

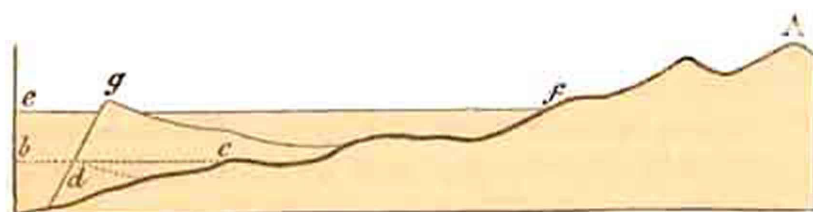
exceeding by several thousand feet the limits at which the efficient stone-building corals can exist, for we have seen that they cease to grow in water which is more than 120 feet deep. That the original rock immediately beneath the points *b c* is actually as far from the surface as *d e*, is not merely inferred from Dampier's rule, but confirmed by the fact, that immediately outside the reef, soundings are either not met with at all, or only at enormous depths. In short, the ocean is as deep there as might have been anticipated in the neighbourhood of a bold coast; and it is obviously the presence of the coral alone which has given rise to the anomalous existence of shallow water on the reef and between it and the land.

After studying in minute detail all the phenomena above described, Mr. Darwin has offered in explanation a theory now very generally adopted. The coral-forming polypi, he states, begin to build in water of a moderate depth, and, while they are yet at work, the bottom of the sea subsides gradually, so that the foundation of their edifice is carried downwards at the same time that they are raising the superstructure. If, therefore, the rate of subsidence be not too rapid, the growing coral will continue to build up to the surface; the mass always gaining in height above its original base, but remaining in other respects in the same position. Not so with the land: each inch lost is irreclaimably gone; as it sinks the water gains foot by foot on the shore, till in many cases the highest peak of the original island disappears. What was before land is then occupied by the lagoon, the position of the encircling coral remaining unaltered, with the exception of a slight contraction of its dimensions.

In this manner are encircling reefs and atolls produced; and in confirmation of his views Mr. Darwin has pointed out examples which illustrate every intermediate state, from that of lofty islands, such as Otaheite, encircled by coral, to that of Gambier's group, where a few peaks only of land rise out of a lagoon, and, lastly, to the perfect atoll, having a lagoon several hundred feet deep, surrounded by a reef rising steeply from an unfathomed ocean.

If we embrace these views, it is clear, that in regions of growing coral a similar subsidence must give rise to barrier reefs along the shores of a continent. Thus suppose *A* (fig. 96.) to represent the north-east portion of Australia, and *b c* the ancient level of the sea, when the coral reef *d* was formed. If the land sink so that it is

Fig. 96.



submerged more and more, the sea must at length stand at the level *e f*, the reef in the mean time having been enlarged and raised to the point *g*. The distance between the shore *f*, and the barrier reef *g*, is now much greater than originally between the shore *c*, and the reef *d*,