

circle can be turned in azimuth and set in the plane of the magnetic meridian by means of the horizontal circle. Both circles are about 5 inches in diameter and the vertical circle is provided with two opposite verniers reading to minutes, while the horizontal circle can be read to minutes with a lens. These are the main features of the dip circle.

THE VARIATIONS OF THE MAGNETIC DECLINATION.

THE SPECIAL PURPOSE OF THIS CHAPTER.

The mysterious force of the earth's magnetism is forever changing its direction and magnitude. It seems quite safe to assert that at no two periods of the earth's history has the state of its magnetism been precisely the same and that at no future period will the magnetic condition of the earth return to precisely the same condition prevailing to-day. The tides, the trade winds, while subject to definite periodic fluctuations, nevertheless will not change their general character for thousands of years, but a half-century will suffice to change materially a cartographical representation of the earth's magnetism.

A survey run on the bearings taken but a comparatively short time ago will result in mapping out a totally different area from the previous one. In this way arise the overlappings of areas and the presence of gores and quadrangles between areas surveyed by the magnetic needle at different times, when the proper allowance for the change of the magnetic meridian during the interval, for some reason or another, was not made.

It is the purpose of this chapter to endeavor to put this matter of proper allowance for secular change in Maryland on a better basis than has hitherto existed. While it is not professed that the tables presented in this connection are perfect or not subject to improvement, nevertheless the assertion can be made that they are very much better than the rules of thumb practised quite generally by surveyors