preclude the admission of this hypothesis; nor does it derive any support from astronomical observations continued for 2000 years.

Even an increase of the obliquity of the earth's axis to the ecliptic, without any other change, would produce a great effect in the climate of northern latitudes, by increasing the summer heat; but the winters would be colder than at present. There is, indeed, an annual change in the obliquity of the ecliptic, but it appears to be confined within limits too small to produce a sensible effect on the temperature of any part of the globe. The effects that might be produced by a change of the earth's orbit remain to be noticed.

A change in the form of the earth's orbit, if considerable, might change the temperature of the earth, by bringing it nearer to the sun in one part of its course. The orbit of the earth is an ellipsis, approaching nearly to a circle: the distance from the centre of the orbit, to either focus of the ellipsis, is called by astronomers the "*eccentricity of the orbit.*" This eccentricity has been for ages slowly decreasing, or in other words, the orbit of the earth has been approaching nearer to the form of a perfect circle; after a long period it will again increase, and the possible extent of the variation has not been yet ascertained.* From what is known respecting the orbits of Jupiter and Saturn, it appears highly probable, that the eccentricity of the earth's orbit, is confined within limits, that preclude the belief of any great change in the mean annual temperature of the globe ever having been occasioned by this cause.†

The heat from solar radiation, may possibly have been greater in remote ages than at present. Sir Wm. Herschel inferred, from the variable spots on the sun, that the mean temperature of the earth was increased or decreased in certain years; or, in other words, that the earth received an unequal annual supply of heat from the sun. We have, however, no data from which to ascertain that there has ever been any considerable change of temperature effected by this cause; to appeal to the high former temperature of the globe in proof of it, would be to substitute vague hypothesis in the place of facts.

Beside solar radiation, it is believed by many philosophers, that there is a source of subterranean heat within the earth itself; this opinion is by no means new, but it appears to have received support from numerous observations and experiments made in a comparatively recent period. The evidence by which the theory of central

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* Sir J. W. Herschel, in a paper on the subject read to the Geological Society, states that a variation in the eccentricity of the earth's orbit, from the circular form to that of an ellipse, having an eccentricity of one fourth of the major axis, would produce only an increase of 3 per cent. in the mean annual amount of solar radiation.

† Un autre phénomène également remarquable du système solaire, est le peu d'eccentricité des orbes des planètes et des satellites, tandis que ceux des comètes sont très-allongés. Nous sommes encore forcés de reconnaître ici l'effet d'une cause régulière, le hazard n'eut point donné une forme presque circulaire aux orbes de toutes les planètes et de leurs satellites."—*La Place, sur les Probabilités.*