SHORT COMMUNICATIONS

A PROBABLE MASKED OWL TYTO NOVAEHOLLANDIAE FROM PLEISTOCENE DEPOSITS OF COOPER CREEK, SOUTH AUSTRALIA

Fossil owls are uncommon in Australia, where only two specimens of the Masked Owl *Tyto novaehollandiae* have been reported from one locality in south-eastern South Australia (van Tets and Smith 1974). Thus, a probable second occurrence of this species from Pleistocene sediments along Cooper Creek expands the presently known geographical range of this species and indicates that a slightly smaller form of the Masked Owl may have inhabited the more interior areas of Australia, then as now.

The following abbreviations are used below: NMV, National Museum of Victoria; SAM, South Australian Museum; UCMP, University of California, Museum of Paleontology, Berkeley, California, USA.

Tyto cf. *novaehollandiae*

Material: Left tibiotarsus (UCMP 56368), lacking most of inner cnemial crest and attached fibula (Fig. 1).

Measurements: See Table I.

Locality and Stratigraphical Position: Markoni Locality (= Markoni Waterhole), UCMP V-5382, Cooper Creek, SA. Fossil material collected from sand bars in the main channel of Cooper Creek below twelve-metre cliffs that form the northern bank of the channel, grid coordinates 627455, Maree sheet (1: 506,880, Aust. Army HQ Cartogr. Co. 1942). Fossils probably derived from crossbedded buff to white quartz sand containing gypseous lenses of green clay, forming the basal part of the fluviatile sediments exposed in the cliffs.

Diagnosis: Differs from the typical owls (Strigidae) and is similar to the barn owls (Tytonidae) as follows: in proximal view, groove between the external articular surface and the outer cnemial crest narrow, not broad; posterior margin of external articular surface nearly parallel with rotular crest not diverging (nor converging) on it, and thus meets posterior margin of internal articular surface at an angle approaching 90°, not at a large obtuse angle. In posterior view, after articulating with tibiotarsal shaft along fibular crest, fibula again detached from tibiotarsus until it rejoins it just distal of the mid-point of the tibiotarsal shaft,

TABLE I

Tibiotarsal measurements (in mm) of fossil and Recent Tytonidae from Australia

	Tyto (UCMP 56368)	*T. alba* (16)* Range	X	SD	SE	*T. longimembris*** SAM B30879	SAM B30880	NMV B7429	*T. novaehollandiae* (5) Range	X	SD	SE	*T. tenebricosa*** (NMV-BO4263
Max. width, prox. end	12.2	8.4–10.2	9.6	0.4	0.1	11.1	10.6	—	11.5–14.4	12.5	1.2	0.5	±15.1
Max. length†	101.2	82.1–96.6	92.0	3.0	0.7	105.9	103.4	—	107.8–114.6	110	2.8	1.3	121.9
Length (A)	71.1	63.2–69.9	66.7	1.5	0.4	80.5	77.8	76.3	72.4–80.8	76.3	3.7	1.6	81.1
Max. width, (B) distal end	12.2	9.5–10.2	9.9	0.2	0.05	10.0	10.2	10.2	12.4–14.9	13.5	1.0	0.4	16.5
Max. depth,¶ int. condyle	11.4	9.1–10.4	9.7	0.3	0.08	11.1	10.3	10.5	11.7–14.9	13.0	1.2	0.5	±16.5
Max. depth ext. condyle¶¶	11.1	9.0–10.6	9.6	0.4	0.09	11.2	10.5	±10.6	11.9–14.7	13.0	1.1	0.5	—16.3
Ratio, A/B	5.8			6.5–7.1		8.1	7.6	7.5			5.3–6.1		4.9

* Number of specimens.
** Measurements made on left elements.
† External articular surface to distal end of external condyle.
(A) From distal end of fibular crest (at change of angle) to distal end of external condyle.
¶ Anteroposterior, internal condyle at right angles to axis of shaft.
¶¶ Anteroposterior, external condyle.

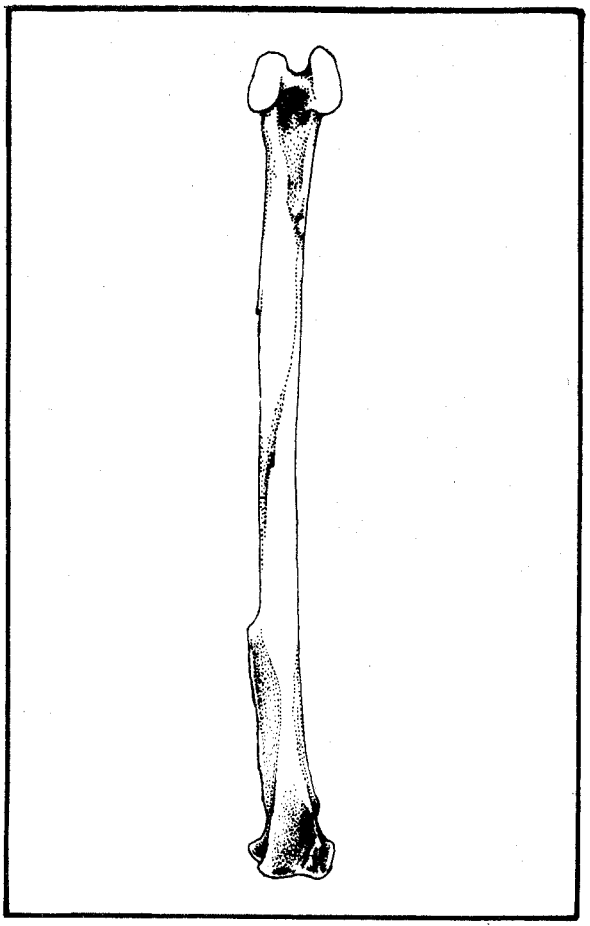

Figure 1. *Tyto* cf. *novaehollandiae*, left tibiotarsus (UCMP 56368), from Pleistocene sediments, Markoni Waterhole, Cooper Creek, South Australia. Total length, 101.2 mm. Drawing by R. Plant, NMV.

not near distal end. In distal view, distal end only slightly broader than deep or very nearly as broad as deep, rather than markedly broader than deep; internal condyle decidedly more slender than external, not equal in width; long axes of condyles markedly divergent anteriorly, not nearly parallel. General proportions of tibiotarsus tending to be elongate and slender, rather than robust.

In the family Tytonidae, two extant genera are known, *Phodilus* and *Tyto*. *Phodilus*, a rather colorful predator of temperate and tropical Asian forests, has a tibiotarsus that is shorter and more robust than the tibiotarsus from Cooper Creek.

When compared with the four Australian species of *Tyto* (*alba, longimembris, tenebricosa* and *novaehollandiae*), the tibiotarsus from Cooper Creek seems closest to that of the living Masked Owl. It is much more slender than is the tibiotarsus of *T. tenebricosa*, a larger and distinctly more robust form (see ratios, Table I) and appears to be somewhat less slender than that of either *T. alba* or *T. longimembris* (see ratios, Table I), although the sample of the latter species is small. The tibiotarsus from Cooper Creek is somewhat larger than any of the sixteen tibiotarsii of *T. alba* that we were able to measure. It is also slightly smaller in most measurements than the few (5) tibiotarsii of *T. novaehollandiae* measured but in most of these measurements the difference is a matter of only a few tenths of millimetre in a measurement of twelve millimetres or more (see Table I). With a larger sample from *T. novaehollandiae*, such small differences would probably be insignificant. Quantitatively, no significant differences can be found between the specimen from Cooper Creek and *T. novaehollandiae*.

Comparison with the other extant species of *Tyto* could not be made because we lacked material. Of these, *Tyto soumagnei, T. inexspectata* and *T. arurantia* with total length of 267, 279–330 and 279–330 millimetres (Grossman and Hamlet 1964) respectively are probably too small to be conspecific with the specimen from Cooper Creek. However, both *T. capensis* of Africa and Asia (and Australia if *T. longimembris* is included; Grossman and Hamlet, 1964) and *T. rosenbergii* from the Celebes certainly are within the range of size of the Cooper Creek owl and cannot be ruled out until further comparisons are made. It seems unlikely, however, that a form such as *T. rosenbergii*, at present restricted to rainforests, would have occurred in central Australia during the Pleistocene.

CONCLUSIONS

Although specific assignment cannot be made until specimens of *T. rosenbergii* and *T. capensis* are available for study, the tibiotarsus of an owl in the genus *Tyto* from Pleistocene sediments along Cooper Creek appears to be closely related to the Australian Masked Owl. Although in many measurements it is slightly smaller than any of the specimens of the living Masked Owls available to us, it ought to be pointed out that the extant sample was rather small. Qualitative differences between the Cooper Creek bone and *T. novaehollandiae* are non-existent and quantitative differences are slight. Quantitative differences, on the other hand, from other species of modern owls present in Australia today are more significant. Even when compared with the much larger sample of *Tyto alba*, the tibiotarsus from Cooper Creek is still significantly larger than that species.

At present *Tyto novaehollandiae* usually occurs in forest and woodland habitats and in some treeless

country where caves are available (Slater 1971); most maps of distribution indicate that this species ranges into the Cooper Creek area today but not into the more arid central parts of Australia. Parker (1977) has recently demonstrated, however, that records along the Cooper are really of the Barn Owl *Tyto alba,* not of *T. novaehollandiae.* Thus, the occurrence of a fossil Masked Owl in this area is an extension of geographical range of this species during the Pleistocene. Despite several erroneous reports of *T. novaehollandiae* in inland Australia, ARMcE believes that he observed this species in the Attack Creek area of the Northern Territory and makes the significant comment that individuals from the interior are smaller and paler than southern ones (based on specimens in NMV) and could easily be mistaken for Barn Owls.

Thus, the Masked Owl's occurrence near Cooper Creek is somewhat unexpected in the Pleistocene, which would then have provided wetter, more heavily vegetated river banks and presumably suitable shelter for this species than now. The small size of the Pleistocene fossil owl in comparison to those in our sample of modern Masked Owls, which unfortunately did not include any specimens from central Australia, may indicate that a small *T. novaehollandiae* has occupied the arid and more northerly latitudes of Australia for some time.

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SUBSPECIATION IN THE WHITE-THROATED WARBLER OF AUSTRALIA AND NEW GUINEA

The White-throated Warbler *Gerygone olivacea* occurs in coastal eastern and northern Australia, continuously from south-eastern South Australia to the Kimberley of Western Australia (McGill 1970) and in south-eastern New Guinea (Rand and Gilliard 1967). In south-eastern Australia it is a regular migrant, moving north presumably to central coastal Queensland (Storr 1973) in March–April and south in August–September.

Meise (1931) in his taxonomic revision of *Gerygone,* recognized four subspecies:

1. *olivacea.* Coastal eastern Australia north to the Barron River, Cairns district.
2. *flavigasta.* Western side of Cape York Peninsula between Normanton and the Watson River. Diagnosed as smaller (wing 55.5–57.5 against 56–62 mm), lighter and less olive above and with a narrower band of white on the base of the tail (5–10.5 against 17 mm) than the nominate form.
3. *rogersi.* Kimberley and the Northern Territory east to Brock's Creek. Like *flavigasta* but with grey (rather than white) barely discernible patches on the inner vanes of the base of the tail and perhaps smaller (wing 52–56 mm).
4. *cinerascens.* New Guinea, in the savanna country between Port Moresby and the Aroa River. Dorsum pale grey with only a tinge of olive and tail with little white at the base (4 mm wide).

Unfortunately Meise lacked material from the central and eastern parts of Cape York Peninsula and the western and southern sides of the Gulf of Carpentaria; so he was unable to determine how *olivacea* and *flavigasta* intergraded. Reader's Digest (1976) accepted all three subspecies for Australia. Storr (1973) amended the distributions as given by Meise, listing the range of *olivacea* as north to Rockingham Bay, Lake Lucy (upper Burdekin River) and the upper Flinders River (Hughenden area) and that of *flavigasta* as Cape York Peninsula, south to Kirrama (inland of Rockingham Bay) and the upper Einasleigh River, north-western Queensland, south to Lawn Hill and Sedan. However, Hall (1974) found that *rogersi* occurs east to Moonlight Creek, north-western Queensland, and *flavigasta* west to Wernadinga (just west of the lower Leichhardt River, head