

been effected with the lapse of vast periods of time, though no reliable standard seems to be available whereby these periods are to be measured. The argument from geological evidence indicates an interval of probably not much less than 100 million years since the earliest forms of life appeared upon the earth, and the oldest stratified rocks began to be laid down.

2. The physical argument as to the age of our planet is based by Lord Kelvin upon three kinds of evidence: (1) the internal heat and rate of cooling of the earth; (2) the tidal retardation of the earth rotation; and (3) the origin and age of the sun's heat.

(1.) Applying Fourier's theory of thermal conductivity, he pointed out as far back as the year 1862, that in the known rate of increase of temperature downward beneath the surface, and the rate of loss of heat from the earth, we have a limit to the antiquity of the planet. He showed, from the data available at the time, that the superficial consolidation of the globe could not have occurred less than 20 million years ago, or the underground heat would have been greater than it is; nor more than 400 million years ago, otherwise the underground temperature would have shown no sensible increase downward. He admitted that very wide limits were necessary. In subsequently discussing the subject, he inclined rather toward the lower than the higher antiquity, but concluded that the limit, from a consideration of all the evidence, must be placed within some such period of past time as 100 millions of years. He would now restrict the time to about 20 millions.⁷¹

⁷¹ Trans. Roy. Soc. Edin. xxiii. p. 157. Trans. Geol. Soc. Glasgow, iii. p. 25. "Popular Lectures and Addresses," 2d edit. (1891), p. 397. Prof. Tait reduces the period to 10 or 15 millions. "Recent Advances in Physical Science," p. 167.