$$C'_{2n-1} > \frac{1+3+5+\ldots+2n-3}{r} = \frac{(n-1)^2}{r}$$

Ferner ist

$$C'_{2n+1} = C'_{2n-1}\left(1+\frac{2n-1}{r}\right)+\frac{2n-1}{r}$$
$$= C'_{2n-1}\left(1+\frac{2n-1}{r}+\frac{1}{C'_{2n-1}}\cdot\frac{2n-1}{r}\right)$$
$$< C'_{2n-1}\left(1+\frac{2n-1}{r}+\frac{2n-1}{(n-1)^2}\right)$$

Schreibt man $\frac{2n-1}{(n-1)^2} = \frac{2}{(n-1)^2}+\frac{1}{n-1}$, so zeigt sich, dass es <3 für $n \geqq 2$ ist. Daher ist

$$C'_{2n+1} < C'_{2n-1}\left(4+\frac{2n-1}{r}\right)$$

Man fasse nun in der Reihe für E' je ein negatives Glied mit dem darauffolgenden positiven zusammen. Die Summe

$$-\frac{\rho^{2n-1}}{(2n-1)}\frac{C'_{2n-1}}{(n-1)!}+\frac{\rho^{2n+1}}{(2n+1)}\cdot\frac{C'_{2n+1}}{n!}$$
$$= \frac{\rho^{2n-1}}{2n-1}\cdot\frac{C'_{2n-1}}{(n-1)!}\left\{-1+\frac{2n-1}{2n+1}\cdot\frac{\rho^2}{n}\cdot\frac{C'_{2n+1}}{C'_{2n-1}}\right\}$$

ist nach der gefundenen Ungleichung und weil $\frac{2n-1}{2n+1}<1$,

$$< \frac{\rho^{2n-1}}{2n-1}\cdot\frac{C'_{2n-1}}{(n-1)!}\left\{-1+\frac{\rho^2}{n}\left(4+\frac{2n-1}{r}\right)\right\}$$

der Coefficient $\frac{4}{n}+\frac{2n-1}{r.n}$ von ρ^2 ist aber selbst $<2+\frac{1}{2}.2=3$, weil $r \geqq 2$ und $n \geqq 2$; und da $\rho<\frac{1}{2}$, ist jene Summe

$$< \frac{\rho^{2n-1}}{2n-1}\cdot\frac{C'_{2n-1}}{(n-1)!}\left\{-1+\frac{3}{4}\right\}<0.$$

Daraus folgt, dass $E'<0$ ist, und weiter, dass auch $E<0$ und schliesslich, was zu beweisen war,

$$\rho_p > \rho\sqrt{\frac{2}{p+1}} \tag{15}$$

ist.

Also hat sich die Ungleichung ergeben

$$\rho\sqrt{\frac{2}{p}} > \rho_p > \rho\sqrt{\frac{2}{p+1}},$$

die in Verbindung mit (7) zeigt, dass

$$r_1 > R_1 > r_1\sqrt{\frac{p}{p+1}}$$

ist; so dass die hier durchgeführte Methode der Berechnung des wahrscheinlichen Fehlers ihn stets kleiner liefert als die gewöhnliche, aber höchstens so, als ob eine Beobachtung mehr vorhanden wäre und die letztere Methode der Berechnung angewandt würde.

Carlsruhe, den 27. December 1875.

J. Lüroth.

Observations of Small Planets with the Transit-Circle at the U. S. Naval Observatory, Washington in 1874.

(Communicated by Rear Admiral *C. H. Davis*, Superintendent of the Naval Observatory at Washington.)

The observed places have been corrected for parallax. No corrections have been applied for flexure or errors of division of the instrument.

The observations of Ceres, Pallas, Juno, Vesta and Astraea were compared with the ephemerides in the English Nautical Almanac; the observations of the other planets were compared with the Berlin. Jahrbuch.

In the column „Observer" E indicates Prof. Eastman and J., Sk. and S indicate assistants Frisby, Skinner and Stone.

Ceres (1).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Dec. 11	J	6h 49m 16s63	+8s43	63° 22′ 12″5	−16″3
14	E	46 41.42	8.46	63 5 40.5	15.3
15	J	45 47.27	8.43	63 0 10.2	16.5
18	E	42 58.81	8.65	62 43 50.1	16.3
23	J	38 0.65	8.58	63 17 22.0	17.9

Pallas (2).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Nov. 3	Sk	3h 0m 8s87	−1s23	115° 29′ 31″3	− 5″0
7	„			116 15 53.8	3.1
12	E	2 52 36.27	1.55	117 4 7.8	4.8
13	J	2 51 46.61	1.16	117 12 27.3	4.4
21	„			118 2 43.8	5.4
25	„			118 17 7.4	6.3
Dec. 2	E	2 38 4.76	1.47		
4	J	2 37 0.94	1.48	118 24 37.7	6.7
14	E	2 33 12.38	1.36	117 56 19.0	7.2
18	„	2 32 26.68	1.26	117 35 45.6	7.0
19	J	2 32 19.30	1.43	117 30 4.2	+ 9.7
			Probably 1rev = 15″3, wrong		
21	Sk	2 32 10.46	0.93	117 17 9.7	− 8.0
22	E	2 32 7.91	1.36	117 10 30.0	− 5.4

Juno (3).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Nov. 16	E	2h55m49s96	+8s25	95°14′31″8	−16″8
21	J			95 37 27.4	18.0
25	„	50 30.33	8.03		
Dec. 2	E	47 30.41	7.83		
4	J	46 52.63	7.50	95 51 33.3	11.7
5	Sk	46 36.25	7.39	95 49 54.6	16.8
14	E	45 29.31	7.00	95 20 43.2	10.8
18	„	45 47.53	6.81	94 59 45.5	9.5
19	J	45 56.49	6.51	94 53 49.9	9.9
21	Sk	46 20.72	6.67	94 41 13.6	10.8

Vesta (4).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Nov. 21	J	4 30 19.11	+0.33	75 25 38.2	− 2.8
25	„	25 52.49	0.22	28 0.8	2.3
Dec. 4	„	16 18.84	0.28	30 13.8	2.2
5	Sk	15 15.30	0.36	30 8.9	3.2
14	E	6 15.70	0.38	26 14.1	3.7
18	„	2 43.01	0.46	22 25.5	1.5
19	J	4 1 52.90	0.23	21 14.2	2.1
22	E	3 59 31.80	0.34	17 12.8	0.8

Astraea (5).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Nov. 21	J	5 3 45.09	−10.22		
Dec. 14	E			76 14 46.6	−97.2
				Probably 2′ wrong	
18	„	4 37 44.50	−10.23	15 37.7	+24.4
22	„	4 34 14.33	−10.29	12 37.0	+25.2

Metis (9).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
June 1	„	15 55 38.88	−0.29	109 47 57.9	− 2.1

Hygeia (10).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Nov. 7	Sk			68 30 58.8	−125.6
12	E	2 51 17.23	−11.07	68 50 30.3	124.5
13	J	50 29.75	−10.90	68 54 33.4	126.5
16	E	48 8.39	−11.17	69 6 44.5	127.3
21	J			69 27 18.2	128.9
27	„			69 51 50.9	127.2

Parthenope (11).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Oct. 15	E	1 29 6.86	+4.66	89 5 52.4	+22 2
16	„	29 12.64	4.65	11 28.0	21.6
19	„	25 31.43	4.49	27 24.8	19.8
20	„	24 38.35	4.39	32 27.8	19.2
22	Sk	22 53.87	4.53	42 3.9	21.4

Lutetia (21).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
June 1	E	16 52 16.27	−3.72	111 49 13.0	− 5.1
13	„	39 49.45	3.36	47 48.4	5.5
17	„	35 53.59	3.37	47 8.7	7.2

Proserpine (26).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Feb. 10	E	9h10m15s40	−2s30	67°44′11″0	− 8″8
17	„	9 3 43.24	−1.46	67 20 36.4	− 6.2

Amphitrite (29).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Feb. 11	S	10 23 35.70	−0.77	74 57 26.9	− 4.9

Polyhymnia (33).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Dec. 15	J	7 30 6.11	+1.06	65 21 21.8	− 7.7

Fides (37).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Feb. 10	E	9 23 37.32	−6.55	70 32 40.2	−30.0
18	J	9 16 4.78	−6.38	70 10 10.4	−27.4

Daphne (41).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Jan. 16	E	7 12 31.09	+3.23	90 13 15.10	+ 1.2

Pales (49).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Dec. 14	„	6 24 44.71	+2.49	64 58 34.4	+ 9.8
15	J	23 48.52	2.57	64 59 8.1	10.1
18	E	20 56.86	2.54	65 1 5.6	11.8

Melete (56).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Nov. 4	„	1 37 6.28	+14.62	84 5 11.6	−49.9
6	S	1 35 42.35	+14.38	84 18 10.2	51.2
7	Sk			84 24 27.2	48.1

Elpis (59).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Dec. 14	E	5 46 41.45	+0.76	80 27 13.1	− 0.7
15	J	45 44.89	0.80	27 18.2	1.6
18	E	42 55.03	0.94	26 47.2	0.7

Leto (68).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Feb. 18	J	10 43 7.83	+1.44	70 14 56.5	+20.5

Feronia (72).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Jan. 16	E	7 17 56.38	−4.10	76 34 38.5	− 5.0

Diana (78).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Nov. 3	Sk	2 52 40.92	+4.77	58 49 55.1	−33.4
6	S	49 24.07	4.76	58 55 35.0	31.7
12	E	42 47.33	4.72	59 12 42.0	27.9
14	S	40 37.08	4.85	59 19 53.3	32.9
16	E	38 29.22	5.04	59 27 55.1	29.2
25	J	29 39.88	4.70	60 10 50.7	27.6
28	E	27 7.14	4.75	60 26 56.4	30.2

Terpsichore (81).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Nov. 16	E	$4^h21^m15^s63$	-20^s65	$56^\circ 17' 58''6$	$-31''6$
Dec. 4	J	4 2 35.54	20.79	22 1.2	22.1
7	„	3 59 39.88	20.90	28 28.4	14.9
8	S	3 58 43.52	20.95	30 56.4	10.8
9	Sk	3 57 48.69	20.73	33 33.3	5.8

Jo (85).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Nov. 13	E	4 17 56.56	+23.56	79 55 51.7	−12.4
16	„	4 15 13.38	23.75	80 15 53.0	12.4
21	J	4 10 34.71	23.90	80 47 29.5	
Dec. 8	S	3 55 26.70	23.89	82 10 25.7	
9	Sk	3 54 39.77	23.07	82 13 56.6	14.5

Minerva (93).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Jan. 16	E	7 41 9.66	− 2.89	56 28 53.0	+12.9
24	„			56 23 15.9	14.0

Miriam (102).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Jan. 16	E	$7^h25^m 9^s04$	$+39^s33$	$75^\circ 41' 46''6$	$-71''3$
24	„	7 17 9.27	+ 1.66	75 21 14.6	−97.0

Thyra (115).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
June 1	E	15 46 24.93	−16.35	126 25 43.6	−50.8

Vala (131).

1874	Obs.	α	O.-C.	N. P. D.	O.-C.
Nov. 4	E	1 43 30.55	−31.21	83 31 59.1	−41.8
7	Sk	1 40 34.70	−51.66	83 40 8.9	−15.9

The observations of Miriam, Thyra and Vala are very uncertain.

Provisional Elements of ω Leonis.

Node $= 151^\circ 34'$, $\gamma = 65^\circ 22'$, $\lambda = 122^\circ 54$, $e = 0.5028$, $P = 107^{\text{yrs}}62$, $T = 1842.77$.

I am occupied with the determination of the definitive elements on 76 annual means of observed angles of position. Professor Klinkerfues' elements do not represent the observations taken after the periastron passage. A comparison of additional observations of double stars with the elements appeared lately in Trans. R. I. A. Vol. XXVI, Pt. I. containing especially observations made by Messrs. Wilson and Seabroke, Mr. Gledhill and Dr. Dunèr.

Markree, 8. Februar 1876.

W. Doberck.

Inhalt:

Kiel 1876. Februar 29.

Druck von Fiencke & Schachel in Kiel.