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FOSSIL FISHES

By PAUL O. McGREW
ASSISTANT CURATOR OF PALEONTOLOGY

The waters of the entire world are now dominated by the group of fishes known as the teleosts, the most highly developed of the bony fishes. This order is characterized by the presence of weak, thin scales (or none at all), an internal skeleton composed entirely of bone, special modifications of fins and tail, and other peculiarities. The teleosts are far more varied than any other equivalent group of vertebrates, containing more than twenty thousand species. These fishes have only recently, speaking geologically, occupied such a dominant position—only since the beginning of Cretaceous time, a mere 120,000,000 years ago.

During the Triassic and Jurassic periods, before the heydey of the teleosts, a more primitive group of fishes, the Holostei, ruled the waters. In numerous internal characters and in the presence of heavy scales these forms were much more primitive than the teleosts. It was from some ambitious holostean that the latter arose. The Holostei were numerous and varied, but now only two are extant, the gar-pike and the bow-fin.

A third group, and one from some member of which the Holostei were evolved, was common during the geologic periods preceding the Triassic. These, the Chondrostei, or ray-finned fishes, were dominant before the more progressive holostians came into being. The Chondrostei, too, have left a few survivors, of which the sturgeon is perhaps the most commonly known.

NATURE IS TOUGH ON THE OBSOLESCENT

The three groups discussed above tell an interesting story of the value of efficient and progressive structural modification. Each of the more primitive orders enjoyed "world" domination when no other group, more efficiently adapted, was present to offer them competition. However, when new and improved structural features appeared, perhaps in a single member, that member spread and diversified so rapidly and so efficiently that the hundreds of more backward forms of the parent group were practically erased from the earth. The few survivors thus attract especial attention as so-called "living fossils."

The large division of fishes which includes the teleosts, the holosteans and the chondrosteans is known as the Osteichthyes, or bony fishes. This major group also contains other orders which are for the most part extinct. One order, of which there are a few surviving members, is the Dipnoi or lung fishes. These are of particular interest because they have functional lungs and may actually breathe air.

The crossopterygians, or so-called tassel-finned fishes, another order of Osteichthyes, were thought to be extinct until 1939, at which time a live specimen was caught off the coast of Africa. This specimen was found to be very close to some fossil forms which lived more than a hundred million years ago. From some early member of this group the land vertebrates evolved.

Of the ten or more major groups of shark-like fishes that lived during the later part of the Paleozoic era, only small remnants of two are now living. The living representatives are the sharks, skates, rays and chimaeras. The extinct types were greatly diversified and took on many forms and structures not found in any living fishes.

THE EARLIEST KNOWN FISHES

Among the most interesting of fossil fishes is a rather large group known as ostracoderms (shell-skinned or armored fishes). These were the earliest fishes to appear in the geologic record and by far the most primitive. The oldest ostracoderms are found in rocks deposited some 480,000,000 years ago during the Ordovician period. The ostracoderms differed from more advanced forms in many ways. The best known types had a body that was rather fish-like in form but which was covered with very thick, bony scales. The head was flattened and was covered by a heavy bony shield. From each side of this shield projected a sharp spur. Certain marks on the top of the head shield indicate that, as in some rays and other fishes, at least some of these early forms were protected by electric organs which dealt a strong shock to any molester. Of particular interest also is the fact that the ostracoderms had no jaws. Their mouth consisted merely of an open slit. In many cases the mouth was on the under side of the head, indicating that these fish were bottom-feeders, perhaps scavengers. The absence of jaws is an exceedingly primitive character.

The lamprey eel and the hag fish, now living, have several characters in common with the primitive ostracoderms and it is very probable that these living forms are degenerate survivors of that primitive stock.

In Ernest R. Graham Hall (Hall 38) many fossil specimens of fishes now extinct are exhibited.

A FLOWER FESTIVAL

Recently *The Chicago Tribune* carried an account of the "Fiesta de Amancaes" which is celebrated every year on the slopes of a mountain near Lima, Peru, beginning June 24 (St. John's Day).

No mention was made of the origin of the festival, and its close association with the blooming of the bright yellow daffodil- or jonquil-like flowers, the "Amancaes" (Hymenocallis Amancaes) which late in June color in golden sheen many of the slopes of Mount Amancaes with thousands upon thousands of brilliant blossoms.

Perhaps the most vivid description of the festival is that written by Stewart in the late 1830's in *Visit to the South Seas.*

His entertaining account of the merry-making is introduced by this paragraph: "The *Amancaes* is an annual festival celebrated at Lima on the 24 of June: it is something similar to our May Day; the occasion of it being the height of bloom at that time of a flower peculiar to Peru called the 'Amancaes' to gather which the citizens of every class, in the afternoon of the day, hasten, as a gala, to a spot in the vicinity of the city deriving its name as well as the festival itself from the flower which grows more abundantly there than in any other place."

After describing the appearance of the multitude and their gaiety as evidenced in talk and laughter, dancing, singing, drinking, and eating, he remarks: "Every person was decorated with the 'Amancaes' and clusters of its flowers were placed in the bridles and harnesses of the horses as well as in the hats and headdress of the riders." Clearly the inspiration of this famous Peruvian festival was and is to this day the blossoming of this beautiful plant of the amaryllis family. —J.F.M.

Tiffany Window is Gift of Mr. F. G. James

Many comments have been received since the opening in June of H. N. Higinbotham Hall (Hall 31—the Gem Room) on the beauty of the Tiffany glass window in the wall opposite the entrance to the hall. This stained glass picture, showing a mermaid rising from the sea, in colors which blend harmoniously with the general atmosphere of the hall, came to the Museum as a gift from Mr. F. G. James, of Cleveland, Ohio. Originally it decorated the wall of the personal studio of Louis Tiffany over a period of twenty-five years. In its new location it adds greatly to the tone of the Gem Room, and the administration of the Museum is deeply grateful to Mr. James.