

The figure of the Earth and the amount of solidification (density) which it has acquired are intimately connected with the forces by which it is animated, in so far, at least, as they have been excited or awakened from without, through its planetary position with reference to a luminous central body. Compression, when considered as a consequence of centrifugal force acting on a rotating mass, explains the earlier condition of fluidity of our planet. During the solidification of this fluid, which is commonly conjectured to have been gaseous and primordially heated to a very high temperature, an enormous quantity of latent heat must have been liberated. If the process of solidification began, as Fourier conjectures, by radiation from the cooling surface exposed to the atmosphere, the particles near the center would have continued fluid and hot. As, after long emanation of heat from the center toward the exterior, a stable condition of the temperature of the Earth would at length be established, it has been assumed that with increasing depth the subterranean heat likewise uninterruptedly increases. The heat of the water which flows from deep borings (Artesian wells), direct experiments regarding the temperature of rocks in mines, but, above all, the volcanic activity of the Earth, shown by the flow of molten masses from open fissures, afford unquestionable evidence of this increase for very considerable depths from the upper strata. According to conclusions based certainly upon mere analogies, this increase is probably much greater toward the center.

That which has been learned by an ingenious analytic calculation, expressly perfected for this class of investigations,\*

*after den Latinske original af Jens Baggesen.* Holberg, who studied for a time at Oxford, was born at Bergen in 1685, and died in 1754 as Rector of the University of Copenhagen.]—*Tr.*

\* Here we must notice the admirable analytical labors of Fourier, Biot, Laplace, Poisson, Duhamel, and Lamé. In his *Théorie Mathématique de la Chaleur*, 1835, p. 3, 428-430, 436, and 521-524 (see, also, De la Rive's abstract in the *Bibliothèque Universelle de Genève*), Poisson has developed an hypothesis totally different from Fourier's view (*Théorie Analytique de la Chaleur*.) He denies the present fluid state of the Earth's center; he believes that "in cooling by radiation to the medium surrounding the Earth, the parts which were first solidified sunk, and that by a double descending and ascending current, the great inequality was lessened which would have taken place in a solid body cooling from the surface." It seems more probable to this great geometer that the solidification began in the parts lying nearest to the center: "the phenomenon of the increase of heat with the depth does not extend to the whole mass of the Earth, and is merely a consequence of the motion of our planetary system in space, of which some parts