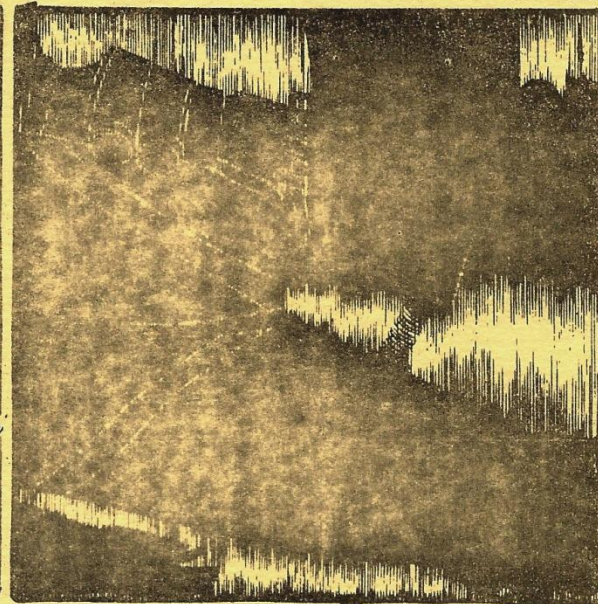
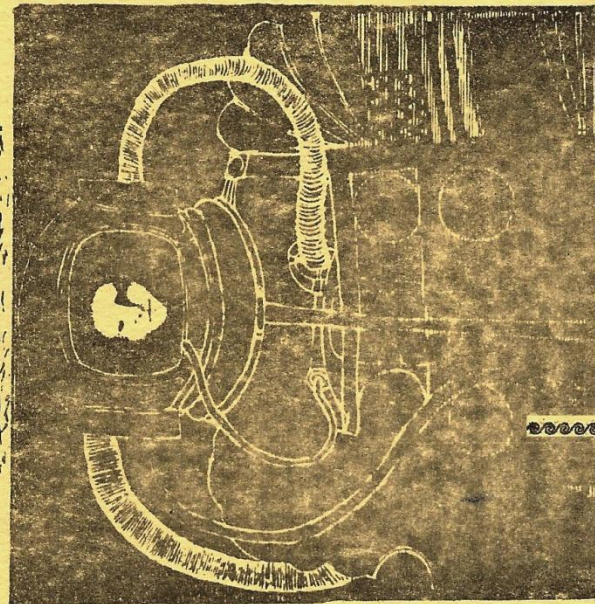
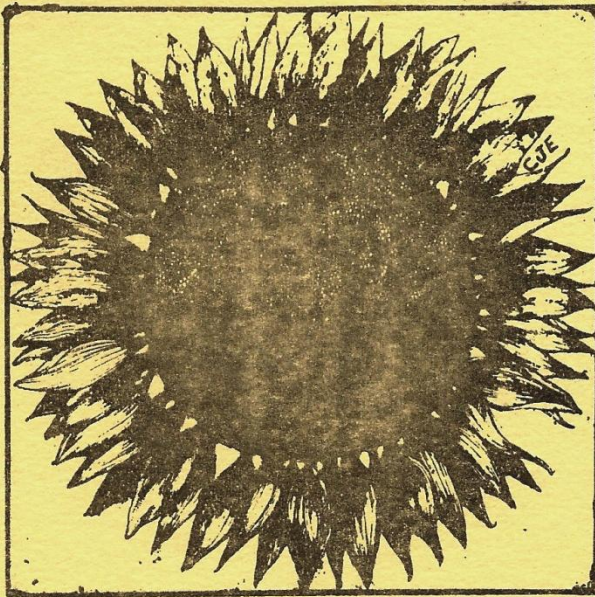




THE WASP



FEBRUARY 1972



the journal of the warren astronomical society

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COVER BY: Chris Edsall

The Warren Astronomical Society Paper (W.A.S.P.) is published by the Warren Astronomical Society monthly as a privilege of membership.

Advertisements are free to members. Subscriptions and non-member advertisements are available upon arrangement with the editors. Contributions, literary and otherwise are always welcomed.

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Kenneth Wilson; 11157 Granada--- 268-9337 - Sterling Hts 48077

The W.A.S. holds correspondence (sometimes infrequent) with the following organizations. We welcome others.

Kalamazoo Astronomical Society, Jackson Astronomical Society (Jackson, Mississippi), Detroit Astronomical Society, D.O.A.A., Astronomical League.

A Letter From the Editors and Staff of the W.A.S.P.

As many of you may know, several members of the Warren Astronomical Society have had some bad luck of late. Both Tim Skonieczny and Mary Riley had foot trouble some time ago. Chris Edsall fell down a flight of stairs, injuring his head, which required numerous stitches. Jim Trombly was in the hospital with, in layman's terms, a heart infection. If you have an hour, Jim will explain the full details to you, in brief. Our long time treasurer, Mrs. Jean Baldwin was in the hospital to have a tumor removed. Recently Tim Skonieczny has gotten over a virus and ear infection. Also of late, Mr. Richard Polus' (a former president of our club) father passed away as did Tim Skonieczny's Grandfather.

Our condolences and best wishes go out to these people who have been so active in our club.

-The Editors and Staff of the W.A.S.P.

The W.A.S.P. Salutes

Chris Edsall has not been given recognition for any contributions or efforts on his part to help our club or to be a part of club activities.

Chris came to us from the D.A.S. and now is associated with both clubs. He has attended WAS meetings for as long as three or four years and has always tried to play a part in contributing to the club in one way or the other.

CONTRIBUTIONS: His suggested name now stands at our observatory (STAR GATE OBSERVATORY). He has attended the joint W.A.S.-D.A.S. expedition to Perry, Florida, where he and Jim Trombly received readings and experience from the club radio telescope. Chris has been a driver on many occasions for our members and has been on the rotation for Fridays Scouts at Camp Rotary. Chris has also been a big help for contributions and assistance in running it (W.A.S.P.) off.

The club now needs new and fresh ideas like his and members will be happy to know Chris has dug up a little surprise for us this summer.

** Apology to Walter Roudebush and Mike Potter for the condition of the last salute.

NEWS ITEMS

by
Kenneth Wilson.

WHAT ECLIPSE?

On Sunday morning, January 30, the Moon was supposed to be eclipsed by the earth's shadow. But, to everyone who attempted to observe it in the Metropolitan Detroit area, the event was as good as theoretical. Just a few hours before the eclipse was due to start, the skies became overcast and stayed that way until after sunrise. This was the second lunar eclipse in a row to be clouded out in the Detroit area.

Kalamazoo, however, had a little better luck. Their skies did not cloud up until about twenty minutes before totality. But, as the newspapers will testify in their photos, Chicago had perfectly clear skies for the eclipse.

SOME PEOPLE JUST DON'T LIKE ECLIPSES

Even if we did not see the eclipse, many people did in Southeast Asia. Several groups of natives believe that when an eclipse occurs, it is caused by a dragon in the sky eating up the moon. To stop this destruction of the moon, they believe that they must fire their weapons at the moon and scare the dragon off. During this latest eclipse, there were several deaths and many injuries due to this custom.

CAN MACHINES REPLACE SPIDERS?

The Vickers instrument firm of York, England have recently replaced the Epiera Diademata spiders, which they have used for sightlines in telescopes and surveyor's theodolites, with new electronic etching equipment.

The spider's webs would be accurate to within just over a ten thousandth of _ inch.

Every year at the end of August factory apprentices would gather on a nearby common and crawl on their hands and knees in the early morning mist, looking for spiders in gorse bushes. In a two week period of good hunting, they would find 200 female spiders to take back to the factory. After spinning enough webs (some up to 40 feet) for the coming year, the spiders would be returned to the common. But the gorse bushes are becoming more and more scarce. On the last hunt only about a dozen are found.

So spider web crosshairs in finder scopes will become a thing of the past, another victim of the industrial revolution.

MARCH MEETING SCHEDULE

1ST THURSDAY, MARCH 2ND: MESSIER CLUB, FRANK McCULLOUGH 775-3536.

2ND THURSDAY, MARCH 9TH ASTROPHOTOGRAPHY CLUB~ LARRY KALINOWSKI 776-9720

3RD THURSDAY, MARCH 16TH W.A.S. GENERAL MEETING, FRANK McCULLOUGH 775-3536.

All interested persons are invited to attend. Please check with the person listed for time and place.

UNIVERSE FOUND TO BE OLDER

(United press International)

The expanding universe and all of us people, planets, stars, and galaxies residing therein- appears to be a trifling billion years or so older than you thought you were.

A couple of Carnegie Institution of Washington astronomers, Drs. Allen R. Sandage and Gustav A. Tammann, have “re-determined” the Hubble Constant after 13 years heavenly observations and much mathematical labor.

The consequence is that our present universe seems to have been born in a big bang 11 billion to 15 billion years ago; not 10 billion to 12 billion years as scientists for some time have been saying.

Since every bit of matter in our bodies is perforce as old as the universe, this finding ages us all, though hardly in the sense that the Social Security and Internal Revenue Service people will take into account.

The American astronomer Edwin Powell Hubble (1889-1953) is famous for having discovered a way to discover how rapidly the galaxies are flying apart as the universe expands. He found that light from receding star families shifts increasingly toward the red end of the spectrum as their speed of recession increases.

As a result of his discovery the Hubble Constant was born. This a number which cranked into the requisite equations measures the expansions of the universe by relating distances of remote galaxies to red shift.

But before you can measure the distance from where you’re standing to a place in the next block, say you have to have a system for measuring the distance from where you’re standing to a shorter distance such as the edge of the nearest curb.

For this shorter measurement, astronomers picked large hydrogen clouds in nearby galaxies, whose dimensions they felt reasonably confident of gauging accurately.

Then with the 200” Hale telescope in California they searched out similar clouds in similar but ever more remote galaxies.

Thus equipped with a linear yardstick plus the velocity evidence supplied by the galactic red shifts, Sandage and Tammann were able after 3 years of toil to come up with a revision of the Hubble Constant which appears to date creation more precisely than before.


Their conclusions support the notion that in the beginning all matter and energy were concentrated in a “primordial atom”, a fantastically compacted fireball,

which exploded and gave birth to the universe which is now flying apart in all directions.

As a sort of side show to all this, the sun and the earth and the rest of the solar planets came into being 4.6 to 4.7 billion years ago. These times are not changed by the new revision of the Hubble constant.

But as fundamental parts of the original universe, we are all perhaps three billion years older than we thought give or take of course, a few billion years or so.

(rewritten by Frank M^cCullough)

A hand-drawn illustration of a night sky. It features several small, five-pointed stars of varying sizes in the upper left quadrant. A long, thin, slightly curved line representing a comet or meteor streaks across the upper right quadrant, ending in a small, dark, irregular shape representing a tail or head.

Messier Contest

Friday, February 18th

8:00 p.m. Camp
Rotary

Awards will be given
1st 2nd 3rd Prize

- The Poet's Corner -

-submitted by Walter Roudsbush

The Moon

I

AND, like a dying lady lean and pale,
Who totters forth, wrapp'd in a gauzy veil,
Out of her chamber, led by the insane
And feeble wanderings of her fading brain,
The moon arose up in the murky east
A white and shapeless mass.

II

Art thou pale for weariness
Of climbing heaven and gazing on the earth,
Wandering companionless
Among the stars that have a different birth,
And ever changing, like a joyless eye
That finds no object worth its constancy?

-Percy Bysshe Shelly

"Cassilda's Song"

Along the shore the cloud waves break,
The twin suns sink behind the lake
The shadows lengthen

In Carcosa.

Strange is the night where black stars rise,
And strange moons circle through the skies
But stranger still is

Lost Carcosa.

Songs that the Hyades shall sing,
Where flap the tatters of the King,
Must die unheard in

Dim Carcosa.

Song of my soul, my voice is dead,
Die thou, unsung, as tears unshed
Shall dry and die in

Lost Carcosa.

--Ambrose Pierce

(submitted by Ken Wilson)

THE ASTRONOMER'S DRINKING SONG

(Sung by the Mathematical Society,

London, ca. 1800)

Who'er would search the starry sky.
It's secrets to divine, sir,
Should take his glass- I mean, should try
A glass or two or wine, sir!
True virtue lies in golden mean,
And man must wet his clay- sir;
Join these two maxims, and 'tis seen
He should drink his bottle a day, sir!

Old Archimedes, reverend sage!
By trump or fame renowned, sir,
Deep problems solved in every page,
And the sphere's curved surface found, sir:
Himself he would have far outshone,
And borne a wider sway, sir,
Had he our modern secret known,
And drank a bottle a day, sir!

When Ptolemy, now long ago,
Believed, the earth stood still, sir!
He never would have blundered so,
Had he but drunk his fill, sir;
He'd then have felt it circulate,
And would have learnt to say, sir,
The true way to investigate
Is to drink your bottle a day, sir!

Copernicus, that learned wight,
The glory or his nation,
With draughts of wine refreshed his sight,
And saw the earth's rotation;
Each planet then its orb described,
The moon got under way, sir;
These truths from nature he imbibed
For he drank his bottle a day, sir!

The noble Tycho placed the stars,
Each in its due Location;
He lost his nose by spite of Mars,
But that was no privation:
Had he but lost his mouth, I grant
He would have felt dismay, sir,
Bless you. He knew what he should want
To drink his bottle a day, sir!

Cold water makes no lucky hits;
On mysteries the head runs:
Small drink let Kepler time his wits
On the regular polyhedrons:
He took to wine, and it changed the chi
His genius swept away, sir!

Through area varying as the time
At the rate of a bottle a day, sir!

Poor Galileo, forced to rat
Before the Inquisition,
E pur si muove was the pat
He gave them in addition:
He meant, what'er you think you prove,
The earth must go its way, sirs;
Spite of your teeth I'll make it move,
For I'll drink a bottle a day, sirs!

Great Newton, who was never beat
Whatever fools may think, sir;
Though sometimes he forgot to eat,
He never forgot to drink, sir:
Descartes took nought but lemonade,
To conquer him was play, sir;
The first advance that Newton made
Was to drink his bottle a day, sir!

D'Alembert, Euler, and Clairaut,
Though they increased our store, sir.
Much further had been seen to go
Had they tiddled a little more, sir!
Lagrange gets mellow with Laplace,
And both are wont to say, sir,
The philosopher who's not an ass
Will drink his bottle a day, sir!

Astronomers! What can avail
Those who calumniate us;
Experiment can never fail
With such an apparatus:
Let him who'd have his merits known
Remember what I say, sir;
Fair science shines on him alone
Who drinks his bottle a day, sir!

How light we rock or those who mock
By this we'll make to appear, sir,
We'll dine by the sidereal clock
For one more bottle a year, sir:
But chose which pendulum you will,
You'll never make your way, sir,
Unless you drink- and drink your fill-
At least a bottle a day, sir!

-submitted by
Walter Roudebush

The W.A.S.P. Uncovers " The Good
d a
y
s

By Frank McCullough

This is the second of a series which will bring memories to some and ancient history to others. Let me waste no time in scraping away the dust and cobwebs from the old issues of the W.A.S.P.

April 1970- NO PAPER!!! Why Not??? No Articles!!!!!!

May 1970-- Club News---Radio Telescope

Jim Trombly has received 15 dollars for the project and work is under way.

Future Articles Wanted!

If interested in writing future articles or advertising something you would like sold, contact one of the following.

Frank McCullough. 772-2011

(Frank, how many phone numbers
have you had since then?)

Martin Butley 758-6755

Gene Francis 751-2836

*****!?!*****

NOVEMBER 1969

Riddles of Astronomy

Venus: Does the "phantom satellite" of Venus exist?

Perhaps inevitably, a moon of Venus was "discovered" in 1686 by G. D. Cassini an early astronomer, who had gained fame by revealing four satellites of Saturn, which were authentic. He described the new moon as about $\frac{1}{4}$ the diameter of Venus, almost as large as the earth's moon. Since all Venus observations are against the sun, glare would make it hard to see any such body except briefly. In following centuries other astronomers claimed to catch a fleeting glimpse of D'Alembert, as the satellite was unofficially named by Fredrick the Great of Prussia.

But by 1760 most astronomers pronounced the moon a myth. Various explanations were given for the false observations: An illusion caused by imperfect telescopic lenses by stray flashes of sunshine, the sighting of a fixed star past which Venus skimmed during the travel through the Zodiac. The twentieth century's superb telescopes have failed utterly to catch any image on photographic plates of a moon for Venus.

(cont.)

However, it is still possible that a very tiny Venus satellite does exist, which no telescope can ever resolve out of the blinding dazzle surrounding the mother planet. Tiny Deimos of Mars, only five miles wide, is barely detectable by giant modern telescopes, even while looking outward from the sun under the best "black lighting" conditions. Any Venus circling object as small or smaller than Deimos would probably escape detection from earth. The Venus moon hunt will be continued by robot or manned space vehicles sent from earth.

There remain the two major enigmas of Venus ...

Taken from: Riddles of Astronomy
by Otto O. Binder

Diane Bargiel

(Look for part III next month of "The Good Old Days")

OBSERVATIONAL ASTRONOMY by
(M-97) Frank M^cCullough

On Christmas morning I spent my time cleaning out the Ursa Major region. One of the most astonishing objects I viewed was a fairly large fuzzy ball with a mottled surface. Mr. Holyoke (author of *Observe*) has said, "The two big dark "eyes" giving the nebula its name (owl nebula) can't be seen in a small telescope. I have never seen them in a 6" telescope."

Now, I must make myself clear when I say "mottled" surface. One thing I never do is read the description of the object, because I want to make my own judgment on how the object looks through the eyepiece. I can say very cautiously that I did see a darkening in the center of the nebula, but I can't say I saw the dark eyes.

For people with a 6" telescope, for your own good get yourself a 40m.m. eyepiece. For five years I have used eyepieces of 20m.m., 18m.m., and 24m.m. for low power and have knocked off most of the Messier objects with these. I purchased recently a 40m.m. Unitron eyepiece with excellent eye relief. I found M-97 with this eyepiece with very little trouble. I couldn't really believe this was it, because I had looked nearly 3 years for the owl on many occasions and a few drivable locations and never found it. The eyepiece gives me nearly a one degree field of view. In the eyepiece I could just fit M-108 along with M-97. M-108 is a galaxy 3min. in R.A. and 39' in Dec. away from our main character. --- Just remember, use low power!!

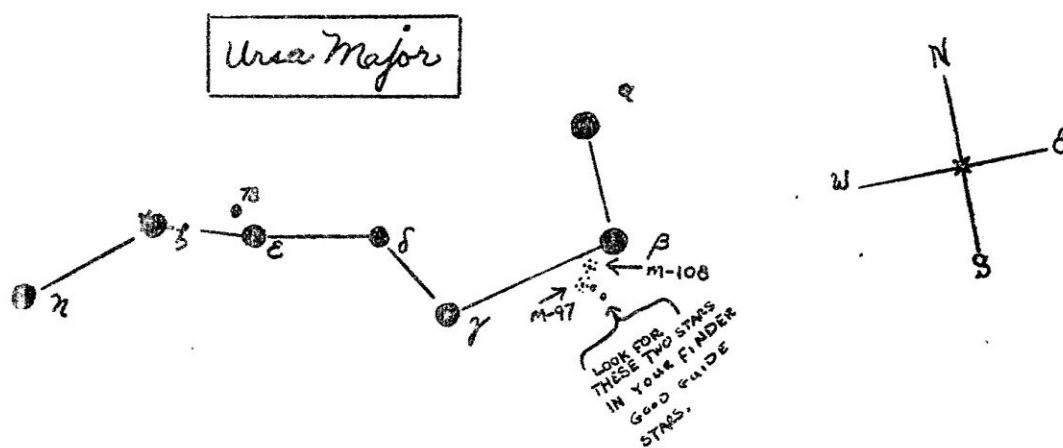
DESCRIPTION: M-97 (owl nebula) NGC-3587, 12th magnitude, R.A. -11hr12min.

Dec.- +55°18', Constellation- Ursa Major

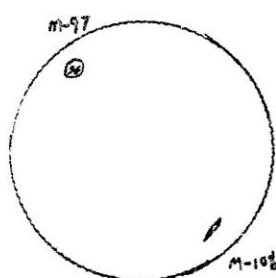
Look for M-97 two degrees south east of β Ursa Majoris. Look closely, M-108 will appear as a faint elongated slash of light. M-97 appears brightest of the two even though this is not really the case.

OBSERVATION

MAP



6" Reflector
35X
40m.m. eyepiece



(Field with 40m.m. eyepiece)

THE OBSERVER'S LIBRARY

By

Kenneth Wilson

STAR CHARTS – II

Last month I examined the Popular Star Atlas; an atlas for the casual observer. Olcott's Field Book of the Skies is another atlas of the same type. Both have a magnitude limit of about 6 and are intended for the observer with naked-eye, binoculars, or a small telescope. However the similarity ends here.

The Field Book of the Skies first appeared in 1929. Since then it has been revised by R. Newton and Margaret Mayall and has been through four editions and seventeen printings. There are several charts covering the general northern sky season by season. But, the main charts, cover all 88 constellations individually. These constellation charts denote prominent double stars, nebulae, clusters, novae and variable stars. All major designations are used including N, H, P, Σ , O Σ , O $\Sigma\Sigma$ and N.G.C. numbers. But, the best feature of this atlas is its supplemental information. Along with each constellation chart are descriptions of prominent objects in the constellation, i.e. doubles, nebulae, clusters, etc. Of particular interest are the texts on the mythological backgrounds of each constellation. This book includes chapters on basic astronomy; the solar system and each of its members; the moon, including eight charts of its main features; occultations; comets; meteors; eclipses, the Milky Way; the design and use of the small telescope; a chronological table of astronomical history; and, a list of star names and their meanings. Appendices include: solar system data; planetary satellite data; comparative planetary sizes; data on the brightest northern stars; data on nearest stars; a graph of limiting magnitudes and numbers of stars visible to various apertures; variable star lists; historical novae; comparative sizes of stellar diameters; list of periodic comets; list of Messier objects; list of stars with large proper motions; astronomical symbols; and formulae for finding Dawes' limit and others. As you can see this atlas packs a lot of information.

Despite its many features there are several drawbacks to this atlas. As this is a thick (482p.) book, it will not lie flat when in use at the telescope. The charts are also listed in an awkward seasonal order. If they were in alphabetical order, one could find a particular chart much quicker. And, this is not a very good atlas with which to find all of the Messier objects, as they are not all listed.

Other than the above mentioned drawbacks. Olcott's Field Book of the Skies is an excellent atlas for the beginning amateur. Its supplemental information is of use to even the advanced amateur. For those not wishing to pay the \$5.00 cost of this atlas, an abridged version in paperback is available for \$1.00. It is entitled A Beginner's Guide to the Skies and published by Cornerstone Library, a division of Pocket Books, Inc.

The editors of the W.A.S.P. are always interested in publishing new material concerning amateur astronomy, in order to expand our scope of coverage. We are particularly interested in personal observation of any astronomical objects; news of the activities of other clubs; evaluations of commercial equipment available to the amateur astronomer; and, any other articles concerning astronomical subjects, particularly those not covered by the major national publications. They may be submitted to any one of our editors or staff members.

Remember, the importance of the observations and thoughts of the amateur astronomer are proportional to how well he communicates them to other amateurs. So keep those articles coming in.

-The Editors

A FORMULA FOR CALCULATING ASTROPHOTOS

By

Kenneth Wilson

One of the basic problems of photographing celestial objects is determining a workable exposure for a given f-ratio, film speed, and object. Ronald Smith of the Griffith Observatory has arrived at a formula for determining such exposures. Several tests on paper of this formula differ somewhat from the exposures listed on the Larry F. Kalinowski guides. But, as the L.F.K. guides can be used at an exposure above or below that suggested, this formula may well be workable.

The formula is:

$$T \text{ (seconds)} = \frac{f^2}{\text{ASA} \times b}$$

where T is the length of exposure in seconds or fractions of seconds, f the total camera-telescope focal ratio, ASA, the speed of the film, and b the surface brightness at the object. The table below gives the appropriate values of b for Venus, Jupiter, Mars, Saturn, and the moon. Round the exposure of the formula to the nearest value for your camera.

<u>Object</u>	<u>b=</u>
Venus (greatest elongation) ...	1100
Moon	20-200
Mars (mean opposition)	32
Jupiter	32
Saturn	13

The "b" values vary for the moon because of its changing surface brightness from the terminator to the sub-polar point.

I have not used this formula as of yet. But its inventor derived it experimentally from his own photographs. If anyone tries this formula, I would like to hear from them as to their results. And, if you're lazy like me, you can just look your exposures up on Larry F. Kalinowski's tried and true exposure guides.

CONSTELLATION OF last MONTH

SCORPIO

The Scorpion

164030

Scorpio is not only in the Milky Way, it also has Antares, the bright orange star (0.9 mag.), and along with that, contains many Messier objects, although unless one is at a latitude of 40 degrees north or less, they get lost in the horizon haze.

A few of the objects to be found in Scorpio:

- M7 - a mass of bright stars scattered – visible with naked eye.
- M6 - an open cluster – visible with naked eye – given appearance of open flower with bright stars being around perimeter.
- M4 - an extensive globular cluster near Antares.
- M80 - it was this globular cluster that Herschel considered the “richest mass of stars in the heavens”
- M19 - discovered by Messier in 1764; another globular cluster (proven so by Herschel).
- NGC 6293 - More with the globular clusters, only this one is followed by a nebula (rather dim).
- ν Scorpii - A beautiful quadruple star although one can see it only as a double with 3” or smaller.
- Scorpiids - A slow moving meteor shower that appear around June 2 and June 17.

Enough on the objects, Scorpio is south of Ophiuchus, the Serpent bearer. The Akkadians called it Girtab – the Stinger, and the Hebrews, Akrabh – the Scorpion. Per Greek mythology, Scorpio was the stellar reincarnation of the monstrous scorpion that killed Orion, after he proclaimed that there was not a creature that he could not master. The Egyptians considered Scorpio the representation of the goddess Selk, who brought forth scorching heat.

Antares is Mars’ rival – the colour is much the same. It is believed to be the fourth largest star in the heavens – also known as the heart of the scorpion. The second brightest would be a lilac-white double known as Acrab.

Herbs of mars-Aries and Scorpio

All-Heal, *Prunella vulgaris*. The root of this plant is used and acts as a stimulant for nerves but then has a sedative effect. It should be powdered, mixed in a tea with ginger or cloves, but should not, must not, be boiled. It wards off head colds.

Basil, *Ocimum basilicas*. A common garden herb that stimulates sensual awareness. A tea made with the leaves is very beneficial for relieving mild nervous disorders.

Cuckoo-Pint, *Arum Vulare*. This is poisonous n the outside, but the roots can be crushed, mixed with equal parts of sugar, and this will alleviate rheumatic difficulties and whet a lost appetite.

Garlic, *Allium sativum*. This herb works spells against evil, works to alleviate asthmatic conditions and lethargy. It should not be used by those who are feverish, bilious, or depressed as it can cause hallucinations (!).

Radish-wild or Horse, *Cochlearis armoracia*. The leaves and root of this plant mixed with water and some sugar bring relief to achy joints and pains in the lower back, hips and surrounding areas.

Wormwood-Roman, *Artemisia pontica*. One variety of this plant, Absinthe latifolium vulgare is used for making absinthe, prohibited in the States, widely partaken of in France, although continued use may cause serious nervous disorders.

Rhubarb-culinary or tart, *Rheum rhapomticum*. The root of this herb boiled in wine that will strengthen brittle fingernails.

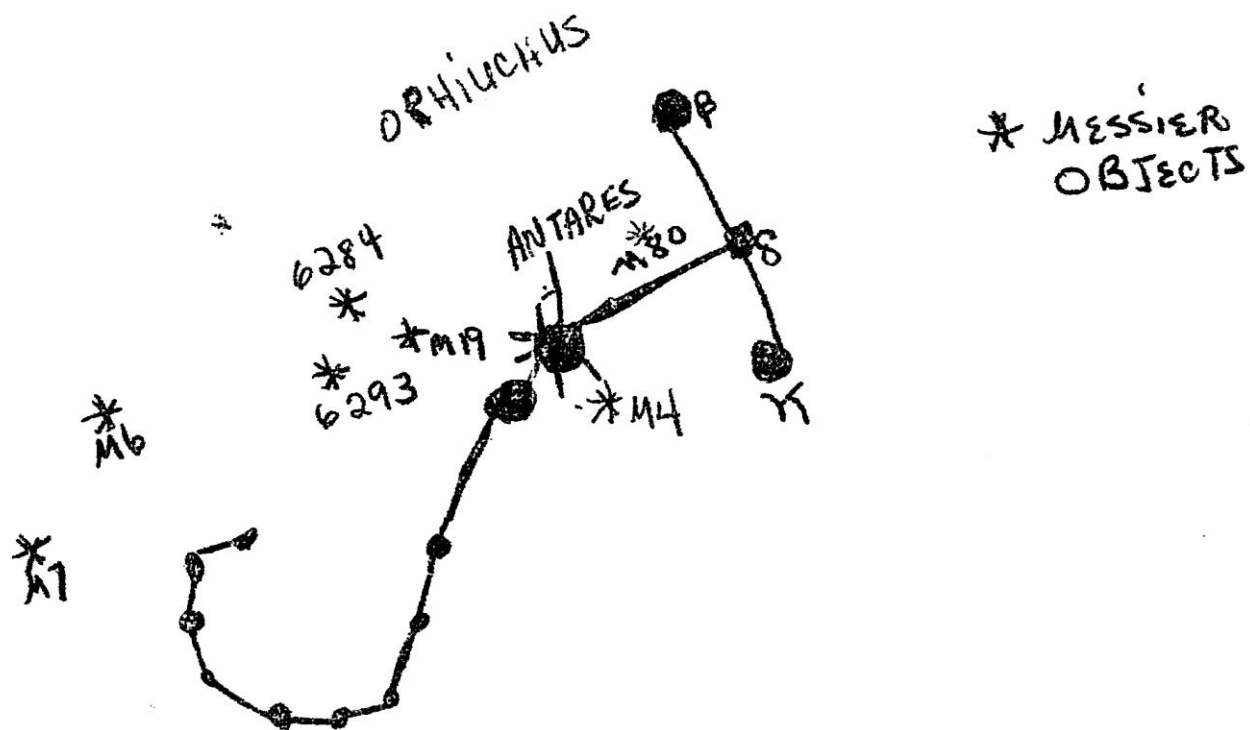
Tobacco, *Nicotiana tabacum*. Small amounts of tobacco will aid in the relief of headaches.

For all Scorpion- (Oct. 24-Nov. 22) this is a highly idealistic time although materialistic; motivated by desire to fulfill private needs yet fit public requirements. Don't believe your leaders-take them with a grain of salt, a lemon, and some tequila.

BORN UNDER SCORPIO

Poet	Dylan Thomas
Painter	Monet
Author	Dostoyevsky
Star	Katherine Hepburn
Composer	Paul Hindemith
Philosopher	Albert Camus
Head of state	Nehru
Wit	F. P. Adams

Scorpio- self-controlled and calm-also ruthless and suspicious-the passionate
Scorpion finds it hard to accept criticism and though intensely loyal to friends is
unfortunate to have as an enemy.



Many thanks to all references- too many to list here.

WFR

IS IT REALLY THAT COLD ? ? ?

WIND CHILL TABLE

When ther- mometer reads	When the wind blows at the m.p.h. below, it reduces Temperature to								
	Calm	5	10	15	20	25	30	35	40
+50	50	48	40	36	32	30	28	27	26
+40	40	37	28	22	18	16	13	11	10
+30	30	27	16	11	3	0	-2	-4	-4
+20	20	16	2	-6	-9	-15	-18	-20	-22
+10	10	7	-9	-18	-24	-29	-33	-35	-36
0	0	-6	-22	-33	-40	-45	-49	-52	-54
-10	-10	-15	-31	-45	-52	-58	-63	-67	-69
-20	-20	-26	-45	-60	-68	-75	-78	-83	-87
-30	-30	-35	-58	-70	-81	-89	-94	-98	-101
-40	-40	-47	-70	-85	-96	-104	-109	-113	-116
-45	-45	-54	-77	-90	-103	-112	-117	-123	-128

To measure speed of wind without instruments: when CALM (smoke rises vertically), 1-12 m.p.h. (just feel wind on face, leaves in motion); 13-24 (raises, dust or loose paper, small branches move); 25-30 (large branches move, wires whistle); 30-40 (whole trees in motion, hard to walk against). Wind speeds greater than 40 m.p.h. have little additional chilling effect.

•

TRUE TALES ABOUT ECLIPSES

As a member was leaving to observe the lunar eclipse, his mother cried, "Don't look at it!"

A mother asked, "How many days does the solar eclipse last?" The daughter replied, "Try 2 minutes, Mother!"

Recently the Detroit Astronomical Society received a letter requesting them to postpone the 1972 solar eclipse, because they would not be able to make it on July 10!?!

* * *

FOR SALE

A Tasco 4½" reflector telescope with equatorial mount and slow motion controls. \$75.00
Contact Diane Bargiel for further information. Call 778-6022.

ASTRO-ALMANAC

By
Kenneth Wilson

MOONS OF		EVENT
MAR. /	JUPITER ¹ /	
1	32014	
2	31024	
3	01234	Uranus 6°N of the Moon at 6 ^h
4	2043*	Mercury at ascending node, Moon at apogee (251,850 mi.) at 14 ^h
5	12043	Beginning of Virginid meteor shower (thru Apr. 2) -maximum: Mar. 20, R.A.: 150°, dec.: 0°
6	40312	
7	43102	Neptune 6°N of Moon at 3 ^h , Neptune stationary at 7 ^h , Moon .3°N of Antares
8	43201	Last Quarter Moon at 2 ^h .5 ^m
9	43102	Mercury at perihelion, Moon 3°S of Jupiter at 11 ^h
10	40132	Twilight begins: 4:46-ends: 19:37 L.M.T., beginning of Boötid meteor shower (thru 12) radiant: 14 ^h 32 ^m +12°
11	4203*	
12	42103	
13	40312	
14	31024	Mercury greatest elongation E (18°) at 5 ^h
15	32014	New Moon at 6 ^h 35 ^m
16	3104*	Mercury 2°S of Moon at 15 ^h , Lunar perigee (223,750 mi.) at 16 ^h
17	0124*	
18	21034	Moon 3°N of Venus at 13 ^h
19	2034d	Mercury greatest hel.lat. N, Moon 4°N of Mars at 9 ^h , Moon 6°N of Saturn at 20 ^h
20	01324	Twilight begins: 4:26-ends: 19:51 L.M.T., Vernal Equinox at 7 ^h 22 ^m
21	31024	Opposition of Pluto at 0 ^h , Mercury stationary at 6 ^h , First Quarter Moon at 21 ^h 12 ^m
22	32041	
23	3401*	
24	43012	
25	41203	Venus at perihelion, Ceres is stationary at 6 ^h
26	42013	
27	4023*	
28	41302	
29	43201	Full Moon at 15 ^h 05 ^m
30	31240	Twilight begins: 4:05-ends: 20 ^h 06 ^m L.M.T., Moon 6°S of Uranus, at 10 ^h , Vesta in conjunction at 18 ^h
31	30412	Inferior conjunction of Mercury at 7 ^h

NOTE: On March 15 Mercury at 0^h43^m+7°06'; Venus at 2^h23^m+16°01' (mag. -3.8); Mars at 3^h17^m+19°09' (mag. +1.5); Jupiter at 18^h25^m-22°59' (mag. -1.7); Saturn at 3^h58^m+18°44' (mag. -0.4); Uranus at 13^h05^m-6°07'; Neptune at 16^h15^m-19°33'.

(All times, unless otherwise noted, are in 24 hour Eastern Standard Time.)

¹ "O" represents Jupiter, d means the moon is on Jupiter's disc, * means the moon is in shadow or behind the disc. The configurations are for the inverting telescope at 5h E.S.T.

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