[Proc. Roy. Soc. Victoria, 42 (N.S.), Pt. II., 1930.]

# Art. XIV.—*Rare Foraminifera from Deep Borings in the Victorian Tertiaries—Victoriella, gen. nov., Cycloclypeus communis Martin, and Lepidocyclina borneënsis Provale.*

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(With Plates VII., VIII.)

[Read 14th November, 1929; issued separately 10th March, 1930.]

During the investigation of numerous samples of Tertiary borecores for the Commonwealth Government, in connection with oil research, we are meeting with large numbers of new and interesting fossils, which we propose to note and describe from time to time. The present paper includes notes of three of these forms, belonging to the larger foraminifera.

## Victoriella, gen. nov.

During the examination of fossils obtained from a boring at Torquay, Victoria, in 1921, there was discovered among the microzoa a specimen supposed at the time to be related to *Carpenteria proteiformis*, but differing in the more verrucose surface-ornament and in having a different plan of growth. This particular species, which is an unattached form, was then referred to as *Carpenteria proteiformis* var. *plecte* (Chapman, 1922, p. 320). In that description, the senior author stated that "this variety [*plecte*] is much more abundant in the Victorian older Tertiary (Balcombian and Janjukian) than the type species." Upon looking up all available evidence of extensive collections of material made from the Balcombian and Janjukian series, it appears that this statement was based upon the supposition that the form was an undeveloped stage of *Carpenteria proteiformis*, which is common to both Balcombian and Janjukian.

The occurrence of this new form, which we now describe as a new genus, *Victoriella*, is very restricted. So far as we know at present, it occurs only in the basal Janjukian at Bird Rock, Torquay, from which a very fine series of tests was obtained many years ago by the late Dr. T. S. Hall, and also more lately in several deep borings in the Dartmoor district.

## Family VICTORIELLIDAE, nov.

Note on the Family.—The description of the allied family Rupertiidae, as defined by Cushman, runs as follows: "Test in the early stages, trochoid, attached by the dorsal side as in *Cibicides,* later extending upward from the base of attachment, still keeping a loose spiral; wall calcareous, coarsely perforate; aperture either at the inner margin of the chamber or becoming terminal or rounded, often with a neck or lip." This present genus, *Victoriella,* in conjunction with *Eorupertia,* is separated from the family Rupertiidae by its non-adherent condition throughout life, by the absence of a definite spiral arrangement of the chambers, and in the more or less slit-like aperture which, in *Carpenteria* and allied forms, has a tendency to assume a tubular neck.

### Genus **Victoriella**, gen. nov.

Description of Genus.—Test free, consisting of a more or less conoidal aggregate of inflated chambers, either alternating or spirally coiled, chambers not numerous. Surface granulated, the tubercles surrounded by the coarsely tubulated shell-wall. Aperture sublunate and limbate. The wall of the test is apparently simple in the later portion, but in the earliest part it consists of two layers as in *Carpenteria,* and is also thicker than in that genus. The surface tubercles are more strongly papillate than those of *Eorupertia.*

### Victoriella plecte (Chapman).

(Plate VII., Figs. 1-4.)

Description of Species.—The original description of this form, previously referred to as a variety of *Carpenteria proteiformis,* runs as follows:—"It is distinguished by the great development of the earlier series of chambers, plaited together and forming almost a rotaline coil, hence the varietal name. The surface ornament is generally more verrucose than in the specific form."

Test conoidal, with inflated chambers non-adherent. Surface verrucose or granulated, the last chamber tending to become smoother. The plan of growth shows the earlier chambers to consist of a sub-spiral aggregate, the succeeding chambers increasing rapidly in size and showing either an alternate or plaited arrangement, or in other cases, having three chambers in one plane. The last chamber shows a sub-lunate to triangular aperture which is distinctly surrounded by an everted lip or flap.

Dimensions.—Length of test, 2·5 mm.; greatest width, 1·8 mm.; thickness of shell wall, 0·15 mm.; papillae average about 0·1 mm. in diam.; stolon passages approximately 4 times the diameter of the coarse tubules.

Observations.—Professors Yabe and Hanzawa (1922, p. 71) have described, under the preoccupied generic name *Uhligina,* an interesting type allied to foraminifera like *Carpenteria* and *Ruper-*

*tia*, but differing in some very essential characters. This genus was afterwards changed by the same authors (1927, p. 97) to *Eorupertia*. It has been shown in the description here given that the above genus *Victoriella*, whilst agreeing with *Eorupertia* in having a free test and occasionally a spiral arrangement of chambers and tuberculate surface, differs essentially in having larger and fewer chambers, a much thicker shell-wall and less pronounced hollow centre. A difference in *Eorupertia* is the less prominent and more conical non-tubulate bosses distributed in the mass of the shell-wall which in *Victoriella* stand out more prominently from the surface.

In *Eorupertia* the stolon passages are slit-like, as in *Victoriella*, but in the latter genus the aperture is modified in most cases by having a lip or rim of shell-material, forming a complete marginal boundary. It is interesting to note that *Eorupertia* is an Eocene genus from Japan, whereas the present genus seems entirely restricted to the Miocene and to a limited horizon in that formation.

Occurrence.—*Victoriella* was represented by only one specimen from the boring at Torquay, at a depth of 24 to 25 feet, whilst the specimens collected by Dr. Hall, before referred to as occurring at the base of Bird Rock, would be relatively about at the same level as the top of the bore. This, therefore, gives us a range of 25 feet of the *Victoriella* zone at Torquay.

In the Dartmoor district, where a series of bores has been put down by the Victorian Geological Survey in conjunction with the Department of Home Affairs, *Victoriella* was found at the following depths—No. 3 at 104 feet 6 inches and 107 feet; No. 4 at 84 feet; No. 5 at 28 feet to 43 feet; No. 6 at 142 to 164 feet; No. 8 at 73 and 76 feet; No. 10 at 95 and 96 feet.

We may therefore conclude, on these grounds, that this genus has a great value as a zonal indicator.

### Cycloclypeus communis Martin.

(Plate VII., Figs. 7, 8; Plate VIII., Figs. 9-13.)

*Cycloclypeus communis* Martin, K., 1880, p. 154, pl. xxvii., figs. 1, 2, Idem, 1891, p. 4, pl. i., fig. 4. Douvillé, H., 1905, p. 445. Douvillé, R., 1909, pp. 136-138, woodcuts, figs. 12-16, pl. vi., figs, 5, 6 (microspheric form). Douvillé, H., 1911, pp. 57, 76, 77. Schubert, R., 1911, p. 97. Chapman, F., 1914, p. 293. Douvillé, H., 1916, p. 28, pl. v., fig. 5. Yabe, H., 1918, p. 19. Rutten, L., 1921, pp. 1141, 1142. Van der Vlerk, I.M., 1922, p. 30, pl. ii., fig. 8.

*Cycloclypeus communis* Martin var. *borneënsis* Rutten, 1914, p. 305, pl. xxiv., figs. 3-6. Van der Vlerk, I. M., 1922, p. 391.

Observations.—We have found the above species for the first time in Victoria, in the limestones of Longford, in the deep

boring at Metung, and similarly at Darriman, whilst Mr. W. J. Parr had previously discovered a fine series of the same species at the Batesford quarries near Geelong.

This species occurs in Victoria in both the megalospheric and microspheric forms of the test (Forms A and B). The only locality where the microspheric form has occurred in the Gippsland area, up to the present, is at Longford, represented by one specimen; at Batesford near Geelong the microspheric form is not uncommon, but the megalospheric form predominates. The Victorian examples of *C. communis* in the megalospheric stage show the test to be entirely covered with small pustules, and the comparatively large central boss agrees in that character with typical specimens described by Martin from Java.

The microspheric form is well illustrated by R. Douvillé in his Madagascar specimens (op. cit., 1909). It was subsequently separated as a variety by Rutten. Yabe later regarded Rutten's *C. communis* var. *borneënsis*, as an annectent form linking *C. communis* with *C. annulatus*.

*Cycloclypeus communis* ranges from the middle part of the Naintoepo Beds (Middle Miocene) to the Poeloe Balang Beds (Upper Miocene) in Borneo. A full list of extra-Australian localities for specimens is given by Van der Vlerk (1922, p. 390).

Occurrence in Victoria.—Batesford, near Geelong (Forms A and B); and the following Gippsland localities: Darriman, No. 3 Bore, at 439 feet (form A); Le Grand's Upper Quarry, South of Longford (forms A and B); and Metung at 872 feet (form A).

### Lepidocyclina (Nephrolepidina) borneënsis Provale.

(Plate VII., Figs. 5, 6.)

*Lepidocyclina tournoueri* Lem. and Douv. var. *borneënsis* Provale, 1909, p. 74, pl. ii., figs. 16-19.

*Lepidocyclina* (*Nephrolepidina*) *borneënsis* Provale: Van der Vlerk, 1928, p. 23, figs. 16 *a-c*.

It is exceptionally interesting to find this Bornean species for the first time in Australia, in material obtained from deep borings and quarry sections in South-east Gippsland, Victoria.

Both externally and in thin sections, the Victorian specimens are indistinguishable from examples in the Tertiary of Borneo. The value of this species in zonal correlation has been proved in the various bores which have lately been examined in detail in connection with oil research in those localities.

From among the associated faunal constituents of the zone of *L. borneënsis* in Victoria, we may mention the following foraminifera: *Amphistegina lessonii; Carpenteria proteiformis; Siphonina australis; Cycloclypeus communis; C. pustulosus; Lepidocyclina marginata; L. angulosa; L. tournoueri; L. inflata; L. martini.*

In East Borneo the following foraminifera are found associated with *L. borneënsis: Miogypsina irregularis; Spiroclypeus leupoldi; S. tidoenganensis; Cycyloclypeus neglectus; Lepidocyclina bonarelli; L. ferreroi; L. inflata; L. planata; L. angulosa; L. dilatata* var. *tidoenganensis.*

*L. borneënsis* is typical of the Naintoepo and Pamaloean Beds of East Borneo.

Occurrence in Victoria.—Woodside Bore No. 5, between 44 and 87 feet, No. 6, between 93 and 121 feet; Darriman No. 3, at 439, 459, and 489 feet; Metung at 730, 872, and 873 feet; No. 1 Bore, Parish of Colquhoun North (Lakes Entrance No. 4 Bore) at 358 feet; and in Le Grand's Upper Quarry, South of Longford. All these localities are in Gippsland.

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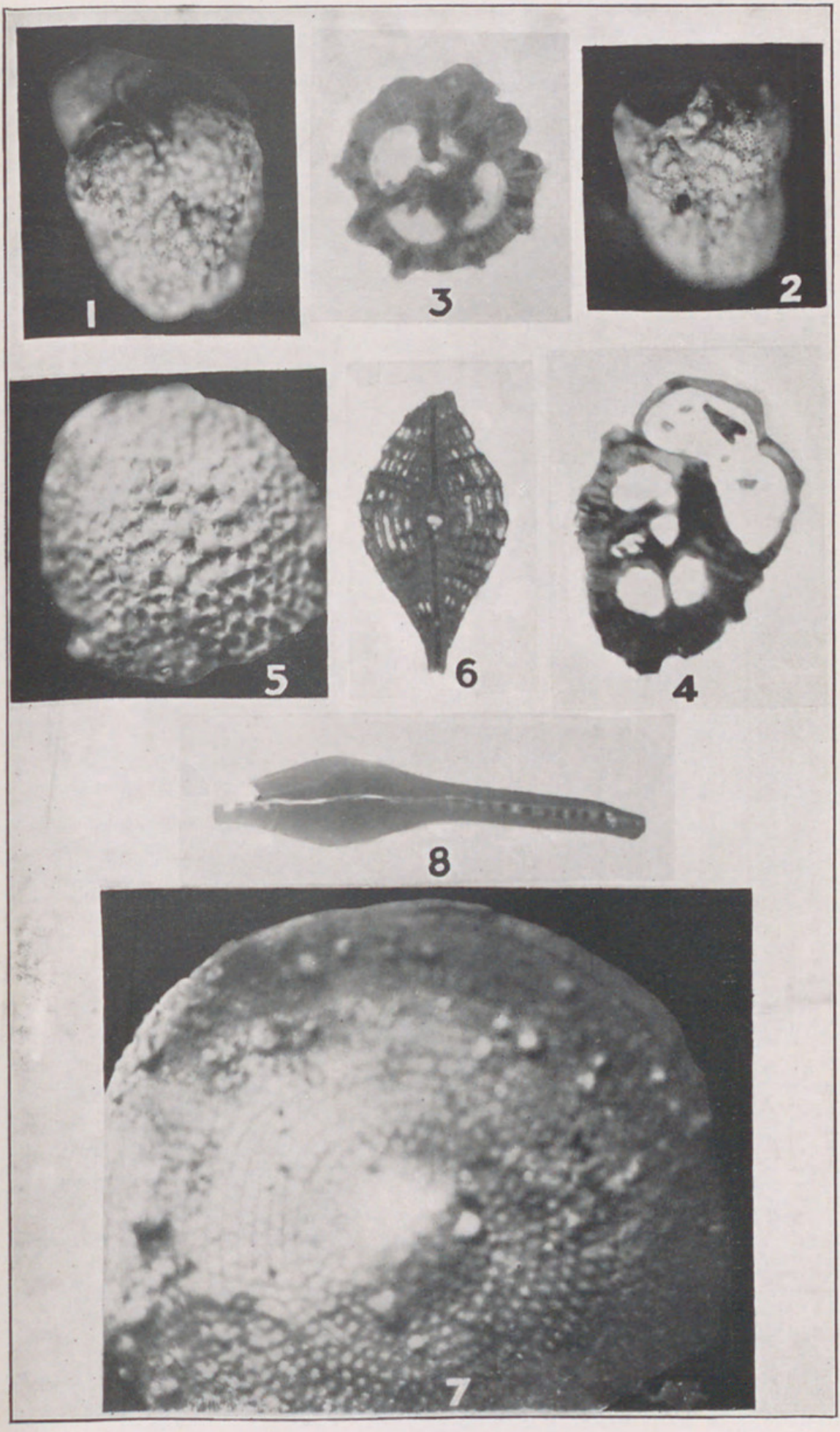


Victoriella, Lepidocyclina and Cycloclypeus.