accurate. Thus, the great law of universal attraction, momentarily lost to science, was again and for ever re-established.

However, the French *Académie des Sciences* was, as yet, only on the threshold of its labours and its triumphs. In 1672, it had despatched the astronomer RICHER [died 1696], to Cayenne, to complete certain physical observations. That astronomer discovered with surprise, that a clock pendulum regulated at Paris lost at Cayenne no less than two minutes and a half per day. The discovery excited universal astonishment.

For NEWTON was reserved the glory of searching out the cause of this unforeseen anomaly, and deducing from it a magnificent consequence. In his immortal work, the *Principia*,* occurs his celebrated explanation of the retardation and acceleration of the movement of the pendulum at different points of the globe. The pendulum slackens its movements as we approach the equator, because the density of the Earth is less at the equator than at the poles, and this for two reasons :—

FIG. 33.—SIR ISAAC NEWTON.

First, on account of the centrifugal force, which increases towards the equator ; and

Second, because there the terrestrial surface is further removed from the centre than at the poles.

The centrifugal force acts in a direction contrary to the density ; originating in the rotation of the globe, it is less on a parallel than on the equator, because the rate of speed of the displacement of the points on any parallel is inferior to that of the equatorial points.

* [The *Philosophiæ Naturalis Principia Mathematica* was first published in quarto in 1687. There are English translations by Motte, Thorp, Carr, and Whewell. It was translated into French by Madame la Marquise du Chastelet, in 1759, with a preface by Voltaire.]