

suggestion which has emanated from one of the first of living geologists? Fish, of all existing creatures, seem the most capable of sustaining high degrees of heat, and are to be found in some of the hot springs of Continental Europe, where it is supposed scarce any other animal could live. Now, all the fish of the ancient type are thickly covered by a defensive armor of bone, arranged in plates, bars, or scales, or all the three modes together, as in the *Osteolepis* and one half its contemporaries. The one-sided tail is united invariably to a strong cuirass. And it has been suggested by Dr. Buckland, that this strong cuirass may have formed a sort of defence against the injurious effects of a highly heated surrounding medium. The suggestion is, of course, based purely on hypothesis. It may be stated, in direct connection with it, however, that in the Lias — the first richly fossiliferous formation overlying that in which the change occurred — we find, for the first time in the geological system, decided indications of a change of seasons. The foot-prints of winter are left impressed amid the lignites of the Cromarty Lias. In a specimen now before me, the alternations of summer heat and winter cold are as distinctly marked in the annual rings as in the pines or larches of our present forests; whereas in the earlier lignites, contemporary with ichthyolites of the ancient type, either no annual rings appear, or the markings, if present, are both faint and unfrequent. *Just ere winter began to take its place among the seasons, the fish fitted for living in a highly heated medium disappeared: they were created to inhabit a thermal ocean, and died away as it cooled down.* Fish of a similar type may now inhabit the seas of Venus, or even of Jupiter, which, from its enormous bulk, though greatly more distant from the sun than our earth, may still powerfully retain the internal heat