

changes which these species have undergone since the raising of the Isthmus of Panama and the isolation of the two Faunæ?"<sup>1</sup>

Edward Forbes distinguished round all seaboards four very marked zones of depth, each characterized by a distinct group of organisms. The first of these is the littoral zone, the space between tide-marks, distinguished by the abundance of sea-weeds, on the European shores of the genera *Lichina*, *Fucus*, *Enteromorpha*, *Polysiphonia*, and *Laurencia*, which severally predominate at different heights in the zone, and subdivide it into subordinate belts like a softly-coloured riband border. This band is under very special circumstances, for its inhabitants are periodically exposed to the air, to the direct rays of the sun, and to all the extremes of the climate of the land. Animal species are not very numerous in the littoral zone, but individuals are abundant. The distribution of many of the littoral species is very wide, and some of them are nearly cosmopolitan. Many are vegetable feeders. Some characteristic genera on the coast of Europe are *Gammarus*, *Talitrus*, and *Balanus* among Crustacea, and *Littorina*, *Patella*, *Purpura*, and *Mytilus* among Mollusca, with, under stones and in rock-pools, many stragglers from the next zone.

The Laminarian zone extends from low-water mark to a depth of about fifteen fathoms. This is specially

<sup>1</sup> Preliminary Report on the Echini and Starfishes dredged in Deep Water between Cuba and the Florida Reef, by L. F. de Pourtales, Assistant U.S. Coast Survey; prepared by Alexander Agassiz. Communicated by Professor B. Peirce, Superintendent U.S. Coast Survey, to the Bulletin of the Museum of Comparative Zoology, Cambridge, Mass., 1869.