

of the great current which, stretching westward from the region of Ducie, Pitcairn and Tubai Islands, follows the line of the Tropic of Capricorn, and branching, sends its northern half to the east coast of Australia to form the East Australian current, whilst its other half passes down S.W. to sweep past the east coast.

The group lies just at the northern limit of the zone of westerly winds, and within that of calms and changeable winds, but so close to the limit that the winds may well have transported many of the plants, and the preponderance of ferns may be due to the possible fact, that the winds have been the main agents in the colonization of the islands, and have sufficed to carry the minute fern spores, whilst heavier seeds have seldom reached the island; when they have done so it has been by other means of transport.

If fern spores are diffused mainly by wind, it should be especially difficult for them to cross the zones of constant rains, and there ought to be a marked separation of fern forms in distribution about those lines.

There is no connection between the flora of the Kermadecs and that of Norfolk Island; as Sir J. D. Hooker states, this might have been expected, on general considerations. The soundings of the "Gazelle" and "Tuscarora," have proved that a channel of more than 2,000 fathoms in depth, passes up between New Zealand and the Kermadec Islands. Hence, an ancient land connection cannot be looked to as an explanation of the New Zealand affinities of the Kermadec flora.

Whilst dredging was going on off the islands, a shark (*Carcharias brachyurus*), which was attended by a pilot fish (*Naukrates sp.*), was caught; it was, as is commonly the case, covered by a small parasitic Crustacean, a species of *Pandarus*. Some specimens of this parasite had, curiously enough, a Barnacle (*Lepas*) attached to them as large as themselves.

On the shark being skinned, I noticed that a layer of superficial or skin muscles extending all over the animal, and only about one-fourth of an inch in thickness, is coloured dark-red by blood-colouring matter (*Hæmoglobin*), as are all the muscles of Mammalia. The main internal muscular mass of the shark is pale, almost white.

Prof. Ray Lankester has described several similar instances of the restriction of the red colouring matter to certain muscles only in animals which possess it.* A closely parallel case is that of the little fish, the "Sea-Horse" (*Hippocampus*), in which the muscles of the dorsal fin only are red.

* E. Ray Lankester, "On the Distribution of Hæmoglobin." Proc. Royal Soc., No. 140, 1873.