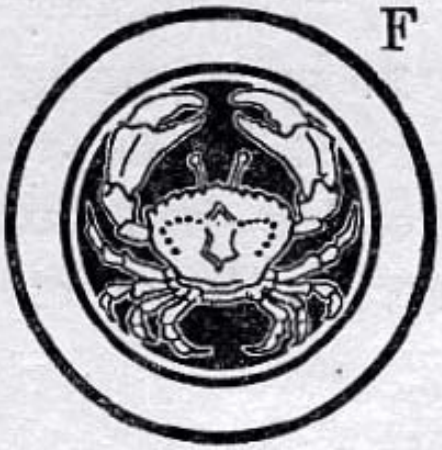
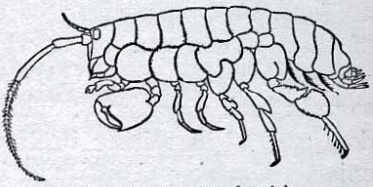
HOPPERS AND SHOLTIES.



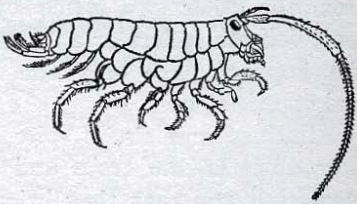
OF the great multitude of different animals which live on the seashore possibly the most numerous are the little creatures known as "sholties" or "Shetland sholties." They are to be found on almost every beach. Their peculiar shape, flattened on the sides, their habit of hiding in crowds under stones or seaweed, their intense alarm when they are suddenly exposed, and their vigour in escaping into a new hiding-place, are known to every schoolboy. They look very different from their pugnacious relatives, the crabs; they are feeble creatures, more ready to escape from danger than to offer fight. Yet they are most interesting little animals, and the more one watches their ways the more one comes to understand their wonderful adaptation to their surroundings.

Though their general appearance is quite familiar, it is not so commonly known that there are many different varieties of these creatures. As a matter of fact, there are scores of different kinds, some living on the beach, some just below extreme low-water mark, and others in the deep sea. We shall concern ourselves here only with those that live on the beach.

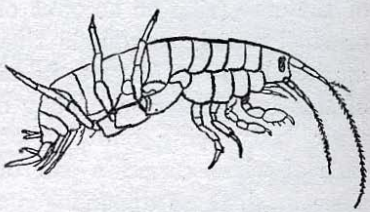
There are three common kinds which every one ought to know. Two of these, curiously enough, though *beach* animals are not really *sea* animals. They are hardly ever in the water; they live on the fringe of beach which lies just above high-water mark. The sea reaches them but rarely, and they never voluntarily seek the water. These two kinds are known as the shore-hopper (*Orchestia*) and the sand-hopper (*Talitrus*), the latter being found mostly on sandy beaches, where they make little burrows in which to hide, and the former living under stones or among the decaying seaweed on stony beaches. They both get their name of "hopper" from their habit of leaping or springing into the air, by means of which they often avoid capture by enemies. French people call them "sea-fleas."



Shore-hopper (Orchestia).



Sand-hopper (Talitrus).



Sholtie (Gammarus).
(All magnified about three times.)

The third variety, which is probably best known of

all, and to which the name of "sholtie" is here more especially applied, is that which occurs farther down on the beach in places which are constantly wet with sea-water. This animal (*Gammarus*) is much narrower in the body than the other two, and some of its legs are bent backwards along its side, so that by means of them it can run or crawl on its side. Indeed, when out of the water this creature in quite unable to walk back uppermost; whenever by any chance it does succeed in raising itself into what is for most animals the normal attitude, it immediately topples over on its side again. It can be readily distinguished from the other two forms by having *two* pairs of long, delicate feelers or antennæ in front of its head; the hoppers have only one long pair of antennæ and one short pair.

All these animals, in spite of their small size, are near allies of the crabs and lobsters. A naturalist would tell you that they belong to the group of the *Crustacea*, this name being applied to all animals of the crab tribe on account of the firm, crackly skin or shell which surrounds them. The Crustacea are marked by other features in addition to the possession of this hard exterior. They are all jointed animals, their body being built up of a series of segments, each of which carries a pair of legs or appendages of some kind, these appendages also being jointed. In the crab and the lobster a number of segments have become fused or welded together to form the front part or body of the animal. In the group of animals to which the sholties belong the segments are all distinct.

To understand something of the structure and the general habits of the sholtie, all that we require

to do is to collect a few specimens from the beach and put them in a saucer with a little sea-water. They will swim about in a very active fashion, the swimming being performed by means of little fan-like appendages attached to the under part of the animal just where the swimmerets are in the lobster. By the vigorous strokes of these appendages the animal forces its way through the water.

These appendages are, however, of use in another way; the gills of the animal are attached to them. Even when it is lying almost dry, or in water too shallow for swimming, these appendages can be seen to work regularly and rhythmically with a gentle flapping movement. Sometimes they stop working for a little and then begin again, but they are never long at rest. In this way currents of water are made to bathe the gills continually, and the flapping of the appendages is really a breathing movement.

The walking legs are attached to the fore part of the body. Some of them point backwards, as has already been mentioned, and the animal prefers to crawl or run on its side. As a rule, too, it propels itself over the ground by jerking movements of its body, its tail being alternately curled up and then suddenly straightened out again. It is in this way that it wriggles over the stones and escapes into a place of safety when exposed.

One of the most characteristic points about the sholtie is its habit of clinging to objects, especially if they afford a cover from the light. Drop a bit of sea-weed into the dish where they are swimming, and in two or three minutes the sholties will all be found clinging to the under surface of the weed. We

might indeed imagine that they had escaped from the saucer. They cluster like swarming bees round the smallest blade of seaweed, and it is only by turning over the weed that we can make sure that they are there. When exposed to full daylight they seem uncomfortable, and keep swimming about trying to find a hiding-place. It is only when they find something to cling to and to hide under that they really rest and feel at ease.

But we have not yet examined the hoppers. Though externally so like the sholties, they are very different in constitution and habits. To understand the difference between the two classes of animals, the best plan is to put either a shore-hopper or a sand-hopper into some water along with a sholtie. The latter is an active little animal in the water, capable of moving about like a fish. The hopper, on the other hand, is obviously out of his element; he sinks to the bottom of the dish and there works his way along in lumbering fashion. His breathing organs can be seen waving backwards and forwards in rhythmical fashion, but they are too feeble to be used for swimming. The shore-hopper can breathe quite well in water, and may live in it for days. It is said that sand-hoppers do not stand long-continued immersion, and die of drowning.

On land, however, the hopper is at home, provided he gets just sufficient moisture to keep his gills damp. Not only can he crawl about back uppermost—a feat which the *Gammarus* would attempt in vain—but as he crawls he keeps his tail curled up under his body, and by suddenly straightening this out he can throw himself into the air with considerable

vigour. In this way he often not merely escapes from an enemy, but even drives terror into the heart of the pursuer. It takes some little time to realize that hoppers can be handled with impunity, and are harmless for all their sudden jerky movements.

Why do these animals live on the upper fringe of beach, and what do they find there to eat? The answer is simple. They live on the cast up refuse of the sea; they are the scavengers of the jetsam. Naturalists who are collecting the skeletons of small animals often put the carcases which they wish to have cleaned under some decaying weed on the beach. After a week or a fortnight the bones are found to be picked absolutely clean.

In order to tell the sand-hopper from the shore-hopper we have only to look at his front feet. If they are all thin and slender, the animal is a sand-hopper; if one pair of the front feet are clubbed at the end and armed with a claw, we know that he is a shore-hopper.