2228
Thirty-foot Sand.....	2400	2420
Gordon Stray Sand.....	2463	2473
Gordon Sand (gas, 2484'; 2490'; 2496'; 2504')....	2483	2516
Total depth.....		2520

The following well was drilled on a branch of Cove Lick east of Laurel Run:

**John Murray No. 72 Well Record (387).**

Courthouse District; on branch of Cove Lick, 2.6 miles northeast of Bealls Mills; authority, Reserve Gas Co.; completed, Sept. 29, 1904; elevation, 995' B.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	32
Water .....	60	
Sand, Lower Pittsburgh.....	140	172
Big Dunkard Sand.....	685	712
Gas Sand.....	780	925
Second Cow Run Sand.....	940	960
Sand .....	1020	1340
Maxton Sand.....	1670	1705
Little Lime.....	1765	1780
Pencil Cave.....	1780	1800
Big Lime.....	1800	1860
Big Injun Sand.....	1860	2010
Berea Sand.....	2190	2196
Gordon Stray Sand.....	2477	2489
Gordon Sand (gas, 2510').....	2507	2525
Total depth.....		2533

The seven following wells were drilled along the headwaters of Cove Lick, all of them being gassers from sands ranging from the Salt to the Fifth:

**Patrick Farrell No. 436 Well Record (389).**

Courthouse District; on Cove Lick, 1.9 miles northeast of Bealls Mills; authority, Hope Natural Gas Co.; completed, Aug. 14, 1901; elevation, 910' B.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	16
Big Lime.....	1840	1930
Big Injun Sand.....	1930	2080
Gordon Sand.....	2490	2500
Fifth Sand (gas, 2662').....	2661	2669
Total depth.....		2679

**T. J. White No. 2002 Well Record (390).**

Courthouse District; on Cove Lick, 2.1 miles northeast of Bealls Mills; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1030' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	356	364
Sand, Big Dunkard.....	902	942
Sand, Maxton.....	1742	1802



	Top. Feet.	Bottom. Feet.
Big Lime.....	1914	2030
Sand, Big Injun (gas).....	2030	2155
Sand, Squaw.....	2185	2215
Sand, Berea.....	2311	2339
Sand, Thirty-foot.....	2520	2540
Sand, Gordon Stray.....	2586	2599
Sand, Gordon (gas).....	2618	2629
Sand, Fifth (gas).....	2800	2808
Total depth.....		2818

### F. J. Matthews No. 2455 Well Record (391).

Courthouse District; 2.2 miles N. 75° W. of Edmiston; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1090' B.

	Top. Feet.	Bottom. Feet.
Sand, Little Dunkard.....	700	740
Sand, Big Dunkard.....	860	890
Sand, Burning Springs.....	980	995
Sand, Second Cow Run.....	1190	1215
Sand, Salt.....	1255	1320
Sand, Salt.....	1495	1600
Sand, Maxton.....	1800	1830
Big Lime.....	1895	1973
Sand, Big Injun (gas).....	1973	2110
Sand, Fifty-foot.....	2370	2385
Sand, Thirty-foot.....	2452	2462
Sand, Gordon Stray.....	2503	2528
Sand, Gordon (gas).....	2533	2578
Sand, Fifth (gas).....	2736	2748
Total depth.....		2774

### Luke White No. 1604 Well Record (393).

Courthouse District; on Cove Lick, 1.5 miles northwest of Edmiston; authority, Hope Natural Gas Co.; completed, June 13, 1910; elevation, 1070' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	760	816
Big Dunkard Sand.....	866	900
Burning Springs Sand.....	960	1042
Gas Sand.....	1042	1168
Second Cow Run Sand.....	1190	1340
Salt Sand.....	1350	1605
Maxton Sand.....	1803	1817
Little Lime.....	1885	1900
Pencil Cave.....	1900	1905
Big Lime.....	1905	1955
Big Injun Sand.....	1955	2115
Squaw Sand.....	2118	2155
Thirty-foot Sand.....	2490	2505
Gordon Stray Sand (gas, 2526' and 2533').....	2525	2543
Total depth.....		2543

### Luke White No. 812 Well Record (394).

Courthouse District; on head of Cove Lick, 1.5 miles northwest of Edmiston; authority, Hope Natural Gas Co.; completed, Apr. 3, 1900; elevation, 1030' B.

	Thickness. Total.	
	Feet.	Feet.
Clay .....	26	26
Slate and lime.....	140	166
Slate .....	60	226
Lime .....	5	231
<b>Coal, Pittsburgh.....</b>	<b>5</b>	<b>236</b>
Slate, red rock and shells.....	229	465
Sand, Grafton.....	35	500
Slate, red rock and shells.....	70	570
Lime .....	30	600
Slate, red rock and shells.....	65	665
Shale, brown, soft.....	20	685
Sand, Little Dunkard.....	40	725
Lime .....	55	780
Sand, Big Dunkard.....	10	790
Lime .....	35	825
<b>Sand, Burning Springs (a little black oil).....</b>	<b>45</b>	<b>870</b>
Slate and red rock.....	30	900
Sand, gas.....	85	985
Slate .....	100	1085
<b>Coal, Mercer.....</b>	<b>3</b>	<b>1088</b>
Slate and lime.....	32	1120
Sand, Salt.....	65	1185
Slate .....	25	1210
<b>Coal .....</b>	<b>2</b>	<b>1212</b>
Slate .....	58	1270
Sand, Salt.....	50	1320
Lime and slate.....	40	1360
<b>Sand, Salt (little black oil and little gas, 1420')..</b>	<b>140</b>	<b>1500</b>
Slate .....	80	1580
Sand, very hard, Maxton.....	165	1745
Slate .....	13	1758
Little Lime.....	22	1780
Slate and Pencil Cave.....	20	1800
<b>Big Lime.....</b>	<b>80</b>	<b>1880</b>
Sand, Big Injun.....	60	1940
Lime, blue (a little gas).....	110	2050
Slate, with pebbles.....	120	2170
<b>Slate and shells (little oil).....</b>	<b>200</b>	<b>2370</b>
Lime, blue, hard.....	20	2390
Slate and shells.....	35	2425
Shells, with pebbles, Thirty-foot Sand.....	3	2428
Slate .....	21	2449
<b>Sand, Gordon Stray (gas).....</b>	<b>19</b>	<b>2468</b>
Slate, broken.....	10	2478
<b>Sand, Gordon (gas).....</b>	<b>41</b>	<b>2519</b>
Slate .....	103	2622
<b>Sand and shells, Fourth (little light oil).....</b>	<b>2</b>	<b>2624</b>
Slate .....	39	2663
<b>Sand, Fifth (gas).....</b>	<b>14</b>	<b>2677</b>
Slate .....	6	2683

10" casing, 140'; 8¼", 945'; 6½", 1886'.

### Luke White No. 1446 Well Record (395).

Courthouse District; on head of Cove Lick; 1.2 miles west of Edmiston; authority, Hope Natural Gas Co.; completed, May 6, 1910; elevation, 1295' B.

	Top. Feet.	Bottom. Feet.
Moundsville Sand.....	940	950
Little Dunkard Sand.....	968	1026
Big Dunkard Sand.....	1080	1113
Gas Sand.....	1180	1310
Second Cow Run Sand.....	1350	1525
Maxton Sand.....	1940	1962
Little Lime.....	2062	2077
Pencil Cave.....	2077	2082
<b>Big Lime.....</b>	<b>2062</b>	<b>2132</b>
<b>Big Injun Sand (gas, 2234').....</b>	<b>2132</b>	<b>2270</b>
Squaw Sand.....	2278	2307
Gordon Stray Sand.....	2705	2728
<b>Gordon Sand (gas, 2747' and 2753').....</b>	<b>2740</b>	<b>2760</b>
Total depth.....		2763

### T. J. White No. 1983 Well Record (396).

Courthouse District; on Cove Lick, 2.0 miles northeast of Bealls Mills; authority, Pittsburgh & W. Va. Gas Co.; elevation, 930' B.

	Top. Feet.	Bottom. Feet.
<b>Coal, Pittsburgh.....</b>	<b>232</b>	<b>237</b>
Sand, Moundsville.....	580	630
Sand, Little Dunkard.....	712	742
Sand, Big Dunkard.....	778	852
Sand, Burning Springs.....	935	1005
Sand, Gas.....	1015	1050
Sand, Second Cow Run.....	1070	1115
Sand, Maxton.....	1750	1770
<b>Big Lime.....</b>	<b>1845</b>	<b>1905</b>
<b>Sand, Big Injun (gas).....</b>	<b>1905</b>	<b>2070</b>
Sand, Squaw.....	2080	2115
Sand, Berea.....	2225	2270
Sand, Thirty-foot.....	2430	2444
<b>Sand, Gordon Stray (gas).....</b>	<b>2478</b>	<b>2498</b>
Sand, Gordon.....	2506	2530
Total depth.....		2536

The Copley Oil Pool extends eastward as far as Rock Run, where several good wells have been drilled, one of which is the following:

## J. W. Cox No. 1 Well Record (397).

Courthouse District; on Rock Run, 0.6 mile north of Bealls Mills; authority, Guffey and Galey; completed, Apr. 2. 1900; elevation, 870' B.

	Thickness. Total.	
	Feet.	Feet.
Conductor .....	12	12
Slate .....	40	52
Lime .....	20	72
Sand, Sewickley.....	30	102
Slate .....	50	152
Lime .....	8	160
Coal, Redstone .....	3	163
Lime .....	9	172
Slate .....	28	200
Lime .....	27	227
Coal, Pittsburgh.....	5	232
Slate .....	23	255
Sand, Lower Pittsburgh.....	15	270
Slate .....	50	320
Lime .....	30	350
Red rock.....	50	400
Lime .....	20	420
Red rock.....	30	450
Sand, Grafton.....	40	490
Red rock.....	50	540
Lime .....	20	560
Sand, Moundsville.....	30	590
Slate .....	50	640
Sand, Little Dunkard.....	30	670
Slate .....	40	710
Sand, Big Dunkard.....	100	810
Lime .....	50	860
Sand, Burning Springs.....	30	890
Slate .....	20	910
Lime .....	60	970
Sand, Gas.....	30	1000
Slate .....	20	1020
Sand, Second Cow Run.....	80	1100
Sand, Salt.....	60	1160
Slate .....	5	1165
Lime .....	40	1205
Sand, Salt.....	20	1225
Slate .....	15	1240
Sand, Salt.....	30	1270
Slate .....	40	1310
Lime .....	15	1325
Slate .....	50	1375
Sand, Salt.....	30	1405
Slate .....	15	1420
Lime .....	10	1430
Slate .....	40	1470
Sand, Salt.....	25	1495
Slate .....	15	1510
Lime (gas).....	20	1530
Sand, Salt.....	40	1570

	Thickness Feet.	Total Feet.
Slate .....	10	1580
Lime .....	20	1600
Slate .....	30	1630
Red rock.....	35	1665
Lime .....	40	1705
Sand .....	30	1735
Slate .....	25	1760
Sand .....	15	1775
Lime .....	20	1795
Slate .....	10	1805
Sand, Maxton.....	15	1820
Little Lime.....	20	1840
Slate, Pencil Cave.....	10	1850
<b>Big Lime</b> .....	80	1930
Sand, Big Injun.....	20	1950
Lime .....	40	1990
Slate .....	30	2020
Sand, Squaw.....	70	2090
Slate .....	40	2130
Sand, Weir.....	70	2200
Slate.....	30	2230
Sand and shells, Berea.....	40	2270
Slate .....	30	2300
Lime .....	20	2320
Sand, Fifty-foot.....	25	2345
Slate and shells.....	40	2385
Lime .....	15	2400
Slate and shells.....	40	2440
Red rock.....	20	2460
Slate .....	30	2490
Sand, Gordon Stray.....	10	2500
Slate .....	12	2512
<b>Sand, Gordon</b> .....	13	2525
Slate .....	12	2537
Sand .....	12	2549
Slate and shells.....	60	2609
Sand, Fourth.....	10	2619
Slate and shells.....	77	2696
Sand, Fifth, (top at 2696').....		
10" casing, 200'; 8¼", 990'; 6⅝", 1913'.		

The two following wells are along Sand Fork in the Copley Pool:

### T. R. Reynolds No. 1 Well Record (400).

Courthouse District; on Sand Fork, 0.3 mile northwest of Bealls Mills; authority, South Penn Oil Co.; elevation, 830' L.

	Top. Feet.	Bottom. Feet.
<b>Pittsburgh Coal</b> .....	210	
Sand, Little and Big Dunkard.....	690	830
Sand, Second Cow Run.....	1030	1110

	Top. Feet.	Bottom. Feet.
Sand, Salt.....	1520	1580
Sand, Maxton.....	1615	1700
Little Lime.....	1775	1795
Pencil Cave.....	1795	1825
<b>Big Lime</b> .....	1825	1870
Big Injun Sand.....	1870	2000
Gordon Stray Sand.....	2481	2486
Gordon Sand, broken.....	2492	2503
<b>Fifth Sand</b> (oil, 2673').....	2673	2677
Total depth.....		2701

### M. M. Summers No. 7 Well Record (403).

Courthouse District; on Sand Fork, 0.9 mile northwest of Bealls Mills; authority, South Penn Oil Co.; elevation, 1190' B.

	Top. Feet.	Bottom. Feet.
<b>Pittsburgh Coal</b> .....	445	449
Big Dunkard Sand.....	1050	1110
Pencil Cave.....	2100	2110
<b>Big Lime</b> .....	2110	2180
Big Injun Sand.....	2180	2400
Gordon Stray Sand.....	2801	2809
<b>Gordon Sand</b> (oil, 2821').....	2819	2831
Total depth.....		2861

The James Mullady No. 2 (404) started flowing at 200 barrels an hour, according to Col. J. M. Guffey, but declined very fast, the oil being found one foot in the Gordon Sand. The James Mullady No. 1 (405), according to the same authority, made a show of oil in the Gordon Stray, and encountered a strong gas pressure in the top of the Gordon which blew out the tools, and, on being drilled deeper into the sand flowed 50 barrels per day.

The three following wells were drilled along the ridge southeast of Copley:

### C. W. McCutcheon No. 1 Well Record (409).

Courthouse District; 0.8 mile southeast of Copley; authority, South Penn Oil Co.; elevation, 1315' B.

	Top. Feet.	Bottom. Feet.
<b>Pittsburgh Coal</b> .....	630	634
Big Dunkard Sand.....	1160	1210
Salt Sand.....	1650	1720
Maxton Sand.....	2125	2225

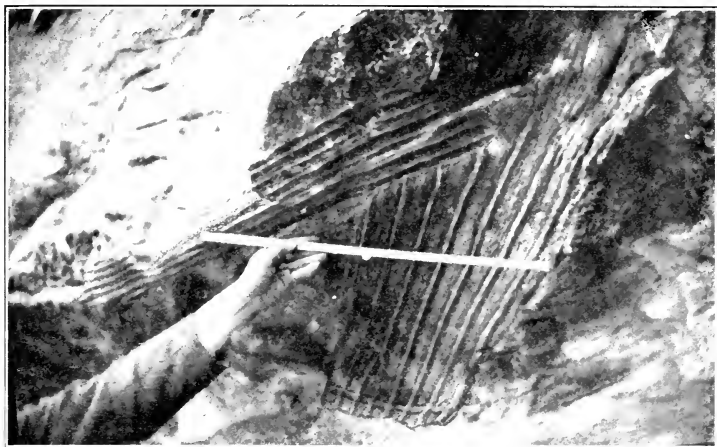


PLATE XXIII(a).—*Sigillaria* of the *Rhytidolepis* Group, in Lower Division of the Lower Freeport Sandstone, 0.6 mile north of Cleveland, Lewis County. See Cleveland Section.

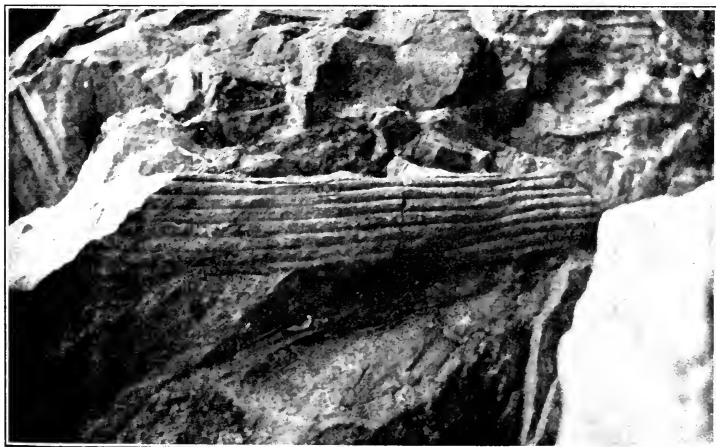


PLATE XXIII(b).—Another exposure in the same outcrop as Plate XXIII(a).





	Top. Feet.	Bottom. Feet.
Big Lime.....	2300	2340
Big Injun Sand.....	2340	2525
Gordon Sand (oil, 2994').....	2990	3000
Fourth Sand.....	3007	
Total depth.....		3015

### William Griggs No. 1 Well Record (410).

Courthouse District; 1.0 mile southeast of Copley; authority, South Penn Oil Co.; elevation, 1185' B.

	Top. Feet.	Bottom. Feet.
Pittsburgh Coal.....	525	529
Gas Sand.....	1285	1340
Sand .....	1400	1550
Maxton Sand.....	1920	2000
Big Lime.....	2215	2265
Big Injun Sand.....	2265	2565
Gordon Stray Sand (oil, 2892').....	2888	2900
Gordon Sand (oil, 2914') to bottom.....	2910	2920

### I. N. Means No. 1 Well Record (412).

Courthouse District; 1.4 miles southwest of Bealls Mills; authority, South Penn Oil Co.; elevation, 1210' B.

	Top. Feet.	Bottom. Feet.
Pittsburgh Coal.....	525	
Coal, Upper Freeport.....	1095	1105
Salt Sand.....	1375	1540
Maxton Sand.....	1925	1985
Little Lime.....	2165	2190
Big Lime.....	2212	2280
Big Injun Sand (show oil, 2320'; gas, 2385').....	2288	2508
Gordon Stray Sand (show oil, 2895').....	2895	2901
Gordon Sand.....	2913	2920
Fifth Sand.....	3075	3078
Total depth.....		3097

The above well, the record of which was published in Volume I(A), page 370, was reported to have flowed a little oil, but was never pumped.

Numerous wells have been drilled along Butchers Fork, south of Copley, in an attempt to extend the Copley Pool, but little oil has been found. The following is the record of a dry hole formerly published in Volume I(A), page 373, of the Survey. The coal at 300 feet is evidently too high for the

Pittsburgh, both by the surrounding structure and by its interval from the Big Lime:

### W. H. Dent No. 1 Well Record (414).

Courthouse District; on Tomahawk Run, 0.8 mlie south of Copley; authority, South Penn Oil Co.; elevation, 1115' B.

	Top. Feet.	Bottom. Feet.
Coal, Lower Uniontown.....	300	
Big Dunkard Sand.....	1050	1090
Pencil Cave.....	2080	2090
Big Lime.....	2090	2180
Big Injun Sand.....	2180	2400
Fifty-foot Sand.....	2640	2646
Thirty-foot Sand.....	2668	2673
Gordon Sand.....	2838	
Total depth.....		3052

The following record, published in Volume I(A), page 370, of the Survey, is that of another comparatively dry hole in the same vicinity:

### James Murphy No. 2 Well Record (416).

Courthouse District; on Butchers Fork, 1.3 miles southeast of Copley; authority, South Penn Oil Co.; elevation, 1210' B.

	Top. Feet.	Bottom. Feet.
Pittsburgh Coal.....	580	583
Little Dunkard Sand.....	1015	1030
Coal, Brush Creek.....	1105	1107
Big Dunkard Sand.....	1189	1234
Salt Sand.....	1840	1905
Big Lime.....	2200	2280
Big Injun Sand (little gas, 2400').....	2280	2450
Gordon Stray Sand (gas and oil, 2887').....	2886	2892
Gordon Sand (dry).....	2904	2910
Fifth Sand (shell) (dry).....	3070	
Total depth.....		3127

"Shot with 20 quarts at 2857 feet. Filled up 50 feet with oil from Stray 24 hours after shot."

The following well, drilled by Guffey and Galey, but now owned by the Pittsburgh & West Virginia Gas Company, is located far enough east on the rising structure to be in gas territory:

## James Murphy No. 1903 Well Record (417).

Courthouse District; on Butchers Fork, 1.7 miles southeast of Copley; authority, Pittsburgh & W. Va. Gas Co.; elevation, 890' B.

	Thickness, Total.	
	Feet.	Feet.
Gravel and loose sand.....	30	30
Sand, soft, coarse, Sewickley.....	30	60
Slate .....	20	80
Sand .....	10	90
Slate and red rock.....	95	185
Lime .....	35	220
Red rock.....	20	240
Slate .....	40	280
<b>Coal, small vein, Little Pittsburgh.....</b>		<b>280</b>
Lime .....	10	290
Slate and shells.....	280	570
Slate and red rock.....	120	690
<b>Coal, Brush Creek.....</b>		<b>690</b>
Slate, black, and shells.....	95	785
Sand, white, very hard at top, Big Dunkard.....	45	830
Slate .....	60	890
Sand, Burning Springs.....	15	905
<b>Coal, Upper Kittanning.....</b>	<b>12</b>	<b>917</b>
Lime .....	21	938
Slate and shells.....	142	1080
Sand, Second Cow Run.....	30	1110
Slate, black.....	15	1125
Sand, white, Salt.....	50	1175
Sand, black.....	15	1190
Sand, white, Salt.....	30	1220
Shale, black.....	260	1480
<b>Sand, white, Salt (little gas, 1532'?).....</b>	<b>40</b>	<b>1520</b>
Slate .....	30	1550
Sand .....	20' } Salt .....	100
Sand, dark.....	40	1650
Sand, white, hard, fine...40 }		
Red rock.....	25	1675
Slate, white, and shells.....	105	1780
Red rock.....	25	1805
Lime .....	20	1825
Red rock.....	20	1845
Slate .....	30	1875
Lime .....	10	1885
Slate, black.....	12	1897
<b>Big Lime and Big Injun Sand.....</b>	<b>233</b>	<b>2130</b>
Slate and shells.....	378	2508
Sand, Thirty-foot.....	11	2519
Unrecorded .....	19	2538
<b>Sand, Gordon Stray (gas, 2538').....</b>		
Unrecorded, slate and shells.....	212	2750
Unrecorded, and sand, Fifth.....	10	2760
Unrecorded .....	44	2804
Sand, dark, Bayard.....	6	2810
Unrecorded and slate to bottom.....	17	2827

10" casing, 182'; 8¼", 690'; 6⅝", 1898'.

The following well, located on the ridge between Sand Fork and Butchers Fork and in the edge of the Copley Pool, is reported a 25-barrel producer:

### John Collins No. 4 Well Record (419).

Courthouse District; 0.6 mile S. 15° W. of Bealls Mills; authority, South Penn Oil Co.; elevation, 1220' B.

	Top. Feet.	Bottom. Feet.
Pittsburgh Coal.....	528	
Big Lime.....	2198	2268
Big Injun Sand.....	2268	2453
Gordon Stray Sand.....	2843	2850
Gordon Sand (oil, 2876').....	2871	2898
Fifth Sand.....	3061	3066
Total depth.....		3078

The three following are gas wells located along the head of Butchers Fork:

### John Collins No. 4016 Well Record (420).

Courthouse District; on Butchers Fork, 2.0 miles north of Aspinwall; authority, Pittsburgh & W. Va. Gas Co.; elevation, 950' B.

	Top. Feet.	Bottom. Feet.
Coal, Elk Lick.....	528	531
Sand, Gas.....	966	985
Sand, Second Cow Run.....	1059	1095
Sand, Salt.....	1445	1500
Big Lime.....	1912	1970
Sand, Big Injun.....	1970	2145
Sand, Berea.....	2250	2281
Sand, Thirty-foot.....	2461	2484
Sand, Gordon Stray (gas).....	2526	2547
Sand, Gordon (gas).....	2555	2573
Sand, Fifth (oil show).....	2742	2762
Total depth.....		2795

### Peter Gillooly No. 1986 Well Record (421).

Courthouse District; on Butchers Fork, 1.5 miles northwest of Finster; authority, Pittsburgh & W. Va. Gas Co.; completed, Nov. 15, 1909; elevation, 1035' B.

	Top. Feet.	Bottom. Feet.
Sand, Little Dunkard.....	795	847
Sand, Big Dunkard.....	885	925
Sand, Gas.....	1030	1100

	Top. Feet.	Bottom. Feet.
Sand, Salt.....	1285	1315
Sand, Salt.....	1495	1555
Sand, Salt.....	1665	1710
Sand, Maxton.....	1765	1865
Big Lime.....	1950	2005
Sand, Big Injun (gas show).....	2005	2150
Sand, Gordon Stray (gas).....	2559	2575
Sand, Gordon, to bottom.....	2587	2597

### Anne Connell No. 2075 Well Record (422).

Courthouse District; head of Butchers Fork, 1.6 miles southwest of Gillooly; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1215' B.

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard.....	920	996
Sand, Gas.....	1120	1164
Sand, Second Cow Run.....	1245	1305
Big Lime.....	2070	2135
Sand, Big Injun.....	2135	2300
Sand, Gordon Stray (gas).....	2720	2742
Sand, Gordon (gas).....	2742	2784
Sand, Fifth (gas).....	2940	2946
Total depth.....		3081

The following well was drilled on Sand Fork just east of the oil zone. It produces gas from the Gordon Sand:

### James Hall No. 1 Well Record (423).

Courthouse District; on Sand Fork, 1.0 mile southeast of Bealls Mills; authority, Guffey and Gale; completed, Feb. 1900; elevation, 845' B.

	Top. Feet.	Bottom. Feet.
Coal, Elk Lick.....	403	
Sand, Gordon Stray.....	2414	
Sand, Gordon (gas).....	2440	
Sand, Fifth (small oil show, 2635').....	2631	2644
Total depth.....		2678
10" casing, 248'; 8", 762'; 6 $\frac{5}{8}$ ", 2025'.		

Several wells were drilled around Bealls Mills along the eastern edge of the Copley Pool. The record of the **J. C. Collins No. 1 (428)** is published in the section for Bealls Mills, page 62. The four following records are from this vicinity:

## John Gillooly No. 2 Well Record (424).

Courthouse District; 0.9 mile east of Bealls Mills; authority, South Penn Oil Co.; elevation, 1130' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	480	483
Moundsville Sand.....	850	875
Little Dunkard Sand.....	940	995
Burning Springs Sand.....	1045	1135
Gas Sand.....	1165	1240
Second Cow Run Sand.....	1340	1475
Salt Sand.....	1765	1850
Maxton Sand.....	1920	1982
Little Lime.....	2080	2097
Pencil Cave.....	2097	2117
Big Lime.....	2117	2172
Big Injun Sand.....	2172	2287
Squaw Sand.....	2287	2357
Weir Sand.....	2400	2418
Fifty-foot Sand.....	2660	2670
Thirty-foot Sand (gas, 2724').....	2713	2730
Gordon Stray Sand (gas, 2753').....	2741	2761
Fifth Sand (oil, light, 2942').....	2940	2949
Total depth.....		2965

## R. B. Shouldis No. 1 Well Record (425).

Courthouse District; 0.5 mile southeast of Bealls Mills; authority, South Penn Oil Co.; completed in 1908; elevation, 825' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	625	690
Burning Springs Sand.....	750	860
Gas Sand.....	910	935
Second Cow Run Sand.....	1016	1055
Salt Sand.....	1124	1285
Salt Sand.....	1495	1570
Salt Sand.....	1575	1592
Maxton Sand.....	1632	1715
Little Lime.....	1727	1742
Big Lime.....	1760	1782
Big Injun Sand.....	1782	2017
Gordon Stray Sand (oil, 2442').....	2435	2453
Total depth.....		2460

The above well had an initial production of 15 barrels daily, but has declined to 9 barrels weekly.

**Beall Heirs No. 1 Well Record (426).**

Courthouse District; at Bealls Mills; authority, Southern Oil Co.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	460	
Sand, Grafton.....	700	745
Sand, Big Dunkard.....	990	1020
Sand, Salt.....	1500	1715
Sand, Maxton.....	1730	1745
Big Lime.....	2020	2125
Sand, Big Injun.....	2125	2245
Red rock.....	2635	
Sand, Gordon Stray.....	2655	2675
Sand, Gordon (oil, 2755').....	2745	2760
Sand, Fifth.....	2940	2942
Total depth.....		2956

The above record was published in Volume I(A), page 371, of the Survey.

**J. C. Collins No. 5 Well Record (429).**

Courthouse District; on Sand Fork, 0.3 mile south of Bealls Mills; authority, Crude Oil Co.; elevation, 1220' L.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	600	
Sand, Big Dunkard.....	1160	
Sand, Salt.....	1465	
Little Lime.....	2175	
Big Lime.....	2200	
Sand, Big Injun.....		2440
Sand, Gordon Stray.....	2852	2862
Sand, Gordon, (oil, 2896').....	2888	2909

The above record was published in Volume I(A), page 372, of the Survey.

The two following wells were drilled on Sleepcamp Run, well up on the slope of the Orlando Anticline. Well No. 430 made a show of oil in the Fifty-foot Sand, but its production soon declined. Both wells produce gas:

**John Finster No. 1921 Well Record (430).**

Courthouse District; on a branch of Sleepcamp Run, 0.8 mile N. 10° E. of Finster; authority, Pittsburgh & W. Va. Gas Co.; elevation, 995' B.

	Top. Feet.	Bottom. Feet.
Sand, Moundsville.....	430	480
Sand, Little Dunkard.....	500	550
Sand, Gas.....	710	730
Big Lime.....	1740	1835
Sand, Big Injun (gas show).....	1835	1943
Sand, Berea (oil).....	2180	2188
Sand, Thirty-foot (gas show).....	2328	2346
Sand, Gordon Stray.....	2358	2398
Sand, Fifth, and unrecorded, to bottom.....	2558	2755

**John Finster No. 1969 Well Record (431).**

Courthouse District; in Sleepcamp Run, at Finster; authority, Pittsburgh & W. Va. Gas Co.; elevation, 915' B.

	Top. Feet.	Bottom. Feet.
Sand, Little Dunkard.....	440	490
Sand, Big Dunkard.....	610	640
Sand, Maxton.....	1475	1485
Big Lime.....	1625	1690
Sand, Big Injun (gas show).....	1690	1860
Sand, Squaw.....	1865	1885
Sand, Fifty-foot.....	2175	2191
Sand, Thirty-foot.....	2221	2228
Sand, Gordon Stray.....	2235	2253
Sand, Fifth (gas).....	2461	2467
Total depth.....		2533

Between the Grassland Syncline and the Orlando Anticline, there is a broad belt of fine gas territory where numerous wells have been drilled. The four following records are from this region along Indian Fork:

**T. T. Dolan No. 7005 Well Record (432).**

Courthouse District; on Indian Fork, 1.2 miles northeast of Aspinwall; authority, Pittsburgh & W. Va. Gas Co.; elevation, 925' B.

	Top. Feet.	Bottom. Feet.
Coal, Elk Lick.....	320	323
Sand, Little Dunkard.....	560	590
Sand, Burning Springs.....	710	750
Sand, Gas.....	773	805
Sand, Second Cow Run.....	900	1020



	Top. Feet.	Bottom. Feet.
Sand, Salt.....	1133	1280
Sand, Salt.....	1328	1410
Sand, Salt (gas, 1495').....	1451	1500
Red rock.....	1590	1679
Little Lime.....	1679	1705
Big Lime.....	1745	1833
Sand, Big Injun.....	1833	1975
Sand, Fifty-foot.....	2250	2270
Sand, Thirty-foot.....	2284	2290
Sand, Gordon Stray (good gas, 2340').....	2330	2351
Total depth.....		2355
10" casing, 145'; 8¼", 790'; 6⅝", 1795'; 5⅜", 2333'.		

The following very detailed record was furnished the Survey by Guffey and Galey who drilled the well several years ago. It is now the property of the Pittsburgh and West Virginia Gas Company:

#### Henry Pumphrey No. 1999 Well Record (434).

Courthouse District; on Indian Run, 0.9 mile northwest of Aspinwall, Pittsburgh & W. Va. Gas Co.; completed, June 26, 1900; elevation, 825' B.

	Thickness, Feet.	Total Feet.
Unrecorded .....	168	168
Red rock.....	100	268
Lime .....	32	300
Sand .....	5	305
Slate .....	35	340
Coal, Bakerstown.....	10	350
Red rock.....	150	500
Sand, white, Big Dunkard.....	30	530
Slate, white.....	25	555
Coal, Upper Freeport.....	10	565
Slate, white.....	10	575
Sand, white, hard, Burning Springs.....	100	675
Lime and slate.....	95	770
Slate, white.....	20	790
Sand, gray, Gas.....	10	800
Lime and gray sand, Second Cow Run.....	100	900
Shale, dark.....	20	920
Coal, Mercer.....	10	930
Sand, gray, hard, Salt.....	100	1030
Lime shells and slate.....	50	1080
Coal, Quakertown.....	5	1085
Shale, brown.....	20	1105
Slate, black.....	120	1225
Shale, dark.....	20	1245
Slate, black.....	15	1260
Sand, Salt.....	46	1306
Shale, black.....	14	1320

	Thickness Feet.	Total Feet.
Sand, Salt.....	75	1395
Lime, hard.....	55	1450
Sand, white, Salt.....	50	1500
Red rock.....	40	1540
Lime, hard.....	20	1560
Red rock.....	30	1590
Lime rock.....	60	1650
Slate, black.....	50	1700
Sand, white, Maxton.....	25	1725
Little Lime, hard.....	25	1750
Slate.....	10	1760
<b>Big Lime.....</b>	<b>140</b>	<b>1900</b>
Sand, Big Injun.....	40	1940
Slate, black.....	10	1950
Sand, Squaw.....	75	2025
Shale and slate.....	50	2075
Shale, black.....	25	2100
Slate, white.....	25	2125
Slate and shells.....	45	2170
Slate, dark.....	40	2210
Slate, white.....	100	2310
Shells, hard.....	5	2315
Slate, white.....	60	2375
<b>Sand, Gordon Stray (little oil at bottom).....</b>	<b>10</b>	<b>2385</b>
Slate and shells.....	45	2430
Sand, gray, hard, Gordon.....	10	2440
Slate, white.....	35	2475
Shells, hard.....	3	2478
Slate.....	27	2505
Sand, black, Fourth.....	25	2530
Slate.....	55	2585
Sand, Fifth.....	15	2600
Slate.....	90	2690
Sand, black, Bayard.....	18	2708
Slate to bottom.....	17	2725
10" casing, 168'; 8¼", 770'; 6¾", 1794'.		

The following well made a minute rock pressure of 40 lbs. and a considerable show of oil, but was abandoned:

### W. C. Mick No. 2018 Well Record (435).

Courthouse District; 1.6 miles N. 45° W. of Aspinwall; authority, Pittsburgh & W. Va. Gas Co.; completed, Aug. 23, 1910.

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard.....	870	955
Sand, Gas.....	1010	1080
Sand, Second Cow Run.....	1156	1226
Sand, Salt.....	1246	1286
Sand, Salt.....	1312	1350
Sand, Maxton.....	1886	1912

	Top. Feet.	Bottom. Feet.
<b>Big Lime</b> .....	1987	2036
Sand, Big Injun.....	2036	2163
Sand, Squaw (oil show).....	2166	2226
Sand, Gordon Stray.....	2584	2601
Sand, Gordon.....	2619	2634
Sand, Fourth.....	2650	2659
Sand, Fifth.....	2798	2801
Total depth.....		2914

### Granville Meeks No. 4014 Well Record (437).

Courthouse District; on Pine Run, 1.2 miles northwest of Finster; authority, Pittsburgh & W. Va. Gas Co.; completed, Sept. 25, 1912; elevation, 1060' B.

	Top. Feet.	Bottom. Feet.
Sand, Little Dunkard.....	750	770
Sand, Big Dunkard.....	845	900
Sand, Gas.....	1015	1040
Sand, Maxton.....	1800	1885
<b>Big Lime</b> .....	1940	2030
Sand, Big Injun.....	2030	2220
Sand, Gordon Stray (gas).....	2603	2620
Sand, Gordon (gas).....	2630	2650
Total depth.....		2655

The eight following wells were drilled along the axis of the Orlando Anticline at the southeast edge of Courthouse District. Most of them have been gas wells, with production ranging from the Salt to the Fifth Sand, though a few dry holes have been drilled:

### W. J. Ryan No. 7011 Well Record (438).

Courthouse District; at head of Indian Fork, 1.6 miles southeast of Finster; authority, Pittsburgh & W. Va. Gas Co.; completed, Aug. 20, 1914; elevation, 1150' B.

	Top. Feet.	Bottom. Feet.
Sand, Burning Springs.....	550	595
Sand, Gas.....	640	750
Sand, Second Cow Run.....	790	885
Sand, Salt.....	895	970
Sand, Salt.....	1105	1205
Sand, Salt.....	1275	1371
Sand, Salt.....	1560	1618
Sand, Maxton (gas, 1672').....	1650	1677
<b>Big Lime</b> .....	1765	1850
Sand, Big Injun (gas, 1930').....	1850	1980
Sand, Thirty-foot.....	2357	2370

	Top. Feet.	Bottom. Feet.
Sand, Gordon Stray.....	2385	2425
Sand, Gordon.....	2430	2445
Sand, Fifth.....	2620	2630
Total depth.....		2680

### John Kelley No. 4003 Well Record (439).

Courthouse District; branch of Goosepen Run; 3.0 miles west of Roanoke; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1130' B.

	Top. Feet.	Bottom. Feet.
Coal, Harlem.....	365	369
Sand, Big Dunkard.....	540	630
Sand, Gas.....	770	810
Sand, Maxton.....	1715	1730
Big Lime.....	1780	1895
Sand, Big Injun.....	1895	1990
Sand, Squaw.....	2030	2050
Sand, Berea.....	2200	2220
Sand, Thirty-foot.....	2351	2370
Sand, Gordon Stray.....	2380	2430
Sand, Gordon.....	2450	2455
Total depth.....		2698

The above well was a dry hole.

### Luke Fitzpatrick No. 1853 Well Record (440).

Courthouse District; on Goosepen Run, 1.6 miles northwest of Finster; authority, Hope Natural Gas Co.; completed, July 21, 1910; elevation, 1315' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	680	700
Big Dunkard Sand.....	770	800
Burning Springs Sand.....	860	895
Gas Sand.....	935	975
Second Cow Run and Salt Sands.....	998	1420
Salt Sand.....	1430	1600
Little Lime.....	1915	1930
Pencil Cave.....	1930	1940
Big Lime.....	1940	2052
Big Injun Sand (gas, 2180').....	2052	2200
Squaw Sand.....	2210	2260
Berea Sand.....	2380	2400
Gordon Sand (gas, 2640').....	2640	2643
Fifth Sand (gas, 2772').....	2767	2777
Total depth.....		2833

The above well made only a small amount of gas, the casing being pulled and the well abandoned.

## Peter Rush No. 4004 Well Record (441).

Courthouse District; on head of Sleepcamp Run, 1.6 miles north-east of Finster; authority, Pittsburgh & W. Va. Gas Co.; completed, Feb. 21, 1912; elevation, 1350' B.

	Top. Feet.	Bottom. Feet.
Sand, Moundsville.....	608	653
Sand, Big Dunkard.....	780	840
Sand, Gas.....	980	1100
Sand, Second Cow Run.....	1110	1240
Sand, Salt.....	1265	1343
Sand, Salt.....	1373	1423
Big Lime.....	1915	2002
Sand, Big Injun.....	2002	2225
Sand, Thirty-foot (no thickness).....	2553	
Sand, Gordon.....	2628	2660
Total depth.....		3024

The above well was abandoned as being too light for commercial use but makes gas for a few families.

## C. J. Nolan No. 1988 Well Record (442).

Courthouse District; 2.1 miles N. 60° E. of Finster; authority, Pittsburgh & W. Va. Gas Co.; completed, Nov. 23, 1909; elevation, 1045' B.

	Top. Feet.	Bottom. Feet.
Sand, Gas.....	680	760
Second Cow Run Sand.....	815	905
Sand, Salt.....	1005	1050
Sand, Salt (gas).....	1075	1210
Sand, Salt.....	1220	1240
Sand, Salt.....	1320	1350
Big Lime.....	1610	1700
Sand, Big Injun.....	1700	1810
Sand, Squaw.....	1850	1865
Sand, Thirty-foot (gas).....	2200	2275
Sand, Fifth.....	2445	2455
Sand, Bayard?.....	2660	2670
Total depth.....		2858

## W. I. Cunningham No. 4001 Well Record (445).

Courthouse District; on Carrion Run, 3 miles northwest of Roanoke; authority, Pittsburgh & W. Va. Gas Co.; completed, March 23, 1912; elevation, 1335' L.

	Top. Feet.	Bottom. Feet.
Sand, Moundsville.....	640	660
Sand, Big Dunkard.....	755	817
Sand, Gas.....	920	960

	Top. Feet.	Bottom. Feet.
Sand, Second Cow Run.....	1016	1130
Sand, Salt.....	1180	1336
Sand, Salt.....	1393	1424
Sand, Maxton.....	1824	1920
Big Lime.....	1972	2032
Sand, Big Injun (gas).....	2032	2173
Sand, Squaw.....	2193	2210
Sand, Berea.....	2395	2410
Sand, Thirty-foot.....	2524	2540
Sand, Gordon Stray.....	2585	2614
Sand, Fifth.....	2789	2797
Total depth.....		2825

### John A. McCauley No. 3026 Well Record (446).

Courthouse District; on Carrion Run, 3.0 miles northeast of Finster; authority, Hope Natural Gas Co.; completed, Aug. 20, 1913; elevation, 1335' B.

	Top. Feet.	Bottom. Feet.
Moundville Sand.....	630	650
Big Dunkard Sand.....	775	840
Burning Springs Sand.....	885	930
Gas and Second Cow Run Sands.....	990	1156
Salt Sand.....	1185	1380
Maxton Sand (shells).....		1825
Little Lime.....	1916	1995
Pencil Cave.....	1995	2005
Big Lime.....	2005	2100
Big Injun Sand (gas, 2190').....	2100	2202
Squaw Sand.....	2225	2240
Berea Sand.....	2410	2416
Fifty-foot Sand.....	2490	2522
Thirty-foot Sand.....	2545	2552
Gordon Stray Sand.....	2560	2609
Gordon Sand.....	2621	2644
Fourth Sand (shells).....		2665
Fifth Sand (gas, 2805').....	2800	2812
Total depth.....		2835

### C. J. Nolan No. 1988 Well Record (447).

Courthouse District; on Crooked Fork, 1.8 miles southeast of Gilooly; authority, Pittsburgh & W. Va. Gas Co.; elevation, 930' B.

	Top. Feet.	Bottom. Feet.
Sand, Gas.....	680	760
Sand, Second Cow Run.....	815	905
Sand, Salt.....	1005	1050
Sand, Salt (gas).....	1075	1110
Sand, Salt.....	1220	1240
Sand, Salt.....	1320	1350

	Top. Feet.	Bottom. Feet.
<b>Big Lime</b> .....	1610	1700
Sand, Big Injun.....	1700	1810
Sand, Squaw.....	1850	1865
<b>Sand, Gordon Stray (gas)</b> .....	2200	2275
Sand, Fifth.....	2445	2455
Sand, Bayard.....	2660	2670
Total depth.....		2858

A large number of wells has been drilled in the neighborhood of Gillooly, about midway between the Grassland Syncline and the Orlando Anticline, most of which have been fine gassers. The thirteen following records are from this locality:

#### Pat Maley No. 2074 Well Record (448).

Courthouse District; 1.4 miles north of Finster; authority, Pittsburgh and W. Va. Gas Co.; elevation, 1130' B.

	Top. Feet.	Bottom. Feet.
<b>Coal, Harlem</b> .....	575	579
<b>Big Lime</b> .....	1955	2015
Sand, Big Injun.....	2015	2160
Sand, Squaw.....	2180	2310
Sand, Thirty-foot.....	2535	2557
<b>Sand, Gordon Stray (gas)</b> .....	2563	2606
<b>Sand, Fourth (gas)</b> .....	2760	2770
Total depth.....		2789

#### John Devaney No. 1902 Well Record (449).

Courthouse District; on Crooked Fork, 0.9 mile south of Gillooly; authority, Pittsburgh & W. Va. Gas Co.; completed, Feb. 1, 1900; elevation, 870' B.

	Thickness. Feet.	Total. Feet.
Clay and slate, soft.....	80	80
Sand, Connellsville.....	40	120
Slate and red rock.....	100	220
Sand, Murphy.....	20	240
Red rock.....	50	290
Slate and red rock.....	180	470
Slate, red rock, and shells.....	55	525
Sandstone, Big Dunkard.....	45	570
Slate.....	40	610
Lime, dark.....	60	670
Sand, white, soft, Gas.....	110	780
Slate, dark.....	110	890
Slate, white.....	20	910
<b>Coal, Mercer</b> .....	11	921
Sand, Salt.....	30	951
Slate, black.....	20	971

	Thickness. Total.	
	Feet.	Feet.
Sand, hard, Salt.....	80	1051
Slate .....	10	1061
Sand, hard, Salt.....	25	1086
Lime .....	20	1106
Sand, dark.....	40	1146
Sand, white, Salt.....	45	1191
Slate and shells.....	20	1211
Sand, dark, Salt.....	50	1261
Sand, white, hard.....	46	1307
Sand and shells, Salt (a little gas).....	10	1317
Sand, black, Salt.....	40	1357
Slate .....	26	1383
Sand, white, Salt.....	35	1418
Shells and slate.....	45	1463
Sand, black, hard, Maxton.....	50	1513
Lime and slate.....	80	1593
Red rock.....	30	1623
Lime and slate.....	70	1693
Big Lime, white, hard.....	80	1773
Sand, Big Injun, and lime.....	127	1900
Slate and shells.....	97	1997
Sand, dark, Squaw.....	45	2042
Slate, shells and streaks of sand.....	233	2275
Sand, Thirty-foot (gas).....	26	2301
Slate .....	6	2307
Sand, Gordon Stray.....	40	2347
Slate and shells (gas).....	155	2502
Sand, Fourth.....	11	2513
Unrecorded to bottom.....	9	2522

10" casing, 431'; 8¼", 670'; 6⅝", 1702'; good gas well.

### Ellen Mulvaney No. 4176 Well Record (450).

Courthouse District; on Crooked Fork, 0.7 mile southwest of Gilly; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1005' B.

	Top.	Bottom.
	Feet.	Feet.
Sand, Big Dunkard.....	710	780
Sand, Burning Springs.....	820	875
Sand, Gas.....	890	935
Sand, Second Cow Run.....	1050	1095
Sand, Salt.....	1160	1220
Sand, Salt.....	1280	1430
Sand, Maxton.....	1730	1800
Big Lime.....	1898	1953
Sand, Big Injun.....	1953	2107
Sand, Thirty-foot (gas).....	2488	2503
Sand, Gordon Stray (gas).....	2513	2550
Sand, Fifth (gas).....	2729	2734
Total depth.....		2749





PLATE XXIV.—The Kanawha Black Flint on Gladly Creek, 1.1 miles north of Bablin, Lewis County; the 6-inch rule is held on the Flint ledge; see Bablin Section for details.



## D. A. McCray No. 2034 Well Record (453).

Courthouse District; on Sand Fork, 1.1 miles northeast of Gillooly; authority, Pittsburgh & W. Va. Gas Co.; elevation, 905' B.

	Top. Feet.	Bottom. Feet.
Coal, Harlem.....	316	320
Sand, Salt.....	1080	1180
Sand, Salt.....	1290	1390
Big Lime.....	1680	1790
Sand, Big Injun.....	1790	1915
Sand, Thirty-foot.....	2250	2280
Sand, Gordon Stray (gas).....	2285	2317
Sand, Gordon.....	2325	2342
Total depth.....		2355

The following well, which was abandoned as a dry hole, starts about level with the Redstone Coal and gives a fine stratigraphic record, but most of the formations mentioned as "lime" were undoubtedly only shale:

## John Brannon No. 1 Well Record (454).

Courthouse District; on Wolfpen Run, 1.4 miles southeast of Edmiston; authority, Guffey & Galey; completed, Feb. 18, 1900; elevation, 950' B.

	Thickness. Feet.	Total. Feet.
Clay .....	14	14
Lime, hard.....	6	20
Slate, white.....	12	32
Lime, blue.....	25	57
Slate, white.....	41	98
Lime, hard.....	10	108
Slate, soft.....	10	118
Sand, Connellsville.....	12	130
Lime, hard.....	30	160
Shale, red.....	22	182
Lime, white.....	10	192
Slate, red.....	38	230
Lime, white.....	10	240
Shale, red.....	25	265
Lime, hard.....	5	270
Slate, brown.....	140	410
Lime, gray.....	5	415
Slate, brown.....	25	440
Sand, white, Moundsville.....	5	445
Slate .....	105	550
Sand, white, Big Dunkard.....	70	620
Slate .....	20	640
Lime, hard.....	30	670
Sand, Burning Springs.....	42	712

	Thickness. Feet.	Total. Feet.
Slate, black.....	17	729
Lime, white.....	10	739
Sand, soft, Gas.....	30	769
Slate.....	11	780
Lime.....	50	830
Sand, white, Second Cow Run.....	70	900
Lime.....	30	930
Coal, Mercer.....	6	936
Slate, brown.....	34	970
Slate, white.....	50	1020
Lime, hard.....	30	1050
Slate.....	20	1070
Sand, hard, Salt.....	30	1100
Slate.....	25	1125
Lime, hard.....	25	1150
Slate.....	20	1170
Sand, hard, Salt.....	30	1200
Slate.....	20	1220
Lime.....	15	1235
Sand, hard, Salt.....	10	1245
Slate.....	20	1265
Lime.....	15	1280
Sand, Salt.....	108	1388
Lime.....	10	1398
Slate.....	10	1408
Lime.....	20	1428
Red rock.....	15	1443
Slate.....	25	1468
Lime.....	25	1493
Red rock.....	50	1543
Sand, hard, Maxton.....	10	1553
Slate.....	50	1603
Lime.....	10	1613
Slate.....	30	1643
Lime.....	15	1658
Slate.....	10	1668
Lime.....	20	1688
Slate.....	10	1698
Lime.....	10	1708
Slate.....	64	1772
Red rock.....	5	1777
Sand, Big Injun.....	100	1877
Lime.....	25	1902
Slate.....	20	1922
Sand, Squaw.....	5	1927
Slate.....	10	1937
Lime.....	20	1957
Slate, soft.....	10	1967
Sand, Weir.....	10	1977
Lime.....	15	1992
Slate.....	10	2002
Sand.....	5	2007
Slate.....	10	2017
Lime.....	10	2027
Slate.....	5	2032

	Thickness. Feet.	Total. Feet.
Lime .....	5	2037
Slate .....	10	2047
Sand, hard, Berea.....	25	2072
Slate .....	5	2077
Lime .....	10	2087
Slate .....	15	2102
Sand, hard, Gantz.....	10	2112
Slate .....	5	2117
Lime .....	10	2127
Slate .....	15	2142
Lime .....	10	2152
Slate .....	2	2154
Sand .....	6	2160
Slate .....	10	2170
Lime .....	15	2185
Slate .....	15	2200
Lime .....	15	2215
Slate .....	10	2225
Sand, Fifty-foot.....	20	2245
Slate .....	5	2250
Sand, hard, Thirty-foot.....	8	2258
Slate .....	12	2270
Lime .....	10	2280
Slate .....	5	2285
Sand .....	15	2300
Slate .....	10	2310
Sand, Gordon Stray, hard (little gas).....	15	2325
Slate .....	8	2333
Sand, Gordon.....	10	2343
Slate .....	5	2348
Lime .....	10	2358
Slate .....	7	2365
Sand, Fourth, hard.....	15	2380
Slate .....	25	2405
Lime .....	10	2415
Slate .....	8	2423
Sand .....	12	2435
Slate .....	16	2451
Sand, hard.....	10	2461
Lime .....	5	2466
Slate .....	3	2469
Lime .....	7	2476
Sand .....	10	2486
Slate .....	28	2514
Sand, Fifth.....	5	2519
Slate and lime (no sands) to bottom.....	234	2753
10" casing, 238' 2"; 8¼", 956' 7"; 6⅝", 1721' 3".		

**P. Flesher No. 2016 Well Record (455).**

Courthouse District; on Sand Fork, 0.8 mile north of Gillooly; authority, Pittsburgh & W. Va. Gas Co.; elevation, 995' B.

	Top. Feet.	Bottom. Feet.
Coal, Harlem.....	490	493
Sand, Gas.....	825	950
Sand, Salt.....	1126	1206
Sand, Salt.....	1451	1581
Sand, Maxton.....	1677	1725
Big Lime.....	1864	1919
Sand, Big Injun.....	1919	2060
Sand, Berea.....	2230	2255
Sand, Fifty-foot.....	2405	2420
Sand, Thirty-foot (gas).....	2480	2497
Sand, Gordon Stray.....	2502	2537
Sand, Fifth.....	2727	2735
Total depth.....		2833

**Margaret Riley No. 1985 Well Record (456).**

Courthouse District; on Sand Fork, 1.1 miles northeast of Gillooly; authority, Pittsburgh & W. Va. Gas Co.; elevation, 875' B.

	Top. Feet.	Bottom. Feet.
Sand, Little Dunkard.....	495	520
Sand, Big Dunkard.....	555	630
Sand, Burning Springs.....	675	715
Sand, Gas.....	721	775
Sand, Second Cow Run.....	805	925
Sand, Salt.....	1020	1080
Sand, Maxton.....	1640	1658
Big Lime.....	1730	1792
Sand, Big Injun.....	1792	1915
Sand, Squaw.....	1925	1945
Sand, Berea.....	2135	2150
Sand, Gordon Stray (gas show).....	2340	2374
Sand, Gordon.....	2383	2410
Sand, Fifth (gas).....	2575	2584
Total depth.....		2602

**Wm. McCudden No. 2831 Well Record (457).**

Courthouse District; on Loveberry Run, 0.9 mile southwest of Edmiston; authority, Hope Natural Gas Co.; completed, April 17, 1913; elevation, 1190' B.

	Top. Feet.	Bottom. Feet.
Moundville Sand.....	803	821
Big Dunkard Sand.....	904	976
Gas Sand.....	1034	1125

	Top. Feet.	Bottom. Feet.
Second Cow Run Sand (water, 1271').....	1160	1336
Salt Sand.....	1356	1427
Little Lime.....	2007	2078
Pencil Cave.....	2078	2087
<b>Big Lime</b> (gas, 2105').....	2087	2146
Big Injun Sand.....	2146	2340
Berea Sand.....	2463	2479
Fifty-foot Sand.....	2529	2552
Thirty-foot Sand.....	2657	2672
<b>Gordon Stray Sand</b> (gas, 2703').....	2698	2719
<b>Gordon Sand</b> (gas, 2738').....	2731	2747
Total depth.....		2759

The following well produces oil from the Fifth Sand. Its original production was not learned but in 1914 it was still making 10 barrels daily:

#### Michael Hoar No. 358 Well Record (458).

Courthouse District; on Loveberry Run, 1.0 mile northwest of Gillyooly; authority, Reserve Gas Co.; completed, July 28, 1912; elevation, 1140' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	910	970
Burning Springs Sand.....	1040	1090
Gas Sand.....	1125	1160
Second Cow Run Sand (water, 1250').....	1175	1430
Maxton Sand.....	1950	1965
Little Lime.....	2025	2045
Pencil Cave.....	2045	2060
<b>Big Lime</b> .....	2060	2105
<b>Big Injun Sand</b> (oil and gas, 2107').....	2105	2258
Squaw Sand.....	2262	2287
Thirty-foot Sand.....	2659	2684
<b>Gordon Stray Sand</b> (gas, 2696-2702').....	2695	2721
Gordon Sand.....	2723	2737
<b>Fifth Sand</b> (oil, 2885').....	2881	2902
Total depth.....		2913

The **Peter Doonan Heirs No. 440 (459)** made both oil and gas from the Fifth Sand. The following well also made some oil:

## Ora Bailey No. 2956 Well Record (459A).

Courthouse District; 1.4 miles N. 80° W. of Gillooly; authority, Hope Natural Gas Co.; completed, July 22, 1913; elevation, 1035' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	790	880
Burning Springs Sand.....	890	960
Gas Sand.....	980	1100
Second Cow Run Sand.....	1120	1200
Salt Sand.....	1250	1700
Little Lime.....	1945	1965
Pencil Cave.....	1965	1973
Big Lime (gas, 1995').....	1973	2030
Big Injun Sand.....	2030	2140
Gordon Stray Sand (gas, 2593').....	2587	2600
Gordon Sand (gas, 2622-8').....	2616	2640
Fifth Sand (gas, 2810-13').....	2804	2821
Total depth.....		2825

## John Copley No. 4036 Well Record (460).

Courthouse District; on Loveberry Run, 1.0 mile northwest of Gillooly; authority, Pittsburgh & W. Va. Gas Co.; elevation, 880' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	..	160
Coal, Elk Lick.....	415	420
Sand, Little Dunkard.....	645	695
Sand, Big Dunkard.....	775	805
Sand, Gas.....	860	960
Sand, Second Cow Run.....	990	1025
Sand, Salt.....	1050	1120
Sand, Salt.....	1310	1336
Sand, Maxton.....	1730	1740
Big Lime.....	1790	1853
Sand, Big Injun.....	1853	2000
Sand, Squaw.....	2005	2030
Sand, Berea.....	2122	2195
Sand, Gordon Stray (gas).....	2400	2418
Sand, Gordon (gas).....	2423	2439
Total depth.....		2442

## Kinley McCudden No. 1307 Well Record (461).

Courthouse District; 2.0 miles N. 60° E. of Bealls Mills; authority, Hope Natural Gas Co.; completed, Aug. 27, 1909; elevation, 910' L.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	16
Little Dunkard Sand.....	720	755
Big Dunkard Sand.....	790	810



	Top. Feet.	Bottom. Feet.
Gas Sand.....	893	940
Second Cow Run Sand.....	955	1062
Salt Sand.....	1113	1215
Maxton Sand.....	1675	1700
Little Lime.....	1746	1756
Pencil Cave.....	1756	1761
<b>Big Lime.....</b>	<b>1761</b>	<b>1871</b>
Big Injun Sand.....	1871	2083
Berea Sand.....	2187	2208
Gordon Sand (gas, 2465-71').....	2448	2473
Total depth.....		2476

In August, 1914, the above well showed a pressure of 270 lbs. in the 2-inch tubing.

### John Bohan No. 1937 Well Record (462).

Courthouse District; 1.3 miles southwest of Edmiston; authority, Hope Natural Gas Co.; completed, Nov. 5, 1910; elevation, 1187' B.

	Top. Feet.	Bottom. Feet.
Moundsville Sand.....	880	890
Little Dunkard Sand.....	906	960
Big Dunkard Sand.....	1008	1062
Second Cow Run and Salt Sands (water, 1260')..	1240	1431
Salt Sand.....	1547	1599
Maxton Sand.....	1996	2000
Little Lime.....	2032	2055
Pencil Cave.....	2055	2075
<b>Big Lime.....</b>	<b>2075</b>	<b>2144</b>
<b>Big Injun Sand (gas, 2165' and 2250').....</b>	<b>2144</b>	<b>2297</b>
Thirty-foot Sand.....	2634	2640
Gordon Stray Sand (gas, 2718').....	2698	2721
Gordon Sand (gas, 2737' and 2756') to bottom....	2736	2756½

In the vicinity of Edmiston, numerous wells have been drilled, most of which have been gassers, but some have produced oil also, being located along the axis of the Grassland Syncline along which the structure is rising rapidly eastward, making the level of the Pittsburgh Coal 150 feet higher than at Copley, and placing these wells well above the strike of the Copley Pool. The oil found in these wells is in the Injun Sand and has no connection with that in the Copley wells. The four following records are from this locality:

### Luke White No. 4081 Well Record (463).

Courthouse District; on Sand Fork, 1.0 mile northwest of Edmiston; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1300' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	431	451
Sand, Little Dunkard.....	926	958
Sand, Big Dunkard.....	998	1056
Sand, Gas.....	1141	1264
Sand, Second Cow Run.....	1269	1339
Sand, Salt.....	1360	1425
Sand, Salt.....	1501	1720
Sand, Maxton.....	1870	1900
Big Lime.....	2000	2115
Sand, Big Injun.....	2115	2260
Sand, Squaw.....	2266	2286
Sand, Gordon Stray (gas).....	2680	2705
Sand, Gordon (gas).....	2717	2740
Total depth.....		2760

### Luke White No. 2072 Well Record (464).

Courthouse District; 1.2 miles N. 30° W. of Edmiston; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1390' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	455	463
Sand, Little Dunkard.....	895	950
Sand, Big Dunkard.....	1035	1110
Sand, Second Cow Run.....	1330	1375
Sand, Salt.....	1415	1435
Sand, Salt.....	1470	1655
Sand, Salt.....	1660	1690
Sand, Maxton.....	1970	1999
Big Lime.....	2005	2110
Sand, Big Injun (gas show).....	2110	2230
Sand, Berea.....	2410	2430
Sand, Thirty-foot.....	2570	2679
Sand, Gordon (gas).....	2713	2738
Total depth.....		2740

### J. S. Turner No. 1967 Well Record (468).

Courthouse District; on Sand Fork, 0.3 mile south of Edmiston; authority, Pittsburgh & W. Va. Gas Co.; elevation, 920' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	140	145
Sand, Little Dunkard.....	560	583
Sand, Burning Springs.....	794	808
Sand, Gas, and Second Cow Run.....	880	1028

	Top. Feet.	Bottom. Feet.
Sand, Salt.....	1045	1300
Sand, Salt.....	1380	1425
Sand, Maxton.....	1645	1720
<b>Big Lime</b> .....	1750	1850
<b>Sand, Big Injun (oil and gas)</b> .....	1850	2000
Sand, Berea.....	2170	2190
Sand, Gordon Stray.....	2390	2408
Sand, Gordon.....	2410	2450
Sand, Fifth.....	2608	2630
Total depth.....		2730

### F. M. Ballard No. 1592 Well Record (469).

Courthouse District; at Edmiston; authority, Hope Natural Gas Co.; completed, May 7, 1910; elevation, 1111' L.

	Top. Feet.	Bottom. Feet.
Murphy Sand.....	520	540
Grafton Sand.....	630	660
Little Dunkard Sand.....	800	840
Second Cow Run Sand.....	1150	1190
Salt Sand.....	1390	1490
Maxton Sand.....	1850	1862
Little Lime.....	1885	1900
Pencil Cave.....	1900	1925
<b>Big Lime</b> .....	1925	1980
<b>Big Injun Sand (show of oil and gas, 2100')</b> .....	1980	2160
Squaw Sand.....	2175	2200
Berea Sand.....	2330	2332
Thirty-foot Sand.....	2480	2495
<b>Gordon Stray Sand (gas, 2572')</b> .....	2557	2580
<b>Gordon Sand (gas, 2592')</b> .....	2589	2625
<b>Fifth Sand (gas, 2785')</b> .....	2783	2789
Total depth.....		2794

Along the head of Murphy Creek numerous gas wells have been drilled, of which the six following records are available:

### S. E. Harrison No. 2041 Well Record (470).

Courthouse District; head of Murphy Creek, 0.7 mile north of Edmiston; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1310' B.

	Top. Feet.	Bottom. Feet.
<b>Coal, Redstone</b> .....	400	402
Sand, Little Dunkard.....	904	968
Sand, Big Dunkard.....	1030	1070
Sand, Burning Springs.....	1105	1125
Sand, Gas and Second Cow Run.....	1145	1335

	Top. Feet.	Bottom. Feet.
Sand, Salt.....	1368	1422
Sand, Salt.....	1705	1730
<b>Big Lime</b> .....	2063	2131
Sand, Big Injun.....	2131	2215
Sand, Squaw (gas show).....	2220	2315
Sand, Fifty-foot.....	2622	2640
Sand, Thirty-foot.....	2663	2673
Sand, Gordon Stray (gas).....	2698	2770
Total depth.....		2790

### David Teter No. 1214 Well Record (471).

Courthouse District; on Murphy Creek, 1.2 miles northeast of Edmiston; authority, Hope Natural Gas Co.; completed, July 29, 1909; elevation, 1120' B.

	Top. Feet.	Bottom. Feet.
Unrecorded (water, 275').....	0	595
Moundville Sand (water, 598').....	595	613
Little Dunkard Sand.....	645	698
Big Dunkard Sand.....	748	795
Gas and Second Cow Run Sands.....	863	1160
Salt Sand.....	1225	1298
Salt Sand (gas, very light, 1485').....	1470	1496
Little Lime.....	1753	1768
Pencil Cave.....	1768	1780
<b>Big Lime</b> .....	1780	1892
Big Injun Sand.....	1892	2005
Sand, Berea.....	2175	2183
Thirty-foot Sand.....	2300	2328
Gordon Stray Sand.....	2392	2405
Gordon Sand (small show of gas, 2462'; gas, 2471').....	2456	2476
Fourth Sand.....	2495	2520
<b>Fifth Sand</b> (gas, 2667' and 2672') to bottom.....	2664	2673
Conductor, 12'; 8¼" casing, 1485'; 6½", 1894'; 5⅜", 2392'.		

### E. C. Fisher No. 501 Well Record (472).

Courthouse District; on branch of Murphy Creek, 1.8 miles northeast of Edmiston; authority, Reserve Gas Co.; completed; Aug. 15, 1915; elevation, 1130' B.

	Top. Feet.	Bottom. Feet.
Coal, Redstone.....	63	75
Little Dunkard Sand.....	595	610
Big Dunkard Sand.....	625	820
Second Cow Run Sand.....	900	1010
Salt Sand.....	1010	1280
Little Lime.....	1685	1705
Pencil Cave.....	1705	1715
<b>Big Lime</b> .....	1715	1814

	Top. Feet.	Bottom. Feet.
Big Injun Sand.....	1814	1952
Squaw Sand.....	2050	2087
Berea Sand.....	2110	2200
Gantz Sand.....	2230	2260
Fifty-foot Sand.....	2298	2310
Thirty-foot Sand.....	2342	2351
Gordon Stray Sand (gas, 2363').....	2358	2428
Fourth Sand.....	2468	2475
Fifth Sand (gas, 2578').....	2576	2593
Total depth.....		2603

### M. O. Edwards No. 996 Well Record (473).

Courthouse District; on Murphy Creek, 2.0 miles northeast of Edmiston; authority, Hope Natural Gas Co.; completed, Dec. 4, 1907; elevation, 1245' B.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	14
Moundsville Sand.....	594	609
Little Dunkard Sand.....	700	750
Big Dunkard Sand.....	785	840
Gas Sand.....	1000	1050
Second Cow Run Sand.....	1120	1180
Salt Sand.....	1370	1440
Salt Sand.....	1480	1515
Little Lime (oil, 1765').....	1762	1790
Pencil Cave.....	1790	1803
Big Lime.....	1803	1870
Big Injun Sand.....	1870	2035
Berea Sand.....	2280	2294
Fifty-foot Sand.....	2320	2340
Gordon Stray Sand.....	2424	2458
Gordon Sand (gas, 2502').....	2485	2515
Fourth Sand.....	2550	2570
Fifth Sand (gas, 2708', 2710' and 2718').....	2706	2721
Total depth.....		2723

The above well flowed some oil from the Little Lime when drilled, but the production has now ceased. It still makes gas from the lower sands.

### M. O. Edwards No. 813 Well Record (474).

Courthouse District; 2.0 miles southeast of Camden; authority, Hope Natural Gas Co.; elevation, 1115' B.

	Thickness. Feet.	Total Feet.
Clay, brown, soft.....	20	20
Lime, blue, hard.....	35	55
Red rock, soft.....	300	355

	Thickness. Total.	
	Feet.	Feet.
Slate, white, soft.....	90	445
Red rock, soft.....	55	500
Sand, white, hard, Big Dunkard.....	145	645
Lime, blue, hard.....	40	685
Unrecorded .....	155	840
Sand, white, hard, Second Cow Run.....	75	915
Red rock, soft.....	135	1050
Sand, Salt.....	200	1250
Red rock, soft.....	290	1540
Lime, blue, hard.....	35	1575
Slate, white, soft.....	30	1605
<b>Big Lime</b> , blue, hard.....	90	1695
Sand, Big Injun, and lime, hard.....	25	1720
Sand, lime, and sand, hard, Big Injun.....	130	1850
Slate and shells, soft and hard.....	330	2180
Sand, white, hard, Gordon Stray.....	20	2200
Slate and shells, hard.....	55	2255
<b>Sand, white, and soft, Gordon</b> (gas).....	27	2282
Slate and shells, black, hard.....	30	2312
Sand, Fourth, white, hard.....	30	2342
Slate, black, soft.....	50	2392
Sand, Fifth, white, hard, pebbly.....	6	2398
Slate, black, soft.....	66	2464

The **M. O. Edwards No. 2 (475)** was drilled to 1992 feet and abandoned, failing to reach the lower sands which would probably have produced gas. The record of the **F. C. Jarvis No. 1 (476)** is published in the section for Camden, page 58. It made gas in the Gordon Stray and Fifth Sands.

#### Geo. Fisher No. 60 Well Record (478).

Courthouse District; on Murphy Creek, 3.0 miles southwest of Weston; authority, Reserve Gas Co.; completed, May 21, 1904; elevation, 1070' B.

	Top.	Bottom.
	Feet.	Feet.
Conductor .....	0	15
Moundville Sand.....	395	455
Little Dunkard Sand.....	490	525
Burning Springs Sand.....	620	685
Gas Sand.....	705	875
Little Lime.....	1460	1475
<b>Big Lime</b> (oil show, 1500').....	1485	1545
Big Injun Sand.....	1545	1650
Squaw Sand.....	1664	1740
Thirty-foot Sand.....	2080	2102
<b>Gordon Stray Sand</b> (light gas, 2120').....	2106	2124
<b>Fourth Sand</b> (strong gas, 2279').....	2276	2293
Total depth.....		2297

The **Murphy Creek Oil Pool**, located north of Murphy Creek, along the Courthouse-Freemans Creek District Line, contains from 10 to 12 producing oil wells, the pay sand being about 1300 feet below the Pittsburgh Coal, and apparently being the lower Salt Sand, or the basal sand formation of the Pottsville Series. It is possibly the same as the Salt Sand of Rosedale, which is also the lowest sand of the Pottsville, but the Rosedale Sand is 1625 feet below the Pittsburgh horizon, the difference of 325 feet in interval representing the southward expansion of the Pottsville, which is nearly 800 feet thick at Rosedale, but only 500 feet on Murphy Creek. The wells vary in size from 2 to 40 barrels daily. The five following records are from this pool:

#### H. B. Henry No. 431 Well Record (479).

Courthouse District; on Murphy Creek, 2.0 miles northeast of Edmiston; authority, Reserve Gas Co.; completed, Dec. 8, 1913; elevation, 1195' B.

	Top. Feet.	Bottom. Feet.
Moundsville Sand.....	405	430
Little Dunkard Sand.....	480	520
Gas Sand.....	655	860
Second Cow Run Sand.....	875	925
Salt Sand.....	970	1100
Maxton Sand (gas, 1568').....	1565	1572
Little Lime.....	1608	1623
Pencil Cave.....	1623	1641
Big Lime.....	1641	1701
Big Injun Sand.....	1701	1867
Berea Sand.....	2028	2053
Gantz Sand.....	2106	2136
Fifty-foot Sand.....	2200	2223
Thirty-foot Sand.....	2231	2269
Gordon Stray Sand (gas, 2304').....	2272	2322
Gordon Sand.....	2326	2348
Fifth Sand (gas, 2499').....	2496	2513
Total depth.....		2543

## A. S. Fisher No. 1 Well Record (481).

Courthouse District; on branch of Murphy Creek, 3.6 miles west of Weston; authority, Southern Oil Co.; completed, Dec. 20, 1911; elevation, 1290' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	..	100
Sand, Salt, to bottom (oil, 1403').....	1393	1403½
Wood conductor, 12'; 8¼", casing, 328'; 6⅝", 1111'; about 10 barrels daily.		

## C. M. L. Butcher No. 1 Well Record (486).

Courthouse District; on branch of Murphy Creek, 3.6 miles west of Weston; authority, Southern Oil Co.; completed, Nov. 27, 1913; elevation, 1420' B.

	Top. Feet.	Bottom. Feet.
Sand, Salt (7' of pay) to bottom.....	1507	1524
10" casing, 382'; 8¼", 741'; 6⅝", 1206'; 10 barrels daily.		

## H. M. Turner No. 1 Well Record (487).

Courthouse District; on branch of Murphy Creek, 3.4 miles west of Weston; authority, Southern Oil Co.; completed, May 27, 1909; elevation, 1265' B.

	Top. Feet.	Bottom. Feet.
Sand, Moundsville.....	490	530
Sand, Big Dunkard.....	625	675
Sand, Burning Springs.....	725	780
Sand, Gas.....	795	825
Sand, Second Cow Run (water, 1010').....	900	1019
Sand, Salt.....	1040	1075
Sand, Salt.....	1105	1135
Sand, Salt.....	1177	1277
Sand, Salt, to bottom (oil and gas, 1346', good well) .....	1290	1358
No Pittsburgh Coal; 10" casing, 217'; 8¼", 966'; 6⅝", 1069'		

## H. M. Turner No. 2 Well Record (488).

Courthouse District; on branch of Murphy Creek, 3.1 miles west of Weston; authority, Southern Oil Co.; completed, Feb. 27, 1910; elevation, 1215' B.

	Top. Feet.	Bottom. Feet.
Unrecorded (water, 900').....	0	1290
Sand, Salt, to bottom (oil).....	1290	1299
10" casing, 220'; 8¼", 1012'; no Pittsburgh Coal.		



The **C. A. Taylor No. 1 (489)**, reported the best well in the Murphy Creek Pool, had an initial production of 40 barrels daily, and still holds up at 25 barrels.

The four following wells are from the numerous gassers that have been drilled along Murphy Creek east of the oil pool:

### S. P. Fisher No. 153 Well Record (491).

Courthouse District; on branch of Murphy Creek, 2.8 miles southwest of Weston; authority, Reserve Gas Co.; completed, May 31, 1909; elevation, 1095' B.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	16
Moundsville Sand.....	400	420
Little Dunkard Sand.....	485	500
Big Dunkard Sand.....	535	648
Gas Sand.....	666	820
Salt Sand.....	1135	1168
Salt Sand.....	1185	1237
Red rock.....	1400	1520
Little Lime.....	1537	1550
Pencil Cave.....	1550	1585
<b>Big Lime.....</b>	<b>1585</b>	<b>1645</b>
<b>Big Injun Sand (gas, 1745').....</b>	<b>1645</b>	<b>1770</b>
Berea Sand.....	1970	1990
Fifty-foot Sand.....	2130	2150
Thirty-foot Sand.....	2180	2190
Sand .....	2202	2210
Gordon Stray Sand (gas, 2230'; gas, 2250').....	2213	2262
Gordon Sand.....	2270	2288
Fourth Sand.....	2325	2330
<b>Fifth Sand (gas, 2435-42').....</b>	<b>2433</b>	<b>2453</b>
Total depth.....		2553

The following well, drilled by Guffey and Galey, but now the property of the Pittsburgh and West Virginia Gas Company, shows a very detailed record, but many of the formations should doubtless have been recorded as shale instead of "lime":

### O. B. Wheeler No. 1904 Well Record (492).

Courthouse District; 2.8 miles west of Weston; authority, Pittsburgh & W. Va. Gas Co.; completed, April 21, 1900; elevation, 1135' B.

	Thickness. Feet.	Total. Feet.
Clay .....	20	20
Lime .....	35	55

	Thickness Feet.	Total Feet.
Red rock.....	245	300
Slate.....	100	400
Sand, Little and Big Dunkard.....	250	650
Lime.....	25	675
Slate.....	10	685
Sand, Gas.....	20	705
Slate.....	15	720
Sand, Second Cow Run.....	50	770
Red rock.....	25	795
Lime.....	40	835
Slate.....	8	843
<b>Coal, Mercer.....</b>	<b>3</b>	<b>846</b>
Sand, Salt.....	35	881
Lime.....	10	891
Slate.....	20	911
Lime.....	5	916
Sand, Salt.....	30	946
<b>Coal.....</b>	<b>4</b>	<b>950</b>
Lime.....	10	960
Sand, Salt.....	60	1020
Slate.....	15	1035
Sand, Salt.....	30	1065
Slate.....	30	1095
Sand, Salt.....	80	1175
Slate.....	3	1178
Lime.....	15	1193
Sand, Salt.....	10	1203
Lime.....	25	1228
Slate.....	50	1278
Red rock.....	90	1368
Lime.....	50	1418
Slate.....	20	1438
Sand.....	40	1478
Red rock.....	10	1488
Lime.....	20	1508
Slate.....	10	1518
Lime.....	35	1553
Red rock.....	60	1613
<b>Big Lime.....</b>	<b>26</b>	<b>1639</b>
Sand, Big Injun.....	200	1839
Slate.....	10	1849
Lime.....	40	1889
Slate.....	20	1909
Lime.....	21	1930
Sand, Weir.....	10	1940
Slate.....	10	1950
Lime.....	40	1990
Slate.....	20	2010
Lime.....	30	2040
Slate.....	10	2050
Sand, Berea.....	35	2085
Slate.....	15	2100
Shells.....	40	2140
Slate.....	10	2150
Sand, Fifty-foot.....	25	2175

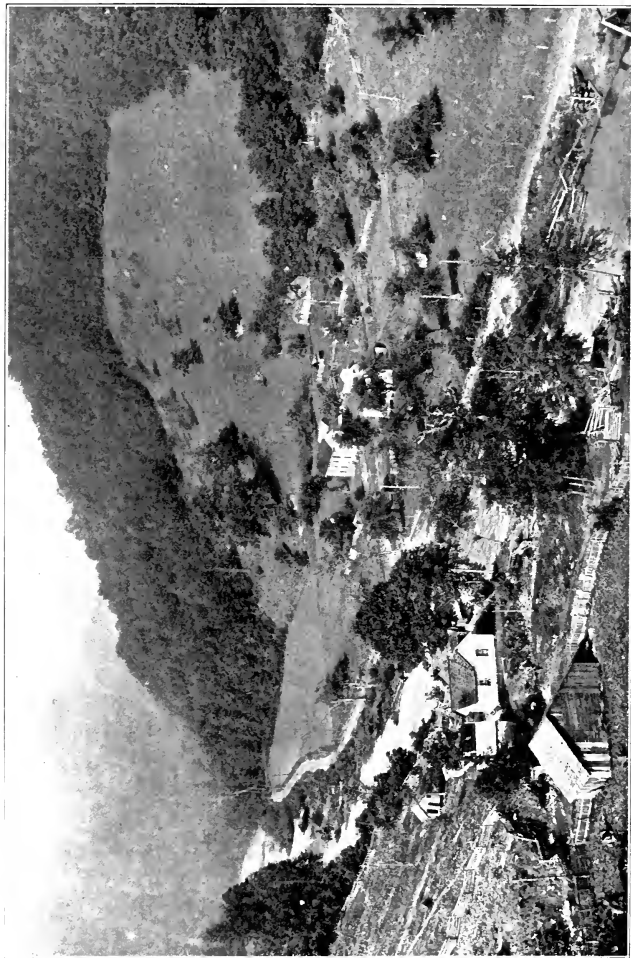


PLATE XXV.—Looking westward down Little Kanawha River from mouth of Hacker Camp, 1 mile south of Bablin; Topography of the Allegheny and Pottsville Series.



	Thickness Feet.	Total Feet
Slate .....	5	2180
Shells .....	10	2190
Slate .....	15	2205
Shells .....	20	2225
<b>Sand, Gordon Stray (gas)</b> .....	50	2275
Slate .....	25	2300
Shells .....	10	2310
Slate .....	15	2325
Shells .....	5	2330
Slate .....	50	2380
Shells .....	25	2405
Slate .....	30	2435
<b>Sand, Fifth (gas)</b> .....	25	2460
Slate .....	5	2465

10" casing, 200'; 8¼", 859' 8"; 6½", 1639' 6".

### Wm. S. Woodall No. 3492 Well Record (494).

Courthouse District; on Murphy Creek, 2.1 miles southwest of Weston; authority, Hope Natural Gas Co.; completed, Oct. 11, 1914; elevation, 1085' B.

	Top. Feet.	Bottom. Feet.
Unrecorded (water, 300').....	0	600
Big Dunkard Sand.....	600	690
Burning Springs Sand.....	700	758
Gas Sand.....	790	897
Salt Sand.....	1080	1148
Maxton Sand.....	1517	1571
Little Lime.....	1580	1630
Pencil Cave.....	1630	1640
Big Lime.....	1640	1713
Big Injun Sand (gas, 1818').....	1713	1860
Berea Sand.....	2060	2083
Fifty-foot Sand.....	2092	2144
Thirty-foot Sand.....	2201	2280
Gordon Stray Sand.....	2290	2316
Gordon Sand.....	2321	2345
Fifth Sand (gas, 2514' and 2527').....	2512	2529
Total depth.....		3000

### J. M. Lancaster No. 188 Well Record (495).

Courthouse District; on branch of Murphy Creek, 2.0 miles west of Weston; authority, Reserve Gas Co.; completed, July 8, 1909; elevation, 1125' B.

	Top. Feet.	Bottom. Feet.
Moundsville Sand.....	385	405
Big Dunkard Sand.....	500	598
Burning Springs Sand.....	650	690
Gas Sand.....	715	815

	Top. Feet.	Bottom. Feet.
Second Cow Run Sand.....	830	900
Salt Sand.....	1175	1274
Little Lime.....	1490	1520
Pencil Cave.....	1552	1570
Big Lime.....	1570	1600
Big Injun Sand (gas, 1710').....	1680	1765
Squaw Sand.....	1775	1800
Berea Sand.....	1900	1925
Fifty-foot Sand.....	2025	2040
Thirty-foot Sand.....	2172	2222
Gordon Stray Sand.....	2227	2263
Gordon Sand.....	2265	2286
Fifth Sand (gas, 2458', 2466' and 2470').....	2456	2480
Total depth.....		2510

Three wells have been drilled on the Weston State Hospital Farm at Weston, all of which have been gas producers. Well No. 1, the record of the upper portion of which was published in Volume I(A), page 355, of the Survey, was first drilled to the Berea Sand, but later drilled deeper when the gas was exhausted in that formation. The well starts 40 feet, by hand level, below the Redstone Coal:

#### Weston State Hospital No. 1 Well Record (497).

Courthouse District; 0.2 mile west of Weston; authority, W. Va. State Hospital; elevation, 1160' B.

	Top. Feet.	Bottom. Feet.
Sand, gray, Salt.....	940	
Slate.....	950	
Lime.....	965	
Slate and shells.....	1085	
Lime.....	1095	
Sand, Salt (oil show).....	1244	
Slate, black.....	1274	
Lime.....	1299	
Slate, white.....	1339	
Red rock.....	1442	
Sand.....	1462	
Red rock.....	1542	
Sand, dark, Maxton.....	1570	
Little Lime.....	1605	
Pencil Cave.....	1615	
Big Lime.....	1680	
Sand, Big Injun (oil show).....	1843	
Slate.....	1883	
Sand, Squaw.....	1945	
Slate and shells.....	2051	
Sand, Berea (gas).....	2066	2086

	Top. Feet.	Bottom. Feet.
Slate to bottom.....		2112
Sand, Fifty-foot (hole reduced from 6 $\frac{5}{8}$ " to 5 $\frac{3}{16}$ " at 2183').....	2178	2200
Sand, Thirty-foot.....	2244	2274
Sand, Gordon Stray.....	2282	2310
Sand, Fourth (gas, 2470').....	2468	2475
Total depth.....		2477
5" casing set in wall packer at 1848'; well tubed with 2" pipe; packer set at 2297'.		

The above well supplied the Weston State Hospital with gas for several years from the Berca Sand, but two or three years ago was drilled deeper to secure more production. The sand encountered at 2468 feet was named as the Fifth by the driller but its interval below the top of the Big Lime, 788 feet, is too small, and it evidently represents the Fourth Sand, as the interval from the top of the Lime to the Fifth in all the surrounding wells is about 850 feet. The well produced only a small amount of gas from the Fourth Sand.

### Weston State Hospital No. 2 Well Record (498).

Courthouse District; 1.0 mile west of Weston; authority, W. Va. State Hospital; completed, May 7, 1907; elevation, 1175' B.

	Thickness. Feet.	Total. Feet.
Conductor .....	16	16
Unrecorded .....	2	18
Coal, Pittsburgh, and unrecorded.....	32	50
Lime .....	25	75
Coal, Little Pittsburgh.....	5	80
Lime .....	15	95
Red rock.....	25	120
Lime .....	30	150
Red rock and shell.....	160	310
Lime .....	20	330
Red rock.....	10	340
Lime .....	35	375
Red rock.....	40	415
Lime .....	15	430
Red rock.....	50	480
Lime .....	145	625
Sand, Big Dunkard.....	10	635
Lime .....	20	655
Slate .....	50	705
Lime .....	40	745
Gas Sand.....	60	805
Slate .....	25	830

	Thickness. Feet.	Total. Feet.
Sand, Second Cow Run (water, 845').....	55	885
Slate and shell.....	80	965
Sand, Salt.....	55	1020
Slate and shell.....	95	1115
Sand, Salt.....	115	1230
Slate.....	5	1235
Sand, Salt.....	50	1285
Slate and shell.....	40	1325
Red rock and shell.....	15	1340
Lime.....	20	1360
Slate and shell.....	50	1410
Red rock.....	30	1440
Lime.....	15	1455
Red rock.....	40	1495
Lime.....	25	1520
White slate.....	15	1535
Black shale and shell.....	45	1580
Little Lime.....	25	1605
Pencil Cave.....	15	1620
<b>Big Lime</b> .....	65	1685
Big Injun Sand.....	55	1740
Red rock.....	5	1745
Squaw Sand.....	100	1845
Slate.....	225	2070
Berea Sand.....	25	2095
Slate and shell.....	110	2205
Thirty-foot Sand.....	80	2285
Slate.....	10	2295
Gordon Stray Sand.....	20	2315
Slate.....	20	2335
Gordon Sand.....	25	2360
Slate and shell.....	20	2380
Slate.....	92	2472
<b>Fifth Sand</b> (gas, 2473').....	8	2480
Unrecorded to bottom.....	4	2484

20/10" water through 6 $\frac{5}{8}$ " casing; volume, 2,338,992 cu. ft. in 24 hours; pressure, 1st minute, 100; 2nd, 190; 3rd, 250; 4th, 310; 5th, 360; 10 minutes, 485 lbs.; 20 min., 550 lbs.; 30 min., 575 lbs; 1st packer, 20 ft. 2" from bottom; 1st packer set at 2453' 10"; 2nd packer, set at 1712'; 772 ft. of Anchor; 2484 ft. tubing in hole.

The above well was shot with 30 quarts of glycerine in November, 1914, securing only a slight increase of gas, the hole being reported full of water when cleaned out.



**Weston State Hospital No. 3 Well Record (499).**

Courthouse District; 1 mile west of Weston; authority, W. Va. State Hospital; completed, Dec. 16, 1914; elevation, 1150' B.

	Top. Feet.	Bottom. Feet.
Coal, Little Pittsburgh.....	68	71
Sand, Big Dunkard.....	600	640
Sand, Second Cow Run (hole full water, 840').....	830	910
Sand, Salt.....	950	990
Sand, Salt.....	1110	1200
Slate and shell.....	1260	1350
Red rock and shell.....	1350	1580
Little Lime.....	1580	1600
Pencil Cave.....	1600	1623
Big Lime.....	1623	1685
Sand, Big Injun (oil show, 1810').....	1685	1830
Sand, Berea.....	2060	2105
Fifty-foot Sand.....	2170	2200
Thirty-foot Sand.....	2225	2250
Unrecorded (gas, 2255'—2/10" water in 2-inch, 68,304 cu. ft.).....	2250	2275
Gordon Stray Sand.....	2275	2300
Gordon Sand.....	2345	2360
Fifth Sand to bottom (gas, 2468-73').....	2460	2479

Gas gauge, 4/10" water in 6 $\frac{5}{8}$ " casing; rock pressure, 395 pounds; casing left in well: 8 $\frac{1}{4}$ " casing, 902'; 6 $\frac{5}{8}$ ", 1690' with packer; 2 in. tubing, 2479', packer set 2184'.

According to Dr. C. W. Halterman, Superintendent, the production of this well declined suddenly to a small amount at the end of 25 days. No water was reported in the hole. The well starts 40 feet, by hand level, below the Redstone Coal.

The six following records are of wells drilled along Middle Run, near the Grassland Syncline:

**Matthews Heirs No. 1 Well Record (500).**

Courthouse District; on Middle Run, 2.6 miles southwest of Weston; authority, W. Va. Central Gas Co.; completed, Oct. 8, 1914; elevation, 1145' B.

	Top. Feet.	Bottom. Feet.
Clay and sand.....	0	55
Slate and shells.....	605	660
Sand, Little Dunkard.....	660	700
Sand, Big Dunkard.....	830	875
Sand, Gas.....	960	995
Sand, Salt.....	1190	1240
Sand, Salt.....	1390	1430

	Top. Feet.	Bottom. Feet.
Little Lime.....	1790	1815
Pencil Cave.....	1815	1820
<b>Big Lime.....</b>	<b>1820</b>	<b>1890</b>
Sand, Big Injun.....	1899	1990
Sand, Fifty-foot.....	2250	2300
Slate.....	2300	2310
Sand, Thirty-foot (gas, 200,000' at 2382').....	2370	2446
Sand, Gordon Stray.....	2450	2530
Sand, Gordon.....	2540	2555
<b>Sand, Fifth (gas, 2677-87').....</b>	<b>2671</b>	<b>2693</b>
Slate to bottom.....	2693	2700
Conductor, 16'; 10" casing, 220'; 8¼", 996'; 6½", 1860'; first minute pressure, 35 lbs.; rock pressure, 600 lbs.; volume, 500,000 cu. ft.		

### Andrew Edmiston No. 1974 Well Record (501).

Courthouse District; on branch of Middle Run, 2.3 miles northwest of Brownsville; authority, Pittsburgh & W. Va. Gas Co.; completed, July 17, 1909; elevation, 1115' B.

	Top. Feet.	Bottom. Feet.
<b>Big Lime.....</b>	<b>1780</b>	<b>1840</b>
Sand, Big Injun.....	1840	2000
Sand, Berea.....	2200	2270
<b>Sand, Thirty-foot (gas).....</b>	<b>2325</b>	<b>2345</b>
Sand, Gordon Stray.....	2355	2480
Sand, Fifth.....	2615	2630
Total depth.....		2768

### W. H. Hawkins No. 1310 Well Record (502).

Courthouse District; on Middle Run, 3.0 miles southwest of Weston; authority, Hope Natural Gas Co.; completed, Aug. 28, 1909; elevation, 1255' B.

	Top. Feet.	Bottom. Feet.
Conductor.....	0	16
Murphy Sand.....	500	531
Gas Sand.....	900	1100
Second Cow Run Sand.....	1200	1270
<b>Salt Sand (gas, 1460').....</b>	<b>1380</b>	<b>1540</b>
Maxton Sand.....	1800	1815
Little Lime.....	1845	1860
Pencil Cave.....	1860	1870
<b>Big Lime.....</b>	<b>1870</b>	<b>1960</b>
<b>Big Injun Sand (gas, 2014').....</b>	<b>1960</b>	<b>2080</b>
Squaw Sand.....	2100	2120
Berea Sand.....	2310	2370
Fifty-foot Sand.....	2430	2455

	Top. Feet.	Bottom Feet.
Gordon Stray Sand (shell).....	2500	
Gordon Sand (shell).....	2600	
<b>Fifth Sand (gas, 2748')</b> .....	<b>2745</b>	2760
Total depth.....		2803

### Wm. McBride No. 1964 Well Record (503).

Courthouse District; on Middle Run, 2.2 miles northeast of Edmiston; authority, Pittsburgh & W. Va. Gas Co.; completed, 1906; elevation, 1175' B.

	Thickness. Feet.	Total. Feet.
Mud .....	10	10
Slate, light.....	30	40
Lime .....	40	80
Red rock.....	60	140
Lime .....	40	180
Slate .....	60	240
Lime .....	15	255
<b>Coal, Redstone</b> .....	<b>5</b>	<b>260</b>
Slate, dark.....	100	360
<b>Red rock</b> .....	<b>100</b>	<b>460</b>
Slate, white.....	25	485
Sand, dark, Murphy.....	20	505
Slate, dark.....	35	540
Red rock.....	15	555
Slate, light.....	85	640
Sand .....	10	650
Pink rock.....	10	660
Sand, Moundsville.....	20	680
Slate, black.....	20	700
Lime, gray.....	50	750
Slate, white.....	20	770
Slate, dark.....	15	785
Lime .....	20	805
Slate, white.....	15	820
Sand, Little Dunkard.....	20	840
Sand lime.....	20	860
Slate, dark.....	5	865
Lime .....	35	900
Sand, dark, Big Dunkard.....	30	930
Sand, Gas, light colored.....	145	1075
Slate, black.....	90	1165
Sand, Second Cow Run.....	40	1205
Slate, dark.....	40	1245
Sand, Salt.....	50	1295
Lime .....	40	1335
Slate, black.....	65	1400
Sand, Salt (no water).....	150	1550
Slate, light.....	95	1645
Red rock.....	105	1750
Sand, Maxton.....	40	1790
Lime .....	20	1810
Slate, dark.....	10	1820

	Thickness Feet.	Total Feet.
Lime .....	25	1845
Little Lime.....	25	1870
Pencil Cave, dark, soft.....	20	1890
<b>Big Lime</b> .....	50	1940
<b>Sand, Big Injun (gas, 2060')</b> .....	180	2120
Slate and shells.....	140	2260
Sand, Berea, hard.....	15	2275
Slate, white.....	15	2290
<b>Slate and shells, (gas, 2325', in 50-Ft. Sand)</b> .....	230	2520
Sand, Gordon Stray.....	42	2562
Slate and shells, dark.....	33	2595
Sand, Gordon, dark.....	20	2615
Slate, white.....	110	2725
<b>Sand, Fifth, dark (gas, 2729')</b> .....	13	2738
Slate, dark, soft, to bottom.....	87	2825

#### Flora Matthews No. 1952 Well Record (504).

Courthouse District; on Middle Run, 2.3 miles northeast of Edmiston; authority, Pittsburgh & W. Va. Gas Co; completed, May 11, 1906; elevation, 1340' B.

	Top. Feet.	Bottom. Feet.
Sand, Little Dunkard.....	810	850
Sand, Burning Springs.....	1020	1060
Sand, Gas.....	1079	1255
Sand, Salt.....	1295	1315
Sand, Salt.....	1685	1710
<b>Big Lime</b> .....	1985	2080
Sand, Big Injun.....	2080	2130
Sand, Fifty-foot.....	2495	2535
<b>Sand, Gordon (gas)</b> .....	2678	2703
<b>Sand, Fifth (gas)</b> .....	2879	
Total depth.....		2920

#### Flora Matthews No. 2455 Well Record (505).

Courthouse District; 2.3 miles N. 80° E. of Edmiston; authority, Pittsburgh & W. Va. Gas Co.; completed, Sept. 9, 1911; elevation, 1175' B.

	Top. Feet.	Bottom. Feet.
Sand, Moundsville.....	700	740
Sand, Big Dunkard.....	860	890
Sand, Burning Springs.....	980	995
Sand, Second Cow Run.....	1190	1215
Sand, Salt.....	1255	1320
Sand, Salt.....	1495	1600
Sand, Maxton.....	1800	1830
<b>Big Lime</b> .....	1895	1973
<b>Sand, Big Injun (gas)</b> .....	1973	2110
Sand, Fifty-foot.....	2370	2385

	Top. Feet.	Bottom. Feet.
Sand, Thirty-foot.....	2452	2462
Sand, Gordon Stray.....	2503	2528
Sand, Gordon (gas).....	2533	2578
Sand, Fifth (gas).....	2736	2748
Total depth.....		2774

Several wells have been drilled along Rush Run, some of which have been light gas producers and others have been dry holes. The seven following records are from this locality:

### Jacob Flesher No. 4119 Well Record (508).

Courthouse District; 0.9 mile east of Edmiston; authority, Pittsburgh & W. Va. Gas Co.; completed, Feb. 20, 1913; elevation, 1300' B.

	Top. Feet.	Bottom. Feet.
Coal, Redstone.....	390	395
Sand, Moundsville.....	840	875
Sand, Little Dunkard.....	910	960
Sand, Gas.....	1070	1200
Sand, Salt.....	1345	1450
Sand, Salt.....	1555	1600
Sand, Salt.....	1715	1750
Big Lime.....	2076	2168
Sand, Big Injun.....	2168	2295
Sand, Thirty-foot.....	2670	2683
Sand, Gordon Stray (gas).....	2695	2727
Sand, Gordon.....	2741	2772
Sand, Fifth (gas).....	2918	2926
Total depth.....		2969

### Edward Priest No. 1 Well Record (510).

Courthouse District; 1.2 miles southeast of Edmiston; authority Louis Bennett; elevation 1315' B.

	Top. Feet.	Bottom. Feet.
Coal, Uniontown.....	135	137
Coal, Redstone.....	400	406
Sand, Moundsville.....	854	874
Sand, Little Dunkard.....	924	978
Sand, Burning Springs.....	1042	1138
Sand, Gas and Second Cow Run.....	1142	1300
Sand, Salt.....	1375	1432
Sand, Salt.....	1540	1600
Sand, Salt.....	1705	1750
Red rock.....	1850	1966
Lime, sandy.....	1966	2024
Little Lime.....	2040	2064

	Top. Feet.	Bottom. Feet.
Pencil Cave.....	2064	2075
<b>Big Lime</b> .....	2075	2145
<b>Sand, Big Injun</b> (little gas, 2250').....	2145	2300
<b>Sand, Thirty-foot</b> (gas, 2662').....	2660	2690
<b>Sand, Gordon Stray</b> (gas, 2721' and 2725').....	2700	2730
Total depth.....		2732
Conductor, 15'; 10" casing, 216'; 8", 1032' 6"; 6 $\frac{5}{8}$ ", 2161' 11".		

### C. H. Skinner No. 3601 Well Record (511).

Courthouse District; 1.5 miles east of Edmiston; authority, Hope Natural Gas Co.; completed, Oct. 31, 1914; elevation, 1285' B.

	Top. Feet.	Bottom. Feet.
Lower Pittsburgh Sand.....	460	485
Connellsville Sand.....	505	525
Grafton Sand.....	680	715
Little Dunkard Sand.....	900	950
<b>Big Dunkard and Burning Springs Sands</b> .....	981	1105
<b>Salt Sand</b> (gas, 1680').....	1655	1725
<b>Little Lime</b> .....	2000	2015
Pencil Cave.....	2015	2021
<b>Big Lime</b> .....	2021	2086
<b>Big Injun Sand</b> (gas, 2210').....	2086	2260
<b>Fifty-foot Sand</b> .....	2525	2536
<b>Thirty-foot Sand</b> .....	2603	2619
<b>Gordon Stray Sand</b> .....	2630	2657
<b>Gordon Sand</b> .....	2676	2685
<b>Fifth Sand</b> (gas, 2887-96').....	2885	2900
Total depth.....		2934

### N. Peterson No. 1984 Well Record (512).

Courthouse District; 1.7 miles S. 75° E. of Edmiston; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1145' B.

	Top. Feet.	Bottom. Feet.
Coal, Redstone.....	190	195
Sand, Moundsville.....	609	627
Sand, Little Dunkard.....	742	775
Sand, Big Dunkard.....	833	842
Sand, Burning Springs.....	897	967
Sand, Gas.....	1010	1082
<b>Big Lime</b> .....	1908	2023
Sand, Big Injun.....	2023	2115
Sand, Berea.....	2270	2300
<b>Sand, Fifty-foot</b> (gas show).....	2350	2385
Sand, Thirty-foot.....	2430	2460
<b>Sand, Gordon Stray</b> (oil, gas and salt water)....	2490	2547
Sand, Gordon.....	2583	2600
Sand, Fifth.....	2729	2744
Total depth.....		2869

The above well shows a gas pressure of 100 to 110 lbs. No attempt is made to recover the oil.

The following well was reported a dry hole in all sands:

### W. J. Ward No. 2015 Well Record (513).

Courthouse District; on Rush Run, 2.2 miles southwest of Brownsville; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1140' B.

	Top. Feet.	Bottom. Feet.
Sand, Little Dunkard.....	640	670
Sand, Burning Springs.....	880	915
Sand, Second Cow Run.....	1090	1130
Sand, Salt.....	1185	1260
Sand, Salt.....	1375	1420
Sand, Salt.....	1435	1540
Big Lime.....	1890	1945
Sand, Big Injun.....	1945	2105
Sand, Squaw.....	2145	2201
Sand, Berea.....	2295	2315
Sand, Fifty-foot.....	2320	2380
Sand, Thirty-foot.....	2390	2425
Sand, Gordon.....	2530	2592
Total depth.....		2906

The following well was a light gasser and also made a show of oil, but was not drilled below the Fifty-foot Sand.

### T. W. Matthews No. 1970 Well Record (515).

Courthouse District; on Rush Run, 1.3 miles northwest of Brownsville; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1030' B.

	Top. Feet.	Bottom. Feet.
Sand, Little Dunkard.....	625	653
Sand, Gas.....	775	870
Sand, Salt.....	1285	1435
Sand, Maxton.....	1665	1705
Big Lime.....	1754	1880
Sand, Big Injun.....	1880	1990
Sand, Fifty-foot, to bottom (gas).....	2215	2254

The following well made only a light show of gas in the Fifth Sand, and was abandoned as a dry hole:

## John H. Hammer No. 1 Well Record (516).

Courthouse District; on Rush Run, 1.4 miles northwest of Browns-ville; authority, Pittsburgh & W. Va. Gas Co.; completed, May 30, 1910; elevation, 1170' B.

	Top. Feet.	Bottom. Feet.
Coal, Redstone.....	190	195
Sand, Little Dunkard.....	760	785
Sand, Burning Springs.....	880	960
Coal, Upper Kittanning.....	975	980
Sand, Salt.....	1185	1300
Sand, Salt.....	1350	1380
Sand, Salt.....	1410	1550
Sand, Salt.....	1615	1660
Sand, Maxton.....	1750	1780
Big Lime.....	1890	1955
Sand, Big Injun.....	1955	2105
Sand, Squaw.....	2145	2175
Sand, Berea.....	2310	2365
Sand, Thirty-foot.....	2425	2451
Sand, Gordon Stray.....	2505	2555
Sand, Gordon.....	2557	2585
Sand, Fourth.....	2590	2615
Sand, Fifth (gas show).....	2715	2730
Total depth.....		2863

The following well, drilled along the Roanoke Syncline, made only a show of gas, finding no sands below the Thirty-foot:

## Z. T. Sandy No. 2694 Well Record (519).

Courthouse District; on West Fork River, 2 miles north of Roanoke; authority, Hope Natural Gas Co.; completed, Oct. 6, 1912; elevation, 1390' B.

	Top. Feet.	Bottom. Feet.
Salt Sand.....	1355	1415
Salt Sand.....	1600	1785
Salt Sand.....	1790	1870
Maxton Sand.....	1995	2015
Little Lime.....	2100	2130
Pencil Cave.....	2130	2142
Big Lime.....	2142	2217
Big Injun Sand.....	2217	2325
Squaw Sand.....	2347	2370
Berea Sand (gas, 2532').....	2530	2574
Fifty-foot Sand.....	2638	2652
Thirty-foot Sand.....	2700	2735
Total depth (no more sands).....		3090

The six following gas wells were drilled near the West Fork River and along the Roanoke Syncline south of its inter-



section with the Grassland Basin, most of them being small producers:

### John Shay Heirs No. 1 Well Record (520).

Courthouse District; on West Fork River, 1.3 miles southwest of Brownsville; authority, Wm. Ahner et al.; elevation, 1050' B.

	Thickness. Total.	
	Feet.	Feet.
Unrecorded .....	1125	1125
Sand, Salt.....	200	1325
Red rock.....	100	1425
Slate and shells.....	425	1850
Little Lime.....	50	1900
Pencil Cave.....	15	1915
<b>Big Lime</b> .....	105	2020
Sand, Big Injun.....	110	2130
Slate .....	110	2240
<b>Sand, Berea</b> (gas, 10 million, 2250').....	45	2285
Unrecorded to bottom.....	5	2290
10" casing, 430'; 8", 1240'; 6½", 2020'.		

Gas from the above well was used to run a carbon black factory in the same locality but the gas was soon exhausted and the plant dismantled.

### Michael Tims No. 1 Well Record (521).

Courthouse District; 0.7 mile southwest of Brownsville; authority, Guffey & Galey; completed, May 23, 1900; elevation, 1050' B.

	Thickness. Total.	
	Feet.	Feet.
Conductor .....	12	12
Lime, hard.....	53	65
<b>Slate, dark, Redstone Coal horizon</b> .....	10	75
Sand, soft, Weston.....	25	100
Slate, dark.....	5	105
Sand, Salt.....	33	533
Lime, hard.....	45	150
Slate, soft.....	5	155
Lime, dark.....	5	160
Slate, soft.....	5	165
Lime, hard.....	35	200
Slate, soft.....	25	225
Lime and red rock.....	175	400
Sand, hard, Grafton.....	25	425
Slate, hard.....	15	440
Red rock.....	50	490
Lime, hard.....	40	530
Red rock.....	40	570

	Thickness.	Total.
	Feet.	Feet.
Sand, gray, Little Dunkard.....	60	630
Slate and lime.....	60	690
Slate, dark.....	5	695
Sand, white, Big Dunkard.....	20	715
Slate, white.....	5	720
Lime, hard.....	120	840
Sand, gray, Gas.....	30	870
Slate and shells.....	140	1010
Lime, hard.....	30	1040
Sand, gray, Salt.....	80	1120
Slate and shells.....	215	1335
Sand, white, Salt.....	15	1350
Lime, gray.....	115	1465
Slate.....	10	1475
Red rock and lime.....	275	1750
<b>Big Lime.....</b>	<b>100</b>	<b>1850</b>
Sand, white, Keener.....	15	1865
Lime.....	25	1890
Sand, gray, Big Injun.....	100	1990
Slate, dark.....	10	2000
Slate and shells.....	206	2206
Sand, hard, Berea.....	15	2221
Slate, soft.....	5	2226
Sand, hard, Fifty-foot.....	20	2246
Slate and shells.....	59	2305
Sand, hard, gray, Thirty-foot.....	30	2335
Slate and shells.....	55	2390
Sand, Gordon Stray.....	35	2425
Slate and shells (shell at 2610') to bottom.....	263	2688
10" casing, 165'; 8¼", 1125'; 6½", 1770'.		

The above well was a light gasser but its product was never used.

### Rachel Cutright No. 1993 Well Record (522).

Courthouse District; 1.2 miles southwest of Brownsville; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1205' B.

	Top.	Bottom.
	Feet.	Feet.
Sand, Little Dunkard.....	760	790
Sand, Burning Springs.....	940	980
Sand, Second Cow Run.....	1109	1115
Sand, Salt.....	1208	1265
Sand, Salt.....	1400	1445
Sand, Maxton.....	1685	1705
<b>Big Lime.....</b>	<b>1950</b>	<b>2040</b>
Sand, Big Injun.....	2040	2150
<b>Sand, Berea, to bottom (gas).....</b>	<b>2497</b>	<b>2427</b>

## Sarah Platt No. 2423 Well Record (524).

Courthouse District; at Brownsville; authority, Hope Natural Gas Co.; elevation, 1050' L.

	Top. Feet.	Bottom. Feet.
Murphy Sand (water, 320').....	285	355
Moundsville Sand.....	450	495
Little Dunkard Sand.....	610	645
Big Dunkard Sand.....	705	728
Gas Sand.....	818	855
Little Lime.....	1705	1723
Pencil Cave.....	1723	1751
Big Lime.....	1751	1804
Big Injun Sand.....	1804	1830
Squaw Sand.....	1840	2035
Sand.....	2083	2130
Berea Sand (gas, 2158').....	2154	2197
Fifty-foot Sand.....	2210	2235
Thirty-foot Sand.....	2325	2375
Gordon Stray Sand.....	2385	2397
Gordon Sand.....	2408	2418
Fourth Sand.....	2457	2470
Fifth Sand.....	2537	2570
Total depth.....		2680

The present rock pressure of this well is reported to be 400 to 440 pounds.

## Thomas Barnes No. 2456 Well Record (525).

Courthouse District; on branch of Washburn Run, 1.4 miles north-east of Brownsville; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1225' B.

	Top. Feet.	Bottom. Feet.
Coal, Redstone.....	145	150
Sand, Maxton.....	1675	1700
Big Lime.....	1785	1915
Sand, Big Injun (oil show).....	1915	2015
Sand, Berea.....	2138	2198
Sand, Fifty-foot.....	2215	2257
Sand, Gordon Stray.....	2382	2393
Sand, Gordon (gas).....	2435	2475
Total depth.....		2504

The Louis Bennett No. 1 (526), the record of which is published in the section for Brownsville, page 64, was a gas well in the Gordon Sand.

## P. J. Dyer No. 2281 Well Record (527).

Courthouse District; on West Fork River, 0.5 mile north of Brownsville; authority, Hope Natural Gas Co.; completed, Oct. 8, 1911; elevation, 1130' B.

	Top. Feet.	Bottom. Feet.
Coal, Redstone.....	120	125
Grafton Sand.....	495	506
Moundsville Sand.....	535	575
Little Dunkard Sand.....	668	708
Big Dunkard Sand.....	770	810
Gas Sand.....	852	930
Little Lime.....	1782	1794
Pencil Cave.....	1794	1822
Big Lime.....	1822	1872
Big Injun Sand (gas, 1958').....	1872	2004
Squaw Sand.....	2021	2053
Sand .....	2121	2149
Berea Sand (gas, 2224-70').....	2218	2272
Fifty-foot Sand.....	2340	2375
Thirty-foot Sand.....	2394	2435
Gordon Stray Sand.....	2454	2462
Gordon Sand.....	2464	2479
Fifth Sand (berak, 2624-7').....	2613	2631
Total depth.....		2706

Several wells have been drilled in the eastern end of the district between the Grassland Syncline and Weston, most of which have been light gassers. The eight following records are from this locality:

## Louis Bennett No. 4 Well Record (529).

Courthouse District; on West Fork River, 1.5 miles south of Weston; authority, Louis Bennett.

	Top. Feet.	Bottom. Feet.
Unrecorded (water, 1 bailer, 120').....	0	120
Coal, Redstone.....	120	124
Sand, Moundsville.....	500	526
Sand, Little Dunkard.....	635	660
Sand, Gas.....	935	956
Sand, Salt.....	1075	1194
Sand, Salt.....	1390	1475
Sand .....	1510	1530
Sand, Maxton.....	1680	1715
Little Lime.....	1779	1786
Pencil Cave.....	1786	1824
Big Lime.....	1824	1879
Sand, Big Injun.....	1879	2062
Sand, Squaw.....	2062	2093
Sand, Berea.....	2220	2222

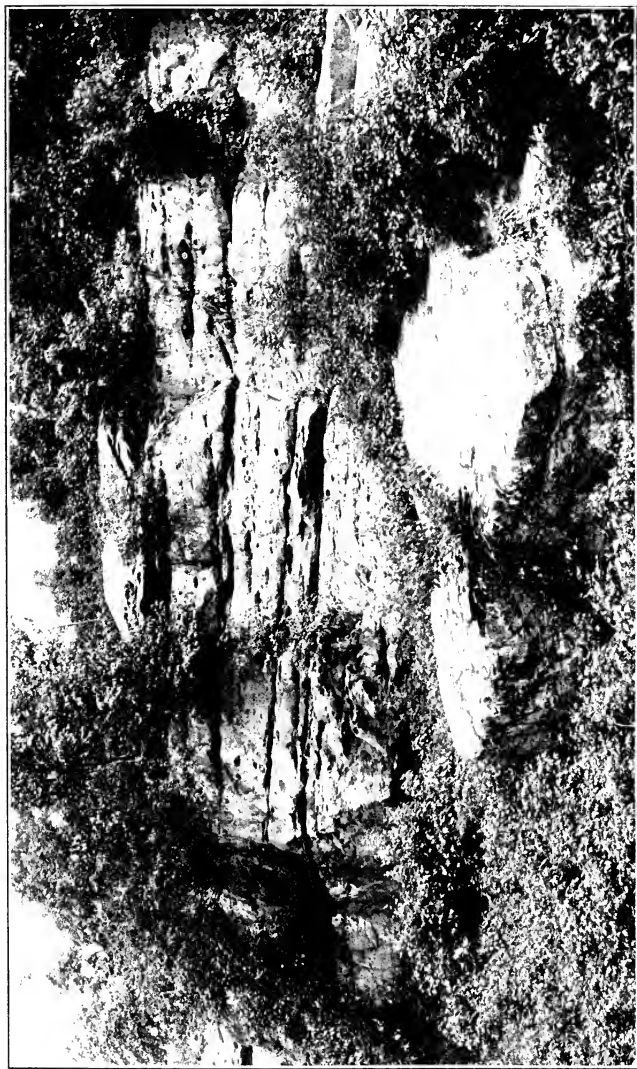


PLATE XXVI.—Cleveland Sandstone cliff along Right Fork of Little Kanawha River, ½ mile west of Bois, Lewis County.



	Top. Feet.	Bottom. Feet.
Sand, Fifty-foot.....	2295	2345
Sand, Thirty-foot.....	2415	2422
Red rock .....	2450	2458
Sand, Gordon Stray.....	2458	2478
Sand, Gordon.....	2485	2575
Total depth.....		2707

10" casing, 200'; 8¼", 900'; 6⅝", 1918'; dry hole; casing pulled; lead plug at 1960'.

### Louis Bennett No. 3 Well Record (530).

Courthouse District; on West Fork River, 1.5 miles south of Weston; authority, Louis Bennett; elevation, 1035' B.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	22
Sand, Murphy.....	250	265
Unrecorded (2 ballers water, 440').....	265	736
Sand, Burning Springs.....	736	770
Sand, Gas.....	820	850
Sand, Second Cow Run.....	885	920
Sand, Salt (little water, 970').....	930	1060
Sand, Salt.....	1085	1245
Red rock.....	1380	1400
Red rock.....	1560	1590
Sand, Maxton.....	1590	1600
Little Lime.....	1665	1685
Pencil Cave.....	1685	1690
Big Lime.....	1690	1735
Sand, Big Injun (gas, 1773'; little oil, 1778')....	1735	1860
Sand, Berea (gas. 2093') and unrecorded to bot- tom.....	2088	2123

### John Dennison No. 4054 Well Record (531).

Courthouse District; 1.4 miles south of Weston; authority, Pitts-  
burgh & W. Va. Gas Co.; completed, Aug. 17, 1912; elevation, 1278' B.

	Top. Feet.	Bottom. Feet.
Coal, Redstone.....	260	262
Sand, Moundsville.....	705	719
Sand, Burning Springs.....	975	1005
Sand, Second Cow Run.....	1136	1190
Big Lime.....	1865	1980
Sand, Big Injun.....	1980	2095
Sand, Berea (little gas).....	2240	2250
Sand, Fifty-foot (gas).....	2345	2367
Total depth.....		2370

### Jackson Arnold No. 3198 Well Record (532).

Courthouse District; on West Fork River, 1.0 mile south of Weston; authority, Hope Natural Gas Co.; completed, Dec. 10, 1913; elevation, 1290' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	755	770
Burning Springs Sand.....	900	935
Second Cow Run Sand (water, 1165').....	1135	1255
Salt Sand.....	1280	1310
Unrecorded (water, 1575').....	1310	1610
Red rock.....	1610	
Little Lime.....	1894	1914
Pencil Cave.....	1914	1920
<b>Big Lime</b> .....	1920	1970
<b>Big Injun Sand</b> (gas, 2079').....	1975	2106
Squaw Sand.....	2112	
<b>Berea Sand</b> (gas, 2321-6').....	2309	2350
Total depth.....		2384

### Weston Electric Co. No. 1 Well Record (533).

Courthouse District, 0.3 mile south of Weston; authority, Weston Electric Co.; completed, 1905; elevation, 1075' B.

	Top. Feet.	Bottom. Feet.
<b>Coal, Little Pittsburgh</b> .....	20	22
Sand, Murphy.....	190	215
Sand, Big Dunkard.....	600	645
Sand, Burning Springs.....	706	726
<b>Coal, Lower Kittanning</b> .....	775	780
Sand, Second Cow Run.....	787	822
Sand, Salt.....	830	860
Sand, Salt.....	935	944
Sand, Salt.....	1035	1050
Sand, Salt.....	1066	1079
Sand, Salt.....	1215	1240
Red rock.....	1250	
Lime.....	1355	1410
Red rock.....	1415	1470
Little Lime.....	1495	1505
Pencil Cave.....	1517	1525
<b>Big Lime</b> .....	1525	
Sand, Big Injun.....	1650	
Sand, Berea.....	1977	
Sand, Fifty-foot (steel line, 2012').....	2008	
Red rock.....	2155	2160
Sand, Gordon Stray.....	2190	2202
<b>Sand, Gordon</b> (light gas).....	2243	2258
Sand, Fourth.....	2265	2300
<b>Sand, Fifth</b> (light gas).....	2410	2413
Total depth.....		2450
Conductor, 16'; 10" casing, 140'; 8¼", 865'.		



According to J. S. Mitchell, Superintendent of the power plant, this well was a light gasser, being used to run the plant for one season, after which the production declined. Like the other wells of this locality, it is located too near the syncline to be in good gas territory.

#### A. B. Brannon No. 4002 Well Record (535).

Courthouse District; on Town Run, 0.8 mile southeast of Weston; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1110' B.

	Top. Feet.	Bottom. Feet.
Sand, Maxton.....	1555	1595
Big Lime.....	1660	1720
Sand, Big Injun.....	1720	1840
Sand, Gordon Stray.....	2280	2290
Sand, Gordon (gas), to bottom.....	2300	2314

#### L. L. Wilson No. 4047 Well Record (535A).

Courthouse District; 1.4 miles S. 20° E. of Weston; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1255' B.

	Top. Feet.	Bottom. Feet.
Coal, Redstone.....	200	205
Big Lime.....	1770	1845
Sand, Big Injun (oil show).....	1845	1965
Sand, Squaw.....	1975	1995
Sand, Fifty-foot.....	2245	2295
Sand, Thirty-foot.....	2335	2360
Sand, Gordon Stray.....	2420	2435
Sand, Gordon.....	2440	2465
Sand, Fourth.....	2500	2520
Sand, Fifth (gas).....	2642	2651
Total depth.....		2663

#### L. L. Wilson No. 1948 Well Record (536).

Courthouse District; at head of Town Run, 1.6 miles southeast of Weston; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1185' B.

	Top. Feet.	Bottom. Feet.
Sand, Second Cow Run.....	945	975
Sand, Salt.....	985	1095
Sand, Salt.....	1274	1380
Sand, Maxton.....	1597	1617
Big Lime.....	1671	1761
Sand, Big Injun.....	1761	1896
Sand, Berea.....	2011	2023

	Top. Feet.	Bottom. Feet.
Sand, Fifty-foot (gas).....	2110	2165
Sand .....	2165	2169
Sand, Thirty-foot (oil show).....	2212	2235
Sand, Gordon Stray and Gordon.....	2272	2397
Sand, Fourth.....	2417	2429
Sand, Fifth.....	2490	2505
Total depth.....		2602

Several wells have been drilled along Skin Creek, east of the Roanoke Syncline. The structure east of this basin rises in a gentle monocline all the way to the Upshur Line, and all the wells drilled along it, with the exception of a few oil wells in Collins Settlement District, have been light gassers or dry holes. The four following records are from this locality:

#### W. G. Bennett No. 2033 Well Record (537).

Courthouse District; on Wolf Fork, 1.0 mile south of Brownsville; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1145' B.

	Top. Feet.	Bottom. Feet.
Sand, Burning Springs.....	850	900
Sand, Gas.....	970	1000
Sand, Salt.....	1100	1250
Sand, Salt.....	1290	1500
Big Lime.....	1795	1900
Sand, Big Injun.....	1900	2060
Sand, Fifty-foot (gas).....	2255	2310
Sand, Gordon Stray.....	2390	2435
Sand, Gordon (oil show).....	2445	2495
Sand, Fifth.....	2640	2650
Total depth.....		2760

#### E. A. Bennett No. 2011 Well Record (538).

Courthouse District; on Skin Creek, 1.0 mile southeast of Brownsville; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1040' B.

	Top. Feet.	Bottom. Feet.
Sand, Salt.....	1176	1201
Sand, Salt.....	1266	1334
Sand, Salt.....	1344	1422
Sand, Maxton.....	1660	1685
Big Lime.....	1718	1798
Sand, Big Injun.....	1798	1948
Sand, Berea (gas show).....	2120	2156
Sand, Gordon Stray.....	2332	2362
Sand, Gordon, and unrecorded to bottom.....	2370	2412

**E. A. Bennett No. 2071 Well Record (539).**

Courthouse District; on Skin Creek, 0.8 mile southeast of Brownsville; authority, Pittsburgh & W. Va. Gas Co.; elevation, 1255' B.

	Top. Feet.	Bottom. Feet.
Coal, Redstone.....	260	265
Sand, Salt.....	1220	1320
Sand, Salt.....	1465	1550
Sand, Maxton.....	1835	1865
Big Lime.....	1900	2015
Sand, Big Injun.....	2015	2140
Sand, Fifty foot (gas show).....	2350	2384
Sand, Gordon Stray.....	2525	2565
Sand, Gordon (gas) and unrecorded to bottom.....	2600	2630

The **Elias M. Stalnaker No. 1 (540)**, drilled by the Pittsburgh and West Virginia Gas Company, was reported to have made a show of gas, but its record was not secured. The following well, in addition to its gas production from the Berea Sand, showed a little black oil:

**S. O. Rittenhouse No. 2601 Well Record (541).**

Courthouse District; on Sleepcamp Run, 1.6 miles northeast of Finster; authority, Hope Natural Gas Co.; completed, June 22, 1912; elevation, 1170' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	365	395
Big Dunkard Sand.....	465	480
Gas Sand.....	590	710
Second Cow Run Sand.....	836	970
Salt Sand.....	1020	1072
Maxton Sand.....	1652	1660
Little Lime.....	1669	1679
Pencil Cave.....	1679	1694
Big Lime.....	1694	1750
Big Injun Sand.....	1750	1910
Berea Sand (gas, 2105-11').....	2105	
Total depth.....		2113

The **W. R. Jewel No. 1 (543)**, drilled by White and Chidister, was reported to have made a small amount of gas, but was abandoned. Its record was not secured.

**Prospective Oil and Gas Areas, Courthouse District.**—Almost the entire area of Courthouse District has already been tested for gas and oil, only a few small portions remaining

untried. The most profitable results in the future will probably be secured by drilling for gas in numerous farms that still remain untouched in the areas that have been tested and have proved to be good, as shown on Map II. Attention is called to the following localities for new production: (1), The northwestern corner of the district between the 700-foot structure contour and the Freemans Creek District Line, along Oldfield Fork and Raccoon Run, for gas in the Gordon and Fifth Sands; (2), A small amount of territory, about one-half mile square, just northwest of Copley for an extension of the Copley Pool in the Gordon Sand; (3), Further drilling along both sides of the Orlando Anticline for gas in sands ranging from the Berea to the Fifth; (4), The eastern part of the district along Wolf Fork of Skin Creek for gas in sands ranging from the Berea to the Fifth.

### *Detailed Well Records, Skin Creek District.*

Skin Creek District occupies a small portion of the eastern part of the county next to Upshur. Its entire area is included within the long monoclinical slope east of the Grassland and Roanoke Synclines, that rises steadily to the Upshur Line. Only seven wells have been drilled in the district, and of these only two have produced gas in commercial quantity. the others being dry holes or having light shows of gas or oil. The records of five of these wells are available.

**The Skin Creek Station** of the Pittsburgh and West Virginia Gas Company, located at the mouth of Skin Creek, one-third mile south of Brownsville, completed January 1, 1915, according to S. L. Montgomery, Engineer in Charge, has an equipment that includes one Nordberg Cross-Compound Condensing Steam Engine of 1200 horse-power, two 19-inch gas cylinders, four Babcock and Wilcox 335 horse-power boilers of the water tube type. The gas is cooled by the usual device of running the pipes through a pool of water.

The following well was a good gasser from the Gordon Sand and was reported to have made a little black oil from the Big Lime:

## G. C. Spaur No. 2493 Well Record (544).

Skin Creek District; on Skin Creek, 1.0 mile southeast of Alkires Mills; authority, Hope Natural Gas Co.; completed, May 22, 1912; elevation, 1055' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	400	480
Second Cow Run Sand.....	690	785
Salt Sand.....	1030	1170
Salt Sand.....	1180	1275
Little Lime.....	1561	1581
Pencil Cave.....	1581	1587
<b>Big Lime</b> .....	1587	1652
Big Injun Sand.....	1652	1792
Berea Sand.....	1951	1969
Fifty-foot Sand.....	2034	2050
Gordon Stray Sand.....	2195	2204
<b>Gordon Sand</b> (gas, 2207-28').....	2205	2228
Total depth.....		2230

The following well, drilled near by, was a good gasser:

## W. R. Jewel No. 4070 Well Record (545).

Skin Creek District; on Skin Creek, 0.5 mile northwest of Jewel School; authority, Pittsburgh & W. Va. Gas Co.; completed, Sept. 7, 1912; elevation, 1310' B.

	Top. Feet.	Bottom. Feet.
Sand, Second Cow Run.....	1075	1090
Sand, Salt.....	1328	1510
Sand, Salt.....	1514	1624
<b>Big Lime</b> .....	1876	1975
Sand, Big Injun.....	1975	2118
Sand, Berea.....	2175	2200
Sand, Fifty-foot.....	2355	2386
Sand, Thirty-foot.....	2391	2435
Sand, Gordon Stray.....	2444	2475
Sand, Gordon.....	2479	2495
Total depth.....		2514

Pressure in 3" tubing, at end of 40 minutes, 900 lbs.

The **Albert Gould No. 1** (546), drilled along Skin Creek, one mile above the Spaur well, was reported to have made a large amount of salt water and enough gas to run the drilling machinery, but was abandoned as a dry hole. The following well was drilled at the head of Skin Creek, near the Upshur Line, and made a show of both oil and gas, but was abandoned as a dry hole:

### John R. Francis No. 3287 Well Record (547).

Skin Creek District; on Skin Creek, 2.1 miles north of Frenchton; authority, Hope Natural Gas Co.; completed, Feb. 10, 1914; elevation, 1230' B.

	Top. Feet.	Bottom. Feet.
Gas Sand (water, 385' and 390').....	280	400
Second Cow Run Sand.....	530	560
Salt Sand.....	710	775
Salt Sand.....	835	875
Salt Sand.....	930	990
Maxton Sand.....	1315	1330
Little Lime.....	1360	1380
<b>Big Lime</b> .....	1390	1495
Big Injun Sand.....	1495	1595
Squaw Sand.....	1615	1700
Berea Sand.....	1740	1795
Fifty-foot Sand.....	1830	1845
<b>Thirty-foot Sand</b> (gas, 1996').....	1988	2007
Gordon Sand.....	2085	2125
<b>Fourth Sand</b> (oil show).....	2156	2166
<b>Fifth Sand</b> (oil show).....	2282	2289
Total depth.....		2662

The following well was reported to have made some gas, but was drowned out by salt water and abandoned as a dry hole:

### J. D. Butcher No. 1 Well Record (548).

Skin Creek District; on Little Skin Creek, 0.5 mile northwest of Clark School; authority, Pittsburgh & W. Va. Gas Co.; completed, July 10, 1912; elevation, 1050' B.

	Top. Feet.	Bottom. Feet.
Sand, Burning Springs.....	590	615
Sand, Gas.....	621	681
Sand, Second Cow Run.....	810	935
Sand, Salt.....	1070	1130
Sand, Salt.....	1155	1275
Sand, Maxton.....	1510	1518
<b>Big Lime</b> .....	1595	1690
Sand, Big Injun.....	1690	1790
Sand, Squaw.....	1840	1850
Sand, Berea.....	1992	2002
Sand, Fifty-foot.....	2052	2070
Sand, Thirty-foot.....	2105	2130
Sand, Gordon Stray.....	2190	
Sand, Gordon.....	2245	2285
<b>Sand, Fifth, to bottom</b> (steel line, 2416').....	2414	2424

The **George Simons No. 1 (549)**, drilled on Hershman Run, one mile northeast of Georgetown, was reported to have made a show of oil and gas, but was abandoned as a dry hole. Its record could not be secured. The following well, the record of which was published in Volume I, page 255, of the Survey, made a show of oil in what seems to be the Fourth Sand. Numerous revisions are made in the correlation of the sands and coals in this record, made possible by much more detailed information than was available when the record was first published:

### Perry Summers No. 1 Well Record (550).

Skin Creek District; on Right Fork of Stonecoal Creek, 2.3 miles southeast of Horner; authority, C. E. Griffiths; elevation, 1060' B.

	Thickness. Total.	
	Feet.	Feet.
Surface, brown, soft.....	15	15
Gravel, brown, soft.....	10	25
Red, soft.....	125	150
Brown, soft.....	75	225
Slate, to lime, white, hard and soft.....	250	475
Sand, white, hard, Burning Springs.....	30	505
Slate and shell, white, hard.....	20	525
Sand, white, hard, Gas.....	30	555
<b>Coal, soft (water), Lower Kittanning.....</b>	<b>12</b>	<b>567</b>
Sand, white, hard, Second Cow Run.....	20	587
Slate, white, soft.....	13	600
Sand, gray, hard, Second Cow Run.....	30	630
Slate, brown, soft.....	5	635
Sand, gray, hard.....	5	640
<b>Coal, soft (water), Mercer.....</b>	<b>5</b>	<b>645</b>
Sand, gray, hard (water), Salt.....	95	740
Slate and limestone, brown and hard.....	68	808
Sand, gray, hard, Salt.....	15	823
Limestone, pale brown, hard.....	17	840
Sand, gray, pebbly, Salt.....	20	860
Slate, black and soft.....	10	870
Sand, gray, hard, Salt.....	45	915
Slate, black, soft.....	55	970
Limestone, blue, hard.....	20	990
Sand, gray, hard, Salt.....	50	1040
Limestone, blue, hard.....	10	1050
Sand, white and yellow, hard, Salt.....	150	1200
Red rock, soft.....	100	1300
Sand, light gray, hard (water), Maxton (cased, 6¼").....	65	1365

	Thickness Feet.	Total Feet.		
Limestone, dark brown.....30' }				
Limestone, gray..... 5 }				
Limestone, white.....50 }	} <b>Big Lime.....</b> 100	1465		
Limestone, brown.....15 }				
Sand, gray, Keener.....			5	1470
Limestone, white.....			30	1500
Sand, gray, Big Injun.....	10	1510		
<b>Red rock.....</b>	5	1515		
Limestone, white.....	55	1570		
Sand, white, Squaw.....	10	1580		
Limestone, dark gray.....	10	1590		
Limestone, black.....	10	1600		
Slate and shell.....	50	1650		
Sand, white, Weir.....	10	1660		
Slate, black.....	5	1665		
Sand, white.....	10	1675		
Slate, black.....	5	1680		
Sand, white, Berea.....	90	1770		
Slate, black, soft.....	5	1775		
Sand, white, hard, Fifty-foot.....	60	1835		
Slate, black, soft.....	5	1840		
Sand, white, hard, Thirty-foot.....	25	1865		
Red rock, and sand shells, red and gray.....	115	1980		
Sand, gray and white, Gordon.....	70	2050		
Slate and shells, white and brown.....	90	2140		
<b>Sand, white and pebbly (oil show), Fourth.....</b>	20	2160		
Slate, black, soft.....	5	2165		
Sand, white, hard, Fifth.....	15	2180		
Slate and shells, black.....	60	2240		
Slate and shells, black and white.....	10	2250		
Slate, white, soft.....	40	2290		
Slate, white, hard.....	10	2300		
Slate, white, to bottom.....	101	2401		

Several wells have been drilled along the head of Stone-coal Creek, in the edge of Upshur County, some of which have been light gas producers, while others have been abandoned as dry holes. The records of six of these wells, kept with exceeding care by Mr. J. J. Singleton, Manager of the Buckhannon Relief Oil and Gas Company, will be published both for their information on oil and gas and for the valuable data on coal that they contain.



## James R. White No. 1 Well Record (552).

Buckhannon District, Upshur County; on Stonecoal Creek, 1.4 miles southwest of Atlas; authority, Buckhannon Relief Oil & Gas Co.; elevation, 1150' L.

	Thickness. Total.	
	Feet.	Feet.
Conductor .....	10	10
Lime (hole full of water).....	14	24
Slate .....	6	30
Lime .....	40	70
Slate .....	13	83
Coal, Brush Creek.....	2	85
Slate .....	15	100
Lime .....	15	115
Slate .....	25	140
Lime .....	23	163
Slate (water, 20 bailers).....	24	187
Lime .....	13	200
Slate .....	5	205
Sand, Big Dunkard (hole full of water).....	20	225
Slate (water).....	5	230
Coal, Upper Freeport.....	8	238
Slate .....	12	250
Lime .....	14	264
Slate .....	36	300
Lime .....	5	305
Coal, Upper Kittanning.....	5	310
Slate .....	20	330
Sand, Gas (water ran over hole).....	31	361
Black slate.....	14	375
Lime .....	14	389
Black slate.....	11	400
White slate.....	46	446
Lime .....	54	500
Sand, Salt.....	33	533
Lime .....	17	550
Sand, Salt.....	13	563
Slate and shells (gas forced water over derrick)..	59	622
Lime .....	18	640
Slate .....	7	647
Sand, Salt.....	103	750
Slate and shells.....	95	845
Salt Sand.....	63	908
Black slate.....	6	914
Lime .....	16	930
Black slate.....	30	960
Sand, Salt.....	20	980
Slate .....	4	984
Sand, Salt.....	46	1030
Red rock.....	10	1040
Lime .....	15	1055
Slate and shells.....	31	1086
Red rock and shells.....	14	1100
Red rock.....	55	1155
Lime .....	10	1165
Red rock.....	15	1180

	Thickness. Total.	
	Feet.	Feet.
Lime .....	8	1188
White slate.....	12	1200
Lime .....	10	1210
Slate .....	25	1235
Red rock.....	20	1255
Big Lime.....	62	1317
Big Injun Sand (red rock at 1380'; show of oil, 1438½'; lots of paraffine, looked like slush) ..	143	1460
Slate .....	10	1470
Lime .....	14	1484
Squaw Sand.....	54	1538
Slate .....	22	1560
Sand, Weir.....	50	1610
Slate and shells.....	20	1630
Sand, white, Berea.....	10	1640
Slate .....	10	1650
Fifty-foot Sand.....	50	1700
Slate .....	8	1708
Lime .....	10	1718
Red rock.....	10	1728
Lime .....	22	1750
Red rock.....	5	1755
Lime .....	15	1770
Red rock.....	9	1779
Sand, Thirty-foot.....	66	1845
Slate and shells.....	22	1867
Gordon Stray Sand (slate at 1890'; steel line, 1906'; show of oil and little gas, 1904')....	45	1912
Slate and shells.....	21	1933
Sand, Gordon.....	12	1945
Slate and shells.....	40	1985
Sand .....	35	2020
Fourth Sand (gas, 2048½', steel line).....	36	2056
Slate and shells.....	104	2160
Slate .....	50	2210
Sandy slate.....	20	2230
Lime .....	35	2265
Slate .....	5	2270
Black slate.....	15	2285
Bayard Sand and shells.....	23	2308
Slate, soft.....	37	2345
Sandy lime.....	20	2365
Slate .....	35	2400
Slate and shells.....	65	2465
Bastard lime.....	25	2490
Slate and shells to bottom.....	314	2804

The above well made a little gas, but was soon abandoned.

The following well was abandoned as a dry\* hole, but makes a little gas that is used in the Krise residence:

## Jacob Krise No. 1 Well Record (553).

Buckhannon District, Upshur County; on Brushlick Run, 2.3 miles southwest of Atlas; authority, Buckhannon Relief Oil & Gas Co.; elevation, 1255' B.

	Thickness. Total.	
	Feet.	Feet.
Unrecorded .....	120	120
<b>Coal</b> .....	2	122
Unrecorded .....	23	145
<b>Coal, Brush Creek</b> .....	5	150
Unrecorded .....	110	260
Sand, Big Dunkard.....	20	280
Unrecorded .....	80	360
Sand .....	5	365
Unrecorded .....	20	385
<b>Coal, Upper Kittanning (water and gas, 388')</b> ....	5	390
Unrecorded .....	82	472
Sand shells.....	23	495
Unrecorded .....	35	530
Sand, Second Cow Run.....	25	555
Slate .....	55	610
Lime shells.....	46	656
Lime .....	10	666
<b>Sand, Salt</b> .....	29	695
Lime shells.....	25	720
<b>Sand, Salt (gas, 795'; steel line)</b> .....	135	855
Slate .....	40	895
Sand, Salt.....	10	905
Slate and shells.....	95	1000
Sand, Salt.....	75	1075
Slate .....	10	1085
Red rock.....	25	1110
Slate .....	21	1131
Lime .....	45	1176
Red rock.....	34	1210
Lime .....	20	1230
Red rock.....	22	1252
Little Lime.....	8	1260
Pencil Cave.....	6	1266
<b>Big Lime</b> .....	115	1381
Sand, Big Injun (steel line).....	44	1425
Red rock.....	6	1431
Sand .....	5	1436
Red rock.....	12	1448
Sand .....	6	1454
Lime .....	36	1490
<b>Sand (oil show, 1515')</b> ..... 30' } <b>Slate (steel line, 1525')</b> ..... 10 } <b>Squaw</b> .... 60 1550 <b>Sand</b> .....	20 }	
Slate .....	5	1555
Sand, Weir.....	75	1630
Slate .....	5	1635
Sand (pebbles at 1641') Berea.....	30	1665
Slate .....	49	1714
Sand, Gantz.....	20	1734

	Thickness. Total.	
	Feet.	Feet.
Slate .....	7	1741
Sand, Fifty-foot.....	32	1773
Red rock.....	30	1803
Sand .....	17	1820
Red rock.....	5	1825
Sand, Thirty-foot.....	20	1845
Red rock.....	22	1867
Sand, Gordon Stray.....	30	1897
Red rock, sand slate (steel line).....	52	1949
Sand shells.....	13	1962
<b>Sand, Gordon</b> (show of oil and gas).....	10	1972
Red rock.....	23	1995
Sand shells.....	3	1998
Slate and sand shells (oil smell, 2050').....	59	2057
Sand, Fourth.....	14	2071
Slate, sand shells.....	33	2104
<b>Sand, dark, Fifth</b> (oil smell, 2112').....	8	2112
Slate, black.....	26	2138
Sand and slate break.....	97	2235
Lime shells.....	5	2240
Slate .....	23	2263
<b>Sand, Bayard</b> (gas) (steel line, 2267').....	10	2273
Sand and slate.....	43	2316
Slate and lime shells.....	19	2335
<b>Sand, Elizabeth</b> (oil or gas smell).....	42	2377
Slate to bottom (steel line).....	27	2404

### John Smith No. 1 Well Record (554).

Buckhannon District, Upshur County; on Brushlick Run, 2.5 miles southwest of Atlas; authority, Buckhannon Relief Oil & Gas Co.; elevation, 1365' B.

	Thickness. Total.	
	Feet.	Feet.
Conductor .....	16	16
Unrecorded .....	4	20
Red clay.....	10	30
Lime .....	10	40
Red rock.....	10	50
White slate.....	10	60
<b>Coal, Bakerstown</b> .....	2	62
Slate .....	13	75
Lime .....	5	80
Slate .....	4	84
Lime, white.....	16	100
Red rock.....	25	125
Sand .....	25	150
Slate .....	50	200
Sand, Big Dunkard.....	30	230
Slate .....	30	260
<b>Coal, Upper Freeport</b> .....	5	265
Slate .....	10	275
Lime .....	35	310
Slate .....	15	325

	Thickness. Total.	
	Feet.	Feet.
Lime .....	35	360
Slate .....	20	380
Sand, Burning Springs.....	20	400
Slate .....	50	450
Sand, Gas.....	35	485
Slate .....	5	490
<b>Coal, Lower Kittanning.....</b>	<b>2</b>	<b>492</b>
Slate, black.....	28	520
Lime, white.....	20	540
Slate .....	30	570
Sand, very hard, Second Cow Run.....	20	590
Slate .....	15	605
Sand, Salt.....	70	675
Sand, hard.....	65	740
Sand, black, Salt.....	50	790
Lime, white.....	20	810
Slate, white.....	5	815
Sand, Salt....	25	840
Slate, black.....	20	860
Salt Sand.....	95	955
Slate, black.....	85	1040
Sand, Salt.....	15	1055
Slate .....	70	1125
Sand, Salt.....	65	1190
Reds .....	20	1210
Sand .....	75	1285
Slate .....	5	1290
Sand, Maxton.....	40	1330
Reds .....	25	1355
Slate and shells.....	65	1420
Red rock.....	10	1430
<b>Big Lime.....</b>	<b>65</b>	<b>1495</b>
Sand (gas)..... 5' } Lime ..... 40 } <b>Big Injun.....</b> 65 1560 Sand ..... 20 }		
Reds .....	5	1565
Lime .....	65	1630
Slate .....	10	1640
Sand .....	10	1650
Reds .....	5	1655
Slate .....	5	1660
Squaw Sand.....	20	1680
Slate .....	15	1695
Sand .....	40	1735
Slate .....	15	1750
Sand, Weir.....	30	1780
Slate .....	10	1790
Sand, hard.....	10	1800
Slate .....	5	1805
Berea Sand.....	90	1895
Red rock.....	20	1915
Sand .....	5	1920
Red rock.....	25	1945
Sand, Fifty-foot.....	5	1950
Red rock.....	20	1970

	Thickness. Total.	
	Feet.	Feet.
Sand .....	15	1985
Red rock.....	15	2000
Sand, Thirty-foot.....	20	2020
Slate .....	5	2025
Reds .....	25	2050
Sand, Gordon Stray.....	15	2065
Red rock.....	12	2077
<b>Gordon Sand</b> (gas, 2088½').....	13	2090
Slate .....	20	2110
Sand .....	20	2130
<b>Slate</b> .....	43	2173
Fourth Sand.....		
Unrecorded to bottom.....	147	2320

The above well is a light gasser.

### Louvina Linger No. 1 Well Record (556).

Buckhannon District, Upshur County; on Pigeonroost Run, 1.6 miles northeast of Abbott; authority, Buckhannon Relief Oil & Gas Co.; elevation, 1380' B.

	Thickness Total	
	Feet.	Feet.
Red clay.....	5	5
Red rock.....	20	25
Sandy lime.....	11	36
Red rock.....	49	85
White slate.....	25	110
Gray lime.....	12	122
White slate.....	3	125
<b>Coal, Bakerstown</b> .....	1	126
Dark slate.....	1	127
Gray lime.....	2	129
White slate.....	13	142
Blue lime.....	14	156
Reds .....	24	180
Lime .....	30	210
Sand, (water), Big Dunkard.....	24	234
Slate .....	12	246
<b>Coal, (show of gas), Upper Freeport</b> .....	8	254
Black slate.....	6	260
Lime .....	81	341
Slate, white.....	15	356
Lime .....	20	376
Sand, Burning Springs.....	16	392
Black shale.....	8	400
Gray lime.....	52	452
<b>Black shale and sand, Gas (gas)</b> .....	11	463
Black slate.....	7	470
Lime .....	7	477
<b>Coal, Lower Kittanning</b> .....	8	485
Slate .....	23	513
Sand, Second Cow Run.....	44	557
Black slate.....	13	570
Lime shale, first gas sand.....	70	640

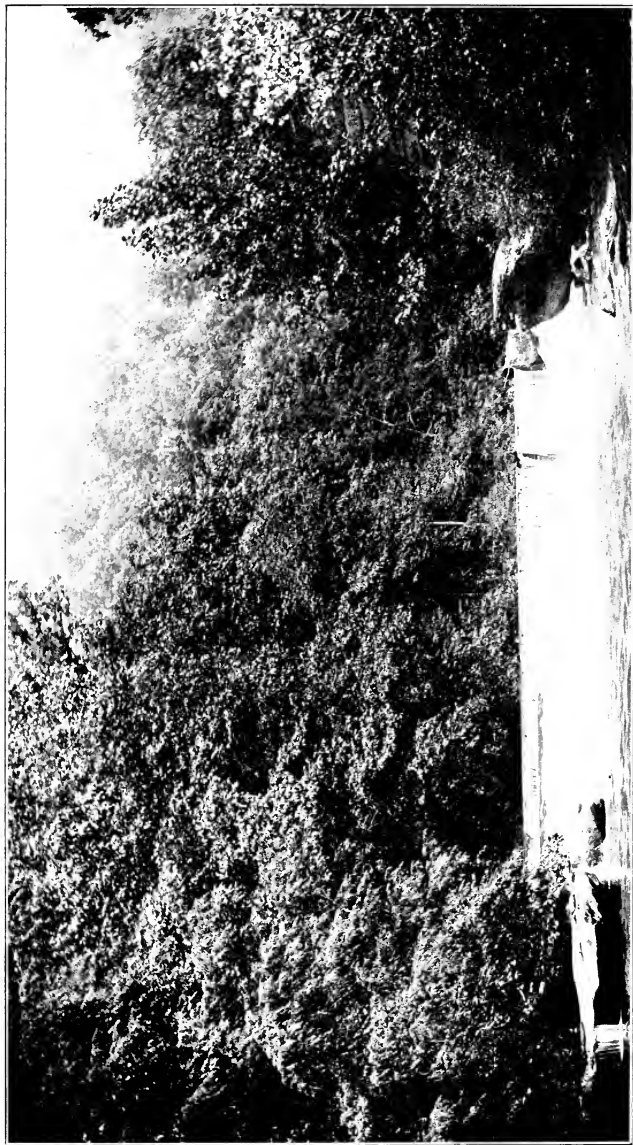


PLATE XXVII.—Falls of Right Fork of Little Kanawha River at Bois, Lewis County; over Cleveland or next underlying sandstone at left and over mill dam on right; Topography of the Pottsville Series.





	Thickness.	Total.
	Feet.	Feet.
Sand, hard, Salt.....	112	752
Slate and sand.....	26	778
Black shale.....	17	795
White slate.....	99	894
Slate.....	12	906
Black shale.....	24	930
Sand and shells, Salt.....	86	1016
White sand, Salt.....	14	1030
Slate and shell.....	45	1075
White sand, Salt.....	25	1100
Black slate.....	16	1116
Hard sand, Salt.....	64	1180
Red rock.....	20	1200
Lime.....	32	1232
Maxton Sand.....	59	1291
Red rock.....	56	1347
Slate and shells.....	25	1372
Lime.....	19	1391
White slate.....	9	1400
Lime.....	12	1412
Red rock.....	5	1417
Little Lime.....	13	1430
Pencil Cave.....	3	1433
Big Lime.....	39	1472
Big Injun Sand (gas, 1478'; show of oil, 1490')... 154		1626
Slate.....	4	1630
Sand.....15' } Squaw		
Sand (oil and water, 1650')..25 }	40	1670
Slate and shells.....	10	1680
Lime.....	5	1685
Sand.....	19	1704
Slate and lime shells.....	19	1723
Sand, Weir.....	35	1758
Slate and shells.....	9	1767
Sand.....	33	1800
Slate and shells.....	10	1810
Sand, Berea.....	67	1877
Red rock.....	64	1941
Lime.....	8	1949
Red rock.....	41	1990
Sand and shells, Fifty-foot.....	6	1996
Red rock.....	56	2052
Sand, Thirty-foot (show of oil and gas, 2058')... 14		2066
Slate.....	5	2071
Lime shells.....	8	2079
Lime, sandy.....	24	2103
Slate.....	49	2152
Gordon Sand (gas, 2154-64').....	34	2186
Slate and shells.....	40	2226
Sand and shells, Fourth.....	4	2230
Slate and shells.....	167	2397
Sand and shells, Bayard.....	3	2400
Unrecorded to bottom.....	10	2410

The above well produces gas from the Gordon Sand.

## J. F. Gould No. 1 Well Record (558).

Buckhannon District, Upshur County; on Pigeonroost Run, 1.5 miles north of Abbott; authority, Buckhannon Relief Oil & Gas Co.; elevation, 1220' B.

	Thickness. Total.	
	Feet.	Feet.
Conductor .....	12	12
Slate .....	66	78
Lime .....	29	107
Slate .....	15	122
Coal, Upper Freeport.....	3	125
Slate .....	8	133
Lime .....	19	152
Slate .....	34	186
Lime .....	17	203
Slate and shells.....	17	220
Slate .....	16	236
Lime .....	32	268
Slate .....	12	280
Lime .....	24	304
Slate .....	56	360
Lime .....	45	405
Sand, Second Cow Run.....	95	500
Sand .....	16	516
Slate .....	34	550
Sand, Salt.....	22	572
Slate .....	23	595
Lime .....	63	658
Slate and shells.....	48	706
Sand, Salt.....	76	782
Slate and shells.....	24	806
Sand, hard, Salt.....	36	842
Sand, Salt.....	58	900
Slate and shells.....	80	980
Sand, Salt.....	83	1063
Red rock.....	29	1092
Sand .....	22	1114
Lime .....	56	1170
Red rock.....	30	1200
Lime .....	15	1215
White slate.....	8	1223
Lime .....	12	1235
Slate and shells.....	33	1268
Little Lime.....	18	1286
Pencil Cave.....	6	1292
Big Lime.....	54	1346
Big Injun Sand.....	147	1493
Slate .....	7	1500
Squaw Sand.....	18	1518
Slate .....	10	1528
Sand, Weir.....	55	1583
Slate and shells.....	77	1660
Sand, Berea.....	75	1735
Red rock.....	26	1761
Slate and shells.....	15	1776

	Thickness.	Total.
	Feet.	Feet.
Red rock.....	133	1909
Sand, <b>Thirty-foot</b> (gas, 1917').....	24	1933
Slate and shells.....	97	2030
Sand, <b>Gordon</b> .....	34	2064
Slate and shells.....	36	2100
Slate .....	54	2154
Lime .....	3	2157
Slate and unrecorded to bottom.....	98	2255

The above well is a light gasser in the Thirty-foot Sand.

### James Duncan No. 1 Well Record (559).

Meade District, Upshur County; on Bearpen Fork, 1.4 miles north-west of Abbott; authority, Buckhannon Relief Oil & Gas Co.; elevation, 1365' B.

	Thickness.	Total.
	Feet.	Feet.
Clay .....	5	5
Red rock.....	15	20
Lime .....	65	85
Red rock.....	25	110
Slate .....	25	135
Lime .....	15	150
Coal, <b>Bakerstown</b> .....	2	152
Slate .....	28	180
Lime .....	76	256
Slate .....	12	268
Coal, <b>Upper Freeport</b> .....	6	274
Slate .....	109	383
Sand, Gas.....	47	430
Slate .....	47	477
Coal, <b>Lower Kittanning</b> .....	6	483
Slate .....	25	508
Sand, <b>Second Cow Run</b> (water, 509').....	22	530
Slate .....	5	535
Sand .....	15	550
Slate .....	61	611
Lime and shells.....	19	630
Sand, Salt.....	15	645
Slate and shells.....	15	660
Lime .....	10	670
Slate .....	30	700
Sand .....	12	712
Slate .....	38	750
Slate and shells.....	40	790
Salt Sand.....	55	845
Slate .....	40	885
Salt Sand.....	35	920
Slate .....	6	926
Sand, Salt.....	14	940
Black slate.....	40	980
Lime and shells.....	15	995

	Thickness.	Total.
	Feet.	Feet.
Black slate.....	15	1010
Lime .....	30	1040
Black slate.....	60	1100
Salt Sand, hard, (gas, 1102').....	15	1115
Slate .....	13	1128
Salt Sand (light show of oil, 1155').....	72	1200
Red rock.....	27	1227
Lime .....	61	1288
Lime, hard.....	10	1298
Red rock.....	19	1317
Sand, hard.....	15	1332
White slate.....	5	1337
Lime .....	23	1360
Sand, white and hard (water, 1366'), Maxton.....	15	1375
White slate.....	7	1382
Lime .....	18	1400
White slate.....	20	1420
Red rock.....	5	1425
Little Lime.....	6	1431
Pencil Cave.....	5	1436
Big Lime.....	50	1486
Big Injun Sand (show of oil, 1675').....	194	1680
Slate .....	5	1685
Sand, hard, Squaw (water, 1720').....	35	1720
Sand, soft, Weir.....	45	1765
Slate and shells.....	51	1816
Sand, Berea.....	85	1901
Red rock.....	73	1974
Lime .....	8	1982
Red rock and shells.....	28	2010
Sand shells, white, Thirty-foot.....	45	2055
Red rock, gritty, with sand shells.....	25	2080
Brown sand, Gordon Stray.....	20	2100
Slate and sand shells.....	30	2130
Sand shells, hard, Gordon.....	5	2135
Slate, white and soft.....	10	2145
Sandy lime.....	15	2160
Slate and shells.....	40	2200
Sand, hard and white, Fourth.....	25	2225
Sand, soft and broken.....	5	2230
Slate and sand shells.....	5	2235
Slate, soft.....	27	2262
Sand, hard, Fifth (gas).....	6	2268
Slate, white (steel line, 2284').....	127	2395
Sand shell.....	20	2415
Chocolate sand, Bayard.....	20	2435
Slate, dark.....	15	2450
Slate, light.....	25	2475
White slate.....	45	2520
Slate and shells.....	35	2555

"Driller reported gas at 2262'-2268', but other man said it was lower down. H. A. Darnall reported gas in chocolate sand."

The above well made only a light showing of gas and was abandoned as a dry hole.

**Prospective Oil and Gas Areas, Skin Creek District.**—The fact that Skin Creek District does not contain any anticlines or synclines, but has only a monoclinial structure, with few abrupt changes of dip, as well as the additional information supplied by the records of the several wells drilled in or around it, few of which have been producers of consequence, leads to the belief that further drilling will prove hazardous. The following suggestions are offered regarding the further testing of this district: (1), The presence of gas in the lower sands in the western part of the district and also in the same group of sands along the Upshur Line, both on the head of Stonecoal and at Frenchton, makes it seem probable that these three gas areas could be connected by wells drilled along Big and Little Skin Creeks. (2), The show of Big Injun oil in Wells Nos. 552, 556 and 559, and the oil found in the Fourth Sand in Wells Nos. 547 and 550, as well as considerable gas in the same sands along the Upshur Line, offers a faint hope that oil may be found at the cove-like structural terrace on Straight Run of the Right Fork of Stonecoal Creek, and along the wide terrace north of Vandalia, between the 1325 and 1350-foot structure contours in the vicinity of Pine Knob.

### *Detailed Well Records, Collins Settlement District.*

Collins Settlement District, occupying the extreme southeastern part of the county, and having its structure diversified by the Orlando Anticline, and the Roanoke Syncline along its western border and the long monoclinial slope on the east and south, has been prospected to a considerable extent for oil and gas, with fairly successful results on the west and indifferent returns on the east and south. No producing oil wells have been found, although important showings have been made in several localities, but gas is found in considerable volume in the western part.

Just north of Frenchton in Upshur County, near the Collins Settlement District Line, six wells have been drilled, some of which produce gas. The **Hazen Phillips No. 2659 (560)** was a light gasser from the Thirty-foot Sand and the

**Hazen Phillips No. 2658 (561)** was a light gasser from the Gordon. The **J. S. Douglass No. 1 (562)** was a dry hole, and the **Charles M. Hyre No. 2656 (563)** made gas from the Gordon and Fourth, the best production being in the former sand. The **Gordon B. Talbott No. 2657 (564)** made a little gas in the Gordon, and the **George P. Talbott No. 3416 (565)** made shows of gas in the Big Injun, Berea and Fourth Sands, but was abandoned as a dry hole.

In the neighborhood of Roanoke several wells have been drilled along the shallow Roanoke Syncline, some of which have produced gas. The record of the **C. W. Watson No. 2554 (570)** was published in the section for Roanoke, page 67. The well was a dry hole. The five following records are available from this locality:

#### G. W. Smith No. 2574 Well Record (567).

Collins Settlement District; on Sand Fork, 0.8 mile southeast of Roanoke; authority, Hope Natural Gas Co.; completed, July 11, 1912; elevation, 1055' B.

	Top. Feet.	Bottom. Feet.
Little and Big Dunkard Sands (water, 545').....	480	575
Burning Springs Sand.....	640	700
Second Cow Run Sand.....	780	925
Salt Sand.....	930	980
Salt Sand.....	1060	1400
Unrecorded (water, 1480').....	1400	1630
Maxton Sand.....	1630	1645
Little Lime.....	1691	1705
Pencil Cave.....	1705	1720
Big Lime.....	1720	1800
Big Injun Sand.....	1800	1940
Berea Sand (gas, 2088').....	2085	2115
Gantz Sand.....	2165	2180
Fifty-foot Sand.....	2230	2272
Thirty-foot Sand.....	2300	2330
Gordon Stray Sand.....	2340	2365
Gordon Sand.....	2405	2418
Fourth Sand (gas, 2512').....	2510	2516
Total depth.....		3104

## John G. Rohrbaugh No. 2588 Well Record (571).

Collins Settlement District; on West Fork River, 0.5 mile north of Roanoke; authority, Hope Natural Gas Co.; completed, June 24, 1912; elevation, 1150' B.

	Top. Feet.	Bottom. Feet.
Grafton Sand.....	440	460
Little Dunkard Sand.....	640	665
Burning Springs Sand.....	840	885
Salt Sand.....	1200	1350
Salt Sand.....	1370	1470
Pencil Cave.....	1875	1895
<b>Big Lime</b> .....	1895	1970
Big Injun Sand.....	1970	2080
Squaw Sand.....	2135	2150
Unrecorded (gas in <b>Weir Sand, 2255-7'</b> ).....	2150	2260
Berea Sand.....	2260	2300
Fifty-foot Sand.....	2400	2500
Thirty-foot Sand.....	2500	2540
<b>Fourth Sand</b> (gas, 2710').....	2708	2719
Total depth.....		2779

## T. F. Mullooly No. 2575 Well Record (572).

Collins Settlement District; on West Fork River, at Roanoke; authority, Hope Natural Gas Co.; completed, July 8, 1912; elevation, 1060' L.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	490	510
Gas Sand.....	650	690
Second Cow Run Sand (water, 740').....	720	745
Salt Sand.....	850	1075
Little Lime.....	1758	1783
Pencil Cave.....	1783	1795
<b>Big Lime</b> .....	1795	1867
<b>Big Injun Sand</b> (oil, 1893').....	1867	2012
Squaw Sand.....	2050	2075
Berea Sand.....	2160	2180
Fifty-foot Sand.....	2275	2290
Thirty-foot Sand.....	2300	2340
Gordon Sand.....	2470	2480
<b>Fourth Sand</b> (gas, 2600-4').....	2598	2606
Total depth.....		2776

According to W. E. Mullooly, the shooter reported enough oil in this well from the Injun Sand to have made a light pumper, but it was abandoned owing to its isolated location.

The following well was a light gasser, the casing being

pulled and the well abandoned. It still furnishes gas for domestic purposes:

### Mary McDonald No. 2595 Well Record (574).

Collins Settlement District; on Middle Fork, 1.5 miles west of Roanoke; authority, Hope Natural Gas Co.; completed, June 28, 1912; elevation, 1270' B.

	Top. Feet.	Bottom. Feet.
Murphy Sand.....	450	465
Grafton Sand.....	550	575
Gas Sand.....	950	1004
Second Cow Run Sand.....	1014	1120
Salt Sand.....	1125	1140
Unrecorded (water, 1810').....	1140	1820
Maxton Sand.....	1820	1835
Little Lime.....	1950	1960
Pencil Cave.....	1960	1980
Big Lime.....	1980	2081
Big Injun Sand.....	2081	2212
Squaw Sand.....	2230	2250
Fifty-foot Sand.....	2515	2540
Fourth Sand (gas, 2812').....	2809	2816
Total depth.....		2994

### Susan Swecker No. 2623 Well Record (575).

Collins Settlement District; on Right Fork, 2.6 miles northwest of Roanoke; authority, Hope Natural Gas Co.; completed, July 30, 1912; elevation, 1285' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	760	790
Gas Sand.....	890	960
Second Cow Run Sand.....	1030	1090
Salt Sand.....	1170	1225
Salt Sand.....	1420	1550
Maxton Sand.....	1740	1820
Little Lime.....	1900	1915
Pencil Cave.....	1915	1930
Big Lime.....	1930	1955
Big Injun Sand (gas, 2012').....	1985	2130
Fifty-foot Sand.....	2430	2452
Thirty-foot Sand.....	2505	2530
Gordon Stray Sand.....	2539	2557
Fourth Sand.....	2717	2729
Fifth Sand.....	2818	2824
Total depth.....		2920

The above well was reported a light gasser.



## Geo. W. Hall No. 2592 Well Record (576).

Collins Settlement District; on West Fork River, 0.6 mile south-east of Roanoke; authority, Hope Natural Gas Co.; completed, July 9, 1912; elevation, 1165' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	660	700
Burning Springs Sand.....	770	820
Gas Sand.....	850	930
Second Cow Run Sand.....	960	1150
Salt Sand.....	1200	1500
Maxton Sand.....	1820	1835
Little Lime.....	1865	1880
Pencil Cave.....	1880	1890
<b>Big Lime.....</b>	<b>1890</b>	<b>1943</b>
Big Injun Sand.....	1943	2100
Squaw Sand.....	2100	2160
Berea Sand.....	2260	2275
Fifty-foot Sand.....	2375	
Sand .....	2430	2450
Thirty-foot Sand.....	2452	
Gordon Stray Sand.....	2483	2520
Fourth Sand.....	2705	2711
Total depth.....		2921

The above well was reported a dry hole.

The **Maud Arnold No. 1 (577)**, drilled at Arnold Station, was reported a dry hole, but its record was not obtained. Residents reported that it was drilled by the Southern Oil Company, but this statement was denied by officials of the company. The two following wells were drilled along the eastern slope of the Roanoke Syncline:

**George Arnold No. 2766 Well Record (578).**

Collins Settlement District; on Twolick Run, 1.3 miles southwest of Arnold; authority, Hope Natural Gas Co.; completed, Jan. 11, 1913; elevation, 1280' B.

	Top. Feet.	Bottom. Feet.
Murphy Sand.....	465	480
Big Dunkard Sand.....	810	860
Gas Sand.....	1040	1135
Second Cow Run Sand.....	1150	1400
Salt Sand.....	1410	1470
Maxton Sand.....	1890	1910
Little Lime.....	2015	2035
Pencil Cave.....	2035	2045
<b>Big Lime.....</b>	<b>2045</b>	<b>2115</b>
Big Injun Sand.....	2115	2255

	Top. Feet.	Bottom. Feet.
Thirty-foot Sand (gas, 2615').....	2613	2617
Fourth Sand.....	2850	2852
Total depth.....		3103

The above well is a producer from the Thirty-foot Sand.

### George Arnold No. 3225 Well Record (579).

Collins Settlement District; on Oil Creek, 0.9 mile northwest of Jacksonville; authority, Hope Natural Gas Co.; completed, Jan. 3, 1914; elevation, 995' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	360	425
Big Dunkard Sand.....	470	560
Gas Sand.....	585	675
Salt Sand.....	1110	1200
Salt Sand.....	1411	1470
Maxton Sand.....	1581	1590
Little Lime.....	1620	1650
Pencil Cave.....	1650	1670
<b>Big Lime.....</b>	<b>1670</b>	<b>1750</b>
Big Injun Sand.....	1750	1865
Squaw Sand.....	1880	1900
Berea Sand.....	2065	2068
Fifty-foot Sand (shell).....	2100	
Gordon Stray Sand.....	2310	2325
Unrecorded (gas in <b>Fourth Sand</b> , 2459').....	2325	2510
Fifth Sand (shell).....	2510	
Total depth.....		3000

The above well was abandoned as a dry hole.

Several wells have been drilled along the Orlando Anti-cline northeast of Orlando, most of which have been good gas producers. The seven following records are from this locality. The record of the **Waters Heirs No. 4 (585)**, which made gas from the Gordon Stray Sand, was published in the section for Orlando, page 69.

### Louis Bennett No. 1 Well Record (580).

Collins Settlement District; on Second Big Run, 0.8 mile north of Bennett; authority, Guffey & Galey; elevation, 880' B.

	Thickness. Feet.	Total. Feet.
Conductor .....	22	22
Sand, Murphy.....	8	30
Slate .....	28	58

	Thickness. Total.	
	Feet.	Feet.
Lime .....	15	73
Red rock.....	45	118
Sand, Moundsville.....	35	153
Slate .....	128	281
Lime .....	74	355
Slate .....	208	563
Lime .....	90	653
Red rock.....	10	663
Lime .....	25	688
Slate and shells.....	235	923
Sand, Salt.....	28	951
Slate .....	12	963
Lime .....	55	1018
Slate and shells.....	140	1158
Sand, Salt.....	132	1290
Coal .....	8	1298
Lime .....	35	1333
Sand, white, Salt.....	54	1387
Lime .....	38	1425
Red rock.....	30	1455
Red limestone, Little Lime.....	42	1497
Slate, Pencil Cave.....	12	1509
<b>Big Lime</b> .....	20	1529
Slate and shells.....	45	1574
Lime .....	26	1600
Slate, black.....	12	1612
Lime .....	28	1640
Slate .....	6	1646
Sand, Big Injun, bottom portion.....	15	1661
Slate and shells.....	20	1681
Lime, (gas, 1750') (Squaw Sand).....	83	1764
Slate .....	22	1786
Sandy lime.....	60	1846
Slate .....	30	1876
Lime .....	18	1894
Slate and shells.....	218	2112
Slate, brown.....	16	2128
Sand, brown, with white pebbles, Gordon Stray...	12	2140
Slate and shells.....	30	2170
Sand, gray, Gordon.....	37	2207
Slate and shells.....	60	2267
Pink rock.....	24	2291
Lime, sandy.....	12	2303
Slate and shells to bottom.....	587	2890

The above well was abandoned, but makes considerable gas from a formation recorded as "lime," but probably represents the Squaw Sand.

### Louis Bennett No. 2616 Well Record (581).

Collins Settlement District; on Second Big Run, 1.8 miles north of Bennett; authority, Hope Natural Gas Co.; completed, Aug. 22, 1912; elevation, 1110' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	500	550
Burning Springs Sand.....	690	710
Salt Sand.....	1050	1160
Salt Sand (gas, 1325').....	1310	1340
Salt Sand (gas, 1562-8').....	1549	1589
Little Lime.....	1727	1747
Pencil Cave.....	1747	1755
<b>Big Lime</b> .....	1755	1840
Big Injun Sand.....	1840	1960
Thirty-foot Sand.....	2327	
Gordon Stray Sand.....		2389
Gordon Sand (gas, 2452').....	2450	2475
Total depth.....		3012

### J. H. Groves No. 2733 Well Record (582).

Collins Settlement District; on Oil Creek, 0.7 mile southwest of Bennett; authority, Hope Natural Gas Co.; completed, Oct. 29, 1912; elevation, 810' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand (water, 310').....	260	310
Big Dunkard Sand.....	360	395
Gas Sand.....	515	595
Second Cow Run Sand (water, 670').....	606	785
Salt Sand.....	820	900
Salt Sand.....	915	950
Salt Sand.....	1120	1150
Little Lime.....	1523	1538
Pencil Cave.....	1538	1546
<b>Big Lime</b> .....	1546	1606
Big Injun Sand.....	1606	1734
Berea Sand (gas, 1950').....	1949	1955
Thirty-foot Sand.....	2097	2103
Gordon Stray Sand.....	2132	2152
Total depth.....		2571

The above well made only a show of gas from the Berea Sand. and was abandoned as a dry hole.

## Louis Bennett No. 2671 Well Record (583).

Collins Settlement District; 0.9 mile northwest of Bennett; authority, Hope Natural Gas Co.; completed, Oct. 3, 1912; elevation 1280' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	705	750
Big Dunkard Sand.....	770	846
Gas Sand.....	955	1040
Second Cow Run Sand.....	1050	1140
Salt Sand.....	1145	1235
Salt Sand.....	1265	1310
Maxton Sand (gas, 1786').....	1750	1820
Little Lime.....	1912	1942
Pencil Cave.....	1942	1950
Big Lime.....	1950	2037
Big Injun Sand (gas, 2125').....	2037	2165
Squaw Sand.....	2183	2197
Weir Sand.....	2224	2244
Berea Sand.....	2400	2412
Fifty-foot Sand.....	2440	2450
Thirty-foot Sand.....	2538	2554
Gordon Stray Sand.....	2567	2597
Gordon Sand.....	Shells.	
Fourth Sand.....	2760	2764
Bayard Sand.....	2915	2923
Total depth.....		3443

The above well was abandoned as a dry hole.

## Waters Heirs No. 3 Well Record (586).

Collins Settlement District; on Threelick Run, 1.9 miles N. 10° E. of Orlando; authority, Snaith & Wilson; elevation, 995' B.

	Top. Feet.	Bottom. Feet.
Coal, Brush Creek.....	450	455
Sand, Big Dunkard.....	500	520
Sand, Burning Springs.....	580	610
Sand, Second Cow Run and Salt.....	700	1000
Sand, Maxton.....	1450	1600
Little Lime.....	1620	1640
Big Lime.....	1646	1700
Sand, Big Injun (gas, 1710'; packer set, 1707')...	1700	1910
Sand, Berea.....	2000	2025
Sand, Fifty-foot (gas, 2160').....	2158	2180
Sand, Gordon Stray (gas, 2305').....	2298	2307
Total depth.....		2525

3/10" mercury in 2" tubing; volume, 431,000 cu. ft. daily.

### Waters Heirs No. 2 Well Record (587).

Collins Settlement District; on Threelick Rnu, 2.0 miles N. 5° E. of Orlando; authority, Snaith & Wilson; elevation, 1060' B.

	Top. - Bottom.	
	Feet.	Feet.
Coal, Bakerstown.....	380	385
Sand, Little Dunkard.....	400	440
Sand, Big Dunkard.....	555	610
Sand, Gas and Second Cow Run.....	685	960
Sand, Salt.....	1240	1270
Sand, Salt.....	1320	1340
Sand, Maxton (gas, 1630').....	1575	1640
Little Lime.....	1660	1690
Big Lime.....	1700	1740
Sand, Big Injun.....	1746	1790
Sand, Berea (gas, 2095').....	2090	2115
Sand, Fifty-foot (gas, 2233').....	2228	2244
Total depth.....		2474

"Test, 8/10" mercury in 2" tubing; volume, 702,000 cubic feet daily"

### Waters Heirs No. 1 Well Record (588).

Collins Settlement District; on Threelick Run, 2.0 miles N. 15° E. of Orlando; authority, Snaith & Wilson; elevation, 1240' B.

	Top.	Bottom.
	Feet.	Feet.
Sand, Moundsville.....	500	525
Sand, Little Dunkard.....	590	600
Sand, Big Dunkard.....	685	735
Coal, Upper Freeport.....	735	739
Sand, Gas and Second Cow Run.....	860	1015
Sand, Salt.....	1035	1200
Sand, Maxton.....	1825	1840
Little Lime.....	1845	1870
Big Lime.....	1875	1920
Sand, Big Injun.....	1920	2090
Sand, Squaw.....	2095	2120
Sand, Thirty-foot.....	2410	2440
Sand, Gordon Stray (gas, 2496' and 2505').....	2491	2508
Total depth.....		2510

Test, 11/10" mercury in 6 3/8" casing; volume, 8,838,000 cu. ft. daily.

No record is available of the E. G. Davisson No. 1 (590), located near Crawford along the West Fork River. According to Mr. Davisson, who drilled the well on his own property, it produced about 100,000 cubic feet of gas daily, most of which was from the Big Injun, the Gordon Sand having only a small amount. Salt water and a show of oil were also found in the Injun. The rock pressure was 700 pounds.

Three wells have been drilled in the edge of Braxton County, two or three miles west of Ireland. The **G. D. Walton No. 1 (592)**, on the head of Knawl Creek, was reported to have made two shows of gas and a little oil, but was abandoned as a dry hole. The **Samuel Cunningham No. 1 (593)**, on Pigeonroost Fork of Knawl Creek, was reported to have made a little oil and enough gas to run an engine. The **John Ware No. 1 (594)**, on Right Fork of Falls Creek, just west of Letch, was reported to have made considerable gas, but was abandoned.

In the southern panhandle of Lewis and in the adjoining territory of Upshur and Webster, fourteen wells have been drilled, nearly all having made shows of oil and gas, mostly from the lower members of the Pottsville group of sands, which produce oil and gas at Rosedale. Concerning this oil in the panhandle. White<sup>6</sup> says the following:

"The oil is of light gravity and amber color, but is so mixed up with water that no paying wells have ever been found, although a fine 'showing' has been obtained in nearly every one of the dozen or more wells that have been drilled. It appears to be impossible to case off the water without also shutting out the oil."

The records of only a few of these wells are available. According to W. T. Wilson, of Bablin, who drilled several of them, the **W. T. Wilson No. 1 (595)** made a little oil; the **W. T. Wilson No. 2 (596)**, the record of which is published in Chapter IX, page 167, was a dry hole; the **A. K. Wilson No. 2 (597)**, the record of which is published in the section for Bablin, page 72, made oil and gas from the Salt Sand and a little oil from the Gordon; the **A. K. Wilson No. 1 (598)** made oil and gas; the **S. M. Holt No. 1 (599)** made oil and gas; the **S. M. Holt No. 3 (600)** was a dry hole; the **S. M. Holt No. 2 (601)** made oil and gas; the **John Snyder No. 1 (602)** was a dry hole; the **William Mearns No. 1 (603)** was reported to have flowed some thick oil at 230 feet; the **V. S. Lynch No. 1 (603A)** was a dry hole; the **G. G. Butcher No. 1 (604)**, according to a resident, made an oil show and enough gas to blow out water, and "lots of salt water." The well still makes a little gas. The following well was reported to

<sup>6</sup>I. C. White, Vol. I(A), W. Va. G. S., p. 375; 1904.

have been drilled by a man named Hague, and is said to have made considerable gas, a little oil and much salt water:

### J. W. Lake No. 1 Well Record (605).

Collins Settlement District; on Hacker Camp Run, 1.6 miles south-east of Bablin; elevation, 1250' B.

	Thickness.	Total.
	Feet.	Feet.
8¼" casing to rock.....	40	40
Slate and shell.....	360	400
Sandy lime (6½" casing, 576').....	176	576
<b>Sandy lime, red rock, shale and slate (little gas, 900')</b> .....	<b>324</b>	<b>900</b>
Unrecorded .....	70	970
Maxton Sand.....		
Pencil Cave.....	10	980
<b>Big Lime, very white.....</b>	<b>220</b>	<b>1200</b>
Red rock.....	15	1215
Sand, Big Injun.....	185	1400
Sandy lime, red rock.....	125	1525
White slate with lime shells.....	175	1700
<b>Sand, hard, close, Thirty-foot (little gas).....</b>	<b>20</b>	<b>1720</b>
Slate and shale.....	95	1815
Hard sand, Gordon Stray.....	5	1820
Shale .....	30	1850
Gray sand, Gordon.....	15	1865
Black shale.....	20	1885
Sandy lime, Fourth.....	45	1930
Shale .....	40	1970
Lime .....	15	1985
Shale and sandy shells.....	55	2040
Sandy lime, Fifth.....	10	2050
Shale .....	50	2100

The Vandervort and Pickens No. 1 (606), drilled in Webster County on Right Fork of the Little Kanawha, 1 mile southwest of Cleveland, the record of which is published in the section for Cleveland, page 75, and which was previously published in Volume I(A), page 393. of the Survey, is reported to have made some gas, but was plugged, the record not showing the formation in which the gas was found. The well was drilled to 1807 feet and did not reach the Gordon and other deep sands of the Catskill Series. The William Mullins No. 1 (607), located in Webster County on a branch of Right Fork of Little Kanawha, 1 mile southwest of Bois, was reported by a resident to have been drilled more than 500 feet deep and made some gas, but was abandoned as a dry hole.



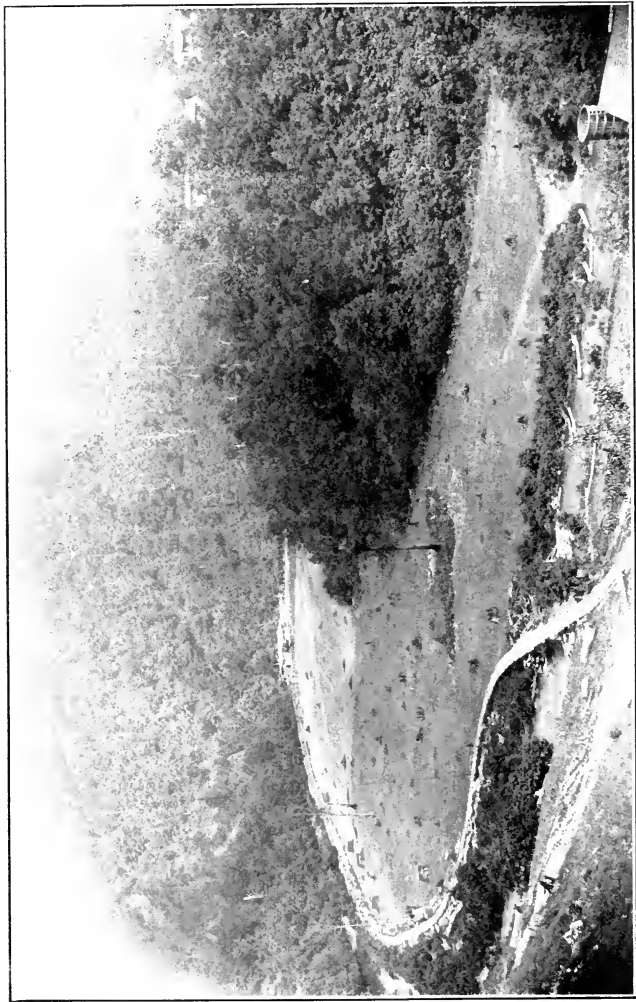


PLATE XXVIII.—Looking north at the mouth of Andy Run,  $\frac{1}{2}$  mile east of Bois, Lewis County; Right Fork of Little Kanawha and lumber tramroad at left; Topography of the Allegheny and Pottsville Series.



**Prospective Oil and Gas Areas, Collins Settlement District.**—While Collins Settlement District has been prospected for oil and gas in the western and extreme southern portions, the main central part remains still practically untouched by the drill. Present development, however, and structural conditions do not warrant the belief that this district will prove nearly as prolific in oil and gas as are the more northern districts where structural conditions are ideal. The fact that gas in considerable quantity has been found in the edge of Upshur on the east makes it seem probable that additional wells will be found joining this production to that along the western part of the district. Attention is called to the following localities: (1) That portion of the district lying between the Orlando Anticline and the Roanoke Syncline offers hope of many new gas wells in sands ranging from the Injun to the Fifth; (2) The northern portion of the district between the West Fork River and the Skin Creek District Line looks favorable for gas in sands ranging from the Injun to the Fifth, since gas occurs in some of these sands at Roanoke, on the west, and at Frenchton, on the east; (3) The southern portion of the district, south of the West Fork River, and between the Roanoke Syncline on the west and the Upshur Line on the east, will bear prospecting for gas, although it is less favored by present development than the northern part of the district; (4) The presence of oil in the Big Injun Sand in considerable quantity in Well No. 572 at Roanoke, in No. 590 at Crawford and the showing in the same sand in some of the Frenchton wells on the east, leads to the belief that it may be found in paying quantity at some point in this region. Since the sand is water-bearing generally in this region, the best chance for drilling would be at some point where a sharp change in the dip of the measures makes it possible for the oil to collect at the foot of a steep structural slope, where the water would occupy the terrace below it. This condition is found  $1\frac{1}{2}$  miles northeast of Ireland, where the structure has a cove-like appearance and oil might possibly be found in the Injun or Gordon Sands between the 1575 and 1600-foot structure contours.

## WELL RECORDS AND PROSPECTIVE AREAS, GILMER COUNTY.

### EARLY HISTORY.

The first drilling for oil and gas in Gilmer County was done on Right Fork of Steer Creek, where one well (782) was drilled on the Daniel Huffman farm and 2 wells (783) and (784) were drilled on the Eli Shock farm, probably 25 to 30 years ago, where seepages of gas were known to occur along the creek. These wells all produced gas, but were never utilized. Another shallow well, drilled with a spring-pole, was completed about 1875 on the Kane farm (760), near Lettergap, and made some gas, and another on the Middleton farm (685), at the mouth of Grace Run, was also completed at an early date. The first deep hole drilled was that on the Fisher farm (653), on a branch of Tanner Creek near Tanner, which was completed in 1891, by John T. Harris and others, and still produces gas. In 1892 a well (689) was drilled on the Norris farm at Glenville, but made only a small amount of gas. Scattered wells were drilled throughout the county within the next few years, but systematic development did not begin until after the great Copley well in Lewis had been completed in 1900, numerous wells soon being drilled along Sand Fork, where a pool was opened at the mouth of Indian Fork.

### SUMMARIZED RECORDS.

The following table, like that published for Lewis on pages 184 to 203, is a compilation from all the detailed records available in the county, and is intended to be a ready summary of the most important facts regarding each well. The same explanations which accompany the Lewis County table are applicable here. The following abbreviations of company names have been used:

Ash Bros.....	Ash Brothers.
Caldwell et al.....	Charles T. Caldwell, Showalter et al.
Carter.....	Carter Oil Company.
Central Rosedale.....	Central Rosedale Oil and Gas Company.
Cresco O. & G.....	Cresco Oil and Gas Company.

Crude.....	Crude Oil Company.
Eastern Oil.....	Eastern Oil Company.
Gilmer O. & G.....	Gilmer Oil and Gas Company.
Guffey.....	Guffey and Galey.
Hagerstown.....	Hagerstown Oil Company.
Harris et al.....	John T. Harris, Caldwell et al.
Hope.....	Hope Natural Gas Company.
Leary Oil.....	Leary Oil Company.
Martin Dev.....	Martin Development Company.
Mill Fork.....	Mill Fork Oil and Gas Company.
Pgh. & W. Va.....	Pittsburgh and West Virginia Gas Co.
Piney Fork.....	Piney Fork Oil Company.
Pulliam.....	Hiram Pulliam.
Revere Oil.....	Revere Oil Company.
Rinehart et al.....	Lloyd Rinehart et al.
Robinette Oil.....	Robinette Oil Company.
South Penn.....	South Penn Oil Company.
Stumptown O. & G.....	Stumptown Oil and Gas Company
Tanner O. & G.....	Tanner Oil and Gas Company.
Troy O. & G.....	Troy Oil and Gas Company.

## Summarized Record of Oil and Gas

No. on Map II	FARM NAME AND NUMBER	Magisterial District	OWNER	Elevation Above Tide
608	Andrew T. Gooden No. 1	Troy	Rinehart et al.	765 B
609	E. M. Talbott No. 1	Troy		753 L
610	E. M. Talbott No. 1	Troy	Troy O. & G.	753 L
611	R. L. Ruddel Hrs. No. 1	Troy	J. T. Carter et al.	750 B
612	Thos. Scott No. 1	Troy	Carter	750 B
612A	Almira M. Dent No. 1	Troy	South Penn.	825 B
613	P. Brannon No. 1	Cove (Doddridge)	Hagerstown	813 L
614	Chas. Spurgeon No. 4246	Cove (Doddridge)	Pgh. & W. Va.	955 B
615	L. A. Law No. 1	Troy	South Penn.	940 B
616	Josiah Nutter Hrs. No. 4007	Troy	Pgh. & W. Va.	940 L
617	Peter Cole No. 1	Troy	Crude	775 B
618	C. B. Bush No. 1	Troy	South Penn.	895 B
619	H. P. Woolfer No. 1	Troy	Hope	912 L
620	F. T. Bush No. 3091	Troy	Hope	850 B
621	J. C. Bush Hrs. No. 3123	Troy	Hope	870 B
622	Powell Hrs. No. 3125	Troy	Hope	830 B
623	James Allman No. 1	Troy	Crude	910 B
624	W. T. Wiant No. 1	Troy	South Penn.	880 L
625	J. C. Bush No. 1	Troy	South Penn.	915 L
626	J. C. Bush No. 2	Troy	South Penn.	930 B
627	W. T. Wiant No. 2	Troy	South Penn.	880 B
628	I. M. Fox No. 1	Troy	R. G. Gillespie	880 B
629	E. I. Waggoner No. 2	Troy	Crude	862 L
630	E. I. Waggoner No. 5	Troy	Crude	960 B
631	A. O. Britton No. 1	Troy	R. G. Gillespie	885 B
632	W. B. & M. S. Hersman No. 1	Troy	Crude	1065 B
633	D. J. Gordon No. 7	Troy	R. G. Gillespie	1075 B
634	D. J. Gordon No. 4	Troy	R. G. Gillespie	862 L
635	G. A. Kemper No. 1	Troy	Crude	855 L
636	D. J. Gordon No. 6	Troy	R. G. Gillespie	1170 L
637	A. S. Britton No. 1	Troy	R. G. Gillespie	985 L
638	A. S. Britton No. 2	Troy	R. G. Gillespie	951 L
639	Swisher Hrs. No. 4	Troy	Crude	1027 L
640	C. C. Snodgrass No. 2	Troy	R. G. Gillespie	920 B
641	R. O. Hinzman No. 1	Troy	R. G. Gillespie	865 B
642	W. W. Gordon No. 1716	Troy	Hope	1070 B
643	W. W. Gordon No. 2011	Troy	Hope	905 B
644	Samuel Bennett No. 1775	Dekalb	Hope	950 B
645	L. S. Vannoy No. 2176	Dekalb	Hope	855 B
646	S. B. Rogers No. 2187	Dekalb	Hope	775 B
647	L. M. Law No. 2181	Dekalb	Hope	850 B
648	E. L. Valentine No. 2186	Dekalb	Hope	905 B
649	Ira G. Ellison No. 1754	Dekalb	Hope	895 B
650	G. L. Ellison No. 2471	Dekalb	Hope	830 B
651	J. S. Shaffer No. 1774	Dekalb	Hope	1065 B
652	Chas. Peterson No. 1	Dekalb	Hope	780 B
653	G. M. Fisher No. 1	Dekalb	Tanner O. & G.	800 B
654	Robert Mitchell No. 1	Dekalb	Jackson & Bowser	865 B
655	Geo. W. Fisher No. 1	Dekalb	Carter	875 B
656	Samuel Riddel No. 1	Dekalb	Hope	950 B
657	Hardman & Haller No. 1	Dekalb	Tanner O. & G.	1055 B
658	G. L. Camden No. 1	Dekalb	Hope	
659	Frank C. Gainer No. 1	Dekalb	Caldwell et al.	800 B
660	Thos. Hardman Hrs. No. 1	Dekalb	Cresco O. & G.	805 B
661	J. D. Harris No. 1	Dekalb	South Penn.	835 B
662	S. M. Beckner No. 3018	Dekalb	Hope	855 B
663	M. E. Gainer No. 1	Dekalb	Eastern Oil	865 B
663A	Lillie F. House No. 1708	Dekalb	Hope	935 B
664	John Raulston No. 1	Dekalb	Hope	910 B
665	Luther Ellison No. 1	Dekalb	Hope	915 B
666	J. T. Wilt No. 2243	Dekalb	Hope	900 B
667	A. B. Ayers No. 3130	Dekalb	Hope	814 L
668	Nancy Nicholas No. 1	Dekalb	Leary Oil	830 B

Wells in Gilmer County

PITTSBURGH COAL		Big Lime. Top	Big Injun Sand. Top	Berea Sand. Top	Gordon Sand. Top	Fifth Sand. Top	Total Depth	PRODUCING SAND AND REMARKS	No. on Map I
Depth Top	Thickness Feet								
								Gas well.	608
		1382	1500					Salt, B. Lm. & B. I. gas; B. Lm. oil.	609
		1535	1640				3204	B. Lm. gas show.	610
300		1531	1712	2135	2485		2633	Dry hole.	611
		1810	1924		2545		2600	B. I. gas.	612
		1800	1897		2495	2705	2740	B. I. gas show.	612A
		1770	1853	2065			2905	Dry hole.	613
		1580	1740			2540	2548	B. Lm. gas show.	614
		1710	1770	2154			2735	Berea gas.	615
		1661	1742	2102			2502	Gas well.	616
		1531	1611				2330	B. I. & Berea gas.	617
		1568	1642				2369	B. I. gas show.	618
		1740	1810	2210		2659	2676	Maxton & B. I. gas.	619
		1780	1840	2236			2276	B. I. gas; Berea oil.	620
		1805	1895	2266			2293	B. I. gas; Berea oil.	621
				2200			2216½	Berea oil.	622
				2162			2214	Berea oil.	623
		1822	1880	2262			2312	Gantz oil.	624
				2196			2222	B. I. gas; Maxton & Berea oil.	625
				2385			2435	Berea oil.	626
				2154			2174	Berea oil.	627
		1660	1740	2132			2156	Salt and Maxton gas; Maxton, Squaw & Berea oil.	628
				2440			2472½	Berea oil.	629
				2166			2101	Berea gas.	630
				2225			2253½	Berea gas.	631
		1800	1875	2290			2323	Berea gas.	632
			1794½				1814½	B. I. oil.	633
		1792	1857	2210			2283	Berea oil show.	634
		1936	2010	2387		2905	3153	Berea oil & gas show.	640
		1820	1890	2248			2358	Show of gas.	641
		1825	1895	2275			2376	Berea gas.	642
		1716	1803	2168			2180	Berea gas.	643
		1615	1679	1920			2832	Maxton & Berea gas.	644
			1746	2092				B. I. & B. Lm gas.	645
		1712	1791	2150			2179	B. I. & Berea gas.	646
			1764	2212			2772	Salt & Berea gas.	647
		1776	1854				2340	B. I. gas show.	648
		1865	1926				3072	Salt gas.	649
		1675	1740	2020	2365		2710	II Cow R. gas.	650
		1760	1820				2700	B. Lm. & B. I. gas; B. I., Gantz oil.	651
		1865	1919				2325	B. I. gas show.	652
		1650	1792				3012	Salt & B. I. gas.	653
		1696	1782	2177			2297	Gas well.	654
		1650	1770				2873	Dry hole.	655
		1770	1865	2240			2945	Salt, B. Lm. & B. I. gas.	656
		1730	1815	2210			2273	B. I. gas.	657
							1392	B. I. gas.	658A
							2000	B. I. gas.	659
							2273	Salt & B. I. gas.	660
							1392	Burn. Spgs. & Salt gas.	661
							2000	B. I. oil & gas; Berea oil.	662

## Summarized Record of Oil and Gas

No. on Map II	FARM NAME AND NUMBER	Magisterial District	OWNER	Elevation Above Tide
736	W. P. Knight No. 1.....	Saltlick (Braxton)...	Hope .....	845B
737	Fred Hoover No. 1.....	Saltlick (Braxton)...	Guffey .....	.....
738	L. W. McNair Hrs. No. 1.....	Saltlick (Braxton)...	South Penn.....	815B
739	Wilson Hrs. No. 1.....	Saltlick (Braxton)...	Guffey .....	810B
740	L. W. McNair Hrs. No. 2.....	Glenville .....	South Penn.....	1277B
741	R. R. Marshall No. 1.....	Glenville .....	Guffey .....	865B
742	R. R. Marshall No. 2.....	Glenville .....	Guffey .....	905B
743	H. S. Hefner No. 1.....	Glenville .....	Guffey .....	740B
747	R. R. Marshall No. 2.....	Glenville .....	Guffey .....	860B
750	C. S. Hudnall No. 2.....	Glenville .....	Gilmer O. & G.....	770B
751	C. S. Hudnall No. 2.....	Glenville .....	Guffey .....	765B
752	C. S. Hudnall No. 1.....	Glenville .....	Guffey .....	760B
753	C. S. Hudnall No. 1.....	Glenville .....	Gilmer O. & G.....	820B
755	G. M. Martin No. 1.....	Glenville .....	Martin Dev.....	770B
756	N. P. Marsh No. 1.....	Glenville .....	Gilmer Dev.....	785B
757	Elliott Spicer No. 1.....	Glenville .....	Martin Dev.....	800B
758	Jesse Conrad No. 1.....	Glenville .....	South Penn.....	837L
760	James P. Kane No. 1.....	Center .....	Pulliam .....	875B
760A	J. B. Van Horn No. 1.....	Center .....	South Penn.....	815B
766	Samuel Burk No. 1.....	Center .....	South Penn.....	795B
767	H. B. Gerwig No. 1.....	Otter (Braxton).....	Ash Bros.....	895L
769	J. O. McCoy No. 1.....	Center .....	South Penn.....	785L
770	Albert Percy No. 1.....	Center .....	A. E. Kenney.....	755B
771	J. W. Boggs No. 1.....	Center .....	Stumptown O. & G.....	815B
772	Clarence Stump No. 1624.....	Center .....	Hope .....	730B
773	Marcellus Stump No. 2.....	Center .....	Stumptown O. & G.....	790B
774	Elihu Stump No. 1.....	Center .....	Hope .....	720B
775	Winfred White No. 1.....	Center .....	Caldwell et al.....	.....
776	Elliott Stump No. 1.....	Center .....	Caldwell et al.....	745B
777	Marcellus Stump No. 1623.....	Center .....	Hope .....	725L
778	Lemuel Stump Hrs. No. 1.....	Center .....	Stumptown O. & G.....	705B
779	Asa Stump No. 1.....	Center .....	Harris et al.....	705B
780	Katie Stump No. 1.....	Sherman (Calhoun).....	Stumptown O. & G.....	701L
781	Melville Stump No. 1.....	Center .....	Caldwell et al.....	755B
782	Daniel Huffman No. 1.....	Center .....	.....	745B
783	Eli Shock No. 1.....	Center .....	Pulliam .....	720B
784	Eli Shock No. 2.....	Center .....	Pulliam .....	790B
785	Louis Bennett No. 1.....	Center .....	South Penn.....	825B
786	T. V. Shock No. 1.....	Center .....	South Penn.....	780B
787	Berry Hrs. No. 1.....	Center .....	Matych & Wilkins.....	820B
788	W. C. Rollyson No. 1.....	Center .....	Enlow & Knisely.....	815B
789	C. N. Snodgrass No. 1.....	Birch (Braxton).....	Carr & Gilmore.....	947L
790	J. W. Smith No. 1.....	Birch (Braxton).....	South Penn.....	815L
791	E. E. Cottrell No. 1.....	Birch (Braxton).....	Alexander & Doty.....	787L
792	U. S. Upton et al No. 1.....	Birch (Braxton).....	R. C. Howard.....	795L
793	J. W. Smith No. 1.....	Birch (Braxton).....	Central Rosedale.....	795L
794	J. W. Teyman No. 1.....	Birch (Braxton).....	South Penn.....	796L
795	Pauline E. Snodgrass No. 1.....	Birch (Braxton).....	Mill Fork.....	790B
796	Pauline E. Snodgrass No. 2.....	Birch (Braxton).....	Mill Fork.....	840B
797	Rebecca Bourn No. 1.....	Birch (Braxton).....	Pgh. & W. Va.....	795B
798	W. G. Bennett No. 3.....	Center .....	South Penn.....	940B
799	W. G. Bennett No. 2.....	Center .....	South Penn.....	1150B
800	W. G. Bennett No. 9.....	Center .....	South Penn.....	1185B
801	W. G. Bennett No. 7.....	Center .....	South Penn.....	1110B
802	W. G. Bennett No. 8.....	Center .....	South Penn.....	1060B
803	W. G. Bennett No. 1.....	Center .....	South Penn.....	960B
804	W. G. Bennett No. 6.....	Center .....	South Penn.....	1145B
805	W. G. Bennett No. 10.....	Center .....	South Penn.....	.....
806	W. G. Bennett No. 5.....	Center .....	South Penn.....	1030B
807	W. G. Bennett No. 4.....	Center .....	South Penn.....	.....



## Wells in Gilmer County—Continued

PITTSBURGH COAL		Big Lima. Top	Big Injun Sand. Top	Berea Sand. Top	Gordon Sand. Top	Fifth Sand. Top	Total Depth	PRODUCING SAND AND REMARKS	No. of Map
Depth Top	Thickness Feet								
.....	.....	.....	.....	.....	.....	.....	.....	.....	786
.....	.....	1670	1725	.....	2338	.....	2904	B. I. gas; Gord. oil.....	787
.....	.....	.....	.....	.....	.....	.....	.....	Oil show.....	788
.....	.....	2140	2357	.....	2838	.....	.....	Gord. oil & gas.....	789
.....	.....	.....	.....	.....	.....	.....	.....	Oil show.....	740
.....	.....	.....	.....	.....	.....	.....	.....	Gas show.....	741
.....	.....	.....	.....	.....	.....	.....	.....	Dry hole.....	742
.....	.....	.....	.....	.....	.....	.....	.....	Dry hole.....	743
.....	.....	.....	.....	.....	.....	.....	.....	Dry hole.....	747
80	5	1807	1848	.....	.....	2639	2672	B. I. gas show; 5th oil & gas show	750
.....	.....	.....	.....	.....	.....	.....	.....	.....	751
92	9	1805	1885	.....	2502	.....	2655	5th oil show.....	752
173	6	1912	1953	.....	.....	.....	2772	Salt & 5th gas show.....	753
.....	.....	.....	.....	.....	.....	.....	.....	.....	755
.....	.....	.....	.....	.....	.....	.....	.....	.....	756
.....	.....	.....	.....	.....	.....	.....	.....	.....	757
.....	.....	.....	.....	.....	.....	.....	.....	.....	758
.....	.....	.....	.....	.....	.....	.....	.....	.....	760
.....	.....	.....	.....	.....	.....	.....	.....	.....	760
.....	.....	.....	.....	.....	.....	.....	.....	.....	766
.....	.....	1830	1875	.....	.....	.....	2009	Salt & B. I. gas.....	767
.....	.....	1610	1715	.....	.....	2463	2802	B. I. oil & gas show.....	769
.....	.....	.....	.....	.....	.....	.....	.....	Gas well.....	770
.....	.....	.....	.....	.....	.....	.....	.....	.....	771
.....	.....	.....	.....	.....	.....	.....	.....	.....	772
.....	.....	.....	.....	.....	.....	.....	1507	Salt (?) gas.....	773
.....	.....	1463	1550	.....	.....	.....	2800	Salt & B. I. gas.....	774
.....	.....	.....	.....	.....	.....	.....	1496	Salt (?) gas.....	775
.....	.....	.....	.....	.....	.....	.....	1397	Salt gas.....	776
.....	.....	.....	.....	.....	.....	.....	1215?	Salt gas.....	777
.....	.....	.....	.....	.....	.....	.....	.....	Gas well.....	778
.....	.....	.....	.....	.....	.....	.....	.....	Gas well.....	779
.....	.....	.....	.....	.....	.....	.....	1491	Salt, light gas & show of oil.....	780
.....	.....	.....	.....	.....	.....	.....	1606	Dry hole.....	781
.....	.....	.....	.....	.....	.....	.....	1100	Gas well.....	782
.....	.....	.....	.....	.....	.....	.....	600	Gas well.....	783
.....	.....	.....	.....	.....	.....	.....	600	Gas show.....	784
.....	.....	1585	1710	.....	.....	.....	2668	Gord. gas show.....	785
.....	.....	1736	1800	.....	.....	.....	3050	Salt oil show; B. Lm. gas.....	786
.....	.....	.....	.....	.....	.....	.....	.....	Dry hole.....	787
.....	.....	.....	.....	.....	.....	.....	.....	Salt oil.....	788
.....	.....	.....	.....	.....	.....	.....	.....	.....	789
.....	.....	.....	.....	.....	.....	.....	.....	.....	790
.....	.....	.....	.....	.....	.....	.....	1528	Gas ss. gas; Salt oil.....	791
.....	.....	.....	.....	.....	.....	.....	.....	Salt oil.....	792
.....	.....	.....	.....	.....	.....	.....	1537	Salt oil.....	793
.....	.....	.....	.....	.....	.....	.....	1619	Gas ss. gas & oil show.....	794
.....	.....	.....	.....	.....	.....	.....	1547	Gas ss. gas; Salt oil.....	795
.....	.....	.....	.....	.....	.....	.....	2000	Salt oil & gas.....	796
.....	.....	.....	.....	.....	.....	.....	1385	Gas ss. & Salt gas.....	797
.....	.....	.....	.....	.....	.....	.....	.....	Dry hole.....	798
.....	.....	2040	2125	2420	.....	2580	3275	Gas well.....	799
.....	.....	.....	.....	.....	.....	.....	.....	Salt oil.....	800
.....	.....	.....	.....	.....	.....	.....	1733	Salt oil.....	801
.....	.....	.....	.....	.....	.....	.....	1740	Salt oil show.....	802
.....	.....	.....	.....	.....	.....	.....	1610	Salt oil & gas.....	803
.....	.....	.....	.....	.....	.....	.....	1756	Salt oil.....	804
.....	.....	.....	.....	.....	.....	.....	.....	Dry hole.....	805
.....	.....	.....	.....	.....	.....	.....	1778	Gas ss. gas; salt oil.....	806
.....	.....	.....	.....	.....	.....	.....	1985	Dry hole.....	807

In addition to the summarized records in the table, the details of most of these wells will be given in the following pages, giving such information as is available regarding the underground strata.

### *Detailed Well Records, Troy District.*

Troy District, with the exception of the western part, where the Newberne pool is located, has not produced oil and gas in large quantity, but outside of the Newberne region only a few scattered wells have been drilled, the evidence of which, though unfavorable, is not sufficient to declare the territory barren. The district is situated in the northeastern corner of the county, next to Doddridge and Ritchie, and in its northern part the geologic structure reaches a low level, where the Robinson Syncline enters it from the north. The southeastern corner is crossed by the Chestnut Ridge Anticline, giving the Pittsburgh Coal horizon an elevation of 975 feet, being a rise of 500 feet from the low level along the Doddridge Line.

A few wells have been drilled along the eastern border of the district next to Lewis. The **Andrew T. Gooden No. 1 (608)**, drilled at Linn, produces gas, but its record could not be obtained. One mile east of Troy on Leading Creek, the **E. M. Talbott No. 1 (609)**, drilled by an unknown company, was plugged and abandoned as a dry hole, but according to residents gas not only blew out the plug, but also escaped in large quantities through the ground around the well. Another well, the **E. M. Talbott No. 1 (610)**, was drilled a few rods distant from the former location and produces gas from the Big Injun Sand, beyond which it was not drilled. The record of this well is published in the section for Troy, page 77. The **Robert L. Ruddel Heirs No. 1 (611)**, drilled by J. T. Carter and others on Leading Creek one-half mile southeast of Alice, was abandoned as a dry hole. Its record could not be secured, but according to Charles Conley, the well made a show of oil in the Maxton Sand, 500,000 cubic feet of gas from the Keener, and a show of oil and gas in a deeper sand, the total depth being about 2200 feet, which was sufficient to penetrate the Berea Sand.

The **Thomas Scott No. 1 Well (612)**, on Cove Creek, 1.1 miles northwest of Troy, at an elevation of 750' B., was drilled by the Carter Oil Company and reported a dry hole, its record being published in Volume I(A), page 383, of the Survey.

The following well, which was abandoned as a dry hole, was reported by residents to have made an oil and gas show:

### Almira M. Dent No. 1 Well Record (612A).

Troy District; on Little Cove Creek, 1.4 miles southeast of Conings; authority, South Penn Oil Co.; elevation, 825' B.

	Top. Feet.	Bottom. Feet.
Pittsburgh Coal.....	300	
Big Injun Sand.....	1712	
Berea Sand.....	2135	
Gordon Sand.....	2485	
Total depth.....		2633

The **P. Brannon No. 1 (613)**, drilled by the Hagerstown Oil Company, in the edge of Doddridge County, at the mouth of Fallen Timber Run of Cove Creek, 1.5 miles south of Leopold, was reported a dry hole, but its record was not secured. The following well, drilled in Doddridge, three-fourths mile from the Gilmer Line, was reported to have made a pressure of 200 pounds in 4½ minutes and 560 pounds in 30 minutes through the 2-inch tubing:

### Charles Spurgeon No. 4246 Well Record (614).

Cove District, Doddridge County; on Bear Fork, 1.0 mile northwest of Spurgeon; authority, Pittsburgh & W. Va. Gas Co.; completed, Jan. 31, 1914; elevation, 955' B.

	Top. Feet.	Bottom Feet.
Sand, Gas.....	1180	1210
Sand, Second Cow Run.....	1250	1370
Sand, Maxton.....	1680	1740
Big Lime.....	1810	1924
Sand, Big Injun (gas, 1974').....	1924	2015
Sand, Gordon.....	2545	2550
Total depth.....		2600

The following well, the record of which was published in Volume I(A), page 383, of the Survey, was abandoned as a dry hole, but made a show of gas, there still being sufficient

to make a small flame at the well mouth. The well starts 110 feet below the Washington Coal, making that in the record the Lower Uniontown instead of the Pittsburgh, as originally supposed:

**L. A. Law No. 1 Well Record (615).**

Troy District; on Horn Creek, 1.2 miles southwest of Spurgeon; authority, South Penn Oil Co.; elevation, 940' B.

	Top. Feet.	Bottom. Feet.
Small show of coal, Lower Uniontown.....	210	212
Big Dunkard Sand.....	960	995
Second Cow Run Sand.....	1200	1331
Salt Sand.....	1460	1540
Big Lime.....	1800	1890
Big Injun Sand (gas, 1910').....	1897	1960
Gordon Stray Sand.....	2480	2490
Gordon Sand.....	2495	2497
Fifth Sand.....	2705	2715
Total depth.....		2740

The following well made only a light show of gas and was abandoned as a dry hole:

**Josiah Nutter Heirs No. 4007 Well Record (616).**

Troy District; on Stonelick Run, 1.8 miles southwest of Auburn; authority, Pittsburgh & W. Va. Gas Co.; completed, Dec. 20, 1912; elevation, 940' L.

	Top. Feet.	Bottom. Feet.
Coal, Bakerstown.....	800	
Big Lime.....	1770	1853
Sand, Big Injun (gas, 1875').....	1853	1930
Sand, Squaw.....	1950	1960
Sand, Weir.....	2065	2127
Total depth.....		2905

The Peter Cole No. 1 (617), drilled on Horn Creek, 1.1 miles southeast of Coxs Mills, the record of which is published in the section for that place, page 79, made a show of gas in the Big Lime, but was abandoned as a dry hole.

The following well, the record of which was published in Volume I(A), page 382, of the Survey, was a small well, but supplies gas for a near by farmhouse:

**C. B. Bush No. 1 Well Record (618).**

Troy District; on Pikecamp Run, 1.5 miles northwest of Coxs Mills; authority, South Penn Oil Co.; elevation, 895' B.

	Top. Feet.	Bottom. Feet.
Black cave.....	750	
Sand, Little Dunkard.....	795	
Big Dunkard Sand.....	910	940
Slate .....	950	
Sand, Burning Springs.....	960	
Slate .....	1000	
Sand, Gas.....	1020	
Slate .....	1100	
Sand, Salt.....	1150	
Salt Sand (gas).....	1335	1375
Sand, Maxton.....	1555	
Little Lime.....	1660	
Big Lime.....	1710	1770
Big Injun Sand (gas, 1820').....	1770	1828
Sand and shells.....	2110	
Berea Sand (gas, 2159').....	2154	2160
Shells .....	2525	2725
Soft slate to bottom.....	2725	2735

"The Gordon and Fifth Sands are indicated only by Shells in this well."

Several wells have been drilled within the past few years on the head of Sinking Creek, some of which have produced gas, mostly from the Big Injun and Berea Sands. The three following records are from this locality. It is worthy of note that no sands were found below the Berea in any of these wells, although they were drilled deep enough to reach the Gordon and probably the Fifth:

**F. T. Bush No. 3091 Well Record (620).**

Troy District: on Sinking Creek, 1.6 miles southeast of Newberne; authority, Hope Natural Gas Co.; completed, Sept. 11, 1913; elevation, 880' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	715	734
Big Dunkard Sand.....	850	875
Salt Sand.....	1170	1191
Salt Sand.....	1280	1327
Salt Sand.....	1419	1490
Maxton Sand.....	1542	1579
Little Lime.....	1630	1646
Pencil Cave.....	1646	1661
Big Lime.....	1661	1742

	Top. Feet.	Bottom. Feet.
Big Injun Sand (gas, 1781').....	1742	1802
Berea Sand (gas, 2104').....	2102	2107
Total depth.....		2502

### J. C. Bush Heirs No. 3123 Well Record (621).

Troy District; on Sinking Creek, 1.8 miles southeast of Newberne; authority, Hope Natural Gas Co.; completed, Oct. 3, 1913; elevation, 870' B.

	Top. Feet.	Bottom. Feet.
Moundville Sand.....	537	582
Big Dunkard Sand.....	703	724
Burning Springs Sand.....	820	870
Gas Sand.....	882	960
Salt Sand.....	1183	1211
Maxton Sand.....	1433	1451
Little Lime.....	1500	1517
Pencil Cave.....	1517	1521
Big Lime.....	1531	1611
Big Injun Sand (gas, 1618').....	1611	1672
Total depth.....		2330

The above well was abandoned as a dry hole.

### Powell Heirs No. 3125 Well Record (622).

Troy District; on Sinking Creek, 1.8 miles southeast of Newberne; authority, Hope Natural Gas Co.; completed, Sept. 16, 1913; elevation, 830' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	618	642
Big Dunkard Sand.....	681	703
Gas Sand.....	755	787
Second Cow Run Sand.....	908	1035
Salt Sand.....	1131	1158
Maxton Sand (gas, 1473-6').....	1470	1485
Little Lime.....	1537	1552
Pencil Cave.....	1552	1568
Big Lime.....	1568	1642
Big Injun Sand (gas, 1697-1705').....	1642	1732
Total depth.....		2369

The above well was a light gasser.

The Newberne Oil Pool, located on Tanner Creek and surrounding the town of Newberne, is at present in active operation, its limits not being yet fully defined. The field was opened 12 to 15 years ago by the drilling of two or three

wells along Shanty Run, but no attempt was made for several years to find further production, the territory being regarded as too poor for exploitation until the high price of oil in the past few years led to further drilling, with the result that about forty producing oil wells and numerous gas wells have been discovered. The producing sand is the Berea, none of the wells being spectacular, but having the prospect of being long lived, as the Shanty Run wells are still producing. The eight following detailed records are from this pool. The abbreviated records of several others appear in the summarized table on a previous page, and the records of the **G. A. Kemper No. 1 (635)**, which produced oil from the Berea Sand, was published in the section for Newberne, page 80. The **James Allman No. 1 (623)**, drilled several years ago, 1.1 miles northeast of Newberne, is a gasser, but its record was not secured:

#### W. T. Wiant No. 1 Well Record (624).

Troy District; on Tanner Creek, 0.6 mile northeast of Newberne; authority, South Penn Oil Co.; elevation, 880' L.

	Top. Feet.	Bottom. Feet.
Coal, Sewickley.....	220	223
Salt Sand.....	1150	
Salt Sand.....	1375	
Pencil Cave.....	1730	
Big Lime.....	1740	1810
Big Injun Sand (gas, 1885').....	1810	1910
Berea Sand (oil, 2211').....	2210	2238
Fifth Sand.....	2659	2664
Total depth.....		2676

The above well, which was one of the first drilled in the pool, was pumped for several years, but is now abandoned.

#### J. C. Bush No. 1 Well Record (625).

Troy District; on Shanty Run, 0.7 mile northeast of Newberne; authority, South Penn Oil Co.; elevation, 915' L.

	Top. Feet.	Bottom. Feet.
Coal, Uniontown.....	130	131½
Black cave.....	840	
Salt Sand.....	1390	1520
Sand, Salt.....	1580	1670

	Top. Feet.	Bottom. Feet.
Pencil Cave.....	1735	
<b>Big Lime</b> .....	1780	
<b>Big Injun Sand</b> (gas, 1900').....	1840	1920
<b>Berea Sand</b> (oil, 2238-48').....	2236	2271
Total depth.....		2276

The above well, one of the first in the pool, still produces one barrel daily. Its record was published in Volume I(A), page 382, of the Survey.

### J. C. Bush No. 2 Well Record (626).

Troy District; on Shanty Run, 0.9 mile north of Newberne; authority, South Penn Oil Co.; elevation, 930' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	850	885
Sand, Big Dunkard.....	935	970
Sand, Burning Springs.....	990	1030
Sand, Gas.....	1145	1170
Sand, Second Cow Run.....	1182	1215
Sand, Salt.....	1460	1600
Sand, Maxton.....	1670	1710
<b>Big Lime</b> .....	1805	1895
<b>Big Injun Sand</b> .....	1895	1940
<b>Berea Sand</b> (oil, 2266-75').....	2266	2280
Total depth.....		2293

The above record was published in Volume I(A), page 382, of the Survey.

### E. I. Waggoner No. 5 Well Record (630).

Troy District; 0.2 mile northwest of Newberne; authority, Crude Oil Co.; completed, Aug. 21, 1914; elevation, 960' B.

	Top. Feet.	Bottom. Feet.
Sand, Lower Connellsville.....	540	575
Sand, Little Dunkard.....	880	920
Sand, Gas.....	1100	1145
Sand, Second Cow Run.....	1160	1285
Sand, Salt.....	1340	1410
Sand, Salt.....	1445	1550
Sand, Maxton (oil, 1719-25'; shot with 20 qts. 1720-5').....	1697	1727
Little Lime.....	1785	1814
<b>Big Lime</b> .....	1822	1880
Sand, <b>Big Injun</b> (gas show, 1920').....	1880	1960



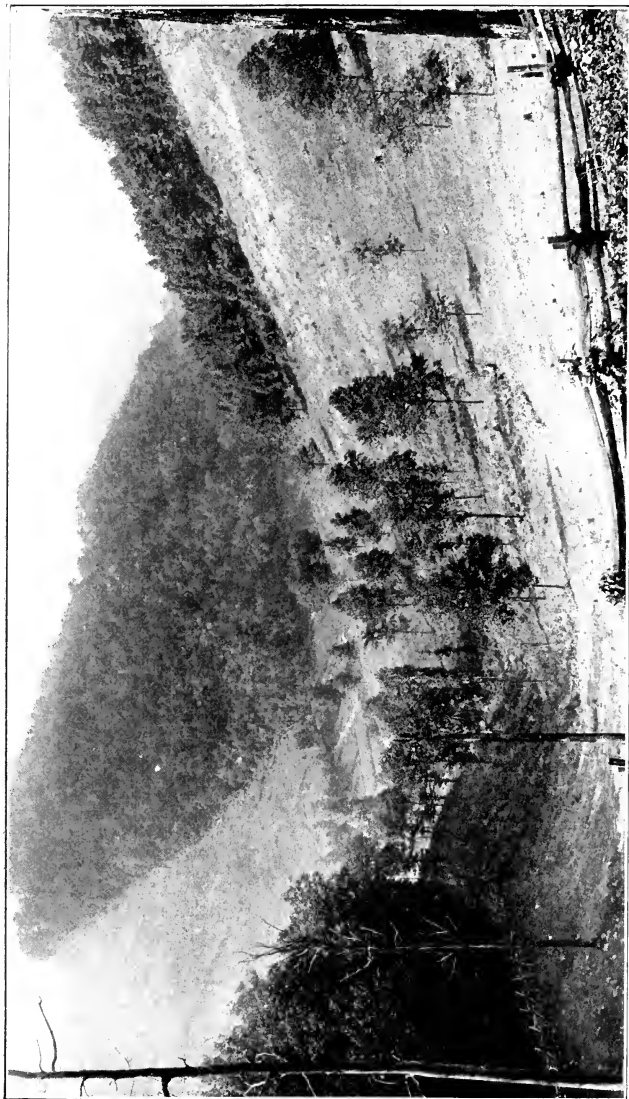


PLATE XXIX.—Looking down Flat Run, 1.3 miles northwest of Cleveland, Lewis County; Topography of the Allegheny and Pottsville Series.



	Top. Feet.	Bottom. Feet.
Sand, Squaw.....	2080	2155
<b>Sand, Berea</b> (first oil pay, 2271-90'; second oil pay, 2305-8').....	2262	2312
Conductor, 11'; 10" casing, 140'; 8¼", 840'; 6⅝", 1704'.		

The above was reported a 7-barrel well.

The **A. O. Britton No. 1** (631) was a 10 to 11-barrel producer; the **W. B. and M. S. Hersman No. 1** (632) made 5 barrels; the **A. S. Britton No. 1** (637) was a gasser of 3½ millions capacity, all three wells being in the Berea Sand.

### Swisher Heirs No. 4 Well Record (639).

Troy District; on Tanner Creek, 0.9 mile southwest of Newberne; authority, Crude Oil Co.; completed, June 10, 1908; elevation, 1027' L.

	Top. Feet.	Bottom. Feet.
Coal, Uniontown.....	150	155
Coal, Bakerstown.....	810	812
Sand, Little Dunkard.....	940	960
Sand, Big Dunkard.....	1070	1100
Sand, Gas.....	1218	1315
Sand, Second Cow Run.....	1370	1420
Sand, Salt.....	1485	1570
Sand, Salt.....	1600	1660
Sand, Maxton.....	1685	1760
Red rock.....	1765	1770
Little Lime.....	1770	1795
Pencil Cave.....	1795	1800
<b>Big Lime</b> .....	1800	1875
Sand, Big Injun.....	1875	1990
<b>Sand, Berea</b> (gas, 2302-6').....	2290	2315
Total depth.....		2323

Made some oil with gas, about 1 bbl. of oil per day; pumped 2 bbls. per day after shot; 2/10" water in 6⅝"; 12/10" after shot; 10/10" mercury through 3" tubing; capacity, 1,770,000 cu. ft.; conductor, 10'; 10" casing, 148'; 8¼", 977'; 6⅝", 1958'.

The **C. C. Snodgrass No. 2** (640), on Pennsylvania Run, was reported a light oil well in the Big Injun. The following made only a show of oil in the Berea and was abandoned:

## R. O. Hinzman No. 1 Well Record (641).

Troy District; on Pennsylvania Run, 0.6 mile west of Newberne; authority, R. G. Gillespie; completed, Feb. 10, 1914; elevation, 925' B.

	Top. Feet.	Bottom. Feet.
Sand, Little Dunkard.....	835	880
Sand, Big Dunkard.....	900	940
Sand, Gas.....	1130	1268
Sand, Second Cow Run.....	1300	1330
Sand, Salt.....	1472	1490
Sand, Salt.....	1510	1550
Sand, Maxton.....	1700	1730
Little Lime.....	1745	1760
<b>Big Lime</b> .....	1792	1850
Sand, Keener.....	1850	1856
Sand, Big Injun.....	1857	
<b>Sand, Berea</b> (oil show, 221').....	2210	2214
Total depth.....		2283
Conductor, 12'; 10" casing, 131'; 8¼", 900'; 6⅝", 1792'.		

## W. W. Gordon No. 1716 Well Record (642).

Troy District; on Bushcamp Run, 1.1 miles southwest of Newberne; authority, Hope Natural Gas Co.; completed, July 30, 1910; elevation, 1070' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	973	997
Big Dunkard Sand.....	1060	1070
Gas Sand.....	1130	1235
Second Cow Run Sand.....	1340	1440
Salt Sand.....	1580	1720
Little Lime.....	1911	1924
Pencil Cave.....	1924	1936
<b>Big Lime</b> .....	1936	2010
Big Injun Sand.....	2010	2093
<b>Berea Sand</b> (oil and gas show).....	2387	2395
Fifth Sand.....	2905	2910
Total depth.....		3153

According to W. W. Gordon, the driller reported that the above well would have made 1½ to 2 barrels from the Berea Sand. It was abandoned as a dry hole.

## W. W. Gordon 2011 Well Record (643).

Troy District; on Bushcamp Run, 1.2 miles west of Newberne; authority, Hope Natural Gas Co.; completed, Jan. 27, 1910; elevation, 905' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	840	865
Big Dunkard Sand.....	930	950
Gas Sand.....	1000	1110
Second Cow Run Sand.....	1210	1335
Salt Sand.....	1445	1490
Salt Sand.....	1645	1670
Little Lime.....	1802	1814
Pencil Cave.....	1814	1820
<b>Big Lime</b> .....	1820	1890
Big Injun Sand.....	1890	1937
Berea Sand.....	2248	2251
Total depth.....		2358

The above well made only a show of gas and was abandoned as a dry hole.

**Prospective Oil and Gas Areas, Troy District.**—Troy District offers several localities where additional prospecting might be done with profit. The following suggestions are made: (1) The large amount of oil found in the Berea Sand in the Fink Pool of Lewis, the Newberne Pool of Gilmer, and the Yellow Creek Pool of Calhoun, all of which are very nearly at the same structural level, with no intervening folds, indicates that these three pools may all be connected with a continuous chain of wells. It is possible that the strike of the pool may veer somewhat southward across Troy District, owing to the influence of the Robinson Syncline, which enters the district from the north, but dies out against the slope of the Chestnut Ridge Anticline. It seems probable, therefore, that oil might be found between the 550 and 600-foot structure contours in the vicinity of Coxs Mills and westward along Pikecamp Run and northeastward toward Conings. (2) The presence of gas in the Big Injun Sand in the Spurgeon (614) well, and the showing of gas in the same sand in the Law (615) well, indicate that oil might possibly be found at a lower structural level toward the Robinson Syncline on the east, the test being made preferably in the vicinity of Spurgeon to avoid the water that may be along the axis of the syncline. (3) That portion of the district southeast of

Troy looks favorable for gas in the Big Injun and in the lower sands. (4) That portion of the district between Sinking and Horn Creeks, south of the Parkersburg and Staunton Turnpike, looks favorable for gas in the Big Injun and Berea Sands.

### *Detailed Well Record, Dekalb District.*

Dekalb District, occupying the northwestern part of Gitter, where the Pittsburgh Coal horizon reaches a low structural level, has been prospected to a considerable extent, and both oil and gas have been found in commercial quantity, most of the production being in the western part. All the wells drilled in the eastern part, toward Glenville District, have been failures. In the northern portion, gas has been found in considerable quantity along Tanner and Sinking Creeks. Several wells have been drilled along Ellis Run, of which the two following records are available:

#### **Samuel Bennett No. 1775 Well Record (644).**

Dekalb District; on Ellis Run, 1.9 miles west of Newberne; authority, Hope Natural Gas Co.; completed, March 9, 1909; elevation, 950' B.

	Top. Feet.	Bottom. Feet.
Salt Sand.....	1510	1550
Maxton Sand.....	1740	1750
Little Lime.....	1800	1815
<b>Big Lime.....</b>	<b>1825</b>	<b>1895</b>
Big Injun Sand.....	1895	1955
<b>Berea Sand (gas, 2290').....</b>	<b>2275</b>	<b>2304</b>
Total depth.....		2376

#### **L. S. Vannoy No. 2176 Well Record (645).**

Dekalb District; on Ellis Run, 2.2 miles southwest of Newberne; authority, Hope Natural Gas Co.; completed, Dec. 31, 1909; elevation, 855' B.

	Top. Feet.	Bottom. Feet.
Coal, Uniontown.....	25	
Coal, Bakerstown.....	708	
Little Dunkard Sand.....	755	800
<b>Salt Sand (light gas, 1440').....</b>	<b>1430</b>	<b>1485</b>
Salt Sand.....	1605	1650
<b>Big Lime.....</b>	<b>1716</b>	<b>1803</b>

	Top. Feet.	Bottom. Feet.
Big Injun Sand, broken up and limy.....	1803	1878
<b>Berea Sand</b> (gas, 2170').....	2168	
Total depth.....		2189
10" casing, 122'; 8¼", 825'; 6⅝", 1725'; 4" tubing, 2180'.		

The following well is on Tanner Creek, near the mouth of Ellis:

### S. B. Rogers No. 2187 Well Record (646)

Dekalb District; on Tanner Creek, 2.2 miles northeast of Tanner; authority, Hope Natural Gas Co.; elevation, 775' B.

	Top. Feet.	Bottom. Feet.
Conductor .....	0	16
Sand, white, Burning Springs, Gas and Second Cow Run.....	850	1150
<b>Salt Sand</b> (gas show).....	1525	1550
Salt Sand.....	1585	1610
<b>Big Lime</b> .....	1615	1679
<b>Big Injun Sand</b> (gas, 1679').....	1679	1702
Dark sand, Berea.....	1920	1960
Slate and shells to bottom.....	1960	2832

The two following wells were drilled along Brushy Run, near the Troy Line:

### L. M. Law No. 2181 Well Record (647).

Dekalb District; Brushy Run, 1.8 miles southwest of Newberne; authority, Hope Natural Gas Co.; completed, Jan. 15, 1908; elevation, 850' B.

	Top. Feet.	Bottom. Feet.
<b>Big Injun Sand</b> (gas, 1752½').....	1746	1776
<b>Berea Sand</b> (gas, 2101').....	2092	
10" casing, 140'; 8¼", 815'; 6⅝", 1610'. Could not get bottom measured—gas too strong.		

### E. L. Valentine No. 2186 Well Record (648).

Dekalb District; on Brushy Run, 1.5 miles southwest of Newberne; authority, Hope Natural Gas Co.; completed, March 15, 1911; elevation, 905' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	740	775
<b>Big Dunkard Sand</b> .....	825	860
Second Cow Run Sand.....	1125	1190

	Top. Feet.	Bottom. Feet.
Salt Sand.....	1310	1365
Salt Sand.....	1500	1555
Maxton Sand.....	1590	1615
Little Lime.....	1687	1700
Pencil Cave.....	1700	1712
<b>Big Lime</b> .....	1712	1791
Big Injun Sand.....	1791	1849
<b>Berea Sand (gas, 2161')</b> .....	2150	2164
Total depth.....		2179

The following well was abandoned but makes a good supply of gas for domestic use:

#### Ira G. Ellison No. 1754 Well Record (649).

Dekalb District; on Jessie Run, 2.8 miles northeast of Tanner authority, Hope Natural Gas Co.; completed, Feb. 11, 1910; elevation, 895' B.

	Top. Feet.	Bottom. Feet.
<b>Sand, Salt (gas or oil, 1400')</b> .....	1390	1420
Maxton Sand.....	1670	1690
Little Lime.....	1700	
<b>Big Injun Sand (gas or oil, 2/10" water in 1" opening, 1775')</b> .....	1764	1835
Berea, shell.....	2212	
Total depth.....		2772

A few gas wells have been drilled on Sinking Creek, near the Troy District Line, of which the two following records are available:

#### G. L. Ellison No. 2471 Well Record (650).

Dekalb District; 1.5 miles northwest of Lucerne; authority, Hope Natural Gas Co.; completed, April 25, 1912; elevation, 830' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	782	804
Gas Sand.....	945	970
Salt Sand (water, 1200').....	1168	1220
<b>Salt Sand (gas, 1447')</b> .....	1415	1497
Salt Sand.....	1595	1650
Maxton Sand.....	1690	1716
Little Lime.....	1758	1770
Pencil Cave.....	1770	1776
<b>Big Lime</b> .....	1776	1854
Big Injun Sand.....	1854	1914
Total depth (no more sands).....		2340



## J. S. Shaffer No. 1774 Well Record (651).

Dekalb District; 1.2 miles northwest of Lucerne; authority, Hope Natural Gas Co.; completed, Oct. 14, 1910; elevation, 1065' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	881	931
Big Dunkard Sand.....	1000	1020
Second Cow Run Sand (gas, 1257'; water, 1268')..	1210	1280
Salt Sand.....	1410	1490
Salt Sand.....	1600	1680
Maxton Sand.....	1820	1840
Little Lime.....	1840	1855
Pencil Cave.....	1855	1865
<b>Big Lime</b> .....	1865	1926
Big Injun Sand.....	1926	1998
Berea, shells only.....		2335
Total depth.....		3072

The above well was reported to have made 1½ millions in the Second Cow Run, but was abandoned, the volume evidently having declined rapidly.

The record of the **G. M. Fisher No. 1 (653)**, drilled on Mitchell Run, 1.5 miles north of Tanner, and already mentioned as the first deep well in the county, is published in the section for Tanner, page 81. It made gas in the Big Injun and shows of oil in both the Big Injun and Berea Sands. The following well was reported to have made considerable gas and still burns at the well mouth, but was abandoned:

## Geo. W. Fisher No. 1 Well Record (655).

Dekalb District; on Jones Cabin Run, 0.8 mile northeast of Alfred; authority, Carter Oil Co.; completed, July 14, 1904; elevation 875' B.

	Top. Feet.	Bottom. Feet.
Sand, Little Dunkard.....	790	820
Sand, Second Cow Run.....	1100	1225
Sand, Salt.....	1325	1485
<b>Big Lime</b> .....	1760	1820
Sand, <b>Big Injun</b> (gas show, 1860').....	1820	1920
Total depth.....		2700
10" casing, 145'; 8¼", 860'; 6½", 1780'.		

The **Samuel Riddel No. 1 (656)**, drilled on the head of Jones Cabin Run, was reported a dry hole, but its record was not secured.

Four wells have been drilled in the immediate vicinity of Tanner, of which two have been gassers and two dry holes. The following is a record of one of these wells:

### Hardman and Haller No. 1 Well Record (657).

Dekalb District; 1.1 miles N. 45° E. of Tanner; authority, Tanner Oil & Gas Co.; completed, Jan. 5, 1914; elevation, 1055' B.

	Top. Feet.	Bottom. Feet.
Coal, Uniontown.....	134	136
Sand, Little Dunkard.....	885	925
Sand, Big Dunkard.....	955	975
Sand, Gas.....	1175	1240
Sand, Second Cow Run.....	1265	1320
Sand, Salt.....	1475	1520
Sand, Salt (gas, 1595'-1600').....	1595	1640
Maxton Sand.....	1810	1840
Little Lime.....	1845	1860
Pencil Cave.....	1860	1865
Big Lime.....	1865	1919
Sand, Big Injun, hard, no water (gas, 1919-1924')..	1919	1997
Sand, Berea, and shells.....	2270	2308
Total depth.....		2325
Conductor, 12"; 10" casing, 138"; 8¼", 960'; 6⅝", 1871'.		

The above well was a light gasser.

The **G. L. Camden No. 1 (658)**, located 1.5 miles north-east of Tanner, was reported a gas well; the **Frank C. Gainer No. 1 (659)**, located 0.6 mile east of Tanner, was abandoned as a dry hole; the **Thos. Hardman Heirs No. 1 (660)**, located 0.5 mile northwest of Tanner, was abandoned as a dry hole, but had a show of gas. Seven wells have been drilled on the head of Laurel Fork, of which five have been gassers. The four following records are available:

### J. D. Harris No. 1 Well Record (661).

Dekalb District; on Laurel Fork, 1.5 miles southwest of Alfred; authority, South Penn Oil Co.; elevation, 835' B.

	Top. Feet.	Bottom. Feet.
Coal, Sewickley.....	150	155
Slate.....	155	170
Slate and red rock.....	170	590
Coal, Harlem.....	590	600
Slate and red rock.....	600	900
White sand, Burning Springs.....	900	1015

	Top. Feet.	Bottom. Feet.
White sand, Second Cow Run.....	1055	1155
Gray sand, Salt.....	1240	1280
White lime.....	1280	1300
<b>Sand, Salt</b> (gas, small, 1390').....	1360	
Gray sand, Salt.....	1395	1530
Lime.....	1535	1545
<b>Big Lime</b> .....	1650	1792
Big Injun Sand.....	1792	1861
Lime and sand.....	1871	1901
Slate and shells.....	1901	2150
Lime.....	2170	2175
Lime and shells.....	2175	3012

The above well was abandoned as a dry hole.

### S. M. Beckner No. 3018 Well Record (662).

Dekalb District; on Spring Run, 1.7 miles southwest of Alfred; authority, Hope Natural Gas Co.; completed, Sept. 19, 1913; elevation, 855' **B**.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	785	805
Second Cow Run Sand.....	1060	1195
<b>Salt Sand</b> (gas, 1397').....	1390	1400
Salt Sand.....	1422	1483
Maxton Sand.....	1611	1651
Little Lime.....	1671	1686
Pencil Cave.....	1686	1696
<b>Big Lime</b> (gas, 1768').....	1696	1782
<b>Big Injun Sand</b> (gas, 1788').....	1782	1855
Berea Sand.....	2177	2190
Total depth.....		2297

The above well was a Big Injun gasser.

The following well, drilled originally by the South Penn Oil Company, but now owned by the Eastern Oil Company, was reported to have been a heavy gas well from the Big Injun Sand, making a line pressure of 600 pounds or more. Its product is used by the Glenville Oil and Gas Company to supply the town of Glenville with gas:

**M. E. Gainer No. 1 Well Record (663).**

Dekalb District; on Spring Run, 1.8 miles southwest of Alfred; authority, Eastern Oil Co.; elevation, 865' B.

	Top. Feet.	Bottom. Feet.
Coal, Sewickley.....	178	183
Red rock.....	198	203
Limestone .....	318	333
Red rock.....	393	453
Black sand, Murphy.....	558	573
Coal, Elk Lick.....	583	593
Black sand, Grafton.....	643	668
Red rock.....	718	768
White sand, Little Dunkard.....	798	818
Limestone .....	1110	1140
White sand, Salt.....	1230	1260
White sand, Salt.....	1280	1320
White sand, Salt.....	1400	1425
Sand, Salt.....	1435	1460
Lime .....	1490	1520
Lime .....	1600	1620
Big Lime.....	1650	1770
Big Injun Sand (gas, 1780' and 1800').....	1770	1874
Slate and shells to bottom.....	1810	2873

**Lillie F. House No. 1708 Well Record (663A).**

Dekalb District; 1.8 miles west of Alfred; authority, Hope Natural Gas Co.; completed, Sept. 30, 1910?; elevation, 935' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	970	1060
Gas Sand.....	1115	1185
Salt Sand.....	1270	1315
Salt Sand.....	1430	1530
Little Lime.....	1730	
Big Lime.....	1770	
Big Injun Sand (gas, 1894').....	1865	1918
Berea Sand.....	2240	2250
Total depth.....		2945

The Luther Ellison No. 1 (665), drilled on Bull Fork, 0.7 mile northwest of Alfred, was abandoned as a dry hole, but supplies gas for domestic purposes at the farmhouse. The following well was drilled on the head of Trace Fork, and was a gasser:

## J. T. Wilt No. 2243 Well Record (666).

Dekalb District; on Trace Fork, 2.0 miles north of Revere; authority, Hope Natural Gas Co.; completed, July 14, 1911; elevation, 900' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	804	831
Big Dunkard Sand.....	917	945
Burning Springs Sand.....	1000	1050
Second Cow Run Sand.....	1200	1275
Salt Sand (water, 1450'; gas, 1483-8').....	1400	1495
Maxton Sand.....	1665	1688
Little Lime.....	1706	1726
Pencil Cave.....	1726	1730
Big Lime.....	1730	1815
Keener Sand.....	1815	1830
Big Injun Sand (gas, 1822-5').....	1830	1880
Berea Sand.....	2210	2220
Total depth.....		2273

The Revere Oil Pool, on Mudlick Run of Trace Fork, 2 to 3 miles northwest of Revere, contains about twenty wells, most of which are oil producers from the Berea Sand, ranging in size from 2 to 50 barrels, being an apparent extension of the great **Yellow Creek Pool** of Calhoun County<sup>7</sup> which extends for several miles along the same northern slope of the Chestnut Ridge Anticline. Besides several short tabulated wells in the summarized table the seven following detailed records are available from this pool. Some of the wells along the arch are gassers:

## A. B. Ayers No. 3130 Well Record (667).

Dekalb District; on Mudlick Run, 1.2 miles northwest of Revere; authority, Hope Natural Gas Co.; completed, Dec. 1, 1913; elevation, 814' L.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	765	780
Burning Springs Sand (gas, 926').....	849	945
Second Cow Run Sand.....	1015	1140
Salt Sand (gas, 1360-8').....	1335	
Total depth.....		1392

<sup>7</sup>Ray V. Hennen, Wirt-Roane-Calhoun Rept., W. Va. Geol. Survey, p. 419; 1911.

The **Nancy Nicholas No. 1 (668)** made oil and gas in the Big Dunkard and a little oil in the Berea; the **W. H. Ayers No. 3 (669)** made oil and gas in the Berea; the **W. H. Ayers No. 1 (670)** was a light oil well from the Big Dunkard, Big Injun and oil and gas in the Berea; the **W. H. Ayers No. 5 (671)** made a little oil in the Berea and gas from the same sand estimated at 3,195,000 cubic feet; the **W. H. Ayers No. 4 (672)** made gas in the Salt and oil in the Berea; the **W. H. Ayers No. 2 (673)** made gas in the Big Injun and oil in the Berea.

### O. C. McQuain No. 2 Well Record (674).

Dekalb District; on Mudlick Run, 1.3 miles northeast of Nobe; authority, Eastern Oil Co.; completed, Sept. 11, 1912; elevation, 1070' B.

	Thickness. Total.	
	Feet.	Feet.
Lime and shells (conductor, 14') .....	110	110
Shells and slate .....	30	140
Sand, Waynesburg .....	30	170
Lime .....	20	190
Sand, Uniontown (water, 195') .....	40	230
Shells .....	30	260
Sand, Arnoldsburg .....	30	290
Lime and slate .....	160	450
Sand, Cedarville .....	40	490
Lime .....	70	560
Coal, Little Pittsburgh .....	5	565
Lime .....	45	610
Sand, Connellsville (small water) .....	25	635
Red rock .....	35	670
Lime .....	25	695
Red rock .....	115	810
Slate and shells .....	55	865
Red rock .....	25	890
Lime and slate .....	60	950
Sand, Little Dunkard .....	30	980
Black slate .....	40	1020
Lime .....	55	1075
Sand, Big Dunkard .....	30	1105
Slate and shells .....	50	1155
Lime .....	25	1180
Sand, Burning Springs .....	25	1205
Slate and shells .....	45	1250
Sand, Gas .....	65	1315
Lime and slate .....	40	1355
Sand, Second Cow Run .....	45	1400
Slate and shells .....	80	1480
Lime and shells .....	120	1600
Sand, Salt (gas, small, 1620') .....	40	1640
Sand, shells .....	60	1700

	Thickness. Feet.	Total. Feet.
Sand, Salt.....	30	1730
Shells and slate.....	40	1770
Lime .....	30	1800
Slate and shells.....	35	1835
Lime .....	35	1870
Slate and shells.....	20	1890
<b>Big Lime</b> .....	60	1950
Sand, Big Injun.....	80	2030
Unrecorded .....	40	2070
Lime .....	90	2160
Lime and slate.....	30	2190
Unrecorded .....	50	2240
Shells and slate.....	60	2300
Lime .....	30	2330
Slate, brown.....	40	2370
<b>Sand, good, Berea, (oil) (little water, 2390') to bottom</b> .....	20	2390
10" casing, 230'; 8¼", 1100'; 6⅝", 1905'.		

### O. W. O. Hardman No. 2 Well Record (675).

Dekalb District; on Mudlick Run, 1.5 miles northeast of Nobe; authority, Eastern Oil Co.; completed, May 14, 1912; elevation, 955' B.

	Thickness. Feet.	Total. Feet.
Unrecorded .....	95	95
Sand (water), Uniontown.....	65	160
Red rock.....	30	190
Lime and slate.....	70	260
Sand, Sewickley (water, 290').....	50	310
Lime and slate.....	205	515
Red rock.....	55	570
Sand, Lower Connellsville.....	15	585
Red rock.....	115	700
Lime, shells and slate.....	60	760
Red rock.....	30	790
Lime and slate.....	50	840
Sand .....	15	855
Lime .....	35	890
Sand, Little Dunkard.....	10	900
Lime and slate.....	105	1005
Sand, Burning Springs.....	85	1090
Shells and slate.....	35	1125
Sand, Second Cow Run.....	120	1245
Slate .....	15	1260
Sand, Salt.....	80	1340
Slate and lime.....	170	1510
Sand, Salt.....	45	1555
Slate and shells.....	65	1620
Lime .....	85	1705
Slate .....	15	1720
Lime .....	55	1775
Pencil Cave.....	5	1780

	Thickness. Feet.	Total. Feet.
Big Lime.....	60	1840
Big Injun Sand (gas, 1842').....	80	1920
Slate .....	25	1945
Lime .....	65	2010
Slate and shells.....	80	2090
Lime .....	45	2135
Lime and slate.....	35	2170
Lime .....	25	2195
Lime and shells.....	25	2220
Slate, brown.....	38	2258
Sand, Berea (gas, 2266-73'; oil, 2273-8') to bottom	20	2278
Conductor, 16'; 10" casing, 140'; 8¼", 1008'; 6⅝", 1815'.		

The above well was a 25-barrel producer.

### O. W. O. Hardman No. 3 Well Record (676).

Dekalb District; on Mudlick Run, 1.7 miles northeast of Nobe; authority, Eastern Oil Co.; completed, June 12, 1913; elevation, 1090' B.

	Thickness. Feet.	Total. Feet.
Slate and shells (hole full of water, 135').....	240	240
Sand, Uniontown (hole full of water, 245').....	25	265
Unrecorded .....	725	990
Sand, Little Dunkard.....	20	1010
Unrecorded .....	55	1065
Sand, Big Dunkard.....	55	1120
Unrecorded .....	25	1145
Sand, Gas, hard.....	125	1270
Unrecorded .....	10	1280
Sand, broken, Second Cow Run:.....	200	1480
Slate and shells.....	140	1620
Sand, Salt (gas, 1700').....	100	1720
Unrecorded .....	94	1814
Sand, Maxton (gas, 1824-9').....	46	1860
Unrecorded and red rock.....	25	1885
Slate and lime.....	5	1890
Little Lime.....	30	1920
Pencil Cave.....	6	1926
Big Lime.....	64	1990
Sand, Big Injun (gas, 1995-2005').....	85	2075
Slate and shells.....	305	2380
Shale, brown.....	23	2403
Sand, Berea, to bottom (gas, 2413-16'; oil, 50 bbls., 2416-22') .....	19	2422
Conductor, 10'; 10" casing, 269'; 8¼", 1110'; 6⅝", 1930'.		



## O. W. O. Hardman No. 5 Well Record (677).

Dekalb District; on Mudlick Run, 1.8 miles northeast of Nobe; authority, Eastern Oil Co.; completed, June 23, 1914.

	Top. Feet.	Bottom. Feet.
Slate (conductor, 11').....	0	35
Lime and sand.....	35	100
Slate and red rock.....	100	171
Sand and red rock.....	171	205
Sand, Uniontown.....	235	265
Sand, Sewickley.....	370	400
Coal, Little Pittsburgh.....	585	587
Sand, Burning Springs.....	1155	1200
Sand, Gas.....	1210	1260
Sand, Second Cow Run.....	1280	1375
Coal, Mercer.....	1390	1392
Sand, Salt.....	1392	1480
Sand, Salt (gas, 1650').....	1605	1685
Sand, Maxton (water, 1840').....	1800	1845
Little Lime.....	1870	1895
Pencil Cave.....	1895	1905
Big Lime.....	1905	1960
Sand, Keener (gas, 1970').....	1960	1970
Sand, Big Injun.....	2020	2065
Shale, brown.....	2365	2396
Sand, Berea, to bottom (gas, 2398'; oil, 2410-16'; water, 2416-18').....	2396	2418
10" casing, 270'; 8¼", 1080'; 6½", 1910'. 10-bbl. well; shot June 24, with 30 qts.		

## O. W. O. Hardman No. 1 Well Record (678).

Dekalb District; on Mudlick Run, 1.9 miles northeast of Nobe; authority, Eastern Oil Co.; completed, Jan. 25, 1912.

	Thickness. Feet.	Total. Feet.
Unrecorded .....	25	25
Sand, Hundred.....	75	100
Slate, lime and sand.....	740	840
Cave .....	75	915
Slate, lime and sand.....	155	1070
Red rock.....	40	1110
Coal, Bakerstown.....	5	1115
Slate, black.....	25	1140
Lime .....	15	1155
Sand, Little Dunkard.....	15	1170
Slate, lime and sand.....	550	1720
Sand, Salt (small gas, 1826').....	130	1850
Unrecorded and sand.....	25	1875
Shells and slate.....	110	1985
Sand, Maxton.....	25	2010
Red rock.....	10	2020
Lime and slate.....	60	2080
Big Lime.....	50	2130

	Thickness. Total.	
	Feet.	Feet.
Sand, Keener.....	80	2210
Break .....	7	2217
Sand, Big Injun (small gas, 2217').....	13	2230
Slate, lime and shells.....	280	2510
Shale, brown, and shells.....	53	2563
Sand, Berea (oil, 2585', 10 bbl.).....	30	2593
Total depth.....		2601
Conductor, 16'; 10" casing, 185'; 8¼", 1207'; 6½", 2095'.		

### O. C. McQuain No. 3 Well Record (679).

Dekalb District; on Mudlick Run, 1.5 miles northeast of Nobe; authority, Eastern Oil Co.; completed, Apr. 15, 1914; elevation, 915' B.

	Top.	Bottom
	Feet.	Feet.
Sand, Uniontown (hole full of water, 65').....	25	70
Sand, Upper Sewickley (water, 85').....	130	215
Sand, Lower Sewickley.....	240	260
Coal, Sewickley.....	275	277
Sand, Little Dunkard.....	810	830
Sand, Big Dunkard.....	905	965
Sand, Burning Springs.....	975	1065
Sand, Gas.....	1085	1185
Sand, Second Cow Run.....	1200	1280
Sand, Salt.....	1325	1340
Sand, Salt.....	1470	1580
Sand, Maxton.....	1665	1680
Little Lime.....	1700	1725
Pencil Cave.....	1725	1740
Big Lime.....	1740	1795
Sand, Keener.....	1795	1865
Sand, Big Injun (small gas, 1890').....	1865	1900
Shale, brown.....	2204	2211
Sand, Berea, to bottom (gas show, 2211'; gas and oil, 2221' and 2228'; water and oil, 2228-33')..	2211	2233
Conductor, 16'; 10" casing, 173'; 8¼", 915'; 6½", 1743'. Shot with 30 qts.; produced 8 bbls. first day.		

The O. C. McQuain No. 1 (680), the first well drilled on Mudlick Run, was an oil producer from the Berea Sand. The Mary E. Radabaugh No. 1 (681), drilled on the head of Trace Fork, 0.5 mile northeast of Nobe, was a gas well, but its record was not secured.

The following well, drilled along the dividing ridge on the Calhoun side, was a Big Injun gasser. but apparently found no Berea Sand:

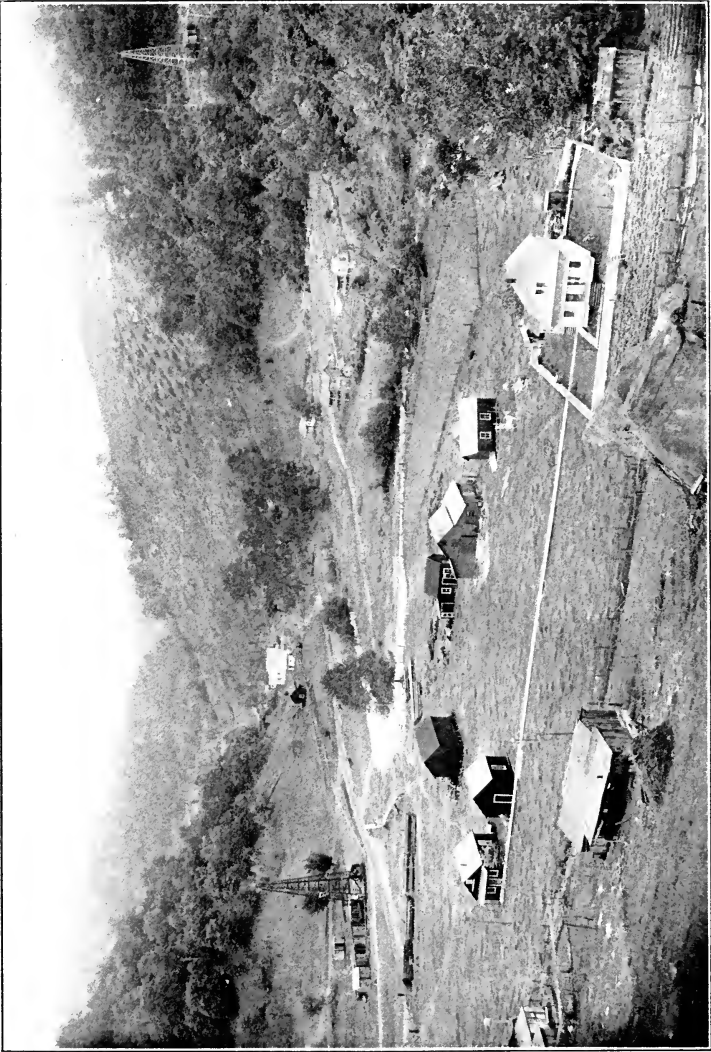


PLATE XXX—Looking eastward along Sand Fork at Copley, Lewis County, South Penn Oil Co. buildings in center; Michael Copley Heirs No. 1 (363) well (perhaps the largest ever drilled in West Virginia) at left center; Waynesburg Sandstone among brush piles near sky line; Topography of the Dunkard and Monongahela Series.



## Jacob Whipkey No. 2929 Well Record (682).

Sherman District, Calhoun County; 1.2 miles west of Revere; authority, Hope Natural Gas Co.; completed, June 13, 1913; elevation, 1170' B.

	Top Feet.	Bottom. Feet.
Moundsville Sand.....	985	1000
Little Dunkard Sand.....	1110	1150
Second Cow Run Sand.....	1410	1470
Salt Sand.....	1520	1555
Salt Sand (gas, 1722').....	1707	1810
Maxton Sand (gas, 1848').....	1848	1858
Big Lime.....	1976	2084
Big Injun Sand (gas, 2098').....	2084	2161
Total depth.....		2602

South of Tanner, only a few wells have been drilled and most of these have been failures. The **Frank N. Gainer No. 1 (683)**, located on a branch of Tanner Creek, 1.4 miles northwest of Latonia, was reported to have made considerable gas and a show of oil. The gas still burns at the well mouth and seeps from the ground along the run, but the well was abandoned. Its record was not secured. The **Henry O. Middleton No. 1 (685)**, reported by Early Rinehart to have been drilled by the springpole method many years ago to a depth of 1600 to 1700 feet, was apparently a dry hole. The **Louis Bennett No. 1 (686)**, drilled on Millseat Run, 0.7 mile southwest of Dekalb, was abandoned as a dry hole, but was reported to have made some gas. The following is the record of a dry hole drilled at the mouth of Leading Creek:

## Thomas M. West No. 1 Well Record (688).

Dekalb District; on Leading Creek, 0.3 mile north of Revel; authority, South Penn Oil Co.; elevation, 740' B.

	Top Feet.	Bottom. Feet.
Sand, Salt.....	1136	1161
Sand, Salt.....	1326	1361
Lime .....	1416	1471
Big Lime.....	1481	1521
Big Injun Sand.....	1521	
Lime .....	1521	1565
Slate and shells.....	1565	1675
Shells .....	1675	1725
Sand and shells.....	1750	1800
Slate to bottom.....	1800	2442

The above well was drilled deep enough to penetrate all the producing sands of the State, but shows an almost entire lack of sands below the Big Lime, a condition found also at the Norris well (689) at Glenville.

**Prospective Oil and Gas Areas, Dekalb District.**—The following suggestions are offered regarding further development in Dekalb District: (1) The northern part of the district in the region of Alfred has room for many additional gas wells; (2) The Revere Oil Pool can probably be extended eastward for about three-fourths mile; (3) Several square miles of territory along Trace and Laurel Forks in the neighborhood of Revere and west of Tanner offer hope of gas wells in the Big Injun and Berea Sands; (4) That portion of the district southeast of Tanner Creek, favored by its structural position along the slope of the great Chestnut Ridge Anticline, offers some show for gas. It is true that such records as are available show a lack of sands below the Big Lime, but it is scarcely likely that this condition prevails throughout all this territory. Further drilling should preferably be undertaken first on Sinking Creek, south of the wells already drilled, which are known to have found the Big Injun Sand, and where the risk would be the least.

#### *Detailed Well Records, Glenville District.*

Glenville District, situated in the eastern part of Gilmer and traversed by both the Chestnut Ridge Anticline and the Grassland Syncline, has produced a considerable amount of oil and gas, and still offers much territory that should prove to be valuable. Numerous records are available and these should be of great service to the operators in planning future work. The **Milton Norris No. 1 (689)**, drilled at Glenville, the record of which is published in the section for Glenville, page 86, made a show of gas in the Salt Sand, and shows of gas and oil in the Big Lime and Big Injun Sands. No sands were found below the Injun although the well was drilled 1008 feet below the top of the Big Lime, far enough to reach any known producing sand of the State. The **J. W. Killingsworth No. 1**

(690), located on Lynch Run, 0.5 mile northeast of Truebada, the record of which is published in the section for Sand Fork, page 88, made a show of gas in the Big Lime and a little oil in the Keener. The well was drilled 1109 feet below the top of the Big Lime but failed to find the lower sands of the Catskill Series that produce oil farther east in the Sand Fork Valley. The **Alfred Messenger No. 1 (691)**, located on the Little Kanawha just west of Sand Fork, was reported to have made shows of both oil and gas, but its record could not be secured. The **James C. Ruddell No. 1 (692)**, located three-fourths mile northeast of Sand Fork, was said to have made enough gas to furnish lights for the farmhouse but was abandoned.

The **Indian Fork Oil Pool**, located along the Grassland Syncline at the mouth of Indian Fork of Sand Fork, and drilled soon after the development of the Copley Pool in Lewis, contains about 60 wells, most of which have been oil producers from the Fifth Sand. The pool as now developed is about three miles long and one-half mile wide at the middle and crosses the Grassland Syncline at an acute angle, its general course being about S. 20° W. The three following wells were drilled along Joes Run at the southern end of the pool:

### J. B. Varner No. 1 Well Record (694).

Glenville District; 1.4 miles northeast of Stouts Mills; authority, South Penn Oil Co.; elevation, 895' B.

	Top. Feet.	Bottom. Feet.
Pittsburgh Coal.....	280	
Little Dunkard Sand.....	740	790
Salt Sand.....	1500	1550
Big Lime.....	1900	1960
Big Injun Sand.....	1960	2110
Gordon Sand.....	2600	2607
Fifth Sand.....	2820	2829
Total depth.....		2918

The above well was a dry hole. The **J. B. Varner No. 2 (695)**, on the same branch, was reported to have made some oil, but the casing collapsed before the well was shot and it was abandoned.

**R. R. Marshall No. 3 Well Record (697).**

Glenville District; on Joes Run, 2.0 miles northeast of Stouts Mills; authority, Guffey and Galey; elevation, 1000' B.

	Top. Feet.
Coal, Sewickley.....	240
Sand .....	790
Little Dunkard Sand.....	815
Break .....	880
Sand, very hard, Big Dunkard.....	890
Sand, Salt.....	1790
Limestone .....	1975
"Blue Monday".....	2000
Break .....	2020
Big Lime.....	2026
Big Injun Sand.....	2086
Sand, Squaw.....	2230
Red rock.....	2670
Gordon Sand.....	2698
Sand, Fifth.....	2864
Total depth.....	2898

The above well has been pumping 10 to 12 years but still produces 120 barrels monthly.

The **R. R. Marshall No. 1 (698)**, which was the first well drilled along Joes Run, had an initial production of 50 barrels and still makes 25 barrels monthly. The following well, the record of which was published in Volume I(A), page 381, of the Survey, had an initial production of 25 to 30 barrels and still makes 12 barrels monthly:

**V. S. and T. M. Lynch No. 4 Well Record (700).**

Glenville District; on Joes Run, 1.6 miles west of Blackburn; authority, Guffey and Galey; elevation, 910' B.

	Thickness, Feet.	Total, Feet.
Red rock, slate and limestone.....	715	715
Coal, Bakerstown.....	5	720
Slate, limestone and red rock?.....	80	800
Big Dunkard Sand and slate.....		1400
Salt Sand.....	160	
Sand, Salt.....	100	1700
Limestone and slate.....	180	1880
Little Lime.....	22	1902 (?)
Pencil Cave.....	22	(?)
"Blue Monday".....	50	1952
Big Lime.....	100	2052
Big Injun Sand.....	150	2202
Slate .....		2237
Berea Grit.....	25	



	Thickness. Feet.	Total. Feet.
Slate .....		
Gordon Sand.....	3	2625
Slate .....	179	2804
Fifth Sand.....	8	
Total depth.....		2830

"This record is very defective, but the measurements to the main sands are probably recorded correctly."

The seven following wells are located along Indian Fork:

### Arnold Moore Heirs No. 1 Well Record (701).

Glenville District; on Indian Fork, 1.0 mile northwest of Blackburn; authority, South Penn Oil Co.; elevation, 765' B.

	Top. Feet.	Bottom. Feet.
Coal, Bakerstown.....	559	
Big Dunkard Sand.....	645	700
Salt Sand.....	1410	1510
Maxton Sand.....	1580	1630
Big Lime.....	1725	1850
Big Injun Sand.....	1850	2100
Gordon Stray Sand.....	2434	
Gordon Sand.....	2452	
Fifth Sand (oil, 2663').....	2662	2669
Total depth.....		2697

### Arnold Moore Heirs No. 2 Well Record (702).

Glenville District; on Indian Fork, 0.5 mile northwest of Blackburn; authority, South Penn Oil Co.; elevation, 765' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	675	740
Burning Springs Sand.....	750	825
Gas Sand.....	865	945
Salt Sand.....	1290	1380
Maxton Sand.....	1720	1750
Little Lime.....	1760	1775
Big Lime.....	1803	1849
Big Injun Sand.....	1849	2004
Gordon Stray Sand.....	2500	
Gordon Sand.....	2510	
Fifth Sand.....	2680	2682
Lime and slate.....	2682	3024
Slate to bottom.....	3024	3028

The above well was abandoned as a dry hole.

**W. H. Cox No. 10 Well Record (704).**

Glenville District; on Indian Fork, 1.1 miles northwest of Blackburn; authority, South Penn Oil Co.; elevation, 1080' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	1000	1035
Salt Sand.....	1300	1390
Maxton Sand.....	1940	1960
Big Lime.....	2098	2160
Big Injun Sand.....	2160	2460
Gordon Sand.....	2800	2812
Fifth Sand (oil, 3008').....	3007	3017
Total depth.....		3045

**W. H. Cox No. 2 Well Record (705).**

Glenville District; on Indian Fork, 1.3 miles northwest of Blackburn; authority, South Penn Oil Co.; elevation, 755' B.

	Top. Feet.	Bottom. Feet.
Coal, Harlem.....	430	
Big Dunkard Sand.....	700	740
Salt Sand.....	1530	1600
Maxton Sand.....	1620	1690
Big Lime.....	1785	1800
Big Injun Sand.....	1800	1960
Gordon Stray Sand.....	2450	2460
Gordon Sand.....	2475	2482
Fifth Sand (oil, 2674').....	2673	2678

The above record was published in Volume I(A), page 377, of the Survey.

**W. H. Cox No. 1 Well Record (706).**

Glenville District; on Indian Fork, 1.5 miles northwest of Blackburn; authority, South Penn Oil Co.; elevation, 755' B.

	Top. Feet.	Bottom. Feet.
Sand, Gas.....	840	900
Pencil Cave .....	1850	1860
Big Lime.....	1860	1920
Big Injun Sand.....	1920	2070
Gordon Stray Sand.....	2482	2492
Gordon Sand.....	2507	2510
Fifth Sand (oil, 2678').....	2677	2683

The above record was published in Volume I(A), page 377, of the Survey.

The **W. H. Cox No. 4 (707)**, the record of which was published in Volume I(A), page 377, of the Survey, made oil in the Fifth Sand.

### W. S. Kirkpatrick No. 4 Well Record (708).

Glenville District; on Indian Fork, 1.5 miles northwest of Blackburn; authority, South Penn Oil Co.; elevation, 930' B.

	Top. Feet.	Bottom. Feet.
Coal, Pittsburgh.....	210	
Sand, Big Dunkard.....	770	825
Big Lime.....	1855	1970
Sand, Big Injun.....	1970	2125
Sand, Fifth (oil, 2853').....	2852	2858

The above record was published in Volume I(A), page 376, and the following on page 372, of the Survey.

### W. S. Kirkpatrick No. 1 Well Record (709).

Glenville District; on Indian Fork, 1.1 miles southeast of Ellis; authority, South Penn Oil Co.; elevation, 760' B.

	Top. Feet.	Bottom. Feet.
Pittsburgh Coal.....	None.	
Sand, Burning Springs.....	830	880
Salt Sand.....	1570	1650
Pencil Cave.....	1805	1810
Big Lime.....	1810	1900
Big Injun Sand.....	1900	2125
Gordon Stray Sand.....	2445	2450
Gordon Sand.....	2465	2469
Fifth Sand (oil, 2681').....	2680	2690
Total depth.....		2723

The two following wells were drilled along Sand Fork above Indian Fork and were both Fifth Sand producers:

### Reuben J. Dyer No. 4 Well Record (710).

Glenville District; on Sand Fork, 1.6 miles northwest of Blackburn; authority, South Penn Oil Co.; elevation, 780' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	660	690
Salt Sand.....	1380	1420
Maxton Sand.....	1645	1670
Big Lime.....	1790	1838

	Top. Feet.	Bottom. Feet.
Big Injun Sand.....	1838	2050
Gordon Stray Sand.....	2493	2497
Gordon Sand.....	2523	
Fifth Sand (oil, 2709').....	2707	2715
Total depth.....		2745

### Reuben J. Dyer No. 1 Well Record (712).

Glenville District; on Sand Fork, 1.5 miles northwest of Blackburn; authority, South Penn Oil Co.; elevation, 755' B.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	640	680
Salt Sand.....	1360	1420
Maxton Sand.....	1630	1660
Big Lime.....	1775	1830
Big Injun Sand.....	1830	2000
Gordon Sand, shells.....	2498	
Fifth Sand (oil).....	2684	2691
Total depth.....		2728

Numerous wells have been drilled along Sand Fork near the Lewis-Gilmer Line in an attempt to connect the Copley and Indian Fork Pools, all of which have resulted in failures, nothing more than shows of oil being found. The five following records are from this locality:

### Wm. E. Lively No. 2 Well Record (713).

Glenville District; 1.2 miles N. 10° W. of Blackburn; authority, South Penn Oil Co.; elevation, 1285' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	1230	1280
Sand, Gas.....	1375	1460
Big Lime.....	2350	2390
Big Injun Sand.....	2390	2580
Gordon Sand.....	3048	3058
Fifth Sand.....	3222	3226
Total depth.....		3276

The above well was a dry hole.

**Wm. E. Lively No. 7 Well Record (715).**

Glenville District; on Sand Fork, 1.0 mile southwest of Donlan; authority, South Penn Oil Co.; elevation, 895' B.

	Top. Feet.	Bottom. Feet.
Sand, Grafton.....	535	580
Coal, Brush Creek.....	825	828
Big Dunkard Sand.....	888	925
Sand, Second Cow Run.....	1110	1238
Coal, Mercer.....	1238	1241
Salt Sand.....	1510	1555
Salt Sand.....	1645	1695
Maxton Sand.....	1705	1730
Big Lime.....	1965	2040
Big Injun Sand (gas, 2115' and 2125').....	2040	2195
Thirty-foot Sand.....	2575	2585
Lime .....	2625	2645
Lime .....	2650	2655
Shell, Fourth.....	2740	2749
Total depth.....		2992

The above well was dry except for the show of gas recorded in the Injun, no Fifth Sand being found.

The following well, the record of which was published in Volume I(A), page 381, of the Survey, was reported to have made a show of oil, having filled up 250 feet in the casing before the well was pulled:

**William E. Lively No. 1 Well Record (716).**

Glenville District; on Sand Fork, 0.8 mile southwest of Donlan; authority, South Penn Oil Co.; elevation, 785' B.

	Top. Feet.	Bottom. Feet.
Pittsburgh Coal.....	None	
Big Dunkard Sand.....	766	776
Gas Sand.....	960	919
Maxton Sand.....	1835	1865
Pencil Cave.....	1960	1962
Big Lime.....	1962	2000
Big Injun Sand.....	2000	2100
Gordon Sand.....	2585	
Fifth Sand.....	2775	
Total depth.....		2908

## J. N. Butcher No. 1 Well Record (720).

Glenville District; on Butchers Fork, 1.2 miles southeast of Copley; authority, South Penn Oil Co.; elevation, 1030' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	1050	1098
Salt Sand.....	1800	1990
Big Lime.....	2120	2200
Big Injun Sand.....	2200	2420
Gordon Stray Sand.....	2780	2787
Gordon Sand.....	2795	2798
Fourth Sand.....	2840	2844
Fifth Sand.....	None	
Total depth.....		3103

The above well was a dry hole, its record being published in Volume I(A), page 373, of the Survey.

## Heath Bros. No. 1 Well Record (721).

Glenville District; on Butchers Fork, 1.8 miles north of Blackburn; authority, Guffey and Galey.

	Thickness. Feet.	Total. Feet.
Slate .....	70	86
Red rock.....	100	186
Slate .....	100	286
Sand, Murphy.....	60	346
Slate .....	20	366
Sand .....	34	400
Red rock.....	50	450
Slate .....	60	510
Slate and shells.....	140	650
Sand, Big Dunkard.....	50	700
Lime .....	60	760
Sand, Gas.....	150	910
Slate .....	80	990
Lime .....	30	1020
Sand, white, Salt.....	150	1170
Lime .....	50	1220
Sand, Salt .....	430	1650
Red rock.....	75	1725
Slate and shells.....	150	1875
Lime .....	25	1900
Slate .....	30	1930
Big Lime.....	90	2020
Big Injun Sand.....	200	2220
Slate and shells.....	275	2495
Sand, Thirty-foot.....	20	2515
Slate .....	35	2550
Red rock.....	10	2560
Slate .....	30	2590
Sand, Gordon Stray.....	15	2605

	Thickness Feet.	Total Feet.
Shale, white.....	13	2618
Sand, Gordon.....	7	2625
Slate.....	54	2679
Red rock.....	21	2700
Slate, dark.....	30	2730
Sand, Fifth.....	47	2777
Slate, white.....	3	2780
Total depth.....		2825

The above well, the record of which was published in Volume I(A), page 380, of the Survey, was a dry hole.

The following well, the record of which was published in Volume I(A), page 376, of the Survey, was drilled in an otherwise untested territory, about midway between the Grassland Syncline and the Chestnut Ridge Anticline. It was abandoned as a dry hole but there is considerable gas seeping from the ground around the hole. The gas burns with a flame 5 feet high from a 1-inch pipe driven in the ground:

#### Amanda B. Connor No. 1 Well Record (717).

Glenville District; on Ellis Creek, 2 miles north of Ellis; authority, South Penn Oil Co.; elevation, 840' L.

	Top. Feet.	Bottom. Feet.
Coal, Elk Lick.....	325	
Sand, Big Dunkard.....	650	709
Sand, Salt.....	1300	1395
Sand, Maxton.....	1515	1550
Pencil Cave.....	1585	1600
Big Lime.....	1600	1660
Big Injun Sand.....	1660	1990
Sand, Gordon Stray (shells).....	2410	
Sand, Fifth.....	2622	2626
Total depth.....		2703

The following well, the record of which was published in Volume I(A), page 376, of the Survey, was reported to have made a light show of gas and was abandoned as a dry hole:

### J. W. Moody No. 1 Well Record (723).

Glenville District; on Indian Fork, 1 mile northeast of Blackburn; authority, South Penn Oil Co.; elevation, 1280' B.

	Top. Feet.	Bottom. Feet.
Coal, Brush Creek.....	1025	1027
Sand, Big Dunkard.....	1080	1095
Sand, Gas.....	1131	1222
Sand, Second Cow Run.....	1280	1328
Sand, Salt.....	1372	1850
Sand, Maxton.....	2160	2200
Pencil Cave.....	2228	2236
Big Lime.....	2236	2306
Big Injun Sand (gas, 2435').....	2306	2528
Sand, Gordon Stray.....	2934	2941
Sand, Gordon (shell).....	2953	
Sand, Fifth.....	3094	3098
Total depth.....		3218

The following is the record of a well recently drilled which made only a show of gas and was abandoned:

### Sarah Dancer No. 3254 Well Record (724).

Glenville District; on Indian Fork, 1.7 miles northeast of Blackburn; authority, Hope Natural Gas Co.; completed, Jan. 6, 1914; elevation, 795' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	615	680
Gas Sand.....	760	815
Salt Sand.....	850	1070
Salt Sand.....	1270	1345
Salt Sand.....	1355	1380
Little Lime.....	1710	1748
Pencil Cave.....	1748	1763
Big Lime.....	1763	1823
Big Injun Sand.....	1823	1948
Gordon Sand (gas, 2415').....	2414	2416
Fifth Sand.....	Shell	
Total depth.....		2816

In the southeastern corner of Glenville District, where the structure is rising rapidly toward the Orlando Anticline, several good gas wells have been drilled. The four following records are from this locality:



## E. E. Bond No. 7009 Well Record (725).

Glenville District; on branch of Calf Run, 1.1 miles southwest of Aspinwall; authority, Pittsburgh & W. Va. Gas Co.; completed, Aug. 31, 1914; elevation, 1090' B.

	Thickness. Total.	
	Feet.	Feet.
Mud .....	15	15
Red rock.....	50	65
Lime .....	25	90
Slate, white.....	43	133
Sand, Sewickley.....	37	170
Red rock.....	90	260
Lime .....	25	285
Slate, white.....	30	315
Red rock.....	70	385
Lime .....	22	407
Slate, white.....	30	437
Red rock.....	83	520
Lime .....	30	550
Slate, white.....	37	587
Lime .....	8	595
<b>Coal, Bakerstown</b> .....	5	600
Slate .....	20	620
Red rock.....	70	690
Sand, Little Dunkard.....	33	723
Red rock.....	27	750
Slate, white.....	70	820
Sand, Big Dunkard.....	70	890
Slate, white.....	15	905
Sand, Burning Springs.....	60	965
Slate and shells.....	45	1010
Lime, white.....	130	1140
Slate, white.....	36	1176
Sand, Salt.....	129	1305
Slate, black.....	15	1320
Sand, Salt.....	60	1380
Slate and shells.....	150	1530
Sand, Salt.....	94	1624
Slate, dark.....	38	1662
Sand, Salt.....	32	1694
Lime .....	91	1785
Slate, black.....	10	1795
Lime, dark.....	35	1830
Sand, white, Maxton.....	70	1900
Red rock.....	20	1920
Lime, white.....	28	1948
Pencil Cave.....	12	1960
<b>Big Lime</b> .....	100	2060
<b>Sand, white, Big Injun (gas show, 2180')</b> .....	215	2275
Slate, brown.....	75	2350
Sand, white, Berea.....	25	2375
Lime .....	65	2440
Slate and shells.....	70	2510
Unrecorded .....	93	2603
<b>Sand, Gordon Stray (gas, 2606')</b> .....	13	2616
Unrecorded .....	20	2636

	Thickness, Feet.	Total Feet.
Sand, Gordon.....	20	2656
Unrecorded .....	162	2818
Sand, Fifth (gas, 2819').....	5	2823
Unrecorded to bottom.....	26	2849
10" casing, 133'; 8¼", 890'; 6⅝", 1967'.		

### Peter Sweeny No. 7010 Well Record (726).

Glenville District; on Calf Run, 1.0 mile southwest of Aspinwall; authority, Pittsburgh & W. Va. Gas Co.; completed, Sept. 28, 1914; elevation, 1160' B.

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard.....	784	845
Sand, Burning Springs.....	915	950
Sand, Second Cow Run.....	1020	1060
Sand, Salt.....	1150	1410
Sand, Salt.....	1600	1667
Sand, Salt.....	1732	1770
Sand, Maxton.....	1840	1890
Big Lime.....	2010	2100
Sand, Big Injun (gas, 2147').....	2100	2267
Sand, Fifty-foot.....	2540	2560
Sand, Thirty-foot (gas, 2625').....	2617	2631
Sand, Gordon Stray.....	2637	2642
Total depth.....		2655

### Peter Farrell No. 3226 Well Record (727).

Glenville District; on Rocky Fork, 1.7 miles southeast of Blackburn; authority, Hope Natural Gas Co.; completed, Dec. 30, 1913; elevation, 1106' L.

	Top. Feet.	Bottom. Feet.
Moundsville Sand.....	625	660
Little Dunkard Sand.....	720	735
Big Dunkard Sand.....	785	820
Burning Springs Sand.....	810	940
Salt Sand.....	1130	1280
Salt Sand (gas, 1645').....	1600	1670
Little Lime.....	1900	1915
Pencil Cave.....	1915	1920
Big Lime.....	1920	1965
Big Injun Sand (gas, 1970').....	1965	2185
Squaw Sand.....	2188	2210
Thirty-foot Sand.....	2567	2572
Gordon Stray Sand.....	2609	2621
Gordon Sand.....	2630	2637
Fourth Sand.....	2660	2671
Fifth Sand.....	2822	2828
Total depth.....		2863

### Samuel Heater No. 3256 Well Record (728).

Glenville District; on Rocky Fork, 1.3 miles southwest of Aspinwall; authority, Hope Natural Gas Co.; completed, Jan. 6, 1914; elevation, 1170' B.

	Top. Feet.	Bottom. Feet.
Lower Connellsville Sand.....	400	435
Little Dunkard Sand.....	710	730
Big Dunkard Sand.....	790	860
Gas and Second Cow Run Sands.....	920	1100
Salt Sand.....	1115	1245
Salt Sand.....	1290	1410
Maxton Sand (gas, 1850').....	1830	1890
Little Lime.....	1895	1900
Big Lime.....	1900	1930
Big Injun Sand (gas, 2100').....	1930	2250
Fifty-foot Sand.....	2430	2445
Thirty-foot Sand.....	2550	2565
Gordon Stray Sand (gas, 2623').....	2611	2627
Gordon Sand (gas, 2646').....	2644	
Total depth.....		2667

Three gas wells have been drilled in Saltlick District, Braxton, near the common corner of Lewis, Gilmer and Braxton, of which the following are the records:

### Hudson Mick No. 3267 Well Record (729).

Saltlick District, Braxton County; 1.6 miles southwest of Aspinwall; authority, Hope Natural Gas Co.; completed, Jan. 5, 1914; elevation, 1265' L.

	Top. Feet.	Bottom. Feet.
Grafton Sand.....	520	590
Little Dunkard Sand.....	709	750
Big Dunkard Sand.....	805	850
Second Cow Run Sand.....	1025	1109
Salt Sand.....	1123	1255
Maxton Sand.....	1956	1986
Little Lime.....	1988	1995
Big Lime.....	1999	2029
Big Injun Sand.....	2029	2175
Squaw Sand.....	2180	2260
Gordon Stray Sand (gas, 2650').....	2644	2655
Gordon Sand (gas, 2682').....	2670	2698
Total depth.....		2699

### Waters Heirs No. 5 Well Record (730).

Saltlick District, Braxton County; at head of Posey Run, 2.3 miles northwest of Orlando; authority, Snaith & Wilson; elevation, 1232' L.

	Top. Feet.	Bottom. Feet.
Sand, Little Dunkard.....	700	760
Sand, Gas.....	1025	1340
Sand, Salt.....	1520	1835
Little Lime.....	1890	1920
Big Lime.....	1925	1960
Big Injun Sand (break, 1965-8'; gas, 1985').....	1960	2200
Thirty-foot Sand (gas, 2596').....	2591	2600
Gordon Stray Sand (gas, 2618').....	2616	2636
Total depth.....		2665
10" casing, 150', pulled out; 8¼", 800', pulled out; 6½", 1971', left in well; 2" tubing, 2665', left in well; tubing packer set at 2594'; gas test in tubing, 18/10" mercury in 2" opening; gas test in Braden Head, 65/10" mercury in 2" opening; volume, 2,150,000 cubic feet daily.		

### Waters Heirs No. 6 Well Record (730A).

Saltlick District, Braxton County; at head of Posey Run, 2.2 miles northwest of Orlando; authority, Snaith & Wilson.

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard.....	800	880
Salt Sand.....	1150	1400
Salt Sand.....	1500	1880
Big Lime.....	1920	1990
Big Injun Sand (gas, 2014').....	1990	2240
Gordon Stray Sand (gas, 2624').....	2622	2633
Gordon Sand (gas, 2663').....	2651	2670
Total depth.....		2679
Packer on 2" tubing set at 2059'; gas test in tubing, 95/10" mercury in 2" opening; gas test in Braden Head, 22/10" mercury in 2" opening; 6½" and 8-inch casing left in well; volume, 2,500,000 cubic feet daily.		

Two wells have been drilled in Saltlick District, Braxton, along the Left Fork of Oil Creek. The **George Robinette No. 1 (731)**, the record of which was published in Volume I(A), page 392, of the Survey, 1.5 miles northeast of Burnsville, made a little gas in the Gordon and a show of oil in the Fifth. The **George Robinette No. 2 (732)**, located one-fourth mile west of the other well, made considerable gas as the well still burns with a great flame. These two wells were drilled about fifteen years ago and were abandoned, but in the present stage

of the gas industry would probably be considered fair gas wells. The record of the **Marshall No. 1** (not listed), drilled on the Little Kanawha River one-half mile northwest of Burnsville, is published in the section for Burnsville, pages 92-3. It made a little oil and gas in the Salt Sand of Rosedale, a show of oil and gas in the Injun and a little oil in the Berea. Seven wells have been drilled along Hyers Run, two miles west of Burnsville, nearly all of which have been light gassers, the Gordon Sand being reported as the producing horizon. These wells are in Braxton, about  $1\frac{1}{2}$  miles from the Gilmer Line. Six wells have been drilled along Longshoal Run,  $1\frac{1}{2}$  to 2 miles northeast of Gilmer Station, some of which are in Braxton and some in Gilmer. The **Fred Hoover No. 1 (737)** was reported a dry hole; the **Wilson Heirs No. 1 (739)** was reported to have made a considerable oil show but was abandoned. The two following wells were recently drilled:

### L. W. McNair Heirs No. 1 Well Record (738).

Saltlick District, Braxton County; on Longshoal Run, 1.6 miles northeast of Gilmer Station; authority, South Penn Oil Co.; elevation, 815' B.

	Top. Feet.	Bottom. Feet.
Big Dunkard Sand.....	533	575
Second Cow Run Sand.....	720	795
Salt Sand.....	1100	1165
Salt Sand.....	1200	1240
Salt Sand.....	1265	1360
Salt Sand.....	1375	1400
Salt Sand (gas, 1470').....	1465	1505
Lime .....	1515	1550
Red rock.....	1550	1575
Lime .....	1600	1630
Maxton Sand.....	1633	1670
Big Lime.....	1670	1725
Big Injun Sand (gas, 1835').....	1725	1945
Squaw Sand.....	1960	1990
Gordon Sand (oil).....	2338	2343
Total depth.....		2904

This was reported by residents as a 40-barrel well.

## L. W. McNair Heirs No. 2 Well Record (740).

Glenville District; on branch of Longshoal Run, 2.1 miles southeast of Stouts Mills; authority, South Penn Oil Co.; completed in 1914; elevation, 1277' B.

	Top. Feet.	Bottom. Feet.
Sand, Waynesburg (conductor, 8').....	3	50
Sand, Sewickley (little water, 285').....	255	305
Sand, Lower Pittsburgh (water, 490').....	450	525
Coal, <b>Brush Creek</b> .....	898	902
Sand, Burning Springs (lime and sand).....	1015	1120
Sand, Second Cow Run.....	1215	1280
Sand, Salt.....	1300	1355
Lime shells and black shale.....	1355	1485
Sand, Salt (½ bailer of salt water per hour at 1497').....	1495	1545
Lime shells and slate.....	1545	1685
Sand, Salt.....	1685	1915
Shale, black, lime shells and red rock.....	1915	2050
Sand, Maxton (solid lime).....	2050	2070
Slate.....	2070	2095
Little Lime.....	2095	2130
<b>Big Lime</b> (oil and gas, 2274').....	2140	2357
Sand, Big Injun.....	2357	2430
Shale, black and lime shells (cave, 2700').....	2430	2717
Sand, Thirty-foot.....	2717	2721
Sand, Gordon (gas, 2844'; oil, 2845').....	2838	
10" casing, 251'; 8", 1198'.		

No figures were obtained on the production of this well, but according to residents it flowed over the derrick when drilled.

The **R. R. Marshall No. 1 (741)**, abandoned as a dry hole, was reported to have made an oil show, residents having dipped oil from the run below the well. The **R. R. Marshall No. 2 (742)** was reported to have made a show of gas. The **H. S. Hefner No. 1 (743)**, drilled on the Little Kanawha, one-third mile east of Gilmer Station, was reported a dry hole, but its record was not secured. Five wells have been drilled just east of Stouts Mills, mostly on Slidinghill Run, without securing oil and gas in commercial quantity. The **R. R. Marshall No. 2 (747)** was reported a dry hole; the **C. S. Hudnall No. 2 (751)** made enough gas to be used in some of the neighboring houses but was abandoned; the **C. S. Hudnall No. 1 (752)**, the record of which is published in the section for Stouts Mills, pages 89-91, made a show of gas in the Fifth Sand. The two following records are from this group of wells:

**C. S. Hudnall No. 2 Well Record (750).**

Glenville District; on Slidinghill Run, 0.7 mile east of Stouts Mills; authority, Gilmer Oil & Gas Co.; completed, May 29, 1909; elevation, 770' B.

	Top. Feet.	Bottom. Feet.
Pittsburgh Coal.....	80	85
Second Cow Run Sand.....	975	1000
Salt Sand.....	1067	1095
Salt Sand.....	1207	1245
Salt Sand.....	1605	1662
Maxton Sand.....	1796	1800
Pencil Cave.....	1800	1807
Big Lime.....	1807	1848
Big Injun Sand (little gas, 1875').....	1848	2000
Fifth Sand (gas and little oil, 2642').....	2639	2647
Total depth.....		2672

The above well was abandoned as a dry hole.

**C. S. Hudnall No. 1 Well Record (753).**

Glenville District; 0.2 mile east of Stouts Mills; authority, Gilmer Oil & Gas Co.; completed, Feb. 26, 1909; elevation, 820' B.

	Top. Feet.	Bottom. Feet.
Pittsburgh Coal.....	173	179
Salt Sand.....	1070	1095
Salt Sand.....	1160	1190
Salt Sand.....	1300	1340
Salt Sand (little gas).....	1700	1755
Maxton Sand.....	1890	1895
Pencil Cave.....	1900	1912
Big Lime (6½" casing, 1925').....	1912	1953
Big Injun Sand.....	1953	2093
Fifth Sand (little gas, 2738-42').....	2738	2742
Total depth.....		2772

This well was also abandoned as dry.

Three wells have been drilled along the Little Kanawha, between Stouts Mills and Sand Fork, but the records of none of them were obtained. The **G. M. Martin No. 1 (755)** was reported a dry hole; the **N. P. Marsh No. 1 (756)** was reported a light gas well, being tubed with 2-inch pipe and shut in; the **Elliott Spicer No. 1 (757)** was abandoned as a dry hole but makes a little gas, a plug being inserted in the 10-inch casing below which a pipe leads to the farmhouse. Southeast of the Little Kanawha only one well has been drilled in Glenville

District, the **Jesse Conrad No. 1 (758)**, on Duskcamp Run, 1.4 miles northwest of Dusk. This well was abandoned as a dry hole, but made a little gas, the owner of the well, Mr. Conrad, having been killed by the accumulated pressure of gas which blew up a barrel that he was tamping over the hole to collect the gas for domestic purposes.

**Prospective Oil and Gas Areas, Glenville District.**—Glenville District offers considerable opportunity for further oil and gas production. Attention is called to the following localities: (1) All that portion of the district lying along the east side of the Chestnut Ridge Anticline for a distance of two to three miles from the axis, looks favorable for gas, the best locality being probably near Baldwin along the structural dome, as shown by Map II. Seepages of gas are reported along Stewart Creek in this locality. That portion of the district west of the anticline probably contains some gas, but, owing to the lack of sands in the Norris and other wells, should be left until the more favorable territory east of the axis has been tested. (2) The wide structural terrace just northeast of Ellis looks favorable for additional oil wells in the Fifth Sand; (3) Additional oil wells in the Fifth Sand could probably be drilled along Joes Run, both above and below the present development; (4) Heaters Fork, south of Blackburn, is favored by structure and development for oil or gas in the Gordon and Fifth Sands; (5) That portion of the southern end of the district, about three-fourths mile wide, between Duskcamp Run and the Braxton Line, looks favorable for gas.

#### ***Detailed Well Records, Center District.***

Center District, occupying the southwestern corner of the county, and being traversed by the Grassland Syncline and the Chestnut Ridge Anticline, has produced a considerable amount of oil and gas in the western part, but none in the central and eastern portion, where only a few wells have been drilled, the most of which gave unfavorable results. Map II shows that in this part of the district, the structure has less pitch than on the north side of the Little Kanawha and therefore offers less



hope for the accumulation of oil and gas in profitable quantity. One of the early wells drilled in the district was the **James P. Kane No. 1 (760)**, located on the head of Grass Run, one-half mile southeast of Lettergap, which was reported to have been put down to a depth of 500 to 600 feet by the springpole method. The well made considerable gas but was not deep enough to test the lower sands. The **J. B. Van Horn No. 1 (760A)**, drilled on Leatherbark Run, 2.2 miles northwest of Cedarville, was reported a dry hole, but its record was not secured. The **Samuel Burk No. 1 (766)**, located on Butchers Run, 1.5 miles southeast of Cedarville, was abandoned as a dry hole, but was reported to have made a show of oil. The following well, drilled in Braxton, about 1½ miles from the Gilmer Line, made a good showing of gas but was not drilled below the Injun Sand:

#### H. B. Gerwig No. 1 Well Record (767).

Otter District, Braxton County; on Toms Run, 1.0 mile southeast of Hope; authority, Ash Brothers; elevation, 895' L.

	Top. Feet.	Bottom. Feet.
Little Dunkard Sand.....	455	475
Sand, Burning Springs.....	600	690
Sand, Second Cow Run.....	740	845
Sand, Salt.....	855	980
Sand, Salt.....	1185	1250
Sand, Salt.....	1345	1355
Sand, Salt (water, 1370').....	1355	1385
Sand, Salt.....	1430	1495
Sand, Salt (gas, 1537').....	1535	1546
Sand, Salt.....	1561	1632
Big Lime.....	1830	1875
Big Injun Sand (gas, 1960').....	1875	1995
Total depth.....		2009

10" casing, 300'; 6½", 1400'; 2" tubing, 2009'; volume, 500,000 cubic feet approximately.

The **J. O. McCoy No. 1 (769)**, located on Right Fork of Steer Creek, 0.7 mile southeast of Bennett, the record of which is published in the section for Bennett, pages 95-6, was drilled 212 feet below the Bayard Sand and found only a show of oil and gas in the Big Injun. In the neighborhood of Stumptown several wells have been drilled, most of which have produced gas, principally from the Salt Sand of Rosedale, the lower

member of the Pottsville Series. The **Albert Percy No. 1 (770)**, located on Owen Run, one mile north of Lockney, was abandoned as a dry hole but made considerable gas which still issues from the ground and is used for domestic purposes. The **J. W. Boggs No. 1 (771)**, drilled on Lade Run, one-half mile northeast of Stumptown, was reported to have been a good gas well but its record was not secured. The **Clarence Stump No. 1624 (772)**, drilled at the mouth of Lade Run, was a gas well. The five following wells were located near the forks of Steer Creek, east of Stumptown:

### Marcellus Stump No. 2 Well Record (773).

Center District; 0.7 mile east of Stumptown; authority, Stumptown Oil & Gas Co.; completed, Jan., 1905; elevation, 790' B.

	Top. Feet.	Bottom. Feet.
Conductor (13" hole, 150').....	0	15
Sand, Big Dunkard.....	480	500
Sand, Burning Springs.....	570	680
Slate (8" casing, 690').....	690	740
Sand, Gas.....	740	765
Slate and shells.....	765	850
Sand, Salt.....	850	930
Slate and shells.....	930	1120
Sand, Salt.....	1120	1160
Slate.....	1160	1270
Sand, Salt.....	1270	1286
Sand, Salt.....	1286	1315
Slate and lime shells (reduced hole to 6½", 1330').....	1410	
Sand, Salt Sand of Rosedale.....	1465	
Slate to bottom.....		1507

### Elihu Stump No. 1 Well Record (774).

Center District; on Right Fork of Steer Creek, 1.0 mile southeast of Stumptown; authority, Hope Natural Gas Co.; completed, Oct. 20, 1902; elevation, 720' B.

	Thickness. Feet.	Total Feet.
Conductor (gravel and sand).....	36	36
Red rock and slate.....	114	150
Sand, Murphy.....	15	165
Lime and slate.....	185	350
<b>Coal, Brush Creek</b> .....	4	354
Lime and slate.....	102	456
Unrecorded.....	9	465
Sand, Burning Springs (big dose of water).....	100	565
Slate and lime shells.....	65	630
Sand, Gas.....	35	665

	Thickness Feet.	Total Feet.
Slate and shells.....	20	685
Sand, Second Cow Run.....	10	695
Lime .....	55	750
Sand, Salt.....	20	770
Lime .....	30	800
Sand, Salt.....	25	825
Slate and shells.....	25	850
Lime .....	40	890
Sand, Salt.....	40	930
Slate and shells.....	120	1050
Lime .....	25	1075
Slate and shells.....	70	1145
Coal .....	5	1150
Sand (some gas in top).....	55	1205
Lime .....	20	1225
Slate shells.....	50	1275
Lime, sandy.....	45	1320
Sand, Salt (gas at top).....	25	1345
Unrecorded .....	9	1354
Sand, "Blue Monday," Salt (water, 1367').....	13	1367
Sand, Salt Sand of Rosedale.....	8	1375
Slate and shells.....	35	1410
Lime, black.....	53	1463
Big Lime.....	87	1550
Lime, sandy, Big Injun Sand..40' } Break (gas, with smell of oil).10 } Sand .....	25 } Big Injun Sand	75 } 1625
Shale to bottom.....	27	1652
Later drilled by South Penn Oil Co. to total depth of.....		2800
"There were 3 seams of sandy lime between 2000' and 2100'; nothing below." 10" casing, 165'; 8½" casing, 630'; rock pressure, about 425 pounds.		

According to Elihu Stump, the principal gas producing horizons in the above well were the three lower Salt Sands, the rock pressure being 400 to 450 lbs.

### Winfred White No. 1 Well Record (775).

Center District; on a branch of Right Fork of Steer Creek, 0.5 mile southeast of Stumptown; completed in 1904; authority, C. T. Caldwell et al.

	Top. Feet.	Bottom. Feet.
Unrecorded (water, 45').....	0	540
Sand, Gas.....	540	680
Coal .....	1287	1291
Sand, Salt (a little gas).....	1305	1355
Second Salt, Salt Sand of Rosedale.....	1461	
Unrecorded (water, 1490') to bottom.....		1496

The above well was abandoned as a dry hole.

## Elliott Stump No. 1 Well Record (776).

Center District; Right Fork of Steer Creek, 0.6 mile southeast of of Stumptown; authority, C. T. Caldwell et al.; elevation, 745' B.

	Thickness. Feet.	Total. Feet.
Unrecorded (water, 30').....	500	500
Sand, Burning Springs (water, 4 ballers per hour, 560'; more water, 630').....	140	640
Unrecorded .....	15	655
Sand, Gas.....	35	690
Lime .....	15	705
Sand, Second Cow Run.....	60	765
Coal, Mercer.....	5	770
Slate .....	30	800
Sand, Salt.....	75	875
Slate, black.....	40	915
Sand, Salt.....	15	930
Lime shells and slate.....	280	1210
Coal .....	5	1215
Sand, Salt (gas, 1240-50').....	45	1260
Lime, sandy.....	25	1285
Slate .....	30	1315
Lime .....	40	1355
Coal .....	5	1360
Lime .....	10	1370
Sand, hard, Salt.....	18	1388
Sand, soft, Salt Sand of Rosedale (heavy gas)... Conductor, 10'; 13" hole, 175'; 8" casing, 660'.	9	1397

"When tubing this well amber oil showed on the bob of the measuring line and the tools were put up again. About two screws were run, when work was stopped for fear of getting the water that showed in the other wells. Even with this precaution, some water showed when well was tested several months later."

## Marcellus Stump No. 1623 Well Record (777).

Center District; on Steer Creek, 0.5 mile east of Stumptown; authority, Hope Natural Gas Co.; elevation, 725' L.

	Top. Feet.	Bottom. Feet.
Sand, Burning Springs.....	485	620
Lime and slate.....	620	695
Sand, Gas.....	695	710
Lime, shells and slate.....	710	785
Sand, Second Cow Run.....	785	890
Lime, shells and slate.....	890	1178
Coal .....	1178	1186
Lime .....	1186	1215
Salt Sand (big gas).....	1215	

The above record was published in Volume I(A), page 383, of the Survey.

The **Katie Stump No. 1 (780)**, located at the west edge of Stumptown, in Calhoun, the record of which is published in the section for Stumptown, pages 97-8, made only a light show of oil and gas in the Salt Sand and was abandoned as a dry hole. The following is the record of another dry hole drilled in the same vicinity:

### Melville Stump No. 1 Well Record (781).

Center District; on Bear Fork, 0.6 mile southwest of Stumptown; authority, C. T. Caldwell et al.; elevation, 755' B.

	Top.	Bottom.
	Feet.	Feet.
Sand, Burning Springs.....	525	
Sand, Gas.....	625	
Sand, Second Cow Run (little gas, 1100').....	850	
Sand, Salt.....	1440	
Sand, Maxton.....	1550	
Total depth.....		1606

"The formations in this well were irregular, black shale and lime shells in place of the regular sands. A very dry hole and barren of oil, gas and water."

Three shallow wells were drilled by primitive methods many years ago along Right Fork of Steer Creek, about one mile north of the Chestnut Ridge Anticline, where gas seepages had been known to exist. The **Daniel Huffman No. 1 (782)**, was reported to have been drilled about 1100 feet and made enough gas to have run a mill. The **Eli Shock No. 1 (783)**, according to Mr. Shock, was drilled about 600 feet deep and made considerable gas which still burns at the well mouth. The **Eli Shock No. 2 (784)** was about 600 feet deep and made only a little gas. These wells start 200 to 220 feet below the Pittsburgh Coal and therefore failed to reach the Salt Sand of Rosedale by about 750 feet, as its depth below the Pittsburgh Coal should be about 1550 feet here. The following is the record of a deep test drilled in the western end of the district. This record was first published in Volume I(A), page 385, and subsequently in the Wirt-Roane-Calhoun Report, page 461, of the Survey:

## Louis Bennett No. 1 Well Record (785).

Center District; on Standingstone Run of Bear Fork, 2.3 miles northwest of Shock; authority, South Penn Oil Co.; elevation, 825' B.

	Thickness. Total.	
	Feet.	Feet.
Conductor .....	20	20
Red rock.....	30	50
Blue sand, Lower Connellsville.....	35	85
White slate.....	15	100
Red rock (cased, 10-inch, 200').....	100	200
White slate.....	50	250
Red rock.....	50	300
White slate.....	35	335
Green sand, Moundsville.....	15	350
Red rock.....	50	400
White slate.....	65	465
White sand, Big Dunkard.....	35	500
White slate.....	75	575
White sand, Burning Springs.....	110	685
Black slate.....	10	695
Limestone .....	10	705
White sand, Gas.....	30	735
White slate.....	75	810
White sand, Second Cow Run.....	20	830
Black slate.....	13	843
White sand, Salt, (gas), (cased, 8¼", 851').....	25	868
White slate.....	35	903
White sand, Salt.....	40	943
Black slate.....	57	1000
White sand, Salt.....	75	1075
Sand, shells and black slate.....	205	1280
White sand, Salt.....	55	1335
Black slate.....	96	1431
White sand, Salt Sand of Rosedale (cased, 6⅝", 1455').....	50	1481
Pencil slate.....	3	1484
Limestone .....	11	1495
Sand, hard.....	14	1509
Sand, soft.....	27	1536
Pebbles .....	29	1565
Black slate.....	20	1585
Big Lime, hard.....	60	1645
White sand, Keener.....	10	1655
Limestone .....	55	1710
White sand, Big Injun.....	75	1785
Sand and shells.....	100	1885
White slate.....	200	2085
Slate and shells.....	200	2285
Black slate, hard sandstone and shells.....	100	2385
Sand, Fourth (gas).....	2	2387
Slate and shells.....	163	2550
Slate, white, and soft, to bottom.....	118	2668

The above well made a show of gas in one of the upper Salt Sands and in the Fourth, but nothing in the Salt Sand of Rosedale, which is productive at Stumptown and Rosedale. The well was abandoned as a dry hole, but the gas still burns at the mouth of the hole.

**The Rosedale Oil Pool**, located in the vicinity of Rosedale, along the line between Gilmer and Braxton, was opened 12 to 15 years ago by the South Penn Oil Company, which drilled ten wells on the head of Anthony Fork, on the Bennett tract. Owing to the fact that four of these wells were dry holes, drilling was discontinued for several years until independent operators drilled a well in the town of Rosedale and secured considerable oil. Within the last two years, numerous wells have been drilled in the town and along the waters of Steer Creek in both counties, many of which have been oil wells of 5 to 50 barrels capacity, and some have been gassers or dry holes. Oil is usually found in the lowest member of the Pottsville Series, called the Salt Sand by the well drillers and mentioned previously in this Report as the **Salt Sand of Rosedale**. Gas is often found in the next sand above the oil stratum and has been called the "Gas Sand" by the drillers. In order not to confuse this horizon with the "Gas Sand" of the northern counties, which is in the Allegheny Series several hundred feet higher in the measures, it has been mentioned heretofore in this Report as the **Gas Sand of Rosedale**. The oil in this pool, as at present outlined, seems confined largely to a narrow belt, about one mile wide, lying between the 900 and 1000-foot structure contours on the south side of the Grassland Syncline. Below this structural level, there seems to be too much salt water for profitable operation, and on the upward slope above the 1000-foot contour gas is found instead of oil. The top of the Rosedale Salt Sand is found at 1625 to 1650 feet below the Pittsburgh Coal horizon, which at Rosedale is about 150 feet above drainage, making the depth to the oil sand about 1500 feet in the town lot wells. The small cost of drilling these comparatively shallow wells has stimulated prospecting, but the results have been far from gratifying, as numerous wells have been dry. The record of the **J. W. Twyman No. 1 (794)**, which made

only a show of oil and gas, is published in the section for Rosedale, page 99. The records of several wells are available and appear in the following pages:

### T. V. Shock No. 1 Well Record (786).

Birch District, Braxton County; on Steer Creek, at Rosedale; authority, South Penn Oil Co.; completed in 1914; elevation, 780' B.

	Top. Feet.	Bottom. Feet.
Coal, Upper Freeport.....	485	486
Gas Sand of Rosedale.....	1318	1390
Salt Sand (oil show, 1533'; water in bottom).....	1490	1538
Maxton Sand.....	1570	1590
Little Lime (oil show, 1720').....	1670	1736
Big Lime (gas, 1790').....	1736	1800
Big Injun Sand.....	1800	1896
Lime, shell and slate to bottom.....	1896	3050
10" casing, 156'; 8¼", 481'.		

The above well, located near the axis of the Grassland Syncline, shows not only the presence of water in the Rosedale Salt Sand, but also the total absence of sands below the Injun where oil might have been expected along the basin. The well was abandoned as a dry hole.

The **Berry Heirs No. 1 (787)**, located on O'Brien Fork, 1.2 miles northeast of Rosedale, and completed subsequent to the writer's visit to the field, was reported a dry hole. The **W. C. Rollyson No. 1 (788)**, in Rosedale, was reported an oil well; the **J. W. Smith No. 1 (790)**, in Rosedale, was reported a 50-barrel well; the **U. S. Upton et al. No. 1 (792)** struck the Salt Sand at 1487 feet and found the oil pay 36 feet from the top.

### E. E. Cottrell No. 1 Well Record (791).

Birch District, Braxton County; on Steer Creek, at Rosedale; authority, Alexander and Doty; completed in 1914; elevation, 787' L.

	Top. Feet.	Bottom. Feet.
Sand (water, 475').....	440	600
Coal, Upper Kittanning.....	615	617
Coal and water, Mercer.....	725	728
Cave .....	741	745
Sand, Salt.....	770	800



	Top. Feet.	Bottom. Feet.
Shell and black slate.....	800	1200
Sand, Salt (gas, 1220').....	1200	1290
Gas Sand of Rosedale (gas, 1403').....	1360	1440
Slate and shells.....	1440	1482
Salt Sand of Rosedale (oil, 1507' and 1525') to bot- tom (still in sand).....	1482	1528
13" casing, 35'; 10", 145'; 8¼", 665'; 6½", 1485'; 30 to 40-barrel well.		

### J. W. Smith No. 1 Well Record (793).

Birch District, Braxton County; on Steer Creek, at Rosedale; au-  
thority, Central Rosedale Oil and Gas Co.; completed in 1914; eleva-  
tion, 795' L.

	Top. Feet.	Bottom. Feet.
Salt Sand (gas, 1400-10' and 1425-7').....	1370	1430
Salt Sand.....	1432	1445
Lime (gas, 1495').....	1478	1520
Salt Sand of Rosedale (oil, 1525') to bottom (still in sand).....	1520	1537
13" casing, 20'; 10", 151'; 8¼", 533'; 6½", 1179'; 5 3/16", 1537'; 10-barrel well.		

### Pauline E. Snodgrass No. 1 Well Record (795).

Birch District, Braxton County; on Mill Fork, 0.2 mile southeast  
of Rosedale; authority, Mill Fork Oil & Gas Co.; elevation, 790' B.

	Top. Feet.	Bottom. Feet.
Sand, Moundsville.....	215	245
Sand, Little Dunkard.....	325	360
Sand, Burning Springs (water, 430'; gas, 541')...	415	530
Sand, Gas.....	593	600
Sand, Second Cow Run.....	658	710
Sand, Salt (gas, 1205-26').....		1275
Sand, Salt (gas, 1386' and 1418').....	1376	1428
Sand, Salt.....	1474	1485
Sand.....	1495	1515
Salt Sand of Rosedale (gas, 1525'; oil, 1527')....	1520	1534
Slate to bottom.....	1539	1547
10" casing, 185'; 8¼", 658'; 6", 1474'; 5 to 6-barrel well.		

Besides the oil, the above well had an estimated gas vol-  
ume of 3,000,000 cubic feet daily, from which the town of  
Rosedale is supplied.

### Pauline E. Snodgrass No. 2 Well Record (796).

Birch District, Braxton County; on Mill Fork, 0.3 mile southeast of Rosedale; authority, Mill Fork Oil & Gas Co.; elevation, 840' B.

	Top. Feet.	Bottom. Feet.
Sand, Big Dunkard (gas, 488'; water, 490').....	480	535
Sand, Burning Springs.....	560	567
Coal, Lower Kittanning.....	672	675
Sand, Second Cow Run.....	745	787
Sand, Salt.....	935	960
Sand, Salt (gas, 1263').....	1238	1390
Gas Sand of Rosedale.....	1400	1468
Sand, Salt (oil, 1567-75'; gas show, 1580').....	1520	1580
Sand, Maxton (oil show in top).....	1660	1710
Big Lime.....	1710	1780
Sand, Big Injun.....	1786	1867
Total depth.....		2000
10" casing, 115'; 8¼", 570'; 6⅝", 1531'; 6 to 7-barrel well; bridged to 1582'.		

### Rebecca Bourn No. 1 Well Record (797).

Birch District, Braxton County; on Right Fork of Steer Creek, 1.0 mile southeast of Rosedale; authority, Pittsburgh & W. Va. Gas Co.; completed in September, 1914; elevation, 795' B.

	Thickness. Feet.	Total. Feet.
Unrecorded .....	37	37
Red rock.....	73	110
Lime .....	15	125
Red rock.....	25	150
Slate .....	50	200
Sand .....	20	220
Slate .....	10	230
Water sand, Little Dunkard.....	25	255
Slate .....	120	375
Sand, Burning Springs.....	95	470
Coal, Upper Kittanning.....	3	473
Slate .....	27	500
Lime .....	14	514
Unrecorded .....	83	597
Coal, Mercer.....	3	600
Sand, Salt.....	35	635
Slate .....	5	640
Sand, Salt.....	24	664
Coal .....	2	668
Slate and shells.....	124	790
Sand, Salt.....	60	850
Slate .....	152	1002
Sand, Salt.....	15	1017
Lime .....	158	1175
Gas Sand of Rosedale (gas, 1203').....	55	1230

	Thickness. Total.	
	Feet.	Feet.
Slate and lime.....	123	1353
<b>Salt Sand of Rosedale</b> (gas, 1355-60').....	32	1385
13" casing, 40'; 10", 155'; 8¼", 765' 5"; 330 pounds pressure in 20 minutes—"8¼" casing gave way or pressure would have been greater"; 38/10" water in 8¼" casing; volume, 5,750,000 cubic feet.		

The above well, located at a higher structural level than the town lot wells of Rosedale, and having its gas production in the Salt Sand of Rosedale, is evidently too far up the structural slope to be within the oil zone.

The six following wells, the records of which were published in Volume I(A), pages 388-390, of the Survey, were drilled at the time of the first development in the Rosedale Pool. Several of them are still producing oil:

### W. G. Bennett No. 2 Well Record (799).

Center District; on Anthony Fork, 2.1 miles southwest of Rosedale; authority, South Penn Oil Co.; elevation, 1150' B.

	Top. Feet.	Bottom. Feet.
Sand, Moundsville.....	450	500
Sand, Little Dunkard.....	600	640
Sand, Big Dunkard.....	780	840
Lime .....	840	955
Sand, Gas.....	955	1000
<b>Sand, Second Cow Run</b> (gas, 1040').....	1030	1150
Sand, Salt.....	1390	1420
Sand, Salt.....	1475	1530
Coal .....	1810	1813
Salt Sand of Rosedale.....	1876	1960
Little Lime.....	2000	2025
Pencil Cave.....	2025	2040
<b>Big Lime</b> .....	2040	2125
Big Injun Sand.....	2125	2220
Shells .....	2220	2420
Sand, Berea.....	2420	2435
Fifty-foot Sand.....	2580	2595
Slate, lime and shells.....	2595	3090
Hard lime shells to bottom.....	3090	3275

The above well was a gasser and is still productive.

**W. G. Bennett No. 7 Well Record (801).**

Center District; on Anthony Fork, 2.3 miles southwest of Rose-  
dale; authority, South Penn Oil Co.; elevation, 1110' B.

	Top. Feet.	Bottom. Feet.
Sand, Moundsville.....	400	450
Slate and red rock.....	450	700
White sand, Big Dunkard.....	700	760
Sand, Burning Springs.....	800	830
White sand, Second Cow Run.....	900	925
Slate and lime.....	925	1180
Sand, Salt.....	1400	1430
Slate and shells.....	1430	1712
Salt Sand of Rosedale (oil rock) to bottom.....	1712	1733

**W. G. Bennett No. 8 Well Record (802).**

Center District; on Anthony Fork, 2.4 miles southwest of Rose-  
dale; authority, South Penn Oil Co.; elevation, 1060' B.

	Top. Feet.	Bottom. Feet.
Coal, Mercer.....	980	984
Coal.....	1670	1674
Salt Sand of Rosedale (oil rock).....	1680	1685
Total depth.....		1740

The above well was considered a dry hole.

**W. G. Bennett No. 1 Well Record (803).**

Center District; on Anthony Fork, 2.2 miles southwest of Rose-  
dale; authority, South Penn Oil Co.; elevation, 960' B.

	Top. Feet.	Bottom. Feet.
Soil and quicksand.....	0	34
Sand, Murphy.....	34	160
Red rock.....	160	262
Sand, Moundsville.....	262	300
Slate and red rock.....	300	400
Sand and lime.....	400	460
Coal, Brush Creek.....	465	472
Sand.....	505	530
Lime.....	530	550
Sand.....	550	560
Sand, Big Dunkard.....	577	590
Lime.....	661	690
Sand, Burning Springs.....	700	730
Sand, Salt.....	900	928
Lime.....	1020	1155
Sand, Salt.....	1155	1165

	Top. Feet.	Bottom. Feet.
Sand, Salt.....	1184	1225
Sand, extra hard, Salt.....	1290	1415
Coal .....	1547	
Gas Sand of Rosedale.....	1560	1580
Slate .....	1580	1585
Salt Sand of Rosedale (oil and gas, 1592'; oil, 1600'; salt water, 1610').....	1585	1610

### W. G. Bennett No. 6 Well Record (804).

Center District; on Anthony Fork, 2.3 miles southwest of Rosedale; authority, South Penn Oil Co.; elevation, 1145' B.

	Top. Feet.	Bottom. Feet.
Sand, Grafton.....	438	465
Sand, Moundsville.....	540	558
Sand, Little Dunkard.....	672	712
Sand, Big Dunkard.....	780	830
Sand, Second Cow Run.....	950	1154
Sand, Salt.....	1350	1380
Sand and lime.....	1440	1727
Salt Sand of Rosedale (oil, 1747').....	1730	1756

### W. G. Bennett No. 5 Well Record (806).

Center District; on Anthony Fork, 2.2 miles southwest of Rosedale; authority, South Penn Oil Co.; elevation, 1030' B.

	Top. Feet.	Bottom. Feet.
Sand, Murphy.....	150	250
Sand, Grafton.....	300	345
Red rock.....	345	350
Sand, Big Dunkard, Burning Springs and Gas....	645	855
Sand, Second Cow Run.....	880	980
Sand, Salt.....	1180	1280
Slate and shells.....	1280	1380
Gas Sand of Rosedale (gas, 1485').....	1465	1500
Lime and shells.....	1500	1535
Black slate.....	1535	1625
Coal .....	1635	1645
Salt Sand of Rosedale (oil rock).....	1665	1685
Slate and shells to bottom.....	1685	1778

**Prospective Oil and Gas Areas, Center District.**—The broken and uncertain character of the lower sands along the Grassland Syncline and the presence of large quantities of salt water in the Salt Sand wherever it descends to a low structural level, indicate that drilling in the southeastern part of Center District will be attended with great risk. The north-

ern and western parts, however, offer some favorable localities for further development, as follows: (1) The extreme northwestern corner of the district, north of Stumptown, along Mikes Run, looks favorable for oil in the Salt Sand of Rosedale, which is the producing gas stratum at Stumptown and showed oil in the Katie Stump No. 1 (780), and has produced it in some quantity in Calhoun, near Dodrill, which is along the same strike as Mikes Run; (2) That territory lying along the crest and north of the Chestnut Ridge Anticline between Right Fork of Steer Creek and Cedar Creek, looks favorable for gas in the Salt and possibly in some of the lower sands; (3) It is possible that the Rosedale Oil Pool extends westward from Rosedale between the 900 and 1000-foot structure contours toward the low divide between Frozen Run and Bear Fork; (4) The Rosedale Basin, similar in structure to the Richardson Basin in Calhoun, where oil is found in abundance, offers some hope of oil in the Berea or other deep sands. It must be remembered, however, that Wells Nos. 785, 786 and 789, all of which were deep, found no sand below the Injun that was present in more than one of these wells. This circumstance does not preclude the possibility of a rich oil-bearing sand in the Rosedale Basin, but is evidence against it and therefore adds greatly to the usual hazard of drilling.

## TABLE OF ROCK PRESSURES.

The following table, showing the average rock pressure of different gas producing horizons in the two counties, has been furnished the Survey by John B. Corrin, Assistant General Manager, of the Hope Natural Gas Company. It shows a gradual rise in pressure according to the depth of the sands:

## Average Original Rock Pressures of Different Gas Producing Sands in Lewis and Gilmer Counties.

## Lewis County.

Sand.	Collins Settlement District. Lbs.	Between Roanoke and Weston. Lbs.	Vicinity of Freemansburg. Lbs.	Sand Fork Field. Lbs.	Vicinity of Churchville. Lbs.	Vicinity of Jane Lew. Lbs.
Salt .....	.....	.....	.....	200	.....	.....
Maxton .....	400	.....	.....	200	500	400
Big Lime.....	.....	.....	.....	.....	500	.....
Big Injun.....	450	600	800	800	1000	700
Berea .....	.....	450	.....	.....	.....	.....
Gantz .....	700	700	1120	.....	1000	800
50-Foot .....	.....	500	.....	.....	.....	875
30-Foot .....	450	.....	.....	.....	.....	300
Gordon Stray....	500	600	.....	800	.....	.....
Gordon .....	.....	700	800	500	900	600
Fourth .....	150	.....	.....	.....	750	.....
Fifth .....	500	500	950	500	500	1000

## Gilmer County.

Sand.	Stumptown. Lbs.	Newberne Field. Lbs.	East of Glenville. Lbs.
Salt .....	400	300	.....
Maxton .....	.....	300	.....
Big Injun.....	.....	500	700
Squaw .....	.....	.....	660
Berea .....	.....	750	.....
Gordon Stray....	.....	.....	825
Gordon .....	.....	.....	650

# CHAPTER XI.

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## COAL.

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In Chapters V to IX, inclusive, a systematic description of all the coal seams found in the two counties has been given, together with type sections and correlations, and some of the smaller beds, that are not of commercial importance, have been fully described. In the present Chapter numerous actual measured sections will be published for those coals that are of minable thickness and purity, and estimates of their probable tonnage with etchings showing their areal extent will be given. At the end of the Chapter, there is a table of analyses showing the chemical composition of all coals tested.

### STATISTICS OF COAL PRODUCTION.

Commercial coal mining in Lewis and Gilmer has been insignificant compared to many other counties of the State, the records of production showing that they stand near the bottom in point of output. Only two mining plants, one of which is now dismantled, have been built in Lewis, and Gilmer has only four. Mining has been done in three seams; viz, Redstone, Pittsburgh and Elk Lick, of which the two former are in the Monongahela Series and the latter in the Conemaugh. All of these are drift mines of small capacity, and comparatively simple equipment.



## Coal Production of Lewis and Gilmer Counties from 1907 to 1915, Inclusive.

Lewis County.		Gilmer County.	
Year.	Tons of 2240 Lbs.	Year.	Tons of 2240 Lbs.
1907.....	5,528	1907.....	312
1908.....	22,640	1908.....	6,697
1909.....	13,780	1909.....	14,740
1910.....	20,906	1910.....	32,255
1911.....	3,684	1911.....	35,029
1912.....	40,057	1912.....	57,641
1913.....	47,024	1913.....	90,150
1914.....	28,956	1914.....	88,369
1915.....	300	1915.....	137,971
<b>Total.....</b>	<b>182,975</b>	<b>Total.....</b>	<b>463,164</b>

In the order of the production of coal by counties, Lewis ranked 31st in 1907 and 1908, 32nd in 1909, 33rd in 1910 and 1911, 30th in 1912, 31st in 1913, 32nd in 1914 and 33rd in 1915, while Gilmer ranked 32nd in 1907 and 1908, and 31st in 1909 1910 and 1911, 28th in 1914 and 25th in 1915.

### Production of Coal by Mines in Lewis and Gilmer Counties for the Years Ending June 30th, 1913 and 1914.

Year	Name of Company	Name of Mine	Production of Coal Tons of 2240 Lbs.			Distribution of Coal Tons of 2240 Lbs.		
			First Six Months	Second Six Months	Total Coal Produced During Year	Used in Opera- tion of Mines	Fur- nished Local Trade and Tenants	Quantity Shipped on Mines
<b>LEWIS COUNTY.</b>								
1913	Kroger Gas Coal Co	Polar.....	25,585	21,439	47,024	500	400	46,124
1914	Kroger Gas Coal Co	Polar.....	21,649	7,307	28,956	.....	.....	28,956
<b>GILMER COUNTY</b>								
1913	McCaa Coal Co...	McCaa.....	4,249	6,864	11,113	268	149	10,696
1914	McCaa Coal Co...	McCaa.....	6,841	5,234	12,075	624	655	10,796
1913	Gilmer Fuel Co...	Kroger Red Ash.....	27,194	30,010	57,204	1,500	1,500	54,204
1914	Gilmer Fuel Co...	Gilmer.....	30,588	31,866	62,454	1,200	400	60,854
1913	Gilmer Consolida- ed Coal Co.....	Brackett, Katherine and Braxton	12,240	9,593	21,833	.....	120	21,713
1914	Gilmer Consolida- ed Coal Co.....	Brackett...	7,060	6,780	13,840	.....	450	13,390
	<b>Totals (1913)...</b>	.....	<b>43,683</b>	<b>46,467</b>	<b>90,150</b>	<b>1,768</b>	<b>1,769</b>	<b>86,613</b>
	<b>Totals (1914)...</b>	.....	<b>44,489</b>	<b>43,880</b>	<b>88,369</b>	<b>1,824</b>	<b>1,505</b>	<b>85,040</b>

The Polar Mine is on the B. & O. Railroad, while those in Gilmer are located on the Coal & Coke Railway.

In Lewis and Gilmer there are 8 minable seams of coal, 19 others too thin, impure or irregular to be of more than local value. These minable coals in descending order are the Washington of the Dunkard Series, the Redstone and Pittsburgh of the Monongahela, the Elk Lick and Bakerstown of the Conemaugh, and the Upper Freeport, Upper Kittanning and Lower Kittanning of the Allegheny. There are coals in the Pottsville Series that apparently reach minable thickness locally, as evidenced by the records of oil wells, but all of them seem too patchy and irregular to warrant their classification as minable beds of definite economic value until they have been tested by the diamond drill. Figure 3 shows the different coal seams of the two counties, giving not only their relative thickness, but also the maximum intervals between them. Figures 4 to 11, inclusive, published in the present Chapter, will show, approximately, the areas where each of the minable seams occurs in commercial thickness.

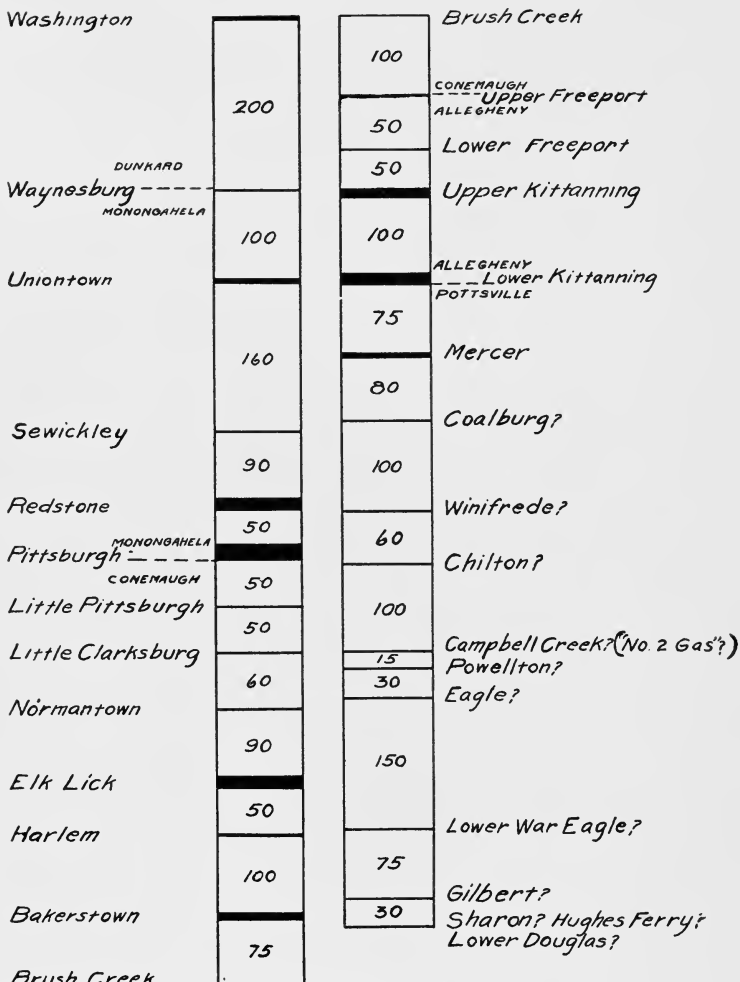


Figure 3 - Showing intervals in feet between Coal Seams of the Lewis-Gilmer Area.

## RECORDS OF COAL TEST BORINGS, LEWIS COUNTY.

### *Summarized Records.*

In Lewis 18 tests for coal have been drilled, all of which were visited in the field in order to secure the accurate location and level. The records of only two of these wells were secured, as most of the operators failed to honor the requests of the Survey for this information. The following table, while lacking the details that these records would afford, is still of value for the columns giving surface elevations and ownership. The first column gives the key number on Map II, by which the position of the boring may be found, and in the elevation column the letter "L" signifies a hand level determination, and "B" indicates that the aneroid barometer was used, checked on the nearest government elevation. In the company column, the letters "L. K. S." refer to the Little Kanawha Syndicate:

### *Detailed Coal Test Records, Lewis County.*

The record of the J. C. Marsh (280) coal test, located on a branch of Fink Creek, 1.2 miles northwest of Hurst, Freemans Creek District, is published in the section for Hurst, page 57. The Pittsburgh Coal was found at 410½ feet and was 7 feet thick. The following test, furnished the Survey by J. Perry Thompson, of Fairmont, W. Va., starts five feet above the base of the Sewickley Sandstone, but failed to find either the Redstone or Pittsburgh Coals:

Summarized Record of Tests for Coal in Lewis County.

No. on Map II	Farm Name and Number.	Magisterial District.	Company.	Redstone Coal		Piusburgh Coal		Total Depth.	No. on Map II
				Depth. Top.	Thickness. Feet.	Depth. Top.	Thickness. Feet.		
177	J. B. Bailey No. 1.	Union (Harrison)	L. K. S.	1060B	.....	.....	.....	.....	177
182	J. B. Coflindaifer No. 1.	Freemans Creek	L. K. S.	1090L	.....	.....	.....	.....	182
197	L. E. Gall No. 1.	Freemans Creek	L. K. S.	1110B	.....	.....	.....	.....	197
223	Joseph Gum No. 1.	Freemans Creek	L. K. S.	920B	.....	.....	.....	.....	223
242	Oscar Chevront No. 1.	Freemans Creek	L. K. S.	1040B	.....	.....	.....	.....	242
280	J. C. Marsh No. 1.	Freemans Creek	N. T. Arnold.	835B	.....	.....	.....	.....	280
286	Abraham L. Griggs No. 1.	Freemans Creek	George Gillmor.	785L	.....	.....	410½	417½	286
315	John Hines No. 1.	Freemans Creek	L. K. S.	915B	.....	.....	.....	.....	315
358	Floyd L. Pratt No. 1.	Courthouse	S. B. Elkins	950B	.....	.....	.....	.....	358
359	G. Melvin Rogers No. 1.	Courthouse	S. B. Elkins.	820B	.....	.....	.....	.....	359
399	Thos. R. Reynolds No. 1.	Courthouse	S. B. Elkins.	820B	.....	.....	.....	.....	399
514	T. W. Matthews No. 1.	Courthouse	S. B. Elkins	1030B	.....	.....	.....	.....	514
517	Michael Brennan Heirs No. 1.	Courthouse	S. B. Elkins.	1115B	.....	.....	.....	.....	517
523	W. E. Arnold Heirs No. 1.	Courthouse	N. T. Arnold.	1040B	.....	.....	.....	.....	523
566	John B. Watson No. 1.	Collins Settlement.	Musgrave	1082L	.....	.....	.....	128	566
568	C. W. Watson No. 1.	Collins Settlement.	.....	1065L	.....	.....	.....	.....	568
573	James F. Conrad Heirs No. 1.	Collins Settlement.	Musgrave	1045B	.....	.....	40(?)	.....	573
591	W. E. Mick No. 1.	Collins Settlement.	S. B. Elkins.	1110B	.....	.....	.....	.....	591

### W. E. Arnold Heirs Coal Test No. 1 (523).

Courthouse District, on West Fork River, 0.5 mile west of Browns-ville; authority, N. T. Arnold; completed, July, 8, 1902; elevation, 1040' B.

	Thickness. Total.		
	Feet.	Feet.	
Surface .....	8	8	
Sandstone, <b>Sewickley</b> .....	5	13	
Blue shale.....	2	15	
Red shale.....	2	17	
Blue shale.....	1	18	
Red shale.....	4	22	
Very sandy shale.....	35	57	
Sandstone .....	8' } Cedarville.....	20	77
Mica sandstone.....12' }			
Blue shale.....	5.5	82.5	
Gray sandstone.....	3.5	86	
Blue shale.....	2	88	
Red and blue shale.....	1	89	
Light blue sand with black band.....	6	95	
Blue shale.....	5	100	
Mica sandstone, <b>Weston</b> .....	6	106	
Blue shale.....	6	112	
Sandy shale.....	7	119	
Blue shale.....	5.5	124.5	
Mica sandstone.....	3.5	128	

### RECORDS OF COAL TEST BORINGS, GILMER COUNTY.

#### *Summarized Records.*

In Gilmer 18 tests have been bored for coal and the available data on these, together with another one in Braxton just across the Gilmer Line, are included in the following table. The table is similar in form to that published for Lewis on a previous page of this Chapter and needs no further explanation. Only a few of the records could be secured, as some of the operators could not be reached, while others refused the desired information:

#### *Detailed Coal Test Records, Gilmer County.*

The following record, furnished the Survey by J. Perry Thompson, of Fairmont, starts 40 feet below the top of the Sewickley Sandstone, making it certain that the streak of coal at 157 feet represents the Pittsburgh, which was too thin to be of value:

## Summarized Record of Tests for Coal in Gilmer County.

No. on Map II.	Farm Name and Number.	Magisterial District.	Company.	Elevation Above Tide.	Pittsburgh Coal.		Total Depth.	No. on Map II.
					Depth.	Thickness, Feet.		
684	Pickens Heirs No. 1.	Dekalb.	Ernest P. Austin.	720B	.....	.....	684	.....
687	Thos. West No. 1.	Dekalb.	Ernest P. Austin.	740B	.....	.....	687	.....
693	Wilson H. Conrad No. 1.	Glenville.	L. K. S.	795B	.....	.....	693	.....
696	T. M. Marshall No. 3.	Glenville.	E. D. Fulton.	930B	.....	.....	696	.....
711	Reuben Dyer No. 1.	Glenville.	N. T. Arnold.	765B	157	230	711	.....
718	Christian Smith No. 1.	Glenville.	L. K. S.	960B	.....	.....	718	.....
744	Geo. L. Smith No. 1.	Glenville.	L. K. S.	975B	.....	.....	744	.....
745	T. M. Marshall No. 1(?)	Glenville.	L. K. S.	845B	.....	.....	745	.....
746	T. M. Marshall No. 1.	Glenville.	T. M. Marshall.	845B	74	114	746	.....
748	C. E. Marshall No. 2.	Glenville.	Withers & Vandevender.	830B	.....	.....	748	.....
749	C. E. Marshall No. 1.	Glenville.	Withers & Vandevender.	810B	.....	.....	749	.....
754	T. M. Marshall No. 2(?)	Glenville.	E. D. Fulton.	725L	112	7.7	754	.....
759	Daniel U. O'Brien No. 1.	Center.	N. T. Arnold.	1048B	.....	265	759	.....
761	W. A. Reed No. 1.	Center.	L. K. S.	1025B	.....	.....	761	.....
762	D. A. Clowser No. 1.	Center.	E. D. Fulton.	950B	.....	.....	762	.....
763	G. A. Sponaugle No. 1.	Center.	E. D. Fulton.	885B	.....	.....	763	.....
764	G. A. Sponaugle No. 2.	Center.	E. D. Fulton.	1115B	.....	.....	764	.....
765	Clara Moore No. 1.	Center.	L. K. S.	970B	.....	.....	765	.....
768	Matthias Gerwig No. 1.	Otter (Braxton).	L. K. S.	1065B	.....	.....	768	.....

## Reuben Dyer Coal Test No. 1 (711).

Glenville District; on Sand Fork, 1.1 miles southeast of Ellis; authority, N. T. Arnold; elevation, 765' B.

	Thickness. Total.	
	Feet.	Feet.
Red clay.....	25	25
White sand (at creek bed).....	2	27
White shale.....	8	35
Blue shale.....	30	65
Gray sand, Cedarville.....	26	91
Red rock.....	6	97
Greenish shale.....	7	104
Red rock.....	2	106
Blue shale.....	32	138
Shale, limy.....	7	145
Red rock and iron ore.....	6	151
Lime.....	1½	152½
Yellow soapstone.....	4½	157
Small streaks of coal, Pittsburgh.....		
Shale and soapstone.....	50	207
Brown shale.....	5	212
Coal, Little Pittsburgh.....	1	213
White sand.....12' } Lower Pittsburgh.....	27	230
Gray sand.....15' } "Quit drilling in gray sand."		

The **T. M. Marshall No. 1 (746)**, drilled by T. M. Marshall on his own farm on Slidinghill Run, 1.6 miles east of Stouts Mills, and starting 40 feet below the Sewickley Limestone, is reported by him to have found the Pittsburgh Coal at 74 feet, the thickness being 6 feet. The **T. M. Marshall No. 2 (754)**, drilled by E. D. Fulton on the Little Kanawha River bar at the mouth of Slidinghill Run at Stouts Mills, and starting 2 feet below the Sewickley Limestone, is reported by William Crennell, of Uniontown, Pa., to have reached the Pittsburgh Coal at 111' 8", with a thickness of 7' 8".

The following test starts 198 feet, by hand level, above the Pittsburgh Coal bench and should therefore have encountered the coal at that depth in the hole, but, as the record shows, found nothing, and indicates the complete disappearance of the coal:



## Daniel U. O'Brien Coal Test No. 1 (759).

Center District; on Cedar Creek, 3.2 miles northwest of Cedarville; authority, N. T. Arnold; completed, June 21, 1902; elevation, 1048' B.

	Thickness. Total.	
	Feet.	Feet.
Surface .....	25	25
White sandstone.....	3	28
Red shale.....	3	31
Blue sand shale.....	13	44
Sandstone and red shale, <b>Sewickley</b> .....	20	64
Fine mica and sandstone.....	15	79
Blue shale.....	2	81
Red shale.....	6	87
Gray sandstone.....	9	96
White sandstone.....	4	100
Blue shale.....	2	102
Red shale.....	30	132
White sandstone.....18' } Cedarville.....	19	151
Blue sandstone.....1 }		
Red sandy shale.....	3	154
Blue sandy shale.....	7	161
Red sandy shale.....	8	169
Red and blue sandy shale.....	1	170
Red sandy shale.....	3	173
Blue sandy shale.....	3	176
Red and blue shale.....	3	179
White sandy shale.....	1	180
Red shale.....	0.5	180.5
White sandstone.....4.0' } Weston.....	11.5	192
Red shale.....0.5 }		
White sandstone.....7.0 }		
Blue sandy shale.....	1	193
Red and blue shale.....	2	195
Blue sandy shale.....	2	197
Blue shale.....	1.5	198.5
White sandstone, <b>Lower Pittsburgh</b> .....	5.5	204
Blue shale.....	3	207
Blue sandy shale.....	4	211
Red shale.....	20	231
Red and black shale.....	4.5	235.5
Black and brown shale.....	1.5	237
Blue shale.....	2	239
Purple and yellow shale.....	2	241
Dark blue and purple shale.....	6	247
Light blue and mica sandstone.....	3	250
Purple and red shale.....	2	252
Blue sandstone.....	3	255
Blue shale.....	2	257
Blue and yellow shale.....	1	258
Blue sandy shale.....	1	259
Sandstone .....	0.5	259.5
Blue sandy shale.....	5.5	265

## MINABLE COALS OF THE DUNKARD SERIES.

### THE WASHINGTON COAL.

The Washington Coal, discussed previously in Chapter V, page 108, and shown by outcrop lines on Map II, is confined largely to the northwestern part of the two counties, being found seldom outside of Freemans Creek District, Lewis, and Troy and Dekalb Districts, Gilmer. As observed in these districts, it is seldom more than 2 feet thick and is usually slaty at the top, making it of little present value. The fact that it was mined generally for local purposes before natural gas displaced it for fuel in these districts indicates that it will again be used extensively when gas can no longer be had. Nearly all of the old openings had fallen shut, making it impossible to study the coal carefully or to collect samples to show its chemical character. Figure 4 shows its probable minable extent.

#### *Washington Coal, Freemans Creek District, Lewis.*

The Washington Coal occurs in considerable quantity along the Doddridge and Harrison Lines in the western part of the district. The **W. Brent Maxwell Opening (No. 1 on Map II)**, on Kincheloe Creek, 1.2 miles northwest of Benson, where the coal has an elevation of 1140' B., was fallen shut when examined, but evidently had found considerable coal. At **Prospect No. 2 on Map II**, on a branch of Freemans Creek, 1.4 miles southwest of Benson, the coal had been opened at an elevation of 1275' B., but was fallen shut. The coal was once opened on Smoky Fork, 2 miles southwest of Coldwater, at **Prospect No. 3 on Map II**, where it had an elevation of 1250' B. At **Prospect No. 4 on Map II**, on the head of Smoky Fork, 2.2 miles southeast of Coldwater, the coal had an elevation of 1130' B. At **Prospect No. 5 on Map II**, on the head of Freemans Creek, 2.5 miles northwest of Churchville, the coal was found at 1165' B. At the following opening, the structure of the coal was obtained:



### Edward Foley Coal Opening—No. 6 on Map II.

On Right Fork of Freemans Creek, 2 miles southeast of Coldwater; **Washington Coal**; elevation, 1140' B.

		Ft.	In.
Slate, black.....		3	0
Coal .....	0' 4"		
Slate, black.....	0 6		
Coal, slaty.....	1 10		
Slate, black.....	0 3		
Coal, good (to slate pavement).1 6 .....		4	5

The coal was opened at **Prospect No. 7 on Map II**, on Dry Fork of Fink, 1.8 miles northeast of Dry Fork, where it occurs at 1045' B. The following opening was fallen shut, but is reported on the authority of Dominick Sweeney:

### Dominick Sweeney Coal Opening—No. 8 on Map II.

On Fink Creek, 0.5 mile northeast of Dry Fork; **Washington Coal**; elevation, 1090' B.

		Ft.	In.
Coal, good.....	1' 0"		
Shale, gray, 4" to.....	0 8		
Coal .....	2 0 .....	3	8

At **Prospect No. 9 on Map II**, on Little Buck Run, 1.2 miles north of Fink, the coal was opened near drainage at 990' B., but had fallen shut. At the **George Droppleman Opening (No. 10 on Map II)**, on Little Buck Run, 1.8 miles north of Fink, the coal was reported 1' 6" thick at an elevation of 990' B. The **M. C. Marsh Opening (No. 11 on Map II)**, on Straight Run, 1.7 miles northeast of Hurst, was fallen shut but was reported by Mr. Marsh as being 1' 6" to 2' 0", its elevation being 1117' B.

### *Washington Coal, Courthouse District, Lewis.*

In Courthouse District, the Washington Coal is caught in the hilltops along the Grassland Syncline in the vicinity of Copley and Bealls Mills, as shown by its outcrop on Map II. No openings were observed but the blossom of the coal is found along the hill roads, sometimes showing 1 to 2 feet of

coal. It is also present in a few high tops along the Roanoke Syncline, but, so far as known, has not been prospected.

### *Washington Coal, Troy District, Gilmer.*

In Troy District, the Washington Coal is found along the western edge and its blossom occurs frequently along the hill roads but it has been prospected but little. It was opened at the **L. A. Law Prospect (No. 12 on Map II)**, on the head of Horn Creek, 1.7 miles northwest of Conings, at an elevation of 1050' B.

### *Washington Coal, Dekalb District, Gilmer.*

In Dekalb District the coal occurs along the northwestern edge, being usually well up in the hills, except near the Ritchie Line. It has been prospected to some extent, but, so far as known, these have fallen shut. At **Prospect No. 13 on Map II**, on Bull Fork, 0.9 mile northwest of Alfred, the coal had an elevation of 1025' B. At **Prospect No. 14 on Map II**, on Trace Fork, 2.1 miles northeast of Nobe, its elevation is 1065' B.

### *Washington Coal, Glenville District, Gilmer.*

In Glenville District, the Washington Coal is found in some of the high ridges along the Grassland Syncline. Owing to its scattered extent and to the fact that the Pittsburgh Coal occurs at a more accessible level and in much more abundant quantity and in superior quality, it has been prospected but little. The coal was opened at **Prospect No. 15 on Map II**, on Sand Fork, 1.3 miles northeast of Sand Fork town, at an elevation of 1135' B., but the mine had fallen shut. It was also prospected at **Opening No. 16 on Map II**, on Locust Knob, 0.2 mile southeast of Rudkin, at an elevation of 1425' B.

### *Quantity of Washington Coal Available.*

In addition to the information of the preceding pages, the accompanying table shows a list of oil and gas wells record-

ing Washington Coal and will be of value in estimating its extent and thickness. Another table is added showing the probable amount of Washington Coal in the two counties. Outside of Freemans Creek, Troy and Dekalb Districts, the coal is too scattered and patchy to be of definite mining value. The table is based on the assumption that an average of one foot of coal may be recovered in these three districts throughout its areal extent.

### List of Oil and Gas Wells Recording Washington Coal.

No. on Map	Name of Well.	Location	Elev. of well mouth A. T.	Depth Feet.	Thickness Feet.
185	Mary G. Small No. 3479....	Hillebert, 0.7 mi. S. E.....	1149L	135	2
210	Timothy Joyce No. 1.....	Coldwater, 1.3 mi. S. E.....	1165B	82	3
301	Joseph Krenn No. 3.....	Hurst, 2.1 mi. N. E.....	1195B	150	5

### Probable Amount of Washington Coal.

Counties By Districts.	Thickness of Coal Assumed. Ft.	Sq. Mi.	Acres	Cubic Feet of Coal.	Short Tons of Coal.
<b>Lewis:</b>					
Hackers Creek.....	1	0.10	64	2,787,840	111,514
Freemans Creek....	1	16.00	10,240	446,054,400	17,842,176
Courthouse .....	1	1.80	1,152	50,181,120	2,007,245
Skin Creek.....	1	0.06	38.4	1,672,704	66,908
Collins Settlement..	1	0.04	25.6	1,115,136	44,605
Totals .....		18.00	11,520	501,811,200	20,072,448
<b>Gilmer:</b>					
Troy .....	1	13.90	8,806	387,509,769	15,500,391
Dekalb .....	1	7.50	4,800	209,088,000	8,363,520
Glenville .....	1	1.90	1,216	52,968,960	2,118,758
Center .....	1	0.70	448	19,514,880	780,595
Totals .....		24.00	15,360	669,081,600	26,763,264
Totals for both counties.....		42.00	26,880	1,170,892,800	46,835,712

## MINABLE COALS OF THE MONONGAHELA SERIES.

## THE REDSTONE COAL.

The Redstone Coal, discussed previously in Chapter VI, page 124, and shown by outcrop lines on Map II, in those regions where it occurs in minable thickness above drainage, is a very valuable bed of fuel in northern and eastern Lewis, but, so far as known, does not occur in minable thickness in Gilmer. In those portions of Lewis County where it occurs, it varies from 2 to 6 feet in thickness and usually carries no slate partings, but is damaged to a considerable extent by clay seams that frequently cross it. Its chemical composition shows it to be a fine coal for steam and domestic fuel and in some regions the sulphur content is low enough to permit its use for coke manufacture. Figure 5 shows its probable minable extent.

*Redstone Coal, Hackers Creek District, Lewis.*

In Hackers Creek District, the Redstone Coal is above drainage along all the principal streams and has been mined for local fuel in numerous places, making it possible to observe it closely. In the northwestern part of the district, along the Chestnut Ridge and Wolf Summit Anticlines, only a small amount of this coal still remains in the hill tops, but in the eastern and southern parts there is a large body of this coal that varies from 4 to 6 feet in thickness. This coal has been mined commercially at one point within the area, near the Harrison Line, where it was examined and sampled by Teets and the results published in the Doddridge-Harrison Report of the Survey, page 572, as follows:

**Kroger Gas Coal Company, Polar Mine—No. 43 on Map II.**

On McKinney Run, 0.7 mile southeast of McWhorter; Redstone Coal; elevation, 1375' B.

	Ft.	In.
1. Slate .....		
2. Coal (to slate pavement).....	6	0

"Principal office, Cincinnati, Ohio; daily capacity, 225 tons; 8 laborers and 30 miners employed; mule haulage; used for steam, gas and domestic fuel; shipped east and west; butts, N. 88° W.;

faces, N. 2° E.; greatest rise, southwest; sample collected from No. 2 of section by D. D. Teets, Jr.; O. F. Limer, Supt., authority for mine data."

The composition of this sample is published under No. 43 in the table of analyses at the end of this Chapter.

The following opening was observed along the crest of the Chestnut Ridge Anticline:

#### S. S. Goodwin Farm Mine—No. 44 on Map II.

On Jesse Run, 3 miles S. 80° E. of Jane Lew; **Redstone Coal**; butts, east and west; elevation, 1433' B.

			Ft.	In.
1. Shale, dark.....				
2. Coal .....	2'	6½"		
3. Slate, dark.....	0	0½		
4. Coal (to slate pavement)...	2	1	4	8

A sample was collected from Nos. 2 and 4 of section, the composition of which is given under No. 44 in the table at the end of this Chapter.

#### Lora T. Cookman Farm Mine—No. 45 on Map II.

On Jesse Run, 2.3 miles north of Aberdeen; **Redstone Coal**; elevation, 1385' B.

	Ft.	In.
Shale .....		
Coal, visible.....	4	3

The full section of the coal was not obtained at this opening as the mine had partly fallen shut.

At the **Edwin Lewis Farm Mine (No. 46 on Map II)**, on a branch of Jesse Run, 2.9 miles north of Aberdeen, the coal showed a thickness of 5' 2", without partings, the elevation being 1375' B.

At the **Edith Goodwin Farm Mine (No. 47 on Map II)**, on a branch of Hackers Creek, 2 miles southeast of Jane Lew, the coal was once mined at an elevation of 1045' B., but the opening had fallen shut, the coal being reported 5 feet thick by residents.





At the **M. L. Law Farm Mine** (No. 48 on Map II), on Stony Run, 1.8 miles northwest of Berlin, the coal was 4' 6" thick, without partings, its elevation being 1433' L.

The **J. C. Allman Farm Mine** (No. 49 on Map II), on Stony Run, 2.6 miles north of Berlin, showed 4' 10" of clean coal, at an elevation of 1400' B.

### John Rinehart Farm Mine—No. 50 on Map II.

On a branch of Hackers Creek, 1.7 miles northeast of Berlin; **Redstone Coal**; elevation, 1320' B.

		Ft.	In.
Shale, sandy, dark.....		5	0
Coal .....	2' 0"		
Slate, dark gray.....	0 2		
Coal (to slate pavement).....	1 4	3	6

The **John Foster Farm Mine** (No. 51 on Map II), on Hackers Creek, 0.5 mile northwest of Aberdeen, now fallen shut, was visited several years ago, and showed 4' 9½" of coal, the elevation being 1250' B.

### M. M. Reger Farm Mine—No. 52 on Map II.

On a branch of Hackers Creek, 1.3 miles northeast of Berlin; **Redstone Coal**; elevation, 1330' B.

		Ft.	In.
Shale, dark, sandy.....		8	0
Coal .....	1' 10"		
Slate, gray.....	0 1		
Coal, visible.....	1 10	3	9

The **Morrison Bros. Farm Mine** (No. 53 on Map II), on the same branch of Hackers Creek, 1.1 miles northeast of Berlin, was partly fallen shut but showed about 4 feet of coal, at an elevation of 1351' B.

### G. R. Swisher Farm Mine—No. 54 on Map II.

On Hackers Creek, 1.4 miles northwest of Berlin; **Redstone Coal**; elevation, 1285' B.

		Ft.	In.
1. Shale, gray, sandy.....			
2. Coal (to slate pavement).....		4	0

A sample was collected from the coal, the composition of which is published under No. 54 in the table at the end of this Chapter.

At the **Fernando Waggoner Farm Mine (No. 55 on Map II)**, on a branch of Hackers Creek, 1.6 miles northwest of Berlin, the coal was 4 feet thick, without partings, the elevation being 1280' B.

The **George Lawson Farm Mine (No. 56 on Map II)**, on Hackers Creek, 0.3 mile southwest of Berlin, showed 3' 8" of clean coal, at an elevation of 1270' L., as published in the section for Berlin, page 49.

#### W. S. Starcher Farm Mine—No. 57 on Map II.

On a branch of Laurel Lick, 0.8 mile southeast of Berlin; **Redstone Coal**; elevation, 1225' B.

	Ft.	In.
Sandstone, shaly.....	3	0
Shale, sandy, dark at base.....	15	0
Slate, black.....	0	6
<b>Coal</b> .....	1' 9"	
Slate, dark, bony.....	0	3
<b>Coal (to slate pavement)</b> .....	2 3	4 3

#### George Allman Farm Mine—No. 58 on Map II.

On a branch of Buckhannon Run, 2 miles southeast of Berlin; **Redstone Coal**; elevation, 1250' B.

	Ft.	In.
Shale, dark.....	5	0
Slate, black.....	1	0
<b>Coal</b> .....	1' 11 "	
Slate, dark gray.....	0	3½
<b>Coal (to slate pavement)</b> .....	2 1½	4 4

The **Ira Queen Farm Mine (No. 59 on Map II)**, on a branch of Buckhannon Run, 2.3 miles southeast of Berlin, was partly fallen shut when examined but showed about 4 feet of coal, at an elevation of 1270' B., as published in the section for Lorentz, page 50.

### Peter Waggoner Farm Mine—No. 60 on Map II.

On Buckhannon Run, 2.1 miles east of Berlin; **Redstone Coal**; elevation, 1250' B.

			Ft.	In.
Shale .....				
Coal .....	2'	8½"		
Slate, black.....	0	2		
Coal (to slate pavement).....	1	3½	4	2

The **J. C. Strahley Farm Mine** (No. 61 on Map II), on Hackers Creek, 2.5 miles northwest of Berlin, showed 4' 2" of clean coal, at an elevation of 1340' B.

The **Cecil Hornbeck Farm Mine** (No. 62 on Map II), on Lifes Run, 2 miles northwest of Berlin, showed 4 feet of clean coal, the lower part of the seam being concealed by mud, at an elevation of 1255' B.

The **Annie Bryan Farm Mine** (No. 63 on Map II), on Maxwell Run, 1.7 miles northeast of Deanville, was fallen shut, but was reported to have had 4 to 5 feet of coal, the elevation being 1410' B.

The **Charles Smith Farm Mine** (No. 64 on Map II), on a branch of Maxwell Run, 0.7 mile east of Deanville, showed 4' 2" of clean coal, at an elevation of 1356' B.

The **Wallace Parsley Farm Mine** (No. 65 on Map II), on West Fork River, 0.4 mile east of Deanville, was fallen shut when examined, but was reported to have been 4 to 5 feet thick, the elevation being 1324' L., as published in the Deanville section, page 52.

The **Clinton Smith Farm Mine** (No. 66 on Map II), on Smith Run, 2 miles east of Weston, was partly fallen shut, but about 4 feet of coal could be seen, the elevation being 1215' B.

The **Richard N. Norman Farm Mine** (No. 67 on Map II), on Smith Run, 2.8 miles east of Weston, at an elevation of 1200' B., was fallen shut when visited, but was reported to have shown 5 feet of clean coal by Alfred Myers, who opened the bank.

The **E. D. Darnall Farm Mine** (No. 68 on Map II), on Hilly Upland Run, 2 miles northwest of Gaston, was partly concealed by water, but showed about 4 feet of clean coal, at an elevation of 1160' B.

**Jacob Jackson Farm Mine—No. 69 on Map II.**

On Hilly Upland Run, 1.9 miles northwest of Gaston; **Redstone Coal**; elevation, 1140' B.

	Ft.	In.
Sandstone, massive, <b>Cedarville</b> .....	7	0
Shale, sandy.....	7	0
Coal .....0' 2"		
Slate, black.....0 2		
Coal (to slate pavement).....4 5 .....	4	9

The **Clara Peterson Farm Mine (No. 70 on Map II)**, at the mouth of Hilly Upland Run, 1.9 miles northwest of Gaston, showed 4' 9" of clean coal, at an elevation of 1158' L.

**Charles Taylor Farm Mine—No. 71 on Map II.**

On Grass Run, 1.1 miles northeast of Gaston; **Redstone Coal**; elevation; 1165' B.

	Ft.	In.
Shale, dark, sandy.....		
Coal, bony.....0' 3"		
Coal, good (to slate pavement).4 4 .....	4	7

**John Stewart Farm Mine—No. 72 on Map II.**

On Grass Run, 1.3 miles northeast of Gaston; **Redstone Coal**; elevation, 1180' B.

	Ft.	In.
Shale, dark.....	2	0
Coal, bony.....0' 6"		
Coal, good (to slate pavement).3 3 .....	3	9

The **Nathaniel Bush Farm Mine (No. 73 on Map II)**, on Stonecoal Creek, 0.2 mile northwest of Gaston, showed 4' 2" of clean coal, as published in the section for Gaston, page 51, butts being N. 85° W., and tidal elevation, 1153' L. A sample was collected from this mine, the **composition of which** given under mine **No. 73** in the table of coal analyses at the end of this Chapter.

The **C. C. Hersman Farm Mine (No. 74 on Map II)**, on Stonecoal Creek, 0.5 mile northeast of Gaston, showed 4' 6" of clean coal, at an elevation of 1200' B.

### *Redstone Coal, Freemans Creek District, Lewis.*

In Freemans Creek District, the Redstone Coal crops along the eastern and southern portions, being above drainage in about half the district. In the northern part this coal is of minable thickness as far west as the region where it goes under drainage on the dip of the measures. In the southern part, it is of minable thickness as far west as Alum Bridge on Leading Creek, beyond which the coal disappears, although its horizon is exposed down the creek all the way to the Gilmer Line. In the northwestern part of the district, the records of numerous wells drilled for oil and gas fail to show any Redstone Coal of minable extent, warranting the conclusion that it is not good in this region. Map II shows by an appropriate symbol the western line beyond which the coal is apparently not of minable thickness and continuity and Figure 5, on a previous page, gives the same information in a different form. On Map II the crop lines are extended westward only as far as the coal is known to be of minable thickness. In the eastern and southern portions numerous openings were examined, the sections of which appear in the following pages.

#### **George Gardner Farm Mine—No. 75 on Map II.**

On McCann Run, 1.7 miles northwest of Lightburn; **Redstone Coal**; butts, N. 45° W.; elevation, 1307' B.

	Ft.	In.
Slate, black.....		
<b>Coal, good (to slate pavement).....</b>	5	6

A sample was collected from this coal, the composition of which is shown under mine **No. 75** in the table of coal analyses at the end of this Chapter.

#### **A. H. Hughes Farm Mine—No. 75A on Map II.**

On Elk Lick Run, 0.3 mile southeast of Mineral; **Redstone Coal**; elevation, 1050' B.

	Ft.	In.
Shale .....		
<b>Coal, visible.....</b>	5	0
Concealed, with shaly sandstone.....	20	0
Limestone, hard, yellow, <b>Redstone</b> .....	5	0

The bottom of the coal was concealed here, but, according to Mr. Hughes, the thickness varies from  $6\frac{1}{2}$  to 8 feet throughout the mine.

At the **James Hitt Farm Mine (No. 76 on Map II)**, on the southern branch of McCann Run, 1.6 miles southwest of Lightburn, the coal has been mined at an elevation of 1345' B., but the mine had fallen shut and its thickness was not obtained.

At **Farm Mine No. 77 on Map II**, on the head of Rush Run, 1.7 miles southwest of Freemansburg, the coal had been opened at an elevation of 1400' B., but the mine had fallen shut.

At the **Peter Hull Farm Mine (No. 78 on Map II)**, on the head of Fink Creek, 1.3 miles east of Churchville, the mine showed a thickness of clean coal varying from 2' 10" to 3' 10", at an elevation of 1020' B.

At Churchville, on Fink Creek, the coal had been opened and mined at the **Morgan McCluster Farm Mine (No. 79 on Map II)**, just south of the village, at an elevation of 922' L., where the coal goes under drainage on the westward dip, but the mine had fallen shut.

The **Alvin Douglass Farm Mine (No. 80 on Map II)**, on a branch of Polk Creek, 0.9 mile north of Camden, at an elevation of 1257' B., had fallen shut, but, according to Mr. Douglass, showed 4 feet of coal.

The **Will Jarvis Farm Mine (No. 81 on Map II)**, on Polk Creek, 1.7 miles southeast of Camden, at an elevation of 1235' B., had fallen shut, but the Will Jarvis well (148), drilled on the hill just above the opening, records 5 feet of coal.

The **Samuel Jarvis Farm Mine (No. 82 on Map II)**, on Sassafras Run, 0.9 mile southeast of Camden, had fallen shut, but the coal was reported  $5\frac{1}{2}$  feet thick, the elevation being 1245' B.

The **John Casey Farm Mine (No. 82A on Map II)**, on the head of Alum Fork, 2.4 miles northwest of Camden, had fallen shut, but was reported by Mr. Casey as being 7 feet thick, being at an elevation of 1080' B., and 45 feet, by hand level, above an opening in the Pittsburgh Coal.

At **Farm Mine No. 83 on Map II**, on Leading Creek, 2.8 miles west of Camden, the opening had fallen shut but there was 4' 6" of coal visible at the outcrop, the elevation being 1100' B.

The **W. L. Butcher Farm Mine (No. 84 on Map II)**, on Leading Creek, 2.4 miles west of Camden, showed 5' 9" of clean coal, at an elevation of 1111' L.

The **Kaspar Kraus Farm Mine (No. 85 on Map II)**, on the head of Crooked Fork, 2 miles southwest of Alum Bridge, measured 4' 5" of clean coal, at an elevation of 1005' B.

#### David Burkhammer Farm Mine—No. 86 on Map II.

On Alum Fork, 1.2 miles north of Alum Bridge; **Redstone Coal**; butts, N. 80° W.; elevation, 935' B.

	Ft.	In.
Sandstone, flaggy, <b>Cedarville</b> .....	3	0
Shale, sandy.....	10	0
Coal (to slate pavement).....	4	0

A sample was collected from this coal, the composition of which is published under Mine No. 86 in the table of coal analyses at the end of this Chapter.

#### *Redstone Coal, Courthouse District, Lewis.*

In Courthouse District, the Redstone is of commercial thickness and purity in the eastern portion, but in the western end it is apparently too patchy and uncertain to be of definite value. Map II and Figure 5 show the approximate western line of disappearance beyond which there may be small deposits of the coal but probably none of minable extent. Numerous openings were examined throughout the region where the coal crops.

#### W. G. Bennett Farm Mine—No. 87 on Map II.

On Stonecoal Creek, 0.6 mile southeast of Weston; **Redstone Coal**; butts, N. 80° W.; elevation, 1175' B.

	Ft.	In.
Shale, sandy and dark.....	4	0
Coal (to slate pavement) 3' 6" to.....	4	2



The opening has been driven into the hill about 40 feet but encountered some shale horsebacks. A sample was collected from the coal, the composition of which is published under Mine No. 87 in the table at the end of this Chapter.

The **Bland Brannon Farm Mine (No. 88 on Map II)**, on Town Run, 0.8 mile southeast of Weston, at an elevation of 1160' B., showed 3 to 4 feet of coal, badly cut up by clay seams.

The **Curtis Brothers Farm Mine (No. 89 on Map II)**, on Town Run, 1 mile southeast of Weston, showed 3' 6" of coal, and numerous clay seams, the elevation being 1140' B.

On the **Weston State Hospital Farm**, at Weston, the Redstone Coal has been opened and mined at several points, but all the openings are now closed. Map II shows that the coal crops about half way up the hill and that the southeastward dip of the seam would make mining easy, so that, with the large acreage available, the State could well afford to mine this coal for the use of the Hospital when the cost of natural gas reaches a prohibitive figure.

#### Jacob Flesher Farm Mine—No. 90 on Map II.

On West Fork River, 0.7 mile southwest of Weston; **Redstone Coal**; elevation, 1130' B.

		Ft.	In.
Shale, sandy.....			
Coal .....	0' 5"		
Slate, black.....	0 3		
Coal, visible.....	3 6	4	2

The above mine had fallen partly shut and the thickness recorded may be slightly smaller than a measurement at the face would show.

#### Michael Mulcahy Farm Mine—No. 91 on Map II.

On Murphy Creek, 1.3 miles southwest of Weston; **Redstone Coal**; elevation, 1095' B.

		Ft.	In.
Shale, dark.....			
Coal .....	0' 7"		
Slate, black.....	0 3		
Coal .....	4 8	5	6

	Ft.	In.
Slate and concealed.....	10	0
Sandstone, massive, shale, and sandstone, <b>Weston</b>	20	0
Shale, gray.....	4	0
Shale, dark.....	1	0
Limestone, hard, <b>Redstone</b> .....	5	0

The above measurement shows in detail not only the section of the Redstone Coal but also its relationship to the Weston Sandstone and Redstone Limestone. The coal exhibits a fine thickness here but it is somewhat cut up with clay seams.

The **Mary E. Lawson Farm Mine (No. 92 on Map II)**, on a branch of Murphy Creek, 2 miles southwest of Weston, had fallen shut, but was reported to have been 6 to 7 feet thick, its elevation being 1195' B.

The **Louis Bennett Farm Mine (No. 93 on Map II)**, on Stonelick Run, 1.2 miles northeast of Brownsville, was partly fallen shut but showed a thickness of about 5 feet, as published in the section for Brownsville, page 64, its elevation being 1055' B.

#### **Bartlett Shay Farm Mine—No. 94 on Map II.**

On Washburn Run, 1.5 miles southeast of Brownsville; **Redstone Coal**; butts, N. 85° W.; elevation, 1105' B.

		Ft.	In.
1. Shale, sandy.....			
2. Coal, slaty.....	0' 8"		
3. Slate, black.....	0 6		
4. Coal (to slate pavement)...	3 9	4	11

A sample was collected from No. 4 of section, the composition of which is given under Mine **No. 94** in the table of coal analyses at the end of this Chapter. The large percentage of sulphur (5.39) indicates that a lens of this impurity may have been included in the sample.

**Mary Dargan Farm Mine—No. 95 on Map II.**

On Washburn Run, 1.4 miles southeast of Brownsville; **Redstone Coal**; elevation, 1075' B.

	Ft.	In.
Shale, dark.....		
Coal .....	0'	8"
Coal, good.....	4	5
	<hr style="width: 50px; margin-left: auto; margin-right: 0;"/>	
Slate, pavement, and concealed to run.....	7	0

**Elias Stalnaker Farm Mine—No. 96 on Map II.**

On Skin Creek, 0.7 mile northwest of Alkires Mills; **Redstone Coal**; elevation, 1060' B.

	Ft.	In.
Shale, sandy.....		
Shale, dark.....	1	0
Coal .....	0'	3"
Slate, dark.....	0	9
Coal (to slate pavement).....	4	0
	<hr style="width: 50px; margin-left: auto; margin-right: 0;"/>	
	5	0

The coal shows a good thickness at the above mine, but is injured to some extent by the presence of clay seams.

**T. J. Lough Farm Mine—No. 97 on Map II.**

On Skin Creek, at Alkires Mills; **Redstone Coal**; butts, N. 82° W.; elevation, 1130' B.

	Ft.	In.
Sandstone, Cedarville, visible.....	5	0
Shale, sandy.....	4	0
Slate, black, with streaks of coal.....	1	0
Coal (to slate pavement).....	3	6

A sample was collected from the coal, the composition of which is given under Mine No. 97 in the table of analyses at the end of this Chapter.

The **O. B. Wheeler Farm Mine—No. 98 on Map II**, on Murphy Creek, 3 miles west of Weston, had fallen shut, but the coal was reported to be 5 to 6 feet thick, its elevation being 1225' B.

The **McDonald Murray Farm Mine (No. 99 on Map II)**, on Laurel Run, 2.9 miles northwest of Edmiston, showed 4' 6" of clean coal, the elevation being 950' L.

### Bland Brannon Farm Mine—No. 100 on Map II.

On Wolfpen Run, 1.8 miles northeast of Gillooly; **Redstone Coal**; butts, N. 80° W.; elevation, 950' B.

	Ft.	In.
Shale .....		
Coal (to slate pavement).....	4	8

A sample was collected from this coal, the composition of which is given under Mine No. 100 in the table of coal analyses at the end of this Chapter.

The **John Finster Farm Mine** (No. 101 on Map II), on a branch of Sleepcamp Run, 0.7 mile northeast of Finster, showed 4' 2" of clean coal, at an elevation of 987' B.

### John Kaden Farm Mine—No. 102 on Map II.

On Goosepen Run, 1.1 miles east of Finster; **Redstone Coal**; elevation, 1108' L.

	Ft.	In.
Shale, sandy.....		
Coal .....	1'	5½"
Slate, black.....	0	0½
Coal (to slate pavement).....	3	2
	4	8

The **Pat Faley Farm Mine** (No. 103 on Map II), on Indian Fork, 0.9 mile south of Finster, showed 4' 2" of clean coal, at an elevation of 1090' B.

The **W. J. Ryan Farm Mine** (No. 104 on Map II), on the head of Indian Fork, 1.8 miles southeast of Finster, showed a thickness of 4' 6" of clean coal, at an elevation of 1135' B., being 50 feet above the blossom of the Pittsburgh Coal.

### *Redstone Coal, Skin Creek District, Lewis.*

In Skin Creek District, the Redstone Coal crops along all the principal streams, but in the southeastern end the rise of the measures carries it to the hilltops so that little acreage is left. Its thickness is usually not so great as in the three districts just described, but its uniformly good quality insures that it will furnish a large quantity of excellent fuel.

**Pal Taylor Farm Mine—No. 105 on Map II.**

On Sauls Run of Stonecoal Creek, 0.6 mile west of Horner; **Redstone Coal**; butts, N. 85° W.; elevation, 1185' B.

	Ft.	In.
Sandstone, visible.....	1	0
Shale, sandy.....	2	0
Coal, slaty.....1' 5"		
Slate, black.....0 5		
Coal (to slate pavement).....4 0	5	10

**Ira Taylor Farm Mine—No. 106 on Map II.**

On Stonecoal Creek, 2.2 miles northeast of Horner; **Redstone Coal**; elevation, 1285' B.

	Ft.	In.
Slate, dark.....	6	0
Coal .....1' 4 "		
Slate, black.....0 0½		
Coal (to slate pavement).....2 5½	3	10

**Margaret McWhorter Farm Mine—No. 107 on Map II.**

On Snyder Run of Stonecoal, 2.8 miles southeast of Horner; **Redstone Coal**; elevation, 1360' B.

	Ft.	In.
Shale, dark, with streaks of coal.....	7	0
Coal .....2' 3"		
Slate, dark, hard.....0 3		
Coal (to slate pavement).....1 0	3	6

The **F. M. Shoulders Farm Mine** (No. 108 on Map II), on Right Fork of Stonecoal, 3 miles southeast of Horner, showed 3 feet of clean coal, the elevation being 1415' B.

The **Joseph Knabenshue Farm Mine** (No. 109 on Map II), on Right Fork of Stonecoal, 2.1 miles northeast of Georgetown, had partly fallen shut, but about 3 feet of coal was visible, its elevation being 1445' B.

**E. M. Lawson Farm Mine—No. 110 on Map II.**

On Sauls Run of Stonecoal, 1.6 miles southwest of Horner; **Redstone Coal**; elevation, 1185' B.

	Ft.	In.
Sandstone, shaly.....		
Shale, sandy.....	2	0
Coal, slaty.....1' 0"		
Coal, good (to slate pavement).4 6	5	6

### Lloyd Smith Farm Mine—No. 111 on Map II.

On Curtis Run, 1.6 miles southwest of Horner; **Redstone Coal**; elevation, 1210' B.

	Ft.	In.
Sandstone, Cedarville.....		
Shale, sandy.....	5	0
Coal, slaty.....1' 0"		
Slate, black.....0 6		
Coal (to slate pavement).....3 3	4	9

### W. L. Clark Farm Mine—No. 112 on Map II.

On Peters Lick Run of Little Skin Creek, 1.1 miles northwest of Georgetown; **Redstone Coal**; butts, N. 80° W.; elevation, 1270' B.

	Ft.	In.
1. Sandstone, massive, Cedarville.....	10	0
2. Concealed .....	15	0
3. Shale, sandy.....	10	0
4. Coal, semi-cannel.....0' 4"		
5. Slate, black.....1 6		
6. Slate, cannel.....0 6		
7. Coal, good (to slate pavement).3 9	6	1

A sample was collected from No. 7 of section, the composition of which is given under Mine No. 112 in the table of coal analyses at the end of this Chapter.

### Stalnaker Heirs Farm Mine—No. 112A on Map II.

On a branch of Little Skin Creek, 0.8 mile northeast of Georgetown; **Redstone Coal**; elevation, 1295' L.

	Ft.	In.
Shale, sandy.....		
Coal, 1' 4" to.....1' 6"		
Slate, dark.....0 4		
Coal (to slate pavement).....1 6	3	4

The J. H. Stalnaker Farm Mine (No. 113 on Map II), on Hershman Run, 1.2 miles east of Georgetown, showed 3' 3" of clean coal, at an elevation of 1400' B.

The Charles Simons Prospect (No. 114 on Map II), on the head of Buckeye Fork of Little Skin Creek, 2 miles southeast of Georgetown, showed 3' 9" of clean coal, but the open-

ing had not been driven far enough into the hill to find the roof of the seam and this measurement may not represent the full thickness of the coal.

### L. C. Clark Farm Mine—No. 115 on Map II.

On Straight Fork of Little Skin Creek, 1.1 miles south of Georgetown; **Redstone Coal**; butts, N. 85° W.; elevation, 1355' B.

	Ft.	In.
Slate, coaly.....	1	0
Coal (to slate pavement).....	3	2

The Redstone Coal was once opened at the **M. L. Bruffy Farm Mine (No. 116 on Map II)**, on Skin Creek, 1.2 miles northwest of Vandalia, at an elevation of 1395' B., as published in the section for Vandalia, page 67, but the mine had fallen shut and could not be measured. So far as known, the coal has not been opened in Skin Creek District southeast of this point.

### *Redstone Coal, Collins Settlement District, Lewis.*

In Collins Settlement District, the Redstone Coal is under drainage in the northern part, crops along the hillsides in the central portion, but south of the Coal and Coke Railway soon rises above the summits and appears no more in the panhandle where the measures are rising rapidly southeastward all the way to the Webster Line. Along the West Fork River, north of Roanoke, where the coal lies under drainage, the evidence is too meager to determine with certainty whether the coal is of minable thickness. At Roanoke (Roanville), it was once mined just above the river level (**Opening No. 117 on Map II**) and apparently had a thickness of about two feet, and this may represent its development to the north. Along the broad belt south of Roanoke, where Map II shows the crop of the coal, it will furnish a large amount of fuel as it varies from 2 to 4 feet in thickness. In the extreme southwestern part of the district, next to Orlando, the coal disappears completely, leaving a barren area of several square miles. The crop of the

coal is shown on Map II only as far southwestward as it is of minable thickness. Several openings were observed in the district, the account of which follows:

The **John B. Watson Farm Mine (No. 118 on Map II)**, on Sand Fork, 2 miles east of Roanoke, had fallen shut, but was reported by Mr. Watson to have been 4 feet thick, its elevation being 1235' L.

The **Susan C. Hawkins Prospect (No. 119 on Map II)**, on Ward Run, 2.3 miles northeast of Roanoke, showed 3' 3" of clean coal, at an elevation of 1265' B., butts being N. 85° W.

The **Thomas Eckess Prospect (No. 120 on Map II)**, on the southern branch of Ward Run, 2.8 miles east of Roanoke, showed 3' 9" of coal, at an elevation of 1375' B., but was driven into the hill only about 10 feet and may not have shown the full thickness of the seam.

#### Joseph Whetsell Farm Mine—No. 121 on Map II.

On Toms Run, 3 miles east of Roanoke; **Redstone Coal**; elevation, 1385' B.

	Ft.	In.
Shale, sandy.....	10	0
Slate, bony.....	0	6
Coal (to slate pavement).....	4	0

#### John Smith Farm Mine—No. 122 on Map II.

On Mudlick Run, 2 miles northeast of Jacksonville; **Redstone Coal**; butts, N. 87° W.; elevation, 1390' B.

	Ft.	In.
Slate, dark.....		
Coal, (to slate pavement).....	2	9

A sample was collected from this coal, the composition of which is published under Mine No. 122 in the table of coal analyses at the end of this Chapter.

#### Michael E. Whalen Farm Mine—No. 123 on Map II.

On Redlick Run, 0.4 mile southeast of Peterson; **Redstone Coal**; butts, N. 83° W.; elevation, 1040' B.

	Ft.	In.
Shale, sandy.....		
Coal (to slate pavement) 3' 0" to.....	4	0



A sample was collected from this coal, the composition of which is published under Mine No. 123 in the table at the end of this Chapter.

### A. B. Cosner Farm Mine—No. 124 on Map II.

On Meadow Run, 1 mile northeast of Blake; **Redstone Coal**; elevation, 1033' L.

	Ft	In.
Sandstone, shaly, <b>Cedarville</b> .....		
Shale, gray.....	5	0
<b>Coal</b> (to slate pavement).....	2	11

A sample was collected from this coal, the composition of which is published under Mine No. 124 in the table of coal analyses at the end of this Chapter. At this opening the coal was faulty, having numerous clay seams.

The **Abram Myers Farm Mine** (No. 125 on Map II), on the head of Clover Fork, 1.3 miles southwest of Jacksonville, at an elevation of 1335' B., showed 3 feet of coal without partings.

### *Quantity of Redstone Coal Available.*

In addition to the coal openings described in the preceding pages, the accompanying table shows a list of oil and gas wells that record the Redstone Coal. Another table is added showing the probable amount of this coal by magisterial districts. In the column of thicknesses, the average applies only to the area in square miles given in the next column which in some cases is less than the total area underlain by the coal horizon in the district, those portions of the district where the coal is not of minable thickness being disregarded entirely in this table:

## List of Wells Recording Redstone Coal.

No. on Map.	Name of Well.	Location.	Eleva- tion of Well Mouth A. T.	Depth Feet.	Thick- ness Feet.
<b>Lewis County.</b>					
57	Elizabeth Lawson No. 3268	Berlin, 1.1 mi. N.			
		80° W.....	1492B	260	4
117	H. L. Frashuer No. 484..	Mineral, 1.1 mi.			
		S. E.....	1210B	80	4
148	Will Jarvis No. 1.....	Camden, 1.7 mi.			
		S. E.....	1358B	123	5
233	Wm. Winans No. 19.....	Churchville, 1.6			
		mi. E.....	1180B	150	..
236	Perry White No. 497.....	Churchville, 1 mi.			
		E. ....	1228L	149	3
371	Barney Bohlen No. 3.....	Copley, 1.1 mi.			
		N. E.....	830B	105	..
397	J. W. Cox No. 1.....	Bealls Mills, 0.6			
		mi. N.....	870B	160	3
470	S. E. Harrison No 2041...	Edmiston, 0.7 mi.			
		N. ....	1310B	400	2
503	Wm. McBride No. 1964...	Edmiston, 2.2 mi.			
		N. E.....	1175B	255	5
508	Jacob Flesher No. 4119..	Edmiston, 0.9 mi.			
		E. ....	1300B	390	5
510	Edward Priest No. 1.....	Edmiston, 1.2 mi.			
		S. E.....	1290B	400	6
512	N. Peterson No. 1984.....	Edmiston, 1.7 mi.			
		S. 75° E.....	1145B	190	5
516	John H. Hammer No. 1..	Brownsville, 1.4			
		mi. N. W.....	1170B	190	5
525	Thomas Barnes No. 2456..	Brownsville, 1.4			
		mi. N. E.....	1225B	145	5
527	P. J. Dyer No. 2281.....	Brownsville, 0.5			
		mi. N.....	1130B	120	5
529	Louis Bennett No. 4.....	Weston, 1.5 mi. S.			
		.....		120	4
531	John Dennison No. 4054..	Weston, 1.4 mi. S			
		.....	1278B	260	2
535A	L. L. Wilson No. 4047....	Weston, 1.4 mi. S.			
		20° E.....	1255B	200	5
539	E. A. Bennett No. 2071...	Brownsville, 0.8			
		mi. S. E.....	1255B	260	5

## Probable Amount of Redstone Coal.

Lewis County by Districts.	Thickness of Coal Assumed. Feet.	Sq. Mi.	Acres.	Cubic Feet of Coal.	Short Tons of Coal.
Hackers Creek....	4	19.40	12,416	2,163,363,840	86,534,553
Freemans Creek..	4.5	28.75	18,400	3,606,768,000	144,270,720
Courthouse .....	4	73.07	46,764.8	8,148,298,752	325,931,950
Skin Creek.....	3.5	11.50	7,360	1,122,105,600	44,884,224
Collins Settlement	3	22.80	14,592	1,906,882,560	76,275,303
Totals .....		155.52	99,532.8	16,947,418,752	677,896,750

## THE PITTSBURGH COAL.

The Pittsburgh Coal, discussed previously in Chapter VI, pages 129-130, is shown by outcrop lines on Map II in those regions where it is of noticeable thickness above drainage. It is also used as the basis of the green structure contours, these lines representing the elevation of its base above sea level, and is an important minable coal in northern Hackers Creek, nearly all of Freemans Creek, nearly all of Courthouse Districts in Lewis, and in southeastern Troy, eastern Glenville, and southeastern and southwestern Center Districts, Gilmer. Map II shows by an appropriate symbol the limits west and north of which this coal is not of minable thickness, the disappearance along this line being, in most localities, abrupt, as though an ancient deepwater shore line prevented the growth of the vegetation which formed the coal, and Figure 6 gives this information in condensed form. In those regions where the coal is found it is nearly always of the same uniform physical structure, usually having but one streak of bony coal near the middle, which, in some cases, contains so much additional volatile matter that buyers do not object to its presence in the car. Chemically, the coal is unusually high in volatile matter, the tested samples averaging 41.82 per cent. or about 5 per cent. higher than the same coal in the Monongahela Valley north of Clarksburg. The sulphur content is too high in most analyses to permit the coal to be used for by-product or metallurgical coke, but if a means of washing about half of this impurity from the coal could be devised, its possibilities

as a gas-making coal would be wonderful. As the coal comes from the mine, it is best adapted for domestic or steam fuel, for both of which uses it is eminently fitted.

### *Pittsburgh Coal, Hackers Creek District, Lewis.*

In Hackers Creek District, as shown by Map II, the Pittsburgh Coal is almost entirely eroded from the hilltops in the northwestern part along the Wolf Summit and Chestnut Ridge Anticlines, but in the central and southwestern parts, it crops above drainage along all the principal streams. It is of present minable value only in that portion of the district north of Jesse Run, next to the Harrison Line. South of Jesse Run, the coal is nearly always present, but is usually not much more than 1 foot thick, making its commercial exploitation possible only after the lapse of many generations when the coal resources of West Virginia approach exhaustion.

The Pittsburgh Coal has been mined commercially at the **Kroger Gas Coal Company Mine (No. 126 on Map II)**, on McKinney Run,  $\frac{3}{4}$  mile southeast of McWhorter, where the seam exhibits a total thickness of 5' 2", with partings, as shown in detail in the section for McWhorter, page 46, its elevation being 1384' B.

The **Edith Goodwin Prospect (No. 127 on Map II)**, on a branch of Hackers Creek, 2 miles southeast of Jane Lew, showed a thickness of 4' 0", but may not have represented the whole seam, as the base was concealed by water.

### **Fernando Waggoner Prospect—No. 128 on Map II.**

On a branch of Hackers Creek, 1.6 miles northwest of Berlin; Pittsburgh Coal; elevation, 1230' B.

	Ft.	In.
Limestone, yellow, Redstone.....	1	0
Shale, dark.....	3	0
Coal (to slate pavement).....	2	10

The coal was once opened at the **Porter Maxwell Farm Mine (No. 129 on Map II)**, on a branch of Sycamore Lick, 2.3 miles southwest of Jane Lew, where the mine had fallen shut, but, according to A. J. Hardman, showed a thickness of 4½



feet, the elevation being 1358' B., as published in the section for Jane Lew, page 47.

At the **Charles Smith Exposure (No. 130 on Map II)**, on a branch of Maxwell Run, 0.7 mile east of Deanville, the Pittsburgh Coal showed a thickness of 1' 9", at an elevation of 1308' B., being 48 feet, by hand level, below an opening in the Redstone Coal.

The **Wallace Parsley Prospect (No. 131 on Map II)**, on West Fork River, just east of Deanville, had fallen shut, but, according to residents, showed a thickness of 1' 6", the elevation being 1272' L., as published in the section for Deanville, page 52.

### *Pittsburgh Coal, Freemans Creek District, Lewis.*

In Freemans Creek District, the evidence is sufficient to class the Pittsburgh Coal as a minable seam in all those portions where its horizon still remains uneroded except in the extreme western region, next to Gilmer and Doddridge, where the western line of disappearance, shown on Map II, indicates that it has thinned out completely. There may be scattered localities east of this line where the coal will not be found, but it is believed that these are few. The coal crops in a broad belt along the Chestnut Ridge Anticline, through the center of the district, and in this region, as well as in numerous oil and gas well records, the coal varies from 4 to 8 feet in thickness.

At **Farm Mine No. 132 on Map II**, on Turkeypen Run, 0.9 mile southeast of Mineral, the opening had fallen shut, but 4 feet of coal was visible at the mouth, the elevation being 1065' B. It is probable that this exposure does not represent the entire seam, as the base was concealed.

### **Hughes Heirs Farm Mine—No. 133 on Map II.**

On Turkeypen Run, 1.1 miles southeast of Mineral; **Pittsburgh Coal**; elevation, 1100' B.

	Ft.	In.
Limestone, hard, yellow, Redstone.....	3	0
Concealed .....	12	0
Coal, bony.....1' 4"		
Coal, good, visible.....4 6 .....	5	10

The **George Gardner Farm Mine (No. 134 on Map II)**, on the head of McCann Run, 1.6 miles west of Lightburn, had fallen shut, but a measurement at the mouth of the mine showed 4' 2" of coal, at an elevation of 1255' B., being 52 feet, by hand level, below Mine No. 75 in the Redstone Coal, previously described.

At **Farm Mine No. 135 on Map II**, on Freemans Creek, 0.4 mile east of Freemansburg, the coal was once mined at an elevation of 1311' L., but the opening had fallen shut, being reported 4 feet thick, as shown by the Freemansburg Section, page 55.

The **Ova Lester Farm Mine (No. 136 on Map II)**, on Left Fork of Freemans Creek, 1.2 miles northwest of Freemansburg, showed 4' 3" of coal, at an elevation of 1095' B.

#### Coal Exposure—No. 137 on Map II.

On Left Fork of Freemans Creek, 1.7 miles west of Freemansburg; **Pittsburgh Coal**; elevation, 1090' B.

	Ft.	In.
Limestone, Redstone.....	3	0
Concealed .....	10	0
Coal (to fire clay floor).....	2	6

The coal was observed at the **Alvin Douglass Farm Exposure (No. 138 on Map II)**, on a branch of Polk Creek, 0.9 mile northwest of Camden, where it is 3' 2" thick, coming 50 feet, by hand level, below Opening No. 80 in the Redstone Coal, and having an elevation of 1207' B.

The **John Casey Farm Mine (No. 139 on Map II)**, on the head of Alum Fork, 2.4 miles northwest of Camden, had fallen shut, but was reported by Mr. Casey as being 4 feet thick, its elevation being 1035' B., and 45 feet, by hand level, below Opening No. 82A in the Redstone Coal.

#### Minor Lovett Farm Mine—No. 140 on Map II.

On Walnut Fork, 1.8 miles northeast of Vadis; **Pittsburgh Coal**; elevation, 841' L.

	Ft.	In.
Sandstone, shaly.....		
Shale, gray.....	2	0
Shale, dark.....	2	0
Coal, visible.....	3	0

### Isaac Pyson Heirs Farm Mine—No. 141 on Map II.

On Walnut Fork, 1.1 miles northeast of Vadis; **Pittsburgh Coal**; elevation, 828' L.

		Ft.	In.
Shale, sandy.....		15	0
Shale, dark.....		3	0
Coal .....	2' 2"		
Slate, black, bony.....	0 1		
Coal (to slate pavement).....	3 10	6	1

### J. C. Rooney Farm Mine—No. 142 on Map II.

On Walnut Fork, at Vadis; **Pittsburgh Coal**; elevation, 835' B.

		Ft.	In.
Sandstone, massive.....		15	0
Shale, gray.....		1	6
Coal .....	0' 8"		
Bone .....	0 2		
Coal (to slate pavement).....	3 5	4	3

A sample from this mine, collected by S. D. Brady and analyzed in the laboratory of the Survey, was published in Volume II, page 206, and is repeated in the table of coal analyses at the end of this Chapter.

The **C. F. Griggs Farm Mine** (No. 143 on Map II), on Walnut Fork at Vadis, showing 5' 1" of coal with parting, is published in detail in the section for Vadis, page 60.

### Madison Lovell Heirs Farm Mine—No. 144 on Map II.

Operated by Burgett Rinehart on Fink Creek, 0.5 mile west of Vadis; **Pittsburgh Coal**; elevation, 792' L.

		Ft.	In.
Sandstone, massive.....			
Shale, sandy.....		8	0
Shale, dark.....		4	0
Coal .....	2' 8"		
Slate, dark.....	0 1		
Coal (to slate pavement).....	4 4	7	1

Another operation on the same tract showed the following:



**Madison Lovell Heirs Farm Mine—No. 145 on Map II.**

On Fink Creek, 0.6 mile northwest of Vadis; **Pittsburgh Coal**; butts, N. 70° W.; elevation, 780' B.

		Ft.	In.
1. Sandstone, massive.....			
2. Shale, gray.....		7	0
3. Coal, good.....	2' 0"		
4. "Copperas Rock" parting...0	1		
5. Coal (to slate pavement)...4	2	6	3

A sample was collected from Nos. 3 and 5 of section, the composition of which is published under Mine No. 145 in the table of coal analyses at the end of this Chapter.

**L. C. Waugh Farm Mine—No. 146 on Map II.**

On Fink Creek, 0.6 mile west of Vadis; **Pittsburgh Coal**; elevation, 780' B.

		Ft.	In.
Sandstone, massive.....			
Shale, sandy.....		5	0
Coal .....	2' 0"		
Shale, dark.....	1 0		
Coal .....	3 0		
Bone .....	0 1		
Coal (to slate pavement).....4	4	10	5

Another opening on the same farm shows the following:

**L. C. Waugh Farm Mine—No. 147 on Map II.**

On Fink Creek, 0.7 mile west of Vadis; **Pittsburgh Coal**; elevation, 780' B.

		Ft.	In.
Sandstone, massive.....			
Shale, sandy.....		6	0
Coal .....		0	2
Shale, dark.....		1	6
Coal .....		0	5
Shale, dark.....		1	0
Coal .....	2' 11"		
Slate, dark.....	0 1		
Coal .....	4 4	7	4

The **T. J. Fahey Farm Mine** (No. 148 on Map II), on Leading Creek, 0.9 mile northeast of Linn, showed 5' 3" of clean coal, at an elevation of 925' B.

The **Lydia Allman Farm Mine** (No. 149 on Map II), on Leading Creek, 0.5 mile northwest of Alum Bridge, showed 7' 3" of coal, its elevation being 930' B.

The **David Burkhammer Farm Mine** (No. 150 on Map II), on Alum Fork, 1 mile north of Alum Bridge, exhibited 4 feet of coal, its elevation being 890' B., and coming 43 feet, by hand level, below Mine No. 86 in the Redstone Coal, and 118 feet below the great Sewickley Sandstone cliff.

### *Pittsburgh Coal, Courthouse District, Lewis.*

In Courthouse District, the Pittsburgh Coal lies principally under drainage, cropping only at two localities, one in the northeastern corner of the district, around Weston, and the other along the southern edge. In both of these regions the coal is too thin for mining or absent entirely from the measures, making it certain that any coal recovered from this seam must be obtained by shafting in the northern and western parts of the district. In those portions of the district where the coal lies under drainage, information regarding its thickness and continuity is not complete. In the eastern part, near the junction of the Grassland and Roanoke Synclines, three diamond drill tests have been made, the record of only one of which (523) was secured. This record which showed no coal, together with the fact that none of consequence is recorded in any of the oil and gas well records of this locality and that none of minable thickness is found in the region of its crop, immediately northward, indicates that the eastern part of the district contains no Pittsburgh Coal of minable value. In the western part three core tests have been drilled in the Copley neighborhood, the records of which could not be secured. Numerous oil and gas well records were obtained, however, and a sufficient number of these record coal to warrant the assertion that a considerable body of Pittsburgh Coal exists in this part of the district, but the fact that many of the records that are apparently complete fail to record the coal, indicates that it is patchy and that extensive tests by

the diamond drill should be made before final judgment can be passed upon it. It is entirely possible that several of the oil and gas well records published for this region, which failed to show the coal, have omitted it, many of them being defective, and their information must therefore be regarded as inconclusive.

In the northeastern end of the district, near Weston, the coal is exposed along the public road near the Crescent Glass Factory, about one mile south of town, where it varies from 1 to 1½ feet in thickness, and comes 10 to 12 feet below the Redstone Limestone and about 50 feet below the Redstone Coal which was once mined in the hillside. The **Weston Brick Works Exposure (No. 151 on Map II)**, on the West Fork River, one mile south of Weston, shows the coal to be 1 foot thick, at an elevation of 1020' B., as published under the description of the Weston Shale, in Chapter VI, page 128.

### *Pittsburgh Coal, Skin Creek and Collins Settlement Districts, Lewis.*

In Skin Creek District, the horizon of the Pittsburgh Coal is above drainage along all the principal streams, but at no point shows a thickness sufficient to indicate that it can ever be mined, although its blossom frequently occurs. In this region, the Redstone Coal, which occurs in minable thickness about 50 feet above the Pittsburgh, has been frequently mistaken for the latter horizon. The outcrop of the Pittsburgh Coal is not shown on Map II for this district, as its presence there would be misleading, but its horizon may be obtained at any point from the structure contours.

In Collins Settlement District, the Pittsburgh Coal horizon is everywhere above drainage except in a small area at the northern end around Roanoke. In this locality, two core tests have been drilled the records of which could not be secured, but the records of the gas wells of the neighborhood, which show no coal, and the fact that in the neighboring regions where the horizon of the coal is exposed, there is no coal of appreciable thickness, lead to the belief that no Pittsburgh Coal of consequence exists in this locality. In the re-

maining parts of the district, where the horizon of the coal is exposed, little more than the blossom of the coal is found, indicating that the entire district contains no Pittsburgh Coal of minable thickness, and its outcrop is not placed on Map II. The Redstone Coal above it has often been confused with the Pittsburgh in this district, but the stratigraphic evidence regarding the two coals is conclusive, making it certain that the Redstone, and not the Pittsburgh, is the minable coal of the lower part of the Monongahela Series in this district.

### *Pittsburgh Coal, Troy and Dekalb Districts, Gilmer.*

In Troy District, the Pittsburgh Coal is of minable thickness in only a small area in the southeastern corner, where it is a good seam, varying from 4 to 8 feet in thickness. The western line of disappearance, shown on Map II, indicates that the coal is not found west of Troy. Its horizon is exposed along Leading Creek and tributary streams in the southern end of the district, but beyond Troy no coal occurs where the Pittsburgh should belong. In the western end of the district, where its horizon is underground, no Pittsburgh Coal is recorded in any of the well records secured in this region, and as many of these records are complete, there can be no doubt that the coal is absent in this region. In the southeastern corner, several openings were observed, and in this region the outcrop is shown on Map II.

The **E. M. Talbott Farm Mine** (No. 152 on Map II), on Leading Creek, 1 mile east of Troy, had fallen shut, but was reported by Mr. Talbott to have shown 3 feet of coal, its elevation being 830' B. The coal has been opened, also, at several points along Fink Creek, between the Lewis Line and its junction with Leading Creek, but all these have fallen shut.

### **J. C. Farnsworth Farm Mine—No. 153 on Map II.**

On Leading Creek, 1 mile northwest of Linn; **Pittsburgh Coal**; butts, N. 80° W.; elevation, 850' B.

	Ft.	In.
Shale .....		
Coal (to slate pavement) .....	5	5

A sample was collected from this coal, the composition of which is published under Mine No. 153 in the table of coal analyses at the end of this Chapter.

Many thousands of tons of coal have been mined for local domestic consumption at the **W. P. Carr Farm Mine (No. 154 on Map II)**, on Leading Creek, 0.5 mile northwest of Linn, where, according to Mr. Carr and the miners employed by him, the coal attained a thickness of 9 feet. The old opening had fallen shut, but a new opening a short distance away showed 6' 9" of coal, at an elevation of 875' B. The coal has also been opened at two or three points around Linn but these openings have fallen shut.

The **Perry Talbott Farm Mine (No. 155 on Map II)**, on Spruce Run, 1.5 miles southwest of Linn, showed 4' 4" of coal, at an elevation of 930' B.

In Dekalb District, the Pittsburgh Coal is not found in the southeastern part, where its horizon crops, nor in the western part where numerous gas wells have been drilled through the measures that should contain it, the conclusion being that the coal does not exist in minable quantity. Its crop is not shown in this district but its horizon belongs at the base of the Monongahela Series which appears on Map II.

### *Pittsburgh Coal, Glenville District, Gilmer.*

In Glenville District, the Pittsburgh Coal has been mined extensively for local domestic consumption and is also being mined commercially at the present, there being 4 mines of this kind. The western line of disappearance on Map II shows that the coal is not found in the district west of Glenville, but may be present in a large part of the district east of this line. In those portions of the district where the coal crops and could be studied, its existence is a matter, not of opinion, but of fact, and is shown as such by the line of its outcrop on the map, which appears thereon only in those regions where the coal is good. In a considerable part of the district, however, the coal is underground along the Grassland Syncline, and since the information contained in available well records is not satisfactory, the existence of the coal as a continuous minable stratum must be a matter of grave doubt. Some of

the oil and gas wells record it and some do not. Several core tests have been made in the district, but, unfortunately, nearly all the operators who drilled them expressed themselves as unwilling or unable to furnish them to the Survey, and the information that they contain is therefore denied to the public. In most of such cases a justifiable suspicion exists that the diamond drill has not proved a satisfactory thickness of coal. The core test (754), at the mouth of Slidinghill Run at Stouts Mills, showed 7' 8" of coal, while another one (711) on Sand Fork, near the mouth of Indian Fork, showed only a streak of coal at the Pittsburgh horizon. Figure 6 embodies the best information available regarding the coal in this region, showing those regions where it is known to be good as well as those where it is defective or uncertain. In the region where the coal crops, numerous openings were examined.

#### Robert Carson Farm Mine—No. 156 on Map II.

On Wolfpen Run of Stewart Creek, 0.9 mile north of Baldwin; Pittsburgh Coal; butts, N. 85° W.; elevation, 975' B.

	Ft.	In.
Slate, dark.....		
Coal (to slate pavement).....	6	8

A sample was collected from this coal, the composition of which is shown under Mine No. 156 in the table of coal analyses at the end of this Chapter.

#### Wade Ratliff Farm Mine—No. 157 on Map II.

On Stewart Creek, 0.4 mile northeast of Baldwin; Pittsburgh Coal; elevation, 985' B.

	Ft.	In.
Draw slate .....	1	0
Coal (to slate pavement).....	4	5

A sample was collected from this coal, the composition of which is given under Mine No. 157 in the table of coal analyses at the end of this Chapter.

The Susan Criss Farm Mine (No. 158 on Map II), on Stewart Creek, 0.4 mile south of Baldwin, measured 4' 6" of coal, at an elevation of 970' B.

### J. W. Wolf Farm Mine—No. 159 on Map II.

On Stewart Creek, 1.2 miles southwest of Baldwin; **Pittsburgh Coal**; butts, N. 80° W.; elevation, 985' B.

	Ft.	In.
Sandstone, shaly.....	15	0
Shale, dark.....	5	0
Coal .....2' 0"		
Bone .....0 1		
Coal (to slate pavement).....4 0	6	1

A sample was collected from this coal, the composition of which is published under Mine No. 159 in the table of coal analyses at the end of this Chapter.

The **Alexander Lyons Farm Mine** (No. 160 on Map II), on Burke Run, 0.7 mile northwest of Baldwin, showed 4' 2" of coal, at an elevation of 1000' B.

Below Burke Run the coal was not observed along Stewart Creek. At Glenville it was formerly mined on the south side of the Little Kanawha, 0.5 mile east of the town, at **Opening No. 161 on Map II**, at an elevation of 925' B., but the mine had fallen shut and could not be measured. This was the most western point where the coal could be found along the Little Kanawha. Between Glenville and Sand Fork the coal has been opened and mined for local domestic fuel at numerous points, at most of which it shows a fine development.

### Charles Hayes Farm Mine—No. 162 on Map II.

On Dry Run, 2 miles southeast of Glenville; **Pittsburgh Coal**; butts, N. 80° W.; elevation, 905' B.

	Ft.	In.
1. Draw slate.....		
2. Coal .....2' 1½"		
3. Cannel bone.....0 1½		
4. Coal (to slate pavement)...3 9	6	0

A sample was collected from this coal, the composition of which is given under Mine No. 162 in the table of coal analyses at the end of this Chapter. The output of this mine is about 500 bushels daily, with 5 men employed.

The **M. B. Morris Farm Mine** (No. 163 on Map II), on

Dry Run, 2.2 miles southeast of Glenville, showed 4' 9" of coal, at an elevation of 865' B.

The J. L. Floyd Farm Mine (No. 164 on Map II), on a branch of the Little Kanawha, 1.2 miles northwest of Truebada, had fallen shut, but was reported as being 5 to 7 feet, its elevation being 925' B.

### Summers Brothers Farm Mine—No. 165 on Map II.

On Little Kanawha River, 1.2 miles west of Truebada; Pittsburgh Coal; butts, N. 70° W.; elevation, 875' B.

			Ft.	In.
1. Draw slate .....				
2. Coal .....	2'	6½"		
3. Bone .....	0	1½		
4. Coal (to slate pavement).....	4	3	6	11

A sample was collected from Nos. 2 and 4 of section, the composition of which is given under Mine No. 165 in the table of coal analyses at the end of this Chapter. The coal from this mine is used for local domestic fuel, the output being about 250 bushels daily, with 4 men employed.

### Elmer Fishback Farm Mine—No. 166 on Map II.

On Duck Creek, 2.1 miles southwest of Sand Fork; Pittsburgh Coal; elevation, 800' B.

			Ft.	In.
Slate, dark.....				
Coal .....	2'	9"		
Bone .....	0	1		
Coal (to slate pavement).....	3	8	6	6

### Charles Wilfong Farm Mine—No. 167 on Map II.

On Duck Creek, 2.5 miles southwest of Sand Fork; Pittsburgh Coal; elevation, 805' B.

			Ft.	In.
Slate, dark, visible.....			5	0
Coal .....	2'	0"		
Bone .....	0	1		
Coal (to slate pavement).....	3	8	5	9



**Coal Exposure—No. 168 on Map II.**

On Duck Creek, in the public road, 2.6 miles southwest of Sand Fork; **Pittsburgh Coal**; elevation, 815' L.

		Ft.	In.
Sandstone .....			
Concealed and shale.....		8	0
Coal .....	2' 0"		
Slate, black.....	4 0		
Coal (to slate pavement).....	1 3	7	3

**W. J. Clovis Farm Mine—No. 169 on Map II.**

On Bear Run, 1.4 miles west of Sand Fork; **Pittsburgh Coal**; elevation, 792' L.

		Ft.	In.
Slate .....			
Coal .....	3' 8"		
Bone .....	0 1		
Coal (to slate pavement).....	3 11	7	8

A sample of this coal was once collected by S. D. Brady, the analysis of which, as made in the laboratory of the Survey, was published in Volume II, page 206, and is repeated under Mine No. 169 in the table of coal analyses at the end of this Chapter.

**John R. Lynch Farm Mine—No. 170 on Map II.**

On Little Kanawha River, 0.3 mile south of Truebada; **Pittsburgh Coal**; butts, N. 78° W.; elevation, 790' B.

		Ft.	In.
1. Draw slate.....			
2. Coal .....	2' 7"		
3. Bone .....	0 1		
4. Coal (to slate pavement)....	3 9	6	5

A sample was collected from Nos. 2 and 4 of section, the composition of which is given under Mine No. 170 in the table of coal analyses at the end of this Chapter.

The **Alva Lynch Farm Mine (No. 171 on Map II)**, on a branch of Mudlick Run, 1.4 miles northwest of Truebada, was partly fallen shut but showed 6 feet of coal at the mine mouth, the elevation being 985' B.

### Calvin Summers Farm Mine—No. 172 on Map II.

On Lynch Run, 0.9 mile northeast of Truebada; Pittsburgh Coal; elevation, 815' L.

		Ft.	In.
Sandstone, massive.....			
Slate, dark.....		2	0
Coal .....	2' 6½"		
Bone .....	0 1½		
Coal (to slate pavement).....	4 0	6	8

### L. L. D. Peters Farm Mine—No. 173 on Map II.

On Lynch Run, 1.2 miles northeast of Truebada; Pittsburgh Coal; butts, N. 85° W.; elevation, 905' B.

		Ft.	In.
1. Sandstone, shaly.....			
2. Shale, sandy and dark.....		10	0
3. Coal .....	4' 3"		
4. Bone .....	0 1		
5. Coal (to slate pavement)....	4 6	8	10

A sample was collected from Nos. 3 and 5 of section, the composition of which is published under Mine No. 173 in the table of coal analyses at the end of this Chapter.

The Isaac Wiant Farm Mine (No. 174 on Map II), on Coal Run of Ellis Creek, 1.5 miles northwest of Ellis, had fallen shut and could not be measured, its elevation being 815' B. A sample was once collected from this mine by S. D. Brady, the analysis of which, as made in the laboratory of the Survey, was published in Volume II, page 206, of the Survey, under the name of "Ellis Mine." The same analysis is published in the table at the end of this Chapter, under Mine No. 174. Mr. Brady reports 5' 5" of coal with 1" of bone 1 foot below the top.

### Newton E. Wiant Farm Mine—No. 175 on Map II.

On Jakes Run, 1.7 miles northwest of Ellis; Pittsburgh Coal; butts, N. 82° W.; elevation, 845' B.

	Ft.	In.
Slate .....		
Coal (to slate pavement).....	4	7

A sample was collected from this coal, the composition

of which is published under Mine No. 175 in the table at the end of this Chapter.

### Lee Davis Farm Mine—No. 176 on Map II.

On Jakes Run, 2 miles northwest of Ellis; Pittsburgh Coal; elevation, 910' B.

			Ft.	In.
Slate .....				
Coal .....	2'	1"		
Bone .....	0	1		
Coal (to slate pavement).....	2	8	4	10

The Burton Fidler Farm Mine (No. 177 on Map II), on a branch of Ellis Creek, 2.4 miles northwest of Ellis, showed 4 feet of coal, at an elevation of 890' B.

Southeast of the Grassland Syncline, the coal rises above drainage again along the Little Kanawha River near Gilmer Station, on the Coal and Coke Railway, close to the Braxton Line. Here it is being mined commercially and furnishes a fine grade of steam and domestic fuel.

### McCaa Coal Company—No. 178 on Map II.

On Little Kanawha River, 0.4 mile northwest of Gilmer Station; Pittsburgh Coal; elevation, 750' B.

			Ft.	In.
1. Draw slate.....				
2. Coal .....	2'	5"		
3. Cannel bone.....	0	1		
4. Coal (to slate pavement)...	3	10	6	4

"Principal office, Charleston, W. Va.; daily capacity, 225 tons, but designed to increase output to 1000 tons; 24 miners and 6 laborers employed; electric haulage; coal shipped West for railroad fuel; butts, N. 80° W.; faces, N. 10° E., by pocket compass; greatest rise, southeast; sample collected from Nos. 2, 3 and 4 of section in room 13, 2nd Right, by D. B. Reger; J. M. Campbell, Vice President, authority for mine data."

The composition of the above sample is published under Mine No. 178 in the table of coal analyses at the end of this Chapter. The cannel bone was included in the sample, because, according to the officials of the company, buyers raise no objection to its presence in the shipment, its high volatile content causing it to burn freely.

### Gilmer Fuel Company—No. 179 on Map II.

On the Little Kanawha River, at the southwest edge of Gilmer Station; Pittsburgh Coal; elevation, 775' B.

	Ft.	In.
1. Draw slate.....		
2. Coal, wild.....	1	0
3. Draw slate.....	2	0
4. Coal .....4' 2"		
5. Cannel bone.....0 1		
6. Coal (to slate pavement)...4 0 .....	8	3

"Principal office, 818 Provident Bank Building, Cincinnati, Ohio; capacity, 350 tons; 36 miners and 34 laborers employed; horse haulage; coal shipped in all directions for general steam fuel; butts, N. 80° W.; faces, N. 10° E., by pocket compass; greatest rise, southeast; sample collected from Nos. 4, 5 and 6 in Room No. 6, 5th Left; W. B. Sims, Superintendent, authority for mine data."

The composition of this sample is published under Mine No. 179 in the table of coal analyses at the end of this Chapter.

### Gilmer Consolidated Coal Company, Katherine Mine—No. 180 on Map II.

On Copen Run, just southwest of Gilmer Station; Pittsburgh Coal; elevation, 810' B.

	Ft.	In.
1. Draw slate.....		
2. Coal .....2' 3"		
3. Cannel bone.....0 1		
4. Coal (to slate pavement)...3 4 .....	5	8

"Principal office, Burnsville, W. Va.; butts, N. 80° W.; faces, N. 10° E., by pocket compass; greatest rise, southeast; sample collected from Nos. 2, 3 and 4 of section, in Main Heading, by D. B. Reger."

The composition of the sample is published under Mine No. 180 in the table of coal analyses at the end of this Chapter. The mine was not in operation when sampled.

### Gilmer Consolidated Coal Company, Brackett Mine—No. 181 on Map II.

On Little Kanawha River, 0.3 mile southeast of Gilmer Station; Pittsburgh Coal; elevation, 802' L.

	Ft.	In.
1. Draw slate.....		
2. Coal .....2' 3"		

		Ft.	In.
3. Cannel bone.....	0' 1"		
4. Coal (to slate pavement)...	2 10 .....	5	2

"Principal office, Burnsville, W. Va.; butts, N. 80° W.; faces, N. 10° E., by pocket compass; greatest rise, southeast; sample collected from Nos. 2, 3, and 4 of section, in Main Heading, by D. B. Reger."

The composition of the sample is published under Mine No. 181 in the table of coal analyses at the end of this Chapter. The mine was not in operation when the sample was taken.

The following mine is operated for local domestic fuel:

### S. L. Fincham Farm Mine—No. 182 on Map II.

On Little Kanawha River, 0.2 mile northeast of Gilmer Station; Pittsburgh Coal; butts, N. 83° W.; elevation, 795' B.

		Ft.	In.
1. Draw slate.....			
2. Coal .....	1' 1"		
3. Bone .....	0 1		
4. Coal (to slate pavement)...	3 7 .....	4	9

A sample was collected from Nos. 2 and 4 of section, the composition of which is published under Mine No. 182 in the table at the end of this Chapter.

### *Pittsburgh Coal, Center District, Gilmer.*

In Center District, the Pittsburgh Coal has been mined for local domestic fuel in a small area just southeast of Cedarville, and also in another locality along Right Fork and Bear Fork of Steer Creek in the southwestern corner of the district. In the region northwest of Cedarville, along the Grassland Syncline, where the coal lies under drainage, no direct information regarding the presence of the coal in minable thickness is available, but the fact that it occurs above drainage to the north, east and south of this locality, is evidence to warrant the belief that there is a considerable body of good coal in the region named.

In the northwestern part of the district, in a large portion of which the horizon crops, no Pittsburgh Coal is found, to show which the "Line of Western Disappearance" and "Line of Northern Disappearance" are placed on Map II. It will be

noticed that there is a broad barren belt, 9 miles wide at the Braxton Line, separating these two minable areas of the coal. In the area shown in the southwestern corner, the coal is patchy and uncertain, and its limits, as shown on Map II and Figure 6, are intended to show the limits beyond which no coal was found rather than to indicate that the coal is of minable thickness in all the enclosed area.

In the eastern part of the district, the coal has been found at one point, the **Joseph Rhodes Farm Mine (No. 183 on Map II)**, on Spruce Run of Cedar Creek, 2.2 miles southward from Glenville, where it is 3' 7" in thickness, having an elevation of 850' B. This mine is very close to the line of western disappearance.

At **Exposure No. 184 on Map II**, on Cedar Creek, 1.7 miles northwest of Cedarville, 2 feet of coal was observed along the public road, at an elevation of 770' B., that apparently represents the Pittsburgh, although no other exposure was observed between this point and Cedarville.

At **Exposure No. 185 on Map II**, at the east end of Cedarville, the coal is exposed in the public road at an elevation of 810' L., and has a thickness of 2' 8" with a large parting, as shown by the section for Cedarville, page 94.

#### Rex Snyder Farm Mine—No. 186 on Map II.

On Upper Level Run, 0.5 mile southeast of Cedarville; **Pittsburgh Coal**; butts, N. 80° W.; elevation, 825' B.

			Ft.	In.
1. Draw slate.....				
2. Coal, soft.....	2'	2½"		
3. Bone .....	0	1¾		
4. Coal, hard.....	0	6		
5. Sulphur band.....	0	1¾		
6. Coal, soft (to slate pavement) .....	3	5	6	4

A sample was collected from Nos. 2, 4 and 6 of section, the composition of which is published under Mine No. 186 in the table of coal analyses at the end of this Chapter.

The **Allen Bailey Farm Mine (No. 187 on Map II)**, on Cedar Creek, 0.5 mile east of Cedarville, showed 4' 0" of clean coal, at an elevation of 800' B.

**J. W. Burk Farm Mine—No. 188 on Map II.**

On Cedar Creek, 0.7 mile east of Cedarville; **Pittsburgh Coal**; butts, N. 85° W.; elevation, 795' B.

	Ft.	In.
Draw slate.....		
<b>Coal</b> (to slate pavement).....	3	3

A sample was collected from this coal, the composition of which is published under Mine No. 188 in the table of coal analyses at the end of this Chapter.

The **Bennett and Chapman Farm Mine** (No. 189 on Map II), on Cedar Creek, just across the county line in Otter District, Braxton, showed 4' 2" of coal, at an elevation of 805' B.

Along Left Fork of Steer Creek, no Pittsburgh Coal was found in Gilmer but its bench was traced across the county line into Otter District, Braxton, where the coal was found at the following opening 2½ miles from the county line:

**Christian Engel Farm Mine—No. 190 on Map II.**

On Granddaddy Run of Left Fork of Steer Creek, 0.5 mile southwest of German; **Pittsburgh Coal**; elevation, 995' B.

	Ft.	In.
Draw slate.....		
<b>Coal</b> .....2' 3"		
Slate, gray, with coal streaks, 0½" to.....0 6		
<b>Coal</b> (to slate pavement).....1 3	4	0

In the southwestern productive area in Center District, the coal was once opened at the **Daniel Huffman Farm Mine** (No. 191 on Map II), on Right Fork of Steer Creek, 2.6 miles southeast of Stumptown, at an elevation of 945' B., but the mine had fallen shut, and no information was obtained regarding its thickness. At the following mine, near by, the coal was well exposed:

**Eli Shock Farm Mine—No. 192 on Map II.**

On Right Fork of Steer Creek, 2.4 miles southward from Stumptown; **Pittsburgh Coal**; butts, N. 70° W.; elevation, 920' B.

	Ft.	In.
Draw slate.....		
<b>Coal</b> (to slate pavement).....	4	8

No regular partings were observed but a few clay seams were visible. A sample was collected from this coal, the composition of which is published under Mine No. 192 in the table of coal analyses at the end of this Chapter.

The coal was once opened at the **Draper Stump Farm Mine (No. 193 on Map II)**, at the mouth of Crooked Fork, 0.5 mile northeast of Valley, at an elevation of 955' B., apparently at the very crest of the Chestnut Ridge Anticline, but the mine has fallen shut, being reported 6 feet thick.

The **E. B. Fetty Farm Mine (No. 194 on Map II)**, on a branch of Right Fork of Steer Creek, 0.3 mile west of Valley, showed 3' 8" of coal, at an elevation of 935' B.

The coal has been mined extensively for local domestic fuel along Bear Fork, where the two following openings were observed:

#### Louis Bennett Farm Mine—No. 195 on Map II.

On Bear Fork, 2.1 miles south of Stumptown; **Pittsburgh Coal**; butts, N. 80° W.; elevation, 890' B.

	Ft.	In.
Sandstone, shaly.....	10	0
Shale, dark, sandy.....	7	0
Coal (to slate pavement), 5' 0" to.....	5	6

A sample was collected from this coal, the composition of which is given under Mine No. 195 in the table of coal analyses at the end of this Chapter. This mine is run by **A. H. Stump**, who has recently made a new opening a few rods distant, which shows a total section of 6' 3", with 1" of bony coal 4 feet above the bottom.

#### Louis Bennett Farm Mine—No. 196 on Map II.

On Bear Fork, at the mouth of Trace Fork, 2.6 miles northwest of Shock; **Pittsburgh Coal**; elevation, 865' B.

	Ft.	In.
1. Draw slate.....		
2. Coal.....1' 3"		
3. Coal, hard, bony.....0 1		
4. Coal (to slate pavement)...3 1.....	4	5

A sample was collected from Nos. 2 and 4, the composi-



tion of which is given under Mine No. 196 in the table of coal analyses at the end of this Chapter.

The coal was once opened at **Prospect No. 197 on Map II**, on Barn Run of Right Fork of Steer Creek, 0.7 mile southwest of Rosedale, in the edge of Birch District, Braxton, at an elevation of 965' B., but had fallen shut. It was observed also at several points along Mill Fork, in Braxton, southeast of Rosedale, but in the immediate vicinity of the town, none could be found.

### *Quantity of Pittsburgh Coal Available.*

The amount of Pittsburgh Coal already mined, when compared to the sum total of all that is available in the two counties, is a negligible quantity and is disregarded entirely in the following table which shows the probable amount of the coal, for those areas indicated as productive on Map II and Figure 6. In the regions where the coal is known to be somewhat defective or patchy, the average thickness is reduced to allow for the decreased tonnage that may be secured. The table shows that about 37 per cent. of the area of the two counties is underlain with Pittsburgh Coal:

### **Probable Amount of Pittsburgh Coal.**

Counties by Districts.	Thickness of Coal Assumed. Feet.	Sq. Mi.	Acres.	Cubic Feet of Coal.	Short Tons of Coal.
<b>Lewis:</b>					
Hackers Creek.	2	23.30	14,912	1,299,133,440	51,963,338
Freemans Creek	6	85.00	54,400	14,217,984,000	568,719,360
Courthouse . . . .	4	54.00	34,560	6,021,734,400	240,869,376
Skin Creek . . . . .	1	3.54	2,265.6	98,689,536	3,947,581
<b>Totals . . . . .</b>		<b>165.84</b>	<b>106,137.6</b>	<b>21,637,541,376</b>	<b>865,501,655</b>
<b>Gilmer:</b>					
Troy . . . . .	5	8.50	5,440	1,184,832,000	47,393,280
Glenville . . . . .	4	64.50	41,280	7,192,627,200	287,705,088
Center . . . . .	3	35.00	22,400	2,927,232,000	117,089,280
<b>Totals . . . . .</b>		<b>108.00</b>	<b>69,120</b>	<b>11,304,691,200</b>	<b>452,187,648</b>
<b>Totals for Both Counties . . . .</b>		<b>273.84</b>	<b>175,257.6</b>	<b>32,942,232,576</b>	<b>1,317,689,303</b>

## MINABLE COALS OF THE CONEMAUGH SERIES.

### THE ELK LICK COAL.

The Elk Lick Coal, discussed previously in Chapter VII, becomes of minable importance only in Skin Creek and Collins Settlement Districts, Lewis. In the former, it has been mined for local domestic fuel along Little Skin Creek in the vicinity of Vandalia, and in the latter it was once mined commercially at Emmart, on the Coal and Coke Railway, but the mine has been abandoned. In parts of these two districts, the coal attains a thickness of 5 to 6 feet, but the upper portion of the seam is bony, having a percentage of ash too high for commercial shipment. The lower half of the seam is good coal. Figure 7 shows those regions where it is of possible minable value. It should not be taken for granted that the coal is good at every point within this area outlined as the scale of the figure is too small to show local defects. The openings described in the following pages are from the localities where it is of value and must serve as a guide for its intelligent exploitation. Map II shows the crop of the coal in those regions where it is of possible minable value.

#### *Elk Lick Coal, Hackers Creek District, Lewis.*

In Hackers Creek District, the blossom of the Elk Lick Coal was observed at several points but only at the following place was it found in any thickness of consequence:

#### **Baltimore and Ohio Railroad Exposure—No. 204 on Map II.**

On West Run, 2 miles south of Jane Lew; **Elk Lick Coal**; elevation, 1140' B.

		Ft.	In.
Shale .....			
Coal .....	1' 4"		
Shale, gray.....	0 1		
Coal .....	0 8	2	1
—————			
Fire clay shale, gray.....		12	0
Limestone, gray, hard, silicious, <b>Elk Lick</b> .....		1	6
Fire clay shale to grade.....		2	6

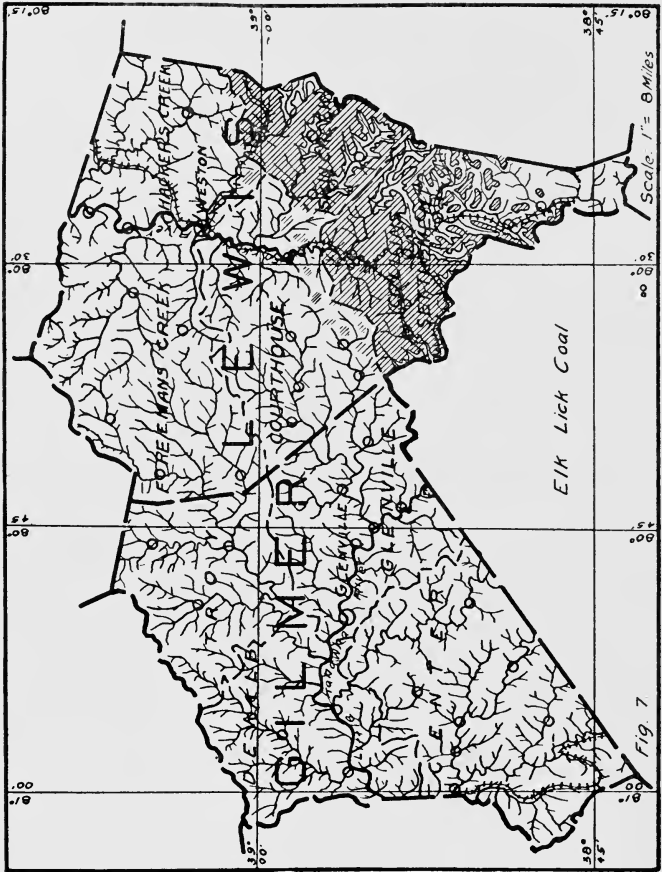


Figure 7.—Showing Area of Elk Lick Coal (See Explanation in Text).

*Elk Lick Coal, Skin Creek District, Lewis.*

In Skin Creek District, the Elk Lick Coal has a good development along Skin Creek, where it has been mined frequently for local purposes. It also appears on the head of Right Fork of Stonecoal Creek, but not in such good development as along Skin Creek.

**Alfred Linger Farm Mine—No. 205 on Map II.**

On Right Fork of Stonecoal Creek, 2.5 miles southwest of Atlas; Elk Lick Coal; butts, N. 85° W.; elevation, 1110' B.

		Ft.	In.
1. Slate .....			
2. Coal .....	2' 8"		
3. Coal, cannelly (to slate pavement).....	0 6	3	2

A sample was collected from Nos. 2 and 3 of section, the composition of which is shown under Mine No. 205 in the table of coal analyses at the end of this Chapter. The coal is somewhat high in sulphur and ash but will make a fair domestic fuel.

At **Exposure No. 206 on Map II**, in the public road on a branch of Pringle Fork, 2.5 miles southeast of Georgetown, the coal was 0' 8" thick, at an elevation of 1250' B.

At **Exposure No. 207 on Map II**, in the public road on Skin Creek, 2.3 miles northwest of Vandalia, 4 feet of coal is visible, at an elevation of 1075' B.

**Bruce Linger Farm Mine—No. 208 on Map II.**

On Skin Creek, 2 miles northwest of Vandalia; Elk Lick Coal; elevation, 1085' B.

		Ft.	In.
Concealed and sandy shale.....		10	0
Coal, slaty.....		0	6
Shale, sandy.....		5	0
Coal, hard.....	1' 11"		
Bone .....	0 1		
Coal, good.....	2 1	4	1
Slate and concealed.....		10	0
Shale, limy, and concealed to creek.....		10	0

**Benjamin Hawkins Farm Mine—No. 209 on Map II.**

On Hog Hollow, 2 miles northwest of Vandalia; Elk Lick Coal; elevation, 1093' L.

		Ft.	In.
Sandstone, massive.....			
Shale, sandy.....		10	0
Coal, bony.....	1' 1"		
Coal, hard.....	2 0		
Bone .....	0 1		
Coal (to slate pavement).....	1 11	5	1

**Granville Radabaugh Farm Mine—No. 210 on Map II.**

On Skin Creek, 1.7 miles northwest of Vandalia; Elk Lick Coal; elevation, 1090' B.

		Ft.	In.
Sandstone, massive, Morgantown.....			
Shale, sandy.....		15	0
Coal, hard.....	2' 0 "		
Bone .....	0 1½		
Coal, softer (to slate pavement).....	1 9½	3	11

At **Exposurè No. 211 on Map II**, in the public road on Skin Creek, 1.5 miles northwest of Vandalia, the coal was 3 feet thick, at an elevation of 1100' B.

At **Exposure No. 212 on Map II**, on Pen Run, 0.5 mile west of Vandalia, the coal has once been opened at an elevation of 1125' B., but the mine had fallen shut.

**Elizabeth Hefner Farm Mine—No. 213 on Map II.**

On Pen Run, 1 mile northwest of Vandalia; Elk Lick Coal; butts, N. 85° W.; elevation, 1135' B.

		Ft.	In.
1. Slate, dark.....			
2. Coal, bony.....	0' 4½"		
3. Coal .....	2 8½		
4. Bone .....	0 1		
5. Coal (to slate pavement).....	1 3	4	5

A sample was collected from Nos. 3 and 5 of section, the composition of which is given under Mine No. 213 in the table of coal analyses at the end of this Chapter. The coal shows a high percentage of ash, owing to the bony nature of member No. 3.

**Elk Lick Coal, Collins Settlement District, Lewis.**

In the northern end of Collins Settlement District, the Elk Lick Coal has a good development, but in the southern end, as shown on Map II, the southeastward rise of the measures elevates the coal high in the hilltops. The coal has much the same character as in Skin Creek District, being bony in the upper and good in the lower portion.

**Robert McCray Farm Mine—No. 214 on Map II.**

On Sand Fork, 2.9 miles northeast of Roanoke; **Elk Lick Coal**; butts, N. 85° W.; elevation, 1090' B.

		Ft.	In.
1. Slate, dark.....			
2. Coal, bony.....	1' 0"		
3. Bone .....	0 2		
4. Coal, hard.....	1 6		
5. Bone .....	0 1		
6. Coal, softer (to slate pavement) .....	2 4	5	1

A sample was collected from Nos. 4 and 6 of section, the composition of which is given under Mine No. 214 in the table of coal analyses at the end of this Chapter.

**A. M. Rollyson Farm Mine—No. 215 on Map II.**

On Sand Fork, 3.9 miles southeast of Roanoke; **Elk Lick Coal**; butts, N. 85° W.; elevation, 1150' L.

		Ft.	In.
Shale, sandy, dark.....		3	0
Coal, hard, bony.....	1' 4"		
Bone .....	0 1		
Coal, good (to slate pavement).....	2 1	3	6

**Thomas Eckess Farm Mine—No. 216 on Map II.**

On Sand Fork, 3.5 miles northeast of Roanoke; **Elk Lick Coal**; elevation, 1140' B.

		Ft.	In.
Shale, sandy, dark.....			
Coal, bony.....	0' 9"		
Coal, hard.....	1 6		
Bone .....	0 1		
Coal, good (to slate pavement).....	2 4	4	8

**D. S. Bennett Farm Mine—No. 217 on Map II.**

On Sand Fork, 3.1 miles southeast of Roanoke; **Elk Lick Coal**; elevation, 1102' L.

			Ft.	In.
Shale, dark.....				
Coal, hard, bony.....	2'	6"		
Bone .....	0	1		
Coal, softer (to slate pavement).....	2	3	4	10

**R. H. Hornor and Son Farm Mine—No. 218 on Map II.**

On Sand Fork at the mouth of Sammy Run, 4.4 miles southeast of Roanoke; **Elk Lick Coal**; butts, N. 85° W.; elevation, 1174' L.

			Ft.	In.
1. Slate, black.....				
2. Coal, bony.....	0'	9"		
3. Coal, hard.....	1	11		
4. Bone .....	0	1		
5. Coal, softer (to slate pavement) .....	2	2	4	11

A sample was collected from Nos. 3 and 5 of section, the composition of which is given under Mine No. 218 in the table of coal analyses at the end of this Chapter.

A commercial mining plant was built about ten years ago at Emmart Station on the Coal and Coke Railway, to operate the Elk Lick Coal, but after about 5 years the mine was abandoned and the plant dismantled, it being reported that the company failed to use proper care in rejecting the bony coal at the upper portion of the seam, making too large a percentage of ash in the shipment. The mine has now fallen shut but the following measurement was made at the mine mouth:

**Jacksonville Coal and Coke Company Mine—No. 219 on Map II.**

On Cap Run, 0.9 mile northeast of Emmart; **Elk Lick Coal**; elevation, 1200' B.

			Ft.	In.
Shale, sandy.....			15	0
Coal, slaty.....	1'	4"		
Coal, bony.....	0	11		
Bone .....	0	1		
Coal, good (to slate pavement).....	3	2	5	6

The coal is mined for local fuel at a farm opening near by which shows the following section:

### Clyde Reger Farm Mine—No. 220 on Map II.

On Cap Run, 1 mile northeast of Emmart; Elk Lick Coal; butts, N. 87° W.; elevation, 1210' B.

			Ft.	In.
1. Slate .....				
2. Coal, bony.....	1'	4"		
3. Coal, good.....	1	2		
4. Slate, black.....	0	1		
5. Coal, good (to slate pavement) .....	2	8	5	3

A sample was collected from Nos. 3 and 5 of section, the composition of which is given under Mine No. 220 in the table of coal analyses at the end of this Chapter. The coal shows a large percentage of ash.

South of the Coal and Coke Railway, the Elk Lick Coal, so far as observed, has not been mined and is probably of little value.

### *Quantity of Elk Lick Coal Available.*

The accompanying table, showing that only a small number of the many oil and gas wells drilled in the two counties show the Elk Lick Coal, indicates that it will not prove to be of minable value in any of those regions where its horizon lies below drainage, and the previous discussion shows that it is of value at its outcrop only in portions of Skin Creek and Collins Settlement Districts, Lewis. Another table that follows shows the probable amount of Elk Lick Coal for these areas:



## List of Wells Recording Elk Lick Coal.

No. on Map.	Name of Well.	Location.	Elev. of well mouth A. T.	Depth Feet.	Thick-ness. Feet.
<b>Lewis County:</b>					
50	T. A. Smith No. 1.....	Berlin, 2.6 mi. S..	1155B	195	5
154	Stark A. White No. 1....	Camden, 1.1 mi. N. 10° E.....	1145B	92	..
165	M. C. Burnside No. 1914..	Freemansburg, 1.5 mi. N. E.....	1075B	85	8
175	J. M. Hall No. 2.....	Benson, 1.1 mi. S. E.....	1065B	465	5
420	John Collins No. 4016....	Aspinwall, 2.0 mi. N. ....	950B	528	3
423	James Hall No. 1.....	Bealls Mills, 1.0 mi. S. E.....	845B	403	..
432	T. T. Dolan No. 7005.....	Aspinwall, 1.2 mi. N. E.....	925B	320	3
460	John Copley No. 4036....	Gillooly, 1.0 mi. N. W. ....	880B	415	5
<b>Gilmer County:</b>					
663	M. E. Gainer No. 1.....	Alfred, 1.8 mi. S. W. ....	865B	583	10
717	Amanda B. Connor.....	Ellis, 2.0 mi. N....	940L	325	..

## Probable Amount of Elk Lick Coal.

Lewis County by Districts.	Thickness of Coal Assumed. Feet.	Sq. Mi.	Acres.	Cubic Feet of Coal.	Short Tons of Coal.
Skin Creek.....	3	34.00	21,760	2,843,596,800	113,743,872
Collins Settlement .....	3	51.50	32,960	4,307,212,800	172,288,512
Totals .....		85.50	54,720	7,150,809,600	285,032,384

## THE BAKERSTOWN COAL.

The Bakerstown Coal, described in Chapter VII, and shown by outcrop on Map II, occurs above drainage in a small area in Hackers Creek and Freemans Creek Districts, near Jackson Mill, in a small part of Skin Creek and in Collins Settlement where it has been mined extensively for local domestic fuel. In the latter district the coal is usually from 2 to 3 feet thick and is regarded as a good steam and domestic coal.

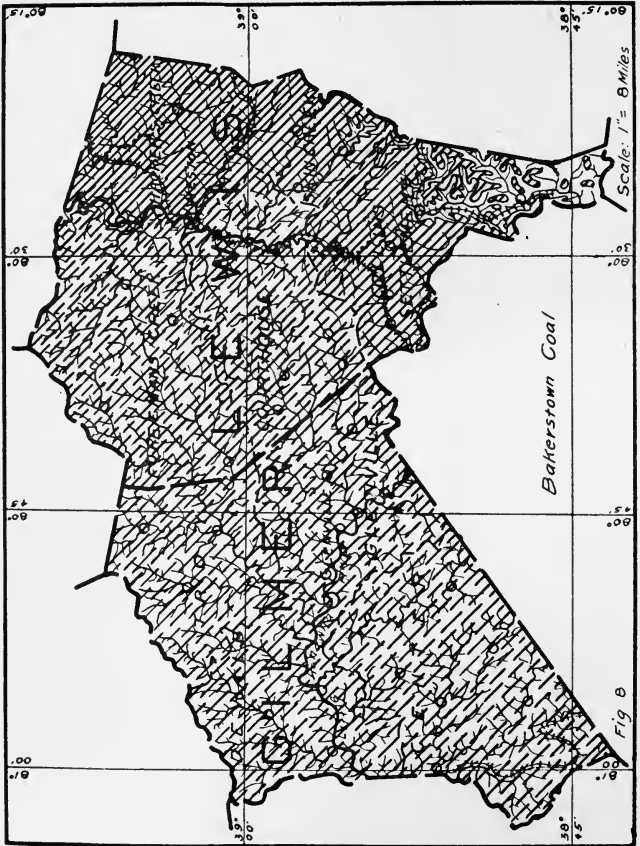


Figure 8.—Showing Area of Bakerstown Coal (See Explanation in Text).

but all the analyses made show it to be high in ash and sulphur. This coal is under drainage in western Lewis and in all of Gilmer, but its presence has been noted in numerous oil and gas well records in this region, indicating that it has a possible thickness of 2 or 3 feet in a considerable territory, on which final judgment can be passed only after it has been thoroughly core tested. Figure 8 shows its possible minable extent, those regions where it is uncertain for lack of sufficient information being shown by a patchy or broken line representation on the figure.

### ***Bakerstown Coal, Hackers Creek and Freemans Creek Districts, Lewis.***

In Hackers Creek District, the Bakerstown Coal crops only in a small region near Jackson Mill at the intersection of the Chestnut Ridge and Wolf Summit Anticlines, and along the West Fork River toward the Harrison Line where the latter uplift keeps it above drainage.

At **Exposure No. 227 on Map II**, on the West Fork River, at the mouth of Broad Run, at Lightburn, the coal is 1' 6" thick, at an elevation of 995' B.

At the **Monongahela Valley Traction Co. Exposure (No. 228 on Map II)**, on Sycamore Lick, 1.1 miles northeast of Jackson Mill, the coal shows a thickness of 1' 3", at an elevation of 1005' B.

At the **A. J. Hardman Exposure (No. 228A on Map II)**, on Sycamore Lick, 1.3 miles northeast of Jackson Mill, the coal has been mined by stripping along the run, at an elevation of 1010' B., and has a thickness of 1' 6", as shown by the section for Jane Lew, page 47.

At the **Monongahela Valley Traction Co. Exposure (No. 229 on Map II)**, on West Fork River, 0.4 mile south of Jackson Mill, the coal is 1' 10" thick, at an elevation of 1045' B.

In Freemans Creek District, the Bakerstown Coal crops along the West Fork River between Jackson Mill and Lightburn, as shown on Map II, but apparently has not been prospected, although its blossom is exposed at several points.

### ***Bakerstown Coal, Skin Creek District, Lewis.***

In Skin Creek District, the Bakerstown Coal is exposed only in the southeastern corner where it has a thickness of 2 to 3 feet.

At **Exposure No. 230 on Map II**, on Skin Creek, 1.5 miles southeast of Vandalia, the coal was noted along the public road at an elevation of 1110' B., and had a thickness of 2' 8".

At **Exposure No. 231 on Map II**, on Skin Creek, 1.7 miles southeast of Vandalia, it was 2' 6" thick, at an elevation of 1135' B., in the hill road.

### ***Bakerstown Coal, Collins Settlement District, Lewis.***

In Collins Settlement District, the Bakerstown Coal was mined extensively for local fuel before the Coal and Coke Railway was built, and was used for mill and domestic purposes in Walkersville, Crawford and Ireland. The thin nature of the seam made mining expensive and laborious, but the coal was regarded as good.

At **Exposure No. 232 on Map II**, on Sand Fork, 3 miles northwest of Frenchton, the coal is 2 feet thick and slaty, its elevation being 1115' B.

At **Exposure No. 233 on Map II**, on Sand Fork, in the edge of Banks District, Upshur, 1.5 miles west of Frenchton, the coal is 1' 4" thick and bony, its elevation being 1405' B.

### **George Blair Farm Mine—No. 234 on Map II.**

On Laurel Run, 0.5 mile northeast of Crawford; **Bakerstown Coal**; butts, N. 80° W.; elevation, 1115' B.

	Ft.	In.
Sandstone, coarse.....	10	0
Concealed .....	10	0
Slate, dark.....	4	0
Coal, bony.....	1' 2"	
Bone .....	0 1	
Coal, bony (to slate pavement).....	0 10	2 1

The coal was formerly mined at the **James Moore Farm Mine (No. 235 on Map II)**, on West Fork River, 0.3 mile southeast of Crawford, at an elevation of 1125' B., and sup-

plied fuel for the Crawford lumber and grain mill for many years. The opening has now fallen shut but the writer once crawled into the mine when but a small boy and can vouch for the statement that the coal was about 2 feet thick.

### George Post Farm Mine—No. 236 on Map II.

On West Fork River, 0.6 mile southeast of Crawford; Bakerstown Coal; elevation, 1180' B.

		Ft.	In.
1. Shale, sandy.....			
2. Coal, good.....	1' 5"		
3. Coal, bony.....	0 1		
4. Coal, good (to slate pavement) .....	0 9	2	3

A sample was collected from Nos. 2 and 4 of section, the composition of which is given under Mine No. 236 in the table of coal analyses at the end of this Chapter.

The coal was once opened at Mine No. 237 on Map II, on the West Fork River, 0.7 mile southeast of Crawford, at an elevation of 1150' B., but the mine had fallen shut.

The A. M. McQuain Farm Mine (No. 238 on Map II), on Wolfpen Run, 0.7 mile southeast of Wymer, had fallen shut when examined but the coal was reported to have been 2 feet thick, its elevation being 1335' B.

At Farm Mine No. 239 on Map II, on West Fork River, 0.5 mile east of Jewell, the coal was once opened at an elevation of 1394' L., as shown by the section for Jewell, page 71, the mine being partly filled with water but showing a thickness of about 2 feet.

The coal was once opened at Farm Mine No. 240 on Map II, on Right Fork, 0.7 mile south of Walkersville, at an elevation of 1105' L., but the place had fallen shut.

At Farm Mine No. 241 on Map II, on Leatherbark Run, 2 miles southeast of Walkersville, the coal was once opened at an elevation of 1195' B., but the mine had fallen shut.

### H. L. McQuain Farm Mine—No. 242 on Map II.

On Sugarcamp Run, 2.9 miles northeast of Ireland; **Bakerstown Coal**; butts, N. 86° W.; elevation, 1445' B.

	Ft.	In.
Shale, dark.....		
Coal (to slate pavement).....	1	5

A sample was collected from this coal, the composition of which is given under Mine No. 242 in the table of coal analyses at the end of this Chapter. The coal is high in both ash and sulphur.

At **Exposure No. 243 on Map II**, in the hill road at the head of Sugarcamp Run, 0.5 mile southwest of Boyd, the coal was noted at an elevation of 1545' B., its thickness being about 1 foot.

### L. E. Mick Farm Mine—No. 244 on Map II.

On Right Fork, of West Fork, 0.6 mile northeast of Ireland; **Bakerstown Coal**; butts, N. 88° W.; elevation, 1158' B.

	Ft.	In.
1. Slate, black.....		
2. Coal (to slate pavement).....	2	0

A sample was collected from this coal, the composition of which is given under Mine No. 244 in the table of coal analyses at the end of this Chapter. The analysis shows a large amount of ash and sulphur.

The **L. E. Mick Farm Mine (No. 245 on Map II)**, on Right Fork, just west of Ireland, showed 1' 10" of coal, its elevation being 1175' B.

The **Reger Heirs Farm Mine (No. 246 on Map II)**, on Right Fork, 0.4 mile southeast of Ireland, was fallen shut but showed a thickness of 2 feet at the outcrop, its elevation being 1245' B.

The coal was once opened at **Farm Mine No. 247 on Map II**, on a branch of Right Fork, 0.9 mile southwest of Ireland, at an elevation of 1225' B., but the mine had fallen shut and could not be measured.

**Quantity of Bakerstown Coal Available.**

As previously mentioned, the large number of oil and gas well records compiled in the accompanying table, showing Bakerstown Coal in a considerable portion of the two counties, where its horizon lies under drainage, indicates that this coal will eventually be worth investigating as a mining proposition when the surface coals have become scarce. In some records too much coal is probably shown, as several feet of black slate often occurs above this coal, accounting for the thickness of 10 to 12 feet given in some of the records. After the list of wells recording Bakerstown Coal, another table appears, showing the probable amount of this coal. The thickness of coal assumed where the coal is under drainage is made smaller than the average shown in the well records in order to allow for those portions where the coal appears to be absent or thin:

**List of Wells Recording Bakerstown Coal.**

No. on Map.	Name of Well.	Location.	Elev. of well mouth A. T.	Depth Feet.	Thick-ness. Feet.
<b>Lewis County:</b>					
1	E. W. Post No. 1.....	Johnstown, 0.5 mi. S. ....	1060B	130	5
5	W. F. Post No. 1.....	Johnstown, 2.5 mi S. W.....	1365B	386	4
6	W. F. Post No. 2.....	Johnstown, 2.6 mi. S. W.....	1280B	316	3
65	M. W. Harrison No. 1923..	Weston, 1.5 mi. S. E. ....	1050B	330	5
67	A. M. Smith No. 1911.....	Weston, 2.3 mi. S. E. ....	1020B	320	6
77	J. C. Roane No. 1.....	Deanville .....	1037L	185	3
94	W. A. Arnold No. 6.....	Jackson Mill, 0.2 mi. S. E.....	1110B	64	4
96	A. J. Hardman.....	Jackson Mill, 1.6 mi. N. E.....	1020B	59	2
98	Hebron Church No. 1.....	Jane Lew, 0.8 mi. S. W.....	1130B	160	4
99	J. H. Ramsburg No. 3515..	Lightburn, 0.5 mi. S. E.....	1065B	69	1
102	L. M. Allman No. 2855....	Lightburn, 0.6 mi. E. ....	1060B	80	2
105	W. W. Wimer No. 369.....	Lightburn, 0.3 mi. N. E.....	1030B	85	2

No. on Map.	Name of Well.	Location.	Elev. of well mouth A. T.	Depth Feet.	Thick-ness. Feet.
108	Richard Beeghley No. 448.	Lightburn, 0.7 mi. N. ....	1025B	100	1
110	Wm. Beeghley No. 442....	Lightburn, 1.1 mi. N. W.....	1215B	292	3
111	J. M. Beeghley No. 436....	Lightburn, 1.1 mi. N. W.....	1215B	298	2
115	A. C. Barb No. 380.....	Lightburn, 0.5 mi. N. ....	1005B	43	2
117	H. L. Frashuer No. 484...	Mineral, 1.1 mi. S. E. ....	1210B	560	8
132	Newton Shaw No. 1.....	Deanville, 1.3 mi. N. W.....	1025B	148	..
153	Stark A. White No. 2....	Camden, 1.1 mi. N. 10° W.....	1285B	500	5
175	J. M. Hall No. 2.....	Benson, 1.1 mi. S. E. ....	1065B	625	12
350	Erma Woofter No. 472....	Alum Bridge, 1 mi. S. W.....	797L	250	3
434	Henry Pumphrey No. 1999.	Aspinwall, 0.9 mi. N. W.....	825B	340	10
554	John Smith No. 1.....	Atlas, 2.5 mi. S. W. ....	1365B	60	2
556	Louvina Linger No. 1....	Abbott, 1.6 mi. N. E. ....	1380B	125	1
559	James Duncan No. 1.....	Abbott, 1.4 mi. N. W. ....	1365B	150	2
585	Waters Heirs No. 4.....	Orlando, 2.0 mi. N. E.....	885B	300	5
587	Waters Heirs No. 2.....	Orlando, 2.0 mi. N. 5° E.....	1060B	380	5
<b>Gilmer County:</b>					
616	Josiah Nutter Hrs. No. 4007	Auburn, 1.8 mi, S. W. ....	940L	800	..
617	Peter Cole No. 1.....	Coxs Mills, 1.0 mi. S. E.....	775B	525	8
635	G. A. Kemper No. 1.....	Newberne, 0.5 mi. S. ....	855L	670	5
639	Swisher Hrs. No. 4.....	Newberne, 0.9 mi. S. W.....	1027L	810	2
645	L. S. Vannoy No. 2176...	Newberne, 2.2 mi. S. W.....	855B	708	..
653	G. M. Fisher No. 1.....	Tanner, 1.7 mi. N. E.....	.....	672	1
678	O. W. O. Hardman No. 1..	Nobe, 1.9 mi. N. E.....	.....	1110	5
689	Milton Norris No. 1.....	Glenville, at.....	.....	264	6
690	J. W. Killingsworth No. 1.	Sand Fork, 1.4 mi. N. W.....	.....	364	6
700	V. S. & T. M. Lynch No. 4.	Blackburn, 1.6 mi. W. ....	910B	715	5
701	Arnold Moore Hrs. No. 1..	Blackburn, 1.0 mi. N. W.....	765B	559	..
725	E. E. Bond No. 7009.....	Aspinwall, 1.1 mi. S. W.....	1090B	595	5
794	J. W. Twyman No. 1.....	Rosedale, at.....	796L	330	5



## Probable Amount of Bakerstown Coal.

Counties by Districts.	Thickness of Coal Assumed. Feet.	Sq. Mi.	Acres.	Cubic Feet of Coal.	Short Tons of Coal.
<b>Lewis:</b>					
Hackers Creek..	2	61.20	39,168	3,412,316,160	136,492,646
Freemans Creek	1	114.53	73,299	3,192,913,152	127,716,526
Courthouse ....	0	.....	.....	.....	.....
Skin Creek.....	2	39.80	25,472	2,219,120,640	88,764,826
Collins Settlement .....	2	66.00	42,240	3,679,948,800	147,197,952
Totals .....		281.53	180,179	12,504,298,752	500,171,950
<b>Gilmer:</b>					
Troy .....	2	69.06	44,198	3,850,564,608	154,022,584
Dekalb .....	2	73.05	46,752	4,073,034,248	162,921,370
Glenville .....	1	78.65	50,336	2,192,636,160	87,705,446
Center .....	1	121.64	77,850	3,391,128,576	135,645,143
Totals .....		342.40	219,136	13,507,363,592	540,294,543
Totals for Both Counties....		623.93	399,315	26,011,662,344	1,040,466,493

## MINABLE COALS OF THE ALLEGHENY SERIES.

## THE UPPER FREEPORT COAL.

The Upper Freeport Coal, described briefly in Chapter VIII, crops only in Collins Settlement District, Lewis, south of the Coal and Coke Railway, where it is occasionally found but does not appear in such good development as in some of the northern counties. It has been prospected at only a few points and these openings show that it is thin and patchy. In the region where this coal lies under drainage, it is noted in only a few oil and gas well records, warranting the statement that it is not of minable value except along the southeastern edge of Lewis. Its outcrop is shown on Map II and its probable minable area on Figure 9.

*Quantity of Upper Freeport Coal Available.*

The following table, showing a list of oil and gas wells in both counties that record Upper Freeport Coal, indicates that the coal is not present in any commercial quantity under

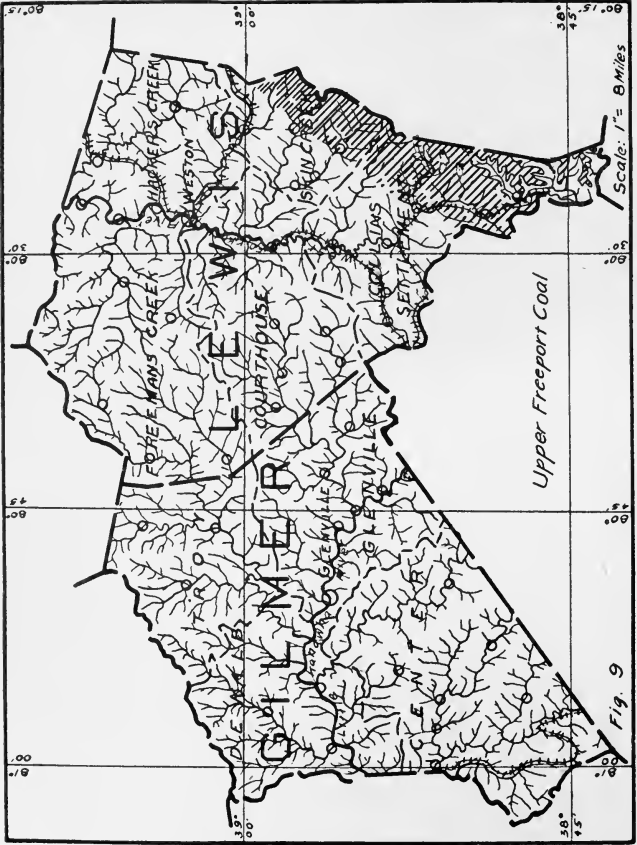


Fig. 9

Figure 9.—Showing Area of Upper Freeport Coal (See Explanation in Text).

drainage, except in the wells along the Upshur-Lewis Line, the others where it is recorded being too far apart to warrant the belief that it will be found in valuable quantity elsewhere. Its presence, therefore, is indicated on Figure 9 only along the southeastern corner of Lewis. Another table gives the probable amount of this coal:

### List of Oil and Gas Wells Recording Upper Freeport Coal.

No. on Map.	Name of Well.	Location.	Elev. of well mouth A. T.	Depth Feet.	Thick-ness. Feet.
<b>Lewis County:</b>					
320	Joseph Fallon No. 1.....	Churchville, 1.7 mi. S. 60° W...	1010B	711	7
412	I. N. Means No. 1.....	Bealls Mills, 1.4 mi. S. W.....	1210B	1095	10
434	Henry Pumphrey No. 1999.	Aspinwall, 0.9 mi. N. W.....	825B	555	10
552	James R. White No. 1.....	Atlas, 1.4 mi. S. W.....	1150B	230	8
554	John Smith No. 1.....	Atlas, 2.5 mi. S. W.....	1365B	260	5
556	Louvina Linger No. 1....	Abbott, 1.6 mi. N. E.....	1380B	246	8
558	J. F. Gould No. 1.....	Abbott, 1.5 mi. N. W.....	1220B	122	3
559	James Duncan No. 1.....	Abbott, 1.4 mi. N. W.....	1365B	268	6
588	Waters Heirs No. 1.....	Orlando, 2.0 mi. N. 15° E.....	1240B	735	4
<b>Gilmer County:</b>					
786	T. V. Shock No. 1.....	Rosedale, 1.3 mi. N. ....	780B	485	1
794	J. W. Twyman No. 1.....	Rosedale, at.....	794L	515	5

### Probable Amount of Upper Freeport Coal.

Counties by Districts.	Thickness of Coal Assumed. Feet.	Sq. Mi.	Acres.	Cubic Feet of Coal.	Short Tons of Coal.
<b>Lewis:</b>					
Skin Creek.....	2	18.00	11,520	1,003,622,400	40,144,896
Collins Settlement .....	2	29.20	18,688	1,628,098,560	65,123,943
<b>Totals .....</b>		<b>47.20</b>	<b>30,208</b>	<b>2,631,720,960</b>	<b>105,268,839</b>

## THE UPPER KITTANNING COAL.

The Upper Kittanning Coal, a brief description of which appears in Chapter VIII, crops only in Collins Settlement District, Lewis, where it has been frequently opened for local domestic fuel. It is a good coal in most of this region, varying from 2 to 4 feet. The only analysis available shows that the coal is somewhat high in ash and sulphur. In those portions of the two counties where the coal lies under drainage this coal has been occasionally found by well drillers but there are not enough records showing it to warrant the statement that it will be found continuous enough for mining in any locality except along the Upshur Line in portions of Skin Creek and Collins Settlement Districts. Its crop is shown on Map II and its probable minable area on Figure 10.

*Upper Kittanning Coal, Collins Settlement District, Lewis.*

The coal was once opened at the W. H. Wood Estate Farm Mine (No. 252 on Map II), on Fallen Timber Run, 1 mile northeast of Bablin, at an elevation of 1435' B., and was reported 4 feet thick.

**Elizabeth McCartney Farm Mine—No. 253 on Map II.**

On Big Wildcat Run, 0.5 mile west of Bablin; **Upper Kittanning Coal**; elevation, 1340' B.

	Ft.	In.
Sandstone, shaly.....		
Shale, dark, with plant fossils.....	3	0
<b>Coal, reported.....</b>	<b>3</b>	<b>0</b>
Concealed .....	2	0
Sandstone, massive, pebbly, <b>Lower Freeport....</b>		

**William P. Kincaid Farm Mine—No. 254 on Map II.**

On Little Wildcat Run, 1.1 miles southwest of Bablin; **Upper Kittanning Coal**; butts, N. 88° W.; elevation, 1365' B.

	Ft.	In.
Sandstone, massive.....		
Slate, black.....	0	6
<b>Coal, (to slate pavement).....</b>	<b>2</b>	<b>6</b>

A sample was collected from this coal, the composition of which is given under Mine No. 254 in the table of coal analyses at the end of this Chapter. It shows a high content of both ash and sulphur.

The **John Beverage Farm Mine (No. 255 on Map II)**, on the Right Fork of the Little Kanawha River, 0.7 mile north of Cleveland, showed a thickness of 3' 7", with parting, as shown by the section for Cleveland, page 75, its elevation being 1780' L. This mine is in the edge of Upshur, about 0.1 mile from the Lewis Line.

### George Davis Farm Mine—No 261 on Map II.

On Cherry Fork, 0.9 mile north of Ingo; **Upper Kittanning Coal**; elevation, 1445' B.

	Ft.	In.
Shale, sandy.....	5	0
<b>Coal</b> .....1' 6"		
Slate, black.....0 3		
<b>Coal</b> .....1 3 .....	3	0
Slate, pavement, and concealed.....	7	0
Sandstone, massive, cliff rock, <b>Lower Freeport</b> ..	30	0

### *Quantity of Upper Kittanning Coal Available.*

The following table, giving a list of oil and gas wells that record Upper Kittanning Coal in those regions where its horizon lies under drainage, shows that this coal does not occur with such frequency as to be classed as a minable seam in those regions except possibly along the Upshur Line in portions of Skin Creek and Collins Settlement Districts. Another table gives the probable amount of this coal, for the area outlined on Figure 10:



Figure 10.—Showing Area of Upper Kittanning Coal (See Explanation in Text).

## List of Wells Recording Upper Kittanning Coal.

No. on Map.	Name of Well.	Location.	Elev. of well mouth A. T.	Depth Feet.	Thick-ness. Feet.
<b>Lewis County:</b>					
93	A. W. Woodford No. 1....	Jackson Mill, 1.0 mi. S.....	1030B	380	8
126	E. S. Butcher No. 1.....	Jackson Mill, 1.0 mi. S. W.....	1010B	306	12
132	Newton Shaw No. 1.....	Deanville, 1.3 mi. N. W.....	1025B	440	4
153	Stark A. White No. 2.....	Camden, 1.1 mi. N. 10° W.....	1285B	740	8
417	James Murphy No. 1903..	Copley, 1.7 mi. S. E. ....	890B	905	12
476	F. C. Jarvis No. 1.....	Camden, 1.5 mi. S. ....	1150B	710	6
516	John H. Hammer No. 1...	Brownsville, 1.4 mi. N. W.....	1170B	975	5
526	Louis Bennett No. 1.....	Brownsville, 1.0 mi. N.....	1055B	740	3
552	James R. White No. 1....	Atlas, 1.4 mi. S. W. ....	1150B	305	5
553	Jacob Krise No. 1.....	Atlas, 2.3 mi. S. W. ....	1255B	385	5
<b>Gilmer County:</b>					
791	E. E. Cottrell No. 1.....	Rosedale, at.....	787L	615	2
794	J. W. Twyman No. 1.....	Rosedale, at.....	794L	625	2
797	Rebecca Bourn No. 1.....	Rosedale, 1.0 mi. S. E.....	795B	470	3

## Probable Amount of Upper Kittanning Coal.

Lewis County By Districts.	Thickness of Coal Assumed. Feet.	Sq. Mi.	Acres.	Cubic Feet of Coal.	Short Tons of Coal.
Skin Creek.....	3	9.50	6,080	794,534,400	31,781,376
Collins Settlement .....	3	24.73	15,827	2,068,272,360	82,730,894
Totals .....		34.23	21,907	2,862,806,760	114,512,270

## THE LOWER KITTANNING COAL.

The Lower Kittanning Coal, described briefly in Chapter VIII, crops only in Collins Settlement District, Lewis, where it has been mined extensively for local domestic fuel.

It is a good thick coal in most of this region, varying from 4 to 12 feet, but usually has several slate partings that reduce its value greatly. The analyses available show that the coal is somewhat high in ash, but very low in sulphur, averaging less than one per cent., and also low in phosphorus, making it suitable for metallurgical coke or gas manufacture. Careful mining methods must be used to separate the slates but the thickness of the seam would permit most of this refuse to be thrown aside without removing it from the mine. Its outcrop is shown on Map II and the probable minable area on Figure 11.

### *Lower Kittanning Coal, Collins Settlement District, Lewsi.*

The most northern exposure of the coal is at the following opening where it is just above drainage;

#### W. B. Mick Farm Mine—No. 256 on Map II.

On a branch of Gladly Creek, 2.2 miles northeast of Duffy; **Lower Kittanning Coal**; butts, east and west; elevation, 1260' B.

		Ft.	In.
1. Sandstone, massive.....			
2. Slate, dark.....	2	0	
3. Slate, hard, black, cannel.....	2	0	
4. Coal .....	0' 5½"		
5. Slate, bony.....	0 2		
6. Coal, somewhat bony.....	1 6		
7. Slate, black.....	0 0½		
8. Coal, good (to slate pavement) .....	1 9	3	11

A sample was collected from Nos. 4, 6 and 8 of section, the composition of which is given under Mine No. 256 in the table of coal analyses at the end of this Chapter.

The **Frank Crawford Farm Mine (No. 257 on Map II)**, on Gladly Creek, 0.9 mile north of Bablin, shows the coal 3' 11" thick, the basal portion being concealed, and the elevation being 1255' B., as shown by the section for Bablin, on page 72.



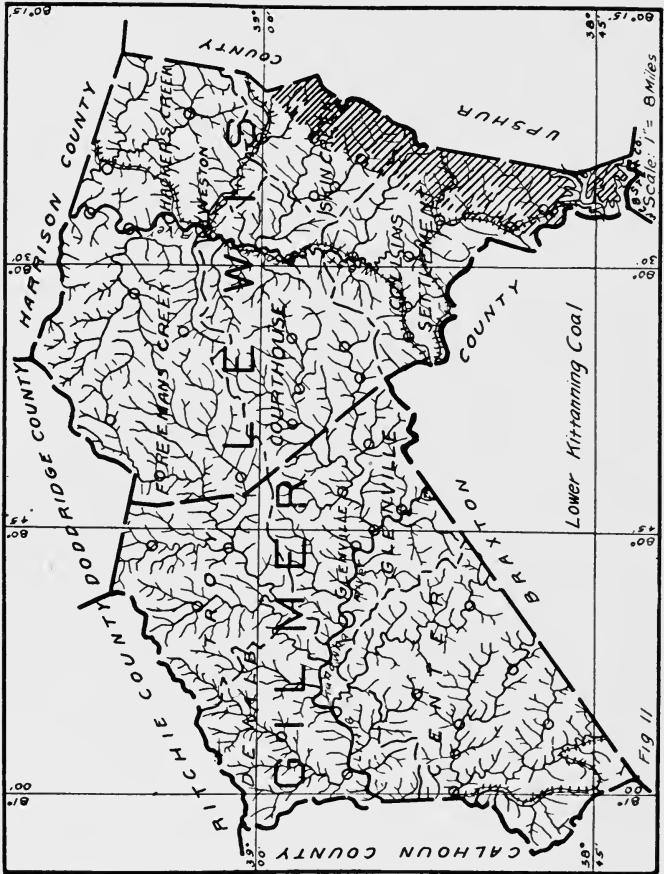


Figure 11.—Showing Area of Lower Kittanning Coal (See Explanation in Text).

### Daniel McCord Farm Mine—No. 258 on Map II.

On Glady Creek, 0.7 mile north of Bablin; Lower Kittanning Coal; elevation, 1285' B.

			Ft.	In.
1.	Sandstone, massive.....			
2.	Coal .....	1' 6"		
3.	Slate, black.....	0 4		
4.	Coal .....	2 2		
5.	Bone .....	0 2		
6.	Coal .....	0 7		
7.	Shale, hard, bony.....	1 8		
8.	Coal, visible, to water.....	2 0	8	5

A sample was collected from Nos. 2, 4 and 6 of section, the composition of which is given under Mine No. 258 in the table of coal analyses at the end of the Chapter.

### W. P. Forinash Prospect—No. 259 on Map II.

On Fallen Timber Run, 0.8 mile northeast of Bablin; Lower Kittanning Coal; elevation, 1350' B.

			Ft.	In.
	Coal, rotten.....	1' 6"		
	Slate, dark.....	0 7		
	Coal .....	4 2		
	Slate, black.....	0 5		
	Coal, visible.....	1 3	7	11

The above prospect was newly made and probably was not yet driven to the full thickness of the coal.

### Charles Forinash Farm Mine—No. 260 on Map II.

On Fallen Timber Run, 1 mile northeast of Bablin; Lower Kittanning Coal; butts, east and west; elevation, 1360' B.

			Ft.	In.
1.	Shale .....			
2.	Coal .....	1' 0"		
3.	Slate, black.....	0 3		
4.	Coal .....	2 0		
5.	Slate, black.....	0 1		
6.	Coal .....	0 6		
7.	Slate, black.....	2 0		
8.	Coal, hard.....	3 0		
9.	Slate, black.....	0 1		
10.	Coal (to slate pavement)....	1 0	9	11

A sample was collected from Nos. 4, 6, 8 and 10 of section, the composition of which is given under Mine No. 260 in the table of coal analyses at the end of this Chapter.

### Wilson McKissic Farm Mine—No. 262 on Map II.

On Trace Fork, 0.9 mile south of Ingo; Lower Kittanning Coal; butts, N. 85° W.; elevation, 1490' B.

			Ft.	In.
1. Coal, visible.....	1'	0 "		
2. Sandstone .....	0	8		
3. Coal .....	0	6		
4. Slate, black.....	0	8		
5. Coal, bony.....	1	6		
6. Coal .....	0	6		
7. Bone .....	0	2		
8. Coal .....	2	0		
9. Slate, black.....	0	0½		
10. Coal, soft.....	0	7½		
11. Coal, hard (to slate pavement) .....	2	0	9	8

A sample was collected from Nos. 6, 8, 10 and 11 of section, the composition of which is given under Mine No. 262 in the table of coal analyses at the end of this Chapter.

### Thomas Kincaid Farm Mine—No. 263 on Map II.

On Little Wildcat Run, 0.5 mile southwest of Bablin; Lower Kittanning Coal; butts, N. 85° W.; elevation, 1245' B.

			Ft.	In.
Slate, black.....			10	0
Sandstone .....			3	0
Slate, black.....			2	0
Coal .....	0'	9"		
Slate, black.....	0	5		
Coal .....	1	11		
Coal, bony.....	0	8		
Shale, hard, sandy.....	2	0		
Coal .....	0	9		
Slate, black.....	0	4		
Coal .....	1	10		
Slate, dark.....	2	3		
Coal, visible.....	1	6	12	5

Only the upper portion of the seam was being mined.

The coal has been mined by stripping at **Prospect No. 264 on Map II**, on Little Wildcat Run, 0.9 mile southwest of

Bablin, at an elevation of 1245' B., but the thickness was not obtained.

### Ed. Bodkin Farm Mine—No. 265 on Map II.

On Pretty Creek, 0.8 mile northwest of Wildcat; Lower Kittanning Coal; elevation, 1200' B.

		Ft.	In.
Shale, sandy.....			
Coal .....	1' 10 "		
Shale, sandy.....	2 10		
Coal .....	0 11½		
Slate, black.....	0 0½		
Coal .....	1 11		
Slate, dark.....	0 1		
Coal (to slate pavement).....	0 6	8	2

The above mine is located in Braxton County, about ¾ mile from the Lewis Line.

### Ursula Lake Farm Mine—No. 266 on Map II.

On Hacker Camp, 0.8 mile southeast of Bablin; Lower Kittanning Coal; butts, N. 85° W.; elevation, 1365' L.

		Ft.	In.
1. Shale, gray.....			
2. Coal .....	3' 3"		
3. Sandstone, hard.....	0 6		
4. Coal .....	0 10		
5. Slate, black, soft.....	1 2		
6. Coal .....	2 10		
7. Slate, black, soft.....	1 0		
8. Coal (to pavement).....	1 2	10	9

A sample was collected from Nos. 6 and 8 of section, the composition of which is given under Mine No. 266 in the table of coal analyses at the end of this Chapter.

The coal was once opened at the J. W. Lake Farm Mine (No. 267 on Map II), on Hacker Camp, 1.8 miles northwest of Cleveland, at an elevation of 1500' B., but the place had fallen shut.

## G. W. Powers Farm Mine—No. 268 on Map II.

On the head of Hacker Camp, 1.7 miles northwest of Cleveland; Lower Kittanning Coal; elevation, 1565' B.

	Ft.	In.
Sandstone, shaly.....	2	0
Slate, bony.....	1	1
Coal .....0' 9"		
Slate .....0 1		
Coal .....2 10		
Slate, black.....0 7		
Coal, thickness concealed.....	4	3

## David H. Forinash Farm Mine—No. 269 on Map II.

On a branch of Little Kanawha River, 1.0 mile southeast of Wildcat; Lower Kittanning Coal; butts, east and west; elevation, 1410' B.

	Ft.	In.
Coal, concealed, reported.....2' 0"		
Slate, dark.....4 0		
Coal .....2 8		
Slate, dark, hard.....0 7		
Coal, to pavement.....1 3 .....	10	6

Along the Right Fork of the Little Kanawha, for several miles above Wildcat, openings were found on the Webster County side, three of which are published, as follows:

## J. A. McCartney Farm Mine—No. 270 on Map II.

On Little Kanawha River, in Hacker Valley District, Webster; 0.8 mile west of Bois; Lower Kittanning Coal; elevation, 1440' B.

	Ft.	In.
Sandstone, massive, pebbly, great cliff, Lower Division of Lower Freeport.....		
Concealed along bench.....	40	0
Slate, black, with plant fossils.....	2	0
Coal .....	2	0
Shale, visible.....	1	0

Mr. McCartney reports that when he was attempting to open another prospect in the same coal at a point one-eighth mile west of this location, he found a small sample of lead ore. A careful examination made by Dr. Price and the writer at the prospect in question showed that the hillside at this point was covered with such a large amount of dirt and debris, that

the prospect did not reach the coal, and exposed only a little black slate, along with a considerable amount of other refuse. It was in this refuse, according to Mr. McCartney, that the sample of lead was found. The sample of lead ore which the writer secured was about  $\frac{3}{4}$ " square, with the crystallization, color and general appearance of Galena ore, and when analyzed by Mr. Krak, proved to contain 83.88 per cent. of metallic lead. The presence of small nuggets of lead ore in the mountainous regions of West Virginia is not unknown but such deposits are always in very limited quantity, usually in connection with limestone and entirely too insignificant for commercial exploitation. The nugget reported above was most probably transported by some agency, human or otherwise, to the location in question.

#### W. H. Boggs Farm Mine—No. 271 on Map II.

On Right Fork of Little Kanawha River, in Hacker Valley District, Webster; 0.4 mile southwest of Bois; Lower Kittanning Coal; elevation, 1505' B.

	Ft.	In.
Sandstone, massive, great pebbly cliff, Lower Freeport.....		
Concealed .....	45	0
Coal, visible.....1' 6"		
Slate, dark, hard.....2 0		
Coal .....	0	8
Slate, black.....1 6		
Coal (to pavement).....2 8 .....	8	4

#### James Baker Farm Mine—No. 272 on Map II.

On Right Fork of Little Kanawha River, in Hacker Valley District, Webster; 0.6 mile southeast of Bois; Lower Kittanning Coal; elevation, 1580' B.

	Ft.	In.
Slate, black.....	1	0
Coal .....	2' 6"	
Slate, black, bony.....1 10		
Coal .....	0	9
Slate, black.....0 1		
Coal .....	0	5
Slate, black, bony.....0 3		
Coal (to pavement).....1 6 .....	7	4

**G. G. Butcher Farm Mine—No. 273 on Map II.**

On Andys Run, 1 mile northeast of Bois; **Lower Kittanning Coal**; elevation, 1490' B.

		Ft.	In.
Sandstone, massive.....			
Slate, black.....		0	10
Coal.....	1' 1"		
Slate, black.....	0 2		
Coal.....	2 9	4	0
<hr/>			
Shale, gray.....		1	6
Sandstone, massive, visible.....		5	0

**H. F. Riffle Farm Mine—No. 274 on Map II.**

On the head of Andys Run, 1.5 miles northeast of Bois; **Lower Kittanning Coal**; elevation, 1540' B.

		Ft.	In.
Sandstone, hard.....		3	0
Slate, black.....		1	0
Coal.....	0' 7"		
Slate, black.....	0 2		
Coal.....	1 8		
Slate, black.....	0 2		
Coal (to pavement).....	2 2	4	9

**B. C. Powers Farm Mine—No. 275 on Map II.**

On Flat Run, 1.1 miles northwest of Cleveland; **Lower Kittanning Coal**; butts, N. 85° W.; elevation, 1640' B.

		Ft.	In.
1. Concealed.....			
2. Coal.....	1' 2"		
3. Sandstone.....	1 10		
4. Coal.....	0 2		
5. Slate, black.....	0 10		
6. Coal.....	1 0		
7. Slate, black.....	0 1		
8. Coal.....	2 9		
9. Slate, black, soft.....	0 10		
10. Coal, visible.....	2 0		
11. Coal, concealed by water, reported.....	1 0	11	8

A sample was collected from No. 8 of section, the composition of which is given under Mine No. 275 in the table of coal analyses at the end of this Chapter. Plate XXII gives a view of this opening.

The Nimrod Lake Farm Mine (No. 276 on Map II), on Flat Run, 1.1 miles northwest of Cleveland, the detailed measurement of which is published in the section for Cleveland, page 75, showed 8' 4" with partings, its elevation being 1665' B.

#### Frank Life Farm Mine—No. 277 on Map II.

On a branch of Right Fork of Little Kanawha River, in Hacker Valley District, Webster; 1.3 miles south of Cleveland; **Lower Kittanning Coal**; elevation, 1835' B.

		Ft.	In.
Sandstone, massive, visible.....		8	0
Coal .....	2' 0"		
Slate, black.....	0 4		
Coal (to pavement).....	1 3	3	7

#### James A. Rexroad Farm Mine—No. 278 on Map II.

On Cherry Fork of Little Kanawha River, 0.7 mile north of Ingo; **Lower Kittanning Coal**; butts, N. 85° W.; elevation, 1335' B.

		Ft.	In.
1. Shale, sandy.....			
2. Coal .....	1' 0"		
3. Shale, dark.....	0 10		
4. Coal .....	3 2		
5. Sandstone, shaly.....	0 9		
6. Coal .....	1 1		
7. Slate, bony.....	0 1		
8. Coal .....	3 1		
9. Coal, bony.....	0 6		
10. Slate, dark.....	0 7		
11. Coal, bony, visible.....	3 6	14	7

A sample was collected from No. 8 of section, the composition of which is given under Mine No. 278 in the table of coal analyses at the end of this Chapter. The coal at this opening, with its streaks of bony coal, has a strong resemblance to the **No. 5 Block Coal** of the Great Kanawha Valley, with which it has been provisionally correlated by Dr. White in Volume II(A), of the Survey. The bony portions may easily represent the streaks of splint coal found at the type locality of the No. 5 Block, as the physical appearance of bone coal and splint is much the same.



*Quantity of Lower Kittanning Coal Available.*

The following list of oil and gas wells, recording Lower Kittanning Coal in those regions where its horizon lies under drainage, shows that in nearly all this area the coal is not persistent enough to be classed as a minable seam, the only exception being along the Upshur Line in Skin Creek and Collins Settlement Districts, where several of the wells record it. The other table gives the probable amount of this coal in the region where it may possibly be mined at some future date:

**List of Oil and Gas Wells Recording Lower Kittanning Coal.**

No. on Map.	Name of Well.	Location.	Elev. of well mouth A. T.	Depth Feet.	Thick-ness, Feet.
<b>Lewis County:</b>					
5	W. F. Post No. 1.....	Johnstown, 2.5 mi. S. W.....	1365B	814	4
6	W. F. Post No. 2.....	Johnstown, 2.6 mi. S. W.....	1280B	751	5
64	Edwin Maxwell No. 3.....	Weston, 1.2 mi. S. E.....	1020B	720	15
73	Edwin Maxwell No. 1.....	Weston, 0.8 mi. E.	1005B	626	6
75	Wm. Donlan No. 2077.....	Weston, 0.7 mi. N. E.....	1220L	775	3
91	S. J. Waggoner No. 1.....	Jane Lew, 0.3 mi. S.....	1365B	814	4
105	W. W. Wimer No. 369.....	Lightburn, 0.3 mi. N. E.....	1030B	405	3
155	Thomas Lovett No. 1.....	Camden, 1.2 mi. N. E.....	1138L	665	10
526	Louis Bennett No. 1.....	Brownsville, 1.0 mi. N.....	1055B	830	3
533	Weston Electric Co. No. 1.	Weston, 0.3 mi. S.	1075B	775	5
550	Perry Summers No. 1.....	Horner, 2.3 mi. S. E.....	1060B	555	12
554	John Smith No. 1.....	Atlas, 2.5 mi. S. W.	1365B	490	2
556	Louvina Linger No. 1.....	Abbott, 1.6 mi. N. E.....	1380B	447	8
559	James Duncan No. 1.....	Abbott, 1.4 mi. N. W.....	1365B	477	6
<b>Gilmer County:</b>					
769	J. O. McCoy No. 1.....	Bennett, 0.5 mi. S. E.....	785L	790	10
796	Pauline E. Snodgrass No. 2	Rosedale, 0.3 mi. S. E.....	840B	672	3

## Probable Amount of Lower Kittanning Coal.

Lewis County by Districts.	Thickness of Coal Assumed. Feet.	Sq. Mi.	Acres.	Cubic Feet of Coal.	Short Tons of Coal.
Skin Creek.....	3	15.00	9,600	1,254,528,000	50,181,120
Collins Settlement	5	28.23	18,067	3,934,993,600	157,399,744
Totals.....	..	43.23	27,667	5,189,521,600	207,580,864

## MINABLE COALS OF THE POTTSVILLE SERIES.

## THE MERCER COAL.

The Mercer (Stockton) Coal horizon is exposed in the extreme southern end of Lewis but apparently has little value, owing to its variable and slaty nature. Only a few openings showed a probable minable thickness. **Prospect No. 283 on Map II**, on Cherry Fork of Little Kanawha River, 0.9 mile north of Ingo, where 2' 4" of coal was exposed, as described under the description of the Pottsville Series in Chapter IX, being one of these.

The coal was once opened at **Prospect No. 279 on Map II**, on Little Wildcat Run, 1 mile southwest of Bablin, at an elevation of 1135' B., where it was locally called the "Eleven-Foot Vein".

## A. B. Pickens Prospect—No. 280 on Map II.

At the mouth of Hacker Camp, 1.1 miles south of Bablin; Mercer (Stockton) Coal; elevation, 1185' B.

	Ft.	In.
Sandstone .....		
Slate, black.....	1	2
Coal .....	0'	3"
Slate, black.....	0	8
Coal (to pavement).....	2	4
	3	3

The Mercer was once opened at **Prospect No. 281 on Map II**, on the Right Fork of the Little Kanawha River, 0.3 mile northwest of Cleveland, as shown in the section for Cleveland, page 75, but the place had fallen shut and only a little coal was visible on the dump.

The following opening was observed in the edge of Webster, coming 205 feet below Mine No. 277 in the Lower Kittanning, but if the rise of the rocks between the two openings be allowed for, it would reduce this interval to about 100 feet:

### Brooks Powers Farm Mine—No. 282 on Map II.

On a branch of Right Fork of Little Kanawha River, in Hacker Valley District, Webster; 0.6 mile south of Cleveland; Mercer (Stockton) Coal; elevation, 1630' B.

		Ft.	In.
Shale, gray.....			
Coal .....	0' 9 "		
Slate, black, bony.....	0 6		
Coal .....	1 3½		
Slate, black, soft.....	0 0½		
Coal (to pavement).....	1 7	4	2

The following table gives a list of oil and gas wells recording Mercer Coal, in those regions where its horizon lies under drainage. It is apparently too uncertain to be classified as a commercial seam in any part of the area, but diamond drilling might reveal some small areas where it would be of value at some future date:

### List of Oil and Gas Wells Recording Mercer Coal.

No. on Map.	Name of Well.	Location.	Elev. of well mouth A. T.	Depth Feet.	Thick-ness. Feet.
<b>Lewis County:</b>					
64	Edwin Maxwell No. 3.....	Weston, 1.2 mi. S. E.....	1020B	810	..
115	A. C. Barb, No. 380.....	Lightburn, 0.5 mi. N.....	1005B	562	3
126	E. S. Butcher No. 1.....	Jackson Mill, 1.0 mi. S. W.....	1010B	555	5
153	Stark A. White No. 2.....	Camden, 1.1 mi. N. 10° W.....	1285B	970	6
213	John Leyden No. 1.....	Dry Fork, 2.3 mi. N. E.....	935B	48	4
320	Joseph Fallon No. 1.....	Churchville, 1.7 mi. S. 60° W.....	1010B	1001	6
394	Luke White No. 812.....	Edmiston, 1.5 mi. N. W.....	1030B	1085	3

No. on Map.	Name of Well.	Location.	Elev. of well mouth A. T.	Depth Feet.	Thick-ness. Feet.
434	Henry Pumphrey No. 1999.	Aspinwall, 0.9 mi. N. W.....	825B	920	10
449	John Devaney No. 1902....	Gillooly, 0.9 mi. S.	870B	910	11
454	John Brannon No. 1.....	Edmiston, 1.4 mi. S. E.....	950B	930	6
492	O. B. Wheeler No. 1904....	Weston, 2.8 mi. W.	1135B	843'	3
<b>Gilmer County:</b>					
677	O. W. O. Hardman No. 5..	Nobe, 1.8 mi. N. E.....		1390	2
689	Milton Norris No. 1.....	Glenville, at.....		673	14
715	Wm. E. Lively No. 7.....	Donlan, 1.0 mi. S. W.....	895B	1238	3
776	Elliott Stump No. 1.....	Stumptown, 0.6 mi. S. E.....	745B	765	5
791	E. E. Cottrell No. 1.....	Rosedale, at.....	787L	725	3
797	Rebecca Bourn No. 1.....	Rosedale, 1.0 mi. S. E.....	795B	597	3
802	W. G. Bennett No. 8.....	Rosedale, 2.4 mi. S. W.....	1060B	980	4

### SUMMARY OF AVAILABLE COAL.

For convenience of reference, all the mines and prospects in the 8 commercial seams described in this Chapter have been given serial numbers, which are printed in blue on Map II, along with the mine symbols. The following table gives a list of these numbers, as well as a summary of the total amount of coal that each seam is estimated to contain:

#### Tabulated Summary of Available Coal.

Coal Seams.	Mines and Prospects Listed on Map II and Described in Chapter XI.	Short Tons (2,000 Lbs.) of Coal.	
		Lewis County.	Gilmer County.
Washington .....	1- 16, inclusive.....	20,072,448	26,763,264
Redstone .....	43-125, inclusive.....	677,896,750	.....
Pittsburgh .....	126-197, inclusive.....	865,501,655	452,187,648
Elk Lick.....	204-220, inclusive.....	285,032,384	.....
Bakerstown .....	227-247, inclusive.....	500,171,950	540,294,543
Upper Freeport..	.....	105,268,839	.....
Upper Kittanning	252-255, inclusive & 261	114,512,270	.....
Lower Kittanning	256-260, inclusive, and 262-278, inclusive.....	207,580,864	.....
Totals.....	.....	2,776,037,160	1,018,245,455
Totals for Both Counties.....	.....	.....	3,794,282,615

The above table represents the amount of coal believed to be available in the two counties. Mining has been conducted on such a small scale that the amount already recovered is a negligible quantity when compared to the total amount. Allowing for a recovery of 80 per cent., the total coal that may eventually be mined is, in round numbers, 3,020,000,000 short tons.

### MINABLE COALS BY MAGISTERIAL DISTRICTS.

The minable coals of the two counties have been described by magisterial districts on previous pages of this Chapter. In the Index, at the end of this Report, under the heading "Mina-ble Coals by Magisterial Districts," will be found a list of page references making this information readily available without further discussion.

### TABLE OF COAL ANALYSES.

The following table, containing the chemical analysis, calorific determination, and fuel ratio of 58 mines and prospects, is the exclusive work of members of the Survey Staff. All samples were taken by members of the force in the field. Those from the commercial mines were taken according to the strict method outlined by the U. S. Bureau of Mines, being quartered and sealed in tins in the mines. The samples from the country mines were collected in sacks with as much care as could be used when depending on a scanty saddle-bag equipment.

The chemical work was mostly done by J. B. Krak, Assistant Chemist, under the direction and with the assistance of B. H. Hite, Chief Chemist. The numbers in the left-hand margin correspond to the numbers given with the mine sections in the text and with the mine symbols on Map II. All samples were cut from the mining section of the seam:

# TABLE OF COAL ANALYSES.

(Under the heading, "Condition of Sample," "A.D."=air dried, and "A.R."=as received.)

Mine No. on Map II	Owner.	County.	Coal Bed.	Condition of Sample.	Proximate.			Common to Both.			Ultimate.			Calorimeter B. T. U. for one lb. of coal.	Calculated B. T. U. for one lb. of coal.	Carbon Divided by Oxygen + Ash.
					Moisture.	Volatile Matter.	Fixed Carbon.	Ash.	Sulphur.	Carbon.	Hydrogen.	Oxygen.	Nitrogen.			
24	John Hines.....	Lewis.....	Uniontown M.	A. R.	2.26	40.46	47.60	0.034	9.68	3.31	.....	.....	.....	.....	.....	.....
30	W. C. Snodgrass.....	Gilmer.....	Uniontown M.	A. R.	0.92	46.10	44.32	0.080	8.66	3.59	.....	.....	.....	.....	.....	.....
34	James A. Bush.....	Gilmer.....	Uniontown M.	A. R.	45.88	40.85	0.341	.....	3.79	.....	.....	.....	.....	.....	.....	.....
	<b>Average</b> .....		<b>Uniontown M.</b>	<b>A. R.</b>	<b>1.37</b>	<b>44.15</b>	<b>44.26</b>	<b>0.152</b>	<b>10.22</b>	<b>3.56</b>	.....	.....	.....	.....	.....	.....
43	Kroger Gas Coal Co.	Lewis.....	Redstone M.	A. D.	1.47	34.18	60.08	0.025	4.27	1.04	78.48	5.39	9.64	1.18	14110	14055
43	Kroger Gas Coal Co.	Lewis.....	Redstone M.	A. R.	2.48	33.83	59.46	0.025	4.25	1.03	77.68	5.45	10.44	1.17	13967	5.64
44	S. S. Goodwin.....	Lewis.....	Redstone M.	A. R.	2.02	37.72	53.06	0.018	7.20	1.09	.....	.....	.....	.....	.....	5.28
54	G. R. Swisher.....	Lewis.....	Redstone M.	A. R.	0.92	40.82	52.68	0.034	5.58	2.36	.....	.....	.....	.....	.....	.....
73	Nathaniel Bush.....	Lewis.....	Redstone M.	A. R.	0.63	41.04	50.85	0.011	7.48	3.57	.....	.....	.....	.....	.....	.....
75	George Gardner.....	Lewis.....	Redstone M.	A. R.	2.03	40.77	51.88	0.019	4.72	1.47	.....	.....	.....	.....	.....	.....
86	David Burkhammer.....	Lewis.....	Redstone M.	A. R.	1.45	44.54	48.66	0.006	5.35	2.40	.....	.....	.....	.....	.....	.....
87	W. G. Bennett.....	Lewis.....	Redstone M.	A. R.	0.81	40.01	50.83	0.033	8.35	2.97	.....	.....	.....	.....	.....	.....
94	Bartlett Shay.....	Lewis.....	Redstone M.	A. R.	0.83	43.25	47.32	0.033	8.60	5.39	.....	.....	.....	.....	.....	.....
97	T. J. Lough.....	Lewis.....	Redstone M.	A. R.	1.21	45.51	50.17	0.025	6.21	2.98	.....	.....	.....	.....	.....	.....
100	Bland Brannon.....	Lewis.....	Redstone M.	A. R.	0.98	40.54	45.01	0.043	13.47	3.76	.....	.....	.....	.....	.....	.....
112	W. L. Clark.....	Lewis.....	Redstone M.	A. R.	1.04	42.27	50.77	0.019	5.92	2.60	.....	.....	.....	.....	.....	.....
122	John Smith.....	Lewis.....	Redstone M.	A. R.	0.86	42.33	49.05	0.011	7.76	3.63	.....	.....	.....	.....	.....	.....
123	M. E. Whalen.....	Lewis.....	Redstone M.	A. R.	0.86	42.89	47.10	0.009	9.15	4.01	.....	.....	.....	.....	.....	.....
124	A. B. Cosner.....	Lewis.....	Redstone M.	A. R.	1.16	41.88	49.58	0.020	7.38	3.01	.....	.....	.....	.....	.....	.....
	<b>Average</b> .....		<b>Redstone M.</b>	<b>A. R.</b>	<b>1.16</b>	<b>41.88</b>	<b>49.58</b>	<b>0.020</b>	<b>7.38</b>	<b>3.01</b>	.....	.....	.....	.....	.....	.....
128	Fernando Waggoner.....	Lewis.....	Pittsburgh M.	A. R.	1.08	40.92	53.66	0.012	4.34	2.50	.....	.....	.....	.....	.....	.....
145	Madison Lovell Hrs.....	Lewis.....	Pittsburgh M.	A. R.	1.19	42.87	51.23	0.036	4.71	1.68	.....	.....	.....	.....	.....	.....
142	James Rooney.....	Lewis.....	Pittsburgh M.	A. R.	1.01	40.99	48.34	0.0306	9.66	3.39	.....	.....	.....	.....	.....	.....
153	J. C. Farnsworth.....	Gilmer.....	Pittsburgh M.	A. R.	1.35	42.56	49.63	0.013	6.46	2.09	.....	.....	.....	.....	.....	.....
156	Robert Carson.....	Gilmer.....	Pittsburgh M.	A. R.	1.19	43.76	49.19	0.006	5.86	2.56	.....	.....	.....	.....	.....	.....
157	Wade Ratliff.....	Gilmer.....	Pittsburgh M.	A. R.	1.32	44.17	49.57	0.009	4.94	2.03	.....	.....	.....	.....	.....	.....
159	J. W. Wolf.....	Gilmer.....	Pittsburgh M.	A. R.	1.42	43.67	48.35	0.016	6.56	2.47	.....	.....	.....	.....	.....	.....
162	Charles Hayes.....	Gilmer.....	Pittsburgh M.	A. R.	1.21	41.10	51.47	0.012	6.92	2.13	.....	.....	.....	.....	.....	.....
165	Summers Bros.....	Gilmer.....	Pittsburgh M.	A. R.	1.27	42.31	49.25	0.013	7.17	2.82	.....	.....	.....	.....	.....	.....
169	W. J. Clovis.....	Gilmer.....	Pittsburgh M.	A. R.	1.16	40.74	50.60	0.0096	7.50	1.79	.....	.....	.....	.....	.....	.....
170	J. L. Lynch.....	Gilmer.....	Pittsburgh M.	A. R.	1.28	41.44	51.69	0.050	5.59	1.90	.....	.....	.....	.....	.....	.....
173	L. L. D. Peters.....	Gilmer.....	Pittsburgh M.	A. R.	1.45	42.29	49.93	0.006	6.33	2.71	.....	.....	.....	.....	.....	.....
174	Isaac Wiant.....	Gilmer.....	Pittsburgh M.	A. R.	1.00	40.51	50.40	0.006	8.09	2.17	.....	.....	.....	.....	.....	.....
175	N. E. Wiant.....	Gilmer.....	Pittsburgh M.	A. R.	1.32	42.00	50.22	0.012	6.46	3.06	.....	.....	.....	.....	.....	.....
178	McCaa Coal Co.....	Gilmer.....	Pittsburgh M.	A. D.	1.91	42.78	48.43	0.097	7.53	2.34	75.76	5.41	7.89	1.07	13780	13800
178	McCaa Coal Co.....	Gilmer.....	Pittsburgh M.	A. R.	1.91	42.52	48.18	0.027	7.49	2.82	75.37	5.43	8.33	1.06	13710	13790

TABLE OF COAL ANALYSES.—Continued.

Mine No. on Map II.	Owner.	County.	Coal Bed.	Condition of Sample.	Proximate.			Common to Both.			Ultimate.			Calorimeter B. T. U. for one lb. of Coal.	Calculated B. T. U. for one lb. of Coal.	Carbon Divided by Oxygen + Ash.	
					Moisture.	Volatile Matter.	Fixed Carbon.	Phosphorus.	Ash.	Sulphur.	Carbon.	Hydrogen.	Oxygen.				Nitrogen.
179	Gilmer Fuel Co.	Gilmer.	Pittsburgh M. S.	A. D.	1.69	41.57	50.15	0.053	6.59	1.96	76.78	5.37	8.25	1.05	13920	13950	5.31
179	Gilmer Fuel Co.	Gilmer.	Pittsburgh M. S.	A. R.	2.66	41.16	49.65	0.053	6.53	1.94	76.02	5.43	9.04	1.04	13790	13810	4.88
180	Gilmer Cons. C. Co. (Kath.)	Gilmer.	Pittsburgh M. S.	A. D.	1.34	40.55	50.17	0.018	7.44	2.46	75.01	5.21	8.84	1.04	13690	13560	4.61
180	Gilmer Cons. C. Co. (Kath.)	Gilmer.	Pittsburgh M. S.	A. R.	2.57	40.54	49.54	0.018	7.35	2.43	74.07	5.29	9.83	1.03	13520	13390	4.31
181	Gilmer Cons. C. Co. (Brackett)	Gilmer.	Pittsburgh M. S.	A. D.	1.12	42.43	49.18	0.013	7.37	2.62	75.68	5.36	8.50	1.01	13890	13750	4.82
181	Gilmer Cons. C. Co. (Brackett)	Gilmer.	Pittsburgh M. S.	A. R.	1.79	42.03	49.19	0.015	6.99	2.46	74.94	5.42	9.28	1.00	13800	13650	4.62
182	S. L. Fincham.	Gilmer.	Pittsburgh M. S.	A. R.	2.75	41.62	48.71	0.015	6.92	2.44	74.94	5.42	9.28	1.00	13800	13650	4.62
182	Rex Snyder.	Gilmer.	Pittsburgh M. S.	A. R.	1.26	42.24	49.34	0.008	7.16	2.36	75.01	5.21	8.84	1.04	13790	13810	4.88
188	J. W. Burk.	Gilmer.	Pittsburgh M. S.	A. R.	0.95	40.07	54.70	0.013	4.28	1.96	74.07	5.29	9.83	1.03	13520	13390	4.31
189	Eli Shock.	Gilmer.	Pittsburgh M. S.	A. R.	1.48	39.99	51.01	0.006	7.52	2.38	75.01	5.21	8.84	1.04	13690	13560	4.61
195	Louis Bennett.	Gilmer.	Pittsburgh M. S.	A. R.	1.60	43.04	49.44	0.010	5.92	2.06	76.02	5.43	9.04	1.04	13790	13810	4.88
196	Louis Bennett.	Gilmer.	Pittsburgh M. S.	A. R.	1.66	40.85	50.23	0.010	7.27	2.40	75.68	5.36	8.50	1.01	13890	13750	4.82
	<b>Average (Ultimate)</b>		<b>Pittsburgh M. S.</b>	<b>A. R.</b>	<b>1.53</b>	<b>41.84</b>	<b>49.49</b>	<b>0.028</b>	<b>7.14</b>	<b>2.30</b>	<b>75.81</b>	<b>5.34</b>	<b>8.37</b>	<b>1.04</b>	<b>13832</b>	<b>13787</b>	<b>4.91</b>
	<b>Average (Ultimate)</b>		<b>Pittsburgh M. S.</b>	<b>A. R.</b>	<b>2.45</b>	<b>41.46</b>	<b>49.02</b>	<b>0.028</b>	<b>7.07</b>	<b>2.28</b>	<b>75.10</b>	<b>5.40</b>	<b>9.12</b>	<b>1.03</b>	<b>13705</b>	<b>13660</b>	<b>4.64</b>
	<b>Average (Proximate)</b>		<b>Pittsburgh M. S.</b>	<b>A. D.</b>	<b>1.26</b>	<b>41.88</b>	<b>50.39</b>	<b>0.0188</b>	<b>6.47</b>	<b>2.35</b>	<b>76.02</b>	<b>5.43</b>	<b>9.04</b>	<b>1.04</b>	<b>13790</b>	<b>13810</b>	<b>4.88</b>
205	Alfred Linger.	Lewis.	Elk Lick.	A. R.	0.53	37.97	47.96	0.063	13.54	4.12	74.07	5.29	9.83	1.03	13520	13390	4.31
213	Elizabeth Hefner.	Lewis.	Elk Lick.	A. R.	0.76	37.29	46.26	0.196	15.69	0.84	75.01	5.21	8.84	1.04	13690	13560	4.61
214	Robert McCray.	Lewis.	Elk Lick.	A. R.	0.80	39.53	48.02	0.061	11.56	1.74	76.02	5.43	9.04	1.04	13790	13810	4.88
218	R. H. Hornor & Son.	Lewis.	Elk Lick.	A. R.	0.97	40.50	48.61	0.034	9.92	1.29	75.68	5.36	8.50	1.01	13890	13750	4.82
220	Clyde Reger.	Lewis.	Elk Lick.	A. R.	0.68	40.63	44.65	0.036	14.04	2.67	75.01	5.21	8.84	1.04	13790	13810	4.88
	<b>Average</b>		<b>Elk Lick.</b>	<b>A. R.</b>	<b>0.77</b>	<b>39.18</b>	<b>47.10</b>	<b>0.082</b>	<b>12.95</b>	<b>2.13</b>	<b>76.02</b>	<b>5.43</b>	<b>9.04</b>	<b>1.04</b>	<b>13790</b>	<b>13810</b>	<b>4.88</b>
236	George Post.	Lewis.	Bakerstown	A. R.	0.97	35.52	48.95	0.011	14.56	3.35	75.01	5.21	8.84	1.04	13790	13810	4.88
242	H. L. McQuain.	Lewis.	Bakerstown	A. R.	0.74	35.46	48.14	0.008	15.66	4.30	75.68	5.36	8.50	1.01	13890	13750	4.82
244	L. E. Mick.	Lewis.	Bakerstown	A. R.	0.67	36.76	47.82	0.118	14.75	6.18	76.02	5.43	9.04	1.04	13790	13810	4.88
	<b>Average</b>		<b>Bakerstown</b>	<b>A. R.</b>	<b>0.79</b>	<b>35.91</b>	<b>48.31</b>	<b>0.046</b>	<b>14.99</b>	<b>4.61</b>	<b>75.68</b>	<b>5.36</b>	<b>8.50</b>	<b>1.01</b>	<b>13890</b>	<b>13750</b>	<b>4.82</b>
254	W. P. Kucavid.	Lewis.	Upper Kittanning M. S.	A. R.	0.61	39.60	47.51	0.011	12.28	3.86	75.01	5.21	8.84	1.04	13790	13810	4.88
256	W. B. Mick.	Lewis.	Lower Kittanning.	A. R.	0.79	36.96	48.37	0.077	13.88	0.87	75.01	5.21	8.84	1.04	13790	13810	4.88
258	Dan McCord.	Lewis.	Lower Kittanning.	A. R.	1.21	34.85	57.61	0.006	6.33	0.81	75.01	5.21	8.84	1.04	13790	13810	4.88
260	Chas. Forinash.	Lewis.	Lower Kittanning.	A. R.	0.71	34.99	53.56	0.008	10.74	1.37	75.01	5.21	8.84	1.04	13790	13810	4.88
262	Wilson McKissic.	Lewis.	Lower Kittanning.	A. R.	0.44	34.98	53.87	0.007	10.71	0.71	75.01	5.21	8.84	1.04	13790	13810	4.88
266	Urslua Lake.	Lewis.	Lower Kittanning.	A. R.	0.94	33.38	52.97	0.012	12.71	0.71	75.01	5.21	8.84	1.04	13790	13810	4.88
275	B. C. Powers.	Lewis.	Lower Kittanning.	A. R.	0.66	31.92	53.16	0.010	14.26	0.77	75.01	5.21	8.84	1.04	13790	13810	4.88
278	J. A. Rexroad.	Lewis.	Lower Kittanning M. S.	A. R.	1.60	34.59	54.35	0.006	9.46	0.73	75.01	5.21	8.84	1.04	13790	13810	4.88
	<b>Average</b>		<b>Lower Kittanning.</b>	<b>A. R.</b>	<b>0.91</b>	<b>34.52</b>	<b>53.41</b>	<b>0.018</b>	<b>11.16</b>	<b>0.85</b>	<b>75.01</b>	<b>5.21</b>	<b>8.84</b>	<b>1.04</b>	<b>13790</b>	<b>13810</b>	<b>4.88</b>

Page References to Detailed Descriptions and Sections of Coal  
Mines Listed in Preceding Table.

No. on Map II.	Sample Number.	Name of Owner.	Page
24	37R	John Hines.....	116
30	43R	W. C. Snodgrass.....	118
34	44R	James A. Bush.....	118
43	D. & H. Rpt., page 572	Kroger Gas Coal Co.....	46, 515
44	30R	S. S. Goodwin.....	516
54	31R	G. R. Swisher.....	518
73	34R	Nathaniel Bush.....	521
75	25R	George Gardner.....	522
86	38R	David Burkhammer.....	524, 542
87	27R	W. G. Bennett.....	527
94	64R	Bartlett Shay.....	526
97	66R	T. J. Lough.....	527
100	40R	Bland Brannon.....	528
112	68R	W. L. Clark.....	530
122	79R	John Smith.....	532
123	62R	M. E. Whalen.....	532
124	61R	A. B. Cosner.....	533
128	32R	Fernando Waggoner.....	536
145	36R	Madison Lovell Heirs.....	541
142	Vol. II, p. 206, 8	James Rooney (No. 82).....	540
153	39R	J. C. Farnsworth.....	544
156	42R	Robert Carson.....	546
157	41R	Wade Ratliff.....	546
159	54R	J. W. Wolf.....	547
162	53R	Charles Hayes.....	547
165	52R	Summers Bros.....	548
169	Vol. II, p. 206, 8	W. J. Clovis (No. 83).....	549
170	51R	J. R. Lynch.....	549
173	55R	L. L. D. Peters.....	550
174	Vol. II, p. 206, 8	Isaac Wiant ("Ellis Mine") (No. 84)	550
175	56R	N. E. Wiant.....	550
178	98R	McCaa Coal Co.....	551
179	100R	Gilmer Fuel Co.....	552
180	101R	Gilmer Cons. Coal Co. (Katherine)	552
181	102R	Gilmer Cons. Coal Co. (Brackett)	552
182	57R	S. L. Fincham.....	553
186	47R	Rex Snyder.....	554
188	46R	J. W. Burk.....	555
192	48R	Eli Shock.....	555
195	49R	Louis Bennett.....	556
196	50R	Louis Bennett.....	556
205	69R	Alfred Linger.....	560
213	71R	Elizabeth Hefner.....	561
214	74R	Robert McCray.....	562
218	75R	R. H. Hornor & Son.....	563
220	94R	Clyde Reger.....	564
236	77R	George Post.....	569



No. on Map II.	Sample Number.	Name of Owner.	Page
242	78R	H. L. McQuain.....	570
244	80R	L. E. Mick.....	570
254	83R	W. P. Kincaid.....	576
256	81R	W. B. Mick.....	580
258	85R	Dan McCord.....	582
260	86R	Charles Forinash.....	582
262	89R	Wilson McKissic.....	583
266	91R	Ursula Lake.....	584
275	90R	B. C. Powers.....	587
278	88R	J. A. Rexroad.....	588

## CHAPTER XII.

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### CLAY, ROAD MATERIAL, BUILDING STONE, WATER POWER, MINERAL WATERS, FORESTS AND CARBON BLACK.

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#### CLAYS AND CLAY INDUSTRY.

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##### PRESENT DEVELOPMENT.

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##### Brick and Tile Plants.

**Jane Lew Brick and Drain Tile Works.**—The Jane Lew Brick and Drain Tile Works, located at the south edge of Jane Lew, Lewis County, was established more than 20 years ago at the old mill site near the town, but was moved to its present location in 1911, according to Fred Flesher, owner and manager, and manufactures common red building brick, drain tile and hollow building tile, having in 1913 an output of 1,000,000 brick and about 70,000 lineal feet of drain tile, and employing 5 men, the monthly pay roll being \$150 to \$200.

The brick equipment includes a pug mill, automatic cutter and a brick machine. There are eight tunnel driers with a total capacity of 14,000, where the brick remain for two days, and are then placed in circular, down-draft Snowden Kilns, two in number, where the burning requires 7 to 8 days, natural gas being used for fuel. The tube plant contains a cutter and dies for sizing.

The clay pit, which is located alongside the factory, is about 200 feet long and 14 feet deep, the material apparently consisting of river clay of Pleistocene age, overlain by a more recent deposit of red clay eroded from the red shales of the

Conemaugh Series in the hill above it, which give it their characteristic color. The lower clay is principally used for making tile, but is mixed half and half with the red clay for brick. A sample collected from the river clay at the base of the pit shows the following analysis, according to Krak:

	Per cent.
Silica (SiO <sub>2</sub> ).....	65.49
Ferric Iron (Fe <sub>2</sub> O <sub>3</sub> ).....	5.81
Alumina (Al <sub>2</sub> O <sub>3</sub> ).....	16.42
Lime (CaO).....	0.63
Magnesia (MgO).....	0.46
Potassium Oxide (K <sub>2</sub> O).....	2.46
Sodium Oxide (Na <sub>2</sub> O).....	0.49
Titanium Oxide (TiO <sub>2</sub> ).....	0.42
Phosphoric Acid (P <sub>2</sub> O <sub>5</sub> ).....	0.15
Moisture .....	2.21
Loss on ignition.....	5.55
Total .....	100.09

Mr. Fleisher has recently opened a test pit in the Pittsburgh Red Shale, in the hillside south of the plant, a section of which, along with an analysis of the shale, is published under its stratigraphic discussion, page 153. A sample of this shale was shipped to Morgantown, where a mechanical test was made of it by Mr. R. R. Feller, acting under the supervision of Hon. A. D. Williams, State Road Engineer, who has kindly furnished it to the Survey, as follows:

No. 78      Received, Feb. 19, 1915.      Name, Pittsburgh Red Shale.  
 Date Sample Mixed, March 26, 1915.      Sample not pressed (dried too quick). Put in Kiln, April 9, 1915. Position in Kiln, Top of edge of layer. Time of Burning, 10 days. Temperature, 2400° Fahr. Removed from Kiln, May 17, 1915. Kind of Brick, Soft Mud. Color and General Appearance, Red and Hard. Dimensions of Brick, 2¾x3¾x7½ inches.

No.	Transverse Test			Modulus of Rupture	Crushing Test		
	Dimen- sions.	How Set	Break- ing Load		Area of Section	Breaking Load Total	Lbs. per sq. inch
	2	3	4	5	6	7	8
1	2¾x3¾	Edge	8790	1853	3⅝x7½	323010	11879
2	2¾x3¾	Edge	5870		3⅝x7½	300950	11068
3	2¾x3¾	Edge	5840	1535	3⅝x7⅝	249170	9015
4	2¾x3¾	Edge	4800		3¾x7½	256790	9132
5	2¾x3¾	Edge	6510		3¾x7½	252950	8996

**Rattler Test.**

No. of Brick.	Weights.		Per cent.	
	Initial.	Final.	Lost.	
9	10	11	12	
10	60.02	42.78	28.72	1 Brick broke in test.
10	59.84	43.54	27.24	1 Brick broke in test.
	Average.....		27.98	

Absorption.		Wet,		Test begun May 18th, 1915.
Per cent.	Dry, lbs.	lbs.	Gain, lbs.	Completed, May 21st, 1915.
4.11	30.36	31.50	1.14	Made on 5 unrattled brick.
4.04	43.54	45.30	1.76	Made on 10 rattled brick.
Average weight of one dry brick==5.99 lbs.				

The shale as tested above is a little too low in the Modulus of Rupture and Rattler tests to conform to the specifications for highway brick recommended by the State Road Engineer, but this may be partly due to improper burning of the brick as they were fired at the plant of a firm that is making common building brick, and under proper conditions, this defect might be remedied. The brick burn to a rich red color that would be fine for residence purposes. The following additional test for shrinkage and porosity, made of the same shale by the U. S. Bureau of Standards at Washington, D. C., was furnished by Mr. Williams, as follows:

**"DEPARTMENT OF COMMERCE  
"Bureau of Standards.**

"Washington, June 30, 1915.

"Mr. A. D. Williams,  
"W. Va. State Road Bureau,  
"Morgantown, W. Va.

"Dear Sir:—

"We beg leave to report upon the sample of shale which you submitted some time ago for test. This material developed good working plasticity and can be pressed easily in a stiff mud machine. No drying difficulties were encountered. The water of plasticity was found to be 18.4 per cent. and the linear drying shrinkage 3.6 per cent. Specimens were made and fired at a number of temperatures and the porosity, color and burning shrinkage determined. These results are compiled in the following table:

Temp. °C.	Per cent. Porosity.	Color.	Per cent. Burning Shrinkage
1050	15.2	Red-Vitrified	6.18
1075	8.53	do	
1100	6.77	do	
1125	6.07	do	
1150	5.59	do	7.82
1175	4.76	Dark-Vitrified	
1200	6.50	do	
1225	11.20	do	overburned
1240	13.80	do	do 3.29

"From these results it appears that this shale burns to its best condition at about 1175° C. Above this temperature overburned structure is developed. It would seem that this clay is suitable for the manufacture of vitrified brick, and is promising as far as the production of paving blocks is concerned.

"Very truly yours,

(Signed)

"P. H. BATES, For the Director."

**Weston Brick Works.**—The Weston Brick Works, located on the West Fork River, opposite the mouth of Murphy Creek, 1 mile south of Weston, and built in 1900, makes common building brick and paving brick, according to Dr. Geo. I. Keener, President, the output being about 15,000 daily, and capacity 25,000. The equipment includes a Frieze combined brick machine and pug mill, an American dry pan, 5 tunnel driers of 6,000 capacity, each, and 3 rectangular up-draft kilns of 180,000 capacity each. The brick remain in the driers 24 hours and in the kilns from 17 to 18 days.

The clay is obtained from a pit alongside the plant, and consists of a stratum of river clay 5 to 8 feet thick, underlain by the Redstone Limestone and Weston Shale, the latter formation being 10 feet thick, as appears in a section published under its description, page 128, where an analysis of it is also given. The river clay and the Weston Shale are mixed half and half to make building brick. A valuable description of this plant by Dr. G. P. Grimsley was published in Volume III, page 273, of the Survey, the portion of which referring to the clay is herein repeated, as follows, it being evident that the pit is much deeper now than at the time of Dr. Grimsley's visit:

"**Clay Pit.**—The river clay is obtained in pits back of the plant and hauled in dump carts. The bottom of the pit is about twenty feet above the river, and the section shows two and one-half feet of red clay with six feet of yellow or buff sandy clay above covered with one foot of soil.

"In making the brick the yellow and red clays are mixed in equal proportion and some surface soil added. The mixture burns to a brownish red color and makes a good common building brick. These clays are found in nearly all the valleys of this section and under the town of Weston.

"Chemical Analyses	Yellow Clay.	Red Clay.
Silica .....	75.01	69.67
Alumina .....	12.15	15.45
Ferric Iron.....	3.65	3.61
Ferrous Iron.....	0.23	0.50
Magnesium .....	0.68	0.92

Lime .....	1.45	0.14
Sodium .....	0.15	0.36
Potassium .....	1.39	1.40
Water .....	1.45	2.00
Titanium .....	0.55	0.95
Phosphorus .....	trace	trace
	<u>100.61</u>	<u>99.53</u>

"The yellow clay by rational analysis shows:

	Per cent.
Free silica.....	57.20
Feldspar .....	6.00
Clay substance.....	36.80

"Mechanical Analyses.

	Range in millimetres.	Yellow clay.	Red clay.
Fine clay.....	0.00 to .001	15.85	20.75
Coarse clay .....	.001 to .005	11.00	12.10
Silt .....	.005 to .020	23.80	28.25
Fine sand.....	.020 to .15	28.10	32.70
Coarse sand.....	.15 to 4.00	19.80	4.20 (to 1.00)
Water .....		1.25	2.00

"The yellow clay slakes in thirty seconds and requires 23 per cent. of water to develop a normal molding consistency. It is unaffected at cone 1 (2102° F.) and is vitrified at cone 5 (2246° F.) becoming viscous at cone 14 (2570° F.). Its fire shrinkage is 9 per cent.

"The red clay is unaffected at cone 05 (1922° F.), reaches incipient vitrification at cone 1 (2102° F.), and complete vitrification at cone 5 (2246° F.), with a fire shrinkage of 10 per cent. It is viscous at cone 10 (2426° F.)"

Samples of both materials from this clay pit were sent by Dr. Keener to State Road Engineer A. D. Williams, who has had mechanical tests made of them, which he reports as follows:

### Red Shale.

"No. 102. Received June 16, 1915. Name, Weston Brick Works. Date sample mixed, Aug. 15, 1915. Pressed, Aug. 29th. Put in kiln, Sept. 25th. Position in kiln, top. Time of burning, 288 hours. Temperature about 2200° F. Removed from kiln, Oct. 14th. Kind of brick, Testing Specimens. Colors and general appearance, red. Dimensions of brick 2"x3¼"x7½".

Transverse Test.				Crushing Test.			
No.	Dimen- sions.	How Set	Break- ing Load	Modulus of Rupture	Area of Section	Breaking Load. Total	Lbs. per sq. inch
1	2.3x3.6x7.5	Edge	5840	Shear	3¼x7½	344850	12261
2	1.9x3.6x7.5	Edge	5390	Shear	3½x7½	340600	12594
3	1.9x3.5x7.2	Edge	9790	Shear	3½x7½	315370	12014

<b>Rattler Test.</b>			
No. of	Weights, lbs.		
Brick	Initial.	Final.	Per cent. Lost
12	64.18	39.86	62.1
Absorption.	Wet.		
Per cent.	Dry, lbs.	lbs.	Gain, lbs.
0.2	18.98	19.02	0.4

Brick were burned at too high temperature causing them to fuse and stick together. Had to be broken apart. Rattler test probably high on account of sharp corners."

### Gray Shale.

"No. 101. Received June 16, 1915. Name, Weston Brick Works. Date sample mixed, Aug. 14, 1915. Pressed, Aug. 28th. Put in kiln, Sept. 25th. Position in kiln, top. Time of burning, 288 hours. Temperature, about 2200° F. Removed from kiln, Oct. 14th. Kind of brick, Testing Specimens. Color and general appearance, red and white. Dimensions of brick, 2½"x4"x8".

<b>Transverse Test.</b>			<b>Crushing Test.</b>				
Distance Between Supports 7"			Break-	Modulus	Area	Breaking Load.	
No.	Dimen-	How	ing	of	of	Total	Lbs. per
	sions.	Set	Load	Rupture	Section		sq.inch
1	2.6x3.9x7.9	Edge	4365	1158	3.9x7.9	112980	3667
2	2.4x3.9x7.9	Edge	2650	742	3.9x7.9	109100	3540
3	2.4x3.9x7.9	Edge	1345	379	3.9x7.9	158130	5132

<b>Rattler Test.</b>			
No. of	Weights, lbs.		
Brick	Initial.	Final.	Per cent. Lost
12	69.56	0.34	99
Absorption.	Wet,		
Per cent.	Dry, lbs.	lbs.	Gain, lbs.
6.4	29.46	31.37	1.91

The tests of shrinkage and porosity as made by the U. S. Bureau of Standards were furnished Mr. Williams as follows:

#### "DEPARTMENT OF COMMERCE

##### "Bureau of Standards

"Washington, September 25, 1915.

"West Virginia State Road Bureau,

"Morgantown, W. Va.

"Gentlemen:—

"A report of the tests on the two samples of shale, marked Nos. 101 and 102, submitted by you to this laboratory, is as follows:

"Sample No. 102 (Red Shale).—The sample was ground, screened through a 10-mesh sieve and tempered to stiff mud consistency by wedging on a marble slab. Briquettes 2½"x1¼"x¾" were prepared by passing the plastic clay through a piston plunger machine, having a rectangular die. The briquettes were dried first at room temperatures and finally in an electrical drying oven at 110° C. The linear drying shrinkage was 3.5 per cent. and the water required to make it plastic 18.5 per cent. The shale has working plasticity favorable to manufacture by the stiff mud process.

"The dried briquettes were placed in a down draft test kiln and fired to 1225° C., trials being drawn at 25° intervals, the first at 950° C. The per cents. porosity of the fired briquettes was determined in the usual manner and are given in the following table:

Temp° C.	Porosity.	Color	Hardness
950	28.4	Light red	
975	12.3	do	
1000	8.6	Dark red	Vitrified
1025	7.5	Dark	do
1050	6.3	do	do
1075	6.1	do	do
1100	6.4	do	do
1125	6.4	do	do
1150	5.8	do	do
1175	7.1	do	Overburned
1200	7.4	Chocolate	do

"The material has a very satisfactory vitrification range and may be easily burned in a commercial kiln. A good red color is developed by burning. The use of this shale as a paving material could be established only by abrasion tests on full sized blocks. The material would be satisfactory insofar as working and vitrification behavior are concerned.

"Sample No. 101 (Blue Shale).—The sample was prepared, molded, dried and burned in the same manner as sample No. 102. The shale has a drying shrinkage of 3.9 per cent., the water of plasticity being 17.5 per cent. This sample is not as plastic as sample No. 102, although it may be worked by the stiff mud process. The per cents. porosity as determined are given in the following table:

Temp° C.	Porosity.	Color	Hardness
950	26.3	Buff and red	Soft
975	24.2	do	do
1000	22.5	do	do
1025	19.7	do	Hard
1050	19.6	do	do
1075	17.3	do	do
1100	15.9	Dark	Steel hard
1125	14.1	do	do
1150	11.2	do	do
1175	10.4	do	do
1200	15.4	do	do
1225	20.8	do	do

"The vitrification behavior of this shale is not so satisfactory as that of sample No. 102, overburning taking place suddenly at 1200° C. The minimum porosity, 10.4 per cent., attained at 1175° C., is perhaps too high for a material designed to be used in the manufacture of paving brick. The burning color of this shale is very inferior to that of sample No. 102.

"Very truly yours,  
 (Signed) "P. H. BATES, For the Director."

**Whiting and West Brick Plant.**—The Whiting and West Brick Plant, located at the mouth of Nutter Run on the south



side of the Little Kanawha River at Glenville, was designed to make building brick from river clay, but has not been operated for several years. The equipment includes an Iron Quaker Brick Machine, run by horse power, having a capacity of 10,000 daily, according to A. N. West. Natural gas is used for fuel, \$60 worth being required at 10 cents per thousand cubic feet to burn 150,000 brick. The river clay, where the plant is located, is 31 feet thick, the upper 17 feet being quarried and tempered with about 10 per cent. of sand from the bed of the river. The clay burns to a dull red color.

#### AVAILABLE CLAY AND SHALE.

##### Transported Clay.

Along the flood plains of the West Fork and Little Kanawha Rivers, as well as on some of the smaller streams, are vast deposits of clay, varying in thickness from 5 to 30 feet, that are well suited for making common building brick, the demand for which increases with the ever increasing cost of lumber. No attempt is made to name these deposits in detail but Map II, showing the alluvial deposits in yellow, will be a guide to their occurrence. It should be remembered that plants operating in such abundant material must seek their advantage over competitors by securing the most favorable locations for distribution, fuel and cheapness of handling raw material.

##### Residual Clay.

Residual clay, which is derived from weathered rocks, and is still in its original location, is not of sufficient importance to be classed as a brick making material in the two counties but such as there is of it should rather be classed as soil, more valuable for agricultural than for other purposes.

##### Stratified Shales.

Stratified shales, composed principally of silica and alumina, and lying between the sandstone ledges of the Carboniferous rocks, compose a large percentage of the surface measures

in both counties, and as nearly all of these shales are of material that can be made into brick of some sort it would be possible for each magisterial district to have its own plants for manufacturing its own building material both for residence and paving purposes. A plant of this sort, operated with convict labor, under the present state law, would reduce by about one-half the cost of brick for road making. For paving purposes the red shales of the Conemaugh Series, described in detail in Chapter VII, will be found best suited. The outcrop of this Series is shown on Map II, and the position of any shale horizon may be easily determined by referring to the general section at the beginning of the Chapter. The Clarksburg and Pittsburgh Red Shales would probably make a good grade of roofing tile as well as good brick.

#### Fire Clay.

The surface rocks of Lewis and Gilmer, so far as observed, do not carry fire clay of commercial thickness and purity. No flint clay of any kind was found, and no plastic clay of any consequence.

#### ROAD MATERIAL.

##### River and Creek Gravel.

Attention has been called in many previous Reports of the Survey to the fact that most of the rivers and creeks of the State contain an abundant supply of gravel, which, being the more resistant portions of the rocks from which they came, afford good material for improving roads that is often cheaper than any other that can be secured. The roads often follow the streams closely, making it possible to macadamize with gravel at much less cost than with stone quarried from the hills.

##### Limestone.

The only calcareous stratum of importance cropping in the two counties is the Redstone Limestone of the Monongahela Series, which is found usually only a few feet above

the Pittsburgh Coal and varies from 2 to 5 feet in thickness. It was observed generally in Hackers Creek, eastern Freemans Creek, and in portions of Courthouse and Skin Creek Districts, Lewis, but was seldom found in good development in Gilmer. This limestone, as described previously, has a hard, firm appearance and would make good road material, either in the form of macadam or as concrete aggregate. Its position at any point may be found by reference to Map II, which shows the crop of the Redstone Coal above, and the Pittsburgh below it. A physical test of this limestone is published on a subsequent page.

### Brick.

The use of brick, made from stratified clays and shales, for road material, has been tried with marked success in many of the more populous and progressive counties of the State. The great amount of material available in every district in the two counties, with cheap natural gas for fuel, and cheap convict labor, probably offers the most suitable means of improving the roads, as this method would reduce to the lowest possible minimum the amount of money spent for labor and material outside the district, and would lessen appreciably the ultimate burden on the taxpayer.

### BUILDING STONE.

In Chapters V to VII, the sandstone quarries of the two counties have been described in detail under their respective geological horizons. The following table gives a list of such as have been quarried and previously described, with page references to their detailed accounts:

Name of Sandstone.	Location of Quarry.	Page
Waynesburg .....	Glennville, 1.3 mi. S.....	109
Gilboy .....	Cedarville, north of.....	113
Upper Sewickley....	Weston, 1.5 mi. N. W.....	121
Upper Sewickley....	Brownsville, 2.3 mi. N. W.....	121
Weston .....	Weston, S. E. of.....	125
Weston .....	Vadis, $\frac{1}{8}$ mi. west.....	125
Connellsville .....	Weston, 0.5 mi. east.....	137
Connellsville .....	Glennville, west of.....	137

Name of Sandstone.	Location of Quarry.	Page
Connellsville .....	Glenville, N. W. of.....	138
Connellsville .....	Glenville, N. W. of.....	138
Lower Connellsville.	Berlin, 2 mi. N. W.....	140
Lower Connellsville.	Weston, north of.....	141
Lower Connellsville.	Weston .....	141-2
Lower Connellsville.	Weston, 3 mi. W.....	142
Lower Connellsville.	Glenville, 0.7 mi. N. W.....	142
Morgantown .....	Weston, north of.....	146
Morgantown .....	Deanville .....	146
Morgantown .....	Weston, 2.5 mi. N.....	146
Morgantown .....	Weston, 1.0 mi. N.....	146
Morgantown .....	Freemansburg, 1.3 mi. N. E....	147
Morgantown .....	Vandalia, 1.5 mi. N. W.....	147
Grafton .....	Jane Lew, south of.....	149
Grafton .....	Emmart, 0.7 mi. S. W.....	149
Saltsburg .....	Jackson Mill, 0.5 mi. south....	155
Buffalo .....	Walkersville, 1.2 mi. south....	157

### Available Stone.

The sandstones of Lewis and Gilmer, as described in Chapters V to IX, inclusive, vary from flaggy and shaly beds that do not have the necessary cohesiveness to be used for building stone, to great massive ledges, 50 to 60 feet thick, that will split into building blocks of any desired size. These massive ledges are all of the same general type, micaceous, gray on fresh fracture and often weathering to brown, some of them being very soft and worthless while others are hard and durable. They do not have the beauty of texture or smoothness of grain to make them desirable for architectural purposes where ornamental or carved stone effects are needed but in all structures where durability and fireproof construction is the main feature, they can not be surpassed by any stone shipped in from other counties or States. They are fitted for bridge piers and abutments, retaining walls, and for buildings of plain construction, such as the Weston State Hospital which is built entirely of stone quarried in Lewis and Harrison Counties. In nearly every locality, one of these ledges is of massive character and can be quarried. No attempt has been made to describe all these outcroppings in detail but Map II shows the geological series outcropping in each locality, and a general description of its sandstones will be found in the text.

### Physical Tests of Stone.

The three following physical tests of stone, the first two of which were made and published by the U. S. Department of Agriculture<sup>1</sup>, and the third made by the State Road Bureau under the direction of State Road Engineer A. D. Williams, give valuable information regarding some Lewis County stones. The limestone from Camden is probably the Redstone as there is no other in that locality. The sandstones are presumably from the Connellsville, Lower Connellsville or Morgantown horizons, but this definite information is lacking as the tests reported do not supply the geological names or the names of quarries:

### Physical Tests of Stone.

Locality and Stone.	Weight (pounds per cu. ft.)	Absorption (pounds per cu.ft.)	Per cent. of Wear.	French Coefficient of Wear	Hardness.	Toughness.	Cementing Value.
Weston Sandstone ..	165	2.30	4.1	9.8	9.9	7	51
Camden Limestone....	168	1.40	*	*	16.7	15	32
Weston Sandstone ...	165.3	1.55	*	*	4.7	9	277

\*Test not made.

## WATER POWER.

### Available Streams.

No attempt has been made to utilize the streams of Lewis and Gilmer for hydro-electric power, although numerous water-wheel mills have been built along the creeks and some of these are still in operation. The only streams worthy of

<sup>1</sup>Goldbeck and Jackson; Public Roads Bulletin No. 44, Physical Testing of Rock for Road Building, page 89; 1912.

attention for commercial power development are the West Fork River in Lewis and the Little Kanawha, flowing through both Lewis and Gilmer, along both of which plants might be constructed, although conditions are not ideal. No gaging records are available in either county along these streams, but it is certain that the run-off in winter and spring is large, while in the summer and fall it is correspondingly small, making it necessary to build enormous storage reservoirs to equalize the flow. An additional drawback is the fact that these streams run through thickly settled regions, where the bottom lands are of great agricultural productivity and there are many coal seams that would be difficult to mine if the valleys were flooded. An additional drawback would be the distance to convenient markets, without which such projects are unsuccessful, and the further fact that both counties have large quantities of cheap natural gas introduces a competing factor that is not found in most regions where hydro-electric development has proved successful. The most favorable location for such a plant would be in the neighborhood of Wildcat on the Little Kanawha River, where the run-off from both branches of the river could be secured, the flow being more constant here on account of the much larger percentage of forest area in this region, and the damage to abutting property would be the least, because the land is poor.

The following table, showing indicated horse-power developed by streams flowing through Lewis and Gilmer, is compiled from Tables 15, 17 and 18, pages 417, 424 and 425, of the Semi-Centennial History of West Virginia, by Dr. J. M. Callahan, the tables in question being part of a special article on "Water Power Resources" by A. H. Horton, District Engineer, Water Resources Branch, U. S. Geological Survey:

Indicated Horse-Power Developed by Streams Passing Through Lewis and Gilmer Counties.

Stream.	Section.		Length, Miles.	Mean Drain- age Area, Square Miles.	Minimum Dis- charge, Sec.-Ft.	Assumed Discharge for Maximum Development, Sec.-Ft.	Total Fall, Feet.	Minimum Horse- Power.	Assumed Maximum Devel- opment Horse-Power.
	From	To							
West Fork R.....	Source .....	Below Washburn Run .....	22	a105	4	19	500	46	218
West Fork R.....	Source .....	Tygart River.....	70	475	17	88	160	250	1300
Little Kanawha R..	Source .....	Below Right Fork..	21	a98	16	76	1500	552	2620
Little Kanawha R..	Source .....	Bulltown .....	11	115	19	90	200	349	1660
Little Kanawha R..	Source .....	Above Tanner Cree..	31	381	27	214	78	194	1540
Little Kanawha R..	Source .....	Upper Level Dam No. 4.....	60	940	47	528	70	303	3400
Sand and Indian Forks.....	Source .....	Mouth .....	16	a68	11	53	500	127	610
Leading Creek.....	Source .....	Mouth .....	25	a128	21	99	500	242	1140
Cedar Creek.....	Source .....	Mouth .....	32	a84	14	65	600	193	897
Left, Crooked, Right and West Forks..	Source .....	Mouth .....	30	a207	35	161	500	402	1850

a—total area.

## MINERAL WATERS.

No medicinal springs are being exploited in the two counties and none are known to exist. No sulphur springs of any consequence were observed, such as are often found in coal counties. The Alum spring at Alum Bridge, Lewis, previously described under the Lower Pittsburgh Sandstone, page 135, has a strong alum taste, and flows throughout the year, but, so far as known, has not been used as a curative spring.

## FORESTS.

### *Lewis County.*

In Volume V, pages 174-176, of the State Survey Reports, by A. B. Brooks, State Forester, there is a description, both of original timber conditions and present forest conditions, that is of pertinent interest and is here republished, not only to show what timber is now available, but also to show what is likely to thrive, should reforestation be taken up:

#### **"Original Timber Conditions.**

"The original forests of Lewis County were essentially hardwood. Hemlock was never plentiful as in some adjacent counties and other softwoods, such as pitch pine and red cedar, grew only in small scattered clumps. Yellow poplars, oaks, black walnuts, locusts, maples, hickories, beeches, and many other hardwoods grew in every locality. In the fertile valleys of Hackers Creek and West Fork River, the stand of timber was once enormous, as indicated by a few remnants that still remain. The broad meadows of the bottom lands are almost everywhere adorned with magnificent specimens of such trees as black maple, white elm, sweet buckeye and white oak. Along the slow-flowing streams, black willows, sycamores, box elders and many other water-loving trees grow in profusion. These individual trees and small areas of timberland furnish the most reliable and satisfactory information regarding the original forests."

#### **"Present Forest Conditions.**

"There are no extensive virgin or cut-over forests left in the county. Approximately 100,000 acres still remain in forest of some kind, but all or nearly all of this is in small woodlots connected with cleared lands. The farmers in most sections own sufficient timber for domestic use, and in some cases have reserved excellent stands of oak and other hardwoods."



### Areas Suitable for Reforestation.

A large proportion of Lewis is such fine agricultural and grazing land that it is highly improbable that much of it will ever be reforested, as those portions of the county where the Monongahela and upper two-thirds of the Conemaugh Series outcrop are natural blue grass land not excelled in any other part of the State. If the need of reforestation should arise, however, the areas most suitable for this purpose would be that portion along the northwestern edge, covered by the Dunkard Series, and the southeast pan-handle where the lower third of the Conemaugh and the Allegheny and Pottsville Series outcrop, all of which are shown on Map II, and which are of the least value for farming.

#### *Gilmer County.*

In Volume V, pages 139-141, of the State Reports, there is a description of the forests of Gilmer, from which those portions relating to original and present forest conditions are re-published here, as follows:

##### **"The Original Forest Conditions.**

"The county once had a superior hardwood forest. White oak, yellow poplar and black walnut were the most valuable of the predominant hardwoods. The white oak, especially, has been much sought after on account of its freedom from defects and its unusual durability. Chestnut, hickory, beech, basswood, white ash, sugar and red maple, red, black, chestnut and scarlet oak, locust and sycamore were other common hardwoods. White pine is said to have grown on Tanner and Lynch Creeks in the northern part of the county. Hemlock and pitch pine grew in small quantities throughout the county, the former along the streams and in cool ravines, the latter on dry ridges. Red cedar grew in abundance on Cedar Creek and in small quantities in other parts of the county."

##### **"The Present Forest Conditions.**

"There are about 13,000 acres of excellent virgin forest lying in the southwestern part of the county on the waters of the Right Fork of Steer Creek. All of this, except about 1,000 acres, is in the hands of operators who will probably manufacture the white oak found there into staves within the next few years. A tract of 1,700 acres in the northern end of the county comes under the head of cut-over forest. All the rest of the woodland is owned in small scattered boundaries

by farmers. As a rule, the farmers' woodlots have but little merchantable timber."

### Areas Suitable for Reforestation.

The soil of Gilmer is very similar to that in Lewis, being located in what is known as the "Blue grass belt," where this valuable forage crop grows of its own accord when the land is cleared. The northwestern edge of the county, where the Dunkard Series outcrops, is not so rich and could be reforested along the ridges if the need should arise, and there are many steep, stony ridges scattered throughout the county where long strips of woodland could be maintained both for the purpose of providing timber and for preserving the water supply. The Soil Map of the Lewis and Gilmer Area, soon to be published by the U. S. Bureau of Soils, of the Department of Agriculture, in cooperation with this Survey, and to be distributed to those having this volume, will show the areas covered by "Rough Stony Land," and other poor types, where reforestation should best be undertaken.

## CARBON BLACK.

### Description of Plants.

In the vicinity of Weston, there are 6 plants engaged in the manufacture of Carbon Black from natural gas, all of which are supplied by wells in close proximity. These plants were formerly operated by several different companies, but all of them have recently come under the control of the **Columbian Carbon Company**, of Williamsport, Pa., and Weston, W. Va., and are jointly supervised by Messrs. Oscar Nelson and Karl Hoskins, who together with local foremen furnished the following information regarding these factories:

**The Raven Carbon Company No. 1 Plant**, located on the West Fork River, 3.5 miles north of Weston, and 0.5 mile northwest of Butchersville Station, was built in 1909 and makes carbon black for miscellaneous purposes, the capacity being 1,500 pounds daily, 4 men being employed, with an average monthly payroll of \$300.

**The Raven Carbon Company No. 2 Plant**, located on West Run, 1.3 miles south of Jane Lew, was built in 1906, and makes carbon black, the daily capacity, including Sunday, being 1,200 pounds, 3 men being employed, with an average monthly payroll of \$300. According to Arthur Reed, Foreman, a special patented process is in use, and the product of the plant is shipped in all directions.

**The American Carbon Company Plant**, located on Stone-coal Creek, 0.7 mile east of Weston, was built in 1901, and manufactures carbon black for printers' ink, shoe polish and other purposes, the capacity being 2,250 pounds, weekly, the present output being only about half that amount, according to James Riley, Foreman, who reports that 3 men are employed with an average monthly payroll of \$180. This plant uses a channel process in which small gas burners deposit their smoke against iron channels that have a reciprocating movement of about 5 feet on a reversible rack, the black being removed by scrapers over which these channels pass, being then collected in hoppers and carried through pipe to the packing room.

**The Carbon Black Manufacturing Company Plant**, located on the Tunstill farm on Polk Creek, 1.5 miles northwest of Weston, was built about 1904, and has a daily capacity of 30 barrels of carbon black, 3 men being employed with an average monthly payroll of \$200.

**The McDaniel Farm Plant**, of the Columbian Company, located on Polk Creek, 3 miles west of Weston, was built in 1900 and makes carbon black for general purposes, the capacity being 2,700 pounds, daily, 3 men being employed, with an average monthly payroll of \$180.

**The White Plant**, of the Columbian Company, located on the S. A. White farm on Dry Fork of Polk Creek, 2.2 miles southwest of Freemansburg, was built in 1900 and has a daily capacity of 1,800 pounds of carbon black, 3 men being employed with a monthly payroll of \$181.

# PART IV.

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## Paleontology.

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### CHAPTER XIII.

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#### NOTES ON THE PALEONTOLOGY OF LEWIS AND GILMER COUNTIES.

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By W. ARMSTRONG PRICE.

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#### INTRODUCTION.

The following preliminary report on the invertebrate fossils of Lewis and Gilmer Counties contains a summary and table of the faunal horizons known to outcrop in the area, with a description of the content of the fauna of each, as represented by the collections studied, the relationships and differences which the faunas present to each other being pointed out, and finally the stratigraphic range and areal distribution of the fossils listed are given in a table supplemented by a register of the localities in the area under investigation from which fossils were collected.

The beds which were found to contain fossils nowhere reach the surface of the ground within the boundaries of Gilmer County, as was determined by D. B. Reger in his study of the geology of the two counties, nor are fossils known to

exist in adjoining areas in the measures which outcrop in Gilmer County. Hence, the following report applies to that county only on the ground that the buried fossiliferous horizons may be expected to contain much the same faunas as those in the corresponding strata of Lewis County.

As may be seen from the register of localities, several collections obtained from the Ames and Orlando Limestones have not been studied. The fossils contained in the lists in this report are to be described and illustrated in a forthcoming report on an adjoining area, and it is expected that the remaining collections from Lewis and Gilmer Counties will be studied and included in that report. In view of the partial nature of the study of the limestones above mentioned, the differences between the various faunas are somewhat exaggerated and rare species appear to be restricted to one or the other fauna in some cases probably only because a large enough number of collections has not been examined to reveal the true distribution of the shells. It is only after extended and intensive study of the faunas of strata so nearly related in time in the Pennsylvanian System as are those included in the confines of a single series of rocks that differences are to be found which will definitely distinguish one faunule from another. In many instances differences in faunal content accompanying changes in lithologic phase within a formation are as striking as the differences between the faunas of two succeeding fossiliferous horizons. Changes in the character of Conemaugh faunas between areas somewhat removed from each other are likewise perhaps as noticeable as those between the different faunas in a single section.

Most of the localities from which fossils were collected for this report were discovered by D. B. Reger and some collections were made by him alone or in company with the writer.

The accompanying map, Figure 12, shows the progress of the work of describing and illustrating the Pennsylvanian invertebrate fossils of West Virginia to the date of writing.



hibited in their relations to one another, to the limits of the two series, and to various coal beds of the region, in the following table, which is adapted from the general section for the two counties given by Reger:

**Table of the Fossiliferous Members of the Conemaugh and Pottsville Series in Lewis County.**

	Thickness. Feet.	Total. Feet.
1. Coal, Pittsburgh (Monongahela Series).....		...
<b>Conemaugh Series.</b>		
2. Interval .....	250	250
3. Limestone, Orlando, shaly and silicious, sometimes double-bedded, with non-marine fossils.....	3	253
4. Coal, Elk Lick.....	5	258
5. Interval .....	35	293
6. Limestone, Upper Ames, shaly and lenticular, with marine fossils	1	294
7. Shale, Ames, dark green, with marine fossils.....	12	306
8. Limestone, Lower Ames, shaly and lenticular, with marine fossils	1	307
9. Coal, Harlem.....	1	308
10. Interval .....	61	369
11. Limestone nodules, in greenish yellow shale, with <i>Spirorbis pusillus</i>	1	370
12. Interval .....	35	405
13. Coal, Bakerstown.....	3	408
14. Interval .....	34	442
15. Limestone, Pine Creek, shaly, lenticular, with marine fossils in edge of Upshur County.....	1	443
16. Interval .....	29	472
17. Limestone, Brush Creek, dark and lenticular, with marine fossils....	1	473
18. Shale, Brush Creek, black, with plant and marine fossils.....	8	481

	Thickness.	Total.
	Feet.	Feet.
19. Coal, Brush Creek.....	1	482
20. Interval .....	100	582
<b>Allegheny Series.</b>		
21. Interval .....	250	832
<b>Pottsville Series.</b>		
22. Sandstone, Homewood, massive..	50	882
23. Interval .....	105	987
24. Limestone nodules, ferriferous, in sandy shale, with marine fossils..	10	997
25. Shale, Kanawha Black Flint, hard and bony, with marine fossils....	1	998
26. Interval (lower 400 feet entirely below drainage) to base of Potts- ville .....	634	1632

Typically marine fossils were found in the Ames, Pine Creek, Brush Creek and Kanawha Black Flint horizons. Fossils were found in the Pine Creek Limestone only in Upshur County, just across the county line from Lewis, and these were of a broken and fragmental nature, as if the shells had been transported to this point from some more remote home by currents, having been worn by the sand which makes up a large portion of the matrix in which they are now enclosed.

Non-marine fossils were found in Numbers 3 and 11 of the above table. Number 3 has been named the Orlando Limestone by Reger in a preceding Chapter. Number 11, a band of limestone nodules, 35 feet above the Bakerstown Coal, was discovered by the writer in the cut of the Monongahela Valley Railroad at Jackson Mill, but as it is not known elsewhere and has not been traced through the area, no name is given to it.

The following section, measured at Jackson Mill, beginning at the supposed horizon of the Bakerstown Coal, which is here concealed by the fill of the electric railroad, but is exposed along the valley of West Fork River both north and south of the section at a distance of half a mile in either direction, was obtained by the writer with the aid of a hand-level and is given in ascending order:



	Feet.	Inches.
1. Bakerstown Coal, concealed in fill of electric railroad.....	0	0
2. Interval, concealed, grade of electric railroad.....	11	0
3. Shale, sandy, greenish, containing limestone concretions.....	7	6
4. Sandstone, fine-grained, slightly micaceous, lenticular, hard, brown.....	1	6
5. Shale, greenish, weathers in chips.....	6	0
6. Shale, black, weathers in chips.....	1	0
7. Shale, green and yellow, red stains, containing limestone nodules.....	7	0
8. Limestone nodules in shale, like the above (No. 7), but containing <i>Spirorbis pusillus</i> in abundance, Locality 89.....	1	0
9. Shale, yellow and green, sandy.....	6	0
10. Sandstone, yellowish, fine grained, hard, top of cut.....	4	0
11. Interval, concealed in hillside (aneroid barometer measurement).....	65	0
12. Ames Limestone, marine fossils, Locality 90.....	..	..

The lithology of the Orlando Limestone and of the marine limestones has been described by Reger in a preceding Chapter and is not repeated here. However, two localities, one in the Ames and one in the Kanawha Black Flint, are unusually fine places to collect fossils, and the sections as measured by the writer are here given. Also the section of the Pine Creek Limestone where fossils were collected is described.

**Section**, ascending, hand-level, in cut of B. & O. R. R. on north side of Maxwell Run, 0.3 mile from its mouth and 0.6 mile northeast of Deanville, Hackers Creek District, 1050' B., Locality 93:

	Feet.	Inches.
1. Shale, gray, weathered to clay.....	3	0
2. <b>Limestone</b> , green, impure, nodular, marine fossils abundant. <i>Myalina subquadrata</i> , <i>Productus cora</i> , <i>Parallelodon obsoletus</i> , <i>Derbya robusta</i> , crinoid plates and stems, adhering to the under surface of the projecting ledge of limestone and weathered out entire in the talus accumulation at the foot of the section, <b>Ames</b> .....	1	0
3. <b>Shale</b> , green and red, with layers and veins of nodular limestone, marine fossils in lower part, becoming sandy and barren toward top, <b>Ames</b> .....	12	0
4. Sandstone, massive, quarried, top of cut	10+	

Section, ascending, hand-level, southwest bank of Right Fork of Stonecoal Creek, 1.1 miles southwest of Atlas, Buckhannon District, Upshur County, 1170' B., Locality 101:

	Feet.	Inches.
Stream level.....		
1. Concealed .....	2	0
2. <b>Shale</b> , red, marine fossils, <b>Pine Creek</b> ..	1	0
3. <b>Shale</b> , gray, sandy, limy, marine fossils, <b>Pine Creek</b> .....	3	0
4. Sandstone, lenticular.....	1	0
5. Shale, weathers to clay, with joint planes locally filled with calcite deposits	20	0
6. Concealed and shale, pea-sized limestone nodules in upper portion.....	20	0
7. <b>Coal</b> and bone, <b>Bakerstown</b> .....	1	6
8. Concealed, mostly shale, with thin sandstones.....	20	0
9. Sandstone, shaly below, changing to massive above, forming cliff.....	15+	

Section, ascending, hand-level, west bank of Gladly Creek,  
1.1 miles north of Bablin, Collins Settlement District, 1085' B.,  
Locality 106:

	Feet.
Stream level.....	
1. Sandstone, thin-bedded, hard, limestone con- cretions, weathering shaly, with some thick beds.....	13
2. Shale, yellow, slightly sandy.....	4
3. Shale, black, stained yellow, weathers gray...	
4. Coal .....0' 4"	
Shale and bone.....0 8 .....	1
5. Sandstone, hard, black, micaceous and calcare- ous, weathers shaly and crumbles, plant and marine invertebrate fossils abundant, <b>Kana- wha Black Flint</b> .....	1
6. Shale, weathers clayey, containing limestone concretions in layers and bands which are fos- siliferous, both marine and plant fossils, <b>Ka- nawha Black Blint</b> .....	11
7. Concealed .....	17
8. Sandstone, thick and thin beds, visible.....	20

## THE FAUNAS.

### Conemaugh Series.

**Orlando Limestone.**—This fauna has not been studied in the laboratory. From notes made in the field while collecting, the following general description may be given. Fish teeth and scales are abundant and striking. They are of small size and frequently fragmentary. *Naiadites elongata* Dawson is found in association with pelecypoda suggestive of *Edmondia*, which latter have been examined only superficially. Ostracoda and plant remains complete an association of forms which strongly suggests a non-marine origin. The *Edmondia*-like pelecypoda may be marine types, and if so have probably been brought in by currents to a non-marine locality, or the inland forms have been carried out toward the sea.

**Ames Limestone.**—The several divisions of this horizon given by Reger in the general section (see table above) are here discussed as a unit. From the table of Range and Distribution of Fossils, it will be seen that this is the most fossiliferous of all the horizons of the area, both in number of species and number of individuals. Of some 83 species listed, about 47 are found in the Ames, 42 in the Brush Creek, 6 in the Pine Creek, and 23 in the Kanawha Black Flint. The Ames contains 12 brachiopod species, 20 pelecypoda and 6 gastropoda. Half the number of brachiopoda found in the Ames are restricted to it in the collections examined. *Productus cora* is the only one of these which is common. *Productus pertenuis*, *Pustula nebraskensis*, *P. symmetrica*, *Ambocoelia planiconvexa*, and *Lingula umbonata* are rare in the collections, and found only in the Ames. *Ambocoelia planiconvexa* is the only one of the above that is known to be restricted to the Ames elsewhere in the neighboring regions of the State and observations in the field indicate that it is more widespread than as represented in the table. The larger number of brachiopoda should serve to distinguish the Ames from the other horizons.

Eight species of pelecypoda are restricted to the Ames, all of which are rare. *Prothyris elegans* seems to be everywhere found in the Ames when large collections are obtained.

Four of the 6 species of gastropoda found in the horizon are restricted to it. *Bellerophon crossus* var. *ææwokanus* in West Virginia seems to be everywhere found only in the Ames, though not abundant in the collections from Lewis County.

In addition to the species restricted to the Ames, an abundance of *Chonetes granulifer*, rather larger on the average than the same species in the Brush Creek, *Leda bellistriata*, *Deltopecten occidentalis*, and ostracoda seem to be characteristic in Lewis County.

**Limestone Nodules 35 Feet above Bakerstown Coal.**—Only *Spirorbis pusillus* was found, and in only one locality, indicating a local, non-marine fauna.

**Pine Creek Limestone.**—On account of the fragmentary and comminuted condition of the shells only a few species

were identified. Little can be said of the character of the fauna, except that an equal number of brachiopod and pelecypod species, and no other orders, appear, which is well in harmony with the general character of this fauna as observed elsewhere by the writer. No unusual or rare species were found in it. As stated above, it appears that these shells were drifted into this locality, possibly after the organisms were dead, and the habitat of the animals was probably not in the area of the report, though not far distant.

**Brush Creek Limestone.**—A smaller number of brachiopod species than in the Ames, with *Chonetes verneuillanus* common and restricted to it, *Chonetes granulifer* also common and on the average below 10 mm. in length of hinge, though specimens up to 15 mm. are known, with a few rare pelecypoda, and especially the group of *Pleurophorus* species, *Bulimorpha nitidula*, and apparently several other species of rare gastropoda serve to make a fairly distinct fauna. Also the absence of Ames species, such as *Ambocoelia planiconvexa*, and the absence of the greenish limestone beds or nodules, separate it from the Ames. A distinct feature of the Brush Creek is its propensity to be a water-bearing stratum, or at least its susceptibility to leaching wherever the shells are abundant. This makes collecting difficult and tedious and the specimens obtainable are frequently only casts.

#### Kanawha Group (Pottsville Series).

**Kanawha Black Flint.**—From the Conemaugh faunas this assemblage of species differs more markedly than do the former among themselves. Of some 23 species collected from this horizon, one-third are restricted to it. Thirteen species are restricted to the Conemaugh in the area of the report. Of these restricted lots, the following Black Flint species are especially characteristic of the Kanawha Group: *Spirifer boonensis?*, *Orbiculoidea capuliformis*, *Parallelodon sangamonensis*, *Pleurotomaria carbonaria?*. *Chonetes variolatus* differs so slightly from *C. granulifer* that I am inclined to regard it as merely a not too clearly defined variety of the latter. *Derbya robusta* is somewhat more abundant than in the Conemaugh, especially in comparison with the Brush Creek.

While about a dozen species are common to the Brush Creek and Ames and do not occur below the Conemaugh, only three species are common to and restricted jointly to the Brush Creek and the Flint, showing the much closer relationship between the Conemaugh faunas than between the horizons below the Ames. However, about 10 species are common to the Conemaugh and the Flint, showing that the one is either a descendant of the other or that they had a common origin.

Characteristic Conemaugh forms are: *Chonetes verneuillanus*, *Orbiculoidea missouriensis*, *Ambocoelia planiconvexa*, *Derbya crassa*, *Rhombopora lepidodendroides?*, besides rare mollusca.

**Range and Distribution of Fossils of Lewis County.**—Numerals refer to localities from which the fossils were collected. (See **Register of Localities** following.) Abbreviations: "a", abundant; "aa", very abundant; "c", common; "x", the species is either rare or its relative abundance is not known.

	91	93	98	99	100	101	103	104	105	106	Ames.	Brush Creek.	Kanawha Black Flint.
<i>Enchostoma elkensis</i> .....				x								x	
<i>Enchostoma</i> sp. (new).....					x								x
<i>Enchostoma</i> ? sp. (rootlet ?)	x										x		
<i>Spirorbis pusillus</i> , Loc. 89.													
<i>Spirorbis</i> ? sp.....										x			x
<i>Vermes</i> indet. (trails ?)...	x												
Crinoidea (plates and stems)	aa	x		x				x	x		a	c	
<i>Rhombopora lepidodendroides</i> ?		x		x							x	x	
<i>Lingula umbonata</i> .....	x										x	x	
<i>Orbiculoidea missouriensis</i> .	x		x								x	x	
<i>Orbiculoidea capuliformis</i> ..										x	x	x	x
<i>Derbya crassa</i> .....	x	x	x			?			?		x	x	x
<i>Derbya robusta</i> .....	x	x								x	x	x	x
<i>Chonetes granulifer</i> .....	aa	x	x	x				x	x		x	a	c
<i>Chonetes variolatus</i> (cf. <i>granulifer</i> ).....								x	x	x			c
<i>Chonetes verneuillanus</i> .....				x				x	x				c
<i>Productus semireticulatus</i> ..		x								?	x		?
<i>Productus cora</i> .....	c	a									a		
<i>Productus pertenuis</i> .....	x					?					x		
<i>Pustula nebraskensis</i> .....	x	x									x		
<i>Pustula symmetrica</i> .....	x										x		
<i>Spirifer boonensis</i> ?.....										x			
* <i>Ambocoelia planiconvexa</i> ..										x			c
<i>Composita subtilita</i> .....										x			
<i>Composita</i> sp.....						x				x			x
<i>Solenomya radiata</i> .....		x									x		
<i>Solenomya</i> ? <i>anodontoides</i>				x									x
<i>Prothyris elegans</i> .....	x					?		x	x				x
<i>Solenopsis solenoides</i> .....					x			x			x		x

	91	93	98	99	100	101	103	104	105	106	Ames.	Brush Creek.	Kanawha Black Flint.
Chaenomya leavenworthensis										x			x
Edmondia reflexa.....			x	x				x		x		x	
Edmondia sp.....	x					?	x	x	x	x	x	x	x
Nucula anodontoides ?...					x		?	?			x	?	x
Nucula parva.....				x				x			x	x	
Anthraconeilo taffiana.....	x	x						x		x			x
Leda bellistriata.....	x	x									x		
Leda meekana.....	?							x			c		
Yoldia propinqua.....				x	x			x			x		
Parallelodon sangamonensis					x						x		
Parallelodon obsoletus....			a							x			x
Aviculipinna americana....				x							x	x	
Aviculipinna nebraskensis..	x				x						x		
Pseudomonotis hawni.....			x								x		
Myalina subquadrata.....		aa									x		
Schizodus affinis.....								?		x			x
Schizodus ulrichi ?.....					x					x			x
Schizodus wheeleri.....										x			
Deltopecten occidentalis....	?	x					a	?	x		c	?	
Pectinoidea (fragments)....					x								
Allerisma terminale.....					x		x			x	x		x
Pleurophorus occidentalis ?					x					x	x		x
Pleurophorus oblongus.....								x					
Pleurophorus angulatus ?								x					
Pleurophorus ? sp.....								x					
Astartella concentrica....		x					x			x	x		x
Pelecypoda indeterminata..	x		x			x				x	x		
Plagioglypta meekiana ?...				x						x	x		
Bellerophon crassus var. wewokanus.....					c								
Patellostium montfortianum								x					
Euphemus carbonarius ?..									x				x
Bucanopsis perlata.....				x									
Bucanopsis kansasensis....		x											
Pharkidonotus percarinatus.		x						x					
Pharkidonotus percarinatus var. tricarinatus.....													
Phanerotrema grayvillense..				x				x					
Pleurotomaria carbonaria ?										x			x
Sphaerodoma cf. primigenia		y											
Sphaerodoma sp.....										x			x
Bulimorpha nitidula.....				x									
Bulimorpha ? sp.....													
Aclisina swallowana.....								x					
Minute, open-spiraled gas- tropod.....	x												
Gastropoda indeterminata (coils).....		x		x									
Orthoceras sp.....	x									x			
Pseudorthoceras knoxense ?	x												
Tainoceras occidentalis....		x							x				
Nautilloidea indeterminata.								x					
Ostracoda Loc. 94.....	x				aa			x			a		
Eumalcostracean arthropod					x								
Spine ? (origin unknown).								x					
Boring organism.....		x											
Pisces; scale Loc. 94.....													

teeth—Localities 94, 97, 134, 135—Orlando Limestone.

Naiadites elongata Loc. 94.

Non-marine pelecypoda, several species not determined. Localities 94, 96.

\*Locality 90. Noted in the field. Collection not studied in the laboratory.

## Register of Localities.

The following register includes all localities in the county from which fossil collections have been made by the writer, together with the name of the fossiliferous bed outcropping at each locality. An asterisk (\*) denotes the collections which have been studied for this report. A few localities from the adjoining counties of Braxton and Upshur, where collections were made in connection with the work on Lewis County, are also included. Unless otherwise stated, the collections are from Lewis:

- 89\*. Hackers Creek District, in cut of Monongahela Valley Railroad at Jackson Mill, 1050' B., Limestone nodules 35 feet above Bakerstown Coal. Not recognized as a persistent horizon.
90. Hackers Creek District, hillside at Jackson Mill above tracks of Monongahela Valley Railroad, 1125' B., Ames Limestone.
- 91\*. Hackers Creek District, side of road from Jane Lew to Lightburn, and 0.7 mile west of Jane Lew, 1085' B., Ames Limestone.
92. Hackers Creek District, slump at roadside from outcrop 15 feet above road up Hackers Creek, 0.3 mile from mouth of Lifes Run, 1055' B., Ames Limestone.
- 93\*. Hackers Creek District, cut of B. & O. R. R. on north side of Maxwell Run, 0.3 mile from its mouth and 0.6 mile north-east of Deanville, 1050' B., Ames Limestone.
94. Salt Lick District, Braxton County, cut of Coal & Coke Railway at Orlando, north of Oil Creek at mouth of Clover Fork and immediately west of Lewis-Braxton County Line, 794' B., Orlando Limestone.
95. Salt Lick District, Braxton County, summit of knob, 0.7 mile northwest of Orlando, 1400' B., Sandstone near top of Monongahela Series.
96. Salt Lick District, Braxton County, Coal & Coke Railway cut opposite mouth of McCauley Run, 1.4 miles northeast of Burnsville, 780' B., Orlando Limestone.
97. Salt Lick District, Braxton County, Coal & Coke Railway cut 0.5 mile northeast of McCauley Run and 1.75 miles northeast of Burnsville, 785' B., Orlando Limestone.
- 98\*. Collins Settlement District, Coal & Coke Railway cut, 0.15 mile east of Wymer, 1175' B., Brush Creek Shale.
- 99\*. Banks District, Upshur County, Coal & Coke Railway cuts, 1.0 to 1.3 miles east of Jewell, 1397' B., Brush Creek Shale.
- 100\*. Collins Settlement District, roadside 0.2 mile south of Abrams Run School, 1135' B., Ames Shale.
- 101\*. Buckhannon District, Upshur County, Right Fork of Stone-coal Creek, south bank of stream, 1.1 miles southwest of Atlas, 1170' B., Pine Creek Limestone.
102. Skin Creek District, east bank of hollow north of Pringle Run and 0.25 mile northwest of mouth of run at Lewis-Upshur County Line, 1210' B., Ames Shale.



- 103\*. Collins Settlement District, roadside 0.1 mile east of mouth of Sammy Run of Sand Fork of West Fork River, 1105' B., Ames Shale.
- 104\*. Collins Settlement District, roadside, 0.8 mile northeast of Ireland, north side McChord Run at its mouth, 1145' B., Brush Creek Shale.
- 105\*. Banks District, Upshur County, head of Whites Camp Fork of West Fork River, 0.7 mile northwest of Cow Run School, 1620' B., Brush Creek Shale.
- 106\*. Collins Settlement District, west bank of Glady Creek, 1.1 miles north of Bablin, 1085' B., Kanawha Black Flint.
132. Braxton County, Salt Lick District, 1.3 miles west of Ireland, on head of Knawl Creek, in roof shales at coal opening, 1185' B., Ames Limestone. Collection by D. B. Reger.
133. Skin Creek District, 2.8 miles southeast of Georgetown, on Pringle Fork of Stonecoal Creek, in public road, 1200' B., Ames Limestone. Collection by D. B. Reger.
134. Braxton County, Salt Lick District, southeast edge of Burnsville, in public road, north side of Little Kanawha River, opposite mouth of Shreve Run, 762' B., Orlando Limestone. Collection by D. B. Reger.
135. Upshur County, Buckhannon District, 0.4 mile southwest of Atlas, on head of Spruce Fork of Stonecoal Creek, in public road, 1370' B., Orlando Limestone. Collection by D. B. Reger.
136. Braxton County, Saltlick District, 1.8 miles northeast of Knawl, on head of Barbecue Run, in public road, 1120' B., Ames Limestone. Collection by D. B. Reger.
137. Skin Creek District, 1.6 miles northeast of Vandalia, on Hughes Fork of Skin Creek, in public road, 1160' B., Ames Limestone. Collection by D. B. Reger.
138. Braxton County, Salt Lick District, 1.1 miles northwest of Orlando, on Posey Run, in Highway cut, 795' B., Orlando Limestone. Collection by D. B. Reger.

# APPENDIX.

## LEVELS ABOVE MEAN TIDE.

### West Virginia and Pittsburgh Branch of the Baltimore and Ohio Railroad.

Miles from Clarks- burg.	Station.	County.	Eleva- tion. Feet.
17.4	Jane Lew.....	Lewis .....	1020.30
20.2	Fisher Summit.....	Lewis .....	1235.36
22.5	Fair Ground.....	Lewis .....	1027.86
23.0	Deanville .....	Lewis .....	1025.40
23.9	Macpelah Junction.....	Lewis .....	1021.80
24.4	South Penn Oil Co.....	Lewis .....	1026.06
24.8	Weston .....	Lewis .....	1025.81
25.6	Crescent Window Glass Co.....	Lewis .....	1036.96
27.8	Brownsville .....	Lewis .....	1038.00
31.7	Rohrbough .....	Lewis .....	1043.00
36.8	Roanville .....	Lewis .....	1067.90
38.8	Arnold .....	Lewis .....	1107.90
41.5	Peterson .....	Lewis .....	862.40
43.2	Bennett .....	Lewis .....	817.40
45.1	C. E. Vandevender Lumber Siding..	Lewis .....	790.40
45.5	Orlando .....	Lewis .....	782.00
49.9	Burnsville .....	Braxton .....	775.90

### Pickens Branch of the Baltimore and Ohio Railroad.

Miles from Macpelah Junction.	Station.	County.	Eleva- tion. Feet.
5.3	Gaston .....	Lewis .....	1052.00
6.3	Horner .....	Lewis .....	1048.00
11.3	Lorentz .....	Upshur .....	1446.00
15.5	Buckhannon .....	Upshur .....	1411.00

### Coal and Coke Railway.

Miles from Charles- ton.	Station.	County.	Eleva- tion. Feet.
109.0	Gilmer .....	Gilmer .....	762
110.7	Hyers .....	Braxton .....	759
113.8	Burnsville .....	Braxton .....	780
118.0	Orlando .....	Lewis .....	782
122.1	Chapman .....	Lewis .....	787
125.5	Jacksonville Tunnel No. 10.....	Lewis .....	1126
126.6	Emmart .....	Lewis .....	1086
128.1	Walkersville .....	Lewis .....	1092
129.2	Crawford .....	Lewis .....	1104
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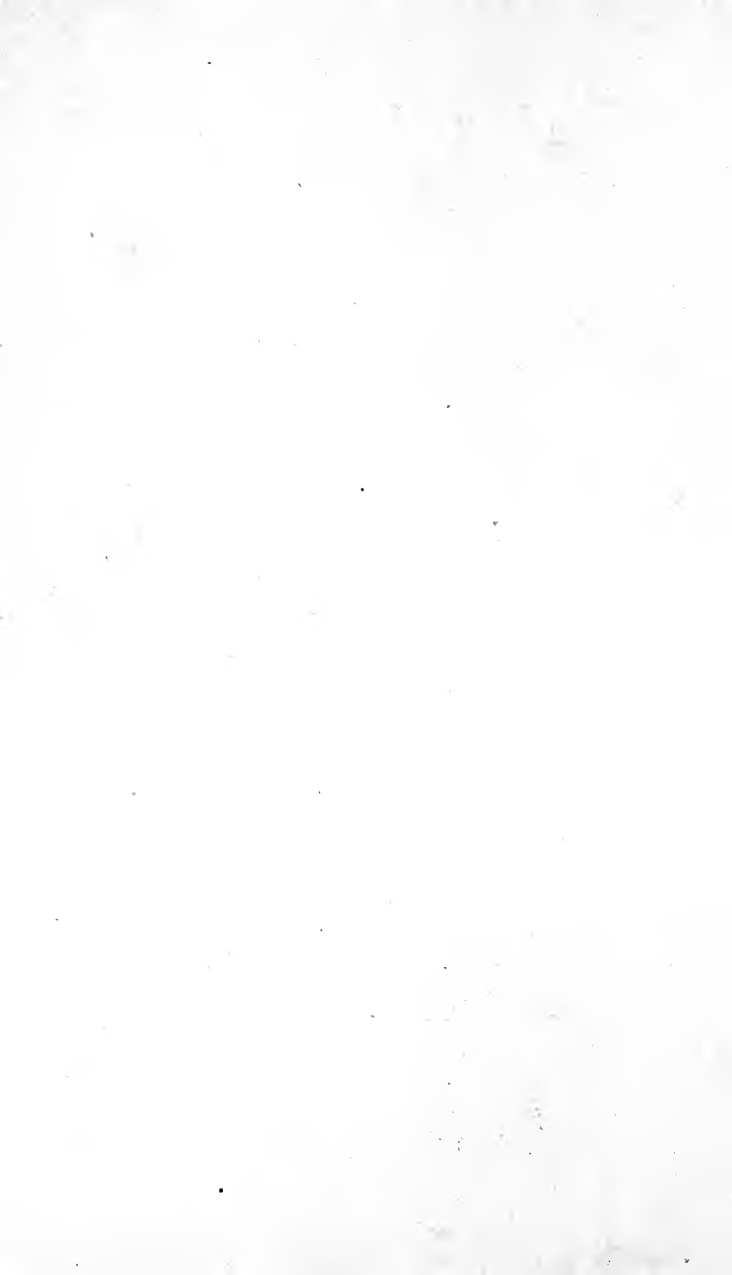
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