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OSTRACOD GENUS

BY

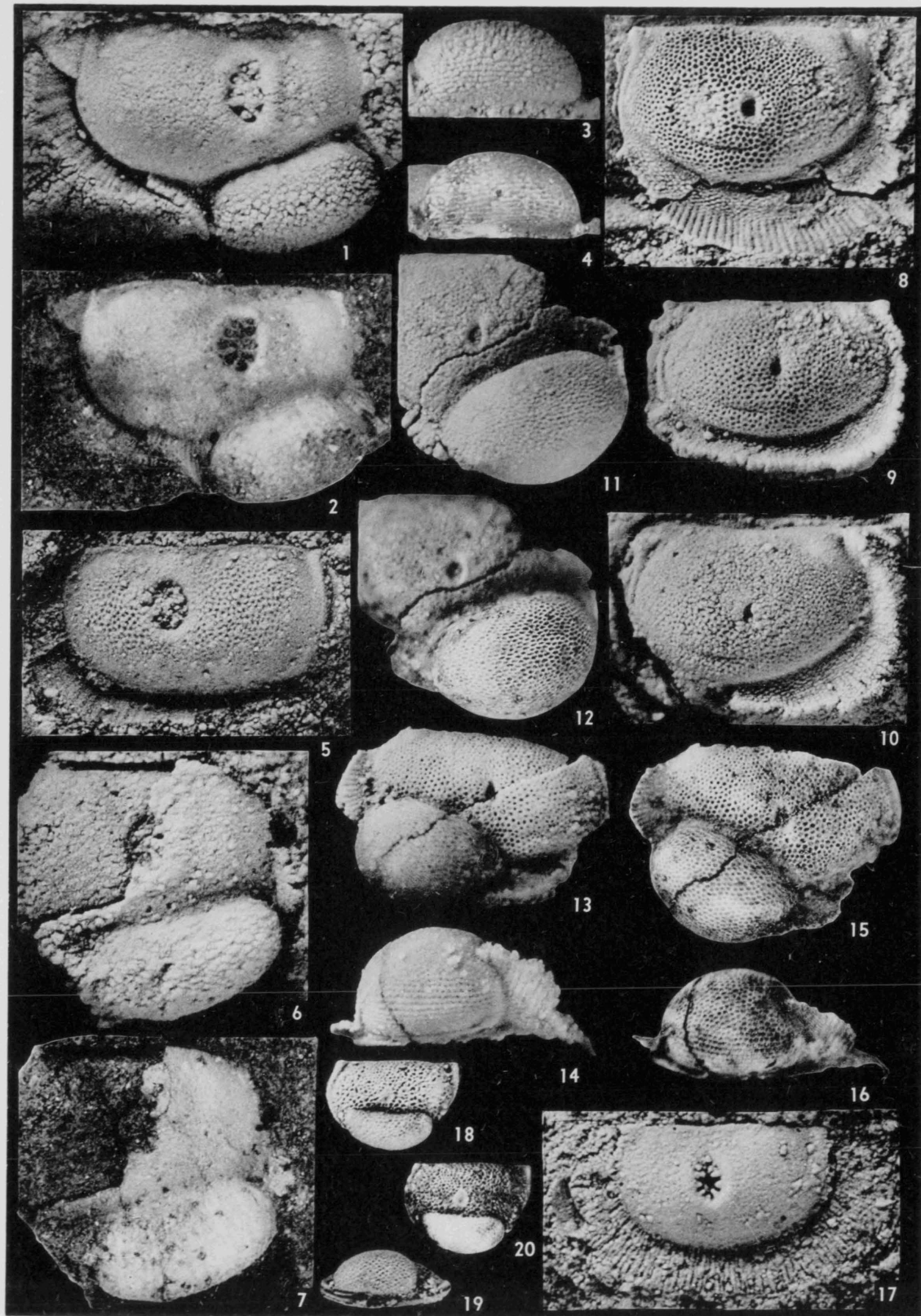
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BOLBINEOSSIA, A NEW BEYRICHIID OSTRACOD GENUS

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ABSTRACT—The Silurian ostracods which Ulrich & Bassler (1923) assigned to the genus *Chilobolbina* are in neither the same genus nor the same family with *C. dentifera* (Bonnema), the type species. They are beyrichiids. We here establish for them the new genus *Bolbineossia*, type species *B. didictyosa*, n. sp.

Bolbineossia resembles *Chilobolbina* in having a nearly central pit and a broad frill from corner to corner, and in being dimorphic. Female ostracods of the two genera cannot be assigned to the correct genus on the basis of a lateral view. Despite their remarkable similarities, the two genera are not closely related. The female of *Bolbineossia* has a brood pouch (opening into the domicilium), whereas the female of *Chilobolbina* has a false pouch (outside of the domicilium).

INTRODUCTION

IN 1923, in the process of describing Silurian ostracods of Maryland, Ulrich & Bassler erected the genus *Chilobolbina*. There is no doubt about their intent. Obviously, they set up *Chilobolbina* as a genus to which could be assigned certain beyrichiid ostracods from the Silurian strata of Maryland and adjacent areas. They made one error. They selected as type species an ostracod known from the Middle Ordovician of Estonia, *Primitia dentifera* Bonnema. This error defeated their purpose. *Chilobolbina dentifera* is not a beyrichiid; it has a false pouch rather than a brood pouch.

As a result, *Chilobolbina* is a good genus, but it does not include beyrichiid ostracods such as Ulrich & Bassler assigned to it. To date, no genus has been established for the Silurian beyrichiid ostracods which super-

ficially resemble *Chilobolbina*. We believe such a genus is necessary, and name it *Bolbineossia*.

We express our appreciation to Dr. G. Arthur Cooper, Dr. Remington Kellogg, and Dr. I. Gregory Sohn of the United States National Museum for the loan of specimens of *Chilobolbina dentifera* (Bonnema). We are also indebted to Dr. George M. Ehlers of the Museum of Paleontology, University of Michigan, for his help in collecting ostracods from the Silurian rocks of the Northern Peninsula of Michigan.

REVIEW OF *Chilobolbina*

Bonnema (1909, p. 25) described *Primitia dentifera* from the Middle Ordovician Kuckers formation in Estonia. This ostracod has a broad frill from corner to corner and a central pit. It is dimorphic. The female has a

EXPLANATION OF PLATE 24

(All figures $\times 30$)

- FIGS. 1-7, 17—*Chilobolbina dentifera* (Bonnema). Specimens catalogued together as USNM 58376. 1-4, two lateral and two ventral views of female right valve; specimen uncoated in figs. 2 and 4; note that ammonium chloride emphasizes the ornamentation and configuration but obscures the denticles projecting into the central pit. 5, lateral view of male left valve. 6, 7, two lateral views of incomplete female right valve; specimen uncoated in fig. 7 to show striations in false pouch. 17, lateral view of immature left valve.
- 8-16—*Bolbineossia didictyosa*, n. sp. 8, lateral view of male right valve, allotype, No. 33748. 9, 10, lateral views of two male right valves, paratypes, Nos. 33749 and 33750. 11, 12, lateral views of incomplete female right valve, paratype, No. 33751; fig. 12 uncoated to show ornamentation of brood pouch. 13-16, two lateral and two ventral views of female left valve, holotype, No. 33752; specimen not coated in figs. 15 and 16.
- 18-20—*Dolichoscapha escharota*, n. sp. 18, 19, lateral and ventral views of female left valve, holotype, No. 34450. 20, lateral view of same specimen without coating of ammonium chloride.

bulbous false pouch formed by part of the frill. Specimens of this ostracod are very fragile. Insofar as we know, no complete valve has ever been separated from the matrix, Kuckers shale (kuckersite). Specimens exposed on surfaces of the shale do not reveal the nature of the pouch. Only in thin sections, polished surfaces, or carefully exhumed parts of valves can the bulbous structure be proved to be a false pouch, lying outside the domicilium and opening below the contact margin.

In 1923, Ulrich & Bassler discovered some Silurian ostracods with a broad frill from corner to corner and a central pit in each valve. Females of these ostracods have a bulbous structure in the anteroventral region in a position corresponding to that described and illustrated by Bonnema for *Primitia dentifera*. The description given by Ulrich & Bassler (1923, p. 515) for *Chilobolbina* shows they intended that the genus should include dimorphic ostracods in which the female has a brood pouch:

"Carapace with the broad striated frill characteristic of the subfamily [Eurychiliniinae], a simple, short, more or less deeply impressed median furrow or spot, the median lobe barely elevated above general convexity of surface, the male closely resembling the older, simply sulcate section of *Eurychilina*. The female differs in having a prominent long ovate brood pouch that covers approximately the posterior three-fifths of the ventral part of the frill and laps slightly onto the convex part of the valve."

It is no discredit to Ulrich and Bassler that they chose a type species with a false pouch. It was not clear from the original figures and description that *Primitia dentifera* had a false pouch. Furthermore, their Silurian ostracods were embedded in a hard matrix, which obscured the ventral edge of the pouch. Actually, their description of the Silurian species as having brood pouches appears to have been fortunate conjecture, for none of the type specimens shows conclusively that the bulbous structure is a brood pouch, opening into the domicilium.

In brief, the genus *Chilobolbina* is valid, its authors are Ulrich & Bassler 1923, and its type species is *C. dentifera* (Bonnema) 1909. However, the Silurian species *C. punctata* U. & B., *C. punctata brevis* U. & B., *C.*

billingsi (Jones), and *C. hartfordensis* U. & B. have brood pouches and are not congeneric with *C. dentifera* (Bonnema).

Öpik (1937, p. 22) was the first to determine that the pouch of *C. dentifera* was a false pouch.

Henningsmoen (1953, p. 227) discussed the classification of *Chilobolbina*. The most recent work is that of Jaanusson (1957, p. 233-241), who made *Chilobolbina* the type genus of the subfamily Chilobolbiniinae (family Eurychiliniidae), carefully reviewed the characters of the genus, and described two new species.

Some additional illustrations and a few pertinent remarks about *Chilobolbina dentifera*, we think, will clarify the nature of the dimorphic frill. In the female, the part of the frill in the anterodorsal and anterior regions and the part in the posteroventral, posterior, and posterodorsal regions resemble those in the male. The anteroventral part of the frill, however, is bulbous and forms a false pouch which closes against the corresponding structure of the opposite valve. As pointed out by Jaanusson (1957, p. 235) this part of the frill is set onto the rest of the valve somewhat higher than the rest of the frill. The bulbous section is continuous with the rest of the frill; each of the two junctures of the bulbous section with the adjacent flat sections is sharply depressed as a deep fissure (pl. 24, figs. 1-4). We have based a reconstruction of the interior view of a female valve (text-fig. 3) on lateral, anterior, and ventral views of incomplete valves. There has been conjecture on the nature of the edges of the false pouch. Hessland (1949, p. 126) said, "The margins of the convex part of the velum seem to lie together when the carapace is closed." As can be seen in plate 24, figures 3-4, the periphery of the false pouch has a narrow, lip-like margin. This margin appears to extend at least to the plane of the contact margin. We believe that the edges of the opposing false pouches formed a closure when the valves were drawn together.

Another point needs clarification. The ornamentation of the pouch in this species was described by Jaanusson (1957, p. 237) as follows: "The proximal narrow part of the dolon adjacent to the domicilium is radially striated. . . . The other parts of the dolon

are covered with moderately large, closely spaced tubercles which are much smaller and more numerous than in *C. sudermannica*." We would add to this that the tubercles distally give way to striae parallel to the periphery (pl. 24, figs. 3,4).

We wish to point out, incidentally, that the central pit appears larger and the denticles within it more clearly defined in specimens that are not coated (compare pl. 24, figs. 1 and 2). This observation should be considered in evaluating photographs of *Chilobolbina* species taken with a coating of sublimate.

SYSTEMATIC DESCRIPTION

Order OSTRACODA

Superfamily BEYRICHIACEA

Family BEYRICHIIDAE

BOLBINEOSSIA, n. gen.

Type species.—*Bolbineossia didictyosa*, n. sp.

Diagnosis.—Beyrichiid ostracod with only a central pit (S2) to represent sulcation. Wide frill, in the female extending onto the protuberant brood pouch.

Description.—Only single valves available. Overlap and hingement not known. Hinge line straight. Valve subovate to subelliptical in lateral view. Domicilium subelliptical, evenly convex except for deep pit (S2) near the center. Frill broad, extending from corner to corner; in the female extending onto the brood pouch. Surface in known species reticulate.

Remarks.—*Bolbineossia didictyosa*, n. sp., was selected as type species because specimens are available to show definitely and distinctly the nature of the brood pouch. The Silurian species assigned to *Chilobolbina* by Ulrich & Bassler (1923) also belong to this genus: *B. punctata* (U. & B.), *B. punctata brevis* (U. & B.), *B. billingsi* (Jones), and *B. hartfordensis* (U. & B.)

Henningsmoen (1953, p. 227) suggested, "These species [Silurian species assigned by Ulrich & Bassler (1923) to *Chilobolbina*] may be transferred to *Apatobolbina*, which will then include forms with or without sulcal pit." We believe the differences in lobation in beyrichiid ostracods are generic. We regard *Bolbineossia* and *Apatobolbina* as distinct genera.

Bolbineossia is the only beyrichiid with a

nearly central pit as the only sulcation; it is readily distinguished from all other genera of the family by this character. The female of *B. didictyosa*, the type species, has the frill encroaching onto the ends of the pouch but not extending across it; however, the females of *B. hartfordensis* and *B. punctata*, according to Ulrich & Bassler's illustrations (1923, pl. 37, figs. 7,11), have frills extending completely across their brood pouches.

The name of the genus is derived from Greek βολβωδης ("bulbous") and νεοσσια, f. ("nesting place") and refers to the shape and function of the brood pouch.

Geologic range.—Only Middle Silurian species are known.

BOLBINEOSSIA DIDICTYOSA, n. sp.

Pl. 24, figs. 8–16; text-figs. 5–7

"*Chilobolbina*" sp. Kesling, 1957, pl. 4, figs. 4–6.
Kesling & Rogers, 1957, p. 1000, pl. 127, figs. 10–14.

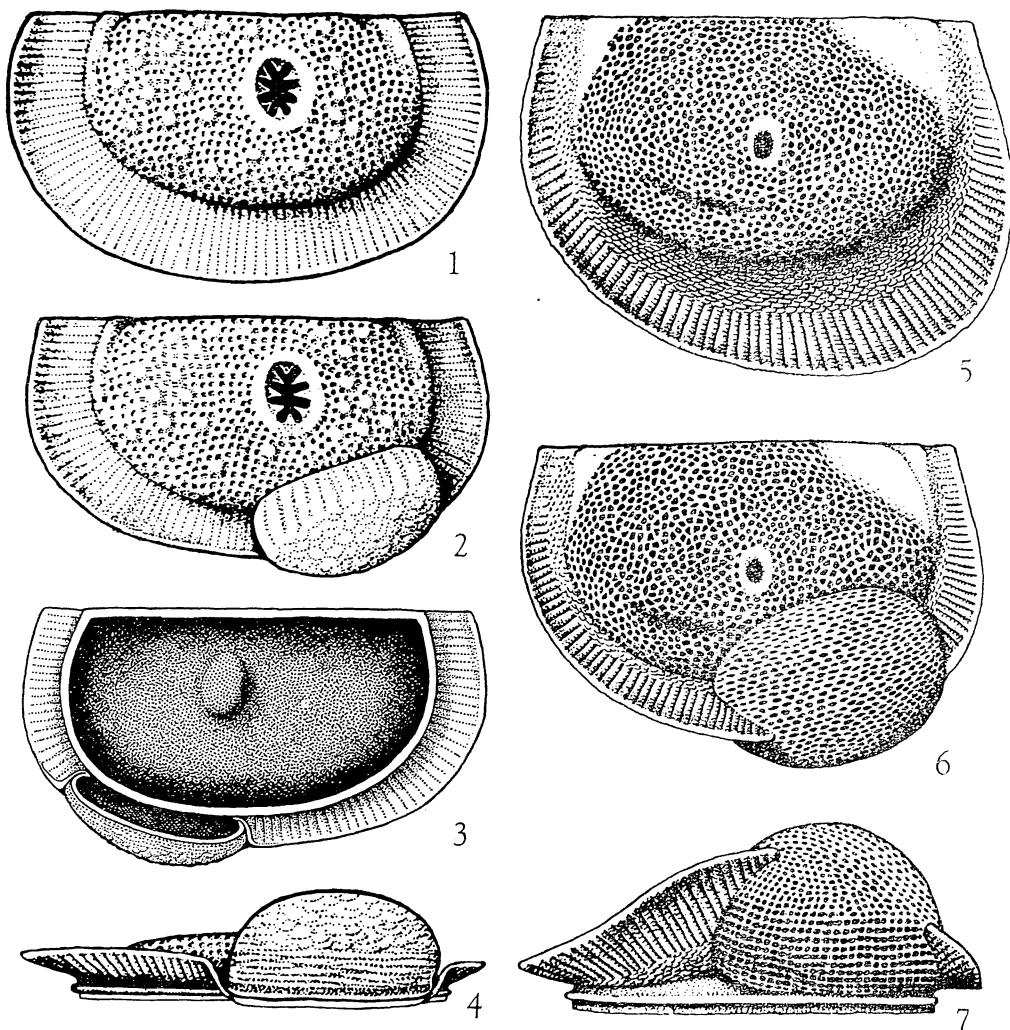
Diagnosis.—A species of *Bolbineossia* with a very broad frill. Frill ornamented with two distinct kinds of ornamentation, proximal flat-ended papillae and distal striae. Ventral part of brood pouch in the female ornamented with rectangular reticules arranged in rows.

Description.—Hinge line straight. Domicilium subelliptical as seen in lateral view, its height about three-fifths its length. Corners of domicilium protuberant. Central pit deep, its diameter equal to about 1/20th the length of the domicilium. Corner areas of domicilium set off from the rest of the lateral surface by distinct curved grooves. Narrow groove on posteroventral region of lateral surface, more or less parallel to the ventral edge of the domicilium, about one-third as long as the domicilium, its front end below the pit about midway between the pit and the frill.

Male with broad frill from corner to corner, widest in the anteroventral region, where its width is greater than half the height of the domicilium.

Female with a bulbous ovate brood pouch on the anteroventral part of the lateral surface. Brood pouch about two-thirds as long as domicilium. Frill encroaching onto each end of the pouch, but not crossing it.

Submarginal ridge in each dimorph; in



TEXTS-FIGS. 1-4—*Chilobolbina dentifera* (Bonnema). Reconstructions based on U. S. Natl. Mus. specimens catalogued together as No. 58376. 1, male right valve, lateral view. 2-4, female right valve, lateral, interior, and ventral views.

TEXT-FIGS. 5-7—*Bolbineossia didictyosa*, n. sp. Reconstructions based on University of Michigan, Museum of Paleontology, Nos. 33748-33752. 5, male right valve, lateral view. 6,7, female right valve, lateral and ventral views.

the female, part of it adjacent to the brood pouch.

Lateral surface finely but distinctly reticulate except narrow posterodorsal corner area, large anterodorsal corner area, and narrow ring around the pit, all of which are smooth. Reticules on lateral surface more or less polygonal, arranged without apparent pattern. Reticules on lateral surface of brood

pouch elongate parallel to long axis of pouch; those on ventral surface of brood pouch square, arrayed in straight rows parallel to the free edge of the valve.

Frill with two distinct kinds of ornamentation: proximal papillae and distal striae. Papillae elongate, subrectangular, more or less in concentric rows. Distal striae deep, faint concentric lines between striae. As seen

on broken specimens, the striae lie between tubules inside the frill. These tubules now filled with clear calcite, but probably hollow originally. Tubules extend, as seen in broken frill, into the proximal (papillose) part of the frill.

Remarks.—*Bolbineossia didictyosa*, n. sp., differs from *B. hartfordensis* (Ulrich & Bassler) in having a narrow curved groove posteroventral to the pit and an anteroventral brood pouch (rather than a centroventral). It differs from *B. punctata* (Ulrich & Bassler) and *B. punctata brevis* (U. & B.) in having distinct ornamentation on the brood pouch. *B. billingsi* (Jones) seems to have, according to Ulrich & Bassler's figures (1923, pl. 37, figs. 4-6), a narrower frill, larger smooth ring around the pit, only one kind of ornamentation on the frill, and a groove which extends not only across the posteroventral region but also onto the anteroventral region. Ulrich & Bassler's retouched figures show that the frill extends across the pouch in *B. hartfordensis* (1923, pl. 37, fig. 7) and *B. punctata* (pl. 37, fig. 11); they do not mention the relationship of frill and brood pouch in their descriptions (1923, p. 516, 520).

The trivial name is derived from Greek δι- ("double, two") and δικτυον, n. ("network") and refers to the two kinds of reticulation on the brood pouch.

Types.—Holotype, a female left valve, No. 33752. Allotype, a male right valve, No. 33748. Paratypes, two male right valves, Nos. 33749 and 33750, and a female right valve, No. 33751.

Occurrence.—All specimens are from a thin, irregular, discontinuous layer of chert

exposed in the abandoned White Marble Lime Company quarry in the city of Manistique, Schoolcraft County, Michigan. This layer, at most 1/16 inch thick, is at or near the top of the Middle Silurian Schoolcraft dolomite of the Manistique group.

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DOLICHOSCAPHA, A NEW BEYRICHIID OSTRACOD GENUS

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ABSTRACT—A very small ostracod from the Middle Silurian Schoolcraft dolomite of Michigan is a female beyrichiid characterized by a smooth central spot, reticulate lateral surface, elongate ventral brood pouch, and a prominent velate ridge. It has no sulci. It is classified as *Dolichoscapa escharota*, n. gen. and n. sp.

Order OSTRACODA
Superfamily BEYRICHIACEA
Family BEYRICHIIDAE
DOLICHOSCAPHA, n. gen.

Type species.—*Dolichoscapa escharota*, n. sp.

Description.—Only a female left valve of the type species known. Male, overlap, and hinge unknown. Hinge line long and straight. Valve nonsulcate, reticulate except for a central smooth spot. Velate ridge extending to each corner. Brood pouch ventral, elongate.

Remarks.—*Dolichoscapa* has a unique combination of features which are known singly in other genera. It resembles *Mesomphalus* Ulrich & Bassler 1913 in having an elongate ventral brood pouch, but differs from that genus in being nonsulcate and reticulate. It has a velate ridge similar to that in *Bolbiprimitia* Kay 1940, but it has a more protuberant and distinct brood pouch and lacks an S2. Unlike the smooth *Apatobolbina* Ulrich & Bassler 1923 and *Phlyctiscapcha* Kesling 1953, which are also nonsulcate, the new genus is reticulate; furthermore, its elongate brood pouch is sharply defined, not posteriorly confluent with the lateral surface like that in *Phlyctiscapcha*, and its velate structure is a ridge, not a frill like that in *Apatobolbina*. Although *Dolichoscapa* has reticulation like that in *Bolbineossia* Kesling, Heany, Kauffman, & Oden 1958 (described in the preceding article), it has a more elongate and more nearly ventral pouch and has a central smooth area instead of a pit.

The central smooth spot is very similar to that in species of *Platybolbina* Henningsmoen 1953, a genus of the subfamily Chilobolbininae according to the classification of Jaanusson (1957, p. 233). In particular, the central smooth spot of *Dolichoscapa es-*

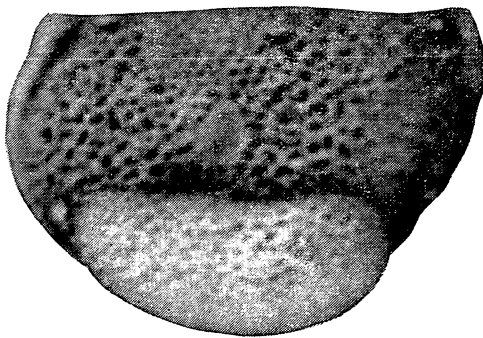
charota, the type species, resembles that of *Platybolbina kapteyni* (Bonnema) (see Jaanusson, 1957, pl. 4, figs. 1-3). It undoubtedly marks externally the position of the internal adductor-muscle scar.

Briefly, we can describe this genus as having an *Apatobolbina*-like lobation, a *Platybolbina*-like central smooth spot, a *Mesomphalus*-like brood pouch, a *Bolbineossia*-like reticulation, and a *Bolbiprimitia*-like velate ridge.

The name of the genus is derived from Greek *δολιχος* ("long") and *σκαφη*, f. ("a cradle") and refers to the shape and function of the brood pouch.

DOLICHOSCAPHA ESCHAROTA, n. sp.
Pl. 24, figs. 18-20; Text-fig. 1

Description.—Dorsal border very gently arched, extending slightly above the hinge line. Valve with a distinct swing. H/L ratio about 2/3. Central smooth spot subpyriform in outline, about $\frac{1}{3}$ as high as valve. Brood pouch ventral, elongate, its length about $\frac{2}{3}$ of that of the valve, its height about $\frac{2}{5}$ that of the valve. Velate ridge, rounded, slightly protuberant above the hinge



TEXT-FIG. 1—*Dolichoscapa escharota*, n. sp. Lateral view of holotype, a female left valve. X85.

line at the corners, extending ventral to the brood pouch. Whether the ridge is complete or separated into two parts below the brood pouch is not clear. Submarginal ridge parallel to free edge, in lateral view obscured by velate ridge.

Lateral surface reticulate, with reticules of several sizes, apparently without regular arrangement except, perhaps, that those on the periphery of the central spot are large and those anterodorsal to the spot are small. Brood pouch ornamented with faint reticulation, much shallower than that on the lateral surface.

Dimensions of holotype, a female left valve: length, 0.73 mm.; height, 0.48 mm.; and width, 0.30 mm.

Remarks.—Inasmuch as this is the only species known in the genus, it is impossible to say whether it is unusually small. It is well known that species of beyrichiid ostracods vary greatly in size within the same genus, so that other species of *Dolichoscapa* may be found which are larger than this very small ostracod.

The name of the species is derived from Greek *εσχαπα*, f. ("scab, a scar from a burn") and refers to the central smooth spot.

Type.—Holotype, a female left valve, catalogued and deposited in the Museum of Paleontology of the University of Michigan as No. 34450.

Occurrence.—The holotype and only specimen is from a thin, irregular, and discontinuous layer of chert exposed in the abandoned White Marble Lime Company quarry in the city of Manistique, Schoolcraft County, Michigan. This layer, at most $\frac{1}{8}$ inch thick, is at or near the top of the Middle Silurian Schoolcraft dolomite of the Manistique group.

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