

ARTICLE V.—*Description of a new form of fossil, Balanoid Cirripede, from the Marcellus shale of New York.* By R. P. WHITFIELD.

Among the fossil crustacea of the Palæozoic formations, Cirripedes have never formed a conspicuous feature, and those which are known are, with a single exception, forms pertaining to the pedunculated group *Lepadidæ*; while sessile forms like the modern *Balanus* have been entirely unknown until very recently—with that one exception, a supposed *Balanus* (*B. carbonaria*, Petzhold*) from carboniferous rocks at Pottschappel, near Dresden, Saxony; but which from their mode of occurrence would give one the impression they might be palatal teeth of fish, like *Orodus*, rather than shells of *Balanus*. Exclusive of this one form, we have no published evidence of any species of sessile Balanoid form in Palæozoic rocks. Hence the discovery of a fossil, presenting features of a true Balanoid in rocks of the lower Devonian, may be considered a matter worth recording.

The form here noticed was first discovered in September, 1879, among specimens of Marcellus shale from Avon, Genesee County, N. Y. The block on which it occurs contains numerous examples of *Leiorhynchus limitaris*, Vanux., with *Ambocælia umbonata*, *Chonetes mucronatus* and *Leiopteria lævis*, Hall. The specimen is of minute size, and of an ovate form, with but a slight elevation; the length is about four and one-third m.m., by a little more than three m.m. in its greater width, exclusive of a narrow fringe-like border which surrounds it, except on the carinal end. It differs from any known form of Balanoid type in the greater number of plates forming the crown or circle, and still more so in the form, arrangement and number of plates representing the opercular plates of the modern forms. In consequence of these important differences it will be necessary to propose for it, not only a new generic name, but also a new sub-family name under the *Balinidæ*. I therefore propose to designate it by the generic name *Protobalanus*, and the sub-family name *Protobalanine*, with the following diagnosis:

Protobalanine, n. sub-fam. **Protobalanus**, new genus.

Shell sessile, the crown consisting of twelve plates, including a carinal, a rostral and ten laterals, five of the latter on each side.

* *Neus Jahrb. fur Mineralogy, &c.*, 1842, pp. 403-409, Pl. 4.

[*March*,

Also possessing seven (?) opercular plates, arranged in three pairs with a single one in advance of the forward pair.

The only individual known of this form is imperfect, the crust from fully two-thirds of the opercular area being broken away, carrying with it the points of the two lateral and of the rostralateral plates on the left side, and of the rostralateral and the adjoining lateral on the right side of the shell, with all the opercular plates except the anterior single plate. These latter plates have, however, left their impressions on the filling, and if these are rightly determined and understood, there have been three pairs, besides the one, yet in place. Along the central line of this denuded area there remains an elevated, zig-zag ridge, showing the junction of plates of the two lines, and on the left side their prolongation inward. These plates would seem to have been hexagonal in outline, but their absolute form and arrangement cannot be determined. The single anterior plate, which is supposed to be an opercular plate, is placed between the points of the anterior laterals, behind the carino-laterals, and is low, rounded and node-like on the surface. That the features which are here described represent the opercular appendages I cannot doubt, although they are too obscure to afford means for positive assertion. Hence this part of the generic diagnosis must be considered as somewhat doubtful. The points wherein this form differs most conspicuously from all other Balanoids is in the greater number of plates forming the crown, and is equivalent to the features upon which the other sub-families of the *Balanidae* is based.

Protobalanus Hamiltonensis, Whitf.*

PLATE 13, FIG. 22.

Protobalanus Hamiltonensis, Whitfield, Pal. N. Y., Vol. 7, p. 209, Pl. 36, fig. 23.

Shell ovate, three-fourths as wide as long, narrowest at the carinal end, and but little elevated. *Carinal* plate subcircular in

* For the purpose of including this form in the Volume of the New York Palæontology, devoted to this class of fossils, the generic and specific names were given to Prof. J. M. Clarke, and the specimen loaned for illustration in that work previous to being published. See Pal. N. Y., Vol. 7, p. 209, Pl. 36, fig. 23. In the figure there given the artist has not fully portrayed the features of the specimen. Prof. Clarke has also described a second Palæozoic form of Balanoid *Palæocreusia*. R. P. W.

outline, or semicircular on the external face, elevated and terminated at the apex in a rounded tubercular boss, from which the rays of the anterior face originate. Rostral plate proportionally short and broad, being a little more than twice as wide as high, the outer or parietal portion is broadly triangular, and has the apex but little elevated above the radial surfaces. *Carino-lateral* plates forming a nearly equilateral triangle on the outer surface, the posterior face being slightly longer than the other. *Rostro-laterals* smaller than the carino-laterals, and narrower in proportion. *Laterals* elongate-triangular, nearly once and a half as high as wide, but somewhat variable. Radial surfaces wide in proportion to the width of the plates, only moderately depressed, the markings of their surfaces not distinguishable, nor are the sutures between the plates discernable.

External surfaces of the plates marked with longitudinal, rounded ridges. The *Carina* having twelve ribs, one of which is bifurcated. *Rostrum* with eight ribs. *Carino-laterals* with six each. *Rostro-laterals* with four each, and the laterals having three each. This formula is varied, in the specimen, by having only three ribs present on the right rostro-lateral plate, and four on the adjoining lateral.

Opercular plates, so far as can be determined, seven in number, arranged in three pairs with one or perhaps two central ones in advance.

Around the margin of the rostral plate, and all of the lateral plates, there appears to be a narrow fringe, which is radiately marked corresponding to the rays of the several plates. This fringe is not seen bordering the carinal plate. (On the left side the shell of a *Leiorhynchus limitaris* covers a portion of the fringe.) On some of the plates the fringe appears to have the ribs doubled, as if a bifurcation had taken place at the margin of the plate.

Locality and position.—The specimen is from the Marcellus shale in the town of Avon, Genesee County, N. Y., and belongs to the Cabinet of the Museum.

[*March,*

EXPLANATION OF PLATE 13.

Primitia cristata, n. sp. Page 59.

Figs. 1 & 2. Views of opposite valve (4 diameters) and an outline profile of each, showing elevation.

Primitia gregaria, n. sp. Page 58.

Figs. 3 & 4. View of opposite valves (4 diameters), with outline profiles.

Fig. 5. View of an internal cast of the same.

Primitia Seelyi, n. sp. Page 60.

Fig. 6. View of a right valve with profiles (4 diameters).

Fig. 7. Enlargement of crust, showing the pits with granules in them.

Bathyrus Seelyi, n. sp. Page 61.

Figs. 8 & 9. View of a glabella and fixed cheeks, the frontal rim imperfect. Also outline profile.

Fig. 10. View of a left movable cheek, imperfect below.

Figs. 11 & 12. Another imperfect head and outline profile.

Figs. 13 & 14. Pygidium, (2 diameters), the marginal rim partly removed.

Bathyrus conicus, Billings. Page 61.

Figs. 15 & 16. View of the central parts of the most perfect head, and profile in outline.

Figs. 17-19. View of imperfect heads of this species.

Figs. 20 & 21. Views of a pygidium, enlarged twice.

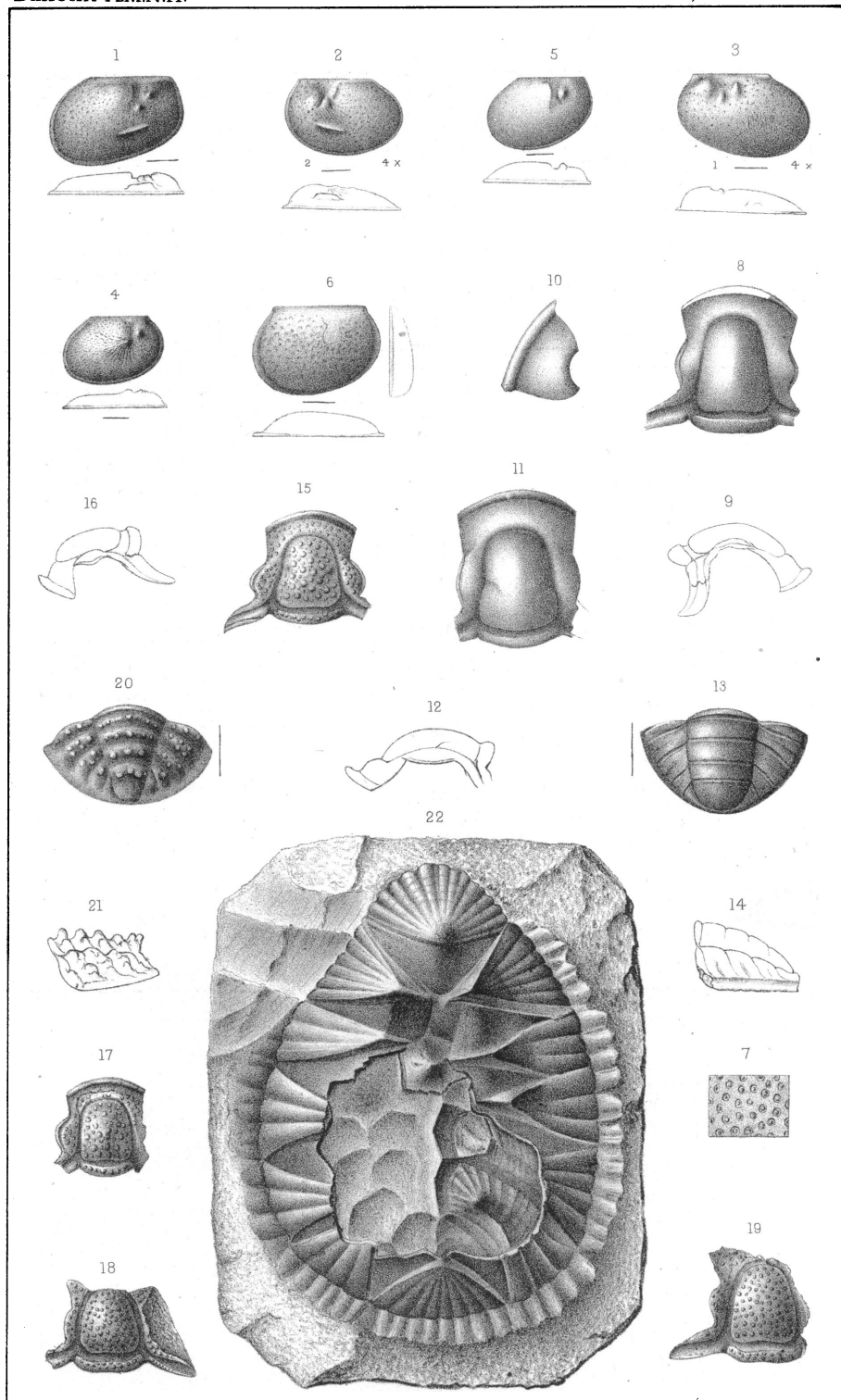
Protobalanus Hamiltonensis, Whitf. Page 67.

Fig. 22. View greatly enlarged, to scale, showing the features described.

LAKE CHAMPLAIN FOSSILS.

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