CURIOSITIES OF ICHTHYOLOGY.

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The study of ichthyology is attended with greater practical difficulties than is that of any other branch of natural history, and on account of this it is far behind its sister sciences in the degree of completeness to which it has attained. Land animals may be tracked to their most secret lairs, patient research will reveal the most cunningly hidden nests, but it is impossible to pass beneath the waves to watch the habits of "all that dwell therein." "The way of a fish in the sea" is almost as much a mystery now as in the days of Solomon, and what is known but shows the extent of the unknown.

Suppose that a visitor from some other planet were to come on an exploring expedition to our earth, but that his vessel could come no nearer than several miles, while our atmosphere was opaque to his vision and unfitted for his respiration. Under such circumstances his position would be not unlike our own in regard to the sea, and it may be perceived that in either case the knowledge to be gained must be scant and fragmentary. The astral explorer might capture a few of the lowest animals in his nets and dredges; he would probably obtain some worms, but he would be unlikely to take a bird, quadruped, man or any other thing that has the power of locomotion. For the same reasons the investigation of the sea has been slow and unsatisfactory, and but little has been made out of even the commonest fishes. Many species and some genera are known by single specimens, and in several instances these have been found by what appears to be the purest chance.

Quite a number of rare specimens have been obtained from the stomachs of other aquatic animals. The greater number of fishes are carnivorous and most of them are voracious feeders, greedily swallowing anything of a suitable size that presents itself. A shark's stomach sometimes contains a remarkable assortment of objects, and sometimes rarities are discovered, for sharks are more intent on the quantity than the quality of their food. There is a genus of fish called the Tarletonbeanea, in honor of Dr. Tarleton H. Bean, a distinguished ichthyologist, but of it only three specimens are known to exist. Of these, one was taken from the stomach of an Albacon off the coast of California, one came from a Sebastodes miniatus, and the third was blown on board of a boat during a storm.

A still stranger example is that of the "seal fish." In making some investigations into the life of the fur seal a few years ago, it was necessary to determine the character of the food on which it subsists. To do this, the stomachs of numbers of seals were opened and their contents examined, and in them the remains of a new kind of fish was found to be very common. Nothing but the bones (Fig. 1) have been found, but these in such numbers as to show that there must be vast quantities of these little fish, although up to the present time no one has seen a single one in life.

The existence of a small fish in the sea is beset with dangers. From the time the eggs are deposited until the moment of its death, it is surrounded by enemies seeking to devour it, and it is forced to find some shelter or die. One little fellow takes refuge under the "Portuguese man-of-war," and swims in safety between the poison curtains, knowing well that the most ravenous foe will not molest this formidable sea nettle. At times, it is said, he pays for his shelter with his life, but such cases are probably rare. The large medusæ, or jelly fishes, found in tropical waters, often cover a shoal of small fry that live in peace amid the poisonous tenacles that keep enemies aloof. In case the medusa seizes an occasional victim, it is but just, for every good citizen should be willing to suffer for the power that protects him, and the defenseless fishes stand in relation to the medusa as did feudal retainers to the lord whose name and fame gave safety.

Living near a protector is a far different matter from living inside of one, but several fishes are known that take up their abode in the interior of some larger animal. The holothurians or sea-cucumbers have long been known to shelter a small fish, to which Cuvier gave the name of Fierasfer. This fish seems to live in rather deep water, for holothurians found close inshore are free from it, while it is very common in those from certain depths. When free the fierasfer swims with its head downward and its tail curved toward its back. It is a feeble swimmer, and is speedily drowned when put into a tank with other fishes, for it can neither escape, fight nor hide, except in its own peculiar lodging-place. When it sees a holothurian, it seems to get excited. It comes up to the opening by which the holothurian sucks in and expels the water necessary for its existence and gradually backs in, taking advantage of the suction and bracing itself against the outward flow, until it is entirely inclosed. Prof. Emory, who studied the fierasfer in Naples, says that it often protrudes its head in search of food, and does not live on its host or the food taken in by the holothurian. It is not a parasite, but a lodger. Several such tenants occupy the same host together, and may inflict fatal injuries, but this is accidental and probably rare.

The sea is the great home of aquatic life, but the fresh waters well repay research. The "lung fishes," that can breathe atmospheric air, and thus avoid polluted waters, or the mud fishes, that are captured by digging them up, are interesting variations from the general rule, but the subterranean species are most wonderful. The blind fishes found in our great limestone caverns and those from the ditches of the ricefields are familiar, but the secrets of "the waters under the earth" are not yet made plain. A few years since, a station was established by the United States Fish Commission at San Marcos, Texas. An artesian well was bored, and a flow of 1,200 gallons of water per minute obtained at a depth of 188 feet. The boring was through almost solid limestone, the "log" of the well showing that one tunnel some two feet in diameter was pierced, but the flow has brought up numbers of living organisms, all new to science. So far four species of shrimps and a salamander have been described, but these have been abundant. Dr. James E. Benedict, of the Smithsonian Institution, described and named the shrimps, and Dr. L. Stejneger, of the same establishment, did the same for the salamander. He gave it the name of Typhlomolge Rathbuni, in honor of Mr. Richard Rathbun, the assistant secretary of the Smithsonian Institution.

The accompanying illustration gives an accurate conception of this strange animal. Its head is large and prolonged forward into a flattened snout in which is the mouth. The eyes are covered by the skin and are visible only as two black specks. Behind the head the external gills form festoons about the neck, their vivid scarlet making a sharp contrast with the dingy white skin. The four legs are in two pairs, the anterior ones having four fingers or toes and the posterior ones having five. It terminates in a flattened, eel-like tail.

Space forbids a consideration of the many questions suggested by the Typhlomolge. It may be a link to by-gone ages that became engulfed in some great convulsion, and, though able to exist in its unfavorable environment, was unable to evolve into the modern type. The source and nature of its food, as well as that of the shrimps, is an interesting problem, but its ability to stand variations of pressure is wonderful. A spouting well 188 feet deep indicates a pressure of six atmospheres, ignoring friction, yet these beings can live at the surface. Two of them were shipped from San Marcos to Washington in an ordinary preserving jar, and not only survived the journey but lived for two months or more, seemingly unaffected by light or the diminished pressure. No discovery of recent years is of greater interest to biologists or geologists than that of these little beings, unlike anything else on earth.

Ichthyology and its allied sciences are being studied now as never before. The economic value of the fisheries has made them of national importance, and the resources of governments are being used to promote the study of the water and its inhabitants. Chief among the agencies of research stands the United States Fish Commission, an organization unlike any other in the world. Originally established to inquire into the condition and needs of the fisheries, its scope has been steadily enlarged as its utility and activity were recognized, and its records are now a splendid monument of American science. The investigations of the "Albatross" take high rank even when compared with the epoch-making "Challenger," and in every department it is worthy the praise so freely given it abroad.

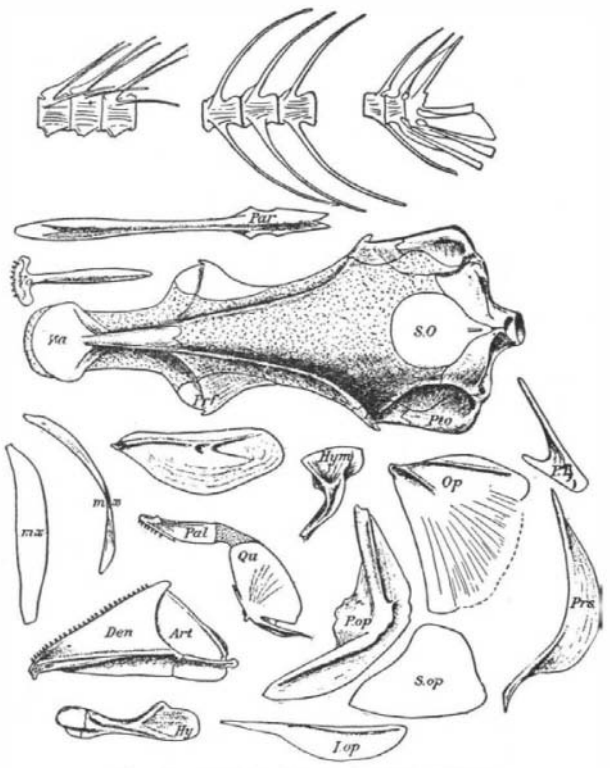

Fig. 1.—BONES OF A "SEAL FISH."
(*Thelyobromus californi.*)
Drawn by L. A. Lucas, from specimens found in stomach of fur seal.*

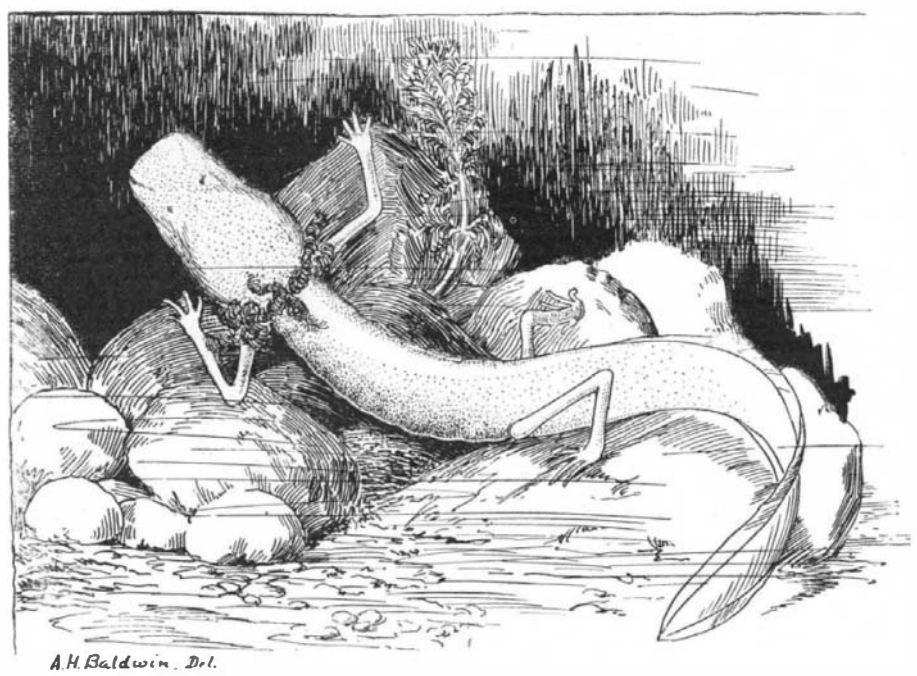

Fig. 2.—TYPHLOMOLGE RATHBUNI. (Drawn from life.)

*From "Report of Fur Seal Investigations," 1896-97.

FROM a series of experiments made on different plants, E. C. Teodoresco finds that if a plant is grown so that the lower leafy part of the stem is exposed to light, while the terminal bud is in the dark, the results, as regards the development of the vegetative parts, are intermediate between plants grown completely in the light and those grown completely in the dark. In a plant thus partially illuminated, the development of the conducting tissue and the lignification of the walls of the mechanical tissue approach more nearly to those in a plant grown entirely in the dark. In a plant entirely deprived of light, starch is altogether wanting in the tissues of the stem; while in one partially illuminated it is present, though in smaller quantities than in a plant grown entirely in the light. The carbohydrates elaborated in the leaves exposed to light may accumulate in the parts of the plants which are not directly exposed to light.—Bonnier's Rev. Gén. de Botanique.

February Building Edition.

The issue of the Building Edition for February is of great interest and beauty. The colored cover represents a modern dwelling at Hartford, Conn., and the engravings on the inner pages of the publication show additional exterior and interior views. There are a number of various-priced houses in this issue, and among the attractive features is a full-page engraving of the new University Club, New York city. The literary contents include "A Lost Principle of Beauty in Architecture" and "British and Dutch Architecture in South Africa."

The Current Supplement.

The current SUPPLEMENT, No. 1259, has many papers of great value. "A Plea for American Archæology" is a paper by Prof. Charles P. Bowditch, of Boston, and is accompanied by an elaborate series of illustrations of antiquities at Yucatan. "The Schneider-Canet Naval Turrets" describes ships' turrets worked by electricity, using a central ammunition tube. The abstract of the "Report of the Committee on Canals of New York State" is continued. "Old Paris at the Exposition of 1900" is illustrated by charming engravings. "An American Pacific Cable" is by George Owen Squier. "The Cruise of the 'Albatross'" is a letter of A. Agassiz.

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