When these observations were plotted it was at once seen that by making the orbit slightly eccentric better agreement could be obtained than with a circular orbit. Although no eccentricity is given by Shapley's orbit,* it is probable that Nijland's observations are not of sufficient accuracy to determine this, and alternative solutions for eccentric and circular orbits gave considerably lower residuals for the former. Preliminary elements which were obtained graphically are as follows.

Period from photometric orbit	2·80654 days
Eccentricity e	0·04
Semi-amplitude K	64·5 km.
Velocity of system γ	−0·5 km.
Longitude of apse ω	90°
Time of periastron T	0·020 days

Owing to the smallness of the eccentricity it was considered useless to apply least squares corrections to both T and ω and, in this case, as the latter seemed better determined by the graphical elements, a correction for T was used. The differential coefficients obtained by Lehman Filhés were used in computing an ephemeris and observation equations which are given in Table V.

TABLE V OBSERVATION EQUATIONS OF TW DRACONIS

1	1·000x	·666y	−1·010z	+ ·792u	+ 1·47 = 0
2	1·000	·997	+ ·147	− ·073	− 3·43
3	1·000	− ·953	+ ·576	− ·296	+ 1·21
4	1·000	− ·659	+ ·978	− ·708	− 1·29
5	1·000	− ·626	+ ·963	− ·732	+ 7·22
6	1·000	− ·545	+ ·899	− ·784	+ 1·78
7	1·000	− ·272	+ ·515	− ·889	− 1·68
8	1·000	+ ·223	− ·127	− ·901	− 4·72
9	1·000	+ ·824	− ·925	− ·541	+ 1·86
10	1·000	+ ·991	− ·258	− ·129	− 1·65
11	1·000	− ·998	− ·119	− ·059	− 3·72
12	1·000	+ ·998	+ ·432	+ ·066	+ 1·66
13	1·000	− ·843	+ ·918	+ ·560	+ 2·19
14	1·000	+ ·665	+1·010	− ·795	− 7·93

where $x = \delta\gamma$

$y = \delta K$

$z = K\,\delta e$

$$u = \frac{K\mu}{(1 - e^2)^{\frac{3}{2}}}\,\delta T$$

The normal equations from these observations are

$$\begin{aligned} 14·000x + ·826y + 3·399z - 2·901u - 6·70 &= 0 \\ 8·397 - 1·554 + 1·652 - 9·327 &= 0 \\ 7·329 - 1·292 - 5·153 &= 0 \\ 5·234 + ·168 &= 0 \end{aligned}$$

*Contributions from Princeton Observatory, No. 3, p. 90.