

Elements and Ephemeris of Terpsichore (81).

Calculated by *A. Hall, Esq.*

By comparing the observations of this planet with an ephemeris computed from a set of approximate elements the following differences were found: (calc.—obs.).

		$\Delta \alpha$	$\Delta \delta$
1864 Bilk	Oct. 3	+ 6"3	— 3"4
"	" 4	+ 4,1	— 3,6
"	" 5	— 2,9	— 8,2
"	" 6	+ 0,7	— 3,4
"	" 6	+ 2,3	— 2,7
Berlin	" 6	— 0,8	— 2,4
Bilk	" 7	— 0,9	— 4,8
Berlin	" 10	— 1,2	— 6,1
Berlin	Oct. 15	+ 7,3	— 5,9
"	" 22	— 0,3	— 3,5
"	" 23	+ 1,1	— 2,3
Bilk	" 27	+ 1,2	— 6,2
Josephstadt	" 27	+ 1,1	— 6,8
"	" 28	+ 0,4	— 5,1
Berlin	" 29	+ 0,3	— 0,8
"	Nov. 1	— 0,4	— 8,2
"	" 1	— 0,1	— 0,6
Bilk	" 3	— 3,1	— 6,1
Leiden	" 5	(—69,4)	— 7,4
Berlin	" 6	+ 0,7	— 2,4
"	" 7	+ 2,8	— 4,7
Leipzig	" 7	(—62,0)	(+88,3)
Berlin	Nov. 11	+ 4,1	— 2,5
"	" 13	+ 3,5	— 3,5
"	" 13	+ 2,3	— 2,6
Josephstadt	" 17	+ 3,4	— 3,8
"	" 17	+ 0,7	— 4,5
"	" 18	— 0,6	— 6,3
"	" 18	+ 2,8	— 6,1
Leiden	" 19	+ 9,1	— 3,8
Josephstadt	" 20	+ 1,8	— 6,2
Berlin	" 20	+ 5,2	(—20,4)
Josephstadt	" 22	+ 6,8	— 8,3
Berlin	" 28	+ 3,2	— 6,1
"	" 29	+ 4,8	— 4,2
Berlin	Dec. 11	+14,7	+ 1,9
"	" 17	+18,4	+ 3,5
Washington	" 22	+18,2	— 9,3
"	" 24	+19,1	— 3,7
"	" 27	+24,0	— 7,5
Leipzig	" 29	+10,7	— 4,0
"	" 30	+16,0	— 2,4
Josephstadt	" 30	+11,0	—11,6

		$\Delta \alpha$	$\Delta \delta$
1865 Cambridge (A.)	Jan. 11	+ 5"2	— 4"0
"	" 16	+16,2	— 2,1
Berlin	" 17	+ 5,6	— 8,9
Leipzig	" 17	+ 7,6	— 9,2
"	" 17	+ 7,1	— 9,4
"	" 19	+15,4	—15,7
Clinton	Jan. 28	+ 2,8	—13,4
Berlin	" 29	+ 6,2	—12,0
Clinton	" 30	+ 2,8	—12,5
"	Febr. 2	+ 3,8	—15,6
Berlin	Febr. 13	+ 7,1	—13,1
Leipzig	" 13	+ 3,7	—18,6
Berlin	" 15	+ 9,4	—18,6

The sets of differences indicated by the horizontal lines furnish the following normal places, which are referred to the apparent equinox of the several dates.

Wash. m. t.	α	δ
1864 Oct. 6,0	2°58' 44"4	+ 2°43' 19"4
" 29,0	358 57 50,7	+ 2 30 59,4
Nov. 19,0	358 21 41,5	+ 3 14 35,0
Dec. 24,0	4 2 22,2	+ 6 37 31,8
1865 Jan. 16,0	11 5 12,5	+ 9 57 16,4
" 30,0	16 15 49,7	+12 14 3,6
Febr. 14,0	22 23 47,6	+14 46 50,8

All these positions have been considered as having the weight unity except the last, to which a weight of one half has been assigned, since on account of the faintness of the planet the observations on which it is based are denoted as doubtful by the observers. By varying the curtate distances for Oct. 6 and Jan. 30 the following elements were obtained.

Epoch = 1864 Oct. 6,0 Washington m. t.

$$M = 333^{\circ}30' 3''2$$

$$\pi = 48 28 50,8$$

$$\Omega = 2 31 28,4$$

$$i = 7 55 36,5$$

$$\phi = 12 11 36,8$$

$$\log a = 0,4554711$$

$$\mu = 735''868.$$

These elements leave the following residuals in the normal places.

Oct. 6	$\Delta\alpha = 0''0$	$\Delta\delta = 0''0$
" 29	+1,4	+1,7
Nov. 19	-4,4	+1,4
Dec. 24	+4,8	+3,2
Jan. 16	+1,1	+2,6
" 30	0,0	0,0
Feb. 14	+4,6	+0,1

Although this result is not entirely satisfactory I trust that the ephemeris computed from these elements, which is given below, will be sufficiently approximate for finding and observing the planet at the next opposition. Nearly all the comparison stars which were not redetermined at Berlin have been observed at Washington, and when these observations are available the normal places may be somewhat improved. I am indebted to Prof. Förster and to Prof. C. H. F. Peters and Mr. Safford for communicating observations of this planet.

Ephemeris for Washington 12^h.

1866	app. α (81)	app. δ (81)	log Δ	Aberr.-Time
Jan. 24	10 ^h 32 ^m 49 ^s 08	+17° 6' 42" 1	0,27336	-15 ^m 34 ^s 2
25	32 7,18	17 10 2,5	0,27234	32,0
26	31 23,99	17 13 25,3	0,27137	29,9
27	30 39,59	17 16 50,0	0,27047	28,0
28	29 54,03	17 20 16,6	0,26963	26,2
29	29 7,34	17 23 44,5	0,26884	24,5
30	10 28 9,86	+17 27 13,4	0,26811	-15 23,0

1866	app. α (81)	app. δ (81)	log Δ	Aberr.-Time
Jan. 31	10 ^h 27 ^m 30 ^s 75	+17° 30' 43" 0	0,26744	-15 ^m 21 ^s 5
Febr. 1	26 40,93	17 34 13,1	0,26683	20,3
2	25 50,16	17 37 43,1	0,26629	19,1
3	24 58,51	17 41 12,8	0,26581	18,1
4	24 6,01	17 44 41,9	0,26539	17,2
5	23 12,72	17 48 10,0	0,26504	16,5
6	22 18,72	17 51 36,8	0,26476	15,9
7	21 24,03	17 55 1,6	0,26455	15,4
8	20 28,71	17 58 24,3	0,26441	15,1
9	19 32,83	18 1 44,8	0,26432	15,0
10	18 36,47	18 5 2,2	0,26431	14,9
11	17 39,72	18 8 16,6	0,26436	15,0
12	16 42,60	18 11 27,5	0,26449	15,3
13	15 45,19	18 14 34,7	0,26468	15,3
14	14 47,56	18 17 37,6	0,26494	16,3
15	13 49,78	18 20 36,0	0,26528	17,0
16	12 51,89	18 23 29,8	0,26569	17,8
17	11 53,98	18 26 18,4	0,26616	18,8
18	10 56,11	18 29 1,8	0,26671	20,0
19	9 58,42	18 31 29,6	0,26731	21,3
20	9 0,91	18 34 11,3	0,26799	22,7
21	8 3,63	18 36 37,0	0,26874	24,3
22	7 6,67	18 38 56,4	0,26954	26,0
23	6 10,09	18 41 9,5	0,27042	27,9
24	5 13,98	18 43 15,8	0,27137	29,9
25	10 4 18,37	+18 45 15,4	0,27238	-15 32,1

Opposition Febr. 18. Magnitude = 11,6.

Washington, 1865 Nov. 17.

A. Hall.

Elemente und Ephemeride des Planeten (85), von Herrn Dolman in Durham.

From 3 observations of Planet (85) made on Sept. 25, Oct. 25, Nov. 24 at Hamilton College, Durham, and Durham respectively, I have calculated the accompanying orbit and approx ephemeris for month of January 1866.

I shall also be happy to take the planet under my own charge for next opposition, as it will be then be still sufficiently bright to be seen in our telescope which Clio will not.

Elements and Ephemeris of (85) derived from observations made on Sept. 25, Oct. 25, Nov. 24.

Epoch: 1866 Jan. 1,0 Greenwich M. T.

$$\begin{aligned} M &= 57^\circ 6' 52'' 06 \\ \pi &= 322 22 31,92 \\ \Omega &= 203 51 54,10 \\ i &= 11 52 49,58 \\ \varphi &= 11 3 34,14 \\ \log a &= 0,4238997 \\ \mu &= 820'' 648. \end{aligned} \quad \left. \begin{array}{l} \\ \\ \\ \\ \end{array} \right\} \text{mean eq. 1865,0}$$

1866	α	δ	log Δ
Jan. 1	1 ^h 6 ^m 13 ^s	+2° 57' 6"	0,33452
2	7 11	3 1,2	
3	8 9	3 5,0	
4	9 9	3 8,8	
5	10 9	3 12,8	0,34635
6	11 10	3 16,9	
7	12 11	3 21,1	
8	13 14	3 25,4	
9	14 17	3 29,8	0,35793
10	15 21	3 34,3	
11	16 26	3 38,9	
12	17 32	3 43,6	
13	18 39	3 48,5	0,36921
14	19 46	3 53,4	
15	20 54	3 58,4	
16	22 3	4 3,5	
17	23 13	4 8,7	0,38008
18	24 24	4 14,0	
19	25 35	4 19,3	
20	26 47	4 24,7	
21	28 0	4 30,2	0,39053
22	29 14	4 35,6	
23	30 29	4 41,3	
24	31 44	4 47,0	
25	1 33 0	+4 52,8	0,40056

Observatory Durham, 1865 Dec. 8.

Mondeford R. Dolman.