

Syndactyly in the Manus of a Marsupial

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(WITH PLATE I AND ONE FIGURE IN THE TEXT)

The wallabies and their allies (Macropodidae) normally have the typical mammalian pentadactyle manus.

A male pouch embryo of the wallaby, *Thylogale billardierii* (Desmarest), from Lake Leake, Tasmania, has been found with both the left and right manus abnormal. The specimen was collected in June, 1946, and is housed at the Tasmanian Museum, Hobart. Principal dimensions; head and body length 95.0 mm., head length 25.5 mm., tail length 22.0 mm., ear length 7.0 mm. and pes length 14.5 mm.

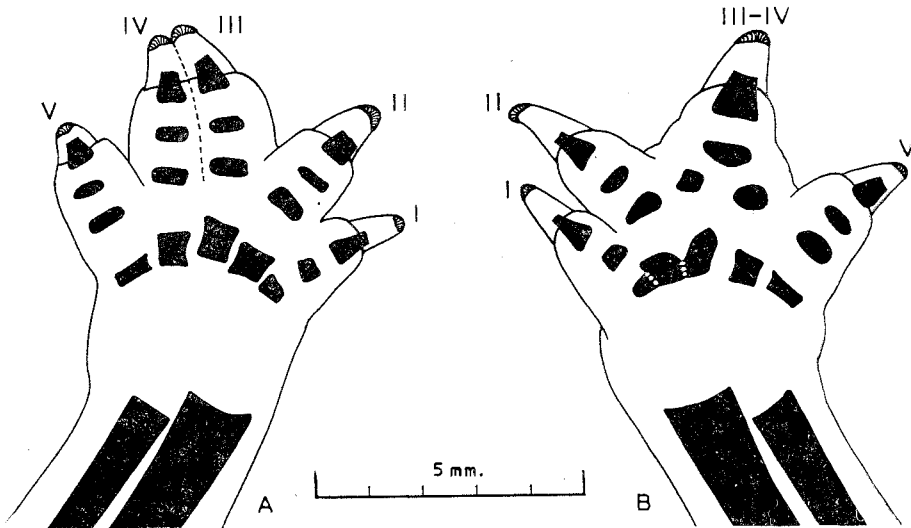


FIGURE 1

Thylogale billardierii.—Abnormal pouch embryo from Lake Leake, Tasmania.

- A. Right manus drawn from radiograph. Although digits 3 and 4 are externally partially syndactylous the metacarpals and phalanges are normal. Note the absence of centres of ossification for the carpal bones in both the right and left manus. Also, note the deciduous claws (shaded) on the ends of the permanent claws.
- B. Left manus drawn from radiograph. Digits 3 and 4 are externally completely syndactylous. Of the phalanges of these digits, the proximal ones are separate but the middle and distal ones are fused. Also, note that metacarpals 1, 2 and 3 are abnormal.

In this unique specimen digits 1, 2 and 5 are normal but digits 3 and 4 are conjoined. On the right side, digits 3 and 4 are partially syndactylous (Pl. I, A); a condition which immediately reminds one of the well known combined 2nd and 3rd digits in the pes of many marsupials. The conjoined digits are enclosed in a common skin and bear two distinct claws which, except at their distal ends, are fused. On the left side, digits 3 and 4 are externally completely syndactylous (Pl. I, B) and together bear only a single claw. Deciduous claws, similar to those described in the bandicoots, *Isodon obesulus* and *Perameles gunnii* (Lyne, 1952, pp. 634-635), are still retained on the ends of the permanent claws.

In order to interpret their bony structures without dissection both abnormal fore limbs have been X-rayed. In the manus with partially syndactylous digits (fig. 1, A) the metacarpals and phalanges are normal. There are five metacarpals, one at the base of each digit. The first digit has two phalanges while each of the other digits has three. In the manus with digits 3 and 4 externally completely syndactylous (fig. 1, B) some of the metacarpals and phalanges are abnormal. Metacarpals 1 and 2 are in close contact and appear to be fused. Proximally, metacarpal 3 is in close contact with metacarpal 2 and may or may not be fused. The phalanges of digits 1, 2 and 5 are normal but those of the fused digits are abnormal; of the phalanges of digits 3 and 4, the proximal ones are separate but the middle and distal ones are fused.

In neither manus does the radiograph show any sign of the carpal bones or distal epiphyses of the radius and ulna.

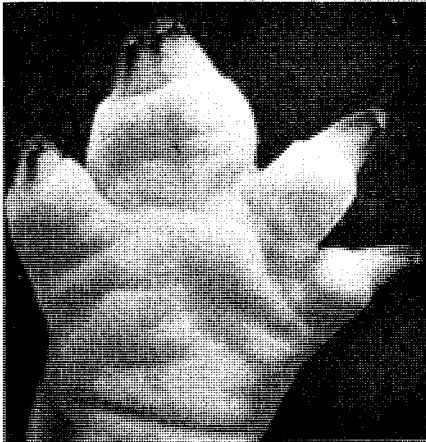
It is interesting to compare the manus of this marsupial with that of a full-time human foetus. In the human the carpus is cartilaginous at birth whereas the metacarpals and phalanges are well ossified (Jamieson, 1947, p. 262). The centres of two carpal bones, the capitate and hamate, appear six months after birth but the remainder of the carpal bones do not appear until much later. The primary centres of the metacarpals and phalanges appear between the eighth and twelfth week of intra-uterine life and at birth these bones are well ossified.

ACKNOWLEDGMENTS

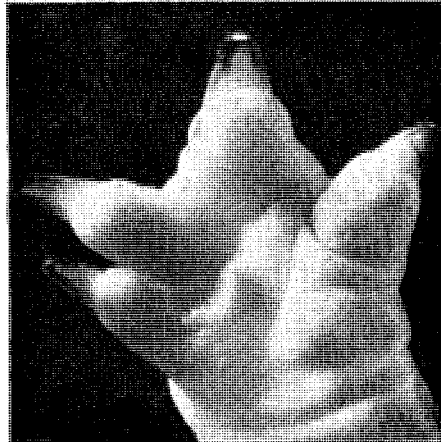
For the opportunity of examining this unique wallaby, I am indebted to Dr. J. Pearson of the Tasmanian Museum. Also, I wish to thank Dr. D. J. Rae, of Hobart, for the radiographs from which figures 1, A and 1, B have been drawn. Finally, I wish to thank Mr. D. W. Peacock who provided the photographs reproduced in Pl. I.

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- JAMIESON, E. B. (1947).—*Cunningham's Text-Book of Anatomy*. Eighth edition. Oxford Medical Publications, Oxford University Press.
- LYNE, A. G. (1952).—Notes on external characters of the pouch young of four species of bandicoot. *Proc. zool. Soc. Lond.*, 122, pp. 625-649.



A



B

Thylogale billardierii.—Abnormal pouch embryo from Lake Leake, Tasmania.

Figure A: Right manus, palmar aspect. Instead of the manus having a normal pentadactyle structure, digits 3 and 4 are partially syndactylous.

Figure B: Left manus, palmar aspect. Instead of the manus having a normal pentadactyle structure, digits 3 and 4 are externally completely syndactylous.

