NIAGARAN OSTRACODS FROM BURLINGTON, WISCONSIN

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Introduction.—The Niagaran ostracods reported were discovered in the insoluble residues in connection with a sedimentary study of the rock succession exposed in the quarry at Burlington, Wisconsin. At the Illinois State Academy of Science Annual Meeting held at Galesburg, May, 1940, Dr. J. R. Ball presented a paper on the Burlington quarry.[1] In his article he describes the location of the quarry, lithology, fauna, and other characteristics of the strata. In brief, the quarry is located one mile west of Burlington along state highway 11; the rocks are extremely well-bedded, argillaceous dolomites which are mottled greenish gray and deep red. Mr. L. E. Workman refers this section to the lower part of the Joliet formation which he considers to be equivalent to the Osgood. Several years ago when the quarry workings were at a level now covered by water, the rocks of this lower part consisted of fairly thick-bedded dolomite of solid deep maroon color containing concretion-like masses of spongy, maroon rock.

Method of Obtaining Residue.—A solution of hydrochloric acid diluted 9 parts of water to 1 part of concentrated acid was used to obtain the residues. It was found that this strong concentration gave more satisfactory results with regard to the extraction of the ostracods than the use of a very dilute acid solution applied over a relatively long period of time. With the latter method the specimens came out with frayed margins despite the precautions taken in handling. Furthermore, the formation of fine particles which coated the other grains caused a retardation in the activity of the process due to the lack of penetration of the weak acid.

Character of Residue.—The percentage of residue ranges from about 10% to 45% of which only a fraction of one per cent is greater than 200 mesh. The very high amount of material less than 200 mesh consisting chiefly of clay and silt suggests the argillaceous character of the rock. The staining technique of adding potassium ferrocyanide [$K_4FE(CN)_6$] to an acid solution (HCl) in which the rock sample is immersed, yields a solid, deep, blue stain except for the calcitic vugs. This indicates the dolomitic character of the rock. The material greater than 200 mesh is mainly secondary silica. A graphical analysis of the quantity of insoluble material indicates a very irregular vertical distribution. This is typical of the lower part of the Joliet formation thus confirming Mr. Workman's correlation.[2]

The fauna of the residues includes the following: arenaceous foraminifera which seem to be abundant throughout most of the section, internal molds of small brachiopods, fragments of small gastropods, abundant bryozoa remains, a few hexaxial sponge spicules, and an abundant ostracod fauna. The ostracod fauna is an interesting one. The specimens obtained are preserved as internal molds of siliceous filling, hence their presence in the residues. Of course, these specimens exhibit the internal characters of the animal's shell. An attempt was made to determine whether the external characters are preserved anywhere in the rock. Samples of rock were crushed and sieved. Each grade size was separated, washed, and examined. Surprisingly enough there was very little or practically no suggestion of a microfauna. It seems very doubtful whether the external characters exist in the present rocks. Along certain zones of fine mottling, there is an abundance of ostracod material.

Ostracod Fauna.—There is quite a diversity of forms represented by approximately 15 species which includes 9 or 10 genera. Most of the internal characteristics are clear except in a few cases where overlap is difficult to determine. Although the complete identification of the fauna has not yet been made due to

[1] Ball, J. R., Typical Lower Mississippi Valley Silurian Lithology in Southeastern Wisconsin, Trans. of the Ill. Acad. Sci., Vol. 33, No. 2, Dec., 1940, pp. 152-154.

[2] Workman, L. E., Contributions to Correlations of Silurian Systems in Northeastern Illinois through Study of Insoluble Residues: Bull. G. S. A., Vol. 50, No. 12, Part 2, p. 2015, 1939. (Abstract.)

the fact that many of these are new forms, a few of the genera represented are: Kloedenella, Tubulibairdia, Leperditia, and Bairdia.

Some of the forms are highly ornamented. One of them is a clear example of dimorphism. The female has two large, bulbous, brood pouches posteroventral. There are perforations along the line of juncture between the brood pouch and the main part of the shell. These brood pouches become detached from the animal and are found separate. It is common to find that the brood pouches are much more abundant in the residues than entire individual specimens. Where perhaps 5 or 6 entire specimens could be found, it is possible to find 50 to 100 brood pouches. The male has the general shape and characters similar to the female without the swellings.

Among the other types are those that contain smooth surface shells.

Conclusions.—Many of the workers on the Silurian rocks of the Middle West such as Workman, Ball, Dunn, Edwards, Priddy, and others have pursued different lines of attack in order to get a better understanding of the correlation of the rocks of this system. Lithological studies, insoluble residues, mineralogical studies, foraminifera[3] and other fossil forms have been used in the attempt. Dr. P. H. Dunn has completed a study of the arenaceous foraminifera of the Silurian rocks of several of the midwestern states. This is in the process of publication.[4] He has indicated that ostracods are abundant in many of the samples he has used for the extraction of foraminifera. The study of the ostracods, their diversity and distribution might supplement other methods. Ulrich and Bassler have done a classical piece of work in using ostracods to correlate the Silurian rocks of Maryland[5] and adjacent states. Perhaps that same approach can be used in the Middle West. The foraminiferal zones will be established by Dunn; the ostracods might lend themselves to the same analysis.

Finally the fossil forms and the high content of argillaceous material suggest proximity to shore line conditions of sedimentation. Cumings and Shrock have indicated this in their paleogeographic map.[6]

[3] Dunn, P. H., Microfaunal Technique in the Study of Older Paleozoic, Trans. of the Ill. Acad. Sci., Vol. 25, No. 4, June, 1933, pp. 140-141.

[4] Dunn, P. H., personal communication.

[5] Ulrich, E. O. and Bassler, R., Paleozoic Ostracoda: Their Morphology, Classification, and Occurrence, Maryland Geol. Survey, Silurian, 1923.

[6] Cumings, E. R. and Shrock, R. R., The Geology of the Silurian Rocks of Northern Indiana, The Dept. of Conservation State of Indiana, Publication No. 75, 1928, p. 165.