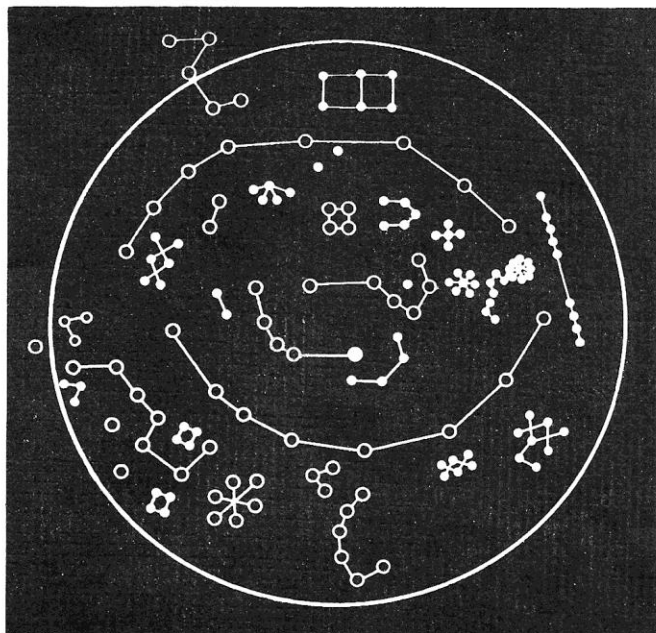


VESPA

Latin, for WASP



No.1
Vol.1



....“Some of the patterns seem to be mere embellishments, such as the small quadrilateral inside the bowl of the Big Dipper.”

思 蚂 星 昴



Chinese Star Map

THE JOURNAL OF THE WARREN
ASTRONOMICAL SOCIETY

JANUARY 1977



The Warren Astronomical Society (W.A.S.) is a local nonprofit organization of amateur astronomers. Membership is open to all interested persons. Annual dues are as follows: Students, K-12 \$9.00- College \$11.00, Senior Citizen \$13.50, Individual \$16.00, Family \$21.00, the membership fees listed here includes a one year subscription to Sky & Telescope Magazine.

Meetings are held on the first Thursday at Cranbrook, and the third Thursday of each month at Macomb County Comm. College, in the student union bldg.

Subscriptions and advertisements are free of charge to all members. Non-member subscriptions and advertisements are available upon arrangement with the Editor of the W.A.S.P. Contributions of any kind are always welcome and should be submitted to the Editor before the second Thursday of the month.

THE EDITOR: Roger A. Civic 776-8735
26335 Beaconsfield
Roseville, Michigan 48066

Editor Note: The old WASP has been changed again. The usual features have been condensed or omitted to make room for a new format. Many members have some very fine photos. It is now possible to reproduce these from B&W prints, color prints or slides. Frank McCullough's double Cluster & Jupiter drawings are the first of many I hope will be made available to the Editor of Vespa.

OBSERVATORY SCHEDULE

Lectures for the coming month are listed below.

Jan. 7/8 ••••• Dennis Jozwik••••• 754-2037
Jan. 14/15 •••• Ray Bullock ••••• 879-9458
Jan.21/22 ••••• Larry Kalinowski•••••776-9720
Jan.28/29 ••••• Roger Civic ••••• 776-8735

The lecturer may select either the Friday or Saturday depending on the weather and their personal schedule. W.A.S. members wishing to be instructed on the operation of observatory and telescope controls should contact the lecturers directly. Additional lecturers and assistants are needed to lessen the load on these faithful old time members. Thank you.

MINUTES OF THE WARREN ASTRONOMICAL SOCIETY
November, 18, 1976

Pete Kwentus, president, called the meeting to order. Details of the Christmas Banquet were discussed.

Ken Kelly proposed the reinstatement of the "call list" - a "hot line" in case of various astronomical events.

Dick Lloyd of the Detroit Astronomical Society asked observers to monitor Omicron Ceti (Mira) for any increase in brightness.

It was announced that a special planetarium show will be given on the Christmas star at Cranbrook Institute of Science Dec. 2, 1976.

Chuck Meyer presented a film on the Sitmar Eclipse Cruise. Pete Kwentus showed his slides of the Canberra eclipse expedition. Jerry Persha presented slides of the Australian eclipse and Paul Strong showed a film (MCC) on the upcoming cruise.

Dave Harrington showed a film and slides of the dome-raising for the observatory (and his 14" Newtonian).

A NASA film on Mars was also shown. The meeting was adjourned by Pete Kwentus

Minutes respectfully submitted,


Dolores H. Hill, Sec'y

•buy-sell-trade•

The L.F.K. Astrophotographic Guide. Special price to club members--- \$1.00 Contact Larry Kalinowski.

DO IT YOURSELF, DRIVE CORRECTOR. DC or AC operation.

Build it with my circuit board. Instructions and parts list included, \$ 5.00. See Jan. S&T '75 pg. 50 for more details. Larry Kalinowski, 776-9720.

Tasco 2.4" f.13 refractor. Alt-azimuth head, three eyepieces, erector lens, star prism, wooden case. Metal 3 leg tripod. Good Condition. Only \$65.00. Contact Mike Grellman, 264-0745.

10" f.7 Newtonian telescope. Factory mirror, yoke equatorial mount, portable, 70 power eyepiece. \$300, also a 40mm Polaris finder telescope 12X, S25., 18mm Kellner eyepiece" \$18. All good condition. Call Doug Tracy, 882-4499.

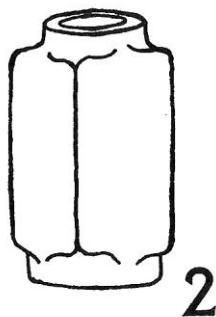
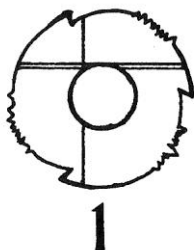
Astronomical Instruments

THE FINDER-SCOPES OF ANCIENT CHINA

by
Christopher Edsall

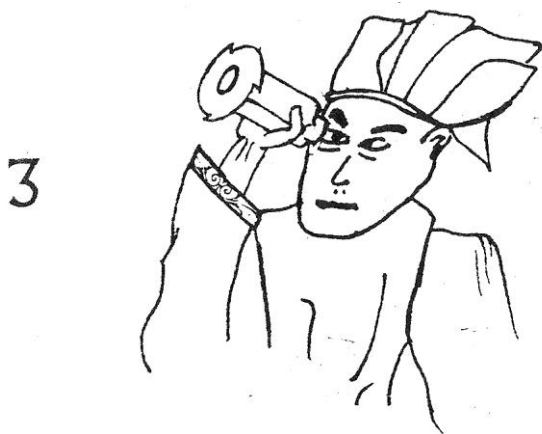
Having stayed a few days in Oxford the last time I was in Britain, the opportunity was provided for me to visit, among other things at that university, their Museum for the History of Science. You might like this museum. Its halls are filled, if not congested, with the equipment and devices used in the observations and experiments made by many famous scientists of the past. The telescopes of Galileo and Herschel, early microscopes and cameras, equipment from the labs of Faraday, Kelvin, and Rutherford - it's all there.

Among the more unusual and interesting of these is an exhibit of instruments associated with the oriental sciences of astronomy and mathematics, the science of feng shui (literally, 'wind and water') which synthesizes all the accepted Chinese theories of the cosmic harmonies between the quasi-living energies of nature, time-relations as indicated by the sun and moon, and the directions in space from any point on earth. That is to say, reckoning - the art of travelling on land and sea. The following remarks refer to the items I saw on display.



The upper planisphere shows the stars of the Northern Hemisphere, the lower one those of the Southern Hemisphere. The configuration of the stars is that of very ancient Chinese maps.

The North Pole is marked by four positions of β Ursa Minoris, forming a square which is crossed by two straight lines. Around the pole there are two rows of stars, called by the Chinese the Eastern Hedge and the Western Hedge. The only constellation commonly recognized by the Chinese and the western world is the Great Bear, which the Chinese call Bushel. Around each planisphere are marked the twelve astrological houses (Rat, Tiger, Hare, Dragon, Serpent, Horse, Goat, Ape, Dog, Boar, Cock, and Bull) and the twenty-eight mansions of the moon.



Early Chinese Astronocical Instrument called Hsüanc-Chi

Certain pieces of early Chinese jade of characteristic shape are traditionally said to represent the heavens and the earth. The jade representing the heavens is a flat circular disc containing a large central hole and is called pi. The jade representing the earth is a tube of which the inside is circular and the outside square (except at each end where it becomes circular), and is called ts'ung. The pi and ts'ung are in fact the two parts of one of the earliest astronomical instruments, the hsüan-chi yü-heng.

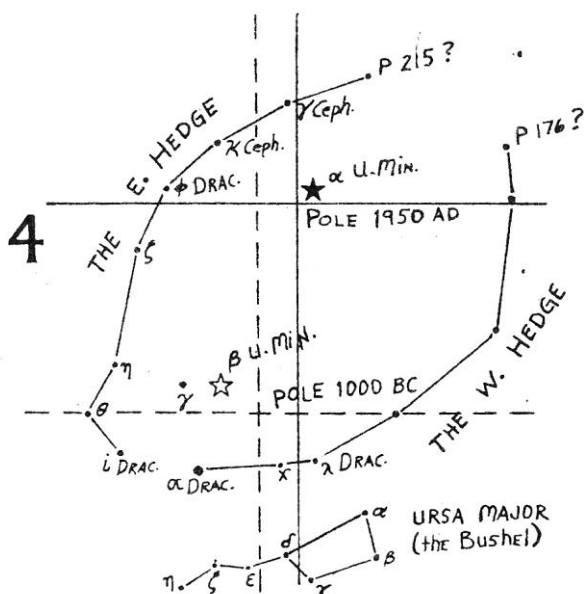
The pi or chi is a circumpolar constellation template and the ts'ung or heng is the sighting tube on which the chi is mounted. The words hsüan and yü refer to the jade of which the instrument is made.

A typical chi is shown in diagram 1. Some early chi do not have the small serrations along the outer edge nor the single line crossing the central hole which are shown in the diagram; others, the traditional pi, are perfectly round, and this is probably the earliest form. A heng is shown in diagram 2 and the mode of use of the combined instrument is seen in diagram 3.

To the Chinese, whose year begins at the Winter solstice (Dec. 20-22), the position of the pole and the direction of the colure of the solstices were of great importance (the solstitial colure being the great circle on the celestial sphere passing through both celestial poles and the solstices). These astronomical data together with the position of the stars at regular intervals of one Chinese 'hour' (= approx. 2 regular hours) could be obtained by means of the hsüan-chi yü-heng. Thus, the instrument was perfected to serve the prime function of the ancient astronomer: to prepare the calendar.

The hsüan-chi also made it possible to sight the point where the god of Heaven resides. This interesting observation was made with the help of a mystical belief that the firmament was a mirror reflecting the image of the world. The organization of Chinese society had its counterpart in Heaven. The Emperor corresponded to the god Shang-Ti whose residence is at the north celestial pole. Consequently, Chinese astronomy was concerned with this pole and the distribution of the circumpolar stars. A determination of the "heavenly pivot" was the starting point for all ceremonial.

Between 2000 and 3000 years ago, owing to the earth's precessional motion, there was no bright star close to the pole, the nearest star being ϵ Ursa Minoris. The hsüan-chi yü-heng overcomes the problem of finding the north polar position under these conditions. A simplified sketch of the circumpolar constellations ca. 2500 BC is given in diagram 4.



The hsüan-chi is shaped so that its outline coincides with parts of these constellations when held at the correct distance from the eye by means of the heng. Learning to use the instrument properly was therefore known, properly, as 'getting the 'heng of it'.

The Oxford hsüan-chi is shown superimposed on a sketch of the relevant stars (diagram 5). Beta Ursae Minoris appears within the central hole; it would in fact lie near the internal circumference of the heng (shown dotted).

Theoretically, this star can be observed in four successive positions at intervals of six hours, by turning the whole instrument four times on its axis, each time through 90 degrees. The double line on the chi, being parallel to one of the flat sides of the heng, helps to show these four positions. The pole lies at the intersection of the lines bisecting opposite sides of the square formed by the four positions of the star. This explains the way in which the pole is indicated on the Chinese celestial map, for the four stars marked there at the polar position do not represent four different stars, but the four positions of β Ursae Minoris as seen through a hsüan-chi. The intersection of the lines bisecting the square is also shown on the map.

SKY CALENDAR JANUARY 1977

Information for helping teachers and students observe the sky

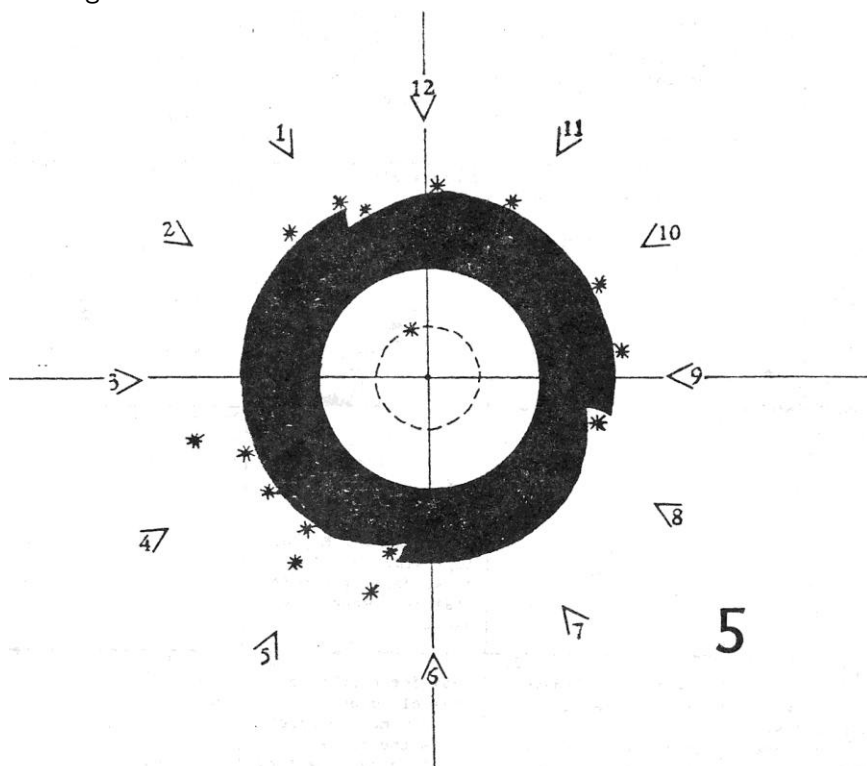
SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<p>Planets: Venus, the brilliant "evening star", is 30° to 40° up in SSW to SW at sunset, and sets in WSW to W nearly four hours later. See next two blocks and Jan 24.</p> <p>One hour after sunset:</p> <p>Now that moon rises late, look for the winter Milky Way, passing nearly overhead from SE to NW. Look 4° east of Taurus' northern horn, and you are facing directly away from the center of our Galaxy.</p> <p>One hour before sunrise:</p> <p>One hour after sunset:</p>	<p>It is easy to see Venus in the daytime, shortly before sunset. Find it as soon as you can after sunset one evening, then look a few minutes earlier each day, and soon you will see it before sunset.</p> <p>With binoculars and telescopes: Early this evening satellites #2, 3, and 4 are all west of Jupiter, #3 and #4 appearing very close together. #1 is east of the planet. 1, 2, and 3 are near greatest elongation.</p> <p>Jupiter, now 10° southwest of Pleiades, passes due south 1/2 hour before that star cluster. See this month's map.</p> <p>45 minutes before sunrise: Face ESE.</p> <p>Venus at greatest elongation, 47° east (upper left) of sun in afternoon and evening sky. Watch Venus approach sun next 10 weeks.</p>	<p>Through a telescope, Venus shows phases like the moon's. Evening observers will find Venus' phases very interesting to follow until early April. For details, see Sept 1976 <i>Sky and Telescope</i>, p. 197.</p> <p>One hour after sunset:</p> <p>At the end of this week Jupiter is stationary and resumes direct (eastward) motion. Watch Jupiter pass within 5° south of Pleiades April 1.</p> <p>45 minutes before sunrise:</p> <p>Mercury reaches greatest elongation this week, 25° west of sun in morning sky. Look 8° above southeast horizon 45 min before sunrise. After this apparition, next good chance to see Mercury in morning will be Sept.</p>	<p>Jupiter, next in brightness after Venus, in early Jan is well up in ESE at dusk and is highest in S about 3 1/2 hrs after sunset. By Jan 31 it passes due S 1 1/4 hrs after sunset.</p> <p>2 hrs after sunset:</p> <p>One hour before sunrise:</p> <p>New Moon, passing conjunction with sun, is not visible. This is only date this month moon can't be seen. Why no solar eclipse? Moon passes 5° north of sun.</p> <p>First Quarter (Evening Half Moon). Moon 90° or 1/4 circle east of sun in afternoon and evening sky. After sunset, moon shows beautiful details in binoculars.</p>	<p>Saturn on Jan 1 rises in ENE within 3 hrs after sunset and remains visible rest of night. By month's end Saturn is visible all night. For position among stars, see this month's map. Mercury: See Jan 14, 17, 18, 25.</p> <p>Which star chart to use? Two hours after sunset tonight, use last month's map, <i>December Evening Skies</i>. 4 hours after sunset, use this month's map.</p> <p>One hour before sunrise:</p> <p>Look for 1 1/2-day-old thin crescent moon low in WSW 45 minutes after sunset. A beautiful sight! Tonight moon sets as evening twilight ends, about 1 1/2 hours after sunset.</p> <p>One hour after sunset:</p>	<p>Jupiter's 4 bright moons are visible in binoculars and small telescopes. Look for #4 farthest west of planet on Jan 1, 2, 17, and 18, and farthest east on Jan 8, 9, 25 and 26.</p> <p>3 hours after sunset:</p> <p>Look for Mercury in morning sky. It now appears as 1st magnitude "star" 4° up in ESE 45 min before sunup. Rapidly improving next few days, Mercury remains visible 4 weeks. See Jan 25.</p> <p>One hour after sunset:</p> <p>One hour after sunset:</p>	<p>One hour after sunset:</p> <p>One hour before sunrise:</p> <p>One hour before sunrise: Face SE.</p> <p>One hour after sunset: Face SW.</p> <p>One hour after sunset:</p>
30	31					

Magnitudes of the Planets: Venus -3.9 to -4.1; Jupiter -2.2 to -2.0; Saturn +0.3 to 0.0 in early Feb. Mercury brightens from magnitude +1 to 0 during January 14-31, and remains at magnitude 0 in early Feb. Planets against star background: Venus moves 33° eastward, passing through Aquarius and entering Pisces. Note Venus' changing position relative to Square of Pegasus last half of month. Jupiter, stationary Jan 15, moves very little this month (see Jan 10-11). Saturn retrogrades (moves west) 2.3°, moving from 9° to within 7° east of the Beehive cluster in Cancer.

East Lansing Sunrise: January 1 8:09 a.m.; January 10 8:06 a.m.; January 31 7:54 a.m. EST
Sunset: January 1 5:14 p.m.; January 10 5:30 p.m.; January 31 5:50 p.m. EST

The three teeth on the chi, in their four successive positions show 12 hour-angles and thus the position of the stars at regular intervals of one Chinese 'hour'.

The second line which is engraved on some chi (as shown in diagram 1) is parallel to the colure of the solstices and is used for finding its direction.



If any of us today wished to construct such a simple device as the hsüan-chi yü-heng, the task would obviously be neither extremely difficult nor expensive. Mine of course, would be of plexiglass or wood, fine jade-craft being, I assume, the province of experts. But could this instrument have any real value, or is the work devoted to such a project only a worthless pastime? Of course it is. But I don't want to build a hsüan-chi, I am looking at the principle on which its construction is based and wondering, what is more, if it might possibly be of use to amateur astronomers for their own purposes of reckoning time and position by locating stars in the sky ,

A template for the circumpolar constelations mounted on the end of a tube. Is this idea worth pursuing or developing or adapting to make a simple sighting device for aligning the polar axes of telescope mountings or perhaps the scopes themselves to regions of the sky other than the pole? I don't know. But that's the kind of question which comes to mind, to mine I mean, after hearing what was done with it in antiquity. Perhaps someone can use a clever little star template like this to be found at present only in museums. I can't.

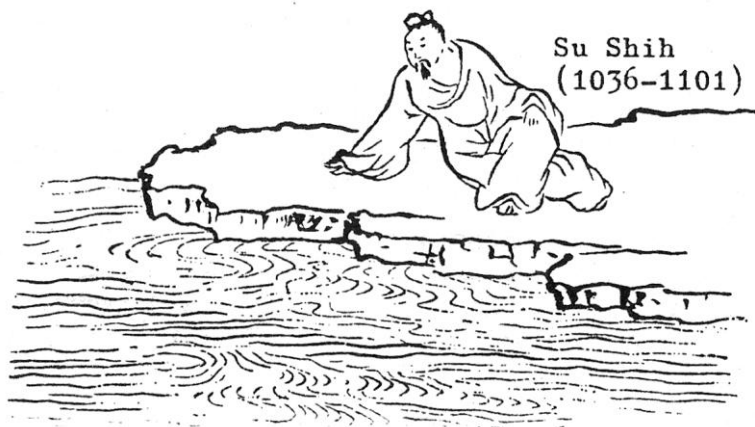
Principal reference for this article-

Science and Civilization in China, VI. 3/ J. Needham

* * * * *

North of the City, Near the Road

At night, on horseback I enter South Mountain valley.
Dark waters roar in the gorge;
Distant stars shine brightly on the mountain ranges.
I lie down drunk and wake to the sound of running water.
Just think of all those old astronomers practising
their art of looking at heaven through a tube.
Peach blossoms float on the water and the carps grow fat.



Su Shih
(1036-1101)

A COUPLE of FINE EVENINGS at STARGATE
or
A PHOTOGRAPHIC and VISUAL
EXPERIENCE

On a couple of evenings in August, I was again to familiarize myself with the 12½" Cassegrain reflector, It looked much different than the old cass which sat on the same mammoth pier. It was clean and white with gears and wheels on both R.A. and declination. Lights on two boxes blinked and flickered on the sides and a box contained many buttons which I was not accustomed to using. A motor now rolled the dome and the long handled pull bar was no longer needed to guide the great silver dome.

On August, the 28th, I happened to turn the big tube upward towards Jupiter and was in for quite an evening., Looking through the eyepiece I sav there was no red spot to my disappointment, but a transit was in progress. Most of all morning I watched the show Jupiter put on, a little white circlet could be seen on Jupiters meridian at 3:00 A.M.(E.S.T.) followed by a shadow being cast on the surface by moon II. (All times and which moon was doing what, was not precisely known till I was able to go home and check my ephemeris.,) The interesting thing was while I was observing and recording, I thought the first shadow on belonged to the first moon approaching the disc, but the great one was wrong! The first shadow beelonged to moon II, which was not to transit (ingress) till another 48 minutes after Io had left its place in the night sky and placed itself on the edge of Jupiter's disc. While both shadows were on the disc Io's shadow could be seen to appear much darker than II's shadow. Also it was fun to watch Io' s shadow move closer to II's shadow

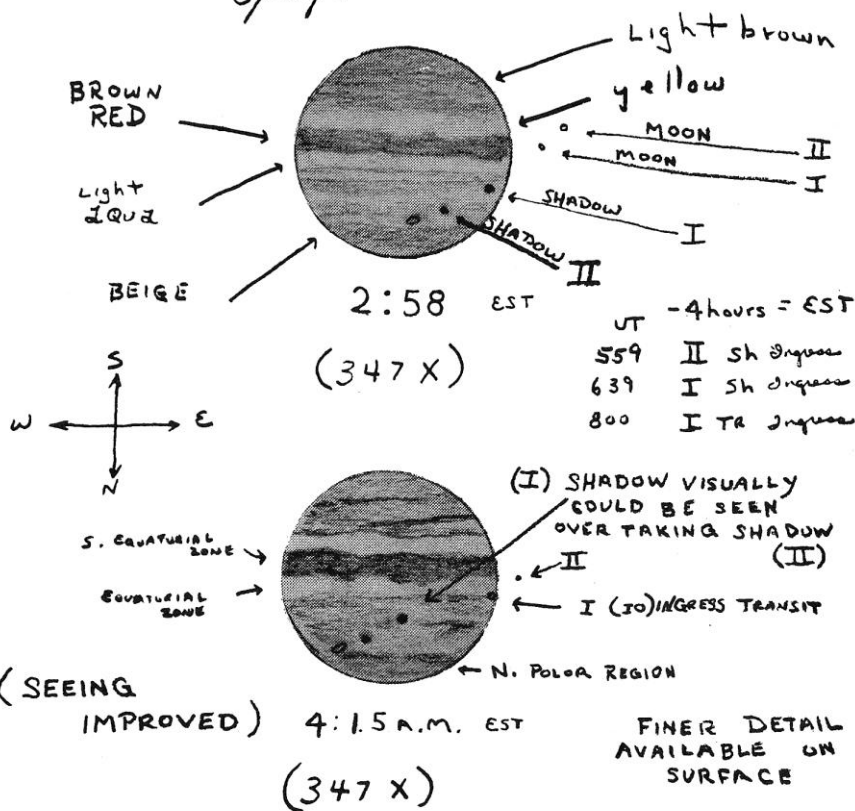
Not much can be said for the coloration of Jupiter itself except it had a very interesting light beige brown appearance. with an aqua band running near the north equatorial region. A little yellow could be seen on the south equatorial band and a fairly dark brown red band running across the center equatorial area.

When Io began to transit, a little white disc could be seen rather easily, it became a little fainter as it moved inward. It was

JUPITER

DRAWINGS BY
FRANK McCULLOUGH

8/28/76



- 1) Notes - Very soft look to Jupiter not very many belts distinguishable
- 2) only one polar cap obvious, (NORTH)
- 3) Special Features one dark brown red belt.
- 4) Double Transit and a white circlet
- 5) IO ingress 3:25 noticed white snow ball completely on disk of Jupiter. Started to fade as it entered on the light equatorial zone.
- 6) I - Shadow darker than II
- 7) 694X was used satisfactorily

great excitement to watch and record and not knowing what was actually predicted. I took home what I had and compared the times and found out which moon was which. Surprisingly my times were fairly accurate visual to predicted and were only off approximately 60 seconds using the clock in the observatory.

A week later after the fine night I had visually, I decided I would like to try some astrophotography. My objects were to be the double cluster, M-45, M-31, and a shot of the surrounding area around Taurus.

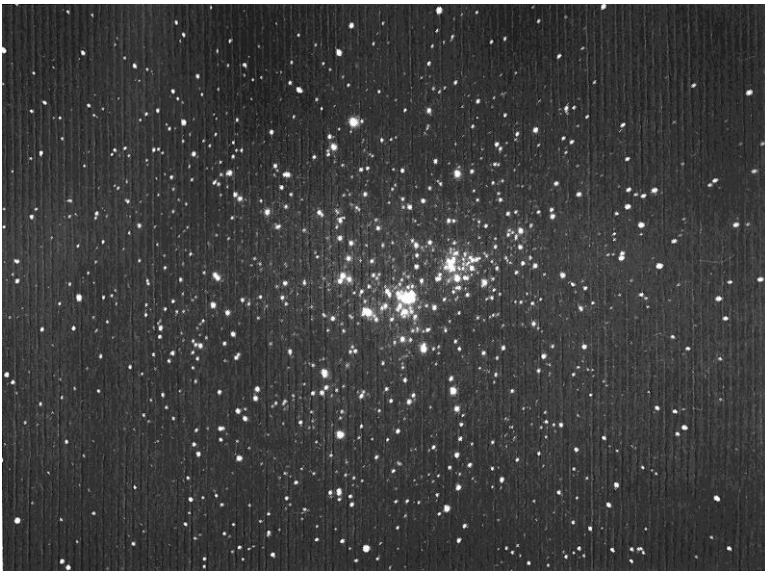
I did not have a cross hair eyepiece so I made a slightly out of focus bright star and kept it in the center of the eyepiece guiding with cass., at approximately 400X. My pictures were taken through the 3" f:4 refractor Pete Kwentus constructed piggyback on the 12½" telescope.

Guiding that evening seemed too easy, the star lay lifeless in the eyepiece, an occasional touch in R.A. every 90 seconds always seemed to do the job. Declination correction was once through a 15 minute exposure and even then I'm not sure it was really needed. The end result was to develop the 15 minute exposures and see what I got. SURPRISE! All shots gave nice round star images from center to edge. M-31, the Andromeda galaxy needed twice the exposure, and sky fog had just barely started to show on the slide film. The double cluster was superb and the Merope nebula in M-45 was finally recorded by myself.

In closing I feel the observatory is even more of a delight to use and you people that spent all the time on gears, lenses, wiring, aligning, etc. let it be known this person appreciates the work done and you people who have not ventured to see, use, or photograph through it, you're missing something.

SUPER SEEING

Frank R. McCullough



The Double Cluster in Perseus: Picture taken by Frank McCullough on August 1976 with 3" f:4 refractor on Focal 100 A.S.A. home processing. Exposure 15 minutes.

An asteroid comes calling – close

Although there may be many hundreds of asteroids whose paths take them inside the orbit of the earth, they are usually small, dark and only rarely discovered. The first was detected in 1932, and one spotted in January of 1976 (SN: 2/7/76, p. 84) was only number 20. Now another has been found, and back-tracking indicates that on Oct. 20 it passed within a mere 1.2 million kilometers of the earth, barely three times as far as earth's moon.

The object, designated 1976 UA (see IAU circulars 2999 and 3000), is a tiny one, according to Brian Marsden of the Harvard-Smithsonian Center for Astrophysics in Cambridge, Mass. He says its absolute magnitude of about 21.5 suggests that it 'is no larger than 0.4 kilometers across. It is following a course that ranges between about 70 million and 183 million kilometers from the sun, tilted about 60 degrees relative to the plane of earth's orbit. Its "year" is a little more than nine months long.

The only such object ever observed in a path that carried it closer to the earth was Hermes, discovered in 1937, which came within about 800,000 kilometers. (Some

such objects have struck the earth itself or burned up in the atmosphere, but none of those have been charted beforehand in their orbits.) The newcomer was first spotted by William Sebok, a graduate student at the California Institute of Technology, in a photographic plate taken Oct. 25 with the 122-centimeter Schmidt telescope at Palomar Mountain Observatory. It was also found on plates made independently the same day by Caltech astronomer Eleanor Helin, and has now been reported, says Marsden, by at least four other observers.

Asteroids whose paths cross the earth's are known as Apollo asteroids. Referring to the name given to the first of them by its discoverer, Karl Reinmuth of Heidelberg Observatory. Though all of the known ones are far too small to be studied in detail by earth-based telescopes (the largest is about 8 kilometers across).