

STAR POSITIONS.—

If α_0 and δ_0 = the right ascension and declination for any time T .

α and δ = the right ascension and declination for any time $T+t$.

Then by Maclaurin's formula

$$\alpha = \alpha_0 + \left[\frac{d\alpha}{dt} \right] t + \frac{1}{2} \left[\frac{d^2\alpha}{dt^2} \right] t^2 + \dots$$

$$\delta = \delta_0 + \left[\frac{d\delta}{dt} \right] t + \frac{1}{2} \left[\frac{d^2\delta}{dt^2} \right] t^2 + \frac{1}{6} \left[\frac{d^3\delta}{dt^3} \right] t^3 + \dots$$

where the differential coefficients in right ascension and declination,

$$\left[\frac{d\alpha}{dt} \right], \quad \left[\frac{d\delta}{dt} \right],$$

include both precession and proper motion.*

MEAN RIGHT ASCENSION and MEAN DECLINATION.—The third and fifth columns contain the mean right ascension and mean declination respectively for 1910.0.

In the case of the B. J., N. A. and A. E. stars, these were taken directly from the catalogues. With the Boss, Greenwich and Ambronn stars the positions were computed as above, using the first and second differentials in the declination. With the close circumpolars the third term was investigated and where appreciable was applied. In order to dispense with the necessity of considering the third term in computing declinations from our catalogue, the positions of all stars whose declinations are north of 83° are given separately in a Catalogue of Stars from $+83^\circ$ to $+90^\circ$ declination for 1915.0, 1920.0 and 1925.0.

It will be noted that the data given for 1910.0 in this subsidiary catalogue for some of the stars differs very slightly from that given in the main catalogue for the same star. The reason for this is that the positions of all the ephemeris stars are deduced in the subsidiary catalogue from Boss, and are referred to as Boss stars. As they are fundamental stars, the differences are very small.

ANNUAL PRECESSION AND PROPER MOTION.—The fourth column gives the annual variation in right ascension $\left[\frac{d\alpha}{dt} \right]$, and the sixth column the annual variation in declination $\left[\frac{d\delta}{dt} \right]$. For the Boss, Greenwich and Ambronn stars, this had to be computed. The second differentials $\left[\frac{d^2\alpha}{dt^2} \right]$, $\left[\frac{d^2\delta}{dt^2} \right]$, are given in the form of a change per 100 years in the Boss and Greenwich catalogues, but are not given in Ambronn.

If $\left[\frac{d\alpha}{dt} \right]$ and $\left[\frac{d\delta}{dt} \right]$ = annual variation in right ascension and declination, respectively, for the epoch T of the original catalogue,

and $\left[\frac{d\alpha}{dt} \right]$ and $\left[\frac{d\delta}{dt} \right]$ = annual variation in right ascension and declination, respectively, for the epoch $T+t$ of our catalogue;

* Doolittle's Practical Astronomy, p. 583.