

along the margin of land whence sediment is derived, conditions are more favorable for the preservation of marine organisms. Sheets of sand and mud are there laid down, wherein the harder parts of many forms of life may be entombed and protected from decay (p. 763). But probably only a small proportion of the fauna that crowds these marginal waters of the ocean, with perhaps an occasional pelagic species, may be expected to occur in such deposits. Moreover, for the entombment and preservation of the remains of these organisms, there must obviously be a sufficiently abundant and rapid deposit of sediment, combined with a slow depression of the sea-bottom. Under the most favorable conditions, therefore, the organic remains actually preserved will usually represent little more than a mere fraction of the whole assemblage of life in these juxta-terrestrial parts of the ocean.

*c. Abysmal deposits.*—In proportion to distance from land, the rate of deposition of sediment on the sea-floor must become feebler, until in the remote central abysses it reaches a hardly appreciable minimum, while at the same time the solution of calcareous organisms may become marked in deep water (p. 767). Except, therefore, where organic deposits such as ooze are forming in these more pelagic regions, the conditions must be on the whole unfavorable for the preservation of any adequate representation of the deep-sea fauna. Hard enduring objects, such as teeth and bones, may slowly accumulate and be protected by a coating of peroxide of manganese, or of silicates, such as are now forming here and there over the deep sea-bottom. Yet a deposit of this nature, if raised into land, would supply but a meagre picture of the life of the sea.

In considering the various conditions under which marine organisms may be entombed and preserved, we must take into account certain occasional phenomena, when sudden, or at least rapid and extensive, destruction of the fauna of the sea may be caused. (1) Earthquake shocks have been followed by the washing ashore of vast quantities of dead fish.<sup>5</sup> (2) Violent storms, by driving shoals of fishes into shallow water and against rocks, produce enormous destruction. Dr. Leith Adams describes the coast of part of the Bay of Fundy as being covered to a depth of a foot in some places with dead fish, dashed ashore by a storm on the 24th of Septem-

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<sup>5</sup> C. Forbes, Q. J. Geol. Soc. xiv. 1858, p. 294.