

NOTES ON THE PENNSYLVANIAN ROCKS OF JASPER COUNTY, ILLINOIS

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Jasper County, Illinois, is located in the southern part of the state, approximately 200 miles south and a little west of Chicago and 125 miles east and a little north of St. Louis. The surface of Jasper County, on the whole, is remarkably flat and featureless. Perhaps the greatest relief is to be found in the southwestern part of the county in South Muddy Township, where most of the streams have reached maturity and dissected the uplands rather thoroughly. But even here the divides between streams are frequently wide and flat. About three miles southwest of Newton, the county seat, there is a low conspicuous ridge, locally known as the Perrine Hill, running in a general east-west direction. Worthen¹ thought this ridge might be an escarpment formed on a sandstone stratum, but to the present writer it also strongly suggests a morainic ridge.

GEOLOGY

The surface material of the county consists of a blanket of loess or loess-like silt. Over much of the county it is so thin as to be almost negligible, but according to Dr. M. M. Leighton² it is thick enough along the east bluffs of the Embarrass River to be easily mapped.

Below the thin covering of loess lies the well-weathered Illinoian drift sheet. Its thickness is variable, but for the area southwest of Newton it appears to average 15 to 20 feet.

The bed rock of the county consists entirely of the McLeansboro formation, Pennsylvanian in age. It is made up of a great thickness of sandstones, siltstones, shales, limestones, and a few thin coal seams. The extreme thickness of this formation is shown by a test hole sunk several years ago on the Perrine Hill in sec. 23, T. 6 N., R. 9 E. which penetrated the entire thickness of the Pennsylvanian formations and well into the Mississippian system. As pointed out by Dr. G. H. Cady,³ it is

¹ Worthen, A. H., *Ill. Geol. Sur.* Vol. VI, p. 33, 1875.

² Personal communication, 1929.

³ Personal communication, 1930.

difficult to locate the base of the McLeansboro formation from the well log, but it appears that this formation may have a thickness at this point of over 1,100 feet. Since Jasper County is not far from the deepest part of the Pennsylvanian basin, it follows that the outcrops of the McLeansboro formation here are very nearly at the top of the section.

Exposures of the bed rock are not numerous in the county because of the relatively slight amount of erosion accomplished by the streams since the retreat of the Illinoian ice. However, exposures are probably more plentiful than is generally supposed, for the thin blanket of drift is easily cut through, even by small streams. Also, vertical sections of any great thickness are difficult or impossible to find because of the nearly horizontal attitude of the strata. Consequently, a section of as much as 20 or 25 feet shows the bed rock underlying a considerable area.

Outcrops are fairly numerous along the Embarrass River near Newton and St. Marie. These were described by Worthen⁴ many years ago. The rocks in this vicinity are sandstones, shales, and impure limestones; one thin coal bed was mentioned. This coal with its associated shales and sandstones outcrops along Brush Creek, a tributary of the Embarrass River, about a mile southeast of Newton. It is known locally as the Brush Creek coal and has been mined to some extent for a number of years by members of the Jourdan family. Worthen⁵ believed this coal correlated with No. 14 or 15 of the general section. Sufficient work has not been done since then by the Illinois Geological Survey to determine whether or not this is correct.

Some interesting exposures have been studied recently by the present writer, and so far as known they have not been visited or described by other geologists. The area lies in the southwestern part of the county in Smallwood Township in secs. 3, 4, 9, 10, 11, and 14, T. 5 N., R. 9 E. The outcrops are best shown along East Weather Creek in secs. 3, 4, and 9 and may be taken as the type section for this immediate vicinity. The section described below begins near the center of sec. 9. Almost continuous outcrops may be traced along the creek for more than one and a half miles northeastward, or to the north boundary of sec. 3.

Much the same sequence is shown along Hurricane Creek in secs. 3, 10, 11, and 14, although the exposures are not shown nearly as well as they are along East Weather Creek.

⁴ *Op. cit.* p. 32-35.

⁵ *Op. cit.* p. 32.

SECTION ALONG EAST WEATHER CREEK, SECS. 3, 4, AND 9, T. 5 N., R. 9 E.,
JASPER CO., ILLINOIS

McLeansboro Formation		Feet	Inches
6.	Shale, dark to black, very fissile.....		3
5.	Shale, soft, dark gray.....		3
4.	Limestone, gray to buff, pure, hard, coquina-like.....		6 to 8
3.	Clay, gray, firm, non-stratified, carbon stained, starch-like fracture, calcareous in part, no fossils observed..	11	
2.	Siltstone and shale, interbedded and lenticular, gray to buff, calcareous, micaceous and slightly sandy, non-fossiliferous, indurated nodular masses of impure limestone	5	
1.	Shale, gray, soft, laminated, micaceous, thin lenses of micaceous sandstone, slightly calcareous in part, non-fossiliferous	9	
Total		26	2

SHAMROCK LIMESTONE MEMBER

The limestone, No. 4 in the above section, is the only true limestone known thus far in this part of Jasper County. The writer has traced it for considerable distances along East Weather and Hurricane creeks, and it has been reported in a shallow water well on the Perrine Hill. Although this is a relatively small area, it seems to indicate that this limestone is of fairly wide distribution; and wherever it has been observed its general characteristics have been well preserved throughout. Because it stands out well in this area and is easily recognized, it may prove valuable for future correlation purposes and for detailed geologic mapping. Therefore, it is here proposed that the name *Shamrock* be given to this member. This name is selected because of typical exposures in sec. 3 in the vicinity of the village of Shamrock.

The Shamrock limestone member, as pointed out in the above section, is a hard, crystalline, platy limestone having a thickness of 6 to 8 inches. It is usually gray on a fresh surface, but may turn slightly buff on exposure. It is a true coquina limestone. The fossils are generally fragmentary and difficult to remove from the hard matrix. Brachiopods and crinoid stems are present in great numbers; gastropods and pelecypods are also present. Close, careful collecting should yield an interesting and instructive fauna.

No analyses are available, so far as known, for this limestone, but it is probably high in calcium carbonate content. This section of Jasper County is sadly in need of a good limestone for agricultural purposes, but the Shamrock member appears to be too thin and covered by too great an overburden of glacial drift to be available for this purpose. Before the days of concrete this limestone was much quarried along East Weather Creek and used for foundation blocks under houses and barns.

CONCLUSIONS

The exposures described above, although small in extent both horizontally and vertically, are believed to be a slight contribution to the geology of southwestern Jasper County. Sufficient data have not been collected from which to draw important conclusions. That group of counties in southern Illinois near the deepest part of the great Pennsylvanian basin have yielded neither coal nor petroleum in any quantity. For this reason they have received less attention from geologists than many other parts of the state. It is hoped that this may be a slight advance in the direction of better understanding of conditions in the extreme upper part of the McLeansboro formation, which marks the closing stages of the Pennsylvanian Period.
