

The two envelopes of the solid surface of our planet—the liquid and the aëriform—exhibit, owing to the mobility of their particles, their currents, and their atmospheric relations, many analogies combined with the contrasts which arise from the great difference in the condition of their aggregation and elasticity. The depths of ocean and of air are alike unknown to us. At some few places under the tropics no bottom has been found with soundings of 276,000 feet (or more than four miles), while in the air, if, according to Wollaston, we may assume that it has a limit from which waves of sound may be reverberated, the phenomenon of twilight would incline us to assume a height at least nine times as great.* The aërial ocean rests partly on the solid earth, whose mountain chains and elevated plateaux rise, as we have already seen, like green wooded shoals, and partly on the sea, whose surface forms a moving base, on which rest the lower, denser, and more saturated strata of air.

Proceeding upward and downward from the common limit of the aërial and liquid oceans, we find that the strata of air and water are subject to determinate laws of decrease of temperature. This decrease is much less rapid in the air than in the sea, which has a tendency under all latitudes to maintain its temperature in the strata of water most contiguous to the atmosphere, owing to the sinking of the heavier and more cooled particles. A large series of the most carefully conducted observations on temperature shows us that in the ordinary and mean condition of its surface, the ocean from the equator to the forty-eighth degree of north and south latitude is somewhat warmer than the adjacent strata of air.† Owing to this decrease of temperature at increasing depths, fishes and other inhabitants of the sea, the nature of whose digestive and respiratory organs fits them for living in deep water, may even, under the tropics, find the low degree of temperature and the coolness of climate characteristic of more temperate and more northern latitudes. This circumstance, which is analogous to the prevalence of a mild and even cold air on the elevated plains of the torrid zone, exercises a special influence on the migration and geographical distribution of many marine animals. Moreover, the depths at which fishes live, modify, by the increase of pressure, their cutaneous respiration, and the

* [See Wilson's Paper, *On Wollaston's Argument from the Limitation of the Atmosphere as to the finite Divisibility of Matter.*—*Trans. of the Royal Society of Edinb.*, vol. xvi., p. 1, 1845.]—*Tr.*

† Humboldt, *Relation Hist.*, t. iii., chap. xxix., p. 514-530.