

ing, not only as showing that deep-sea animals must derive food largely from such sources, but because they are necessarily of great geological importance as showing how specimens of land vegetation are becoming imbedded in deposits which are being formed at very great depths.

Between the Fiji Group and the New Hebrides we dredged from 1,450 fathoms a piece of a branch of a tree, 3 feet in length. Off the Island of Palma, one of the Azores, we dredged from 1,135 fathoms the leaf of a Shrub, possibly a Holly-leaf, which was still green and firm, though water-logged. With this leaf were numerous fish otoliths and eye-lenses. We constantly dredged bones of whales and fish from great depths. Off the coast of Nova Scotia we dredged a quantity of glacially striated stones.

The deep-sea animals of course prey upon one another just as do shallow-water species. We dredged once a fish from 2,500 fathoms which had a deep-sea Shrimp in its stomach. A *Cerianthus* dredged from 2,175 fathoms had a small Crustacean in its stomach.

The waters of the deep sea being everywhere dark and always cold, the conditions of life in them are the same all over the world. The temperature of the deep sea is practically the same, as far as effect on life is concerned, under the Equator and at the Poles. Hence there are absolutely no barriers to the migrations of animals in the deep sea. Time only is required for any deep-sea animal to roam from any distant part of the earth to another.

It is only in the strata of water comparatively near the ocean surface that there is any great difference in range of temperature in various latitudes. Up to the depth of 1,000 fathoms, even from the greatest existing depths, the range amounts only to a few degrees Fahrenheit; and at 1,000 fathoms everywhere the water is cold and dark, and the conditions of life practically the same as those in the greatest depths; even at a depth of 500 fathoms the water is almost everywhere as cold as 40° F. The effects of difference of pressure may be neglected, since, when encountered gradually, they would be of no injury to migrating animals.

Hence, even the ridges, which project up from the ocean floor and separate areas of great depth from one another by intervening expanses, over which the depth is only 1,000 fathoms or somewhat less, do not oppose any obstacle to the migration of deep-sea animals. Such ridges exist in the Atlantic and Pacific Oceans.

In the Atlantic, a long sinuous ridge, with a depth of only 1,000 fathoms over it, separates the two deep troughs on