

formation occurs without interruption along the bed of the Gulf Stream, in the sinuosities of the Gulf of Mexico, and in the deep channels through the Bahama Bank, and again along the Atlantic coast from a depth of 100 fathoms, or, what comes to much the same thing, from the internal edge of the Gulf Stream, whence it stretches over a vast extent of the Atlantic. He says the whole bottom is an immense bed of chalk in process of formation, while the littoral fauna, with its numerous Corals and Molluscs, will furnish material for oolitic calcareous beds of shells, corals, conglomerate, &c.

Pourtalès also gives a description of the different stages in the formation of glauconite. He says:—"We find, side by side, the tests perfectly fresh, others still entire, but filled with a rusty-coloured mass, which permeates the finest canals of the shells like an injection. In others, again, the shell is partly broken away, and the filling is turning greenish; and finally we find the cast without trace of shell, sometimes perfectly reproducing the internal form of the chambers; sometimes, particularly in the larger ones, cracks of the surface or conglomeration with other grains obliterates all the characters. They even coalesce into pebbles, in which the casts can only be recognised after grinding and polishing."¹ Pourtalès observes that these glauconitic grains are deposited in depths of 50 to 100 fathoms near the coasts of Georgia and South Carolina. Greensand may also be found in the bed of the Gulf Stream, but in such cases it is sporadic. Dredgings were taken down to a depth of about 700 fathoms, the zoological results of which were published by the Museum of Comparative Zoölogy, Cambridge, Massachusetts. In 1869 L. Agassiz addressed to Professor Pierce a report bearing upon the general results of these dredgings,² showing how instructive they were in accounting for the manner in which certain geological strata have been deposited in the ocean. The Corals dredged from the Pourtalès Plateau have some affinity with Tertiary and Cretaceous types, while the Echinoderms have some resemblance to those of the chalk; *Voluta junonia*, also found there, is related to *Voluta lamberti* of the Crag and *Voluta mirabilis* of the Miocene strata of Virginia and Maryland. Two common Brachiopods contribute to give the fauna an archaic character. Beyond this plateau the bottom descends rapidly to 500 or 600, and even 800, fathoms, and is covered with a thick adhesive mud presenting the aspect of a Cretaceous marl;³ life here diminishes, which he thinks is due to the very nature of the bottom.

Agassiz is of opinion that the exploration of the sea must prove of advantage to the study of geology, and states that what he had seen of deep-sea deposits seemed to indicate that no recent or ancient formation ever occurred in very deep water. He concludes that the present continental areas within the 200-fathom line, as well as the oceans, have preserved their outlines and positions from the earliest times.⁴ The

POURTALES ON
STAGES IN THE
FORMATION OF
GREENSAND.

LOUIS AGASSIZ ON
THE PERMANENCE
OF CONTINENTS
AND OCEANS.

¹ Report U.S. Coast Survey for 1869, p. 224.

² Report upon deep-sea dredgings in the Gulf Stream during the third cruise of the U.S.S. "Bibb," *Bull. Mus. Comp. Zool.*, vol. i. pp. 363-386, 1869.

³ *Ibid.*, p. 367.

⁴ *Ibid.*, pp. 368, 369.