

The Pterosaur Database

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1901; Guide to the Fossil reptiles, Amphibians and Fishes in the British Museum of Natural History.

This is a transcript of an extract of this publication devoted to the pterosaurs in the museum collection in 1901. The text was presented as a guide booklet to the collections of the British Museum of Natural History, London; this is now The Natural History Museum. The preamble is about earth history and the Pterosauria appear as the second order of reptiles, following marine reptiles and followed by crocodiles, etc...

This work shows how the perception of the pterosaurs had changed from that of Pterodactyles in 1891 to that of the Pterosauria or Ornithosauria.

GUIDE TO THE FOSSIL REPTILES, AMPHIBIANS AND FISHES IN THE BRITISH MUSEUM.

PART I

REPTILIAN GALLERY

[Introduction and marine reptiles omitted here]

Order II. - ORNITHOSAURIA.

True flying reptiles lived throughout the Secondary period, and are known by many nearly complete skeletons from the Lias of England and Germany, the Lithographic Limestone (Kimmeridgian) of Germany, and the Chalk of Kansas, U.S.A. They form the Order Ornithosauria ("bird-lizards"), or Pterosauria ("winged-lizards"), and are commonly referred to as Pterodactyls, because Cuvier gave the name of *Pterodactylus* ("wing-finger") to the first specimen when he originally described them and recognised their true nature. In these reptiles the skeleton is very light, and composed of hard, dense bone like that of the birds of flight; while the vertebrae and limb-bones have well-fitting joints, and are hollowed to receive air from the lungs. The head is shaped like that of a bird, and similarly fixed at right angles to the neck. The brain is comparatively small, but in the arrangement of its parts it bears a most striking resemblance to the brain of birds. The neck is stout and mobile, its large vertebrae being united by ball-and-socket joints, in which the ball is posterior. The body is relatively small, and the tail varies in extent, being sometimes long and slender, sometimes very short. The wings are disproportionately large, and the wing-membrane is supported by the much-elongated fifth finger, while the other fingers remain small or even rudimentary. The breast-bone is expanded as in birds, and keeled in front to accommodate the muscles for flapping the wings. The hind limbs are weak, and four of the slender toes bear claws. No armour of any kind has been noticed even in the finest known specimens from the Lithographic Stone of Bavaria, which exhibit clear impressions of smooth wing-membrane.



FIG. 3.—Skeleton of a toothless Flying Reptile (*Pteranodon occidentalis*), from the Upper Cretaceous of Kansas, U.S.A.; about one fifty-fourth nat. size. (Wall-case 2.)

The latest Pterodactyls are the largest, and are best known by skeletons from the Chalk of Kansas. They are well illustrated by a fine pair of wings of *Pteranodon*, which are mounted on a picture of the complete skeleton in Wall-case 2 (Fig. 3). The outline and proportions of the bones painted in the picture are based partly on specimens in American museums, partly on the imperfect remains in Table-case D. The jaws form a sharp, toothless beak, and the head rises behind into a prominent crest. The breast-bone is short and broad with a keel in front; and the shoulder-blade on each side is firmly fixed to the backbone to strengthen the socket in which the wing works. The wing-fingers, of which the actual bones are shown, are immense, and the supposed extent of the membrane they originally supported is indicated in colour. The total expanse of the wings is about eighteen feet [5.5m], and it is thought that the principal muscle which rises them upwards had their origin in the crest at the back of the head [an interesting idea!]. Three diminutive fingers with conspicuous claws occur as mere splints grafted on the basal piece of each wing-finger. The hind legs are weak, and could scarcely have supported the whole weight of the animal when at rest or moving on the ground.



FIG. 4.—Skeleton of a short-tailed Flying Reptile (*Pterodactylus spiciferus*), from the Upper Jurassic (Lithographic Stone) of Eichstätt, Bavaria; nat. size. a. pubic bone. (Table-case 1.)

The remains of Pteranodon in Table-case D. include an imperfect skull and mandible, and the hind legs associated with the wings and breast-bone. All the specimens from the Kansas Chalk are flattened in the rock and broken by pressure; but a few bones of similar gigantic Pterodactyls from the English Chalk have their central cavity filled with rock, and so preserve their original shape. An incomplete humerus from the Chalk at Burnham, Kent, in Table-case 4 is especially noteworthy in this respect: where sharply cut across in three places it displays the extreme thinness of the dense bony wall, and also exhibits traces of an internal framework of delicate struts to strengthen the expanded upper end. Most of the English Cretaceous Pterodactyls (*Ornithocheirus*) were provided with large teeth in sockets, as shown by portions of jaws from both the Chalk and the Cambridge Greensand. Some of their American contemporaries were also toothed.

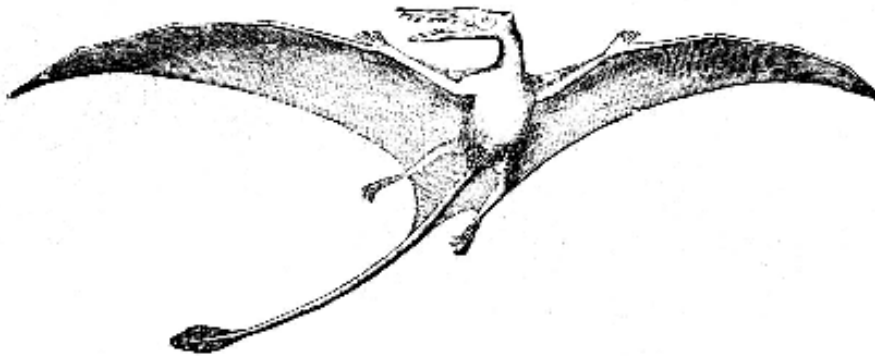


FIG. 5.—Restoration of a long-tailed Flying Reptile (*Rhamphorhynchus phyllurus*), from the Upper Jurassic (Lithographic Stone) of Eichstätt, Bavaria; one-seventh nat. size. (After O. C. Marsh.)

The Jurassic Pterodactyls are much smaller than those which followed them in the Cretaceous period. Some of the short-tailed forms (*Pterodactylus*, Fig. 4), exhibited in Table-case 1, are, indeed, no larger than sparrows or thrushes. All are provided with teeth in sockets, and all have three complete fingers with claws adjoining the base of the wing-finger. Their first finger, or thumb, is commonly supposed to be reduced to a little spur of bone which turns inwards to support the piece of the membrane originally extending from the shoulder to the wrist. A long tailed form (*Rhamphorhynchus*), with the slender-toothed jaws ending in front in a pointed toothless beak, is represented at the bottom of Wall-case 2 by several portions of skeletons from the Lithographic Stone of Bavaria. The grain of this stone is so fine that some specimens of *Rhamphorhynchus* have been found displaying impressions of smooth wing-membrane. A plaster cast of the best of these fossils, now in the Yale University Museum, is exhibited, and justifies the late Professor Marsh's restoration of the animal reproduced in Fig. 5. It will be noted that there is a rudder-like expansion of the skin at the end of the long tail. Another long-tailed Pterodactyl (*Dimorphodon*) is also represented by some well-preserved portions of skeletons in slabs of Lias from Lyme Regis, Dorsetshire. Its head is disproportionately large and of remarkably light structure, with large teeth in sockets in front, small teeth behind. Its hind limbs are also relatively large and stout; and its long tail is strengthened by bony tendons. A plaster cast of the skull another Pterodactyl (*Scaphognathus purdoni*), from the Upper Lias of Whitby, is noteworthy as displaying the shape and proportions of the brain (Table-case 1).

[The guide continues with the Crocodilia]

Displays

Wall-case No.1	Introduction Model of <i>Rhamphorhynchus muensteri</i> Rhamphorhynchus remains Dimorphodon macronyx
Wall-case No. 2	Pteranodon Wing and outline of body
Table-case No.1	Rhamphorhynchus remains Pterosaurs from Solenhofen Scaphognathus purdoni cast Crocodilians
Table-case No.2	Pterodactylus remains Cambridge Greensand remains Pterosaurs from Solenhofen Crocodilians
Table-case D	Pteranodon Specimens