

THE GUARDIAN OF THE OYSTER.

BY DR. BENJAMIN SHARP.

This little crab, which we know as the oyster-crab, is about the size and shape of a pea, resembling somewhat a bleached-out spider. In Europe it is called the pea-crab, where it is rarely seen except by naturalists, for there it is not eaten by those who like oysters, while in this country it is well known, as we often see it floating upon the surface of an oyster stew. It is common on our coast, not only in oysters, but also in mussels and scallops.

The name "Washington-crab" has been suggested by some for the oyster-crab, as it was considered a great delicacy by our first president.

The crab has been known to naturalists from the earliest times of history, and the lively imaginations of writers on natural history have woven a curious network of stories about the life and home of this modest little animal.

Aristotle the Greek and Pliny the Roman, naturalists, believed that a definite relation or understanding existed between the shell-fish and its little lodger, and even went so far as to say that death would be the result if the crab should desert its host. The watchful crab, living within the home of the dull and stupid oyster, on seeing small fish approach, would wait until one more bold than the rest of his companions ventured within the open shell, then gently nipping the oyster, the doors would be closed and the fish held a prisoner. Thereupon the two, the host and his guest, would feed at leisure upon the body of the venturesome fish.

A very beautiful arrangement between these two—the blind and the lame—and a very pretty compact—but the cold eye of science saw that bivalves do not feed upon fish, but upon microscopic animals and plants, which live and float in the water, and that the little crab, whose limbs are so soft and yielding, could have neither the strength nor the power to pinch off morsels of food from an ordinary fish.

Another story, which held its own until late in the last century, was that this little crab played the part of the "King's Jackal," who hunted by night for his majesty the lion. It would sally forth to hunt and bring food to the helpless mussel or oyster, and on returning from the hunt, should it find the house closed, would give a cry, which was recognized by its host, the door instantly opened, and it was allowed to enter. Study has shown that the crab never leaves its home, and cannot cry, but as with the lion, who, in fact, often gets the food for the jackal, so it is that the little crab feeds upon the substances which are swept in by the current of water made by the bivalve, in order to bring in its own food, and to freshen the water for its respiration.

Again the crab was said to warn its protecting host from danger by a timely pinch, so that the doors could be closed against some crafty octopus or insidious star fish, and for which service the crab was rewarded by board and lodging.

This relation between the crab and the bivalve was used by the ancients to illustrate how helpless is a man without a friend. Even Cicero is said to have used this simile, and we find the same idea expressed by the Egyptians in their hieroglyphic writings.

The oyster-crab, it is true, may act in such a manner that it warns the oyster of the approach of danger, but we scarcely believe that it is anything but a personal motive on its part. We nineteenth century folks do not believe that any intelligent understanding exists between the two. We have all seen how a crab will hurry back and forth on the approach of danger, will dart into the first crevice to escape its foe, and when in safety brandish its formidable claws with the greatest show of bravery. So the little Pinnotheres may, with the same instinct, run back and forth within the sensitive mantle of the oyster, and retreating push against its soft body, which will indicate to the slothful intelligence of its host that something is wrong outside, when it will discreetly close its shell, as the better part of valor.

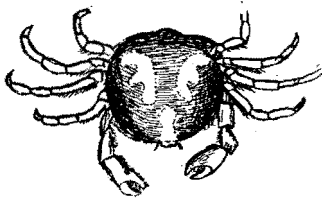
The oyster-crab is about the size of a large pea, the body is globular, the legs small and weak, and it differs from nearly every other crab in having a perfectly soft yielding skin. In fact, it was always a "soft-shelled crab."

In the large "blue-claw" crabs of our coast the carapace, or shield which covers the body, is hard and firm, the legs and especially the pincers extremely rigid. On examination we find that this shell is made up of a fine horn-like skin, in which has been deposited a quantity of lime salts, making its covering almost as hard as marble. As the crab grows in size this armor, not being able to grow with the crab, is thrown off, while there is formed just under it a new soft skin. The shell cracks open, allowing the crab to crawl out of its old clothes, and for a day or two it is in a very helpless condition. It is at this time that they are captured and sold in our markets as "soft-shelled crabs." However, it is not long before the soft skin becomes as hard as it ever was, but during this period the crab is a very quiet, modest and retiring fellow, he has lost all his pugnacity, and is not found scurrying about for food or anything else. He retires

from the sight of the world as much as possible and when his skin becomes hard again, like some persons under similar conditions, he sallies forth making himself very disagreeable to those who differ with him.

The little oyster-crab is in this sensitive thin-skinned condition throughout its whole life, and consequently always keeps hidden and as much as possible out of harm's way, within the protecting shells of some bivalve.

This state of affairs is a good example of the law of use and disuse, which we find so widely spread in the animal kingdom. When an organ or any part of an animal is not properly exercised, or becomes useless to its possessor, nature allows it to dwindle away and in time to disappear. One of these Pinnotheres, which lives, not in any shell-fish, but deep away in the water lungs of a sea-cucumber, is during the whole period of its adult life in total darkness: it loses its eyes and is totally blind—as blind, and for the same reason, as the blind fish of Mammoth Cave. The eyes being of no use in its dark abode, they degenerate and disappear; so it is with those crabs which are so well protected from their enemies by the hard shells of their hosts: they never get hard skins, but remain always soft and transparent. In fact, naturalists have given the name

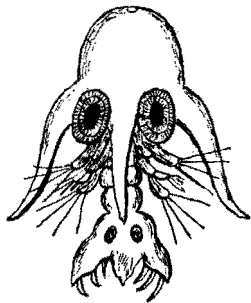


THE OYSTER-CRAB.

"membrane-body" (Hymenosoma) to one set of these crabs, to indicate the soft and delicate nature of their skin.

Now, how does the crab get in, and does it ever get out of its shelly home? Oppian, who lived in the second century after Christ, and who placed his ideas in verse, tells us that the Pinnas and oysters open their shells to feed on mud and water, which they take into their shells. The little crab, wandering about in search of a home, sees the open shells and thrusts between them a small stone or pebble, and while this prevents the shells from closing, it creeps in with safety. This implies a great deal of craft and cunning on the part of the crab, and, were it true, the theory which accounts for its soft skin must be set aside, for during a certain time at least the crab must wander about, as do other hard-shelled crabs, unprotected, while searching for a home.

The crab gets into its future residence at a very early period of its life, when, indeed, it looks so unlike its parent that one would not believe that any relation existed between them. When the eggs of crabs are hatched, a curious little object comes forth, known to naturalists as a Zoea, and they speak of this period as the "Zoea stage." This form is so unlike any known crab and always found freely swimming in the water, and never on the bottom, that when it was first dis-



A ZOEAL.

covered it was supposed to be an adult animal, and was named Zoea. By raising crabs from the egg, it was found that this Zoea was only the childhood of nearly every crab or lobster, and as it grew and shed from time to time its transparent skin, it gradually came to look more and more like its parent.

By the discovery that the eggs of barnacles passed through stages common to most crab-like animals, naturalists found that they did not belong to that great group including the snails, clams, and cuttle-fish, where they had been placed prior to 1829, but belonged to the group which includes crab, lobster, and shrimp-like animals, but greatly modified in the adult state, to suit their habits and surroundings.

The tiny Zoea, not larger than a pin's head, leads for a time a perfectly free life in the water, swept hither and thither by the currents of the sea: as it gets older, it finds its way to some open oyster and then it is swept within its shell by the current of water which passes over the gills and on to the mouth. It here gives up its wandering life and soon grows to the adult form, shedding from time to time, as with all crabs, its transparent skin. We find, moreover, that it is only the female which lives in the oyster. The male Zoetas do not remain thus protected, but prefer the freedom of a life upon the ocean bottom, only visiting its mate in the

oyster at certain seasons of the year. This male form is not soft, like its well housed mate, but, as we would suppose from its free life, has a fairly hard shell, like other crabs.

The Pinnotheres are found all over the world, wherever we find oysters, mussels, or scallops, from the Antarctic Ocean to the frozen north; but it seems that they are only used as a table delicacy by the American people. In the West Indies there is an oyster which attaches itself to the long roots of the mangrove trees. When Columbus first saw them, he was greatly astonished to find, among the many wonders of the Western world, oyster bearing trees, and having read that pearls were formed in oysters by drops of dew falling into their open mouths, reported to the credulous Europeans that the mangrove oyster must yield an abundant harvest, for the dew was so heavy in these tropical islands. Dr. Patrick Browne, however, tells us, in 1756, that the oyster crab is very common in the mangrove oyster, and such "as eat them do not think them a bit the worse for being accompanied with some of these crabs, which they swallow with the [shell] fish."

These crabs are quite common in the true pearl oyster of the Indian and Pacific Oceans, and there is a specimen of one of these shells in which a male is imprisoned in the substance of the shell and covered over with a layer of mother-of-pearl. The little fellow probably entered the oyster in search of his mate, and, not finding her, wandered about and finally passed between the mantle of the oyster and the shell, where he was finally enshrouded in mother-of-pearl.

There are about seventy-five kinds of crabs belonging to the oyster-crab family, all more or less related. All of them are small and of a retiring disposition. Some do not live within the shells of a protecting bivalve, but remain on the sea bottom under stones and hidden within small holes. Naturalists can, by the study of these animals, trace the different steps from the free crab, hiding in holes and crevices, to those which enter the open mouths of oysters, where, being protected from the attacks of enemies and having its food brought to it by the exertions of its host, it spends its entire life.

But perhaps the most curious habit found in any crab is that of a near relation of the oyster-crab, which we may call the "Coral-crab." This very small animal, after the free Zoea life common to most crabs, settles down in the fork of a growing coral and waits for a home to be built up around it. As the coral grows, the crab is slowly surrounded by the hard skeleton of the polyps. A very wonderful equilibrium is now formed. The crab must grow just as fast and no faster than the coral, for if it did not keep pace with the growth of the coral it would be soon walled in and no room allowed for its future growth. So, until the crab has reached its full size, about one-quarter of an inch, it lies in a cup-shaped hollow, with its opening on a level with the coral-polyps. When the full growth of the crab has been attained, the coral-polyps would now certainly close in over the little crab, and make it a prisoner, as did the pearl oyster, but the currents of water made by the crab in breathing-force the polyps to grow slanting from the mouth of her cave, so that in time a long funnel-like opening leads past the growing polyps to the body of the little crab.

We have here a beautiful adaptation. The crab chooses its own place among the coral branches, and then gently forces the workmen to build it a safe and comfortable home.

Replacing a Propeller at Sea.

The steamship "Border Knight" was disabled at sea by losing a propeller. The tail shaft broke short off at the boss and dropped to the bottom of the ocean. The machinery was immediately stopped and for safety the steam was run through the winches instead of using the automatic blow-off. Very interesting repairs were then made. The "Border Knight" carried only water ballast and was 2,000 miles from New York. There was a spare tail shaft and propeller on board. Of course, it would not have done to have pulled the broken tail shaft back into the tunnel, as this would have opened a hole below the water-line. The engineer, whose name is Gerrie, made a plug just the size of the shaft hole. He was then lowered over the stern with a rope, and seated himself on the pintle of the rudder. He then succeeded in inserting the plug and driving it home. The broken tail shaft was then removed and the water was pumped from the stern ballast tanks. It was necessary to drive the plug still further in, and this was accomplished by the heroic engineer, though sharks were following the vessel in considerable numbers. The spare tail shaft was gotten into position and the spare propeller, which weighed eight tons, was lowered over the side of the boat and slewed around until it was in proper position. The tail shaft was then pushed out through the hole in the stern, displacing the plug. The propeller was then worked over it to the shoulder of the boss, and the key was driven in. The forward section of the shaft was then replaced, the couplings were made, the bolts tightened, and after four days and three hours' work the vessel proceeded upon her journey.