

SOME NEW SPECIES OF *CAMAROTOECHIA* FROM
THE BAINBRIDGE LIMESTONE OF MISSOURI*

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During the years 1923 to 1926, under the direction of the late Stuart Weller, the senior author has studied and described some of the fauna of the Bainbridge limestone of southeastern Missouri. The descriptions written at that time are in a manuscript filed in the libraries of the University of Chicago. A faunal summary and a possible correlation of the limestone have been published in one of the theses abstracts of the University of Chicago.¹ A study of the Bryozoa, and of the micro-fauna was not undertaken in this earlier investigation. During the summer of 1930 the junior author has collected extensively from the Bainbridge formation. In the large amount of additional material that he has secured it becomes evident that some modification of earlier conclusions reached regarding the fauna may be justifiable. Some of those modifications are presented in this paper. In addition, the studies of the junior author are revealing a large micro-fauna in practically all of the Bainbridge.

In the course of the earlier study of the Bainbridge fauna, three new species of *Camarotoechia* were described. Two of them are named *Camarotoechia indianoidea* n. sp. and *Camarotoechia neglectoidea* n. sp., respectively. These names were given in recognition of their striking resemblance to the well-known Silurian species from Indiana and elsewhere. With both of these Bainbridge species in the collections first studied were a number of closely related forms, rather sparsely distributed among the specimens. On account of their relatively rare appearance in the fauna, therefore, it was judged to be more conservative to regard them as but variants of the much more abundant species named above. *Camarotoechia neglectoidea* apparently had but one or

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¹ Ball, J. R., "The Faunas of the Brassfield and Bainbridge Limestones of Southeastern Missouri," The University of Chicago Abstracts of Theses, Science Series, Vol. V, 1926-27, pp. 261-269.

two variants but there appeared to be at least five related to *Camarotoechia indianoidea*. In the evidence afforded by the additional material that Mr. Dunn has collected it becomes quite evident that certain forms, previously regarded as variants, may be considered as distinct species of *Camarotoechia*. They are present in really significant number, and the particular differences that they possess are represented both in individuals that are young and also in mature representatives. It is the conviction of the authors, therefore, that some of the "variants" of the earlier descriptions may be set aside, and that one variant of *C. neglectoidea*, and three of the five variants of *C. indianoidea* may be elevated to specific rank. This reassignment of the forms recently studied, leaves at present one variant remaining for *C. neglectoidea*, and two others that now are regarded probably as variants of *C. multiplicata* Ball and Dunn, n. sp., described in this paper. This study, accordingly, increases the number of new species of *Camarotoechia* in the Bainbridge fauna from three to seven, and makes the total number of Brachiopoda now known from the Silurian horizons of this locality fifty-nine.

Descriptions of the new species, including also those of *Camarotoechia indianoidea* and *Camarotoechia neglectoidea*, follow:

Class BRACHIOPODA Dumeril
Order TELOTREMATA Beecher
Family RHYNCHONELLIDAE Gray
Genus *CAMAROTOECHIA* Hall and Clark

CAMAROTOECHIA INDIANOIDEA Ball, n. sp.

Plate 1, Figs. 1-5

Description.—Shells small, subpentagonal, commonly wider than long, the greatest width about midway between the beak and anterior margin, the postero-lateral margins nearly straight or sometimes slightly concave, diverging at an angle of approximately 95°, the lateral margins nearly straight, the antero-lateral and anterior margins commonly straight but in some instances gently rounded. The dimensions of one individual are: length 11.8 mm.; width 12.5 mm.; thickness 7.6 mm.; greatest width of sinus 10 mm., greatest width of fold 8 mm.

Pedicle valve shallow, its greatest convexity in the umbonal region, the surface sloping abruptly from the umbo to the postero-lateral margins near the beak, with a gently convex curvature toward the lateral and antero-lateral margins becoming slightly flattened or concave near the margins. From beak to anterior margin along the mesial line the

curvature is regularly elliptical, while transversely the curvature is depressed convex. Originating near the base of the umbo, a broadly triangular and shallow mesial sinus, its surface slightly convex transversely, is produced anteriorly in a long and regularly rounded linguiform extension into the opposite valve. It usually bears three, sometimes four, low, broadly rounded plications, faintly discernable across the umbo, but evidently extending from the beak; on each lateral slope are three or four distinct plications with occasionally a few additional ones along the postero-lateral margins, all of them faintly defined posteriorly. Beak small, pointed, and slightly incurved.

Brachial valve thicker than the pedicle, its greatest thickness slightly anterior to the midpoint of the valve, the mesial region flattened transversely in the umbonal vicinity, the flattening continuing anteriorly into the broad mesial fold which originates in about the midpoint of the valve, and in some cases well toward the anterior margin. From the flattened umbonal region the surface descends almost at a right angle into the compressed, slightly concave postero-lateral surfaces. On each lateral slope the surface curves regularly and strongly from the umbonal region toward the antero-lateral margins with a curvature about equal to that in the mesial sinus of the pedicle valve. Along the mesial line from the beak over the umbo the curvature at first is strongly convex, then continues anteriorly in a flattened, gentle, convex line, in some specimens becoming slightly concave near the anterior margin. On the mesial fold commonly are four plications, well defined and subangular at the anterior margin, while on each lateral slope are three or four plications less conspicuous than those on the fold. All the plications extend from the beak but are faintly defined posteriorly. A distinct mesial furrow is well developed in the umbo and extends anteriorly across it. Beak broad, inconspicuous and closely incurved.

Faint concentric markings, sometimes present on both valves, generally are best developed near the anterior margin.

Observations. This species apparently is confined to what has been called the "Merista" bed in the Bainbridge limestone. Along with *Merista tennesseensis*, *Camarotoechia neglectoidea* n. sp., and *Atrypina welleri* n. sp., it is one of the most prevalent brachiopods of that stratum and, like the first two of these named, it is noteworthy for the number of young specimens represented. It is quite similar to *Camarotoechia? indianensis* (Hall) and resembles that species in its variability of form; it differs from it, however, in its relatively more transverse outline, in the fainter development of its plications, and in the persistent occur-

rence of three plications in the pedicle sinus and four on the brachial fold. Individuals in the Bainbridge fauna with three and four plications, respectively, in the sinus and on the fold are so numerous in a collection of over three hundred specimens that they are here regarded as the prevalent and characteristic type of this species.

Location.—South slopes of Greither Hills, overlooking the St. Mary's road, two and one-half miles southeast of Ozora, Missouri.

CAMAROTOECHIA EXTANS, Ball and Dunn, n. sp.

Plate 1, Figs. 11-15

Description. Shells small, subpentagonal, length and width about equal, the greatest width slightly anterior to the midpoint, postero-lateral margins gently rounded, diverging at an angle of about 113° , lateral and antero-lateral margins regularly rounded, anterior margin nearly straight. The dimensions of two individuals, one of them the holotype, are: length 12.6 mm., 13.1 mm.; width 12.5 mm., 13.5 mm.; thickness 10.6 mm. and 7 mm.

Pedicle valve shallow, its greatest convexity in the umbonal region, the surface sloping abruptly from the umbonal region to the postero-lateral margins near the beak and with gentle curvature toward the lateral and antero-lateral margins, and greatly flattened along the lines of the plications bounding the mesial sinus. Along the mesial line from beak to anterior margin the curvature is strongly elliptical, while transversely in the posterior region the surface is depressed convex and deflected downward abruptly at the lateral margins. A shallow mesial sinus, whose width at the anterior margin is about three-fifths the greatest width of the shell, originating at the base of the umbo, nearly flat or slightly convex transversely, is produced anteriorly in a linguulate extension into the opposite valve. In the sinus is a single plication, usually sharply angular, but sometimes faintly defined and extending from the beak: on each lateral slope are three or four low and rounded plications, those next to the sinus larger than the others. These plications also extend from the beak and in some instances there are more than four. Beak erect, small and pointed.

Brachial valve thicker than the pedicle, its greatest thickness in the midpoint of the valve, the surface depressed and flattened at the base of the umbo and on the fold. From the umbonal region the surface descends abruptly, almost at right angles, into a slight concavity on the postero-lateral margins, while along the lateral slopes the curvature from the umbo is strong and regular near the fold, but near the antero-lateral margins the surface is deflected abruptly downward into

