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A NOTE ON THE POSTCRANIAL SKELETON OF *MILLERETTA* (AMNIOTA: PARAREPTILIA).

by

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ABSTRACT

This description of a partial postcranial skeleton of a mature individual of *Milleretta rubidgei* shows that it has very broad (laterally expanded) ribs, and growth of limb bones had ceased. Previously the only described postcranial skeleton was that of a young individual in which the ribs are not as broad and the ends of the limb bones were still formed of cartilage.

KEYWORDS: *Milleretta*, parareptiles

INTRODUCTION

The monospecific genus *Milleretta* is the least derived member of the Millerettidae, which also includes *Millerosaurus* and *Milleropsis* (Gow 1972). The family is remarkable for the development of a lateral temporal opening, and it is only adult *Milleretta* which have a completely closed temporal region. Until now the post cranial skeleton of *Milleretta* has been known from a single, nearly complete (including the skull), articulated juvenile individual, BP/1/3821. In the juvenile the ribs are moderately laterally expanded, but they do not overlap, thus, though the specimen described below was familiar to the writer, because of its greatly expanded ribs, it did not occur to him until recently that it might be a millerettid.

MATERIAL

The specimen, number BP/1/2040, was collected by J.W. Kitching in 1950 on the farm Wilgebosch, district New Bethesda, from the *Dicynodon* Assemblage zone (formerly *Daptocephalus* zone). It is thus the same age and from the same geographic region, as previously described millerettid material. Minimal mechanical preparation was required.

DESCRIPTION

The specimen is articulated, but somewhat laterally crushed. There are 15 presacral vertebrae, two sacrals, and three caudals, all with their ribs in fair condition on at least one side. Most of the pelvic girdle is preserved, also the left femur and proximal ends of tibia and fibula (Figure 1).

Vertebrae have the broad neural arches typical of fossil parareptiles; the spines have been eroded off. Transverse processes are prominent; widely spaced zygapophyses are oriented horizontally. Centra are amphicoelous and narrow ventrally. Intercentra are present. These vertebrae are indistinguishable from those of the juvenile, except that arch and centrum are fused in the adult.

Ribs (Figure 2) are very robust dorsally, and postero-laterally they have extensive caudad expansions which overlap the next rib posteriorly. Expansion has resulted from a drawing out of the posterior margin of each rib into a thin sheet; the posterior edge of each expanded rib bears fine crennelations. Ribs are holocephalus.

Gastralia are preserved along the full length of the trunk as previously recorded for *M. rubidgei* (Gow 1972).

Pubes and ischia are fused together, but the two plates have shifted relative to one another and appear to have been loosely connected.

Only the left ilium is complete; the dorsal blade is broadly expanded relative to the neck of the bone, with most of the expansion directed posteriad. The acetabular region is damaged on the right side and obscured by the femur on the left.

Whereas the limb bones of the juvenile skeleton have unfinished extremities, the femur of this specimen (Figure 2) is fully ossified, a clear indication that the animal was full grown.

The femur is drawn foreward displaying the large internal trochanter and intercondylar fossa. Only the proximal ends of tibia and fibula are preserved, in articulation with the femur.

DISCUSSION

The skeleton described above is the same geological age as the only other *Milleretta* skeleton known (Gow 1972), which is that of a juvenile. The new skeleton is clearly that of an adult as demonstrated by fusion of the elements of the vertebrae and the fully formed articular ends of the limb bones. In view of correspondence in provinence and morphology, there can be no doubt that this is a *Milleretta* skeleton. Expansion of the ribs increases considerably with age, resulting in considerable overlap of adjacent prelumbar ribs. Why the animal should have such robust, imbricating ribs is not obvious, particularly as the

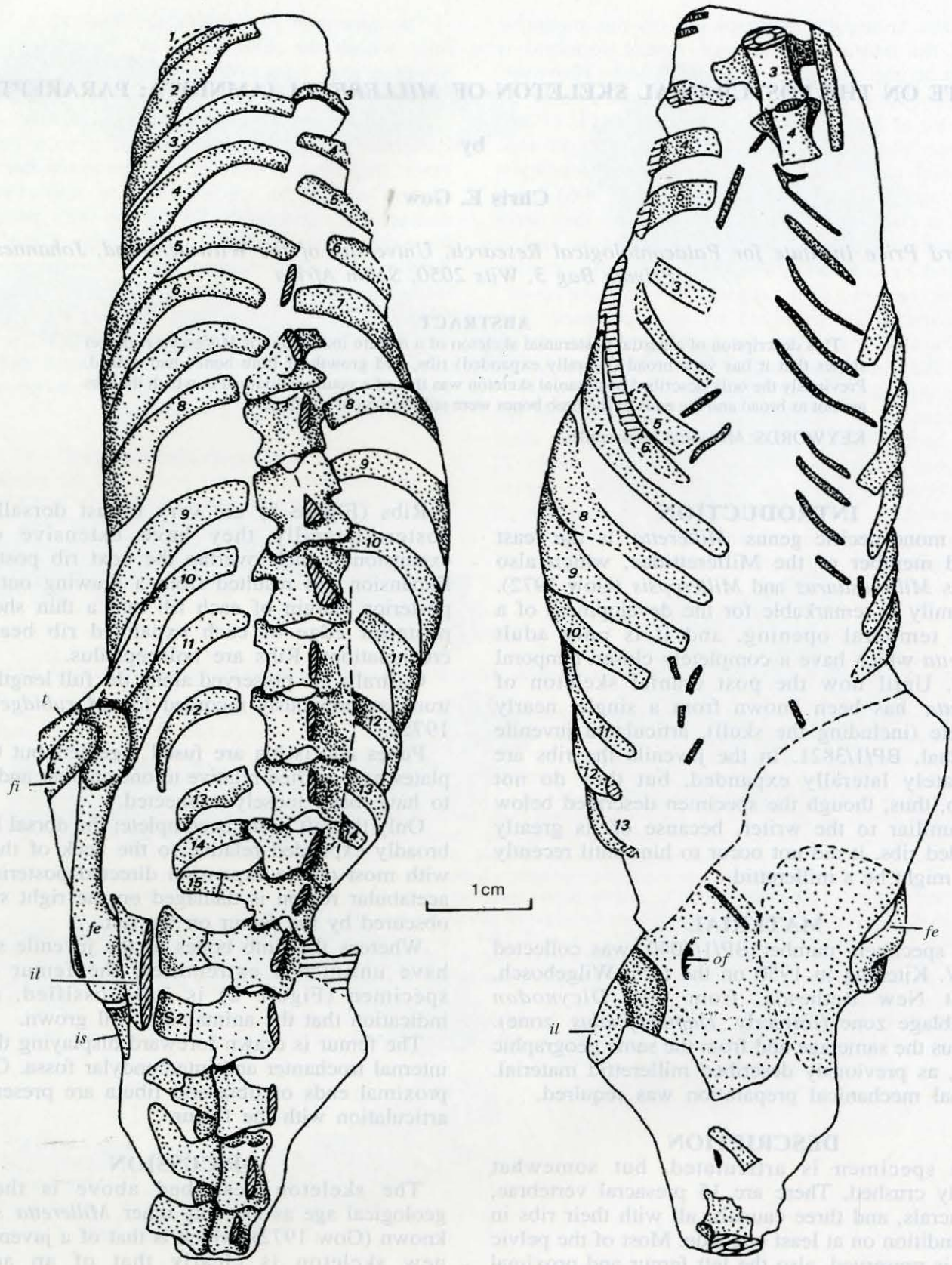


Figure 1. *Milleretta* BP/1/2040 postcranial skeleton in dorsal and ventral views.

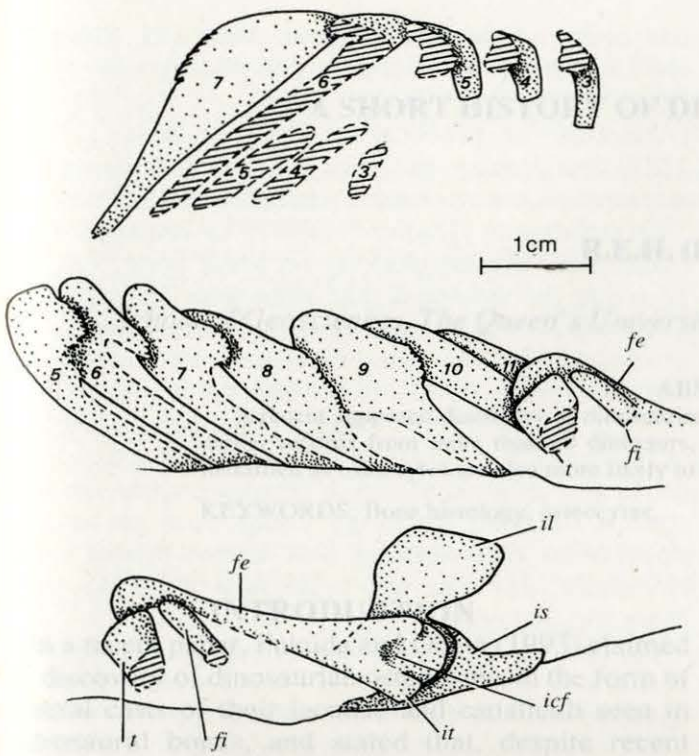


Figure 2. *Milleretta* BP/1/2040. Top to bottom: anterior ribs of right side; posterior ribs of left side and part of hind limb; left pelvic girdle and hind limb.

related *Millerosaurus* and *Millerops*is have slender ribs. Certainly thick ribs offer considerable physical protection; they could also limit the degree of lateral flexure of the body, which might reduce speed, but on the other hand facilitate sustained slow locomotion (a well known capability of modern day Karoo tortoises, for example). It could be that a more rigid trunk in adults is an adaptation to burrowing; foot morphology could have a bearing on this suggestion, but the feet are not known at this time.

It is argued elsewhere (Gow in prep.), that millerettids and *Eunotosaurus* are sister taxa lying outside Ankyramorpha (Debraga and Reisz 1996) in Parareptilia. However, rib morphology should not be regarded uncritically as an additional synapomorphy, as it has been attained rather differently in the two genera. In *Milleretta* the vertebrae are plesiomorphic, while the ribs are broadened by simply drawing out the shaft to an airfoil like section; in contrast, the *Eunotosaurus* trunk vertebrae are elongated and the ribs have double articulations and a drawn out "T" shaped section. If there is a synapomorphy it cannot be stated more precisely that "ribs thickened".

ABBREVIATIONS

fe	femur
fi	fibula
h	humerus
icf	intercondylar fossa
il	ilium
is	ischium
it	internal trochanter
of	obturator foramen
t	tibia

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