

ART. IX.—*Preliminary Notice of certain beds of Fish-remains, in the Hamilton group of Western New York; by FRANK H. BRADLEY.*

ACCOMPANYING the Moscow black shale of the upper part of the Hamilton group, at Geneseo and Moscow, Livingston county, and East Bethany, Orleans county, N. Y., are certain thin lenticular masses of impure pyrites, which contain large quantities of the teeth, fin-spines and bony-scales, of fishes, and numerous Mollusca.

The layers composing these beds are very variable in thickness and in composition, some being quite solid and composed almost entirely of pyrites; others, thin and fragile, and interlaminated with layers of black shale. The latter portions commonly contain the bones, while the more solid portions yield shells most numerously.

It would seem that the sulphur of the pyrites must have come from the decomposed fish, and that the beds correspond to the deposits of fish-remains reported by dredgers in certain seas, while the surrounding bottom yields not a fragment.

Information concerning the situation of these localities was given by Mr. H. A. Green in the January number of this Journal.

So far as I have been able to ascertain, they had not been explored by any one previous to my visit in July, 1864, at which

time, as well as in the succeeding year, I collected largely therefrom for the cabinet of Yale College. I have also employed Mr. Green to increase my collections. The specimens thus obtained are sufficient to indicate the existence of at least two or three species of fish, and to show the principal characters of one of them. It is hoped that further explorations, now in progress, will be still more successful.

The most common species has a two- or three-forked tooth, somewhat resembling that of *Diplodus*. The scales are all pustulose: some are rectangular, measuring one to two inches on a side; others are curvilinear, one of which measures six inches across (probably a distinct species). One large, probably interior, bone measures three by four inches, with a thickness, at one end, of over an inch. One jaw is between three and four inches long.

These remains all retain their bony structure, though some of the larger and more porous fragments are thoroughly permeated with the pyrites.

Accompanying these remains are very numerous shells of Cephalopods, Gasteropods, Brachiopods, and Lamellibranchiates, which are mostly replaced with nearly pure pyrites, and separate readily from the rock, with very brilliant surfaces.

A few of the Orthocerata retain their calcareous structure, and also have their cavities mostly filled with calcite. The same mineral is sometimes found in the interior of the Goniatites which are common in the beds.

Of *Goniatites*, there are at least three species, besides a very minute form which I am inclined to call the young of *G. uniaugularis*, but which may prove distinct. Of Gasteropods, we have twelve or fifteen species; probably as many Lamellibranchs; and five or six Brachiopods. Excepting the Goniatites, which are sometimes two inches across, the shells are all minute.

A few specimens of three or four small species of *Pentremites* have been found, and the stems of larger crinoids are quite common in some layers. Corals are very rare.

Many of the species will very probably prove identical with those which crowd the Hamilton blue shales, but I have reason to think that most of them are new. No careful examination and comparison have as yet been made; but I hope that it may, ere long, be completed, and the results published.

In this connection, the following fact may be interesting:

From the *Black slate* of the Hamilton group at the West, which has proved almost entirely barren wherever worked, a German clergyman residing at Delaware, Ohio, has recently obtained, at that locality, nearly the whole of a thick, heavy

pustulose scale, measuring about ten inches by fourteen; the pustules are about one-fourth of an inch in diameter. Considerable digging was done, but no further discoveries made.

Being absent from home, I have not the opportunity of referring to my specimens, and I cannot therefore make the present notice more complete.

Panama, U. S. C., May 11, 1866.