

DIATOMACEÆ.

NAVICULA DIDYMA, Ktz.

RHABDONEMA ADRIATICUM, Ktz.

BIDDULPHIA PULCHELLA, Gray.

These are the only diatoms observed; they were procured by washing some specimens from the nests of the *Sterna*; guano from the same might have yielded other species.

XI. Notes on Plants Collected at Fernando de Noronha (Sept. 1st and 2nd, 1873). By H. N. MOSELEY, M.A., Naturalist to H.M.S. 'Challenger.'

[Read April 16, 1874.]

FERNANDO DE NORONHA is situate in lat. $3^{\circ} 50'$ S., distant from the nearest point of S. America (which is about Cape S. Roque) rather more than 200 miles. The island is long and narrow, and stretches about N.E. and S.W. At the eastern extremity is a series of islands known as Platform Island, St. Michael's Mount, Booby Island, Egg Island and Rat Island. The entire length of the whole chain, including the main island, is about seven geographical miles. The main island itself is about 4 miles long, and nowhere more than $2\frac{1}{2}$ broad. At about the middle of its northern coast a remarkable column-like mass of bare rock projects up to the height of 1000 feet. It is known as the Peak. The Peak is composed of phonolite; and the island generally is volcanic, many of the exposed cliffs being seen to be composed of columnar basalt. There are dunes of calcareous sand at the eastern extremity of the island, and some sand-rock like that of Bermuda. The island is hilly, one hill being 600 feet in height. St. Michael's Mount is a conical mass of phonolite 300 feet in height. The other islands are low and flat, and are mainly or entirely composed of sandstone rock like that of Bermuda, but containing volcanic particles.

There is a rainy and a dry season in the island. The rainy season is from January to July, and the dry from July to December. In the dry season there is occasionally want of water; but it often rains during this season, as it did heavily during our stay on September 2.

Apparently the only account of the vegetation of Fernando de Noronha existing is that given by Webster in his narrative of Captain Foster's voyage ('Voyage of the Chanticleer'). Webster mentions a series of plants as occurring, most of which I recognized. Darwin, in his Journal, mentions only two plants—a dark laurel-like tree, and one with pink flowers but without leaves.

All the higher ground of the island, where not cleared for cultivation, with the exception of the perpendicular part of the Peak, is covered with a thick growth of trees, which are indicated on the Admiralty Chart. The trees are none of them large. It is said that all the large ones have been cut down by the convicts for the construction of the small rafts or catamarans, which are much used by them for fishing. The trees are overgrown with dense masses of creepers of various kinds. The plant-growth is thickest and apparently virgin at the western extremity of the island, near the opening through the rock called the Hole in the Wall. The commonest tree is that called by Webster the laurelled Bara; it has dark green laurel-like leaves, and an abundant milky juice; the bark is smooth and brown. I could find no flower or fruit on the tree, but did not search much, since I expected to be able to collect specimens next day; I unfortunately did not even secure a leaf. The tree does not grow on any of the outlying islands; it is evidently the laurel-like tree referred to by Darwin. The next abundant tree or, rather, large shrub, is another Euphorbiaceous plant called by Webster *jatropha* or *pinhao*, *Jatropha gossypifolia*, Linn. It has a pink flower, and had only single tufts of young leaves immediately beneath the inflorescences at the time of our visit, although it was in full flower; its bare stems and branches render it a striking object amongst the green of the creepers when the forest is viewed from the sea. Webster says that it casts its leaves in July and August (that is, at the commencement of the dry season). It is evidently the tree mentioned by Darwin as occurring on the Peak. The tree grows on St. Michael's Mount and Rat Island. I saw several specimens of a tree with rounded leaves of a bluish green and stout thorns; it had a Euphorbiaceous look; I looked for flower and fruit without success. The tree occurs only on the main island. One of the trees was about 20 feet high and 9 inches in diameter of trunk. Some thorny Acacia bushes are abundant on the shore. *Abrus precatorius* twines round every thing on the main island; but I did not see it on the

outliers; *Jatropha urens* is abundant everywhere, and a horrible pest.

An *Ipomœa* (*I. pes-capræ*), apparently the same as at Bermuda and the Cape-Verdes, is in abundance on the sand-hills, and is covered with a *Cuscuta* (*C. americana*), which is extremely abundant and attacks most of the low herbs.

I saw only one grass (*Oplismus colonus*) on the main island; but that was abundant. A *Cereus* covers the cliffs; but I did not see *Cactus quadrangularis*, mentioned by Webster. The Cape gooseberry and Castor-oil plant grow wild on all the islands. Some few of the plants which I collected on the main island were gathered in the neighbourhood of the convict settlement, and are therefore probably introduced species.

The upper part of St. Michael's Mount is covered with a thick growth of bushes, trees, and creepers; the island is comparatively inaccessible, and affords no space for cultivation; all the plants upon it have therefore probably reached it by natural agencies. I was several hours on the rock, and believe that I made a tolerably complete collection of its flora. At the base of the rock grows an *Ipomœa* with a large white flower. I did not see this species on the main island, but only the blue-flowered one (*I. pes-capræ*), which does not grow on St. Michael's Mount or any of the other outliers on which we landed, although this white-flowered species is abundant on all of them. A fig grows all over the upper part of the rock, and in favourable spots forms a considerable tree; I saw one about 18 inches in diameter of trunk, and 30 feet in height; the tree is wide and spreading, and throws down aerial roots like *Ficus indica*. Webster mentions the Banyan as growing at Fernando de Noronha; this is evidently the tree referred to. It grows also on Rat Island, near the sea-level, but does not there form a tree, but merely a sort of low scrub. Another tree, *Capparis cyanophallophora*, Linn., with dark green leaves of an oval lanceolate form, grows abundantly on the summit of St. Michael's Mount; it has curious green masses upon it, about which I am uncertain whether they are an inflorescence or a morbid growth; the tree has a stem about 8 or 9 inches in diameter, and an almost creeping habit. On Rat Island there is a thick growth of a grass with clinging seeds mingled with Leguminous and Euphorbiaceous herbs and Cucurbitaceous creepers; there is no tree, there not being sufficient shelter from the wind; the Fig does not reach more than 5 or 6 feet in height.

An *Halophila* was dredged in shallow water, but unfortunately without flower or fruit.

On the whole I should expect from what I saw during my few hours on the islands, that the flora of Fernando de Noronha is not very rich in species; the same plants recur everywhere. I collected only about fifty species of flowering plants in all.

I could find no Fern, either on the mainland or on St. Michael's Mount, although there are moist and shady spots about the latter rock where Ferns might have grown. I saw also no Moss or Liverwort on the islands. Lichens are very scarce. I noticed only two incrusting species; and these were not abundant. There is a small inland lake marked on the chart at the western extremity of the main island. Ferns, Sedges, &c. may possibly grow there; but perhaps the occasional drought is too much for them.

The top of the Peak appears to be without vegetation; it is utterly inaccessible. Marine Algæ, excepting incrusting calcareous forms, are not at all abundant about tide-mark; but about twenty-four species were obtained by Prof. Thomson whilst dredging in shallow water of from 7 to 20 fathoms, and with these the *Halophila*. A green *Ulva* grows on some low rocks on the sandy northern beach.

Sugar-cane, Maize, Cassava, a black Bean, and Sweet Potatoes are cultivated in Fernando de Noronha, the beans and maize in the greatest quantities, Bananas and Melons are the principal fruit; the latter are especially fine and abundant. Grapes are not now cultivated, though they are said to do well.
