

The Spectrum

BUFFALO ASTRONOMICAL
ASSOCIATION, Inc.

Darwin Christy, Editor

* MARCH - APRIL *
* 1981 *

MARCH meeting: The March 13th meeting will begin at 8:00 PM at the Buffalo Museum of Science on Humbolt Pkwy. The guest speakers will be Dr. Fred Price, Roland Rupp, Kurt Mancuso and Darwin Christy. Their topics will be their various astronomical observations. Let's welcome this quartet.....

? QUIZ ?

- 1) What were 'Hesperus' and 'Phosphorus' to ancient astronomers?
- 2) Does 'Venus' or 'Mars' come closer to the Earth?
- 3) When will the next transit of 'Venus' occur?
- 4) How much brighter is the 'Sun' than the 'Full Moon'?
- 5) The Moons of the Planets have names, but what is the name given to the Earth's 'Moon'?
- 6) What is meant by recurrent 'Novae'?

APRIL meeting: The April 10th meeting will again be held at 8:00 PM at the Buffalo Museum of Science on Humbolt Pkwy. Our guest speaker will be Dr. David Meisel from Geneseo State College. His topic will be, "Comets and Meteors". Dr. Meisel is the head of the American Meteor Society.

(LUNAR PHASES)

New Moon - March 6th - April 4th - May 4th
First Quarter Moon - March 12th - April 11th - May 10th
Full Moon - March 20th - April 19th
Last Quarter Moon - March 28th - April 27th

* SOLAR *

The Sun will cross the equator on the 20th of March at 12:03 PM EST; this is otherwise known as the 'Vernal Equinox'.

From this, the little Robin is quoted as saying, "SPRIGG HAS CUBB!"

* PLANETARY *

The second conjunction of the 'Great Conjunction' between Jupiter and Saturn will occur on March 4th. The first conjunction was blotted out by clouds from our vantage point.

--: METEORS :-

ZETA BOOTES - March 11th

CORONA AUSTRALIDS - March 16th - It is normally seen in the south.

VIRGINIDS - March 26th - Enjoy this one even though the moon may interfere.

ALPHA VIRGINIDS - April 9th - These are NOT related to the above.

LYRIDS - April 21st - This is one NOT to be missed. Enjoy it!

ETA AQUARIDS - May 4th - This is fairly prominent shower.

O CETIDS - May 15th - This could be your chance to see a daytime bolide.

ZETA HERCULIDS - May 17th

ETA PEGASIDS - May 30th

-NEW MEMBERS -

A welcome goes out to these new members since the last 'Spectrum'; Richard McCarthy. Also, welcome back, John Riggs.

- - VENUS - -

Often regarded as Earth's sister planet, Venus resembles the Earth only in density and volume. Hidden under a thick layer of opaque clouds, the surface suffers from searing temperatures, crushing atmospheric pressures, and deadly gases.

The clouds act as an efficient thermol insulator while providing the planet with a 76% albedo. The Solar energy that does penetrate is absorbed and reradiated by the clouds in the infrared regions of the spectrum, causing a greenhouse effect. The result is a fairly uniform temperature distribution of 485° C. from the poles to the equator.

These high temperatures liberate carbon dioxide from crustal rocks, adding to the 97% carbon dioxide already in the atmosphere. Some of the CO₂ is broken down into carbon monoxide and oxygen. The oxygen moves through cycles of reactions resulting in sulphuric acid, hydrochloric acid and hydrofluoric acid. The sulphuric acid vapors condense into droplets in the higher altitudes and fall as an acid rain that will revaporize before reaching the surface.

Radar mapping from Earth shows Venus to have craters and mountain ranges with extremely subdued elevations due to an atmospheric pressure 90 times the Earth's.

The temperatures, the pressures and the corrosive acids all contributed to the short life spans of the Venera space-crafts that landed on Venus, none of which survived it's first hour on the planet. The Venera landers reported surface wind velocities of 1 M/sec., however at altitudes of 50 KM., wind velocities of 100 M/sec. were recorded.

Venus orbits the Sun at .72 AUs and at inferior conjunction it approaches closer to the Earth than any other planet. At -4.2 magnitude, it is the brightest body in the sky other than the Moon and the Sun and reaches a maximum elongation of 45° from the Sun.

It has a sidereal period of 224.7 days, an asynodic period of 583.9 days and it's 243.2 day rotational period is too slow to generate a magnetic field

As seen through a telescope, Venus will display a disc approximately 60.8 arc seconds in diameter and will pass through phases of crescent and half illuminations similar to those displayed by the Moon.

James A. Machowski

-: WANTED :-

ROOMMATE for a fourteen day eclipse trip to Russia!!! The trip consists of 4 days in Moscow, 3 in Kiev, 2 in Yalta, 4 in Leningrad and 1 day in Bratsk for the eclipse. In addition, 5 scientists and astronomers will accompany us. We will see two theater performances and a side trip to the world's largest telescope. The price- \$2295 - includes meals, gratuities, first class hotels and round trip, economy class, air transportation by Finair from New York City....Call LEON WINANS at 759-6674 for more information. Date of trip :- July 18 to August 1, 1981.....

-:FOR SALE:-

6" f:8 Reflector - Budd tube (University) - Beral coated mirror - 3 point mount
Right angle finder (University) 6X30 - Rack & pinion focuser.

Starliner "quality-line deluxe" equatorial mount with 6" cradles. Will accept up to 14" diameter 1 3/4 shafts, cast aluminum housings.

Praktina 35mm SLR camera adapted for astrophotography with adaptors. Delay shutter to prevent mirror slap. Top view ground glass with fold down magnifier.

Oculars - 20mm Kellner - 12.5mm Ortho - 2-3x Achromatic Barlow
DOUG BAEHM phone 691-5941 \$500.00 for all or offer.....

THE CONSTRUCTION AND READING OF HORIZONTAL SUNDIALS

by Paul A. Young

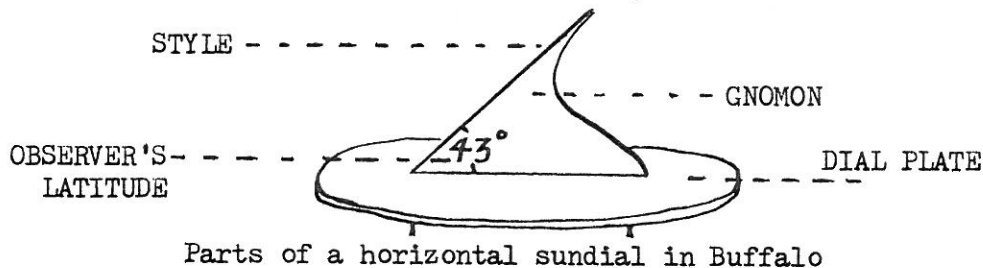
This is a two part series on simple horizontal sundials, their construction, setting and reading. Its intent is to make available to the young or the newly interested, a nonlogarithmic approach to constructing and interpreting sundials.

Part 1

Construction

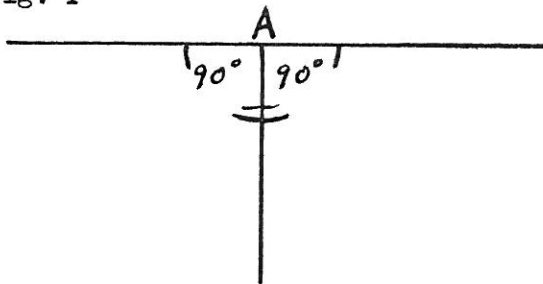
In the forward of Horologographia Optice - Dialling Universall and Particular, 1652 is the statement, 'The use of Dials all men understand; To make them few'. Today, few men understand them, and even fewer their construction. Most regard the sundial as nothing more than a garden ornament or if they do inspect it more closely, will certainly scoff when its time does not compare with their digital watch. But there is much to be learned and appreciated about the earth, its movements, and seasonal progressions as displayed on the dial.

The basic principle of any sundial is simply that an indicator of some type, known as the gnomon, casts a shadow onto some form of time scale. The time is read by either the length of the shadow, resulting from the altitude of the sun, or by the direction of the shadow, resulting from its bearing. The sundials we are concerned with are of the latter type. Individual sundials are unique in that each is made for a particular latitude. The gnomon in the illustration below is cut at an angle equal to the observer's latitude. The style is the shadow-casting edge of the gnomon and is set up parallel to the earth's axis. It is the shadow of the style from which we read hours as the shadow falls over the hour lines of the dial plate.



The construction of the dial plate requires a few simple items, a compass, a protractor and ruler. Begin by drawing one horizontal and one vertical line so that they meet at a point 'A', forming right angles (90°) as in figure 1.

Fig. 1



Draw line AD perpendicular (90°) to BC as in figure 3.

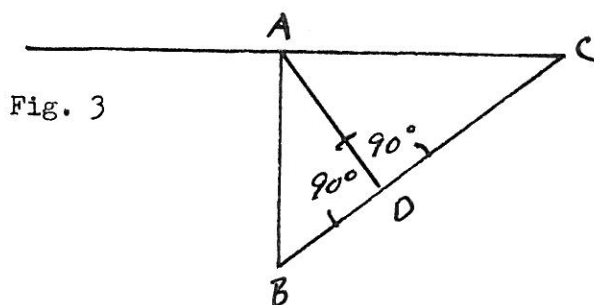


Fig. 3

On the vertical line below point 'A', select a convenient length*. With the aid of a protractor, construct the angle ABC equal to your latitude (43°) as in figure 2.

*Select any length while learning the process. Later the length of this line will determine the overall size of the face of the dial.

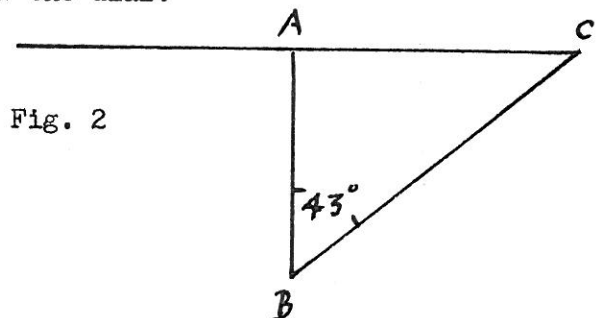
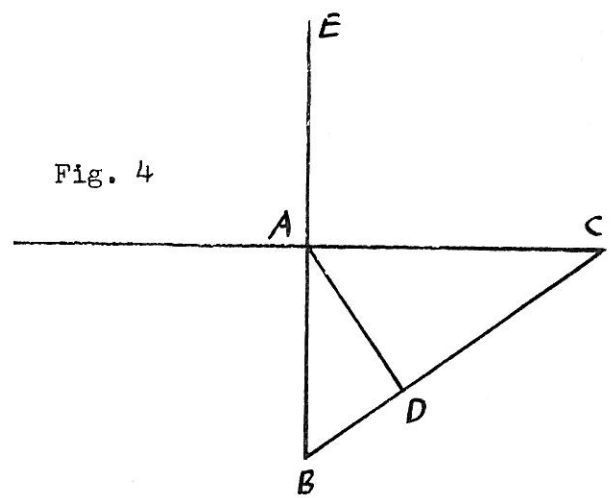


Fig. 2

Locate E on the extension of the vertical line so that AD equals AE as in figure 4.

Fig. 4



With a compass, draw a semicircle using point E as the center and EA the radius. Divide this semicircle into 15 arcs and extend the lines to the horizontal line, as in figure 5 and label F, G, H, I, J. Extend the horizontal line as necessary.

Fig. 5

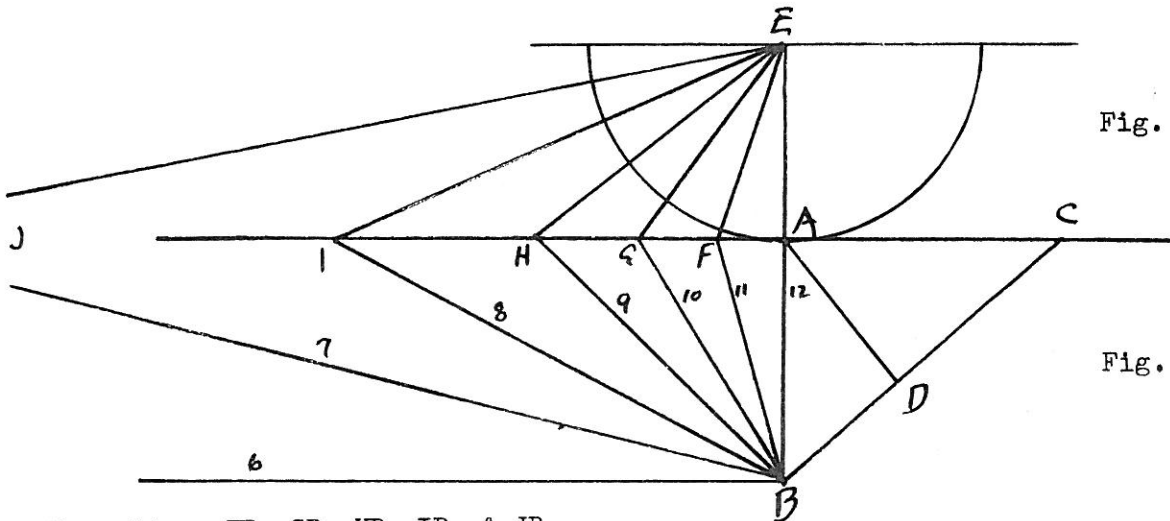


Fig. 6

Draw lines FB, GB, HB, IB, & JB.

These are the morning hour lines for a horizontal sundial.

Line AB is the base of the gnomon, the substyle line or the noon-line.

The six o'clock line is a line parallel to line JA constructed through B, as in figure 6.

In the same manner, the afternoon hour lines may be constructed as in figure 7.

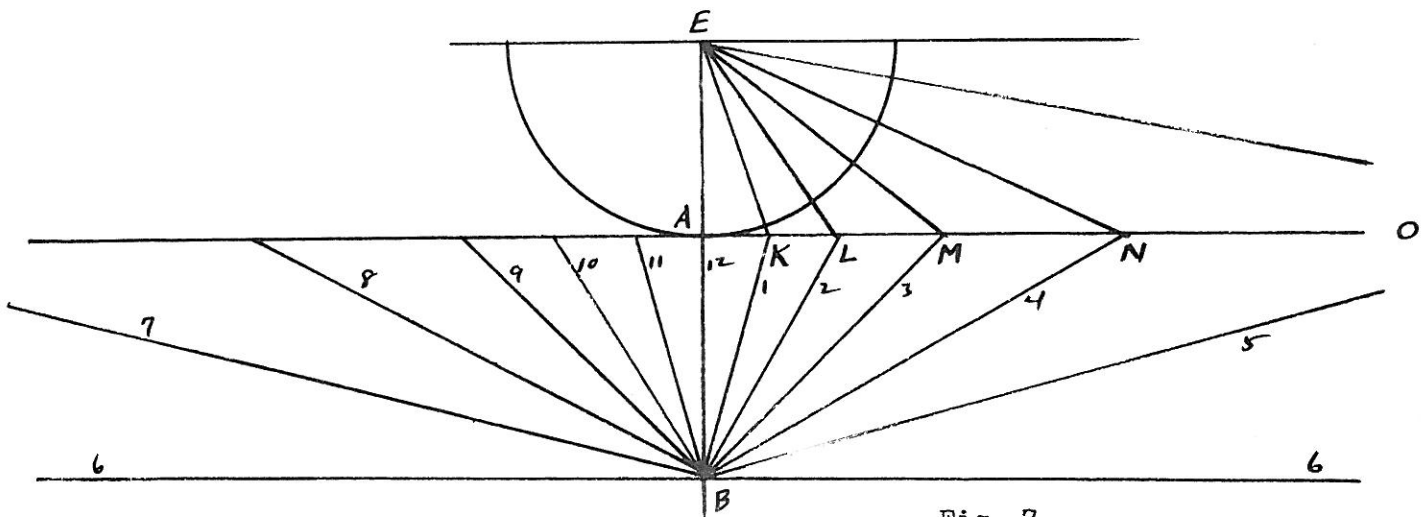
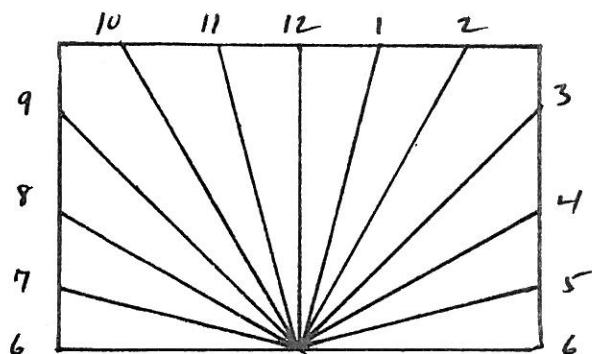


Fig. 7

The sundial may now be shaped to any convenient size as in figure 8.

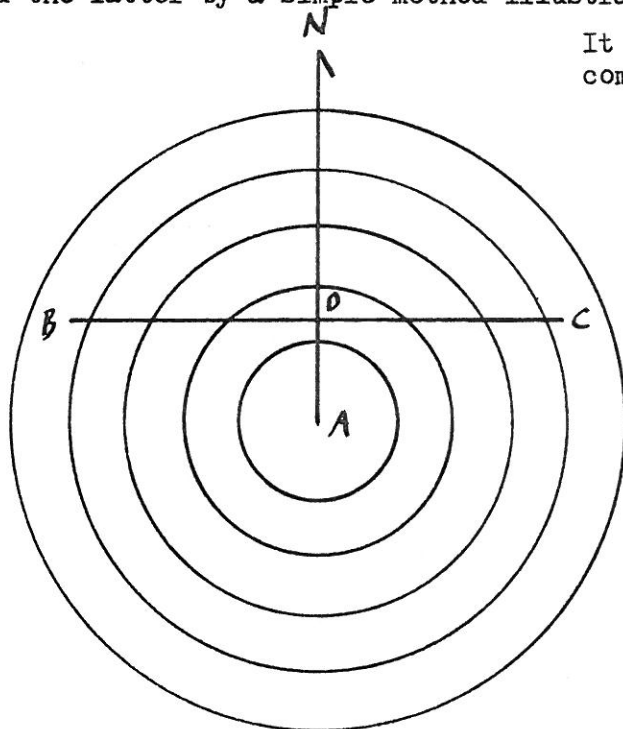


The only change necessary to adapt this process to make a vertical sundial on a south wall is to change angle ABC to one's co-latitude
 $(90^\circ - 43^\circ = 47^\circ)$

Fig. 8

After the basic pattern has been completed, it can be repeated on the material of your choice and design and fitted with a gnomon of your choice and design.

Horizontal sundials must be aligned so that the gnomon is level and on a line with south (noon). The former can be accomplished with the aid of a carpenter's level and the latter by a simple method illustrated below in figure 9.



It is advisable not to use a magnetic compass because of deviation.

Finding true north by equal shadows (not to scale).

On a level surface draw a series of concentric circles. Set up a vertical rod sharpened at the top at the center, A - figure 9. On a sunny morning watch until the tip of the shadow of the rod exactly touches any of the circles, for example at point B, and mark the point. During the afternoon of the same day, mark the same circle again as the tip of the shadow just touches it at C. Draw a line between B and C and divide it in half at point D. Construct the perpendicular north-south line as shown. The principle is that the shadows are the same length when the sun is at equal distances before and after its noon position.

Place the gnomon so that it is on this north-south line (or noon-line) of the dial plate with the hour line 12, directly beneath its base and the tip of the latitude angle is on the north end. Set it on a window sill in the sun and you are ready to read it. It will not be accurate if you check it with standard time.

Part 2 will be concerned with adjusting it for longitude and the equation of time which will follow in the next "SPECTRUM".

?DID YOU KNOW?

The Apollo missions to the Moon brought a total of 842 pounds of lunar material to earth, and out of that, the heaviest rock weighed 26 pounds....

The 'Coals Sack' is a dark region five degrees in size in one of the bright areas of the southern Milky Way, on the south eastern edge of the Southern Cross.

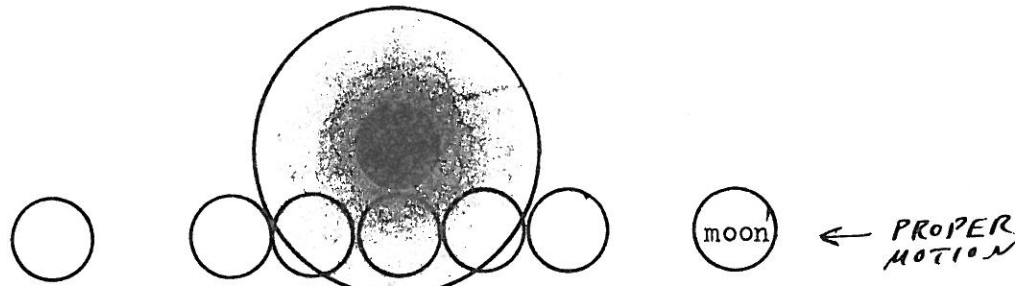
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* OBSERVATIONS *

On January 20th the penumbral eclipse of the moon was observed by Steven Desmond. He reports that he was able to notice the darkening of the moon on the northern portion next to the umbral shadow. It was a total penumbral eclipse.

Steven also reported as having seen an aurora on the 31st of January.

On January 30 th two objects inside the Andromeda galaxy were seen with our club's telescope at Beaver Meadow. The first was a globular cluster which belongs to that galaxy, known as 12 which appeared as a 13th mag. star. The other object was a star cloud in that galaxy's spiral arm known as NGC-206. It was 1 by 3 minutes in size and about 13th mag. If you would like to try looking for objects in the galaxy, take a look at the November 1979 issue of Sky & Telescope, page 490. There is a nice chart to help you.



Time lapse of the January 20th penumbral eclipse.

-: OBSERVATORY UPDATE :-

Soon, the icy Lake Erie winds will subside and once again the stars will sparkle overhead.

The winter, though not very snowy has been very cold and cloudy. There have only been about a dozen nights, and those usually started to cloud over as soon as as the eyepiece was set in place.

With temperatures dropping below zero, the observatory was hampered with a roof that was frozen shut. All that was needed was to free the wheels, which were frozen in place.

We hope to see many of you out using the observatory this year. Any new member wishing to get checked out at the observatory, please contact one of us. We'll be glad to start you on your way to conquering the 'Messier' list.

Al Mohn

Jim Russell

* STUDY GROUP *

The January meeting of the Study Group had as its topic the gas giants, Jupiter and Saturn. By the end of the meeting it was plain that we were all overwhelmed by the vast amounts of new information from Voyager. At our February meeting Dr. Fred Price will lead the group in a discussion on the causes of cratering in the solar system. The study group meets the third friday of the month in the conference room (213) of the New Science Building at Buffalo State.

EVERYONE IS WELCOME!!!!

Ken Kimble

NFCAAA

Anyone interested in helping Ed Lindberg with planning and/ or running the programming please contact him. He certainly will appreciate anyone stepping forward.

* INSTRUMENT SECTION *

The instrument section meets on the fourth fridays at the Buffalo Museum of Science on Humbolt Pkwy. Ed Lindberg is chairman and will answer any quæstions you may have regarding this section and its functions.

NO AMOUNT OF EXPLANATION CAN EXCEED OUR ABILITY TO FOUL IT UP.....

From Sorry about that collection - Esther L. Goetz '81

"Rights Reserved" you'll never see
above a verse composed by me
the substance of my manuscripts
holds naught of moon's or sun's eclipse,
the magnitude of stars I know
lies in their worth at theater show
on proscenium or thrust stage sky
they can be seen with naked eye,
now I'd be flattened and surprised
if what I write were plagiarized!

INTRODUCTION TO ASTRONOMY

The Buffalo Museum of Science is presenting a 10-week class entitled Introduction to Astronomy to be held Wednesday evenings from 7:30 to 9:30 p.m. starting March 18th. Four members of the BAA, Edith Geiger, Ken Kimble, Al Kolodzieczak and Rowland Rupp, will lead the class. This group organized the course and received approval from the Board of the BAA as well as its pledge to support the course with club facilities.

The material will cover conventional topics in astronomy, including the sun and moon, planets, stars, galaxies and cosmology. It will encourage observation and student participation, with the hope that enthusiastic amateurs can impart some of their fervor and knowledge in astronomy to others.

We think this course will appeal to members of the BAA and hope some of you will register for it. If you are interested in more details, please contact me, or get an Education Programs brochure from the Museum. The fee for Museum members is \$24; for all others \$30.

Rowland A. Rupp 839-1842

SPY AND TELL

Our sincere congratulations to Curt Mancuso on his award-winning project on the usefulness of the solar spectroscope for atmospheric research, which placed him among the 40 nationwide winners in the Westinghouse Science Talent Search. The 40 winners were chosen from 993 entrants. Ernst Both taught Curt how to use the museum's solar spectroscope, and occasionally supervised that which was essential to the project.

Curt and John O'Dee have been assisting Mr. Both with the summer sun shows, and have been conducting public nights at the Kellogg Observatory since Ernst became Acting Director of the museum.

Curt, a senior at Nichols, is graduating cum laude and has received that honor in mid-year. We rejoice with him in his achievements and wish him a brilliant future.

A fine article by John Riggs appeared in the February issue of SKY AND TELESCOPE (pp. 162-164) in which he described the making of his uniquely designed, comfortable, and portable observing chair. John also thanked Bob Mayer for his help and advice, remarking on the many times Bob has given aid to him and other B.A.A. members with their projects.

The Christys are active, as usual. Darwin was honored by being named "Man of Goodwill" for 1980, by radio station WWOL. A young lad submitted Darwin's name because of his kindness in giving the boy a tour of the Christy Honeyhouse Observatory and a view of the stars and planets through the telescope, and allowing him to return later with his friends. This award carried with it a dinner for two, an AM-FM radio, a \$50 gift certificate at Tops, and 5 country music record albums.

Ruth has been on the Altar Committee for the Salem United Church of Christ for a number of years. Now Darwin has joined her on that same committee.

Orrin is working on another kayak for a week long kayak race again this summer through the Erie-Barge Canal from Tonawanda to Albany, in which Darwin will act as Orrin's pit crew.

Orrin is also a goalie for an indoor soccer team. Outside of the fact that he receives injuries from opponents heads and toes and is hurried off to the Emergency

Room in DeGraff Hospital, he plays a terrific game.

Congratulations and best wishes to Gary Kirst and Beth Morris who were married on February 7th, and to Terrance Farrell who became engaged on Valentine's Day.

David Bertuca, who is a commercial photographer, has a new position with the Runco Commercial Studio in Tonawanda. He is hoping to apply his knowledge of photography to astrophotography in the near future.

Art Gielow, who is Assistant Director of the planetarium at Buff. State, takes charge of the booking and scheduling of the public schools for trips to the planetarium. He is working on a program with Dr. Orgren entitled "Springtime of the Universe" which will have its public showing March 6th.

Edith L. Geiger

----- MIRO CATIPOVIC -----

Whenever you see a small B.A.A. gathering. you will very often find that its members are under the spell of Miro Catipovic as he weaves his knowledge and sharp wit into a delightful conversation. Miro was born in Yugoslavia in the resort town of Split in the mountain region of Dalmatia on the Adriatic Sea. After finishing his early education he went on to the medical branch of the trade school to receive training in prosthetic and orthotics and to earn a bachelor's degree in prosthetics. While a student in the trade school he spent his evenings, for four years, attending the music school in Split, where he studied clarinet, conducting, and theory. He played in the local bands and in several band concerts, and also in a seventy-four piece theater orchestra, and was allowed to participate as a listener at the symphony rehearsals.

From an early age he was drawn to the heavens as he followed the Milky Way across the very dark, clear skies of his native land. An astronomical instrument would be a luxury with the limited means of the people of Yugoslavia, so he found that his yearning for a telescope would have to be satisfied at some time in the future. He went into photography as a hobby, and also enjoyed painting portraits in oil.

In 1949, with troubles in his country, he and four other young people became political refugees and tried to escape. They were captured on an island off the coast of the Adriatic, and were put in a political jail. They went through two months of intensive interrogation, and then went to court where they were found guilty and put on probation for two years. If their probation was violated they were to be sentenced to hard labor.

In 1950 the five political refugees escaped to Italy by crossing the Adriatic Sea in a small boat. Miro's friends went on to Australia and Canada, but Miro went to Naples for six years and did some photographic work for the United Nations Headquarters in Switzerland. Miro operated from both Naples and Salerno.

During his stay in Italy he waited patiently for someone to sponsor him as an emigrant to the United States. He could have had sponsorship to other countries, but he turned them down to wait for the opportunity to enter our country. In 1956, his dream came true and he was permitted to come into the United States, and in 1959 he became an American citizen.

In Buffalo he worked for a local company in prosthetics and orthotics. The government then offered him a job at the Veterans' Hospital, where after an eight hour work day he was permitted to maintain a private practice elsewhere. After four years and enough money, he left Veterans' Hospital to establish his own highly successful business, that of Tonawanda Limb and Brace, Inc. He has a federal government contract for American disabled veterans plus his own prosperous practice.

After coming to this country Miro, at last, was able to purchase a telescope, a Celestron 8, and found great joy in observing. He saw an ad for an Adult Education course in astronomy at Tonawanda High School with Orrin Christy as instructor. Miro enrolled in the course, visited the Christy Honeyhouse Observatory, and became interested in building a large telescope. He read several books on the subject and discussed telescope making with Orrin who encouraged Miro's enthusias.

Miro had a friend who worked at the Corning Glass Center, and he alerted Miro to the fact that the company had a large piece of broken pyrex glass which had been made for some industry and couldn't be reused, and would either have to be scrapped or remelted, and that Miro could have it, free of charge, if he wished. Excited over this rare opportunity, Miro drove to Corning with a truck to pick up this

48" x 48" x 3" treasure, weighing about 1100 pounds. He has used every bit of this glass, cutting some blanks 24", 20", 18", 16", 14", 10", and so forth.

He enrolled in Ed Lindberg's instrument making course at the museum and received advice from Ed on grinding the mirror. He also received valuable advice from Bob Mayer who made the dials for his telescope.

In the basement of Miro's home one sees an amazing array of extraordinary machinery which he has made, including a grinding machine, testing machine, and a Foucault tester. The 20" Schmidt-Cassegrain telescope he has built, is a spectacular piece of work requiring special machinery to produce its 120 pound mirror, all of which Miro designed and built. He also built a vacuum distillation machine to aluminize this sizable mirror. The final touches on this magnificent scope are nearing completion. The primary and secondary mirrors are finished, and the corrector, made from rough glass which Miro has polished on both sides, is half finished. His talents are manifest further as he contemplates making a camera for his scope in the not too distant future.

Last spring Miro and Tom Dessert attended the Bear Lake City Amateur Telescope Makers' convention near Los Angeles. This convention is the Stellafane of the west. While there, Miro met Leo Vandrbyl, a member of the R.A.S.C., who lives in Victoria, British Columbia. Mr. Vandrbyl is an engineer and architect and is deeply involved in astronomy. He had a strong need for a piece of glass for an astronomical project, so after enthusiastic discussions, Miro, in his great generosity, donated one of his 20" optical flats to Mr. Vandrbyl for his club's use. The glass will be finished and used in the large telescope in the huge traveling dome observatory which is now under construction.

Miro is an accomplished linguist. He speaks, reads and writes exceedingly well in both Croatian and Italian. He is also well-versed in Russian and Spanish. When he came to the United States he did not know a word of English, but in a short time he mastered the language.

He has furthered his education in this country by taking post graduate courses at the medical schools at Northwestern University (3 times), New York University, Miami University, and the University of Michigan, and holds diplomas from all of them.

Among his hobbies are his travels throughout the country and his excursions to Canada. The family has a summer home on Grand Island where many happy hours are spent boating, swimming, fishing, and good eating. Miro hopes to get back into photography and painting if he can find the time in his busy schedule. He has done some professional photography for weddings, and recently purchased a Hasselblad camera with hopes of finding more time to pursue professional photography. He continues to play clarinet and now has two saxophones.

Along with his many other accomplishments, More is a champion chess player. While in Italy he won many awards in chess tournaments between the provinces. He has not found anyone in the area to be challenging enough for him to take the many hours that chess requires.

Joanne (nee Geisen), his devoted wife, is Vice President, Treasurer, and book-keeper of their thriving business. Miro has the highest words of praise for his extremely capable and excellent partner. Miro and Joanne have two fine sons; Richard, a third year student at Canisius College, who may follow in his father's footsteps and go into prosthetics, and Robert, a student at the Rochester Institute of Technology, who is studying Mechanical engineering.

How does one find words to summarize the accomplishments and personality of this amazing man whose drive and intellectual capacity are so astounding? His multi-talents in medicine, science, technology, language, music, art and photography are truly remarkable. His warm, friendly personality, and keen wit coupled with his kind and generous nature, spreads joy to all who have the good fortune to know him.

Edith L. Geiger

----- ANSWERS TO QUIZ -----

- 1) The names used before they discovered that the evening star, Hesperus, and morning star, Phosphorus, were one planet, which they later named, Venus.
- 2) Venus, less than 25 million miles at inferior conjunction. Mars, a little over 34 million miles at closest approach.
- 3) In the years 2004 and again in 2012
- 4) 400,000 times brighter.
- 5) LUNA (the moon). Among the Greeks, "SELENE", Her Worship is said to have been introduced among the Romans in the time of Romulus. She had a temple on the Aventine, one on the Capitol and a third on the Palatine.....
- 6) Those that explode more than once, such as "T" Coronae Borealis which exploded in 1866 and in 1946.....

BAA ANNALS

5 YEARS AGO - The March 1976 meeting was addressed by Fred Price who presented a talk entitled "The Bright Ray Systems of the Moon". The April meeting of that same year was held at the Strasenburgh Planetarium in Rochester. The March/April Spectrum for that year contained an article by Bill Deazley outlining suggestions for improvements at the Beaver Meadow Observatory that seems worth reviewing.

10 YEARS AGO - The March 1971 meeting featured Dr. Price speaking on "Water and Life on the Moon?" Seems outwardly as if the poor man is only allotted March every 5 years to share his views. The April '71 speaker was Ralph Dakin of Bausch and Lomb Inc. The subject was "Gratings in Astronomy."

15 YEARS AGO - The March 1966 meeting featured two speakers. Les Stoklosa on "Finding a Telescope Mirror" and Paul Redding who talked to the club about the search for Dr. Duzee's 13" refractor which was originally in Buffalo and considered the world's largest refractor in its time. The April 1966 meeting was moved to the third Friday to avoid conflict with the Easter weekend. This meeting featured not two but four speakers, Ernst Both, Walter Semerau, Rudy Buecking and Ed Lindberg.

25 YEARS AGO - The March 1956 meeting featured a 40 minute movie entitled "The Story of Palomar". The April meeting hosted guest speaker Dr. F. Shirley Jones from the Climax New Hampshire Observatory. The subject of that talk was "Solar Prominences. The third Wednesday of the month in those times was club observing night at the Kellogg Observatory. Gene Wallmeyer ran the show.

The Buffalo Astronomical Assn., Inc.
% Darwin Christy, Editor - The SPECTRUM
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FIRST CLASS