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# GEOLOGICAL SURVEY OF KENTUCKY

JOHN R. PROCTER, DIRECTOR.

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## REPORT

—ON THE—

### GEOLOGY OF PARTS OF JACKSON AND ROCKCASTLE COUNTIES,

WITH MAP.

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BY GEO. M. SULLIVAN.

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## INTRODUCTORY LETTER.

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HON. J. R. PROCTER,

*Director Kentucky Geological Survey:*

SIR: The accompanying report on the Jackson county region, prepared by Assistant G. M. Sullivan, in accordance with your instructions, may be regarded as a continuation of that part of the report on Whitley and Pulaski which relates to the conglomerate measures or the Rockcastle Group of these counties.

To extend the work in this belt to Menefee county, on which a report has already been published, will add a report on parts of Lee, Estill, Wolfe and Powell, for which the map is yet wanting.

The map prepared for this report by J. B. Hoëing is drawn from the notes of Mr. Sullivan.

Very respectfully,

A. R. CRANDALL.

*Prof. A. R. Crandall:*

DEAR SIR: I herewith submit to you a preliminary report on those parts of Jackson and Rockcastle counties visited by me during the summer of 1889. As there have been but few openings made in the coals of this region, and as those that have been made are necessarily distant from each other, the data obtained falls somewhat short of complete exhibit of the value of the beds; but will, in a more general way, serve to indicate their place and character.

Very respectfully,

GEO. M. SULLIVAN.

LEXINGTON, KY., July 1, 1891.

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## JACKSON COUNTY.

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The region covered by this report consists of parts of Jackson and of Rockcastle counties. The sections of Jackson visited lie on Horselick creek and its branches, Indian creek and branches, and on South and War Forks of Station Camp. Jackson county, which was formed out of portions of Madison, Estill, Owsley, Clay, Laurel and Rockcastle counties in 1858, and named in honor of General Andrew Jackson, lies on the western border of the coal field of Eastern Kentucky. It is situated between Madison and Estill counties on the north, and Laurel on the south, Lee and Owsley on the east, and Rockcastle on the west. The county line on the north, beginning near Cox's store, runs a northeastward course to the line of Estill, crossing the branches of Red Lick, and not following any main divide; on the east it follows the dividing ridge between War Fork of Station Camp and Sturgeon to the head of War Fork, then the dividing ridge between the waters of Middle Fork of Rockcastle river and Sturgeon; on the south it meanders with South Fork of Rockcastle river, on the west, with Horselick to Wolfpen branch; then follows the spur between Wolfpen and Trace branches to the old State road, following this to the beginning of northern line.

Jackson county has an approximate area of about 470 square miles or 300,800 acres. The population in 1880 was 6,678, and by the census of 1890, 8,261, showing an increase of about 23 per cent. In the drainage of this county, two great systems are represented, the Cumberland and the Kentucky rivers. The Rockcastle and its tributaries, representing the Cumberland system, drain all of the county but the northeast quarter, which is drained by the South and War Forks of Station Camp, a part of the Kentucky river system.

## GEOLOGY.

The geological series of Jackson includes the Waverly shales and sandstones, the St. Louis limestone, the Chester shale and limestone, the Conglomerate formation with its coal-bearing shales, and a hundred feet or more of the coal measures above the Conglomerate. The Waverly shows in outcrop only on the South and War Forks of Station Camp and some of their branches. Near mouth of South Fork, at Drip Rock P. O., it has thickness of 125 to 150 feet, but goes below drainage about fifteen miles above this place. On War Fork, the Waverly goes below drainage about three miles above the mouth. The St. Louis limestone crops out along the streams in the northern, northeastern and central portions of the county. In the northern part of the county 100 to 125 feet of it is exposed; but dipping south-southeast, it goes below drainage on Horselick creek, about nine and one half miles from mouth, near mouth of Raccoon creek. In the northeastern part it is exposed from the source to the mouth of South Fork of Station Camp, a distance of about twenty-five miles. At Drip Rock P. O., its total thickness is 225 to 250 feet. This limestone formation extends up the War Fork about six miles before going below drainage. In the central part, its greatest exposed thickness, 50 to 75 feet, is on Indian creek, about five miles below McKee. It extends down Indian creek to its mouth; then down the Middle Fork about two miles before going below drainage. This group also crops out on Outen and Birchlick branches of Indian creek. It extends up Birchlick four miles before going below drainage. The St. Louis group in this region is cavernous; there being many caves, some of them of considerable extent. The creeks in many places, where their beds have been cut in this rock, have underground channels, the surface channel being dry except at times of high water. This is the case on the upper waters of South Fork and the lower of War Fork of Station Camp, and on parts of Horselick. The upper 25 to 50 feet of this group, as noted in this region, generally contains many flint concretions, which would make it useless for economic purposes. The remainder is a hard and close-grained whitish limestone, some of the strata breaking with conchoidal fracture. This, in all prob-

ability, would make an excellent quality of lime. No sample of this stone was taken for analysis. The Chester group, as showing in outcrop, consists of 15 to 30 feet of reddish brown and greenish shales, with bands of argillaceous limestone intermixed. This group occurs on South Fork of Station Camp near top of Big Hill, where it is rich in Pentremites and other fossil remains. It is exposed on Dry Fork of Horselick, near Goochland P. O., at McKee, which is at the top of it, and at the France's place, on old State road, where there is 10 to 20 feet of shaly sandstone between it and the St. Louis group.

The Conglomerate sandstone is found throughout this entire region, with the exception of the southwest corner. At McKee it has a thickness of about 300 feet. This group consists, for the most part, of thick sandstone ledges, alternating with beds of shale, in which the coals of this region are found.

These sandstone ledges are principally a hard, coarse-grained rock, the "Hailstone Grit" or true Conglomerate occurring only locally. In the southwest corner, on Pond and Moore's creeks, the coal measure shales above the Conglomerate are found capping the low hills; but no work has been done in this section, as yet, to ascertain the areal extent of this group, or to develop the coals of this part of the upper series.

At "High Rock," a point on Horselick creek, about ten miles from the mouth, there is a feature in the relation of the Conglomerate to the St. Louis formation not noted elsewhere in this region. Here, in the St. Louis limestone, a channel has been eroded to a depth of 50 to 60 feet, which has been refilled by true Conglomerate. The width of this channel has not been accurately determined, its course not being shown; but it is apparently 100 to 150 yards wide. No intervening shales are here found, and the first coal seam is above the cliff. The St. Louis group is exposed along the creek below unbroken.


### COALS.

The lowest coal in this region is the bed known as the cannel coal bed. It is found at a distance varying from 5 to 30 feet above the St. Louis limestone. This seam has been opened in a number of places, and proves, from these openings, to be a

bed of variable thickness. It has been opened at Jack Jones's, on Big Clover branch of Horselick, 15 feet above the St. Louis limestone, and shows, for thickness, 13 inches of cannel coal on top of 8 to 12 inches of common coal. On Horselick, at High Rock, this bed crops out in the branch, on T J. Ballard's land, 25 feet above the limestone. It was so badly covered here that it could not be measured, but thickness was reported, as remembered by Mr. Ballard, to be 18 inches of cannel coal on top of 12 to 18 inches stone-coal. On Horselick, near mouth of Raccoon, this seam rests immediately on the Chester group, and shows only 6 inches of cannel coal over 12 inches of common coal.

About one quarter of a mile above last, on Horselick, there is a coal opened 15 feet above the limestone, which shows thickness as in following section. This bed occupies the horizon of the cannel coal at this point.

A sample cut near outcrop gave the following results on analysis:

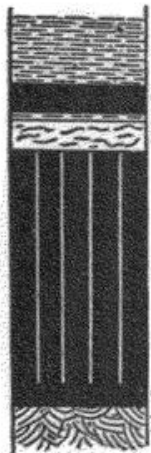
	<p>Sandstone Shale 3"</p> <p>Coal 36"</p> <p>Jack Carpenter Coal Horse Lick Cr.</p>	<table border="0"> <tr> <td>Moisture . . . . .</td> <td style="text-align: right;">3.60</td> </tr> <tr> <td>Volatile combustible matter . . . . .</td> <td style="text-align: right;">33.20</td> </tr> <tr> <td>Carbon in coke . . . . .</td> <td style="text-align: right;">56.80</td> </tr> <tr> <td>Ash . . . . .</td> <td style="text-align: right;">6.40</td> </tr> <tr> <td>Sulphur . . . . .</td> <td style="text-align: right;">0.494</td> </tr> </table>	Moisture . . . . .	3.60	Volatile combustible matter . . . . .	33.20	Carbon in coke . . . . .	56.80	Ash . . . . .	6.40	Sulphur . . . . .	0.494
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Sulphur . . . . .	0.494											

An opening on Phillips' branch of Horselick, 30 feet above the limestone, shows a thickness of 22 inches.

At Ballard's opening, on the land of the W. H. White heirs, on Dry Fork of Horselick, this bed has a thickness of 45 inches as in cut below. This opening has been worked on a small scale, and the output hauled to Richmond, Madison county, Kentucky, where it commanded a good price. But as the distance from market is great and the roads bad, it has been abandoned as unprofitable. It was worked on the old plan of stripping and prying up the coal. This is an excellent can-



nel coal, as will be seen by analysis and comparison with other well known cannel coals :

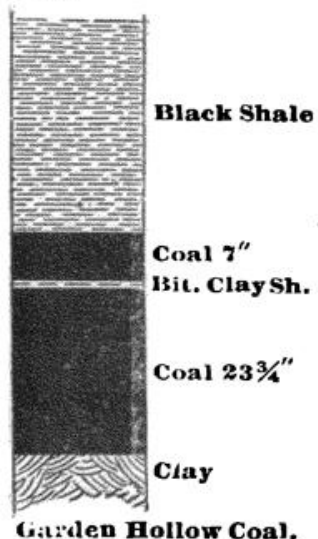
 <p>Shale Coal 4" Bit. Sh. 1" Sandstone 4"  Cannel Coal 33"  Coal 3" Bit. Clay</p> <p><b>Ballard's Cannel Coal Dry Fork Horse Lick.</b></p>		Ballard coal . . . .	Mud Br. Cannel, Big Clear Creek, Bell County . . . .	Haddock's Creek Cannel, Breathitt County . . . . .	Quickland Can- nel, Breathitt County . . . . .
Moisture . . . . .	1.80	1.00	1.30	2.10	
Vol. combust. matter	42.40	51.60	47.00	43.10	
Carbon in coke . . . .	46.60	40.40	44.40	43.36	
Ash . . . . .	9.20	7.00	7.30	11.44	
Sulphur . . . . .	0.645	0.739	1.574	4.609	

If, on further investigation, the area should prove to be extensive, this bed would be of marked economic value to this region. On Indian creek, this bed has not been opened in section visited. The stain of a coal shows 15 to 20 feet above the limestone, on Outen branch of Indian creek, which may be referred to this horizon.

On Birchlick branch of Indian creek, in the road near school-house, there is a stain 10 feet above the limestone, which may also be referred to this horizon. But neither of the last two stains indicate cannel coal. On Bill's branch of Indian creek, near McKee. 15 to 20 feet above the Chester group, there is a coal 8 to 12 inches thick. On War Fork of Station, at the mouth of Turkey Foot branch, this coal has been partly opened on Neil Isaac's land. Here it is 35 feet above the St. Louis limestone, and shows the following thickness on outcrop: 6 to 9 inches of cannel slate above 21 inches of soft coal. On Turkey Foot branch near last, and also on Mr. Isaac's land, there is an outcrop of this same bed, which, from general appearance, is much better than the opening at the mouth of the branch. The outcrop was so badly covered that the whole face could not be measured, which Mr. Isaac's reports, as he remembers it, to have been about 36 inches of soft coal.

At Sharp's store, near head of South Fork of Station Camp, there are several openings in a coal at the horizon of the cannel coal bed. None of these show a workable thickness. One

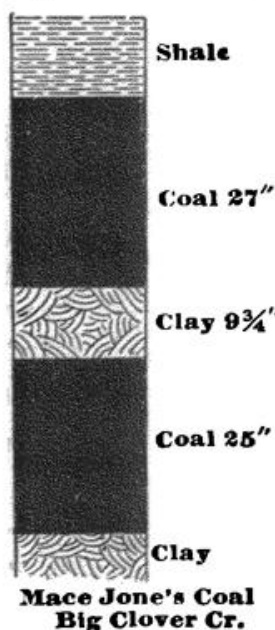
opening, made by Mr. Sharp, has an entry driven in about 100 feet; but the coal is thin, there being only 2 inches of cannel coal over 8 to 10 inches of soft coal, with thin clay parting between. There is a peculiarity of the under-clay of this opening not seen elsewhere; zinc and lead sulphides with Barite are disseminated through it, but not in any available quantity.



The next seam of any importance is the one 45 to 60 feet above the St. Louis limestone. Openings at this horizon have been made at a number of places, and show a thickness varying from 12 to 52 inches.

On Dry Fork of Horse lick, 50 feet above the limestone, there is a coal which shows a thickness of 12 inches. At Geo. Privit's, on Garden Hollow branch of Big Clover creek, 50 to 60 feet above the limestone, there is a bed of coal opened in two places, one having a thickness as in the accompanying section.

On Big Clover creek, at Mace Jones's, this bed has been opened 45 feet above the limestone, and shows thickness as in the following section. This opening is known as the Mace Jones bank, and was made by Mr. McGuire, of Goochland P. O.



Sample was taken from the weathered outcrop, which gave the following results on analysis:

Moisture . . . . .	3.20
Volatile combustible matter . . . . .	32.10
Carbon in coke . . . . .	51.70
Ash . . . . .	13.00
Sulphur . . . . .	0.480

The percentage of ash will probably be somewhat reduced when the opening is driven to firm coal. On Gravel Lick, near Thos. Alcorn's store, about 60 feet above the limestone, there is an opening which shows a thickness of 23 inches. At top of Big Hill this bed has been opened in a number of places and worked to some extent. Here it is 45 feet above the St. Louis limestone, and has thickness of 36 inches.

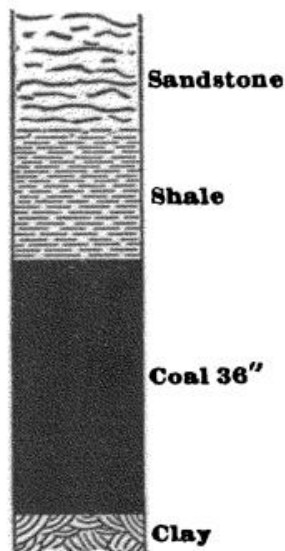
A sample from Cox's opening, top of Big Hill, gave the following results on analysis :

Moisture . . . . .	2.66
Volatile combustible matter . . . . .	33.68
Carbon in coke . . . . .	56.16
Ash . . . . .	7.50
Sulphur . . . . .	0.824

At Judge Martin's on Horselick, a coal was formerly opened 35 feet above the St. Louis group, but is now fallen in and covered. The thickness was reported 30 to 36 inches. On Outen and Birchlick branches of Indian creek, openings have been made in a coal at the horizon of the second bed. On Outen, it has the following bed section : 24 inches cannel slate, 2 inches shale, and 10 inches splint coal. Here it is 40 feet above the limestone.

On Mayapple branch of Birchlick, it is 30 feet above the limestone, and has thickness of 30 inches, the roof being cannel slate. Further up Birchlick, on Hurst branch, at same elevation as last above the limestone, it shows a thickness of 23 inches only.

At an elevation of 75 to 95 feet above the St. Louis group, is the next bed of economic importance. The principal opening of this seam is in the vicinity of McKee. The opening which has been worked here principally, is situated on Bill's branch of Indian creek, about 1 mile above McKee, and 95 feet above the Chester group. It is known here as the Dickson and Harrison bank. At the head of the main entry, which is driven in 75 to 100 feet, the thickness is 36 inches. An opening in same bed across valley from last has thickness of 31 inches only.



Dickson & Harrison Coal McKee.

A sample taken from head of entry gave the following results on analysis :

Moisture . . . . .	3.40
Volatile combustible matter . . . . .	36.60
Carbon in coke . . . . .	57.70
Ash . . . . .	6.30
Sulphur . . . . .	1.648

At Jake Gabbard's, two miles below McKee, on Indian creek, near the mouth of Outen creek, this bed has been opened 90



**Jake Gabbard's Coal**  
Indian Cr.

feet above the limestone. At outcrop it has thickness as shown in following section. The sample cut from the badly weathered outcrop gave the following results on analysis :

Moisture . . . . .	4.60
Volatile combustible matter . . . . .	27.30
Carbon in coke . . . . .	58.10
Ash . . . . .	10.00
Sulphur . . . . .	0.522

The percentage of ash will, in all probability, be somewhat reduced when opening is driven to firm coal.

Near head of Turkey Foot branch of War Fork, on Capt. Wilson's land, there is a coal opened at this horizon. Here it



**Capt. Wilson's Coal**  
Turkey Foot.

is 75 feet above the St. Louis limestone, and has a thickness of 41 inches, as in the following section.

A sample taken from hard coal near outcrop gave the following results on analysis :

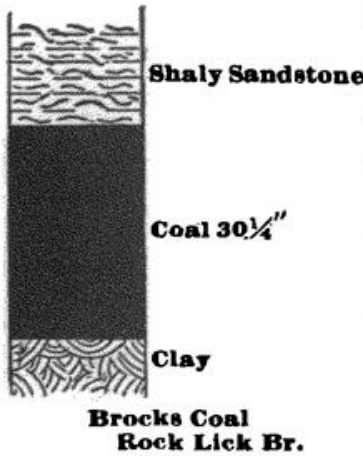
Moisture . . . . .	4.40
Volatile combustible matter . . . . .	36.60
Carbon in coke . . . . .	55.90
Ash . . . . .	3.10
Sulphur . . . . .	1.098

On Big Clover creek, 95 feet above the limestone and 50 above the Mace Jones coal, this bed crops out under a sandstone ledge. It has not been opened here, and shows only 12 to 18 inches in outcrop. An opening on Sugar Camp branch of Horselick, 75 feet above the limestone, has a thickness of 17 inches.

At Judge Martin's the stain of this coal outcrops 85 feet above the limestone. This bed, so far as noted, occurs under the second heavy sandstone ledge of this region.

At an elevation of 120 to 160 feet above the St. Louis group, a bed of coal has been noted in several places. It varies from 27 to 30 inches in thickness. On Dry Fork of Horselick, near

Si. Carpenter's, it is 27 inches thick. Here it is 160 feet above the limestone. Near last, on Spicelick branch, this seam is opened 160 feet above the limestone, and has a thickness of 27 inches. This coal has been opened by Shelton Brock on Rock



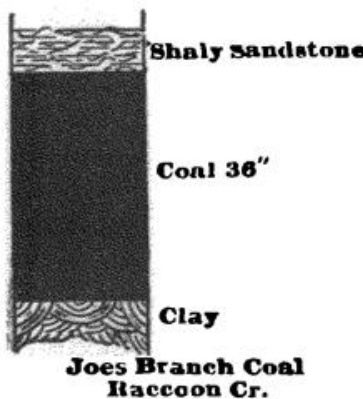
lick branch of Big Clover creek, 150 feet above the limestone, and shows a thickness of 30 inches soft coal, as in the following section.

A sample from outcrop gave the following result on analysis:

Moisture . . . . .	1.70
Volatile combustible matter . . . . .	35.10
Carbon in coke . . . . .	58.56
Ash . . . . .	4.64
Sulphur . . . . .	0.824

An opening on Pigeon Roost branch, one mile above McKee, has a thickness of 28 inches. Here it is 125 feet above the Chester group. This opening has been worked to some extent for local use around McKee, the entry being driven in about 50 feet. At John Marcum's, on Mash branch, near head of Birchlick, this coal is opened 150 feet above the limestone, and has a thickness of 29 inches.

Under the third heavy sandstone ledge, and at a height of 185 to 200 feet above the St. Louis group, the next coal of economical importance is found. All of the openings in this bed visited were on the waters of Horselick. On Joes branch of Raccoon creek, Mr. T. J. Ballard has opened this bed about 200 feet



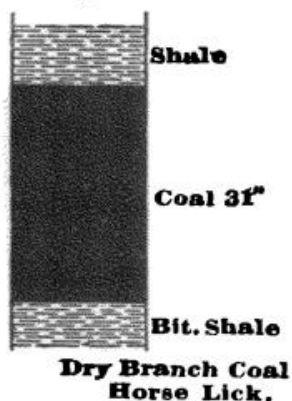
above the limestone. Here it is 36 inches thick, as in the section below.

An outcrop sample gave the following on analysis:

Moisture . . . . .	1.70
Volatile combustible matter . . . . .	37.60
Carbon in coke . . . . .	49.10
Ash . . . . .	11.60
Sulphur . . . . .	2.307

Near head of Stone Coal Lick, about one mile from last, this bed crops out in the bed of the creek. It is same height above the limestone, and has the same bed section as last. At the

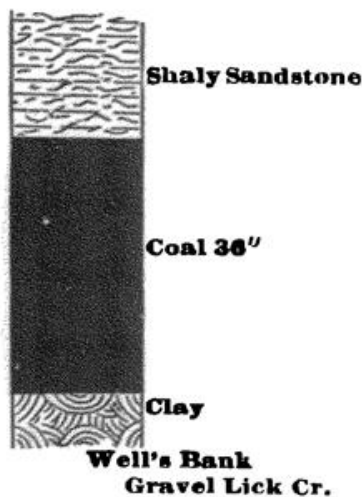
head of Dry branch of Horselick, Mr. Ballard has opened this bed; here it is 215 feet above the limestone, and has thickness of 31 inches. See section.



An analysis of sample cut near outcrop gave the following results on analysis :

Moisture . . . . .	1.80
Volatile combustible matter . . . . .	42.40
Carbon in coke . . . . .	46.60
Ash . . . . .	9.20
Sulphur . . . . .	0.645

This seam is opened on Gravel Lick branch of Big Clover. Here it is near the top of the mountain, and about 200 feet above the St. Louis limestone. The thickness is 36 inches, as in the following section.



A sample from whole face of outcrop on analysis gave the following :

Moisture . . . . .	3.20
Volatile combustible matter . . . . .	32.80
Carbon in coke . . . . .	55.80
Ash . . . . .	8.20
Sulphur . . . . .	0.782

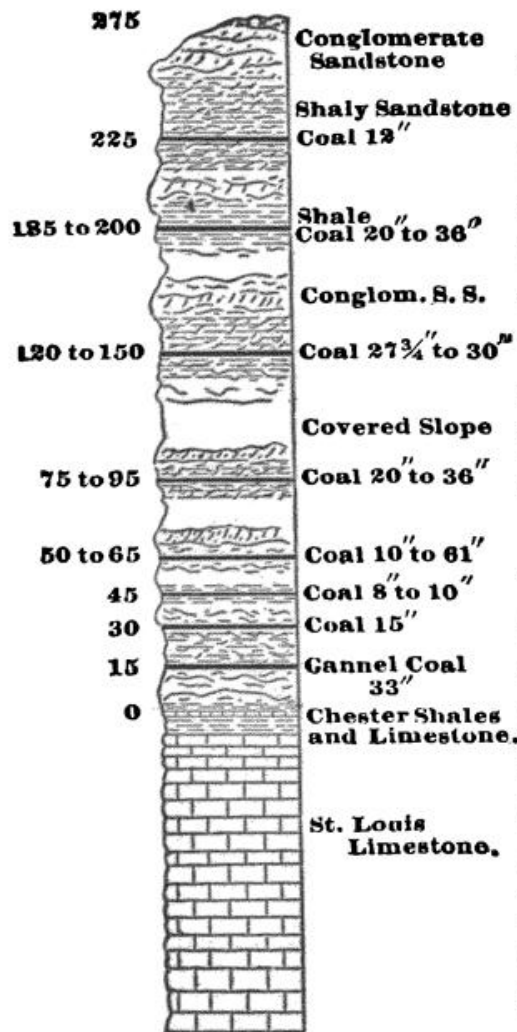
These four openings of this bed are in the main divide between Horselick creek and Middle Fork of Rockcastle river. On the opposite side of Gravel Lick from the Wells' bank, and near Sand Gap, this bed was formerly opened and worked, but is now abandoned, and so badly covered that it could not be examined.

On Phillips's branch of Horselick, about 200 feet above the limestone, this coal is opened in two places, being 18 inches at one and 21 at the other. The last coal noted in this region is 250 feet above the St. Louis group. It is opened near T. J. Ballard's, on the old State road, where it is 1 foot thick.

While some of the beds of this region have a large workable area, it will be seen, by comparing the openings made in different localities, that they are not altogether regular; and that, to some extent, they are local.

The position and general relation of these coals are shown in the following general approximate vertical section.

IRON.



GENERAL SECTION,  
Jackson & Rockcastle  
Counties.

Iron occurs in this section as thin bands of Siderite ore, and, at some points, as Limonite kidney-shaped concretions. These bands and concretions are found in the shale beds principally. Nowhere, so far as seen, are they of any great thickness, the bands being only a few inches thick, and the few kidneys distributed vertically through a considerable thickness of shale.

The ore bands were noted at three horizons: The first, about 50 feet above the St. Louis limestone; the second, about 100 to 110 feet above the limestone; the third is 200 to 225 feet above the limestone. Near the mouth of Little Clover creek of Horselick, pieces of yellow ocherous clay occur in the drift 40 to 50 feet above the limestone, but no work has been done to ascertain the amount present.

On top of many of the spurs, pieces of impure ore are found which has weathered out of the shales and shaly sandstones that formerly capped the hills at these points. Although present, sometimes in quantities, these drift pieces are not, as is sometimes supposed, indicative of iron in any great abundance.

TIMBER.

The timber of this region consists of both the hard and soft varieties. Among the hard woods the following are found:

White Oak (*Quercus alba*).

Mountain Chestnut Oak or Tan-bark Oak (*Q. Prinus*, var. *monticola*).

Red Oak (*Q. rubra*).

Black Oak (*Q. tinctora*).

Blackjack Oak (*Q. nigra*).  
 Pignut Hickory (*Corya glabra*).  
 Shellbark Hickory (*C. sulcata*).  
 Beech (*Fagus ferruginea*).  
 Sugar Maple (*Acer sacharinum*).  
 Black Birch (*Betula lenta*).  
 Iron Wood (*Ostrya Virginica*).  
 Locust (*Robinia pseudacacia*).

Among these, the White Oak and Chestnut Oak are the most abundant.

The soft woods consist of the following :

Yellow Poplar or Tulip Tree (*Liriodendron tulipifera*).  
 Ohio Buckeye (*Aesculus glabra*).  
 Chestnut (*Castanea pumilla*).  
 Sourwood (*Oxydendrum arboreum*).  
 Sassafras (*Sassafras officinale*).  
 Yellow Pine (*Pinus mitis*).  
 Linden or Basswood (*Tilia heterophylla*).  
 Spruce Pine, Hemlock (*Abies Canadensis*).

The Chestnut is the most abundant of these. Much of the Poplar has been cut, especially along the large streams.

Many smaller trees and shrubs are also found, among which are the Flowering Dogwood (*Cornus florida*), Holly (*Ilex opaca*), Redbud (*Cercis Canadensis*), Service Berry (*Amelanchier Canadensis*), Persimmon (*Diospyros Virginia*), and the Kalmias.

The Fox Grape (*Vitis vulpina*), and the Winter or Frost Grape (*V. Cordifolia*), are found. The Service Berry and the Persimmon are abundant.

The topography of this region is characterized by narrow, and, in many places, cliff-bound valleys. The arable land is, principally, on the slope or hill-side, as but few of the spurs are of any great width. The ridge known as Big Hill, beginning at the northern boundary of the county and extending in a S. S. E. course to its southern limit, a distance of eighteen miles, is, at many points, sufficiently broad for small farms. The soil is a sandy loam of average productiveness after the vegetable mould of the forest becomes exhausted. The adaptation to fruit-growing is shown by orchards bearing abundantly



without special care. In the valleys and on the slopes, where the limestone is in part the source of the soil, are found the best pasture lands. The Blue Grass appears to take root and grow well on this formation.

References to former reports relating to Jackson county are as follows:

Topography and General Geology, "Owen's Reports," vol. IV, report of Joseph Lesley, pages 479-81.

Soils and Coal, same vol., chemical report of Dr. Robert Peter, pages 186-9.

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## ROCKCASTLE.

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Rockcastle county was formed in 1810, from parts of Lincoln, Pulaski, Madison and Knox counties. It was named for the Rockcastle river, which borders it on the southeast. The eastern and southern parts of this county lie on the western border of the Eastern Kentucky coal field. It is situated between Garrard and Madison on the north, Laurel and Pulaski on the south, Jackson on the east, Pulaski and Lincoln on the west.

By the census of 1880, the population was 9,670; by census of 1890, 9,841. An approximate area is 375 to 400 square miles or 256,000 acres. The section visited lies between the Jackson county line on the east and the Kentucky Central Railroad on the west, and is drained by tributaries of the Rockcastle river.

Roundstone creek, which rises at the northern limit of the county, and its branches (Crooked creek, Brush creek, Clear creek, &c.), drain all of this region except the southern part, this being drained by Gauly and White Oak creeks and their branches.

### GEOLOGY.

The geological series noted in this section are the Waverly shales and sandstones, the St. Louis limestone and the Conglomerate formation with its coal-bearing shales. The series, here, correspond for the most part, with the series noted in

Jackson. The Waverly group crops out on Roundstone, near Mullin's or Withers' Station, Kentucky Central Railroad, and extends up stream to its source at Boone's Gap, where most of the hills consist of this formation. At Muellersville, on the Kentucky Central Railroad, there is a fine building stone found in this group, which is worked for use in Cincinnati and other points.

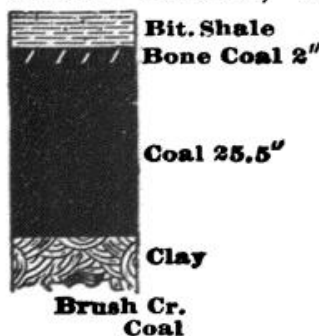
The St. Louis limestone outcrops along Roundstone and its branches, none being found on White Oak creek of Horselick, or on Gauly creek of Rockcastle river in the southern part of the region. There is an outcrop in the Rockcastle river two miles above Livingston, but this is due to the fault which occurs here. On Brush creek this series is 200 feet thick, and on Crooked creek, below W. D. McGuire's coal opening, it is 210 feet. The character of the group in this region is the same as in Jackson.

The Conglomerate formation, in the northern and central portions of this region, tops the limestone hills, and varies from 45 to 100 feet in thickness. In the southern part, the entire mountain above drainage consists of this formation, it being 150 to 250 feet thick. Much of the Conglomerate, in this region, consists of the "Hailstone Grit," the ledges of sandstone being very thick and the quartz pebbles large.

### COALS.

The coals are interglomerate like those of Jackson county, with which they correspond for the most part.

The cannel or the lowest bed has not been developed in this region so far as seen. On Brush creek, one mile from Brush Creek station, Kentucky Central Railroad, a coal has been opened about 60 feet above the St. Louis group, and shows a thickness as in section.






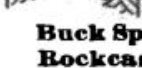
This opening is immediately above a thick hailstone grit ledge, and at the horizon of the second coal of importance in the Jackson series. The grit ledge is similar to the one which is found at Livingston, over which there

is also a coal.

On Crooked creek a coal has been opened by W. D. McGuire, 75 feet above the limestone series and 285 feet above the bed of

the creek. The entry has been driven in about 100 feet, and shows a thickness of 36 inches as in the following section.

A sample, cut 25 feet from mouth of entry, gave the following results on analysis :

	Shale	Moisture . . . . .	3.80
		Volatile combustible matter . . . . .	31.00
		Carbon in coke . . . . .	56.20
		Ash . . . . .	9.00
	Coal 28"	Sulphur . . . . .	0.412
<p>On Brush creek, this seam has been opened by Mr. Clark 85 feet above the St. Louis group, 375 above the bed of the creek, and within 75 of the top of the hill. Here it has thickness of 52 inches as in section below. The entry is driven in about 50 feet, from the head of which a sample was taken that gave the following results :</p>			
	Shale	Moisture . . . . .	4.40
		Volatile combustible matter . . . . .	31.00
	Bony Coal 2"	Carbon in coke . . . . .	60.20
		Ash . . . . .	4.40
		Sulphur . . . . .	0.494
<p>On Rockcastle river, two miles above Livingston, on Widow Griffith's land, there is an opening about 75 feet above the limestone. At outcrop it has thickness as shown in the following section.</p>			
	Bit. Shale		
	<p>A sample taken from the outcrop gave the following results on analysis. This bed is known as the Spievy coal :</p>		
	Shale	Moisture . . . . .	4.20
		Volatile combustible matter . . . . .	33.70
		Carbon in coke . . . . .	55.90
	Ash . . . . .	6.20	
Coal 33"	Sulphur . . . . .	0.968	
<p>At Jack Sam's, on Trace branch, there is a coal in the bed of the creek which probably may be the same bed as the Spievy coal. The outcrop was so covered with water and drift that</p>			
	Clay		
	<p>McGuire's Coal Crooked Cr.</p>		
<p>Clark's Coal Brush Cr.</p>			
<p>Buck Spievy Coal Rockcastle Riv.</p>			

measurement was not made. The thickness was reported by Mr. Sams to be about 30 inches. In Barnett's valley, it outcrops 75 feet above the St. Louis series. On Ballard's Spring branch, there is an opening 95 feet above the limestone. This shows a thickness of 18 inches. This bed, which is 75 to 95 feet above the St. Louis group, is at same horizon as the third bed of importance in the Jackson series.

Near Mullin's Station, Kentucky Central Railroad, an opening has been made by Mr. Welsh, of Pine Hill. It is 180 feet above the St. Louis group, and has thickness as shown in following section.

This bed is same distance above the limestone as the last bed described in Jackson county.

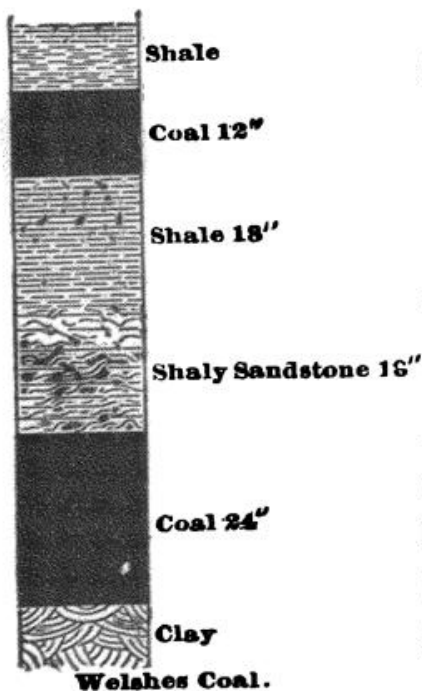
### IRON.

No iron of any importance was noted in this region.

### TIMBER.

The original forest growth of Rockcastle was like that of Jackson.

Most of the timber trees along the Kentucky Central Railroad in this section have been cut for the market. Some white oak, chestnut oak and poplar timber yet remains on the spurs back from the railroads, where the old forest growth is, to some extent, unbroken.

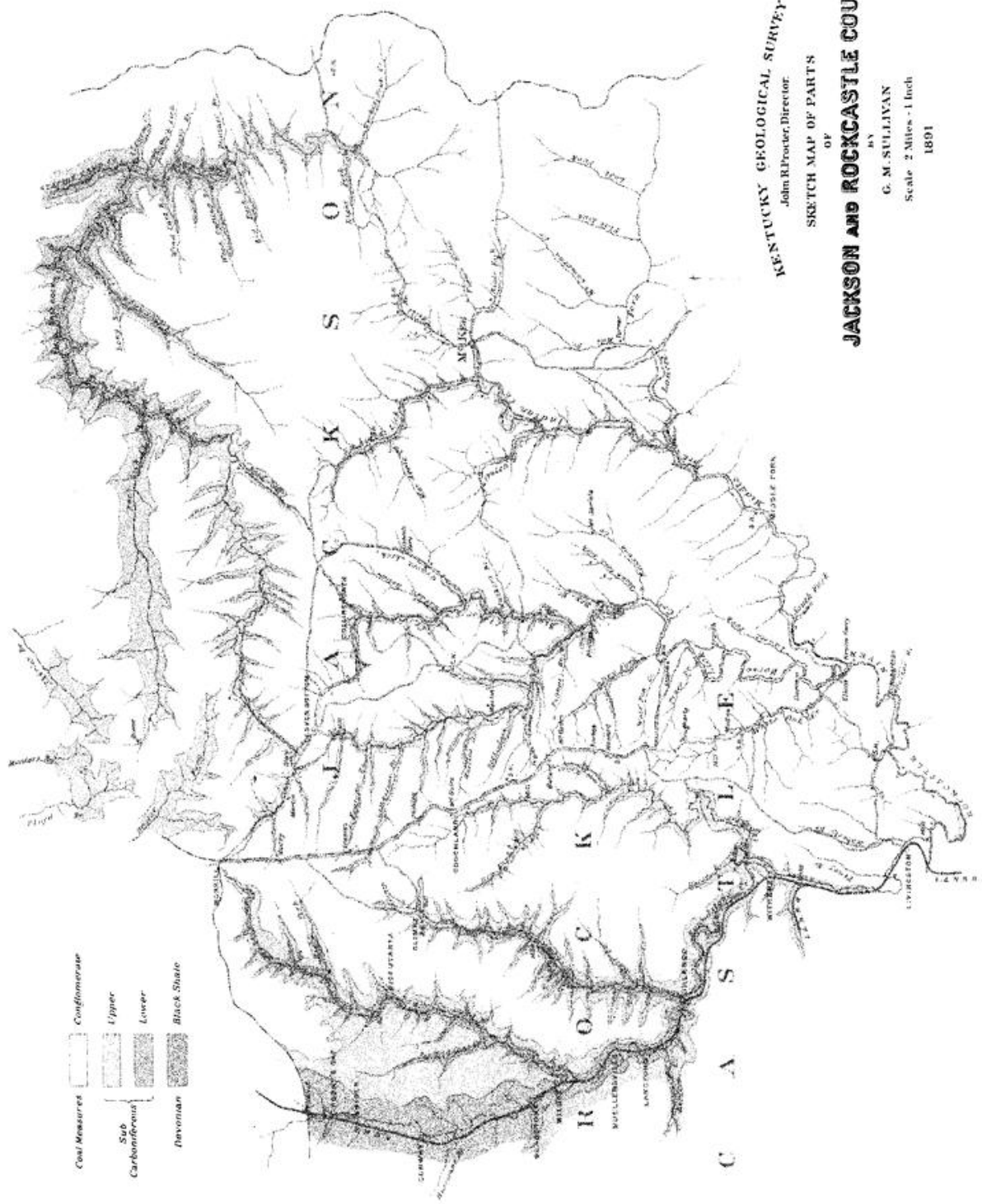


References to former reports relating to Rockcastle county are as follows:

Topography, General Geology, &c., "Owen's Reports," vol. III, page 154. Vol. IV., pages 181-4, report of Joseph Lesley.

Coals, &c., chemical report of Dr. Robert Peter, vol. IV, "Owen's Report," page 251.

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KENTUCKY GEOLOGICAL SURVEY  
John R. Prosser, Director.

SKETCH MAP OF PARTS  
OF

**JACKSON AND ROCKCASTLE COUNTIES**

BY  
G. M. SULLIVAN  
Scale 2 Miles - 1 Inch  
1891