

ON DIPROTODON MINOR—Hux.

By C. W. DE Vis, M.A.

It is now a quarter of a century since Professor Huxley, in the *Annals and Magazine of Natural History* (Vol. 18, pp. 422-427), gave descriptions and figures of maxillary teeth of two extinct mammals, regarded by him as *Diprotodons*—one under the name of *D. (australis ?)*, the other under that of *D. minor*. Both of these were, in 1887, identified by Sir R. Owen with ascertained species of his genus *Nototherium*; *D. (australis ?)*, was refigured as *N. mitchelli*, *D. minor* as *N. victoriae*. These determinations of the learned author of the "*Extinct Mammals of Australia*" have not hitherto been disturbed. Indeed, after the recognition by the same authority of the mandible with a strictly bilophodont premolar figured in his work as *D. australis*, it became almost impossible to believe that if the tooth so identified had no successor, the maxillæ noticed by Professor Huxley could have belonged to *Diprotodon*. But certain *Diprotodon* remains collected by Mr. R. Frost, of King's Creek, and lately transferred to the Queensland Museum, seem to necessitate a reconsideration of the matter, inasmuch as they reveal not only the premolar typical of the genus (that of *D. australis*), but the fact that a smaller contemporary of *D. australis* had a real existence as a species.

In Mr. Frost's collection is a skull of a large *Diprotodon* which, in the absence of any contra-indication, may be assumed to be that of *D. australis*. The greater part of the superstructure of this skull is wanting, but its more solid base and sides, though broken up into fragments in the matrix have been recovered and reconstructed. Fortunately all the teeth, save the posterior incisors, are in place, and well preserved, though we recognise in the state of the grinders—the second being reduced to a mere shell—the conditions of advanced age.

The premolar, rather more than half worn down, is a subtriangular unilobate tooth, 23 mm. in length, 20 mm. in breadth, with

a short posterior and a longer anterior talon, the latter armed with a prominent tubercle. By this tubercle seen in profile, and by a mesial indent of the crown, deepening and widening as it approaches the culmen—the tooth is on its outer side made to appear somewhat trilobate : anteriorly and posteriorly the outer surface is smooth and feebly concave ; the mesial indent is bounded laterally by the free edge of the surface on either side of it, and towards the base by a deep and sharp basal ridge connecting the lateral edges. On its surface of wear it presents a broad stirrup-iron shaped band of dentine, placed transversely with its sole on the outer side. The enamel forming the inner edge of this band is the margin of a subtriangular pit of enamel in the centre of the crown, deepest (about 3 mm) near the base of the triangle which is opposite the inner side of the tooth, and shallowest at the apex, which is opposite the mesial indent of the outer surface, and separated therefrom by the narrowest part of the linking portion (sole of the stirrup-iron) of the dentinal band. The plan of this surface strongly suggests that at an earlier stage of wear the linking portion was not uncovered, and that the dentine appeared as a loop-like band separated at its free ends by continuity of enamel. In this case the tooth at eruption rose as a single lobe, with its summit excavated from the outer side—the excavation forming a transverse valley which sunk deeply into the centre of the crown and passed with a contracted course over the outer edge to join the external indent. The trenchant summit seems to have formed a continuous $\cap$ shaped curve of constant breadth ; there is at least no indication in any contraction of the dentinal band that even towards the summit the cusp was subdivided into three parts, one internal and two external. The prebasal or antero-internal ridge springs from the antero-external angle of the tooth, or rather from the tubercle within that angle—it passes inwards, then curves boldly backwards and ascends upon the antero-internal angle ; the postbasal ridge differs mainly in the reversal of its course. The curves of the ridges with the interval between their terminations gives a slight appearance of emargination to the inner side of the crown, and this, in conjunction with the external indent, causes it to appear a little contracted laterally. The prebasal tubercle is a triangular promin-

ence rising from the base of the fore angle of the tooth upon the foot of the lobe—it is much too small to be termed a lobe.

The welcome advent of a premolar in connection with its cranium fixes the identity of two similar teeth which had been previously referred, but with hesitation, to *D. australis*. From one of these, the premolar of a series exactly equal in both dimensions to that of the cranium aforesaid, we learn that the tooth at an earlier stage of abrasion was in complete accord with the anticipation already expressed—the dentine forms a $\cap$ shaped loop, the legs of which are separated by their enamel edges—the edges themselves meeting upon the line which is afterwards to appear as the linking tract of dentine. The third example shows us on the other hand the aspect of the tooth at a greater age—the only differences are a broader continuous band of dentine surrounding a smaller and shallower central pit of enamel. The prebasal tubercle in both these is as insignificant as in the one described.

Allowing for variation in the size and shape of the prebasal tubercle (scarcely a specific character), and for the changes in the aspect of the grinding surface consequent upon the uncovering of deeper-seated structure, the premolar of *Diprotodon australis* is generically identical with the premolar figured by Professor Huxley as *D. minor*. To Professor Huxley, therefore, the merit of being the first to recognise the *Diprotodon* premolar is certainly due. But the fossils examined by him comprised a second premolar, which at the time declared itself to be, without doubt, specifically distinct from the other. Viewed from the outer side, the two teeth are indeed strikingly different, the smoothly convex lobes of the one being in marked contrast with the sharply-ridged surfaces of the other. But assume that the definition of the anterior and posterior depressions in the type of *D. minor* may occasionally disappear, leaving the mesial indent as we see it in the figure and that by a further modification the abrupt edges of the latter may be removed, and its central line deepened, the tooth as it presents itself in *D. (australis?)* will be very near the product. Now, such intermediate condition is opportunely exemplified by the premolar of *D. australis*, as will be seen from the description; albeit, the fact proves nothing more to the point than this, that the possibility of such condition

in another species is not a mere assumption. But, fortunately, we are able to show that such intermediate condition is also exemplified in a *Diprotodon* corresponding in size to *D. minor*. In a maxilla, wanting only the last molar, and about a fourth smaller in every part than *D. australis* the premolar has the mesial indent, and that alone, fashioned as in *D. minor* (type), the rest of the outer surface being very much as in Sir R. Owen's figure of *N. mitchelli* (Pl. 88, fig. 11, E.M. of Aust.), and consequently it shows neither the three vertical ridges of the one type (minor), nor the merely undulating surface of the other (*australis*?). Unless then, we are prepared to accept this tooth also as the index of a distinct species (and the presence of at least four different *Diprotodons* on a few square miles of old Australia is improbable), we must take the alternative and conclude that the premolar of *D. minor* had externally a range of variation of perhaps unusual extent from the comparatively angular to the comparatively smooth condition. And symptoms of its variability are not shown by its outer surface only. The prebasal tubercle which, according to the figures, is much less developed in the type specimen of *D. minor* than in its co-type (*D. australis*?) is in the example before us, intermediate in size, and differs from both in its close approximation to the lobe behind it—an approximation apparently due to the contraction of the prebasal talon which renders the whole tooth about 3 mm. shorter than the type, which again is shorter than the co-type. Professor Huxley mentions a difference in the form of the antero-internal ridges, and it may be gathered from the figures that this consists in the prolongation of the ridge in *D. minor*, so far backwards as to render it confluent with the postero-internal ridge; whereas in the companion tooth it terminates as in *D. australis*, on the fore-angle of the lobe—in this respect the example of *D. minor* in hand agrees with *D. (australis?)*. In all the specimens of *D. minor* the dentinal band is much contracted in width as, in its anterior course, it approaches the inner side of the tooth; the antero-external portion of the unworn summit was therefore, in this species, more or less divided off from the rest by an anterior and posterior indent; but there is no indication of apical separation of the postero-external from the postero-internal part of the cusp. We are consequently, unable to see in it a tooth composed of external and internal lobes, much less of large external

lobes separated by longitudinal sulcus from mamillary tubercles on the inner edge, as we have them in *Zygomaturus trilobus* MacI, also identified by Sir R. Owen with *Nototherium mitchelli*.

As the only important difference between the teeth described by Professor Huxley loses most of its significance in the presence of an intermediate form, and as the probabilities of the case are against the admission, without strong corroborative evidence, of a third small *Diprotodon*, we are provisionally led to the conclusion that there is but one, *D. minor*, Hux., and that this includes in its synonymy *D. (australis?)* Hux. *Nototherium mitchelli*, part Ow—*Nototherium victoriae*, part Ow.

Mandible—Confirmatory of the evidence given by the upper jaw in favor of *D. minor*, we have the testimony of two mandibles against the identity whereof the only thing that can be said is that neither of them was found associated with a maxilla. Distinguishable in many respects from *D. australis*, they correspond with the maxilla of *D. minor* in the only feature in which they are comparable, the length and relative breadth of the molar series $d^4 - m^3$. The more perfect of these may be described. It is the left mandible of a young adult whose age is registered in the narrow tract of dentine on the hinder summit of the last molar. The rough labial tuberosity situated in *D. australis* below the premolar, is placed on the diastema obliquely across the front fang of the premolar, and in the vertical of the hinder edge of the dental foramen. This orifice is larger than in the larger species, opens on the middle of the jaw, (below the middle in *D. australis*), and is bounded posteriorly by a convex vertical ridge descending upon the symphysial boss which is much subdued, and presents a regular rotundity of form contrasting with its expansive angularity in the mature *D. australis*. This conspicuous feature of the *D. minor* symphysis is repeated in three other examples. The outer surface of the incisive socket, so far as preserved, does not slope inwards in front of the boss, but remains parallel with the surface of the ramus behind it. The surface here is rendered concave by the prominence of the post-foraminal margin in front and the convexity of the boss below. The convexity of the outer wall of the ramus commencing below the hind lobe of m^1 ; and increasing to the root of the coronoid process, is higher and better defined above and below than in the larger species, and gives off the

process more gradually and with a distinct backward slope, which is continued along the edge of the coronoid plate—this in *D. australis* is vertical. The ascending ramus is relatively narrow, its external fossa very concave—below the condylar process its posterior wall is reduced to extreme thinness, where in *D. australis* the bone retains nearly an inch of thickness. The neck of the condyle is at its narrowest considerably broader—its articulating surface, not quite perfect in the specimen, also broader at its inner end. On the inner side of the jaw the post molar platform which in *D. australis* forms with the inner side of the ascending ramus a continuous surface expanding transversely, and produced backwards and upwards from the angle so that its edge overhangs the posterior dental foramen, in *D. minor* forms a narrow short and convex surface, with a low obtuse angle distant from the foramen by much more than the length of the last molar. The difference in age between these two jaws being entirely insufficient to account for the structural difference here shown, it must be due either to sex or species. The molar teeth are those of *D. australis*, reduced in dimensions. The premolar has been shed—its loss at this early age can hardly be other than an individuality, yet it may be observed that in the cast of a mandible of the species, the original of which is unknown to the writer, the appearances indicate a similarly early shedding of the premolar.

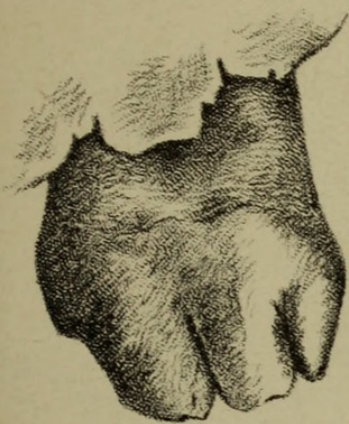
DIMENSIONS.	D. MINOR.	D. AUSTRALIS.
Length from anterior edge of dental orifice to back of coronoid process...	mm. 402	mm. 404
Height at sigmoid notch	254	264
„ condyle	296	309
„ m ³	106	115
„ d ⁴	129	147
Width of ascending ramus at the condylar process	149	172
Length of condyle	126	121
Breadth „ (mesial)	38	36
Length of molar series d ⁴ —m ³ ...	181	215

So far as these measurements are concerned, the points of greatest differentiation in *D. minor* are the length of the dental series, the anterior height of the jaw and the width of the ascending ramus—these are co-ordinate and might be sexual—but any such inference is contradicted by the greatest difference of all, a positive increase in the size of the condyle and condylar process, which is anything but a feminine character. The least difference is shown in the height of the ascending ramus, a dimension in which a female jaw would be expected to shew a decrease proportional to those of other parts. It may also be remarked that although the ascending ramus is narrower, its muscle capacity resulting from the depth of the external fossa, is little, if at all, inferior to that of *D. australis*. If, accepting the identification of the mandible, we recollect the better furniture of the upper premolar with its large prebasal tubercle, we may, from the whole, decide to discard any suspicion that we are dealing with the female of *D. Australis*.

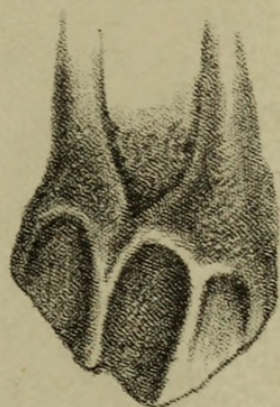
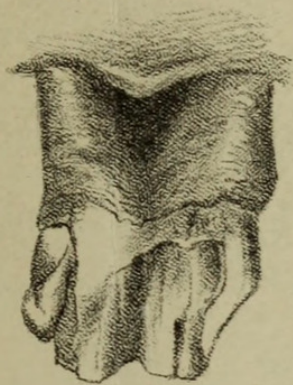
Obviously the mandible referred to *D. minor*, has much in common with that described by Sir R. Owen under the provisional name of *D. bennetti*.

To recapitulate.—The premolars figured by Professor Huxley are unmistakeably teeth of *Diprotodon*. The distinctness of the animal they represent from *D. australis*, affirmed with some reserve by Professor Huxley, and practically without reserve by Sir R. Owen, is confirmed by fresh evidence. The differences between the three premolars made known are reconcileable, the difficulty raised by them less than that of admitting three allied species in the same habitat. They represent one form, *D. minor*, which is a species, and not the female of *D. australis*. The genus therefore contains two Queensland species, *D. australis* Ow., and *D. minor* Hux.

DIPTROTODON TEETH
D. Minor. Huxley



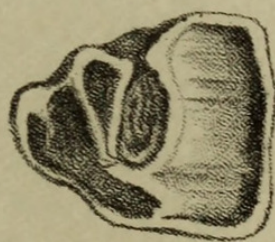
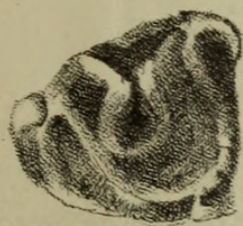
After Huxley



After Huxley

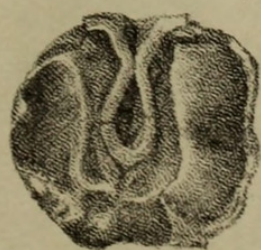
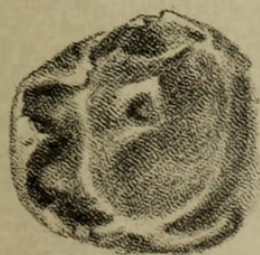
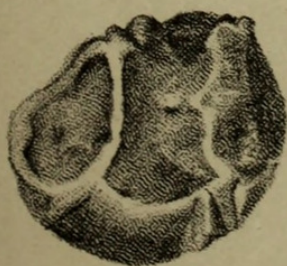
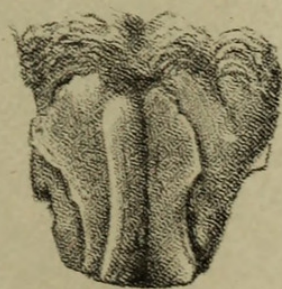
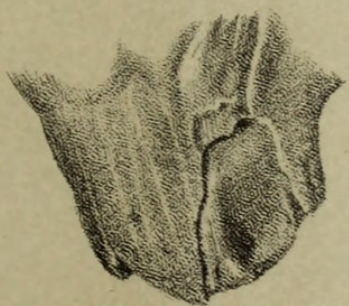
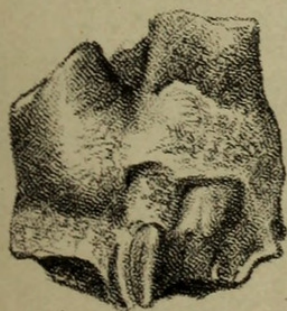


After Huxley



After Huxley

D. Australis. Owen





De Vis, Charles Walter. 1888. "On Diprotodon minor-Hux." *The Proceedings of the Royal Society of Queensland* 5(2), 38–44. <https://doi.org/10.5962/p.351109>.

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