

the Spectrum

BUFFALO ASTRONOMICAL ASSOCIATION INC.
BUFFALO MUSEUM OF SCIENCE
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JANUARY - FEBRUARY 1977

JANUARY MEETING: Bill Chambers of the BAA will speak on "Image Intensifiers" at our January 14, 1977, meeting. This meeting will be held in the New Science Building Auditorium at Buffalo State College starting at 8:00 p.m., as will all other meetings through June 1977. Bill is Chief Engineer of High Energy Laser Technology at Bell Aerospace Textron and has had extensive experience in the field of image intensifiers.

FEBRUARY MEETING: Another BAA member, Dr. Fred West, is scheduled to speak at the February 11, 1977, meeting. His topic will be "Open Clusters". Fred has contributed fine talks and Spectrum articles to us in the past and we shall look forward to hearing from him again in February.

Rowland A. Rupp, Jr.

Secretary

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"LOST ON THE MOON": Here are the answers given in Design News to the "Lost on the Moon" problem that appeared in the last issue of The Spectrum. I am sure not everyone will agree with these answers (in fact some seem far-fetched), but remember that the people who provided the answers were concerned with management, not science. - Rowland A. Rupp, Jr.

Item:	Correct Answer:	Reasoning:
a. Box of matches	13	No oxygen on moon to sustain flame; virtually worthless.
b. Food concentrate	4	Efficient means of supplying energy requirements.
c. Fifty ft of nylon rope	6	Useful in scaling cliffs, tying injured together.
d. Parachute silk	8	Protection from sun's rays.
e. Solar-powered portable heater	15	Cannot use without sunlight and not required when sun is shining.
f. Two .45 caliber pistols	11	Possible means of self-propulsion.
g. One case, dehydrated milk	12	Bulkier duplication of food concentrate.
h. Two 100-lb tanks of oxygen	1	Most pressing survival need.
i. Stellar map (moon's constellation)	3	Primary means of navigation.
j. Self-inflating life raft	9	CO ₂ bottle in military raft may be used for propulsion.
k. Magnetic compass	14	Magnetic field not polarized.
l. Five gal of water	2	Replacement of tremendous liquid loss on lighted side.
m. Signal flares	10	Distress signal when mother ship is sighted.
n. First-aid kit with injection needles	7	Fits aperture in space suit.
o. Solar-powered FM receiver/transmitter	5	Requires line-of-sight transmission and short ranges.

Items 13, 14 and 15 are virtually worthless so priority is in inverse order to their weight.

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* CAROLINE HERSCHEL, 1750 - 1848 * By a Member of the B.A.A.



While the inhabitants of the former British Colonies in America were founding a new country, a woman was launching an astronomical career in England. In 1782, Caroline Herschel was just beginning her independent studies of the heavens; today, she is known as the first woman astronomer of note. But this milestone in the history of women was not a foregone conclusion from the start. Like the history of our homeland, things might have been different. Caroline Lucretia Herschel, who was born March 16, 1750, in Hannover, Germany, originally studied violin and concert singing. She even worked as a dressmaker until 1772 when she went to England to join her brother, William, an organist at Bath. There she resumed her musical training and later performed in oratorios.

William, eighteen years her senior, became interested in astronomy, built himself a telescope, and in 1781 discovered a new planet. He was rewarded by the appointment as private astronomer to King

George III and the brother and sister thereupon abandoned their successful musical careers, moved to Slough near Windsor, and devoted themselves to astronomy. Caroline studied under her brother and became his assistant, receiving a salary in this position from George III, commencing in 1787. William made her a small telescope which she used for her own observations, discovering three nebulae in 1783 and eight comets between 1786 and 1797, five of them with undisputed priority.

Of her earlier years as William's assistant, Caroline later wrote: "My time was taken up with copying music and practising, besides attendance on my brother when polishing his mirrors, since by way of keeping him alive I was constantly obliged to feed him by putting the victuals by bits into his mouth. This was once the case when, in order to finish a seven-foot mirror, he had not taken his hands from it for sixteen hours together. Generally I was obliged to read to him while he was at the turning-lathe or polishing mirrors, serving tea and supper without interrupting the work, and sometimes lending a hand. I became in time a useful member of the workshop ..."

Up until William's death in 1822, Caroline read his instruments and copied his observations, performed the necessary calculations, and then edited his papers and prepared his catalogues for publication. Her own "Index to Flamsteed's Observations of the Fixed Stars" with a list of Flamsteed's errata containing 561 stars omitted in the British Catalogue, was published in 1798 by the Royal Astronomical Society. After William's death she returned to Hannover and catalogued his observations, publishing in 1828 the "Reduction and Arrangement in the Form of a Catalogue in Zones of all the Star Clusters and Nebulae Observed by Sir William Herschel". For this she received the Gold Medal of the Royal Astronomical Society. In 1835 she was created an honorary member of that society.

Caroline, who never married, lived a long life, which was fortunate for she was awarded the Prussian gold medal in science on her 96th birthday and had the honor of entertaining the Crown Prince and Princess the following year. She died January 9, 1848, two months before her 98th birthday, but received the posthumous honor in 1889 of having the asteroid LUCRETIA named after her. Caroline Herschel earned fame for herself as the first important woman astronomer and she set an example for the many women who have since made significant contributions in this field. Quite an achievement

for an erstwhile musician in a foreign country long before women played an active role in the sciences!

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* REPORT ON BEAVER MEADOW OBSERVATORY * By Thomas L. Dessert, Director.

As we start our second year at Beaver Meadow, I would like to take this opportunity to thank those who made it possible. For volunteering their service on Public Night as Program Director, my thanks to: Carl Millazzo, Warren Steinberg, Carl Kalweit, Bill Gehrke, Mike Dlugosz, Bob and Bill Hewitt, Rick Janas, and Larry Carlino. Also to: Bob Mayer, Bill Deazley, Dave Maul, Walt Semerau, Bob Hewitt, Carl Kalweit, Troidl Optical Inc., Ron Whyte, and Bob Kirchgessner my thanks for providing equipment and material that has benefited the observatory greatly. A very special thanks is extended to our friends at Dow and Co. Through their generous financial support, programs are being added and improved which provide our members and, in fact, the public with opportunities for advanced education in astronomy. And last but hardly least I give my warmest thanks to the one who has advised and assisted me since the very beginning, who endured and inspired me during the confused days of planning, meetings, and fund raising, and who has pitched in unselfishly to keep the observatory neat and supplied: to my wife, Marty, for being a true astronomer's wife.

With the new year come new hopes and goals. One of the few shortcomings at Beaver Meadow is that there are not enough telescopes. The Robert Kartyas Memorial 8-inch reflector has recently been renovated and reinstalled at Beaver Meadow thus improving our observing capability. However, at least three additional telescopes will be required to fill our observational needs. A 6-inch, f/15 Dall-Kirkham Cassegrain mounted on a Springfield equatorial mounting is needed to fill out our lunar and planetary observing programs. For those who choose to study the more distant nebulae and galaxies, an 8-inch, f/4 Newtonian, built open tube and possibly in a simple English yoke mounting for observing convenience. For examining the splendor of the Milky Way star clouds and for hunting comets, a 5-inch, f/4 refractor is an absolute must. The mounting can and possibly should be of a simple alt-azimuth type. I recommend that the construction of these telescopes be varied and yet made of the simplest but enduring materials to demonstrate to the public and novice the ease and economy in which our hobby can be pursued. The mountings should be permanently located around the building on the east, south, and west sides. Persons interested in building one of the above telescopes or contributing material, etc. should come to the Instrument Section meeting, 8-10 p.m., January 28th. This section still holds its meetings at the Buffalo Museum of Science on the fourth Friday of every month, September to June.

Programs are now being considered for this spring and summer at Beaver Meadow. Individuals who have an interest they would like to develop further or who would like to teach a course, should contact me at 652-5530 or at the membership table at the monthly meetings. 1976 was a very successful year at Beaver Meadow Observatory. With your continued support, 1977 will see an expansion of programs and facilities to again produce a very good astronomical year.

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* SPY AND TELL * Larry Carlino, a teacher at Williamsville High, also teaches a class in astronomy at the school. He is a planetary expert and is reported to have seen cloud detail on Uranus. *** Dave Steinagle has finished his observatory which houses a 10" Cave Deluxe observatory model. *** Tom Dessert is very busy cataloging his many photos of the heavens. He has over 60 pictures of Messier objects and around 60 lunar photos and about 100 planetary photos. *** Rev. Engelhardt is planning to build a two-story observatory in Colden. The lower floor will be a workshop. (continued on page 6)

* * From Micrometeoroids to Micrometeorites * * by Darwin Christy

The fact that I could find little about micrometeorites in the literature prompted me to set out on my own and find out more about them through my own observations. After extensive observations I have come to the conclusion that they can be formed in three different ways. I will start out with the siderites or the metallic micrometeorites. Most of the investigators do not consider these to be micrometeorites because they did not start out by being a micrometeoroid. As a meteoroid (not a micrometeoroid) enters our atmosphere, the friction with the atmosphere produced by the meteoroid's velocity causes the material to heat up and vaporize. If the meteoroid is large enough to be seen as a fireball or bolide, the molten material sloughs off. This material will be slowed down by the atmosphere and will start to cool rapidly. In the cooling process it will take on various shapes. If it cools rapidly, a tear-drop appearance will result (fig. 1). If the cooling process is slower, the tear-drop effect will change to that of a pear shape (fig. 2) or a dumbbell (fig. 3). Finally, if the cooling is extremely slow, the material being flaked off the meteoroid will be able to pass through all of the previous stages and become a spherule or small sphere (fig. 4). The shapes which are produced are similar to those produced in the manufacture of lead shot or in water dripping from a faucet.



fig. 1
teardrop



fig. 2
pear



fig. 3
lozenge



fig. 4
sphere



fig. 5
micro-
meteoroid



fig. 6
sphere with
pockets

I am convinced that these micrometeorites are a result of a meteor shower. My reason for believing this comes from direct observation. For the past four years I have set up microscope slides in a given area. Each day I would change the slide and examine it for any micrometeorites which may have been caught on the slide. I made up a graph showing a rise in number of these objects following a meteor shower, compared to the number preceeding a shower. In each case there was a delay in time which indicated that the micrometeorites took from 7 to 10 days to reach the Earth's surface following a shower.

Micrometeorites from a meteor shower averaged about 40 microns in diameter (a micron being one-one millionth of a meter). The largest were about 200 microns which is very rare, and the smallest about 10 microns in diameter. The most frequent shapes are spheres, while tear drop shapes are rarest. Pear shapes and ovates are only slightly more numerous than tear drops.

One type of micrometeorite not encountered by me is the microtektite, found only in certain areas of the Earth's surface. Microtektites are not found as spheres but rather as elongates, tear drops, dumbbells, and buttons or flat discs. The origin of Tektites has not been established definitely. Some astronomers believe that they came from the Moon when the craters were created by meteoroid impact. Others believe that they were formed on Earth, blasted into space by meteoroid impact and came back

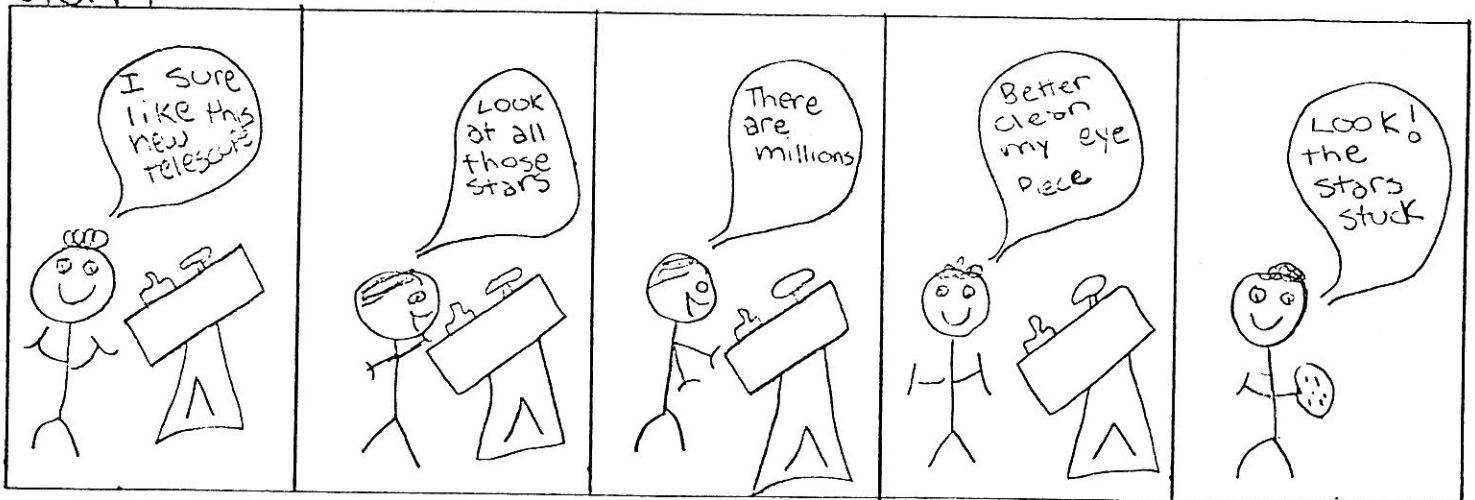
through the atmosphere, making them terrestrial rather than celestial. I personally lean toward an origin on the Moon.

Micrometeorites are truly produced from micrometeoroids. Micrometeoroids are probably very irregular in shape (fig. 5) and tumble through space in a random motion. Upon entering the atmosphere at a velocity of 40 km/sec they collide with the atmospheric particles creating friction. Because of their finite size and small mass, the atmosphere will cause them to slow down before they can vaporize. However, they will start to melt on their surface and because they are tumbling will start to form a ball or sphere. The irregularities will fill in somewhat but tiny pockets of gas, mainly hydrogen and helium, both of which are abundant in outer space, will result (fig. 6).

When the micrometeoroids have turned into the spheres, they are then known as micrometeorites. Having cooled down, they will remain aloft for some time, but they do start their journey downward and will eventually reach the Earth's surface. That journey may take as long as 30 to 60 days. They take longer to reach the surface than those from meteor showers because they were formed so much farther up in the atmosphere. A recent article has stated that there are in the neighborhood of about 650,000 metric tons of these objects coming into our atmosphere annually. That means that about 2,000 metric tons rain on us every day - a figure much higher than that quoted in the past.

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Starry



The above is a contribution by one of our youngest members. We hope you enjoy it and remember it when you use your new telescope. Thank you, Patty!

By Patty Rupp

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* B.A.A. NEWS ITEMS: * At a meeting of the BAA Board of Directors on December 10, 1976, it was decided to continue to meet at Buffalo State College at least through June 1977. It was also decided to inform the Buffalo Society of Natural Science (BSNS, administrator of the Buffalo Museum of Science) that the BAA would continue its affiliation with the BSNS, but that it could not agree with the BSNS' policy statement of June 17, 1976 (which would require the members of all affiliated groups to also be members of the BSNS) since that policy infringes on the sovereignty of the BAA. As of writing this

* SPY AND TELL (continued from page 3) * Miro Catipovic came upon a lucky find of 1,100 pounds of scrap pyrex (what a find!). He has a 20" blank, a 20" mirror, and an 18", a 16", and an 8" - Whew!!! *** Esther Goetz has discovered that she has an ulcer, but is recovering nicely from her attack. She is a prolific potess and her verses often appear in our local and suburban papers. They have also appeared in papers in other parts of the country. She has hundreds of poems to her credit and deserves national recognition. *** eg *** Edith Geiger continues to observe those elusive domes on the Moon in a freshly painted observatory. *** DUES ARE DUE NOW *** PLEASE ***

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* ODDS AND ENDS ABOUT CONSTELLATION NAMES * The constellation Lyra was originally represented as a turtle - Hermes used a turtle shell to make a lyre, thus the constellation became Lyra the lyre or harp Eridanus the river used to be called Potamos by Ptolemy, the Greek word for the river Nile. But the Romans changed this to Eridanus, their name for the Elbe river in Germany (Elbe comes from the later Roman name Albis) Argo navis was pictured with either 12 or 52 oars, for it served as a symbol of the year, the number of oars indicating either months or weeks it was the Arabs who changed Ptolemy's name Therion (meaning "wild beast") to Lupus the wolf the Ptolemaic name for Ganis minor, the little dog, was Prokyon which then was transferred to the principal star of that constellation Apus, a southern constellation, used to be translated as "the legless" or "the footless". Since this did not make much sense to some, it was at one time changed to Apis the "bee". The correct name in Bayer's Uranometria is Apus Indica, the Bird of Paradise - in those days it was believed that the Bird of Paradise never touched ground and hence was thought to be "footless"! The Southern Cross was at first called the Southern Wain (by Alvise de Cadamosto, 1484), then named Rhombus by Amerigo Vespucci but finally called a cross by Andrea Corsali in 1515. It used to be part of what the ancients called "Centaurus" All very confusing

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