

TALE OF A NECK— THE TURTLE'S

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Most persons think of anatomical features merely in terms of their beauty or ugliness. But many structural peculiarities of animals are of general interest because they show the workings of evolution. Living things are adjusted to their surroundings and there is a distinct relationship between the structural organization of an organism and the functions that it performs. Such bodily adjustments to particular functions are, however, not always of the same kind and consequently far from equally efficient. An example which will clearly demonstrate this fact is described below—the interesting ability of the turtles to retract their heads and necks under the protective cover of their shells.

The turtles have the most peculiarly modified anatomy found among vertebrates.

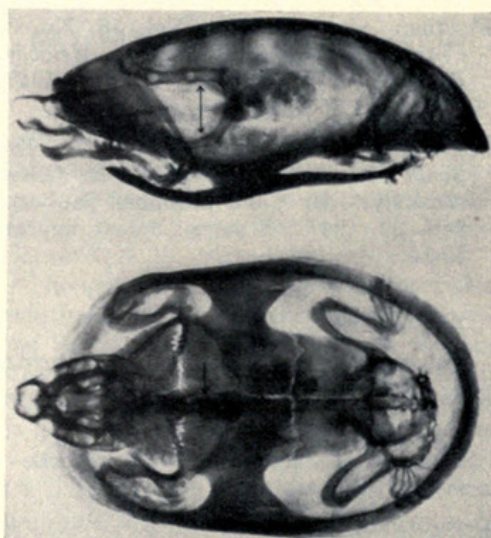


Fig. 1. X-RAYS OF A CRYPTODIRE

The common mud turtle, *Sternotherus odoratus*. In side view (above), the neck vertebrae (arrow) form an "S" shaped loop inside the shell. In dorsal view (below), the neck is retracted into the interior of the shell (arrow).

The major part of the body is encased in a solid, bony box, open in front and back to permit the head and neck, the limbs and the tail to be extended from it, or to be retracted under its protective margin. The shoulder girdle and the pelvic bones, to which the limbs are attached, lie inside rather than outside of the ribs, as they do in all other vertebrates. The vertebral column is fused with the bony shell in the trunk region. The tail is usually short. The vertebrae of the neck are greatly elongated, always eight in number, and the joints between these vertebrae are so developed that they permit considerable freedom of movement, a matter of great importance to an animal with an otherwise rigid body. Most modern turtles are capable of retracting the head under the protective rim of the shell, or, at least, of bringing it close to the shell, but the early turtles, the extinct

Amphichelydia, could not do this. Retractibility of the head and neck developed in the course of time, and was accomplished in two radically different ways, the two solutions of the problem being by no means equally efficient.

In both solutions the neck is strongly curved; in all the so-called cryptodire turtles the curve lies in the vertical plane of the body (see Fig. 1), whereas in the pleurodires or "side neck turtles" the loop is formed in the horizontal plane of the animal (Fig. 2). In the cryptodires the neck is pulled into the interior of the shell where it is totally hidden from view and thus completely protected, but in the side-neck turtles it can only be pulled underneath the front lobes of the shell, where it is always partly visible from the outside.

Cryptodires are most familiar to us, since all North American turtles are included in this group. Pleurodires are mainly tropical in their distribution, but in the geological past they inhabited the northern temperate zones as well. Members of the modern genus *Podocnemis* of the pleurodire group have recently been described from the late Cretaceous marls of Arkansas and Alabama by Mr. Karl P. Schmidt, Chief Curator of Zoology in this Museum, and by the writer.

The representatives of the genus *Podocnemis* are freshwater animals and have an interesting, discontinuous geographical distribution at present: seven species inhabit northern South America and one species is restricted to Madagascar. This fact was widely used, in the past, as evidence in favor of intercontinental land bridges along which these animals were supposed to have reached their present distribution areas.

Fossil species of the genus were found in the Cretaceous of North and South America; in the Paleocene of the Congo; in the Eocene of England, Egypt and India; in the Oligocene of Germany and Egypt; and in the Miocene of Malta and Egypt. Thus the

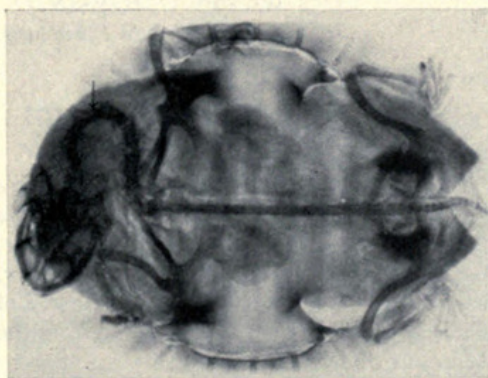


Fig. 2. X-RAY OF A PLEURODIRE

Rhinemys nasuta has the neck vertebrae in front of the shoulder girdle (arrow). Compare with Fig. 1 (below).

paleontological record indicates clearly that the genus had a wide, probably holarctic distribution in its early history, which, in itself, dispenses with the necessity for the hypothetical assumption of land bridges.

Furthermore, both North American spe-

SPECIAL NEW FEATURES ADDED TO CHILDREN'S PROGRAMS

The spring series of free programs for children presented by the James Nelson and Anna Louise Raymond Foundation, including motion pictures and several special features, will be given on Saturday mornings during March and April. The programs begin at 10:30 A.M. in the James Simpson Theatre of the Museum.

The special features include a lecture on reptiles demonstrated with living specimens and other materials, a complete marionette show presented on the stage, and three motion picture programs accompanied by personal appearances of lecturers who will tell the story of the films.

Children may come alone, accompanied by adults, or in groups from schools, etc.

Following is an outline of the programs:

March 1—FISHING IN A BIG WAY.

Color motion picture showing salmon run and entire story of salmon. Lobster fishing and catches off Nova Scotia. Also a cartoon.

March 8—THE STORY OF REPTILES.

Told and demonstrated with materials, charts and living specimens by Jack Raymon, Director, Kentucky Reptile Garden.

March 15—THE CROW AND THE FOX.

A stage production by The Foltake Marionette Studio—Basil Milovsoroff, artist-producer, of Thetford Center, Vermont.

March 22—REVIVAL OF SPRING.

Color motion pictures of effects of spring on animals, birds, flowers and people.

March 29—HIGH COUNTRY.

Color motion picture of big game in the mountains of Colorado; story told by Alfred Bailey, Director, Colorado Museum of Natural History.

April 5—INSECT NEIGHBORS.

Also a cartoon.

April 12—SAID THE OWL TO THE SPOON-BILL.

Color motion picture; accompanying story by Peter Koch.

April 19—THE EARTH "BLOWS HER TOP."

Story of volcanoes, by Winona Hinkley.

April 26—WINGS OVER IRELAND.

Also a cartoon.

cies occur in marine shoreline deposits, and the species of the late Eocene of Egypt were discovered in estuarine beds, indicating that the dispersal of the genus might, at least in part, have taken place along the continental shores.



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