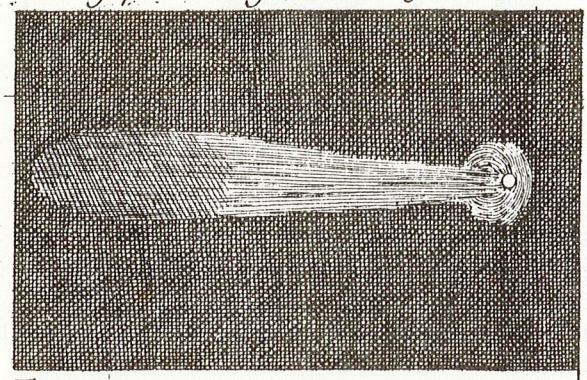
Charles J. Morris
Prospect Hill Obs.
Harvard, Massachusetts

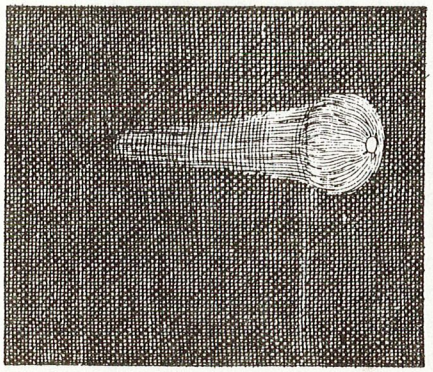
THE COMET

AUGUST 1978 No. 28

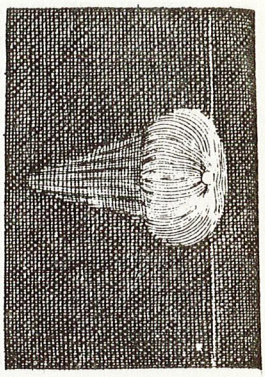
Philosoph. Transact. N.o 382.



F.1. *Friday Oct.r 11.th at 7. in the Evening.*



F.2. *Sunday Oct.r 13.th at 6. ditto*



F.3 *Tuesday Oct.r 15.th at 6.*

Supposing the Moon to be of this Diameter, the Comet Seem'd to me to be in proportion to this Circle; as above delineated.

Fig. 4.

Fig. 5.

I. *Observations upon the Comet, that appear'd in the Months of* October, November, *and* December, 1723. *By the Reverend Mr.* Bradley, *M. A. Prof. Astron. Oxon. F. R. S.*

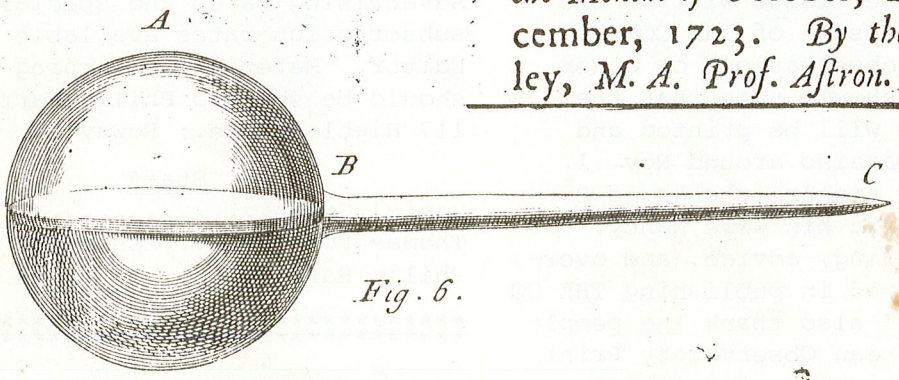


Fig. 6.

FROM THE EDITOR

This past weekend, I attended a meeting of Stellafane in Springfield, Vermont, where I was able to speak with writers Walter Scott Houston, Dr. Jay Gunter, and Dr. Joe Marcus, and comet observers John Bortle and Rolf Meier (discoverer of Comet Meier 1978f), who were only a few of the hundreds at the convention. I highly recommend Stellafane: It is the best amateur astronomy meeting in America in my opinion and in the opinion of many, many others, as well; I already plan to attend my second annual Stellafane in August 1979.

This issue is the third to be mailed this summer. Although the July issue (No. 27) was published a month ago, it was not then sent to regular subscribers on THE COMET mailing list because of the slow progress in sending the address list from Boone, N.C., to Cambridge. However, this has been corrected, and publishing and mailing should run smoothly now. In the past two months, we have had an increase in reader-circulation of about 40; the circulation for the July issue was about 300.

Readers are urged to note the new editorial address for THE CQ: 721 S. Elmwood Ave.; Oak Park, IL 60304, USA. The temporary address of the Editor for items for the November issue will be as follows from August 28, 1978, until December 15, 1978: 610 Union St.; Valparaiso, IN 46383.

The November issue will be the next quarterly issue of THE COMET; those sending observations or other contributions should note that the November issue will be printed and mailed in Valparaiso around Nov. 1.

I give my sincere thanks to Dr. Brian Marsden and his wife Nancy, for their proofreading, advice, and overall help involved in publishing THE CQ this summer. I also thank the people at the Smithsonian Observatory Print Shop for the fine job of printing Nos. 27 and 28.

Your letters and observations are very welcome, and I thank the readers of THE CQ for your continued support.

Daniel W.E. Green
Cambridge, Mass.
August 8, 1978

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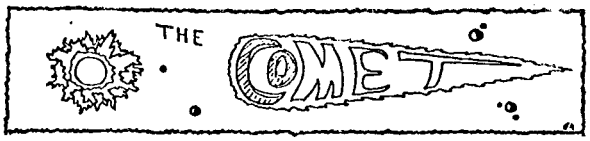

THE COMET QUARTERLY is a non-profit journal centering on comets and novae, with the goals of publishing useful observations by amateur astronomers, and producing timely and helpful news and aids (charts, etc.) for the observer. Issues are published 4 times a year, with occasional special issues published to inform readers quickly of an important new comet or nova. THE CQ is sponsored by the Blue Ridge Astronomers (formerly the Western Carolina Astronomy Club) and the Physics Department of Appalachian State University in Boone, North Carolina. The subscription rate is $2.00 per year (4 regular issues), $4.00 per year outside North America. Make checks payable to THE COMET QUARTERLY and send to Daniel Green; 721 S. Elmwood Ave; Oak Park, IL 60304, USA. Back issues available from Dr. Thomas Rokoske; Physics Dept.; Appal. St. Univ.; Boone, NC 28608. Advertising rates and special group subscription rates available from the Editor. Material concerning novae should be sent to Philip Harrington; 117 Highland Ave.; Rowayton, CT 06853.

Staff

Daniel Green.....Editor
Thomas Rokoske.....Associate Editor
Philip Harrington.....Nova Editor

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COVER PAGE

A note about page 1 is on page 10.

MAGNITUDE ANALYSES OF FOUR COMETS

by Daniel W.E. Green

EDITOR'S NOTE: This article is a shortened and somewhat revised version of the paper under the same title which won third prize in the Bok Astronomy Contest, sponsored by the Astronomy Department of Boston University in February-March 1976 (SKY & TEL, 51, p. 398).

The brightness of a comet as observed from the earth depends upon the comet's distances from the earth and the sun as well as its own characteristics. The characteristics may be represented by two standard parametric symbols: H, an adjusted parameter representing the absolute magnitude of the comet, and n, a parameter which determines how the comet's brightness varies with heliocentric distance. Beyer, paraphrases K. Wurm (1963), found that the value n is generally smaller in comets with distinct visual tails than in comets "which exhibit a roundish head without a strong visual tail." The former type of comet has much dust, while gas predominates in the latter type.

The author has written this paper with the objective of presenting derived magnitude formulae, together with the method for derivation of these equations, for four comets which had apparitions in 1974 and 1975. No detailed analyses of the selected comets had been published previously to this study of February 1976, to the knowledge of the author. Comets Bradfield 1974b (1974 III), Honda-Mrkos-Pajdušáková 1974f (1974 XVI), Mori-Sato-Fujikawa 1975j (1975 XII), and Suzuki-Saigusa-Mori 1975k (1975 X) are the objects in this magnitude study.

MAGNITUDE REDUCTION

All of the magnitude reductions for comets in this paper were completed using the procedure which follows.

Magnitude estimates of comets which are made using instruments of different aperture will vary. Morris (1973a, b) found the following formulae to correct magnitude estimates to a standard aperture of 2.67 inches:

$$H_a = m - 0.167(Ap - 2.67) \quad (1a)$$

$$H_a = m - 0.048(Ap - 2.67), \quad (1b)$$

where H_a is the aperture-corrected magnitude and Ap is the aperture in inches. Equation (1a) is for refracting telescopes, and equation (1b) is for reflectors.

The power-law magnitude formula for comets is expressed in terms of total visual magnitude, m (as observed on earth), by the equation

$$m = H + 5 \log \Delta + 2.5n \log r, \quad (2)$$

where H is the brightness of the comet if it would be placed 1 Astronomical Unit (AU) from both the earth and the sun (i.e., the absolute magnitude), Δ is the comet-earth distance in AU, and r is the comet-sun distance in AU. (The value n is the previously-mentioned characteristic parameter of the comet.) (Wurm, 1963).

The heliocentric magnitude, H_Δ, is found with the formula

$$H_\Delta = m - 5 \log \Delta. \quad (3)$$

To obtain the value n, all of the magnitude estimates are reduced to heliocentric magnitude, y, by the formula (3) (Bortle, 1975). After adding all of these heliocentric values, the total is divided by the number of observations, N, producing $\bar{y}$ in the equation

$$\bar{y} = \frac{\Sigma y}{N}. \quad (4)$$

Magnitude Analyses of Four Comets (Cont.)

The values of log r, or X, for each observation are then averaged through the same procedure, becoming the value $\bar{X}$. These values are placed into the equation

$$2.5n = \frac{\Sigma xy - N(\bar{x}\bar{y})}{\Sigma x^2 - N(\bar{x})^2} \quad . \qquad (5)$$

The absolute magnitude is found by simplifying the linear equation

$$H = -2.5n(\bar{x}) + \bar{y} \quad . \qquad (6)$$

The formal probable error (Baird, 1962, and Rokoske, 1976) in H and n for the four comets considered in this paper range from ±0.01 in the case of Comet Bradfield to more than ±0.5 for Comet Mori-Sato-Fujikawa, but Marsden (1978) notes that probable errors are rather meaningless in the magnitude analysis of a comet.

All calculations for the results in this paper, using the above procedure, were made by the author with a Texas Instruments SR-50A calculator.

ANALYSIS OF COMET 1974b

Comet Bradfield was the second comet to be discovered in 1974, and it provided amateur and professional astronomers with a look at a more stable comet very soon after the unstable performance of the famous Comet Kohoutek 1973f. This comet has a very long orbital period, and its orbit's shape approaches a parabola (Marsden, 1975). Only four pre-perihelion observations were obtained, as the comet was largely in Southern Hemisphere skies before the perihelion date (March 18, 1974).

The author collected over 100 observations directly from 6 members of the Comets Section of the Association of Lunar and Planetary Observers (A.L.P.O.). The 6 observers are listed in Table 1. Several observations had to be eliminated because of poor weather conditions or because no magnitude estimate was made in the observation. A total of 93 magnitude estimates were used to determine the magnitude formula for the recent apparition of Comet 1974b. These 93 magnitude values were aperture-corrected and fitted into the power-law solution, providing

$$m = 7.57 + 5 \log \Delta + 7.19 \log r. \qquad (11)$$

The heliocentric magnitudes were plotted on a graph with H_Δ versus log r (Figure 1). From a line drawn through these magnitudes (Table II), a linear equation may be found:

$$H_\Delta = k(\log r) + b \quad , \qquad (12)$$

where k will generally be found equal to 2.5n and b equal to H. However, in the case of Comet Bradfield, the magnitude rate of decrease slowed when the comet went beyond r = 1.0. The heliocentric magnitude within 1 AU of the sun can be represented by the equation

$$H_\Delta = 10.87 \log r + 7.91 \quad , \qquad (13)$$

while beyond the distance of 1 AU, the heliocentric magnitude can better be represented by

$$H_\Delta = 6.73 \log r + 7.49 \quad . \qquad (14)$$

If one line were to represent the "apparent" average, the equation

$$H_\Delta = 9.21 \log r + 7.83 \qquad (15)$$

would probably work the most efficiently.

Figure 1 shows vividly how these equations are graphed. As noted previously, the slope is generally equal to 2.5n, and the y-intercept (in Figure 1, the point where a line crosses the H_Δ-axis) is close to

Magnitude Analyses of Four Comets (Cont.)

the absolute magnitude, H. Equation (15) is a combination, or average, of (13) and (14), and the value b in (15) appropriately lies between the values for b in (13) and (14). The equation numbers are labelled to the respective lines in Figure 1, and it can be seen that (15) intercepts the H_Δ-axis between the points where (13) and (14) intercept the same axis.

The values obtained in this study can be compared with a study done by John E. Bortle of W.R. Brooks Observatory (Marsden and Roemer, 1978a). He found a power-law formula for Comet Bradfield 1974b in the form

$$m = 7.32 + 5 \log \Delta + 7.70 \log r \quad (16)$$

Bortle used 24 observations.

ANALYSIS OF COMET 1974f

Comet Honda-Mrkos-Pajdušáková 1974f came within the range of small telescopes for Northern Hemisphere observers for about one month from early December 1974 to early January 1975. Perihelion was on December 28, 1974, at a distance of 0.57887 AU. The eccentricity (e = 0.80908) and the period (5.279 years) make this comet the only short-period comet in this study (Marsden, 1976).

Forty-three of the 45 reports obtained by the author were made by members of the A.L.P.O. (Milon, 1975). Two additional observations were made by B. Comsa (1975). Several reports were eliminated because no magnitude estimate was made, poor weather persisted, or the source of reference stars was not listed. Twenty-eight magnitude estimates were thus selected to provide the power-law formula:

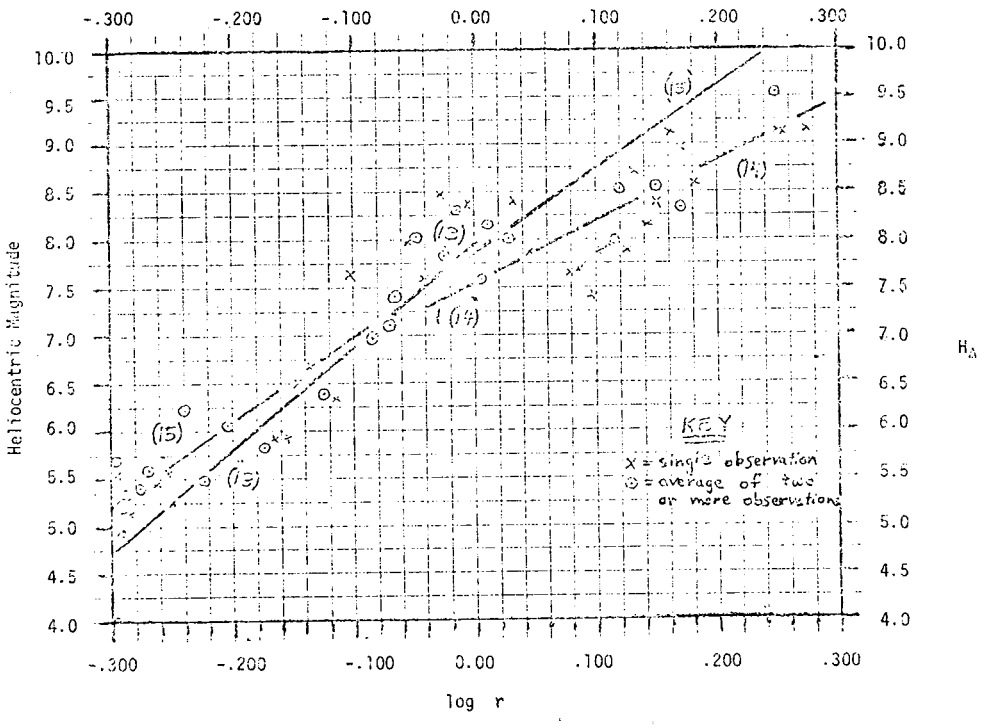
$$m = 10.96 + 5 \log \Delta + 8.47 \log r. \quad (17)$$

The heliocentric magnitude formula contains identical values of H and n with the visual magnitude formula (17). The heliocentric magnitudes are presented in Table III.

Bortle's study produced the following equation, from 8 observations:

$$m = 11.19 + 5 \log \Delta + 10.30 \log r. \quad (18)$$

FIGURE 1: MAGNITUDE CHARACTERISTICS OF COMET BRADFIELD 1974b



ANALYSIS OF COMET 1975j

Although Comet Bradfield was the only fairly bright comet in this study (in terms of heliocentric magnitude), Comet Mori-Sato-Fujikawa 1975j approached that standard when it neared the sun in late 1975. Although quite a distance from the earth (and thus fairly faint throughout its apparition for earth-based ob-

Magnitude Analyses of Four Comets (Cont.)

servers), Comet 1975j approached heliocentric magnitude 7.0 in November (Table IV). Twenty magnitude estimates made by members of the A.L.P.O. (Milon, 1976) were selected for magnitude reduction, and the following power-law formula was found for Comet Mori-Sato-Fujikawa:

$$m = 6.56 + 5 \log \Delta + 4.14 \log r. \quad (19)$$

Bortle found the following (Marsden and Roemer, 1978b), based on 5 observations and assuming that $n = 4$:

$$m = 5.08 + 5 \log \Delta + 10 \log r. \quad (20)$$

This comet was at perihelion on Christmas Day, 1975, at a distance of 1.60470 AU from the sun (Marsden, 1976). Comet 1975j, with a parabolic orbit, tends to deviate from the power-law formula in several places, especially when it is further than 1.8 AU from the sun.

ANALYSIS OF COMET 1975k

Comet Suzuki-Saigusa-Mori 1975k has a highly elliptical orbit, and passed perihelion on October 15, 1975 (Marsden, 1976) at a distance of 0.83804 AU. Twenty magnitude estimates made by members of the A.L.P.O. (Milon, 1976) produce the power-law formula,

$$m = 10.10 + 5 \log \Delta + 13.96 \log r. \quad (21)$$

For comparison, Bortle's study (again assuming $n = 4$) involved 6 observations to produce the equation,

$$m = 9.80 + 5 \log \Delta + 10 \log r. \quad (22)$$

The high eccentricity of the comet's orbit shows that its path approaches that of a parabola, making Comet 1975k one of the three long-period comets in this study. A listing of heliocentric magnitudes of Comet 1975k is in Table V.

The type of comet tail which is composed strongly of dust is usually called Type II, while a tail which gives off little or no visible light, and which has the predominantly gaseous tail described by Beyer, is called Type I. Comet Bradfield 1974b had a fairly strong tail of dust while it was within about 1 AU of the sun.

Generally, when a tail was noted by observers of Comet 1975k, it was short and spike-like, representing the characteristics of a gaseous tail. Both Comets 1974b and 1975k follow Beyer's theory that the parameter n is generally smaller in comets with Type I tails than in comets with Type II tails (Table VI). No A.L.P.O. reports include sightings of a tail for Comet 1975j. A few were noted for Comet 1974f, and it is thus included in Table VI.

ACKNOWLEDGEMENTS

The author would like to thank several people who helped to make this paper possible. Special thanks go to Dennis Milon of Cambridge, Mass. (now at Maynard, MA), who kindly sent A.L.P.O. reports of 3 of the 4 comets used in this study. Especially helpful was the advice received from Dr. Brian G. Marsden (Smithsonian Astrophysical Observatory), who also supplied computer printouts for the r and Δ values used in the computation of 3 of the 4 cometary power-law formulae in this paper. John E. Bortle (Brooks Observatory, Stormville, NY) and Charles S. Morris (formerly at Purdue University) contributed advice and procedure methods used in the study. And finally, Dr. Thomas L. Rokoske (Physics Dept., Appalachian State University, Boone, North Carolina) was instrumental and vital in improving and perfecting the order of this paper.

Magnitude Analyses of Four Comets (Cont.)

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TABLE I.

OBSERVERS OF COMET 1974b

Observer	No. of Observations
J.E. Bortle	33
D.W.E. Green	11
C.S. Morris	22
K. Simmons	5
D. Sutherland	16
D. Wallentine	6
	93

TABLE II.

COMET 1974b: AVERAGE DAILY HELIOCENTRIC MAGNITUDE

1974 Date (UT)	$H_{\Delta avg}$	No. of Observations
March 15.0	5.20	2
17.0	(5.56)	1
19.0	5.72	2
21.0	(5.24)	1
22.0	4.88	2
23.0	5.30	2
24.0	(5.18)	1
25.0	5.37	2
26.0	5.62	4
27.0	(5.44)	1
28.0	(5.56)	1
29.0	(5.25)	1
30.0	6.24	2
April 1.0	5.50	2
3.0	6.04	2
6.0	5.86	2
7.0	(5.91)	1
8.0	(5.93)	1
9.0	(6.50)	1
10.0	(6.72)	1
11.0	6.39	3
12.0	(6.32)	1
14.0	(7.65)	1
16.0	6.93	2
17.0	7.16	4
18.0	7.41	3
19.0	(7.99)	1
20.0	8.02	5
21.0	(7.66)	1
22.0	(8.48)	1
23.0	7.78	2
24.0	8.30	2
25.0	(8.38)	1
27.0	7.63	2
28.0	8.16	2
30.0	8.00	2
May 1.0	(8.38)	1
2.0	(7.89)	1
6.0	(7.65)	1
9.0	(7.72)	1
11.0	(7.39)	1
12.0	(7.84)	1
13.0	(7.93)	1
14.0	7.98	3
15.0	8.06	2
16.0	(7.86)	1
17.0	(8.72)	1
19.0	(8.19)	1
20.0	(8.38)	1
21.0	8.56	2
23.0	(9.09)	1
24.0	8.30	2
25.0	(8.95)	1
27.0	(8.66)	1
June 12.0	(9.16)	1
13.0	9.55	2
14.0	(9.13)	1
19.0	(9.13)	1

TABLE II. (Cont.)

TABLE III.

COMET 1974f: AVERAGE DAILY HELIOCENTRIC MAGNITUDE

1974-5 Date (UT)	$H_{\Delta avg}$	No. of Observations
Dec. 5.0	(9.84)	1
10.0	9.62	2
15.0	(9.32)	1
16.0	9.06	2
17.0	(9.31)	1
18.0	9.15	2
19.0	9.07	2
20.0	9.29	2
22.0	(9.36)	1
23.0	(9.32)	1
25.0	(9.33)	1
29.0	9.06	2
30.0	(9.04)	1
31.0	8.72	2
Jan. 1.0	(8.71)	1
2.0	(8.73)	1
3.0	8.93	5

Magnitude Analyses of Four Comets (Cont.)

TABLE IV.

COMET 1975j: AVERAGE DAILY HELIOCENTRIC MAGNITUDES

1975 Date (UT)	$H_{\Delta avg}$	No. of Observations
Oct. 8.4	(7.95)	1
21.4	(7.75)	1
23.4	(7.90)	1
31.4	7.52	2
Nov. 1.4	7.60	2
2.4	(8.61)	1
5.4	7.53	3
11.4	7.37	3
12.4	7.16	2
14.8	(7.88)	1
10.4	7.22	3

TABLE V.

COMET 1975k: AVERAGE DAILY HELIOCENTRIC MAGNITUDES

1975 Date (UT)	$H_{\Delta avg}$	No. of Observations	1975 Date (UT)	$H_{\Delta avg}$	No. of Obs.
Oct. 7.4	(8.62)	1	Oct. 23.4	9.38	2
8.4	(8.68)	1	26.4	(9.43)	1
11.4	8.78	3	27.4	(9.68)	1
12.4	8.87	3	28.4	9.87	2
14.4	(8.59)	1	29.4	(10.14)	1
21.4	(9.15)	1	Nov. 11.4	(9.58)	1
22.4	(9.15)	1	12.4	(9.65)	1

TABLE VI.

SUMMARY AND CORRELATION TABLE

Comet	Derived Values: n	Tail Type	Eccentricity, e, of orbit
1974b	2.88	II	0.999697
1974f	3.39	I?	0.80903
1975k	5.58	I	0.984123

NEWS AND NOTES OF RECENT COMETS

Periodic Comet Shajn-Schaldach was recovered by C.-Y. Shao and G. Schwartz at the Agassiz Station of Harvard College Observatory, on plates taken July 2 and 3, 1978, with the 155-cm reflector. It was then located by the constellation border between Pisces and Aquarius, and its nucleus had a magnitude of 20 to 20½. This comet has been given the designation Comet 1978i.

IN JUNE R. Weinberger of the University Observatory and Astronomical Institute at Insbrück, Austria, wrote a letter to Dr. Brian Marsden at the SAO in Cambridge, Mass., saying that he found what appeared to be a cometary image on a Palomar Sky Survey print. Working under Dr. Marsden this summer, I located the print to which Weinberger referred in the Palomar Sky Survey set in the library of the Harvard-Smithsonian Center for Astrophysics. Each plate for the Sky Survey had a "duplicate" made; in other words, when the astronomers at Palomar were conducting the Survey in the early 1950's, they took two exposures of the same area, one immediately after the other, one in blue light, and one in red light. The blue exposure in this case was a 10-minute one, and the red photograph, requiring much more time to collect the same amount of light because of the lower plate sensitivity, was exposed for 60 minutes.

The diffuse object located on Survey prints Nos. 471-O and -E definitely appears to be a comet that was not noticed when the plates were originally scanned. The date of the 2 exposures in question was Feb. 1, 1952. On the 60-minute exposure, a trail about 0!5 in length can be seen, and knowing which of the two prints was taken first, I found the daily motion of the newly-found comet to be about 14' in a direction about 30 degrees north of west. (cont. on p. 9)

NEWS AND NOTES OF RECENT COMETS (Cont.)

This Survey comet will not be named, however, and will not be given a designation because no orbit can be computed from just 2 observations. More information can be found on IAU Circular No. 3246.

ANOTHER COMET in a similar fashion has been discovered by R. D. Eberst of the Royal Observatory in Edinburgh, Scotland. Eberst found his object, along with a fast-moving asteroidal object, on plates which were taken in July 1977 with the United Kingdom 122-cm Schmidt telescope at Siding Spring, New South Wales, Australia. Again, this comet, which had a tail about 3' long when the plates were taken, will not be named. The comet was around magnitude 18. More information on this object is on IAU Circular No. 3247.

IN EARLY AUGUST, the only known comet within the range of amateur instruments is Periodic Comet Ashbrook-Jackson (1977g). John Bortle, Brooks Observatory, observed this comet with a 32-cm reflector on July 12.30 and 13.30 UT, when he estimated total visual magnitudes of 12.8 and 12.9, respectively. This comet may get as bright as 11th magnitude during September, when its nucleus is predicted to reach magnitude around 15½. Following is an ephemeris from IAU Circular No. 3161.

Ephemeris for Comet 1977g

Date (1978 UT)	α_{1950}	δ_{1950}
Aug. 10	$0^h38^m.7$	$-0^\circ52'$
20	0 38.4	+ 0 03
30	0 35.3	+ 0 50
Sept. 9	0 29.6	+ 1 29
19	0 21.9	+ 2 02
29	0 13.3	+ 2 29
Oct. 9	0 05.0	+ 2 56
19	23 58.1	+ 3 24

COMET MEIER 1978F: T - 200D

What would be the case if the intrinsically-bright Comet Meier would have been at perihelion this spring rather than its scheduled time in November? To find an approximate answer to this question, I put the same orbital elements for Comet Meier into the computer at the Smithsonian Astrophysical Observatory with one change: I changed the perihelion date from November 11 to April 25.39, 1978, ET. Thus, it would be at perihelion the same time it would have been at opposition for observers on earth; it would thus be conveniently placed in the midnight sky, especially for observers in southern latitudes.

I also plugged the values for absolute magnitude, H, and the parameter n (see "Magnitude Analyses of Four Comets" elsewhere in this issue) into the computer program. I used two sets of values: One is a "conservative" set by Brian Marsden, and the other is a set of values calculated by John Bortle from observations of the comet by himself. Marsden's values are

$H = 3.5 \qquad 2.5n = 10,$

while Bortle's values are

$H = 0.1 \qquad 2.5n = 16.4.$

If Comet Meier had been at perihelion on April 25, 1978, it would have gotten as bright as -0.7 according to Bortle's values, but "only" around magnitude +2.1 according to Marsden's values; in both cases, the comet would be moving southwestward from the constellation Crater in March through Hydra into Antlia and Vela, and gradually into the far southern constellation Pictor by mid-April. The closest approach to the earth would be about .328 AU around March 20.

COVER PAGE: SOME ETCHINGS OF THE COMET OF 1723

On Page 1 of this issue is the frontispiece to an article by the Reverend James Bradley in the 18th century. These are some etchings of the comet of 1723 as observed by Bradley and published with his article in PHILOSOPHICAL TRANSACTIONS No. 382.

In 1705 Edmund Halley utilized a method, devised by Sir Isaac Newton in 1687, to calculate the orbits of 24 comets which were visible in the sky between 1337 and 1698. Three of the comets, those of 1531, 1607, and 1682, were successive apparitions of the famous comet to be named for Halley.

Dr. Brian Marsden (1974) notes that the next orbit calculations were apparently done by Rev. Bradley. In other words, the 25th orbit of a comet ever to be calculated was computed by Bradley, and this orbit was for the comet of 1723; the results appear in this article by Bradley as published in the PHILOSOPHICAL TRANSACTIONS. Bradley, best known as the discoverer of the aberration of starlight, succeeded Halley as Astronomer Royal of England when the latter died in 1742. D.W.E.G.

REFERENCES

Bradley, J. (1724). Philosophical Transactions, No. 382, p. 41.
Marsden, B. G. (1974). Celestial Mechanics 9, p. 305.

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OBSERVATIONS OF RECENT COMETS

Compiled by Daniel Green

Periodic Comet Ashbrook-Jackson 1977g. The following precise position was obtained by Daniel Green from a plate taken by Green with the 16-inch astrograph at the Agassiz Station of Harvard College Observatory. The exposure was 23 minutes on Kodak emulsion IIaO, sensitized with H_2. More on 1977g: p. 9.

Date (1978 UT)	α_{1950}	δ_{1950}	m_2	m_{pg}
July 31.30844	$0^h36^m10^s.98$	$-1^\circ55'08''.7$	~16	~12

Comet Kohler 1977m. Following are observations by Charles S. Morris which he made at 3 different locations: Woburn, MA; Harvard College Observatory, Cambridge, MA; and Harvard Observatory's Agassiz Station, Harvard, MA. All magnitude estimates (m_1) were made using the In-out method. The column headed "Ref." indicates the reference used for comparison stars involved in magnitude estimates; "SAO" indicates the Smithsonian Astrophysical Observatory Star Catalog, and "AAVSO" indicates the charts of the American Association of Variable Star Observers (AAVSO). "DC" is the degree of condensation according to the definition by the Association of Lunar and Planetary Observers. The next column lists the tail lengths observed. The instrument column uses abbreviations which can be found in No. 27 of THE CQ, p. 7. Coma diameter in min.

Date (1977 UT)	m_1	Ref.	Coma	DC	Tail	Instr.	Comments
Sept. 12.04	9.0-9.5:		?	0-1	-	20x80 B	Coma was large (>5') and round.

(Cont. on p. 12)

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Observations of Recent Comets (Cont.)

Comet Kohler 1977m (cont.)

Date (1977 UT)	m_1	Ref.	Coma	DC	Tail	Instr.	Comments
Sept. 13.03	9.7	SAO	5'x10'	1	?	23-cm R	Comet elongated in PA 330°.
15.03	8.9	AAVSO	9'	4	-	20x80 B	
15.04	-		5'	4	20'	23-cm R	Second tail 3'
15.09	8.9	AAVSO	9'	4	30'	20x80 B	
28.01	8.1	AAVSO	10'	4	-	20x80 B	Moon in east
28.08	-		-	4	10', 3'	23-cm R	2 tails
29.02	8.0	AAVSO	11'	5	-	20x80 B	Moon in east
30.01	7.9	AAVSO	10'	6	?	20x80 B	Coma is round
Oct. 5.03	7.8	AAVSO	6'	7	?	20x80 B	Possible tail
5.03	7.8	AAVSO	6'	6	-	12x50 B	
5.03	8.5:	SAO	-	7-8	20', 4', 8'	15-cm R	3 faint tails: straight, short fan, and straight
6.99	7.8	AAVSO	5'	6	-	20x80 B	round
8.00	7.8	AAVSO	5'	6	-	20x80 B	
11.02	7.5	AAVSO	7'	6	-	20x80 B	
12.01	7.4	AAVSO	7'	6	-	20x80 B	
16.05	7.4	AAVSO	6'	6	-	10x50 B	
21.99	7.3	AAVSO	5'	6	-	20x80 B	Moon
24.00	7.3	SAO	4'	6	-	20x80 B	Moon
24.99	7.2	SAO	5'	6	-	20x80 B	Moon
27.97	7.0:	SAO	5':	6:	-	20x80 B	Moon, clouds
28.97	7.0	SAO	6'	6	-	20x80 B	
29.97	6.9	SAO	8'	6	40'	20x80 B	Narrow, straight tail
30.97	6.8	SAO	7'	6	1°	20x80 B	
30.98	-		-	-	*	23-cm R	See note below
31.96	6.9	SAO	6'	5	40'	20x80 B	
Nov. 1.97	6.9	SAO	6'	6	20'?	20x80 B	
11.97	6.7	SAO, AAVSO	8'	6	20'?	20x80 B	
14.95	6.8	SAO	7'	6	50', 20'	20x80 B	Moon
15.96	6.9	SAO	7'	6	-	20x80 B	Moon
18.95	6.9	SAO	6'	5	-	20x80 B	Moon
19.95	7.1	SAO	5'	5	-	20x80 B	Moon
20.95	7.0:	SAO	5':	?	-	20x80 B	Moon, clouds

*Comment on observation of Oct. 30.98: Significant detail in coma. Nucleus and central condensation displaced toward tail. Sunward extension of coma very pronounced in PA 200-230°. The shape of the coma was very irregular. Besides the main tail, there was another tail or jet in PA 15° which was 5' in length and curved toward the main tail. Ω

Comet Bradfield 1978c. This comet was a difficult one for Northern Hemisphere observers. Daniel Green, observing from near Boone, NC, and Karl Simmons, observing near Jacksonville, FL, could not locate the comet despite repeated efforts. Charles Morris had similar luck in Woburn, MA. (Cont. on page 13)

Observations of Recent Comets (Cont.)

Marco Cavagna of Milan, Italy, was able to locate Comet 1978c on two occasions in March. In the table which follows, MC is the observer-designation for Cavagna. Other observers, with their designations, are: PC, Peter Collins, Tucson, AZ; MT, Marvin J. Mayo and Joseph Truxton, Agoura, CA; VF, Vicente Ferreira de Assis Neto, Saõ Francisco de Oliveira, Brazil; DS, David Seargent, The Entrance, New South Wales, Australia; PM, Paul Maley, Houston, TX. The outline of the table for Comet 1978c is the same as for the table on pages 10 and 12 of this issue.

Comet Bradfield 1978c.

Date (1978 UT)	m_1	Coma	Tail	Obs.	Instr.	Comments
Feb. 20.75	∿6			DS	15x80 B	probable tail, PA 215°
28.31	6.5			VF	10x70 B	
Mar. 8.53	∿5.8	2½'		PC	11x80 B	
9.32	5.2	2!0	12'	VF	10x50 B (magn.) 31-cm L (tail)	diffuse with condensation; straight tail
10.32	5.0		17'	VF	10x70 B	straight tail
10.77	5			DS	15x80 B	strongly condensed
14.50	5.5		8'	PM	13-cm R	tail PA 240°
15.50	5.4			PM	13-cm R	
16.48	5.5			PM	13-cm R	
16.55	5.5			MT	5-inch moonwatch teles.	no tail
17.48	5.5			PM	13-cm R	
22.18	5.0	2'		MC	20x80 B	probable sign of tail in PA 327°; coma brighter toward center
25.18	5.2	2'		MC	20x80 B	coma brighter toward center

The magnitude estimates by Cavagna were made using the In-out method and the SAO Catalog for comparison stars. The other observers did not mention method or reference.

Comet Meier 1978f. The following observations are by Marco Cavagna of Milan, Italy. He used the In-out method and the SAO Catalog for magnitude estimates. The style is the same as for the other observation tables in this issue.

Date (1978 UT)	m_1	Coma	Instr.	Comments	DC	Obs.
June 28.89	8.4	2!5	20x80 B	coma diffuse		MC
July 7.89	8.0	2!5	20x80 B	coma diffuse		MC

The following observations of Comet 1978f are by John D. Sabia, observing from Keystone Observatory near Scranton, PA. He used the SAO Catalog for magnitude estimates. He noted no tail in any of his observations. (Key: JS)

May 26	∿10.5	2!0	23-cm R		0	JS
July 1	8.5	7!0	23-cm R	coma has condensation 3!0 off center, m_2 ∿9.0	5	JS
6	∿8.5	5!0	23-cm R		3	JS

Observations of Recent Comets (Cont.)

Comet Meier 1978f (cont.). Sabia writes (July 20) that he obtained two photographs of this comet, and neither of these shows any trace of a tail when the negative is placed under a microscope. The photographs were taken with an 8-inch f/1.5 Schmidt camera.

Periodic Comet Jackson-Neujmin. Your Editor spent several nights in July with Mr. Cheng-Yuan Shao, Dr. Gunther Schwartz, and Dr. Richard McCrosky at the Agassiz Station of Harvard College Observatory trying to recover this faint comet. Using the 61-inch reflector at the Newtonian focus, we took photographic plates of the calculated area that the comet should have been in. The 61-inch telescope has a specially-designed camera in which a motor moves the plate to follow the path of the moving object while the telescope itself follows the motion of the stars. The end result is a plate in which the object appears stationary while the background stars are trailed. Despite several scares, P/Comet Jackson-Neujmin was not found in July. It was then an object of magnitude 20½ or 21, and this magnitude is close to the limiting magnitude of the 61-inch reflector. On a few of the plates, several dots were located, but none could be traced from one plate to the next. Most, if not all, of these plate "objects" are defects either from the Kodak manufacturing of the plate or from the developing at Agassiz. Meanwhile, P/Comet Jackson-Neujmin awaits recovery on this, its possible third apparition. It was discovered in 1936 (Comet 1936 IV) and was not seen again until some 8 years ago (Comet 1970 IX). It could be currently some distance from its computed orbit.

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ADDRESS CHANGE

The Editorial address of The Comet Quarterly *has changed effective immediately. FORMER ADDRESS: 506 Fairview Dr., Boone, NC 28607. The new address is 721 S. Elmwood Ave., Oak Park, IL 60304. (The publication address is: Dr. Thomas Rokoske, Physics Dept., Appalachian State Univ., Boone, NC 28608.) See also the Editorial on page 2 of this issue.*

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