

THE DETERMINATION OF THE MAGNETIC DECLINATION BY THE SURVEYOR.

In conclusion, it may be remarked that when the surveyor determines the value of the magnetic declination himself it would be well for him to make the observations on several days, if possible. Probably the best time of day for making the observations would be towards evening, about 5 or 6 o'clock.¹ At this time the declination reaches, approximately, its mean value for the day (see Table II). The observations on any one day should extend at least over one-half of an hour, preferably an hour, and the readings should be taken every ten minutes. Before each reading of the needle it would be well to tap² the glass plate lightly with the finger or a pencil so as to slightly disturb the needle from the position of rest it may have assumed. The accurate time should be noted opposite each reading and a note entered in the record-book as to the date, the weather and the kind of time the observer's watch was keeping. A brief description of station and of method employed in determining the meridian line and declination should be added to the record. It is very essential that the surveyor should have some knowledge as to the *error*³ of his compass. He can determine this by making observations at one of the magnetic survey stations. He should reduce his value to January 1st, 1900, by allowing an annual change of 3' per annum, as explained elsewhere, and then compare his value with that obtained in the magnetic survey. This correction can best be determined at the county-seats where meridian lines have been established. It would not be amiss to determine the compass correction before and after the determination of the magnetic declination.

¹ Or the surveyor may make his observations in the morning and early in the afternoon, at about the times of minimum and maximum values of the magnetic declination. He may regard the mean of the two extreme values as corresponding closely to the mean value for the day (24 hours).

² Great care must be taken not to electrify the needle by rubbing the glass plate in any manner. Remarkable deflections of the needle can thus be produced.

³ I have found surveyor's compasses to differ at times as much as 1° from the readings with the C. and G. S. magnetometer. The error may be due to a variety of causes, such as an imperfect pivot, non-coincidence of magnetic axis of needle with the geometric axis, and loss of magnetism of the needle.