

METHOD OF THE NEW MEASUREMENTS AT POTSDAM BY MEANS OF THE REVERSIBLE PENDULUM

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So far, the work for the new determination of the absolute intensity of gravity at Potsdam is in a state of development. Full clearness, however, has been attained as to the principle of the measurements. In spite of the well-known uncertainties concerning the elastic compression at the knife-edge I have adopted the reversible pendulum-method, introducing, however, some important improvements as regards the construction:

(1) Two pendulums swinging on the same support in order to eliminate in first approximation the influences due to movements of the support or of the sub-soil.

(2) Measuring of the length of the pendulum immediately before and after the observations for the determination of the period of oscillation in both positions. In the meantime the pendulums remain in the evacuated apparatus hanging on their bearing, while all the lengths are being measured.

(3) The support has been provided with an upper and a lower bearing. The distance between them is somewhat less than the distance between the knife-edges. By turning the whole apparatus (including the arrested pendulums) the reversal is effected and the parts played by the bearings are interchanged.

(4) In the pendulums there are two additional auxiliary planes. The distance between them as well as the distances between them and the planes of the bearings are found by interferometric comparison with quartz end-gauges in the apparatus itself. They are sufficient for the determination of the distance between the knife-edges (reduced pendular length).

According to ideas, which lead back to BESSEL and were applied by DEFFORGES for the reversible pendulum, then seized by HELMERT and later by AGALETZKI and BERROTH, we are trying to eliminate the influences due to the mutual elastic reaction of the edge and the bearing during the oscillation by using pendulums of different length, provided, however, that the relations between edge and bearing and especially the weights of the pendulums are the same in all cases. The edges, with respect to the bearings, are interchangeable for all pendulums, which facilitates investigations as to the influence of the radius of curvature and of the material of which the edges are made.

The new pendulum apparatus of Potsdam will be transportable.