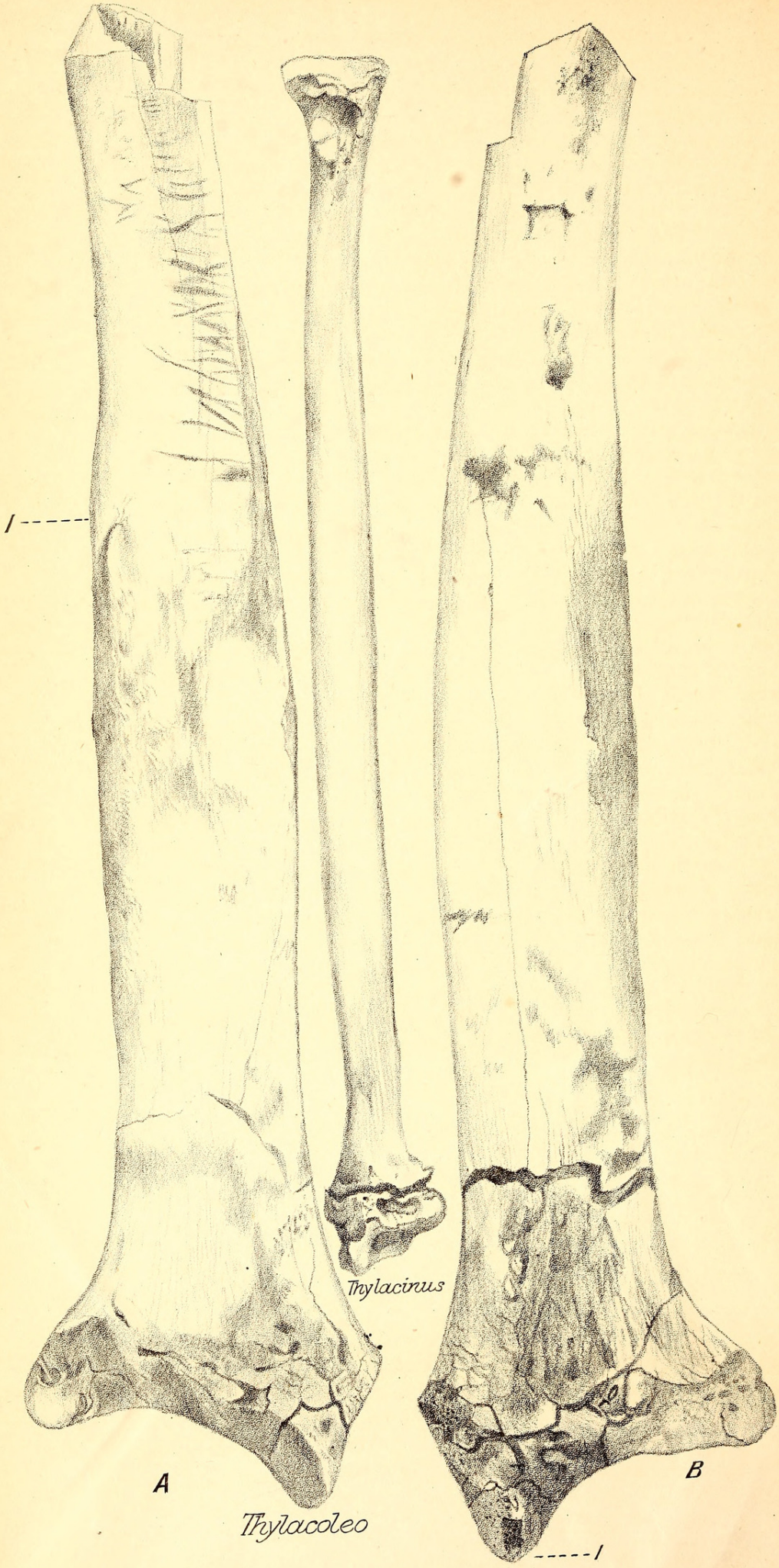

Thylacinus
A
Thylacoleo
B

BONES AND DIET OF THYLACOLEO.

In the year 1886 there was submitted to the judgment of osteologists (Pro. Roy. Soc. Queensland) a fossil femur bearing unmistakeable marks of derivation from some member, or close ally, of that strictly predaceous family of the *Marsupialia*, the Dasyuridæ. The affinity then recognised has not, apparently, been called in question. The animal, of which the bone is a relic, had at that time left to us no other known trace of its existence, unless, perchance, there might be attributed to it those jaws of formidable name, whose pretensions to represent marsupially the "king of beasts," have been, and still are, so briskly, and from one point of view not altogether unjustly, oppugned—the jaws of *Thylacoleo*. Pending, of course, the discovery of teeth, not thylacoleonine, possibly to be found in skeletal association with a like femur, or the rise of some other objection nearly as cogent, it was then proposed to see in a bone of that size, proportions, and form a part of the almost unknown skeleton of the beast, over which science has waxed warm, if not weary; and, since a phytophagous *Dasyure* is a thing hardly to be thought of, to disregard for the nonce the indications of a dental system, shown by experience capable of leading to contradictory conclusions, in favour of those given by a concomitant limb-bone, taken to be co-specific with such teeth, and infer from it that *Thylacoleo* was no more a plant-eater than *Thylacinus*, to which, on the testimony of this femur, it was more nearly related than to any other *Dasyure*.

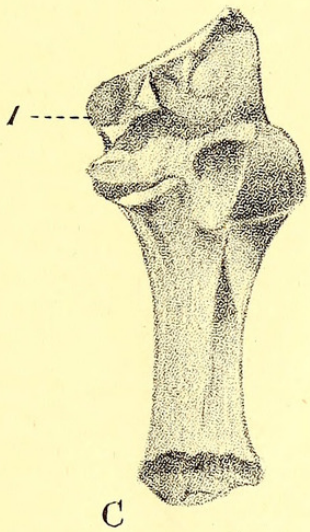
Since that time two things have happened: one is that other femoral fossils from the same, and other bones from the same or a very like source, have been brought to light; the other is that time has shown itself kindly disposed towards this line of argument, discrediting though it does the vegetarianism of the beast, in that it has not disclosed the teeth of any other marsupial in size compatible with this femur, and claiming affiliation with the Dasyuridae. The second thigh-bone which has presented itself for study is, with the exception of the head, complete, and is in all respects, save in exact equality of size, identical with the one already described. Its entire length to the summit of its great trochanter is 12 mm. less, and it is proportionately narrower in the joints and slenderer in the shaft. A small reduction of size in all dimensions may be held to indicate sexual inferiority rather than distinction of species; consequently the bone hardly calls for either detailed description or portraiture here. Still less does the third example, the distal fourth of a specifically identical femur, which in its bad state of preservation serves only to support the others in showing that the rarity of their owners was not sufficiently great to explain that entire absence of their teeth, which must be confessed if these are not to be seen in the much debated ones of *Thylacoleo*. The other bones showing relations with *Thylacinus* in an equal degree, and in size proportionate to the femurs, are portions of a right and left radius, part of a tibia, and three calcanea.

Radius.—Plate IV., figs. A, B. The only mammalian limb-bone which has a sufficient general resemblance to this to be at all comparable with it is the radius of *Thylacinus* shown in the intermediate

figure, but the amount of difference in form between the two forbids the slightest suspicion that the fossil may have come from a *Thylacine*, even could we easily imagine one of that genus some ten or twelve times the bulk of the living species. The following are the most obvious points of divergence: The convex ridge which serves the purpose of the so-called "styloid process" of anthropotomy has in *Thylacinus* a very oblique direction across the long axis of the shaft, more oblique than one would gather from the drawing. In the fossil its direction is parallel to that axis. The distal articular surface is at its ulnar end bounded by a pronounced tuberosity directed downwards; this feature, absent in *Thylacinus*, seems to be peculiar to its extinct relative. The shaft is compressed fore and aft like that of the dog, much broader than it is thick (27 mm. × 17 mm.), and of nearly the same breadth for the lower two-thirds of the part preserved; proximad of this two-thirds it contracts rather suddenly. It is interesting to find on this bone muscular impressions that have much significance; the extent of the origins of the pronator teres and supinator longus is strongly defined by terminal ridglets, while the surface for the supinator brevis extends downwards as low as the uncontracted part of the shaft, where, as it passed over the edge, its surface of attachment was increased by a protuberance on the margin of the bone—Plate IV., fig. A, 1. These indications of muscular activity in pronation and supination are to say the least not inconsistent with the possession and use of the great talon-cores attributed to the animal by Owen, and rather numerously represented in our collections; they point to free play of muscular forelimbs in the prehension or retention of provender of whatever kind.

The second sample of this bone being merely a much weathered distal end yields no further information, and may be passed over.

Tibia.—Plate V., fig. A.—The tibia, which, in the absence of any other claimant, may very reasonably, if not necessarily, be attributed to *Thylacoleo*, is exemplified by a proximal end with about 50 mm. of the shaft. The general form of its articular surface approaches decidedly to that of the tibia of *Thylacinus*, and, so doing, departs widely from the forms established in other Marsupials. Outside of the Marsupialia, the one of those which are available for comparison that comes nearest to it is the tibia of the Viverrine carnivores. Of the shaft, all that need be said is that the surface for the insertion of the ligamentum patellae is without any marked protuberance. The articular surface differs little in proportion but much in detail of form from that of *Thylacinus*. Its maximum and minimum diameters are 61 mm. and 50 mm.; those of *Thylacinus*, 38 mm. and 30 mm. Difference of general form results first from the greater proportionate length as well as breadth of the anterior tuberosity—Plate V., fig. A, 1—of which almost the whole anterior moiety was in the extinct animal occupied by the insertion of the patellar ligament. The great size of this tuberosity indicates, as in the kangaroos, uncommon power in the knee-joint, but that this power was not expended in saltatory swiftness is clear from the strong trend of the tuberosity outwards from the line of the thigh-bone (not

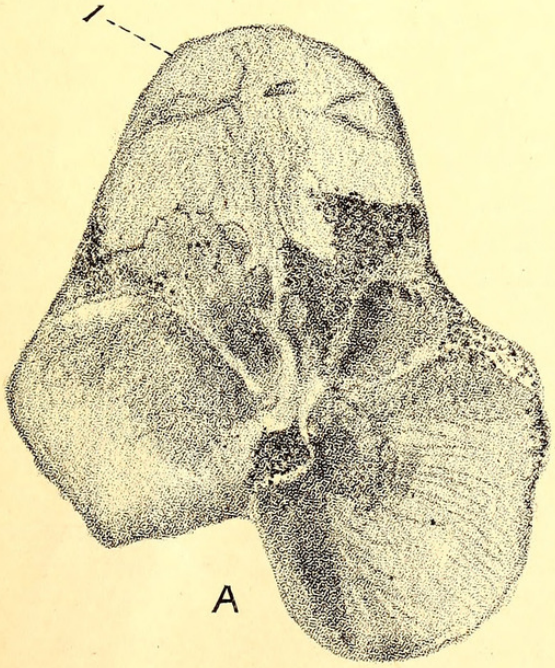


C

Thylacinus

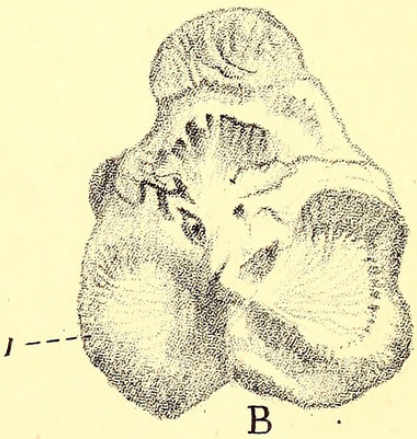
D

Thylacoleo



A

Thylacoleo

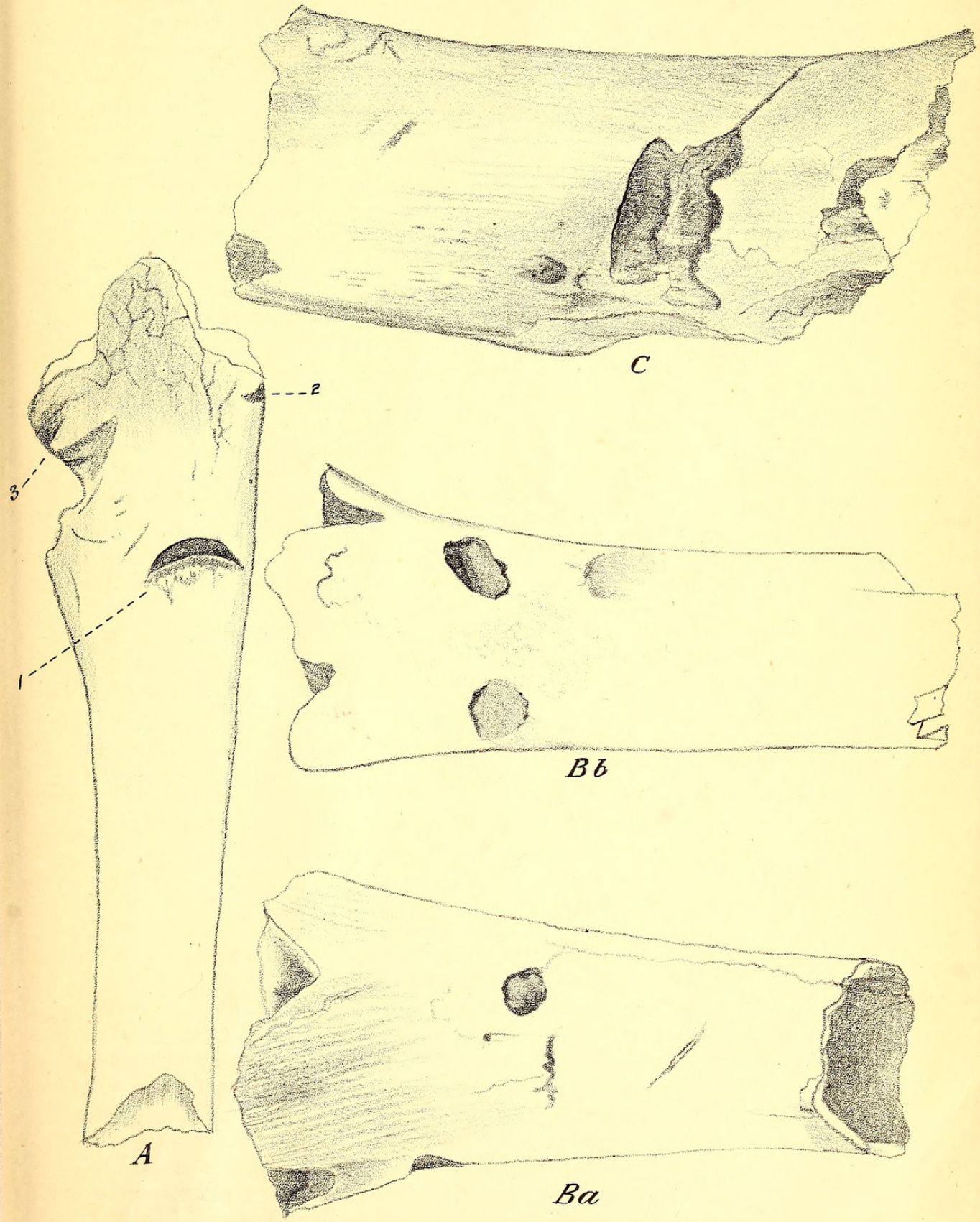


B

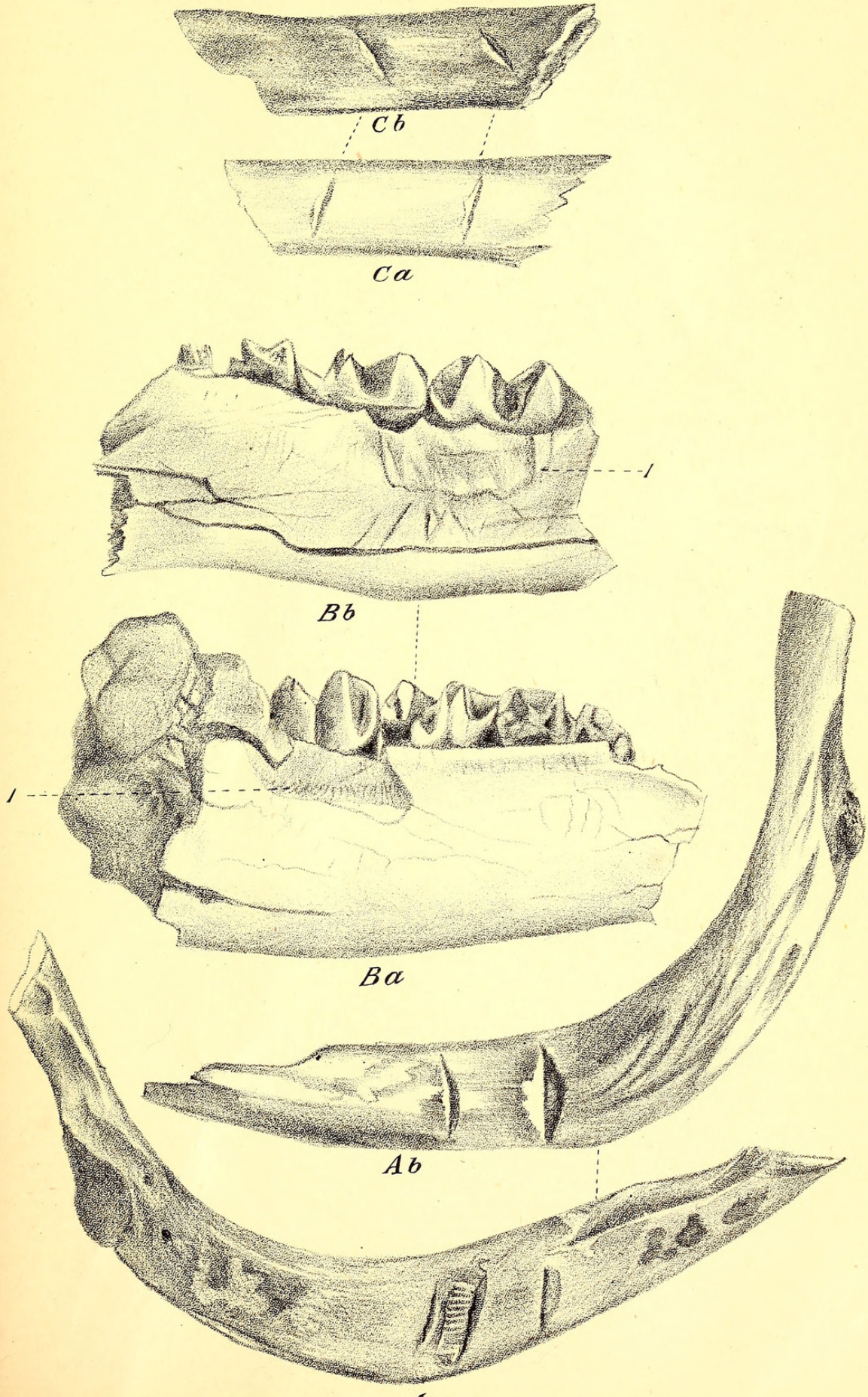
Thylacinus

work and recorded the fact on monuments left to us to decypher? On a former occasion those who are interested in the matter were asked (Pro. Lin. Soc., N.S.W., Vol. 8, p. 187) to accept a statement that tooth-marked bones are not unfrequently found interspersed among the fossils of the Darling Downs, and with it a suggestion that such bones bear evidence of maltreatment between the jaws of *Thylacoleo*, the cuts and bruises on their surfaces being fairly attributable to the action of the peculiar premolars of that animal. Up to that time no other teeth capable of producing the effects described were known, and the inference was a reasonable one, if only we could stand aside from the odontological dispute. No other such teeth have been subsequently discovered among some thousands collected in the interval, and the inference appears still more reasonable. But by way of presenting the facts in a clearer light by an appeal to the eye, some illustrations of the injuries to which the bones have been subjected are now offered.

On Plate VI., fig. A, we have delineated a part of an ulna of a large kangaroo. On the convexity of its anterior surface is a lunulate incision (1), conformable in its downward curve to that convexity; the proximal edge of the incision shows a clean slanting cut through the dense outer table of the bone to the vertical depth of a millimetre; the other the rough splintered surface from which the bone tissue was broken off by the stroke. This cut into the substance of the bone is clearly due to a vigorous use of some broad incisive instrument. Near the surface of fracture appears a smaller nick of the like nature (2), and nearly in opposition to it several scorings (3), evidently the marks of gnawing teeth, show where the division of the bone was ultimately effected. By what means was the cut (1) so cleanly made? The only two capable instruments known to me are the tomahawk and the tooth of *Thylacoleo*. The tooth of the dog was an incapable one, even were that animal on the spot at the time, which, as far as we know, it was not, The use of the human implement, were man also in existence then in Queensland, is positively denied, while that of the tooth of *Thylacoleo* is as positively affirmed by the second example. This (Plate VII., figs. Ca. and Cb.) is a rib of a kangaroo exhibiting on one side two adjacent cuts each similar to the one before mentioned, and exactly opposite to them on the other side two corresponding cuts. These latter prove incontestably that they and their opposites were made simultaneously by two chisel-edged shearing blades brought together with sudden force, for their sloping sides are inclined in opposite directions. Of precisely similar character are the cuts shown on opposite sides of a third fossil (Plate VII., figs. Aa. and Ab.)—and if it were necessary or even possible, there might be figured quite a number of bones telling the same tale in like manner though with varying emphasis. From the surface of the bone figured on Plate VI., fig. C., two contiguous portions of the substance of the bone have been chopped out bodily. Plate VII., Figs. Ba. and Bb., represents the most striking proof, however, that the interpretation of these palaeoglyphs is well founded. It is a mandible of a young kangaroo; on its outer side (Ba.) close to the root of the ascending limb the alveolar margin of the bone has



Tooth-marked Bones N°1



Toothmarked Bones 2

been crushed inwards and downwards so that a deep and well-defined area of impression has been left, Ba., and that impression is a mould in the soft bone of the surface of the tooth of a young *Thylacoleo.* On the inner side, opposite to this is another impression, Bb. 1, but shallower and with irregular vertical ridges and groovings just as clearly produced by the opposite tooth of the same jaw. The kangaroo mandible has unquestionably been grasped transversely by *Thylacoleo* jaws, which have vainly attempted to crush it between them. In addition to these signs of the work done by the premolars, the caniniform incisors of *Thylacoleo* have also left sufficient evidence of their destructive function. The subject of Plate VI., figs. B., *a* and *b*, is the distal end of a tibia. On one side of it is a deep circular pit, Ba, sunk through the substance of the bone by a conical body, which, in its passage, has thrust inwards the surface of the bone; opposite to this, on the other side, B b, are two similar pits. Pits like these are by no means infrequent, and can hardly be ascribed to any other agent than *Thylacoleo.* The ascription is, of course, open to the objection that they might have been caused by conical teeth other than those of *Thylacoleo*, crocodilian for example; but as on some bones they are found accompanying the transverse cuts—for example, on Plate VI., Fig. B*a*—it is difficult to suppose that the two kinds of toothmarks had different origins.

Whoever is inclined to think that the conclusions drawn from the two classes of data adduced in the preceding notes are as veritable as the facts on which they are founded are verifiable will have no difficulty is summarising the results as follows:—That in the old fauna there was a Dasyuridine animal of bulk commensurate with that of the skull called *Thylacoleo*; that this beast, though probably carnivorous, was also habitually ossivorous—in fact, a marsupial hyæna; that the marks of its teeth upon bones are such as could be made by the teeth of *Thylacoleo*; that in the absence of positive proof, or indeed any evidence to the contrary, we cannot reasonably refuse to accept that kind of evidence in this case, which in so many analogous cases we allow to direct our judgment, circumstantial and inferential, and decide that *Thylacoleo* was a beast of prey belonging to or nearly akin to, the Dasyuridæ.

In brief, one might suggest that, systematically, *Thylacoleo* should be placed under Dasyuridæ as a sub-family Thylacoleonina.