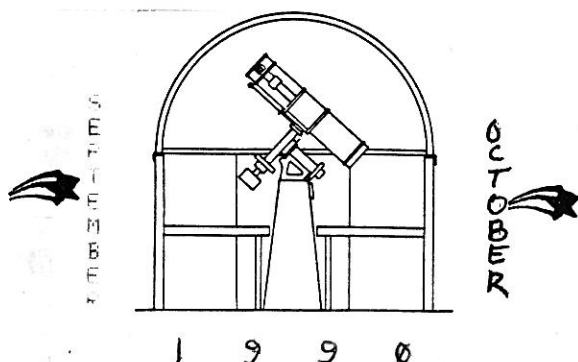


THE SPECTRUM



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BUFFALO ASTRONOMICAL ASSOCIATION, Inc.

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Robert Hughes - Vice President
Lynn Sigurdson - Secretary
Steve Kramer - Treasurer
Ed Lindberg - Fellow Representative
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A telephone has been installed at Beaver Meadow for emergency calls at not cost. It can, however, be used to make domestic calls for 50 cents for the first three minutes and 10 cents per minute thereafter. PLEASE abide by the ruling. THANK YOU!!! The number is (716) 457 3104.

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MEETING NOTICES

SEPTEMBER - The September meeting will be held in the Science Building Auditorium at Buffalo State College on Elmwood Avenue beginning at 7:30 PM. Our featured speaker will be Rick Albrecht of Rochester. His talk is entitled, "George Hale's Last Giant Step." The talk will feature George Hale, the great telescope maker who was responsible for four giant telescopes, each being the largest in the world in its class at the time it came into being. The culmination was the 200-inch giant on Mount Palomar. Rick was able to gain access to the observatory and made many fine photos showing the structural details on the great instrument. Refreshments will follow -----

OCTOBER- The October meeting will also be held at Buffalo State College beginning at 7:30 PM. Our featured speaker this evening will be Peter Jedicke from London, Ontario. His talk is entitled, "Recipes for a Star." This presentation goes lightly into stellar evolution and astrophysics. The material is not too technical for members with some knowledge of elementary topics. Refreshments will also follow.....

PRESIDENT'S REPORT

Welcome to the 1990-1991 season of the Buffalo Astronomical Association. We have a new group of officers this year with myself the only holdover from before. I succeed Doris Koestler as President. Bob Hughes replaces me as Vice-President. Lynn Sigurdson takes Ken Biggie's post as Secretary and Steve Kramer succeeds Jack Empson as Treasurer. Many thanks to those who are stepping down and good luck to those who are taking over.

An opening for Member-at-Large on the Board of Directors has occurred with Bob Hughes' election. Doris Koestler and Gene Witkowski have accepted nominations for that position; the election will be held at the September general meeting. Nominations from the floor will also be accepted at the meeting. Marilou Bebak and Fred Price return as Members-at-Large.

Bruce Newman will become our Membership Chairman in September. He replaces Diane Borowski who did a great job for the last couple of years. John Yerger will handle publicity for the BAA, an area in which we definitely need improvement. John brings fresh ideas and enthusiasm to that post. Others will return to jobs they held last year. Dan Marcus will remain as Observatory Director, Joe Provato is Refreshment Chairman, and Darwin Christy will continue to edit the SPECTRUM. Thank you for the job you have done and for staying on.

A question we need to answer is: what to do about a new telescope for Beaver Meadow? For the last couple years we have raised that question, surveyed it exhaustively and studied it without arriving at a concrete plan and commitment. I'd like to get some inputs from you at the September meeting so we can arrive at a consensus about what to do. I still sense that we don't have clear and enthusiastic support for this project from the general membership.

One project has been progressing thanks to the help of Ed Czaplá. Ed Lindberg, Dan Marcus and Leonard Milks. That is the camera mount using the pedestal and drive

donated by Bell Aerospace. A structure to hold the camera and the guide scope donated by Conrad Stolarski has been built. One thing we still need is a variable speed clock drive. This equipment will be suitable for relatively wide angle photography at Beaver Meadow without tying up the main scope.

I'd like to see a resurgence of the Instrument Section. If you are interested in this group see Ed Lindberg. It would be nice to revive the Study Section or create an Observing Section. If you have any ideas see me, or any other Board member, about it.

I have a sad note to report: Fred Price's mother died August 11. His mother's sister died three days later. On behalf of the BAA I extend sincere condolences to Fred.

Rowland A. Rupp

BAA ANNALS

5 YEARS AGO - Five years ago we were looking forward to the coming apparition of Halley's Comet. We kicked off the year in September with Dr. David Meise of Geneseo State College, an expert on comets, as our guest speaker. The SPECTRUM doesn't tell who our October speaker was to be; apparently we had difficulty lining somebody up.

Beaver Meadow was busy preparing for public showings of Halley's Comet. According to Director Carl Milazzo up to 35 people were showing up for public night and more could be expected as Fall and the comet came on. Dan Marcus, Tom Reid, Ed Lindberg, Bob Mayer and Paul Noye were all thanked for helping work on the observatory and the telescope.

Ed Lindberg contributed an article for the SPECTRUM on "The Dinosaur Problem Again" in which he reviewed the current astronomical explanations for dinosaur extinction. Six inductees to the BAA College of Fellows were announced. They were: Ken Biggie, Larry Carlino, Darwin Christy, Ken Kimble, Jack Mack and Rowland Rupp.

10 YEARS AGO - Ten years ago our September speaker was Dr. John Paris, a member of the Rochester Academy of Science, who spoke on "Visual Allusions". That's right: the SPECTRUM said "allusions", not illusions. In October Jack Mack spoke on the microwave background and the temperature of space, a cool topic in those days.

Our new President, Al Kolodziejczak, wrote a report outlining his hopes and plans for the coming two years. He thanked those who expended significant effort to support the club, especially Fred Price and Tom Dessert in their roles as President and Observatory Director respectively. Speaking of Al K, the SPECTRUM reported he and Mary got married on July 14th of that year.

Fred Price contributed an article on the "Future of Amateur Earth-Based Lunar Observation", no doubt a forerunner of his recently published book on lunar observation. Edith Geiger wrote a biography of our distinguished member, Dr. Gilbert Brink, Professor of Physics at U.B.

15 YEARS AGO - In 1975 we were meeting at the Museum of Science. In September we heard from Ray Manners, but his topic wasn't mentioned. Dr. Lyle Borst, Professor of Physics and Astronomy at U.B. spoke in October on "Problems with the Expanding Universe".

Dr. Fred West, professor at Buffalo State, wrote an article on asteroids for the SPECTRUM. He covered their physical properties including: determination of mass resulting from studying perturbations, new techniques for measuring their diameters and predictions about their composition from their reflection properties. Fred's articles are always worth rereading.

25 YEARS AGO - Ron Clippinger, a very active BAA member a couple of decades ago, spoke on "Trepidation of Fixed Stars" at our September 1965 meeting. What's that? Larry Hazel's topic for October was variable stars, a field he has long studied and contributed to.

An interesting note appeared in the September SPECTRUM. Joseph Ashbrook, long time editor of 'Sky and Telescope', was the house guest of the Boths. Even though the SPECTRUM was published monthly back then there is little besides meeting notices in them. No reflection on Editor Bruce Cook, you can't print articles unless people submit them. The same applies today, so keep them coming.

Rowland A. Rupp

SPY and TELL

During July and August the Children's Page in the Buffalo News, Sunday Edition, was produced in cooperation with the Buffalo Museum of Science Education Department under the direction of Marilou Bebak.

Jack and Jayne Mack and family toured the Southwest in July, visited the Grand Canyon en route, and returned home in early August.

Jack Empson, as a marshal for the car races at Watkins Glen on June 30th, had an enviable assignment keeping crowds away from Paul Newman who was racing his car at the event. Casual comments passed between Jack and Newman from time to time. On August 11th, Jack did some safety work in the pit area at Watkins Glen for the Nascar Race with the big names in stock car racing participating. Dave Sepulveda and Bob Hughes were at the race and did safety work on the track.

A representative of Seymour Knox purchased two of John Yerger's paintings that went into the Knox collection. John also has three paintings on consignment at the Martin Gallery in Seattle, Washington. Buffalo Spree magazine coming out in September, will carry a full color page of one of John's paintings. Congratulations!

On a warm Saturday night near the end of July, Rosemary Paar and her daughter went out into the backyard to enjoy the refreshing evening air. Rosemary commented on the bright area lights and wished they were off. With that, the lights went off as a result of a power failure. A simple wish from Rosemary and light pollution vanished and an aurora shimmered in the heavens. On August 11th, she had the misfortune of sustaining an injury to her right foot with a fracture in the fifth metatarsal. She was sleeping in a chair where she had been watching the 11 p.m. News on TV. Her husband, Julius, woke her around 11:15 and Rosemary, a bit dazed, stood up and went to turn off the TV and her right leg gave out and she collapsed to the floor, moving the TV as she fell. She is now wearing a unibon shoe, and with the aid of a cane the doctor thinks her foot will be healed in about two months.

Tom Nigrelli, who joined the BAA in September 1989, is very excited over his new hobby of astronomy. At our Perseids Meteor Star Party at Beaver Meadow, he saw eight meteors, and now his eyes are on the comets and all that the sky opens up to him. He enjoys sharing his interest with his friends and happily shows them the many wondrous sights he has observed as his hobby grows.

A brief write-up on former member, Steve Desmond, appeared in the Orchard Park Bee, giving his new position with the Bee, where he has been a photographer with the Bee Group newspapers since February 1988. He is now employed as full-time chief photographer with the Bee, supervising a staff of nine photographers. He is also coordinating photo assignments for the nine Bee newspapers and the advertising department. While in Orchard Park High School, he was the winner of a Gold Medal and Navy Award for astrophotos of the moon and stars in the 41st Western New York Science Congress held in 1981. In 1988 he was the

journalism from the State Education Department.

Darwin Christy, acknowledged to be an expert fisherman, caught a 42" muskie in the Niagara River and made the mistake of putting his thumb in the mouth of the fish, which prompted the muskie to bite through Darwin's leather glove, leaving a tooth piercing his thumb. Darwin used his rusty pair of pliers to remove the tooth. Another muskie, 36" long, pulled the same trick and Darwin found another tooth that had to be removed from his other thumb. His thumbs have healed and all is well.

You recall how Jack Mack and family arrived at the Rupp's Star Party a day late in 1989. Well, Gene Witkowski also seems to have trouble with Star Party dates. He appeared at Marilou Bebak's Star Party a week early.

Edith L. Geiger

Kellogg Observatory Report

The Summer Sun Shows in the Museum's Solar Lab have been a tremendous success this year. As of August 10th, 5,000 visitors from 37 states and 18 countries have viewed sunspots, prominences and the solar spectrum. B.A.A. member Nancy Adams, who is in charge of the Sun Shows this year, also demonstrates solar energy by baking chocolate chip cookies in a solar oven on the Museum's roof. Nancy is also working on an astronomy research project for college, compiling a daily sunspot number and record of solar activity. Her results will be compared to the international record.

Fall Evening Observing in the Kellogg Observatory will be held every Friday from September through November from 7:00 - 9:45 pm. The Museum is also currently working with an astronomy student intern, Jill Betts. She is a senior at Frontier Central in Hamburg and will be giving 160 hours of volunteer service to the Museum's observatory.

ML. Bebak

OBSERVATORY REPORT *457-3104*

You did not make it to a Star Party? or public night? Too bad, our targets have included Comet Levy, weather balloons, aurora, huge Sunspots, Saturn, Neptune, meteors, as well as various assorted galaxy and nebula!

A special thanks to Jack and Jayne Mack, Rowland and Irene Rupp, Marilou Bebak, Bill Smith and Carol Lorenc (and Carol's Dad for all the wonderful waffles and pancakes), Bill and Carolyn Halbert, for hosting Star Parties!

I also appreciate the support for public activities at Beaver Meadow by: Jack Empson, Dave Sepulveda, Lary Carlino, Ed Czapla, Conrad Stolarsky, Tom Nigrelli, John and Maryann Yerger, Lynn and Wade Sigurson, Doris Koestler, keep up the good work! The Observatory has not seen as much activity since Halley's Comet!! Speaking of comets, you did not know about Levy?? 457-3104!! It is a local call.

Observatory Sept/Oct schedule:

Sept 1: Public Night

Weekend of Sept 15/16: Beaver Meadow Nature Festival. We will need help as the Observatory will be open 10am to 5pm both days, and we will be having public night on Sept 15! Might even catch a last glimpse of Levy!

Oct 6: Public Night

Oct 20: Public Night time to check in on Mars!

Astrophoto Sessions: Will be on Sept 22, and Oct 20.

Tracking Mount: Beaver Meadow has given us permission

to install the "Bell" tracking mount at a permanent site just South of the Observatory. The next meeting for this will be announced at the Sept meeting. Our thanks to Lenard Milks for his help with machining of mount parts.

Items needed for Observatory: Illuminated digital clock to replace the clock which died. Old and New telescope catalogues for telescope parts. The new style of dew shutter for the Telrad that was shown at one of the club meetings last year. (get 2) Speaking of things donated to the Observatory, the answering machine you hear at 457-3104 was donated by Jack Empson. Also you will notice the Lazer printed copy of the Arizona Data Base! graciously printed, and donated by Bruce Newman.

It has been a great summer, I'll sign off for now so I can watch comet Levy.

Daniel R Marcus

INSTRUMENT NOTES

For years now NASA has been regaling us with unbelievable accomplishments. There were four capsules that landed on the moon. Each had two astronauts who walked on the moon, talked to earth and showed movies of their activity. Then they collected actual samples of the surface material for scientists to test and enjoy and to raise new questions for them to puzzle over. Then came the Voyager flybys with their sensational close up view of several planets and their moons. It was a brilliant era for science.

Then it almost seemed as if NASA got careless. There was the tragic Challenger disaster traced to faulty caulking of fuel tank seams. And fuel tank leaks on two later missions that fortunately were caught before launching. Meanwhile, NASA was rushing to completion the Hubble Space Telescope. It had been a long time in coming but the pace seemed to quicken as the project neared the final stages.

The space telescope project was plagued by problems from the start. Some of the difficulties may have been related to the scale of the undertaking. Everything was huge. (See the illustration in April Sky & Telescope, page 378.) This is a "thin" mirror 8 feet in diameter. I wonder how much thought was given to the possible change in internal strains as the gravitational force was balanced by the force of acceleration of orbit.

One of the weaknesses of a large government construction project is that individual sub-contractors are let to low bidders. Sometimes quality of workmanship suffers. One astronaut was asked if he was ever nervous while awaiting lift-off. "Sometimes I'm nervous" he said, "when I realize that I'm sitting on several million dollars worth of hardware produced from low bidders." One of the things that seems to be missing is corporate pride. Remember the Roll-Royce story????

A party of scientists was crossing one of our southwestern deserts. One of the vehicles, a Rolls-Royce, developed engine trouble. Whether it was the terrible heat or faulty lubrication or both, one of the bearings seized and broke the crankshaft. One member of the party knew a distributor and so they were able to send a cablegram to the factory in England ordering a new part. The part arrived promptly by air delivery. However, there was no packing slip or statement of charges due. They cabled the factory: "SEND STATEMENT CHARGES DUE REPLACEMENT CRANKSHAFT SHIPPED TUESDAY". Back came the answering cablegram: "NO RECORD SUCH SHIPMENT. ROLLS CRANKSHAFTS NEVER NEED REPLACEMENT".

It is corporate pride like this that seems to have been lacking in the optical section of the Hubble project. Perkin Elmer, the prime optical contractor, had been taken over by a large conglomerate. They are now the Perkin-Elmer Division of the Hughes Danbury Optical Systems Inc. Whenever a revered corporation is taken over by a big holding company something is lost. The name Perkin-Elmer used to bring thoughts of high precision telescope optics.

they made fine mirrors for which they claimed to hold the surface to a precision of one fiftieth wavelength of light or to within less than half a millionth of an inch. On of the recent reports stated that Perkin-Elmer figured the primary by computer and did not check it optically. And they did not set up a test of the whole system. This is not the Perkin-Elmer of old!!

Whatever we may say about the team, they did build about as big a telescope as could be hoisted into orbit and they did launch it successfully. When the scientific community heard of the successful launch and the deployment of the telescope everyone waited for further news. Unfortunately most of the news was bad. The telescope was pointed at a star. But what we saw was a view of the earth as there was a 180 degree pointing error. This trigonometrical goof was quickly corrected. But then when the telescope was pointed at a star the parabolic radio antenna could not be pointed at the earth's receiver. Someone had snubbed a signal cord to a wrong strut so that the antenna did not have its full range of rotation. For some targets the telescope had to be rolled to position the antenna and then the optical system had to be re-pointed. But this problem was also not difficult to correct. These and other minor difficulties were corrected by the shuttle crew before the telescope was deployed. But then came the shocking news from NASA - the telescope could not be focused sharply.

NASA immediately launched an investigation. It was revealed that there had never been a systems test. Kodak offered such a test but their bid was rejected in favor of the lower Perkin-Elmer bid which did not offer such a test. Later along in the string of bulletins came the report that the primary mirror was exhibiting spherical aberration. Yet Perkin-Elmer had supposedly figured the mirror to perfection. Subsequently came the report that Perkin-Elmer had polished and figured the mirror by computer and had NEVER TESTED IT OPTICALLY! Still later we learned that there appeared to be a flaw in the null testing device used to figure the primary. It is pretty clear that we don't know much about what actually happened. Maybe more definitive reports will appear in the journals.

A still later chapter on this bizarre story is a news note from NASA. They are now experimenting with improving the focus of the out of focus images by computer correction. At the Monday Morning Quarterback's desk we are wondering what will happen next. Will NASA try to make the best of what they have? Or will they bite the bullet and return the pride and joy to earth for reworking? Or is there a political face saving problem? Or is there an economic problem? MAYBE 1.5 Billion dollars is all the money there is!!!

Assuming that the jewel is returning to earth for rehabilitation the MMQB's can make some valuable suggestions.

Assemble a group of experienced telescope makers who have made many mirrors and mountings. Their function would be to ask questions and make suggestions during the rehab work.

Decide whether to go with the present primary or to reduce the diameter to perhaps six feet and double the thickness.

If the larger primary is to be figured, mount it in a horizontal plane for figuring and testing to reduce the chances of weightlessness.

Make a systems mock-up and test the system with a Hartmann photographic test.

The "eager and experienced" helpers will be available for further suggestions and discussions. They will not accept remuneration as this would jeopardize their amateur standing. But they could accept surplus materials such as telescopes of about 24-inch aperture, etc.

Ed Lindberg

DEADLINE FOR THE NEXT ISSUE OF THE "SPECTRUM"

OCTOBER 12, 1990

ASTRONOMICAL HAPPENINGS

SOLAR: The Sun will be in Leo until September 12th and then enter Virgo where it will stay until October 24th. It will then enter Libra and remain there into November. On the 23rd of September at 1:55 AM the Sun will cross the equator which is also referred to as the Autumnal Equinox. For about an hour before and after 1:55 AM, you should be able to stand an egg on end. Try it!!

LUNAR: The phases of the Moon will be Full (CORN) Moon on September 4th and Full (HARVEST) Moon on October 4th; Last Quarter Moon on September 11th & October 10th; New Moon on September 18th & October 18th; & First Quarter Moon on September 26th & October 26th.

LUNAR CONJUNCTIONS: Mars on September 10th & October 8th; Jupiter on September 15th & October 12th; Mercury on September 17th; Antares on September 24th & October 22nd; Uranus on September 27th & October 24th; Neptune on September 27th & October 24th; Saturn on September 28th & October 25th.

PLANETARY EVENTS: Venus & Regulus conjunction on September 6th; Mercury at inferior conjunction on September 7th; Mercury & Venus conjunction on September 14th; Uranus stationary on September 14th; Mercury stationary on September 16th; Saturn stationary on September 22nd; Neptune stationary on September 23rd; Mercury at greatest elongation west 18 degrees on September 23rd; Mars & Aldebaran conjunction on September 25th; Vesta stationary on September 28th; Mars stationary on October 20th; Mercury at superior conjunction on October 21st.

METEOR SHOWERS:

September 1st - Beta Lacertids
September 1st - Aurigids
September 11th - Epsilon Perseids
September 20th - Southern Piscids
September 21st - Kappa Aquarids
September 22nd - Alpha Aurigids
September 29th - Sextantids (daytime)
October 2nd - Quadrantids
October 3rd - Andromedes
October 8th - Giacobini-Zinner (1985)
October 9th - Draconids
October 12th - Northern Piscids
October 17th - Epsilon Arietids
October 19th - Epsilon Geminids
October 21st - Orionids
October 24th - Leo Minorids

ASTRONOMER from the PAST

OLE ROMER

Ole Romer was a Danish astronomer, born September 25, 1644 in Aarhus and died September 19, 1710 in Copenhagen. He studied at the University of Copenhagen and then went to Paris where he made observations in the royal observatory. There he was elected into the academy. In 1661 he was advanced to professor of mathematics and director of the observatory at Copenhagen, then became a councilor of state. Discovery of the velocity of light was his greatest achievement, determining by observation of the eclipses of the satellites of Jupiter. He found that when Jupiter and earth were on opposite sides of the sun, the eclipse seemed to occur too late. In the same token, when the two planets were on the same side of the sun the eclipses were too early. This extreme deviation from mean time he computed at eleven minutes. Today it is now known to be approximately eight minutes plus twenty seconds for light to cross the space between the sun and the earth a distance of about 93 million miles. Romer invented the transit instrument in 1689 and the meridian circle in 1690. These inventions have proved many times over to be very useful in astronomy as well as in other professional uses.

Darwin Christy

Book Review
Millennial Dreams and Moral Dilemmas:
Seventh-day Adventism and contemporary ethics
 by Michael Pearson

Cambridge University Press 1990

At our June 1990 B.A.A. meeting Spectrum editor Darwin Christy announced that he had received a copy of a new book from Cambridge University Press with a request from their publicity department for a review. Darwin said he was puzzled by this request but was seeking a volunteer member to do the review, and for some reason or other it ended up in my hands as Diane and I were making a hasty exit from the meeting to attend a Buffalo Bison baseball game at Pilot Field that night. I did not really pay much attention to the particulars of Darwin's request at that time other than to note that the book had something to do with Seventh-day Adventism and contemporary ethics. I briefly wondered what this had to do with astronomy or the B.A.A. but my mind was concentrated on getting to the game before it was over.

Anyway, being unclear about what Darwin wanted me to do with the book, which, at a glance, appeared to have nothing to do with astronomy, and not seeing any urgency in the matter, I left it sit on a shelf at home until recently when Mr. Christy called to see if I would have the review ready for publication in the next Spectrum issue. A quick look at the book's table of contents and the jacket description seemed to validate my original cursory impression of the lack of anything related to astronomy between its covers. Now, not being inclined to disappoint our esteemed Spectrum editor, I told him that I would spend some time looking at the book in more detail and see what I could find. Darwin insisted that the review did not have to be detailed or extensive, but only that it be from the perspective of astronomy in general.

The book is by Dr. Michael Pearson, a lecturer in Christian philosophy and ethics at Newbold College and attempts to illuminate contemporary Adventist thought and practice regarding issues of ethics and morality. The author deals in depth with five key controversial issues (contraception, abortion, role of women, divorce, and homosexuality) all of which are related in a general way to human sexuality but particularly how these issues are dealt with within the context of Seventh-day Adventism.

Seventh-day Adventism is a nondenominational, sectarian religious movement which first developed in early nineteenth century America. The period roughly between 1800 and 1840 was a time of great Christian religious revivalism in the expanding United States. There was much optimism among believers that the American continent would develop into God's kingdom on earth, and that those fortunate enough to be there at this time would be witnessing the onset of the millennium (that period of a thousand years of peace and justice predicted in the bible). Most of these believers held the view that the day of judgment of all individuals would then follow this period.

However, a minority of those revivalist believers were very critical of this optimistic view of the American experience and, in rejecting this belief, put forth a contrary version based on their own version of biblical prophecy regarding this world and this life. They came to believe that the 2nd coming of Christ and judgment day was imminent, even setting the exact date of the great event to be October 22, 1844.

When the great event failed to materialize several explanations were given by various adventist believers. One widely respected explanation was given by a young woman named Ellen Gould Harman-White (1827-1915) who rationalized the failure of the 1844 prophecy to take place by saying that Christ did not pass from heaven to earth (the 2nd coming), but actually He only moved from one part of His heavenly sanctuary to another, there to begin the work of "investigative judgment" of each human being in preparation for judgment which would soon come. Ellen G. White's adventist beliefs forced her out of the Methodist church and she claimed to have become a visionary who God was calling to tell other believers to give special observance to the Sabbath, or seventh day of biblical creation. Those who followed her believed she was a God chosen visionary, a divine prophet, and an oracle and eventually she became the group's recognized leader. Her writings and pronouncements became the basis and authority for the adventists movements doctrines, and at a 1963 convention the movement was officially established as the Seventh-day Adventist Church.

The group spread to Europe in 1874, and by 1915 when Ellen White died it was world wide with over 125,000 members. As of 1985 total membership was about 4.5 million of which 15% are in the U.S. and who continue to dominate the movement even though membership is growing fastest in the Third World. Because every apocalyptic prophecy to date has failed to come about, the character of the movement has changed considerably over the years with different divisions developing. Some members hold to the original primitive doctrine of the imminent 2nd coming, while others are attempting to modernize the movement along the lines of evangelical Protestantism. This division is generally similar to those found in most contemporary religions as a split along a traditional/conservative - modern/liberal continuum of individual behavior and church teaching regarding various moral, ethical, and socio-political issues.

Now, what does any of this have to do with astronomy? Well, the basic belief of the Adventist in the end of the world and the 2nd coming gives the movement a nature centered around the concept of time, and time is most definitely of interest to the field of astronomy, but the dimension of time which interests Adventists is not related either to the seasons, to planetary orbits, to relativity, or to anything like the space time continuum. The time they are concerned with, as covered in this book anyway, is specifically that time of transition of the existence of the faithful from a worldly phase to a heavenly phase. Modern Adventists believe that in the interim period life must go on and that the church acts mainly as a vessel for keeping the faithful together until the time of transition comes. So there is no connection with astronomy here.

Another possible astronomy connection, also associated with the Adventists unique concentration on the imminent end of the world as we know it, might, I thought, involve the catastrophic event itself. This it would seem would be one obvious connection if the details of how the great event will take place were covered, but I found no mention or reference to anything astronomical associated with this coming disaster. There is nothing in the book about potential stray asteroid, comet, or other extraterrestrial object collisions. In fact this book doesn't deal at all with this aspect of the Advent.

In conclusion, this book is strictly for those who would have an interest in moral and ethical issues related to the Seventh-day Adventist movement. Perhaps one would have to review other Adventist literature to discover an astronomical connection to the 2nd coming, for there is none to be found here.



Ken Biggie 08/16/90

??? FOR SALE ???

6-inch Schmidt Cassegrain "Dynamax" - Golden Field Tripod
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12.5-inch aluminized mirror. Focal length about 8 feet
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 10x40 finder, star diagonal, full-aperture solar filter
 carrying cases, home-made dolly for rolling out
 excellent condition

This telescope is a superior instrument for astrophotograph
 and has shown the following objects visually:
 the companion to Sirius
 Deimos (Mars' outer moon)
 intricate planetary detail
 globular clusters resolved to the core
 Pluto
 dust lanes and detail in many galaxies

Asking \$2800

4-inch, f/10
weighs just 13 pounds
ac clock drive, setting circles, finder
star diagonal and one eyepiece
table top tripod
slow motion controls in both axes
piggyback camera mount, carrying case
rarely used, in like-new condition

\$525

For additional information or demonstration, contact:

LARRY CARLINO
7118 Kinne Road, Lockport
ph. 433-3432



* LETTER TO THE EDITOR *

July 10, 1990

Dear Darwin:

I want to take a moment to say thank you for the joy that you have brought me and Marty over the years with The Spectrum.

You have a real nice touch as editor of your newsletter and we enjoy reading every issue. I am not an astronomer and so don't always read the heavy astronomy articles, but you break the newsletter

with news of people and notes about happenings and things of interest and of course the Beaver Meadow sections.

Your task has been ongoing since I came to Beaver Meadow and I (we) really appreciate the job you do. And of course we save the newsletters for the historical significance about Beaver Meadow.

I often read the interesting things aloud at the breakfast table when our son Don Dessert is there for him to hear as he has a lifelong interest in the club, too.

We appreciate your good works,.

Very sincerely,

David & Marty

David & Marty Junkin

CETUS

With gills pulmonic breathes the enormous whale.

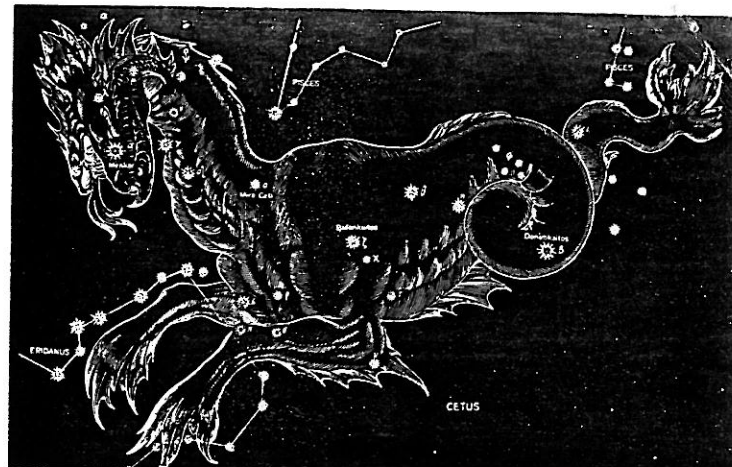
-Darwin

CETUS, The Whale, or Sea Monster has been distinguished at least since Aratos' time. It is one of the largest constellations and is an extremely ancient one. A couple tales follow:----

The south wind brings her foe
The ocean beast.

Aratos

In connection with the Andromeda-Perseus legend, Cetus had been deemed the monster of the deep who is supposed to have churned its way from the ocean after Andromeda, the daughter of Cassiopeia. The region of the skies was considered the terror and mystery of the deep ocean long before the legend was heard of. It was incorporated into that legend long after the Babylonians thought it to represent the waste waters and picturing Cetus as a large strange and fearful monster of sorts. They did not figure it to be a whale, but rather, a sea serpent such as a

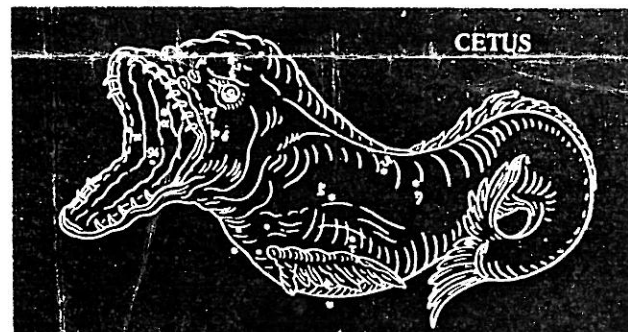


The legend concerning Andromeda gave way to the monster being turned to stone by the sight of Medusa's head in the hands of Perseus on its attempt to devour Andromeda. From Pliny and Solinus an equally veracious addition was that the monster's bones were brought to Rome by Scaurus. The skeleton measured forty feet in length and the vertebrae was six feet in circumference. Saint Jerome wrote that he had seen them at Tyre and the Pausanias described a nearby spring being red from the blood of the slain monster.

It has also been deemed to have represented the ferocious 'Tiamat' of the early Chaldean Myths.

The arrangement of the stars has suggested that it forms a reclining chair to the imagination of many. Another name for the constellation, therefore, is the "Easy Chair."

Cetus, in more modern times, is described as swimming in the River Eridanus, but usually as resting on the river bank with fore paws in the water.



In Biblical times the whale is supposed to have swallowed Jonah. Commentators on that great astronomical poem, from the Book of Job, have said that it typified the 'Leviathan' of which the Lord spoke to the Patriarch.

Cetus is surrounded by Aries, Pisces, Aquarius, Sculptor, Fornax, Eridanus and Taurus.

In the next issue will contain the legends of Eridanus and Orion.



Darwin Christy

? ANSWERS TO QUIZ ?

"EPICYCLES"

Epicycles are circles rolling around the circumference of a larger circle which is called a deferent.

"SYZYGY"

Syzygy is a word describing the positioning of three (3) bodies when they line up in a row such as the Sun, Earth and Moon in either a Solar or Lunar Eclipse.

STAR NAME	RIGHT ASCENSION H M	DECLINATION D M	CONSTELLATION
Alpheratz	00 06.3	28 52	Andromeda
Ankaa	00 24.3	-42 31	Phoenix
Schedar	00 38.2	56 19	Cassiopeia
Diphda	00 41.6	-18 12	Cetus
Achernar	01 36.2	-57 26	Eridanus
Hamal	02 04.9	23 16	Aries
Acamar	02 36.7	-40 28	Eridanus
Menkar	03 00.2	03 56	Cetus
Mirfak	03 21.5	49 43	Perseus
Aldebaran	04 33.6	16 26	Taurus
Rigel	05 12.6	-08 15	Orion
Capella	05 13.7	45 58	Auriga
Bellatrix	05 23.0	06 19	Orion
El Nath	05 23.8	28 35	Taurus
Alnilam	05 34.2	-01 14	Orion
Betelgeuse	05 53.0	07 24	Orion
Canopus	06 23.1	-52 40	Carina
Sirius	06 43.4	-16 40	Canis Major
Adhara	06 57.1	-28 55	Canis Major
Procyon	07 37.2	05 20	Canis Minor
Pollux	07 42.9	28 07	Gemini
Avoir	08 21.7	-59 23	Carina
Suhail	09 06.5	-43 16	Vela
Miaplacidus	09 12.8	-69 33	Carina
Alphard	09 25.6	-08 29	Hydra
Regulus	10 06.2	12 10	Leo
Dubhe	11 01.3	61 58	Ursa Major
Denebola	11 47.0	14 48	Leo
Gienah	12 13.7	-17 19	Corvus
Acrux	12 24.4	-62 53	Cruce
Gacrux	12 28.9	-56 53	Cruce
Alioth	12 52.3	56 11	Ursa Major
Spica	13 23.1	-10 57	Virgo
Alkaid	13 46.0	49 31	Ursa Major
Hadar	14 01.0	-60 11	Centaurus
Menkent	14 04.3	-36 10	Centaurus
Arcturus	14 13.8	19 23	Bootes
Rigel Kentaurus	14 36.9	-60 40	Centaurus
Zubenalgenubi	14 48.5	-15 50	Libra
Kochab	14 50.8	74 19	Ursa Minor
Alphecca	15 33.0	26 51	Corona Borealis
Antares	16 26.9	-26 21	Scorpius
Atria	16 44.4	-68 57	Triangulum Australis
Sabik	17 08.1	-15 41	Ophiuchus
Shaula	17 30.9	-37 05	Scorpius
Rasalhague	17 33.1	12 35	Ophiuchus
Eltanin	17 55.7	51 30	Draco
Kaus Australis	18 21.5	-34 24	Sagittarius
Vega	18 35.6	38 45	Lyra
Nunki	18 52.8	-26 21	Sagittarius
Aitair	19 48.8	08 46	Aquila
Peacock	20 22.5	-56 52	Pavo
Deneb	20 40.1	45 08	Cygnus
Enif	21 42.2	09 41	Pegasus
Al Na'ir	22 05.7	-47 09	Grus
Fomalhaut	22 55.4	-29 50	Piscis Australis
Markab	23 02.8	14 59	Pegasus

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VISUAL METEOR OBSERVATION FOR AMATEURS

by

R. D. Manners

For Presentation at the 1967 Annual Convention
Northeast Region of the Astronomical League,
Buffalo, New York, May 26 - 28, 1967.

1. INTRODUCTION

Some of our earliest records of meteor showers have been found in the ancient writings of China, Egypt, and Arabia. However, it was not until the 19th century that the study of shooting stars was put on a firm scientific basis. The great Leonid shower of 1833 appears to have been the turning point, since it is not until about 1834 that we first find the suggestion that meteor showers are periodic phenomena. The idea that meteors were connected

with comets was postulated by Airwood in 1861, and the latter half of the last century saw the beginning of a new era of scientific investigation of meteoric phenomena.

Recently however, and especially since the advent of radar methods, interest in visual meteor work has waned to the point where it is almost non-existent. A glance through the literature of the last ten years or so will show that only the major well known showers have been observed and then mainly for the purpose of obtaining hourly rates. The current lunar program has sparked interest in the chemical and geologic analysis of meteorites, and many ancient impact craters on earth have been described and explored in great detail. But many questions remain to be answered; for example, what is the origin of meteors? Are they part of the original cloud that condensed to form the solar system, are they remnants of long disintegrated comets, or are they mute evidence of the cataclysmic forces that acted to disrupt the Earth and Moon at the time of lunar capture? Are all meteors members of the solar system, or do some of them come to us from interstellar space?

Visual observations were carried out in many countries on a regular basis until just after World War II when Clegg and Lovell at Manchester announced their method for obtaining meteor radiants by radar observations. Subsequent to this amateur meteor work suffered a sharp decline, but once the new methods had been used to probe the structure of some of the major streams, even these methods were discontinued. Today, most of the large radio telescopes are used on other programs and the field of meteor work has been deserted by professional and amateur alike.

This is a distinct loss to science and amateurs alike, because meteor work is a rich and interesting field and can often be very rewarding. Only a relative handful of radiants are known with exactitude, whereas many hundreds of others certainly exist; some will be new to science, others will be badly needed confirmations of earlier work. Most of the meteors presently classed as sporadic are not necessarily so, many of them will be found to belong to the lesser known streams and the identification and cataloging of these minor streams is one of the important tasks that have been left undone. There is also a need for more accurate observations of fireballs. Some of these have been seen by hundreds or thousands of persons over a wide area, yet insufficient information has been obtained to allow the determination of a precise orbit or ground point. Fireballs also are rarely sporadic and several radiants produce them in quantity, but again much remains to be done.

2. OBSERVING TECHNIQUES

The observation and recording of meteors has two main purposes: the determination of radiants and the determination of the actual path of the meteor in the earth's atmosphere. For both purposes, accurate measurements are essential to success. The basic observing techniques were laid down by a number of amateurs during the latter years of the last century and were refined and brought to perfection by J.P.M. Prentice who was for many years the Director of the Meteor Section of the British Astronomical Association (BAA). Mathematical methods for the determination of true paths and orbits were established mainly through the work of Davidson and Porter. (Refs 1, 2, 4, 5, 6.)

The essential basis of meteor observations is the recording of the flight path with reference to the star field in which the meteor moves. The first requisite is then a good set of star maps, such as Nortons, and an excellent working knowledge of the constellations, down to at least fourth magnitude for a beginning observer. Getting to know the stars this well is in itself a very satisfying achievement and one which will pay dividends whichever branch of astronomy may be taken up in future years.

The recording of position can be broken down into three steps, namely, the determination of the direction in which the meteor was moving, known as the flight direction, the measurement of the length of the luminous portion of its path, and the provision of certain supporting data. The determination of flight direction must be carried out accurately and may conveniently be done as follows.

in the star field A, B, C, ..., where the letters represent known stars. It invariably happens (almost) that there are no stars so near to the flight path that they may be used to obtain the flight direction, so the flight path is extended by a string about two feet long held at arms length, until we discover stars suitable to our purpose, as those labelled X, Y, Z, in the Figure. In this case the flight direction of the meteor can be stated as $\frac{1}{2}^\circ XY$ to $\frac{1}{2}^\circ NP Z$. Notice that the order of stating the reference stars follows the sense of the meteors motion. In practice, and as a check on possible errors, it is better to take the flight direction from three points or more. The following are typical examples of the recording of flight directions using this method:

- | | | |
|-------------------------------------|--------------------------------|--------------------------|
| 1) $\frac{1}{2}^\circ N \eta$ Leo | $3/4^\circ N \alpha$ Gem | $1^\circ N \epsilon$ Gem |
| 2) $\frac{1}{4}^\circ Sp \psi$ Uma | $\frac{1}{4}^\circ Sp \mu$ Uma | z Uma |
| 3) $\frac{1}{2}^\circ Sf \zeta$ Uma | $2/3 \times 65$ Uma | $1^\circ Sf 30$ Lmi |

If these flight directions are plotted on a celestial globe or good star atlas, it will be seen that the direction of flight of these meteors is defined with some accuracy.

The next task is to determine the beginning and end points of the meteors luminous flight. We adopt again the convention of calling the direction in which the meteor is moving the positive direction. Then if the meteor began its flight at a point 1° beyond the perpendicular dropped from star A (see Figure 1) we can note the beginning of the flight as $.....A + 1$. Similarly, if it ended its flight $1\frac{1}{2}^\circ$ before the line joining stars C and E, we note the end point as $.....[CE - \frac{1}{2}]$, where the symbol $[\]$ means 'on a line joining'. Alternatively, we can determine one point and a length, which amounts to the same thing.

We can now add to the record of the meteors the details of their path lengths. This addition is as follows:

- 1) $e = \alpha \text{ Gem} + \frac{1}{2}$, $1 = \alpha \beta \text{ CMi} + 3/4$
- 2) $\psi \text{ Uma } 37 \text{ LMi}$ to $\mu \text{ Uma} + \frac{1}{2}$
- 3) $M - 4$ to $M - 3/4$

this shorthand notation can be written in full as follows:

- 1) On the given flight direction, the end (e) of luminous flight was $\frac{1}{2}^\circ$ beyond $\alpha \text{ Gem}$, in the direction of the meteors motion, and the length of path (1) was a distance $3/4^\circ$ greater than the distance between α and $\beta \text{ CMi}$.
- 2) On the given flight direction, the meteor began its luminous path on the intersection with the line joining $\psi \text{ Uma}$ and 37 LMi ; it ended $\frac{1}{2}^\circ$ beyond $\mu \text{ Uma}$
- 3) On the given flight direction, the meteor began 4° short of the midpoint (M) of the flight direction (i.e. $2/3 \times 65 \text{ Uma}$) and ended $3/4^\circ$ short of this midpoint.

*** TO BE CONTINUED ***

This is a rather lengthy article and therefore will continue in the next issue of The "SPECTRUM". It may not be in its entirety in the next issue either, therefore, utilizing three issues to complete. I wish to thank Edith Geiger for her time copying this article for The "SPECTRUM", which took her away from her many other summer activities.

I also wish to thank the many other members who afforded their time in sedning articles or helped to put this newsletter together. I have been threatening to quit as editor but I also have stated that I would contribute a total of thirteen years as editor, after which I do hope some one will take over the job. I have now finished my eleventh year, giving me but two more years to stay at the helm as editor. It has been fun but it has also been trying. Thanks - everyone!!

Darwin Christy

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