

An Upper Triassic Lamellibranch from the Southern Alps of North Westland, New Zealand (Sheet S53)

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Summary

Palaeoneilo mundeni Fleming n.sp. is described from a single specimen from Slaty Creek, Waiheke River, Westland. The fossil is from more strongly metamorphosed rocks than the nearby *Monotis* beds of Harper Pass (Warepan Stage, Norian) and has distinctive characters shared by an Otamitan (Carnian) specimen from Nelson

INTRODUCTION

Fossils are so rare in the indurated sediments forming the Southern Alps that every specimen that can be determined is worth recording. Wellman, Grindley, and Munden (1952) described the geology of the Harpers Pass Sheet District (S52), mapped the rocks east of the Alpine Fault in five belts of decreasing metamorphism, and listed the localities in which *Monotis richmondiana* Zittel (Warepan Stage, Norian, Upper Triassic) has been found. The fossil described below was collected in the adjoining Lake Sumner Sheet District (S53).

SYSTEMATIC DESCRIPTION

By C. A. FLEMING

Class PELECYPODA

Family CTENODONTIDAL

Genus **Palaeoneilo** Hall

1869 *Prelim. Not. Lamellibr. Shells*: 6

Type species: *Nuculites constructa* Conrad (Devonian)

Palaeoneilo (sens. lat.) **mundeni** Fleming n.sp. (Plate 4, figs. 1, 2, 4-9)

MATERIAL: Unique holotype (GS 5803) in the New Zealand Geological Survey. The specimen consisted of the almost complete external mould of the linked valves of a crushed individual, containing an internal mould ("stenkern") held in place by residual shell. The shell was dissolved in dilute acid, freeing the internal mould. The species is diagnosed from rubber, plaster, and wax casts made from the internal and external moulds. The shell has been compressed so that the left valve has collapsed, the ventral margin of the right valve has been forced inside that of the left, and the anterior dorsal portion of the right valve forced above the corresponding part of the left valve. The hinge plate has been bent in a sinuous curve. The outer surfaces of both valves are broken by minute oblique parallel fracture lines, the result of incipient slaty cleavage in the containing rock.

* New Zealand Geological Survey.

DESCRIPTION: Shell very large, inflated, and thick (for the genus), elongately oval, cylindrical. Beaks anterior, a little more than one-third distance from the front, low, approximated, slightly prosogyrous. Valves evenly inflated, anterior margin rounded, ventral margin almost parallel to hinge-line, posterior margin more narrowly rounded. Growth lines indicate that the young shell tapered towards the posterior margin more than the adult. No posterior ridge. Valve margins smooth. Anterior dorsal margins ridged, running back into a pronounced chink between the beaks. Posterior dorsal margin hidden by compression of the valves which has reduced the escutcheon to a deep linear groove. Sculpture of coarse, irregular, concentric growth folds with fine growth lines between them. Hinge plate deep, consisting of a long, gently arched posterior limb and a shorter descending anterior limb, its base expanded above the muscle scar. Posterior teeth small, about 40, set low on hinge-plate so as to indent the internal mould. Anterior teeth apparently larger and fewer (about 10); other hinge details not preserved. Anterior adductor pit deeply sunk, bounded behind by a strong, broad buttress extending to the hinge, infringed on by expanded convex base of the anterior hinge-plate. Posterior adductor less deeply sunken. Pallial line simple, squarely truncated behind, situated well above ventral margins.

Internal mould (Figs 2 and 5) with distinctive projections marking anterior adductor scars, flanked by pits formed by expansions of hinge-plate; less pronounced expansions marking posterior scars, and a zig-zag ridge marking hinge-line.

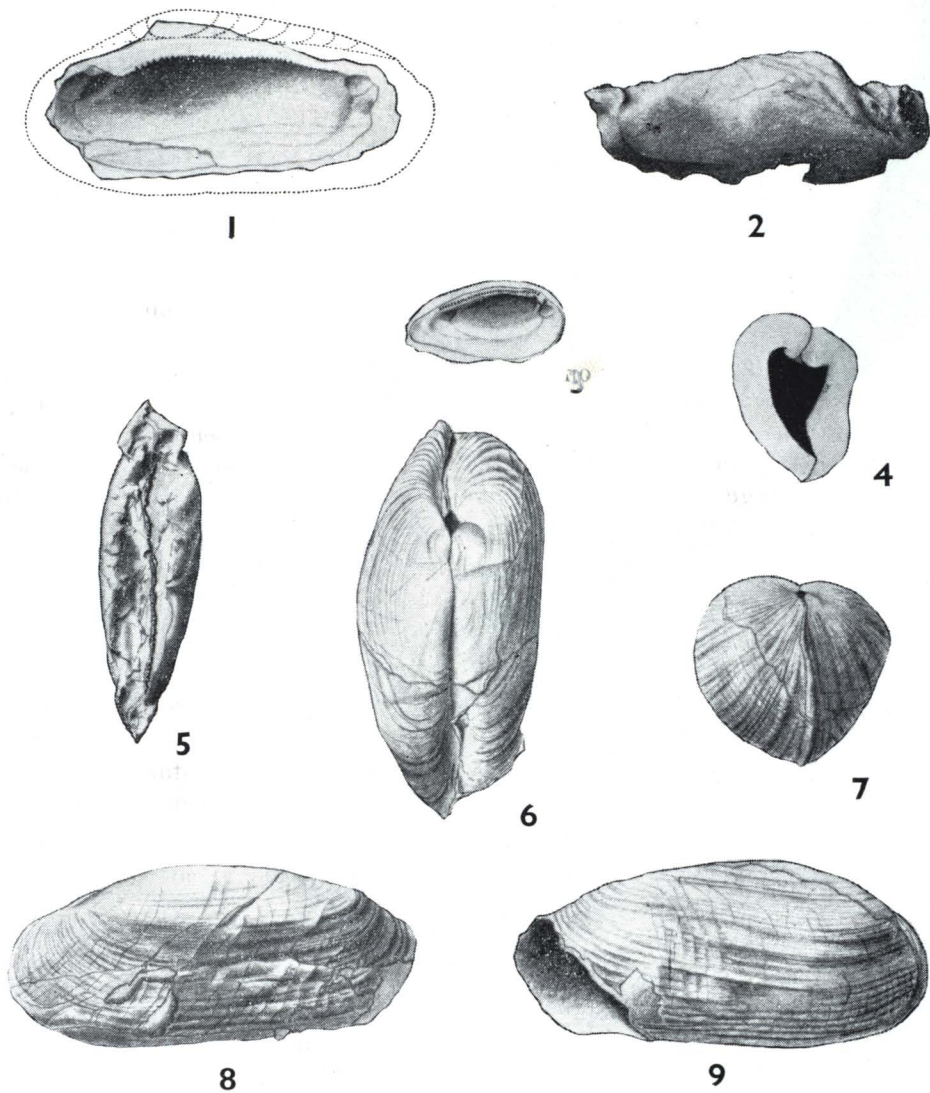
DIMENSIONS: Length, 52, height 23, inflation (2 valves) 23, shell thickness 4.5 mm.

LOCALITY: GS 5803, S52/501, boulder in Slaty Creek, tributary of Waiheke River, grid reference 523764. Collected by F. W. Munden, December, 1952.

REMARKS: The matrix of the fossil is very compacted, poorly sorted, sandy siltstone (argillite) containing large grains of quartz, biotite, and feldspar and scattered pebbles of quartz and limestone up to 25 mm. in diameter, suggesting that it is a re-deposited sediment.

The distinctive features of *P. mundeni* are its great size, long, thick, cylindrical shell, low beaks, small amount of posterior taper, and deep muscle scars. The only other New Zealand fossil examined that shares most of these features is an internal mould of a left valve from the Otamitan Stage, GS 385, *Nautilus* beds east side of Mt. Heslington, Nelson, collected by A. McKay, 1878. This specimen (Plate 4, Fig. 3) is only 22 mm. long, and has a simple pallial line not truncated behind, but agrees with *mundeni* in shape (neglecting distortion), position of beaks, and sunken muscle scars, the anterior emphasized by a buttress. This characteristic combination of features has not been noted in any other specimens or illustrations of *Palaeoneilo*, but many are not well enough preserved to show the muscle scars. *P. tobieseni* Böhm, 1903 (Carnian, Bäreninsel) has similar anterior scars and is probably related, but differs in shape.

In New Zealand, *Palaeoneilo* has been used (Allan, 1935) for a Devonian fossil (which additional specimens show to be quite unrelated to that genus) and for three Otamitan (Carnian) species, one of which perhaps ranges into the Warepan (Norian). *P. otamitensis* Trechmann and *P. aff. praecucuta* Klippst (Trechmann, 1918, 190, Pl. 21, Figs. 21, 22) differ from *P. mundeni* in smaller



Palaeoneilo mundeni Fleming n.sp.

R. C. Brazier, del.

FIG. 1.—Rubber cast of interior of right valve from holotype.

FIG. 2.—Natural internal mould, holotype, lateral view showing muscle impressions.

FIG. 4.—Cross section at posterior third, showing thick shell, deformed by compaction of enclosing rock.

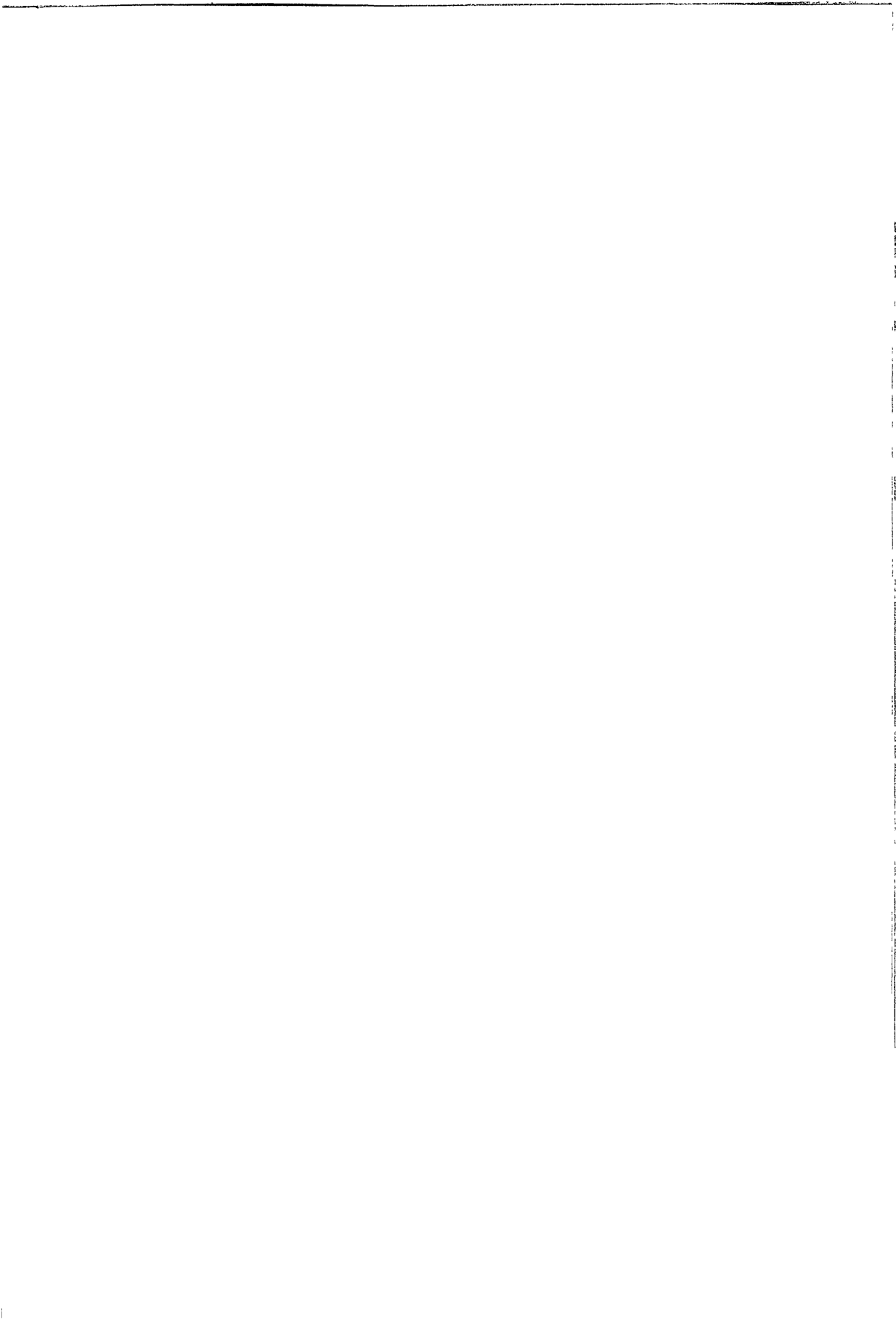
FIG. 5.—Natural internal mould, holotype, dorsal view showing muscle impressions and taxodont hinge.

FIGS. 6-9.—Rubber casts from holotype, dorsal, anterior and lateral views.

Palaeoneilo aff. *mundeni* Fleming n.sp.

FIG. 3.—Rubber cast of interior of left valve. G. S. 385, Mt. Heslington, Nelson (Otamitan Stage).

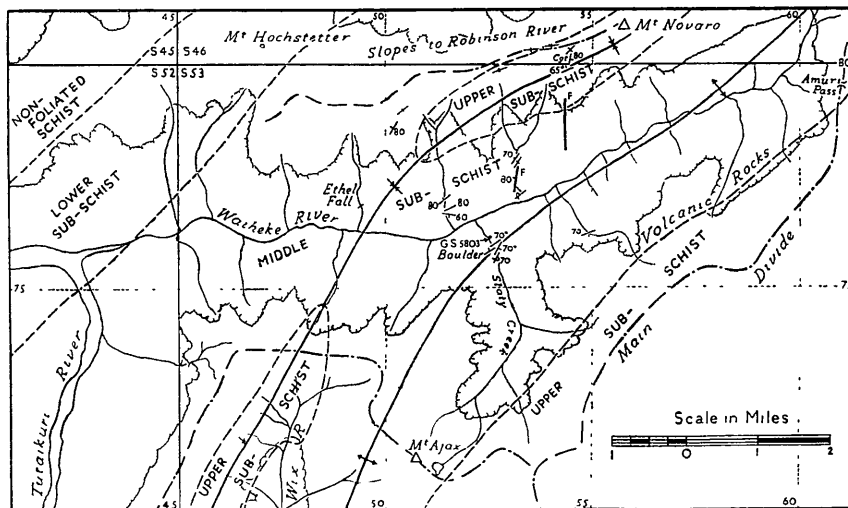
All figures natural size.



size, more anterior beaks, and tapering posterior margins. *P. hamiltoni* Wilkens (1927: 15, Pl. 2, Fig. 8) is still smaller, higher, with more central beaks, curved ventral margin and inconspicuous muscle scars. The Geological Survey collection includes a single internal mould of *P. aff. otamitensis* Trech. from the Warepan (Norian) of Wairoa Gorge (GS 140) that lacks the sunken muscle scars of *P. mundeni*. The species recorded by Trechmann and Wilkens are more like species of *Palaeoneilo* of the Upper Trias (Carnian) of Austria (Bittner, 1895), Mexico (Burekhardt, 1905), and Brazil (Reed, 1935), and from the Jurassic of Britain (Cox, 1937), none of which has strong muscle scars, judged by published illustrations.

The genus *Palaeoneilo* is currently used to include a great variety of Devonian to Triassic taxodont bivalves, and for Jurassic species by Borissjak (1904) and Cox (1937). It will doubtless be subdivided when monographed. *P. mundeni* differs from the Devonian type species, *P. constricta* (Conrad), figured by Shimer and Shrock (1944, Pl 146, Figs 20, 21), in many characters that could justify generic separation. Buttressed sunken anterior adductors are commoner in Nuculidae than in Mallettiidae and hint at derivation from the Paleozoic stock exemplified by *Ctenodonta*, *Cucullella*, *Cleidophorus* and *Nuculites*

AGE: In the absence of more reliable evidence, the occurrence of a fossil closely related to, if not identical with, *P. mundeni* in the Otamitan Stage (Carnian) of Nelson is the best indication of its age. *P. mundeni* is from rocks that are more indurated than rocks in the same district containing the Warepan (Norian) fossil *Monotis richmondiana*, and is thus probably from a lower stratigraphic horizon. Otamitan (Carnian) age is thus consistent with the limited paleontological and stratigraphic evidence.



TEXT-FIG 1.

Geological Sketch Map of Waiheke Valley, North Westland, showing metamorphic belts, locality of *Palaeoneilo mundeni* (GS 5803) and upper timber line. Geology by F. W. Munden and R. P. Suggate.

GEOLOGICAL SETTING

By F. W. MUNDEN and R. P. SUGGATE

The specimen of *Palaeoneilo mundeni* was found in a sub-rounded boulder in Slaty Creek, 25 chains upstream from Waiheke River, at the conclusion of a trip during which only the lowest half mile of Slaty Creek was examined. Consequently the source bed is not known with certainty.

Slaty Creek joins Waiheke River 15 miles north-east of the Trent River area described by Wellman, Grindley, and Munden (1952), where belts of schist and sub-schist were mapped on field metamorphic criteria. The geology of the Waiheke Valley (Text-fig. 1, which joins these authors' map of the Trent River area) was mapped on the same criteria, but slaty cleavage is less prominent in the middle sub-schist than in the Trent River area. The position of the sub-schist belts in the Slaty Creek area is based on observations in south bank tributaries of Waiheke River, and on their stream gravels.

The fossiliferous boulder is composed of sandy siltstone containing rare pebbles of quartz and limestone. It is not quartz-veined and shows little signs of slaty cleavage except for parallel fractures across the fossil, but as slaty cleavage is apparently not everywhere well developed in siltstones of the middle sub-schist, it probably came from that metamorphic belt. Similar rock, although not noted as containing fossils and pebbles, crops out in Slaty Creek half a mile upstream from Waiheke River and is mapped as middle sub-schist.

From the evidence available, *P. mundeni* is from the middle sub-schist which the writers consider older than the upper sub-schist from which *Monotis richmondiana* (Warepan Stage, Norian) is found at Trent River.

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