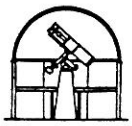
The Spectrum

SPECIAL EDITION

BUFFALO ASTRONOMICAL ASSOCIATION Inc.

MAY - 1995 - JUNE



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BEAVER MEADOW TELEPHONE

The telephone at **Beaver Meadow** (716) 457 3104, is for emergency use only at no cost. There is however, a box placed near the phone for which we ask that you deposit 50 cents for the first three minutes and 10 cents per minute thereafter for domestic calls. Please abide by this ruling.

IN CASE OF EMERGENCY

If, for any reason, there might be cause for cancellation of the meetings of the **B.A.A.**, tune your radios to either **WBEN (930)** or **WGR (550)**. Also, if Buffalo State College has been closed because of inclement weather, so will the meeting of the **B.A.A.** be cancelled.

Taxacom Computer Bulletin Board

phone (716) 896 7581
for more information, call Jack Empson at (716) 745 3138.

***** MEETING NOTICE *****

MAY 12: "Four Giant Steps of George Hale"
A presentation on Mt. Palomar, Mt. Wilson and Yerkes Observatory which were pioneered by Hale.

Special note: Our guest speaker for May will be speaking at 7:45 pm instead of 8:15 pm. Please be in attendance at 7:30 pm. The business portion of the meeting will be conducted after the talk.

June 9: "Amateur Rocketry and the astronomical connection." (see meeting description below)

Meetings: 2nd Fridays @ 7:30pm Jan-June & Sep-Dec.
Location: New Science Building Auditorium at Buffalo State College on Elmwood Ave.
We hope to see you at these meetings.
As usual refreshments will follow.

The May meeting will feature Rick Albrecht, an amateur astronomer from Rochester who has had the opportunity to visit Mt. Palomar, Mt. Wilson, & Yerkes Observatory and to receive detailed tours of these facilities. Rick has also spent three nights at Palomar. His talk will show slides and video of scenes and views that are rarely if ever shown in public.

The June meeting will feature Dean Oberg, a member of the Reaction Research Society for Amateur Rocketry. One aim of this group is to launch a rocket carrying a telescope, designed by amateurs into space. Dean will also present ways that amateur astronomers can be involved with the above mentioned project.

Bring a friend and your ideas!

***** 1995 DINNER MEETING UPDATE *****

The annual dinner meeting was held on Friday, March 10, 1994 at Ilio Dipalo's Restaurant in Blasdell. There were 34 people in attendance and everyone enjoyed the excellent food and fellowship. In addition, Dr. Jack Mack enlightened us with his talk on the Hubble Space Telescope and how it is being used to determine the age of the universe. Overall, the dinner was a great success.

***** MEMBERSHIP SURVEY *****

The membership survey committee has prepared the survey which will be available at the April and May meetings or by mail. All members are asked to complete this questionnaire and return by the June meeting. Your responses are extremely important and will be reviewed by the committee to assist the Board of Directors in planning future events. If you are unable to attend monthly meetings, please call Terry Farrell (826-3738) to have a copy mailed to you or to answer any questions. Thank you.

*** NATIONAL ASTRONOMY DAY CELEBRATION ***

The BAA is having a celebration of national astronomy day on Saturday, May 6, 1994 at Beaver Meadows. Bob Hughes has been coordinating this event which is open to the public and is looking for assistance in making this event a success. This event is being publicized and extra help is needed. If you are interested in helping please call Bob at 833-2407 to offer your services.

*** TRIP TO DAVID DUNLAP OBSERVATORY ***

Plans are being made for a possible trip to visit the David Dunlap Observatory and McLaughlin Planetarium in Toronto if there is enough interest. The proposed date will be sometime in late July or early August. The observatory has several domes with the largest housing a 74" inch newtonian. If interested, please contact any board member or club officer ASAP.

*** PRESIDENT'S MESSAGE ***

"THE SUMMER SKIES ARE APPROACHING"

Several months ago, I wrote a newsletter article titled "Astronomy for Winter Skies". In this article I suggested ways on how to enjoy astronomy during the winter months. Now, that the weather is finally changing and summer is almost upon us, it is time to take advantage of the summer skies. Perhaps, for some members the winter months offered an opportunity to buy, build or upgrade a telescope. For others, the knowledge gained from astronomical study or planning summer observing sessions can be applied. To the dedicated individuals who braved the elements, you can observe in comfort without resembling an eskimo with a telescope.

Public nights will continued to be offered on the First and Third Saturdays of each month from now until October. Members only nights will be on the opposite weekends. Summer public nights are always well attended and offer the club an opportunity to demonstrate and apply our knowledge of astronomy. Members only nights allow both veteran and new observers the chance to exchange ideas and work together.

Now, as we look skyward shortly after sunset, we see the winter constellations approaching their summer hiatus, while the summer constellations are preparing to assume the celestial stage. So, take the opportunity to view the summer triangle, scorpio, sagittarius, M57, Alberio and the other astronomical splendors of summer. Whether you observe from your own back yard or at Beaver Meadow Observatory, enjoy and have fun.☺

Terry Farrell

MEMBERSHIP CORNER

A very busy work schedule kept me from putting a "Membership Corner" article into the last Spectrum. I do apologize for that but I'm sure everyone enjoyed this year's early end to my continual harangues about dues. There's a brief lull in membership activity now as we move from renewals toward the drive for new members during the summer observing season. This lull gave me some time to think about membership in the BAA. First, I thought it would be interesting to look at some statistics. I went into the BAA membership database, did a little data collection and number crunching, and came up with the following figures:

YEAR	JOINED	DROPPED
1992	14	13
1993	16	10
1994	22	18
1995(to date)	15	—

The YEAR is a membership year which runs from September to August, JOINED shows the number of new members that signed up that year, and the DROPPED figures show the number of members who did not renew beyond that year. The slightly higher figures for 1994 reflect increased public interest due to the solar eclipse in May of that year. The BAA currently has 102 members with family membership counted as a single member. Happily, the BAA has had a net gain in membership in each of the past three years. This means we are growing steadily albeit slowly. But we also loose about a dozen people each year. There are many reasons why members do drop out but maybe, just maybe, a few of them would have stayed if their BAA experience had been a little different. Perhaps just a little effort could have changed a negative or mediocre experience into an experience worth renewing.

"What kind of effort are you talking about?" Honestly, not a lot. Come to the meetings. Or come to the observatory. Or come to a star party this summer. I started out by showing up at the observatory during a public weekend. I hung around to watch and to listen and before I knew it I was learning about the observatory equipment and I was learning astronomy. "And what will I get for my efforts?" Well, that depends on you. I know my way around the night sky a lot better than I used to and I've learned about all sorts of new things to observe with my modest 3" refractor. (I never even heard of the "Coathanger" until I joined the BAA.) My wife and I have even traveled with some other members to the Winter Star Party in Florida where we had the opportunity to observe the Orion Nebula without the usual distortions caused by chattering teeth. And on top of all that, I've gotten to know some really great people. There are rumblings of another group trip in the near future. So if you're interested you should start participating now.

But this is not a one-sided affair. The club as a whole also needs to put some effort into keeping those DROPPED numbers low. The acquisition of the new 20" telescope and CCD camera, the expansion and improvements at the observatory, and the investment in computer resources were certainly steps in the right direction. But the BAA realizes that this must be an ongoing effort. Which brings me to the recently released member survey. With the help of your input the club will be able to identify other areas to improve and issues to address. There's more on the survey elsewhere in this issue.

Clear skies!

Joe Orzechowski

ASTRONOMY 1879

This is a reverse order sequel to an article entitled "Astronomy 1929" that I wrote for the September-October 1988 SPECTRUM. That article was prompted by finding a 1929 edition of Sir James Jeans' "The Universe Around Us" in a used book store. This sequel stems from a Christmas present - "Recreations in Astronomy" by Henry White Warren, D.D., published 1879. As a Doctor of Divinity, Warren frequently calls upon the Almighty in his dissertations, making this book an odd mixture of middle eighteenth century astronomy and theology.

As I did in the previous article I'll highlight some of the peculiar ideas that were presented, not to ridicule the author, but to show how much we have learned subsequently. In this case we have an amateur astronomer; in the case of Jeans we had a respected professional. To reiterate what I said in 1988 - don't feel too smug about how much we know today; readers in 2095 AD will probably laugh at some of the quaint ideas and concerns we currently have about astronomy.

Toward the end of the eighteenth century writers indulged in more flowery prose than we are accustomed to today. This tendency was surely exacerbated in this case by the author's occupation of writing sermons. For instance, the good D.D. says of gravity ". . . every particle shall reach out its friendly hand, and there shall be a drawing together of every particle in existance." Having so disposed of gravity he went on to explain light in terms of "undulations in ether". The ether was alive and well back then before the famous Michelson-Morley experiment that marked the beginning of its demise.

The sun was more of a mystery in Warren's day than it is in ours, although we still have plenty to learn about it. Its real source of energy, nuclear fusion, was unknown in 1879. The explanation given was that energy was released by contraction; basically gravitational potential energy was converted to heat as the sun continuously condensed. According to the author, "It is estimated that the contraction of our sun, from filling immensity of space to its present size, could not afford heat enough to last more than 18,000,000 years, and that its contraction from its present density (that of a swamp) to such rock as that of which our earth is composed, could supply heat enough for 17,000,000 years longer." Actually his assessment that the sun has lived about half its lifespan stands up well against today's estimate; it's just that the timescale is off by a couple of hundred to one. Doctor of Divinity notwithstanding, Warren rejected the notion often entertained by theologians that creation took place only 6000 years earlier.

He spoke of a sudden brightening observed on the surface of the sun, and subsequent magnetic disturbances on the Earth. He attributed the phenomenon to the impact of a meteor; I would guess it was a white light flare. Sunspots were identified as depressions in the solar surface. He correctly noted that they were dark because sunspots are cooler than the rest of the sun. The eleven year sunspot cycle was also well established at this time. Warren dismissed an earlier theory that the gravitational influence of Jupiter caused the cycles, pointing out that Jupiter's period of revolution is nearly twelve years, not eleven.

Other solar properties were better understood than were sunspots. The author identified the corona, chromosphere, photosphere, granulation, and prominences. The distance to the sun was given as 92.5 million miles--a little short by today's standard. The spectroscope had been used to identify hydrogen, iron, magnesium " . . . and other metals, some of them as yet unknown on earth". We still haven't identified all the lines in the solar spectrum.

Warren gave descriptions of the spectrum and the spectroscope. He explained how Doppler shifts enabled us to measure rotation speeds and stellar motion, and how Michelson's experiment in 1879 established the speed of light at 186,305 miles per second, good to about 50 mps according to the author.

Each planet was described briefly, but there was some misinformation. For instance, Vulcan was believed to be one of four planetesimals that revolved in orbits closer to the sun than Mercury. They had been reported during the solar eclipse of 1878 (See "The Fire God", SPECTRUM, March-April 1993). Also, the rotation periods for the next four planets were given as follows:

Mercury	24h 05m
Venus	23h 21m
Earth	23h 56m
Mars	24h 37m

Amazingly uniform, aren't they? The last two were right on the mark, but the first two missed by about 59 to one and 243 to one respectively. Win some, lose some!

Mars was believed to be much more earth-like than it has turned out to be. To quote the author ". . . an inhabitant of Earth might be transported to the surface of Mars, and be no more surprised at what he observed there, than if he went to some point on the earth to him unknown." There was no mention of canals, they hadn't been invented yet. The polar caps were described, and the melting of their ice was thought to ". . . give rise to uncomfortable currents in oceans and air". Who needs canals when you have oceans?

Very little was said about the outer planets. In the single paragraph that covered Jupiter the author pointed out that the planet's low density implied it retained internal heat and could not yet have formed a solid crust. If it did form a crust it might be more like the sun than like the Earth. Again - some right, some wrong. He commented that the inner ring of Saturn appeared to be widening, causing its inner edge to approach the planet. Warren noted the ring would contact the planet in 2160 AD, although he suggested that the apparent widening might really result from better observations afforded by improved telescopes.

Quite a bit of attention was devoted to comets which were believed to be ". . . composed of small separate masses of matter, hundreds of miles apart." The tails were vapor created from the sun's heat acting on the nucleus. He also noted that a storehouse of comets probably forms a sphere around the sun a light-year or two distant. Sounds pretty familiar, doesn't it? Not to worry about the Earth being struck by a comet, however. First, he assures us that Professor Newcomb has calculated that the probability of an impact is minute, and second, and more important no doubt, is that God wouldn't allow such an event ". . . till he sees that it is best."

Warren subscribed to the nebular theory to explain the creation of the solar system from matter in a diffused state "rarer than any gas". The planets condensed from rings of material thrown off as the nebula contracted. He rejects the purely natural explanation offered by Laplace--his theology intervenes. He believes it is incredible that matter could be imbued, a priori, with properties that would enable it to ". . . develop itself into orderly worlds . . ." and contain a force that would later cause dead matter to become alive and ultimately acquire consciousness.

The book continues with a brief, and very dated, discussion of stars, globular clusters, nebulae and novae. The last two chapters, "The Worlds and the Word" and "The Ultimate Force", are eloquent (at least I think they're supposed to be eloquent) treatises devoted to the Almighty, little of which I found comprehensible.

Rowland A. Rupp

These observatory grade window panes are TERRIFIC !

NAKED-EYE EVENTS OBSERVING LIST AVAILABLE

A monthly list of the best visual events is available for members. They will be at the next several meetings for free or are available by mail from Bill Smith for a dollar (goes to BAA general fund) to cover postage and envelope.

This 6 page guide was created using the PC planetarium programs DISTANT SUNS and SKYGLOBE. The eastern and western horizons were watched each day of the year at a time of an hour before sunrise and an hour after sunset. Interesting looking planetary patterns were noted and collected. Then the planets were watched for close approaches with the Moon. Further planetary approaches to Messier objects were also done for any time of night. The information contained in here is unavailable anywhere else in so compact a form. This batch of celestial delights is your ticket to heavenly viewing.

- Bill Smith

RedShift - Multimedia Astronomy

(CD-ROM available for Windows/IBM compatible, MacIntosh, and Power MacIntosh)
by: Maris Multimedia, 3872 Piedmont Avenue, Oakland, CA 94611 (Internet:redshift@maris.com)

After hearing the recommendation of **ComputerMan** on WGRZ-TV, **RedShift** seemed a perfect educational birthday gift for our astronomy crazy 11-year old son, Michael. Due to its popularity, it was hard to find in 4 days in time for the big day!

Installation into Windows was straightforward and took only minutes. Much like 82.335% of all computer users, we dove into **RedShift** without the user's manual. The interface was extremely easy and we quickly began cruising through space and time. One very nice feature of **RedShift** is the set of 20 guided tours to acquaint you with its features. Our son, notorious explorer of DOS, Windows, and America On-Line was right at home pulling up various star fields, zipping around the planets, and pulling up many of the hundreds of astronomical images on file.

Basic operation combines the use of pull down menus, monitoring boxes, and control panels. The initial view is the sky from London, England looking north. A pull-down menu with pre-designated locations allows you to quickly place yourself in Buffalo or Budapest, or a custom location. This is done by specifying a position using longitude and latitude. The sky view can also be made as seen from the surface of Mars, the Moon, or the Sun. You can customize your start-up sky in view files so you need not reset all information each time you log on. Time and date are just as easy to set. What you have on your monitor is more than just a star map, however.

After learning the first 80% of **RedShift** features by random exploration, a few hours at the computer with the user's guide made learning the other 90% easy. It is then that you gain an appreciation of what is on that 4.75" optical disk. **RedShift** calculates the positions of the stars and planets mathematically for whatever time, location, and direction of view you specify. An infinite number of sky views are therefore possible. A serious amount of calculation occurs - over 15,000 years of stellar, planetary, and lesser object positions starting in 4172 B.C. through 11,000 A.D. [If you a true purist, **RedShift** will also do precession and stellar positions with proper motion included, but there is a loss of operational speed.] Included in the object list is an impressive array of objects:

- 88 constellations
- 9 Planets plus 35 major moons including earth's
- 250,000 stars down to 12th magnitude
- 40,000 deep sky objects
- 5011 asteroids and 100 short period comets
- All grids, horizons, and positioning aids

Put all this on my monitor simultaneously and it would resemble a mosquito's last millisecond of life while being vaporized in a bug zapper. However, **RedShift** provides you with sets of adjustable *filters* allowing you to select objects by groupings. Stars can be displayed by magnitude, spectral type, or luminosity. Deep sky objects are filtered by magnitude and classification. Comets and constellations, grid lines and horizons are all quickly controllable with simple menu selections. Default filters also automatically keep the view sensible and pleasing. Who needs to see all 12th magnitude stars in a 30° x 30° view anyway?

Want more information? Move the cursor over any object on the map and click on it. You'll get a full report not just on location (Dec. and R.A.), but you'll find visual magnitude, rising-transit and setting times, spectral type, a planet's orbital elements, albedo, and the 800 number of its local tourist bureau (last item, just kidding!). You can also call for observing reports such as the times when the object is visible in your skies and a whole bunch of useful information about the yearly visibility of the planets. Pictures of many of the objects are also available immediately upon call up from the photo gallery. Zooming your view in and out is easily mastered. **RedShift** also allows you to print out sky charts of the current view on your screen. This is particularly nice if you need customized charts of specific sky locations. Printing of certain tables and data sheets is also possible.

Eclipses and conjunctions come under the pull-down menu heading of *events*. This we found to be a fun feature allowing you to ask the program when your favorite planets come into alignment or how many eclipses there are this decade. For instance, a quick search revealed the closest conjunction of Venus and Jupiter in this decade is May 17, 2000. The two planets will appear a little over 1 arc-minute apart.

The information menu in **RedShift** is perfect frosting on the cake. The photo gallery provides over 700 full screen pictures of planets, the moon, deep sky objects, and other subjects. They can quickly be called up through an index and detailed explanations are present with many of the views. A movie gallery presents 10 brief clips including Apollo views of the moon and radar imaged views of the terrain of Venus. A thorough dictionary of astronomical terms is also provided including many cross references and several animations to illustrate concepts such as lunar phases.

RedShift runs on any IBM compatible with a minimum 386SX processor and requires Windows 3.1 and MS-DOS 3.3 or better. Four megabytes of RAM, CD-ROM drive, VGA display, and a mouse are also needed. For the MacIntosh versions, consult the system requirements as outlined on the side of the box.

We can find little to fault in **RedShift** without looking at our own enthusiastic oversights while trying to learn the final 90% of its features. **RedShift** is available in local computer and media stores priced in the range of $46 - $50. Once you start with **RedShift**, use the guided tours and try some of the features. Then have a serious session at the PC with the user's guide. You'll be amazed what you'll find in that other 90%.

Orrin Christy
VikingPC@AOL.COM

Beaver Meadow Observatory

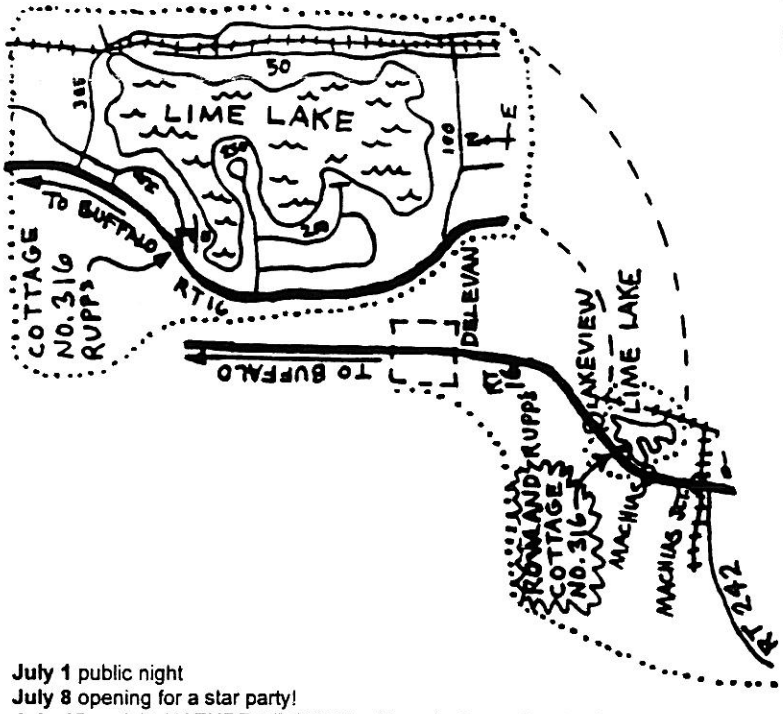
Well public nights have started!, and already we have had our first one. It was cloudy of course! but over 20 people showed up anyway☺. So if you are wondering what happens on public night come on out and join in the fun. We can always use help with crowd control!! I hope to have the 12" scope back in service before astronomy day.

Astronomy Day: May 6, we can use all the help we can get- need computers, telescopes, slides, talks, help with the walking solar system tour. Of course there will be the usual bring a dish to pass picnic from 5pm to when ever the public starts to show up for public night!

Star Parties: I am currently looking for members to hold star parties. Please see me Dan Marcus #773-5015 if you wish to schedule one. Never been to one☹? Well they are great fun! We get together at any place someone wishes to organize one. They can be at a city park, at someone's home, or at Beaver Meadow. The main goal is to have a great time, and eat too much food. They can be an all day bring a dish to pass event or just come on over for some late night viewing. The only requirement for these events is to bring all your astro toys (if you wish) and have a great time! When I schedule these events, I usually recommend that they be held rain or shine. I do this because if the weather is questionable, the person normally ends up holding two parties. Note all star parties have been scheduled rain or shine for Saturday, and the Beaver Meadow events are usually Saturday and Sunday

The current star party schedule is:

May 6 Astronomy Day public night
May 20 public night and CCD class at 6pm
June 3 public night
June 17 and 18 BEAVER MEADOW'S TRASH AND TREASURE SALE: Noon to 5pm. Public Night on Saturday dusk to 10pm.
June 24 (Saturday) Rowland and Irene Rupp invite you to their cottage #316 at Lime Lake starting at 1pm. This is a bring a dish to pass picnic. The Rupps will provide the drinks, and the hot dogs. There will also be volley ball, swimming, and the romantic early evening boat ride around Lime Lake. There phone there is 353-4636.



July 1 public night
July 8 opening for a star party!
July 15 and 16 NATURE FESTIVAL: Noon to 5pm. Public Night on Saturday - dusk to 10pm.
July 22 opening for a star party!
July 29 (Saturday) Bill Smith and Carol Lorenc invite you to their home (petting zoo) at 184 Creek Rd, Jamestown (at Bust, follow the BAA star signs). Party starts promptly (just kidding) at 3pm. Phone #664-0841. Dinner is a bring a dish to pass, Bill and Carol will supply the dogs, and drinks. Feel free to bring your sleeping bag and crash for the night!! Kids are welcome and have plenty to do chasing the 7 cats, 1 dog, 4 horses, 1 donkey, on their 20 acre farm. Bill has a 10" scope, and really dark skies. P.S. Bill promises that this time he will have his 20" and the Martz 30"! completed! Now all he needs is clear skys!☺
August 5 public night
August 12 opening for a star party
August 19 public night, CCD class at 6pm
August 26 opening for a star party

Attention Observatory Users: There seems to be a need to clarify the rules for borrowing Books, the loaner telescope, using the CCD camera, and obtaining the combination to the observatory.

To Borrow the 8" Loaner Scope

1 Must be a member in good standing.
2 The Observatory Director will check the Borrower out on the use of the scope, and will determine which spare Observatory eyepieces will the Member may borrow for use with the loaner scope.
3 Loan time will be for a period of **1 month**.

To Borrow Books

1 Must be a member in good standing.
2 Book must be one with a card in the book indicating that it is loanable. Fill out card and put in file card box that is in the bookshelf for that purpose.
3 Loan time will be a period of **1 month.**

Note: If there is no card in book, it is not loanable! There may be a chance that someone left one of their books there by accident!

Requirements for Obtaining Observatory User Status

1 Must be a member in good standing.
2 Observatory Director will determine when a member has show sufficient competency in the use of the observatory. At that time the Observatory Director will issue the combination to that member.
3 CCD camera users will attend 3 CCD camera sessions, and demonstrate proficiency in its use, before using the CCD camera by themselves.

Note: The combination is ***only*** to be given out by the Observatory Director. If a member asks you for the combination, have them contact the Observatory Director.

I hope to see you soon at the observatory, as soon as the 12" mount is back, we will get into CCD imaging big time! All and all it should be a great summer.

Observatory needs: We could use a couple of small night lights (7 watts or less) to keep the optics warm on the scopes so the mirrors will shed the dew if some one does not get them thoroughly dry.

Dan Marcus

*** BOOK REVIEW ***

A month or two ago my wife presented me with a new hard-covered book, "Masters of Time" by John Boslough. I wondered what provoked this generous act until I found additional copies at Barnes and Noble for $4.99. So, on the principle that books selling at a deep discount may soon be unavailable, I decided to give you a brief review in case you have an extra fiver around (plus tax) and are interested in slightly irreverent cosmology.

The author writes extensively for prominent publications, the National Geographic for one. I think he is primarily a writer who has picked up a good background in physics as result of his scientific articles. Occasionally I found what I believed were mistatements of fact, although, in general, I thought the book was pretty well written.

Boslough's theme is that the Big Bang theory of creation has outlived its credibility and will eventually be replaced with a new theory that will be as revolutionary as the Copernican revolution or the relativity revolution. Early in the treatise, he identifies some of the major inconsistancies in the Big Bang. Unfortunately, in my opinion, he shows a tendancy to treat scientific uncertainties somewhat like writers who are promoting a pseudo-scientific notion such as astrology or ancient visitations. That is, he treats scientists who try to reconcile cosmological inconsistancies with a measure of contempt - a small one mind you, he doesn't want to bite the hand that feeds him. As you will see if you read "Masters of Time", Boslough is on good terms with many people prominent in astronomy and particle physics. Insights into what they do and what they think are some of the high-points in this book.

The biggest problem, inevitable I suppose, is that the author doesn't offer a replacement for the Big Bang. I had read through most of the book before I realized this had to be the case; if a revolution in cosmogeny is coming it's unlikely a responsible amateur scientist knows what it will be. (Non-responsible amateurs suffer no such restriction - they can hypothesize anything.) Nonetheless, this is a pretty good summary of the state of cosmology and particle physics as of 1992. There are several better books on both subjects, without the irreverence, but not for $4.99.

Rowland A. Rupp

BOOK vs. BOOK vs. BOOK
Planetary Nebulae

I have always found the treatment of a topic by different authors fascinating for both what they include and leave out. Naturally the aim of the book has a lot to do with that. I looked at several books recently on how they cover Planetary Nebulae. A planetary nebula is a luminous shell of gas expelled from a dying star on its journey from a red giant to a white dwarf. Small amateur scopes show them as generally round, often with a greenish cast, similar in appearance to Uranus. Otherwise there is no connection with them to planets. So what do the books say...

Astronomy Today by Chaisson and McMillan (1993) is an fine, college introductory textbook. Two pages with 6 diagrams and photos (out of 660 pages) detail planetary nebulae in the chapter dealing with stellar evolution. Explanation of the ejection process of the star's outer envelope is clear. The process is nicely diagrammed vs. time. The "ring" shape of many nebulae is described and diagrammed. Photos of 3 distinctly different nebulae round out the topic.

A Guide to the Galaxy by Henbest and Couper (1994) is a non-technically written, current book for the general reader. Since planetary nebulae are located in our galaxy I thought they would cover it well. The nebulae are talked about on parts of 8 pages throughout the book; and as such they are not treated as a separate topic but are intertwined into other subjects as the origin of the term 'planetary nebulae' in a short biography on Herschel; an 130 word description of formation and shell ejection as part of a discussion of stellar birth and death in a chapter on geography of the galaxy; an excellent, but short, discussion of how they are found, how far out in the galaxy they can be seen, some wonderful examples to see and speculation on the fate of our sun in a chapter about the Orion arm; and as a precursor in a highlight on the pulsating red giant star CW Leonis. The dialogue on CW Leonis is particularly interesting as the best simple discussion of interstellar dust origin; large molecule formation (bucky balls) and their subsequent molecular breakdown from UV light of other stars. Lucid maps and artist renderings of where they are in our neighborhood and spiral arm are nice additions.

Burnham's Celestial Handbook is an observer's guide with much descriptive background material on the object types and many individual objects. It is an older work reflecting mid 1970's theories. Historical perspectives are its forte. Good visual descriptions of many planetary nebulae are listed in the constellation which contains the planetary. A fine 8 page description following the Ring nebula (M57) details evolution of planetary nebulae from a historical bent based on research discoveries. 19 photos show many examples and, in particular, the Ring nebula in the light of different wavelengths. Also a nice list is provided of prominent nebulae for viewing.

Webb Society Deep-Sky Observer's Handbook vol. 2: Planetary and Gaseous Nebulae written in 1978 is somewhat dated in its theory as Burnham. Pretty thorough description of the object class, historical background and formation theory are combined with many observing techniques and hints and a catalogue of 89 prominent ones that can be seen from our latitude. The catalogue includes visual descriptions and drawings made from mostly 6 and 8 inch telescopes, quite modest sizes nowadays. Noteworthy is the visual details that can be seen in different objects such as a ring imposed on a disk (NGC 7662) and broken, irregular shell (NGC 246).

Planetary Nebulae by Hynes (1990) offers 10 pages of history of planetary nebulae discovery; 17 pg. of the physics of their origin, spectra and central stars; 7 pg. covering objects that aren't but can appear to be planetary nebulae; 22 pg. covering observing techniques, telescopes and filters; 35 pg. of extended notes on a number of interesting nebulae; a listing of 1340 objects; and 80 pg. of almost useless, photograph based "finder charts". 'Extended notes' covers discovery, research results and observational details. The listing is an essentially complete catalogue of all known planetary nebulae as of July 1990 and includes coordinates, type, diameter and magnitude. You will not run out of objects for the club's 20" scope!

THE WINNER

All the books treat the subject differently. No one can be judged "best". I enjoyed the context that Henbest and Couper put them in. Chaisson was the most succinct. Burnham was the most readable for a history of planetary nebulae study. Webb Society had the best visual descriptions of what could be seen through a variety of scopes. Hynes was the winner in object data, technical depth, and observing hints (especially filters) although his "finder charts" are lousy.

Interested in looking at any of these books? A couple have already been presented as "book previews" at club meetings for members to peruse. Take your chance at what folks may bring in or give me a call and I'll bring any or all in for you to look through at the next meeting. Happy reading and planetary hunting.

- Bill Smith

PUBLIC NIGHT SEASON UNDERWAY !!

Public Night season is here, and we need your help! Volunteers are needed to help show off the skies to the interested public. Show off objects in the 20" scope, the 12", or your own scope. Point out naked eye objects, constellations, passing satellites, colorful, interesting or well-known stars, tell a story, talk about the BAA, the Observatory, our telescopes or our hobby. Everyone can get involved!

When are Public Nights? The first and third Saturday of each month through October. We start at dusk and view until at least 10:00. Additionally, we'll be having daytime activities at the Observatory (solar viewing, computer demos, etc.) the afternoons of May 6, June 16 & 17, July 15 & 16, and November 11 & 12. Daytime activities usually wind down around 5:00, at which time the feasting starts. No one's left any of our Saturday potluck picnics hungry, and I expect that this season will be no exception. Bring a dish to pass and dive right in!

We're desperately in need in volunteers for the following projects. If your interested in getting involved, even in a small way (in any of these projects or in some other way), please contact Bob Titran at 774-2742:

1. Have a 20-30 minute slide show, talk, or presentation that you'd be willing to give to visitors on cloudy public nights. We have a couple volunteers now, having more would not only help to distribute the workload but also add some variety to our cloudy night programs.

2. Prepare a stock 20-30 minute presentation with visual aids and script that anyone could give on a cloudy public night. This would be a tremendous help to public night assistants who don't have their own shows prepared but would like to help out on a cloudy public night.

Also, I'm working on assembling a show using the BAA's Dow Collection of slides. The collection has plenty of sun, comet, aurora, lunar and solar eclipse slides, as well as some deep sky slides. It's lacking slides showing lunar close-ups and phases (other than full), sunspot close-ups, planets, constellations, and many deep sky showpieces. Can anyone help fill in the gaps?

3. Prepare a brief (10-15 minute) presentation on the Observatory and the BAA that would supplement the other programs. Too often visitors leave the site without knowing what the BAA is, what the club does, what goes on at the Observatory, etc. This is a chance to "get the word out," invite people to join the club or at least invite them to donate a few bucks to our cause.

4. Configure the computers so that anyone could start them up and run a program demo (or just play). Write down these instructions and post them near the PCs. This way anyone can give the public a quick software demo and maybe even sell a few copies of SkyGlobe. Alternatively, the public can help themselves to a software demo as the interest strikes them.

5. Organize the stuff stored at the Observatory and label the storage areas so that things stay organized. No more excuses for not putting something back where it belongs!

6. Build some small low-level lights that can be easily set up along the paths leading between the Observatory and the parking lots.

7. Find wall hangings (posters, photos, etc., informational or artistic, whatever) that could be put up at the Observatory to make it look good. Get them mounted properly so that they stand up the the night air and keep looking good.

Thanks for your help!!

Bob Titran

ASTRONOMICAL HAPPENINGS

MAY

1 - Conjunction - Mercury & Moon
Phi Bootid meteor shower
2 - Moon at apogee (405,925 km)
3 - Omega Scorpiid meteor shower
4 - Eta Aquarid meteor shower ****
5 - Uranus statioanry
7 - FIRST QUARTER MOON
8 - Conjunction - Mars & Moon
10 - Conjunction - Mercury & Aldebaran
11 - Mercury at greatest elongation (22° east)
12 - **B.A.A. MEETING (7:30 P.M.)**
13 - Conjunction - Spica & Moon. This will appear as an occultation from Iceland through Europe.
14 - FULL (FLOWER) MOON
15 - Moon at perigee (358,040 km)
Conjunction - Jupiter & Moon
'O' Cetid meteor shower (see below)
17 - Zeta Herculid meteor shower
18 - Conjunction - Neptune & Moon
19 - Conjunction - Uranus & Moon
20 - Pluto at opposition
21 - LAST QUARTER MOON
22 - EARTH passes to the south side of Saturn's ring-plane.
23 - Conjunction - Saturn & Moon
24 - Mercury statioanry
Conjunction - Mars & Regulus
27 - Conjunction - Venus & Moon. An occultation will be observed through Iceland, Europe and the Arctic region.
29 - NEW MOON
30 - Moon at apogee (406,515 km)
Eta Pegasid meteor shower

JUNE

1 - Jupiter at opposition
3 - Tau Herculid meteor shower
5 - Mercury at inferior conjunction
Conjunction - Mars & Moon
Chi Scorpiid meteor shower
6 - FIRST QUARTER MOON
8 - Librid meteor shower
Arietid meteor shower (daytime - see below)
9 - **B.A.A. MEETING (7:30 P.M.)**
Conjunction - Spica & Moon. As in May, this will be an occultation as seen through Russia and the northern half of North America.
Zeta Perseid meteor shower (daytime - see below)
Alpha Scorpiid meteor shower
10 - June Aquarid meteor shower
11 - Sagittariid meteor shower
12 - Conjunction - Jupiter & Moon
Moon at perigee (357,009 km)
FULL (STRAWBERRY) MOON
13 - Omicron Ophiuchid meteor shower
14 - Conjunction - Jupiter & Antares
15 - Conjunction - Neptune & Moon
Conjunction - Uranus & Moon
Conjunction - Mercury & Aldebaran
Lyrid meteor shower
17 - Mercury stationary
18 - Conjunction - Mercury & Aldebaran
Juno statioanry
19 - LAST QUARTER MOON
Conjunction - Mercury & Venus
Conjunction - Saturn & Moon
Conjunction - Venus & Aldebaran
20 - Ohpiuchid meteor shower
21 - **Summer Solstice**
25 - Conjunction - Mercury & Moon. An occultation can be observed from northern Russia, Japan and northwestern North America.
Vulpeculid meteor shower
26 - Moon at apogee (406,441 km)
Conjunction - Venus & Moon
Corvid meteor shower
27 - NEW MOON
28 - Bootid meteor shower
Draconid meteor shower *****
29 - Mercury at greatest elongation (22° west)
30 - Beta Taurid meteor shower

METEOR SHOWERS

On May 15th, the "O" Cetid meteor shower occurs from just before sunrise to almost noon. For a duration of about 5 days, they can be observed from 02h 19m right ascension and -03° declination. Because they are seen at the times mentioned, their magnitude aveages -5. These meteors (bolides) are short and fast but can leave jet trails as long as 30 degrees and sometimes even break up into smaller trails as they explode. Not many are observed hourly, although 6 to 8 may be seen in that time.

On June 8th, another daytime meteor shower, the Arietids might be observed from 02h 56m right ascension and +23° declination, beginning well before sunrise, lasting into mid-morning. Unlike the 'O' Cetids, they produce long slow trails, perhaps not seen but do leave jet trails. This shower does produce a few bolides or fire-balls, which can be seen in the daytime hours. The average magnitude of these meteors is -2, although brighter ones have been recorded. Their duration is 12 days and up to 60 may be observed in an hour.

On June 9th, another daytime shower, the Zeta Perseids will occur from 04h 08m right escension and +23° declination. Even though they have the same duration of time and are close to the Arietids, they can be distinguished by their difference in shortness in length. As the Arietids, they produce a few bolides and leave trails, but only a quarter as long. Again, they can be observed from just before sunrise, lasting into mid-morning. Though they are short in length, they are very slow in making the trail, another distinguishing mark.

Darwin Christy

SPY and TELL

Early in the year, Ernst Both gave a talk to the Toronto Mycological Society on "The Boletes of Northeastern United States." At the March dinner meeting we had the pleasure of his company at our table. Not only is Ernst a top astronomer, a highly respected mycologist, and one of the outstanding musicologists in the area, he is a master story teller, sighting events in his life with humans and creatures to the delight of his listeners.

The newer members of the BAA do not realize that "Spy and Tell" was a creation of Ernst's fertile brain. It first appeared in the September '67 issue of the Spectrum at the time when Ernst became Spectrum editor. He wrote many tidbits with some additional contributions from members.

Most of you have heard that Ernst is retiring as Director of the Museum of Science in June. As Curator of Astronomy, he provided guidance for the BAA, giving endless hours of service to its members. He was a dedicated leader of an observing section, and a Board of Directors member for many years who helped the BAA to grow into a fine organization.

Thank you Ernst. We appreciate all you did for our association, and wish you the very best with all you have planned for your retirement.

Gene Witkowski now has an 18" scope. He made it from a cardboard Sonotube and bought all the other necessary parts. He made a new cradle and belting for the scope and determined the placement for the focal length closer to the focus The Galaxy mirror is 18" f/4.5. Ed Cerasani made a new polar axis shaft. We are looking forward to seeing more of Gene's excellent astrophotos.

Ed Ratajczak was in charge of an April 1st field excursic planned by the Buffalo Audubon Society, to visit the Iroquoi National Wildlife Refuge to observe the waterfowl.

A series of Sunday programs began at 2:00 P.M. on March 5th at Beaver Meadow, opening with a slide talk on "Ol Time Naturalists," given by Center Director, David Junkin. Marty Junkin showed slides on Kenya's wildlife on April 2nd.

Joe Drabek has been retired for almost a year. In the last two years or so, he has seen all of the Messier objects, with some assistance from Bill Smith. Joe now has his ham radio license. The exam was given by former BAA member, Vern Siegel, who is an accreted volunteer examiner who licenses other amateurs, and teaches courses for ham radio.

The Buffalo News carried an article in February, on Zoran Krizanec, a 24 year old Croatian soldier, who lost his leg in a mortar explosion in the battle at Vukovar. A benefit concert in Croatia made possible a flight to Tampa, Florida, for necessary surgery to save his other leg which was also torn by shrapnel. Former BAA member, Miro Catipovic, who has a home in Florida, arranged for a flight to Buffalo for Krizanec, where Miro's sons, Richard and Robert, provided a prosthesis at the Tonawanda Limb and Brace Company, established by Miro, who was born in Split on the Adriatic coast. He lost a leg in World War II. He had earned his degree in prosthetics and orthotics before coming to the U.S. Krizanec has returned to Croatia, but will return to Tampa this summer for more surgery on his knee, and a check-up.

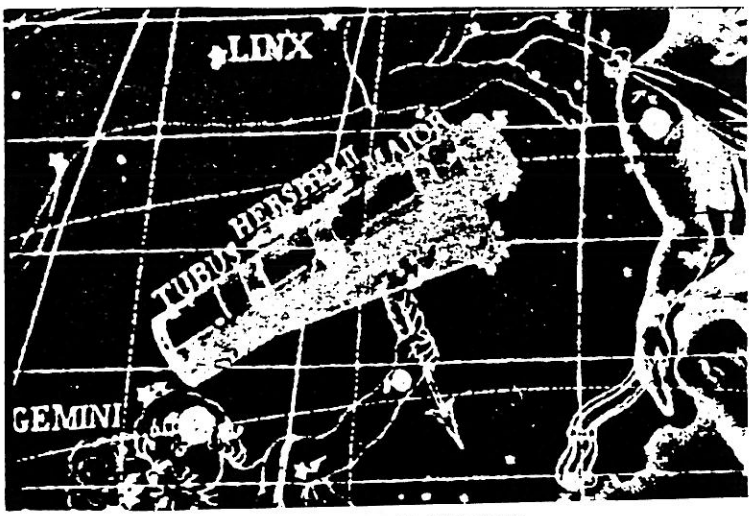
On April 3rd, another article appeared in The Buffalo News concerning Darko Furgan, who also lost a leg in the Croation war. He came to the U.S. at the urging of his friend, Zoran Krizanec, and has also been provided with a prosthetic leg at Tonawanda Limb and Brace Company at no cost.

Bud Abate and Carl Milazzo are attending the May 25-27 Astroblast 95, in Oil City, Pennsylvania. Carl has been invited to speak on astrophotography. He will also be a speaker at Stellafane in August. His talk will be, "Stellafane at Night, Plus More." A photo taken by Carl appears in the May issue of Sky & Telescope on page 64.

Edith L. Geiger

TUBUS HERSCHELLI MAJOR

TUBUS HERSCHELLI MAJOR is the larger of two telescopes which were created to honor Sir William Herschel by Father Maximilliam Hell circa 1781. This telescope was depict as being from the star Pi in Gemini through the Psi stars and Beta in Auriga. This telescope, also, is probably the same telescope refered to as another ancient constellation, "Telescopium Herschelii." In the chart described by Hell, it appears to be held by one of the Twins in his left hand.

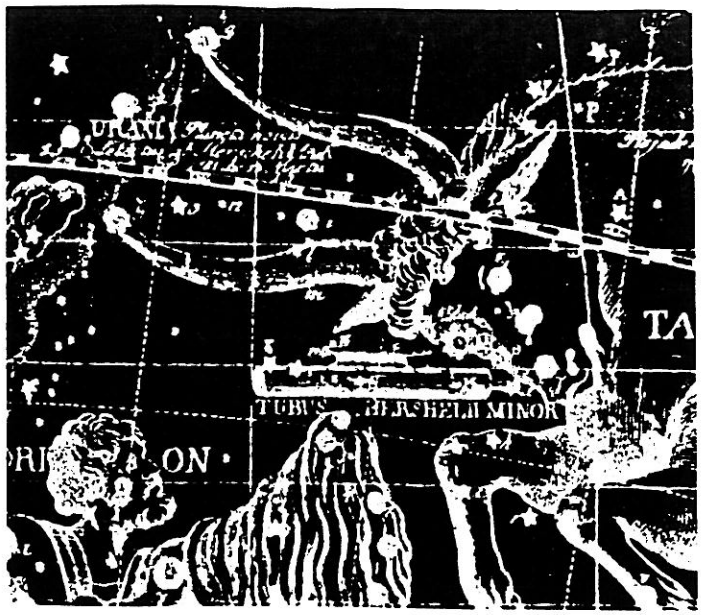


BAA HISTORY

Copies of the BAA History can still be obtained from:

Rowland Rupp
132 Burroughs Dr.
Snyder, NY 14226

The cost is $7.50; mailing is an additional $1.50. If not mailed, the history will be brought to you at a meeting. Checks should be made out to the Buffalo Astronomical Association.



TUBUS HERSCHELLI MINOR

TUBUS HERSCHELLI MINOR, the smaller telescope was placed just below and to the east of the "Hyades" in Taurus. Its tripod extended into Orion's left arm which is holding his prey. These telescopes were listed on Bode's maps of 1800 and also appeared on Burritt's charts of the same era.

BAA ANNALS

5 YEARS AGO – In 1990 our May dinner meeting was actually held in May, not in March as it has been recently. We dined at the Lord Amherst in Snyder and heard Ernst Both speak on the Voyager spacecraft that had just completed its tour of the outer solar system. In June we heard from two speakers. Marylou Bebak presented additional material on Voyager; Bob Hughes talked on the effect of sunspots on the ionosphere.

There wasn't much in the way of member-contributed articles in the SPECTRUM except for an instrument report by Ed Lindberg in which he described a tour he and Olga had of a precision toolmaking factory. An informative article by Jeff Lichtman, borrowed from the Journal of the Astronomical Society of the Atlantic, was entitled "Getting Started in Radio Astronomy". An obituary for Esther Goetz, the BAA's resident poet, appeared as well.

10 YEARS AGO – Our first May dinner meeting was scheduled to be held at Buffalo's famous Wilcox Mansion. Tristan and Debbie DiLapo catered the buffet dinner and Ernst Both provided the entertainment with "Astronomical Foibles". Light pollution was Darwin Christy's topic at our June meeting. We also were planning to host the NFCAAA on May 11 at Buffalo State.

The SPECTRUM included a profile of Thomas William Webb by Fred Price, a compilation deep sky objects located near Messier objects by Bill Smith (who had just moved to Jamestown according to Edith Geiger's Spy and Tell) and the end of Ken Biggie's article on SS-433. Spy and Tell had other tidbits: Phil Cizdziel had just contributed to an article published in the "Astronomy Journal", Marilou Bebak applied to fly on the space shuttle (!), and Cliff Stoll was working on the Space Telescope. (Hubble, I presume.)

15 YEARS AGO – In May 1980 we met at the Buffalo Museum of Science where Dr. J. Gibson Winans spoke on his observations of the February solar eclipse seen in India. For June, Miro Catipovik and Tom Dessert reported on the Riverside, California astronomy meeting they had recently attended.

The second installment of an article on Mercury by an anomynous author appeared in the SPECTRUM, as did a description of the design of a guide telescope by Tom Dessert. Jack Mack contributed an article on measuring astronomical distances by various methods as we move outward into the universe. Edith Geiger wrote a tribute to Bob Mayer, specifically highlighting the instruments he built for club members. Just for the nostalgia of it, here are some of the names of the recipients of Bob's generosity: John Riggs, Miro Catipovic, Dave Steinagle, Mike Dlugosz, William Gehrke, Rowland Rupp, Bob Schneider, Father Englehardt, Gordon Rees, Tim Coons, Al Ricciuti, Charles Meiss, Irv Goetz and Edith Geiger.

25 YEARS AGO - For May 1970 we heard from Dr. Martin Green from Westinghouse in Elmira who spoke on "Observations with an Ultrasensitive TV Camera". In June, John Ruiz from Erie, PA spoke on "Photoelectric Observations of Variable Stars".

Fred West concluded his article on transits of Mercury, while Fred Price wrote on his observation of Mercury's 1970 transit. Ernst Both wrote on Comet Bennett's appearance in 1969. YThe mysterious Kurt Erland cited the disasters throughout history that ensued from the passing of Halley's Comet. In this sophisticated day and age we don't believe in such stuff anymore—although now that I think about it, I don't believe that an AFL team has won a Superbowl since the 1985-1986 apparition.

40 YEARS AGO - In May 1955 Dr. Olsen of Linde Air was our speaker. His topic was the spectral properties of light. For June 21 we planned a star party at Grover Cleveland golf course—right on the practice driving range. (Which reminds me to invite you to the Rupp's star party at Lime Lake this year on Saturday, June 24.)

Rowland A. Rupp

PROFILE

Terrance L. Farrell

Our very energetic president was born in Buffalo. His early education started at Elementary School #29 in South Buffalo, a K-8th grade school. Terry was always a good student with an A average, and was on the honor roll. He was interested in drawing and painting and won art certificates in competitions within the school.

His years at South Park High School were very fruitful. He continued his involvement in art with emphasis on commercial and abstract art and drawing. His work in charcoal and acrylics was seen in some school exhibits, and two appeared in the Buffalo Public Schools exhibit, Our Best in 1975, displayed at Buffalo City Hall.

During high school he participated in an extracurricular outside activity called Junior Achievement. This activity was encouraged by the high school, but was supported by Buffalo businesses to teach high school students about American business. These students met Tuesdays for two hours during the school year. They formed companies which they ran like a business. They produced items such as cookie sheets, terrariums, and key chains, and sold them as one would do in a business. Terry was a member for three years and during this period was one of the top salespeople, and served as vice president of manufacturing. In 1975, he was selected as the number one vice president of manufacturing for the Niagara Frontier and attended the National Junior Achievement conference in Indiana. In addition, he attended the regional conference three years in a row, and also won the Junior Executive, and Executive awards which exemplified the ideas of the free enterprise system. During his senior year in school, Terry was selected to participate in the Executive High School Internships Program. This program allowed students to earn their school credits by working in a business or government position instead of attending regular classes. Terry was selected to work in the Department of Community Development at Buffalo City Hall. He worked with his boss on the development of the Naval Park, and the placement of the USS Little Rock as a permanent exhibit. He graduated with his senior class in '76, and was commended on his work with Junior Achievement, the Executive High School Internship Program, and being a member of the honor roll.

After graduating, he enrolled at ECC South Campus in business administration. He worked part time in the men's department at Sattlers, Seneca Mall, for two years while maintaining a solid B average at the school. In '78, he took a class in Earth science taught by Dr. Ganley who gave a presentation on astronomy to the class. As a result of this presentation, Terry, who was introduced to astronomy as a sophomore in high school, found his interest renewed.

From ECC he went to Buff State to major in business management. With his desire to know more about astronomy, he attended Dr. Orgren's class, and joined the Buff State Astronomy Club, which was in the process of reorganization. Dr. Orgren and Dr. Mack urged Terry to take over the presidency of the astronomy club, which he did, and proceeded to lay the groundwork for the organization. While at Buff State, Terry served as a Ferguson Planetarium instructor, ran shows and gave lectures to school groups and the general public. Terry still has very close ties to the Buff State Astronomy Club, most recently being involved in planning a successful 15 year reunion of its members. From 1979 to 1982 he was a member of the BAA. In 1991, Terry, along with club member, Mark Reville, and former BAA members, Bill Kirst and Dave Williams, formed the Southtowns Astronomy Club, in which Terry served as its first president.

In 1982, Terry and Roberta Fose were married. They have two children, Shannon age 6, and Matthew age 2 in March. Terry became employed at Richman Brothers Clothing as assistant manager and went on to become manager. He worked there for two years, and then went to work at Bakers Shoes, Seneca Mall, moving on to their Main Street store to become assistant manager, a position he held for three and a half years.

By 1987 he was tired of the retail business and decided to enroll at Bryant and Stratton to study accounting, in which he received solid A's. Presently, he is working at Associated Healthcare on Main Street in Buffalo, where he has been employed for six years. He first worked in the accounts receivable department, and is currently the staff accountant. He is in the process of setting up his own bookkeeping business designed for small businesses, to supplement the family income, and he is looking for clients.

Besides his interest in astronomy, he enjoys wooden model ship building. He studies the history of the boats before he starts working on the model kits, so he will be able to make any necessary changes to produce models as authentic as possible. He has made a Mississippi River boat; the Bluenose II fishing schooner; and the Revenge, the English galleon that Drake used to defeat the Spanish Armada.

Along with his many activities, he has served seven years as a deacon at the Trinity Lutheran Church in West Seneca.

During the last several years, Terry has been very busy with his work and family and there has been little time for astronomy, but early in 1994 he rejoined the BAA, and was elected president in June. He is a quiet, affable, outgoing young man, bursting with a driving force which constantly pushes him forward. May his many skills lead to a bright future.

Edith L. Geiger

"SPECTRUM" DEADLINE

THE DEADLINE FOR THE **JULY-AUGUST** ISSUE OF THE **"SPECTRUM"** IS **JUNE 9TH.** IN THIS MY FINAL ISSUE OF EDITING WILL BE MY **EDITORIAL**, A PROFILE (PART IV) ON DAVID RITTENHOUSE, "MID-WINTER OBSERVING PROJECT: MAP 4, SPY & TELL, BAA ANNULS, **STAR PARTIES**, AND OTHER ARTICLES.

WILLIAM PARSONS ROSSE

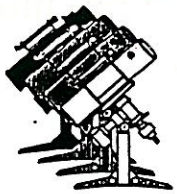
The 3rd Earl of Rosse, he was a British astronomer born in York on June 17, 1800 and passed away on October 31, 1867 in Monkstown, Ireland. He gained his education at Dublin University and Magdalen College, at Oxford where he graduated in 1822. He became a member of Parliament for King's County in 1823, serving through 1834, and succeeded his father in the earldom in 1841. Although he took little interest in politics, he was elected as a representative peer in Ireland in 1845. During stormy discussions on the first reform bill, he became occupied with the construction of his first reflecting telescope. The 'speculum' of this telescope measured three feet in diameter and was superceded by one of double that size..

Two great defects which had baffled opticians here-to-for, in constructing large telescope mirrors were spherical aberration and absorption of light by specula. In casting those large mirrors, arose the apparent impossibility of preventing cracking and warping of the surface in cooling. Even the proper mixture of metals for the reflector had to be ascertained by numerous and costly experiments. At least, as time allowed, a gigantic speculum of over three tonnes was turned out without any sign of warping or flaws. It was then ground, polished and mounted on a telescope fifty-two feet in length in Lord Rosse's park at Parsonstown, at a grand cost (at that time) of $150,000. The sphere of celestial observation was immediately widened by an instrument so powerful, and almost beyond belief; nebulae which had defied Herschel's telescope were resolved into stars and new nebulous mists were revealed to the observer.

The construction of the telescope which was effected under the Earl's direction and superintendance, is fully described in the, "Philosophical Transactions of the Royal Society", of which body he was president between 1849 and 1854.

Darwin Christy

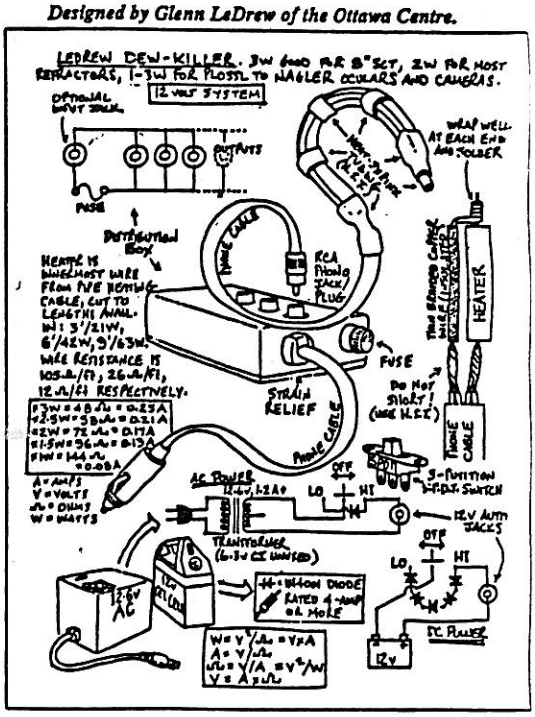
SCOPE TALK



An anti-dew system for scopes, eyepieces, and camera lenses.

Designed by Glenn LaDrew of the Ottawa Centre.

Here are plans for an anti-dew system I recently designed and built. All parts are available at Radio Shack except the heat cables, which are carried by many hardware outlets. Total cost should be about $80 not including the battery. That ain't cheap but it's about half the cost of a comparable commercial system. And I gotta tell ya, when you're surrounded by people firing up hair dryers...it's worth the price.☆



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THE SPECTRUM

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