# New Genera of Foraminifera from the Tertiary of Victoria

*By W. J. Parr, F.R.M.S.*

In the present note, the writer continues his revision of the nomenclature of the fossil and Recent foraminifera of Southern Australia.

## SPIROSIGMOILINA, gen. nov.

GENOTYPE—*Spiroloculina tateana* Howchin, 1889, *Trans. Roy. Soc. Sth. Aust.*, vol. XII., p. 3, pl. i, figs. 4*a*, *b*, 5.

Test imperforate calcareous, early chambers arranged as in *Sigmoilina*, later chambers spiroloculine.

The species described by Howchin from the Middle Miocene of Muddy Creek, near Hamilton, under the name of *Spiroloculina tateana*, and later referred by him to the genus *Sigmoilina* (*The Geology of South Australia*, 2nd Edn., 1929, Fig. 108, figs. 4, 5), represents a new generic type combining the characters of *Sigmoilina* and *Spiroloculina*.

## AUSTROTRILLINA, gen. nov.

Figs. 1-3.

GENOTYPE—*Trillina howchini* Schlumberger, 1893, *Bull. Soc. Géol. France*, sér. 3, vol. XXI., p. 119, woodcut, fig. 1, and pl. iii, fig. 6.

Test calcareous, porcellanous, with chambers arranged as in *Triloculina*, each chamber completely surrounded by its own wall, chamber wall thick, labyrinthic in that portion on the outside of the chamber cavity, non-labyrinthic in the portion overlapping the previous whorl; chamber cavity not divided; surface of test smooth, not punctate; aperture doubtfully cribrate.

This genus is erected for the reception of the well-known species *Trillina howchini*, which for reasons which are given hereunder is not considered to belong to the genus *Trillina*.

The genus *Trillina* was described by Munier-Chalmas in 1882 (*Bull. Soc. Géol. France*, sér. 3, vol. XII., p. 424). His very brief description (translated) is as follows:—

"*Trillina* Munier-Chalmas, 1882.

"Three external chambers; chambers of each order disposed in a spiral. Test punctate on the outside.

"Type.—*Triloculina strigillata* d'Orb. (Middle Eocene)."

As the genus was included in Munier-Chalmas's group of "Miliolidées trematophorées", the aperture was cribrate. Only the type species was referred to by Munier-Chalmas, and in view of this, and his express designation of it as the genotype, the characters of *Triloculina strigillata* must determine the status of *Trillina*. Unfortunately *T. strigillata* is not a satisfactory species, for the history of which reference may be made to Fornasini's notes in *Mem. Accad. Sci. Istit. Bologna*, ser. 6, vol. II., 1905, p. 4, pl. i, figs. 7, 7*a*, *b*, where Berthelin's tracings of d'Orbigny's unpublished figures of it are reproduced. The types were from the Middle Eocene of Valognes, in the Paris Basin.

Prior to the publication of Fornasini's paper, Terquem, who was familiar with d'Orbigny's "Planches inédites", recorded (1882, *Mém. Soc. Géol. France*, sér. 3, vol. II, Mém. 3, p. 169, pl. xvii, figs. 25*a–c*) *T. strigillata*, and, in addition to figuring it, gave the only description of it that has been published. His specimens were from Septeuil, near Paris, the beds being also of Middle Eocene age.

The figures given of *T. strigillata* in the papers of Fornasini and Terquem show a species with a short, broad, fairly thick shell, the surface of which is closely striated, while the aperture has a single plate-like tooth. There is no suggestion in any of the figures nor in Terquem's description that the surface is punctate, nor does the aperture, with its one plate-like tooth, agree with Munier-Chalmas's reference of *T. strigillata* to the group of miliolines with cribrate apertures. The internal structure of *T. strigillata* has not been described.

Munier-Chalmas's description of *Trillina* makes no reference to the shell wall being labyrinthic, but merely states that the test is externally punctate. Anyone familiar with the miliolines of the Paris Basin Tertiaries will be aware that species with a pitted surface are not uncommon, but no species has been figured, nor has the writer seen one, from these beds, or indeed elsewhere, showing an internal structure at all like that of *T. howchini*. The first mention of a labyrinthic shell wall in *Trillina* was made by Schlumberger (*loc. cit.*), whose description of the genus is obviously based on *T. howchini*.

It is then clear that the status of *Trillina* is, to say the least, uncertain, and the genus may even prove to be a synonym of *Triloculina*.* There can, however, be no doubt that *T. howchini* is not a true *Trillina*, and, in view of this, a new genus, *Austrotrillina*, is proposed for the Australian species.

While the test of *A. howchini* was described by Schlumberger as punctate, this statement was based on worn specimens. The shells of this species seem to be very easily eroded, and it is rarely that a well-preserved example is met with. When one is found, no perforations are seen and the surface is formed by a very thin film of shell substance through which is visible, like capillaries under the skin, a delicate tracery formed by the extensions of the wall canals (see figs. 2, 3). These extensions are apparently Schlumberger's little longitudinal canals.

Schlumberger did not find any specimens showing the last-formed chamber with the cribrate aperture in position. His statement that the aperture is covered with a perforate plate was based on his interpretation of the internal structures seen by him in grinding down shells for thin sections. The present writer has been unable to satisfy himself that the aperture is cribrate. The best-preserved specimens show a small, rather irregular, rounded to triangular opening at the end of the final chamber. With the large number of canals in the shell wall, it is extremely difficult to distinguish the very similar structure of a cribrate aperture in a thin section.

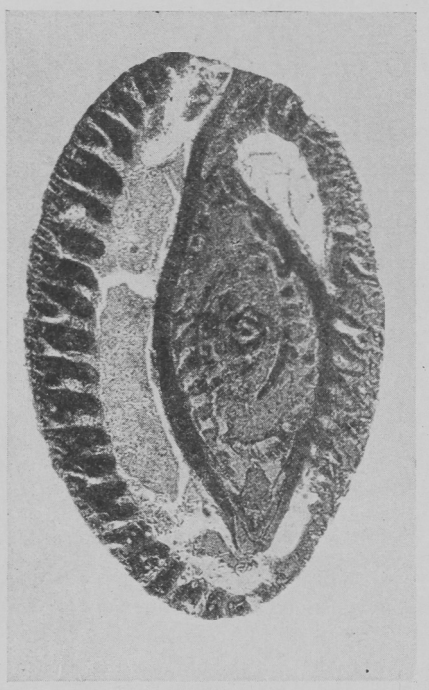
## CRESPINELLA, gen. nov.

Figs. 4, 5.

GENOTYPE.—*Operculina* (?) *umbonifera* Howchin and Parr, 1938, Trans. Roy. Soc. Sth. Aust., vol. 62, pt. 2, p. 309, pl. xviii., figs. 3, 4, 6, 13, 14.

Test, biconvex, slightly asymmetrical, trochoid in the early stages, adult nearly planospiral; chambers almost entirely involute; wall calcareous, very thick, laminated, closely and

*NOTE.—In 1905, Schlumberger (Bull. Soc. Géol. France, sér. 4, vol. V., p. 124, pl. ii, figs. 35, 35*a*, *b*; pl. iii, figs. 39*a*, *b*; text figs. 15-17) described a species which he identifies as *Quinqueloculina strigillata* d'Orb. and refers to the genus *Pentellina*. There is no species named by d'Orbigny *Q. strigillata* and Schlumberger's description and figures show that he had a species which at times was triloculine. If Schlumberger's species is identical with d'Orbigny's *Triloculina strigillata*, *Trillina* is a synonym of *Miliola*, as *Pentellina* is itself a synonym of *Miliola*.



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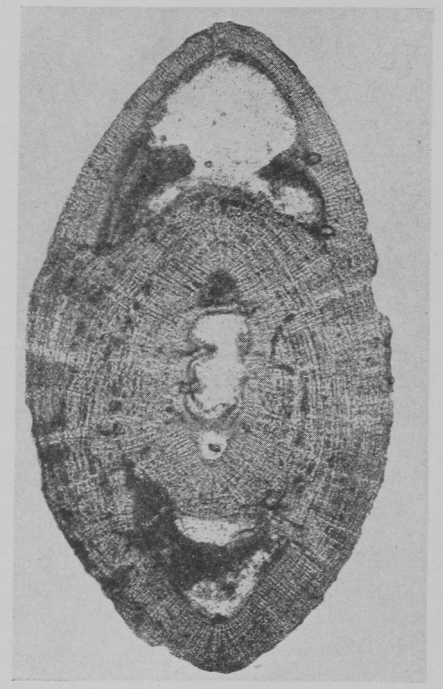

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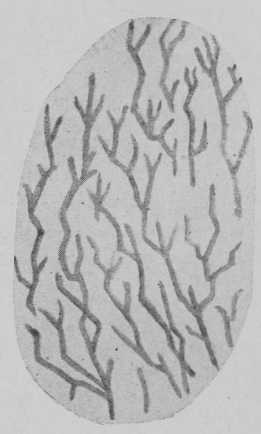

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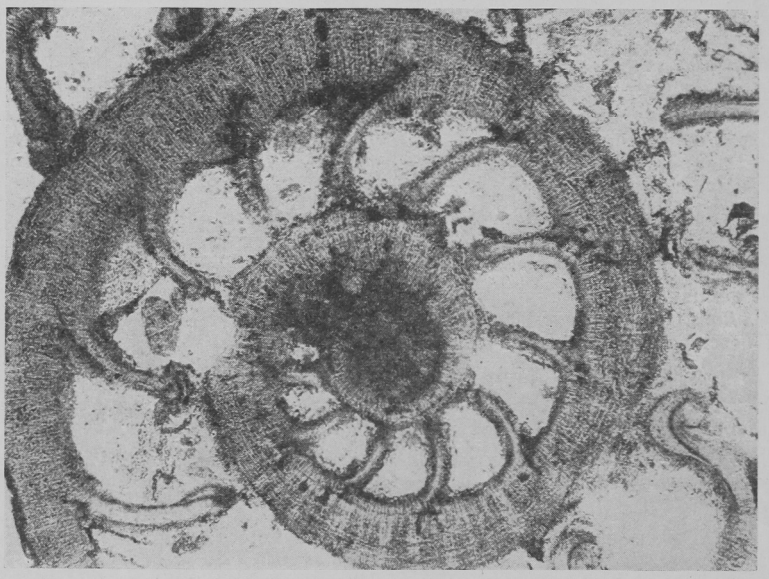

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Figs. 1–3. *Austrotrillina howchini* (Schlumberger). 1. Longitudinal section through centre of glauconite-infilled example. × 55. 2, 3. Drawings of part of the surface of two examples showing development of sub-surface extensions of canals in chamber wall. The surface layer has been eroded in No. 2. 2. × ±60; 3. × ±100. All specimens from Miocene, No. 1. bore, Parish of Pallarang, 295–310 feet.

Figs. 4, 5. *Crespinella umbonifera* (Howchin and Parr). Vertical and horizontal sections through centre of shell. Miocene, yellow limestone, Parwan Brown Coal Mine shaft, 316–329 feet. 4 × 53; 5 × 70.

distinctly tubulated; aperture a slightly curved slit at the base of the last-formed chamber in the median line, with a projecting, thick, hood-like upper margin.

In our paper on the foraminifera of the Abattoirs Bore, near Adelaide, the late Professor Howchin and the present writer described a peculiar form from the Miocene of the Bore under the name of *Operculina* (?) *umbonifera*. The suggestion was then made that the species represented a new generic type but the material available at the time was insufficient to determine this. Since then the writer has met with numerous specimens and is now satisfied that the species belongs to a new genus, for which the name *Crespinella,* in honour of Miss Irene Crespin, B.A., the Commonwealth Palaeontologist, is proposed.

It was previously considered that the affinities of *C. umbonifera* were with the Camerinidae, but it is now placed in the Rotaliidae, as some of the smaller specimens are definitely rotaline in form and show the comparatively coarse tubulation of the chamber wall characteristic of many species of the Rotaliidae. Although it was otherwise stated in the paper by Howchin and the writer, there does not appear to be any canal system.

The most striking features of *C. umbonifera* are the almost symmetrical test and the extremely thick, laminated and closely tubulated shell wall. In external form, the species is much like *Anomalinella rostrata* (Brady), but internally is quite different. While the resemblance is perhaps not significant, the thick closely-perforated wall recalls that seen in the genus *Calcarina*.

*C. umbonifera* has occurred in beds of Miocene age as follows:—

South Australia.—Abattoirs Bore, Adelaide, 575-620 feet.

Victoria.—State Rivers and Water Supply Commission Bore No. 1, Parish of Pallarang (at junction of allotments 12, 13, 17, 18), 295-310 feet (associated with *Austrotrillina*); Parwan Brown Coal Mine shaft, 316-329 feet (very common in limestone with *Lepidocyclina hamiltonensis*); railway cutting, Neumerella, near Orbost.

ACKNOWLEDGMENTS.

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# *The Age of the Lignite Deposits at Parwan*

*By W. J. Parr, F.R.M.S.*

Much uncertainty exists as to the age of the various lignite deposits in Victoria. This is due to the fact that, in most cases, these deposits are not found associated with marine sediments or with igneous rocks whose age is otherwise determinable, while the few plant fossils found in the lignites have not enabled a satisfactory estimate of their age to be made. Evidence has, however, been recently forthcoming, enabling a closer estimate than has hitherto been possible to be made of the age of the important lignite deposits in the Parish of Parwan. This evidence is given in the following notes.

The latest published opinion on the age of the lignites of Victoria is that of Dr. F. A. Singleton, given in his work, "The Tertiary Geology of Australia" (*Proc. Roy. Soc. Vic.*, vol. liii, pt. 1 (n.s.), 1941, pp. 1-125). He notes (p. 50) that the age of "the lignites, sands, and clays of Altona and Parwan, to the north-west of Port Phillip, which are overlain by marine Balcombian," is probably pre-Miocene.

The Parwan lignite deposits were located in 1927 as a result of bores put down by the Mines Department in search of water. Subsequently a shaft was sunk close to the site of Bore No. 7, Parish of Parwan, near Balliang East, and the lignite has been mined, but so far without commercial success. The log of the bore (published in the Mines Department's Boring Records for 1923-30, p. 76) is as follows:—

Position of bore—28·85 chains north, then 17·16 chains west from the south-east corner of allotment 63, section 8, Parish of Parwan.

| | *Thickness.* Feet. | *Depth.* Feet. |
|---|---|---|
| Soil and clay | 3 | 0–3 |
| Basalt | 256 | 3–259 |
| Clay, sandy | 57 | 259–316 |
| Clay, yellow, with limestone bands | 13 | 316–329 |
| Clay, blue, fossiliferous | 28 | 329–357 |
| Brown coal | 11 | 357–368 |
| Clay, blue, fossiliferous | 28 | 368–396 |
| Sand, cemented, with pyrite | 9 | 396–405 |
| Brown coal | 103 | 405–508 |

Samples of the blue, fossiliferous clay found in the bore between 329–357 feet and, again, intercalated in the lignite between 368–396 feet are preserved in the Mines Department Museum. The Director of the Geological Survey, Mr. W. Baragwanath, has collected from the mine dump samples of the limestone occurring between 316–329 feet. The examination of these samples has given the following results:—

316–329 feet.—Yellow limestone which varies in composition from a rather friable rock, with a considerable proportion of large, sub-angular to rounded, quartz grains, to a harder rock, with little, and finer, quartz sand. Foraminifera are the only identifiable organisms.

*Foraminifera*—

*Guttulina regina* (B., P., and J.); *Sigmoidella elegantissima* (P. and J.); *Crespinella umbonifera* (Howchin and Parr); *Amphistegina* sp. aff. *hauerina* d'Orb.; *Elphidium chapmani* Cushm.; *E. parri* Cushm.; *Operculina victoriensis* Chap. and Parr; *Lepidocyclina hamiltonensis* Chap. and Crespin.

The larger foraminifera are all represented by numerous examples. The specimens of *Lepidocyclina* are smaller than usual, with a diameter of 1·25 mm. They have a lenticular test, showing no tendency to assume a stellate outline, but there is little doubt that they are referable to *L. hamiltonensis*, which occurs around the Port Phillip area at Flinders, and in borings at Tyabb, Cheltenham, and Cardinia. This is a variable species, and its poor development here may be accounted for by its existence under shallow water conditions which are indicated by the large percentage of coarse sand grains in the rock.

329–357 feet.—Dark grey clay. The greater part of the residues after washing consists of fine angular to sub-angular quartz grains, with much pyrite and some glauconite. Abundant fragments of siliceous sponge spicules and of mollusca, with foraminifera and a few bryozoans, constitute the balance.

*Foraminifera*—

*Bolivina* sp.; *Uvigerina* sp.; *Ceratobulimina australis* Cushm. and Harris; *Siphonina australis* Cushm.; *Anomalina* sp. aff. *rotula* d'Orb.; *Cibicides* sp. aff. *ungerianus* d'Orb.; *Amphistegina* sp. aff. *hauerina* d'Orb.; *Elphidium parri* Cushm.; *Operculina victoriensis* C. and P.; *Quinqueloculina* sp. nov. aff. *vulgaris* d'Orb.; *Q.* sp. nov. aff. *lamarckiana* d'Orb.; *Cornuspira* sp. aff. *striolata* Brady; *Planispirinella exigua* (Brady); *Dorothia parri* Cushm.

*Vermes*—

*Ditrupa* sp.

368–393 feet.—Dark grey clay. The residues consist almost wholly of quartz grains usually well rounded, in some cases wind polished, and pyrite, foraminifera, a few ostracods, worm tubes, and some fragments of echinoid spines. Many of the foraminifera and ostracods are pyritized.