

terest as furnishing proof of vast oceanic subsidence. In the year 1868, C. Semper pointed to some cases of atolls which, he said, could not be explained by Darwin's theory. The Pelew Islands, at the western end of the Caroline archipelago, show true atolls at their northern extremity, while at their southern end, only 60 miles away, there are raised coral-reefs, and an island entirely destitute of reefs. Semper considered that the atolls had grown up under the influence of peculiar conditions of marine currents and erosion, simultaneously with elevation rather than subsidence.³⁷⁷ In 1870 J. J. Rein cited the case of Bermuda as one capable of explanation by upgrowth of calcareous accumulations from the bottom without subsidence.³⁷⁸ More recently, Mr. Murray, whose researches in the "Challenger" Expedition led him to make detailed examination of many coral reefs, has suggested that barrier-reefs do not necessarily prove subsidence, seeing that they may grow outward from the land upon the top of a talus of their own débris broken down by the waves, and may thus appear to consist of solid coral which had grown upward from the bottom during depression, although only the upper layer, 20 fathoms or thereabout in thickness, is composed of solid, unbroken coral growth. He points out that in the coral-seas the islands appear to have always started on volcanic ejections, at least that all the non-calcareous rock now visible is of volcanic origin. Where the submarine peak lay below the inferior limit of coral growth, it may have been brought up to the requisite level by the gradual accumulation of the remains

³⁷⁷ See Semper's papers quoted in footnote on p. 814. In the Appendix to the second edition of his "Coral Reefs" (p. 223) Mr. Darwin replies to Semper's criticism, maintaining that his objections present no insuperable difficulty in the theory of subsidence.

³⁷⁸ See paper cited in footnote on p. 814.