**Romer, A. S.** 1954 Man and the Vertebrates (1). Penguin, pp. 88-90.

This text is an extract from Alfred Sherwood Romer's two volume work on Man and the Vertebrates. It is a popular text intended as a cheap student text and was originally printed in 1933. Reprints in 1954, 57, 60, 63, 65, 68 and 70 were in paperback and the 1970 volume sold for 10/- (50p).

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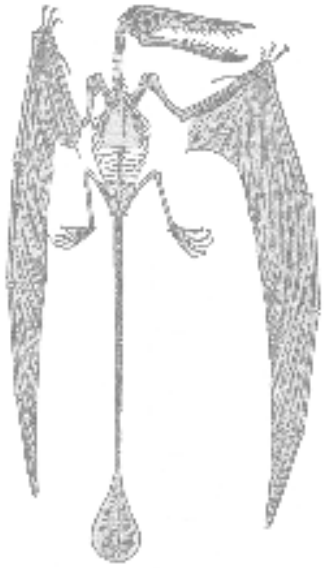
# FLYING REPTILES

With the adoption of the bipedal gait, the front legs of the archosaurs became freed for other uses. In some groups they tended to degenerate; in a few forms they functioned as grasping organs, 'hands'. In two cases they took on an entirely new use – that of wings, organs of flight. Flight was twice evolved in the ruling reptile stock; once by the ancestors of the birds, as noted later; again, and for the time more successfully by the flying reptiles.

The pterosaurs ('winged reptiles'), or pterodactyls ('wing-fingered'), were common forms during the Jurassic, middle period of the Age of Reptiles. The remains of these and many other contemporary animals have been preserved in considerable numbers in the German lithographic stone deposits such as that at Solenhofen. These deposits appear to represent fine sediments which settled in the bottom of ancient coral-reef lagoons, and in them are preserved many delicate structures such as jellyfish and the wing impressions of pterosaurs. A good example of a primitive flying reptile was *Rhamphorhynchus* (not a bad name to spell if sprinkled liberally with h's), shown in our figures.



The skeleton of *Rhamphorhynchus*, a long-tailed Jurassic pterosaur. About one-fourth natural size. Impressions of the soft tissues of the tail 'rudder' and wing membranes are often preserved. The wings were supported by one very long finger (the fourth). The other fingers were short and, with the feeble hind legs, were probably used for clutching purposes when at rest. (From Williston, *The Osteology of the Reptiles*, by permission of the Harvard University Press)

This was a creature about a yard in length, with a long beak armed with sharp teeth, a short body, and a long tail tipped by a steering rudder. The hind legs were slim and feeble; but the front legs were powerful wing supports.

In the hand the first three fingers were short and armed with claws. The little finger had been lost. The fourth one, however, was very stout and long and was the sole support of the wing, a batlike flap of skin which ran back to the thigh region.

This type of flying structure is, of course, quite in contrast to that of birds. Nothing in the nature of feathers was present in the pterosaur.

These arial reptiles appear to have been fish-eating types, flying over the water and diving after small fishes as do some modern marine birds. What they did when ashore to rest or nest, however, has been a disputed problem. The legs were ill suited for walking purposes but were perfectly good for clutching organs, as were the three fingers of the 'hand'. Probably, like the bats, they hung suspended from tree limbs or overhanging rocks during their times of rest.

Besides these long-tailed flying reptiles, the Jurassic lagoon deposits have also yielded remains of short-tailed relatives, some no bigger than a sparrow. These were destined (in contrast to the more primitive ruddered pterosaurs) to last over into the Cretaceous, the third and last of the great reptile periods. Some forms of this age grew to great size. *Pteranodon*, a form found in the chalk rocks deposited by the seas which once covered western Kansas, had a wingspread of twenty-seven feet in one specimen and was thus much larger than any bird. The beak was toothless; and a curious feature was an enormous crest projecting from the back of the head like a weather vane. *Pteranodon* and his kin were the last of the flying reptiles. By that time birds were already far along in their developmental history and soon entirely superseded their reptilian cousins as aerial navigators.