

termine the amount of the oblateness. Laplace showed, at the same time, that along with this Inequality in Longitude there must be an Inequality in Latitude; and this assertion Burg confirmed by the discussion of observations. The two Inequalities, as shown in the observations, agree in assigning to the earth's form an Ellipticity of 1-305th.]

*Sect. 8.—Confirmation of the Newtonian Theory by Experiments on Attraction.*

THE attraction of all the parts of the earth to one another was thus proved by experiments, in which the whole mass of the earth is concerned. But attempts have also been made to measure the attraction of smaller portions; as mountains, or artificial masses. This is an experiment of great difficulty; for the attraction of such masses must be compared with that of the earth, of which it is a scarcely perceptible fraction; and, moreover, in the case of mountains, the effect of the mountain will be modified or disguised by unknown or unappreciable circumstances. In many of the measurements of degrees, indications of the attraction of mountains had been perceived; but at the suggestion of Maskelyne, the experiment was carefully made, in 1774, upon the mountain Schehallien, in Scotland, the mountain being mineralogically surveyed by Playfair. The result obtained was, that the attraction of the mountain drew the plumb-line about six seconds from the vertical; and it was deduced from this, by Hutton's calculations, that the density of the earth was about once and four-fifths that of Schehallien, or four and a half times that of water.

Cavendish, who had suggested many of the artifices in this calculation, himself made the experiment in the other form, by using leaden balls, about nine inches diameter. This observation was conducted with an extreme degree of ingenuity and delicacy, which could alone make it valuable; and the result agreed very nearly with that of the Schehallien experiment, giving for the density of the earth about five and one-third times that of water. Nearly the same result was obtained by Carlini, in 1824, from observations of the pendulum, made at a point of the Alps (the Hospice, on Mount Cenis) at a considerable elevation above the average surface of the earth.