A tabulation of the mean monthly declinations of each year was obtained from the magnetic observatory at Agincourt. The declination, for the corresponding date and mean local time at which the observation to be reduced was taken, was scaled from the trace of the declinometer at Agincourt. If the trace showed the declination then fairly steady, the difference between the mean declination of the month and the actual declination scaled from the trace was applied as a correction to the observation.

To reduce an observation to January of the same year, the difference between the mean declination of the month in which the observation was taken and the mean declination of January was applied to the observation reduced to the mean of the month.

In the absence of any definite knowledge of the secular variation a plus correction of three minutes per year, which agrees closely with the mean secular variation of the corresponding western portion of the United States as shown on the isogonic map of the United States Coast and Geodetic Survey, published in 1905, Was of our declination obserwas adopted for the reduction of our declination observations to January 1st, 1912. From the few stations in the West which have been reoccupied this would appear to be a close approximation, and the maximum error from this general assumption cannot be large, as the period for reduction covers only three years.

Dip and Total Force.-During the season 1908 dip and total force observations were taken by Mr. J. E. Morrier, D.L.S., at Norway House, Oxford House, Fort Churchill and York Factory.

In 1910 similar observations were taken by Mr. C. Engler, D.L.S., during his trip from Athabaska Landing to Fort Smith, and subsequently by Mr. J. A. Cote at different points between Edmonton and Calgary. Unfortunately the results of these observations were lost during a fire at Carstairs, Alberta.

A. Carson, D.L.S., in 1910, about 24 stations were occu-pied for di pied for dip and total intensity, between Swan River, Man., and Lashburn, Sask. Every complete observation consisted consisted of a dip, a total force and a dip, the mean dip being used in working out the total force. This complete observation was generally duplicated at every station. In some instances the same station was reoccupied during the same instances the same station was reoccupied during the season and the results compared with those already

The instruments used for the determination of these magnetic elements were Dover dip circles, the constants of which of which were determined both before and after every season, season's work. The total force constant was the mean of at least six observations.

The following are the directions for the use of the dip circle and attachments in observing for magnetic declination, dip and total force.

The conditions to be satisfied in choosing a magnetic station are freedom from present and probable future local dia local disturbance, combined with convenience of access. Proximity of electric railways, masses of iron or steel, sas or water pipes, buildings of stone or brick, should be avoided to first, 500 feet be avoided. A quarter of a mile from the first, 500 feet from the third and fourth may from the second, 200 feet from the third and fourth may be considered. The station should be at be considered safe distances. The station should be at least 50 feet from any kind of building. If any doubt possible arises in the selection of a station on account of the possible existence of local disturbances, two intervisible points a transmission of a station on account should be selected points a hundred yards or more apart should be selected and the magnetic bearing of the line joining them ob-s rved at hetween the two s rved at both. A lack of agreement between the two results is evidence of local disturbance.

When taking the observations, the instrument box, especially the bar magnets, should be 40 or 50 feet away for the declination observation and 25 or 30 feet for the dip and total force observations. All knives, etc., should be removed from the person. It should be noted also that iron is frequently present in buttons, hats, neckties, etc.

Care should be taken to keep the instrument in good adjustment, clean and free from dust. A camel hair brush, pith, chamois and tissue paper are supplied for that purpose.

The dipping needles should be carefully guarded against moisture, and after use should always be wiped dry with chamois or tissue paper. They should be put back in the box with poles of opposite polarity at the same end and should be magnetized afresh for each station.

The bar magnets should be touched with the hands as little as possible and should always be wiped with chamois or tissue paper after the observation to prevent rusting. They should not be allowed to touch each other except at their opposite poles and, when placed in the box, the ends of opposite polarity should be connected by a soft iron armature.

The instrument is levelled in the ordinary way with the plate level.

The trough compass should be attached to the upper horizontal plate by means of the two thumb-screws and the telescope to the vernier arms of the vertical circle. The observation for magnetic declination is then taken and recorded in accordance with the instruments given for magnetic declination observations with the D.L.S. pattern transit.

The magnetic meridian may also be determined by means of the dipping needle. Set the vertical circle verniers to read 90° and revolve the instrument in azimuth until the needle is bisected by the microscopes and read the horizontal circle. As the dipping needle points vertically when in the magnetic prime vertical, in this way the magnetic prime vertical is found and by applying 90° the magnetic meridian.

The magnetic meridian found in this manner is sufficiently accurate, however, only for the dip and total force observations. The former method is preferable and should always be adopted when possible.

The needles for the dip observations are carried on the lid of the instrument box. Taking out one of these needles carefully wipe with tissue paper and clean the pivots with pith and having also carefully cleaned the agate planes in the box with pith, place the needle on the brass v's with the face of the needle to the face of the instrument. (The face of the needle is that side which is lettered, the face of the instrument that side which is graduated.) Turn the instrument in azimuth until it lies in the magnetic meridian (previously determined in the declination observation) and with its face to the east, and lower the needle gently on the agate planes. It will now swing in the approximate position of the dip. When it settles it ought to be slightly raised and lowered once or twice by means of the screw, so as to ensure its being exactly in the centre of the instrument. The vernier of the vertical circle is now turned until the north, that is the lower end, is seen to be bisected by the cross hair of the microscope; the lower vernier is then read. Similarly, the upper end is bisected by the upper microscope and the upper vernier read; the needle is then slightly disturbed by the screw and the readings repeated until there are three readings for each end. The instrument is now turned 180° in azimuth so that the face of the instrument