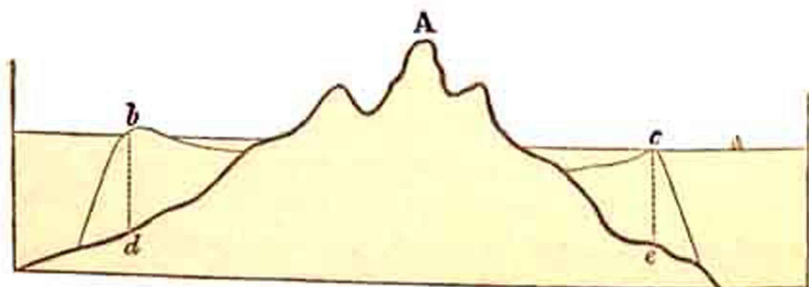


north-east coast of Australia for nearly 1000 miles, is another most remarkable example of a long strip of coral running parallel to a coast. Its distance from the mainland varies from twenty to seventy miles, and the depth of the great arm of the sea thus inclosed is usually between ten and twenty fathoms, but towards one end from forty to sixty. This great reef would extend much farther, according to Mr. Jukes, if the growth of coral were not prevented off the shores of New Guinea by a muddy bottom, caused by rivers charged with sediment which flow from the southern coast of that great island.*

Two classes of reefs, therefore, have now been considered; first, the atoll, and, secondly, the encircling and barrier reef, all agreeing perfectly in structure, and the sole difference lying in the absence in the case of the atoll of all land, and in the others the presence of land bounded either by an encircling or a barrier reef. But there is still a third class of reefs, called by Mr. Darwin "fringing reefs," which approach much nearer the land than those of the encircling and barrier class, and which indeed so nearly touch the coast as to leave nothing in the intervening space resembling a lagoon. "That these reefs are not attached quite close to the shore appears to be the result of two causes; first, that the water immediately adjoining the beach is rendered turbid by the surf, and therefore injurious to all zoophytes; and, secondly, that the larger and efficient kinds only flourish on the outer edge amidst the breakers of the open sea."†

It will at once be conceded that there is so much analogy between the form and position of the strip of coral in the atoll, and in the encircling and barrier reef, that no explanation can be satisfactory which does not include the whole. If we turn in the first place to the encircling and barrier reefs, and endeavour to explain how the zoophytes could have found a bottom on which to begin to build, we are met at once with a great difficulty. It is a general fact, long since remarked by Dampier, that high land and deep seas go together. In other words, steep mountains coming down abruptly to the sea-shore are generally continued with the same slope beneath the water. But where the reef, as at *b* and *c* (fig. 95.), is distant several miles

Fig. 95.



Supposed section of an Island with an encircling reef of Coral.

A. The island.

b, c. Highest points of the encircling reef between which and the coast is seen a space occupied by still water.

from a steep coast, a line drawn perpendicularly downwards from its outer edges *b c* to the fundamental rock *d e*, must descend to a depth

* Quart. Journ. Geol. Soc. 4. xciii.

chap. 20, and Coral Islands, chapters 1, 2, 3.

† Darwin's Journal, p. 557. 2d edit.