by which species are enabled to travel from one end of a province to the other; take as examples the East and West Indian Islands. The efficiency of the North Atlantic as a barrier between the Caribbean and Lusitanian provinces will appear from the following considerations. The average rate of the Gulf Stream across the Atlantic is certainly not over 2 miles per hour, or 48 miles per day, say for convenience 50; if the distance from Florida to the Canaries be taken as 3000 miles, it will take sixty days to accomplish the journey, and long before the expiration of that time the larvæ will have come to maturity and fallen to the bottom of a sea where conditions are not favourable for their existence; by this calculation we perceive, however, that distances of 500 miles may easily be accomplished by many larvæ, by those, that is to say, that do not accomplish their development in a shorter period than six days.

Returning to the case of the East and West Indies, one may suggest that the transport which must take place there of larval forms from island to island may be connected with the rich development of varieties in these areas, since swarms of larvæ must according to slight shiftings in direction of the variable currents be transported to numerous resting places differing more or less from each other as environments, and thus determining the survival of different varieties.

The general correspondence between ocean currents and distributional provinces will be seen by comparing the appended map with one of the oceanic circulation; the Arctic province would appear to be peopled by species borne southwards by the Arctic currents, the Lusitanian by the westerly extension of the Gulf Stream and its return branches; the interdigitation of the Arctic and Lusitanian faunas in the British area follows from the interdigitation which occurs between the two systems of currents. The Caribbean province is dependent on the Gulf Stream, but separated from the Lusitanian by the width of the Atlantic; possibly at some earlier period of the earth's history some kind of coast line connection extended from America to Europe, so that the Lusitanian province may have been peopled from the New World; this bridge has been long enough non-existent to allow of a differentiation of the Caribbean and Lusitanian faunas, which still, however, maintain a close family resemblance. On the other hand, as Professor Haddon suggests to me, there may have existed a chain of islands not more remote from each other and the coast than 500 miles, and extending from West Africa, south of the Verde Islands, to St. Paul's on the one hand, and thence along the connecting ridge to Brazil on the other. If so, the migration may have been as in so many other cases from the east; and since in Tertiary times the Indo-Pacific area was continuous with the Lusitanian (as already pointed out by Mr. Hoyle[1]), this might account for the resemblance previously remarked between the fauna of the Indo-Pacific and Brazilian provinces, as well as that said to exist between the Mollusca of Africa and Brazil. The Brazilian province owes its existence to the Brazil current, and as in the course of geological history the point of

[1] Report on the Cephalopoda, Zool. Chall. Exp., part xliv. p. 224.