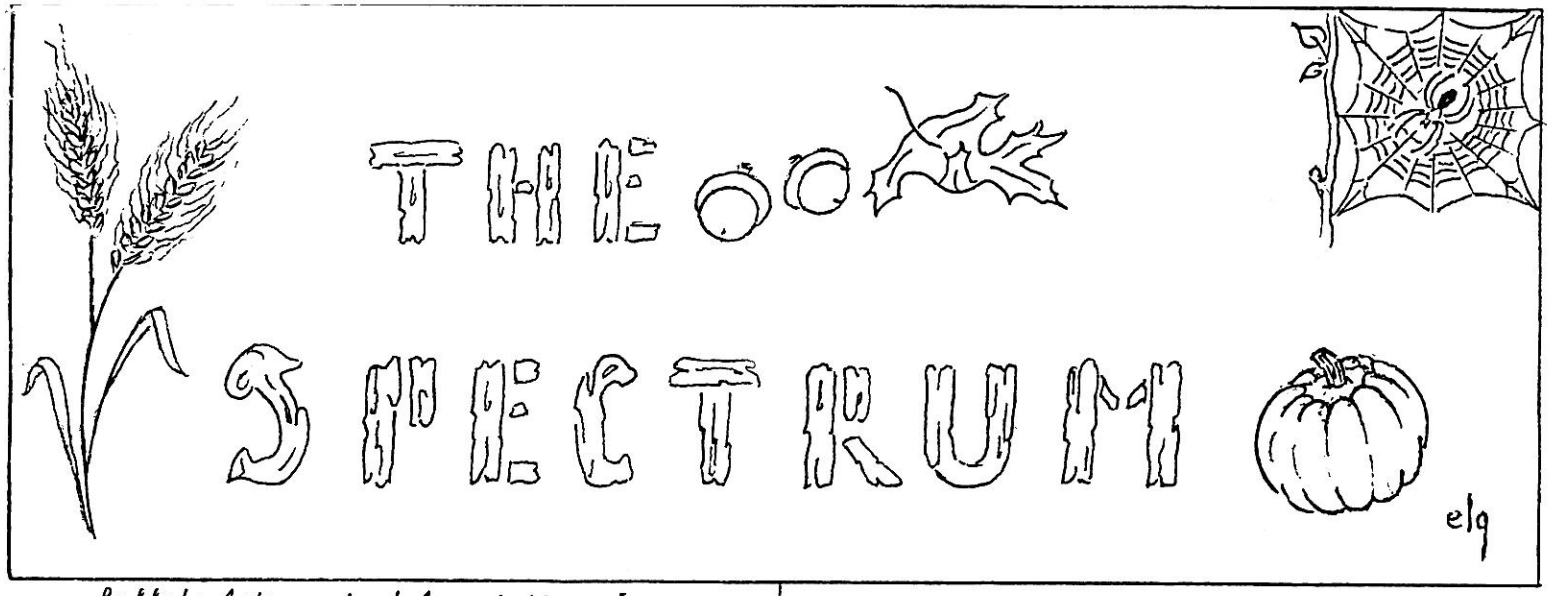
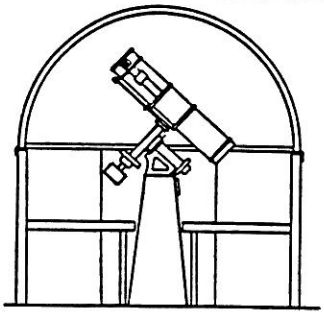


Buffalo Astronomical Association, Inc.
SEPTEMBER - 1992 - OCTOBER



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"SPECTRUM" DEADLINE

*The **deadline** for the November-December issue of the **"SPECTRUM"** is **no later** than October 9th. **REMEMBER!** This is your newsletter, articles are needed to keep this newsletetr alive and going!*

MEETING NOTICES

SEPTEMBER MEETING: Charlie Fassel from the Niagara Centre of the Royal Astronomical Society of Canada will speak on "NIAGARA CENTRE AT WORK, EH". Charlie was scheduled to speak in June but was side-tracked by illness. The meeting will be held in the auditorium of the Science building at Buffalo State College starting at 7:30 PM. Donuts, coffee and a social hour will follow the meeting.

OCTOBER MEETING: Dr. David Meisel of the Department of Physics and Astronomy at SUNY Geneseo will speak on CCDs. This is especially important to us because we have a plan to add CCD equipment to Beaver Meadow Observatory once we have purchased and installed the new 20-inch telescope.

NFCAAA --- Fall Meeting

The regular fall meeting of the Niagara Frontier Council of Amateur Astronomical Associations will be held in our club meeting area at Buffalo State on Saturday, November 7th 1992.

Invitations with registration forms will be passed out at our September and October meetings. For more information about the NFCAAA, call Dave Fliss at 824 6457 or Ed Lindberg at 633 6725. Help is needed to make it a success.

PRESIDENTS CORNER

Welcome to the 1992 fall session. These are exciting times for amateur astronomers! Involvement in this hobby can be very gratifying. We all want to make the most of our time; certainly enjoying ourselves and come away from a meeting, a book or an observing session with pleasant memories. Those amateurs who do research and contribute to astronomy should be encouraged and applauded but most folks are in astronomy simply because they enjoy it. I've gone to enough meetings at different clubs and conventions to see that most people are content to be celestial tourists using occasional time that their schedules allow. "Serious" astronomy is a small part of amateur astronomy and has limited appeal. Let's respect everyone's interests and keep astronomy an entertaining pastime.

MEMBER SURVEY

In this light how can a club do it, satisfy the individual's needs and expectations? Fortunately the club members have the answers! The problem is finding them. I propose a small group get together and draw up a membership survey to find out who we are, what we want and how the club can help fulfill expectations. Meeting programs are set through the end of the year. I would like this survey drawn up, sent out and analyzed by mid-October to help the board shape next year's meeting agendas and special events calendar. Call me (664-0841) if you'd like to help. Welcome aboard and help form a balance to foster growth and interest for all parts of the member spectrum!

INNOVATION

Let's face it, most people have a curiosity about astronomy that can be easily disenchanted. Any level of participation takes dedication and those that make the effort should be congratulated. One reason that people join clubs is that the club has resources. The proposed 20" scope allows better viewing than most people have access to. A CCD system will yield even better viewing than visually with the same scope. Visible detail is mind boggling and research possibilities are extended. Possibly the largest advantages of CCD use is in public nights and the ability of using and sharing images for those that do not have access to a good sky or for cloudy conditions or for those that have access to a computer (for example the club machine). One need not have to be up at 3am on a cold night to view a certain object or event if it has been stored on disk by others.

Better equipment is available to make observational astronomy easier and more enjoyable. This club should move forward for the benefit of all.

Bill Smith

A BUYER'S GUIDE TO AFFORDABLE TELESCOPES

Looking through any recent issue of Sky & Telescope or Astronomy, the prospective buyer of an affordable telescope is bombarded with enticing advertisements that promise the perfect instrument for every purpose and pocketbook. Refractors, reflectors, Schmidt-Cassegainians, and some exotic hybrids that all claim superiority in one way or another add to the confusion.

What then is the right telescope for the novice astronomer, the apartment dweller with limited storage space, and the amateur on a tight budget (and who isn't)?

The obvious consideration of price aside, a number important factors should be taken into account. For what purpose is the 'scope to be used: casual exploration of the night sky? Lunar and planetary observation? Tracking down elusive and challenging deep sky objects? Astrophotography? Each type of telescope has its own set of built-in advantages and shortcomings. Refractors generally yield the sharpest lunar, planetary, and double star images, but they tend to be very expensive in apertures of more than 4 inches. Reflectors, especially in their "low-tech" Dobsonian form, provide a great aperture-to-cost ratio for the deep-sky observer who is looking for maximum light grasp. The ubiquitous Celestron and Meade Schmidt-Cassegrainians are superior all-purpose 'scopes that offer good optics, portability, and astrophotographic capability.

Many amateurs, especially beginners, are lured by the promise of gadget-ladden, computerized sophistication in their quest for astronomical Nirvana. But the cost is high and the complexity of the equipment so great that the effort in setting up doesn't justify the results. It seems much better to start with a relatively simple, low-cost telescope and upgrade later if interest warrants.

Several basic rules of thumb should be taken into account when considering a telescope:

1. Bigger aperture means better views
2. TOO big (and heavy) means the 'scope will almost never be used
3. Simple is better than complicated
4. Good optical and mechanical quality is essential

Each individual should consider his or her needs, portability requirements, and observing location before committing to a particular instrument. Can the telescope be left fully assembled in a garage? Can it be easily broken down for transport to a dark sky location? Is it maintenance free? Does it allow for convenient and comfortable seated or standing observing? Thinking in advance about these factors will just about insure getting the right 'scope for your own unique situation.

Fortunately, at this time (August 1992), we are blessed with an abundance of reasonably-priced, good quality telescopes. Competition between manufacturers is fierce, and dealers are cutting prices to combat the current recession.

I've tried here to list the best available telescope buys by price category along with the a brief description of the strong and weak points of each instrument. Much of this data comes from my own personal experience looking at and through these 'scopes or from a first-hand report of someone who owns one. In a few cases, the manufacturer's reputation has served as a guide. A listing of recommended dealers will be found at the end of the article.

UNDER $75

Bad news here. The inexpensive department store refractors are almost always of poor quality: the optics will not provide a sharp, pleasing image, and the mount is generally a toy-like contraption. At times, a used telescope of higher quality might be picked up in this price range at a garage sale, but the best new choice would be a pair of 7x50 or 10x50 binoculars. Bausch and Lomb and Jason make some good units in this range, but they should always be tested at the store before purchase.

$75 - $175

Celestron C60 - A 2.4" altazimuth refractor with good optics and a reasonable mount. Japanese standard .965" eyepieces are marginal and could be upgraded later. Probably the least expensive 'scope that wouldn't shatter the enthusiasm of a beginner. $118 + shipping. Wholesale Optics (address listed below).

Orion Televista 60mm refractor - Similar to the Celestron, but with better optics and mount, two good eyepiece-

$169 + shipping. From Orion Telescope Center (address below)

Please note: Avoid these small refractors with equatorial mounts; they are a nightmare of cables, locks, and needless complexity.

$175 - $300

Vixen 4.5" equatorial reflector - Vixen telescopes are made in Japan and imported by Celestron. This 4.5" features good optics, a nicely made mount and 2 fairly decent .965" eyepieces. A 6x30 finder is included. A genuine bargain at $289 + shipping from Wholesale Optics.

Edmund Astroscan - The Astroscan is a highly portable, short-focus 4.125" Newtonian reflector with sealed-in optics and a unique ball-shaped tube that rides on a metal base for pointing and tracking. The peepsight finder is difficult to use, but the wide field of view makes for the easy locating of objects. This 'scope gives good low and medium power views, but is mediocre for planetary observing. Higher power eyepieces are an extra-cost option. $287 + shipping from Wholesale Optics.

$300 - $500

Celestron C4.5 - This is a high-quality equatorial reflector with a superb mount. Optics are first-rate, and the mount is by far the most stable in its price range. One low-power standard 1.25" eyepiece is included, and a clock drive can be added at any time. A great 'scope for a beginner. $398 + shipping from Wholesale Optics.

Coulter 10" compact Dobsonian reflector - An incredible amount of aperture for the money. An f/4.5 reflector on a painted flakeboard mount, it's a bit crude and very heavy (65#), but the optics are surprisingly good. One low-power eyepiece is included but a finderscope is not. This is a deep-sky telescope that does not do particularly well on the planets or double stars. Shipping costs from the California factory are very high, and delivery may take 4 months or more. $345 from Coulter Optical Co.

Vixen 90mm refractor - A quality 3.5" refractor on a

good altazimuth mount, this Japanese import is a bargain for the lunar and planetary observer. Three .965" eyepieces and a finder are included. $430 from Wholesale Optics.

$500 - $700

Meade 2045D Schmidt-Cassegrainian - a super portable catadioptric that weighs only 13 lbs., this 'scope has a sturdy, compact fork mount, a battery-powered clock drive and tabletop mini legs to tilt it into its equatorial mode. A low-power eyepiece and star diagonal are included, but a carrying case is optional. Optics are quite good, perhaps equivalent to a good 80mm refractor in performance. $545 + ship. from Wholesale Optics.

Meade Starfinder 8" - This 8", f/6, equatorially mounted Newtonian with clock drive is a very capable, high-resolution lunar and planetary 'scope with enough aperture for outstanding deep-sky views. Setting circles, a finder, and one eyepiece are included. The drive is good enough to allow limited short-exposure astrophotography. A tremendous value for the money, but heavy and awkward (72#). $650 + $60 shipping from Astronomics.

Coulter Odyssey 13.1" - A large Dobsonian similar to Coulter's 10" that offers simplicity and tremendous light grasp. Needs a finder. Weight is slightly over 100 lbs., making one-person set-up a bit difficult. Delivery times may exceed six months. Shipping is expensive. $545 from Coulter Optical Co.

$700 - $1000

Celestron SuperPolaris C8 - This lowest priced 8" Schmidt-Cass may be the best optically. Celestrons, on the whole, seem to have slightly better optics than their Meade counterparts. At least they are consistently good. They also tend to hold their optical alignment better. Performance on the moon and planets is very satisfying, but image quality falls short of that of a sophisticated (and expensive) 6" apochromatic refractor. The neat German equatorial mount on this 'scope is well-finished and sturdy. Optional AC or DC drives permit astrophotography.

At 45 lbs., the SPC 8 is quite portable and therefore encourages frequent use. An excellent value at about $895 + shipping from Wholesale Optics.

Meade Starfinder 10" - Using the same mount as the 8" Meade, this f/4.5 unit is ideal for the deep-sky fanatic. Planetary views are fair but not outstanding. Weight of approximately 75# makes it a bear to set up and transport. $750 + $75 shipping from Astronomics.

Celestron SPC 102 Refractor - This 4", f/10 achromatic refractor utilizes the same mount as the SPC 8 Schmidt-Cass. This is a fine 'scope for the lunar and planetary observer who needs portability and observes under sub-standard skies. Light grasp is not impressive, but image quality is. $895 + shipping from Wholesale Optics.

$1000 - $1500

Meade 2080 and Celestron Classic 8 - These are the original fork-mounted 8" Schmidt-Cass's that started a revolution in amateur astronomy. Optics are very good, mounts extremely stable, and long-exposure astrophotography is possible with the appropriate accessories. Weights are reasonable at about 45 lbs., so portability is good. The AC clock drives track well. The choice of Celestron or Meade is really a toss-up; prices are just about the same. Price: about $1100-1200 from Wholesale Optics or Astronomics.

Coulter Odyssey 17.5 - 200 lbs. of killer Dobsonian reflector, this is the way to go for extraordinary deep-sky views. Delivery times may range to a full year, and the shipping costs are frightful, so buying just the mirror and building the 'scope yourself might be considered. Something this size needs two average people or one Schwarzenegger to set up and transport. $1150 + shipping from Coulter.

Meade 2120B - A larger version of the Meade 8" Schmidt-Cass, this 10" is a real value. Its chief drawback is the 75 lbs. of awkward, top-heavy weight. Still, this is a very capable unit for all types of observing and astrophotography. $1449 + shipping from Astronomics.

Hopefully, this listing of "best buys" will cut through some of the advertising hype that often clouds a prospective buyer's judgment. Shopping for a good telescope retailer is also a tricky proposition, but those listed below have proven to be, at least in my experience, reputable and competitive in price and service. By all means, peruse the ads in Sky & Telescope and Astronomy, make some inquiries about price and delivery time, and get the best deal possible. Be sure especially to determine shipping charges and what basic accessories are included with the 'scope. If you can, find someone who owns an identical or similar instrument to see if it fits your requirements.

Finally, remember that a convenient-to-use telescope is one that you WILL use. Happy hunting!

Dealers and Manufacturers

Astronomics
2401 Tee Circle, Suites 105/106
Norman, OK 73069 ph. (800) 422-7876

Coulter Optical Company
P.O. Box K
Idyllwild, CA 92349 ph. (714) 659-4621

Orion Telescope Center
2450 17th Ave., P.O. Box 1158
Santa Cruz, CA 95061 ph. (800) 447-1001

Wholesale Optics (Pauli's)
29 Kingswood Rd.
Danbury, CT 06811 ph. (203) 746-3579

Larry Carlino

SPY and TELL

Rowland Rupp will be speaking at the Buffalo Audubon Society meeting on October 7th. He will speak on the constellations and on the Beaver Meadow Observatory.

The Planet Observer's Handbook, a new book written by Fred Price, will probably be published sometime next year. Fred has used three or four of Gene Witkowski's excellent photographs in the work. John Westfall has reviewed the book with a "fine tooth comb," and has found that everything is OK. Westfall has also written the forward to Fred's book.

Dave Bull went to Toronto for the company on June 25th to make a commercial for a client involving the filming of a seven year old Bengal tiger. During the filming, Dave was placed behind the trainer and his assistant. Throughout the session, a great deal of time was spent in waiting for the cat to wake up from dozing. After the filming, Dave and Dave's assistant were given the exciting opportunity of having their picture taken with the tiger.

Ken Biggie will be working this year as a substitute teacher in the public schools, teaching any subject, K through high school and BOCES.

Jack Empson suffered a minor fracture in his little finger on his right hand while playing volleyball, which can produce unexpected injuries. Sports activities included white water rafting for 10 miles in $4\frac{1}{2}$ hours on the Black River near Watertown.

Jack Mack painted his house during the summer uncovering a colony of troublesome carpenter ants.

The Macks are enjoying the company of an exchange student from Germany who will be living with them for a year.

Bob Hughes and Jack Empson are working part time on security at Rich Stadium where they patrol on the job for rock concerts and the Bills' games.

In the spring issue of UB Today, Olga Lindberg, B.A. 1930, was cited for her writings on Niagara Frontier history, which include Buffalo in the Gilded Age and Family Life in Early Buffalo, both of which may be obtained at the Buffalo and Erie County Historical Society. Olga has been a member of the National League of American Pen Women for many years. She is also a member of the Bowmansville Garden Club, and has belonged to the American Association of University Women for more than fifty years.

In the same issue of UB Today, an article on Gil Brink appeared. According to theories put forth by physicists, "something about the way the universe is expanding is going terribly awry," and researchers are striving to "fix" those theories, by working in their labs endeavoring to simulate some of the chemicals found in outer space. Gil Brink who teaches physics and astronomy at UB, is one of the researchers. He is making a simulated resemblance of "the outer envelope of a red giant star ... using a device that creates an arc between two carbon electrodes encased in a water-cooled copper shell." The simulation is in reality a search for the origin of "dark matter," which may provide a new concept of the universe and its future.

Kevin Biggie is a senior at Carnegie-Mellon University. He spent six weeks during the summer at OCS (Officer Candidate School) at Quantico, Virginia. After graduation, he will go into the Marine Corps for four years.

For those of you who remember Sheridan Simon, a BAA member in the 60s, he is the author of a biography of Stephen Hawking, published in February 1991.

Edith L. Geiger

ASTRONOMICAL HAPPENINGS

SEPTEMBER

1) Beta Lacertid meteor shower
   Aurigid meteor shower
2) Conjunction - Mercury & Regulus
3) FIRST QUARTER MOON
6) Conjunction - Uranus & Moon
   Conjunction - Neptune & Moon, and will appear as an occultation from North Africa, the British Isles and throughout the Mediterranean.
8) Conjucntion - Saturn & Moon
9) Moon at apogee (406,079 km)
11) FULL (HARVEST) MOON
    Epsilon Perseid meteor shower

14) Mercury at supoerior conjucntion
16) Veres stationary
17) Conjunction - Jupiter & Sun
19) Conjunction - Venus & Spica
LAST QUARTER MOON
20) Conjunction - Mars & Moon, also it will be seen as an occultation from SW Atlantic Ocean on the extreme tip of Antarctica Peninsula
Southern Piscid meteor shower
22) Uranus stationary
EQUINOX - the Sun will cross the equator near 1:43 PM EST.
24) Moon at perigee (359,928 km)
26) NEW MOON
27) Neptune Stationary
28) Conjucntion - Venus & Moon
29) Sextantid meteor shower

OCTOBER

2) Conjunction - Mercury & Spica
Quadrantid meteor shower
3) Conjunction - Uranus & Moon
Conjunction - Neptune & Moon, which will also be visible in NW Canada as an occultation
FIRST QUARTER MOON
Andromedes meteor shower
6) Conjunction - Saturn & Moon
7) Moon at apogee (405,298 km)
8) Giacobini-Zinner meteor shower
9) Draconid meteor shower
11) FULL (HUNTERS'S) MOON
12) Northern Piscid meteor shower
15) Saturn statioanry
17) Albert Einstein arrived in America, 1933
Epsilon Arietid meteor shower
18) Conjunction - Mars & Moon
19) LAST QUARTER MOON
Epsilon Geminid meteor shower
21) Orionid meteor shower
23) Moon at perigee (364,778 km)
Conjunction - Mercury & Moon, from the east coast of North America we will observe an occultation
Conjunction - Venus & Antares
28) Conjucntion - Venus & Moon, another occultation visible from the Northern Coast of South America across the Atlantic through central Africa
31) Conjunction - Uranus & Moon
Conjunction - Neptune & Moon
Mercury at greatest elomgation, east 24 d.

METEOR SHOWERS

KAPPA AQUARIDS - On September 21st these little known meteors can be seen from radiant 22h 32m RA at -05 d. It is an irregular shower lasting about 17 days. What is known is that they are white and are of 4th magnitude. Their trajectory is not rerally known and the count is somewhat variable. Perhaps some of you might want to try to locate and record any that you might find.

SOUTHERN PISCIDS - Being an insignificant shower, you could, perhaps, have fun looking towards the radiant 00h 48m RA at +21 d on the 20th of September. Lasting 12 days, they are irregular, 4th magnitude, reddish meteors. MIGHT BE WORTH A TRY!

NORTHERN PISCIDS - On October 12th ffrom radiant 01h 44m RA at +14 d.are these not-so-well-known meteors. They last 25 days, are irregular, 4th magnitude meteors of a yellowish hue. They are a part of the Southern Piscids but their colours are what separates them from one another. ENJOY!

EPSILON ARIETIDS - On the 17th of October is what could be another little known shower. From the area of 02h 48m RA at +21 d. are these reddish, 4th magnitude meteors. They last about 12 days in all. Hopefully you can locate them and record how many you can find.

Darwin Christy

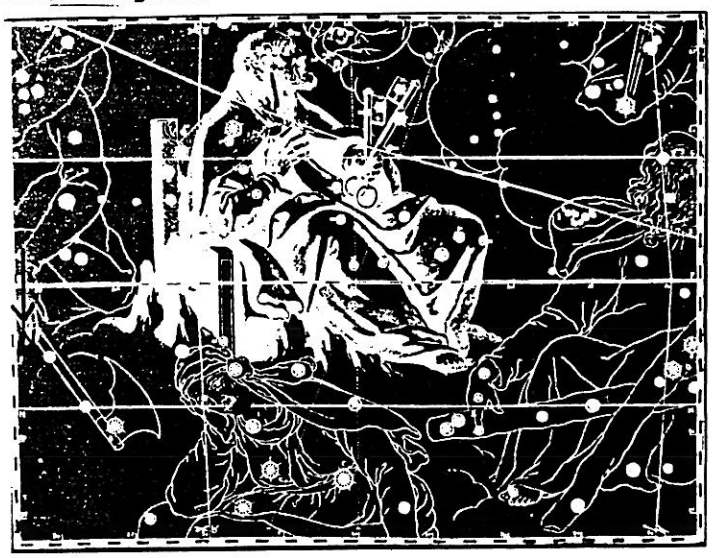
ANCIENT CONSTELLATION

ST. PETER

St.Peter was one of the first to be recognized as a constellation taken from the Bible. Julius Shiller created this constellation, proposing, that the southern constellations be named after the books from the Old Testament. The northern constellations be named, **not** for the books of the Bible, but for the Saints mentioned therein.

English writers, including Chaucer, from the 14th through the 17th centuries, Angelicized Aries, entitling it **Ariete**. During those centuries, the astronomers of that era, decided that the reconstruction of the known constellations should be made to represent names within Biblical lines.

Caesius considered that the Lamb was sacrificed on Calvary for all mankind who had sinned. It was said that Aries represented Abraham's **Ram** which was caught in a thicket. Therefore, having been sacrificed, an opening in the heavens gave way for a new constellation. So-- to fill the space left by the Ram, the Bishop of the early Church, propsed that St. Peter would be given the honor to be placed as a new constellation, having with him as his **Mitre**, Triangulum.



St. Peter was, and is now considered to keeper of the Pearly Gates, and holds the keys to the Heavens, so often refered to, in Biblical language. Many other constellations were also changed into Biblical figures, but, of course, none remain as such in modern astronomy, nor even in the Great Book are they to be found.

The figure accompanying this article is from a plate on Basil Brown's Astronomical Atlas. It shows the stars of Aries and Triangulum, although not in their respective places. South being up, showing Andromeda at the bottom and with the Plieades near the right knee of St. Peter. Notice the line of the Zodiac in respect to the Plieades.

Darwin Christy

BAA ANNALS

5 YEARS AGO - We heard from Raymond Rusk a Ph.D. candidate from the University of Toronto at our first meeting of the 1987/1988 season. His topic dealt with extragalactic sources of jet emissions - like quasars and HL Lacerta objects. Who spoke in October? The SPECTRUM doesn't tell; we had a problem confirming a speaker apparently.

The SPECTRUM had several interesting articles. One by Karyn Bennett (Hamilton Centre) was on ancient Egyptian astronomy. Ralph Dakin (Rochester) wrote on "Matching a Binocular to Your Eyes". Another article, this one by Leslie Martin, traced the development of theories explaining the source of sunshine. Carl Milazzo wrote on "Active Galactic Nuclei", just in time for the September meeting.

Carl and Fred Price contributed observation reports, and Observatory Director John Yerger wrote on activities at Beaver Meadow. Newly elected Board Members At-Large were Edith Geiger, Bob Hughes and Gene Witkowski. On a sadder note, Bob Mayer's obituary appeared.

10 YEARS AGO – In September 1982 long-time BAA member Larry Hazel spoke on "Astrophotograpy with a Surplus Lens". In October Charlie Fassel (Niagara Centre) spoke on the history and possible future of space exploration, including colonization.

SPECTRUM articles included a contribution by Ed Lindberg on "The Eye as an Instrument" and another from Masahiro Yamaguchi (Tokyo) on the brightness of the moon when totally eclipsed. Edith Geiger's profile was of John Riggs, our Observatory Director at that time. His observatory report appeared also.

We had a new set of officers: President Rowland Rupp, Vice-President Ken Biggie, Secretary Ken Kimble, Treasurer Edith Geiger. Darwin Christy, Carl Milazzo and Rowland Rupp contributed observation reports. We had BAA Annals then too; Ken Kimble wrote them.

15 YEARS AGO – Fred Price, then President of the BAA, and Larry Carlino gave a joint presentation in September on "Recent Visual Observations of Jupiter". Both are excellent planetary observers. Who spoke in October? Once again the SPECTRUM doesn't say. Apparently October is an "iffy" month!

Things were changing for the BAA in 1977. In the preceding year we started meeting at Buffalo State instead of the Museum of Science. There was some debate about what to do in the future. Eventually we compromised and met at Buffalo State in the fall and at the museum in the spring. Ernst Both resigned from his long-time positions as our editor and Museum Representative to the Board. Edith Geiger's "Thank You" in this 1977 issue of the SPECTRUM highlights his service to the BAA. He was replaced as editor by Larry Carlino, and as Museum Representative by Jack Mack who still holds that post.

25 YEARS AGO – Changes were taking place in 1967 too. Dick Zygmunt had just resigned as SPECTRUM editor and Bruce Cook took over. Our September speaker was Walter Semerau, who spoke on "The Sun in Action". Walter was a BAA member nationally known for his solar work. Edith Geiger had a profile for him in that issue.

In October George Keene spoke on "Close-up Photography of the Moon". He was a very active member of the Rochester club and a noted astrophotographer. Fred Price had on article in the October SPECTRUM on his early lunar observations. Dick Zygmunt wrote about the observatory he built for Camp Sprucelands in Java Center, and Darwin Christy explained how to groove a pitch lap.

Rowland A. Rupp

STAR PARTIES

They are a time for sharing things astronomical and socializing. Neighborliness and good conversation are standard fare - good therapy for the psyche.

Larry Carlino's party has some nice viewing even though it was raining elsewhere. In particular, Joe Drabek left home on his motorcycle in nice weather, rode thru downpours in the Tonawandas and dried out under improving skies at Larry's. Conditions improved steadily as many objects were viewed then reviewed through a 22" Dob and a 6" Starfire refractor. The refractor showed stars as chiseled pinpricks - what a fine instrument! On steady nights this is the way to view planetary detail. Many Messier objects, the Veil nebula and some interesting double and multiple stars were seen. Perhaps 20-25 people came, viewed objects and reviewed goings-on of things astronomical, political and plain down-to-Earth.

Six folks came down from Buffalo to our Jamestown party in the clouds and rain but we still saw about 60 deep sky objects on the big monitor at Ron Kohl's automated 20" CCD scope. Okay-they were stored on disk from exposures taken in good conditions. The detail on the galaxies and nebulae was on par with all but the best published images from the major professional observatories. Seeing them on an 18" monitor was truly awesome. The brightness and richness off the screen exceeds that possible in print form. We plan to have a return visit for those folks interested. Back at home the clouds parted enough to see M27, M57 and M13 in binoculars.

I didn't get to Bill Halpert's or Rowland's. I heard they went well. Dan Marcus's is at press time.

Bill Smith

INSTRUMENT NOTES

When Leon Foulcault brought out his revolutionary new method of testing telescope mirrors, he specified the use of a pinhole light source, representing an **artificial star.** He did not specify the pinhole size. It was later found that the optimum pinhole size varies with different observer's eyes. If the pinhole is too small there are excessive diffraction effects. If it is too large the desired shadow contrast is too low.

The way diffraction interfers with our testing procedure is more understandable if we consider the nature of the medium that the light has to traverse. We consider that the air in our room is clean. But– if we happen to see a beam of sunlight enter a darkened room we notice a profusion of tiny dust particles. The same, or at least a similar condition, is found within our eye ball. The fluid seems clear but it actually contains many tiny particles. They usually cause no trouble, in fact we are not even aware of them.

When a narrow but intense beam of light enters the eye, diffraction effects are produced. This could be the returning beam from the mirror under test. With certain very small sizes of pinhole, there sometimes appear tiny cones on the surface of the mirror. If these are diffraction effects, they will move when the eye moves. If they do not move the indication is incomplete mirror polishing.

If the pinhole is made larger the diffraction effects are reduced, but the shadow contrast is reduced. Some ingenious worker of quite a few years ago found that if a slit was substituted for the pinhole the test could be equally well done. This not only gave a bright image but also allowed for making a slit of adjustable width. By using two razor blade straight edges, the slit could be made wide for initial adjustments and then narrowed to any desired width until a good contrast was obtained.

A still further refinement came when some unharolded genious announced the **"phantom slit"**. Here, only one straight edge is used. The reflected image of the one straight edge forms the other side of the slit. When the straight edge is moved to change the width of the slit, the image moves reciprocally. It is easy to set the slit at a wide value for the initial adjustment. It can then be narrowed as desired.

The idea of zonal testing is not new. But, Wally Everest introduced in ATM's a simplification in the 40's. A thin wooden slat is mounted across the center of the mirror. In the slat are mounted twenty nails or thin sticks, ten on each side of center. The pins divide the mirror surface into ten rings of equal area. As the entering shadow approaches a pin on the left, the departing shadow leaves the area on the right. When the micrometric adjustment of the mirror radius is read it is recorded for each zone. The result will be a curve of mirror radius versus the distance of the zone from the center of the mirror. This is compared with the calculated curve for a perfect paraboloid. The error for any zone can be expressed in wavelengths of light. It is a very tedious procedure but it is a very good indication of the mirror correction. This test makes Foulault's invention seem all the more remarkable.

Ed Lindberg

BEAVER MEADOW OBSERVATORY *457-3104*

Summer finally washed away☹! In spite of all the rain and clouds we had a exceptional summer at the Observatory. The night of August 1 was the **BEST** night I've seen in over a year. The skies were exceptionally clear, and there was virtually no dew. We had the pleasure of observing many meteors that night, along with Uranus and Neptune. Bruce and Joel are getting pretty good with the new setting circles, so you might show up some night and see how they work. In case you haven't heard, Bruce redrew the circles on his computer printer! I would like to thank Larry Carlino, Bill Smith, Bill Halbert, and Irene (and Rowland) Rupp for having **STAR PARTIES** this summer. You only have to try planning a party once where you can get any where from 0 to 40 people showing up, depending on the weather. Of course the Weather Man was no help, he couldn't figure out the weather either.

Observatory Schedule:
September 5: Public Night. I need 2 rain or shine volunteers.
September 19 & 20: Beaver Meadows Trash and Treasure Sale, and as usual We need people to bring Computers, telescopes, pictures, and show the public our observatory. Saturday is from 10am to 5pm followed by Public Night dusk till 10pm. Sunday is from 1pm to 5 pm. Come join in on the fun.

☞**September 19:** From 5pm till dusk, there will be a meeting at the Observatory to get Ideas on how to improve the Observatory. All Ideas will be considered. We need to get a handle on what sort of improvements we require before going after a grant. Before we apply, we had better get our act together, if we expect to accomplish anything.
October 3: Public Night dusk till 10pm, still looking for volunteers.
October 17: Last Official Public Night of the Year. Come Early to check out the fall foliage.

Attention all Observatory Users: The combination will be changed during November's public weekend. Only those who have paid their dues will get the new combination.

Computer: We are still hot on the trail of the of an IBM computer. I have made the suggestion of purchasing a high resolution monitor, and video card. The cost will be around $400. We could use some cash contributions towards this purchase. If I can get a donation of $20 from at least 10 or more members, I am sure we can convince the Board to make the purchase. Oh yes what can you do with a computer? Come to the September Trash and Treasure Weekend, and we will be glad to show you the Shareware Programs we sell, as well as some commercial versions. We will also be demonstrating what you can do with a ST-4 CCD camera.

Dan Marcus

OBSERVATION NOTES: JUNE & JULY 92

The spring and summer skies were still affected by the Pinetubo volcano causing hazy and brighter skies. While we couldn't see as deep as usual and extended objects were less extended, there were still some good nights (even July!) and plenty of objects worth viewing. Perhaps the volcano did us a favor by making us shift our viewing habits to a wider range of objects.

COMET SHOEMAKER-LEVY

Around May thru mid-August this comet traversed the sky from Cassiopeia thru the Big Dipper and on to Virgo. A June 3rd attempt (40 degree altitude @ 4:30AM) picked up nothing although I did see 11th mag M76 near the predicted position. A July 6 try (30 degree altitude @ 11:30PM) was successful; it was easily seen in 16x80 binoculars making a narrow triangle with M81 and M82 galaxies. Seeing it with other objects in the same field of view really enhances the image! It looked about half the size of M82 and midway in brightness between the galaxies; thus I'd say it was mag 7.5. In a 10" scope at 44 to 210x it looked quite round with the nucleus a bit off center. The nucleus was starlike and looked certainly smaller than the core of M81. No tail was seen and an UHC filter did not help at 210x perhaps as the object was quite extended in the field and the field was already rather dark at that magnification.
TIP: Moving objects like comets are easier to find when they go near brighter stars or better known objects. See the map in Sky and Tel June 92 p706 and check the comet's location on June 13, July 7 and July 11. Of course it has to be clear sky!

The comet moved but appeared the same two days later. I next saw it on July 21 in the 16x80 binos and it looked dimmer than before. Compared to the Whirlpool galaxy, M51, it looked a third as large but brighter.

PARTIAL LUNAR ECLIPSE, JUNE 14

This fine partial eclipse covered 69% of the Moon. I watched it sporadically for 2 hours from the late penumbral starting phase thru mid-eclipse. The cat and mouse game between the Moon and clouds was fascinating in itself. The best part for me was the transition between the phases where the penumbral shading gave way to the much darker and more sharp-edged umbral stage. I mainly just looked without any instrument but also used 16x80 binos to spot a few shadow covered craters. No star occultations were attempted nor seen.

NGC 4361

This large planetary nebula in Corvus is easily found and has tantalizing texture that deserves time and scrutiny to pick out.

MILKY WAY

The rains of mid July subsided on July 21st to yield the cleanest skies I've seen this year. The Cygnus Milky Way was brilliant overhead. This misty ribbon was tattered in places where many dark clouds obscured the background stars. On a night like this some of the best observing is just reclining in a chair and watching the sky. It is a good time to reaquaint oneself with the constellations and just be a star-peeker. The whorls, knots and looping arcs of stars form unending patters to behold. The Scutum-Sagittarius region is in my darkest sky and was so bright that when returning to view Cygnus I had to let my eyes expand and adjust to the "darker" Milky Way. I was content to scan this Main Street of the Heavens with just naked eye and binoculars - no scope! Binoculars allow a clearer view yet stay in keeping with the wide view of the naked eye. Smudges to the eye turn into star clusters- diamonds showered on black velvet. A slow moving meteor as bright as Venus was seen near midnight.

With a chair and binos as equipment -no maps- I had to rely on memory and random scanning to find objects. Many Messier objects can be seen with surprising detail: gas nebulae M8, M17 and M20; planetary nebula as M27 and M57 (a very tiny disc in binos); globular clusters as M13, M92, M4, M22 and M28 were easy, and M56, M70, M54 and M69 appeared with a little scrutiny. Scanning back to Comet Levy in the brighter north sky I picked up the Dipper Messiers M101, M81 and M82 easily but M108 and M97 were quite difficult and M109 not seen at all. CJ our Appaloosa horse came by (I observe from the horse pasture) and gave me a nudge from behind to remind me to say "enough straining the eyes on objects - just sit back and gaze (or it is graze?) at the sky". When a thousand-pounder gives advice, I listen.

GLOBULAR COUNTRY

Starting at 11:30, I spent two hours on July 27 viewing objects in Sagittarius under good skies. The overhead Milky Way was a step under the July 21 night so this time the 10" came out and I viewed from the front yard where the southern stars play hide and seek with the trees. After a futile 20 minute search for comet Levy in the hazy western sky I went southbound into globular country. The 16x80 binos easily picked up 14 area Messier objects. Notable were the nebulae M16, M17, M20 and M8. Starfields were splendid with many colorful stars sprinkled about.

The 10" got to view the Messiers as well and brought out the sparkle in M11, details in the gas nebulae and resolution in globular M22 and edges of M28 and M70. Other globular were essentially glows varying in size and concentration.

Look at Sky Atlas 2000 and note there are many objects near bright stars.
TIP: To maximize viewing time look for objects near stars you can easily find and don't wander all over but stay in a small area of the sky.
5 Messier and 7 NGC globular, 4 NGC open clusters and 3 NGC planetaries were found by this technique. Notable was the open cluster NGC 6568 easily found south of Mu Sagittarius. It has a bright ring of stars that form a perfect Corona Borealis in it. Just east is NGC 6583, a much fainter open cluster. Use the "object near bright star TIP" to find M28 and NGCs 6638 and 6644 near Lambda; NGCs

6642 and 6629 near M22; the globular pair NGCs 6528 and 6522 near Gamma; NGC 6624 near Delta; 6407 near M11 and NGCs 6544 and 6553 just south of M8. Some of these are small and faint. For NGC 6644 I moved an O-III filter in and out between eyepiece and eye (blinking technique) to pick out this tiny (3" arc) planetary. This is the first time I saw the two globular near M8 which leads to the next observing **TIP: For objects you routinely find by memory, check an atlas once in a while to find other objects, usually smaller and fainter, nearby.** You'll naturally pass these by otherwise while looking at the showpiece.

Bob Titran told me of a real pretty double star (Gamma) at the tip of Delphinus. He saw it in his 4" reflector. Gamma Delphinus is a stunning, easy double! There is another 3 magnitude fainter in the same field. A super double pair worth viewing. Thanks, Bob! 3 degrees away was the globular NGC 7006, a diminutive glow. Have others seen this or other objects in this neglected constellation?

Before packup it was nice to view some large, bright objects high off the horizon: M15, M13 with NGC 6207, the colorful double Alpha Hercules and the Ring nebula, M57, provided the final pleasing touch.

Bill Smith

ASTRONOMER from the PAST

Sir James Hopwood Jeans

Sir James Hopwood Jeans was an English Astronomer and Mathematician. He was one of the great astronomers and physicists of more modern times. He was born of a newspaperman in Southport (London), England on September 11, 1877, and took interest in mathematics and mechanisms, especially those of clockworks.

At the age of 18, he won a scholarship to Trinity College of Cambridge University. After graduation in 1898, he earned a professorship and taught mathematics at Trinity College. He was a most enjoyable and interesting writer on science and expressed complex astronomcial and physical concepts in simple terms. One proposal was that matter might be created continuously throughout the universe.

In his studies of interstellar gases, he simplified a formula using his own JEAN'S MASS (Mj) which becomes:-

$$M \quad Mj \geq 3 \times 10^{-7} \sqrt{T^3/n} \quad \text{SOLAR MASSES}$$

T = temperature in Kelvin; n = number of hydrogen atoms per cubic meter. He also, with three other astronomers, Moulton, Chamberlin and Jefferys, had suggested that the planets were formed from material pulled from the sun by a tidal force caused by a passing star. In studying this theory, he examined the mechanics mathematically rather than by merely asserting verbal conclusions. To further your curiosity, you might refer to the Cambridge Encyclopedia of Astronomy and the Exploration of the Universe.

In 1905 he came to the United States to teach at Princeton University. From 1923 to 1944 he was made a research associate at Mt Wilson Observatory in Passadena, California after which he returned to Cambridge University to teach mathematics and astronomy a few more years before retiring. In 1928, while at Mt. Wilson, he was Knighted for which his science post included the secretaryship of the Royal Society and the Presidentcy of the Royal Astronomcial Society of England. In 1939 he was awarded the "Order of Merit".

After compiling learned books and papers, including thermodynamics, kinetics, mechanics, electricity and magnatism, he began to write for a wider audience. And, on September 16, 1944, he passed away in Surrey, England.

Books and Papers he has written are:-

"The Dynamical Theory of Gases"; 1904
"Theoretical Mechanics"; 1906
"The Mathematical Theory of Electricity and Magnatism"; 1908
"The Universe Around Us"; 1929
"The Mysterious Universe"; 1930
"Physics & Philosophy"; 1942

Darwin Christy

ASTRONOMICAL MISFITS

Answers to puzzle in last "SPECTRUM"

1) The misfit was Antares as it is not a part of the solar system.
2) The misfit M-42 is a nebula while the other M objects are galaxies.
3) The misfit here is Ceres as the others are moons of the planet Jupiter.
4) The misfit is Sagitta, not being a constellation on the line of the Zodiac.
5) The misfit is Orion while the others are circumpolar as seen from our area.

NOTICE:

MAGAZINE SUBSCRIPTIONS

Members of the BAA are entitled to discounts on annual subscriptions to the two popular astronomical magazines SKY & TELESCOPE and ASTRONOMY.

ASTRONOMY is $16 a year and renews one time each year. If you wish to subscribe or renew, bring $16 to the Sep. 11 or Oct. 9 meeting or mail it to Steve Kramer by OCTOBER 9; mailing labels are not necessary for renewal. (The other Kalmbach publications, Deep Sky and Telescope Making are no longer issued.) Make ckecks out to Buffalo Astronomical Assn.

SKY & TELESCOPE is $20 a year. You can start or renew any time; for renewal, S&T sends you a notice, which you give to Steve with the $20. Make ckecks out to Buffalo Astronomical Assn.

In addition, BAA members, who are subscribers to S&T, can order directly all other Sky publications and products at a 10% discount by using the form to be provided in future issues or by calling: 1-800-253-0245.

Stephen Kramer
80 Donna Lea Blvd.
Williamsville, NY 14221

The following was taken from the OCTOBER 1962 "SPECTRUM"

Nuggets of Information Department

Best Altitude Conditions for Observing the Moon

For each phase of the moon there is a certain time in the year when altitude conditions are most favorable for observing. This is, of course, when the moon is highest in the sky. The moon's path usually coincides with the ecliptic, or the path of the sun. The altitude at the highest point, on the average, will be exactly the same as that of the sun at noon when it has a similar Right Ascension. For example: If the sun on September 14th has an R.A. of 18 hours and the altitude of 45 degrees, the moon, at some othere date, when occupying the same R.A. will have the same altitude.

MOON	3-4 day	1st quarter	full	3rd quarter	25-26 day
most favorable	end of APRIL	vernal equinox	winter solstice	autumnal equinox	end of JULY
least favorable	end of OCTOBER	autumnal equinox	summer solstice	vernal equinox	end of JANUARY

Author Unknown

BAA OBSERVATORY: OPINIONS PLEASE

We are taking a strong look at the club observatory for renovations which may include:

- Storage for the 20" Dobsonian scope
- Location of the tracking mount
- Outside deck or pad; scope piers
- Computer center; secure area
- Efficient use of space
- **Your ideas**

We need your concepts on changes you'd like to see. This is the "brainstorming" part of the process and any and all ideas, simple to crazy, are needed.

We will hold an at-site session to go over these ideas from 6-8pm, Saturday Sept 19.

This is after the Audubon Trash and Treasure sale and before the scheduled public night.

If you haven't been to the observatory or the Audubon center in a while, this is a good time to do so.

Volunteer for the committee. Send ideas and sketches, written or verbal to Dan Marcus, 23 Riverdale Dr., Grand Island, NY 14072; 773-5015.

Bill Smith

FOR SALE

Celestron Super Polaris C-8 Schmidt-Cassegrain. Sturdy German equitorial mount with setting circles, adjustable-height tripod and DC battery powered clock drive. 6x30 finder, star diagonal, a 26mm Plossol eyepiece, piggyback camera mount, dewcap and tube assembly carrying case are included. Excellent both optically and mechanically. --$825.00--

Larry Carlino
7118 Kinne Rd.
Lockport, NY 14094
ph. (716) 433 3432

* The "SPECTRUM" *

BUFFALO ASTRONOMICAL ASSOCIATION, Inc.

Darwin Christy, editor
216 Kohler St.
Tonawanda, NY 14150

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