

drew attention to the eccentricity of the earth's orbit round the sun, and the fact that during the summer season of the southern hemisphere the earth is in its nearest position to the sun (perihelion), while during the winter season of the same hemisphere the earth is at its greatest distance from the sun (aphelion). He then argued, since the eccentricity of the orbit was variable, sometimes having the form of a long ellipse, sometimes approximating to a circle, during the epochs of greater eccentricity of the orbit, the hemisphere whose winter falls in aphelion would undergo a protracted period of winter cold. The climate might be thereby rendered so severe that stupendous masses of ice would accumulate near the Pole in aphelion, and as a further consequence the centre of gravity of the earth might be shifted. According to Adhémar, the conditions favourable for extensive glaciation recur in each hemisphere at intervals of 10,500 years, and thus call forth periodic Ice Ages.

Although Sir John Herschel, Arago, and Humboldt were of opinion that the eccentricity of the earth's orbit could have but a slight influence upon the climate of our planet, Adhémar's theory was accepted by Julien (1860) and Le Hon (1868) with scarcely any modification. James Croll treated the subject of cosmic causes of climatic variation in a memorable work, *Climate and Time* (1875). He improved the theory enunciated by Adhémar, inasmuch as he showed the dependence of the prevailing winds and ocean-currents upon the eccentricity of the earth's orbit, and explained how masses of ice and snow accumulating at the Pole must, in virtue of their radiation of cold, absorption of heat, and condensation of moisture, tend strongly to reduce the temperature. Croll supposed that the interglacial periods were characterised by the almost complete withdrawal of the glacier ice, and by extensive subaerial disturbance of the glacial deposits. In Great Britain, Croll's views have been accepted by many geologists, amongst others by Sir Archibald Geikie and his brother, Professor Geikie. Professor Penck and Professor Pilar are the best known of Croll's adherents on the Continent.

Sir Charles Lyell took objection to Croll's theory, mainly because of the insufficient geological evidence of recurring epochs of glaciation; nor can this objection be said to be even yet overcome. Neumayr doubts, on the one hand, whether