urements, made by the aid of new and more perfect analysis, have, however, shown that the compression of the poles of the terrestrial spheroid, when the density of the strata is regarded as increasing toward the center, is very nearly $\frac{1}{300}$th.

Three methods have been employed to investigate the curvature of the Earth's surface, viz., measurements of degrees, oscillations of the pendulum, and observations of the inequalities in the Moon's orbit. The first is a direct geometrical and astronomical method, while in the other two we determine from accurately observed movements the amount of the forces which occasion those movements, and from these forces we arrive at the cause from whence they have originated, viz., the compression of our terrestrial spheroid. In this part of my delineation of nature, contrary to my usual practice, I have instanced methods because their accuracy affords a striking illustration of the intimate connection existing among the forms and forces of natural phenomena, and also because their application has given occasion to improvements in the exactness of instruments (as those employed in the measurements of space) in optical and chronological observations; to greater perfection in the fundamental branches of astronomy and mechanics in respect to lunar motion and to the resistance experienced by the oscillations of the pendulum; and to the discovery of new and hitherto untrodden paths of analysis. With the exception of the investigations of the parallax of stars, which led to the discovery of aberration and nutation, the history of science presents no problem in which the object attained—the knowledge of the compression and of the irregular form of our planet—is so far exceeded in importance by the incidental gain which has accrued, through a long and weary course of investigation, in the general furtherance and improvement of the mathematical and astronomical sciences. The comparison of eleven measurements of degrees (in which are included three extra-European, namely, the old Peruvian and two East Indian) gives, according to the most strictly theoretical requirements allowed for by Bessel,* a compression

* According to Bessel's examination of ten measurements of degrees, in which the error discovered by Puissant in the calculation of the French measurements is taken into consideration (Schumacher, *Astron. Nachr.*, 1841, No. 438, s. 116), the semi-axis major of the elliptical spheroid of revolution to which the irregular figure of the Earth most closely approximates is 3,272,077·14 toises, or 20,924,774 feet; the semi-axis minor, 3,261,159·83 toises, or 20,854,821 feet; and the amount of compression or eccentricity $\frac{1}{299 \cdot 152}$d; the length of a mean degree of the meridian, 57,013·109 toises, or 364,596 feet, with an error of +