

the values found so far, the indication is that a reduction of 3 per cent should be applied, but a more considerable body of observational evidence might alter this value a good deal.

I am much indebted to Dr. R. H. Stoy, Dr. A. W. J. Cousins, Dr. W. S. Finsen, Dr. A. D. Code, Mr. T. Houck and others for discussion of these problems.

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Royal Observatory,
 Cape of Good Hope,
 1955 June.

OBSERVATIONS OF COMETS AND ASTEROIDS *

By H. M. JEFFERS AND ELIZABETH ROEMER

The list of observations in this paper continues that given in *Lick Observatory Bulletin* No. 529, which is published in the *Astronomical Journal* **59**, 305, 1954.

The plates were taken either with the Crossley reflector or with the 20-inch Carnegie Astrograph. The observations by Jeffers were made only with the Crossley; Elizabeth Roemer used

U. T.	α	δ	Par. Factor	α	δ	Par. Factor
Comet Schwassmann-Wachmann I (1925 II)						
1954 1950.0						
Mar. 4. 49956	15 ^h 42 ^m 53 ^s .57	-29°56'40".6	-0 ^s .148 +7 ^m .96	J, J		
Mar. 4. 54400	15 42 53.81	-29 56 46.7	+0.002 +8.10	J, J		
Apr. 29. 31907	15 31 40.31	-30 37 47.5	-0.213 +7.85	J, R		
Apr. 29. 36699	15 31 39.01	-30 37 44.9	-0.054 +8.12	J, R		
Comet Oterma (1943a)						
1954 1950.0						
July 4. 45730	22 50 22.10	-6 57 53.0	-0.143 +6.08	R, R		
July 5. 40534	22 50 18.38	-6 58 39.2	-0.273 +5.96	R, R		
Aug. 21. 21262	22 33 42.66	-9 01 05.7	-0.386 +5.88	J, J		
Aug. 21. 25845	22 33 41.19	-9 01 17.2	-0.292 +6.11	J, J		
Sept. 26. 26733	22 14 29.98	-11 10 53.8	+0.045 +6.56	R, R		
Sept. 26. 32340	22 14 28.53	-11 11 02.4	+0.207 +6.43	R, R		
Comet Pons-Brooks (1953c)						
1954 1950.0						
Feb. 3. 57573	20 49 21.65	+38 13 44.4	-0.594 +4.44	R, R		
Feb. 3. 58300	20 49 23.10	+38 13 47.3	-0.595 +4.24	R, R		
Comet Reinmuth II (1953d) 1954 VI 3/27						
1954 1950.0						
July 5. 45969	2 59 57.16	+23 10 25.6	-0.498 +4.32	R, R		
July 7. 44991	3 03 59.08	+23 29 30.1	-0.503 +4.42	J, R		
Aug. 5. 41693	3 58 36.73	+27 15 02.1	-0.514 +4.04	J, R		
Sept. 27. 40127	5 02 29.81	+30 47 45.1	-0.399 +2.12	R, R		
Sept. 27. 49061	5 02 32.56	+30 47 58.1	-0.141 +1.10	R, R		
Nov. 25. 42671	4 38 46.05	+30 36 03.1	+0.238 +1.36	J, R		
Nov. 25. 50935	4 38 40.71	+30 35 44.3	+0.450 +2.57	J, R		
Comet Abell (1953g) 54 x Jul 7						
1954 1954.0						
Mar. 4. 19756	1 22 05.84	+72 15 34.4	+1.534 +1.66	R, R		
Mar. 4. 20310	1 22 07.22	+72 15 33.2	+1.533 +1.89	R, R		
Mar. 31. 27051	3 35 40.95	+69 15 43.0	+1.241 +4.11	R, R		
Mar. 31. 27676	3 35 43.03	+69 15 38.7	+1.223 +4.35	R, R		
Apr. 20. 16546	5 21 13.56	+64 11 37.7	+0.976 -0.32	R, R		
Apr. 20. 16788	5 21 14.26	+64 11 34.2	+0.983 -0.23	R, R		
May 20. 24214	7 33 01.83	+48 31 55.2	+0.706 +3.48	R, R		
May 20. 24456	7 33 02.34	+48 31 49.5	+0.706 +3.56	R, R		
June 2. 20199	8 16 02.29	+38 38 34.4	+0.584 +3.18	R, R		
June 2. 20545	8 16 02.87	+38 38 24.0	+0.586 +3.27	R, R		
June 21. 20740	9 07 12.35	+21 28 42.8	+0.500 +4.72	R, R		
June 21. 20896	9 07 12.53	+21 28 37.6	+0.501 +4.75	R, R		
June 28. 19795	9 23 19.43	+14 40 00.9	+0.481 +4.97	R, R		
June 28. 19951	9 23 19.64	+14 39 55.6	+0.481 +4.98	R, R		

* *Lick Observatory Bulletin*, No. 536.

U. T.	α	δ	Par. Factor	α	δ	Par. Factor
Comet Finlay (1953i)						
1954 1950.0						
Mar. 4. 14735	2 ^h 19 ^m 38 ^s .61	+15°19'20".9	+0 ^s .410 +4 ^m .13	R, R		
Mar. 4. 16466	2 19 42.41	+15 19 42.1	+0.436 +4.31	R, R		
Comet Honda-Mrkos-Pajdusakova (1954a)						
1954 1954.0						
Feb. 8. 11934	23 33 01.45	-4 51 20.9	+0.428 +5.53	R, R		
Feb. 8. 12591	23 33 03.80	-4 51 16.2	+0.435 +5.51	R, R		
Feb. 20. 12676	0 50 13.84	-3 20 57.0	+0.409 +5.50	R, R		
Feb. 20. 13333	0 50 16.62	-3 20 53.8	+0.418 +5.48	R, R		
Mar. 31. 21229	6 13 11.53	+1 12 09.3	+0.356 +5.21	R, R		
Mar. 31. 23586	6 13 21.30	+1 12 16.0	+0.396 +5.23	R, R		
Comet Borrelly (1954b)						
1954 1950.0						
Mar. 4. 29419	13 47 02.69	+36 02 38.7	-0.506 +2.30	R, R		
Mar. 4. 39823	13 46 57.69	+36 03 32.9	-0.230 +0.51	J, R		
Comet Harrington (1954c) I Jan 18						
1954 1954.0						
July 28. 24583	14 29 18.10	+28 25 44.0	+0.435 +2.75	R, R		
July 28. 33344	14 29 14.43	+28 25 05.8	+0.530 +4.47	R, R		
July 31. 22639	14 27 13.46	+28 01 25.8	+0.414 +2.63	R, R		
July 31. 30741	14 27 10.39	+28 00 47.3	+0.522 +4.15	R, R		
Aug. 25. 22078	14 19 38.90	+24 56 31.1	+0.500 +4.09	R, R		
Aug. 31. 20625	14 19 45.66	+24 19 04.1	+0.499 +4.16	R, R		
Comet Kresak-Peltier (1954d) 54 XII Aug 27						
1954 1954.0						
June 30. 23472	14 18 40.49	+8 13 15.6	+0.207 +4.35	WS, R		
June 30. 27074	14 18 24.40	+8 10 39.4	+0.297 +4.48	WS, R		
July 5. 24398	13 42 20.01	+1 59 42.4	+0.321 +5.13	R, R		
July 5. 24779	13 42 18.41	+1 59 25.5	+0.329 +5.13	R, R		
July 12. 20894	12 58 46.28	-6 04 31.3	+0.352 +5.77	R, R		
July 12. 21240	12 58 45.18	-6 04 42.0	+0.358 +5.76	R, R		
Oct. 9. 52469	8 52 40.73	-20 03 08.0	-0.372 +6.58	R, R		
Oct. 9. 53507	8 52 39.51	-20 02 56.3	-0.349 +6.70	R, R		
Comet Faye (1954e) 1955 II Mar 4						
1954-55 1950.0						
July 1. 39330	21 36 17.34	+0 49 19.3	-0.200 +5.22	R, R		
July 1. 44732	21 36 16.90	+0 49 31.6	-0.047 +5.20	R, R		
Aug. 25. 29938	21 03 09.18	-0 20 48.2	+0.027 +5.35	R, R		
Aug. 25. 32233	21 03 07.99	-0 20 57.4	+0.094 +5.35	R, R		
Sept. 26. 20881	20 46 58.65	-4 25 31.9	+0.051 +5.83	R, R		
Sept. 26. 22334	20 46 58.58	-4 25 38.3	+0.093 +5.82	R, R		

U. T.	α	δ	Par. Factor	
	α	δ	α	δ
Comet Faye (1954e) (Continued)				
1954-55 1950.0				
✓ Nov. 29. 11097	21 ^h 45 ^m 46 ^s .87	- 7°39'30".2	+0.156	+6.14 R, R
Nov. 29. 11928	21 45 47.80	- 7 39 29.4	+0.179	+6.12 R, R
Jan. 13. 11344	23 20 25.16	- 2 55 55.3	+0.306	+5.57 R, R
Jan. 13. 12625	23 20 26.91	- 2 55 48.6	+0.334	+5.55 R, R
Comet Vozarova (1954f) VIII Jan 1				
1954 1954.0				
✓ Sept. 30. 16774	18 40 38.77	+58 13 18.4	+0.402	-2.51 R, R
Sept. 30. 18368	18 40 40.48	+58 12 33.9	+0.479	-2.22 R, R
Dec. 18. 13603	20 21 00.60	+25 08 51.0	+0.480	+3.70 J, R
Dec. 18. 18117	20 21 03.41	+25 08 28.7	+0.514	+4.52 J, R
Comet Schwassmann-Wachmann II (1954g) 55 I 2/27				
1954 1950.0				
July 28. 45451	4 48 38.49	+19 27 59.3	-0.494	+4.79 J, R
July 28. 48194	4 48 41.30	+19 28 04.9	-0.478	+4.39 J, R
July 31. 48134	4 53 52.85	+19 36 02.7	-0.475	+4.33 J, R
Aug. 5. 46345	5 02 29.38	+19 47 44.4	-0.484	+4.46 J, R
Aug. 5. 48637	5 02 31.82	+19 47 48.2	-0.463	+4.14 J, R
Sept. 26. 39596	6 26 29.78	+20 03 52.0	-0.471	+4.21 J, R
Sept. 26. 40916	6 26 30.87	+20 03 51.2	-0.456	+4.02 J, R
Oct. 28. 40861	7 04 51.54	+19 12 28.2	-0.348	+3.37 J, J
Oct. 28. 42597	7 04 52.45	+19 12 26.3	-0.307	+3.21 J, J
Nov. 29. 39010	7 21 03.93	+18 47 34.4	-0.199	+2.96 R, R
Nov. 29. 39911	7 21 03.94	+18 47 34.7	-0.173	+2.91 R, R
Comet Baade (1954h) 55 VI Aug 13				
1954 1954.0				
Aug. 12. 18453	14 38 29.45	+65 23 26.6	+0.797	-2.27 V, R
Aug. 12. 20358	14 38 28.97	+65 23 18.0	+0.886	-1.70 V, R
Aug. 18. 19169	14 35 51.11	+64 45 59.5	+0.892	-1.42 V, V
Aug. 18. 20974	14 35 50.67	+64 45 52.3	+0.958	-0.82 V, V
Aug. 24. 20196	14 34 16.70	+64 09 21.4	+0.967	-0.41 I, I
Aug. 24. 22001	14 34 16.47	+64 09 15.1	+1.013	+0.26 I, I
Sept. 30. 13000	14 43 15.71	+61 21 22.5	+0.931	+0.71 R, R
Sept. 30. 13762	14 43 16.04	+61 21 20.5	+0.943	+1.00 R, R
Nov. 29. 55841	15 44 51.75	+63 48 48.9	-1.059	+2.23 R, R
Nov. 29. 57088	15 44 52.90	+63 48 55.4	-1.054	+1.73 R, R
Comet Van Biesbroeck (1954i) IV Feb 20				
1954 1954.0				
Sept. 3. 20285	22 46 59.66	- 9 46 38.1	-0.356	+6.02 V, R
Sept. 3. 21570	22 46 59.20	- 9 46 43.3	-0.329	+6.09 V, R
Sept. 20. 18850	22 38 07.52	-11 16 49.0	-0.272	+6.33 R, R
Sept. 20. 20650	22 38 07.00	-11 16 54.1	-0.226	+6.41 R, R
Sept. 25. 17072	22 36 08.23	-11 37 21.2	-0.279	+6.34 R, R
Sept. 25. 19565	22 36 07.59	-11 37 26.1	-0.215	+6.46 R, R
Sept. 30. 23561	22 34 31.02	-11 54 48.3	-0.058	+6.63 R, R
Sept. 30. 25535	22 34 30.70	-11 54 51.4	+0.001	+6.64 R, R
Nov. 17. 11309	22 42 34.34	-11 45 09.7	-0.049	+6.62 R, R
Nov. 17. 15535	22 42 35.82	-11 45 02.2	+0.077	+6.61 R, R
1955 1955.0				
Jan. 15. 14584	23 34 22.45	- 6 33 32.2	+0.366	+5.78 R, R

COMET NOTES

Comet Schwassmann-Wachmann I (1925 II)
 Mar. 4: Mag. 18.5, nearly stellar.
 Apr. 29: There was a faint fan-shaped coma extending 0.5 west of an 18th mag. nucleus.

Comet Oterma (1943a)
 All the plates showed a nearly stellar nucleus of 17.5 mag., with a faint slender tail 0.5 long towards 250°.

Comet Pons-Brooks (1953c)
 The comet showed a round coma 0.8 in diameter, with a well-condensed nucleus on the east side. The exposure was of ten min., and the mag. was about 14.

Comet Reinmuth II (1953d)
 July 5, 7: Mag. 17.5, the comet was round, and about 0.2 in diameter.
 Sept. 27: Mag. 18, otherwise as on July 5 and 7.
 Nov. 25: The comet had a sharp nucleus, with faint coma 0.3 in diameter. Total mag. about 17.

Comet Abell (1953g)
 The plates of March 4, 31, and June 2 were obtained with the Crossley reflector; for the others the 20-inch astrograph was used.
 Mar. 4: Mag. about 12.5, round, condensed in the center, diameter 0.7 with 5 min. exposure.
 Mar. 31: Mag. about 14.

U. T.	α	δ	Par. Factor	
	α	δ	α	δ
Comet Wirtanen (1948b) 1954j) XI Aug 13				
1954 1950.0				
Sept. 8. 50242	7 ^h 42 ^m 43 ^s .18	+21°06'48".2	-0.469	+4.07 W, R
Sept. 26. 47300	8 32 30.05	+20 37 17.2	-0.482	+4.32 J, J
Sept. 26. 51675	8 32 37.27	+20 37 11.0	-0.428	+3.70 J, J
Oct. 2. 44391	8 48 12.42	+20 21 05.1	-0.495	+4.70 R, R
Oct. 2. 50382	8 48 21.75	+20 20 55.7	-0.439	+3.83 R, R
Oct. 28. 47388	9 50 30.11	+18 59 02.6	-0.438	+3.97 J, R
Oct. 28. 53048	9 50 37.53	+18 58 52.0	-0.331	+3.33 J, R
Comet Haro-Chavira (1954k) 56 I Jan 26				
1955 1950.0				
Jan. 13. 17924	4 08 12.92	+24 16 24.3	-0.065	+1.98 R, R
Jan. 13. 21628	4 08 11.38	+24 16 34.3	+0.054	+1.97 R, R
Jan. 22. 12903	4 02 33.73	+25 01 16.1	-0.135	+1.95 R, R
Jan. 22. 15397	4 02 32.92	+25 01 23.2	-0.055	+1.87 R, R
Jan. 26. 13542	4 00 25.25	+25 21 20.1	-0.075	+1.83 R, R
Jan. 26. 16035	4 00 25.51	+25 21 27.5	+0.006	+1.80 R, R
Jupiter Satellite IX				
1954 1950.0				
Nov. 29. 44758	8 01 41.20	+21 24 31.4	-0.115	+2.45 R, R
Nov. 29. 51061	8 01 40.34	+21 24 35.1	-0.083	+2.42 R, R
(1597) = 1949EB				
1954 1950.0				
Mar. 31. 35125	13 40 12.37	+ 2 26 31.5	-0.098	+5.02 R, R
Mar. 31. 37759	13 40 11.34	+ 2 26 46.4	-0.021	+5.01 R, R
1951 RA (Wilson-Minkowski Object)				
1954 1950.0				
Nov. 29. 25573	5 05 19.35	+53 42 47.5	-0.491	-1.28 R, R
Nov. 29. 27859	5 05 14.61	+53 42 50.4	-0.396	-1.74 R, R
1953GA = 1931KL				
1954 1950.0				
June 28. 36589	20 23 12.01	+ 9 51 10.6	-0.161	+4.10 R, R
June 28. 40226	20 23 10.44	+ 9 51 17.3	-0.056	+4.04 R, R
July 5. 33400	20 18 01.06	+10 09 23.0	-0.187	+4.09 R, R
July 5. 35963	20 17 59.82	+10 09 26.1	-0.114	+4.03 R, R
1953 PA				
1953 1950.0				
Nov. 25. 13958	22 21 35.02	- 6 33 45.4	+0.137	+6.04 V, V
Nov. 25. 16493	22 21 36.88	- 6 33 37.8	+0.207	+5.99 V, V

Apr. 20: Mag. about 13.5. A 3 min. exposure shows a round coma about 0.2 in diameter, somewhat condensed toward the center. A 30 min. exposure shows the coma to be unsymmetrical with a short fan-shaped tail in 20°.

May 20: Mag. 11 on a 2 min. exposure. The comet had a hazy coma about 0.5 in diameter surrounding a sharp nucleus. A 30 min. exposure showed a very broad fan-shaped tail about 5' in length extending NE.

June 2: A 15 min. exposure showed a sharply condensed round coma 2' in diameter, and a faint tail 30' long extending east.

June 21: Mag. about 11. On a 90 second exposure the comet had a somewhat asymmetrical coma with quite strong central condensation.

June 28: Coma about 0.8 in diameter surrounding a not quite stellar nucleus on a plate of 90 seconds exposure. Mag. about 10.

Comet Finlay (1953i)
 Mar. 4: The comet had the appearance of a moderately condensed round nebulosity, of total diameter 0.3 and mag. 17.

Comet Honda-Mrkos-Pajdusakova (1954a)
 Feb. 8: 20-inch plate. The comet showed a fairly well condensed nucleus in a coma about 1' in diameter and a weak tail extending about 5' in position angle 70°. The mag. was about 9.2.

- Feb. 20: 20-inch plate. The mag. was about 11.5.
 Mar. 31: There was a weak nucleus in a round diffuse coma. The measure was difficult. The diameter was 0'.4, and the mag. was about 17.
- Comet Borrelly (1954b)
 The comet was a slightly diffused object of mag. about 19.5. The exposures were of 2 hours.
- Comet Harrington (1954c)
 July 28, 31: Mag. about 18.5, not quite stellar.
 Aug. 25, 31: Mag. about 19, diffuse, diameter 0'.2.
- Comet Kresak-Peltier (1954d)
 June 30: 20-inch plate. The comet was diffuse, and difficult to measure. The positions are uncertain by several seconds of arc. The comet was seen in the 36-inch refractor, but it was so diffuse as to be more easily visible in the 4-inch finder than in the large telescope.
 July 5: The Crossley photograph shows a round coma 0'.8 in diameter, with some central condensation. The exposure was for 5 min.
 July 12: 20-inch plate. The comet appeared as a diffuse coma about 0'.6 in diameter without central condensation. The images were difficult to measure, and the positions are uncertain by several seconds of arc.
 Oct. 9: The comet, with 5 min. of exposure, showed a round coma about 1' in diameter, with a not very well condensed nucleus. The mag. was about 13. A Crossley plate.
 Crossley plates on Nov. 25 (10^m), Nov. 29 (30^m), and Jan. 15, 1955 (70^m) showed no trace of the comet.
- Comet Faye (1954e)
 July 1: A nearly stellar coma, with a faint tail 0'.8 long in 260°. Mag. about 17.8.
- Aug. 25: Mag. about 16; the appearance was that of a well condensed coma 0'.2 in diameter.
 Nov. 29: Mag. 15, appearance as on Aug. 25.
 Jan. 13: 20-inch plate. Mag. about 14.5; comet about 0'.5 in diameter, poorly condensed toward the center.
- Comet Vozarova (1954f)
 Sept. 30: Round coma 0'.2 in diameter with faint fan-shaped tail 0'.7 long in 60°. Mag. about 16.
 Dec. 18: A nearly stellar coma of mag. 18.5.
- Comet Schwassmann-Wachmann II (1954g)
 July 28: Small nearly stellar coma of mag. 18.
 Aug. 5: Mag. 17.
 Sept. 26: Mag. 16.5, nearly stellar.
 Oct. 28: Mag. 16, with a faint fan-shaped tail 0'.5 in 270°.
 Nov. 29: Mag. 15, with tail like that of Oct. 28.
- Comet Baade (1954h)
 Aug. 12: 20-inch plate. Mag. 16. Coma about 0'.2 in diameter, slightly condensed toward the center.
 Aug. 18: 20-inch plate. Mag. about 15. Coma about 0'.3 in diameter with fairly well condensed nucleus.
 Aug. 24: 20-inch plate. Mag. 15. Weak tail extending about 1' toward 130° on a 30 min. exposure.
- Sept. 30: Uncondensed coma 0'.2 in diameter, mag. 16.
 Nov. 29: Mag. 15.
- Comet van Biesbroeck (1954i)
 Sept. 3: 20-inch plate. Comet nearly stellar in appearance, mag. 16.
 Sept. 20: 20-inch plate. Mag. 16.
 Sept. 25: 20-inch plate. Coma 0'.2 in diameter, mag. about 16.
 Sept. 30: Coma 0'.2 in diameter, mag. 16.
 Nov. 17: Mag. 16.5.
 Jan. 15: Mag. 19, nearly stellar.
- Comet Wirtanen (1948b) (1954j)
 Sept. 8: The 20-inch plate by Wirtanen showed a faint image, which had been noted, but it was not possible to confirm it as being one of the comet until the later Crossley positions became available.
 Sept. 26, Oct. 2: A somewhat diffuse image of mag. 18.5.
 Oct. 28: The images are of mag. about 19.5, and were difficult to measure.
 Jan. 27: An exposure of 120 min. did not show the comet.
- Comet Haro-Chavira (1954k)
 All the exposures were made with the 20-inch Carnegie astrograph.
 Jan. 13: Mag. 15. There was a coma about 0'.5 in diameter surrounding a nearly stellar nucleus.
 Jan. 22, 26: The comet was well condensed with a coma about 0'.3 in diameter. Mag. 15.
- 1951 RA (Wilson-Minkowski Object)
 Dr. Samuel Herrick of the University of California at Los Angeles is of the opinion that the identification is correct.

both instruments. Eight plates by S. Vasilevskis, one by C. A. Wirtanen, two by Robert Innes, and two by Whitney Shane were from the 20-inch. The various observers and computers are indicated by initials given with each position.

As in the past, fainter reference stars from the Astrographic Catalogues were nearly always used for the reductions of Crossley plates. For the 20-inch plates it was usually possible to find reference stars in modern meridian or photographic catalogues, for which proper motions were available. The magnitudes were estimated by comparing the comet images with star images on similarly-exposed plates of the polar sequence.

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 1955 March.