The main change is in the eccentricity, which was greatly over-estimated in the preliminary elements. In proceeding to a second solution ω was put at 90 degrees, and a small change made in T to correspond. The eccentricity was made 0·05, and the solution again carried through. The normal equations using Schlesinger's notation are:

$$\begin{aligned}
10\cdot200\mathrm{r} + 0\cdot808\kappa - 1\cdot249\pi + 0\cdot705\epsilon - 0\cdot652\tau &= -1\cdot586\\
+ 4\cdot863\kappa - 0\cdot774\pi + 0\cdot299\epsilon - 0\cdot719\tau &= +1\cdot114\\
+ 5\cdot337\pi + 0\cdot182\epsilon + 4\cdot765\tau &= +0\cdot352\\
+ 1\cdot300\epsilon + 0\cdot209\tau &= +0\cdot425\\
+ 4\cdot285\tau &= +0\cdot190
\end{aligned}$$

whence,

τ	$= -5\cdot54$	dT	$= -\ \cdot125$
ϵ	$= +0\cdot44$	de	$= -\ \cdot008$
π	$= +5\cdot037$	$d\omega$	$= -11\cdot73$
κ	$= +0\cdot174$	dK	$= +\ \cdot174$
r	$= +0\cdot063$	$d\gamma$	$= -\ \cdot19$

and the final elements with the probable errors become,

P	$= 3\cdot854$ days	
e	$= 0\cdot042$	$\pm\ \cdot025$
T	$=$ J. D. 2,420,370·259	$\pm\ \cdot351$ day
ω	$= 78°\cdot27$	$\pm\ 21°\cdot9$
K	$= 24\cdot77$ km.	$\pm\ \cdot70$ km.
γ	$= +7\cdot81$ km.	
$a \sin i$	$=$ 1,312,000 km.	
$\dfrac{m_1^3 \sin^3 i}{(m+m_1)^2}$	$= 0\cdot0061\odot$	

The residuals from these elements agree with the residuals from the observation equations to the nearest tenth of a kilometre. Comparison with the residuals given by the first solution shows that little has been gained, and the differences between the last two sets of elements are less than the probable errors.

The residuals given by the individual plates are tabulated under the heading (O–C) in the table of observations. The probable error of a single observation is 3·7 km.

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Ottawa
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