that they are subject to a cycle of large variations, such as those "perturbations" which affect even the regular orbits of the planets. Such cycles of variation have been *suggested*, but unless a *cause* be assigned (as is done for the planetary perturbations), this gratuitous addition of one hypothesis to another weakens the probability of both. This appears to us an impartial view of the subject.

Climate.

That during early geological periods, the northern zones of the earth enjoyed a climate approaching to that which is now confined to the equatorial regions, is admitted among the established inferences of geology, upon the evidence of the remains of plants and animals found imbedded in the strata. For reasoning on this subject which we deem satisfactory, the reader may consult a former chapter of this work. (Vol. I. ch. v.) A true geological theory must be capable of fully accounting for the change of temperature which has thus affected large regions of the globe.

Besides the general speculation of a refrigerating globe, we have on this subject three others to examine. The hypothesis advanced by Mr. Lyell is founded on the acknowledged fact that the mean temperature of any point on the earth's surface is liable to considerable variation, according to the position of land and sea. By supposing a peculiar distribution of masses of land, equal in area and elevation to the present continents and islands, this eminent author endeavours to account for the facts regarding ancient climate, without calling in aid any external or internal sources of a change of heat.

There are, however, two external sources of change of the mean temperature of the whole globe. The calorific influence of the sun may increase or diminish, because the mean distance of the earth from that luminary is subject to variation: the temperature of the ethereal spaces in which suns and planets move may not be the same in every part; and, if the whole solar system has a move-