The azimuth formulæ is as follows:

A = position of Polaris.

P = pole.

Z = Zenith.

ZC = meridian.

AC = perpendicular on meridian from *Polaris*.

Az = Azimuth angle A Z C.

h =hour angle A P C.

p = A C.

n =portion of meridian intercepted between P. and foot of perpendicular p on meridian.

 $\phi =$ latitude of place.

 δ = declination of *Polaris*.

 $\cos h = \tan n \tan \delta$ (I.), $\sin p = \sin h \cos \delta$ (II.), sin (colat + n) = tan p cot Az. (III.) from which the Azimuth is found.

The latitude corrections to the S. T. and Az. are based upon a mean position for each star and t t' a and a' are the necessary corrections for the other days and are applied directly to the S. T. and Az. columns by simply changing their signs which is already done in the tables; b and c are corrections for the time interval and are simply direct interpolations.

EXPLANATIONS.

The Sidereal Times and Azimuths of *Polaris* are rigorously calculated to the nearest second of arc for every 20th day of the year for the 45th degree of north latitude, and the corrections for other latitudes are very close approximations, in fact sufficiently close for almost any kind of time and azimuth work ordinarily required of the surveyor or engineer.

In the first column, under Z, will be found the zenith distance of the time star followed by the dates.

t and t' are corrections of decimals of a second of time for each degree of latitude differing from 45, and to be applied with its proper sign to the S. T. after multiplying by the difference in latitude. t being used for latitudes south of 45 and t' for places north of 45. a and a' are similar corrections to be applied to the Azimuth.

LATITUDE CORRECTIONS.

Column L is for the latitude.

S.T. and Az. are corrections to be applied to the Sid. Time and Azimuth according to their signs.

b contains the corrections to be applied for the interval of time between the observations on *Polaris* and the time star. They are decimals of a second and require to be multiplied by the interval in seconds. c are similar corrections for the Azimuth.

These corrections require the interval between the observations not to be extended much over two minutes.

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