THE Prairie Astronomer

Vol 28 Num 7
July 1987

PRESIDENT'S MESSAGE....

It is with great satisfaction, and some relief, that I announce our formal acquisition of Atlas Site. In case anybody wants to record it in the club's Annals, we signed the papers and handed over the check on Thursday, July 9, 1987, at 11:45 a.m. That afternoon, I took the deed down to the Gage County Courthouse and had it recorded.

Shortly after I arrived, Beatrice was engulfed in a Severe Thunderstorm Warning. High winds, hail and heavy rain trapped me at the courthouse. The lights went out. The elevator was stalled between floors (I wasn't in it.) I trust that this was not an Omen.

The very next day, Cheryl Alberts, an alert reporter from the Beatrice Daily Sun, found the transfer record at the Register of Deeds office and somehow traced me to KLDZ, where she got the details of who we were and what we were up to. A copy of the resulting article appears here. Note that I anticipated an open house for our neighbors in Gage County sometime in September. We need to begin planning for this.

The next order of business is to get The Infamous Access Shaft closed up, and to that end, I contacted Strohmeyer's (since Ron Veys was on vacation, as usual.) They said "in about two weeks", and promised to call back. Meantime, Ron got back to town for awhile, so I dumped it--er, delegated--the task of getting the shaft closed, to him. I trust he will have a report at the meeting.

Dave Knisely reported, by way of the Beatrice-Lincoln Hamlink through Rick Johnson, who happened to be in town briefly on his way from Minnesota to the Southwest. He said that concrete for the official burial of The Infamous Shaft will be $50/cubic yard plus a flat delivery fee of $15 up through 4 cubic yards after which the price is the same, but they drop the delivery fee. Now, if I reported those figures correctly, not only is it testimony to information technology and accurate reporting (by word-of-mouth, Knisely-to-Johnson-

to Thomas, transferred by hamlink and recorded on my telephone answering device), but it is a price nicely within our budget. Thanks, Dave! August project: troweling the fresh concrete into a reasonably presentable vault. Volunteers?

I have numbered keys for those who have paid their money. If you don't have your key by the meeting, it will be available for you then. The weekend before the meeting is the Midstates Regional Convention in K.C., which I plan to attend. I vowed when I left college that I would Never Again Live In a Dorm, if it meant pitching a tent. So, I plan to commute from the nearest motel to Avila College. They tell me the nearest motel is somewhere in Arkansas, so this should be an interesting convention, if for nothing else than the commute. If I make it back, I'll see you at the meeting.

--Lee T.

Daily Sun 7-10-87

Club buys observation site

Star hustlers in the Sunland area will soon have a heavenly delight.

The Prairie Astronomy Club Inc. of Lincoln is hoping to expand its membership with the purchase of a new observation site east of Cortland.

According to club president Lee Thomas of Lincoln, the club is for public education and for private star gazing. It was some of the 25-year-old club's members who got the idea for building the Hyde Memorial Observatory in Lincoln's Holmes Park, Thomas said.

Club members had been looking for a suitable place for about three years where they could see the sky enveloped in complete darkness, Thomas said, and the 4.25 acre site approximately three miles east of Cortland fit the need.

The acreage is a former U.S. Army missile site, which hasn't been used since the 1960s and was owned by the Firth Cooperative Co. Eventually the club would like to put up an observatory, Thomas said.

The club's 65 members, including some from Beatrice, have interests in cosmology, astrophysics, radio astronomy and telescopes, although some may just enjoy star gazing through binoculars, Thomas said.

Thomas hopes to have an open house under the skies in September. Anyone interested in more information about the club may call Thomas at 483-5639.

The Prairie Astronomer is published monthly by The Prairie Astronomy Club Inc., and is free to all club members. Membership expiration date is listed on the mailing label. Membership dues are: Junior Members and Newsletter Only Subscribers... $8.00/yr, Regular Members... $22.00/yr, Family Membership... $25.00/yr. Address all Membership renewals or questions to THE PRAIRIE ASTRONOMY CLUB, INC., P.O. BOX 80553, LINCOLN, NE. 68501. For other club information contact one of the following officers: Lee Thomas (Pres) 483-5639, David Knisely(V. Pres) 223-3968, John Lortz (Sec.) 390-9821 (Omaha), Norma Coufal(Treas.) 483-5685, Dan Neville (2nd VP) 476-7772. All articles and comments should be sent to newsletter editor JOHN LORTZ 9255 CADY AVE. #14, OMAHA, NE. 68134 no later than 6 days before monthly club meetings.

The Reviewer...

BY DAVID KNISELY

STANDARD HANDBOOK FOR TELESCOPE MAKING
By Neale E. Howard
1984, Harper and Row, Publishers, New York
List price: $15.95 hardbound

There aren't too many books out that deal with telescope making from the ground up. Happily, Neale Howard has put out a slightly updated version of his classic work from 1959 that helps fill the gaps in the knowlege of most beginners in amateur telescope making. It deals primarily with the design and construction of an eight inch f/7 Newtonian reflector, along with a number of other topics such as building telescope enclosures and photography. Its treatment of mirror grinding, however, is what makes the work stand out from most of the rest of the telescope making books.

Howard starts out by discussing what type of telescope should be the best to try and build. He leads the novice through basic optics and shows why the Newtonian is probably the best choice for the beginner. He then outlines the materials and general proceedures that will be used in making a telescope mirror from scratch. This gives the beginner a feel for just what is involved in mirror making without all the technical details that might initially confuse the reader.

Chapters three through nine go through step-by-step proceedures for grinding, polishing, testing, and figuring the eight inch mirror. Howard goes into detail concerning the various grinding strokes used and their effects. He devotes an entire chapter to fine grinding alone, which helps the beginner to get a nice smooth finish without too many scratches. His chapter on the Foucault test is good, providing the novice with a basic understanding of how it works and, more importantly, how to build a Foucault tester. He covers making the pitch lap and the effects of the various lap mats that are available. Howard devotes two chapers to polishing, one to testing, and one to final parbolizing. He uses the traditional mirror masks for testing zones, and it is here that Howard slips up a bit. The Everest, or first Caustic test method is far easier to use for the beginner and gives more accurate readings than does the standard mirror mask method. Howard does discuss the Everest method, but does such a poor job that the reader cannot really understand what is going on. I was rather mad at Howard when I was testing my ten inch mirror and couldn't get the hang of the Everest method. A far better discussion of it is in Amateur Telescope Making: Book Three, "The Caustic Test". Still, the beginner who sticks to the mirror mask method Howard uses will probably end up with a good mirror.

Howard's chapter on the diagonal mirror is fairly good, but his discussion on making the secondary is a little outdated, since most ATMs buy their diagonal mirrors rather than make them. The chapter on eyepieces is good, except that it should have included a few more designs like the Nagler. The chapters on mirror cells, telescope tubes, and mountings are also nice, except that his pipe mount has fittings that are way too small for an eight inch. He even discusses the construction of the ever popular Dobsonian. Howard tells the beginner how to collimate the telescope, build a simple observatory, and do some photography with the instrument. Howard also provides a set of appendices but they are a bit outdated as they still list Cave Optical as a telescope maker. They also do not mention the Astronomical League in the list of astronomical organizations.

All in all, Standard Handbook for Telescope Making will make a fine addition to any amateur telescope maker's library. Its easy-to-use style will make it possible for allmost anyone to make a fine astronomical instrument.

NASA SCIENTIST BELIEVES A TENTH PLANET MAY EXIST

by Carolyn Collins Petersen

A tenth planet may exist beyond the known solar system. If it does, it must travel in an orbit nearly at a right angle to the orbits of the known planets and lie so elongated that it only nears the Sun and known planets every 700 to 1000 years, according to NASA scientist Dr. John Anderson.

His conclusion was first put forward in a book, "The Galaxy and the Solar System", published by the University of Arizona Press. It follows examination of long-term astronomical measurements, together with the absence of gravitational effects of a tenth planet on the Pioneer 10 and 11 spacecraft. Pioneers 10 and 11 are in the far outer solar system. The two Pioneers represent a uniquely sensitive measuring system for gravity effects. Anderson, of NASA's Jet Propulsion Laboratory, Pasadena, Calif., is principal investigator in celestial mechanics for the Pioneer spacecraft, which is managed by NASA's Ames Research Center, Mountain View, Calif.

Astronomers have long sought a large planet or other object beyond the orbits of Neptune and Pluto. Data exist on orbits of the planets to indicate that some kind of celestial object has affected the orbits of the outer planets. Until 1978, that object was thought to be Pluto. However, Dr. James Christy, of the U.S. Naval Observatory, found a moon around Pluto and determined that neither the planet nor its moon were massive enough to cause the long-observed waverings in the orbits of the outer planets. Anderson believes some other object must be responsible for this phenomena.

Anderson says between 1810 and 1910, during which measurement techniques were comparable to modern astronomical standards, evidence for an additional solar system body was strong. Yet the Pioneer findings have shown none of these effects.

This has caused experts in the field of planet-orbit measurement (celestial mechanics) to reexamine Anderson's interpretation of the long record of orbit data.

Anderson has reviewed many types of orbit measurements taken over a period of almost 2 centuries. His reinterpretations of these data now appear to show that, from the present back as far as 1910, all types of measurement techniques have failed to show any unexplained outer planet variations. This despite the fact that most orbit experts had long assumed that these well-known effects were continuing into the present century.

Long time periods are required to reach final conclusions about the very small effects on planet orbits because the outer planets take a very long time to orbit the Sun. Therefore, measurements of small position drifts in orbital arcs take decades. Uranus, for example, circles the Sun once every 84 years and Neptune once every 165 years.

Anderson maintains that the best explanation for an object very likely to have been there for at least 100 years, and then disappearing is a "planet" on a greatly elongated orbit. His data also tends to strengthen the idea that some kind of tenth planetary body may have caused the cataclysmic comet impacts some scientists believe are responsible for periodic mass extinctions, including that of the dinosaurs.

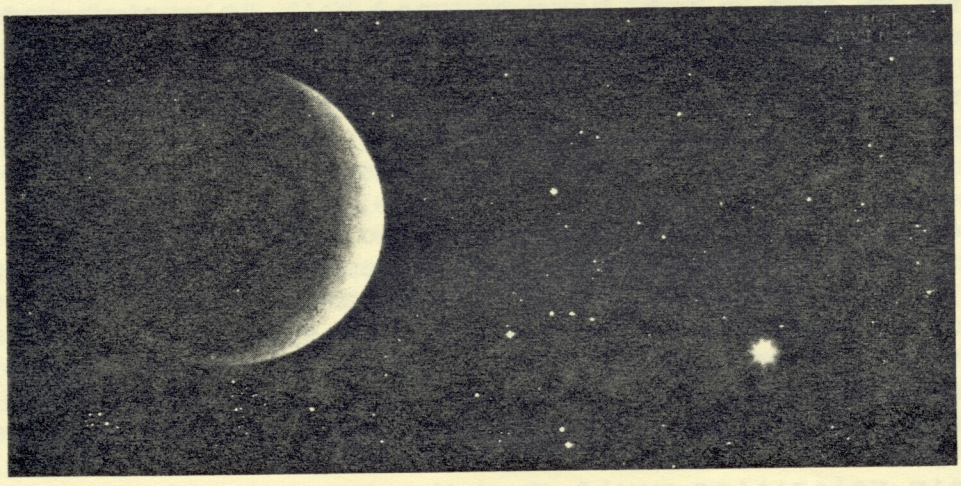
Anderson's surveys of theories for additional solar system bodies to explain first the apparent presence and then the absence of such a body have covered both "planets" and "stars," including mini-sized brown dwarfs. One of the current theories, which he feels fits the data quite well, is that of a planet whose orbit is tilted at almost right angles to the orbits of the other planets. In one dimension, this orbit might be from 10 to 20 billion miles across.

Anderson tracks the Pioneers to seek undiscovered heavenly bodies (and in another research area to look for gravity waves). The Pioneers are good indicators of the gravitational pull of celestial objects because the spacecraft generate almost no forces of their own which affect their trajectories. They are stabilized by their own spin, rather than the thrusts of control jets, and like tiny planets, they float free in the gravityfields of the solar system planets. Unexpected changes in their velocities would show the presence of an uncharted star or planetary object. Because their trajectories move them rapidly outward from the Sun and because of precise radio tracking, they are very exact gravity sensors.

NASA's Deep Space Network (DSN) telescopes, located in Madrid, Spain; Canberra, Australia; and Goldstone, Calif., transmit a signal to the Pioneer spacecraft and then measure the Doppler shift in the wavelength of returning signals.

The faster the spacecraft pulls away from the Sun, the longer the wavelength the DSN receives. According to Anderson, "Two-way Doppler tracking gives us the best tracking data we could obtain." It is accurate to 1 millimeter per second.

In 3 years of precise measuring, Anderson has found no gravitational effect on Pioneers 10 and 11 which cannot be explained by the known nine planets. His review of planetary orbit data appears to show that this has been the case for the past 75 years. But Anderson believes that the data gathered between the 17th and early 20th centuries, showing orbit irregularities, is valid. He suggests that his own negative data means that whatever perturbed the orbits of outer planets is now either a huge distance from the Sun or is orbiting on the side of the Sun opposite Uranus and Neptune.



The Observing Chairman's Report

by David Knisely

CLUB PICNIC AND STAR PARTY: The annual Prairie Astronomy Club Picnic and Star Party will be held SATURDAY, AUGUST 22nd, at Holmes Park in southeast Lincoln. We will meet at Hyde Observatory at about 4:30 or 5:00 p.m. informally and will start the pot luck supper at 6:00 p.m. on picnic tables near the observatory. After the picnic sometime after 8:00 p.m., we will head out to the Atlas observing site for the star party. If the weather is bad, the picnic WILL be held in Hyde Observatory, so please come anyway.

The August sky is dominated by the Milky Way, so start looking down south for all the open and globular star clusters in Sagittarius. Two very nice targets for binoculars or small telescopes are the open clusters M6 and M7. M7 is the larger of the two, and can be found five degrees west of Epsilon Sagittarii. It is fairly rich in bright stars with large telescopes showing an enormous number of faint background stars in the area. M6 is about five degrees north-west of M7, and is somewhat smaller. It is sometimes known as the "Butterfly Cluster", since its brightest stars seem to outline the wings of that insect. The great Sagittarius star cloud is also best seen in binoculars or rich-field telescopes with the dark lanes being visible in 7x35 binoculars under good conditions. Near the center of the cloud is the small open cluster NGC 6520, about two and a half degrees north and one half degree west of Gamma. It can be seen in a six inch as a small fairly rich group of moderatly bright and faint stars, but bordering it is the really remarkable dark nebula Barnard 86. It can be seen as a definate dark spot or "hole" in the rich background of very faint stars when viewed in an eight inch at low power.

The highlight of Sagittarius has got to be the Lagoon Nebula M8. Visible to the naked eye, this gas cloud can be found just north of the Great Sagittarius Star Cloud, with binoculars showing its oval outline. This object responds well to the use of Lumicon's UHC filter, and shows a wealth of detail in instruments as small as six inches. Just north of M8 is M20, the Trifid Nebula. It can be glimsed in binoculars as a faint fuzzy patch, but to see the three dark lanes, you should probably use at least an eight inch telescope and averted vision. For those of you who like globular clusters, try M22, located about eight degrees east of M8. It is easy in binoculars and I have heard a few reports that some of its component stars can be seen in a pair of 11x80 binoculars. A six inch should resolve M22 into a large ball of very faint stars. There are many nice open clusters in the area, including M23, located about five degrees north and just under two degrees west of M8. It looks nice in allmost any telescope as it has many moderately bright stars. Those with large telescopes may want to try the nearby planetary nebula NGC 6445, which is about two degrees west and one south of M23. It shows up as a moderate to small sized bluish-grey fuzzy disk of light with a brighter spot near one edge when viewed in an eight inch.

SKY & TELESCOPE NEWS BULLETIN -- JULY 17, 1987

From Compuserve's Astronomy Forum, uploaded by Bill Shawcross and Roger Sinnott of Sky & Telescope Magazine

JULY 17, 1987

SUPERNOVA 1987A

The supernova in the Large Magellanic Cloud continues to fade at visible wavelengths, and is now about magnitude 4.6. That makes it roughly as bright as it was when Ian Shelton discovered it on February 24th. In the ultraviolet, however, the supernova brightened recently, perhaps because the expanding debris cloud is overtaking and heating gas from the host star's earlier stellar wind.

JULY 3, 1987

COMETS, COMETS, COMETS

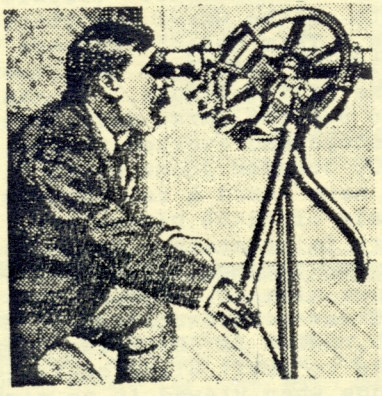
If you've been keeping up with SKY & TELESCOPE's Comet Digest column, you're aware that our summer skies now teem with comets within the range of amateur telescopes. Here are some brightness estimates from several observers, reported to us by Dan Green at Harvard.

Comets Klemola and Howell are rather faint, at about magnitude 13; Grigg-Skjellerup is at 11.5; and NTT shines at 9.5. Comet Sorrells is now about magnitude 10, while Wilson has faded to 9. Information and ephemerides for many of these can be found on page 108 of the July issue of S&T.

THE PRAIRIE ASTRONOMER
c/o Prairie Astronomy Club, Inc.
P.O. Box 80553
Lincoln, NE 68501

OMAHA, NE 689
PM
JUL '26
1987

1st Class Mail



EARL MOSER
HICKMAN NE 68372
88/09 F 08-87/07

NEXT PAC MEETING
JULY 28TH