RESIDUALS, COMET *c* 1913

O-C	I	III
$\cos \delta \Delta \alpha$	+6"	+2"
$\Delta \delta$	+3	+0

No attempt was made to remove these residuals, which correspond to the *direct conditioned* solution.

CONSTANTS FOR THE EQUATOR 1913.0

$$\begin{aligned} x &= r [9.99587] \sin (94^\circ 48'9 + v) \\ y &= r [9.99713] \sin (5^\circ 43.8 + v) \\ z &= r [9.25251] \sin (135^\circ 07.3 + v) \end{aligned}$$

BERKELEY ASTRONOMICAL DEPARTMENT,
October 28, 1913.

EPHEMERIS FOR GREENWICH MEAN MIDNIGHT

1913	True α	True δ	Log Δ	Br.
Oct. 26.5	18 ^h 56 ^m 17 ^s	— 7° 24' 2"	9.7561	1.05
28.5	19 06 02	9 16.2		
Oct. 30.5	16 16	11 11.6	9.7397	
Nov. 1.5	26 58	13 09.8		
3.5	38 11	15 09.9	9.7264	
5.5	19 49 53	17 11.0		
7.5	20 02 06	19 12.3	9.7169	1.26
9.5	14 49	21 12.6		
11.5	28 01	23 10.6	9.7117	
13.5	41 42	25 05.1		
15.5	20 55 50	26 54.9	9.7113	
17.5	21 10 21	28 38.7		
Nov. 19.5	21 25 12	—30 15.3	9.7159	1.19

Brightness October 24 = 1.00.

ANNA R. KIDDER.

THIRD ELEMENTS AND EPHEMERIS OF OBJECT NEUJMIN

The new orbit has been derived from two normal places, Sept. 9.05947 and Sept. 22.46146 based on Nos. 1, 2, 3, 4, 5, 6, and Nos. 8, 9, 10 of the list of observations given below, and from a telegraphic position by Aitken on Oct. 17.86509.

ELEMENTS

Epoch = 1913 Sept. 23.45800 Gr.M.T.

$$\begin{aligned} M &= 2^\circ 06' 12''.3 \\ \omega &= 346^\circ 13' 16.8 \\ \Omega &= 347^\circ 53' 55.5 \\ i &= 14^\circ 50' 45.2 \\ \phi &= 50^\circ 53' 41.1 \\ \mu &= 199'' 001 \end{aligned} \quad 1913.0$$

CONSTANTS FOR THE EQUATOR 1913.0

$$\begin{aligned} x &= r [9.999372] \sin (64^\circ 30' 45''.8 + v) \\ y &= r [9.897029] \sin (332^\circ 06' 40.9 + v) \\ z &= r [9.790180] \sin (338^\circ 26' 54.2 + v) \end{aligned}$$

EPHEMERIS FOR GREENWICH MEAN MIDNIGHT

1913	True α	True δ	Log Δ	Mag.
Oct. 28.5	23 ^h 35 ^m 45 ^s .2	+14° 56' 23"	9.9396	12.75
Nov. 1.5	37 46.9	15 29 58		
5.5	40 16.5	16 00 57	9.9829	13.02
9.5	43 12.0	16 29 56		
13.5	46 31.3	16 57 21	0.0261	13.30
17.5	50 12.2	17 23 32		
21.5	54 13.0	17 48 48	0.0687	13.57
25.5	23 58 32.0	18 13 26		
Nov. 29.5	00 03 07.7	18 37 40	0.1102	13.84
Dec. 3.5	07 58.5	19 01 43		
7.5	13 03.1	19 25 44	0.1504	14.11
11.5	18 19.8	19 49 47		
15.5	23 47.3	20 13 54	0.1891	14.37
19.5	29 24.4	20 38 09		
23.5	35 10.3	21 02 33	0.2262	14.61
27.5	41 04.2	21 27 09		
Dec. 31.5	00 47 05.5	+21 51 58	0.2617	14.85

Adopted magnitude Oct. 11 = 12.20.

According to this orbit the period, which is still somewhat uncertain, is 17.83 years.

REPRESENTATION OF OBSERVATIONS

	1913 Gr.M.T.	α	Comet's Apparent δ	O-C $\cos \delta \Delta \alpha$	$\Delta \delta$	Observer
I	(1) Sept. 6.6028	23 ^h 49 ^m 55 ^s .9	—0° 27' 44"	+1"	+3"	†Graff
	(2)	7.4143	49 28.1	—0 05 10	+2	†Bianchi
	(3)	8.82116	48 36.92	+0 33 35.7	+0.7	Aitken
	(4)	9.78381	48 00.87	0 59 45.9	—0.8	*Barnard
	(5)	9.84050	47 58.94	1 01 19.6	—0.8	Aitken
	(6)	9.84334	47 58.36	1 01 22.5	—1.3	*Barnard
	(7)	13.79594	45 28.14	2 45 50.5	+1.1	Aitken
II	(8)	22.69808	39 51.94	6 18 52.8	—0.4	Aitken
	(9)	23.82550	39 11.63	6 43 18.8	+0.2	*Barnard
	(10)	23.86079	39 10.64	6 44 07.1	+0.4	Haynes
	(11) Sept. 27.71912	37 06.08	8 03 12.7	—0.7	+0.3	*Barnard
	(12) Oct. 1.64646	35 19.84	9 16 32.9	+0.2	+0.4	Aitken
	(13)	5.70682	33 54.74	10 24 57.0	—0.2	*Barnard
	(14)	7.77461	33 22.91	10 57 05.4	+0.9	*Barnard
III	(15) Oct. 17.86509	23 32 46.99	+13 10 06.4	—0.2	—0.2	Aitken

* Yerkes Observatory, † Bergedorf, ‡ Rome.

BERKELEY ASTRONOMICAL DEPARTMENT,
October 27, 1913.

S. EINARSSON,
S. B. NICHOLSON.