

around the earth. 6. Temperature of the interior of the earth, independent of external agencies.

1. *Solar Heat.*—The solar rays exert no influence, as a general fact, at a greater depth than about 100 feet. (Baron Fourier mentions 130 feet as the maximum depth; Poisson fixes it at seventy-six feet.) A thermometer placed at that depth remains stationary all the year. The diurnal effect does not extend more than three or four feet. In receding from the tropics, the amount of solar heat diminishes. During six months it continues to increase, and to diminish the remaining six months. The decrease of the mean temperature from the equator towards the poles is nearly in proportion to the cosines of latitude. Prof. Forbes has made some observations near Edinburgh, from which it appears that the oscillations of annual temperature would cease at the depth of forty-nine feet in trap tufa, sixty-two feet in incoherent sand, and ninety-one feet in compact sandstone.

Solar heat is the fundamental element on which depends the surface temperature of the globe and the character of the climate.

2. *Nature of the Surface.*—The radiating and absorbing power of land is quite different from that of water. Ice and snow are still different; and the nature of the soil affects sensibly its power to imbibe or give off heat. Hence low islands have a higher temperature than large continents in the same latitude; and the ocean possesses greater uniformity of climate than the land.

On these facts Sir Charles Lyell has founded an hypothesis for explaining the high temperature of the surface of the globe in northern latitudes in early times. He supposes that but little land then existed in the northern parts of the globe, and that this produced so great an elevation of temperature above what it is at present, that tropical animals and plants might then have inhabited regions now subjected to almost perpetual winter. That the quantity of dry land in the northern hemisphere, during the deposition of the older fossiliferous rocks, was much less than at present is very probable; and this might affect the climate somewhat. But if the action of currents from tropical regions extending to the frigid zone, at the present day, is not sufficient to render the climate temperate, we can not think a greater depression in ancient times would be adequate to the production of a climate in which tropical plants and animals might flourish.

3. *Height above the Ocean.*—The temperature of the air diminishes one degree Fahrenheit for 300 feet of altitude; two degrees for 595 feet; three degrees for 872 feet; four degrees for 1,124 feet; five degrees for 1,347 feet; and six degrees for 1,539 feet.