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OBSERVATIONS OF COMETS AND ASTEROIDS

BY

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The list of observations in this paper continues that published in *Lick Observatory Bulletin*, Number 520.

Various persons participated in both the observational and computational work. With each position are initials indicating the observer and, second, the person (or persons) who made the reductions. Following is a list of those having to do with the positions in this paper. The figures indicate the number of plates obtained, and of reductions performed, by each.

Two plates were reduced by two persons, which accounts for the number of reductions being greater by two than the number of plates. All plates by Jeffers, Mayall, and Sill were obtained with the Crossley reflector; the rest were obtained with the Carnegie astrograph. The general supervision of the reductions, and

		Obs.	Red.
H. M. Jeffers.....	J	76	7
Miss B. J. Mattson..	BM	..	109
N. U. Mayall.....	M	1	..
H. D. McNamara...	McN	..	2
G. Reaves.....	GR	..	4
C. D. Shane.....	S	8	..
W. W. Shane.....	WS	4	6
R. C. Sill.....	Si	11	..
C. A. Wirtanen.....	W	26	..

the checking of all the numerical work, are by the writer.

The remarks in *Lick Observatory Bulletin*, Number 520, concerning reference stars, magnitude estimates, and order of listing of results, apply in this paper also.

COMET SCHWASSMANN-WACHMANN I (1925 II)

19 48	U.T.	α 1948.0	δ 1948.0	α	δ	
Nov.	9.44623	9 ^h 23 ^m 12 ^s .17	+17° 27' 49".7	-0° 39.3	+3° 8.1	Si, BM
Nov.	9.48238	9 23 12.49	+17 27 47.4	-0.316	+3.46	Si, BM
Nov.	29.43616	9 25 0.08	+17 15 18.5	-0.299	+3.43	J, BM
Nov.	30.46171	9 24 59.47	+17 15 6.8	-0.226	+3.23	J, BM
Dec.	29.39777	9 20 36.75	+17 27 4.1	-0.174	+3.10	J, BM
Dec.	29.44221	9 20 35.96	+17 27 6.7	-0.041	+2.97	J, BM
1949		α 1949.0	δ 1949.0			
Jan.	27.38536	9 09 54.83	+18 02 13.9	+0.051	+2.89	Si, BM
Jan.	27.42966	9 09 53.59	+18 02 17.1	+0.183	+3.04	Si, BM
Mar.	29.28498	8 49 8.02	+18 50 18.0	+0.283	+3.17	J, BM
Mar.	29.32595	8 49 7.64	+18 50 17.7	+0.377	+3.56	J, BM

1948-1949:

November 9: Diffuse appearance, 0.2 in diameter, magnitude 18.3.

November 20, 30: Stellar, trace of coma, magnitude 18.6.

December 29: Nearly stellar, magnitude 18.8.

January 27: Sharp nucleus of magnitude 17.5, fan-shaped tail 0.3 long extending northeast, total magnitude about 14.

March 29: Stellar nucleus with very faint coma, magnitude 18.2.

COMET OTERMA (1943a)

1948	U.T.	α 1948.0	δ 1948.0	α	δ	
Oct.	9.44347	4 ^h 11 ^m 44 ^s .77	+16° 14' 22".0	-0° 05.9	+3° 15	J, BM
Oct.	9.49486	4 11 44.04	+16 14 16.9	+0.098	+3.18	J, BM

COMET OTERMA (1943a)—Continued

	U.T.	α 1949.0	δ 1949.0	α	δ	
1949						
Jan.	28.19229	3 ^h 27 ^m 2 ^s .58	+14°14'58".3	+0°188	+3".56	Si, BM
Jan.	28.23694	3 27 3.18	+14 15 4.4	+0.304	+3.81	Si, BM

1948-1949:

October 9: Magnitude 17.3, 0'.1 in diameter.

January 28: Magnitude 17.0, 0'.1 in diameter.

COMET JONES (1946h)

	U.T.	α 1948.0	δ 1948.0	α	δ	
1948						
July	10.38582	21 ^h 02 ^m 47 ^s .27	+49°25'44".6	-0°128	-1".78	J, BM
July	10.43027	21 02 45.59	+49 25 50.8	+0.073	-1.84	J, BM
Nov.	23.18727	20 28 49.14	+40 19 13.7	+0.534	+1.82	J, BM

July 10: Magnitude 17.8, stellar nucleus, faint fan-shaped tail in 135°.

a second plate taken at a low altitude shows only a questionable image in the proper place. Therefore it is not certain that the position of November 23 is genuine.

November 23: Image appears real, nearly stellar in appearance and of magnitude about 19.3. Nevertheless,

COMET BESTER (1946k)

	U.T.	α 1948.0	δ 1948.0	α	δ	
1948						
July	27.21699	18 ^h 50 ^m 04 ^s .22	+60°16'12".7	-0°341	-3".04	J, BM
July	27.26213	18 49 59.56	+60 15 56.4	-0.081	-3.43	J, BM

July 27: Small round coma, magnitude 18.7.

COMET WHIPPLE (1947g)

	U.T.	α 1948.0	δ 1948.0	α	δ	
1948						
July	18.46466	3 ^h 04 ^m 35 ^s .05	+14°30'27".1	-0°435	+4".38	J, BM
July	18.47716	3 04 36.19	+14 30 29.7	-0.417	+4.26	J, BM
Sept.	28.50265	4 24 26.77	+13 07 15.3	+0.003	+3.58	J, BM
Sept.	28.52071	4 24 27.11	+13 07 9.7	+0.057	+3.59	J, BM
Nov.	30.39368	4 02 3.11	+7 12 28.4	+0.226	+4.50	J, BM
Nov.	30.41590	4 02 2.13	+7 12 24.0	+0.282	+4.56	J, BM
1949		α 1949.0	δ 1949.0			
Jan.	27.29405	3 52 4.03	+8 17 33.2	+0.374	+4.64	J, BM

1948-1949:

July 18: Small round coma, magnitude 17.

November 30: Round coma of 15.3 magnitude.

September 28: Small coma of 16.8 magnitude, with a faint tail extending 1' toward the west.

January 27: Magnitude 16.5, about 0'.1 total diameter.

COMET WIRTANEN (1947h)

	U.T.	α 1948.0	δ 1948.0	α	δ	
1948						
June	12.35417	18 ^h 28 ^m 39 ^s .5	+68°13'30".0	-0°235	-4".42	J, WS
June	12.40625	18 28 29.0	+68 13 58.1	+0.177	-4.47	J, WS
July	30.23586	16 07 29.99	+66 42 40.4	+0.575	-3.52	J, BM
July	30.29627	16 07 23.70	+66 42 7.2	+0.917	-1.95	J, BM

June 12: Nearly stellar coma, magnitude 18.1. Reference star positions from adjacent plates of the astrophotographic catalogue disagree by about 1" in right ascen-

sion. Positions adopted depend on mean of the two plates.

July 30: Nearly stellar, magnitude 19.0.

COMET BESTER (1947k)

	U.T.	α 1948.0	δ 1948.0	α	δ	
1948						
July	15.20528	10 ^h 42 ^m 30 ^s .74	+40°09'8".2	+0°608	+3".63	J, BM
July	15.21292	10 42 30.99	+40 09 4.8	+0.610	+3.85	J, BM
Nov.	11.49353	11 49 16.79	+36 22 9.2	-0.548	+2.91	J, BM
Nov.	11.52478	11 49 17.12	+36 22 22.2	-0.500	+2.16	J, BM
1949		α 1949.0	δ 1949.0			
Feb.	6.44664	10 43 23.88	+50 52 3.4	+0.186	-1.91	J, BM
Feb.	6.47581	10 43 20.81	+50 52 15.1	+0.314	-1.57	J, BM

1948-1949:

November 11: Nearly stellar, magnitude 17.7.

February 6: Nearly stellar, magnitude 17.5.

COMET SCHWASSMANN-WACHMANN II (1947f)

1949	U.T.	α 1949.0	δ 1949.0	α	δ	$p\Delta$
Jan.	27.48084	13 ^h 19 ^m 36 ^s .80	- 4° 29' 36".9	-0°176	+5".80	Si, BM
Jan.	28.42681	13 20 10.91	- 4 30 49.3	-0.307	+5.71	J, BM
Jan.	28.44208	13 20 11.45	- 4 30 50.3	-0.270	+5.74	J, BM
April	30.34895	12 48 30.19	+0 41 30.7	+0.232	+5.23	J, BM
April	30.37672	12 48 29.39	+0 41 34.1	+0.299	+5.24	J, BM

January 27, 28: Coma 3" across, with a very faint tail
1' long in 280°. Magnitude 16.2.

April 30: Round condensed coma, magnitude 17.0.

COMET MRKOS (1948a)

1948	U.T.	α 1948.0	δ 1948.0	α	δ	$p\Delta$
Sept.	26.22676	0 ^h 05 ^m 31 ^s .03	+37° 25' 30".1	-0°349	+0".79	J, BM
Sept.	26.25801	0 05 28.75	+37 24 50.6	-0.250	+0.36	J, BM
Oct.	27.21640	23 39 9.75	+25 48 39.8	-0.028	+1.73	M, BM
Oct.	27.24714	23 39 8.86	+25 48 0.8	+0.072	+1.80	Si, BM

September 26: Round coma 0'.2 across, magnitude 15.

October 27: Appearance like that above, but magnitude 16.

COMET PAJDUSAKOVA-MRKOS (1948d)

1948	U.T.	α 1948.0	δ 1948.0	α	δ	$p\Delta$
July	25.21518	10 ^h 47 ^m 11 ^s .05	+77° 23' 6".3	+2°123	+1".98	J, BM
July	25.22354	10 47 10.77	+77 23 0.5	+2.107	+2.33	J, BM
1949		α 1949.0	δ 1949.0			
Jan.	28.29139	2 07 20.62	+54 50 54.3	+0.758	+2.11	Si, BM
Jan.	28.33570	2 07 23.23	+52 50 1.5	+0.771	+3.66	Si, BM

1948-1949:

July 25: Round coma 0'.7 in diameter, magnitude 11.

January 28: Round coma 0'.2 in diam., magnitude 16.

COMET FORBES (1929 II), (1948e)

1948	U.T.	α 1948.0	δ 1948.0	α	δ	$p\Delta$
May	14.28633	13 ^h 22 ^m 27 ^s .9	-10° 45' 57"	+0°105	+6".49	J, BM
May	14.33494	13 22 25.6	-10 45 54	+0.240	+6.34	J, BM
June	7.26345	13 13 39.70	-11 08 12.8	+0.240	+6.38	J, BM
July	9.22958	13 36 16.05	-14 26 54.6	+0.335	+6.40	J, BM
July	9.26639	13 36 18.85	-14 27 12.6	+0.406	+6.09	J, BM
Sept.	27.15160	16 50 11.4	-27 05 25	+0.379	+6.93	J, BM

May 14: The comet was about 8' north of *Spica*. There were not enough reference stars to yield a good measure.

July 9: Nearly stellar, magnitude 17.5.

June 7: Condensed coma, nearly stellar, trace of a tail in 120°. Magnitude 17.8.

September 27: Poor plate due to low altitude and bad seeing. Magnitude 15, about.

COMET HONDA-BERNASCONI (1948g)

1948	U.T.	α 1948.0	δ 1948.0	α	δ	$p\Delta$
June	7.44904	2 ^h 10 ^m 14 ^s .17	+48° 07' 2".7	-0°695	+4".16	W, BM
June	11.45856	1 21 35.04	+52 04 34.6	-0.741	+2.04	W, BM
June	13.46763	0 54 34.76	+53 33 12.8	-0.714	+0.80	W, WS
June	14.46421	0 40 39.52	+54 08 26.5	-0.704	+0.45	WS, BM
June	14.46531	0 40 38.61	+54 08 28.0	-0.702	+0.41	WS, BM
June	16.47192	0 11 52.73	+55 00 34.6	-0.625	-0.64	W, WS
June	16.47290	0 11 51.63	+55 00 35.6	-0.622	-0.67	W, WS

June 11-16: Round, condensed in the center, about 2' in diam. Exposures of one minute with Carnegie astrograph.

COMET WIRTANEN (1948h)

1948	U.T.	α 1948.0	δ 1948.0	α	$p\Delta$	δ	
July	15.41243	21 ^h 13 ^m 40 ^s .21	+ 7° 54' 43".4	+0° 01.3	+4".29		W, BM
July	17.37721	21 10 52.60	+ 7 33 29.3	-0.069	+4.35		W, BM
July	18.44999	21 09 18.97	+ 7 21 26.6	+0.155	+4.42		W, J
July	19.45486	21 07 50.05	+ 7 09 51.0	+0.179	+4.46		W, BM
July	30.34484	20 50 35.76	+ 4 46 3.7	-0.018	+4.71		J, GR
July	30.36012	20 50 34.23	+ 4 45 50.6	+0.027	+4.71		J, GR
Sept.	26.14040	19 23 31.46	-12 04 51.3	+0.024	+6.66		W, BM
Sept.	26.15841	19 23 30.45	-12 05 8.9	+0.078	+6.64		W, BM
Nov.	23.11019	19 08 53.93	-23 15 11.0	+0.405	+6.55		J, BM
Nov.	23.12130	19 08 54.16	-23 15 17.3	+0.425	+6.39		J, BM

July 15: Measured from a contact print of original discovery plate. The comet shows as a diffuse trail over 2 mm long.

July 17-19: Comet shows a sharp nucleus with a faint surrounding coma.

July 30: Condensed nucleus, faint tail 1' long extending southeast. Magnitude 16.2.

November 23: Poor image in low altitude and bad seeing. Magnitude about 16.5.

COMET ASHBROOK-JACKSON (1948i)

1948	U.T.	α 1948.0	δ 1948.0	α	$p\Delta$	δ	
Oct.	7.31976	22 ^h 41 ^m 37 ^s .39	-12° 07' 40".2	+0° 23.1	+6".48		J, BM
Oct.	7.32601	22 41 37.23	-12 07 37.8	+0.247	+6.45		J, BM
1949		α 1949.0	δ 1949.0				
Jan.	27.17391	0 17 14.10	+ 6 57 34.5	+0.418	+4.88		J, BM
Jan.	27.18224	0 17 14.88	+ 6 57 40.5	+0.429	+4.92		J, BM

1948-1949:

October: Magnitude 14, round, centrally condensed coma. January 27: Magnitude 16, round, 0'.1 in diameter.

COMET WIRTANEN (1948k)

1948	U.T.	α 1948.0	δ 1948.0	α	$p\Delta$	δ	
Oct.	7.19695	21 ^h 29 ^m 51 ^s .73	+ 2° 58' 11".5	+0° 02.1	+4".94		S, BM
Oct.	10.18637	21 27 30.02	+ 2 26 18.0	+0.018	+5.01		W, BM
Oct.	10.22341	21 27 28.29	+ 2 25 55.7	+0.126	+5.02		W, BM
Oct.	11.13721	21 26 47.20	+ 2 16 20.5	-0.116	+5.04		S, BM
Oct.	11.15660	21 26 46.34	+ 2 16 10.2	-0.060	+5.03		S, BM
Oct.	21.11163	21 20 22.81	+ 0 39 8.5	-0.098	+5.23		W, BM
Oct.	21.12894	21 20 22.25	+ 0 38 58.9	-0.048	+5.23		W, BM
Nov.	24.10641	21 11 39.36	- 3 14 45.9	+0.173	+5.67		S, BM

October 7: Comet discovered by Wirtanen on a plate by Shane. Appearance was that of a faint diffuse trail nearly 2 mm long. Position determined from a copy of original plate.

October 10, 11: Comet shows a round, condensed coma, of magnitude 14.

October 21: Magnitude 15.

COMET (1948l)

1948	U.T.	α 1948.0	δ 1948.0	α	$p\Delta$	δ	
Nov.	11.55954	12 ^h 57 ^m 34 ^s .6	-24° 03' 16".	-0° 46.0	+6".10		S, BM
1949		α 1949.0	δ 1949.0				
Jan.	27.32322	5 57 18.88	-13 32 07.0	+0.252	+6.56		J, BM
Jan.	27.33086	5 57 18.49	-13 31 57.3	+0.271	+6.52		J, BM
Mar.	29.19399	6 05 41.48	- 0 00 23.6	+0.319	+5.31		J, BM
Mar.	29.20649	6 05 41.97	- 0 00 18.9	+0.345	+5.31		J, BM

1948-1949:

January 27: Round coma, centrally condensed, 1'.3 diameter with 8-minute exposure, magnitude about 11.

March 29: Magnitude 15.5, coma 0'.3 in diameter.

COMET BESTER (1948m)

1949	U.T.	α 1949.0	δ 1949.0	α	$p\Delta$	δ	
Feb.	18.17478	2 ^h 40 ^m 17 ^s .67	+ 8° 23' 37".7	+0° 35' 6"		+4".58	J, BM
Feb.	18.18728	2 40 18.14	+ 8 23 57.3	+0.380		+4.64	J, BM

February 18: Sharp nucleus of 16.5 magnitude; faint tail extending 1' toward the east.

COMET HONDA-MRKOS-PAJDUSAKOVA (1948n)

1949	U.T.	α 1949.0	δ 1949.0	α	$p\Delta$	δ	
Jan.	7.54655	13 ^h 41 ^m 40 ^s .24	-28° 45' 34".8	-0° 21' 3"		+7".75	W, BM
Jan.	9.54284	13 41 37.04	-28 58 25.8	-0.208		+7.77	J, J
Jan.	9.56853	13 41 36.97	-28 58 36.4	-0.126		+7.95	J, J

January 9: Diffuse, 0.6 in diameter, scarcely any central condensation, magnitude 17.5.

AMOR (1221)

1948	U.T.	α 1948.0	δ 1948.0	α	$p\Delta$	δ	
July	9.30598	17 ^h 17 ^m 30 ^s .10	+ 9° 32' 46".3	+0° 13' 3"		+4".12	J, BM
July	9.33723	17 17 30.52	+ 9 31 49.2	+0.219		+4.21	J, BM

The star trails were long and irregular. The positions may in consequence be uncertain by 3" or 4".

1935 QN (1373)

1948	U.T.	α 1948.0	δ 1948.0	α	$p\Delta$	δ	
July	17.43935	4 ^h 23 ^m 03 ^s .23	+50° 59' 15".8	-0° 74' 0"		+3".73	J, BM
July	17.46296	4 23 07.91	+50 59 25.5	-0.740		+2.92	J, BM
1949	U.T.	α 1949.0	δ 1949.0	α	$p\Delta$	δ	
May	1.19132	6 58 34.55	+20 17 47.3	+0.437		+3.81	J, BM
May	1.21631	6 58 36.23	+20 17 35.2	+0.469		+4.16	J, BM

1948-1949:

July 17: Magnitude 16.5.

May 1: Magnitude 17.8.

1946 QB JOHNSON OBJECT

1949	U.T.	α 1949.0	δ 1949.0	α	$p\Delta$	δ	
April	26.46674	16 ^h 33 ^m 15 ^s .76	+15° 08' 2".4	+0° 10' 2"		+3".34	J, BM
April	26.48479	16 33 15.12	+15 08 12.6	+0.155		+3.39	J, BM

Magnitude 17.

1947 NH

1948	U.T.	α 1948.0	δ 1948.0	α	$p\Delta$	δ	
Nov.	12.48383	10 ^h 14 ^m 01 ^s .56	- 2° 49' 13".1	-0° 35' 5"		+5".53	Si, BM

Magnitude 18.0.

1947 UC

1949	U.T.	α 1949.0	δ 1949.0	α	$p\Delta$	δ	
Mar.	27.50784	17 ^h 41 ^m 24 ^s .10	-20° 17' 44".2	-0° 16' 7"		+7".27	J, BM
Mar.	27.52936	17 41 25.58	-20 17 57.0	-0.102		+7.36	J, BM

Magnitude 17.3.

1948 EA (OBJECT WIRTANEN)

1948	U.T.	α 1948.0	δ 1948.0	α	$p\Delta$	δ	
Aug.	15.46009	1 ^h 21 ^m 36 ^s .20	+ 3° 47' 58".5	-0° 10' 3"		+4".84	W, McN
Aug.	15.48294	1 21 38.86	+ 3 47 37.7	-0.036		+4.83	W, McN
Sept.	28.13495	23 41 3.64	+ 8 51 51.8	-0.416		+4.73	W, BM
Sept.	28.15642	23 41 1.28	+ 8 51 51.4	-0.381		+4.61	W, BM

1948 OA (OBJECT WIRTANEN 1948-3)

1948	U.T.	α 1948.0	δ 1948.0	α	Δ	δ	
July	17.37721	21 ^h 09 ^m 10 ^s .17	+ 6° 43' 54".2	-0° 066		+4".46	W, BM
July	18.44999	21 08 52.59	+ 8 08 13.1	+0.156		+4.32	W, J
July	21.39366	21 07 46.56	+12 27 0.8	+0.018		+3.67	W, J
July	25.35608	21 05 18.24	+19 30 44.3	-0.059		+2.68	S, WS
July	26.33152	21 04 29.10	+21 30 26.7	-0.126		+2.45	W, BM
Aug.	3.17845	20 52 44.43	+41 48 45.5	-0.537		+1.55	WS, BM & GR
Aug.	3.18000	20 52 44.19	+41 49 4.4	-0.534		+1.51	WS, BM & GR
Aug.	6.17994	20 43 43.41	+51 27 20.9	-0.600		+0.03	S, BM
Aug.	6.18116	20 43 43.14	+51 27 35.9	-0.597		-0.01	S, BM
Oct.	15.50441	10 26 14.66	+18 41 50.6	-0.471		+4.36	W, BM
Oct.	15.53280	10 26 17.69	+18 40 48.0	-0.437		+3.99	W, BM
Nov.	29.51322	11 56 16.43	- 4 23 5.7	-0.346		+5.65	J, BM
Nov.	29.54447	11 56 19.87	- 4 23 53.4	-0.278		+5.73	J, BM

1948 WA

1949	U.T.	α 1949.0	δ 1949.0	α	Δ	δ	
Mar.	29.22942	5 ^h 56 ^m 21 ^s .00	+10° 37' 44".7	+0° 404		+4".54	J, J
Mar.	29.24331	5 56 22.18	+10 37 43.8	+0.424		+4.63	J, J

Magnitude 17.5.

1949 CA (AREND OBJECT)

1949	U.T.	α 1949.0	δ 1949.0	α	Δ	δ	
Feb.	18.33312	8 ^h 16 ^m 19 ^s .63	+ 7° 53' 38".8	+0° 178		+4".37	J, BM
Feb.	18.34493	8 16 18.69	+ 7 53 28.6	+0.210		+4.40	J, BM

Magnitude 15.5.

MOUNT HAMILTON, CALIFORNIA

JULY 26, 1949

Issued September 30, 1949