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Brown: A Contribution to Madison County Geology

A CONTRIBUTION TO MADISON COUNTY GEOLOGY.

BY F. A. BROWN.

There is given below a typical or general section of the Missourian formation in Madison county, as given by Tilton and Bain.* It is mainly to the rocks of this stage that reference will be made in the present paper.

NO.	SECTION.	FT.	INS
20.	Limesone, yellow, earthy, thin layers, fusilina, aulopora and Productus	4	
19.	Shale, drab to yellowish	1	
18.	Alternating calcarean and shaly bands yellowish with Derby-crassa,—Productus and spirifer planoconvexa	3	
17.	Dark shale	1	2
16.	Ledge of compact limestone	1	2
15.	Dark blue shale, many crushed Productus	1	6
14.	Black, very carbonaceous shale	1	
13.	Shale, argillaceous above, sandy below	4	6
12.	Limestone, coarse, divided by shaly partings	3	
17.	Shale, dark, in part very carbonaceous with band crowded with Chonetes. In places, the Chonetes are cemented into a band of limestone	8	
10.	Blue limestone, very fossiliferous, three bands separated by shale	3	
9.	Shale, dark above, lighter below	2	
8.	Marly, yellowish shale	2	
7.	Yellowish soft limestone becoming harder below	5	
6.	Thin layers of limestone shaly partings	12	
5.	Black slate and shale	3	
4.	Yellowish, earthy, calcareous beds	4	
3.	Limestone, with thin alternating bands of shale	12	
2.	Black shale	3	
1.	Band of limestone		6
	To continue this section to the base of the Missourian we have:		
5.	Sandy shale	15	
4.	Limestone weathering into nodular fragments	5	
3.	Shale parting		3
2.	Limestone, similar to number 4	4	
1.	Shale, blue to buff	2	

According to the authors of the report on the geology of Madison county, the foregoing constitutes a typical section from the top of the Des Moines stage to and including the base of the Fusilina limestone, which is number 20 of the section: Nos. 6, 7 and 8 of the above are the Winterset limestone. The following section is exposed at the quarries of the stone company at the town of East Peru.

10.	Yeielowish, marly shale, with Derbya and Phillipsia	3 or more	
9.	Limestone, yellow earthy—Allorisma	2	
8.	Shale		1
7.	Limestone, yellowish somewhat sandy	4	
6.	Shale, with numerous Choretetes	10	
5.	Limestone, bluish with Conchoidal fracture	10	
4.	Shale parting		1
3.	Limestone, heavy bedded	4	1
2.	Shale, with Chonetes and Rhombopora	1	
1.	Limestone, bedded from 4 to 12-in.	6	

It seems probable, that number 10 of the quarry section at Peru corresponds with No. 8 of the general section, that Nos. 7, 8 and 9 are the equivalent of No. 7 of the general section, and Nos. 1, 2, 3, 4, 5 and 6 of the Peru quarry section can be correlated with No. 6 of the general section given above.

*Geology of Madison county, in VII Ann. Report Ia Geol. Surv.

If this be the case then the limestone at Peru is the equivalent of that found at Winterset (See Geol. Mad. Co. Ia. Geol. Surv. Vol. VII, p. 512). The writer has gone over the ground alone and in company with Mr. Herman Mueller, and he agrees with the writer that the Peru section should be assigned to the Winterset.

Now the top of the uppermost beds exposed in the Reed quarry, which is one-half mile west of the Peru quarry, is about 10 or 12 feet above No. 9 of the Peru quarry section, which is also exposed in Reed quarry.

As neither Mr. Mueller, Mr. T. E. Savage, nor the author have found any *Fusulina* while examining the Reed quarry beds above No. 9 of the Peru section and since there is thickness of 28 feet of strata between the top of the Winterset limestone and the base of the *Fusulina* limestone, according to Tilton and Bain, it seems probable that the *Fusulina* limestone is not exposed at the Reed quarry (See Mad. Geol. Ia. Geol. Surv. Vol. VII, pp. 525-529).

The writer does not hope to offer much that is new concerning the geology of Madison county, but he would call attention to a vein of coal of fair quality eleven inches thick, a short distance below the Earlham limestone (Nos. 3 and 5 of the general section).

Another feature not formerly mentioned is the glacial striations on the ledge in the Peru quarry. The striae run, as near as could be determined with a pocket compass, north 27° west, and a level board laid across the top of the ledge at right angles to the striations would perhaps show some of them to be two or more inches deep in the center and as much as two or three feet in width.

In some places the grinding has been carried on until the surface is almost as smooth as glass, again it is barely perceptible. There is a fair sample of this glacial work in the office of the Iowa Geological Survey at the Capitol.

The glacial deposits at Peru carry a very great number of limestone boulders varying in size from small ones weighing one or two ounces to large ones weighing as much as two tons. Many of them are rounded and others show marks of glaciation. There are also the usual number of fossils of different kinds in that drift.

The writer has found a small specimen of *Rhombopora* hardly one-inch long and as large as a small knitting needle, also a *Derbya crassa* scarcely one-half inch in diameter, which came out of the clay lying directly above the limestone at Peru.

An amethyst crystal one inch long, a specimen of iron ore and a species of favositid coral also were found in the gravel above the clay just mentioned.

Some small fish teeth were picked up from the sands of Middle river west of Winterset, but it may be that they were brought there, by the river from the Cretaceous farther north and west, rather than by the ice.

There is given below a list of fossils found in the Missourian formation in Madison county. Messrs. Tilton and Bain have been followed in so far as they gave the horizon of the fossil mentioned in their report.

Thanks are also due to Prof. T. E. Savage and Mr. Herman Mueller, for assistance in identifying fossils in the appended list. The number placed opposite the name corresponds with that of the bed in the typical section and indicates the horizon at which it may be found.

PROTOZOA.

Fusulina cylindrica. Meek & Hayden20

COELLENTERATA.

Aulopora (probably *gracilis*). Keyes10

Azophyllum rude. White and St. John3

Chaetetes milleporaceus. Milne-Edwards and HaimeDes M.

Lophophyllum profundum. Milne-Edwards and HaimeX2&X4

Micheltnia eugeneae. White3

Syringopora multattenuata. McChesney3

ECHINODERMATA.

Archaeocidaris agassizi. Hall5&X1

Hydreionocrinus mucrospinus. McChesney6

Ulocrinus kansasensis. Miller & Gurley6

MOLLUSCOIDEA.

Fistulipora nodulifera. Meek6

Rhombopora lepidodendroides. Meek6

Septopora biserialis. Swallow6

BRACHIOPODA.

Ambocoelia plano convexa. Shumard18

Chonetes granulifer. Owen6&7

Chonetes mesolobus. Norwood and PrattenDes M.

Chonetes parvus. ShumardDes M.

Chonetes verneuillanus. Norwood and Pratten6,9&11

Derbya biloba. Hall & Clarke6

Derbya crassa. Meek and Hayden7&8

Dielasma bovidens. MortonX2&X4

Hustedia mormoni. MarconX2&X4

Mekella striato-costata. CoxX2

Productus cora. D'Orbigny11

Productus costatus. SowerbyX2&X4

Productus longispinus. SowerbyX2,X4&11

Productus muricatus. Norwood & PrattenDes M.

Productus nebraskensis. Owen6

Productus punctatus. Martin6

Productus semireticulatus. Martin6

Pugnax uta. MarconX2&X4

Reticularia perplexa. McChesney3

Rhipidomella pecosi. MarconX2&X4

Spirifer cameratus. Morton3,6&11

Spiriferina kentuckensis. ShumardX2&X4

Seminula argentea. ShepardX2,X4,X3&6

MOLLUSCA.

Allorisma subcuneatum. Meek & Hayden7

Aviculopecten occidentalis. Shumard18

Myalina kansasensis. Shumard11

Myalina subquadrati. Shumard11

Myalina swallowi. McChesney11

GASTEROPODA.

<i>Bellerophon</i> (probably <i>carbonarius</i>). Cox	X2&X4
<i>Naticopsis altonensis</i> . McChesney	X2&X4
<i>Pleurotomaria carbonaria</i> . Norwood & Pratten	6
<i>Straparollus catilloides</i> . Conrad	X2&X4

CEPHALOPODA.

<i>Nautilus</i> . Sp. Undt.	2&4
<i>Orthoceras cribrosum</i> . Geinitz
<i>Orthoceras rushense</i> . McChesney	2&4

ARTHROPODA.

<i>Phillipsia major</i> . Shumard	8
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The nomenclature of this list is in accordance with Mr. Stuart Wellis as used in his "Bibliographic Index of North American Carboniferous Invertebrates". (See Bul. U. S. Geol. Surv. No. 153.)