

aspect of nature in my journeyings by sea and land, by the careful study of forms and forces, and by a vivid impression of the unity of nature in the midst of the most varied portions of the Earth. In the rapid advance of all branches of physical science, much that is deficient in this attempt will, perhaps, at no remote period, be corrected, and rendered more perfect, for it belongs to the history of the development of knowledge that portions which have long stood isolated become gradually connected, and subject to higher laws. I only indicate the empirical path in which I and many others of similar pursuits with myself are advancing, full of expectation that, as Plato tells us Socrates once desired, "Nature may be interpreted by reason alone."*

The delineation of the principal characteristics of telluric phenomena must begin with the form of our planet and its relations in space. Here, too, we may say that it is not only the mineralogical character of rocks, whether they are crystalline, granular, or densely fossiliferous, but the geometrical form of the Earth itself, which indicates the mode of its origin, and is, in fact, its history. An elliptical spheroid of revolution gives evidence of having once been a soft or fluid mass. Thus the Earth's compression constitutes one of the most ancient geognostic events, as every attentive reader of the book of nature can easily discern; and an analogous fact is presented in the case of the Moon, the perpetual direction of whose axes toward the Earth, that is to say, the increased accumulation of matter on that half of the Moon which is turned toward us, determines the relations of the periods of rotation and revolution, and is probably cotemporaneous with the earliest epoch in the formative history of this satellite. The mathematical figure of the Earth is that which it would have were its surface covered entirely by water in a state of rest; and it is this assumed form to which all geodesical measurements of degrees refer. This mathematical surface is different from that true physical surface which is affected by all the accidents and inequalities of the solid parts.† The whole figure of the Earth is determined when we know the amount of the

* Plato, *Phædo*, p. 97. (Arist., *Metaph.*, p. 985.) Compare Hegel, *Philosophie der Geschichte*, 1840, s. 16.

† Bessel, *Allgemeine Betrachtungen über Gradmessungen nach astronomisch-geodätischen Arbeiten*, at the conclusion of Bessel and Baeyer, *Gradmessung in Ostpreussen*, s. 427. Regarding the accumulation of matter on the side of the Moon turned toward us (a subject noticed in an earlier part of the text), see Laplace, *Expos. du Syst. du Monde*, p. 308.