

(4) The effects of change of eccentricity and precession have been so ably urged by Croll, and recently by Ball, and have so strongly influenced the minds of those who are not working geologists, that they deserve a more detailed notice.

(5) The heat of the sun is known to be variable, and the eleven years' period of sun spots has recently attracted much attention as producing appreciable effects on the seasons. There may possibly be longer cycles of solar energy; or the sun may be liable, like some variable stars, to paroxysms of increased energy. Such changes are possible, but we have no evidence of their occurrence, and they could not account for periods of refrigeration of limited duration like the Glacial age.

(6) It has been supposed that the earth may have at different times traversed more or less heated zones of space, giving alternations of warm and cold temperature. No such differences in space are, however, known, nor does there seem any good ground for imagining their existence.

(7) The differences in the form and elevation of our continents, and in the consequent distribution of surfaces of different absorbent and radiating power, and of the oceanic currents, are known causes of climatal change, and have been referred to in these papers as competent to account for many, at least, of the phenomena.

(8) Reference has already been made, in connection with the distribution of plants, to the possibility that the primeval atmosphere was richer in carbon than that of more modern times, and that this might operate to produce diminution of radiation, and consequent uniformity of temperature; but this cause could not have been efficient in the later geological periods.

There may thus be said to remain two theories of those enumerated by Wood, to which more detailed consideration may be given, namely, numbers four and seven, which may be named