

THE LEATHER CARP.

BY A. W. ROBERTS.

The leather carp (*Cyprinus nudus*, Block) is distinguished from the mirror carp by having only a few scales along the back and abdomen, and sometimes none. The intermediate space consists of a thick skin, soft, and velvety to the touch like that of a frog. The general color is a dark olive brown. Its mouth is toothless, but situated on the pharyngeal bones of the throat are three rows of stout teeth. The lips are thick, and on the upper jaw are four barbels, two short and two long.

Carp were first cultivated in Austria in 1227, in the time of Charles IV. At the present time the Princes of Schwarzenberg own ponds comprising a total area of twenty thousand acres. The annual catch of carp from these ponds is five hundred thousand pounds. The leather carp, from the fact of its being scaleless (or nearly so), is a much safer fish to transport and keep than the mirror or scale carp. In transporting fish great danger is always encountered from chafing, bruising, and scaling. As a rule, when a fish loses a scale or is chafed or bruised it seldom escapes being attacked with fungus; on the other hand, the leather carp, having a tough, pliable, and slippery skin, like that of a frog, it will heal more readily, the epithelium covering it immediately the new skin will begin to form. Mr. Rudolph Hessel says he has often seen scars on the leather carp produced from the bite of a heron or pike or some other hurt, but never saw anything of the kind on a scale carp, for if one of these be wounded it almost invariably dies. The scale, mirror, and leather carp will live in either fresh or salt water. They have been found in the Black Sea weighing twenty pounds, also in the Caspian Sea in great numbers. They are capable of living in almost any kinds of water, that of bogs, swamps, etc. In Germany they have been known to live and thrive in water having a temperature of over 100° Fah. I have at the present time a small specimen that has lived in a ditch of brackish water for over two months.

On the approach of winter the carp form into groups of from fifty to one hundred, making a cavity in the muddy bottom, which is called a "kettle;" in this they hibernate till spring, huddled in circles with their heads together, the posterior part of the body held immovably. In this condition they do not take a particle of food, yet during their long winter's sleep they neither diminish nor increase in weight.

The carp leaves its winter home as soon as the water becomes warm. Spawning commences in May and continues through the warm months. Rainy and cool weather interrupts the spawning, which is again continued during warm and clear weather. The male, during the spawning season, displays a number of protuberances on the head and back. The pharyngeal teeth are cast some time before the breeding season; these are renewed every year. As the breeding season approaches the fish become more active, two or three male fish accompanying each female. The female swims more swiftly and keeps close to the surface, constantly followed by the males. This is called running spawning. The male fish follow the females close to the water's edge till there is hardly depth of water to swim in; they losing all their timidity and caution can be easily captured. They lash the water, twisting the posterior of the body energetically, and shoot through the water with short, tremulous movements of the fins. This is the moment when the female drops her eggs, which are instantly impregnated by the milt. As the female drops probably only from four hundred to five hundred at a time in order to gain rest, it will require days and weeks before she has given up her last egg.

The eggs of the carp are adhesive, and adhere in lumps to the object on which they are deposited.

Old carp have been taken in different parts of Europe weighing all the way from forty to ninety pounds. When this fish does so well in Europe, where it is forced to spend many months in its winter's sleep, and where natural food at best is scarce, what may we not expect of this wonderful and useful fish when introduced into the ponds and streams of the Southern States, where they can feed to repletion on the choicest of natural food all the year round, and where they will often spawn twice a year?

In the waters of Central Europe the carp, after its awakening from its long winter's

sleep, seeks most diligently for the seeds of the white and yellow water lily, also the *Phellandrium aquaticum*, *Festuca fluitans*, etc. The waters of the United States abound in all these plants and many others, the seeds of which will serve the fish as food; for instance, the wild rice (*Zizania aquatica* and *Z. fluitans*), also the well known rice or "water oats," with its great riches of seeds, and many others which will yield food profusely, and which European waters do not possess.

Let us once more consider the extraordinary increase of weight of about one hundred per centum in the exceedingly short space of four months, for during the winter time it is

recover when placed in roomy ponds. Five hundred fish to an acre of water is about the right proportion; more than that number will not do well.

Some two years ago I received from one of the German steamers, through the kindness of Professor Beard, a number of small leather carp; none were more than an inch and a half in length. These were placed in an aquarium of the proportion of four feet by two, which was supplied with slow running water. The few that are now left are from seven to eight inches in length, and have always been kept in the same tank.

These carp have passed through every conceivable trial.

They have jumped out of the tank repeatedly, but have recovered rapidly from the wounds. Fungus has attacked them many times, forming in patches about the head, but it did not seem to make the least impression on their tough skin, and soon disappeared. On one occasion I placed one of these carp in a sea-water tank, the density of the water being eleven, to rid him of fungus; but being called away I forgot all about the carp till the next day, and was surprised to find him perfectly at home in his new element. Some "horse leeches" escaping from their tank through the strainers, concluded to settle down for life in the leather carp tank. When I discovered them in the tank, one of the carp (to which was attached a well-filled leech) was lying on its side nearly exhausted. And yet this fish recovered from its injuries.

Having a number of soft clams left over after feeding the fish, I placed them in a pickle of strong

brine to keep till next day; but forgetting till the end of the week, they were more like India-rubber than the tender soft clam.

Being anxious to learn the digestive powers of the leather carp, for I had long been of the opinion that they could digest anything they could swallow, and thus far they had swallowed every variety of food, I concluded to give them a feed of the pickled siphons of the clams, of which they partook bountifully. In the next tank were a number of yellow perch, all in fine condition, these also partook of the clams. Well—half the perch died, but the carp are living.

These carp are so tame that they will take the ends of my fingers in their mouths.

I am indebted for much of the information contained in the above article to Dr. Hessel, of Washington, and to Mr. Eugene Blackford, of New York, for living specimens of the fish.

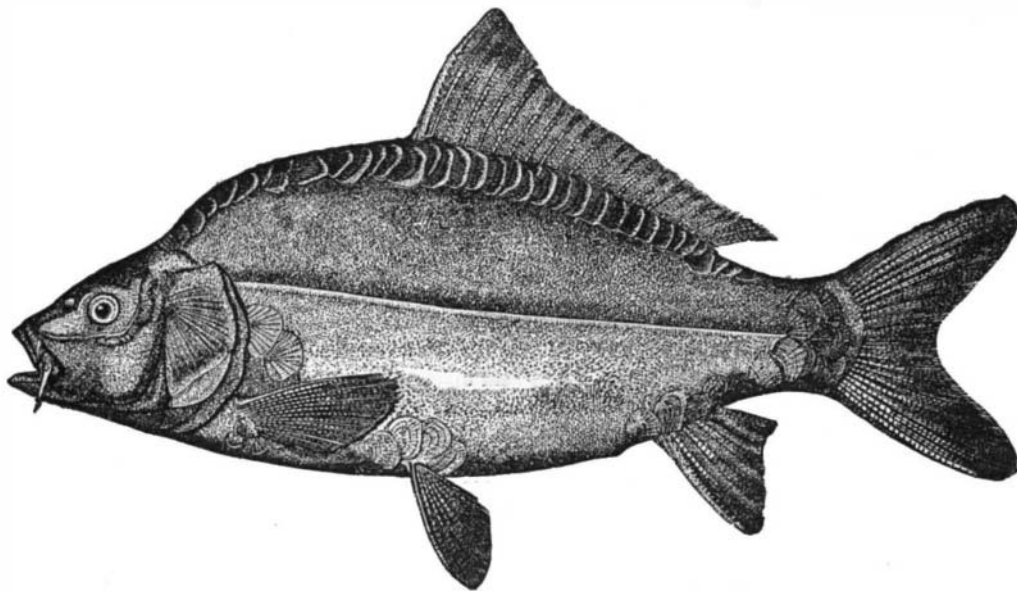
MONSTER BONES (FOSSILS) FROM THE ANCIENT CRETACEOUS SEAS OF KANSAS AND COLORADO.

BY C. F. HOLDER.

Among the recent additions to the geological department of the Museum of Natural History, Central Park, are some bones representing several large reptiles that existed during the cretaceous period of North America. The reader will remember that during this period—the time during which the Dover Cliffs of England and the green sand marl was deposited—the great plains of the West were the bottoms of a vast sea that found its eastern shore near the present site of Fort Riley, Kansas, and beat upon unknown sands far to the north, south, and west. The animals found in this era had arrived at the maximum of physical growth in all time, and the entire age is characterized by the enormous growth of its dependents. All of the species thus far discovered in the sands of Kansas and Colorado—and there are over fifty—have been referred to the reptiles and fishes, and are of the most gigantic proportions.

The late Prof. Mudge, of Kansas, has probably done more work in unearthing these extinct monsters than any other scientific man, and the fine collections in the Museum at Yale College and the specimens at the Central Park are legacies of his labor.

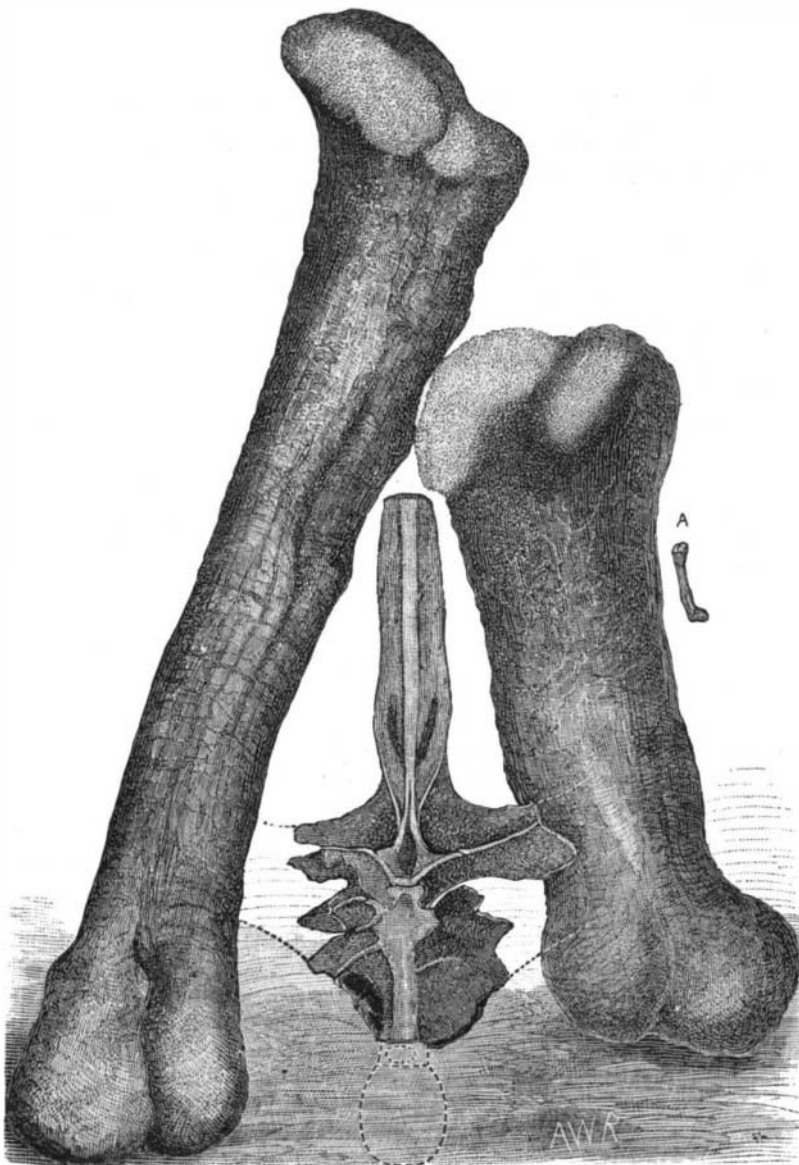
The largest specimens have been found near Cañon City, and are known to science as the *Clidastes*, *Camarasaurus*, *Amphicelias*, etc. The first named was a veritable sea serpent of these ancient seas, and the huge bones and almost incredible number of vertebrae show it to have attained a length of nearly two hundred feet. Prof. Mudge states that while riding through the *Mauvaise Terres* of Colorado, he saw from his horse the remains of no less than ten of these monsters strewn upon the plain, their whitened bones bleached in the suns of centuries, and their gaping jaws armed with ferocious teeth, telling a wonderful tale of their power when alive.



THE LEATHER CARP.

banished by nature into its temporary tomb. This fish needs from fifteen to eighteen months of growth, to gain, at a low estimation, three pounds without being fed. There are some culturists who obtain in the same space of time fishes of four pounds weight; but they possess ponds of warm situation, which thaw early in the spring, and perhaps they assist nature by feeding the fish.

Up to the present time of writing over twenty-five thousand carp have been distributed from the Smithsonian carp ponds over all parts of the Union. The carp, being slow and sluggish in its movements, has many natural enemies, such as turtles, large frogs, snakes, eels, mink, and muskrats. Persons having carp ponds should keep a sharp lookout for these pests. Dr. Hessel says that he has seen three year old fish so crowded in ponds in Europe that they were principally head with a small body. Such stunted fish will never



MONSTER BONES FROM THE ANCIENT CRETACEOUS SEAS OF KANSAS AND COLORADO.