

ON THE *MACROCHEILUS* OF PHILLIPS, *PLECTOSTYLUS* OF CONRAD, AND *SOLENIUSCUS* OF MEEK & WORTHEN.

By CHARLES A. WHITE.

Among the somewhat numerous species of fossil shells which have been published from North American Devonian and Carboniferous rocks, especially the latter, and which have been referred to the genus *Macrocheilus* of Phillips, are certain forms which plainly do not answer the description of that genus as it was originally given or as its characteristics have usually been stated by authors. The differences between these species and those which I regard as true *Macrocheilus* pertain mainly to the columella and inner lip, but they also possess a more massive test than those which are referred to *Macrocheilus* proper. Some of the American species which have been referred to *Macrocheilus* have a plain, more or less sinuous inner lip, which is only slightly covered with callus, and destitute of any trace of ridges or folds. These I assume to be typical forms of that genus, and the following, among others, may be mentioned as examples: *Macrocheilus hebe* and *M. hamiltonia* Hall, of the Devonian, and *M. anguliferus* White, of the Carboniferous. My present belief is that all the Devonian forms which have been referred to *Macrocheilus* will fall into this group, but it will properly include only a very small part of those which have been referred to that genus from Carboniferous strata.

With the very few exceptions referred to, I think that all the numerous North American Carboniferous forms which various authors have referred to *Macrocheilus* constitute a distinct natural group, which ought to be designated by one and a different generic name. I also think the form for which Meek and Worthen proposed the generic name of *Soleniscus* should be included in this group.

The shells of this group are characterized by a more or less thickened inner lip, which also bears one more or less distinct revolving fold. This fold, when the outer lip is entire, is usually visible only as an obtuse prominence near the anterior end of the inner lip, but upon breaking away the outer lip the fold is usually found to be distinct and often sharp and prominent. Sometimes also there is upon the posterior side of the fold a broad, concave depression, which ends at and deepens the inward flexure of the inner lip, the posterior border of which depression is sometimes so well defined as to appear like a second revolving fold. This depression, which is sometimes a tolerably distinct groove, is excavated out of the callus which covers the columella and inner lip, in such cases quite thickly, between the depression and the posterior angle of the

aperture. Forward of the fold there is little and sometimes no accumulation of callus, the anterior end of the outer lip, where it joins the inner lip, being usually thin and more or less prominent when entire. There is, therefore, in unbroken shells a rather broad, short, more or less distinct anterior canal, too broad and short to really deserve the name of canal, strongly recalling the corresponding part of *Nassa*. The anterior border of this short canal, however, is prominent, and not emarginate, as in *Nassa*.

From the fact that the columellar fold upon these Carboniferous shells is distinct only within the aperture, and the latter is usually filled with the imbedding matrix, this distinguishing feature seems to have usually escaped notice. It has not always done so, however; both those eminent paleontologists, Professors Hall* and Geinitz,† having referred to it in published descriptions. Meek and Worthen also observed that the inner lip is "usually provided with an obtuse revolving fold"; but none of these authors appear to have regarded that feature as separating such shells generically from those which are destitute of it. Mr. Conrad, however, so early as 1842, proposed the generic name of *Plectostylus* to include shells possessing this character, but that name was previously used by Beck for another group of mollusks. Mr. S. A. Miller, also, in his Catalogue of American Paleozoic Fossils, refers the *Macrocheilus halli* of Geinitz to *Soleniscus* Meek and Worthen. In 1881 I described‡ two similar species from the Carboniferous rocks of New Mexico, and also referred them to *Soleniscus*.

Notwithstanding the conscientious accuracy which is apparent in all the work of those authors, I suspected that the anterior portion of Meek and Worthen's type species of *Soleniscus* is not so prominent as it is represented to be by the restored part of their figures.

Applying to Mr. Worthen for permission to examine the type-specimen, I learned that it was inaccessible, but he sent me for examination an authentic duplicate example. A careful examination of this specimen satisfies me that the anterior portion of the shell in this species is only a little more prominent than it is in several of those forms which have been referred to *Macrocheilus*, and that that portion is not produced into a proper beak. Meek and Worthen's figures show that the anterior portion of their type-specimen was broken off, and if the line of the restored part had been continued with the curve of the outer lip it would agree with the lines of growth which are observable upon the specimen sent me by Mr. Worthen. Moreover, their figure shows a prominence of the fold upon the inner lip which did not appear on the one just referred to until I had dug out the stony material which had filled the aperture. Their

* Geology of Iowa, 1858, Part II, pages 719 and 720.

† Carboniferous and Dyas in Nebraska, 1866, page 6, Pl. 1, Fig. 7.

‡ Expl. and Sur. West of the 100th Merid., supp. to Vol. III, pp. xxviii and xxix, Pl. IV, Figs. 4 and 5.

figure appears to represent the outer lip as unbroken; but to exhibit the columellar fold so prominently as that figure shows it to be, the outer lip must have been largely removed.

Understanding the real characters of the type-species of *Soleniscus* to be such as I have here indicated, it is, I think, necessary to regard it as congeneric with the greater part, if not all, of those forms which are figured with it on Plate VIII; and with most of those Carboniferous shells which have been by different authors referred to *Macrocheilus*. The principal differences, according to my observations, which that species presents from the others referred to, are its more than usually elongate form, a little greater than the usual prominence of the anterior part of the aperture, and a smaller accumulation of callus upon the inner lip.

These forms, as before remarked, are regarded as constituting a natural group, which, it appears to me, well deserve a generic designation distinct from *Macrocheilus*. If it were not that Conrad's name, *Plectostylus*, was preoccupied by Beck, that name would be appropriately retained for this group, to which it was really applied. Conrad's name not being available, the next generic name that has been used for any member of the group ought to be used for the whole group. As *Soleniscus* is regarded as a member of this group, that name should be properly used for it because no other available name has priority.

The following species which have been hitherto referred to *Macrocheilus* have been found to possess the prominent columellar fold and other characteristics of the group here discussed, and I would therefore refer them to *Soleniscus*: *Macrocheilus fusiformis* Hall, *M. newberryi* Hall, *M. planus* White, *M. ventricosus* Hall (= *Soleniscus brevis* White), *M. texanus* Shumard? *M. paludinaformis* Hall, and *M. halli* Geinitz. All except the last are figured on Plate VIII.

It is not to be denied that there are certain forms among those Carboniferous species which have usually been referred to *Macrocheilus* that possess at best only an obtuse fold upon the columella. They are, however, much more closely related by all their characteristics to the species just referred to *Soleniscus* than are those Devonian and other species which I have referred to *Macrocheilus* proper. Among these species are the three following, which are represented with the others on Plate VIII: *Macrocheilus ponderosus* Swallow? *M. medialis* Meek & Worthen, and *M. primigenius* Conrad. These I regard as at best no more than subgenerically different from those which I refer to *Soleniscus*.

As to the family relations of the shells of this group I am inclined to adopt the views suggested by Meek, that they belong to the *Actæonidæ*. Those shells which I have referred to the genus *Macrocheilus* proper are perhaps not suggestive of such a relationship, but they do not appear to differ from the *Soleniscus* group any more than some recognized genera of the *Actæonidæ* do from certain other genera of that family.

EXPLANATION OF PLATE VIII.*

SOLENISCUS? (MACROCHEILUS) PONDEROSUS Swallow?

FIGS. 1, 2.—Opposite views of a large example from Southern Iowa. The outer lip and a portion of the columella have been broken away so that the obtuse fold is not clearly shown. Professor Swallow's species was never figured; and this form is doubtfully identified by means of his description. (Museum No. 9142.)

SOLENISCUS? (MACROCHEILUS) PRIMIGENIUS Conrad.

FIG. 3.—Lateral view of a damaged example from Illinois, showing the thickened columella, but only a slight trace of a fold. (Museum No. 747.)

SOLENISCUS (MACROCHEILUS) FUSIFORMIS Hall.†

FIGS. 4, 5, 6.—Different views of two examples from Illinois, showing some variation in the outward form of the shell, and also the character of the columella. Fig. 5 shows the character of the inner lip at mature growth; and Fig. 6 shows the columella with its fold and broad groove after a portion of the last volution has been removed.

SOLENISCUS (MACROCHEILUS) NEWBERRYI Hall.

FIGS. 7, 8.—Opposite views of an example from Illinois, showing the outward form, the accumulation of callus upon the inner lip, and the columellar fold and broad groove.

SOLENISCUS PLANUS White.

FIGS. 9, 10.—Opposite views of an example from Illinois, showing the outward form, and the columella with its fold and groove. This form is possibly identical with the *Macrocheilus newberryi* of Hall; but it seems to be different.

SOLENISCUS (MACROCHEILUS) VENTRICOSUS Hall.

FIGS. 11, 12.—Lateral views of two Illinois examples. Fig. 11 represents an apertural view of a nearly perfect shell; and Fig. 12, another shell from which a large part of the last volution has been removed, to show the columella with fold and groove. (Museum Nos. 9372 and 12210.)

SOLENISCUS (MACROCHEILUS) TEXANUS Shumard.

FIGS. 13, 14.—Opposite views, showing the outward form of the shell, and the character of the columella with its fold and groove. Dr. Shumard's species was never figured, and this form from the Coal Measures of Illinois has been doubtfully identified by means of his description.

SOLENISCUS? (MACROCHEILUS) MEDIALIS Meek & Worthen.

FIGS. 15, 16.—Opposite views of an example from Indiana, showing the outward form and the columella, which bears only a slight trace of a fold.

SOLENISCUS (MACROCHEILUS) PALUDINEFORMIS Hall.

FIG. 17.—Lateral view of an example from Indiana, with a part of the last volution removed, showing the columellar fold and broad groove.

SOLENISCUS TYPICUS Meek & Worthen.

FIGS. 18, 19.—Copies of Meek & Worthen's figures of their type-specimen.

All figures on this plate are natural size.

* This plate is also to appear in the annual report of the Indiana State Geological Survey; and the use of a part of the examples here figured have been courteously loaned for the purpose by Prof. John Collett, State Geologist.

† The name *Macrocheilus fusiformis* was preoccupied by Sowerby. Professor Hall's species belongs to the group which I refer to *Soleniscus*. If this view is accepted, and Sowerby's species also belongs to that group, the name of the American species must be changed.

PLATE VIII.*

(For text see pages 184-187.)

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