C. S. Peirce Sept 6, 1877

The paper opens with a strict mathematical analysis of the problem of the oscillation of a pendulum on a slightly flexible stand. I will send a copy of this part as soon as possible; meantime I may mention that the result of the investigation is that the length of the seconds pendulum as determined by a reversible pendulum on a flexible stand requires a correction of

$$+ MS\frac{\lambda}{l}$$

where M is the mass of the pendulum, S is the horizontal deflection perpendicular to the knife-edge of the middle of the support of the knife-edge under the influence of a force in the same direction equal to the unit of weight;

x is the length of the seconds' pendulum;
and l is the distance between the knife-
edges of the pendulum used.

The second part of the memoir is experimental. The first series of experiments described, are direct determinations of N. The general plan of these experiments is as follows. The tripod being set up ready for the pendulum, it is first ballasted by a weight of some 10 kilogrammes on its lower part. A cord is then attached to the middle of the support of the pendulum. This cord is stretched out horizontally and sideways (i.e. perpendicular to the direction of the knife-edge). At a convenient distance from the stand, it passes over 1/4 of the circumference of a pulley wheel so as to turn from a horizontal to a vertical direction and to its extremity

a kilogramme is alternately attached and detached. This attachment and detachment of the weight causes horizontal sideways deflection. In front of this scale and looking at it, is a filar micrometer microscope at the focal distance and with the moveable wires vertical. This microscope rests on a stand entirely separate from the ~~tripod~~ pendulum-tripod. When the weight is put on or taken off, an observer looking through the microscope sees a deflection one way or the other and can measure it with the filar micrometer. The deflection so observed would be S if the micrometer scale were in the middle of the support of the pendulum. But the scale ob- may cannot be placed there but must be either