

COMMENTS ON WEINBERG'S SUGGESTIONS FOR FIELD WORK.¹

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With modern instruments and reasonable control of secular variation and a scheme of observation arranged so as to aid in the elimination of diurnal variation, it seems assured that the values of the magnetic elements for a given epoch at stations where observations have once been made may be known with an accuracy approaching $\pm 2'$ in declination, D , and inclination, I , and with an accuracy of $\pm 0.001H$ in horizontal intensity, H , with the exception of stations in high magnetic latitudes where diurnal-variation corrections and reductions on account of magnetic storms are uncertain.² This should hold even in regions where there are relatively few stations. The real values at points intermediate between stations should be capable of interpolation with a precision not much less than above indicated *provided* no local disturbances exist. It is the practice of the Department of Terrestrial Magnetism, as indicated in our "General Directions for Magnetic Observations," to determine at each station, before carrying out the complete program of observations, whether there is any appreciable local disturbance, thus insuring that distribution and secular-variation stations may represent, as nearly as possible, normal values in the regions concerned. For regions where local disturbances are found to exist, provision is made for a greatly increased number of stations with a lower order of precision.

Multiplicity of relatively inaccurate observations in regions of known distribution, at practically the same expenditure of time and money, would be a mistake, particularly in view of the fact that the secular change, as shown by extensive experience, may not be extrapolated safely for many years. Secular-change data resulting from observations made at intervals of from 20 to 30 years, a procedure indicated as desirable by Weinberg, would not meet requirements.

The extensive experience of our observers in all parts of the world has shown that with the modern form of magnetometers difficulties of transportation can be successfully overcome. For surveys in regions of high magnetic latitude our work has been facilitated, with no great decrease in general accuracy, by the use of the dip circle with compass and telescope attachments, using Lloyd's method for the determination of total intensity, F , and inclination, I , with the restriction that loaded-dip and deflection observations should invariably be made at every station; with this universal instrument it is possible to secure observations for the determination of all three elements in a very short time.

Our practice is to take advantage of every opportunity offered to secure observations, even if only one element can be determined,

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¹ Cf. *Terr. Mag.*, this article, pp. 150-155.

² Because of the different order of values of H at various stations, it is desirable to express the order of accuracy of observation in parts of H rather than in gammas, as Weinberg has done.