

## Re-examination of the Quanbun Local Fauna, A Late Cenozoic Vertebrate Fauna from Western Australia

T.F. Flannery\*

### Abstract

Re-examination of a collection of fossil bones and teeth from Quanbun Station in the south-western Kimberley, Western Australia, has raised the possibility that the fossils may be Pliocene in age. If so, these bones represent the oldest described mammalian remains from Western Australia. The following taxa are present in the fauna: *Phascolonus* sp. cf. *P. gigas*, Diprotodontoidae indet., *Protemnodon* sp. cf. *P. roechus*, *Macropus pan*, cf. *Osphranter* and Crocodylidae indet.

### Introduction

The State of Western Australia, which comprises approximately one-third of the land mass of Australia, has thus far not yielded a single marsupial fauna of definite Tertiary age. The oldest published mammalian fossils from Western Australia are a P/3 similar to that of the species of *Potorous*, and some bone fragments from a bore at Jandakot near Perth, which are early Pleistocene in age (Balme 1980). Indeed, fossil marsupial faunas of any age except Holocene are extremely rare in the northern three-quarters of the State. The only substantial find reported thus far is the Quanbun local fauna. Glauert (1921) reported the finding of fossil bones during the excavation of a tank on Quanbun Station. Merrilees (1968) notes that the fossil locality is about 15 km north of Quanbun Homestead, and was formerly called Alligator Dam but is now known as Jubilee Dam. The stratigraphy of the site according to Glauert (1921) is as follows: 5 feet of dark, slate-coloured clay which is overlain by a conglomerate of varying thickness (no measurements given). Below this clay is a lighter and softer bone-bearing clay (no thickness given). Glauert identified '*Macropus*' (*Protemnodon*) *anak*, *Phascolonus gigas* and *Crocodylus* sp. in the fauna. Merrilees (1968) gives the faunal list as *Phascolonus gigas*, a large macropodine resembling *Protemnodon anak*, a further large macropodine and a crocodylian. The present author decided that the material warranted further examination upon recognizing *Macropus pan*, previously known only from early-mid Pliocene localities in Queensland, in the fauna.

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\* T.F. Flannery, School of Zoology, University of New South Wales, P.O. Box 1, Kensington, New South Wales 2033, Australia.

Dental terminology and homology follows Archer (1976a; 1978). All numbers refer to specimens in the collection of the Department of Palaeontology, Western Australian Museum. As is suggested in Flannery (1980) and Flannery and Archer (1982) the names *Macropus*, *Osphranter* and *Prionotemnus* are given generic status, although the species composition and status of *Prionotemnus* is at present under revision by the author.

### Systematics

Class Reptilia  
Order Crocodylia  
Family Crocodylidae  
**Crocodylidae indet.**

#### Material

A very large specimen of a crocodile is represented by two teeth, WAM 66.8.24 and WAM 66.8.23 (see Figure 1), and possibly some postcranial fragments.

#### Remarks

These teeth are indistinguishable in morphology from the anterior teeth of the largest specimens of *Crocodylus porosus* in the Australian Museum collections, but are slightly larger.

Molnar (1982) has recently reviewed fossil crocodile remains from Queensland. On the basis of his study, it is apparent that the Quanbun teeth cannot be distinguished from those of either *Pallimnarchus pollens* or *Crocodylus porosus*. However, they are unlikely to belong to any other named Australian taxon. *Crocodylus porosus* remains are known from the Pliocene to Recent, while those of *P. pollens* are restricted to Pliocene and Pleistocene sediments (Molnar 1982).

Class Mammalia  
Infraclass Marsupialia  
Family Vombatidae  
***Phascolonus* sp. cf. *P. gigas* (Owen, 1858)**

#### Material

A large wombat is represented at Quanbun by two incisor fragments, WAM 65.2.34, an I1/ fragment, and WAM 65.2.35, an I/1 fragment.

#### Description

The I1/ fragment indicates that this tooth was broad and flattened, such as is seen in *Phascolonus gigas* (Figure 1). The I/1 is slightly laterally compressed and indistinguishable in size and morphology from the same tooth in *P. gigas*.

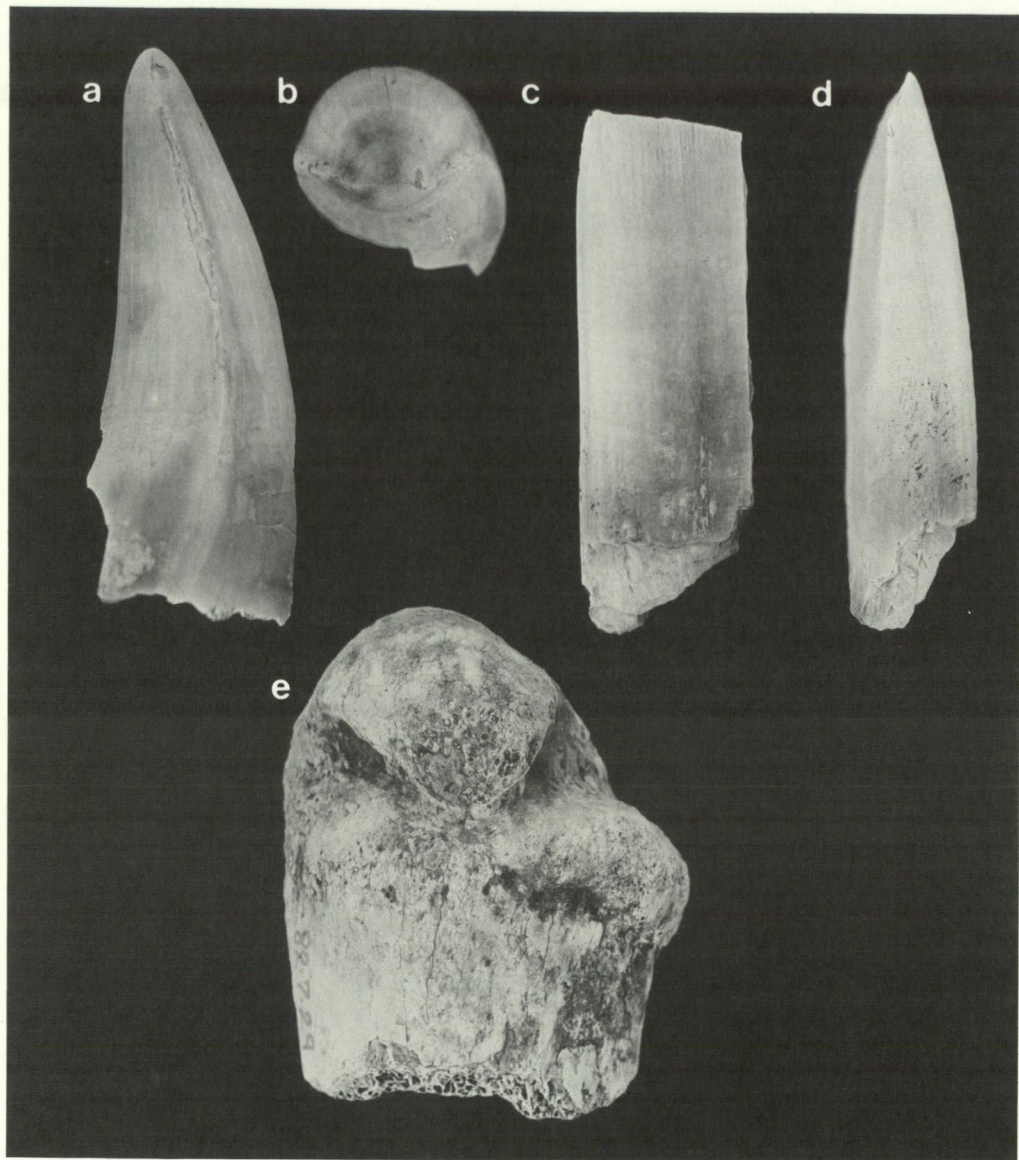


Figure 1 Crocodylidae indet. WAM 66.8.24, in (a) anterior or posterior view and (b) occlusal view. Partial left I1/ of *Phascolonus* sp. cf. *P. gigas* WAM 65.2.34, in (c) buccal and (d) posterior view; (e) Diprotodontoid partial metatarsal WAM 82.7.29 in dorsal view; x 1.25.

### Remarks

In being unusually flattened and broad, the Quanbun I1/ fragment is similar to I1/ fragments from the early Pliocene Bluff Downs (pers. obs.) and Bow (Skillbeck 1980) local faunas, and to specimens of *Phascolonus gigas* from many Pleistocene localities. Thus far, only *Phascolonus gigas* is known to possess such upper incisors. However, it is possible that the Pliocene specimens may belong to a separate species. *Phascolonus lemleyi* Archer, 1976b, known from the lower dentition from the Bluff Downs local fauna, may belong within the genus *Ramsayia* (Dawson 1981). Its relationship to *Phascolonus*-type material from the Pliocene is at present unknown.

### Superfamily Diprotodontoidea

#### Diprotodontoidea indet.

### Material

A diprotodontoid is represented by WAM 82.7.31, the closed, fused roots of a molar, and WAM 82.7.29, the distal end of a metatarsal, probably the fourth (Figure 1).

### Remarks

The metatarsal is too massive, and the epiphysis too deeply grooved laterally and medially to belong to a vombatid, and on the basis of size clearly represents a diprotodontoid. It cannot be determined at present whether it represents a diprotodontid or a palorchestid. However, it does not match closely any pedal element of the species of *Diprotodon*.

### Family Macropodidae

#### Subfamily Macropodinae

#### *Macropus pan* De Vis, 1895

*Macropus pan* De Vis, 1895: 124-7, Figs 7, 9-10.

*Macropus (Osphranter) pan* Bartholomai, 1975: 214, pls 16-18.

### Material

*Macropus pan* is represented in the Quanbun collection by a left dentary fragment containing M/4 (WAM 61.7.9) and four unguals of the fourth toe (WAM 68.10.84, WAM 68.10.83, WAM 68.10.85 and WAM 82.7.48). Other bones of a large species of *Macropus*, possibly *M. pan* are WAM 61.7.12a, a distal fourth metatarsal fragment, WAM 82.7.46, a left fifth metatarsal fragment, and WAM 68.10.79, a right calcaneum.

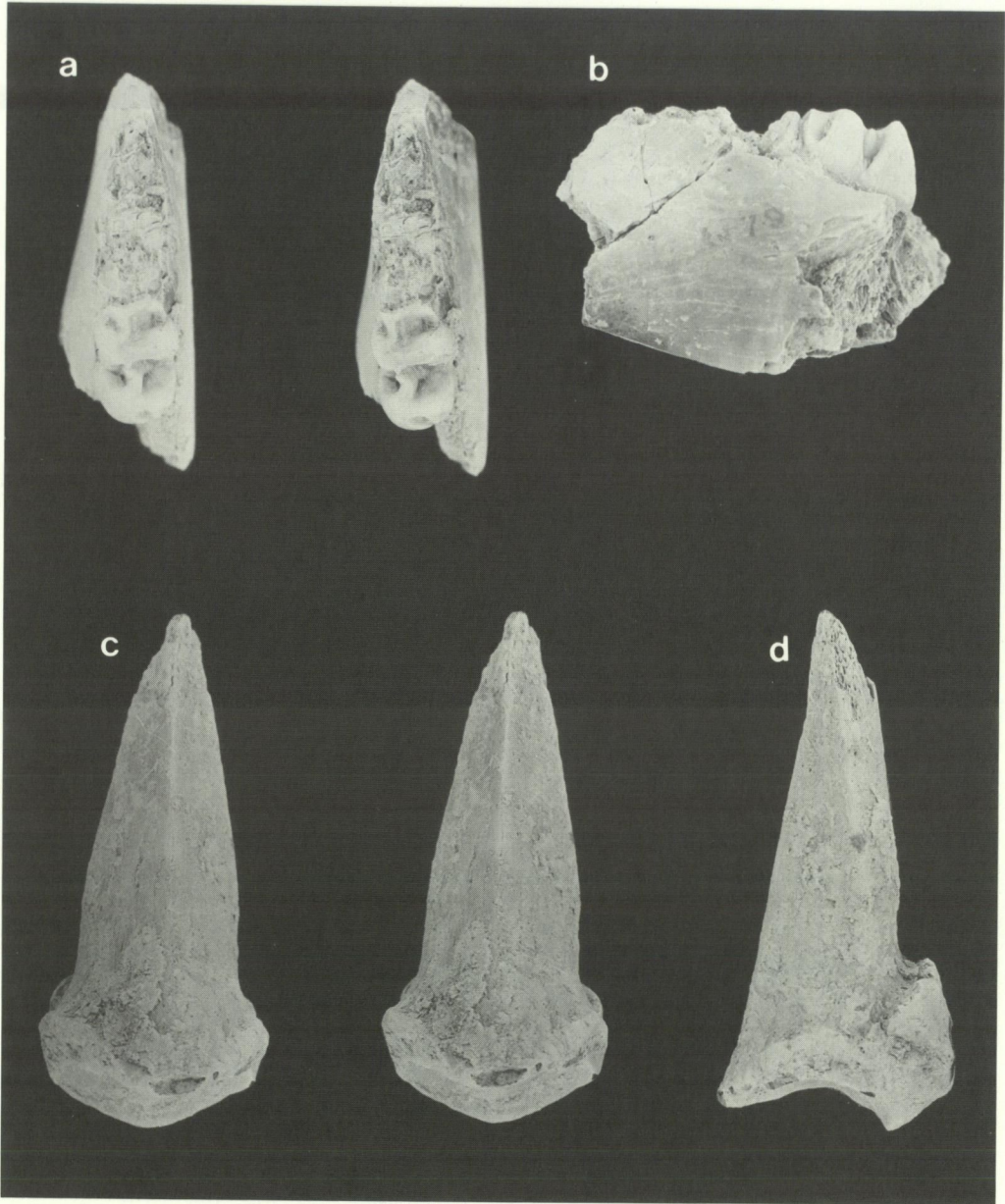


Figure 2 Stereopair of occlusal view (a) and buccal view (b) of left dentary of *Macropus pan*, WAM 61.7.9; and stereopair of dorsal view (c) and lateral view (d) of ungual of fourth toe assigned to *M. pan*, WAM 68.10.84; x 1.

## Description

The dentary fragment and M/4 are large, and the dentary is much deeper below the roots of M/2 than below the posterior of M/4 (Figure 2). The dentary is also markedly narrow anterior to the roots of M/2. The M/4 is high-crowned and the lophids have convex rear surfaces. The hypolophid is ornamented by a deep, slightly diagonally placed groove.

## Remarks

This specimen is too large to belong to *Osphranter altus*, *Osphranter woodsi* or *Osphranter pavana* (the M/4 being 18.7 mm in length, the protolophid 11.0 mm in width and the hypolophid 10.2 mm in width). It differs from *M. pearsoni* in lacking the very wide and flaring hypolophid groove, and it differs from *Macropus giganteus*, *Macropus fuliginosus* and *Macropus mundjabus* in having the hypolophid groove slightly more diagonally placed (see Bartholomai 1975, Flannery and Archer 1982). It also differs from the latter two species in being larger. However, the specimen is consistent in size and morphology with *M. pan*. The status of *Macropus ferragus* is at present uncertain and under revision. However, the Quanbun dentary differs from material referred to *M. ferragus* from western New South Wales (Marshall 1974) in being smaller, and in having a more diagonally placed hypolophid groove.

Further evidence of the existence of *Macropus pan* at Quanbun comes from the unguals of the fourth toe. They are very distinctive in morphology (Figure 2). The bones are large, straight and triangular in cross-section as in most species of *Macropus*, but differ from those of all other species by being slightly upwards-curving, and in possessing slightly concave dorsolateral sides. Although these foot bones have never been found directly associated with teeth of *M. pan*, they are thought to represent this species for the following reasons. Despite a very extensive search of Pleistocene and Tertiary fossil collections in Australian museums, unguals of this morphology have only been found in collections from the Pliocene Chinchilla and Bluff Downs local faunas, Queensland, and from Quanbun. The unguals clearly belong to a very large species of *Macropus*, and differ from those of *M. giganteus* (including large size variants known as *titan*), *M. fuliginosus*, *M. mundjabus* and *M. ferragus* (material from western New South Wales) which are known and associated with cranial material (see Flannery 1980). At Chinchilla and Quanbun, these unguals are found along with the dental remains of *M. pan*, and this is the largest species of *Macropus* occurring in these faunas. The only other *Macropus* species reported from Chinchilla is *Macropus woodsi*, and this species is clearly too small to be associated with the unguals. Thus it is considered likely that these unguals belong to *M. pan*. *M. pan* has thus far only been reported from Pliocene sediments.

*Protemnodon* sp. cf. *P. roechus* Owen, 1874**Material**

A large species of *Protemnodon* is represented by WAM 66.7.9, a right M4-5/, WAM 63.11.8, a right I/1, WAM 68.10.77, a left fourth metatarsal, WAM 68.10.78, a left fifth metatarsal, WAM 68.10.82, a proximal phalanx of the fourth toe and WAM 82.7.36, a medial phalanx of the fourth toe. Also, WAM 61.7.11, a right hypolophid, possibly of M/2, and WAM 61.7.10, a left protolophid, possibly of M/3 may come from Quanbun.

**Description**

The M4-5/ and I/1 are the most diagnostic elements. The right I/1 is moderately worn. The ventral enamel margin is rounded, as in *P. roechus*. In this feature it differs from the I/1 of *P. anak*, which possesses a distinct, sharp ventral enamel flange, not a rounded surface (Figure 3).

**Remarks**

The I/1 of the Pleistocene *Protemnodon brehus* and the Pliocene *Protemnodon chinchillaensis* and *Protemnodon devisi* are unknown. However, the I/1 of the Pliocene *Protemnodon newini* is narrower than the Quanbun tooth and also possesses a ventral enamel flange.

The M4-5/ can be clearly distinguished from all species of *Protemnodon* except *P. roechus* by their superior size (Table 1). Bartholomai (1973) reviewed the species of *Protemnodon* from Queensland, and gave revised diagnoses. In morphology, the Quanbun specimen resembles both *Protemnodon brehus* and *P. roechus*. However, the specimen is atypical of *P. roechus* in lacking the tuberculation of the lingual interloph valley often seen in that species (Figure 3). While it is possible that this specimen represents an extremely large form of *P. brehus*, this is considered unlikely, as in all measurements except M5/ length, the Quanbun specimen falls outside the range of variation of the extensive sample from Queensland studied by Bartholomai (1973).

**Table 1** Measurements (in mm) for WAM 66.7.9, *Protemnodon*, sp. cf. *P. roechus*; l = length, pw = protolophid width, hw = hypolophid width.

	l	pw	hw
M4/	18.5	15.5	14.3
M5/	18.5	15.3	13.2

Clearly, these specimens do not belong to *P. anak* as previously suggested, nor to any named Pliocene species. The Pleistocene species *P. roechus* and *P. brehus* are difficult to distinguish on the basis of fragmented remains. However, the Quanbun fossils are clearly closer to these species than to other named forms.

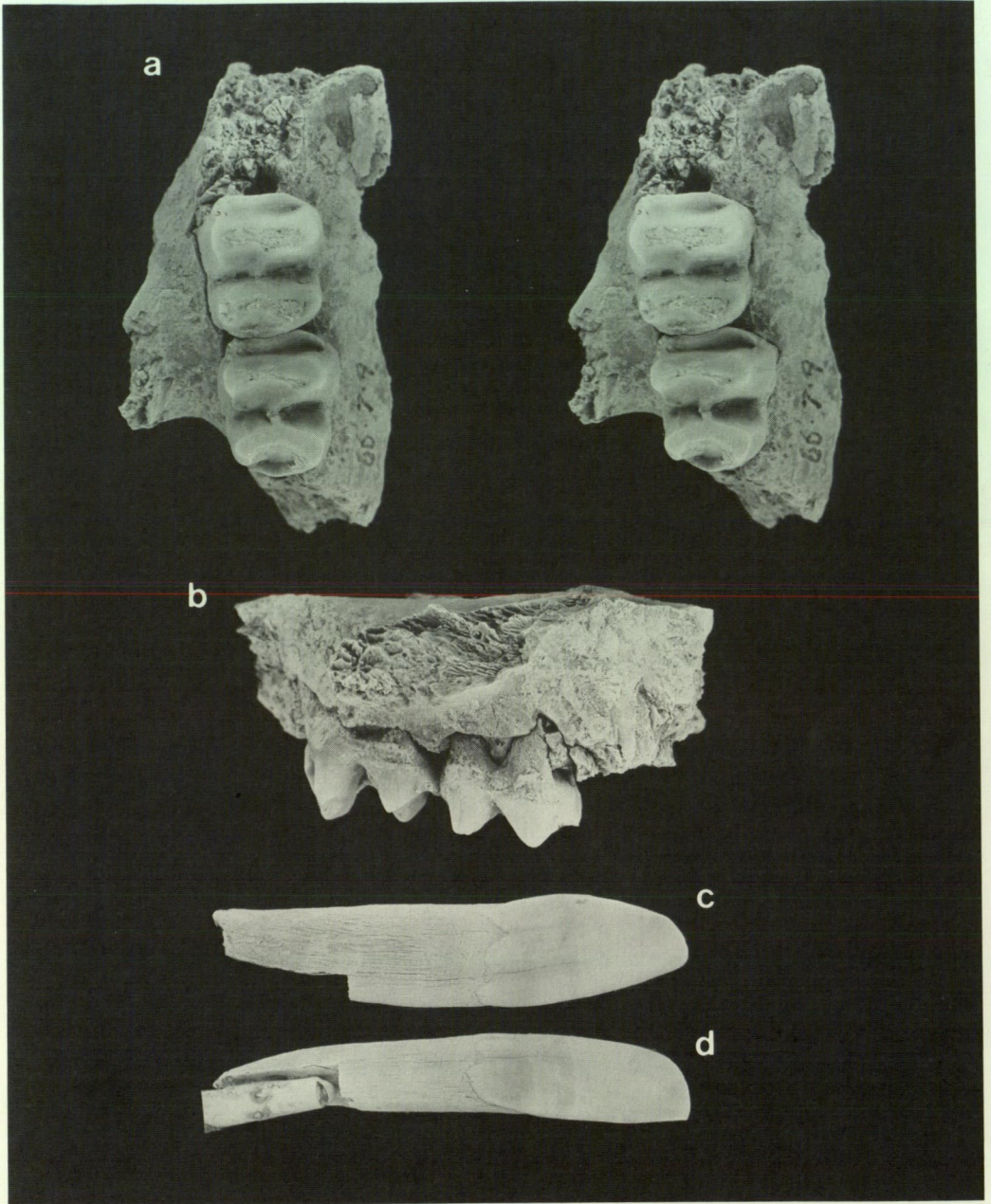


Figure 3 Stereopair of occlusal view (a) and buccal view (b) of M4-5/, WAM 66.7.9, and buccal view (c) and ventral view (d) of I/1 WAM 63.11.8, both of *Protemnodon* sp. cf. *P. roechus*; x 1.



WAM 61.7.10 and WAM 61.7.11 may not form part of the Quanbun local fauna, but may come from Cherrabun according to Merrilees (1968). They are clean of matrix and so unfortunately it cannot be determined if the same greyish-white clay that coats the Quanbun specimens was present on them also. However, if they are from Quanbun and belong to the same *Protemnodon* taxa as the other Quanbun material, WAM 61.7.11 would also be atypical of *P. roechus* in possessing a well-developed posterior cingulum.

### cf. *Osphranter*

#### Material

WAM 61.7.12b, the distal end of a left fourth metatarsal.

#### Remarks

This specimen may represent a species of *Osphranter*. The distal epiphysis is asymmetrical, the lateral side being noticeably shallower than the medial side. The shaft is also asymmetrical, the lateral side sloping more gently than the medial side. This morphology is characteristic of the species of *Osphranter* (particularly *O. rufus*), and some sthenurines. However, it can be distinguished from species of *Simosthenurus* and *Procoptodon* in that the central keel of the distal epiphysis is more prominent than in those forms (see Tedford 1966). However, the possibility that it belongs to a species of *Sthenurus* cannot be discounted.

### Discussion

At present our only extensive knowledge of the late Cenozoic fossil mammals of north-western Australia is derived from the Quanbun local fauna. Because of the nature of the remains, and a lack of sites for comparison in the area, the age and significance of the fauna are difficult to evaluate. The association of *Macropus pan* (elsewhere known only from the Pliocene of Queensland) and a large species of *Protemnodon* similar to *P. roechus* (known from the Pleistocene of eastern Australia) is unique to this site, and could be interpreted in several ways. Either the site is Pleistocene in age and the occurrence of *M. pan* is due to its survival in the Kimberley region after its extinction further east, or it is Pliocene in age and the large *Protemnodon* represents a new species, or an early occurrence of *P. roechus*.

Apart from the occurrence of these taxa together, the rest of the fauna is rather representative of Pliocene and Pleistocene faunas from elsewhere, particularly northern Australia. Unfortunately, little more can be said in terms of age or significance at present. However, the possibility of confirming the presence of Tertiary mammals in Western Australia should act as a strong incentive to re-excavate the site.

## Conclusions

The Quanbun local fauna is late Cenozoic in age. It consists of Crocodylidae indet., Diprotodontoidea indet., *Phascolonus* sp. cf. *P. gigas*, *Protemnodon* sp. cf. *P. roechus*, *Macropus pan* and cf. *Osphranter*.

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