

tation that it is very difficult to observe the rock structure. The wells, which are round holes sunk to a depth of four or five feet close to the shore, show a mere continuation of the reef-structure of the shore covered by about a foot of soil.

It was interesting to recognise amongst the littoral plants of Tonga many forms which had been gathered on the shores of the far-distant Bermuda; these were cosmopolitan tropical plants, and became familiar objects on nearly all the tropical shores visited subsequently. One plant (*Nitella flexilis*) which grows in Tonga is almost identical with one occurring in Kerguelen Island (*Nitella antarctica*), but it again is cosmopolitan and a water weed. The *Casuarina* trees in Tonga remind one of Australia, but they are nowhere abundant. In every direction there are large tracts of land which have been under cultivation, but are now overrun with a wild growth of a dense low tangle of several species of *Convolvulus* and a trailing bean, affording plain evidence of the reduction of the population (see Pl. XVIII.). The position of the more recent clearings is marked in the distance by the projection from the main mass of dark foliage of the dead branches of trees that have had their bark ringed.

Bats are the only indigenous mammals in Tonga. A large Fruit Bat, probably *Pteropus keraudrenii*, which occurs in Fiji and Samoa and also in the Caroline Islands,¹ is very abundant. These Fruit Bats appear on the wing in the early afternoon in full sunlight, and at the time of the visit were feeding on the bright red flowers of one of the indigenous trees. Flowers form a large proportion of the food of the Fruit Bats. At Botany Bay, New South Wales, in May, numbers of Fruit Bats were to be seen feeding on the flowers of the gum trees. The bats probably often act as fertilizers, by carrying pollen from tree to tree, adherent to their fur. As dusk comes on, the Fruit Bats on the wing become more and more plentiful, and it is probably only those specially driven by hunger that come out before dusk. Besides these large bats, there are small insectivorous bats in Tonga, which dart about amongst the cocoanut trees, but no specimens were obtained. The heavy flapping of *Pteropus* is as strongly contrasted with the rapid motion of the true bats as is the flight of a goose with that of a swallow. There are plenty of horses and cattle in Tonga, and the high ground of Eooa is occupied as a sheep run.

A small Heron (*Demiegretta sacra*) wades about on the coral reefs at Tonga, and catches small fish, and is also to be seen frequently inland all over the island. This bird changes its plumage from pure white to uniform grey, and all stages of parti-coloured plumage were to be seen during the visit; contrary to the usual rule, the bird is white when young, and dark in the mature state, hence it is probable that the ancestors were white, and the race is assuming a darker plumage for protection. In the groves, the most abundant bird is one about the size of a sparrow, brown with yellow wattles (*Ptilotis carunculata*), which has a sweet and very loud song, and fills the

¹ Die Carolinen Insel Yap oder Guap, *Journal des Museum Godeffroy*, Heft. ii., 1873.