

hence the new values of the elements:—

$$\begin{aligned}\gamma &= -29.83 \\ K &= 25.69 \\ e &= .037 \\ \omega &= 182^{\circ}.22 \\ T &= 2,420,024.881 \text{ J. D., as before.}\end{aligned}$$

These new values of the elements gave a reduction of Σpr from 107 to 81 or about 25 per cent. The residuals computed from the orbital elements and those from the observation equations were very nearly identical and no further corrections were attempted.

The probable error of a normal place is ± 2.1 and that of a single observation of average weight ± 2.8 . The probable errors of the various elements are given after the final values in the summary following.

SUMMARY

Element.	Preliminary	Final.	Probable Error.
P	17.767 days	17.7673 days	
e	.05	.0	$\pm .022$
ω	180°	$182^{\circ}.22$	$\pm 1^{\circ}.27$
γ	-29.70 km.	-29.83 km.	± 0.40 km.
K	26 km.	25.69 km.	± 0.57 km.
T	2,420,024.881 J. D.	2,420,024.881 J. D.	
$a \sin i$		6,272,000 km	

In the figure the circles are Ottawa normal places and the circles crossed are Lick observations. It will be seen that if the whole curve were raised about 3 km. the Lick observations would be better satisfied. This is probably due to different wave-lengths being used, or perhaps, to some extent, to the fact that no doubt in the work here many of the lines measured are blends. Any change in the period does not seem to bring the Lick observations closer to the curve given by our own observations.

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