

the world accompanying this volume, has approximately the course which that of 68° F. probably had in Oölitic times. It should have a little less northing, and the loop to the north should lean more to the eastward. The latter would have been a consequence of the submerged condition at the time of most of the European continent.

The ocean's waters seem to have cooled somewhat before the next period—the Cretaceous—began, since evidence fails of any Cretaceous coral reefs in the British seas; but such reefs prevailed then in central and southern Europe, so that the amount of cooling in the interval since the Oölitic era had not been large; and as late as the Miocene Tertiary there were reef corals in the seas of Northern Italy, above latitude 45° N., or that of Montreal, in Canada.

The absence from the American coast of the Atlantic of any coral reefs in the Cretaceous beds, and of any reef corals, seem to show that the oceanic temperature off this coast was not favourable for such corals; and if so, then the line of 68° F. extended at least 20° farther north on the European side of the ocean than on the Atlantic—an inequality to be accounted for in part by the existence of the Gulf Stream.² But, in addition, the whole range of life in the European Cretaceous, and its vastly greater variety of species, leave no doubt as to the higher temperature of the ocean along its European border; so that the idea of a Cretaceous Gulf Stream must be accepted. And that of a Tertiary is demonstrated by similar facts.

If the Gulf Stream had its present position and force in Oölitic, Cretaceous, and Tertiary times, then the ocean had, throughout these eras, its present extension and oceanic character; and, further, no barrier of land extended across from South America to the Canaries and Africa, dividing the South from the North Atlantic, but all was one great ocean. Such a barrier would not annul entirely the flow of the Gulf Stream; yet the North Atlantic is so small an ocean that, if left to itself, its system of currents would be very feeble.

² The influence of oceanic currents on the isothermal lines of the ocean is briefly stated on pages 255, 256.