when such conditions exist by comparing the time given in the table with his astronomical time of observation. *The upper culmination to be used at any time will always be the* LAST *one that occurs before the observation.*

When an hour angle comes out within *one minute* of either 0h. 0m., or 23h. 56m.1, the observation may be regarded as having been taken with the star on the meridian, *above* the pole; if within one minute of 11h. 58m., Polaris may be considered on the meridian *below* the pole at the time of observation.

At *elongation* Polaris is nearly 5h. 55m. west (or east) of its position at upper culmination; consequently if the hour angle for *any* observation comes within *five minutes* of 5h. 55m., or 18h. 1m., the star may be assumed to be *at elongation, west* for the first and *east* for the second hour angle, and its azimuth may be taken from a preceding table (No. XVI), which gives its value at elongation from 1890 to 1910 inclusive.

Should the surveyor wish the time of *lower culmination*, for use with the plumb-line method (No. II), described on page 516, or for any other purpose, he will first determine the time of *upper* culmination for the date (Table XV) and then *subtract* 11h. 58m. for the *preceding* lower culmination, or *add* 11h. 58m. for the lower culmination *following* the derived time for upper culmination, attending to the addition or subtraction of 23h. 56.1m., as directed in an example (1) below.

The time to be used when making observations on Polaris off the meridian should be as accurate as can be obtained. Looking at Table XVII, near the top of the page, the surveyor will observe that for a difference of *four* minutes in the time argument there is a change of about *two* minutes in azimuth; consequently, to obtain the azimuth to the *nearest whole minute of arc*, the *local mean time*, upon which all depends, should be known *within two minutes*. When the surveyor uses a solar instrument, he can readily determine the time for himself during the afternoon *before* observing Polaris, or in the morning *after* observation, and, without moving the hands of his watch, apply the necessary correction to his *observed* watch time. When