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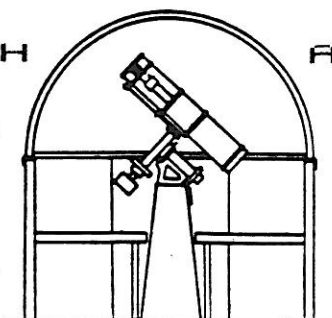
SPECTRUM

MARCH

APRIL

19

86



BUFFALO ASTRONOMICAL ASSOCIATION, Inc.

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ASTRONOMER FROM THE PAST

KING, William Frederick King was a Canadian Astronomer and surveyor. He was born in Stowmarket, Suffolk, England on February 19, 1854 and passed away in Ottawa, Ontario, Canada on April 23, 1916. His family emigrated from England to Canada in 1861 where he entered the University of Toronto. He graduated from there in 1875. He was employed by the Dominion government as a land surveyor in the great Northwest, where he became chief inspector of surveyors in 1886. Four years after, he became chief astronomer for the Department of the Interior. In 1905 he was made director of the Dominion Astronomical Observatory in Ottawa and in 1909 became superintendant of the Geodetic Survey of Canada. For these and other works, he became a companion of St. Michael and St. George in the year 1908. "Astronomy in Canada" was one of his many publications in the scientific papers.

Darwin Christy

LIGHT POLLUTION

The following was taken from the 'Whirlpool' of the Niagara Center's (R.A.S.C.) newsletter. Take heed and help to fight for less light at night.

I am writing this article with the hope that many of you will become anti-light-pollution activists. With the recent significant victories and high public interest in astronomy due to Halley's Comet, translating our efforts here on local, regional and national levels may be much easier than many of you may think!

Recently there has been a spate of coverage on light-pollution in both "Astronomy" & "Sky & Telescope" magazines. More importantly, this topic has not been limited to astronomical journals but has received extensive coverage in other publications including newspapers such as the "Wall Street Journal". Just as important, many communities have passed light-pollution-control ordinances as in San Diego (1934) and the state of New Jersey earlier this year (198

The law in the state of New Jersey represents the toughest and most comprehensive anti-light-pollution legislation yet passed. This bill was introduced by Senator Harley who in turn had been made aware of this problem by Mr. Fred Schaaf's efforts. Mr. Schaaf has also seized the opportunities presented by Halley's Comet to educate the public on the need for a saner use of nighttime illumination. We should do likewise! It may be possible to reach the highest levels of government, wherever applicable, because of the high public interest. There are two educational kits which may help in this regard: one is a 70-page booklet by Dr. David Crawford entitled, "Outdoor Lighting Control;" the other one is a copy of the New Jersey State Law with the accompanying information package that Senator Harley's office is making available to every city and municipality in his state.

A suggested protocol of accomplishing this goal in our cities, towns and provinces, and on the federal level would be to have a cover letter detailing some of the means of achieving light-pollution-control accompanied by the available kits. A proposed list of recommendations to be incorporated into your cover letter is as follows:

-The use of LPS (Low Pressure Sodium vapour) versus HPS (High Pressure Sodium vapour). LPS is \$200,000 cheaper per year than HPS for 50 million more lumens. The savings to municipalities, towns, cities and ultimately the taxpayer should be emphasized! For us astronomy enthusiasts, LPS being a single/narrow band emitter has the promise of being easily eliminated by the development of appropriate interference (anti-pollution) filters. This would be impossible with HPS light.

Other advantages of LPS over HPS are: 1) much less glare. This recognized feature is the reason U.S. Navy aircraft carriers use LPS lights on their runways; 2) LPS has had a long history of successful use in Europe (40 years).

- Use of shade/shielding on ALL lighting sources. These shields should extend below the bottom of the bulb so that all light is directed downwards and none to the sides or the sky.

- On highways use of shielded LPS standards and a reduction in their present densities. Current set-up (unshielded, densely-packed poles/lights) contribute to glare, presenting a traffic hazard.

- For pedestrian walkways--use a 3-foot poles instead of the 15-foot standards. Here too the illumination source should be LPS with appropriate shielding (i.e., light should be directed onto the pathways.)

- For shopping malls-- 1) use of shielded LPS fixtures. 2) Lighting curfews after mall closing time at 10 or 11 PM. The savings to business should be stressed if they are not already evident.

- Billboards and/or outdoor advertising displays-- 1) LPS should be shielded and directed downwards at the sign rather than upwards.

MISCELLANEOUS TOPICS

1) Elimination of searchlights and lighted (all night) car lots.

2) Role of crime and lighting: Statistics available from the F.B.I. show no correlation between crime and lighting. The majority of crimes are daytime occurrences. Here the lighting industry has made its fortune by playing on the fears of adults who haven't outgrown their childhood fears, pure and simple! Are we to believe that crime was rampant before the advent of electricity and lighting? (as a matter of fact, it was. That is why sundown curfews were established and nearly everyone carried a weapon.--D.)

3) The effect of light-pollution on the environment:

a) On plants, a delay in leaf abscission in Autumn and a premature leaf nascence in the Spring. Undetectable effects of abnormal lighting levels or regimes are bound to be even more significant.

b) On animals, alteration of hormonal levels, bird kills in migration, etc. (glare, disorientation or attraction to beacons, lighted skyscrapers, etc.)

4) Remember, light pollution is easy to cure and unlike other environmental pollutants saves money to eliminate. Also we would not need nuclear power plants were it not for the need to light up the night.

5) The 70-page booklet is available from:

Dr. David Crawford
Outdoor Lighting Control Booklet
KPNO (Kitt Peak National Observatory)
950 N. Cherry Ave.
P.O. Box 26732
Tucson, Az. USA 85726

6) The New Jersey Anti-Light Pollution Bill and Lighting Control Kit is available from:

Mr. Fred Schaaf
706 E Street
Millville, NJ USA 08332

Mr. Schaaf is a noted anti-light-pollution activist, editor of DSCH Journal, and author of a regular column in "Astronomy" magazine.

7) We have a right to dark skies!

Dan Kahraman, Bsc, Msc (Biology), author of the article RR #3
Wheatly, Ontario, Canada NOP 2P0

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WALT WHYMAN, a long standing member of the B.A.A. is now in Batavia Nursing Home, 257 State St., Batavia, N. Y. 14020. Walt is known by many who know his activities within the B.A.A. Anyone caring to send him a card can do so through the above address. He will greatly appreciate hearing from any or all B.A.A. members.....

? ! ? SPY & TELL ? ! ?

Clark Chapman, astronomer and son of the late BAA member and well-known physicist, Seville Chapman, is now getting busy with the imaging team for the Galileo project.

In a new book, The Planets, published by Bantam, there is a chapter on Mercury written by Clark.

Former member, Steve Desmond, took a leave from RIT Rochester in May to work full-time at a local TV station. He was promoted to head technician and head of production. He worked for nine months when his job ended because of cutbacks. He is going back to RIT for two courses to complete his Associates in film and television.

James Dow spent about ten days in Hawaii at Christmas time and saw the 150" telescope at Mauna Kea. The mount was topped by an inch of snow and ice, with winds at 70 miles an hour.

Kevin Koestler, son of Doris and Bill, was married last October in a very impressive wedding ceremony.

John Raymonda is enjoying his computer. He has an I Plotter and is busy doing math functions, letters, charts and graphs.

The Kimbles are very involved in scouting. Adrienne has a Brownie group and Ken is a Cub Master.

Doris and Bill Koestler will be seeing Halley's Comet while they cruise through the Panama Canal in April.

In the January 12th Buffalo News, a picture appeared in which Shaun Hardy, Kenan Center education director, encouraged an 82 year old man, who had seen Halley's Comet in 1910, to try to penetrate the cloud cover to see it again through the telescope at the Remick Memorial Observatory at Lockport Senior High School. Twenty-two fifth grade students from Lindbergh Elementary School in the Town of Tonawanda were also on hand.

Another of our members, Claudia Bielinski, had her picture in the January 19th Buffalo News showing sculpture from the Buffalo Museum of Science stone carving class.

Marilou Bebak and Ken Biggie were seen on television on January 24th conducting a public viewing night at the Kellogg Observatory at the museum.

Some happy news from Jerry and Adrienne Morris. They are expecting their first child in August.

Shaun Hardy again made the Buffalo News on February in a picture showing the hanging of paintings for an exhibit which ran through February 23rd at the Kenan Center in Lockport.

Edith L. Geige

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? FOR SALE ?

FOR SALE: CELESTRON SUPER C8 PLUS WITH HIGH REFLECTIVE COATING. INCLUDES TRIPOD AND WEDGE, 8x50 FINDER SCOPE, 28mm, 7mm EYEPIECES AND COMPLETE MANUFACTURER'S PACKAGE. 7 MONTHS OLD, USED LESS THAN 5 TIMES. \$1575.00. CALL 846-4183 DURING WORKING HOURS OR 876-3698 AFTER HOURS. ASK FOR STUART.

? MEMBERSHIP DUES ?

FAMILY - \$ 15.00

REGULAR MEMBERSHIP - \$ 10.00

STUDENT - \$ 5.00

SENIOR CITIZEN - \$ 5.00

SUBSCRIPTION ONLY - \$ 4.00

Please make payment to Claudia Bielinski, 5450 Clinton St., Elma, N. Y. 14059 -- or to John Raymonda, 80 A Foxbe Dr., Getzville, N. Y. 14068 -- or to either of these people at any regular meeting.

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ANCIENT CONSTELLATION

The GORGON'S head, a ghastly sight,
Deformed and dreadful, and a sign of woe.
from the Iliad.

CAPUT MEDUSAE, The head of Medusa---

This ancient constellation was formed out of four stars, including Algol which is situated in the constellation of Perseus. Besides Algol, the other three stars are Pi, Rho and Omega Persei. Hipparchus and Pliny each made a separate constellation of the Gorgon stars. They called it the "Head of Medusa". Algol, the Demon Star, is said to have been called this because of the rapid and wonderful variations produced by it. Ptolemy catalogued it, "the bright one of those in the Gorgon's Head."

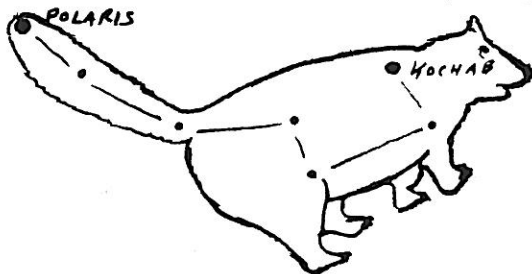
Algol is a white star which is famous as being a spectroscopic binary and variable, ranging in magnitude from 2.3, maximum, to 3.5, minimum and back to maximum again in a period of 2 days, 20 hours, 48 minutes and 55 seconds,



MARCH CONSTELLATION

URSA MINOR - The Little Dipper - The Lesser Bear is not a very conspicuous constellation if it wasn't for the shape. Not many objects of interest are within it's boundary. It is surrounded by three other constellations; Cepheus, Draco and Camelopardalis. It does not even touch upon its sister constellation, Ursa Major.

The objects of interest are:- Galaxies - NGC 6217; Novae N - 1956; Double Stars - Alpha, Pi¹, Pi²; Variable Stars - Alpha, Epsilon, RW (N-1956), V, U & RR. At least you can line up your telescope on the principle star, "POLARIS".



APRIL CONSTELLATION

URSA MAJOR, The Great Bear or The Big Dipper is one of the more noted constellations in the northern hemisphere. It is chiefly noted by its dipper appearance, which, in part, is a group of an old 'open cluster'. Also, two of its stars, in the dipper, point out the 'north star', Polaris. This constellation is bordered by seven other constellations as follows: Bootes, Leo, Leo Minor, Coma Berenices, Lynx, Camelopardalis & Canes Venatici. It makes up in deep sky objects of interest which are not found in its lesser companion, Ursa Minor.

The many interesting objects are as follows:-

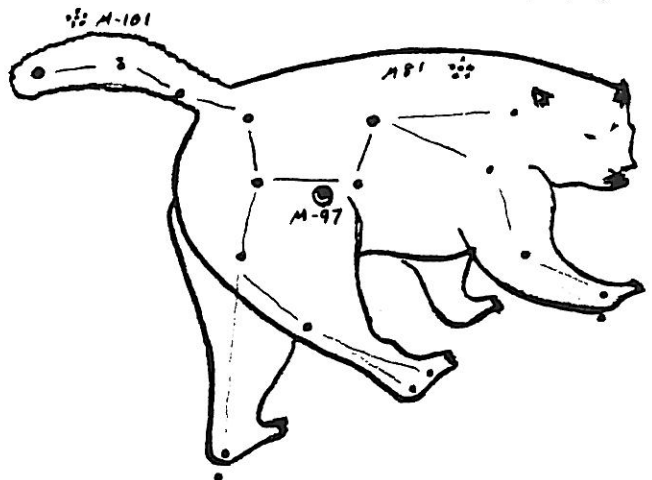
GALAXIES - NGC's 2636, 2639, 2681, 2685, 2693, 2701, 2787, 2841, 2950, 2976, 2985, 2998, 3031 (M-81), 3034 (M-82), 3043, 3065, 3077, 3079, 3184, 3198, 3206, 3259, 3310, 3319, 3320, 3353, 3359, 3415, 3445, 3448, 3458, 3478, 3516, 3549, 3556 (M-108), 3583, 3610, 3613, 3614, 3619, 3631, 3642, 3675, 3683, 3687, 3690, 3718, 3726, 3729, 3738, 3756, 3769, 3780, 3782, 3813, 3863, 3877, 3888, 3893, 3894, 3898, 3917, 3938, 3941, 3945, 3949, 3953, 3972, 3982, 3985, 3992 (M-109), 3995, 3998, 4013, 4026, 4036, 4041, 4047, 4051, 4062, 4085, 4088, 4096, 4100, 4102, 4144, 4157, 4290, 4605, 4814, 5204,

5308, 5319, 5322, 5376, 5422, 5430, 5443, 5457 (M-101 M-102 5473, 5474, 5475, 5480, 5485, 5585, 5631 & I, 749, I, 750, & I, 2574

PLANETARY NEBULAE - NGC 3587 (M-97) The Owl Nebula

DOUBLE STARS - Omicron, Rho², 23, Theta, Phi, 78, Zeta, Xi, Iota, Kappa, Upsilon, & 62

VARIABLE STARS - VW, R, VY, W, CG, TX, Z, ST, T, S, RY & Aa



ASTRONOMICAL HAPPENINGS

SOLAR:-

The Sun will cross the equator on the 20th of March, Th beginning the Spring season. It will be eclipsed on April 9th, not to be seen in these parts. To observe it, one will have to go to the Pacific Southwest, Australia, New Guinea, New Zealand and other places near that vantage point.

LUNAR:-

The Moon's phases for March & April are:-
Last Quarter - March 3rd & April 1st & 30th.

New Moon - March 10th & April 9th.

First Quarter - March 18th & April 17th.

The March Full (WORM) Moon is on the 25th.

The April Full (PINK) Moon is on the 24th.

Also on the 24th the Moon will be eclipsed, again out of the observational territory in which we live. To see it, you will have to go to the Orient.

LUNAR OCCULTATIONS:-

Antares - March 30th. It will not occur in our area, but will be observed in the Pacific Northwest.

LUNAR CONJUNCTIONS:-

March 3rd - Mars - Saturn & Uranus

March 4th - Neptune

March 31st - Uranus & Mars

April 1st - Neptune

April 5th - Jupiter

April 6th - Mercury

April 10th - Venus

April 26th - Saturn & Antares

April 27th - Uranus

April 28th - Neptune

April 29th - Mars

PLANETARY CONJUNCTIONS:-

March 8th - Mercury & Venus

March 13th - Mars & Uranus

April 8th - Mars & Neptune

GREATEST ELONGATIONS:-

April 13th - Mercury will be 28 degrees west.

"ASTRO-HAP" continued on page 4, column 2

As everyone probably knows the transparency of the sky strongly effects a given telescope's ability to attain faint stellar magnitudes. The atmospheric clarity, though, whatever its degree has a constant effect relative to telescopic aperture. But what of the effect of atmospheric turbulence (the seeing conditions) on a telescope's ability to penetrate to faint magnitudes?

To answer this question, I have studied this effect systematically for the past three years and now have enough data points to be statistically meaningful.

The atmosphere can be thought of as an assemblage of discreet convective 'cells' each of which possesses a slightly different reflective index and density due chiefly to slight temperature differences. Strictly speaking, these convective cells are not the total picture for at high altitude differential air currents or streams predominate while at lower altitudes convective cells are dominant, even the tube structure of the telescope and its immediate surroundings contribute to the over-all seeing effect by providing so called tube currents (warm air currents streaming through and across the telescope's front aperture). The total result is a general blurring and enlargement of a star's image with resultant loss of the faintest images.

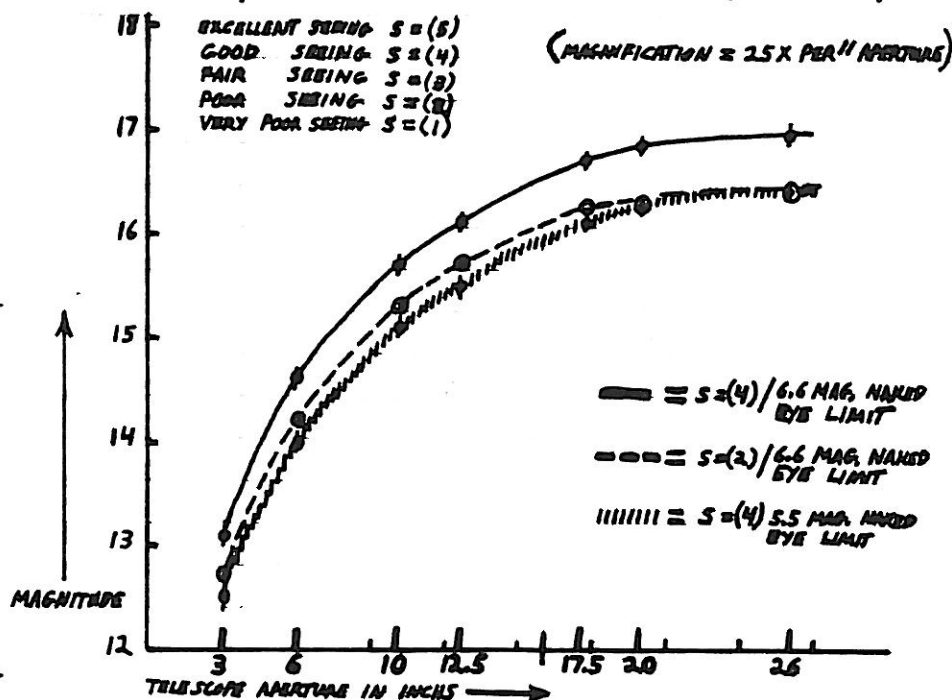
The average size of these convective cells must, therefore, have a strong effect relative to telescopic aperture. I have found that if the average convective cell diameter <2% the telescope's aperture, the seeing will be judged as very poor, if 25-50% telescopic aperture, seeing is rated as poor, if 50-70% telescopic aperture, seeing is rated as fair, if 70-80% seeing is rated as good and if >80% the seeing will be rated as excellent. Clearly good seeing demands that something of the majority of a telescope's light collecting area be encompassed by a single wavefront or cell area at any given time. At smaller apertures, turbulence tends more to bodily move the image around, while at large aperture/turbulence tends to optically degrade the image. Thus for any given aperture the smaller the average convective cell diameter, the greater the optical wavefront error and the less the degree of telescopic efficiency. Thus larger apertures are much more handicapped by poor seeing that are smaller apertures. This is well seen in the graph of figure 1.

Notice that the magnitude loss due to inferior seeing remains virtually constant, at 0.4 magnitude, right up to about 16" aperture and then suddenly increases with accelerating rapidity as aperture is further expanded.

Why this aperture sensitive effect? The answer lies with the average size of the atmospheric 'cells' prevalent, on average, over western New York. If a 6" aperture can be considered as the break-away point and a 70% (per aperture) diameter convective cell as indicative of good seeing conditions then the largest average cell comes out to be about 10" in diameter. Anyone who has ever used the Beaver Meadow telescope can plainly demonstrate this for himself by viewing a bright star with the eyepiece removed. As a result, apertures exceeding 16" in this geographic area tend to be plagued by relatively poor seeing, approximately on 80% of all clear nights, if conditions prevalent over the past 6 years persist. Never-the-less larger apertures remain superior to small telescopes as per magnitude limit all be it at an increasingly retarded rate. Also notice, from the graph, that the ratio of transparency versus see-

ing effect relative to aperture depends on the size of the telescope. At 16" aperture the effect of transparency predominates while at aperture 16" seeing conditions fully equal the effect of transparency as per magnitude limit.

The seeing conditions also considerably influence a telescope's ability to resolve fine detail. Here too large of telescopes tend to be more adversely effected by the



prevalent seeing conditions, whether magnitude or resolution limits, much depends on the observer's personal visual sensitivity or acuity will bodily alter the results to a moderate extent.

In conclusion if one requires large aperture, perhaps the best compromise would be a 16"-18" aperture for 80% of the time its magnitude reach would fall only 0.4 magnitude short of a 29" !

Michael Idem

The first supernova discovered in a quasar's host galaxy was in 1985 which is associated with the quasar QSO-1059+7. The supernova is 3 arc seconds from the quasar and had an absolute magnitude of -17.6.

C. M.

"ASTRO-HAP"

METEOR SHOWERS:-

March 11th - Zeta Bootes
March 16th - Corona Australis
March 26th - Virginids * * * * *
April 9th - Alpha Virginids
April 17th - Rho Leonids
April 21st - Lyrids * * * * *
April 25th - Mu Virginids
April 28th - Alpha Bootes

OTHER BITS OF INFORMATION:-

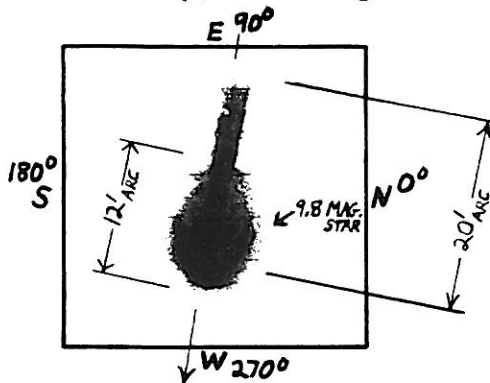
Percival Lowell born March 13, 1855
Halley's Comet nearest Earth April 11th
Daylight Savings Time starts April 27th
Mt. St. Helens erupted after 123 years - 1980

"SPECTRUM" DEADLINE

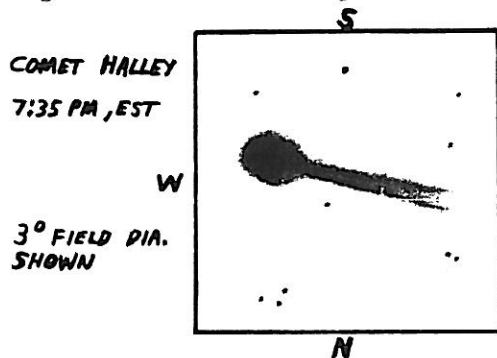
for the MAY-JUNE issue is APRIL 22nd. Articles are needed. Come on Mr. & Mrs. B.A.A. member and submit something for the "SPECTRUM".

**** OBSERVATIONS ****

1) December 14-15 Comet Halley now distinctly possesses a short tail. This tail projects eastward at position angle of 80° . From its base within the inner coma to its visual terminus the tail is $20'$ arc in length. All-in-all the tail is very narrow and jet-like, fan angle is only 3° . The coma or comet head remains $12' \times 10'$ arc in visual extent, like the tail the major axis lies at position angle 80° - 260° . The inner coma is very strongly condensed toward a bright nearly stellar nucleus. The western or leading edge of the coma has a well defined solar wind induced shock boundary, the trailing coma is less defined. At 7:03 P.M. EST a 9.8 magnitude star lies within the coma only $0.4'$ arc SSW of the nucleus but by 7:15 P.M. this distance had increased to almost $1'$ arc NE relative to the nucleus. Currently the comet is magnitude 5.3, plainly visible to the naked eye under good sky conditions.

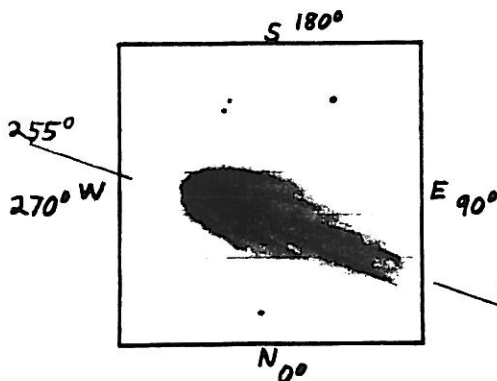


2) December 25-26 Even under this bright moonlit sky Comet Halley is a very easy sight indeed. Tonight the comet's magnitude is estimated at 5.0. The inner coma's surface brightness now exceeds that of the central portion of the Andromeda Galaxy. The comet is strongly condensed to the middle but the faint outer most coma is $16' \times 10'$ arc in full extent. A narrow conic tail streams outward to the east



for some 2° , quite interesting !

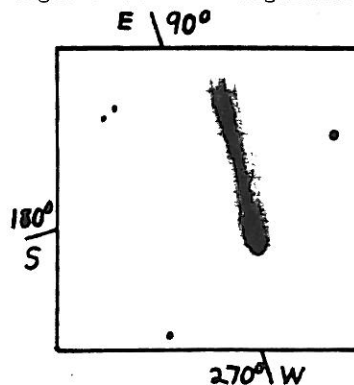
3) December 30-31 Many interesting features have developed within Halley's Comet gas envelope as well as its tail. A surprising amount of slightly curved streaks or striations have become evident. These striations issue from the comet nucleus or in some cases from the shock front just preceding the nucleus. Afterwards the striations fan rearward in the general direction of the tail. This veining structure is most evident with narrow band blue filters but are also obvious visually



The nucleus remains compact and almost star-like, magnitude 9.2 on its own. Visible to the naked eye even in mediocre skies, Halley's Comet still shows no obvious color differentiation visually.

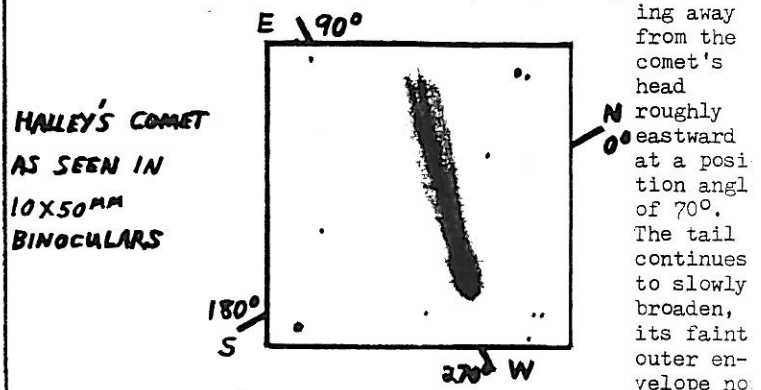
So to the tail possesses similar striations but they are longer and more ray-like, generally more diffuse. Something of a milestone the comet has broken the 5th magnitude barrier looking to be magnitude 4.9 this night.

4) January 6-7 Halley's Comet continues to brighten, and tonight looks to be magnitude 4.8. The inner coma remains at $16' \times 10'$ arc in extent, very strongly condensed to the middle. The tail is faint in 10×50 mm binoculars but fully 2.4° in length, still narrow and conic but slowly broadening. The tail trails behind the comet head at position angle of 70° . The major axis of the comet as a whole lies at position angle 250° - 70° . Much of the tail is already visible to naked eye at a clear dark country site.



This was at 6:48 P.M. EST.

5) January 16-17 Halley's Comet continues to brighten nicely, tonight looks to be magnitude 4.6. Its tail continues to lengthen for now it is visually quite 3° long and trailing away from the comet's head



roughly eastward at a position angle of 70° . The tail continues to slowly broaden, its faint outer envelope now fans out to a 0.5° width at its visual terminus. The coma or head is now fully $18' \times 12'$ arc in extent. Comet Halley is now getting quite low in the sky and will soon disappear into the evening twilight, hopefully to remerge in the early morning sky, this spring, even brighter.

6) January 18-19 Now armed with a larger aperture telescope, I have recently begun what might be called my second supplemental survey of deep-sky objects. Thus far this month I have observed 55 'new' galaxies and quasars. All were extremely faint, the faintest galaxies being magnitude 15.8 while the faintest quasar observed was magnitude 16.7. In total, 2656 deep-sky objects have been observed to date

Michael Idem

I observed a zero magnitude meteor through Cetus on December 30th at 5:51 PM. It was white and lasted $1\frac{1}{2}$ seconds, traveling south for 15 degrees before burning up. Shortly afterwards, Halley's Comet was seen in Aquarius with 10×50 binoculars and a 5 inch f:4.2 refractor as a 4th magnitude diffused object like m-31. A tail 2 degrees long was visible with a star like nucleus and a coma of fairly high surface brightness.

On January 11th the tail of Halley's Comet was seen to total length of $4\frac{1}{2}$ degrees which I viewed with my rich field scope and binoculars.

Carl Milazzo

INSTRUMENT REPORT

One new B.A.A. member is planning to grind a mirror for a kit. He is getting his instruction from Sam Brown's fine book on telescopes. The Museum of Science is no longer offering classes in telescope making because of dwindling enrollment. The very viable alternative to a course of instruction is the purchase of a kit of supplies and a text book. An enterprising individual can learn the technique by trial and error.

There are fewer suppliers of kits than there were some years ago as fewer builders make their own mirrors. There are a couple, however, who advertise in the magazines. And there are several good books on the subject. Another route favored by many builders these days is the purchase of a finished mirror. There are several suppliers advertising in the magazines. When your telescope is finished (if you don't need our help before then) bring it to one of our group meetings for collimation.

Our instrument section will be holding meetings from time to time whenever a problem surfaces or there is an attractive sky some afternoon. This will hold promise of a fine evening when we can bring some of our home spun scopes. We can interchange eyepieces and test different objectives directly on the stars, then we can imagine we are William Herschel trying out a new mirror.

Ed Lindberg.

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PRESIDENT'S CORNER

We have two **MALL SHOWS** coming up this Spring. **MARCH 22 & 23** (Saturday & Sunday). We will have a display at the new McKinley Park Mall in Hamburg and on **APRIL 12 & 13** (Saturday & Sunday), we will be set up at the Eastern Hills Mall in Clarence. This is an opportunity for all members of the BAA to offer a little of their weekend time to insure the success of these worthwhile events. We need items (telescopes, books, pictures, ect) for display, help in setting up on Friday evenings and bodies to be on hand to meet the public.

For further information contact John Yerger for the Southtowns show in March and Doris Koestler for the Eastern Hills Mall show in April. Also, much thanks to John & Doris for coordinating these events.

About nine (9) people expressed an eager interest in reviving the B.A.A. 'Inquiry' or 'Studies Section' at our February meeting. I have a list of their names, so its just a matter getting the section set up and arranging a date and location. The Study Section has traditionally met on the 3rd Friday of the month at Buffalo State College, but those who are interested may wish to change this. Anyone interested in expanding their knowledge of astronomy should be interested in this group; so please contact me for further information. Also call me if you would like to take charge and get the group organized.

There was also some interest expressed in forming an Observation Section, so if anyone has similar interests or would like to try to organize an Observer's Section please also contact me.

Remember also to offer your occasional assistance to our Observatory Director, Carl Milazzo for Sunday Public Nights at Beaver Meadow and to Mary Lou Bekak on Friday nights at the Museum of Science. Contact Carl or Mary Lou for information.

Also, congratulations to Dan Marcus for his Museum of Science sponsored trip to Australia to study Halley's Comet this Spring.

Al Kolodziejczak has kindly offered to chair our nomination committee for the election of officers at the June business meeting. Anyone wishing to run for **PRESIDENT, VICE PRESIDENT, SECRETARY, or TREASURER** or wishing to nominate another for a 2 year term to these offices, should contact Al and express their wishes.

Also remember the **N.F.C.A.A.A.** will meet on May 24th in Toronto and Ed Lindberg can provide further information.

On March 5, 1986 the newly formed 'Lake Shore Astronomical Society' will be giving a slide presentation: Our Planets at a Glance. B.A.A. members are invited, and I believe the show will be at the High School. For information; contact Derrick Lovelle Whitt at (716) 549 3769 in Angola.

Ken Biggie, President

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The problem of the roof not being able to open up has finally been rectified, and the mystery has been solved. For the past 3 years the roof has not been opening to the fullest extent that it was designed for. The cause of the problem was because the motor was fastened to the observatory by means of nails which were slowly prying loose over these past three years. This was noticed by Ken Biggie during a repair trip to the club's Beaver Meadow Observatory. Others who came to help were Mark Schmidt, Tristan Dilapo and Carl Milazzo. After the exact cause of the problem was discovered, the next weekend the repairs were made by Mark Schmidt, Bob Griffiths and Carl Milazzo. Mark donated six four inch long wood bolts and washers which were used to fasten the motor to the observatory which opens the roof. It is now better than new. The club's observatory is now on good working order and is ready for its members to put it to good use as well as for the public nights usage.

The latest publicity about the observatory has been on the following radio stations:- **WGBR** - Buffalo, **WECK** - Cheektowaga, **WCJW** - Warsaw. The observatory appeared in Terry Dickinson's monthly astronomy column for January and in the Buffalo News-Gusto under the family section.

The below normal amount of clear skies has continued through-out January and February. Yet, in spite of this, many of our club members have made use of the observatory on the few clear nights we've had.

As always, B.A.A. members who volunteer their time to do public nights at our Beaver Meadow Observatory are always needed. Please contact me if you can help in any way. Public nights for March and April are from 8 to 11 PM on clear sundays.

An 8 inch f:9 equatorial loaner telescope is available free for a month at a time to take home. If you want, I can put you on the waiting list of this popular telescope.

It has now been one year since I have been appointed by the B.A.A. Board of Directors to be the club's director of the Beaver Meadow Observatory which the club has built and operates. I would like to take this time to thank all of those who have volunteered their time in making the observatory a success. They are the following:- Ken Biggie, Tristan Dilapo, Bob Griffiths, Bob Hughes, Dave Junkin, Al Kolodziejczak, Dan Marcus, Bob Mayer, Adrienne and Jerry Morris, Tom Reid, Jim Russell, George Scheck, Mark Schmidt, Scott White and John Yerger.

Carl Milazzo
Observatory Director

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NEW MEMBERS

Let us welcome the following new members---

Gerald T. Cutway
Terry Farrell
John & Elisa Malona
Hugh M. Pettit
Helen M. Lenihan
Elizabeth S. Wasiluk
Matthew K. Kantar
Thomas & Russell Giasomo
James Kwiatowski
George V. McNamara
Sharon Krawczyk

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ANOTHER COMET

"A Comet is Coming", "A Spectacular Visitor from Outer Space". These two statements sound like something seen recently to herald the return of Halley's Comet. Actually they are titles of articles written in 1973 when Comet Kohoutek was expected to blaze a brilliant path across the heavens. What a rash of excitement and anticipation that event provoked twelve years ago. For some, this comet was the 'comet of the century'; while others suggested it might

of us it was a dud, a comet that barely achieved naked eye visibility for a short period during the depth of winter.

The comet was discovered in March 1973 by a Czech astronomer, Dr. Lubos Kohoutek, at the Hamburg Observatory in West Germany, while he was searching photographically for asteroids. It was a 16th magnitude object in the constellation Hydra at that time. This discovery was exceptional because the comet was approximately five astronomical units from the Sun, in the vicinity of Jupiter's orbit. It gave astronomers an unprecedented opportunity to observe an incoming 'new' comet at a great distance. Unfortunately it also gave them an opportunity to make some poor guesses about how bright the comet might become.

Apparently the comet was very bright, considering its extreme distance at the time of discovery, so astronomers concluded it was large--some 10 to 20 miles in diameter--compared to about 5 miles for Halley's famous comet. Being larger, more material should boil off its surface when the comet heats as it approaches the sun. Early estimates of how bright Kohoutek might become around the time of perihelion, December 18, 1973, ranged from an optimistic -10th magnitude to a pessimistic -3. An article in Astronautics & Aeronautics suggested that the comet might become bright enough to be seen in broad daylight. Even Sky & Telescope noted in August 1973 that -10th magnitude was possible, and it might be visible in daylight. They also pointed out that -3 magnitude was a lower limit, but most of us hoped for a brilliant year-end display and tended to disregard the conservative end of the estimates.

The prospect that this comet might be more spectacular than the great apparition of Halley in 1910 brought forth a plethora of articles and promotions. A sort of 'comet fever', more intense in some respects than the one we've just experienced during the return of Comet Halley, ensued. The Buffalo Evening News ran a feature in its November 3, 1973 edition, the Museum of Science printed a booklet authoring by Ernst Both and Scientific American offered an article "The Nature of Comets" by Fred L. Whipple. Offsetting these, and many more, scientifically sound accounts, were hastily written and highly imaginative commentaries that were designed to entertain an interested, but sometimes poorly informed, public.

I inadvertently picked up one of these in paperback format "The Comet Kohoutek" by Joseph F. Goodavage. What I thought would be a treatise on Kohoutek's comet turned out to be a fantastic book of incredible events and prognostications of physical, social and political consequences that would follow the coming of the great comet. It was something right out of the middle ages, written in the exasperating style of soothsayers, who, by exposing an error or disagreement in scientific thinking, extrapolate it to discredit any scientific fact that contradicts the author's dogma. The author wrote of famine, earthquakes, tidal waves and upheaval, all attendant to the passage of Kohoutek. He spent much of his time straying from the topic of Comet Kohoutek discussing instead rains of salamanders, Venus as a former comet, and how microbes from Venus ate the emulsion off photographic plates at Cambridge Observatory! Books like these can be amusing, but they're a little frustrating too because there's no way to dispute their claims effectively. You can sense the author will casually dismiss your complaint, however well founded, by simply including you in the incredulous scientific community whose limited perception he has already discredited. How can you refute skillfully presented nonsense? Fortunately, my confidence in the good sense of most people when confronted with this kind of silliness leads me to think it provided most of them with as much amusement as it did me.

As Kohoutek approached the sun it failed to brighten enough to match the more optimistic of the early predictions, and reduced brightness estimates began to appear. In its October 1973 issue, Sky & Telescope warned its readers that the comet might not be as bright as expected and, in later numbers, reduced the magnitude range to between -4 and 0. They stated in December, "The development of Comet

tail, though impressive, has been slower than the most optimistic forecasts". The hope remained that the comet might still develop a 20 to 30 tail.

There were many plans for scientific observations. Ground-based studies were scheduled at Mount Baldy, Mount Palomar and Kitt Peak. Ultraviolet radiation is blocked by the atmosphere, so UV spectroscopic measurements were to be undertaken by the Orbiting Astronomical Observatory (OAO-3) to determine the chemical composition of the comet. The Orbiting Solar Observatory (OSO-7) would photograph it, and the Mariner spacecraft, soon to be launched toward Venus and Mercury, was to record solar wind effects. If Skylab 4 could be launched on schedule, astronauts would observe Kohoutek in visible light and in the ultraviolet.

And so the eagerly awaited moment of perihelion arrived. By late November the comet had become a dim naked-eye object with a 1/2 degree tail. The final brightness prediction for the time of perihelion was -0.6 magnitude--Kohoutek would be a fairly bright comet, as comets go. However, compared to the optimistic -10 magnitude and daylight visibility predicted a few months before, it would be a disappointment to astronomers, and especially to the public that anticipated a memorable display.

One of the first Earth-based observations after perihelion was made January 1, 1974. Kohoutek's tail was reported to be 3 degrees and its magnitude was estimated at -1.5. By January 5th the comet was judged to be +2.9 magnitude; it faded to 4.0 on the 8th, and by the 16th it had dropped to 5.4. Because of its proximity to the sun, the comet was poorly placed for observing until the second week of January. By the time it was convenient to search for it, Kohoutek was approaching the limit of naked-eye visibility.

The Skylab astronauts had the best view. With no atmosphere to reflect sunlight, they were able to recover Kohoutek on December 29th, one day after perihelion. To them it was "a very elegant and impressive sight". They noted that the comet brightened significantly as it neared the sun, but then faded rapidly as it receded. Its color was white as it approached, and yellowish as it departed. Their sketches show a 4 to 6 degree tail for several days around the time the comet passed the sun.

Using a 14-inch Schmidt camera at South Baldy, astronomers recorded a narrow gas tail that was 25 degrees long and a broader dust tail 10 degrees long. They also photographed a 0.5 degree antitail, pointing toward the sun. Other professional work identified chemicals in the emission spectrum of the comet, including cyanogen, methyl cyanide and water. The presence of water and dust was a strong confirmation of Fred Whipple's "dirty snowball" model of cometary structure. A halo of hydrogen was observed by sounding rockets and Mariner 10. Absorption lines in the comet's spectrum led to the identification of the hydroxyl radical.

The "comet of the century" was now heading back to the void which it came. Its orbit, indistinguishable from a parabola as the comet approached the sun, had closed to an ellipse due to planetary perturbations. It will return in roughly 75,000 years. Sky & Telescope described Kohoutek as "A Scientist's Comet". Perhaps it was; it certainly was not the public's comet and, unless one was dedicated and well organized, it wasn't particularly rewarding for an amateur astronomer either.

Today, Comet Halley is also something of a disappointment, but to a much lesser degree because its poor showing was predicted far in advance of its arrival. Occasionally we see advertisements for telescopes or a Southern Hemisphere trip that shows a 1910 photograph of Halley's Comet or hints at the kind of hype cited at the beginning of this article. But anyone still hoping for a great show from the comet this time around has either failed to read the literature or has engaged in extremely wishful thinking. It is our misfortune that our apparition of a great astronomical event is unfavorable and most of us won't get another shot at it.

Rowland A. Rupp

MEETING NOTICES

MARCH 14, 1986 MEETING - Will be held in the Roosevelt Room at the Buffalo Museum of Science, Humboldt Parkway, Buffalo beginning at 7:30 P.M. SHARP!! Our featured speaker will be Professor Philipp Kronberg from the University of Toronto, Department of Astronomy.

His topic will be the GALAXY M-82 - so lets all attend and offer a warm welcome to Professor Kronberg.....

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APRIL 11, 1986 MEETING - This meeting will be of special interest as it will feature a brand new presentation of the recent encounter of the Voyager Space Craft with the planet Uranus. It will be presented by either Ernst Both or Mary Lou Bebak from the Buffalo Museum of Science - both members of the B.A.A. This should be one you don't want to miss...

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MAY 9, 1986 DINNER MEETING - Our 2nd Annual Dinner Meeting will be held at the campus of Buffalo State College on Elmwood Avenue at 7 P.M.... At this point Tristan Dilapo and Debbie will probably be providing food and drink, and the exact location on the campus will be announced at a future meeting. Our speaker will be Dr. Mark Shure from the University of Rochester, who is doing infrared work with Comet Halley. Tickets will soon be available from Al Kolodziejczak, John Raymonda, or Claudia Bielinski. There will also be a College of Fellows Awards Ceremony.

REMEMBER -- the JUNE 13, 1986 MEETING will be our annual business meeting with elections of officers plus another HALLEY'S COMET presentation. It will be at the Museum of Science.

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* THE SPECTRUM *

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ED LINDBERG

KEN BIGGIE

ROWLAND RUPP

AL KOLODZIEJCZAK

RUTH CHISTY

JOHN RAYMONDA

Thank you all for the articles, observations, charts and drawings and for the help which comes from behind the scenes.

A SHORT EDITORIAL

I wish to express my need for more articles as well as observations and any short story anyone of the members of the B.A.A. may come forth with. It is necessary that I have these articles, otherwise no "SPECTRUM" can be published. I wish NOT to keep asking the same persons to respond to my requests as well as I do not wish to embarrass anyone who may think that they cannot write. I do know for a fact that there are many more of you who can write if you only put your mind to it....;

Darwin Christy, Editor

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