time. This number will be a constant or nearly so for a given place, except for slight variations, of which we will speak later, but will vary with change of place. The number of vibrations will decrease or, what amounts to the same thing, the time of one vibration will increase with approach towards the "magnetic pole." *The time of one vibration thus found is a measure of the intensity of the earth's magnetic force as exerted in the horizontal plane in which the needle swings,* the exact relation being that H, the horizontal component of the earth's magnetism, is equal to a constant divided by a square of the time, T, of one vibration. Suppose we obtain the value of T at two different places with the same magnet. Let these values be T_1 and T_2; then will the respective values of H at these two places be inversely to each other as the squares of the times of vibration, or

$$H_1 : H_2 : : T_2^2 : T_1^2,$$

hence,

$$H_2 = H_1 \frac{T_1^2}{T_2^2}.$$

We can thus obtain the horizontal intensity at any place in terms of some known or unknown value at some initial station. This is the principle of relative measurement of the earth's magnetic force.

The first one to apply this principle was William Whiston, chiefly famous as the translator of Josephus. His achievements in the domain of terrestrial magnetism have only recently been set forth. His researches were animated by his desire to determine the latitude and longitude at sea with the aid of magnetic observations, chiefly of dip. It will be recalled that the problem of determining longitude at sea was a perplexing one for a long time, and large prizes were offered for the best solutions. It is largely owing to this endeavor of the early magneticians to determine geographical position magnetically that observation data were so thoroughly multiplied and new facts brought to light.

Just so was it with Whiston. In his desire to win the coveted prize, and having apparently considerable influence at court and being, therefore, richly favored with money grants, he made a series of dip observations in various parts of southern England, and drew the earliest isoclinics—the lines connecting the places of equal magnetic dip—of