

### The Pterosaur Database

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This short paper was written to describe a single wing-metacarpal bone found in the Belgian Congo near Bibanga. The 3 figures, which appeared on one plate, have been appropriately positioned within the text.

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## A Cretaceous Pterosaur from the Belgian Congo,

by W. E. SWINTON.

In May 1947, it was announced by M. L. Cahen and J. Lepersonne (1, p.614) that the remains of the first reptile bone to be found in the Karoo of the Belgian Congo had just been discovered. This important announcement stated {Il nous reste à signaler ici que M. Bequaert, attaché au Musée du Congo belge, a ramené des environs de Bibanga (Sankuru) un os fossilisé de reptile trouvé en contre-bas d'un petit relief formé des couches L 3 ou B. Des lambeaux de schistes adhérent encore à l'os qui est ainsi bien localisé stratigraphiquement. Ce fossile est à l'étude actuellement et nous espérons qu'une détermination permettra de tirer profit de cette importante trouvaille paléontologique.}

This fossil is of great importance and it is with appreciation of this that I wish to thank the authorities of the Musée du Congo Belge, and especially M. Lepersonne and Cahen for the honour they have done me in submitting the specimen for examination and allowing me to contribute this paper to their symposium.

The bone was found lying upon the ground, in three closely associated pieces. The locality may be given, as near Bibanga (Katanga-Kasai border), Belgian Congo, Latitude 6° 29' S, Longitude 23° S 4' E.

A small amount of matrix was adhering to the bone and it is clear that in colour and texture it approximates to the constituents of the Lualaba Series that is probably Middle Beaufort (Karoo) age.

On their receipt in the Geological Department of the British Museum the three fragments were very carefully cleaned and fitted together. There is no doubt that they are three adjoining portions of one bone. This bone is incomplete and only the distal part is represented. The combined portion is of a pinkish brown colour, at first sight reminiscent of many Karoo bones. The distal end is well preserved but proximally the bone surface is much cracked with a characteristic egg-shell type of fracture. The main characteristic is the extreme thinness of the bone wall, which is never more than 1 mm thick.

The dimensions are:

Total length of fragment	184 mm
Maximum width (lateral) at proximal end	27 mm
Anterior-posterior width at proximal end	20 mm
Maximum width (lateral) at distal end	22 mm
Maximum anterior-posterior width	24 mm

The broken proximal end is oval, the medullary cavity being filled with a fine grained soft grit and there is no sign of any structure. The bone then gradually narrows until it reaches its maximum width, in both

directions, at 55mm from the distal end. From this point it runs very nearly straight, but with a very slight expansion, to the articular end. The surface of the bone throughout, where it is not coloured by the matrix, is compact and calcite-like in appearance. The view of the hinder (or ventral) surface is seen in figure 1.

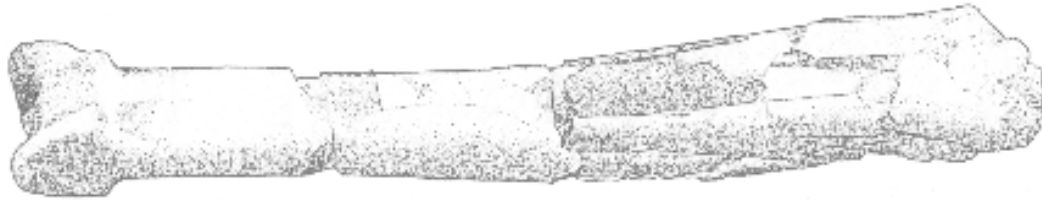


Fig. 1. Hinder (ventral) aspect of wing-finger metacarpal. Natural size.

The distal, articular, end is very distinctive and is closely similar to a fragment described by Owen (2, pp. 17-19, pl. IV). It is clearly a pulley-joint with three convex ridges. The two outer ridges form the lateral margins of the bone and extend from the front surface, where they start 16 mm above the distal end, right round to the posterior surface, where they die out 18 mm above the distal end. They both thus describe more than a half circle. The middle ridge is small and less extensive; indeed it is only seen for 10 mm on the very base of the bone. The ridges are all roughly parallel and are oblique, being inclined  $23^\circ$  outwards from the antero-posterior direction. The outer ridge is thicker than the inner but projects slightly less anteriorly and considerably more posteriorly than the inner ridge. Seen from below, the bone is very much like a pulley in section and these ridges are 3 mm high, whereas the central ridge is elevated slightly less than 1 mm. The pulley muscle was therefore confined in a well-developed groove and a testimony to its strength is given by the impression of a sesamoid bone on the hinder surface above the ridges. Although the outer and inner ridges are in the same direction so far as their effective control over the pulley muscle is concerned, their varied thickness makes the sides of the bones slope at different angles so that the lines continuing their directions would converge at 60 mm behind the back of the bone. These features are observable in figures 2 and 3.



Fig. 2. Outer (lateral) aspect of distal articular end. Natural size.



Fig. 3. Articular surface of distal end. x 2.

The remarkable lightness and thinness of the bone and the details of its trochlear joint prove that the bone comes from a Pterosaur, or flying reptile.

The bone itself is the distal half of the metacarpal of a wing finger of the left side. The proximal end, despite its crushing, is clearly not of the triangular section that is characteristic of the proximal end of the complete metacarpal. A comparison with other specimens suggests that the present specimen if complete might be about 36 cm long. This again suggests that, using the general proportions that obtain in some of the Pterosaurs, the length of the whole wing might be just over 2 metres (7 feet) and that the whole wing span would be in the region of 4-5 metres (15 feet).

Reliability cannot be placed on this figure for considerable variety exists in the relative length of the metacarpus and phalanges (*sic*) in different genera of Pterosaurs but it is certain that the Pterosaur from which the bone was derived was of considerable size. Its actual generic identity may then be sought along two lines. Firstly, by direct comparison with other specimens; and secondly on the grounds of size alone, since it does roughly distinguish the Pterosaurian families.

Comparison with other specimens shows its very close similarity to the bone described by Owen and referred to above, although that specimen is slightly larger, with a slightly wider groove, and is from the opposite wing-finger. It is also in close agreement with three specimens, showing the distal articular ends, in the British Museum, each of which was separately determined by Sir Arthur Smith Woodward and Dr. C. W. Andrews. All these specimens have been referred to the genus *Ornithocheirus*, and Owen's species, *Pterodactylus sedgwicki* and *P. fittoni*, have since been transferred to that genus also.

Further it is clear, from the examination of specimens and literature, that it is not similar in size and build to *Dimorphodon*, *Rhamphorhynchus*, *Scaphognathus* or *Pterodactylus*.

It is with some assurance, therefore, that this bone can be placed in the family Ornithocheiridae, and it is probably referable to a genus close to *Ornithocheirus*. The family Ornithocheiridae includes the largest of the Pterosaurs, reptiles with wing spans of from 1.5 to 6 metres. The age of all these specimens is cretaceous.

Pterosaur remains have already been reported from Africa, as the Upper Jurassic beds at Tendaguru, Tanganyika Territory have yielded fragments that have been assigned to *Rhamphorhynchus* and *Pterodactylus*. The new discovery would suggest that the Congo deposits from which it came was younger in age. The oldest *Ornithocheirus* is of Wealden age; the majority are of Cambridge Greensand to Lower Chalk age. There is nothing to suggest that the Pterosaurs were developed earlier or more fully advanced in Africa so that its age is not likely to be pre-Wealden.

The precise stratigraphical consequences of this discovery will be obvious to those taking part in the symposium. It would seem that the bone is derived from some stage of the Kalahari, and that this was not later than stages 2b or 3 of the table given by Cahen, Jamotte, Lepersonne and Mortelmans (3) and is probably slightly younger.

Whatever the precise stratigraphical conclusions may be, the importance of the discovery of this small fragment of a Cretaceous Pterosaur is considerable.

British Museum. Natural History.

#### References.

1. Cahen, L. et Lepersonne, J., 1947, *Bull. des séances de l'Inst. Royal Col. Belge*, XVIII, 1947, 2, p. 614.
2. Owen, R., 1859, Monograph on the Fossil Reptiles of the Cretaceous Formations (*Mon. Pal. Soc.*, Supplement No 1, London).
3. L. Cahen, A. Jamotte, J. Lepersonne et G. Mortelmans, 1948, Congo belge et Ruanda-Urundi (*Bull. du Service Géologique*, no 2, 1946, fasc. II pp. 237-289).