MEAN PLACES FOR 1903.0 OF COMPARISON STARS.

Star.	α	Red. to app. place.	δ	Red. to app. place.	Authority.
1	23 ^h 9 ^m 42.06	-0.27	+ 4° 54' 8".6	+2".3	Micrometer comparison with (2)
2	23 10 10.31	-0.27	+ 4 58 6.7	+2.3	A.G. Albany 8028
3	23 14 47.62	-0.27	+ 6 7 14.5	+1.9	Micrometer comparison with (4)
4	23 16 54.61	-0.27	+ 6 9 50.8	+1.9	A.G. Leipzig II 11617
5	23 16 56.05	-0.28	+ 6 42 23.8	+1.8	" " II 11618
6	23 17 45.18	-0.28	+ 6 37 28.3	+1.8	Micrometer comparison with (5)
7	23 21 13.47	-0.25	+ 8 23 46.2	+1.8	A.G. Leipzig II 11644
8	23 24 53.59	-0.25	+ 8 20 57.6	+1.8	Micrometer comparison with (7)
9	23 26 25.45	-0.24	+ 9 13 34.7	+1.6	A.G. Leipzig II 11676
10	23 29 44.40	-0.23	+ 9 17 17.3	+1.5	Micrometer comparison with (9)
11	23 31 18.85	-0.23	+ 9 58 8.3	+1.3	A.G. Leipzig II 11702
12	23 32 47.29	-0.23	+ 9 57 22.7	+1.3	Micrometer comparison with (11)
13	23 35 24.60	-0.23	+10 18 46.3	+1.2	A.G. Leipzig I 9397
14	23 38 31.28	-0.23	+11 3 50.9	+1.1	" " 9412
15	23 39 46.75	-0.23	+11 27 26.6	+1.0	" " 9422
16	23 43 58.04	-0.21	+12 5 36.3	+0.9	" " 9451
17	23 53 1.59	-0.18	+14 0 16.5	+0.6	" " 9505
18	23 55 44.04	-0.18	+14 29 55.9	+0.5	" " 9522
19	23 57 33.60	-0.18	+14 47 42.2	+0.4	" " 9530
20	23 59 30.70	-0.18	+15 13 44.7	+0.3	" " 9540

FURTHER OBSERVATIONS OF COMET *d* 1902 (GIACOBINI), WITH ELEMENTS AND EPHEMERIS

The following observations of this comet continue the series published in Lick Observatory Bulletin No. 28. The comet's appearance has remained unchanged, unless it may be a little fainter than at first. It is a difficult object to measure with the 12-inch telescope except under good conditions. The observations on February 19 and 28 were made with the 36-inch telescope, the others with the 12-inch. $\Delta\alpha$ was measured directly with the micrometer on all the dates.

From the observations of December 5 and 30, 1902, and the second observation of January 17, 1903, a set of parabolic elements was computed. These were published in Popular Astronomy for February, 1903,

together with an ephemeris extending to March 25, 1903. Comparison with my recent observations indicates that these elements satisfy the observed motion of the comet more exactly than any other elements so far published, the residuals (O—C) for the observations of February 28 being $-0^s.6$ and $+9''$. It thus seems probable that they will represent the comet's motion with all necessary accuracy to the end of the apparition period.

I therefore reprint them here, together with an extension of the ephemeris to June 1, 1903.

R. G. AITKEN.

March 6, 1903.

1903	Mt. Hamilton M. T.			Star.	No. of Comparisons.	Comet — Star		Comet's Apparent		$\log p \Delta$	
						$\Delta\alpha$	$\Delta\delta$	α	δ	α	δ
Jan.	28 ^d	10 ^h	12 ^m 52 ^s	18	10, 8	+ 9.79	-3' 13".6	6 ^h 43 ^m 35.84	+12° 40' 12".9	n7.472	0.561
	28	10	41 37	19	10, 6	+15.16	+0 31.7	6 43 53.10	+12 40 38.2	8.757	0.563
Feb.	2	7	41 57	20	8, 6	+14.01	+4 37.8	6 41 4.98	+14 17 58.3	n9.415	0.567
	13	6	53 55	22	8, 6	- 8.37	-6 21.6	6 37 20.75	+17 50 9.0	n9.425	0.512
	14	7	23 42	23	8, 6	-22.95	+5 53.7	6 37 8.35	+18 9 12.8	n9.311	0.486
	18	7	31 54	24	8, 6	+22.73	+6 37.9	6 36 37.21	+19 22 27.8	n9.191	0.447
	19	11	31 52	25	8, 6	-22.54	+1 7.4	6 36 32.47	+19 43 15.5	9.528	0.514
	23	7	14 44	26	8, 6	- 5.42	+1 54.2	6 36 34.14	+20 50 2.9	n9.180	0.413
	28	11	13 18	27	10, 6	+ 9.44	+3 6.0	6 37 13.73	+22 16 2.6	9.567	0.491

MEAN PLACES FOR 1903.0 OF COMPARISON STARS.

Star.	α	Red. to app. place.	δ	Red. to app. place.	Authority.
18	6 ^h 43 ^m 24.09	+1.96	+12° 43' 39".1	-12".6	A.G. Leipzig I. 2505
19	6 43 17.98	+1.96	+12 40 19.1	-12.6	" " " 2504
20	6 40 49.05	+1.92	+14 13 32.9	-12.4	Micrometer comparison with (21)
21	6 40 33.86	+1.92	+14 8 38.0	-12.4	A.G. Leipzig I. 2476
22	6 37 27.23	+1.89	+17 56 42.1	-11.5	A.G. Berlin A. 2341
23	6 37 29.43	+1.87	+18 3 30.6	-11.5	" " " 2342
24	6 36 12.66	+1.82	+19 16 1.1	-11.2	" " " 2325
25	6 36 53.20	+1.81	+19 42 19.2	-11.1	" " " 2334
26	6 36 37.82	+1.74	+20 48 19.0	-10.3	A.G. Berlin B. 2535
27	6 37 2.58	+1.71	+22 13 6.7	-10.1	Micrometer comparison with (28)
28	6 36 43.21	+1.71	+22 13 27.3	-10.1	A.G. Berlin B. 2536

ELEMENTS.

$T = 1903 \text{ March } 23.27958 \text{ G.M.T.}$

$\omega = 5^\circ 45' 4".4$

$\Omega = 117 \ 28 \ 0.0$ } Mean equinox of 1903.0

$i = 43 \ 53 \ 57.9$

$\log q = 0.443156$

Residuals (O-C).

$\Delta\lambda' \cos \beta' - 3".6$; $\Delta\beta' - 3".1$

CONSTANTS FOR THE EQUATOR OF 1903.0.

$x = r [9.896716] \sin (221^\circ 33' 31".7 + v)$

$y = r [9.999990] \sin (131 \ 15 \ 44.4 + v)$

$z = r [9.789065] \sin (40 \ 46 \ 31.3 + v)$

EPHEMERIS FOR GREENWICH MEAN MIDNIGHT.

1903	True α	True δ	$\log \Delta$	$\log r$	Brightness	1903	True α	True δ	$\log \Delta$	$\log r$	Brightness
Mar. 21.5	6 ^h 47 ^m 8. ^s 0	+27° 10' 5"	0.3834	0.4432	0.67	Apr. 14.5	7 ^h 11 ^m 21. ^s 2	+31° 12' 24"	0.4389	0.4446	0.52
23.5	48 40.0	27 34 12				16.5	13 53.1	31 28 12			
25.5	50 17.7	27 57 34	0.3929	0.4432	0.64	18.5	16 29.2	31 43 21	0.4476	0.4452	0.50
27.5	52 0.9	28 20 12				20.5	19 9.3	31 57 52			
29.5	53 49.6	28 42 7	0.4023	0.4433	0.62	22.5	21 53.2	32 11 45	0.4561	0.4458	0.47
31.5	55 43.8	29 3 19				24.5	24 40.9	32 25 1			
Apr. 2.5	57 43.3	29 23 48	0.4117	0.4435	0.59	26.5	27 32.3	32 37 40	0.4644	0.4466	0.45
4.5	6 59 47.8	29 43 36				28.5	30 27.2	32 49 43			
6.5	7 1 57.2	30 2 42	0.4209	0.4438	0.56	30.5	33 25.4	33 1 11	0.4725	0.4475	0.44
8.5	4 11.4	30 21 7				May 2.5	36 26.9	33 12 5			
10.5	6 30.2	30 38 52	0.4300	0.4442	0.54	4.5	39 31.5	33 22 24	0.4803	0.4484	0.42
12.5	8 53.5	+30 55 58				6.5	42 39.1	33 32 8			
						8.5	45 49.5	33 41 18	0.4879	0.4495	0.40
						10.5	49 2.6	33 49 55			
						12.5	52 18.4	33 57 59	0.4953	0.4506	0.39
						14.5	55 36.7	34 5 31			
						16.5	7 58 57.4	34 12 30	0.5025	0.4518	0.37
						18.5	8 2 20.4	34 18 57			
						20.5	5 45.5	34 24 53	0.5095	0.4531	0.36
						22.5	9 12.7	34 30 18			
						24.5	12 41.9	34 35 13	0.5162	0.4545	0.35
						26.5	16 13.0	34 39 38			
						28.5	19 46.0	34 43 33	0.5226	0.4559	0.33
						30.5	23 20.7	34 46 59			
						June 1.5	8 26 57.0	+34 49 56	0.5288	0.4574	0.32