

SCIENCE

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ISOSTASY AND THE SIZE AND SHAPE OF THE EARTH¹

It is the speaker's desire, in this paper, to touch briefly on some phases of geodesy which should be of general interest to the physicist.

Geodesy is one of the oldest sciences; probably second in this respect to astronomy alone. What is the extent of the earth in the horizontal plane, to what depth does it extend, and what is on the other side are questions which must have been asked by men of the earliest times. The history of geodesy will have to be passed over, for lack of time, although it would be interesting to follow the accumulation of data as to the shape and size of the earth.

Before one can study efficiently the great geophysical facts and comprehend them, he must know the shape and size of the earth with considerable accuracy. For some time before the end of the seventeenth century, it was taken for granted that the earth was a true sphere.

The announcement by Newton in 1687 of his theory that the earth was an oblate spheroid added much interest to the subject of its exact shape.

A meridional arc of about 8½ degrees, extending north and south of Paris, was measured by J. and D. Cassini between the years 1683 and 1716. The results of the first computations of this arc indicated that the length of the degree was less at the northern than at the southern end. This gave to the earth the shape of a prolate spheroid. A great controversy arose over

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