

THE

SPECTRUM



NEWSLETTER OF THE BUFFALO ASTRONOMICAL ASSOCIATION, INC.

MEETINGS NOTICE

FRIDAYS: JAN 9, FEB 13

Jan 9th: "Fireworks" - Jim Wornick presents a sparking talk on the ins and outs of fireworks. Explosives, propulsion, patterns and colors. A treat for the whole family. Preliminary short talk by Roland Rupp with audience interaction: "Can You Identify This Object?"

Feb 13th: "Meteorics" - Darwin Christy's renowned presentation of micrometeors. Short talk to be announced.

Meetings: 2nd Fridays @ 7:30 pm September-June.

Location: New Science Building Auditorium at Buffalo State College on Elmwood Ave.

We hope to see you at these meetings. As always, refreshments will follow.

Mars !! Are we really here?

After a seven month trip in space, our spacecraft eases through the atmosphere to a gentle landing. When the hatch opens, we step out onto a dusty reddish terrain. The rocks, sand dunes and hills seem almost like some of the deserts of earth. We look up; but rather than a blue sky with white clouds, we see a reddish dusty haze. As we explore the area, we notice that we feel light on our feet; the gravity is so low. (about 1/2 of earth's) Still, it gives a good feeling after the months of weightlessness during the trip. Later on, we will explore with our Martian rover and really see the sights of this strange land.

While this imaginary trip will probably occur within the next several years, let us recap what has happened in the past.

Mars is 630 million miles from earth at it's farthest, 56 million at it's closest. It's rotation is 24 hours, 37 minutes or just a tiny bit longer than earth's. Rather than call this period of time "one rotation a day", it has been given the name "sol". Mars has seasons twice as long as ours as it's orbit around the sun is twice that of earth's. In size, Mars is 1/2 the diameter of earth with a gravity also about 1/2 earth's. It's axis is

presently tilted at about 25 degrees. The entire planet has a reddish cast, even its atmosphere is red tinged. We now know that the color is due to iron oxide; the planet is literally rusting. Olympus Mons, a huge volcano on Mars, rises about 27 kilometers into the Martian atmosphere. In contrast, the largest Hawaiian volcano only rises 10 kilometers above the ocean floor. Helas and Arygre are a pair of impact basins from meteor hits that are over 5 kilometers deep; the debris kicked up from them may be part of the cause for the Martian dust storms.

With a good telescope and clear viewing, polar caps similar to earth's can be seen. These caps grow during the Martian winter and shrink during the summer. Some experts think that the caps are water ice that may be up to a kilometer thick. During the Martian winter the temperatures fall below -197 degrees Fahrenheit, the temperature where carbon dioxide freezes. These winter polar caps may very well be made up of "dry ice" rather than water ice.

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MEETINGS CANCELLATION POLICY

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

BEAVER MEADOW TELEPHONE

The telephone at Beaver Meadow, 716-457-3104, is for emergency use only at no cost. Local calls may be placed for a small charge - see the collection box by the phone. This phone cannot make long distance calls.

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TAXACOM computer bulletin board - 716-896-7581
for more information call Jack Empson at 716-745-3138

MEMBERSHIP CORNER Joe Orzechowski

I'd like to begin by thanking everyone who has already renewed their BAA membership for the 1997-1998 year. My membership list shows that 80% of you have already renewed which is better than the 72% who had renewed by this time last year. Unfortunately, that still leaves 22 members who have forgotten to renew because of their many obligations during the busy holiday season or who are, like me, accomplished procrastinators. If a "(97)" still follows your name on the Spectrum mailing label, it means that my records show that you have not yet renewed your membership. If my records are wrong (entirely possible), please contact me immediately at 632-7091 or 839-9109 so that we can straighten out my mistake. Otherwise, please take a moment to remit your dues for the coming year using the colored renewal form included with this issue.

"What do I get for my money?" you may ask. Well, I can start by listing the usual things like free Spectrum newsletters, discounts to magazine subscriptions, and access to the scopes, computers and reference library at the Beaver Meadow Observatory (BMO). The observatory is a great resource available to BAA members and is well worth the drive. Neil Dennis and Bill Aquino have spent considerable time and effort in fixing up, cleaning up and adding to our observatory. Thanks to Bill's excellent (and possibly devious) recruiting tactics, we now have a Computer Coordinator (Dennis Hohman) to maintain the computers at the BMO and a Media Coordinator (Maurice Melaney) to manage the club's text and reference books, slides, magazines and video tapes.

There are also some less tangible benefits to membership. "Belonging" can get you more involved in astronomy and, if you really enjoy it like I do, that's worth quite a lot. For example, I'm much more likely to go out and observe when I know I'll be with a group of people rather than by myself. When I'm observing with others, I'll usually manage to pick up an observing tip or see a new object or two. And those cold nights don't feel quite as cold when I'm standing next to someone who is also trying to pretend that it's not so cold out. Now that Bill Aquino has managed to delegate some of his duties as Observatory Co-Director, he has more time to devote to projects like a beginners-only observing session. Those of you just getting started in astronomy might want to give Bill a call at 731-9366 to let him know your interested. Armchair astronomers should check elsewhere in this issue for details on borrowing a tape from the club's new video tape collection. Its a great way to enjoy astronomy on those cold winter nights. If you are one of those people who is comfortable speaking to a group of more than three people and you're interested in infecting others with the astronomy bug, you might consider calling Rowland Rupp at 839-1842 to ask about joining our speakers group. New members who would like to "belong" should consider joining us at our March dinner meeting (see insert in this issue for details) or driving down to the BMO for one or our public nights starting in April. Finally, if any of you have questions about the BAA or about astronomy in general I'll do my best to answer your questions (even if I have to make one up). I have been out of town a lot lately so I have been unable to

respond to my phone messages as promptly as I'd like. I ask for your patience in advance.

I will begin compiling the 1998 BAA Membership Directory in the next few weeks. If your address, phone number and/or e-mail address has changed, if you have upgraded your equipment, or if your astronomical interests have changed or expanded, I would appreciate hearing from you so that I can publish the most up-to-date information about our members in the directory.

MEMBERSHIP SERVICES

To renew, join, or for address changes or questions call or write:
Joe Orzechowski, 125 Roycroft Blvd., Buffalo, NY 14226
(716) 839-9109

BAA ANNALS

Rowland A. Rupp

5 YEARS AGO - Five years ago our January speaker was our own Tom Bemus who presented a talk on a 20-inch automated scope and the Marshall Martz club. He treated us to a musical slide show as well. We held a round table discussion the following month on getting the most out of your scope.

In early 1993 the new 20-inch telescope was on order, a computer was anticipated and we had plans for building the addition to Beaver Meadow Observatory. Two Messier Marathon star parties were planned for March: one at BMO, the other at Bill Smith's and Carol Lorenc's place near Jamestown.

Darwin Christy's article on the coming conjunction of Uranus and Neptune highlighted an unusual event. If you missed it--cheer up, there'll be another in 2164. Edith Geiger wrote a profile of Dave Fliss. Just one observation report appeared. After all Buffalo in late fall is not a great place for observing. The report was by Bob Titran who had to go to Delaware to make the observations.

10 YEARS AGO - Our January 1988 meeting was held in the Museum's Roosevelt Room. "Extraterrestrial Intelligence" was the topic, and I gave it. Darwin Christy spoke on his specialty, "Micrometeorites", in February.

An article by Walt Whyman, "The Third Planet", gave a Martian observer's perspective of our world. This was almost certainly a reprint as Walt was ill at this time. Another reprint, this appearing first in the *Farmer's Almanac* by Richard M. Head, Ph.D., was entitled "Is the Sun Growing Dimmer?"--a chilling thought indeed.

Observation reports were made by Gary Kielich, Carl Milazzo, Bob Hughes, Marilou Bebak and Dave Bull. Doug Smith was cited in "Spy and Tell" for winning a \$25,000 grant from the U.S. Department of Education's Christa McAuliffe Fellowship Award. Doug taught fifth grade at Sweet Home Central where he planned to use the grant for a radio lab, a laser lab and a rocketry lab.

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Officers

Bob Hughes - President (833-2407)
Gene Witkowski - Vice President (876-4301)
Lynn Sigurdson - Secretary
Bev Orzechowski - Treasurer (839-9109)
Dr. Jack Mack - Museum Representative

Board members at large

Joe Orzechowski - Bill Smith (664-0841)
- Bob Titran (774-2742)
Rowland Rupp - Fellow Representative
Joe Orzechowski - Membership
(839-9109)

Observatory Directors

Neil Dennis (322-7596) & Bill Aquino (731-9366)

SPECTRUM STAFF

Bill Smith - Editor / Layout
Bev Orzechowski - Circulation

BAA Annals continued from page 2

15 YEARS AGO - Former BAA member Shaun Hardy spoke in January 1983 on "The Classification and Origin of Meteorites". In February we heard from Ed Lindberg and Al Kolodziejczak who recounted their recent trip to Stellafane. Beverly Botto, our resident space artist, gave us a private showing of her paintings.

Observatory Director, John Riggs, reported on some recent additions to the inventory of BMO. One was an eyepiece dew eliminator built by Rowland Rupp. Another was the purchase of Sky Atlas 2000. He noted that, nonetheless, the most important piece of equipment we offered observers at this time of year was the electric heater! We had articles on "Red Dwarfs" by anonymous, and an historical summary of unusual observations by various astronomers of the lunar formation Nasmyth, written by Fred Price. Another was a reprint of Orrin Christy's 1969 article on astronomical probabilities entitled "Chances Are". Carl Milazzo submitted the lone observation report.

25 YEARS AGO - "Variable Stars" was Larry Hazel's January 1973 topic. Larry was a very active member of the AAVSO at the time. Vice President Tom Dessert spoke on "Telescopes and Accessories" in February. Newstead Observatory was still going strong in those days; six star parties were scheduled there for January and February.

President Darwin Christy noted that we were planning an exhibit at Eastern Hills Mall, an astrophotography exhibit at the Museum of Science and moving our observatory site to Beaver Meadow. The SPECTRUM had articles on stellar evolution by Bill Parker, "Off-Axis Photographic Guiding" by Tom Dessert, and "Observations of Infrared Stars" by Bill Chamber, who used his own image converter on the Remick Memorial telescope in Lockport.

35 YEARS AGO - Telescope making was Alan Gee's topic for the January 1963 meeting. In February, Fred Price spoke on "Lunar Ray Systems". An observatory committee was planning to gather the final parts needed to complete the 12.5-inch telescope, now at BMO. These included the mirror cell, diagonal support and eyepiece focuser.

The first members of the College of Fellows had just been elected. They were Rudolf Buecking, Edward Lindberg and Walter Semerau, all now deceased. An anonymous article on Jupiter appeared in the SPECTRUM. Dick Zygmunt began his bimonthly star charts which appeared in several subsequent issues.

SPY AND TELL*Edith L. Geiger*

An update on our well-known member, **Ernst Both**, who along with being a noted astronomer and accomplished musicologist, is an outstanding mycologist who is in great demand for seminars and symposiums. He is also called upon to identify mushroom specimens sent to him from various states. He is available to the Poison Control

Center when it is critical that mushrooms ingested by uninformed people be identified in case of harmful or fatal properties. He has been involved in research and contributing papers, and is co-authoring four others for the Goodyear "Festschrift." Ernst has appeared before numerous mycological organizations describing his work on North American boletes. With all of these activities, he has found time to care for the Museum's collections, organizing and cataloging thousands. He continues collecting mushrooms on his sojourns around the country and locally. Ernst is a very active retiree.

Gary Baldwin made a barn door hinge platform of his own design for photography. He can automatically set the length of exposure, and in addition, he has made a device which will shut the shutter down when it is finished. He has an 8' dome observatory for his homemade 12-inch scope with a German equatorial mount.

Frank Chalupka has been taking a night course in computers at ECC in the Department of Computer Service, and has completed the Adobe 3.0 Intermediate program. He has finished beginners and intermediate courses and has a certificate. He also has taken a course in computer maintenance. He has a charming wife, and they have a 19 year old daughter, **Lee**, who has a grant at Canisius and is a sophomore majoring in pre-med. She gets up very early in the morning twice a week to do research on whales at Marineland which she finds most enjoyable. She is also the No. 1 top shooter in the Canisius College Rifle Club. The Chalupkas also have a 15 year old daughter, **Kristen**, who is a sophomore at Lancaster High School, and is a member of the choir. **Mrs. Chalupka** worked at Bon Chance for 5 1/2 years, but left to devote more time to developing a strong family unit. As a result the Chalupka family have a very happy home where they enjoy many activities together, and each other.

Joan Riley works as a drug counselor at a rehabilitation unit in downtown Buffalo. It is a very exhausting job.

Judy Heubel was very busy during the holidays working a temporary job at the Post Office Annex near the airport. She had worked at a post office a number of years ago, as well as with the Department of Social Welfare. Judy is also a very capable, qualified baby sitter. Her hobbies include: reading history and the novels of Danielle Steel, viewing sky events, and walking.

On October 6th, **Rowland Rupp** and **Carl Milazzo** were the speakers at the Lockport Camera Club's "Astronomy Night." About 20 people gathered to hear Rowland's talk on "Comets" and Carl's presentation on "Aesthetic Astrophotography." Carl showed his astrophotos with emphasis on foreground settings, gave a demonstration of his "barndoor" guiding method, and explained his photographic techniques. The talks were well received.

In the January '98 issue of SKY & TELESCOPE, **Carl Milazzo** has one of his photos on a January calendar covering dates 24/31 (pg. 85).

*continued on page 4***SPECTRUM DEADLINE**

The deadline for the Mar-Apr issue is

Feb 13th.

Send all submissions to **Bev Orzechowski**
125 Roycroft Blvd, Buffalo NY 14226-4557.

Spy & Tell

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Darwin Christy gave another very interesting talk to the men's group of the Salem United Church of Christ in Tonawanda, entitled "A Mystery Solved", following the battle of Gettysburg. Darwin has been engrossed in the Civil War over a period of many years and has paid many visits to the Gettysburg National Cemetery. He has taken more than 300 photos of the monuments and continues to photograph more on each visit. If any of you are Civil War enthusiasts, you might want to contact Darwin.

On August 27th, Darwin boarded a plane to Lompoc, California to visit his Gunnery Officer. Due to a plane delay in LA, Darwin missed his connecting flight to Santa Maria airport and was forced to get another, 1 1/2 hours later. Unfortunately, his luggage didn't make it at the same time he did; but, due to his 3 hour jet lag, he awakened at 4:00 am CA time and found his luggage outside his doorway. With nothing else to do at that hour, he unpacked. His grand tour included a visit to Vandenburg AFB, Honda Beach, and Morro Bay and, he almost got to ride in a homemade T-18 airplane. Many enjoyable hours were spent with his Gunnery Officer reliving old times in the Southwest Pacific.

The best to you in 1998.

Have you visited our web site yet ?

Then visit www.webt.com/mreville/indexbaa.html

See the latest information from Mars, what's NASA up to ?, See the latest astro photography from our members.

Our web page features:

- a) Information on our club meetings and Beaver Meadows Observatory and maps to get to them.
- b) Astrophotography pictures from our members.
- c) Members only password section.
- d) A place for new members to join live on the web.
- e) There is a web page counter to see how many times it is viewed.
- f) The latest newsletter in the password section.
- g) Star charts.
- h) Member feedback area.
- i) Much more!!

If you want the password you have to email me at mreville@webt.com

Having trouble accessing the site please call me at 716-627-4213 before 10:00 p.m.

Mark Reville

COLLEGE OF FELLOWS MEETING

The annual College of Fellows meeting will be held at 7:30 PM, Tuesday, January 27, 1998 at my home at 132 Burroughs Drive, Snyder. Please let me know if you have a problem with this time or date. My telephone number is 839-1842.

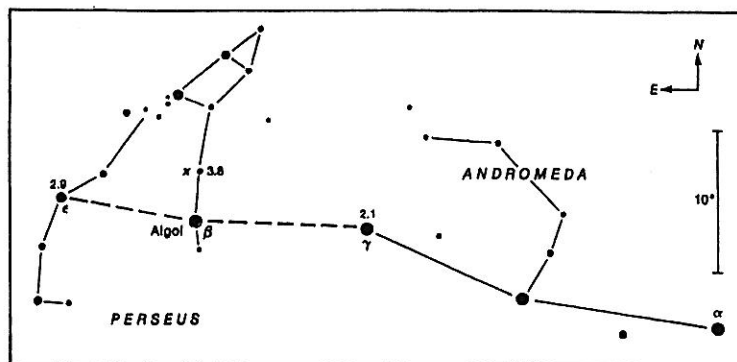
Rowland A. Rupp

OBSERVATION REPORT

Date of Observation: 12/02/97
Time of Observation: 6:31 PM (EST) and 11:31 PM (EST)
Location: Beaver Meadow Observatory
Seeing Conditions: Very Good
Instrument: Naked-eye and 35 mm camera (with 50 mm lens on tripod)
Observed: Minimum (6:31 PM EST) and maximum (11:31 PM EST) of the eclipsing binary Beta Persei.

Comments:

Beta Persei (Algol) quickly dips to it's minimum brightness and just as quickly returns to it's maximum brightness every 2.867 days. It takes about 10 hours to complete the main eclipse, 5 hours to drop from maximum to minimum and an additional 5 hours to get back up to maximum again. I have a schedule of all the expected eclipses of Algol for the 97 - 98 season (Thanks Dennis) and have been waiting patiently for a clear evening when a minimum would occur. As luck would have it, Tuesday December 2nd was a crystal clear night for western New York and only a couple of days past the new moon. The minimum occurred shortly after sundown which allowed me to observe not only the minimum but also the return to maximum (5 hours later) and still get to bed at somewhat of a reasonable hour. My visual magnitude estimates were made with the help of the chart below (Sky & Tel, Feb 1986, page 176). I also photographed the star at both of it's extremes in magnitude. It was interesting to observe motion in celestial objects which lay so far beyond the confines of our own solar system. Sometimes the stars smile down on us.



Algol, or Beta (β) Persei, can easily be followed by constellation watchers. Estimate its brightness by comparing it to the three stars whose magnitudes are marked.

Observation Report *continued from page 4***Note:**

If you are interested in watching this eclipse yourself there are still several good opportunities left this season; 11 Jan 10:00 PM, 14 Jan 6:49 PM, 3 Feb 8:34 PM, 23 Feb 10:19 PM, 26 Feb 7:08 PM, and 18 March 8:53 PM.

Bill Aquino

(G)ASTRONOMICAL RECIPES
MARTIAN SANDWICHES

1 PKG	Duncan Hines Yellow Cake Mix
4 EGG WHITES	(No Yolks)
1/2 CUP	Vegie Oil
1/2 CUP	Oatmeal

Blend ingredients using electric mixer at slow speed until combined. Spoon drops on a greased cookie sheet. Bake at 350 degrees for 7-15 minutes or until the cookies just start to brown. Cool for 2-3 minutes and remove. Create Martian sandwiches by spreading bottom of one cookie with P'butter and placing 2nd cookie on top.

Darwin Christy

Mars !! Are we really here? *continued from page 1*

In 1877, Asaph Hall was the first human to see a satellite of Mars. He charted the positions of two moons, one about 10 miles in diameter (Phobos - "Fear"), the other (Deimos - "Terror") even smaller. The names were taken from the chariot horses of Mars in Greek mythology. An interesting bit of history is that in 1726 Jonathan Swift wrote Gulliver's Travels and gave Mars two moons -- over 100 years before these moons were discovered.

In the 1600's astronomers were sketching markings that they thought indicated canals. By the 1800's it was believed that Mars had vegetation that changed with the seasons and was supported by the supposed canal system. In 1895 Percival Lowell founded a personal observatory in Arizona to study Mars. He wrote a book telling about the "canals" and guessing that the inhabitants were bringing water from the poles to the warmer regions to support their life on a dying planet. This argument about canals carried on for many decades. Today, we know they do not exist from the information derived from the space probes. As Carl Sagan has commented: "they indicate intelligent life, but on the wrong end of the telescope."

H. G. Wells wrote a novel about the War of the Worlds in 1898 whereby the Martians sent many spaceships to invade earth. During the early 1900's Edgar Rice Burroughs and others wrote stories about intelligent life on a dying planet. On October 30, 1938 (Halloween) Orson Wells broadcast a radio program that mimicked a news broadcast of a story about the Martians landing in New Jersey with an attacking force that could destroy human life on earth. This program was so realistic that it caused a nationwide panic.

Enough fanciful history -- let's talk about the "probes".

In July 1965 Mariner IV sent photos of the surface of Mars as it flew past the planet. When these were published in the newspapers, the reported sightings of UFOs increased by a factor of 6. One thing these photos did was put to bed the rumors and history of any "canals" on the surface of Mars.

At 4:00 pm on July 20, 1976 a white parachute appeared in the Martian sky. As it approached the surface rockets flared, then the chute was cut away. With a swirl of red dust the Viking I bumped to a landing. This was the first earth originated machine to land on and gather data from the surface of Mars. There had been several Russian attempts, some of their spacecraft had actually crashed on the surface of Mars but were unable to return information. Viking II also

successfully landed on September 3, 1976. Both Vikings sent photos back to earth. These showed that Mars was a beautiful but desolate desert. The landscape contained rocks, hills and sand dunes mostly coated with a reddish dust. The Martian sky was reddish-tan, probably from the fine dust in the air. These Viking probes cost over one billion dollars to complete their mission.

In late January of 1989, the Russian probe Phobos II arrived at Mars. Its primary mission was to make a close flyby of the moon Phobos and to land two instrumented probes on that moon. This did not happen as communication with the probe was lost while it was orbiting Mars. However, much data was received from spectrometers and radiometers about the surface of Mars.

Now 21 years after Viking and at a cost of only 200 million, we the people of earth, have a new entity on Mars. On July 4, 1997 a big soccer ball appeared in the Martian sky. After it bounced to a stop, the ball deflated and opened like a flower. From this flower, a tiny wheeled vehicle rolled down a ramp, scanned the area with its camera and proceeded to investigate the rocky terrain. You know this probe as "Pathfinder" with its cohort "Sojourner". I'm sure you have all seen the photos that have been sent back to earth. They have been featured in newspapers, magazines, and the Internet. They give much more detail that proves Mars is a desert planet with no visible signs of life. Pathfinder has now been renamed the "Carl Sagan Memorial Station" in honor of Carl Sagan. On September 12, 1997 the Mars Global Surveyor arrived. After aero-braking in the atmosphere to achieve its orbit, it will begin to map the planet from the air. As of October 17, 1997, it's orbit was at an altitude of 22K miles and it had completed 21 orbits at a speed of 4000 miles per hour. Present plans are that it will be in a stable orbit sometime in January 1998 so that it can start it's mapping mission.

Neil Dennis

See Neil's article in the Mar-Apr 98 issue of the SPECTRUM:

"SPECTACLES IN THE SKIES" - eds.

HELP WANTED !!
With Editing and Layout of the
SPECTRUM
Call Bill Smith (962-3412)
or Bev Orzechowski (839-9109)

OBSERVATORY NEWS

Public Activities Summary for 97 - During the calendar year of 1997 a total of 19 "public" events were held at the observatory; 13 public nights, 1 astronomy day, 1 lunar eclipse, 4 other (mostly scout troops on reserved visits). A total of 551 public signatures were recorded in the log book as well as over 200 club member signatures. A total of \$291.00 was collected by the observatory from member donations, public donations, and fee's charged for reserved visits. All moneys were added to the clubs treasury. THANK YOU to everyone who helped make our observatories public activities for 1997 a success.

Mr Perseus' Neighborhood - There is still time to join the informal observation group which is studying the Perseus constellation. Contact Don Knecht (838-2456), Dennis Hohman (662-2904), or Bill Aquino (731-9366). This invitation is open to all club members, especially to NEW members.

CCD System - The CCD camera and associated equipment has been removed from the observatory temporarily for modifications and upgrades. We hope to get the work completed and the system back up and running sometime in February, we will keep you posted.

THANKS for a Job Well Done - A general cleanup of the observatory took place on the weekend of November 8 and 9. The volunteer's did a great job and it really shows. THANK YOU to all of those who participated including; Bob Hughes, Gene Witkowski, Dan Marcus, Frank Chalupka, Wade and Lynn Sigurdson (a special thanks to Lynn's children who cleaned the garage), August Grillo, Maurice Melaney, Neil Dennis, Bill Aquino.

Thanksgiving Party - A star party was held at the observatory on Friday 28 November. It was cloudy and our friends the stars did not show up. However, a pleasant group of club members did. The food was very good and the conversation was even better. Thanks for coming, maybe we can do it again next year.

Donations Needed - The observatory is looking for donations of several everyday items including; a hammer, pliers, welcome mat, and a broom. These items should be "used" but still in "usable condition". Also, THANK YOU to Bev Orzechowski for donating the printer cable.

Volunteer Needed - A volunteer is needed to clean and repair the small Meade refractor that's been sitting in the front room (now the computer room) of the observatory. This is a "loaner" telescope and seems to be in pretty good shape, it just needs some Tender Loving Care.

New Equipment Cabinet - An equipment cabinet has been installed at the observatory in the observing room. The cost of the basic materials for this cabinet was \$88.00 dollars. This project was approved by our board and paid for out of our treasury. This is a large multi-shelved cabinet with insulated walls and an enclosed heating system which will keep our sensitive electro-mechanical equipment (computer hard-drive, playback and record heads in the VCR / answering machine, even the eyepieces and binoculars) at a reasonable ambient temperature during the cold months. It will help extend the service life of this equipment. The cabinet was designed by Neil Dennis and Dan Marcus. It was custom-built entirely from scratch by Neil Dennis. The cost of this project was kept low thanks in large part to all of the special hardware donated by both Neil and Dan. We

owe both of these gentlemen a sincere THANK YOU !

Observatory Staff Expanded - The observatory staff has been expanded to include two specialists; a computer coordinator (Dennis Hohman) and a media coordinator (Maurice Melaney). Both of these gentlemen have been generous enough to volunteer their time and talents to perform the following tasks;

Computer Coordinator (reports to the observatory directors)

- responsible for keeping observatory computers fully operational.
- only person in club authorized to install hardware or software.
- maintain an up to date inventory of hardware and software.
- make recommendations for purchasing hardware and software as required.
- make recommendations for the disposal of obsolete materials as required.
- responsible for producing computer system support documentation.
- support Mark Reville in his web-site efforts.

Media Coordinator (reports to the observatory directors)

- Responsible for text book collection (loanable books and reference books). Make sure the collection is kept in functional working order. Keep an inventory of all publications in the collection.
- Maintain the magazine collection.
- Maintain adequate amounts of handout literature for the public.
- Responsible for planetarium programs sold to the public.
- Responsible for the displays on the bulletin boards at the observatory.
- Maintain the clubs "slide" collection.
- Maintain instruction manuals for telescopes, computers, etc...
- Make recommendations for purchases as required.
- Make recommendations for the disposal of obsolete materials as required.

Access to Club's Library - To make the library materials more accessible we are starting a delivery service between the observatory and the clubs monthly meeting. This service will work as follows; a list of all available media materials will be posted at each meeting (in a binder on the back table), if you want something from the library let someone from the observatory staff know and we will bring it to the next meeting where you can pick it up. When your done with it (all materials are loaned for one month) return it to the next meeting and we will take it back to the observatory for you. This may be somewhat of a slow process but should make the library materials much more accessible to the membership. We'll see how it works out.

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BILL & CAROL'S MESSIER MARATHON

Bill Smith and Carol Lorenc will be hosting their annual Messier Marathon at their marvelous "NEWHOME" on February 28, 1998. They are now happily housed at 1880 Thornton Road, Sinclairville NY 14782 (new phone number 962-3412), a couple of miles down the road from the Cockaigne Ski Resort.

Food, Fun & Frolic starts around 3:00 pm. If you wish, bring a dish to pass. In former years, Bill & Carol have held this party each year during March - but apparently they have decided that March isn't going to be COLD ENOUGH this year.

OBSERVATORY NEWS *continued from page 6*

Borrowing from the Library - The requirements for borrowing from the clubs library are:

- you must be a member in good standing. (dues paid up for the year)
- sign and date the "borrowing card" attached to the item.
- put the signed/dated card into the "borrowed box" on the library shelf or give the card to someone on the observatory staff.
- return the item after one months use and put the "borrowed" card back into the item.

Video Tape Collection - We have started a video tape collection consisting of astronomy related documentaries. This collection will be donated by the membership, housed out at the observatory, and "borrowed" in the same fashion as our textbooks. The purpose of this collection is to enlighten and educate the members of our club in the science of astronomy. We have 14 tapes to start the collection with, all were donated by Don Knecht and Bill Aquino. The ground rules for the collection are:

- The tapes should be of astronomical subject matter only.
- The tapes must be recorded in the popular VHS format.
- All copied and donated tapes should be of "publicly aired" programs, from such channels as PBS, the Discovery channel, the Learning channel, etc... Try to get the beginning and ending credits of the documentary as well as the broadcasting stations ID on your recordings.
- Commercially purchased tapes must be donated "as is". Do not donate copies of tapes that you bought, donate only the originals.

Bill Aquino

IF YOU WERE AN EGYPTIAN--

Did you ever stop to think what you would know about astronomy if you lived in the past? With all the astronomical information available to us today it's easy to forget how little was known long ago. Suppose you were an Egyptian living in the seventh century BC, well before the Greek conquest influenced their astronomical thinking. What would you know then?

Egyptian history was already ancient by this time. The great pyramids had been built two millennia before, maybe even earlier if we take seriously some of the astronomical evidence that follows. We have found that the sides of the pyramids are very accurately oriented to the cardinal directions. The Egyptians had a simple astronomical instrument that established directions with great accuracy. They erected a tall, slender pillar of stone. From the shadow it cast they could establish south by noting the direction of the shadow when it was shortest on any given day. Not only did this determine south, it also determined the precise time of noon. So they had a direction finder and a time finder in one instrument.

These pyramids have a property that casts some uncertainty on when they were built. Many have a shaft that extends from their center out to their north face. These shafts have an upward slope within a few

minutes of arc of 26 degrees. The popular concept is that one could make astronomical observations from the center of the pyramid up through the shaft. What would one look at, and why? Maybe if you really were an Egyptian astronomer back then you could tell us, but it's not at all evident now.

Since the shafts point to true north we might think they point to the north celestial pole. Not so--the angle is too shallow by a couple of degrees, and the ancient Egyptians certainly would not have made a mistake like that. So the idea of observing some star at lower culmination, when it is directly north but below the celestial pole, has been strongly advanced. The best candidate is Thuban, the star in Draco that was the pole star at about the time the pyramids are generally thought to have been built. Obviously that doesn't make much sense since the star would be near the pole and the shaft doesn't point in that direction. Another possibility is that shaft was installed to observe Thuban at a time before or after precession made it the pole star. Just why anyone would want to do that is pretty obscure and, besides, the eras during which the star could be seen in this position miss the accepted archeological time frame for the erection of the pyramids by an uncomfortable margin of several hundred years either way. In any case it wouldn't have served as much of an observatory: one could see only a tiny circle of sky with or without Thuban. Moreover the design of the pyramid called for plugging up the shaft upon completion anyway.

An important part of Egyptian astronomy was time-keeping. Time was measured in periods of years, months, weeks and hours, just as it is today. We probably have the Egyptians to thank for that, although the meaning of a year, a month or a day in terms in astronomical events should be pretty evident to anyone. Since the Egyptians already had a means of determining noon thanks to the pillar, there should be little problem in equating the length of the day from one noon to the next. The year and the month, however, are somewhat awkward to define in terms of days. Early Egyptians divided the year into twelve months, some of which were twenty-nine days and some of which were thirty days. Added up the year came to 354 days, just about the right number of days for the moon to go through all of its phases twelve times. After all, month is derived from moon, and we all know there should be twelve "moonths" in a year.

The problem is that it takes a little more than eleven additional days for the Earth to make a full orbit of the sun. To make up for the difference an extra month was added from time to time. Later, the year was recognized to be 365 days and was divided into twelve, thirty day months each having three, ten day weeks. Why not a ten day week? After all, the Egyptians had ten fingers, not seven. Of course this system needed some adjusting too, it still fell short of the real length of the year, and it also contained a fractional number of lunations. Today we still have the same problem of reconciling years, months and days.

The business of time keeping was somewhat urgent. The Nile floods annually, providing critical water for crops in this arid land. Accurately predicting the onset of this flood was essential for planting. It turns out that the Nile rose near the time when Sirius could be seen rising for the first time before the sun in the dawn sky--its helical rising. In fact, it was when Sirius rose in the wrong month that the Egyptians added the extra month in their original calendar. Each week was marked by the first glimpse of a star or of a constellation just before sunrise. This led to the identification of thirty-six decans, one for each week, a term still used in astrological reckoning.

Day and night were each divided into twelve hours regardless of their actual durations. The real length of day and night depend on the season of the year, but the Egyptians didn't worry about that. The idea for twelve hours probably arose from the fact that approximately twelve of the decans could be seen to rise in the dark sky during the course of

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a typical night. Those that rose in twilight didn't count.

The Egyptians had astronomical instruments somewhat more sophisticated than the stone pillar used for determining noon. They had various time keeping instruments, one of which was a shadow clock. It had a scale of time that was positioned horizontally. The sun's shadow projected by a cross member fell on the horizontal part. In the morning the device was pointed due east, after noon it was pointed due west. The hour divisions marked on the horizontal scale were not uniform since shadows move more rapidly when the sun is near the horizon than when it is overhead.

Water clocks were built as well. Here the steady accumulation of water dripping into a vessel marked the passage of time. Surely the discrepancy between equal numbers of hours of daylight and nighttime in all seasons and the measurement of time by water clocks must have been a cause of concern, unless the Egyptians considered these to be two independent methods of measurement not necessarily needing reconciliation.

Another instrument, the merkhat, was used to find the transit time of stars. Two astronomers some distance apart and in a north-south orientation with respect to one another were required for the job. Each suspended a plumb line. One astronomer also held a sighting device to make sure that his alignment with the two plumb lines was accurate. The result was a primitive meridian circle. As each star passed the lines it was known to be on the meridian, and a proper star map could be devised by timing the subsequent passage of various stars.

The Egyptians assigned stars to constellations just as we do, only they weren't the same ones we know today. They saw a bull in the sky, but it wasn't Taurus. There was a crocodile, a hippopotamus and even a mooring post among their constellations. And then there were those thirty-six decans to keep track of too.

If you wanted to be an Egyptian astronomer you had to learn some cosmology as well. What form you believed the heavens took depended on where you lived and when. For some, the universe was shaped like a rectangular box, the longer sides running north-south. In this cosmology the ceiling was flat and was said to be supported by four pillars located at the cardinal points. (That sounds awkward if the sides ran parallel to the cardinal directions.) The sun was worshiped as the god Ra who sailed in a boat over the eastern horizon each morning, traversed the sky and set in the west in the evening. During the night the sun boat traveled over an ocean through the underworld back to the east for the dawn of the next day. Elsewhere, the goddess Nut was believed to form the sky. The stars and planets were imagined to be attached to her body draped over the Earth. That the Egyptians had any idea that the Earth was other than flat is highly improbable.

This is astronomy Egyptian style up to the time when other cultures like the Persians and Greeks infused new ideas into their sciences through conquest. These primitive cosmologies, crude instruments, and limited observations were accumulated over a period exceeding two millennia. Being an adept astronomer was somewhat less challenging in those distant days than it is now. But their astronomy did provide these desert dwellers with calendars to regulate their planting and harvest, an order and a map of the heavens, a method of dividing time that remains to this day and at least some concept of how the majestic heavens were formed and organized.

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