

converted into a barrier reef, and finally, by continued subsidence of the floor, passed into the form of an atoll. The essential feature is a certain reciprocity between the secular movement of subsidence and the vertical or horizontal growth of the reef. Darwin brings the movements of the area of subsidence in the Pacific Ocean into correlation with the volcanic phenomena so widely extended in that ocean. Where fringing reefs still occur, he supposes that instead of subsidence, local elevation is taking place. The presence of barrier reefs and atolls, on the contrary, indicates a submergence of islands and a subsidence of the sea-floor.

The distinguished American geologist and zoologist, Dana, had abundant opportunity during the Wilkes Expedition (1839-41) of investigating coral reefs, and he accepted Darwin's theory on all the essential points. The apparent naturalness of Darwin's theory recommended it to all, and in 1860 it seemed to find striking confirmation from the geological side. In that year Ferdinand von Richthofen published his account of the geology of Predazzo, St. Cassian, and adjacent localities in the South Tyrol Dolomites. He described the limited local occurrence of dolomite or dolomite limestone cliffs, in many places 2000-3000 feet thick, and the varying age of the sedimentary deposits at the base of the cliffs. These were sometimes the tufaceous Wengen strata, sometimes richly fossiliferous Cassian marls, sometimes the older dolomite rocks (*Mendola Dolomite*), sometimes volcanic lavas. Von Richthofen suggested that the variation in the age of the deposits at the base of the calcareous or dolomite cliffs, as well as the great inequality in the dimensions of the cliffs, might be explained in the sense of Darwin's theory on the supposition that the cliffs represented coral reefs whose growth had increased during a prolonged epoch of subsidence of the sea-floor, and had spread over deposits of different ages at the base. Mojsisovics, in conjunction with other members of the Austrian Survey, afterwards examined the area in greater detail, and in 1879 published his work, *The Dolomite Reefs of South Tyrol*, in which he confirmed Richthofen's suggestion that the cliffs were fossil coral reefs, but declared the growth of the reefs to have been contemporaneous with the sedimentation of the earthy and volcanic rocks in the neighbourhood.

Gümbel, however, proved the frequent occurrence of species of gyroporella, or sea-algæ, in the dolomite rocks of South Tyrol,