LOWER CRETACEOUS *Lamellaptychus* (APTYCHI, AMMONOIDEA) FROM SOUTH-EASTERN ALEXANDER ISLAND

By M. R. A. THOMSON

ABSTRACT. Aptychi are described for the first time from Antarctica in sediments of Lower Cretaceous age on the south-eastern coast of Alexander Island. Two forms, both referable to *Lamellaptychus*, are present; one belongs to the group of *L. seranonis* (Coquand) and the second is probably new.

ONLY eight specimens of ammonite aptychi have so far been recovered from the Mesozoic marine sediments of Alexander Island, although varied and occasionally rich ammonite faunas are known from the area (Howarth, 1958; Thomson, 1971). All of the examples may be referred to Trauth's *Lamellaptychus*. None was found in position within any of the ammonite conches but one small example was found in close association with oppeliid ammonites at a locality 8 km. south-west of Ablation Point (Fig. 1). Lamellaptychi are usually considered as belonging to oppeliid ammonites (Arkell, 1957*a*, p. *L*439) and the present examples could have come from some of the Aconeceratinae which commonly occur in parts of the Alexander Island Lower Cretaceous succession.

Opinion on the systematic nomenclature of aptychi is divided. Not all aptychi can be traced to the species of ammonite from which they came and Arkell (1957*a*) argued that this could cause difficulties if, under the *International Rules of Zoological Nomenclature*, the Linnaean name given to an aptychus could be shown to have precedence over the Linnaean name of an ammonite conch from which it was later shown to have come. He therefore proposed that the various aptychi "genera" should be treated as form genera and not italicized when written. While agreeing with Arkell's aims of avoiding the interference of aptychus names with ammonite names, Moore and Sylvester-Bradley (1957*a*, *b*) thought that aptychi were useful fossils and that a binomial nomenclature should be maintained. They sought to place aptychi in a separate classificatory unit (Parataxa) such that they would not interfere with normal ammonite genera based on conches. A lengthy discussion followed in which Arkell (1957*b*) expressed his support for Moore and Sylvester-Bradley's (1957*b*) proposals to the International Commission of Zoological Nomenclature but no decision was reached by the 1958 International Congress of Zoology.

Closs (1961, p. 128), in consultation with Schindewolf, concluded that setting names in italics did not necessarily imply acceptance of the *International Rules of Zoological Nomenclature* but that it was technically convenient for the reader. For ease of reading in the present descriptions the name "*Lamellaptychus*" will be italicized as well as the binomial nomenclature of earlier authors, but the use of the terms "genus" and "species" will be avoided. Two forms of *Lamellaptychus* have been distinguished in the collection but, in the absence of an international ruling on the nomenclature of aptychi and other similar discrete parts of organisms, the use of new binomial nomenclature is avoided here. The morphological terms used are those given by Arkell (1957*a*, fig. 556).

Lamellaptychus I

Fig. 2a–c

Material

Two right valves (KG.12.5, 19.35), both preserved as external moulds, from localities L and D, respectively. The larger of the two (KG.19.35) had part of the test adhering and this still preserved some of the original structure.

Description

The better and larger specimen (Fig. 2a) is narrowly triangular with an obtuse apical angle of 120°. Its harmonic margin and remnant inner margin are straight; the lateral margin curves smoothly into the rounded outer margin but the umbilical projection is broken away. On its outer surface the valve is ornamented with strong folds which trend sub-parallel to the lateral

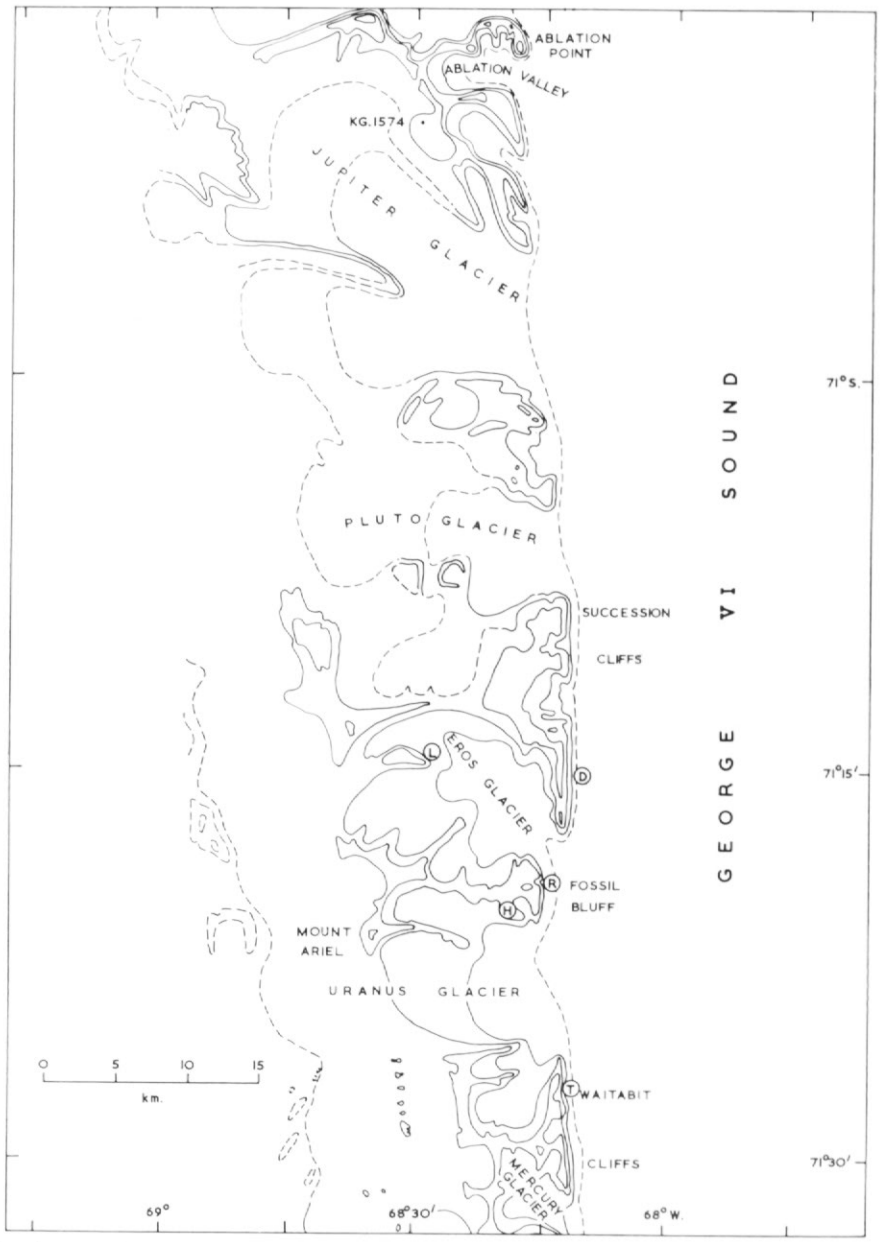

Fig. 1. Sketch map of part of Alexander Island showing the localities from which aptychi have been collected.

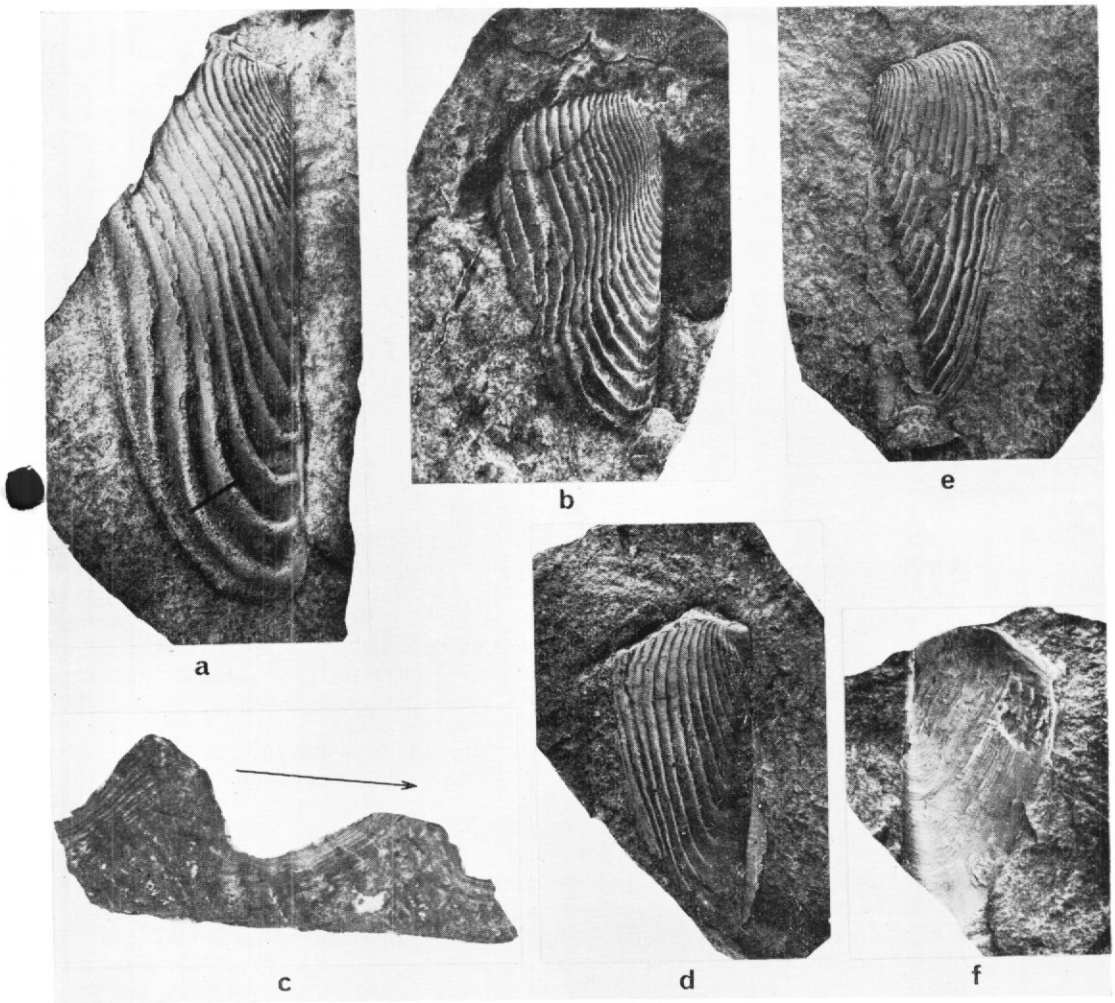

Fig. 2. a. *Lamellaptychus* I; latex cast of a large right valve. The black line marks the location of the thin section of test in Fig. 2c; × 1·5, coated (KG.19.35).
b. *Lamellaptychus* I; latex cast of a second right valve which differs in points of detail from the larger example; × 2, coated (KG.12.5).
c. *Lamellaptychus* I; thin section of the test found adhering to specimen KG.19.35. The arrow points towards the harmonic margin; ordinary light, × 10.
d. *Lamellaptychus* II; latex cast of a right valve; × 2, coated (KG.2.211).
e. *Lamellaptychus* II; latex cast of a left valve; × 2, coated (KG.6.21).
f. *Lamellaptychus* II; latex cast showing the internal surface of a right valve; × 2, coated (KG.2.65).

and outer margins but which are flexed gently inwards approximately half-way along their length. At their ventral extremities in their later stages of growth, the folds are strongly recurved and abut against a thin harmonic ridge which appears to terminate before reaching the apex. In the early stages of growth no such recurving of the folds is visible. Dorsally, the folds are gently flexed towards the apex and terminate short of the inner margin, which is also marked by a ridge.

In cross-section the folds are reclined adapically and are overlapping like the tiles on a roof. Towards the outer margin the folds become more widely spaced and more upstanding.

Extending from the apex to the approximate point of junction between the outer and lateral margins is a broad swelling or keel and, where the folds have their median flexure, the surface of the valve is depressed. Thus the resultant valve surface is undulating.

The smaller example (Fig. 2b) is essentially similar to the first but it differs in points of detail. It appears to be relatively broader, but this impression is due in part to incomplete preservation, and the apical angle is less obtuse (90°). The ornamental folds are recurved against the harmonic margin at an earlier age and at the ventral end of the valve close to the harmonic margin there are three or four radial riblets. The latter are only clearly defined in the troughs between the ornamental folds.

A thin section of the shell material adhering to the ventral part of the larger valve (Fig. 2c) shows that the test is calcareous and is stained dark brown, probably by the presence of organic matter. A thick, outer lamellar layer is well developed but much of the inner part appears to be structureless because of recrystallization. However, there are a few patches in this inner zone where some structure is visible. Here the shell is again layered but each of the layers has regular box-like kinks which are concentric from one level to the next. The resultant structure is comparable to that seen on a larger scale in some lime-secreting algae, and it has a quasi-prismatic effect. There is a gradual transition from this layer into the more regular, outer lamellar layer. The thin inner layer, normally present, is missing.

Remarks

Both aptychi described here possess overall similarities to others which have been identified with the so-called *Lamellaptychus seranonis* (Coquand). Two European examples, first described by Pictet and Loriol, were re-figured by Trauth (1938, pl. XIII, figs. 27 and 28) as typical forms of *L. seranonis*. They differ from the present specimens in being broader and in having folds or ribs which are not concentric with the lateral margin. Examples illustrated by Imlay (1942, pl. 11, figs. 4 and 6) from the Viñales Limestone (? Tithonian) of Cuba are of a type previously identified by O'Connell (1921) as *Aptychus cubanensis*, and which was later regarded by Trauth (1936) as *L. seranonis*. They differ from the European forms in having ornamental folds which are more or less parallel to the lateral margin and in this respect they are much closer to the Alexander Island material. In particular, specimen KG.12.5 (Fig. 2b) compares well with O'Connell's (1921, fig. 9) example except that the latter has a more broadly rounded ventral margin. A third example re-figured by Trauth (1938, pl. XIII, fig. 29) has folds which are parallel to the lateral margin, and the position of the lateral indentation of its ornamental folds is much closer to the ventral end of the valve than in any of the specimens discussed above.

Such variations, together with the observations that in the three examples figured by Trauth (1938, p. XIII, figs. 27–29) there is a range in apical angle from a little more than 90° to 113°, indicate that *L. seranonis* has been interpreted widely in the past. It has been recorded from sediments ranging in age from Tithonian to Barremian, and therefore it must come not only from many different species of ammonite but from several different genera. In view of the broad interpretation of this form of aptychus and the present state of aptychus nomenclature, there seems little point in excluding the present examples from the group of *L. seranonis*; nor does it seem worthwhile to separate the two Antarctic forms described here, despite their obvious differences.

A fragment from the Neocomian of the Swiss Alps, first described by Ooster (1857, p. 30, pl. 7, fig. 10) as *Trigonellites* indet., was re-figured by Trauth (1938, pl. XIV, fig. 1) as *L. seranonis* (Coquand) var. *longa*. While its narrow shape suggests the possibility of closer comparison with the present material than with "typical" examples of *L. seranonis*, its preservation is too poor for useful comment to be made.

Lamellaptychus II

Figs. 2d–f and 3

Material

Five internal and external moulds of moderate-sized individuals (KG.1.813, 2.65, 2.211, 6.21, 103.126) from localities R, H and T. A slab from a locality 8 km. south-west of Ablation Point bears the external moulds of three tiny examples (KG.1574.4).

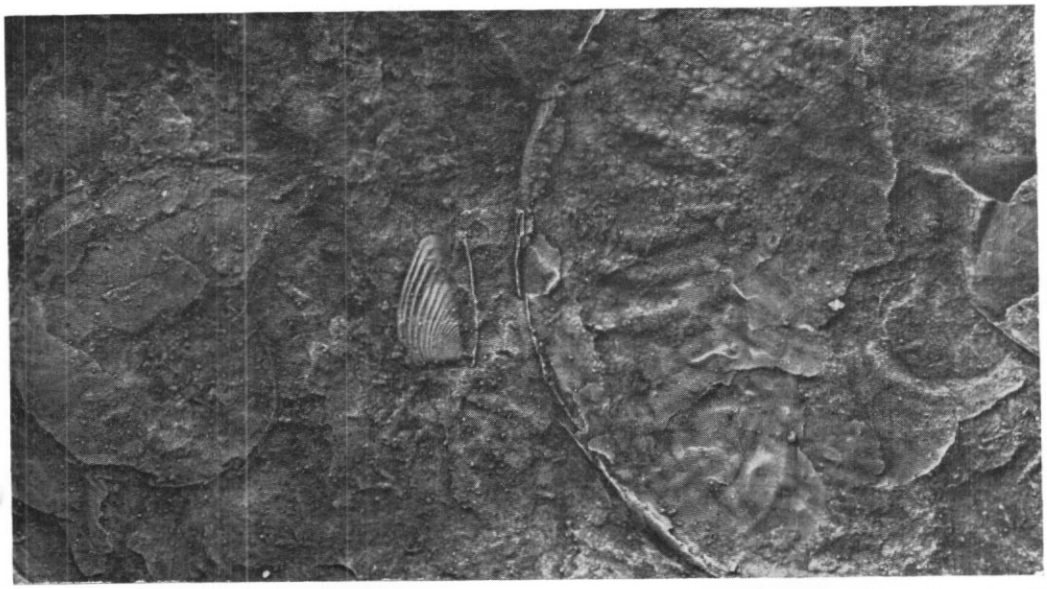

Fig. 3. Latex cast from the natural external mould of a small pair of aptychus valves (*Lamellaptychus* II) occurring in close association with oppeliid ammonites. *Lamellaptychus* has been widely found elsewhere inside the conches of oppeliid ammonites; × 3, coated (KG.1574.4).

Description

The valve has a narrow triangular outline, an apical angle of 110°, straight harmonic and inner margins, and a gently convex lateral margin. The umbilical projection is tightly curved and the outer margin bends smoothly round from the lateral margin before recurving close to the harmonic margin. A deep adharmonic furrow and a corresponding, but feebly developed, adharmonic ridge are present. On the convex external surface of the valve (Fig. 2d and e) is an ornament of flat ribbon-like folds which are reclined adapically and overlap one another like the tiles on a roof. The course followed by the folds is parallel to the outer and lateral margins; there is no ridge on the inner margin and the folds merge into it after swinging adapically. The recurved ventral part of the folds is situated in the adharmonic furrow and here the ornament is suddenly reduced in strength until it is scarcely visible.

The concave internal surface (Fig. 2f) is smooth apart from concentric growth lines which are coarsest close to the harmonic margin and along the zone corresponding to the adharmonic ridge on the convex side.

An otherwise poorly preserved specimen from Waitabit Cliffs (KG.103.126b) shows two of these valves paired along the harmonic margin as in their supposed original life position. However, there is no trace of the original conch. A *steinkern* accompanying specimen KG.2.211 indicates a Bivalvia-like preservation where the two aptychus valves are folded back on each other.

Remarks

Lamellaptychus II is readily distinguished from the first form by its marked adharmonic furrow, the lack of a median flexure in the external ornament, and the sudden reduction in strength of the external ornament along the adharmonic furrow. There is also no ridge along the inner margin and the apical angle is smaller.

The small specimens on a slab from a locality south-west of Ablation Valley (KG.1574.4; Fig. 3) have a smooth area along the harmonic margin which suggests that they may be grouped with the forms described above. The best specimen (Fig. 3) comprises the exterior of a left valve with the harmonic margin of the right valve just visible by its side. Their close association with

oppeliid ammonites (*Theganeceras* (*?*)), similar to others from the Fossil Bluff area (Thomson, 1971), suggests that they are Aptian in age.

It has not been possible to compare satisfactorily the present specimens with any previously described forms. The inner surface is similar to that of some Tithonian examples from Argentina (Closs, 1961, pl. IV, figs. 8 and 9) and of some European Upper Liassic *L.* cf. *lamellosus* (Parkinson) (Trauth, 1938, pl. XI, figs. 11 and 12), but this surface is of little diagnostic use. An adharmonic furrow on the outer surface is present in such forms as the Berriasian *L. herthae* (Winkler) var. *laevadsymphysalis* Trauth (1938, p. 180, pl. XIII, figs. 23 and 24) and the Upper Liassic *L. thoro* (Oppel) var. *laevadsymphysalis* Trauth (1938, p. 185, pl. XIII, fig. 7). However, the former has a median flexure in the external ornament while the latter, apart from being much older than the present examples, was too poorly illustrated to see the ornament near the harmonic margin. In all probability *Lamellaptychus* II is a new form.

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