Annals and Magazine of Natural History: Series 5
Publication details, including instructions for authors and subscription information:
http://www.tandfonline.com/loi/tnah11

XXVI.—Notes on the Palæozoic Bivalved Entomostraca.—No. XXII. On some undescribed species of British Carboniferous Ostracoda

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Published online: 09 Oct 2009.

To cite this article: Prof. T. Rupert Jones F.R.S. & James W. Kirkby Esq. (1886) XXVI.—Notes on the Palæozoic Bivalved Entomostraca.—No. XXII. On some undescribed species of British Carboniferous Ostracoda , Annals and Magazine of Natural History: Series 5, 18:106, 249-269, DOI: 10.1080/00222938609459968

To link to this article: http://dx.doi.org/10.1080/00222938609459968

THE ANNALS

AND

MAGAZINE OF NATURAL HISTORY.

[FIFTH SERIES.]

No. 106. OCTOBER 1886.

XXVI.—*Notes on the Palæozoic Bivalved Entomostraca.*—No. XXII. *On some undescribed Species of British Carboniferous Ostracoda**. By Prof. T. RUPERT JONES F.R.S., and JAMES W. KIRKBY, Esq.

[Plates VI., VII., VIII., & IX.†]

IN this paper it is proposed to notice the undescribed species of Carboniferous Ostracoda occurring in Britain. This has been suggested to us as necessary for the better understanding of our papers on the distribution of these fossils, now about to be published by the Geological Society and the Geologists' Association.

The descriptions of these species are brief, and the figures in illustration of them are limited, in most cases, to two or three views of each. It is believed, however, that they will suffice for the identification of the species; and they will certainly help our observations on their distribution.

In noticing the following species, in many instances we give only a few of their localities; and this is invariably the case where the species are of common occurrence, as exhaustive

* For No. XXI. see Ann. & Mag. Nat. Hist. for May 1886, p. 403.

† These Plates have been drawn with the aid of a grant from the Royal Society for the illustration of Fossil Ostracoda.

lists would take up too much space in the present brief account.

1. *Bythocypris Phillipsiana*, Jones & Holl, var. *carbonica*, nov. (Pl. VI. figs. 1 *a*, 1 *b*, 2 *a*, 2 *b*.)

Bairdia Phillipsiana, J. & H., Ann. & Mag. Nat. Hist. ser. 4, vol. iii. p. 213, pl. xiv. fig. 7.

Subovate or bean-shaped, convex; dorsal border arched, ventral border straight, extremities rounded, the anterior being smallest; the left valve overlaps the right all round; lateral contour ovate, widest behind, pointed in front; surface smooth or minutely punctate. Length $\frac{1}{40}$ to $\frac{1}{35}$ inch.

This little Ostracod has much the form of the common Coal-measure Cyprid (?) *Carbonia fabulina*, J. & K., with which it has sometimes been confounded. It is, however, smaller than the latter, has the left valve (instead of the right) the largest, with a more decided overlap, and it is always found in the marine beds of the Carboniferous-Limestone series with Corals, Crinoids, Brachiopods, &c., and never in estuarine beds with plants and fish-remains as the *Carbonia* occurs. Discovered by Mr. John Young, F.G.S., of Glasgow.

B. Phillipsiana (formerly *Bairdia*) is a Silurian species differing but little from this form, which we place with it as a variety. *Bythocypris bilobata* (Münster) (*Cythere*, Ann. & Mag. Nat. Hist. ser. 3, vol. xv. p. 409, pl. xx. fig. 10) is a Carboniferous relative, also of similar form, though nearly twice the size.

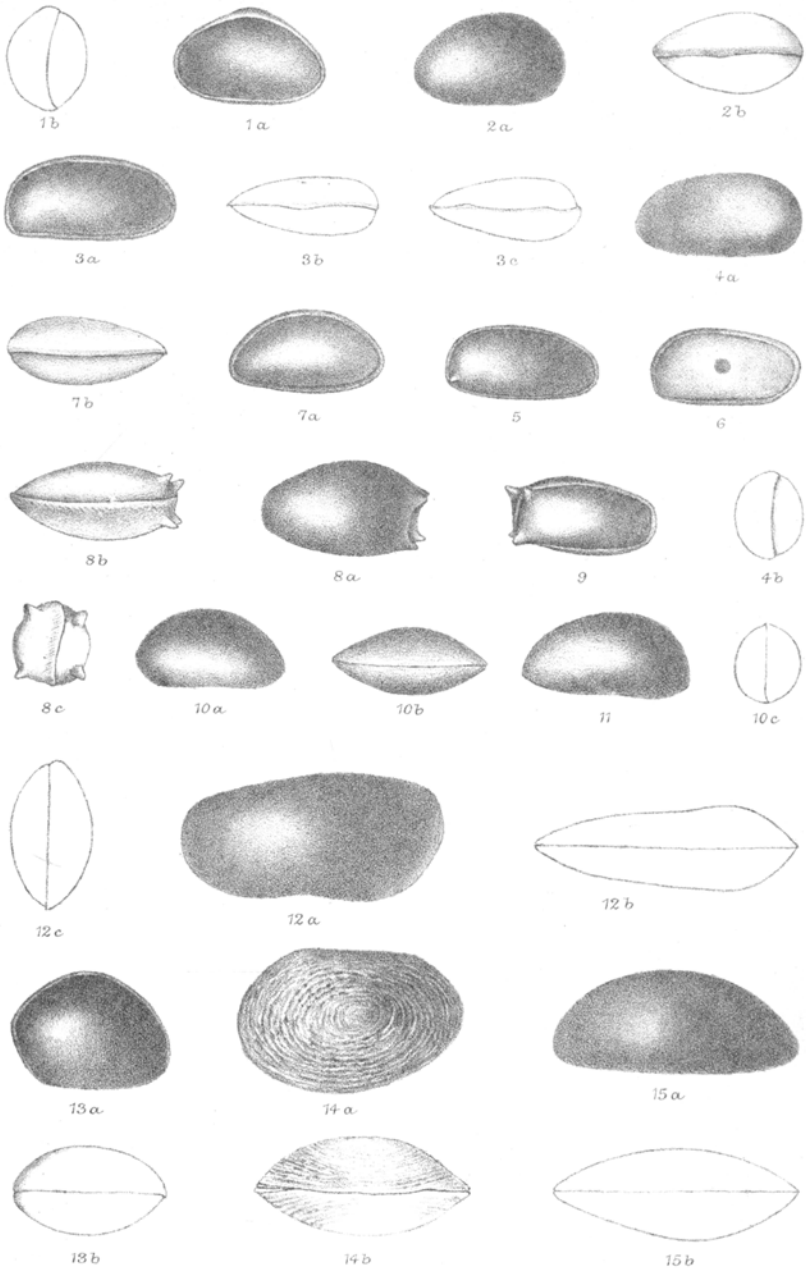
Localities. Arnside, in Westmoreland; Woodend Quarry and Dun Quarry, near Lowick, Northumberland; Barmullock Old Quarry, Hillhead Quarry, near Wilsontown, County Boundary, Lanarkshire.

2. *Bythocypris* (?) *cuneola*, Jones & Kirkby. (Pl. VI. figs. 3 *a*, 3 *b*, 3 *c*, 4 *a*, 4 *b*, 5, 6, 7 *a*, 7 *b*.)

Cythere * *cuneola*, J. & K., MS. 1867, Trans. Geol. Soc. Glasgow, vol. ii. p. 223.

Elongate or suboblong, convex, with greatest height and width rather behind the centre; dorsal border flatly convex, ventral border straight, extremities rounded; left valve

* The difficulty of allocating fossil Ostracodous valves to their true genera has been often noticed. *Cythere* was formerly the recipient of nearly all doubtful forms, and is still conveniently used. Judging, however, by the relative size of the right and left valves (where possible), in combination with their shape, we can refer to some recent genera as representing certain old and even Palæozoic Ostraceds, with more or less certainty.



J.W.K. del. & E.C.K lith.

West, Newman & Co. imp.

Carboniferous Ostracoda.

largest and overlapping the right; a short spine is occasionally present on the postero-ventral region, and sometimes a dark round spot in the centre of the valve; lateral contour elongate-ovate or subcuneiform. Shell thick; surface smooth. Length $\frac{1}{30}$ inch.

Usually referred to this species is a form (fig. 7) similar in size and general character, but with the dorsal border arched and the posterior extremity obtusely pointed. This we consider a variety.

B. cuneola is common in the marine shales of the Carboniferous-Limestone series in Scotland, and in similar deposits of the Yoredale rocks in England. Discovered by Mr. John Young, F.G.S.

We are not quite sure about fig. 7; but we have always regarded it as belonging to *B. cuneola*, and have found it at several places.

Localities. Holker Park, Scales Green, Humphrey Head, in Lancashire; Arnside, Sandside, Heversham, in Westmoreland; Dun Quarry and Woodend Quarry, near Lowick, Ancroft, Scremerston, Elsdon Burn, Penchford, in Northumberland; Brockley, Mousewater, and Haywood, near Wilsontown, Brankumhall Quarry, Boghead, Robroystone, Meikle Earnock Burn, Kennox Water, in Lanarkshire; Darcy Quarry, Brunston Colliery, in Midlothian; Whitebaulks, Kinneil Mill, in Linlithgowshire; Seafield Tower, Gleniston Quarry, Wilkieson Quarry, Ravenscraig, in Fife; and in many other places.

B. cuneola also occurs in the Calciferous Sandstone at Linnhouse Water, opposite Oakbank Oil-works, Linlithgow; River Esk above Gilnockie Tower, Dumfriesshire; Back Burn, Plashetts, Northumberland.

3. *Bythocypris* (?) *cornigera*, J. & K.
(Pl. VI. figs, 8 *a*, 8 *b*, 8 *c*, 9.)

Cythere cornigera, J. & K., MS. 1867, Trans. Geol. Soc. Glasgow, vol. ii. p. 223.

Suboblong, very convex, and quadrately horned behind; left valve largest and overlapping; surface smooth; lateral contour subcuneiform. Length $\frac{1}{35}$ to $\frac{1}{27}$ inch. Old specimens have the valves very tumid and the extremities truncate. This species is evidently a near relation to *B. cuneola*, with which it is often associated. Discovered by Mr. John Young, F.G.S.

Localities. Scales Green, Humphrey Head, in Lancashire; Ancroft, Penchford, Dun Quarry, near Lowick, in Northumberland; Brockley, Ponfeigh Burn, Mousewater, Calderside Quarry, Kennox Water, in Lanarkshire; Whitebaulks, Lin-

lithgowshire; Carlops Quarry, Whitefield Old Quarry, in Peebleshire; Sunnybank Quarry, Abden, Gleniston Quarry, Charlestown, Wilkieson, in Fife.

4. *Bythocypris* (?) *pyrula*, sp. nov.
(Pl. VI. figs. 10 *a*, 10 *b*, 10 *c*, 11.)

B. (?) *pyrula* is a rare form, though apparently of more recent occurrence in the southern than in the northern portion of the British area.

It is subtriangular or sublunate in outline, highest behind; the dorsal border is arched, the ventral incurved, with a rounded or subangular posterior extremity, and an obtusely pointed anterior. The valves are convex and smooth; the lateral contour is acute-ovate with the greatest width near the centre. Length $\frac{1}{35}$ inch. Discovered by the late Mr. Charles Moore, F.G.S.

Localities. In Carboniferous Limestone at Backwell, Holwell*, and Weston-super-Mare, Somerset; Arnside, Westmoreland.

5. *Bythocypris* (?) *Moorei*, sp. nov.
(Pl. VI. figs. 12 *a*, 12 *b*, 12 *c*.)

It is questionable if we have seen this species in a thoroughly perfect condition. The only specimens examined by us are from the Carboniferous Limestone of Weston-super-Mare, and sent to us by the late Mr. C. Moore.

It is comparatively large, being $\frac{1}{20}$ inch or more in length; has a long, flatly-convex, dorsal border; a shorter ventral border; one extremity much higher than the other and boldly curved ventrally; and the small extremity evenly rounded. The valves are rather compressed, and their contour, as seen from above, is almost lanceolate, widest at anterior (?) third.

6. *Bythocypris* (?) *thraso*, J. & K.
(Pl. VI. figs. 13 *a*, 13 *b*.)

Cythere thraso, Jones, MS. 1867, Quart. Journ. Geol. Soc. vol. xxiii. p. 494.

Suborbicular, rather longer than high; dorsal and extreme borders rounded, ventral flattened; valves very convex, one larger than the other and slightly overlapping it; lateral contour oval; surface smooth. Length $\frac{1}{35}$ inch. Discovered by the late Mr. C. Moore.

A rare species, and only as yet found in the Carboniferous

* Quart. Journ. Geol. Soc. vol. xxiii. p. 483.

Limestone of Charterhouse *, Somersetshire, and Woodend Quarry, near Lowick, Northumberland.

7. *Bythocypris lunata*, sp. nov.
(Pl. VI. figs. 15 *a*, 15 *b*.)

Lunate, highest in the centre; dorsal border arched, ventral border straight, except where it curves up to the extremities, which are subacute, and one slightly the larger; lateral contour lentiform, widest in the centre; surface smooth (?). Length $\frac{1}{20}$ inch.

It is only known to us from the Carboniferous Limestone of Holwell, Somerset, where it was found by Mr. C. Moore.

Bythocypris sublunata, J. & K. (Geol. Mag. 1886, p. 250, pl. vii. figs. 9–11), comes near the present species in general form, and is possibly nearly related to it; but it is smaller, relatively higher, and has more acute extremities.

8. *Cythere* (?) *gyripunctata*, J. & K.
(Pl. VI. figs. 14 *a*, 14 *b*.)

Cythere gyripunctata, J. & K., MS. 1885, Geol. Mag. dec. 3, vol. ii. p. 540.

Ovate in outline, highest behind, very convex; dorsal border short and straight; ventral border convex, projecting posteriorly; extremities rounded, the anterior being smallest; lateral contour oval, with pointed extremities; surface coarsely striated and pitted concentrically; valves apparently of equal size. Length $\frac{1}{35}$ to $\frac{1}{30}$ inch.

This rare species has been found only in the Carboniferous Limestone of Arnside, Westmoreland.

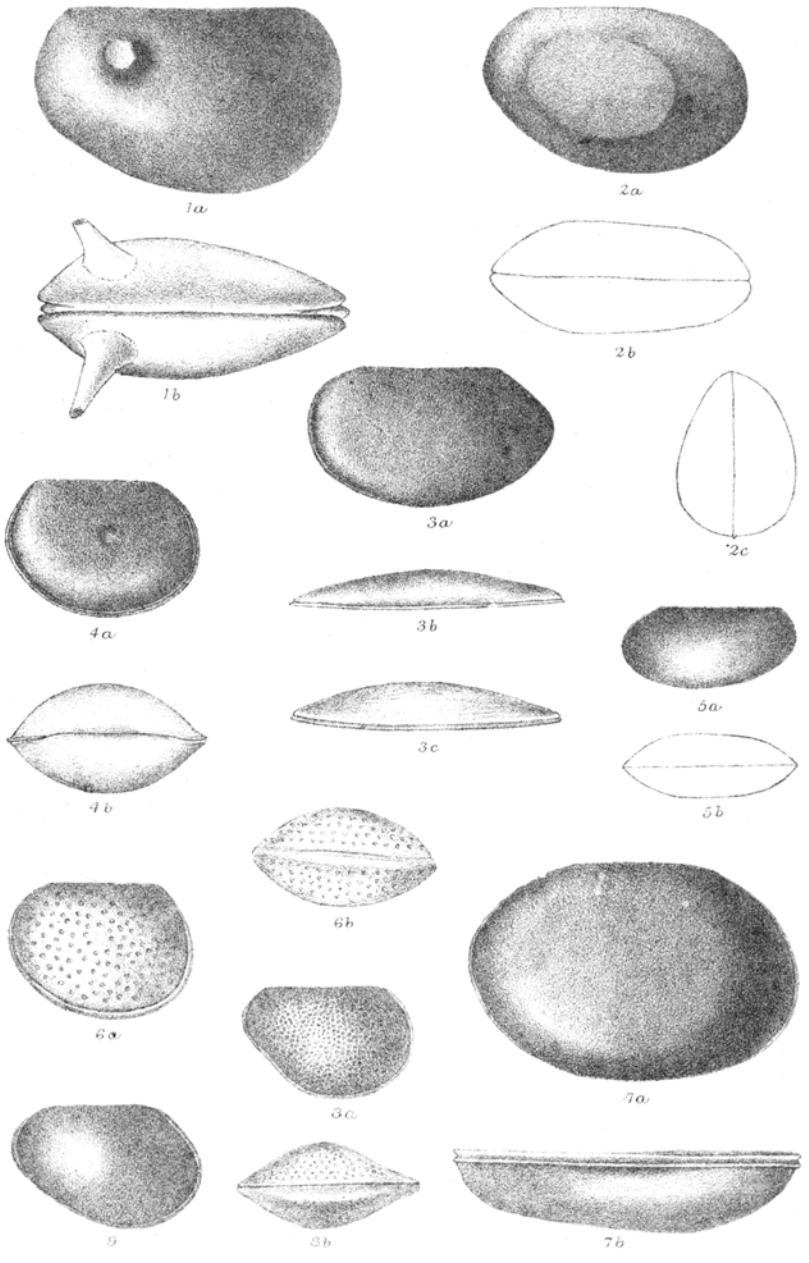
9. *Leperditia Armstrongiana*, J. & K.
(Pl. VII. figs. 1 *a*, 1 *b*.)

Leperditia Armstrongiana, J. & K., MS. 1867, Trans. Geol. Soc. Glasgow, vol. ii. p. 219.

L. Armstrongiana is a well-marked species and can always be identified by its large antero-dorsal spines, or the stumps usually left of them.

The valves are much higher behind than in front, with the posterior extremity boldly rounded and passing imperceptibly into the ventral margin, which is very convex; anterior extremity much the smaller, rounded or subangular; dorsal margin straight; lateral contour lentiform, widest a little in front of centre; surface smooth. Length $\frac{1}{15}$ inch.

* Quart. Journ. Geol. Soc. vol. xxiii. pp. 491–495.



J.W.K. del. & E.C.K. lith. West, Newman & Co. imp.

Carboniferous Ostracoda.

The spines, which occupy the position of the "eye-spot" of other *Leperditiæ*, are stout at the base, of considerable length, and tapering to a fine point; they are directed outward, upward, and rather forward. In casts from Law Quarry, Ayrshire, kindly sent us by Mr. James Bennie, the spines are about one third of the valve-length.

This species was discovered by Mr. James Armstrong in the Carboniferous-Limestone series at Howrat Quarry, East Kilbride, Ayrshire; it is also found in the same series at Carluke and Brockley, in Lanarkshire, and Craigenglen, Stirlingshire, and in the Scar Limestone near Storr Moss, Lancashire.

10. *Leperditia Bosquetiana*, sp. nov.
(Plate VII. figs. 2 *a*, 2 *b*, 2 *c*.)

Suboval in outline; valves convex, flattened centrally; dorsal border short and straight; ventral border elliptical; extremities regularly rounded; lateral contour compressed-ovate, rather widest at posterior third, obtusely pointed behind, rounded in front. Length $\frac{1}{20}$ inch.

This species first became known to us when examining material from Belgium, given to us by our late friend M. J. Bosquet, of Maastricht. It was afterwards found by Mr. James Thomson in Carboniferous Limestone at Tirfergus Glen, Campbelltown, Argyleshire.

11. *Leperditia Youngiana*, J. & K.
(Pl. VII. figs. 3 *a*, 3 *b*, 3 *c*.)

Leperditia Youngiana, J. & K., MS. 1867, Trans. Geol. Soc. Glasgow, vol. ii. p. 218.

Subovate, compressed; dorsal border rather short; ventral border elliptical, posterior extremity regularly rounded; anterior extremity more pointed than the other and with a well-marked dorsal angle; valves rimmed, widest near centre; surface finely punctate. Length $\frac{1}{20}$ inch.

This species, discovered by Mr. John Young, is mainly characterized by the punctate surface of its valves. It occurs abundantly in a bituminous shale of the Carboniferous-Limestone series at the Den pit, Dalry, and at a pit at Lugton, Dunlop, both in Ayrshire.

12. *Leperditia scotoburdigalensis* (Hibbert).
(Pl. VII. figs. 4 *a*, 4 *b*.)

Cypris scotoburdigalensis, Hibbert, 1834, Trans. Roy. Soc. Edinburgh, vol. xiii. p. 179.

Leperditia scotoburdigalensis, J. & K., 1866, Ann. & Mag. Nat. Hist. ser. 3, vol. xviii. p. 34; Jones, 1884, Proc. Berw. Nat. Club, vol. x. pp. 321 and 324, pl. ii. figs. 7 and 9.

Suborbicular, slightly oblique, convex; height three fourths of length; dorsal border short; ventral border and extremities continuous and boldly curved; lateral contour elliptical in males (?), ovate in females (?), greatest width rather in front of centre; valves rimmed, left moderately overlapped by right; muscle-spot circular, convex within, concave without; surface smooth. Length $\frac{1}{35}$ to $\frac{1}{25}$ inch.

In many localities where this species occurs there are both thin and fat specimens, as in the case of *Leperditia Okeni* and other species; the former we regard as probably males, the latter as females, similar differences of carapace being well known to mark the sexes in many cases among recent Ostracoda.

L. scotoburdigalensis was noted and illustrated by a poor woodcut in Hibbert's classical memoir on the Burdiehouse Limestone. It is not therefore an absolutely undescribed species; but, for the sake of easy reference, we include a notice of it in this paper.

It is about the most common and characteristic Ostracod of the Lower Carboniferous strata of Scotland. Some of the shales and limestones of that series are filled with its remains, and it is found on many horizons.

Localities. In Carboniferous-Limestone series: Hurlet Pits, Renfrewshire; Craig Burn (Douglas), Braidwood Burn (Carluke), Lanarkshire; Tweedmouth &c., Northumberland.

In Calciferous Sandstones: Billow Ness, Pittenweem, Caiplie, Randerstone, Pitmilly Burn, Buddo Ness, Craigkelly Quarry, Grange Quarry, in Fifeshire; Burdiehouse, Craiglockhart, Water of Leith, in Midlothian; Linnhouse Water, near Oakbank Oil-works, Linlithgowshire; Penton Bridge, Dumfriesshire; south of Cockburnspath, Burnmouth, in Berwickshire.

13. *Leperditia parallela*, J. & K.
(Pl. VII. figs. 5 *a*, 5 *b*.)

Leperditia parallela, J. & K., 1865, Ann. & Mag. Nat. Hist. ser. 3, vol. xv. p. 407, pl. xx. figs. 6 *a*, 6 *b*.

This species was figured and described from Bavarian specimens in 1865, as quoted above. We figure it anew from British examples and on a larger scale; but we can add nothing to the description then given. It is rare and has occurred to us only from the following localities:—

Carboniferous-Limestone series: Ladedda Quarry, Fifeshire; and railway-tunnel near Bristol.

14. *Leperditia obesa*, J. & K. (Pl. VII. figs. 6 *a*, 6 *b*.)

Leperditia obesa, J. & K., MS. 1885, Geol. Mag. dec. 3, vol. ii. p. 540.

Suborbicular; valves evenly convex; ventral border boldly elliptical, posterior extremity flatly convex and rather higher than the anterior; surface irregularly bestrewed with comparatively large shallow pits, except near the free margins, where there is a narrow band without them; a roundish spot or area in the centre of the valve is also free from them; overlap moderate. Length $\frac{1}{30}$ to $\frac{1}{27}$ inch.

This species is somewhat like *L. suborbiculata* (Münster) and *L. scotoburdigalensis* (Hibbert) in outline, but differs from them in its pitted surface. It is rare in the Carboniferous Limestone at Arnside, Westmoreland.

15. *Leperditia compressa*, J. & K. (Pl. VII. figs. 7 *a*, 7 *b*.)

Leperditia compressa, J. & K., MS. 1867, Trans. Geol. Soc. Glasgow, vol. ii. p. 219.

Nearly oval in outline, highest behind (in some) or in the centre; valves flattened in the central two thirds, then sloping abruptly to the margins, which are rimmed; dorsal border short and straight, ventral border elliptical, extremities rounded, the anterior more pointed than the other; lateral contour compressed-oval; surface smooth. Length $\frac{1}{15}$ inch.

L. compressa was discovered by Mr. John Young at Craigenglen, Campsie, Stirlingshire; it also occurs in the Yoredale series, at Whorlton and Barnard Castle, in Durham; and in the Carboniferous Limestone near Bundoran, Co. Donegal, Ireland.

16. *Leperditia lovicensis*, sp. nov. (Pl. VII. figs. 8 *a*, 8 *b*.)

Subtrigonal in outline; valves swollen in centre, compressed at extremities; anterior extremity subacute, posterior high and rounded; overlap of right valve slight; surface finely and densely punctate. Length $\frac{1}{30}$ inch.

Rare in shale above the Limestone (Yoredale), Woodend Quarry, Lowick. The material was sent to us by Mr. James Bennie.

17. *Leperditia acuta*, J. & K. (Pl. VII. fig. 9.)

Leperditia Okeni (Münster), var. *acuta*, J. & K., 1865, Ann. & Mag. Nat. Hist. ser. 3, vol. xv. p. 406, pl. xx. fig. 4.

Subtrigonal, oblique; anterior extremity acute and sloping

rapidly inward beneath; posterior extremity higher and sloping as rapidly outward until it sweeps round to the front to form a short, convex, ventral margin; right valve overlapping the other moderately; surface smooth. Length $\frac{1}{30}$ inch.

It is convenient to treat this as a species. It was figured, as above quoted, from a Bavarian example. We now give a figure of a specimen from the Scar Limestone of Arnside. It also occurs at Back Burn, Plashetts, Northumberland, Weston-super-Mare, Somerset, and other places.

18. *Beyrichia radiata*, J. & K.
(Pl. VIII. figs. 1, 2 *a*, 2 *b*.)

Beyrichia radiata, J. & K., MS. 1867, Trans. Geol. Soc. Glasgow, vol. ii. p. 220.

Subrhomboidal in outline, highest in front; dorsal border straight, ventral border convex; valves convex, with a round prominent boss rather behind the centre, and separated from a small anterior boss by a deep sulcus; a curious broad submarginal sickle-like plate, cross-lined, so as to represent a solid radiate frill, runs concentrically from the antero-dorsal angle to the postero-ventral curve; surface smooth, granulated, or tuberculated; shell thick. Length $\frac{1}{25}$ to $\frac{1}{12}$ inch.

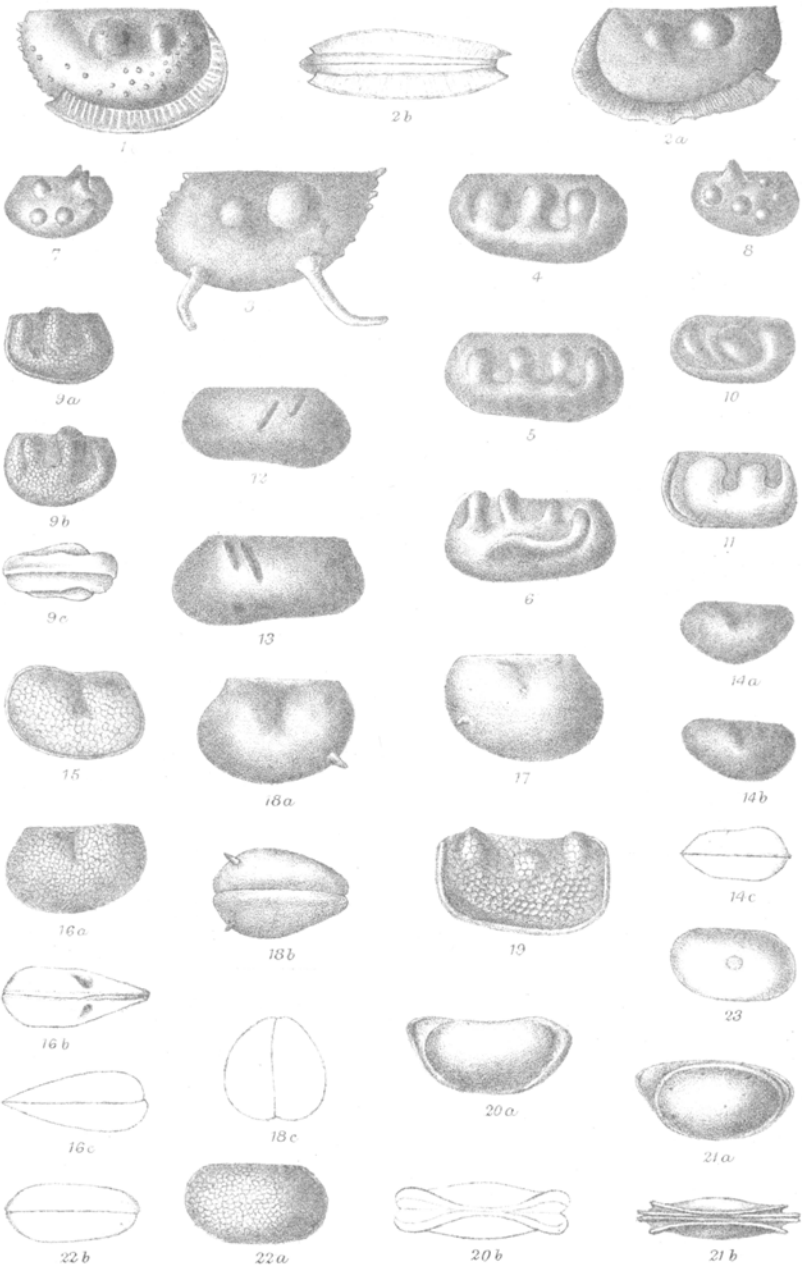
This strongly-marked species (discovered by Mr. John Young) characterizes the Carboniferous-Limestone series and upper half of the Lower Carboniferous. In the former it is found at:—

East of St. Monans, Wilkieson Quarry, Sunnybank Quarry, Teasses Quarry, in Fifeshire; East Salton, Paiston Quarry, Burlage Quarry, in East Lothian; Hillhead Quarry (Wilsontown), Williamswood, Robroystone, Calderside Quarry, Boghead Quarry, in Lanarkshire; Craigenglen, Stirlingshire; Orchard Quarry, Renfrewshire.

In Calciferous Sandstone: Pittenweem, Fifeshire; Harelawhill, Roxburghshire; Cam Beck, Cumberland; Plashetts, Northumberland; Kendal and north of Storr Moss (in Scar Limestone), Westmoreland.

19. *Beyrichia longispina*, sp. nov. (Pl. VIII. fig. 3.)

Similar in general form to the species immediately preceding, and lobed or bossed in the same way; but with no submarginal plate. In lieu of the latter feature are two large, curved, ventral spines, which are tubular (?) and always placed in the same position—one towards each extremity. Length $\frac{1}{23}$ inch.



J.W.K. del & E.C.K. lith. West, Newman & Co. imp.

Carboniferous Ostracoda.

Localities. In the Carboniferous-Limestone series, at Murrayfield Pit, Linlithgowshire.

In Lower Carboniferous: Cam Beck, Cumberland; Plashetts, Northumberland.

20. *Beyrichia fodicata*, sp. nov. (Pl. VIII. figs. 4, 5, 6.)

Oblong; dorsal border straight, ventral border straight or slightly convex; extremities rounded; valves divided into three or four lobes by deep sulci, the posterior lobe sometimes curving round ventrally to near the anterior third; surface smooth. Length $\frac{1}{27}$ inch.

The only specimens we have seen of this species are single valves, collected by Mr. James Bennie from the Carboniferous-Limestone series (Upper) at Linlithgow Bridge.

21. *Beyrichia tuberculospinosa*, sp. nov.
(Pl. VIII. figs. 7, 8.)

A small, subovate, rather compressed species, very curiously tuberculated and spiked. The two specimens figured have four or five round tubercles and a postero-dorsal spike on each valve. These features vary, however, in number in other specimens; some have two or three spikes on each valve, others have none, but only tubercles, and others again have more tubercles than here figured. Length $\frac{1}{45}$ inch.

Mr. John Young discovered this species in the Carboniferous-Limestone series at Boghead Quarries (Hamleton), Lanarkshire; it also occurs in the same series at Stacklawhall (Stewarton), Ayrshire; Craigenglen, Stirlingshire; Murrayfield, Linlithgowshire; Sunnybank Quarry, Fifeshire; Skellygate (Ridsdale), Northumberland.

22. *Beyrichia multiloba*, J. & K.
(Pl. VIII. figs. 9 *a*, 9 *b*, 9 *c*.)

Beyrichia multiloba, J. & K., MS. 1867, Trans. Geol. Soc. Glasgow, vol. ii. p. 219.

Another small *Beyrichia* with the surface of its valves broken up into three or four mammiform or clavate lobes (the centre one of which projects above the dorsal border) by deep and wide sulci. In general form it is almost subpentagonal, being straight above, subangular below, and nearly truncate at the extremities, the anterior of which is the smallest; the right valve is largest and overlaps the left; the surface is faintly reticulated (with large meshes). Seen from above (or below)

compressed-ovate, with very blunt extremities. Length $\frac{1}{45}$ inch.

Discovered by the late Dr. Rankine, of Carluke, as impressions in an alum-shale of the Carboniferous-Limestone series at Raes Gill, Carluke. It is found in the same series also at Boghead, Blantyre, Gair, Mousewater (Wilsontown), in Lanarkshire; Craigenglen, Stirlingshire.

23. *Beyrichia varicosa*, sp. nov. (Pl. VIII. figs. 10, 11.)

This species is somewhat akin in character to *B. fodicata*, but it is smaller, and has larger lobes, of which it possesses three, the anterior one being the largest. The valves appear to have been strongly rimmed. Length $\frac{1}{35}$ inch.

Collected by Mr. James Bennie at Whitebaulks, Linlithgowshire, where it is rare. A similar form is found at Gair, near Carluke, and also at Brunston Colliery, Midlothian. These localities are all in the Carboniferous-Limestone series.

24. *Beyrichia* (?) *bicæsa*, sp. nov. (Pl. VIII. figs. 12, 13.)

Suboblong; with rounded ends, the anterior being largest and most projecting; dorsal border straight and about two thirds of the total length; ventral border incurved at the centre, rounded towards the ends; valves compressed above, rather convex below, and with two straight and parallel cuts or narrow grooves that pass from near the antero-dorsal border diagonally backward halfway across the valve; surface smooth. Length $\frac{1}{30}$ inch.

The straight narrow sulci of this species are not typically Beyrichian, and we have only seen another Carboniferous form with anything like them. This form is from Weybourne, Cumberland (Carboniferous-Limestone series), and has a single narrow groove.

Sent to us by Mr. James Bennie from shale above Robroystone Limestone (Carboniferous-Limestone series) and labelled "Woodhill."

25. *Primitia* (?) *Holliana*, sp. nov.
(Pl. VIII. figs. 14 *a*, 14 *b*, 14 *c*.)

Small; sublunate in outline, with convex valves; dorsal border straight, ventral border arched; posterior extremity subacute. A deep V-shaped sulcus marks the centre of the valve; lateral contour subovate; surface smooth. Length $\frac{1}{35}$ inch.

Found by Dr. H. B. Holl, F.G.S., in Carboniferous Limestone, Great Ormes Head.

This and the two following unisulcate forms have the aspect of *Primitia*, but further research is necessary before we can determine if they belong to that genus or to our new group *Beyrichiella* (Geol. Mag., Oct. 1886).

26. *Beyrichiella* (?) *reticosa*, sp. nov.
(Pl. VIII. figs. 15, 16 *a*, 16 *b*, 16 *c*.)

Obliquely subovate; valves compressed in front, widest behind, and thus with a subcuneiform lateral contour. A deep and narrow sulcus marks the centre of each valve, and the postero-dorsal region of each is sharply ridged, leaving a depressed dorsal area between; right valve slightly larger than the left. Surface regularly reticulate. Length $\frac{1}{40}$ to $\frac{1}{35}$ inch.

The angulate postero-dorsal region of this species (not well shown in fig. 16 *b*) suggests relationship to *Beyrichiella*; further knowledge of it may probably cause its removal to that genus.

Collected by Mr. James Bennie in the Carboniferous-Limestone series at Whitebaulks, Linlithgowshire; and Abden, Fifeshire.

27. *Beyrichiella* (?) *ventricornis*, J. & K.
(Pl. VIII. figs. 17, 18 *a*, 18 *b*, 18 *c*.)

Cythere ventricornis, J. & K., MS. 1867, Trans. Geol. Soc. Glasgow, vol. ii. p. 223.

Obliquely subovate; convex, especially below; dorsal border straight; ventral border convex; anterior extremity high and rounded, protuberant below; posterior extremity smaller than the other and curving backward below. A simple shallow sulcus extends from the dorsal border less than halfway across each valve, near the centre; a short spine is always present on the postero-ventral region, and very rarely another is seen at the postero-dorsal angle. Lateral contour ovate, wide behind, narrow in front. Valves nearly equal; surface smooth. Length $\frac{1}{40}$ to $\frac{1}{35}$ inch.

We place this species in *Beyrichiella* on account of its Leperditioid outline, unisulcate valves, and probable dorsal crests. It belongs, however, to a very simple type of the genus.

Mr. John Young discovered this species, which is a characteristic form of the Carboniferous-Limestone series in Scotland, and of the Yoredale rocks in England.

Localities. St. Monans, Inverteil Quarry, Charlestown

Quarry, Roscobie Quarry, in Fifeshire; Kidlaw Quarry, Burlage Quarry, in East Lothian; Whitebaulks, Linlithgowshire; Barmullock Quarry, Williamswood, Brockley, Gair, Robroystone, in Lanarkshire; Orchard Quarry, Renfrewshire; Scales Green, Humphrey Head, in Lancashire.

28. *Kirkbya tricollina*, J. & K. (Pl. VIII. fig. 19.)

Kirkbya tricollina, J. & K., MS. 1885, Geol. Mag. dec. 3, vol. ii. p. 540.

Dorsal border straight or slightly incurved; ventral border convex; extremities flatly rounded or subtruncate. Three round tubercles form the chief character, one placed just above the centre of valve, the others high up, one near each extremity. Free margin strongly rimmed; surface strongly reticulate; traces of a subcentral oval pit just below middle tubercle. Length $\frac{1}{30}$ inch.

Rare in the Scar Limestone at Arnside, Westmoreland.

29. *Moorea obesa*, sp. nov.
(Pl. VIII. figs. 20 *a*, 20 *b*.)

Subtriangular in outline, greatest length rather below the dorsal border; dorsal border incurved; ventral and extreme borders forming an inverted arch; extremities pointed; free margins rimmed, a little inside of which is another and stronger ridge, continuous and concentric; main area of valve smooth. Length $\frac{1}{30}$ inch.

A very rare species, and only known from the *débris* of Carboniferous Limestone in a vein at Brocastle, near Bridgend, Glamorganshire, where it was collected by Mr. Charles Moore, F.G.S.

30. *Moorea tenuis*, sp. nov. (Pl. VIII. figs. 21 *a*, 21 *b*.)

This species is from the *débris* of Carboniferous Limestone in a vein at the Charterhouse lead-mine, Mendip Hills, Somerset, and it has much the outline of *M. obesa*, but the dorsal border is convex instead of incurved, and the valves are less compressed. The inner ridge is also further away from the margin and almost regularly oval in shape, thus not concentric; the surface seems to have been smooth. Length $\frac{1}{30}$ inch.

These two species* and *Moorea silurica*, J. & H. (Ann. & Mag. Nat. Hist. ser. 4, vol. iii. p. 225, pl. xv. fig. 8), are the only members of the genus known to us, and that but

* These were referred to in the Quart. Journ. Geol. Soc. vol. xxiii. 1857, pp. 494, 523, and 559, as *Moorea obesa* and *M. tenuis*, Jones, MS. (once with a misprint of "*obtusa*" for *obesa*).

imperfectly. They are very curious Ostracods, apparently more nearly related to *Kirkbya* than to any other group.

31. *Cytherella* (?) *reticulosa*, J. & K.
(Pl. VIII. figs. 22 *a*, 22 *b*.)

Cytherella? *reticulosa*, J. & K., MS. 1885, Geol. Mag. dec. 3, vol. ii. p. 540.

Oblong; dorsal and ventral borders straight and parallel; ends rounded, one a trifle more prominent than the other; valves moderately convex, and apparently not very unequal in size; surface regularly reticulated, mesh rather large; a round muscle-spot is seen in the centre of the valve, in casts. Length $\frac{1}{45}$ to $\frac{1}{40}$ inch.

This neat little form has the aspect of *Cytherella*, and we place it in that genus on that account, though with some doubt, as there is not the usual difference in the size of valves of *Cytherella*, and we have not seen any interiors.

It has occurred in the Carboniferous-Limestone series at Dun Quarry (Lowick), Northumberland; and in the Scar Limestone, north of Storr Moss, Westmoreland.

32. *Cytherella valida*, J. & K., var. *affiliata*.
(Pl. IX. figs. 1 *a*, 1 *b*.)

Subpentagonal in outline, compressed, umbilicated; dorsal border subangulate; ventral border straight; anterior extremity rounded and larger than the posterior, which latter is obliquely truncate; lateral contour much compressed, pointed in front, truncate behind; surface smooth. Length $\frac{1}{22}$ inch.

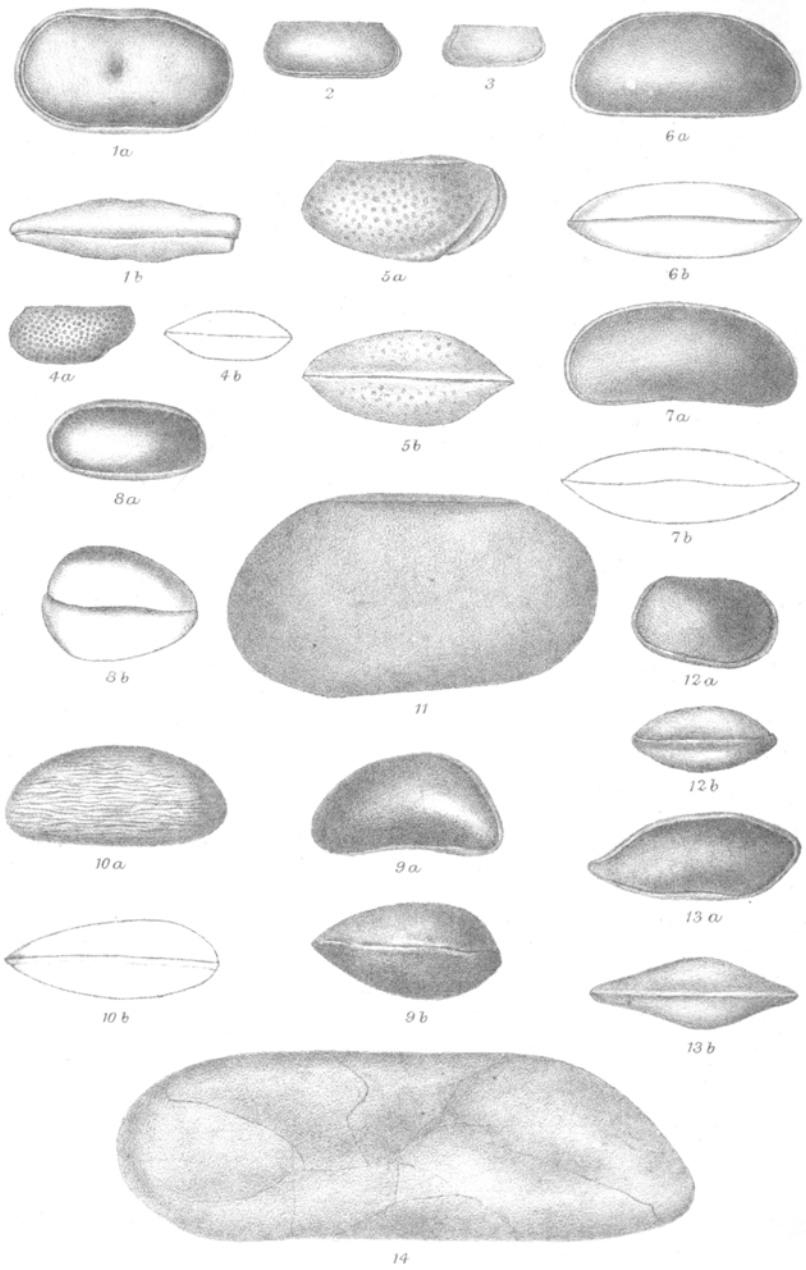
This form resembles *C. valida* in general outline, but differs from it in its compressed and posteriorly truncated lateral contour; also in its central pit or umbilicus. For the present we retain it under this species as a variety.

A similar, though probably distinct, form occurs in the Lower Carboniferous at Tweeden Burn and Pittenweem.

Locality. In Yoredale beds at Gleaston Castle (near Barrow-in-Furness), Lancashire.

33. *Cytherella* (?) *elongata*, sp. nov.
(Pl. IX. figs. 2, 3.)

Small, elongate, highest behind; dorsal border straight and long; ventral border straight or flatly convex; extremities rounded (with dorsal angles), the posterior being higher than the anterior; free margins rimmed, the right overlapping the left moderately; shell thin; surface smooth. Length $\frac{1}{40}$ inch.



J.W.K. del. & E.C.K. lith. West, Newman & Co. imp.

Carboniferous Ostracoda.

Fig. 3 is a right valve, showing a flat marginal area, wider behind than before.

This species is doubtfully referred to *Cytherella*. It was collected by Mr. Bennie in the Carboniferous-Limestone series at Murrayfield (Bathgate), Linlithgowshire.

34. *Bythocythere antiqua*, sp. nov.
(Pl. IX. figs. 5 *a*, 5 *b*.)

Subrhomboidal in outline, tumid; dorsal border nearly straight; ventral border convex; anterior extremity subtruncate and projecting below; posterior extremity flatly rounded and projecting above. Valves apparently equal, and with a ventral expansion or wing, as in the recent *Bythocythere* and *Cytheropteron*, which is most developed posteriorly; lateral contour subovate with pointed ends, greatest width about the posterior third; surface pitted, pits shallow, rather large, and wide apart. Length $\frac{1}{30}$ inch.

We have two examples of this interesting species from Mr. G. R. Vine, of Sheffield, who obtained them from the Lower Carboniferous of Skellygate (Ridsdale), Northumberland.

35. *Bythocythere Youngiana*, sp. nov.
(Pl. IX. figs. 4 *a*, 4 *b*.)

This is a smaller species than that just noticed, and less angular in outline. The ventral wings also are relatively smaller; the lateral contour of regular width throughout (compressed-oval with pointed ends); and the surface is more closely and regularly pitted. It is $\frac{1}{45}$ inch in length.

It was discovered by Mr. John Young in the Carboniferous-Limestone series, at Brockley, Lanarkshire. We have also met with it in a washing of shale from Woodend Quarry, Lowick, Northumberland, kindly sent us by Mr. James Bennie.

36. *Argillœcia æqualis*, J. & K.
(Pl. IX. figs. 6 *a*, 6 *b*.)

Argillœcia æqualis, J. & K., MS. 1885, Geol. Mag. dec. 3, vol. ii. p. 540.

Elongate, compressed, nearly equal in height thoughout, and with equal ends; dorsal border flatly arched; ventral border straight or slightly convex; anterior extremity rather higher and less projecting than the other; lateral contour elliptical, widest in the centre; right valve largest and overlapping the left; surface smooth; shell thick. Length $\frac{1}{25}$ to $\frac{1}{22}$ inch.

In most specimens this species is a trifle highest in front;

though in others there is no difference observable, and the ends are about alike.

In general form it has so much the character of recent *Argillœciæ* that we place it in that genus, with the approval of our friend Prof. G. S. Brady.

It is not the same species as D'Eichwald's *Bairdia æqualis*, which has more the appearance of a *Bairdia*.

Arg. æqualis is essentially a Lower-Carboniferous form, though it apparently occurs rarely in the lower beds of the Carboniferous-Limestone series.

Localities. Calciferous Limestone : Randerstone, Fifeshire; Linnhouse Water (opposite Oakbank Oil-works), Linlithgowshire; Heads of Ayr, Ayrshire; Larriston Quarry (Newcastletown), Roxburghshire ; Plashetts and Warksburn, Northumberland.

Carboniferous Limestone : Arnside, Westmoreland; New Rake, Grassington Mine, Yorkshire. Carboniferous-Limestone series : Wilkieson ?, Fifeshire.

37. *Aglaia* (?) *cypridiformis*, J. & K.
(Pl. IX. figs. 7 *a*, 7 *b*.)

Cythere cypridiformis, J. & K., MS. 1880, Quart. Journ. Geol. Soc. vol. xxxvi. p. 588.

Elongate-reniform, nearly of equal height before and behind, valves moderately convex; dorsal border very flatly arched; ventral border slightly incurved; extremities rounded and rather alike; lateral contour elongate-oval, widest in the centre; right valve rather the largest; surface smooth. Length $\frac{1}{25}$ inch.

This rare species is confined to the Lower Carboniferous.

Localities. Calciferous Sandstone: Randerstone, Fifeshire; Tweeden Burn, Roxburghshire; Glencartholm (River Esk), Dumfriesshire; Plashetts, Northumberland.

38. *Xestoleberis* (?) *subcorbuloides*, J. & K.
(Pl. IX. figs. 8 *a*, 8 *b*.)

Xestoleberis subcorbuloides, J. & K., MS. 1885, Geol. Mag. dec. 3, vol. ii. p. 540.

Elongate, suboblong, very tumid; dorsal border flatly convex, sloping at extremities; ventral border straight; extremities rounded, the anterior least in height; left valve larger than right; lateral contour ovate or obtusely cuneiform, and of great width at posterior third; shell thick; surface smooth. Length $\frac{1}{35}$ inch.

We refer this species to *Xestoleberis*, because it much re-

sembles it in general habit. *Cythere corbuloides* *, Jones & Holl, from Silurian strata, seems to be a related form †.

Locality. In the Scar Limestone, north of Storr Moss (near Silverdale Station), Lancashire.

39. *Macrocypris carbonica*, G. S. Brady, MS. (Pl. IX. figs. 9 *a*, 9 *b*.)

Subtrigonal, highest (and gibbous) behind, convex; dorsal border very convex, with a long anterior and a short abrupt posterior slope; anterior extremity rounded; posterior low and subacute; lateral contour elongately subovate, pointed in front and wide behind; right valve largest, and overlapping the dorsal and ventral margins of left valve; surface smooth. Length $\frac{1}{22}$ inch.

This form was figured in a paper on *Carbonia* as a doubtful variety of *C. fabulina*, J. & K.‡. Prof. G. S. Brady has since examined specimens of it for Mr. John Young (who discovered the species), and has named it as above. We are glad to adopt this view of the matter, and on such good authority.

Mr. Young informs us that it occurs, along with *Carbonia fabulina*, and fish and plant remains, in the Millburn beds at Campsie, Stirlingshire.

40. *Carbonia Wardiana*, sp. nov. (Pl. IX. figs. 10 *a*, 10 *b*.)

Elongately suboval, convex; dorsal border regularly arched; ventral border straight, curving up to form the extremities; one extremity a little more pointed than the other; lateral contour subovate, pointed anteriorly; surface covered with closely-set, irregular, fine striæ or wrinkles; traces of a slightly sunken circular muscle-spot (on some examples). Length $\frac{1}{22}$ inch.

Specimens of this species were sent us by Mr. John Ward, F.G.S., of Longton, from a limestone of the Upper Coal-measures of North Staffordshire. These specimens, being in a hard matrix, are not very easy to make out; but the species evidently comes near to *Carbonia Agnes*, Jones, from the South-Wales coalfield.

* Ann. & Mag. Nat. Hist. 1869, ser. 4, vol. iii. p. 211, pl. xiv. figs. 4 *a*–5 *b*.

† Var. *inflata* of *Carbonia fabulina* also simulates this species in some of its features.

‡ Ann. & Mag. Nat. Hist. 1879, ser. 5, vol. iv. p. 31, pl. ii. fig. 24.

41. *Cythere superba*, J. & K. (Pl. IX. fig. 11.)

Cythere superba, J. &. K., MS. 1880, Quart. Journ. Geol. Soc. vol. xxxvi. p. 588.

Large, oval or subovate, rather oblique, dorsal border straight; ventral border slightly incurved; anterior extremity rounded; posterior rounded and higher than the other; both extremities angular dorsally; valves convex or compressed, rimmed, the right larger than the left and overlapping it moderately on free margins; lateral contour compressed-oval, with pointed ends, or elliptical; surface smooth in most cases, in others faintly punctate. Length $\frac{1}{12}$ inch.

This fine species requires several figures to illustrate it properly, as it varies much in outline and convexity. Many examples are tumid and big-bellied, others are comparatively thin; hence there are great differences in the outlines of lateral contour (as seen from above or below) and end views. Some casts show traces of a circular muscle-spot; but we have never observed anything like the eye-spot of *Leperditia*, though in some of its forms this species has much the style of that genus.

It is confined to the Calciferous Sandstones.

Localities. Buddo Ness, Billow Ness, east of Pittenweem, and Craigkelly Quarry, Fifeshire; Oakbank Sandstone Quarry, Linlithgowshire.

42. *Cythere* (?) *obtusa*, sp. nov. (Pl. IX. figs. 12 *a*, 12 *b*.)

Subovate (almost subpentagonal), highest behind, convex; dorsal border short and straight, ventral convex; extremities rounded, posterior largest; right valve largest and overlapping the left on the free margin; lateral contour suboval, widest in centre; surface smooth. Length $\frac{1}{35}$ inch.

This species is probably not a *Cythere*, though now placed in that genus until more is known about it. Two examples only of it were found in a washing of shale from Woodend Quarry (Lowick), Northumberland, sent us by Mr. James Bennie.

This is not the *Cythere obtusa* mentioned in the list of Ostracoda in 'Catalogue of Western-Scottish Fossils' (p. 44); the species to which that name refers is a *Cytherella—C. concinna*, J., K., & B. (Monogr. Foss. Entom., Palæont. Soc. 1884, p. 71).

43. *Bairdia legumen*, J. & K. (Pl. IX. figs. 13 *a*, 13 *b*.)

Bairdia legumen, J. & K., MS. 1885, Geol. Mag. dec. 3, vol. ii. p. 540.

Elongate, subpentagonal, high in front, low and acuminate behind; dorsal border subangulate; ventral border faintly

incurved; anterior extremity high and truncated inwardly; posterior extremity acute, rostrate; lateral contour elliptical, widest just in front of centre; surface smooth. Length $\frac{1}{23}$ inch.

This is probably the same species as that represented by fig. 7, pl. xxxii., in our paper on *Bairdia* *. Its nearest allies seem to be *B. amputata*, K., *B. nitida*, J. & K., and *B. submucronata*, J. & K., when ranging beyond their typical forms.

Localities. In Carboniferous-Limestone series, at Cowden Quarry, Fifeshire; in Yoredale rocks, at Gleaston Castle, Lancashire; in Scar Limestone, at Arnside and Sandside, Westmoreland.

44. *Bairdia subelongata*, J. & K., var. *major*.
(Pl. IX. fig. 14.)

This is a very large *Bairdia*, somewhat crushed by pressure. It has rather the shape that a big *B. subelongata* might take if squeezed flat, and we put it as a variety of that species.

It is about $\frac{1}{9}$ inch in length, elongate, with straight dorsal and ventral borders, with the anterior extremity high and evenly rounded, and the posterior low and subacute; the surface is smooth.

It occurs in the Carboniferous-Limestone series at Barmoor Redhouse (Lowick), Northumberland.

As intimated at the beginning of this paper, the foregoing descriptions of species are necessarily very brief and rather incomplete. In some cases little more can be said until the species shall have been better known. With other species we have already material enough to allow of fuller accounts being given, and this we hope by-and-by to do, either in these pages or elsewhere.

It will have been seen how much we are indebted to various friends for assistance in specimens; and though their names have been repeatedly mentioned in this and former pages, we must again express our thanks, especially to our old friends Mr. John Young, of the Hunterian Museum, Glasgow, and Mr. James Bennie, of the Geological Survey, Edinburgh.

EXPLANATION OF THE PLATES.

Plate VI.

[All the figures magnified about 25 diameters.]

Fig. 1. *Bythocypris Phillipsiana*, J. & H., var. *carbonica*, J. & K. *a*, right valve; *b*, end view.

* Quart. Journ. Geol. Soc. 1879, vol. xxxv. p. 565.

Fig. 2. The same. *a*, left valve; *b*, ventral view.
Fig. 3. *Bythocypris* (?) *cuneola*, J. & K. *a*, right valve; *b*, ventral view; *c*, dorsal view.
Fig. 4. The same. *a*, left valve; *b*, end view.
Fig. 5. The same. Right valve, with postero-ventral spine.
Fig. 6. The same. Right valve, showing central spot.
Fig. 7. The same ? (variety ?). *a*, right valve; *b*, dorsal view.
Fig. 8. *Bythocypris* (?) *cornigera*, J. & K. *a*, left valve; *b*, dorsal view; *c*, end view.
Fig. 9. The same. Right valve.
Fig. 10. *Bythocypris* (?) *pyrula*, J. & K. *a*, left (?) valve; *b*, ventral view; *c*, end view.
Fig. 11. The same. Right (?) valve.
Fig. 12. *Bythocypris* (?) *Moorei*, J. & K. *a*, right (?) valve; *b*, edge view; *c*, end view.
Fig. 13. *Bythocypris* (?) *thraso*, J. & K. *a*, right valve; *b*, dorsal view.
Fig. 14. *Cythere* (?) *gyripunctata*, J. & K. *a*, right valve; *b*, dorsal view.
Fig. 15. *Bythocypris lunata*, J. & K. *a*, side view; *b*, edge view.

Plate VII.

[All the figures magnified about 25 diameters.]

Fig. 1. *Leperditia Armstrongiana*, J. & K. *a*, left valve, Storr Moss; *b*, dorsal view (cast), Law Quarry, Ayrshire.
Fig. 2. *Leperditia Bosquetiana*, J. & K. *a*, left valve; *b*, dorsal view; *c*, end view. Campbelltown.
Fig. 3. *Leperditia Youngiana*, J. & K. *a*, right valve; *b*, ventral view; *c*, dorsal view. Dalry, Ayrshire.
Fig. 4. *Leperditia scotoburdigalensis* (Hibbert). *a*, left valve; *b*, dorsal view. West of Pittenweem, Fife.
Fig. 5. *Leperditia parallela*, J. & K. *a*, right valve; *b*, edge view. Near Bristol.
Fig. 6. *Leperditia obesa*, J. & K. *a*, left valve; *b*, ventral view. Arnside.
Fig. 7. *Leperditia compressa*, J. & K. *a*, left valve; *b*, ventral view. Craigenglen.
Fig. 8. *Leperditia lowicensis*, J. & K. *a*, left valve; *b*, ventral view. Woodend, Lowick.
Fig. 9. *Leperditia acuta*, J. & K. Left valve. Arnside.

Plate VIII.

[All the figures magnified about 25 diameters.]

Fig. 1. *Beyrichia radiata*, J. & K. Right valve of a tuberculated variety. Geol. Surv. Scotland Coll. B 2831 E.
Fig. 2. The same. *a*, left valve; *b*, ventral view. } Cam Beck.
Fig. 3. *Beyrichia longispina*, J. & K. Left valve. }
Figs. 4 & 5. *Beyrichia fodicata*, J. & K. Right valves. } Linlithgow
Fig. 6. The same. Left valve. } Bridge.
Fig. 7. *Beyrichia tuberculospinosa*, J. & K. Left valve. } Murrayfield.
Fig. 8. The same. Right valve. }
Fig. 9. *Beyrichia multiloba*, J. & K. *a*, right valve; *b*, left valve; *c*, ventral view. Mouse Water, Wilsontown.

Figs. 10 & 11. *Beyrichia varicosa*, J. & K. Side views of right and left valves. Whitebaulks.
Fig. 12. *Beyrichia* (?) *bicæsa*, J. & K. Right valve.
Fig. 13. The same. Left valve. } Woodhill.
Fig. 14. *Primitia* (?) *Holliana*, J. & K. *a*, left valve; *b*, right valve; *c*, ventral view. Great Ormes Head, Caernarvonshire.
Fig. 15. *Beyrichiella* (?) *reticosa*, J. & K. Right valve. Abden, Fife.
Fig. 16. The same. *a*, left valve; *b*, dorsal view; *c*, ventral view. Whitebaulks, Linlithgowshire.
Fig. 17. *Beyrichiella* (?) *ventricornis*, J. & K. Right valve. Robroystone.
Fig. 18. The same. *a*, left valve; *b*, ventral view; *c*, end view. Charlestown, Fife.
Fig. 19. *Kirkbya tricollina*, J. & K. Right valve. Arnside.
Fig. 20. *Moorea obesa*, J. & K. *a*, side view; *b*, ventral view. Brocastle, South Wales.
Fig. 21. *Moorea tenuis*, J. & K. *a*, side view; *b*, ventral view. Mendips.
Fig. 22. *Cytherella* (?) *reticulosa*, J. & K. *a*, side view; *b*, edge view. Storr Moss.
Fig. 23. The same. Internal cast, showing the muscle-spot. Storr Moss.

Plate IX.

[All figures magnified about 25 diameters.]

Fig. 1. *Cytherella valida*, J. & K., var. *affiliata*, nov. *a*, left valve; *b*, dorsal view. Gleaston Castle.
Fig. 2. *Cytherella* (?) *elongata*, J. & K. Left valve.
Fig. 3. The same. Right valve. } Murrayfield.
Fig. 4. *Bythocythere Youngiana*, J. & K. *a*, left valve; *b*, dorsal view. Woodend Quarry, Lowick.
Fig. 5. *Bythocythere antiqua*, J. & K. *a*, left valve; *b*, dorsal view. Skellygate.
Fig. 6. *Argillœcia æqualis*, J. & K. *a*, left valve; *b*, ventral view. Larriston.
Fig. 7. *Aglaia* (?) *cypridiformis*, J. & K. *a*, left valve; *b*, ventral view. Plashetts.
Fig. 8. *Xestoleberis* (?) *subcorbuloides*, J. & K. *a*, right valve; *b*, ventral view. Near Storr Moss.
Fig. 9. *Macrocypris carbonica*, G. S. Brady. *a*, left valve; *b*, dorsal view. (After Brady.) Millburn, Campsie.
Fig. 10. *Carbonia Wardiana*, J. & K. *a*, side view; *b*, edge view. Longton, Staffordshire.
Fig. 11. *Cythere* (?) *superba*, J. & K. Carapace, showing the right valve. Craigkelly.
Fig. 12. *Cythere* (?) *obtusa*, J. & K. *a*, carapace, side view; *b*, ventral view. Woodend, Lowick.
Fig. 13. *Bairdia legumen*, J. & K. *a*, right valve; *b*, dorsal view. Gleaston Castle.
Fig. 14. *Bairdia subelongata*, J. & K., var. *major*, nov. Left valve. Barmoor Redhouse, Lowick.