

XIV.—*Notes on Palæozoic Bivalved Entomostraca*. No. II. *Some British and Foreign Species of Beyrichia*. By T. RUPERT JONES, F.G.S.

[Continued from p. 92.]

[With a Plate.]

IN my former notice of Palæozoic Bivalved Entomostraca ('Annals,' No. 92, p. 81, &c.) the *Beyrichiæ* of Sweden and Gothland only were treated of; and I now propose to illustrate the British species, as far as my materials will allow, as well as some foreign species which I have had the opportunity of studying. I owe much to Mr. Salter for his friendly advice and assistance in the examination of these little fossils, and I have much pleasure in acknowledging his kindness; Mr. Morris also has kindly aided me; the Portuguese specimens have been lent to me by Mr. D. Sharpe; and to Sir R. Murchison I am indebted for permission to use and to illustrate the specimens in the Museum of Practical Geology in Jermyn Street, which form the largest portion of the series. I ought here also to repeat my thanks to Prof. Beyrich and Sir C. Lyell for the Scandinavian specimens above mentioned; for without them I could not have entered upon the subject, and because a part of the materials of this notice also is derived from that source.

Like the Scandinavian species, the forms now described also represent the three groups into which I divide the genus according to the surface-divisions of the valves;—and they are described in the same order.

The figures in Pl. VI. represent the objects magnified 4 diameters, as in Plate V.

Referring to my former communication for the generic characters, I proceed to the description of the several species.

(JUGOSÆ.)

1. *Beyrichia complicata*, Salter. Pl. VI. figs. 1-5.

Mem. Geol. Survey, 1848, vol. ii. part 1. p. 352. pl. 8. fig. 16; Brit. Palæoz. Foss. Cambridge, 1851, part 2. fasc. 1. p. 136 (M'Coy's descript.) pl. 1 E. fig. 3; *ibid.* 1852, fasc. 2. Appendix A. p. ii. (Salter's descript.).

Surface of valve depressed, deeply furrowed, and bearing three sharply defined ridges, which are usually united by a connecting ridge along the ventral margin. Anterior ridge largest, pear-shaped; middle ridge narrow, club-shaped: these two ridges, somewhat curved and pointing obliquely downwards and backwards, are frequently less distantly separated than the middle and posterior ridges are. The hindermost ridge is variously

modified by a transverse depression on its thickest part, usually forming an oblique indentation on its inner (anterior) side, and producing a bifurcation of the ridge. In the figures in pl. 18 of the 'Mem. Geol. Survey' (above referred to) the artist has inadvertently made the small inner branch of the posterior ridge uniformly continuous with the produced upper part of the ridge; a condition, however, almost arrived at sometimes by the indentation on the broad part of the ridge (compare fig. 3).

I have not seen the carapace-valve itself of this species; but, judging from the aspect of the casts and impressions it was probably smooth. All the figures are from casts. Figs. 1-4 are selected from a number of drawings illustrative of the variations of outline, and of the disposition of the ridges. Figs. 1 and 2 may be regarded as the typical form.

In a young specimen from Harnage (fig. 5) the anterior furrow (dividing the fore and middle ridges or lobes) is seen to be shorter than that between the middle and hinder lobe; and the indentation on the upper part of the last ridge is vertical and distinct. This specimen is very interesting, as it shows that in the young state this species (so strongly ridged in the adult state) is scarcely removed, except by its well-defined marginal rim, from the merely "crumpled" condition of the *Corrugata*. With this young individual several adult specimens occur, which retain the vertical bifurcation of the posterior lobe, as is also seen in Prof. M'Coy's figure, Cambridge Pal. Foss. pl. 1 E. fig. 3 (which is better matched by our fig. 5 than by the others); in other respects they resemble our fig. 1.

Figs. 1 and 2 are from artificial casts of impressions in dark siliceous micaceous Llandeilo flagstone, from Llan Mill (two miles east of Narberth, Haverfordwest district). Figs. 3 and 4 are from internal casts in a dark calcareous Llandeilo flagstone of the same locality. The specimens are very abundant in the shelly bands of the flagstone and scattered over its divisional planes, together with the remains of Trilobites, *Leptaena*, *Encrinurus*, &c. (In the Museum of Practical Geology.)

Fig. 5 is from a soft greenish-yellow argillaceous and micaceous bed of the lower Bala rocks at Harnage, near Shrewsbury; and occurs with a few older individuals, several specimens of *B. bicornis*, and a vast number of minute specimens, described further on under the heads of *B. strangulata* and *B. simplex*;—together with palliobranchiate and other Bivalves*,—nearly all in the state of casts, on the surface of a divisional plane of the rock. (In the Museum of Practical Geology.)

* Harnage, from whence many of these specimens are described, is a rich locality in the Lower Llandeilo (or Bala) flags; Trilobites, including *Alenus*, are found there.—J. W. S.

The black Bala flagstone of Abermarchant (in the Museum of Practical Geology) contains specimens of *B. complicata* in which the furrows are not so deeply excavated as in the Llan Mill specimens. Hence the ridges are broader and less steep, the connecting ridge along the ventral border more distinct, and the aspect of the valves approaches that of some of our *Corrugatæ*; thus making the passage still less difficult between our *B. Ribeiriana*, Barrande's *B. Bohemica*, and the typical *B. complicata*. There is here and there on the Abermarchant specimens some slight evidence of a granulated surface.

B. complicata, var. *decorata*. Pl. VI. fig. 6.

Accompanying the broad-ridged form of *B. complicata* in the Abermarchant flagstone (Mus. Pract. Geology), is an impression of the valve of a variety of this species, which has a semicircular outline, a finely granulated surface, and a broad, depressed, sloping marginal rim, which was crested by a continuous series of fine projecting spines. The ridges are disposed in much the same manner as those in fig. 5 and in M'Coy's specimen above referred to, the bifurcation of the posterior ridge being vertical; the furrows are very strongly marked; the middle ridge is somewhat crenulate, and the anterior lobe is impressed by a slight indentation along its thickest part.

Beyrichia complicata is a characteristic Lower Silurian form; its localities above alluded to are—Llan Mill, near Narberth; Harnage, near Shrewsbury; and Abermarchant. Prof. M'Coy mentions as localities for this species—

Llanfwrog, near Ruthin.

Cwm of the Cymmerig, E. of Bala.

Hill N. of Moel Uchlas, Montgomeryshire.

Tregib, S. of Llandeilo.

Coed-y-Bedw, Bala.

Selattyn Road, S. of Llangollen.

Bryn Eithin, Penmachno.

Mynydd Mawr, Caermarthenshire.

Mathyrafal, S. of Meifod.

Pen-y-Park, Llanfyllin.

} Upper Bala.

Pont-y-Meibion, two miles S. of Llansantfraid, on the Ceiriog.

Milltir Cerrig, Llangynnog, Montgomeryshire.

} Lower Bala.

2. *Beyrichia Klædeni*, M'Coy. Pl. VI. figs. 7 & 9.

Synops. Sil. Foss. Ireland, 1846, p. 58 (woodcut figs.); Brit. Pal. Foss. Cambridge, 1851, part 2. fasc. 1. p. 135. pl. 1 E. fig. 2. *Agnostus tuberculatus*, Sil. Syst. 1839, p. 604. pl. 3. fig. 17 (non *Battus tuberculatus*, Klöden). *Beyrichia tuberculata*,

Salter, Mem. Geol. Survey, 1848, vol. ii. part 1. p. 352. pl. 8. figs. 14, 15, and *B. gibba*, *ibid.* p. 352. pl. 8. figs. 17, 18. *B. tuberculata*, Siluria, 1854, p. 234 (woodcut 45, 4), pl. 34. fig. 21.

Surface of valve convex, divided into three lobes; the hind and front lobes both large, pyriform, but somewhat variable in their relative proportions; the ventral extremity of the anterior lobe extending below that of the posterior lobe; the middle lobe small, oval, and frequently united with the posterior lobe by a narrow depressed curved neck; marginal rim distinct.

The surface sometimes smooth (fig. 7), and sometimes granulated (fig. 9).

Messrs. Salter and M'Coy have given several figures of this species, most of which accord generally with the above description, except that for the most part the anterior and posterior lobes are made to appear continuous along the ventral part of the valve. M'Coy's figure 2, pl. 1 E. Brit. Pal. Foss. is an interesting exception to this condition; and it differs from our specimens in having the anterior lobe much reduced in width. Salter's figures 17 and 18. pl. 8. Mem. Geol. Surv. are exceptional also in the angular production of the ventral border; these are from the Middle or Upper Silurian series at the Slate Mill, S.W. of Haverfordwest.

M'Coy also mentions (*loc. cit.* p. 136) a well-marked variety, having a long central ridge continued to the ventral* border from the Bala schist at Dermydd Fawr, near Craig Bronbanog, N.W. of Corwen.

Fig. 6 is an artificial cast of an impression in calcareous flagstone (in the Museum of Practical Geology), which contains numerous specimens of this species, chiefly on the divisional planes, with remains of Trilobites, *Leptæna*, &c., and belongs to the Wenlock shale of Tynewydd, S. of Llandovery. Fig. 9 represents the exterior of a well-preserved specimen (in Mr. Morris's collection) from the Wenlock limestone of Lincoln Hill, near Dudley.

In addition to the above-mentioned localities for this species Sir R. Murchison† gives "Tilestone (Upper Ludlow), Lodge Bank, Downton;" Mr. Salter mentions Woolhope (Wenlock limestone); and Prof. M'Coy enumerates Underbarrow, Kendal, Westmoreland (Ludlow Rocks); Cowan Head, Kendal (Upper

* In the comparison of the species here described, with the descriptions by Prof. M'Coy, it should be observed that I regard as the dorsal border that which M'Coy describes as ventral, and vice versa.

† This species "is very abundant from the base of the Wenlock shale to the highest Ludlow stratum, and is a good index of Upper Silurian rocks, though found sometimes in the upper division of the Caradoc."—Siluria, p. 236.

Ludlow); Llanfair Road, W. of Welchpool (Wenlock shale); [Gaer Fawr, Montgomeryshire (Upper Bala) ?]; and the sandstone of Boocaun and the slates of Cappacorcogne, Cong, County Galway.

B. Klædeni, var. *antiquata*. Pl. VI. fig. 8.

Fig. 8 represents a very fine dextral valve, clearly referable to this species, but differing from the typical form in its greater proportional length and squareness,—the relative shortness of the anterior lobe,—the greater development of the marginal rim, which has its outer edge furnished with strong spines,—and especially in the finely punctated surface of the valve. I found this specimen in a calcareous nodule, containing *Graptolites* and *Orthoceras subgregarium*, from the Wenlock schists in the road-cutting about half a mile from Montgomery towards Garth Mill.

B. Klædeni, var. *torosa*. Pl. VI. figs. 10, 11, 12.

Accompanying specimens of the typical form (fig. 9) in soft light brown micaceous shale of the Upper Ludlow series, from Frith quarry, Stapleton, near Presteign, are numerous individuals of *B. Klædeni* in which the anterior and posterior lobes are each divided into two knobs, which with the central boss make the valve 5-lobed (figs. 10, 11). The infero-anterior lobe attains in the larger specimens a great (relative) size, and overhangs the ventral border. The valve is more quadrate, and the marginal rim is better developed, than in the usual smaller 3-lobed form.

The specimens occur as impressions on a divisional plane of the rock. (Mus. Pract. Geol.)

In greenish clayslate from the lowest beds at Wooltack, Pembroke (Mus. Pract. Geol.) occurs an imperfect impression of a very large individual of this variety. The anterior lobe is oblique and subdivided into three tubercles, the lower one large and overhanging the ventral border, the other two decreasing rapidly in size upwards. The central lobe is represented by two triangular knobs, and the posterior lobe appears to be pyriform and curved, but is not well preserved.

This variety may be the result of age, especially as the greater development of the isolated lobes appears to accompany increase of the size of the valve. Still there appears to be a want of an intermediate stage between the forms represented by figs. 9 and 10.

At first sight, fig. 12 appears to bear a close resemblance to Klöden's fig. 22 (pl. 1. Verstein. Mark Brandenburg, &c.) ; but

I think that the resemblance is not real. I can trace no exact counterparts in the two figures; our specimen is imperfect posteriorly, and it seems to me probable that Klöden's specimen also was not quite perfect. Under the circumstances, I prefer to consider the two specimens as very old individuals of their respective species.

3. *Beyrichia lata*, Vanuxem, sp. Pl. VI. fig. 13.

Agnostus latus, Vanuxem, Conrad's Report Geol. New York; and Vanuxem, Geol. New York, p. 80 *et seq.*

Beyrichia lata, Hall, Palæontology of New York, vol. ii. p. 301. pl. A 66. figs. 10 *a-e*.

Surface of valve divided into three unequal ridges or lobes; posterior lobe largest, broad, its ventral portion curved forwards to meet the constricted neck of the middle lobe; anterior lobe smallest, depressed, forming a narrow oblique ridge which is scarcely separated at its lower end from the advanced extremity of the hinder lobe. Marginal rim well developed, uniform.

The specimens here described, and referred to the *B. lata* figured by Prof. Hall, are dispersed in great numbers, together with fragments of Trilobites, in the ferruginous (weathered) portion of a compact sandstone or quartzite, from a locality three or four miles south of Utica, New York State, and marked "Hudson River Group*." All trace of the carapace itself has disappeared, and the casts and impressions afford no good evidence either of a smooth or an ornamented state of the surface of the carapace-valves. (In the Museum of Practical Geology.)

Prof. Hall† describes his specimens (which are from the ferruginous rocks of the Clinton group of the State of New York‡) as having on one valve a subcentral ridge, and on the other a subcentral and corresponding depression. But, guided by Mr. Hall's figures and by the specimens before me, I think that this description cannot be applicable; and that it has arisen from the relatively great breadth of the subcentral furrow, between the middle and hinder ridges or lobes, and from the sometimes almost obsolete condition of the anterior ridge.

* Most probably incorrect.

† With regard to the *Beyrichiæ* of the New York State, Prof. Hall remarks (*loc. cit.* p. 301), that "we have three or four species of *Beyrichiæ* in our successive groups, beginning with the Clinton group."

‡ "In the ferruginous shale associated with the iron ore at Wadsworth's quarries, and in the ferruginous sandstones below, at New Hartford, Oneida County; in numerous localities in the same position farther west, and in the green shale of the group at Sodus and Rochester."—Hall, *op. cit.* p. 301.

4. *Beyrichia Bussacensis*, Jones. Pl. VI. fig. 14.

Quart. Journ. Geol. Soc. vol. ix. p. 160. pl. 7. figs. 5, 6.

Surface of the valve depressed, smooth, bearing three well-defined, transverse, slightly curved, narrow, separate ridges; posterior ridge close to the posterior margin, and curving downwards and forwards until it meets and runs into the marginal rim of the ventral and anterior borders. Marginal rim well developed, and raised into a narrow continuous ridge, which in old specimens is one and the same with the posterior ridge and its extension forward.

In the majority of adult specimens (for instance, fig. 5. pl. 7. Quart. Journ. Geol. Soc. vol. ix.), the posterior ridge is placed close to the posterior margin; but in the young state (fig. 6. *loc. cit.*) and in the specimen here figured (fig. 14) a shallow depression occurs behind this ridge.

In young individuals the marginal rim is not so strongly developed, and the valve is rather less quadrate in outline.

This characteristic species occurs in great numbers on the divisional planes of Lower Silurian schists from near Coimbra (Serra de Mucela, and Porto de Louza in the Serra de Bussaco), Portugal, which form part of the collection made by Senhor C. Ribeiro and described by Mr. D. Sharpe, Quart. Journ. Geol. Soc. vol. ix. pp. 135 *et seq.*

(CORRUGATÆ.)

5. *Beyrichia Ribeiriana*, nov. sp. Pl. VI. fig. 15.

Carapace-valves contracted anteriorly, convex, impressed towards the dorsal border by two short, broad furrows, the hinder of which is largest and subcentral. The convexity of the valve forms a broad curved posterior lobe, a narrow short, oblique middle lobe, and an oblique anterior lobe; the last two near together, and forming a short angle, with the apex pointing downwards and backwards; and all three lobes continuous with the convex ventral portion of the valve. The posterior lobe is frequently indented on its broad dorsal extremity. Marginal rim indistinct.

The younger specimens may be described as presenting a nearly semicircular convex lobe, parallel with the ventral border and bounding a subcentral pit or furrow; the extremities of the two arms of the lobe being each, but unequally, impressed by an obliquely vertical indentation.

This interesting form (which I have named after Senhor C. Ann. & Mag. N. Hist. Ser. 2. Vol. xvi.

Ribeiro, who brought these Portuguese fossils to light) occurs plentifully, as casts, with *B. Bussacensis* in the Porto de Louza schist. When examining these schists in 1853, I overlooked this species, regarding the casts as crumpled specimens of a large variety of *B. simplex*. The corrugations of the surface, however, are quite constant and peculiar, as well as the outline of the valves, which differs from that of *B. simplex*. I have already mentioned (*supra*, p. 91 & p. 165) that *B. Bohemica* (in which the lobes are much more pinched up and ridge-like) forms a passage from this species to *B. complicata*.

6. *Beyrichia affinis*, nov. sp. Pl. VI. fig. 16.

Carapace-valve depressed; nearly semicircular, but obliquely acute at one extremity (anterior). Surface of valve, if regarded as 2-lobed, may be described as being divided into two parts by a deep and broad central indentation; the anterior part of the valve forming a somewhat convex, pyriform, curved lobe, tapering downwards and backwards; the other portion of the surface subdivided by a short furrow on its dorsal part and forming a depressed, bifurcated, v-shaped lobe, the anterior arm of which is more prominent than the other, and constitutes a middle lobe, if the valve be regarded as 3-lobed,—in which case, besides the pyriform, curved, anterior lobe, there are two less prominent lobes, which are near together, occupying the broad (posterior) half of the valve, and are separated from the anterior lobe by a broad central pit; the middle lobe small, but well defined; posterior lobe larger, but depressed, curved. Marginal rim distinct, especially on the posterior border.

This little *Beyrichia* is essentially different from any other that I have seen, although it is not without points of resemblance to some of the above-mentioned forms, such as *B. Klædeni* and *B. Ribeiriana*; and hence I propose to distinguish it by the name of *B. affinis*.

It is represented by the cast of a single valve in a Lower Silurian dark-coloured schist from Waterford, Tramore. (In the Museum of Practical Geology.)

7. *Beyrichia Barrandiana*, nov. sp. Pl. VI. fig. 17.

Carapace-valve nearly semicircular; surface divided by a sub-central furrow into two unequal lobes; the smaller lobe is pyriform, tapering downwards; the other triangular and subdivided by a faint vertical furrow, and its largest portion, occupying the middle of the valve, gradually rises towards the ventral border

until it is elevated into a strong conical projection or spine. The marginal rim is well defined, and was furnished with a series of thin projecting spines.

This well-marked and peculiar species is established on a distinct impression (somewhat squeezed obliquely by the cleavage-structure of the rock), discovered by Mr. Salter in the Lower Llandeilo schist of Mynydd Garw, Beddgelert, N. Wales. (In the Museum of Practical Geology.)

I have dedicated this *Beyrichia*—the earliest, so far as yet known, of the genus, and one of the most peculiar—to M. Barrande, of Prague, whose indefatigable and extensive researches in the palæozoic rocks of Bohemia will have comprised the study of the *Beyrichiæ* and their allies, as well as the larger and more important groups of organic life, some of which M. Barrande has already so elaborately and lucidly illustrated.

(SIMPLICES.)

8. *Beyrichia strangulata*, Salter. Pl. VI. fig. 18.

Brit. Pal. Foss. Cambridge, part 2. fasc. 1. p. 136 (M'Coy's descript.), pl. 1 E. figs. 1 *a*, 1 *b*; and fasc. 2. Appendix A. p. ii. (Salter's descript.).

Carapace-valves subquadrate, convex; impressed at or near the dorsal border, and towards the narrow (anterior) end of the valve, by a short, vertical, subcentral furrow; the anterior side of the furrow rising up in a low rounded knob or tubercle.

The marginal rim is very broad, convex, divided from the body of the valve by a deep narrow furrow, and is seldom well preserved. From Mr. Salter's observations (*loc. cit.*), the marginal rim would appear to be broader at the antero-inferior, than at the posterior border of the valve. Prof. M'Coy says that the marginal rim is often wanting, having been broken away.

B. strangulata is abundant in the Upper Bala calcareous schists at Coniston Waterhead, Lancashire.

The foregoing description of the typical specimens is not quite applicable to any of the forms that I have next to notice. Still I see no good reason for regarding as distinct species the individuals represented by figs. 19-22; for, although neither of them exactly corresponds with the above description, yet there are some important characters common to all, especially the uniform convexity of the valve, and the single dorsal sulcus. On the other hand, there is a considerable, though not an unlimited,

variation in the shape of the valve ; and, what appears to me to be of more importance, the marginal rim is in one variety highly developed (as in the type), and in others it is absent ; nor do I find any reason to suppose that these latter individuals have *lost* their rims accidentally.

B. strangulata, var. α . Pl. VI. fig. 19.

Valve much less quadrate than the typical form ; dorsal furrow faint, extending across two-thirds of the width of the valve (another but very faint impression occurs on the anterior part of the valve, but amounts to little more than an undulation in the general convexity of the surface) ; marginal rim strongly developed at the infero-anterior border, and tapering off posteriorly.

Fig. 19 is from a unique cast in Lower Silurian fossiliferous schist from Robeston Wathen, Pembrokeshire. (Mus. Pract. Geol.)

B. strangulata, var. β . Pl. VI. figs. 20, 21.

Carapace-valve (adult) narrow-oblong, with the ends rounded and the anterior extremity contracted ; surface coarsely pitted ; dorsal furrow short and deep, in the middle of the anterior half of the valve ; anterior side of furrow slightly elevated in some of the casts, but not in the impression made by the outside ; no trace of marginal rim.

Four specimens of this form occur (as casts or impressions) in dark-coloured fossiliferous schist, of Lower Silurian age, from Sholes Hook, Haverfordwest. (Mus. Pract. Geol.)

The cast and impression of a young individual (fig. 21) accompanies the foregoing. It is proportionally broader and shorter ; nearly semicircular, but obliquely acute anteriorly ; the sulcus is well defined, and its anterior edge is raised (in the cast) ; the surface appears to be smooth ; there is no marginal rim.

B. strangulata, var. γ . Pl. VI. fig. 22.

Cast of carapace-valve very small ; convex ; narrow-oblong, narrower in front than behind ; dorsal furrow short, strongly marked, and accompanied by an anterior tubercle ; no marginal rim.

From Harnage, Shrewsbury ; and accompanies *B. complicata* (fig. 5) and others : see p. 165.

With regard to *B. strangulata* and its varieties above mentioned, I would observe that M. Barrande's collection of the

Silurian Entomostraca of Bohemia (now in the British Museum) comprises several forms closely allied to this group.

9. *Beyrichia bicornis*, nov. sp. Pl. VI. fig. 23.

Carapace-valves flattened; impressed with a distinct, short, subcentral, dorsal pit-like furrow; a small semicylindrical tubercle rises up on either side of the furrow. Marginal rim well developed, sloping, and crested by a narrow continuous ridge. The carapace-valves, in one or two rare well-preserved specimens, are smooth; but in various stages of dissolution the surface puts on a deceptive pitted, reticulated, or carious aspect.

The well-defined outline, raised border, and bi-tubercled surface, with its deep subcentral notch, sufficiently characterize this interesting little species. It is from the Harnage rock before mentioned. (Mus. Pract. Geol.)

10. *Beyrichia seminulum*, nov. sp. Pl. VI. fig. 24.

Carapace-valves convex, almost symmetrically semicircular; coarsely punctate; impressed with an almost central dorsal furrow, extending across one-third of the width of the valve. Marginal rim distinct, uniform.

I met with this neat little species in the Wenlock schists of the Town Hill, Montgomery, as casts and impressions, in company with casts of *B. Klædeni*.

11. *Beyrichia simplex*, Jones. Pl. VI. fig. 25.

Quart. Journ. Geol. Soc. 1853, vol. ix. p. 161. pl. 7. fig. 7.

Carapace-valves convex, smooth, somewhat ovate; posterior half of the valve much broader than the anterior; ventral border rounded; anterior and posterior borders obtusely angular; dorsal border somewhat angular, formed partly of the straight hinge-line (which is about half the length of the valve), and partly of the obliquely rounded upper margins of the two extremities. Dorsal furrow slight, subcentral, towards the anterior extremity. Marginal rim indistinct.

This species was established on numerous specimens, constant in form and character, accompanying *B. Bussacensis* in the Lower Silurian schists of Serra de Bussaco and Serra de Mucela, near Coimbra, Portugal.

B. simplex? var.? Pl. VI. figs. 26, 27.

Figs. 26 and 27 represent small individuals, which, with other similar but somewhat variable forms, occur in numbers in

the Harnage rock already frequently referred to. For the most part, they much more nearly approach *B. simplex* than *B. stragulata*,—their only other ally. If fig. 22—one from amongst this crowd of minute individuals in the Harnage rock (and which, like others of the *Simplicies*, have been hitherto regarded as *Cytherinæ*)—be placed in the same category with figs. 26 and 27, we can but see what a difference of form these little associates present.

Probably in mere casts of the external coverings of such minute animals, and with such general simplicity of outward form, we should not expect to arrive at exact specific determinations.

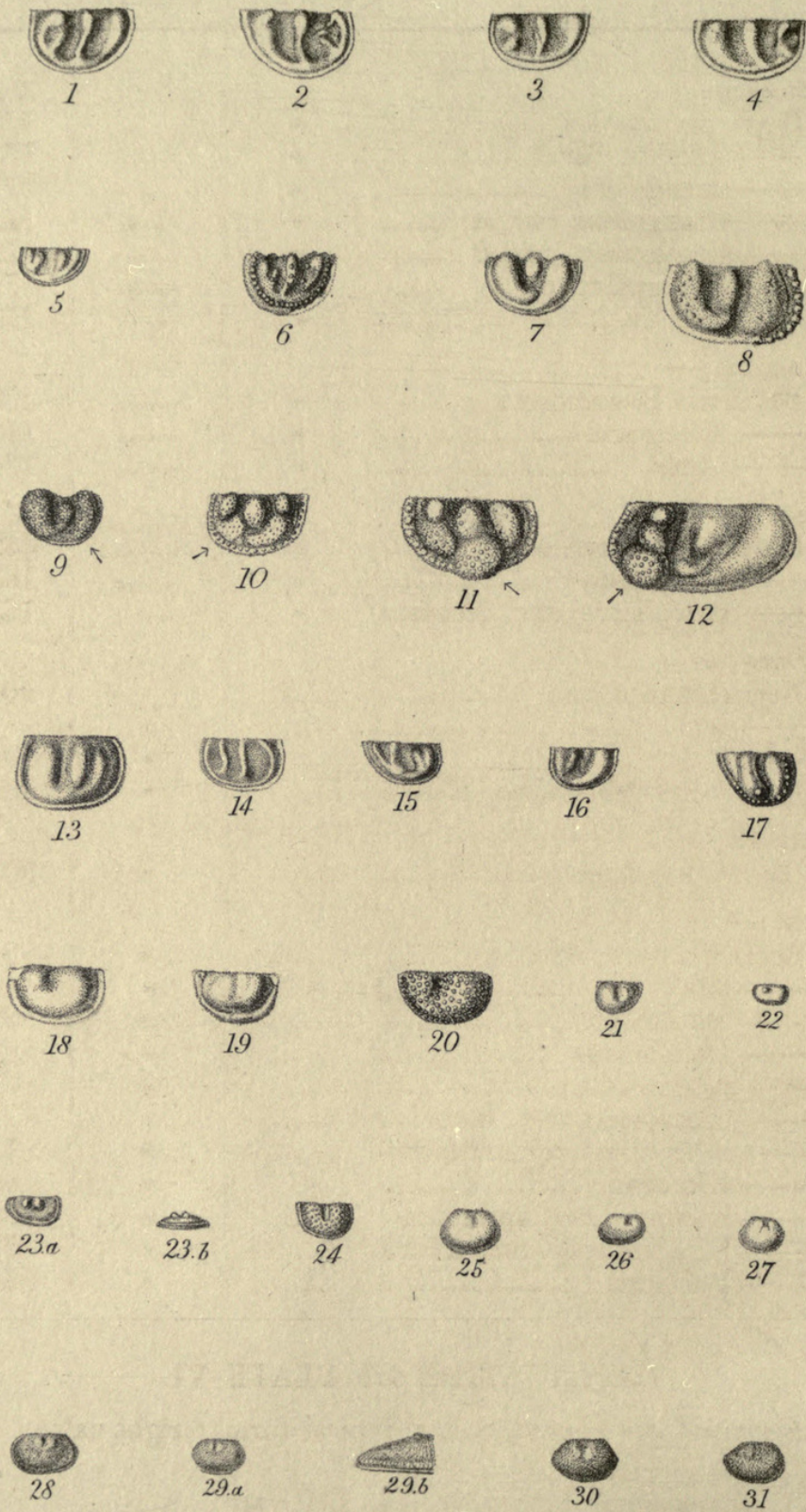
12. *Beyrichia mundula*, Jones. Pl. VI. figs. 28–31.

Annals and Mag. Nat. Hist. Ser. 2. No. 92 (Aug. 1855), p. 90. pl. 5. fig. 23.

Since writing the description of this Scandinavian species (*loc. cit.*), I have met with several very well-preserved specimens in the limestone No. 5 (*vide supra*, p. 84), some of which exhibit the well-marked marginal rim and striato-punctate surface (fig. 29 *b*). The generality of the individuals have a marked straightness of the hinge-line (about two-thirds the length of the valve), and a decided obliquity of the upper part of the margins of the extremities, and frequently a conspicuous angularity of the extremities themselves. In the specimens which have these characters most strongly marked, the valves have a tendency to be depressed towards their margins, and to lose the impression of the dorsal sulcus (figs. 30 & 31); thus resembling the carapace-valves of *Leperditia*,—a genus which I hope to treat of in my next notice of the Palæozoic Bivalved Entomostraca.

In the subjoined Table I have arranged the *Beyrichiæ* so as to indicate the geological distribution of the genus and its three subdivisions, as far as the species above described will permit. The few other species known in the United States, already referred to (p. 168), and the *Beyrichiæ* collected by M. Barrande and now to be seen in the British Museum, are all the species of which I am cognizant, with the exception of some Lower Silurian specimens of the *Simplex* group from Canada, which have been collected by Mr. W. E. Logan, and will, I trust, form part of the materials for a future notice on the Palæozoic Bivalved Entomostraca of Canada.





Beyrichia.



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