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THE FOSSIL BARNACLES (CIRRIPEDIA: THORACICA)

OF NEW ZEALAND AND AUSTRALIA

BY

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PRESENTED IN FULFILMENT OF THE  
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GEOLOGY AT THE UNIVERSITY OF AUCKLAND  
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NOVEMBER 1979

FRONTISPIECE

RECENT NEW ZEALAND CIRRIPIEDIA

- Figure 1: *Lepas anatifera* Linné, from floating wood, x 1.6
- Figure 2: *Megalasma carinatum* (Hoek), from cable, x 2.2
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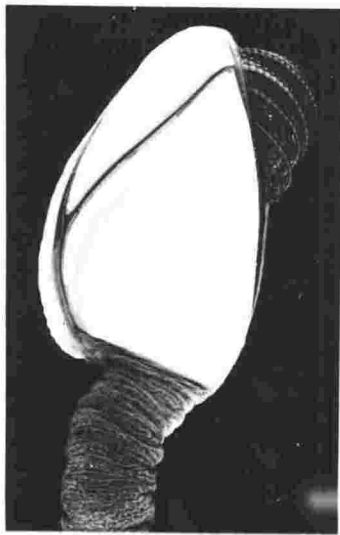
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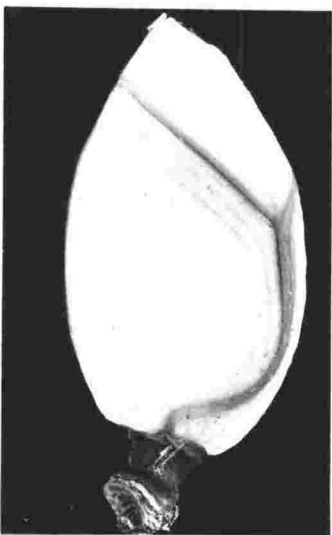
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Photographed by G. W. Batt, from Foster  
(1978), by courtesy of Dr Brian Foster



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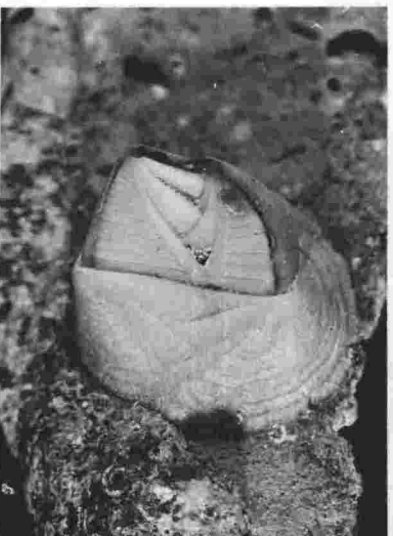
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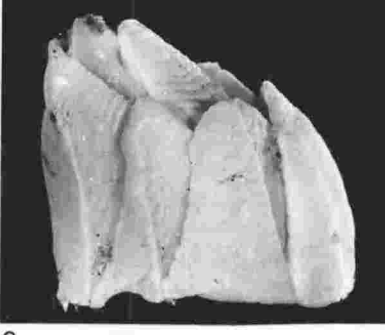
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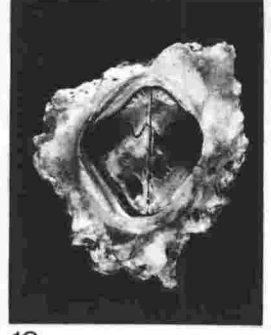
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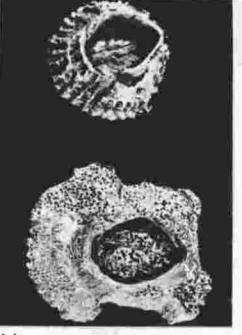
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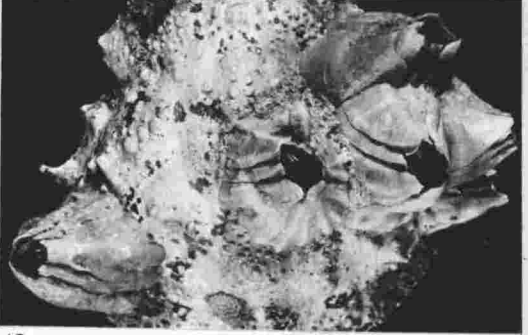
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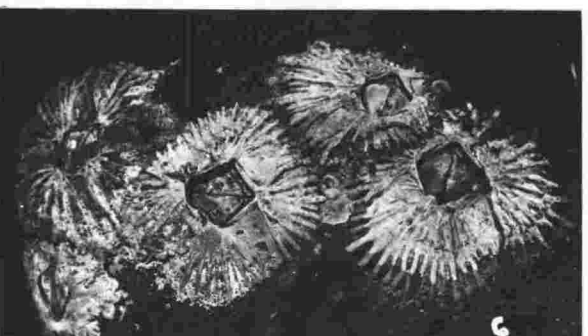
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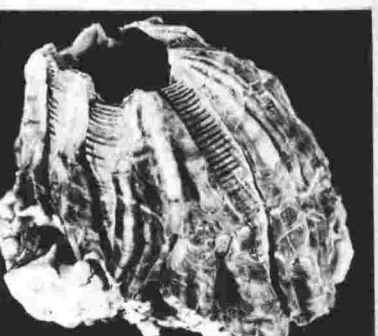
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ABSTRACT

The fossil Cirripedia : Thoracica of Australia and New Zealand have been studied. One hundred and three taxa are now known as fossil, and these are systematically described and illustrated. A number of major systematic revisions are proposed, including 1 new superfamily, 6 new subfamilies, 7 new genera, 2 new subgenera and 52 new species or subspecies.

The material studied has revealed inconsistencies in the presently held views on phylogeny. Amongst the Balanomorpha, the Balanidae are shown to have evolved from a new six-plated archaeobalanid (with a tripartite rostrum), rather than *Hexelasma*; and in the Lepadomorpha, *Arcoscalpellum* is revised, and a new genus, which gave rise to many modern arcoscalpellids, is proposed. The difficulties in assigning the more primitive representatives of families to generic level are discussed, and keys are introduced to facilitate identification.

The study also identifies many taxa with restricted time ranges, illustrating the stratigraphic importance of cirripeds. Thoracican ecology is discussed, and it is shown that early taxa preferred the shallower upper shelf environment; but following an explosive evolutionary radiation during the Lower Cenozoic, a great diversity of habitats became occupied. Neogene species especially, can be of considerable importance in paleoecology, both as indicators of depth and temperature.

Faunal relationships are discussed in the light of new advances in plate tectonics. An early association between Australia and New Zealand can be recognised, and this is followed in the Neogene by the development of a South American fauna with distinct Australasian influences.

Laboratory techniques, including thin section analysis and scanning electron microscopy are discussed with relevance to their use in identification.

Charts showing both the stratigraphic and lithologic distribution of the known fossil Thoracica of Australasia are included.