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(p. 368.)

SUBMERGENCE OF THE SAHARA IN THE POST-PLIOCENE PERIOD.

THE numerous experiments made by the French of late years with a view of obtaining water in the great African desert, by means of Artesian borings, have proved that a vast area, now chiefly occupied by barren sand, was under water at a period when the existing shells of the Mediterranean were already in being. We learn from a memoir by M. Ch. Laurent* that sand identical with that on the nearest shores of the Mediterranean, and containing recent shells, among which the common cockle (*cardium edule*) is very abundant, has been observed over a vast space from west to east, from a height of more than 900 feet above the level of the sea, to depths of 300 feet below it, for there are depressions of land in Africa, as in Western Asia, below the level of the sea. The common cockle was not only seen lying on the surface, but was brought up by M. Laurent from more than 20 feet below it by the Artesian auger; while the same shell has also been observed still living in some salt lakes in the desert. A widely-spread superficial incrustation of salt seems also a sign of the final evaporation of the sea in certain districts.

The sea appears to have once extended from the Gulf of Cabes (or Gabes), in Tunis, to the west coast of Africa north of Senegambia, having a width of several hundred (perhaps where greatest, according to Mr. Tristram, 800) miles. Successive terraces, or ancient sea-beaches, and lines of sea-cliff with caves at their base, are traceable in various regions, especially where the rocks consist of limestone. Many of the old beaches take the form of conglomerates, in which shells or the casts of them are agglutinated together with sand and pebbles. Some of these are seen along the southern borders of the French possessions in Africa.

The Rev. H. B. Tristram, author of 'Travels in the Great Sahara,' has given me shells of *cardium edule* (the variety called by Lamarck *C. crenulatum*, now living in the Mediterranean), which he collected as far south as lat. 32° N., long. 6° E., in a watercourse called Wid

* Bulletin de la Soc. Géol. de France, vol. xiv. p. 615, 1856–7.