tinged with green, four times the size of the operculum, the form of which it resembles in general outline; lip thin; throat nacreous; operculum shelly, ear-shaped, closely resembling that of *I. Cookii.* The base appears to lack the ornamentation peculiar to this last-named shell, though the whorls show traces of the wavy corrugation. The principal distinguishing marks between the two would seem to be the difference in the form of the aperture, and the far more marked tendency toward the conical form presented by the contour of the present specimen.

This shell, the only example at present obtained,* was discovered at low water at the cliffs at Nelson, N.Z., by the late Mr. E. H. Davis, of the New Zealand Geological Survey.

ART. XXXVIII.—*A Rock Pool and its Contents.* By P. THOMSON.

[*Read before the Otago Institute, 18th April,* 1871.]

FROM some remarks made by our vice-president about the wants in our local museum, and the difficulty of getting them supplied, I am inclined to think that the best means of doing so, as well as an excellent means of making our members practically acquainted with out-door science generally, would be by the establishment, in connection with our Institute, of a Field Naturalists' Society. Such associations are not unfrequent in the home country, and have proved of considerable benefit, not only to the districts in which they labour, but to the members themselves. They generally meet once or twice a month during the summer, and fix upon some locality over which to extend their researches, the scene of the next excursion being generally fixed before the breaking up of the last one. During these excursions each member is free to follow his or her peculiar branch of study. While one may push his way into a thicket to look for some fern or other plant, another may have come provided with net and other apparatus for catching moths, butterflies, or other insects. Another, again, may have found the outcrop of some rock, and, with hammer in hand, will go chipping off specimens; while another still may explore the thick bushes for birds' nests, etc. It is rather late in the season now for initiating such a society as that proposed; but even yet a good deal may be done. At all events the society may be organised, so that work might be begun at any time. There are numerous localities round about Dunedin which abound with interesting objects of every kind. I need only mention the shores of the harbour, the ocean beach, the valley of the Leith, the Pine Hill bush, Flagstaff, etc., to show that a Naturalists' Society has

* Another specimen has since been obtained in the same locality.—ED.

plenty of scope for variety of study. By way of illustrating what may be seen in a very small space, I venture to lay the following remarks before the Institute, premising that they were written several months ago.

It is a well-known fact, that though all men have been provided with eyes, it does not follow that they all make the same use of them. Some men walk through the world with their eyes pretty widely open, yet after all they see very little; while others are perpetually finding something to interest them. It is given to some men to be curious or inquisitive, not to be content with merely looking at a thing; they must see into it, see what sort of a thing it is. Other men are content with knowing that a tree is a tree, a rock a rock, and so on. Place two men on the sea beach: one sees only tumbling water on the one hand, and rocks or sand on the other; while the other sees a difference in every wave that comes rolling in to his feet—its force, its colour, its height, are all noted; while the sand tells its story of pounded shells or disintegrated rock. It is with the view of noting what may be seen by careful and minute observation, even in such an apparently trifling thing as the subject of my remarks, that I proceed to tell of what may be found in one of the most familiar objects that meet the eye on the sea-shore—a Rock Pool. I may say that the idea of writing this paper occurred to me during a recent visit to the Heads, in company with one of those men who have not the faculty of observing.

We were standing on a low point of rock looking at the ebbing tide rushing past, when he complained of weariness, and there being nothing to see. Against this I exclaimed, stating there were thousands of things all round us well worthy of study, and, casting my eye around, fixed on a little pool at our feet as an illustration. My friend was rather startled when I made him sit down on the rock beside me while I tried to describe to him the microcosm contained in the little pool of water left by the tide. It was a depression in the surface of a flat piece of rock, about two feet or so above low water mark, about fifteen inches in length by eight or nine wide, of an irregularly oval shape, and might contain two or three gallons of beautifully clear water. The first feature noticeable was that the pool was fringed with vegetation, and on a narrower inspection there were found three distinct sorts. The first and most beautiful was a bright green broad-bladed plant—the green laver—which belongs to the class of Chlorosperms; there were also some tufts of a grassy looking plant, belonging to the same class. In the darker nooks grew several plants of a hard tough texture, of a dark red colour, belonging to the Rhodosperms, not unlike the dulse of the old country, but harder and not at all palatable. There were also some tufts and patches of that common and very pretty plant, the Coralline or Rosetangle, a plant which is more than one half lime. It was also observed that on the borders

of the leaves of these plants there were crowds of little globules of air—this being oxygen gas, which the plants elaborate from the carbonic acid given off by the animals which lived in the pool.

Carefully removing some of the vegetation, so as to allow of more light getting into the water, we disturbed a small brown fish, evidently a member of the Goby family, from its bluff-shaped head, and from a habit of attaching itself to the perpendicular sides of the pool, the ventral fins being shaped something like a sucker. The little fellow eluded capture very cleverly, and glided hither and thither until it was finally lost in a dark nook at one end. Below the weed at one point there was a colony of those pretty animals the *Serpulæ*, which live in calcareous tubes, twisted like a snake. They are annelids, and have a number of beautiful feather-like tentacles round their head, protruding from their shell, by which they grasp their prey. One of these tentacles is swelled out, and placed on a slightly longer stalk than the others, and forms a sort of cork, by which the animal shuts itself into the shell when alarmed. The *Serpulæ* are said to have no eyes, but they must have something which serves them quite as well, for if the hand is drawn quickly across the surface of the water so that the shadow falls upon them, they instantly disappear. After waiting a little the cork will be seen to protrude, slowly followed by the rest of the organs. There were plenty of the common Barnacle in the pool, the rock being studded with them here and there. They are cirrhipeds, throwing out a number of bent arms covered with fine hairs, placed something like the fingers on one's hand; these they are constantly opening and shutting, of course conveying to the stomach whatever articles of sustenance they may happen to inclose. Adhering to the rock were some small molluscs, much resembling a *Nerita*, and one Limpet (*Patella*). These are gasteropods, and creep over the rocks on a broad foot; their mouths are furnished with a very peculiar tongue, rough like a file, and with it they scrape the surfaces of the rocks and plants as they travel hither and thither, so keeping down the growth of plants, which would otherwise fill the pool to the exclusion of all else.

Carefully lifting and turning over a stone which lay at the bottom, quite a crowd of crustaceans was discovered. However, they mostly scuttled away so rapidly that they were lost sight of; but one sort remained: this was the Porcelain crab, of which there were several specimens. These crabs are very peculiarly constructed, and are so named from the under sides of the bodies resembling porcelain. They mostly inhabit dark places, under stones, etc., and are armed with large powerful nippers, though they are quite harmless, and may be handled with impunity. These little creatures are wonderfully adapted to the circumstances in which they live. Their bodies are quite thin and compressed, so as to be able to wriggle themselves into any hole or under a stone, where they lie quite out of the reach of any harm. A very minute

crab, with a carapace about the size of a pea, was discovered on the mud at the bottom where the stone had lain, and when taken out of the water was found to be a very pretty object, having light red legs; it was very active, and escaped back to the water again. On examining the stone, its lower surface was found to be partially covered by a species of sponge, of a yellowish colour, rising here and there into tubercles, each of which had a hole communicating with the interior. Close beside the sponge were several small semi-transparent globules, evidently the ova of some animal.

Turning now to the other end of the pool, under the clear water were seen a number of those interesting animals, Actinias, which form a link as it were between the animal and vegetable worlds. They much resembled a small single *Chrysanthemum*, of a pale whitish shade, with here and there on the tentacles a bright red spot. Some of them were very little, not over a quarter of an inch in diameter, while others measured about an inch across. To test their voracity we dropped one of the *Neritas* on one of them, and though nearly as big as itself, it closed its tentacles on it, and soon gorged it out of sight. There were several other singular organisms in the pool, particularly a long worm, with what looked like fringes on its sides, probably a *Nereis*; but as we had no means of carrying anything away for further investigation, it was impossible to say definitely what they were. Anyone who may wish to explore for himself in this direction should take with him a clear sided glass dish and a magnifier, and he will find plenty to interest, amuse, and instruct him in any one of the numerous pools on the rocky parts of the coast.

In recapitulating the contents of this little patch of water, it will be observed that we found representatives of all the great divisions of the animal world. Beginning with the lowest—the sponge, we have a member of the fifth sub-kingdom—the Protozoa. A stage higher and the *Actiniæ* represent the fourth—the Radiata. Then the Mollusca—the third sub-kingdom—are represented by the *Patella* and the *Nerita*; while the second—the Articulata—claims the various crabs, etc., and the highest—the Vertebrata—claims the fish.

Over this little pool my friend and I spent a very pleasant hour, and on leaving the spot he honestly confessed he had no idea that these pools contained anything but water; and said that he had arisen not a sadder but a wiser man. After all, I do not think I have mentioned more than half of what was contained in the pool; but have ventured to run the foregoing remarks together with the view of showing that even the commonest things are worth investigation. Now to compare the contents of this pool with a similar one in the old country, I find that there is very great resemblance. The plants are nearly identical, the *Serpulæ* and the Barnacles are exactly so; the fish, or a near relative, the Blenny, would be sure to be found; while the

Nerita would be represented by a *Trochus*. The Porcelain crab is the very same as the one found at home, both as to colour and size; while the *Actiniæ*, though differing in colour, very much resemble the *Actinia mesembryanthemum*, which studs the rocks so plentifully along the coast in the neighbourhood of St. Andrews.