

ART. V.—*New or Little-known Victorian Fossils in the
National Museum.*

PART XIX.—THE YERINGIAN GASTEROPOD FAUNA.

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(With Plates II.–VI.).

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Introductory.

Of late years a considerable number of Silurian gasteropods have been added to the collection of the Melbourne National Museum, chiefly through the assiduous work of collectors whose names are mentioned in the body of the text, and who have permitted the Museum to benefit by their discoveries. Amongst the more notable genera of Silurian gasteropods herein described are:—*Helcionopsis*, *Temnodiscus*, *Carinaropsis*, *Cyrtostropha*, *Craspedostoma*, *Orthonychia*, *Diaphorostoma* and *Hercynella*, all of which appear to be new to the Southern Hemisphere.

Coelocaulus is here used to replace *Niso* (*Vetotuba*); the murchisonian affinities of the Cave Hill specimens being clearly shown in the Museum examples. The wide area of distribution for this genus in palaeozoic times is thereby extended into the Australian region. A new genus, *Liomphalus*, is herein suggested for smooth euomphalid shells with biconcave surfaces and partially open whorls.

A noteworthy feature of the Yeringian fauna is the comparative abundance of gasteropoda in contrast with their rarity in the Melbournian. The complete list of Yeringian gasteropods comprises 36 species, whilst there are only six species known up to the present time in the Melbournian. This gives a deeper water aspect to the Yeringian sea as a whole, and is concomitant with the data derived from the lithological structure and general stratigraphy of the two groups of beds in question.

So large a proportion of the Victorian Yeringian gasteropods is here described for the first time, comprising sixteen new species, and a variety, that it seemed advisable to make this paper a complete record of all the Yeringian species, so far as the material is sufficiently well preserved for descriptive purposes.

LIST OF YERINGIAN GASTEROPOD FAUNA.

Name.	Lilydale (limestone or mudstone).	Loyola (limestone or mudstone).	Upper Yarra.	Kilmore.	Other Localities.
<i>Helcionopsis nycteis</i> , Cressw. sp.	- L	-	-	-	-
<i>Helcionopsis elegantulum</i> , sp. nov.	- L	-	-	-	-
<i>Temnodiscus pharetroides</i> , sp. nov.	-	M	-	-	-
<i>Trematonotus pritchardi</i> , Cressw.	- L	-	-	-	Thomson R.
<i>Bellerophon fasciatus</i> , Lindström	-	-	X	-	-
<i>Bellerophon</i> aff. <i>fastigiatus</i> , Lindström	-	-	-	X	-
<i>Bellerophon cresswelli</i> , Eth. fil.	- L	-	-	-	-
<i>Bellerophon pisum</i> , sp. nov.	- L	-	-	-	-
<i>Carinaropsis victorise</i> , sp. nov.	- M	-	-	-	-
<i>Pleurotomaria maccoyi</i> , sp. nov.	-	-	X	-	-
<i>Mourlonia duni</i> , Eth. fil.	-	-	-	X	-
<i>Mourlonia subaequilatera</i> , sp. nov.	- L	-	-	-	-
<i>Phanerotrema australis</i> , Eth. fil.	- L	-	-	-	-
<i>Coelocaulus brazieri</i> , Eth. fil. sp.	- L	-	-	-	Marble Cr.
<i>Coelocaulus apicalis</i> , sp. nov.	- L	-	-	-	-
<i>Cyrtostropha lilydalensis</i> , sp. nov.	- L	-	-	-	-
<i>Goniostropha pritchardi</i> , Eth. fil.	- L	-	-	-	-
<i>Gyrodoma etheridgei</i> , Cressw. sp.	- L	-	-	-	-
<i>Euomphalus centrifugalis</i> , sp. nov.	-	M	X	-	-
<i>Euomphalus northi</i> , Eth. fil. sp.	- L	-	-	-	-
<i>Liomphalus australis</i> , sp. nov.	- L	-	-	-	-
<i>Straparollus debilis</i> , sp. nov.	- M	-	-	-	-
<i>Omphalotrochus globosum</i> , Schlotheim sp.	- L	-	-	-	-
<i>Scalaetrochus antiquus</i> , Cressw. sp.	- X	-	X	-	-
<i>Scalaetrochus lindstroemi</i> , Eth. fil. sp.	- L	-	-	-	-
<i>Craspedostoma lilydalensis</i> , Cressw. sp.	- L	-	-	-	-
<i>Cyclonema lilydalensis</i> , Eth. fil.	- L	-	-	-	-
<i>Cyclonema australis</i> , Eth. fil.	- L	-	-	-	-
<i>Loxonema sinuosa</i> , Sow. sp., var. <i>australis</i> , nov.	- L	-	-	-	-
<i>Orthonychia brevis</i> , sp. nov.	-	L	-	-	-
<i>Platyceras minutum</i> , sp. nov.	-	-	-	-	Deep Creek (Thom. R.)
<i>Platyceras cornutum</i> , Hisinger	-	L M	-	-	-
<i>Platyceras erectum</i> , J. Hall sp.	-	-	-	-	Kilmore D.
<i>Diaphorostoma retrorugatum</i> , sp. nov.	- M	-	-	-	-
<i>Diaphorostoma incisum</i> , sp. nov.	-	-	-	-	Thomson R.
<i>Hercynella victorise</i> , sp. nov.	-	-	X	-	-

DESCRIPTION OF THE SPECIES.

Fam. ACMAEIDAE.

Genus *Helcionopsis*, Ulrich and Scofield.*Helcionopsis nycteis*, Cresswell sp. (Plate II., Fig. 1).

Tryblidium nycteis, Cresswell, 1893. Proc. Roy. Soc. Victoria, vol V. (N.S.), p. 41, pl. IX., fig. 4.

Capulus nycteis, Cresswell sp., Chapman, 1913. Rep. Austr. Assoc. Adv. Sci., vol. XIV., p. 227.

Description.—Shell sub-ovate, strongly convex along the back, broadening and expanding towards the sides. Form resembling a strongly-arched *Crepidula*. Apex slightly overhanging the pre-apertural area. Side view plano-convex, highest at the middle point between the apex and ventral edge. End view semi-ovate, with a slight cant towards one side. Lines of growth marked by numerous raised concentric ridges, the interspaces relieved by radial striae. Lines of growth in middle of shell about .5 mm. apart.

Dimensions.—Holotype. Length, 31 mm.; greatest width, 20 mm.; height, from back of shell to ventral edge, 15 mm.

Observations.—This shell was originally referred to *Tryblidium* by Mr. Cresswell on account of its resemblance to some Gotland forms described by Lindström. The Gotland specimens are more depressed, with the exception of one species, referred doubtfully to *Tryblidium*,¹ and which appears to belong to *Helcionopsis*, and somewhat related to the above species.

The present writer referred this species to *Capulus* in 1913, on account of the asymmetrical apex, but in the light of the structure shown in the next species described, the relationship appears to be with *Helcionopsis*.

Occurrence.—Silurian (Yeringian). In limestone, Cave Hill, Lilydale. Holotype presented by the Rev. A. W. Cresswell, M.A.

Helcionopsis elegantulum, sp. nov. (Plate II., Figs. 2, 3; Plate VI., Fig. 49).

Description.—Shell sub-ovate, one and a-half times as long as broad; apex acuminate but not prominent; sides gently rounded, back highly arched near apex and depressed convex near ventral border. Growth-lines lamellate and situated about 1.5 mm. apart in the middle of the shell; interspaces marked with numerous radial

1 (?) *Tryblidium radiatum*, Lindström. Kongl. Svenska Vet.-Akad. Handl., Bd. xix., No. 6, 1884, p. 58, pl. xviii., figs. 1, 2.

ribblets, which extend over the edge of the lamellae where well preserved.

Dimensions.—Length, 20 mm. Approximate width when complete, 15.5 mm. Greatest height from ventrum to dorsum, 10 mm.

Observations.—This distinct species is easily separated from the earlier named Victorian form, *H. nycteis*, in the more spacious concentric ornament, its lamellate character, and in the more evenly rounded dorsum.

H. elegantulum is closely allied to *H. eminens*, Barrande sp.¹ from the Lower Devonian (Etage F), Konieprus, Bohemia. It differs from that species in having a more narrowly ovate and higher shell, and agrees in the lamellate and radial ornament.

Occurrence.—Silurian (Yeringian). In limestone, Cave Hill, Lilydale. Holotype presented by Mr. J. S. Green.

Fam. CYRTOLITIDAE.

Genus *Temnodiscus*, Koken, 1896.

Temnodiscus pharetroides, sp. nov. (Plate, II., Figs. 4, 5; Plate VI., Figs. 50, 51).

Description.—The Victorian specimen is in the form of a cast. It shows the compressed initial coil with rapidly widening body-whorl. The latter is expanded on the inner side. The slit-band is keel-shaped and prominent, and the surface of the shell is ornamented with concentric rugae.

Dimensions.—Diameter, 8 mm.; width of last whorl, 6.5 mm.; width of mouth, 8 mm.

Observations.—In form this species resembles Lindström's "*Cyrtolites*" *pharetra*,² of the Silurian of Gotland, with the exception that the Victorian species is wider across the mouth at the inner part of the body whorl, its keel is sharper and more salient, and the concentric ornament more rugose.

Another somewhat allied species is Perner's *Temnodiscus ferrigena*,³ from which the Victorian species differ in the greater umbilical diameter and the more discoidal outline. The ornament in the Bohemian species consists of finely striate growth-lines, as

1 Perner, in Barrande's Syst. Sil. Bohême, vol. iv., tome i., 1903, p. 37; tome ii., 1907, pl. civ., figs. 13-15 and fig. 10 in text.

2 Kongl. Svenska Vet.-Akad. Handl., Bd. xix., No. 6, 1884, p. 83, pl. vi., figs. 39-51.

NORR.—Some of Lindström's species referred to *Cyrtolites* properly belong to *Oxydiscus*, as pointed out by Koken—Bull. Acad. Imp. Sci. St. Petersburg, ser. v., vol. vii., 1897.

3 In Barrande's Syst. Sil. Bohême, vol. iv., tome i., 1903, p. 78, fig. 54 in text; tome ii., 1907, pl. cxiv., figs. 5, 6.

contrasted with the more rugose character of those in *T. pharetroides*.

Occurrence.—Silurian (Yeringian). In ochreous mudstone, Loyola, near Mansfield. Collected and presented by Mr. G. Sweet, F.G.S.

Fam. BUCANIIDAE.

Genus *Trematonotus*, J. Hall,

Trematonotus pritchardi, Cresswell.

Trematonotus pritchardi, Cresswell, 1893. Pro. Roy. Soc. Victoria, vol. V. (N.S.), p. 42, pl. VIII., fig. 1.

Trematonotus pritchardi, Cresswell, Chapman, 1913. Rep. Austr. Assoc. Adv. Sci., vol XIV., p. 227.

Observations.—This species shows some marked resemblances to the Gotland form, *T. longitudinalis*, Lindström.¹ The Victorian species has a more regularly planorbid spiral shell, which is not anteriorly elongated as in *T. longitudinalis*. The interior of the aperture is almost smooth in *T. pritchardi*, whilst the longitudinal spiral lines are undulose, producing with the concentric lines of growth a decided fenestration. A medium-sized example from the Thomson River, Gippsland, has the perforations in the slit-band rather larger than in the Lilydale specimens, and the spiral lines are decidedly more flexuous.

Occurrence.—Silurian (Yeringian). In limestone, Cave Hill, Lilydale. Collected by the Rev. A. W. Cresswell, M.A. Thomson River, Gippsland, 3½ miles N.W. of Mt. Lookout; presented by Mr. G. T. Lovat.

Fam. BELLEROPHONTIDAE.

Genus *Bellerophon*, Montfort.

Bellerophon fasciatus, Lindström. (Plate II., Fig. 6; Plate VI., Fig. 52).

Bellerophon fasciatus, Lindström, 1884. Kongl. Svenska Vet.-Akad. Handl., Bd. XIX., No. 6, p. 75, pl. VI., figs. 13, 14.

Observations.—The Victorian specimen agrees with Lindström's form in having a compressed shell which is hardly umbilicate, and an inconspicuous and blunt keel; the growth lines are gently sinuous.

¹ Kongl. Svenska Vet.-Akad. Handl. Bd. xix., No. 6, 1884, p. 86, pl. iii., figs. 39, 40; pl. iv., figs. 1-7.

Occurrence.—Silurian (Yeringian). In brown mudstone, junction of the Woori-Yallock and the Yarra. Coll. of the Geol. Surv. of Vict. (B23.)

Bellerophon aff. *fastigiatus*, Lindström. (Plate II., Figs. 7, 8).

Bellerophon fastigiatus, Lindström, 1884. Kongl. Svenska Vet.-Akad. Handl., Bd. XIX., No. 6, p. 76, pl. VI., figs. 1-10.

Observations.—A complete cast of a subspherical *Bellerophon* occurs in the Yeringian mudstone of Kilmore. In the moderate compression of the dorsum, the faint keel and conspicuous and fairly narrow umbilicus, it is very close to Lindström's species from the Silurian of Gotland. Probably better preserved specimens will show it to be a new species allied to the northern one.

Dimensions.—Greater diameter, 13.5 mm.; shortest diameter, 11 mm. Width of aperture near base of whorl, 9.5 mm.; height of aperture, 5 mm.

Occurrence.—Silurian (Yeringian). Kilmore. Collected and presented by Mr. G. Sweet, F.G.S.

Bellerophon cresswelli, Etheridge fil. (Plate II., Fig. 12; Plate VI., Fig. 53).

Bellerophon cresswelli, Etheridge, jnr., 1891. Rec. Aust. Mus., vol. I., No. 7, p. 130, pl. XIX., figs. 6-8.

Observations.—This species has already been compared with *B. squamosus*, Lindström,¹ by Mr. Etheridge in his original description, where he states that the shell is not fenestrate as in the Gotland species. It is worth noting, however, that a well preserved specimen in the National Museum shows a faint but definite lattice structure of wavy striae across the growth-lines. The form of the earlier portion of the shell is so distinctly globular that this feature alone separates it from *B. squamosus*.

Occurrence.—Silurian (Yeringian). In limestone, Cave Hill, Lilydale. Collected by the Rev. A. W. Cresswell, M.A., and others.

Bellerophon pisum, sp. nov. (Plate II., Figs. 9-11).

Description.—Shell almost globular, umbilical depression small, moderately deep. Aperture low, sub-crescentic, about four times as broad as high. Growth-lines making a widely open V in the band area. Sinus band distinct, narrow, slightly raised from the surface. Surface of shell marked with interrupted radial striae, seen distinctly between the lines of growth.

¹ Kongl. Svenska Vet.-Akad. Handl., Bd. xix., No. 6, 1884, p. 78, pl. v., figs. 17-24.

Dimensions.—Height, 11.25 mm. Width, 10 mm.

Observations.—Lindström has figured a small *Bellerophon* (*B. pilula*) from Gotland,¹ which is even of smaller dimensions than the Victorian, and which is of the same globular shape. Lindström's species differs in the minute but clearly fenestrate ornament which in ours is apparently evanescent on the growth-lines, and also in the weaker sinus band.

Occurrence.—Silurian (Yeringian). In limestone, Cave Hill, Lilydale. Collected by the Rev. A. W. Cresswell, M.A.

Genus *Carinaropsis*, J. Hall.

Carinaropsis victoriae, sp. nov. (Plate II., Figs. 13, 14).

Description.—Shell patelloid, ovate, transversely elongate. Spire prominent, narrowly rounded, depressed on the shoulders and rapidly widening and expanding to the depressed subcircular body cavity. Dorsum moderately convex, and depressed towards the ventral and lateral margins. Surface relieved with shallow sulcate growth-folds and numerous radial folds or shallow riblets. Inner surface shows a thick, broad, umbonal platform, beneath which is a shallow groove corresponding to the carina on the external surface.

Dimensions.—Holotype.—Diameter from spire to ventral margin, 18.25 mm. Extreme width, 22.75 mm.

Paratype.—Diameter from spire to ventral margin, circ. 21 mm. Extreme width, 24 mm.

Observations.—The present species is nearly related to *Carinaropsis ithagenia*, Clark,² a fossil of the Ithaca fauna, of Upper Devonian age. The only differences existing between these forms are the more salient spire, the depressed and more obliquely sloping shoulders, and the more irregular growth-lines in the Victorian species.

Occurrence.—Silurian (Yeringian). In olive-brown mudstone, Ruddock's Quarry, near Lilydale. Holotype coll. R. H. Annear. Paratype presented by Mr. J. S. Green.

Fam. PLEUROTOMARIIDAE.

Genus *Pleurotomaria*, Sowerby.

Pleurotomaria maccoyi, sp. nov. (Plate II., Figs. 15-17).

Description.—Shell trochoid, moderately high, the width and height being nearly equal. Apical angle 80 deg. Whorls about six

1 Tom. supra cit., p. 80, pl. vi., figs. 29, 30.

2 New York State Mus., 57th Ann. Rep., Mem. 6, 1904, p. 323 (footnote), pl. xvi., figs. 18-20.

in number, subangulate and rounded, more convex below than above. Slit band prominent, projecting beyond the contour of the whorls, and bounded above and below by a raised border; surface gently concave, with four crescentic growth-lines in a millimetre. Base moderately convex; umbilicus open. Mouth, subovate. Surface of whorls traversed by close and fine growth-lines, curving backwards to the band above, with a sigmoidal forward and backward curve below. Fine cross-lines between growth-lines visible in a strong light.

Dimensions.—Height about 27 mm. Width at base about 30 mm. Height of body whorl, 18 mm. Width of slit-band, 1 mm. Most of the specimens are more or less distorted, but being fairly numerous, an accurate average idea may be formed of the dimensions.

Observations.—This striking species is not far removed from McCoy's *P. crenulata*, from the Upper Ludlow, of Brigsteer, Kendal, Westmoreland.¹ It differs in the larger number of whorls, in their more depressed contour and in the less deeply incised suture; moreover, the band in *P. maccoyi* is not concave as in the English species.

Another closely related form is Lindström's *P. claustrata*,² from the Wenlockian, of Gotland, which resembles the Victorian species in proportionate height and width, in the number of whorls and in the general ornament, with the specific difference that the growth-lines on the whorls of *P. maccoyi* have a distinctly sigmoidal sweep, whereas in *P. claustrata* they are more gently curved. The latter form also has a more excavated slit-band.

The above described examples of *P. maccoyi* were selected many years ago by McCoy from a collection of Survey fossils, and placed in the Museum under the name of *Pleurotomaria*, but without further reference. The species is now identified with his name in honour of his classical work on the gasteropods of the British palaeozoic system.

Occurrence.—Silurian (Yeringian). Moderately common in olive-brown and blue mudstone, from the junction of the Woori-Yallock and Yarra, Upper Yarra district. G.S.V. (B23).

Genus *Mourlonia*, de Koninck.

Mourlonia duni, Etheridge fl.

Mourlonia duni, Etheridge, jnr., 1898. Rec. Austr. Mus., vol. III., No. 4, p. 73, pl. XV., fig. 5; pl. XVI., fig. 2.

¹ Brit. Pal. Foss., 1855, pt. ii., p. 291, pl. i., k, fig. 45.

² Kongl. Svenska Vet.-Akad. Handl., Bd. xix., No. 6, 1884, p. 97, pl. vii., figs. 31-36.

Observations.—This shell was described by Etheridge from the Wellington Caves, New South Wales, and recorded as of Siluro-Devonian age.

The species is not uncommon in the Yeringian series of Victoria. As far back as 1902 I identified it in the Museum collection. Owing to the overlapping of the locality numbers used on the early Victorian Geological Survey specimens, this species was erroneously recorded in my list of Silurian Fossils of Victoria,¹ as from "Anderson's Creek," but which should read "Police Paddock, Kilmore," a locality that has yielded a number of Yeringian species.

Occurrence.—Silurian (Yeringian). In brown, sandy mudstone, Police Paddock, Kilmore, G.S.V. Bb 22. Also a form with flatter whorls, but evidently belonging to the same species; in similar rock, Fraser's or No. 3 Creek, Springfield, G.S.V. Bb 25.

Mourlonia subaequilatera, sp. nov. (Plate III., Figs. 18, 19).

Description.—Shell heliciform. Whorls six or seven, convex, sutures distinct. Slit-band slightly above the median line, narrow, bordered by prominent threads above and below. Whorls ornamented with strong, raised costae, above arcuate and inclined forward to the mouth, and vertically arcuate below. Area between costae finely striate, at right angles to them. Spire low, with pointed apex. Base in the holotype encrusted, but with indication of a wide umbilicus.

Dimensions.—Greatest breadth of shell about 26 mm. Height, from base to apex, 15.5 mm.

Observations.—The above species appears to belong to de Koninck's genus *Mourlonia*, which is a conical or discoidal pleurotomarid with distinct umbilicus. A closely allied species is *Mourlonia aequilatera*, Wahlenberg sp.,² a well-distributed Upper Silurian fossil in Europe. The Australian species differs in having the slit-band superior to the median line, and in the costae being more pronounced and intercancellate.

Occurrence.—Silurian (Yeringian). In limestone, Cave Hill, Lilydale. Collected by the Rev. A. W. Cresswell, M.A.

Genus *Phanerotrema*, Fischer.

Phanerotrema australis, R. Etheridge fil. (Plate III., fig. 25).

Phanerotrema australis, R. Etheridge, jnr., 1891. Rec. Austr. Mus., vol I., No. 7, p. 128, pl. XIX., figs. 4, 5.

¹ See "*Pleurotomaria (Mourlonia) duni*, Eth. fil." Rep. Austr. Assoc. Adv. Sci., Melbourne Mtg., 1913, vol. xiv., p. 218.

² *Helicites aequilatera*, Wahlenberg. Petrifacta Svecana Telluris, 1818, p. 73. *Pleurotomaria aequilatera*, Wahl. sp. Lindström, Kongl. Svenska Vet.-Akad. Handl., Bd. xix., No. 6, 1884, p. 111, pl. ix., figs. 20-29.

Observations.—This large and handsome form of the pleurotomarid group bears close relationship with both *Phanerotrema balteata*, Phillips sp.,¹ from the Wenlock series, and *P. labrosa*, J. Hall sp.,² from the Lower Helderberg series. By the discovery of a fine, nearly complete specimen of *P. australis* in the Cave Hill limestone by Dr. E. Brooke Nicholls, it is possible to add some notes of interest to the original diagnosis of the less complete specimen described and figured by Mr. Etheridge.

Dimensions.—Height from base of columella to apex of whorls, 92 mm.; greatest width of shell, 90 mm. Height of penultimate whorl, 13 mm. Height of last whorl, 68 mm. Approximate width of aperture, 55 mm.; approximate length, 66 mm. Distance of slit-band from base of shell, 50 mm. Distance of slit-band from last suture, at mouth, 37 mm. Width of slit-band at mouth, 6.5 mm.

Comparisons.—Body whorl—Depressed and even slightly concave as in *P. labrosa*. In *P. balteata* it is gently convex. Spire—Moderately well developed as in *P. balteata*. Sutures—Deeply channelled as in *P. balteata*.

The Australian species appears to exceed in size any other of this group, and as remarked by Mr. Etheridge, is a more obliquely elongated shell.

Occurrence.—Silurian (Yeringian). In friable limestone,³ Cave Hill, Lilydale. Presented by Dr. E. Brooke Nicholls.

Fam. MURCHISONIIDAE

Genus *Coelocaulus*, Oehlert.

Amongst Silurian *Murchisoniidae* there occurs a peculiar generic type of shell characterised by its turritid form, with flat whorls, especially in the earlier stages, and a conspicuous, persistent umbilicus. This type of shell is widely distributed, occurring in various Silurian faunas of Europe, North America and Australia. The slit-band is often obscure in shells of this type where the later whorls are not preserved, but in specimens where the last two whorls are found, the latter are subangularly convex with an infra-median slit-band, and show a relationship to the genus *Hormotoma*, Salter, as emended and typified by Mrs. Longstaff (Miss Jane Donald),⁴ in the species *H. cingulata*, Hisinger⁵

1 (*Pleurotomaria balteata*). Mem. Geol. Surv. Gt. Brit., vol. ii., pt. i., 1848, p. 358, pl. xv., figs. 1, 2.

2 (*Pleurotomaria labrosa*). Pal. N. York, vol. iii., 1859, p. 339, pl. lxvi., figs. 1-5.

3 This matrix is a calcareous sand composed of granules largely of algal origin, together with fragments of crinoids.

4 Quart. Journ. Geol. Soc., vol. lv., 1899, p. 257.

5 *Turritella cingulata*, Lethaea Svecica, 1837, p. 39, pl. xii., fig. 6.

Although related to *Hormotoma* by the form of the later whorls and the position of the slit-band, the open and persistent umbilicus is a very distinct feature in the shells under notice. Consequently forms of this type of Devonian age were generically separated as *Coelocaulus* by Oehlert in 1888.¹ In 1897 Ulrich² referred the Onondaga (Silurian) species, *Murchisonia logani*, to the same genus.

Coelidium was more recently suggested as a genus name to replace *Coelocaulus* by Clarke and Ruedemann,³ but has not been adopted, even in America, apparently on insufficient grounds of pre-occupation.

The Australian Silurian and Devonian faunas both contain representatives of this interesting genus. In 1877 de Koninck described a Devonian species from the Yass district in New South Wales under the name of ? *Niso darwinii*,⁴ a form which undoubtedly species congeneric with de Koninck's, from the Silurian of Cave belongs to this genus. In 1890 Mr. R. Etheridge, jnr.,⁵ described a Hill, Lilydale, Victoria, to which he gave the name *Niso (Vetotuba) brazieri*, at the same time remarking on the close correspondence between de Koninck's and his species.

Whilst examining some senile forms of the Lilydale specimens of this type, and in particular one found by Mr. J. S. Green, I noticed the presence of a sinus-band in the later whorls which confirmed a determination as *Murchisonia* made many years ago by McCoy on a Museum specimen presented by Dr. G. B. Pritchard.

Referring in this place to other occurrences of *Coelocaulus*, we may note Lindström's Silurian example—" *Murchisonia* " *compressa*⁶ from the Silurian of Gotland, which has a similar wide and open umbilicus extending apparently to the apex.

The Upper Silurian of Petropaulowsk in the Russian Oural appears to contain examples of this genus, represented by "*Cerithium*" *helmerseni*, de Verneuil,⁷ judging from the form of the shell with its compressed whorls; but the figure does not indicate an umbilicated base, nor does the description throw light on this point.

1 Bull. Soc. d'Etudes Scientifiques d'Angers, p. 20.

2 Geol. Surv. Minnesota. Palaeontology, 1897, vol. iii., pt. 2, p. 1019.

3 "Guelph Fauna in the State of New York." University State of N. York, 57th Ann. Rep., vol. iii., Mem. 5, 1903, pp. 65 and 67.

4 Mem. Soc. Roy. Sci. Liège, 2nd ser., vol. ii., 1876-7. See also Mem. Geol. Surv. N. S. Wales, Pal. No. 6, 1898, p. 101, pl. iv., fig. 11.

5 Rec. Austr. Mus., vol. i., No. 3, 1890, p. 63, pl. viii., figs. 4, 5; pl. ix., figs. 2, 3. See also Mem. Geol. Surv. N. S. Wales, Pal. No. 6, 1898, p. 101 (footnote).

6 Kongl. Svenska Vet.-Akad. Handl., Bd. xix., No. 6, 1884, p. 129, pl. xii., fig. 18.

7 Geol. de la Russie D'Europe. Murchison, Verneuil and Keyserling, 1845, vol. ii., p. 342, pl. xxii., fig. 4.

In the Lower Devonian of the Karnic Alps, in beds adjacent to Silurian rocks, a *Murchisonia*-like shell has been described and figured by Frech,¹ referred to *Murchisonia davyi*, Barrois, and compared with Lindström's *M. compressa* previously cited. The Lower Devonian fauna of Bohemia is also fairly rich in examples of *Coelocaulus*. In Bassler's "Bibliographic Index of American Ordovician and Silurian Fossils"² there are no less than twelve American species listed, seven of which are of Upper Silurian (Niagaran) age, three of Ordovician age, and two of Lower Devonian.

Coelocaulus brazieri, Etheridge fil. (Plate III., Figs. 20-22).

Niso (*Vetotuba*) *brazieri*, R. Etheridge, jnr., 1890. Rec. Aust. Mus., vol. I., No. 3, p. 62, pl. VIII., figs. 4, 5; pl. IX., figs. 2, 3. Cresswell, 1894. Proc. R. Soc. Vict., vol. VI. (N.S.), p. 158. Chapman, 1907. Rec. Geol. Surv. Vict., vol. II., pt. I., pp. 11, 17.

Description, emended.—Shell turriculate, elongate-conical, slowly tapering to a blunt apex. Apical angle from 25 deg. to 30 deg. Sides gently convexly curved. Whorls about 12 in full-grown examples; surface convex to nearly flat. Sutures fairly well impressed. Slit-band slightly below median line, feebly concave, bounded by raised threads above and below. Traces of spiral threads on the rest of the whorl. Umbilical cavity open from the base to the apex, sides undulating owing to the convex impingement of the whorls on the inner surface. Seen in section the whorls are quadrately globose, and secondary thickening has occurred in some examples, which tend to flatten the external surface of the shell by filling up the suture lines. Length of the largest example about 70 mm., or more when complete.

Observations.—We have already pointed out the relationship of the above and other related forms to *Murchisonia* under the generic heading of *Coelocaulus*. It is interesting to find another species of the same group in Australia, in the Devonian of Yass, viz., *C. darwinii*; thus showing that this peculiar type of shell had as extensive a range as many another Silurian or Devonian genus, and helping to link up the faunas of the two formations.

Occurrence.—Silurian (Yeringian). In limestone, Cave Hill, Lilydale. From the collection of the Rev. A. W. Cresswell, M.A. Also presented by Mr. J. S. Green and Dr. G. B. Pritchard. In beds of similar age from Marble Creek, Gippsland (Geol. Surv. Vict.—determined by the author).

1 Zeitschr. d. deutschen geol. Gesellsch., vol. xlv., pt. iii., 1894, p. 458, pl. xxxii., figs. 4a-d.

2 United States National Museum, Bull. No. 92, 1915, p. 249.

Coelocaulus apicalis, sp. nov. (Plate III., Figs. 23, 24).

Description.—Shell somewhat like *C. brazieri*, but spire more acute and with a more numerous apical series of whorls. Apical angle about 25 deg. Whorls depressed convex to flat, short and numerous near the apex, numbering altogether about 20. Sutures well marked, but not widely channelled. Slit-band median or slightly below the median line, depressed in earlier convolutions, prominent in later ones and bordered by raised threads above and below. Umbilical axis open to apex. Cast of perforation more regularly cylindrical than in *C. brazieri*.

Dimensions.—A smaller shell than *C. brazieri*, measuring in the type specimen 40 mm. in length and 16.5 mm. at the base (so far as preserved).

Observations.—The above species appears to occupy a middle position between *Coelocaulus brazieri* and *C. darwinii*. From several examples of the latter species collected by Mr. A. J. Shearsby, one is able to note some interesting points of comparison. It is smaller and more slender in the apical half of the shell than either of the Victorian Silurian species; whilst in the numerous whorls and the cylindrical form of the hollow columella it agrees with *C. apicalis*. The examples of *C. darwinii* from the Shearsby collection came from the Middle Devonian of Yass (Portion 208, Par. Waroo), New South Wales. De Koninck gives the Yass district as the locality, and refers it to the Devonian, whilst Mr. Etheridge refers it to "the Upper Silurian, probably Wenlock, beds of Yass."¹

Genus *Cyrtostropha*, Donald.

Cyrtostropha lilydalensis, sp. nov. (Plate IV., Figs. 26-28).

Description.—Spire of moderate length, turriculate; consisting of eight whorls, including the protoconch. Sides of whorls convex with the sutures deeply incised. Sinus band median. Growth-lines moderately oblique above and curving backward to the band, and forward below; lines conspicuous on the sinus-band. Band bordered with strong raised lines above and below. Rest of whorl relieved with about three threadlike or slightly nodulose lirae above and below the band. Aperture longer than broad, columellar margin slightly produced. Umbilicus closed.

Dimensions.—Length of holotype (incomplete at base), 31 mm.; width at base about 12 mm. Length of body whorl about 14 mm.

¹ Rec. Austr. Mus., vol. i., No. 3, 1890, p. 63.

Width of sinus band on body whorl, 1.25 mm. Length of body whorl of a large specimen about 18 mm.

Observations.—The nearest form to the present species appears to be Sowerby's "*Pleurotoma*" *coralli*,¹ which Miss Donald has placed in the genus *Cyrtostropha*.² The British species ranges from the Llandovery to the Ludlow series. The present species differs from the British in the more numerous lirae and their slightly nodulose character. Mr. Etheridge has remarked on a species of *Murchisonia* (sp. ind.)³ from Lilydale, which from the details given seems to belong to the above form, except for there being no mention of spiral lirae.

Occurrence.—Silurian (Yeringian). In limestone, Cave Hill, Lilydale. Collected by the Rev. A. W. Cresswell, M.A.

Genus *Goniostropha*, Oehlert.

Goniostropha pritchardi, Etheridge fil. (Plate IV., Fig. 29).

Goniostropha pritchardi, Etheridge, jnr., 1898. Rec. Aust. Mus., vol. III., No. 4, p. 71, pl. XV., figs. 1-4.

Observations.—Some examples of the above species are found in the present collection. They are distinguished from *Cyrtostropha lilydalensis* by the shorter habit and more angulate whorls; the lirate ornament in both forms is very similar, but the sinus band in *C. lilydalensis* is not so deeply excavate.

Occurrence.—Silurian (Yeringian). In limestone, Cave Hill, Lilydale. Collected by the Rev. A. W. Cresswell, M.A.

Genus *Gyrodoma*, R. Etheridge, jnr.

Gyrodoma etheridgei, Cresswell sp.

Eunema etheridgei, Cresswell, 1893. Proc. R. Soc. Vict., vol. V. (N.S.), p. 41, pl. VIII., fig. 2.

Gyrodoma etheridgei, Cresswell sp., R. Etheridge, jnr., 1898. Rec. Aust. Mus., vol. III., No. 4, p. 72, pl. XVI., fig. 1.

Observations.—Mr. Etheridge has referred, in the paper above cited, to the question raised by Mr. Cresswell's depiction of the type specimen as having a double band. An examination of the type, which is in the National Museum collection, shows the band to be single, rather depressed, and marked along the middle with a raised spiral thread; hence the slight mistake in the details of

1 J. C. Sowerby. Sil. Syst., 1839, p. 612, pl. v., fig. 26.

2 Quart. Journ. Geol. Soc., vol. lviii., 1902, p. 322, pl. vii., figs. 5, 6.

3 Rec. Austr. Mus., vol. i., No. 7, 1891, p. 129.

the figure. In the earlier whorls of other specimens the band is distinctly depressed and bounded above and below with a raised thread. The longest example, but imperfect, of this fine species in our collection measures 70 mm.

Occurrence.—Silurian (Yeringian). In limestone, Cave Hill, Lilydale. Collected by the Rev. A. W. Cresswell, M.A., who presented the type specimen.

Fam. EUOMPHALIDAE.

Genus *Euomphalus*, Sowerby.

Euomphalus centrifugalis, sp. nov. (Plate IV., Figs. 30, 31 ;
Plate VI., Figs. 54, 55).

Description.—Shell compressed, planorbiform. Outline discoidal, but tending to irregular growth; sometimes almost subovate in outline. Superior face gently convex and sloping to the periphery on the last whorl, the inner series excavate; inferior face flat on the periphery and concave towards the centre. Spire visible on both sides and evolute. Aperture compressed, pyriform. Surface of whorls marked by numerous strong, sharply deflected growth-lines.

Dimensions.—Holotype. Greatest diameter, 14 mm.; at right angles, 10.5 mm. Width of last whorl, 4 mm. Approximate thickness of shell, 2.25 mm.

Observations.—This species bears some resemblance to *E. declivis*, Remeles,¹ of the Lower Silurian limestone obtained from the diluvium deposit of North Germany; especially in the sinuate and oblique character of the growth-lines. In that species, however, the whorls are not so deeply concave, and the body whorl tends to become an open spiral.

In general appearance Lindström's *Oriostoma dispar* may be mentioned,² which, by the way, is probably a true *Euomphalus* species. In this form, however, the outer whorl is not so highly convex on the inner side nor so steeply sloping to the periphery. Lindström's shell, being a Gotland species, comes from a bed of similar age as the above.

E. centrifugalis appears to be a thin-shelled ancestor of the *Euomphalus catillus* type,³ a compressed and striate species well known as a Carboniferous limestone fossil.

1 Zeitschr. d. deutsch. geol. Gesellsch., vol. xl., 1888, p. 669, pl. xxviii., fig. 3.

2 Kongl. Svenska Vet.-Akad. Handl., Bd. xix., No. 6, 1884, p. 173, pl. xxi., figs. 11-14.

3 Min. Conch., vol. 1, 1814, p. 98., pl. xlv., figs. 3, 4. Phillips' Geol. Yorkshire, vol. ii., 1836, pl. xiii., figs. 1, 2.

Occurrence.—Silurian (Yeringian). Apparently fairly common in the newer Silurian. Holotype, in mudstone from Killara, near Seville, Upper Yarra district; presented by Mr. J. S. Green. Paratype, from brown mudstone, Loyola, near Mansfield; presented by Mr. G. Sweet, F.G.S.

Euomphalus northi, Etheridge fil. sp.

Oriostoma northi, R. Etheridge, jnr., 1890. Rec. Aust. Mus., vol. I., No. 3, p. 64, pl. IX., figs. 6, 7.

Euomphalus northi, Eth., fil. sp., Chapman, 1913. Rep. Aust. Assoc. Adv. Sci., vol. XIV., p. 227.

Observations.—The nearly equilateral spiral form of the shell and the concave external face of the umbilicus show the relationship of the above species to be with *Euomphalus*.

The operculum in *Oriostoma* has a convex or conical exterior, whilst in *Euomphalus northi* it is concave.

Examples in the brephic to neanic stages exhibit a smoother shell than the adult form.

Occurrence.—Silurina (Yeringian). Numerous specimens in limestone, Cave Hill, Lilydale. One fine example with the operculum in situ, was presented by the Rev. A. W. Cresswell, M.A.

Genus *Liomphalus*, gen. nov.

Definition.—Shell discoidal, widely umbilicate and biconcave; whorls smooth and sometimes obscurely keeled along the back. Earlier whorls consisting of a thin shelled series, followed by two or more stout whorls, either closely adpressed or free in the later portion. Early part of series divided into chambers as in *Euomphalus* and *Straparollus* (*S. dionysii*, Montf.). Aperture elliptical or angularly ovate. Type, *Liomphalus australis*. The genus includes *Euomphalus disjunctus*, J. Hall, *E. (Straparollus) clymenioides*, J. Hall, *E. triquetrus*, Lindström, and *E. gotlandicus*, Lindström.

This generic type may be distinguished from *Euomphalus*, Sowerby (*sensu stricto*) in having smooth, rounded or uniangular whorls; and from *Straparollus*, Montfort, in having a concave spire; whilst from *Lytospira*, Koken, it differs in the more closely coiled shell, and in the absence of a scaly ornament.

Name derived from *leios*, smooth, and *omphalos*, an umbilicus.

Liomphalus australis, sp. nov. (Plate IV., Figs., 32, 33).

Description.—Shell moderately large, discoid, compressed. Spire somewhat concave, umbilical surface rather deeply concave, consist-

ing of two or three whorls rapidly widening on the last turn, with free surfaces. Exterior smooth. Aperture suboval to sub-rhomboidal, the angulation when present, situated on or above the median line of the periphery. From the penultimate whorl inwards the shell is divided by deeply concave partitions, the concavity outwards. In some cases the septa are numerous, simulating a cephalopod, but distinguished by the absence of siphuncular openings.

Dimensions.—Greatest diameter of type specimen about 65 mm., when complete. Width of last whorl at 30 mm. from aperture, 16 mm. Length of aperture, 24 mm. Greatest thickness of shell, 13 mm.

Observations.—This species was formerly identified by myself with *Euomphalus disjunctus*, J. Hall,¹ to which species it bears a close resemblance, and it was listed under that name in my paper "On the Palaeontology of the Silurian of Victoria."² Upon a closer examination of a fair number of specimens it was seen that the Australian examples were distinct from those of Hall's species from the Upper Pentamerus limestone of New York State, in having a more truly euomphaloid sectional outline to the aperture, which in ours is more angulate, and in the closer coiling of the outer whorls.

In Lindström's *Euomphalus triquetrus*,³ which I would refer to *Liomphalus*, the outer whorl widens very rapidly, and the aperture becomes everted on the margin, whilst the last quarter turn of the whorl is remarkably free.

In *E. gotlandicus*, Lindström,⁴ the shell is closely coiled, and whorls are inflated, with subcircular aperture. The spire in this form is also depressed, otherwise it would naturally fall into the genus *Straparollus*.

Another member of this genus is *Euomphalus (Straparollus) clymeniodes*, J. Hall,⁵ from the Devonian of the United States and Canada (Schoharie Grit, New York, and Upper Helderberg limestone, near Cayuga, Ontario). This is a smaller shell than usual, the largest being about two inches in diameter. It has about four or five whorls as in the Australian species, but, unlike it, has them more evenly increasing in diameter, whilst the volutions are not free. The mouth is subovate.

1 Pal. New York, vol. ii., pt. i., 1859, p. 340, pl. lxx., fig. 8; pl. lxxvii., figs. 4a, b.

2 Rep. Austr. Assoc. Adv. Sci., Melbourne Mtg., 1913, vol. xiv., p. 227.

3 Kongl. Svenska Vet.-Akad. Handl., Bd. xix., No. 6, 1884, p. 140, pl. xliii., figs. 32-35.

4 Op. cit., p. 139, pl. xliii., figs. 19-31.

5 Pal. New York, vol. v., pt. ii., 1879, p. 62, pl. xvi., fig. 15; pl. lxx., figs. 1-5.

Occurrence.—Silurian (Yeringian). In limestone, Cave Hill, Lilydale. Chiefly from the collection of the Rev. A. W. Cresswell, M.A.

Genus **Straparollus**, Montfort.

Straparollus debilis, sp. nov. (Plate IV., Fig. 34 ; Plate VI., Fig. 56).

Description.—Shell depressed, subcircular. Whorls about five, rounded, coiled in an irregular spiral and increasing slowly in width. Surface relieved with fine threadlike lines of growth, which are only slightly curved. Aperture subcircular.

Dimensions.—Greatest diameter, about 15 mm.; measurement at right angles about 14 mm. Height of shell, 4.25 mm.

Observations.—This species has a somewhat vermiform appearance from its weakly and irregularly coiled shell. Its nearest specific analogues seem to be *S. rudis*, J. Hall sp.,¹ and *S. hecale*, J. Hall sp.,² the former from the Middle Devonian (Hamilton group) of West Bloomfield, New York, the latter from the Upper Devonian (Chemung group) of Rockville, New York. *S. rudis* is a larger shell and increases rather rapidly in its later whorls, whilst *S. hecale* is more regularly discoidal in outline. *S. annulatus*, Phillips sp.,³ from the Devonian of Newton, Devonshire, is another related form, distinguished by its discoidal outline and prominent growth-lines.

De Koninck has figured a related form to the above from the Silurian at Rock Flat Creek, east side of Maneero, New South Wales, under the name of *Euomphalus solarioides*.⁴ This species differs in having an ornament of transverse tubercles instead of striae as in the Victorian species.

Occurrence.—Silurian (Yeringian). In brown mudstone, Rud-dock's Quarry, near Lilydale. Collected by F. Chapman.

Fam. TURBINIDAE.

Genus **Omphalotrochus**, Meek.

Omphalotrochus globosum, Schlotheim sp. (Plate IV., Figs. 35, 36).

Trochilites globosus, Schlotheim, 1820. Petrefactenkunde, p. 162

Euomphalus funatus, Sowerby, 1823, Min. Conch., vol. V., p. 71, pl. 450, figs. 1, 2. Id., 1839, Silurian System, p. 626, pl. XII..

¹ *Euomphalus (Straparollus) rudis*, J. Hall. Tom. supra cit., p. 58, pl. xvi., figs. 6, 7.

² *Euomphalus (Straparollus) hecale*, J. Hall. Ibid., p. 59, pl. xvi., figs. 10-14.

³ *Euomphalus annulatus*, Phillips. Pal. Foss. Cornwall, Devon and W. Somerset, 1841, p. 138, pl. lx., fig. 172.

⁴ Mem. Geol. Surv. N. S. Wales, Pal. No. 6, 1898, p. 30, pl. i., fig. 5.

fig. 20. Salter, 1867, *Siluria*, Ed. 4, p. 531, pl. XXV., fig. 3.

Oriostoma globosum, Schl. sp., Lindström, 1884. Kongl. Svenska Vet.-Akad. Handl. Bd. XIX., No. 6, p. 160, pl. XVII., figs. 24, 25, 29-31; pl. XVIII., fig. 24; pl. XX., fig. 16.

Observations.—The representatives in Victoria of this widely distributed species are rare and small. They are clearly referable to the above form on account of the depressed spire, ventricose whorls and expanding mouth. The ornament, as in the European species, consists of numerous spiral keels, about ten on the body whorl, with an intermediate and finer line. The interspaces are crossed by fine and coarse lines rather closely set and slightly curved.

Dimensions.—Greatest diameter of plesiotype, 11 mm.; height, 9 mm. Width of aperture, 7 mm.

Occurrence.—Silurian (Yeringian). In limestone, Cave Hill, Lilydale. Collected by the Rev. A. W. Cresswell, M.A. Also a fine example presented by Mr. J. S. Green.

Fam. TROCHIDAE.

Genus *Scalaetrochus*, Etheridge, jnr.

Scalaetrochus antiquus, Cresswell sp.

Stomatia antiqua, Cresswell, 1893. Proc. R. Soc. Vict., vol. V. (N.S.), pp. 41, 43, pl. VIII., fig. 3.

Trochus (Scalaetrochus) antiquus, Cressw. sp., Chapman, 1913. Rep. Aust. Assoc. Adv. Sci., vol. XIV., p. 229.

Observations.—Some of the Victorian examples of *Scalaetrochus* appear to indicate the presence of a narrow umbilicus,¹ and therefore show affinity to *Omphalotrochus*.

The above species was founded on a fragmentary shell, which is closely comparable with Etheridge's *Trochus (Scalaetrochus) lindstroemi*.² It differs in the slightly convex surface of the volutions, whereas in Etheridge's species they are either flat or concave.

A specimen figured by Lindström from the Silurian of Gotland³ as *Trochus gotlandicus* shows some affinity with the above, and also with *Sc. lindstroemi*, but it is non-perforate.

De Koninck's *Euomphalus (Omphalotrochus) clarkei*⁴ is closely related to *S. antiquus*, and differs only in the stronger and more irregular growth of the shell.

1 Rec. Austr. Mus., vol. i., No. 3, 1890, p. 66.

2 Ibid., p. 66, pl. viii., figs. 1, 2.

3 Kongl. Svenska Vet.-Akad. Handl., Bd. xix., No. 6, 1884, p. 146, pl. xiv., figs. 1-11.

4 Mem. Geol. Surv. N. S. Wales, Pal. No. 6, 1898, p. 32, pl. i., fig. 7.

Occurrence.—Silurian (Yeringian). In limestone, Cave Hill, Lilydale. In brown mudstone, junction of the Woori-Yallock and Yarra; Geol. S. Vict. B23.

Scalaetrochus lindstroemi, Etheridge fil. sp.

Trochus (*Scalaetrochus*) *lindstroemi*, R. Etheridge, jnr., 1890 Rec. Aust. Mus., vol. I., No. 3, p. 66, pl. VIII., figs. 1, 2. Chapman, 1913. Rep. Aust. Assoc. Adv. Sci., vol. XIV., p. 228.

Observations.—The high spiral and angulate sutural margins serve to separate this form from *S. antiquus*. It is fairly common in the Lilydale limestone, but has not yet occurred elsewhere, although an indeterminate form of the genus has been noted by me from Yeringian beds at Marble Creek, Gippsland.¹

Occurrence.—Silurian (Yeringian). In limestone, Cave Hill, Lilydale.

Fam. TROCHONEMATIDÆ.

Genus *Cyclonema*, J. Hall.

Cyclonema lilydalensis, Etheridge fil. (Plate V., Fig. 38).

Cyclonema lilydalensis, Etheridge, jnr., 1891. Rec. Aust. Mus., vol. I., No. 7, p. 128, pl. XIX, fig. 3.

Observations.—In the collection of the National Museum there is a fair number of quite small specimens of *Cyclonema*. As it had been suggested that these probably represent a new species, it is worth putting on record my conclusions regarding them. These small forms consist of about five whorls. The sides of the volutions are rounded, but as a rule the whorls are rather depressed, though occasionally the spire is fairly high, as in *C. australis*.² The ornament is exactly similar to that in full-grown specimens of *C. lilydalensis*, and when the number of whorls is taken into consideration, there being from four to six in the small shells, and eight in the fully developed ones, it will be seen that there is no ground for their separation. Further than this, a series of *Cyclonema* in the Dennant collection shows all gradations from the immature to the adult condition. The increase in size of the later whorls is very rapid, the height of a six-whorled shell being 14 mm., and an eight-whorled shell, 42 mm. Mr. Etheridge, in giving the number of whorls as six in *C. australis*, states that *C. lilydalensis* has a much larger number.

¹ Rec. Geol. Surv. Vict., vol. ii., pt. i., 1907, pp. 11, 17.

² Rec. Austr. Mus., vol. i., No. 3, 1890, p. 63, pl. ix., figs. 4, 5.

Occurrence.—Silurian (Yeringian). Cave Hill, Lilydale. Young forms in Rev. A. W. Cresswell collection.

Cyclonema australis, Etheridge fil.

(?) *Cyclonema australis*, R. Etheridge, jnr., 1890. Rec. Aust. Mus., vol. I., No. 3, p. 63, pl. IX., fig. 45.

Cyclonema australis, Idem, 1891, *ibid.*, vol. I., No. 7, p. 127, pl. XIX., figs. 1, 2. Chapman, 1913. Rep. Aust. Assoc. Adv. Sci., vol. XIV., p. 227.

Observations.—This species is separable from *C. lilydalensis* by the stronger liration of the shell-surface, and the more distinct and thread-like ornament crossing the interspaces between the spiral ribs.

Occurrence.—Silurian (Yeringian). In limestone, Cave Hill, Lilydale. Rarer than the preceding species.

Fam. DELPHINULIDAE.

Genus *Craspedostoma*, Lindström.

Craspedostoma lilydalensis, Cresswell sp. (Plate IV., Fig. 37).

Naticopsis lilydalensis, Cresswell, 1893, Proc. R. Soc. Vict., vol. V. (N.S.), p. 44 (name only), pl. IX., fig. 7.

Craspedostoma lilydalensis, Cressw. sp., Chapman, 1913. Rep. Aust. Adv. Sci., vol. XIV., p. 227.

Description of Type.—Shell naticoid, with a short, rather depressed spire of about three whorls and a large body whorl. Whorls inflated and ornamented with an obscure open cancellated structure consisting of flattened spiral and longitudinal ribs. Base umbilicated. In a supplementary specimen a part of the columellar area of the everted lip is preserved, which shows relationship to the above genus.

Dimensions.—Compiled from both examples, and approximate only. Width at base, 27 mm. Height of complete shell, circ., 22 mm.

Observations.—The present species approaches very closely Lindström's Wenlockian form, *C. elegantulum*,¹ in which, however, the ribs are thinner and more conspicuous. In the comparative smoothness of the whorls it shows some relationship also to *C. filistriatum*, Lindström.² The genus appears to be restricted to beds of the Upper Silurian epoch.

¹ Kongl. Svenska Vet.-Akad. Handl., Bd. xix., No. 6, 1884, p. 183, pl. ii., fig. 58; pl. xxi., figs. 20-29.

² *Ibid.*, p. 183, pl. xxi., figs. 35-38.

Occurrence.—Silurian (Yeringian). In limestone, Cave Hill, Lilydale. Collected by the Rev. A. W. Cresswell, M.A.

Fam. PYRAMIDELLIDAE.

Genus *Loxonema*, Phillips.

Loxonema sinuosa, Sowerby sp., var. *australis*, nov. (Plate V., Fig. 39).

? *Terebra sinuosa*, Sowerby, 1839. Silurian System, p. 619, pl. VIII., fig. 15.

Loxonema sinuosa, Sow. sp., Phillips, 1841. Pal. Foss. Cornwall, p. 99, pl. XXXVIII., fig. 182. Salter, 1859, Siluria, 3rd ed., pl. XXIV., fig. 3.

Observations.—The present specimen is fragmentary, only portions of two whorls being preserved. The form of the shell and the ornament is, however, so well indicated as to leave little doubt of its very close affinity to Sowerby's species. The folds are straight and sharply ridged, and the sinuosity well marked, whilst there is a tendency to form a faint nodose shelf near the basal part of the whorl. This latter constitutes a varietal feature.

L. sinuosa has been recorded in Great Britain from the Upper Llandovery beds, the Lower Ludlows and the Aymestry Limestone. Prof. Phillips also recorded it from the Petherwin Group of Cornwall, referred by Jukes-Browne to the Famennian or Upper Devonian.

Occurrence.—Silurian (Yeringian). In limestone, Cave Hill, Lilydale. Presented by Mr. J. S. Green.

Fam. CAPULIDAE.

Genus *Orthonychia*, Barrande.

Orthonychia brevis, sp. nov. (Plate V., Fig. 40).

Description.—Shell conical, slightly curved, less than a quarter of a revolution in 12 mm. Convex side of shell evenly rounded, inner surface elliptically convex. Apex compressed and sulcated on the inner side. Lines of growth faintly marked.

Dimensions.—Length of shell about 38 mm. Width of aperture when complete, about 20 mm.

Observations.—A described species which affords a close comparison with the above is *O. subrectum*, J. Hall sp.¹ This shell, however,

¹ *Platyceras (Orthonychia) subrectum*, J. Hall. Pal. New York, vol. v., pt. 2, 1879, p. i., pl. i., figs. 1, 2.

is longer and more apically arcuate. It was found in the Upper Helderberg (Lower Devonian) of New York State.

Occurrence.—Silurian (Yeringian). In dark limestone, Loyola, near Mansfield. Collected and presented by Mr. G. Sweet, F.G.S.

Genus *Platyceras*, Conrad.

Platyceras minutum, sp. nov. (Plate V., Fig. 41; Plate VI., Figs. 57, 58).

Description.—Shell minute, consisting of a coiled series of about three whorls. Body whorl rapidly widening. Shell depressed above, gently convex below. Back compressed but rounded. Surface of whorls ornamented with distinct, somewhat salient folds, curving sharply backwards, the interspaces with striated growth-lines. Aperture subangulate, ovoid.

Dimensions.—Greatest diameter of holotype, 4.25 mm. Thickness of paratype, 1.5 mm.

Observations.—This extremely small species resembles the initial portion of a variety of *Platyceras cornutum*, Hisinger sp.,¹ a common Upper Silurian species in Europe. In the holotype the superior face shows the spire to be slightly sunken and evolute. In the paratype, on the inferior face, the spire is involute.

Occurrence.—Silurian (Yeringian). In dark blue limestone, Deep Creek, a tributary of the Thomson River, Gippsland. Collected and presented by the Rev. A. W. Cresswell, M.A.

Platyceras cornutum, Hisinger. (Plate V., Fig. 42).

Observations.—It is practically impossible to specifically separate the many variations of this Silurian type of *Platyceras*, a form which, by the way, also probably extends into the Devonian. It is known from Great Britain, Scandinavia, Germany and the United States. The synonymy is large, and for this Lindström's paper on the Silurian Gasteropoda and Pteropoda of Gotland may be consulted.²

The Victorian specimens are of the typical, intermediate form, which is a neritoid shell having a depressed spire. The aperture is broadly ovate, and the growth-lines on the shell well-marked, appearing as irregular concentric folds.

¹ *Pileopsis cornuta*. Lethaea Suecica, 1837, p. 41, pl. xii., fig. 11. *Platyceras cornutum*, His. sp. Lindström, Sil. Gaster. and Pter. of Gotland. Kongl. Svenska Vet.-Akad. Handl., Bd. xix., No. 6, 1884, p. 63, pl. ii., figs. 29-51; pl. iii., figs. 6-9, 19-26.

² Tom. supra cit., p. 63.

Dimensions.—Two specimens from Loyola measure in greatest length, from outer border of spiral to ventral edge, 46.5 mm. and 30 mm. respectively.

Occurrence.—Silurian (Yeringian). In dark limestone, Loyola, near Mansfield. Collected and presented by Mr. G. Sweet, F.G.S. A small example (cast) in ochreous mudstone. Loyola, near Mansfield; G. Sweet collection.

Platyceras erectum, J. Hall sp. (Plate V., Fig. 43).

Platyceras erectum, Hall, 1879. Pal. New York, vol V., pt. II., p. 5, pl. II., figs. 4-11.

Observations.—The present specimen is a cast in mudstone of a depressed ovate *Platyceras*, partially erect in character and with an open spire. The nearest allied species appears to be J. Hall's *Platyceras erectum*, found in the Lower Devonian of New York State.

Occurrence.—Silurian (Yeringian). In yellow mudstone. Parish of Wallen, Sect. 44; Geol. Surv. Vict. Bb 15.

Genus **Diaphorostoma**, Fischer (= *Platyostoma*, Conrad, non Klein).

Diaphorostoma retrorugatum, sp. nov. (Plate V., Figs. 44, 45).

Description.—Based on a cast of the thin shell. Consisting of four rapidly increasing compressed whorls, forming a somewhat ovoid outline. Spire slightly elevated. Body whorl large. Base narrowly umbilicate. Aperture apparently suborbicular to ovate. Shell surface traversed by well-marked irregular folds or corrugations which curve obliquely backwards.

Dimensions.—Approximate length of shell when complete, 35 mm. Greatest width, 26.5 mm. Height, 21 mm.

Observations.—This shell appears to be quite distinct from any figured species hitherto known, but approaches *Diaphorostoma lineatum*, J. Hall sp.¹ in general form. That species occurs in the Upper Helderberg limestone of New York, and in the Hamilton Group of the western part of the State.

The Victorian species is distinguished from *Platyceras* by the large and open body whorl.

Occurrence.—Silurian (Yeringian). A cast in yellow mudstone. Ruddock's Quarry, near Lilydale. Collected by Mr. R. H. Annear.

¹ *Platyostoma lineatum*, J. Hall. Pal. New York, vol. v., pt. ii., 1879, p. 21, pl. x., figs. 1-21.

Diaphorostoma incisum, sp. nov. (Plate V., Fig. 46; Plate VI., Fig. 59).

Description.—Shell depressed, helicoid; spire moderately depressed, rapidly widening to body whorl, of four volutions. Penultimate whorl one-third the diameter of the body whorl. Surface of shell gently convex, marked with numerous closely set, incised growth-lines, which are sometimes undulate and crossed by sparse, radiating folds. Aperture large, subovate.

Dimensions.—Extreme width, circ., 40 mm. Height, 18 mm.

Observations.—In general character the above species approaches *D. lineatum*, J. Hall sp., the fossil cited in the comparison of *D. retro-rugatum*, but in that species the body whorl does not increase so rapidly in width, and the shell is higher. The concentric ornament also, whilst agreeing in its incised character, is not crossed by so regular a system of radial lines.

Whidborne's "*Capulus ? invictus*"¹ from the Middle Devonian of Devonshire, is almost identical in form with the Victorian species, but the apical spire is smaller or more closely coiled.

Occurrence.—Silurian (Yeringian). In dark limestone, Thomson River, Gippsland. Collected by the Dept. of Mines, Victoria. No. 91F.

Fam. ? SIPHONARIIDAE.

Genus *Hercynella*, Kayser, 1878.

Hercynella victoriae, sp. nov. (Plate V., Figs. 47, 48).

Description.—Shell patelliform, depressed conical, with a sharp apex. Slopes of shell alternately convexly and concavely folded; one side, on the longer axis, is pinched up to form a subangulate ridge extending to the apex. Concentric lines of growth appearing as low folds. Surface of shell radiately marked with close, low riblets, strengthening as they approach the ventral margin.

Dimensions.—Greatest length of holotype, 53 mm. Greatest width, 35 mm. Approximate length, complete, 55 mm.; width, 39 mm. Height 13.5 mm.

Observations.—This interesting species resembles *H. radians*, Barrande sp.² in the radial ornament, but is more elongate-ovate in outline, and the vellication or pinching up of the dorsum is more

¹ Pal. Soc. Mon., vol. xlv., 1891. Mon. Dev. Fauna S. of England, p. 204, pl. xix., figs. 12-14.

² Barrande's Syst. Sil. Bohême. Perner, vol. iv., tome i., 1903, pl. xliii., figs. 20, 21; pl. xlvi., figs. 16-24. Tome ii., 1907, pl. cxxi., figs. 15-18.

marked than in the Bohemian species. *H. radians* is found in the Lower Devonian (Stage F of Barrande).

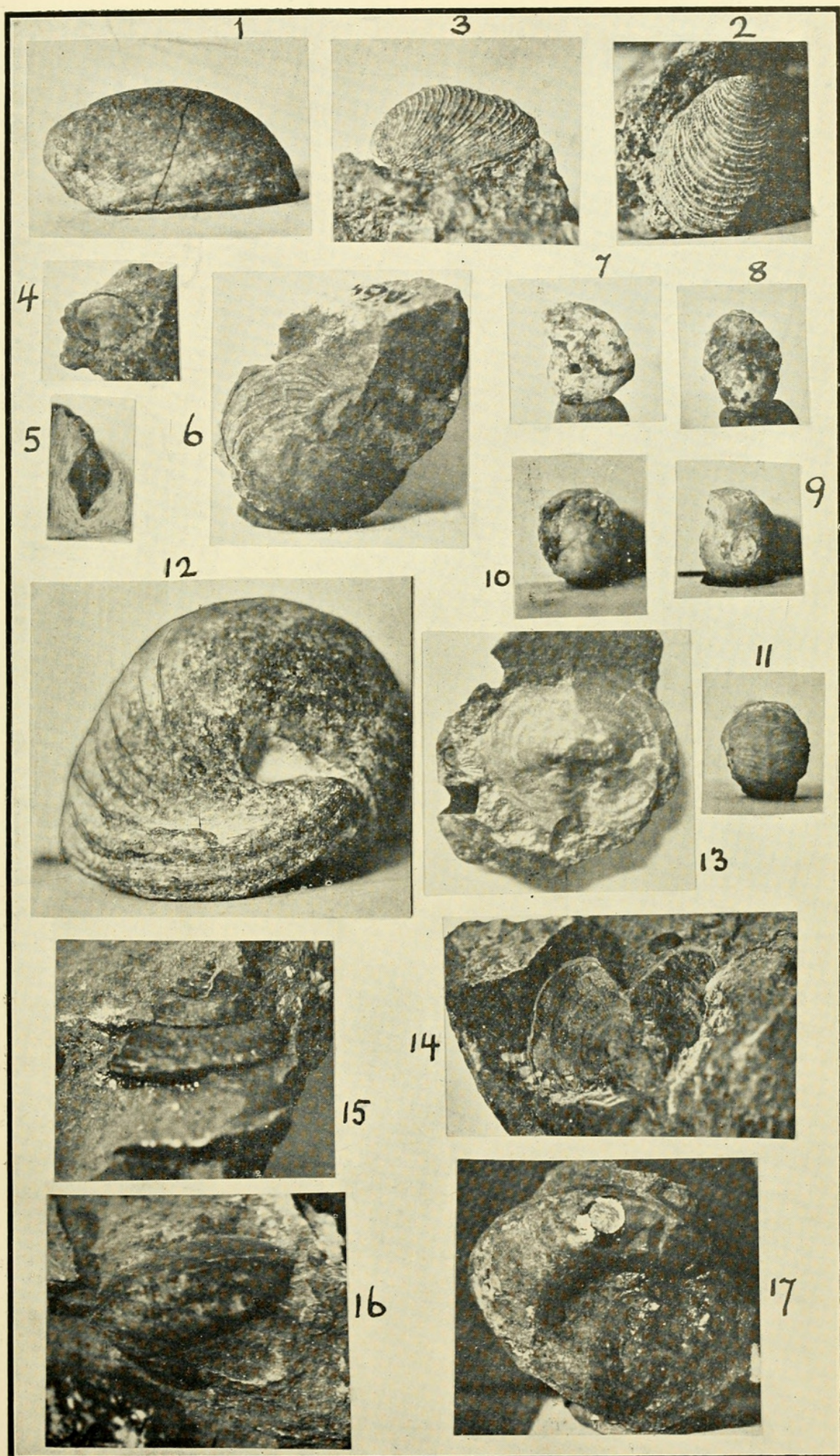
Occurrence.—Silurian (Yeringian). In olive-grey mudstone. Junction of the Woori-Yallock and the Yarra. Collected by the Geol. Surv. Vict. B23.

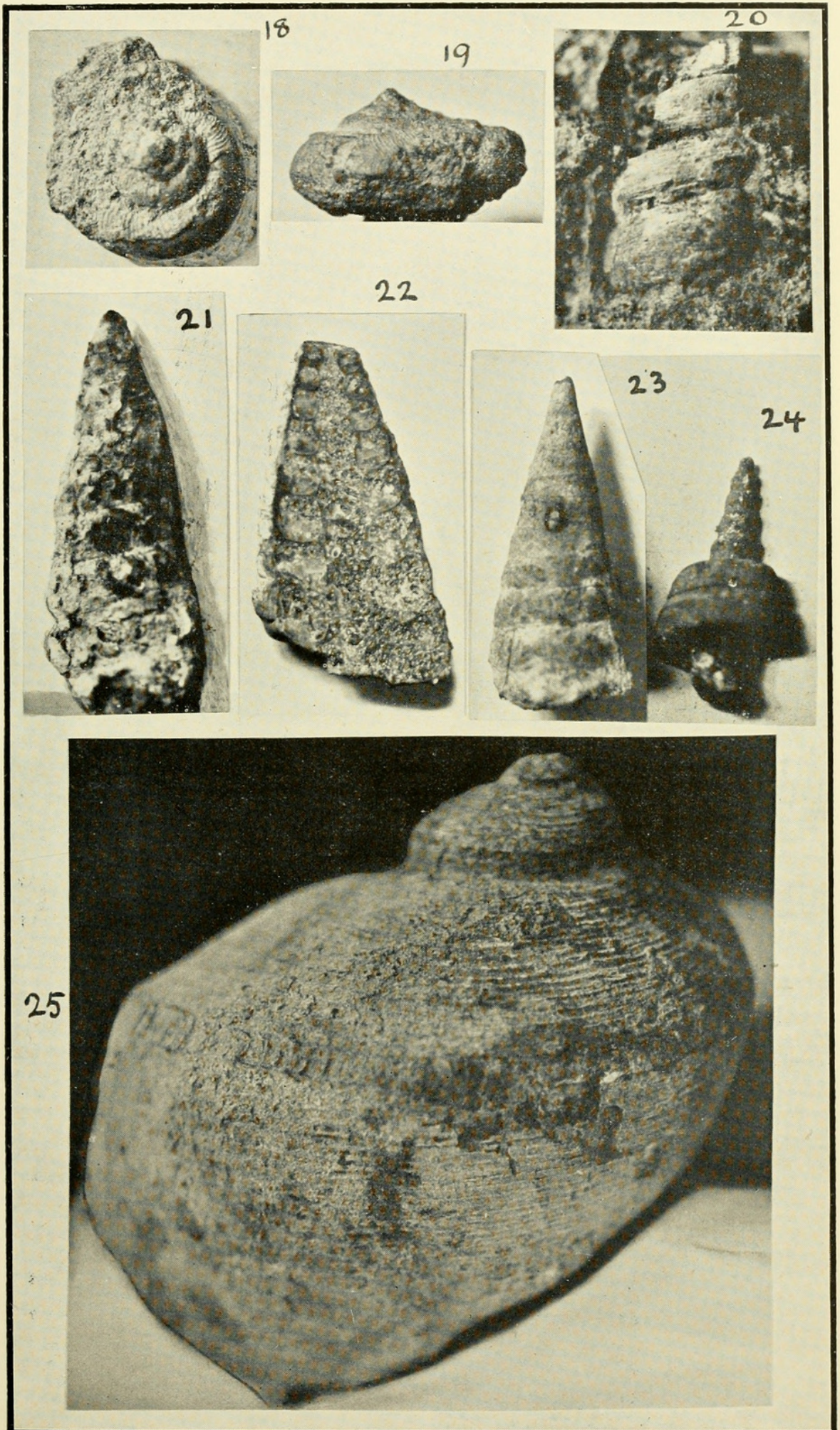
EXPLANATION OF PLATES.

N.B.—All the photographic figures are enlarged one-sixth over natural size. For exact dimensions, see text.

PLATE II.

- Fig. 1.—*Helcionopsis nycteis*, Cresswell sp. Side view of holotype. Cave Hill, Lilydale.
- „ 2.—*Helcionopsis elegantulum*, sp. nov. Dorsal view of holotype. Cave Hill, Lilydale.
- „ 3.—*H. elegantulum*, sp. nov. Side view of holotype.
- „ 4.—*Temnodiscus pharetroides*, sp. nov. Lateral view of holotype. Loyola, near Mansfield.
- „ 5.—*T. pharetroides*, sp. nov. Back view of holotype.
- „ 6.—*Bellerophon fasciatus*, Lindström. Side view. Junction of Woori-Yallock and Yarra.
- „ 7.—*Bellerophon* aff. *fastigiatus*, Lindström. Umbilical aspect. Kilmore.
- „ 8.—*B.* aff. *fastigiatus*, Lindström. Oral aspect of same specimen.
- „ 9.—*Bellerophon pisum*, sp. nov. Umbilical aspect of holotype. Cave Hill, Lilydale.
- „ 10.—*B. pisum*, sp. nov. Oral aspect of holotype.
- „ 11.—*B. pisum*. Dorsal view of holotype.
- „ 12.—*Bellerophon cresswelli*, Etheridge fil. Side view of a senile specimen. Cave Hill, Lilydale.
- „ 13.—*Carinaropsis victoriae*, sp. nov. Interior of shell of paratype, showing umbonal platform. Ruddock's, near Lilydale.
- „ 14.—*C. victoriae*, sp. nov. Exterior of shell, holotype. Ruddock's, near Lilydale.
- „ 15.—*Pleurotomaria maccoyi*, sp. nov. Holotype, lateral aspect. Junction of Woori-Yallock and Yarra.
- „ 16.—*P. maccoyi*, sp. nov. Paratype. Shell showing slit-band. Junction of Woori-Yallock and Yarra.
- „ 17.—*P. maccoyi*, sp. nov. Paratype, showing base of shell. Junction of Woori-Yallock and Yarra.







Chapman, Frederick. 1916. "New or little-known Victorian fossils in the National Museum. Part XIX. The Yeringian Gasteropod fauna." *Proceedings of the Royal Society of Victoria* 29(1), 75–103.

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