

ADDITIONAL SPECIES FROM THE SILICA SHALE OF LUCAS COUNTY, OHIO.

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INTRODUCTION.

Since the publication of my earlier study on the Fauna of the Silica Shale of Lucas County, in 1927* additional collecting from this shale over a period of two years has yielded eight more species. These are represented by very few specimens, but it seems worth while to record them inasmuch as three of them are apparently new. The species described in this paper are: *Favosites nitella*; *Stropheodonta demissa* var.; *Terebratula medio-cris* n. sp.; *Leiorhynchus kelloggi*; *Tornoceras uniangularis*; *Isochilina scapha* n. sp.; *Leperditia* (?) *subrotunda* (?); *Bythocypris indianensis*.

An excavation on the floor of the quarry of the Sandusky Cement Company within the past year has revealed an additional two and a half feet of the Silica shale. This shale is not continuous with that above but is separated from it by an eight-inch limestone layer which forms the quarry floor at the north end. No systematic collecting has been done from this lower shale horizon but so far as observed there is no marked variation in the faunal content from that in the shale above.

DESCRIPTION OF SPECIES.

PHYLUM COELENTERATA

CLASS ANTHOZOA

SUBCLASS TABULATA

Genus *Favosites* Lamarck

Favosites nitella Winchell

(Plate I, Fig. 1.)

1866. *Favosites nitella* Winchell, Rept. Low. Pen. of Mich., p. 89.
1876. *Favosites nitella* Rominger, Geol. Surv. Mich., Vol. III, Foss. Corals, p. 33.
Pl. XI, Fig. 4.
1899. *Favosites nitella* Lambe, Contrib. to Can. Palaeon., Vol. IV, Pt. 1, p. 17.

*Stewart, Grace A. Geol. Surv. Ohio, Bull. 32, 1927.

Rominger's Description, 1876.—"Tubes rounded-polygonal, subequal, stout-walled, not fully one millimeter in width. Tube channels smooth or beset with distant lateral squamæ. Diaphragms partially simple, regular, partially of complicated irregular form through intersection with the lateral squamæ. Pores large, distant, in a single row on each side. Mode of growth globular or pyriform or digitatoramose."

Remarks.—One discoidal colony attached to an *Atrypa* shell conforms very well with the characters of this species. The specimen is about 2 inches in diameter. The corallites are prismatic, small, scarcely a millimeter in diameter. Here and there are interspersed larger, circular tubes slightly more than a millimeter across. The pores and squamæ are imperfectly shown. The species has been found quite abundantly at higher horizons in the Devonian formations of Northwest Ohio.

PHYLUM MOLLUSCOIDEA

CLASS BRACHIOPODA

ORDER PROTREMATA

Genus *Stropheodonta* Hall

Stropheodonta demissa var.

(Plate I, Fig. 2.)

A few specimens of *Stropheodonta demissa* (Conrad) are at hand which are not entirely typical of the species, in that they do not have the striations stronger and more elevated on the umbo of the valves and becoming distinctly smaller and more numerous from there to the margin. Instead the striations bifurcate very close to the beak, and then are uniformly strong and of the same size until very close to the margin. Here they bifurcate and become much finer, and additional fine striæ are intercalated between them. A few striations bifurcate midway between the umbo and anterior margin.

Because of these differences the specimens are considered to represent a variety of the typical species.

Figured specimen, No. 16532, Geological Museum, Ohio State University.

ORDER *TELOTREMATA*Genus **Leiorhynchus** Hall**Leiorhynchus kelloggi** Hall

(Plate I, Figs. 3, 4).

1867. *Leiorhynchus kelloggi* Hall, Pal. New York, Vol. IV, p. 361, Pl. 57, Figs. 1-12.
1893. *Leiorhynchus kelloggi* Hall and Clarke, Pal. New York, Vol. VIII, Pt. II, p. 194, Pl. 59, Figs. 18-20, 32, 33.

Description.—Shell of moderate size; biconvex; transversely ovate to suborbicular; slightly wider than long, although in some cases the length and width are equal. Cardinal margins meeting beak at obtuse angle; lateral margins rounding uniformly to the anterior margin which is sinuate. The dimensions of an average sized specimen are: Length 25 mm., width 26 mm. A more orbicular specimen has a length and width of 24 mm.

Pedicle valve moderately to strongly convex on the umbo, flattening out on the lateral slopes, and anteriorly becoming depressed into a wide flaring sinus. Beak small, erect, rising only slightly above the brachial beak, perforated by a small foramen. Brachial valve more convex than the pedicle, curving regularly to the lateral margins; about the middle of the shell developing a low, broadly expanding fold. Beak curving under that of the pedicle valve. A median septum, with elongate muscle scars on either side, is present on the interior of the brachial valve.

Each valve marked by low, rounded, radiating plications which are usually less distinct in the umbonal region; commonly five or six are in the sinus, and an equal number on the fold, but occasionally as many as ten have been noticed. Six or seven poorly developed plications are present on the lateral slopes. Fine concentric striations are present on well-preserved specimens, and in some cases less distinct radiating ones are also present.

Remarks.—This species was originally described by Hall from specimens which came from the Olentangy shale in the northern part of Ohio, where they have been found in profusion in some places. Only two or three specimens have been found in the shale pit of the Sandusky Cement Company at Silica, but an abundance of them have been found at other horizons of the Devonian in northwest Ohio. Along Tenmile creek just south of Silica, some shaly limestone blocks dredged up from the bottom of the creek have yielded numerous excellent specimens. Stratigraphically this limestone is about twenty-five feet above the Silica shale of the Sandusky Cement Company quarry. The specimens are identical with those described by Hall from the Olentangy shale on the east side of the anticline.

The shape, small erect beak, and the weak development of the plications on the umbonal region are outstanding characters of the species.

Genus **Terebratula** Klein.

Terebratula mediocris n. sp.

(Plate I, Figs. 5-7.)

Description.—Shell of moderate size; rostrate, biconvex, elongate ovoid in outline; becoming flattened anteriorly, with evenly rounded anterior margin. The dimensions of the type specimen are: Length, 20 mm., width, 16 mm., with the greatest width anterior to the middle of the shell.

Pedicle valve moderately and uniformly convex from the beak to a little beyond the middle and then flattening quite noticeably to the anterior margin. Beak arcuate, rising some distance above the beak of the opposite valve; moderately incurved; perforated by a round foramen. Deltidial plates closing the greater part of the delthyrium. Cardinal slopes rounded.

Brachial valve shorter than the pedicle valve, moderately convex, the greatest convexity in the middle of the valve; depressed slightly anteriorly. Beak low, incurved below the beak of the opposite valve.

Surface of both valves marked by fine concentric growth lines, which near the anterior margin become crowded into rather prominent wrinkles. Shell structure finely punctate. Internal characters not observed.

Remarks.—Only one specimen of this species has been collected. It appears to be a well-marked species since it does not entirely conform to any described species of the genus known to the writer. The specimen most closely approaches *Terebratula sullivanti* Hall, from which it differs in its greater convexity, and in having an evenly rounded anterior margin instead of an emarginate one. From *Terebratula roemingeri* Hall it differs in the larger size. It resembles *Terebratula harmonia* Hall but that species is flatter and the beak is more erect.

Holotype, No. 16534, Geological Museum, Ohio State University.

PHYLUM MOLLUSCA

CLASS CEPHALOPODA

ORDER AMMONOIDEA

Genus *Tornoceras* Hyatt*Tornoceras uniangularis* (Conrad)

(Plate I, Figs. 8, 9.)

1842. *Goniatites uniangularis* Conrad, Jour. Acad. Nat. Sci. Phila., Vol. 8, p. 268, Pl. 16, Fig. 4.
 1879. *Goniatites uniangularis* Hall, N. Y. Palaeon., Vol. V, Pt. 2 (1), p. 444, Pl. 71, Fig. 14; Pl. 72, Figs. 6, 7; Pl. 74, Fig. 2.

Description.—Shell small, discoidal, having a diameter of about 12 mm. Only about two volutions are present on the specimen examined, but according to Hall a complete mature specimen probably has about four. Whorl section broadly oval, the dimensions on a septum near the living chamber being: Width 5 mm.; height 4 mm. Lateral surfaces almost flat.

Volutions compressed, gradually enlarging in size, in close contact, each one being deeply impressed on the preceding one. Umbilicus a small shallow depression. Living chamber not preserved, so that character of aperture is not known.

Well defined sutures on the cast of the interior mark the edges of the septa, and show the outline of the numerous cameræ. The sutures are a series of lobes and saddles, closely arranged at the umbilical margin, diverging and curving towards the aperture to form prominent saddles, then recurving to form deep lateral lobes; on the ventrolateral margins the saddles are shallower and narrower than on the lateral surface; the ventral lobe is narrow and conspicuously pointed.

Siphuncle not well shown on the specimen examined, but specimens of this species from elsewhere show it to be small and situated just beneath the test on the ventral side, and expanding anteriorly between the adjacent septa.

Shell characteristics not observed.

Remarks.—Only one small incomplete specimen of this neat little cephalopod has been obtained from the Silica shale, but it preserves very well the outstanding characteristics of the species. The species has not been recorded previously from the Devonian rocks of Ohio, but has been reported from the Hamilton and Portage shales of New York, and from rocks of Hamilton age in western Canada. The compressed state of the whorls and the prominent curving and recurving of the sutures to form saddles and lobes are the characters used in identifying this species.

PHYLUM *ARTHROPODA*CLASS *CRUSTACEA*SUBCLASS *OSTRACODA*Genus *Leperditia* Rouault*Leperditia* (?) *subrotunda* (?) Ulrich

(Plate I, Fig. 10.)

1890. *Leperditia* (?) *subrotunda* Ulrich, Cinc. Soc. Nat. Hist., Vol. 13, p. 181, Pl. 16, Figs. 1a, b, c.

One incomplete right valve with a portion of the anterior end missing is insufficient for accurate specific determination, and is doubtfully referred to this species. The specimen is small having a length of about 1.50 millimeters, and a height of 1 millimeter, the greatest height occurring almost in the middle of the shell. Valve moderately convex and more or less depressed toward the margin all the way round. Dorsal edge straight, curving with somewhat rounded angles to the anterior and posterior margins; ventral margin slightly triangular. Anterior margin more projecting and less broadly rounded than the posterior. Sub-centrally the shell is marked by a rounded muscle imprint; otherwise the surface is smooth and shows no indication of an eye tubercle.

This little shell is most closely connected with *Leperditia* (?) *subrotunda* Ulrich in its appearance, but is relatively wider, and the ends are more narrowly rounded.

Genus *Isochilina* Jones*Isochilina scapha* n. sp.

(Plate I, Figs. 11, 12.)

Description.—Carapace very small, transversely elongate, canoe-shaped in form. Viewed dorsally the shell is elliptical in outline, the posterior end swollen in appearance as contrasted with the thinner anterior end. The dimensions of a perfect specimen are: Length 1.25 mm.; height .75 mm.; thickness, .50 mm. Valves moderately and evenly convex, the right one flattened a little marginally except along the dorsal edge. Dorsal margin straight or very slightly convex, merging into moderately rounded cardinal angles of which the anterior is the sharper of the two. Ventral margin straight, curving gradually into the rounded ends, the posterior end being more broadly rounded than the anterior. An oval sulcus occurs along the hinge. Surface smooth and even, with no sign of either muscle spot or eye tubercle.

Remarks.—This species is represented in our collections by one perfect specimen. It approaches *Isochilina fabacea* Jones

in its characters, but it does not have the finely reticulate surface of that species, and the ends are more uniformly rounded.

Holotype, No. 16538, Geological Museum, Ohio State University.

Genus *Bythocypris* Brady

Bythocypris indianensis Ulrich

(Plate I, Fig. 13.)

1890. *Bythocypris indianensis* Ulrich, Journ. Cinc. Soc. Nat. Hist., Vol. 13, p. 197, Pl. 16, Figs. 11a, b, c.

Description.—A small slender carapace having a length of about 1 millimeter and a height of .75 millimeters. Biconvex, subovoid, transversely oblong, the ends unequal. Left valve the larger and overlapping the right, the greatest overlap on the dorsal margin. Dorsal margin arched, postero-cardinal angle more pronounced than the other. Ventral margin slightly convex, curving to the ends of which the posterior is the more blunt. Eye tubercle distinct, a little anterior to the center in position. Surface smooth.

Remarks.—A few minute specimens have been collected from the Silica shale which in their general characteristics agree very well with this species. Stauffer questionably reported the species from the Devonian beds in northwest Ohio.

EXPLANATION OF PLATE I.

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