

and yet trituration by the action of the waves and winds has in many places reduced all to the finest material, so that an embedded shell is seldom to be found in the beach or drift oölite, and rarely too in much of the fine-grained coral reef-rock.

The lagoon basin appears to be eminently the place for making these non-fossiliferous limestones. This is the case in two widely different conditions: *first*, over the portions that are below the coral-growing depths, which are sometimes of great area; and *second*, in lagoons that have become so small and shallow that corals and large shells have all disappeared, and the trituration is of the finest kind, producing calcareous mud; such lagoons being properly in a marsh condition. These last appear to illustrate on a small scale the conditions under which many of the ancient non-fossiliferous, or sparingly fossiliferous, limestones were formed.

VII. THE WIDE RANGE OF THE OLDER LIMESTONES NOT EXEMPLIFIED AMONG MODERN CORAL-REEF FORMATIONS.

Coral-reefs, though they may stretch along a coast for scores of miles, are seldom a single mile in width at the surface; and if elevated above the sea, they would stand as broad ramparts separated by passages mostly 20 to 200 feet deep, and often of great width. The substratum, however, is, in general, continuous coral-rock; and if these more elevated parts were removed by any process, after an elevation, they would leave a nearly level area of coral limestone often as extensive as the whole reef-grounds. This is at once seen from the map of the islands of the Gilbert Group (p. 132), or that of the Feejees. In an island like Dean's, one of the Paumotus, these reef-grounds are 1,000 square miles in extent.

But the most extensive reef-grounds of the oceans are after all of small breadth compared with many of the ancient limestones of the continents; and the reef-rocks also are peculiar in their very abrupt limits, the margins sometimes descending at a steep angle a thousand feet or more. These differences