

HAVERHILL.

(Mr. W. Boreham.)

		Greenwich M.T.			R.A.			N.P.D.			No. of	Star of
1851.		h	m	s	h	m	s	°	'	"	Obs.	Comp.
May	21	11	0	2	16	2	14.89—0.012 P	103	26	25.6 —0.904 P	6	<i>a</i>
	22	11	6	40		1	14.25 .012		28	1.1 .903	6	<i>a</i>
	23	10	33	51	16	0	16.60 .013		29	41.2 .903	7	<i>b</i>
	28	11	15	39	15	55	16.33 .003		39	10.8 .911	5	<i>b</i>
	30	11	16	28		53	19.59 .000		43	21.8 .912	3	<i>c</i>
	31	10	21	14		52	25.22 .009		45	32.9 .908	6	<i>c</i>
June	1	10	31	25		51	28.14 .006		47	52.3 .911	5	<i>c</i>
	4	10	28	31		48	45.00—0.003	103	55	16.0 .912	6	<i>c</i>
	16	11	55	2		39	34.33+0.020	104	51	44.8 .898	5	<i>d</i>
	17	11	33	46		38	57.28 .017		55	8.0 .904	5	<i>e</i>
	19	10	31	36		37	50.65 .009		42	26.3 .916	3	<i>f</i>
	21	10	47	27		36	48.81 .012		49	57.5 .913	5	<i>f</i>
	22	10	26	30		36	20.62 .009	104	53	46.1 .916	6	<i>f</i>
	24	10	37	42		35	28.51 .013	105	1	47.0 .914	5	<i>g</i>
	26	10	20	36	15	34	44.09+0.012 p	105	9	59.1 —0.916 p	6	<i>g</i>

P = horizontal equatoreal parallax in arc.

	Mean Places, 1851.0.			N.P.D.		
	^h	^m	^s	[°]	[']	["]
a = Weisse xv ^h , 38	16	2	43.22	103	35	54.3
b = — xv ^h , 1118	15	53	46.02		40	0.5
c = Greenwich 12-year Catalogue, 1308	49	51.10		103	50	43.2
d = Weisse xv ^h , 744	38	44.80		104	46	7.6
e = — — 705	36	37.41			41	56.6
f = Greenwich 12-year, No. 1282 = B.A.C. 5188 ...	35	3.95		104	33	39.7
g = — — — 1283 = — 5190 ...	15	35	41.86	105	11	38.8

Elements.

Calculated by M. Fergola, of the Royal Observatory, Naples.

Epoch 1851, June 1^o, Greenwich M.T.

Mean Anomaly	44	5	32.3	Mean Equinox of Epoch.
π	185	27	35.41	
δ	87	16	29.6	
i	8	52	28.6	
ϕ	8	50	10.5	
Log a	0.4078482			
μ	867".4298			

The elements are based upon Mr. Hind's observation of May 19, and the Neapolitan observations of May 25 and June 3.

By Mr. R. C. Carrington, of the Durham Observatory.*

"From Hind's first observation and the Durham observations of May 31 and June 15 I have computed the following approximate Elements by the method of Gauss, carried to two approximations to P and Q:—

1851, June 10.

Mean longitude	M = 227° 43' 36".66	} Mean Equinox. Jan. 0.
Longitude of perihelion	π = 180° 42' 49".74	
— ascending node.	N = 87° 2' 39".04	
Inclination	I = 9° 0' 18".20	
Angle of excentricity	ϕ = 9° 28' 10".80	
Mean diurnal motion	μ = 858".1956	

"Residual errors.

	Computed—Observed Places.		
R.A.	—0".55	+0".55	+0".43
N.P.D.	+1".17	+1".05	+0".92

"Heliocentric co-ordinates. (u = excentric anomaly.)

x = [0.4055744]	$\sin(u + 270^\circ 40' 3".98) + 0.4185795$
y = [0.3670459]	$\sin(u + 184^\circ 42' 30".08) + 0.0314439$
z = [0.0390821]	$\sin(u + 161^\circ 1' 46".50) - 0.0585202$

By Mr. Norman Pogson, from the following Observations:—

1851.	^h _h ^m _m ^s _s	R.A. ^h _h ^m _m ^s _s	N.P.D. [°] _° ['] _' ["] _"	
May 21	12 5 41.8	16 2 11.99	103 26 28.5	Cambridge.
31	10 53 59.1	15 52 23.74	103 45 38.0	Liverpool.
June 10	12 58 36.8	15 43 41.79	104 12 24.4	Liverpool.
Mean Anomaly ...		48 13 33.72	June 1, 0 ^h	Greenwich M.T.
π		178 37 41.88	} Mean Equinox, June 1 ^d 0 ^h .	
Ω		86 50 1.60		
i		9 6 22.08		
ϕ		9 47 20.75		
e		0.1700220		
Log a		0.4126288		
Log q		0.3316958		
Log μ		2.9310634		
μ		853".2248		
Sidereal period, 1518.94345 days.				

The middle observation is represented in longitude within +0".42, and in latitude within —0".08; Observed — Computed place.

* "Mr. Carrington wishes to call the attention of those Fellows of the Astronomical Society who may call at the Society's apartments to a model which he left there some months ago of the orbits of the *Asteroids*, then 13. His object in doing so was to illustrate a certain convergency or *bundling up of the orbits at about 182° of longitude*. Two new planets having conformed to the view taken since it was first entertained, he thinks it may not be improper to call more decided attention to the circumstance."

By MM. E. Vogel and G. Rümker.

Mean Anomaly ...	55 4 49.67	July 10, 1851, Berlin M.T.
Long. Perihelion ..	179 9 55.01	Mean Equinox,
— Node	86 51 5.89	Jan. 0, 1851.
Inclination	9 5 47.03	
ϕ	9 39 47.64	
Log e	9.2249390	
Log a	0.4124446	
Log μ	2.9313397	

Ephemeris. By Mr. N. Pogson, and MM. Vogel and G. Rümker,
from their preceding Elements.

For Greenwich Mean Midnight.

1851.		R.A. h m s	N.P.D. ° ' "	Δ m s	Hor. Par. "	Log Δ .
July 1	15	33 22	105 31.9			
2		33 12	36.5			0.19555
3		33 3	41.2			
4		32 55	45.9			
5		32 50	50.6			
6		32 46	105 55.5			.20708
7		32 44	106 0.3			
8		32 44	5.2			
9		32 45	10.2			
10		32 50	15.2	13 46.7	5.17	.21891
11		32 54	20.2			
12		33 1	25.3			
13		33 9	30.5			
14		33 19	35.8	14 9.9	5.03	.23095
15		33 31	41.1			
16		33 44	46.4			
17		33 59	51.7			
18		34 16	106 57.1	14 34.1	4.89	.24312
19		34 34	107 2.5			
20		34 54	8.0			
21		35 15	13.5			
22		35 38	19.0	14 59.2	4.75	.25535
23		36 2	24.5			
24		36 28	30.1			
25		36 55	35.8			
26		37 24	41.5	15 24.9	4.62	.26757
27		37 54	47.2			
28		38 26	52.9			
29		38 59	107 58.6			
30		39 34	108 4.3	15 51.2	4.49	0.27974
July 31	15	40 10	108 10.0			

1851.	R.A.			N.P.D.	478° Δ.	Hor. Par.	Log Δ.
Aug. 1	h	m	s	°	m	"	
1	15	40	47	108	15.8		
2		41	25		21.6		
3		42	5		27.4	16 18.1	4.37 0.29181
4		42	46		33.2		
5		43	28		39.1		
6		44	12		44.9		
7		44	58		50.8	16 45.5	4.25 .30379
8		45	45	108	56.7		
9		46	32	109	2.6		
10		47	21		8.5		
11		48	11		14.4	17 13.2	4.14 .31557
12		49	2		20.3		
13		49	54		26.2		
14		50	48		32.1		
15		51	43		38.0	17 41.2	4.03 .32719
16		52	39		43.9		
17		53	36		49.8		
18		54	34	109	55.6		
19		55	34	110	1.4	18 9.4	3.93 .33860
20		56	35		7.2		
21		57	36		13.1		
22		58	38		18.9		
23	15	59	41		24.7	18 37.9	3.83 .34978
24	16	0	46		30.5		
25		1	51		36.3		
26		2	57		42.1		
27		4	4		47.9	19 6.5	3.73 .36072
28		5	12		53.7		
29		6	21	110	59.5		
30		7	31	111	5.2		
31	16	8	42	111	10.9	19 35.3	3.64 0.37139

The elements and ephemeris of *Irene* were computed by Mr. N. Pogson at the particular request of the Editor. Mr. Pogson is now attached to the Radcliffe Observatory.

An Ephemeris for 9^h 36^m Berlin Mean Time, computed by MM. Vogel and G. Rümker from their own elements, was very kindly forwarded by our associate M. C. Rümker, but it was received after Mr. Pogson's Ephemeris was set up. On reducing the Ephemerides to the same date they are so nearly identical, that it has not been thought worth while to print both, as both are only approximate.

HEBE.

HAMBURG.

1851.	Hamburg M.T.			R.A.	Decl.
July 3	h	m	s	°	'
	10	40	56	291	44 47.6
5	10	51	9	291	17 32.0
	Not corrected for parallax.				
					—8 8 30.3
					—8 22 0.9