1903–4 Gr. M.T.	*	Comp.	$\Delta\alpha$	$\Delta\delta$	App. α	App. δ	log $p\Delta$	Red. to App. Pl.
				(29) *Amphitrite.*				
1903 d h m s			m s	′ ″	h m s	° ′ ″		s ″
Mar. 18 16 17 25	29	10,8	−1 18.03	− 2 27.5	13 8 24.15	− 9 53 56.7	*n*9.364	0.829	+2.28 −10.4[2]
				Comet 1903 *c.*				
July 17 14 38 4	30	10,7	−1 43.28	+10 21.2	18 35 1.17	+62 36 54.3	*n*9.481	*n*0.460	+3.36 +17.0[1]
23 15 30 17	31	12,8	−1 12.01	+ 7 51.8	13 52 32.86	+65 58 8.0	0.011	9.643	−0.15 +13.1[1]
				(324) *Bamberga.*				
Oct. 3 15 14 14	32	10,6	−1 12.74	− 8 14.9	21 42 47.59	− 5 59 2.1	9.194	0.811	+3.32 +24.5[1]
1904				Comet 1904 *a.*				
May 2 15 48 42	33	12,8	+1 56.10	+ 3 48.6	16 4 4.81	+53 3 0.9	*n*9.646	*n*9.844	+2.11 − 2.6[1]
3 15 18 3	34	* 7,8	−0 52.78	− 0 29.5	16 0 0.32	+53 28 15.6	*n*9.701	*n*9.628	+2.14 − 2.3[1]
5 13 47 55	35	12,8	−1 17.24	− 3 26.0	15 51 44.82	+54 15 6.1	*n*9.821	9.927	+2.18 − 1.5[1]
7 15 15 39	36	12,8	+2 25.21	+10 10.8	15 42 40.66	+55 0 31.7	*n*9.646	*n*0.033	+2.21 − 0.5[1]
9 16 12 57	37	6,4	+2 30.60	+ 3 10.8	15 33 29.94	+55 40 27.5	*n*9.406	*n*0.271	+2.24 + 0.4[1]
16 15 1 12	38	6,4	−1 51.00	− 8 14.9	15 1 8.95	+57 20 50.0	*n*9.436	*n*0.321	+2.23 + 3.5[1]

Mean Places of Comparison-Stars for the beginning of the year.

*	α	δ	Authority	*	α	δ	Authority
	h m s	° ′ ″			h m s	° ′ ″	
1	15 37 3.58	− 7 20 44.6	Münich I, 11637	20	23 43 58.04	+12 5 36.3	A.G. Leipzig I, 9451
2	15 37 45.30	− 7 9 32.0	Schj. 5566 [5797]	21	23 46 26.59	+13 13 36.5	" " I, 9461
3	15 35 15.26	− 6 59 3.8	½ [Mü. I, 11612 + Mü. II,	22	23 53 1.59	+14 0 16.5	" " I, 9505
4	15 33 37.39	− 6 49 4.9	Münich I, 11592	23	23 55 44.04	+14 29 55.8	" " I, 9522
5	3 9 25.49	+ 9 25 29.7	A.G. Leipzig II, 1208	24	0 8 48.86	+16 2 30.1	A.G. Berlin A, 34
6	3 5 0.83	+ 9 19 18.1	" " II, 1184	25	0 22 59.16	+17 21 20.2	" " A, 109
7	3 3 1.98	+ 8 56 18.3	" " II, 1169	26	0 24 40.29	+17 4 28.0	" " A, 119
8	5 2 5.96	+14 5 25.6	" " I, 1512	27	11 23 50.43	+ 4 45 35.1	Toulouse 1778
9	5 1 10.38	+13 57 25.8	" " I, 1506	28	11 12 51.98	+ 6 10 9.2	A.G. Leipzig II, 5756
10	5 44 52.91	+19 39 59.7	A.G. Berlin A, 1716	29	13 9 39.90	− 9 51 18.8	Radcliffe '90, 3443
11	6 4 50.61	− 5 41 39.6	Radcliffe 1890, no. 1519	30	18 36 41.09	+62 26 16.1	A.G. Hels.-Gotha 9906
12	6 19 27.04	+31 57 55.6	A.G. Leiden 2597	31	13 53 45.02	+65 50 3.1	A.G. Christiania 2079
13	6 29 31.22	+ 7 38 53.6	A.G. Leipzig II, 3037	32	21 43 57.01	− 5 51 11.7	½ [Radcliffe '90, 5880 + Schjellerup 8856]
14	10 15 51.50	+ 4 21 10.1	A.G. Albany 4009	33	16 2 6.60	+52 59 14.9	A.G. Camb.(U.S.) 4911
15	10 15 54.77	+ 4 26 33.3	A.G. Albany 4010	34	16 0 50.96	+53 28 47.4	" " " 4903
16	23 8 20.25	+ 5 12 41.4	A.G. Leipzig II, 11563	35	15 52 59.88	+54 18 33.6	" " " 4869
17	23 35 35.90	+ 9 51 45.9	" " II, 11726	36	15 40 13.24	+54 50 21.4	½ [A.G. Cambridge (U.S.) 4822 + Hels.-Gotha 8474]
18	23 38 31.28	+11 3 50.9	" " II, 9412	37	15 30 57.10	+55 37 16.3	A.G. Hels.-Gotha 8408
19	23 41 37.28	+11 34 18.9	" " I, 9436	38	15 2 57.72	+57 29 1.4	" " " 8227

* $\Delta\alpha$ measured directly. † Clouds prevented complete observation.

[1] Observer, Mary W. Whitney. [2] Observer, Caroline E. Furness. [3] Observer, Elise C. Whitney.

CONTENTS.

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COMET *e* 1904 (*BORRELLY*).

[From RITCHIE'S Circular, No. 137, of January 3.]

A message via Harvard College Observatory from Kiel, received on December 30, announces the discovery of a comet by BORRELLY at Marseilles, on December 28. A second position, by HAMMOND, came the following day through the courtesy of Admiral CHESTER, Director of the U.S. Naval Observatory, which was distributed to American astronomers, and later the same day, the Königsberg position, by COHEN, was received from Kiel. Admiral CHESTER has also telegraphed the hereunder given Elements and Ephemeris, computed at the Observatory by Messrs. MORGAN and LAMSON, from observations of Dec. 30, 31 and Jan. 1.

These positions are given below.

POSITIONS.

Gr. M.T. 1904	R.A. h m s	Decl. ° ′ ″	Observer
Dec. 29.365	1 13 40.	−10 − −	Marseilles
30.6620	1 15 14.2	− 8 56 24	Hammond
31.2085	1 15 56.5	− 8 29 59	Cohen
31.5926	1 16 26.1	− 8 11 6	Seares

ELEMENTS.

T = 1905 Jan. 13.47 Greenw. M.T.

ω = 349° 59′
Ω = 72 57 } Mean Eq. 1904.0
i = 32 47

q = 1.4899

EPHEMERIS.

Gr. Midnight 1905	R.A. h m s	Decl. ° ′	Light
Jan. 5	1 23 12	−4 9	0.97
9	1 29 12	−0 54	
13	1 35 40	+2 18	
17	1 42 32	+5 25	0.87

Light, Dec. 29=1.

ORBIT OF COMET *d* 1904 (*GIACOBINI*).

[From RITCHIE'S Circular, No. 137, of January 3].

The orbit of GIACOBINI'S comet, which was circulated by telegraph to American astronomers, having run out, and the comet being exceedingly faint, the following Elements and Ephemeris are here published. They have been kindly communicated by Admiral COLBY M. CHESTER, having been computed by Messrs. MORGAN and LAMSON, at the U.S. Naval Observatory, from observations of Dec. 18, 20 and 21.

ELEMENTS.

T = 1904 Oct. 19.10 Greenw. M.T.

ω = 31° 30′
Ω = 217 1 } Mean Eq. 1904.0
i = 98 55

q = 1.8091

EPHEMERIS.

Gr. Midnight 1905	R.A. h m s	Decl. ° ′	Light
Jan. 6	17 9 8	+31 18	0.96
10	17 21 36	39 24	
14	17 34 36	41 32	
18	17 48 12	+43 40	0.87

Light, Dec. 17 = 1.

OBSERVATIONS OF COMET *e* 1904 (*BORRELLY*),

MADE WITH THE 16-INCH EQUATORIAL OF THE CINCINNATI OBSERVATORY,

BY J. G. PORTER.

1905 Cin. M.T. d h m s	*	Comp.	$\Delta\alpha$ m s	$\Delta\delta$ ′ ″	App. α h m s	App. δ ° ′ ″	log $p\Delta$		Red. to app. place s ″
Jan. 1 7 56 17	1	12 , 12	−1 51.01	+1 28.9	1 17 42.71	−7 23 17.4	9.207	0.799	−0.13 −9.1
3 8 0 10	2	12 , 12	+1 7.10	+3 35.5	1 20 25.86	−5 45 7.2	9.253	0.787	−0.14 −8.7

Mean Places of Comparison-Stars for 1905.0.

*	α h m s	δ ° ′ ″	Authority
1	1 19 33.85	−7 24 37.2	Rad. 1890, 327; Gr. 10-yr., 216; 2d Gr. 10-yr., 516
2	1 19 18.90	−5 48 34.0	DM. −6°266; equatorial comparison with
	1 14 48.65	−5 49 30.1	Ll. 2394; W 1h, 186; Rüm$_2$. 593; Par. 1674

In last star, LALANDE'S R.A., and WEISSE'S Decl., rejected.

OBSERVATION OF COMET *e* 1904 (*BORRELLY*),

By E. E. BARNARD.

Time 6h slow of Gr.	Comp.	$\Delta\alpha$	$\Delta\delta$	App. α	App. δ	Red. to app. place	
1904 d h m s		m s	′ ″	h m s	° ′ ″	s	″
Dec. 31 7 0 0	16.8	+2 12.36	−1 7.5	1 16 22.34	−8 13 35.5	+2.85	+9.9

	α	δ	Authority
	h m s	° ′ ″	
Comp.-Star 1904.0	1 14 7.13	−8 12 37.9	Wien-Ottakring, A.G.C. 263

The comet is rather large, 2′–3′ in diameter, of the 11th magnitude, very much brighter in the middle, to a nucleus or very strong condensation. The measures were made with the 40-inch. The time is 6h slow of Greenwich M.T.

Yerkes Observatory, 1905 *January* 1.

DISCOVERY OF A SIXTH SATELLITE OF *JUPITER*.

A dispatch from Prof. Campbell to Harvard College Observatory, on Jan. 5, states that a sixth satellite of *Jupiter* has been discovered by Perrine. It was suspected in December, and confirmed last night. Position angle with reference to *Jupiter*, 269°, distance 49′, decreasing 45″ daily. Apparent motion retrograde; magnitude 14. Crossley reflector, Dec. 3, 8, 9, 10; Jan. 2, 3, 4.