UNIVERSITY OF CALIFORNIA PUBLICATIONS

ASTRONOMY

LICK OBSERVATORY BULLETIN

NUMBER 186

ELEMENTS AND EPHEMERIS OF COMET *e* 1910 (CERULLI-FAYE).

From the following telegraphic positions, two sets of elements have been derived by the formulae of Leuschner's short method:

1910 Gr.M.T.	Comet's Apparent			Observer
	α	δ		
Nov. 9.3131	3h 38m 35s.9	+8° 43' 20"	Milloseovich (Rome)	
11.5801	38 27.0	+8 09 17	Eppes (Washington)	
Nov. 13.8217	3 38 14.8	+7 36 34	Young (Lick)	

PARABOLIC ELEMENTS AND EPHEMERIS.

$$\begin{aligned}
 T &= 1910 \text{ November } 19.4871 \text{ Gr. M.T.} \\
 \omega &= 200^\circ 17' 22'' \\
 \Omega &= 212 57 49 \\
 i &= 18 17 07 \\
 q &= 2.19575
 \end{aligned}
 \left. \vphantom{\begin{aligned} \omega \\ \Omega \\ i \end{aligned}} \right\} 1910.0$$

The residuals are

$$\begin{array}{rcl}
 \text{O-C} & & \text{I} \\
 \cos \delta \Delta \alpha & - 9'' & - 8'' \\
 \Delta \delta & + 13 & + 9
 \end{array}$$

EPHEMERIS FOR GREENWICH MEAN MIDNIGHT.

1910	True α	True δ	log Δ	Br.
Nov. 15.5	3h 38m 06s	+7° 12' 2"	0.0860	1.00
19.5	37 41	6 16.7	0.0876	
23.5	37 17	5 24.5	0.0906	
Nov. 27.5	3 36 56	+4 36.3	0.0950	0.94

Brightness November 11 = 1.00.

ELLIPTIC ELEMENTS AND EPHEMERIS.

$$\begin{aligned}
 T &= 1910 \text{ November } 12.4129 \text{ Gr. M.T.} \\
 \omega &= 206^\circ 20' 22'' \\
 \Omega &= 205 29 05 \\
 i &= 10 14 11 \\
 e &= 0.54590 \\
 \mu &= 512''34 \\
 \log a &= 0.56030 \\
 \text{Period} &= 6.926 \text{ years}
 \end{aligned}
 \left. \vphantom{\begin{aligned} \omega \\ \Omega \\ i \end{aligned}} \right\} 1910.0$$

The residuals are

$$\begin{array}{rcl}
 \text{O-C} & & \text{I} \\
 \cos \delta \Delta \alpha & 0'' & + 3'' \\
 \Delta \delta & + 2 & - 3
 \end{array}$$

EPHEMERIS FOR GREENWICH MEAN MIDNIGHT.

1910	True α	True δ	log Δ	Br.
Nov. 15.5	3h 38m 04s	+7° 12' 9"	9.8262	0.98
19.5	37 36	6 19.5	9.8286	
23.5	37 09	5 31.2	9.8331	
Nov. 27.5	3 36 47	+4 49.0	9.8395	0.93

Brightness November 11 = 1.00.

The computation of the constants to the equator has been omitted as new elements will be derived before the above ephemerides shall have run out.

The parabolic elements are the result of the direct solution for a parabola. The geocentric and barycentric parallax having been eliminated, the residuals of this solution are larger than the presumable errors of observation. An attempt to improve the parabola by a differential correction proved unsuccessful. The differential correction was therefore continued without hypothesis regarding the eccentricity and resulted in a short period orbit similar to the elliptic orbit given above.

The futility of a parabolic solution being thus established, the *original direct* solution for a parabola was continued without hypothesis regarding the eccentricity and resulted in the elements printed above.

The failure to represent the observations by a parabola and the similarity of the parabolic elements i , Ω , ω , and T to the corresponding elements of Faye's comet, led Professor Leuschner to suspect the identity of Cerulli's and Faye's comet and to announce the same, together with the parabolic elements, by telegram. This identification is now fully confirmed by our foregoing elliptic elements.

The elements derived by Strömgren for the return of Faye's comet in 1903 are given in *A. N.* 3858, and are as follows:

$$\begin{array}{lcl} T = 1903 \text{ June } 3.64 \text{ Berlin M.T.} & & \\ \omega = 198^\circ 58.8 & & \\ \Omega = 206 \quad 28.0 & \left. \vphantom{\begin{array}{l} \omega \\ \Omega \end{array}} \right\} & 1900.0 \\ i = 10 \quad 37.5 & & \\ \phi = 34 \quad 24.8 & & \\ \mu = 480''16 & & \end{array}$$

Owing to the unfavorable position of the comet in 1903, it was not found during that apparition. According to Strömgren's elements, if perturbations be

neglected from 1903 to 1910, Faye's comet should have passed perihelion October 24, 1910. It is hardly to be suspected that the errors in the observations upon which the foregoing computations are based, can be such as to render accidental the agreement between our elliptic elements and those of Faye's comet.

W. F. MEYER,
SOPHIA H. LEVY.

BERKELEY ASTRONOMICAL DEPARTMENT,
November 16, 1910.