

## DISCOVERY AND OBSERVATIONS OF A COMET,

BY E. E. BARNARD, ASTRONOMER OF THE LICK OBSERVATORY.

On the morning of June 24, at about 2<sup>h</sup>, I discovered a faint comet in *Andromeda* with the 6½-inch equatorial. | The following are the observations so far obtained:

FILAR-MICROMETER OBSERVATIONS OF COMET c 1889 (*BARNARD, June 23*),  
MADE WITH THE 12-INCH EQUATORIAL.

1889 Mt. Hamilton M.T.	*	No. Comp.	—*		s apparent		log pΔ		
			Δa	Δδ	a	δ	for a	for δ	
June 23 <sup>d</sup>	14 <sup>h</sup> 41 <sup>m</sup> 21 <sup>s</sup>	1	8, 7	—0 <sup>m</sup> 37.73	+3 <sup>s</sup> 36.7	1 20 53.41	+38 50 43.6	n9.745	0.387
24	13 56 14	2	12, 6	+0 13.42	—9 20.6	1 25 26.25	+39 24 39.6	n9.774	0.510
25	12 59 4	3	24, 8	—0 18.50	—4 43.9	1 29 58.36	+39 57 14.7	n9.787	0.634
26	13 23 57	4	5	—	+5 50.3	—	+40 30 35.5	—	0.594
	14 4 0	4	8	—1 56.90	—	1 34 53.93	—	n9.779	—
29	12 46 43	5	14, 9	—0 17.89	+1 9.6	1 48 48.20	+42 1 31.5	n9.794	0.661
30	12 57 0	6	12, 8	+1 6.66	+3 42.6	1 53 33.14	+42 30 8.7	n9.798	0.643
July 1	13 38 3	7	14, 10	—2 2.17	—8 21.1	1 58 23.53	+42 58 8.5	n9.805	0.525
2	13 47 28	8	16, 10	—1 27.07	+4 58.0	2 3 8.32	+43 24 27.2	n9.807	0.511

### Mean Places for 1889.0 of Comparison-Stars.

*	a	Red. to app. place	δ	Red. to app. place	Authority
1	1 21 31.05	+0.09	+38 47 16.9	—10.0	Weisse's Bessel I, 419-420
2	1 25 12.74	+0.09	+39 34 10.3	—10.1	" " I, 503-508
3	1 30 16.75	+0.11	+40 2 8.7	—10.1	" " I, 625
4	1 36 50.71	+0.12	+40 24 56.4	—10.2	" " I, 805
5	1 49 5.95	+0.14	+42 0 32.1	—10.2	Comp. with Weisse's Bessel I, 1182
6	1 52 26.32	+0.16	+42 26 36.1	—10.0	Weisse's Bessel I, 1184
7	2 0 25.57	+0.13	+43 6 39.7	—10.1	Lal. 3849
8	2 4 35.26	+0.13	+43 19 39.3	—10.1	Weisse's Bessel II, 15

June 23. Comet faint, with no condensation and no tail.  
 June 24-25. Probably somewhat more condensed.  
 June 26. Excessively difficult in haze, but observations good.

June 29. \*5 —W.B. 1182; Δa = —3<sup>m</sup> 18<sup>s</sup>.14, Δδ = 9' 13<sup>''</sup>.0  
 July 2. Comet smaller and more condensed; somewhat brighter, owing to the condensation.

*Mt. Hamilton, 1889 July 3.*

## THE DEDUCTION OF PLANETARY MASSES FROM THE MOTIONS OF COMETS,

BY A. HALL.

The laborious and interesting investigations of BACKLUND and HAERDTL on comets of short period, namely, Encke's and Winnecke's, and the results found by these astronomers for the masses of planets, brings up the question whether the motions of such bodies can be used for accurate determinations of these masses. For some time this has seemed to me a doubtful point.

In his last memoir BACKLUND has reduced the coefficient of the resisting medium in space to one-half the value found by ENCKE, and he finds a mass of *Mercury* three or four times greater than that found by ENCKE from this motion of the same comet. This value of the mass would give this planet the density of lead. Dr. v. HAERDTL finds in the motion

of the Winnecke comet no evidence of a resisting medium in the regions traversed by this comet. In fact, there is a small retardation, and to remove this the mass of *Jupiter* has been slightly increased.

The objection to deducing values of planetary masses from the motions of comets consists, I think, in the fact that apparently other forces than that of gravitation act on these bodies. As a comet approaches the sun it changes form, disintegrates, and matter is thrown off to form a tail. Until we know more of the theory of these changes the computation of masses from the motions of comets, and inferences about the resisting medium in space, must be uncertain.

1889 June 10.