

atolls, it was stated that some of the smallest observed by Beechey in the Pacific were only a mile in diameter. If their external slope under water equals upon an average an angle of 45° , then would such an atoll at the depth of half a mile, or 2640 feet, have a diameter of two miles. Hence it would appear that there must be a tendency in every atoll to grow smaller, except in those cases where oscillations of level enlarge the base on which the coral grows, by throwing down a talus of detrital matter all round the original cone of limestone.

Bow Island is described by Captain Beechey as seventy miles in circumference, and thirty in its greatest diameter, but we have seen that some of the Maldivas are much larger.

As the shore of an island or continent which is subsiding will recede from a coral reef at a slow or rapid rate, according as the surface of the land has a steep or gentle slope, we cannot measure the thickness of the coral by its distance from the coast; yet, as a general rule, those reefs which are farthest from the land imply the greatest amount of subsidence. We learn from Flinders, that the barrier reef of north-eastern Australia is in some places seventy miles from the mainland, and it should seem that a calcareous formation is there in progress 1000 miles long from north to south, with a breadth varying from twenty to seventy miles. It may not, indeed, be continuous over this vast era, for doubtless innumerable islands have been submerged one after another between the reef and mainland, like some which still remain, as, for example, Murray's Islands, lat. $9^\circ 54'$ S. We are also told that some parts of the gulf inclosed within the barrier are 400 feet deep, so that the efficient rock-building corals cannot be growing there, and in other parts of it islands appear encircled by reefs.

It will follow as one of the consequences of the theory already explained that, provided the bottom of the sea does not sink too fast to allow the zoophytes to build upwards at the same pace, the thickness of coral will be great in proportion to the rapidity of subsidence, so that if one area sinks two feet while another sinks one, the mass of coral in the first area will be double that in the second. But the downward movement must in general have been very slow and uniform, or where intermittent, must have consisted of a great number of depressions, each of slight amount, otherwise the bottom of the sea would have been carried down faster than the corals could build upwards, and the island or continent would be permanently submerged, having reached a depth of 120 or 150 feet, at which the effective reef-constructing zoophytes cease to live. If, then, the subsidence required to account for all the existing atolls must have amounted to three or four thousand feet, or even sometimes more, we are brought to the conclusion that there has been a *slow* and *gradual* sinking to this enormous extent. Such an inference is perfectly in harmony with views which the grand scale of denudation, everywhere observable in the older rocks, has led geologists to adopt in reference to upward movements. They must also have been