

Sect. 6.—Theories of Changes of Climate.

As we have already stated, Geology offers to us strong evidence that the climate of the ancient periods of the earth's history was hotter than that which now exists in the same countries. This, and other circumstances, have led geologists to the investigation of the effects of any hypothetical causes of such changes of condition in respect of heat.

The love of the contemplation of geometrical symmetry, as well as other reasons, suggested the hypothesis that the earth's axis had originally no obliquity, but was perpendicular to the equator. Such a construction of the world had been thought of before the time of Milton,¹¹ as what might be supposed to have existed when man was expelled from Paradise; and Burnet, in his *Sacred Theory of the Earth* (1690), adopted this notion of the paradisiacal condition of the globe :

The spring
Perpetual smiled on earth with verdant flowers,
Equal in days and nights.

In modern times, too, some persons have been disposed to adopt this hypothesis, because they have conceived that the present polar distribution of light is inconsistent with the production of the fossil plants which are found in those regions,¹² even if we could, in some other way, account for the change of temperature. But this alteration in the axes of a revolution could not take place without a subversion of the equilibrium of the surface, such as does not appear to have occurred; and the change has of late been generally declared impossible by physical astronomers.

The effects of other astronomical changes have been calculated by Sir John Herschel. He has examined, for instance, the thermotical consequences of the diminution of the eccentricity of the earth's orbit, which has been going on for ages beyond the records of history. He finds¹³ that, on this account, the annual effect of solar radiation would increase as we go back to remoter periods of the past; but (probably at least) not in a degree sufficient to account for the apparent past

¹¹ Some said he bade his angels turn askance
The poles of earth twice ten degrees and more
From the sun's axle, &c.—*Paradise Lost*, x. 214.

¹² Lyell, i. 155. Lindley, *Fossil Flora*. ¹³ *Geol. Trans.* vol. iii. p. 295.