phyre instead of cavities, render it difficult, notwithstanding the admirable simplicity of the method, to arrive at any great result regarding the figure of the Earth from observation of the oscillations of the pendulum. In the astronomical part of the determination of degrees of latitude, mountain chains, or the denser strata of the Earth, likewise exercise, although in a less degree, an unfavorable influence on the measurement.

As the form of the Earth exerts a powerful influence on the motions of other cosmical bodies, and especially on that of its own neighboring satellite, a more perfect knowledge of the motion of the latter will enable us reciprocally to draw an inference regarding the figure of the Earth. Thus, as Laplace ably remarks,* "An astronomer, without leaving his observatory, may, by a comparison of lunar theory with true observations, not only be enabled to determine the form and size of the Earth, but also its distance from the Sun and Moon—results that otherwise could only be arrived at by long and arduous expeditions to the most remote parts of both hemispheres."

declivity of Ararat, which with Caucasus may be said to lie in the center of gravity of the old continent formed by Europe, Asia, and Africa, the very exact pendulum experiments of Fedorow give indications, not of subterranean cavities, but of dense volcanic masses. (Parrot, *Reise zum Ararat*, bd. ii., s. 143.) In the geodesic operations of Carlini and Plana, in Lombardy, differences ranging from 20″ to 47″·8 have been found between direct observations of latitude and the results of these operations. (See the instances of Andrate and Mondovi, and those of Milan and Padua, in the *Opérations Geodes. et Astron. pour la Mesure d'un Arc du Parallèle Moyen*, t. ii., p. 347; *Effemeridi Astron. di Milano*, 1842, p. 57.) The latitude of Milan, deduced from that of Berne, according to the French triangulation, is 45° 27′ 52″, while, according to direct astronomical observations, it is 45° 27′ 35″. As the perturbations extend in the plain of Lombardy to Parma, which is far south of the Po (Plana, *Opérat. Geod.*, t. ii., p. 847), it is probable that there are deflecting causes *concealed beneath the soil of the plain itself.* Struve has made similar experiments [with corresponding results] in the most level parts of eastern Europe. (Schumacher, *Astron. Nachrichten*, 1830, No. 164, s. 399.) Regarding the influence of dense masses supposed to lie at a small depth, equal to the mean height of the Alps, see the analytical expressions given by Hossard and Rozet, in the *Comptes Rendus*, t. xviii., 1844, p. 292, and compare them with Poisson, *Traité de Mécanique* (2me éd.), t. i., p. 482. The earliest observations on the influence which different kinds of rocks exercise on the vibration of the pendulum are those of Thomas Young, in the *Philos. Transactions* for 1819, p. 70–96. In drawing conclusions regarding the Earth's curvature from the length of the pendulum, we ought not to overlook the possibility that its crust may have undergone a process of hardening previously to metallic and dense basaltic masses having penetrated from great depths, through open clefts, and approached near the surface.

* Laplace, *Expos. du Syst. du Monde*, p. 231.