ELEMENTS OF (655) [1907 BF].

By ELEANOR A. LAMSON.

This asteroid was discovered by METCALF at Taunton, Mass., on November 4, 1907. Elements were computed from a photographic position by METCALF on November 4 and two observations at Washington by HAMMOND on November 25 and December 11, 1907. The method used is that given by Dr. W. EBERT in his *Eine einfache Methode zur Bestimmung elliptischer Bahnen aus drei Beobachtungen*. See the discussion of asteroid (611) [1906 VL] by J. C. HAMMOND, on page B 104.

The observations are as follows:

Date.	Place.	Washington Mean Time.	Apparent α .	Apparent δ .	Log $p\Delta$.		Red. to 1907.0	
					α	δ	α	δ
1907		h m s	h m s	° ' "			s	"
Nov. 4	Taunton.....	10 52.2	2 45 6.2	+5 19 42.	9.051 _n	0.719	-1.5	-0.1
25	Washington...	10 56 27	2 29 15.42	+4 28 48.1	8.932	0.695	-1.72	+0.04
Dec. 11	Washington...	10 34 22	2 21 50.92	+4 34 59.1	9.250	0.697	-1.90	+0.09

Elements.

Epoch: 1907, December 11.5, Greenwich Mean Time.

$$M = 359 \ 30 \ 14.8$$

$$\omega = 279 \ 15 \ 7.7$$

$$\Omega = 130 \ 35 \ 4.2 \quad 1907.0$$

$$i = 6 \ 29 \ 30.2$$

$$\varphi = 4 \ 51 \ 28.0$$

$$\mu = 650''.067$$

$$\log a = 0.475592$$

$$M = 359 \ 30 \ 14.8$$

$$\omega = 279 \ 15 \ 13.5$$

$$\Omega = 130 \ 36 \ 38.9 \quad 1909.0$$

$$i = 6 \ 29 \ 29.5$$

The residuals (O-C) for the middle place are $\cos\beta \Delta\lambda = -0''.1$ and $\Delta\beta = +0''.4$.

Heliocentric Coordinates 1907.0

$$x = r [9.998392] \sin (140 \ 1 \ 7.7 + v)$$

$$y = r [9.975292] \sin (51 \ 43 \ 59.4 + v)$$

$$z = r [9.530194] \sin (36 \ 10 \ 51.9 + v)$$

Ephemeris for 1907.

Greenwich Mean Time.	Apparent α .	Apparent δ .	Log d .
1907	h m s	° ' "	
Nov. 2.5	2 46 51.61	+5 27 58.2	0.244870
8 6.5	2 43 35.45	5 13 2.4	0.245182
10.5	2 40 20.40	4 59 46.6	0.246602
14.5	2 37 10.29	4 48 27.2	0.249267
18.5	2 34 8.77	4 39 17.8	0.252661
22.5	2 31 19.11	4 32 28.7	0.257185
26.5	2 28 44.14	4 28 7.9	0.262625
30.5	2 26 26.45	4 26 19.8	0.268897
Dec. 4.5	2 24 28.16	4 27 7.8	0.275918
8.5	2 22 51.26	+4 30 31.7	0.283584

The observations made at Taunton and Washington give the following corrections to this ephemeris:

Corrections to the Ephemeris.

Date.	O-C		Date.	O-C		Date.	O-C	
	α	δ		α	δ		α	δ
1907	s	"	1907	s	"	1907	s	"
Nov. 4	+0.19	-2	Nov. 14	-0.01	-2.4	Dec. 2	+0.04	-1.9
13	+0.11	+1.2	25	+0.05	-2.1	8	+0.13	0.0
13	+0.08	+0.2	29	-0.15	-1.4	11	-0.06	-1.3

An ephemeris for 1909 was computed from the above elements.

Heliocentric Coordinates 1909.0

$$\begin{aligned}
 x &= r [9.998393] \sin (140 \quad 2 \quad 48.5 + v) \\
 y &= r [9.975299] \sin (\quad 51 \quad 45 \quad 36.6 + v) \\
 z &= r [9.530135] \sin (\quad 36 \quad 12 \quad 46.4 + v)
 \end{aligned}$$

Ephemeris for 1909.

Greenwich Mean Time.	Apparent α .	Apparent δ .	Log d .
1909	h m s	° ' "	
Feb. 24.5	9 20 12.22	+17 44 26.0	0.307229
28.5	9 17 27.93	18 3 18.1	0.312099
Mar. 4.5	9 14 59.21	18 20 23.4	0.317792
8.5	9 12 48.19	18 35 34.5	0.324219
12.5	9 10 56.51	18 48 47.6	0.331298
16.5	9 9 25.67	18 59 59.5	0.338945
20.5	9 8 16.67	19 9 8.8	0.347078
24.5	9 7 30.26	19 16 15.4	0.355613
28.5	9 7 6.76	+19 21 22.8	0.364468