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NOTOTHERIA AND ALLIED ANIMALS—

A. REJOINDER.

By

H. H. SCOTT, Curator Launceston Museum,  
and  
CLIVE E. LORD, Curator Tasmanian Museum.

Plates I.-III.

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Before presenting to the Royal Society of Tasmania our notes upon the extinct Marsupial Rhinoceros, *Nototherium mitchelli*, (1) we cast them into such a form as to embrace extreme osteological details upon the one hand, and the widest taxonomical scope upon the other. This latter item, in fact, had its entire origin in the circumstances incidental to the super-imposition of the Rhinoceros trend upon the more or less generalised Marsupial races of geological periods long since past. Any criticism of our work or methods should therefore, in justice, take note of this duality, or to descend to details—deductions made from the wide scope of the trend should not be quoted in terms of that man-made taxonomy that is enthralled within the iron bands of genus, species, and variety. Again, to quote backwards from the living—and largely fixed—marsupials of to-day, to plastic, rapidly evolving generalised types, is to throw ourselves open to contradiction by the very next discovery that fortune places at our disposal. Accordingly, we used considerable caution in this respect, but, as it now appears, stand charged with an under-estimation of the values of the evidence yielded by a study of the Nototherian and modern marsupial premolars. (1920, pp. 13, 17, and 76.)

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(1) Pap. and Proc. Roy. Soc. Tas. 1920.

We therefore desire to add the present note to our previous papers in order to reply to certain remarks made by Mr. Heber Longman in his recent interesting contribution to the memoirs of the Queensland Museum, (2) on *Euryzygoma dunense*. (1920, p. 65.)

The extent to which generalisation obtained among Nototherian animals can only be appreciated by those who have for some reason or other paid special attention to the matter, and, therefore, we must be pardoned for giving in detail the following item of cranial morphology.

The zygomatic arch of a Nototherium such as that of *Nototherium tasmanicum* leaves the occiput under conditions that are not exactly repeated by either *Macropus* (Kangaroos), *Phascolomys* (Wombats), or *Phascolarctus* (Native Bears), but upon the whole they are those of *Macropus*. It descends into the orbit at a vertical line at least 50 mm. in advance of the premaseter process (not so in *N. mitchelli*), while in the Kangaroo this process outwardly underprops the posterior third of the orbit. It does not reach it by 8 mm. in the Native Bear and 10 mm. in the Wombat. Owing to the heavy developed premaseter process the morphology of the orbit here departs from that of the Kangaroo, misses the Wombat outline, but with generic characteristics assumes in exaggeration that of the Native Bear, which it continues to follow with added closeness to the end of the skull, including the lateral incisors, but not the nasal regions. Here, then, in a few inches of space we have the characters of three modern animals in generalised association in the skull of a single Nototherium, and might we not then expect that equally generalised creatures of the same age should show intergrading dental characters that would render the strictest terms of modern classification untenable?

Our use of the word *Phascolonus* was intended to imply that the jaws called *Nototherium dunense* conformed even more strongly to the *Phascolonian* type than they did to the *Nototherian*. In other words we considered the Wombat characters so accentuated in this mandible that it would be eventually classified with a type more generalised than *Nototherium*, and one that more closely approached the common progenitor of gigantic Wombats and Nototheria. Others besides ourselves have found such a creature thinkable; for instance, the late Richard Lydekker wrote thus of the family *Nototheridæ*:—"This family connects *Phascolomyidæ* with the

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(2) Heber A. Longman. A New Genus of Fossil Marsupials. Mem. Qld. Mus. Vol. VII., pt. II.

"*Diprotodontidæ*. . . . It is easy to see how the structure of "the cheek teeth could pass into that of the *Phascolomyidæ*; "and it is not improbable that the two families may have "diverged from a common ancestor." (3) (1887, Vol. 5.)

That was our thought at the time of writing, and Mr. Longman's association of these jaws, almost immediately afterwards, with a more aberrant type of cranium than anything that had hitherto come to light, shows that our diagnosis was not misplaced.

Anybody who will carefully read our notes cannot fail to see how highly we estimated De Vis' work, and we regret to stand charged with any unfairness to him. We, therefore, take the first opportunity of saying that nothing was farther from our thoughts. Our general perusal of De Vis' works left the definite impression upon our minds that he looked to *Sceparnodon* to clear up some outstanding puzzles in regard to these generalised creatures, of which (as the future may yet prove) he visualised at least eight groups. In effect our reference simply meant this—*Sceparnodon*, having been shown by Stirling to be a synonym of *Phascolonus*, was eliminated *ipso facto* as a possible generalised animal, and this, in our opinion, left its generalised connection to the Wombat stirp pure and simple. Unfortunately (so hard is it to kill "genus," "species," and "variety"), the word "genus" crept in here, although the wider sense of the word is quite manifest when the sentence enclosing it is taken in conjunction with the full context.

Mr. Longman's criticism therefore pivots upon the single word "genus." Nature never produced animals ready made to genus, species, or variety, although she may have produced them in groups, and we yet hope to see these Nototherian groups with their sex, age, and individual variations clearly defined.

As, however, this was not a *fait accompli* when our notes were in course of compilation, and very much printer's ink had already been used over the dentition by those who had gone before us, we decided to seek the effects produced by the super-imposition of the Rhinoceros trend upon this section of the *Marsupialia*, rather than re-list the variation of the premolars; some of which mutations are dangerously close to the morphological minutiae inseparable from diphyodont succession. That any marsupial group should have taken on the Rhinoceros trend would, in the fact itself, introduce

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(3) Lydekker. Cat. Fossil Mammalia, Brit. Mus. Vol. 5, 1887.

an enormous element of variation, from which the teeth, in addition to the other parts of the skeleton, could hardly escape the process of remoulding, and in the absence of a complete series of such changes, even in one group of animals, quite apart from the sum total, we tentatively classified known material in terms of the most obvious trend characters. If all extinct creatures had first been classified in groups, and as knowledge increased genera and species had been eventually created within the groups, how much confusion would have been avoided!

All classification is man-made, and in essence chiefly intended to avoid ambiguity when the name of an animal is mentioned. Most of us admit this, and yet rise up in arms immediately we are asked to act upon our conviction. Accordingly, we did not expect a ready acceptance of our group taxonomy, yet nevertheless it is as sound as if we had called the White Rhinoceros of to-day "A large-horned Rhinoceros" and the Chittagong animal a "Small-horned Rhinoceros."

#### RECAPITULATION.

- (1) We are convinced that the several groups of more or less generalised animals lived in the Australian Zoogeographical province and that the names *Diprotodon*, *Nototherium*, *Phascolonus*, *Euryzygoma*, etc., stand as outpost flags to a largely unexplored realm.
- (2) That De Vis' estimate of seven or eight groups may yet prove to be feasible.
- (3) That the most generalised groups have yet to be re-constructed.
- (4) That in view of these facts it is better to seek the elucidation of the groups than it is to argue over the sub-divisions of such groups. Accordingly, we write, and always have written, in that spirit, and without any desire to under-estimate the works of others.

#### EXPLANATIONS OF PLATES.

##### PLATE I.

Side view of the articulated skeleton of *Nototherium mitchelli*. The specimen, although not perfect in all details, shows, for the first time, the general outline of this animal.





SKULL OF NOTOTHERIUM MITCHELLI.

## PLATE II.

This aspect shows the aggressive, bulldog-like character of the fighting *Nototherium*.

## PLATE III.

This view is specially arranged to show the pugnacious type of skull incidental to the evolution of the Rhinoceros trend among the Marsupials.

## LIST OF WORKS REFERRED TO.

- Longman, Heber A., 1920.—A New Genus of Fossil Marsupials. *Memoirs of the Queensland Museum*, Vol. VII., Pt. II., pp. 65-80.
- Lydekker, R., 1887.—*British Museum Catalogue of Fossil Mammalia*, Part V.
- Scott, H. H., and Clive Lord, 1920.—*Studies in Tasmanian Mammals. Papers and Proceedings of the Royal Society of Tasmania*, 1920.