defects in the earlier observations, and this likewise explains why Gunter had not reached the same conclusion as Gellibrand. The latter appears to have been the first one to publish the fact. Up to this time no particular pains had been taken to note the date of observation of the needle's declination, but now the importance of giving the date was made apparent.

The phenomenon of the secular variation—called *secular* for the reason that it requires many centuries for its fulfillment—is the one which most intimately concerns the land surveyor, who is obliged to retrace old lines referred to the compass direction. We shall enter more fully into this matter in the chapter specially devoted to its exposition.

The cause of this striking phenomenon constitutes one of the most refractory enigmas in the whole domain of geophysics. The best minds have given it their undivided attention. Innumerable and ingenious theories have been evolved, but the pearl of truth still lies hidden. Its discovery promises to disclose many another of nature's secrets. It also seems probable that the two causes, that of the origin of the earth's magnetism, as well as that of the secular variation, are so intimately connected that the discovery of the one will include that of the other. The question proposed by Schuster, as cited above, should be carefully investigated by experimental physicists and an exhaustive examination should be made of the resultant effect, by reason of the earth's rotation, of that part of the earth's magnetism which is not symmetrical about the rotation axis. No greater nor grander task has ever confronted the human mind than this of the investigation of the consequences and interactions which must necessarily result from the motions of our mighty geomagnet. The solution of this problem will do for *geophysics* what the accomplishment of the great task which Laplace set for himself did for *celestial physics*.

The phenomenon of the secular variation has been nowhere so carefully and thoroughly investigated as in this country and, in consequence, in no other country can such precise corrections for the secular shifting of the magnetic meridians be made, of which we shall give evidence in another chapter. This has been almost entirely due to the fact that in no other country has it been necessary to give the