ELEMENTS OF (660) [1908 CC].

By MATT FREDERICKSON.

This asteroid was discovered by METCALF at Taunton, Mass., on January 8, 1908. From three observations made at Washington, elements were computed using the method given by WATSON in his Theoretical Astronomy.

These observations are as follows:

Date.	Washington Mean Time.	Apparent α .	Apparent δ .	Log $p\delta$.		Red. to 1908.0	
				α	δ	α	δ
1908	h m s	h m s	° ' "			s	"
Jan. 12	12 2 6	8 13 51.34	+ 5 17 9.0	8.967 _n	0.686	+0.92	-1.1
29	10 52 7	7 58 20.04	+ 7 12 48.6	8.836 _n	0.663	+0.76	-0.4
Mar. 24	8 36 38	7 39 45.43	+14 13 16.8	9.123	0.570	+0.39	0.0

Provisional Elements.

Epoch: 1908, January 12.5, Berlin Mean Time.

$$\begin{array}{l}
 M = 221 \ 11 \ 40.9 \\
 \omega = 108 \ 10 \ 53.4 \\
 \Omega = 156 \ 31 \ 5.7 \\
 i = 15 \ 17 \ 23.1 \\
 \varphi = 5 \ 52 \ 6.4
 \end{array}
 \left. \vphantom{\begin{array}{l} M \\ \omega \\ \Omega \\ i \\ \varphi \end{array}} \right\} 1908.0$$

$$\mu = 876''.840$$

$$\log a = 0.404725$$

The middle place computed from these elements gave rather large residuals, hence n and n'' , according to the notation of WATSON, were computed from the approximate elements and the geocentric distances recomputed. From these geocentric distances new elements were determined which represented the middle place satisfactorily.

The corrected elements are as follows:

Corrected Elements.

Epoch: 1908, January 12.5, Berlin Mean Time.

$$\begin{array}{l}
 M = 221 \ 57 \ 35.9 \\
 \omega = 107 \ 23 \ 10.3 \\
 \Omega = 156 \ 37 \ 21.5 \\
 i = 15 \ 14 \ 23.6 \\
 \varphi = 5 \ 52 \ 48.2
 \end{array}
 \left. \vphantom{\begin{array}{l} M \\ \omega \\ \Omega \\ i \\ \varphi \end{array}} \right\} 1908.0$$

$$\mu = 877''.992$$

$$\log a = 0.404344$$

$$m_0 = 10.6 \quad g = 7.6$$

Heliocentric Coordinates 1908.0

$$\begin{aligned}
 x &= r [9.997625] \sin (354 \ 44 \ 48.2 + v) \\
 y &= r [9.994180] \sin (265 \ 44 \ 13.5 + v) \\
 z &= r [9.285993] \sin (232 \ 33 \ 54.8 + v)
 \end{aligned}$$

Ephemeris for 1908.

Berlin Mean Midnight.	Apparent α .	Apparent δ .	Log d .	Aberr. Time.
1908	h m s	° ' "		m s
Jan. 12	8 14 4.02	+ 5 15 51.1	0.253726	14 54
16	8 10 29.34	5 39 9.7		14 48
20	8 6 48.67	6 5 5.0	0.248264	14 43
24	8 3 5.83	6 33 18.9		14 40
28	7 59 24.97	7 3 30.9	0.246324	14 40
Feb. 1	7 55 50.31	7 35 19.4		14 43
29	7 38 33.80	11 29 17.4	0.284605	16 9
Mar. 4	7 37 39.46	12 0 18.6		16 27
8	7 37 11.88	12 29 59.5	0.301040	16 47
12	7 37 11.05	12 58 10.7		17 7
16	7 37 36.49	13 24 44.5	0.318798	17 29
20	7 38 27.48	13 49 36.6		17 51
24	7 39 43.17	+14 12 43.3	0.337240	18 15

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

Corrections to the Ephemeris.

Date.	O-C		Date.	O-C	
	α	δ		α	δ
1908	s	"	1908	s	"
Jan. 12	+0.04	+0.7	Mar. 7	+0.05	+0.6
14	+0.18	-0.2	10	+0.03	+1.1
19	-0.20	-0.3	21	+0.13	+4.5
24	+0.03	+0.5	24	+0.26	+3.3
29	-0.17	+0.1	24	+0.17	+2.8