

polyp, the thicknesses and areal dimensions attained in virtue of the continued upward growth and seaward extension of the reef, and the proportion of coral formations in the limestone and dolomite rocks of the Alps and other regions.

Reinhold Forster, who accompanied Captain Cook on his voyage round the world in 1778, expressed the view that the formation of coral reefs was limited to the seas of warm climates, and wrote as follows regarding the mode of construction :—"The reef is built up by the lithophyte worms from the ocean-floor until it comes within a very small distance of the surface of the ocean. The waves wash against this newly-built wall all kinds of *débris*, mussel shells, fronds of sea-weed, fragments of coral, sand, and other material, so that the submarine coral wall gradually increases in height, and begins to be seen above the surface."

The circular form of atoll reefs is explained by Forster as the result of a continued effort on the part of coral polyps to erect a wall protecting them from dominating winds. James Cook added a number of observations on reef-growth, supplementary to those of Forster; and John Barrow in 1806 made the first attempt to determine the thickness of coral rock on an island. Flinders prepared in 1801 a map of the reefs off the Australian coast, and in 1814 published an important cartographical work, in which he agreed with Forster's views on reef-growth. Péron in 1816 enumerated 245 islands of reef-coral, and determined their geographical position between 34° north and south latitude.

Valuable observations were made on the conditions favourable for the growth of reef structures by Chamisso and Eschholz, who accompanied Kotzebue's voyage of exploration (1814-18) in the southern seas. Adalbert von Chamisso, during a prolonged sojourn on an atoll of the Radack group, took accurate measurements, upon the basis of which he afterwards sub-divided coral reefs into three classes, coastal reefs, inland groups, and atolls. Atolls were described as circular or ring islands, rising like table mountains from the ocean depths and only showing a narrow edge above the water. Chamisso distinguished very emphatically the higher side of a reef directed towards the prevailing wind from the lower protected side, which is frequently interrupted, and through which a channel leads into the central lagoon of the island.

He doubted whether the calcareous rock-material of the reef