A DECADE OF COMETS

A STUDY OF 33 COMETS DISCOVERED BY AMATEUR ASTRONOMERS BETWEEN 1975 + 1984

BY DON MACHHOLZ

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PART 5: THE DISCOVERERS

INTRODUCTION

Forty-five times during these ten years an amateur astronomer discovered a comet and had his name placed on it. Who are these people? Where are they located? What type of instruments did they use? And how long did it take for them to find their comets? These are some of the questions we'll examine in this section.

Two additional names are on comets, we will not include them in most of our discussions. First, Comet Denning-Fujikawa (1978n) was discovered by Shigehisa Fujikawa on Oct. 9, 1978. It was later determined that this is also a comet discovered by William Denning in 1881. So Denning's name was placed on this comet along with Fujikawa's. We will not include Denning's discovery since it took place before this decade. Secondly the satellite IRAS co-discovered Comet 1983d in Apr. 1983. Since it was not human, observing from a fixed location nor using conventional amateur astronomer means to discover the comet, it too will not be included in this section.

A few words should be said about independent discoveries of comets. Several of the observers in this study reported discovering comets shortly (usually several days) after they had been discovered by someone else and named. It is difficult to include such finds in this study, for here the discovery details are less well known and published. Additionally, besides all the other factors influencing comet finds, slow communications aids in many independent discoveries. The astronomer who hears about a discovery the day after the comet is found is likely to know of the find before the next observing session. Armed now with this fore-knowledge, he cannot honestly "discover" that comet. On the other hand, an observer who doesn't hear about a new comet for three weeks is likely to independently "discover" the comet himself during the intervening weeks.

There are also a few instances where someone found a comet and failed to report it in time to have it named after them, even though their discovery time was early enough to merit the name. In these cases they assumed the comet had already been known and named, or they did not know how to report it, or they were late in getting the word to the Smithsonian Astrophysical Observatory.

THE DISCOVERERS

The 33 comets found in this decade were discovered by 26 people and a total of 45 named discoveries were made. Here is a list of the comets found, the discoverers, their hemisphere (N or S), country, the number of their finds in this decade and their lifetime total comet count.

TABLE 11

THE DISCOVERERS AND THEIR COMETS

COMET	DISCOVERER	HEM.	COUNTRY	DEC.	LIFE
1975a	Leo Boethin	N	Philippines	1	1
1975d	William Bradfield	S	Australia	1	3
1975h	Toru Kobayashi	N	Japan	1	1
	Doug Berger	N	USA	1	1
	Dennis Milon	N	USA	1	1
1975j	Hiroaki Mori	N	Japan	1	1
	Yasuo Sato	N	Japan	1	3
	Shigehisa Fujikawa	N	Japan	1	3
1975k	Shigenori Suzuki	N	Japan	1	2
	Yoshikaza Saigusa	N	Japan	1	1
	Hiroaki Mori	N	Japan	2	2
1975p	William Bradfield	S	Australia	2	4
1975q	Yasou Sato	N	Japan	2	4
1976a	William Bradfield	S	Australia	3	5
1976d	William Bradfield	S	Australia	4	6
1977m	Merlin Kohler	N	USA	1	1
1978c	William Bradfield	S	Australia	5	7
1978f	Rolf Meier	N	Canada	1	1
1978j	Toshio Haneda	N	Japan	1	1
	Jose de Silva Campos	S	S. Africa	1	1
1978l	Don Machholz	N	USA	1	1
1978m	David Seargent	S	Australia	1	1
1978n	Shigehisa Fujikawa	N	Japan	2	4
1978o	William Bradfield	S	Australia	6	8
1978c	William Bradfield	S	Australia	7	9
1979i	Rolf Meier	N	Canada	2	2
1979l	William Bradfield	S	Australia	8	10

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TABLE 11 (con't.)

THE DISCOVERERS AND THEIR COMETS

COMET	DISCOVERER	HEM.	COUNTRY	DEC.	LIFE
1980k	Kazimeras Cernis	N	USSR	1	1
	Jovaras Petrauskas	N	USSR	1	1
1980q	Rolf Meier	N	Canada	3	3
1980t	William Bradfield	S	Australia	9	11
1980u	Roy Panther	N	England	1	1
1982g	Rodney Austin	S	New Zealand	1	1
1983d	Genichi Araki	N	Japan	1	1
	George Alcock	N	England	1	5
1983e	M. Sugano	N	Japan	1	1
	Yoshikaza Saigusa	N	Japan	2	2
	Shigehisa Fujikawa	N	Japan	3	5
1983l	Kazimeras Cernis	N	USSR	2	2
1984a	William Bradfield	S	Australia	10	12
1984i	Rodney Austin	S	New Zealand	2	2
1984j	Kesao Takamizawa	N	Japan	1	1
1984o	Rolf Meier	N	Canada	4	4
1984t	David Levy	N	USA	1	1
	Michael Rudenko	N	USA	1	1

A PROFILE OF THE DISCOVERERS

Of the 33 comets found:

25 were found by one discoverer,
3 were found by two discoverers,
and 5 were found by three discoverers.

The longest span between first and last discovery for a particular comet (excepting Comet IRAS-Araki-Alcock) was for Comet Kobayashi-Berger-Milon: 4.6 days. The next longest time was twenty three hours for David Levy and Michael Rudenko with Comet 1984t.

The shortest time between first and last finds of a particular comet is that of Comet Cernis-Petrauskas (1980k), probably a simultaneous find.

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The table below shows the number of named comet discoveries for each individual during the past decade. William Bradfield of Australia found the most comets, while Rolf Meier of Canada found more than anyone else living in the Northern Hemisphere during the decade 1975-1984.

TABLE 12

THE NUMBER OF FINDS FOR EACH DISCOVERER (1975-1984)

#	NAME	# OF FINDS
1	William Bradfield	10
2	Rolf Meier	4
3	Shigehisa Fujikawa	3
4	Rodney Austin	2
	Kazimeras Cernis	2
	Hiroaki Mori	2
	Yoshikaza Saigusa	2
	Yasou Sato	2
5	George Alcock	1
	Genichi Araki	1
	Leo Boethin	1
	Doug Berger	1
	Jose Campos	1
	Yoshio Haneda	1
	Toru Kobayashi	1
	David Levy	1
	Merlin Kohler	1
	Don Machholz	1
	Dennis Milon	1
	Roy Panther	1
	Jovaras Petrauskas	1
	Michael Rudenko	1
	David Seargent	1
	M. Sugano	1
	Shigenori Suzuki	1
	Kesao Takamizawa	1

All the discoverers are male, ages range from the early twenties to the late sixties, a span of over forty years. As for occupations, some of the discoverers are retired, but most are still working, a fair number in technical and electronic areas.

Twenty-one of the 26 discoverers found their first comet during this decade. Six of these men went on to find at least one more comet during the same decade.

PART 5: THE DISCOVERERS

How many discoverers were intentionally searching for a comet when they found one? Of the 45 names on the comets, two- Berger and Milon, who found Comet 1975h, were not searching for comets. Four more might have been but we don't know for sure. But 39, or 87% of all the names on the comets were made by people intentionally looking for comets.

Or, to look at it differently, at least 20, and as many as 24, of the 26 individuals who found comets this decade were actually looking for an undiscovered comet when they found it. This means that 77% to 92% of the discoverers were seeking comets.

One comet, 1978j, was found by observers in both the Northern and Southern Hemisphere. Each of the remaining comets were found only by either Northern or Southern Hemisphere hunters, even when three discoverers were involved. And although 18 of the 33 comets were found south of the celestial equator, the Southern Hemisphere had only four comet discoverers while the Northern Hemisphere had 22. Those four southern men made 14 finds, while the 22 northern men made 31 finds.

In the table below is listed the countries in which the discoverers resided. Stated is whether their name was first, second or third on the comet, the totals for each country, then the number of people from each country who found comets during the decade.

TABLE 13

COMETS AND DISCOVERERS BY COUNTRIES

COUNTRY	FIRST	SECOND	THIRD	TOTAL	DISCOVERERS
Japan	7	4	3	15	10
Australia	11	0	0	11	2
U.S.A.	3	2	1	6	6
Canada	4	0	0	4	1
U.S.S.R.	2	1	0	3	2
New Zealand	2	0	0	2	1
England	1	0	1	2	2
Philippines	1	0	0	1	1
South Africa	0	1	0	1	1
IRAS Satellite	(1)	0	0	(1)	(1)
Total	32 (33)	8	5	45 (46)	26 (27)

Table 13 shows us that Japan has both the largest number of discoveries and the greatest number of successful comet hunters. Only nine countries were involved in the amateur comet discoveries of the past decade. While comet observations and comet hunting is being done in many other countries, only from the above listed countries were they discovered.

How many hours of hunting does it take to find a comet? Some amateurs do not count this, but many do. Below is a list of the number of hours for these individuals to find each comet, along with the size and type of instrument used. The symbol "acc" stands for an accidental find. A set of "()" indicates the figure is only a guess based on the discoverer's report.

TABLE 14

THE NUMBER OF HOURS TO FIND A COMET

COMET	DISCOVERER	TELESCOPE	# HOURS
1975h	Berger	8",f/7 refl.	acc.
1975h	Milon	4" refl.	acc.
1975k	Mori	20x120 bino.	less than 1
1976d	Bradfield	6",f/5.5 refr.	9
1980q	Meier	16",f/5 refl.	25
1979i	Meier	16",f/5 refl.	29
1984i	Austin	6",f/8 refr.	43
1978f	Meier	16",f/5 refl.	50
1976a	Bradfield	6",f/5.5 refr.	57
1979l	Bradfield	6",f/5.5 refr.	67
1978o	Bradfield	6",f/5.5 refr.	75
1984o	Meier	16",f/5 refl.	86
1979c	Bradfield	6",f/5.5 refr.	98
1980k	Petrauskas	12x80 bino.	(100)
1975p	Bradfield	6",f/5.5 refr.	106
1980t	Bradfield	7x35 bino.	113
1978j	Campos	5" refr.	116
1975h	Kobayashi	6" refl.	117
1975d	Bradfield	6",f/5.5 refr.	145
1982g	Austin	6",f/8 refr.	151
1984t	Rudenko	6", f/8 refr.	247
1983l	Cernis	19",f/4.8 refl.	297
1978c	Bradfield	6",f/5.5 refr.	360
1984a	Bradfield	10", f/5.6 refl.	384
1978j	Haneda	3.3" refr.	463
1975j	Fujikawa	6.2" refl.	(500)
1980u	Panther	8",f/4 refl.	601.5
1978m	Seargent	15x80 bino.	(650)
1980k	Cernis	20x110 bino.	808
1984t	Levy	16", f/5 refl.	917.5
1978l	Machholz	10", f/3.8 refl.	1700

The average search time for all of these comet hunters (excluding the accidental finds) is:
286.8 hours.

If we subtract the highest and lowest value we get:
245.0 hours.

PART 5: THE DISCOVERERS

THE TYPES OF INSTRUMENTS USED FOR DISCOVERIES

One of the oft-asked questions of comet hunters is: "What type of optical instrument is best for comet hunting?" There probably is no ideal instrument for comet hunting because each comet is different, some are small, some big, some bright and some faint. Generally, a larger instrument can pick up fainter objects, but the field of view is smaller so it takes longer to sweep a given area. A smaller instrument can usually sweep a given area in less time, but the faint comet might be missed. All in all, it is a combination of telescope, eyes and skies which helps to determine the efficiency of a comet sweeper.

Comet discoverer David Seargent, in his book "Comets-Vagabonds of Space", mentions a formula to determine the sky brightness of an optical instrument. This figure is found by dividing the aperture (in millimeters) by the magnification, then squaring this quotient. The result is a number, usually between 15 and 70, which indicates field brightness. A figure of, say, over 50 means the instrument is good for night use, but contrast is lacking so the idea is to go for a low field brightness figure. This can be done by either decreasing the aperture, or increasing the magnification. Either solution has its advantages and disadvantages. This "field brightness figure" is included in Table 15, along with the comet, discoverer and instrument used. For reference, the comet's discovery magnitude, elongation (degrees from the sun), and whether it was in the morning or evening sky is also included.

TABLE 15

TYPE OF INSTRUMENT USED FOR EACH DISCOVERY

COMET	DISCOVERER	INSTRUMENT	MAG.	EL.	SKY	FD.BRT.
		BINOCULARS				
1980t	Bradfield	7x35	6.0	22d	M	25.
1983d	Alcock	11x80	6.4	92d	M	53.
1980k	Petrauskas	12x80	8.5	43d	E	44.
1978m	Seargent	15x80	5.0	35d	M	28.
1980k	Cernis	20x110	8.5	43d	M	30.
1975j	Mori	20x120	10.7	65d	M	36.
1975k	Mori	20x120	8.8	52d	M	36.
1984j	Takamizawa	20x120	9.4	171d	M	36.

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TABLE 15 (con't.)

TYPE OF INSTRUMENT USED FOR EACH DISCOVERY

COMET	DISCOVERER	INSTRUMENT	MAG.	EL.	SKY	FD.BRT.
		REFLECTORS				
1975h	Milon	4"	7.6	133d	M	--
1975k	Suzuki	5.8", 22x	8.8	52d	M	40.
1975h	Kobayashi	6", 30x	7.6	133d	M	26.
1975j	Sato	6", 25x	10.7	65d	M	37.
1975q	Sato	6", 25x	9.8	78d	M	37.
1975k	Saigusa	6", 27x	8.8	52d	M	32.
1975j	Fujikawa	6.2", 23x	10.7	65d	M	48.
1975a	Boethin	8"	11.0	61d	E	--
1975h	Berger	8", f/7	7.6	133d	M	--
1980u	Panther	8",f/4, 35x	9.7	63d	M	34.
1978l	Machholz	10",f/3.8,36x,2.8d	10.7	72d	M	50.
1984a	Bradfield	10",f/5.6,44x,1.3d	10.7	46d	M	33.
1978f	Meier	16",f/5,56x,1.25d	10.4	71d	E	53.
1979i	Meier	16",f/5,56x,1.25d	11.8	69d	E	53.
1980q	Meier	16",f/5,56x,1.25d	10.3	75d	E	53.
1984o	Meier	16",f/5,56x,1.25d	11.7	52d	E	53.
1984t	Levy	16",f/5,64x, 0.8d	9.4	60d	E	40.
1983l	Cernis	19",f/4.8, 65x	10.7	73d	M	55.
		REFRACTORS				
1978j	Haneda	3.3"	10.0	147d	E	--
1978j	Campos	5"	10.0	147d	E	--
1975d	Bradfield	6",f/5.5,26x,2.2d	9.3	30d	E	34.
1975p	Bradfield	6",f/5.5,26x,2.2d	9.7	58d	M	34.
1976a	Bradfield	6",f/5.5,26x,2.2d	9.4	56d	E	34.
1976d	Bradfield	6",f/5.5,26x,2.2d	8.8	44d	M	34.
1978c	Bradfield	6",f/5.5,26x,2.2d	8.0	48d	M	34.
1978o	Bradfield	6",f/5.5,26x,2.2d	8.4	32d	M	34.
1979c	Bradfield	6",f/5.5,26x,2.2d	10.2	44d	E	34.
1979l	Bradfield	6",f/5.5,26x,2.2d	5.0	26d	M	34.
1982g	Austin	6",f/8, 18x	10.4	68d	M	71.
1984i	Austin	6",f/8, 18x	5.8	69d	M	71.
1984t	Rudenko	6", f/8, 30x	9.4	60d	E	26.
		SCHMIDT-CASSEGRAIN				
1977m	Kohler	8",f/10, 100x	9.5	68d	E	4.

PART 5: THE DISCOVERERS

As shown, the sizes and types of instruments in the possession of most amateurs today have been recently used to discover comets. We also find that in eight instances binoculars were employed, while reflectors were used 18 times, refractors: 13 and a Schmidt-Cassegrain once.

It is a little more difficult learning of the types of mounts used on these instruments. The large binoculars usually have altazimuth mounts, while some of the large refractors use equatorial mounts. In most cases the scopes are not motor-driven. Concerning the direction of the sweeps, in some instances it is done in vertical sweeps, in other instances it is horizontal.