

THE RADIATA.

The zoological class termed the *radiata* was comparatively unknown until within the past century, and its species were considered to be connecting links between the animal and vegetable kingdoms, being known as zoöphytes; and Linnaeus defines them as "composite animals which appear to rank between animals and vegetables; though they are true animals, and possess sensation and voluntary motion."

The radiata are entirely aquatic, and are mostly marine. They are divided into three classes. These are: 1. Polyps—sea anemones, nearly all the corals, etc. 2. Acalephs—jelly fishes, medusæ, Portuguese men-of-war, etc. 3. Echinoderms—sea cucumbers, star fishes, crinoids, etc.

The structural plan of all the polyps is so nearly similar that a single illustration will answer for all, although they differ greatly in size, shape, and minute particulars. Let us suppose an orange with a small portion of the stem end removed, and a hole descending to a little past the center from this end. Now the skinny partitions which, like longitudinal planes, extend through the fruit will divide it into chambers. We must suppose a similar wall surrounding the cavity which runs down from the end of the fruit, but communicating freely with all the inner portions of the orange, through the lower end of this opening. Polyps have but this one orifice, which is the mouth. Into this all the food is taken, and from this all rejected matter is thrown out. The digested food passes from an opening in the lower portion of this cavity or sack into all the chambers of the polyp, and finally into the delicate, hollow tentacles with which the upper part of the body is fringed. This is the general form of life of all the polyps, some of which, like the corals, are stationary, while others are nomadic, and still others are parasites, living in the mouth folds of still larger radiata. The polyps vary quite materially in shape, some being almost saucer-like, others pyramidal, cone-shaped, etc.

In the lower polyps the eggs are formed on all the inner edges of the vertical partitions, and when these are ready for exclusion they drop to the bottom of the digestive sack, whence they pass outward through the mouth. In the higher order of polyps not all of these partitions are fruitful, the limitation increasing as the species rise in organic superiority. Some of the polyps also increase by buds similar to fruit buds, others by subdivision. Polyps may be cut into several pieces, and the majority of these will each become a perfect animal. They vary in size from a foot in diameter to mere microscopic mites.

From what has been said of the growth of these polyps it will be seen that coral insects have too long enjoyed the fellowship of bees, ants, etc., as hardworking creatures, with some knowledge or method of architecture. They produce coral no more ingeniously or laboriously than a fish produces bones, and cannot help it if they would. Coral is only what is left after the death of a whole community—a village of individuals whose bones, not their houses, are fashioned by cunning artisans into such beautiful adornments for our fashionable belles.

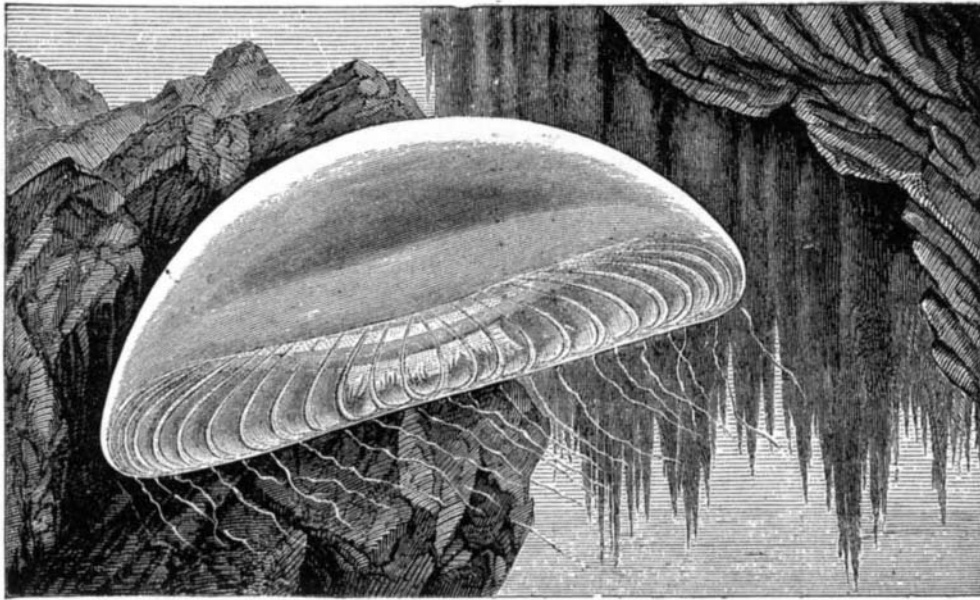
The acalephs are perhaps more interesting to the student and naturalist than the polyps. In these we find exemplifications of the curious law of alternate generations. The egg of a butterfly produces a caterpillar, which in turn becomes a chrysalis, and from this the perfect fly is in due time hatched. In some of the jelly fishes different but no less wonderful changes take place, while in others the method of reproduction is similar to that of the budding polyps. In some cases two generations intervene between the parent and a progeny which resembles it in form or mode of life.

The jelly fishes, with few exceptions, are short-lived in comparison with other radiates, some of the polyps living many years, while star fishes and sea urchins are sometimes ten or a dozen years in attaining their maturity. The acaleph's cycle of existence is only about twelve months. The eggs, laid in the fall, become hydroids in the winter, jelly fish in the spring, and, having made the necessary arrangements for a continuance of the species, die during the autumn. Great numbers of jelly fishes are annually killed by the severe storms of that season, and are washed upon the beach, where they almost literally melt into jelly, and leave no trace behind, there being none but the most perishable elements in their physical construction, nearly the entire animal being water. Mention is made of one specimen, which when alive weighed thirty-four pounds, being left to dry for some days, and then weighed five and one half ounces. The radiate partitions of the polyps are changed into tubes

in the jelly fishes, but the general law of radiation is strictly followed. Excepting a few species they are all jelly-like in their construction; the *discophora* have a trifle more solid structure, but all are exceedingly soft and frail.

Very many of the more delicate species are so transparent that the casual observer often fails to see every portion of a specimen, even in the still water of the aquarium, until a movement of the animal presents its parts in a different light.

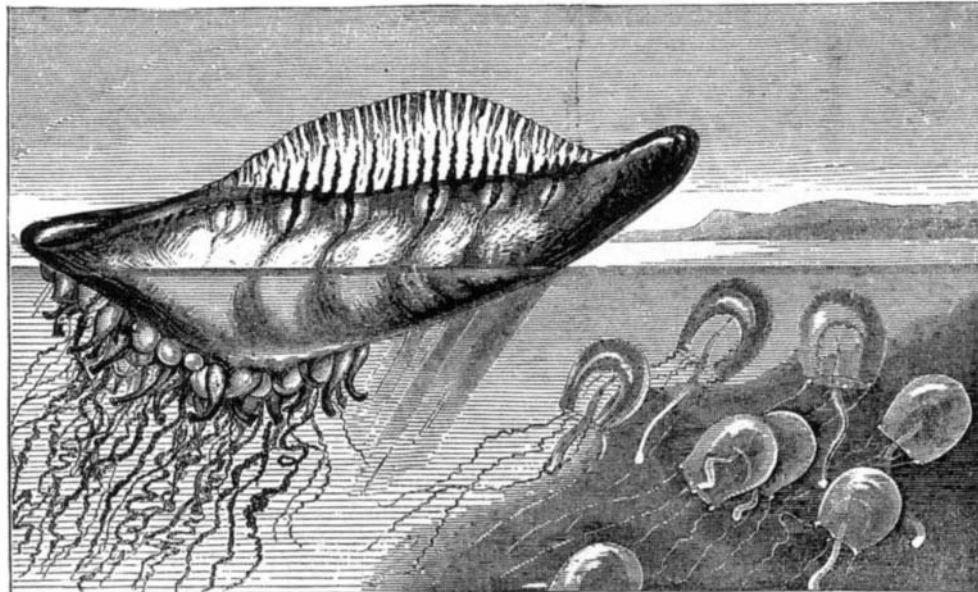
A great variety exists in the shape of these animals, and they vary no less in size, some being so small as to be entirely overlooked by the casual observer, while Agassiz mentions one, a *cyanea arctica*, a sea blubber, whose umbrella-shaped disk measured seven feet across, while the tentacles



THE DISK-BEARING JELLY FISH

which streamed behind him measured roughly about one hundred and twelve feet. The parent of this monster is one of many from a single egg, transformed first into a stalk not unlike a cabbage stump in shape, but which subsequently changes into a tolerable representation of a pile of saucers, open side up. Each saucer, when cast off, turns over and is then a perfect *cyanea*. Yet the stalk which produces all these, when fully grown, is but an inch or so in height. Were it not for their delicate structure these creatures would be as dangerous as sharks, for each of these long tentacles is capable of producing a severe smarting sensation by mere contact, while their nearly perfect transparency renders their noiseless approach almost imperceptible. Bathers along the coast of the Atlantic often encounter these unawares, and lose no time in extricating themselves from the dilemma, while large, red swellings, not unlike those produced by nettles, attest the truth of the contact. It sometimes happens that the jelly fishes which are possessed of these sting-

there is a marked resemblance to a beautiful white flower. The *cyanea* is a dark, brownish red with a milk-white margin, and tentacles of purple, yellow, and pink. *Idya* is mostly of a bright pink, while red, yellow, orange, green, and purple chase each other rapidly along its undulating fringes. Other varieties appear in no less beautiful and different shades of beauty; while at night, if the sky be overcast or the moon is not a disturbing witness, the slightest movement, of the depths where these delicate beauties are, brings out the most resplendent flashes of green and gold and liquid phosphorescent flames that seem almost to kindle the entire waters. Myriads of the lesser varieties, scarcely noticeable in the bright light of day, thus disturbed, become globes of brilliant gold, and the oars of the boat, as they rise from the water, drip with liquid flame given out by these and other minute inhabitants of the deep, while the glistening particles extend far in the diverging wake of the passing craft.—*Home and School.*



THE PORTUGUESE MAN-OF-WAR AND THE SEA BLUBBER.

ing threads—for many of the species are without them—find themselves entangled with a too formidable antagonist. In such an event they drop or shed the tentacles, and escape with all possible haste; but notwithstanding their separation from the body of the jelly fish, contact with the dead tentacles is equally painful as when living.

The stinging property is used by the jelly fish not only for defence but also for the purpose of paralyzing and retaining its prey, which consists of small crustacea, fish, and other jelly fish, or polyps. Captured individuals often show the remnants of a meal, their transparency affording the most perfect study of their internal organisms. These tentacles are covered by minute cells, lasso cells as they are called, each one of which contains a whip finer than the finest thread, coiled in a spiral within it. These are thrown out at the will of the animal, and their movements are so instantaneous that their irritating power is very great.

ture will show whether the new British Dairymen's Association, which was formally instituted at Birmingham recently, will enable the farmers over the water to drive us out of their markets. We opine, says the *Canadian Farmer*, that it will not. Nevertheless, it is never well to have only one string to one's bow. The move of our English brethren should teach us to be on the alert for new markets. And if it should also direct our energies more to the manufacture of butter by the factory system, it will benefit us as much as it will them.

AMERICAN CREMATION.—A citizen of Washington, Penn., has built a large stone house on a hill for the reception of dead bodies, and a furnace scientifically constructed, in which they are to be burned. He has given strict injunctions to his executors that his own body be burned in the furnace.

Cheese Factories in England.

British farmers are notoriously slow to accept innovations, and this may be said without fear of hurting their feelings, as they are well aware of it, and in fact rather pride themselves on their conservatism. But they are now moving in a direction which possesses some interest to Canadian farmers. The United States and Canada may be said to have absolute possession of the British cheese market except for certain fine brands with which we do not compete. Our factory system has already made its way into Britain, and is as successful there as it is here. And now they are going to adopt another of our institutions, the Dairymen's Association. Certain leading spirits think it a shame that English cheese makers can be beaten in their own markets, and they are going to leave no stone unturned in the attempt to regain possession. Dear land and high taxes will operate against them just as distance will against us. The fu-