a given time at the equator and n' the numbers at the station,

$$n'^2 = n^2 \ [1 + (\tfrac{5}{2}\, m - c) \sin^2 \varphi) \qquad (4)$$

Also, $g' = \dfrac{l'}{l}\, g$

$\therefore$ if we take the lengths of the seconds pendulums instead of the number of their oscillations, we have

$$l' = l \ [1 + (\tfrac{5}{2}\, m - c) \sin^2 \varphi] \qquad (5)$$

l being the length of the pendulum at the equator. m being known, and n n', or l l', being found by experiment, we at once get the value of c from equation (4) or (5).

Borda's pendulum, which was used by the French astronomers to find the length of the second's pendulum (that is, a pendulum oscillating in a single second) at different stations, consisted of a sphere of platinum suspended by a fine wire, attached to the upper end of which was a knife edge of steel resting on a level agate plane. The length of the simple pendulum corresponding to Borda's was obtained by measurement and calculation.

In 1818 Captain Kater determined the length of the seconds pendulum in London (39.13929 inches) by means of a pendulum which had two knife edges facing each other—one for the centre of suspension, the other at the centre of oscillation—so that, provided the two knife edges were at the correct distance apart, they could be used indifferently as points of suspension ; the pendulum being, of course, inverted in the two positions. The pendulum was made to swing equally from either point of suspension by adjusting a sliding weight. The distance between the two edges gave the length of the simple pendulum.

The advantage of such a pendulum is that it contains two in one, and that any injury to the instrument is detected by its giving different results when swung in the two positions. This pendulum was afterwards superseded by another of similar principle, in which, instead of