

# GEOLOGICAL RECONNOISSANCE

OF THE

## COAL MEASURE ROCKS OF PUTNAM COUNTY.

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Examinations in Putnam county were limited by instructions to the coal measure rocks lying in the extreme western part; but no mention will be made of the underlying sub-carboniferous beds which form the general surface rocks, and are exposed in a majority of the valleys and ravines in the district under consideration. The area in which these rocks occur in Putnam county is bounded on the west by the west line, on the south by the south line of the county, as far east as the western bluff of Doe creek, thence northeast along said bluff to Jno. B. Sackett's sandstone quarry, two miles west of Cloverdale, thence nearly north and northwest by Cemetery Hill, at Greencastle, and Morton, to the northwest corner of the county. The foregoing boundary includes the most extreme eastern outliers of the Conglomerate sandstone and coal A. Throughout this area, the streams, brooks and branches have cut down to the underlying limestone; and over one-fifth of it have wholly eroded and moved the coal measure rocks, as in the wide valleys of Big and Little Raccoon, Walnut fork, Deer creek, Eel river and their tributaries. The surface is generally rolling or hilly, the soil, although not of the best,

produces corn, wheat, oats, and the grasses, and some extensive belts of oak, poplar and beech timber, were noticed.

CONNECTED SECTION OF THE COAL MEASURE ROCKS.

	Ft.		Ft.	In.
1. Soil and drift.....	90	to	20	00
2. Groy shale with iron nodules.....			11	00
3. Coal B (on outcrop).....	3	to	1	00
4. Fire clay.....			2	00
5. Gray shale and sandstone.....	20	to	10	00
6. Conglomerate.....	10	to	80	00
7. Aluminous shale.....	10	to	4	00
8. Coal A.....	0	to	2	00
9. Fire clay.....	5	to	1	00
10. Gray aluminous shale with small seams and partings of coal to the Chester beds.....	20	to	10	00
			<u>141</u>	<u>00</u>

DESCRIPTION OF CONNECTED SECTION.

The glacial phenomena in this county are obvious and interesting. Along the eastern side of the district under consideration, the soft Chester sandstone, 20 to 90 feet thick, are exposed. When the great ice flow came down from the north, this stone, more easily worn than the Conglomerate, was largely eroded, while the latter, presenting an obdurate and unflinching wall against the ice, caused deep wide valleys and valley plains to be formed, which extend from north to south, through the county, and east of Cloverdale, and conducted the masses of ice and water south to White river and Eel river near Cataract, giving origin to the Lacustral valley near Quincy, in Owen county. Many outlying hills and solitary knobs survive, measuring the amount of denudation, and showing the stratification of the companion rocks, now removed. From the tops of some of the hills, near and west of Cloverdale, extensive views may be enjoyed, reaching over the wide valley plains to the commanding hills at Cataract. On W. B. Williams' farm, northwest quarter, section 28, township 13, range 4, two

miles south of Putnamville, the Conglomerate sandstones still show the scars and striæ\* of the glacier track, while the limestones north of Greencastle are still more plainly marked.

These few remarks must suffice for a mere reconnoissance. The county, as a whole, presents some of the most interesting evidences of the glacial age, including, besides the rock striations already mentioned, beds of lacustral and glacial drift, and the erosion, to a depth of over 120 feet below the present channel, of the ancient bed of Big Walnut and Croy's creeks.

A single outcrop was seen near the top of one of the highest eminences in the county, on Aaron Bales' land, northwest quarter of section 34, township 13, range 4, that appeared referable to seam B, No. 3 of section. It was opened by a drift 200 or 300 feet long. The mine was not in work, and the supports had fallen in so that measurements could not be made; the coal was reported to be three feet thick at the best pocket, with an average of less than two feet. It contains some sulphur, and is not desirable for smiths use, but burns well in grates. There is no probability of finding this seam in this county sufficiently developed to pay for working. The Conglomerate sandstone, No. 6 of section, in heavy beds or massive ledges is well developed in this district, forming the surface rock and the steep bold bluffs of the valleys. It is a coarse red or yellow ferruginous sandrock, excellent for walls, foundations and other hammered masonry, and at several stations good grits and glass sands occur; but the abundance of other superior building stone overshadows its ordinary good fire and weather-proof qualities.

The aluminous shales at the base of the Conglomerate, No. 7 and 9 of section, is a pretty constant feature, and generally takes the place of coal A. When the latter is disseminated, thick beds of black slaty shale are found. Kidney ores of iron and bands of pyrites are generally present in this stratum.

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\*Course of striæ south, 10° west.

The subconglomerate coal A, No. 8 of section, occurs at intervals all over the district. At a few localities it attains a thickness, in small pockets, of two to three feet, but they are limited in extent to a few yards or rods; as a rule the seam is barren, or only one or two inches thick, and will probably not exceed an average of four inches. Irregular and inconstant, at the same time the coal is generally sulphurous and inferior. Money spent in mining at this horizon will not earn an average return of more than ten cents on the dollar. One of the most interesting features of this region is the frequent beds of subcarboniferous lime and sandstone exposed in all the ravines and valleys; their consideration belongs to a full survey of the county, and may be described in a future report.

#### LOCAL DETAILS.

In the vicinity of Cloverdale considerable research for coal and other minerals has been made. Six miles southwest of town, on the land of H. T. Weathers, northeast quarter of section 12, township 12, range 5, a very considerable outcrop of rich band and kidney iron ore was seen in a wild, deep, gorge-like ravine. In 1860 Mr. W. mined some 30 tons and sold it to the Watson furnace at Knightsville; it was found to be an excellent ore to mix as a flux with Missouri ore. It was delivered at Hamrick's station, on the Terre Haute and Indianapolis railroad, at five dollars a ton, which just paid expenses, and the project was, of course, abandoned. The following section is exposed:

#### SECTION AT WEATHERS' IRON BANK.

	Ft.	In.
Soil and clay.....	10	00
Shaly sandstone.....	12	00
Reported coal (B?).....		08
Massive conglomerate.....	14	00
White soft conglomerate.....	8	00
Gray laminated conglomerate.....	9	00
Pyritous shale, with band and nodules of iron ore..	11	00
Coal A.....	2 ft. to	1 00
Gray shale to Chester beds.....	4	00
	<u>69</u>	<u>00</u>

Coal A in thin outcrops is reported on Wrightson's and Turman's land, adjoining this section on the east. The under-clay of a coal was noticed near a school house on Jos. Herbert's land, northeast quarter of section 17, township 12, range 4. It is of good, if not superior quality, and is worthy of the attention of potters.

At Silas Riley's, northeast quarter of section 8, township 12, range 4, at the bottom of a ravine, just north of his residence, is a bed of siliceous shale, which encloses a great number of comical and eccentric concretions, presenting almost every imaginable shape. Northwest and west of Cloverdale, outcrops of coal are reported as follows:

COALS NEAR CLOVERDALE.

	Ft.	In.
Chamberlain, southwest quarter, section 26, township 13, range 4, A .....	1	00
A. Bales, northwest quarter, section 34, township 13, range 4, B .....	2	00
Secrest & Co, southwest quarter, section 7, township 12, range 4, A .....	...	...
T. Hanna, northeast quarter, section 3, township 12, range 4, A .....		04
W. B. Williams, northwest quarter, section 28, township 13, range 4, A .....	3 ft. to	09
A. Lye, section 36, township 13, range 5, A .....		06

At nearly all these points, coal A is overlaid by massive Conglomerate 20 to 75 feet thick, and accompanied by considerable beds of iron ore. At W. B. Williams', seam A is irregular as usual, varying from two inches to small pockets three feet thick. From seven or eight openings on the Williams farm, it has been dug, and before the completion of the railroad, was even hauled in wagons to Indianapolis for blacksmiths.

Putnamville is noted for having extensive banks of superior stone. It is siliceous, compact, and furnishes choice paving, step and other building stone. Sills and door steps from this quarry have been in constant use at the main entrance of the Terre Haute House for thirty years, without appreciable wear. This is one of the most valuable quarries in the State. West of town, coal A, two feet thick, was mined for local use on the Sellars farm.

A mile south of Greencastle, Cemetery Hill is capped with decomposed Conglomerate. The following section was taken :

## SECTION NEAR GREENCASTLE.

	Ft.	In.
Disturbed Conglomerate, with <i>Lepidodendron</i> and <i>Stigmaria</i> .....	20	00
Laminated sandstone.....	8	00
Thin coal.....		06
Shaly sandstone.....	12	00
Pyritous shale, with ironstones.....	8	00
Black slate and coal A?.....	3	00
Chester shales and sandstone, with coal plants and large pronged fucoides.....	31	00
Sub-carboniferous limestone in brook.....	10	00
	92	06
	92	06

On the farm of Andrew Black, five miles west of town, the high hills are built up with Conglomerate, some of which furnish good, white, grit, stones.

## SECTION AT ALEXANDER BLACK'S.

	Ft.	In.
Ferruginous Conglomerate, with "pipe" and "pot" iron ore.....	10	00
Heavy sandrock, with diagonal bedding.....	15	00
Massive Conglomerate.....	35	00
Aluminous shale—"rock houses".....	5	00
Black slate.....	2	00
Coal A.....	1	00
Fire-clay.....	2	00
Sub-carboniferous, to Walnut creek.....	95	00
	165	00
	165	00

The hills in the vicinity of Reel's mills are capped with Conglomerate, exposing sub-carboniferous shales and limestones in the creek valley. In the extreme northwestern part of the county, the coal measure rocks are generally eroded by Raccoon creek, but outliers of Conglomerate sandstone are reported near Morton, with some beautifully preserved fern leaves and trunks, which mark the horizon of coal A.

In conclusion, sincere thanks are returned to that earnest scientist Prof. Tingley, Dr. Layman, W. B. Williams and J. B. Sackett for information and assistance.