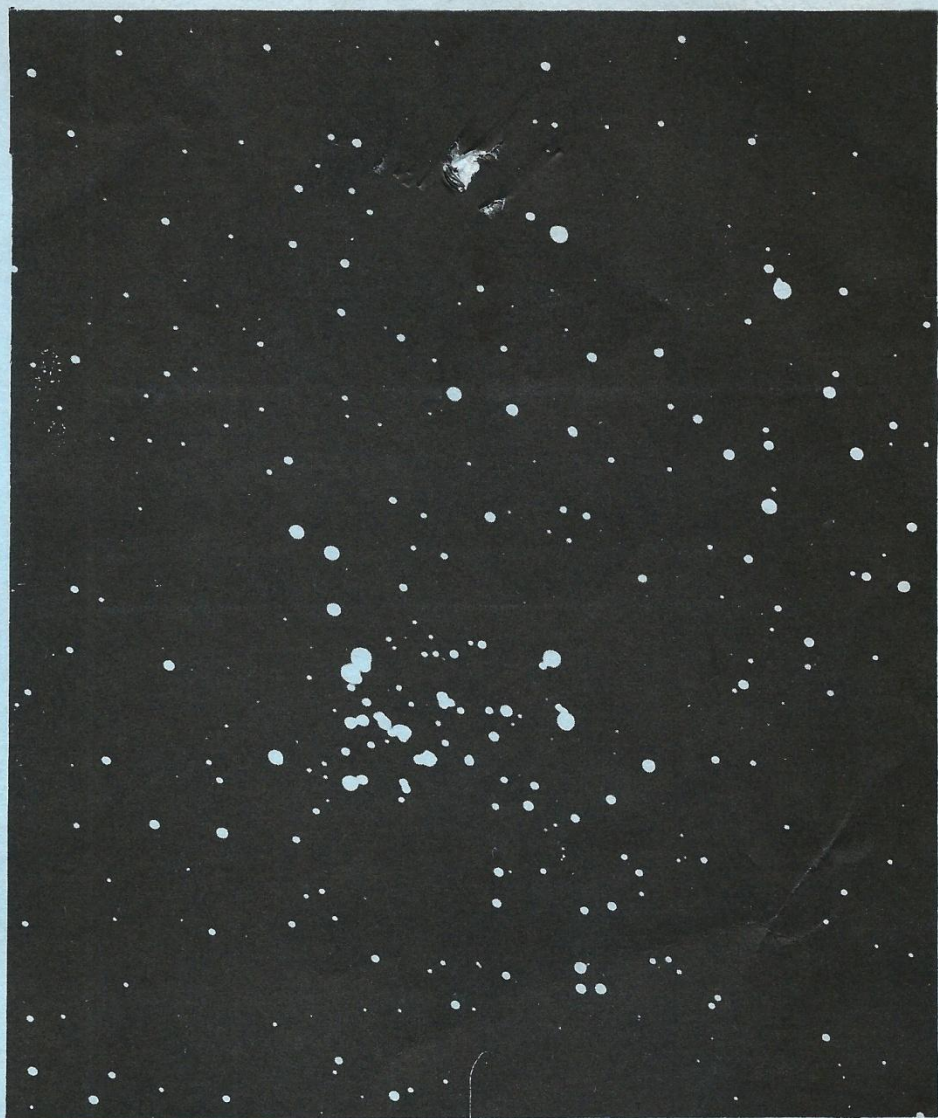


THE WASP



THE JOURNAL
OF THE WARREN
ASTRONOMICAL
SOCIETY



OCT. 1978



The Warren Astronomical Society
P.O. Box 474
East Detroit, Michigan 48021

Some Spectacular Summer Nebulae: Top right is the beautiful Eagle nebula in Serpens. Top left is the famous Trifid nebula in Sagittarius. Above is the fascinating Dumbbell nebula in Vulpecula. And left is the famous Ring nebula in Lyra. All these nebulae are very interesting in binoculars or telescopes at low power. These nebula are all fairly bright with magnitudes varying from 7 to 9. Nebulae like these look the most interesting in long exposure photographs with 35mm cameras.

Club News

The Warren Astronomical Society (W.A.S.) is a nonprofit organization of Amateur Astronomers. Membership is open to all interested persons. Annual dues are as follows; Student- \$11.00, College- \$13.00, Senior Citizen- \$15.50, Individual- \$18.00, Family- 23.00, the membership fees listed here include a one year subscription to Sky & Telescope Magazine.

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

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

Assistant Editor: Jeff Stanek---29589 Moulin
Warren, Michigan---48093-751-1673

OBSERVATORY SCHEDULE

Dennis Jozwik..Chairman • 754-2037

Lectures for the coming month are listed below.

Oct .6/7 Jeff Stanek751-1673
Oct. 13/14 .. Ray Bullock879-9458
Oct. 20/21 .. Bob Dennington779-6345
Oct. 27/28 .. Dave Dobrzelewski778-9715

The lecturer may select either the Friday or Saturday, depending on the Weather and their personal schedule. NOTE .. If you cannot lecture on your scheduled weekend, please call for a replacement as early as possible. If you wish to use Stargate, please call by 9 pm. on the evening you plan to go out.

•buy – sell – trade•

For Sale ...8" f/6 reflector, with 2.14 diagonal, mounted in 10" tube-50" long no eyepiece focusing mount. \$125.00. Use 4" O.D.-24" black iron stand that is ready to accept 3 legs and Equatorial head (Pacific) \$15.00 plus, a 22½ lb. counter weight with 1" hole & screw clamp. \$15.00
Contact Roger Civic, 776-8735.

FOR SALE...Celestron 8 with: wedge, tripod, 3 eyepieces, aluminum dew cap, counterweights, prism diagonal, piggyback camera mount, off axis guider, illuminated eyepiece, telecompressor, teleextender, and 'T' mount and ring for Cannon body. New cost-\$1571.00, selling for-\$1150.00. Write Richard Hill, 3932 Todd, Midland, Mich. 48640 Or call 1-517-835-5548.

FOR SALE .. Best offer over \$20.00, Coulter 4¼" f4 tube assembly with tripod bracket, no eyepiece. Call Bob Shannon 885-4283.

FOR SALE .. 6 inch f6 tube assembly. Homemade mirror. Never used, telescope in mint condition. Will sell for best offer over \$150. Contact Jeff Stanek 751-1673.

FOR SALE .. 6 inch f10 telescope. Good condition. Telescope also has clock drive. Telescope is mounted on a lightweight tripod. Selling for \$300. Call Joe Tocco at 573-8547.

FROM THE IAU CIRCULARS

By Ken Kelly

Three new comets, a nova and a fast moving Apollo type object were recently discovered.

COMET HANEDA-CAMPOS (1978j)

This comet was discovered by Toshio Haneda of the Tokyo Astronomical Observatory On September 1, and later that night by Jose da Silva Campos in Southern Africa. The object was described on September 2 as diffuse with condensation and tail less than 1 degree. The magnitude was estimated as 10. The latest estimated magnitude was 9.9 on September 10 by C. S. Morris, Prospect Hill Observatory, using 20 x 80 binoculars. An ephemeris follows:

		R.A. (1950)	DEC.		mag
Sept. 19	21H	38.67M	-39	27.0'	10.3
	29	22	38.26	-43 51.3	9.9
Oct. 9	0	0.46	-44	1.4	9.8
	19	1	20.42	-38 24.9	9.9
	29	2	17.21	-29 20.0	10.2
Nov. 8	2	52.22	-1.9	53.0	10.7
	18	3	13.73	-11 34.7	11.4

The estimated time of perihelion passage is 1978 Oct. 9 at a distance of 1.1 A.U. from the Sun. At that time its distance from earth will be 0.15 A.U. or about 14 million miles. This is a new periodic comet, with a period of 5.37 years, inclination 5.8 degrees and eccentricity 0.64.

NOVA CYGNI 1978

This nova was discovered by Peter Collins at the Mount Hopkins Observatory on Sept. 10. Its position is 21H 40M 38.2S, +43 48' 9.8" (equinox 1950). The magnitude at that time was 6.9. The latest estimate was 6.4 on Sept. 14.

1978 RA = 1975 TB

A fast moving asteroidal object was discovered by Eleanor Helin on Sept. 10 at magnitude 11 to 12, using the 40 cm Schmidt telescope on Palomar Mountain. It has been identified with 1975 TB and determined to be an Apollo type object. It has an eccentricity of 0.436, semi-major axis of 0.832 A.U. and period of 0.759 year. Its closest distance to the Sun is 0.469 A.U. or just outside the earth's orbit. The magnitude will be 14.4 on Sept. 21 and it will continue to get dimmer.

FROM THE IAU CIRCULARS

(continued)

COMET GICLAS (1978k)

This comet was discovered by Henry Giclas at Lowell Observatory on Sept. 8 at magnitude 15.6. on Sept. 29 it will be at 0H 3.37M, -12 50.1' and heading south.

COMET MACHHOLZ (19781)

Don Machholz, Los Gatos, California reported the discovery of a comet on Sept. 12 at magnitude 11, with a 25 cm reflector (10 in). On Sept. 14, the object was diffuse with condensation, but no tail. At that time its magnitude was 10.7 and its position was 6H 37.9M, -20 0'.

SCIENCE NEWS OF THE WEEK

Moon Believed Found for Pluto . . .

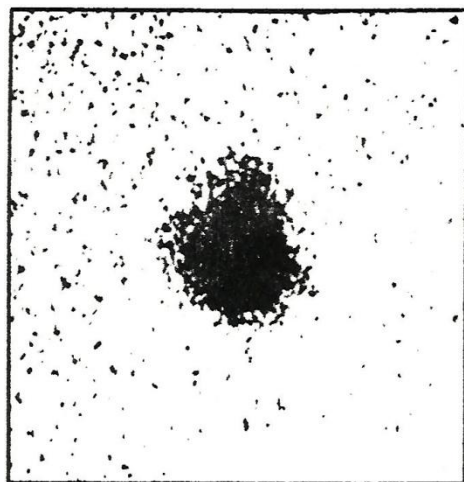
Scientists wandered the halls of the U.S. Naval Observatory in Washington asking if anyone knew which room had been designated for the event. Reporters were directed first to one room, then to another then back again. But the confusion was understandable: "The last time we had a press conference here," quipped one astronomer, "was 101 years ago." At that time, the event was Asaph Hall's discovery of Phobos and Deimos, the moons of Mars. Last week's announcement concerned a planet that, nearly 50 years after its discovery, is in many ways even less known than the Mars of a century ago.

In the charts of many astronomy textbooks, Pluto is represented by a row of blanks. Its atmosphere, its surface, its density, even its size—almost nothing is certain about what is (at least for most of its unusual orbit) the solar system's most distant world. Its mean distance from the sun is nearly 40 times that of the earth, giving it an orbit so long that less than one fifth of a Plutonian year has passed since Clyde Tombaugh found the planet in 1930. Of at least one significant detail, however, the Naval Observatory astronomers are now almost certain: Pluto has a moon.

Its discovery was an accident. On June 22, James W. Christy of the observatory was examining some photographs of Pluto taken in April and May through the observatory's 1.55-meter astrometric telescope in Flagstaff, Ariz., as part of the routine task of refining data on the planet's orbital motion (even *that* is imperfectly known). On photos from two evenings, Christy noticed, Pluto seemed to be elongated, bulging out to the side by an amount far too great to be due to a mere surface bump—or even, for that matter, to a Plutonian Mt Everest or Olympus Mons.

On the premise that it could indeed be a moon, Robert S. Harrington, also of the USNO, calculated an orbital period for the bulge by measuring the times when it appeared to be pointing in different directions. Christy, meanwhile, had looked back through the observatory's files and found the same elongation in a number of photos taken with the same instrument in June of 1970 and in April and May of 1965. The proposed period matched, and was further confirmed in a series of plates taken for the purpose from June 30 to July 4 of this year. It was verified again, this time from the southern hemisphere, in observations made on July 5 by John A. Graham of the Cerro Tololo Observatory in Chile.

Harrington's calculations and the subsequent photos indicate that the presumed moon circles Pluto every 6 days, 9 hours and 17 minutes. Curiously, this is exactly the same as the rotational period of Pluto itself,



U.S. Naval Observatory

Pluto and possible moon (near top).

as calculated a few years ago from the planet's "light curve"—cyclic changes in brightness as the planet turns on its axis. The implication is that the moon is always over the same spot on the planet's surface. (It is possible that the light curve is dominated by the presence of the moon, so that Pluto's rotational period is not really being measured at all, but Harrington believes that the moon is so much fainter than Pluto that it accounts for only about half of the observed brightness change.)

The moon also offers keys to the difficult study of its host planet, although, as is usually the case with distant objects, some assumptions are required. Pluto and its moon appear from the photos to be about 20,000 kilometers apart (center to center), Harrington says, which yields (from Keplerian theory) a total mass for the two bodies. The assumption that the objects have the same surface reflectivity gives their relative size, and the assumption of equal density leads to the ratio of their masses. The absolute sizes, however, depend heavily upon what the surface reflectivity actually is, since a small, shiny body can reflect as much light as a larger, darker one. In 1976, a group of astronomers at the University of Hawaii reported the spectral detection of substantial amounts of methane ice, or frost, on Pluto's surface (SN: 4/10/76, p. 228). Prior to that time, Pluto's most-cited diameter was about 5,800 km, but the Hawaii researchers estimated that the actual figure might be less than 3,500 km, smaller even than the earth's moon. With part of Pluto's brightness reassigned to its moon, the planet looks smaller still, perhaps as little as 3,000 km, with its moon about 1,200 km across. Again assuming equal densities, the moon would then have about 5 to 10 percent of the mass of Pluto, making it by far the largest moon in the solar system in

comparison to its planet. (Earth's moon has about 1.2 percent of the earth's mass.)

Even with its newly reduced size, Pluto now appears to have a density only slightly greater than that of water, suggesting that it could be a dirty iceball or an icerock mixture incorporating some frozen gases. Whatever its true nature (some have suggested that it is not a "planet" at all, but an escaped moon of Neptune), it is likely to draw many new eyes in the future.

1978 PERSEID METEOR SHOWER

Fourteen members and associates of the Warren Astronomical Society conducted an organized watch for the Perseid Meteor Shower on the night of August 11-12. Observing was done at the Rotary International Campground, twenty nine miles north of Detroit. The team was divided into five two man squads with four persons standing by to provide relief during the five hour vigil. Lawn chairs were arranged to have two persons facing each cardinal point while two persons sat at a tabulating bench in the center. Teams rotated positions each half hour. Complete sky charts were prepared for every thirty minute interval. When an observer saw a meteor he would call out its magnitude to the nearest integer, the color and trail details. The tabulator would record that data and assign a number to sighting and log the time from the master clock. The observer would then draw the path on his chart and note the number at the end of the trail. While one team member was drawing, his companion would continue to visually patrol the assigned sky quadrant.

The observing session began at 10:30 PM EDT under skies. Transparency at the zenith was only fifth magnitude and diminished to third magnitude near the horizon. Conditions improved marginally from midnight to 2:30 AM. A cloud cover developed abruptly at 3:00 AM and the observing sessions was concluded. After retiring to the warmth and dryness of the fireside, all four team charts were reduced to a single chart for the half hour interval (See Figure One). Composite plotting allowed sporadic meteors to be sorted out from the true Perseid shower members. A total of 213 meteors were observed. Thirty three were determined to be sporadic and their rate was fairly constant, averaging 7.3 per hour.

A peak Perseid rate of 68/hour was observed at 1:45 AM (EDT). Figure Two plots the hourly rate throughout the night. The decline in both the Perseid and sporadic count rate between 11:30 PM and midnight is believed to have been caused by an undetected reduction in sky transparency. The decline between 2:00 and 3:00 AM is believed to be real as the transparency was unaltered.

The limited plotting experience of most members, resulted in a radiant pattern which could be reduced to an ellipse pattern no smaller than 150×30 , centered at 2 hrs, 18 min. Right Ascension and $+60^\circ$ Declination. This data placed the nominal origin point just north of the Double Cluster and midway between Perseus and Cassiopeia. Most meteors were observed in a ring zone $30^\circ - 60^\circ$ away from the origin point. Plotting the paths of sporadic meteors produced an unexpected and unexplained result. Thirteen of sporadics (41%) appeared to emanate from a 15° circular zone centered near Delta Cygnus. (Reference Figure 3) Analysis of all magnitude, color and trailing data failed to establish any statistically significant difference between the Perseid members and sporadic meteors.

Color data was reduced to the cumulative frequency distribution diagram seen in Figure Four. All colors ranging from blue to red were observed with white being the most prevalent. The color distribution between Perseids with and without trails was deemed to be statistically significant at the 90% confidence level. (Figure Five) Meteors with trails had more blue and yellow to orange members and fewer white members than meteors without trails. This data implies that physical differences, as well as entry velocity, influences the development of a visible trail.

Observer fatigue was tested by analyzing the distribution of brilliance data for each hour throughout the night. It was determine that the team held up quite well as their limiting magnitude data was statistically the same at 3:00 AM as it was at 11:00 PM. The effects of sky transparency are believed to account for the skewness of the brilliance distribution curve seen in Figure 6. A color/magnitude matrix, table one, refuted the expectation that dim meteors would tend to be cooler (i.e. redder) in color than bright meteorites. These data suggest that the visual color may be more related to the mass and composition of the meteor than to its kinetic energy and entry velocity.

Starting from this modest first effort, the number of the Warren Astronomical Society are looking forward to improving and refining their abilities as meteor observers.

Louis J. Faix
Activities Chairman

/st

TABLE NO. 1
COLOR - MAGNITUDE MATRIX

Color	Magnitude							
	-2	-1	0	1	2	3	4	5
Blue	-	-	-	1	4	5	2	-
Blue White	2	-	1	1	2	2	1	-
White	1	1	5	14	36	28	15	4
Yellow White	-	1	-	4	2	2	-	-
Yellow	-	1	4	1	5	9	6	-
Yellow Orange	-	-	1	5	-	-	-	-
Orange	-	-	1	2	2	3	-	-
Red	-	-	-	-	-	1	-	-
TOTAL	3	3	11	31	51	50	24	4

NOTE: These data include only Persei d meteors. Sporadic meteors are excluded.

12⁰⁰ - 12³⁰ AM (EDT) Date Aug 11-12

Observers Faix

Sector Composite

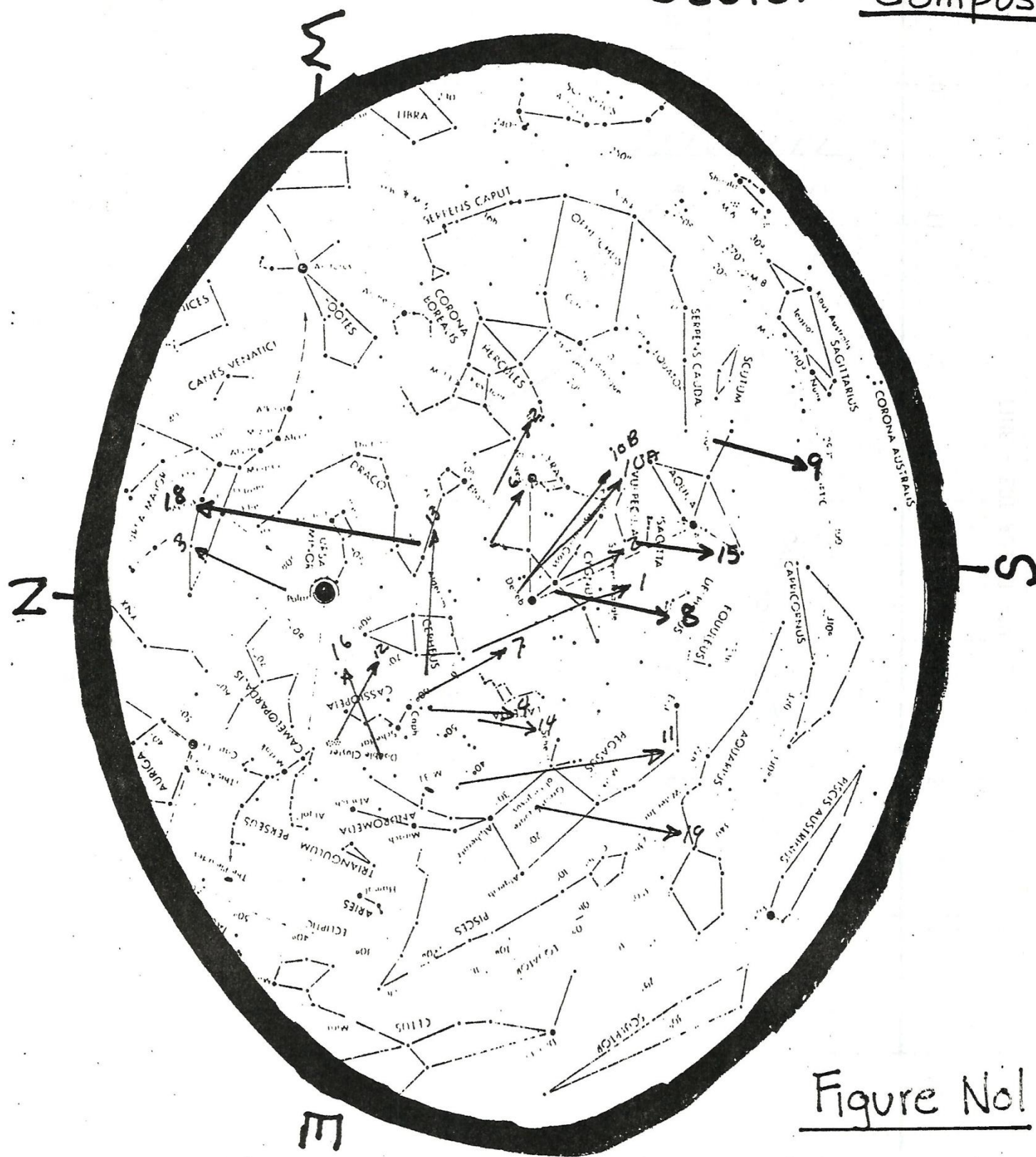


FIGURE 2
Hourly Count Rate

COUNT RATE - METEORS/HOUR

PERSEIDS

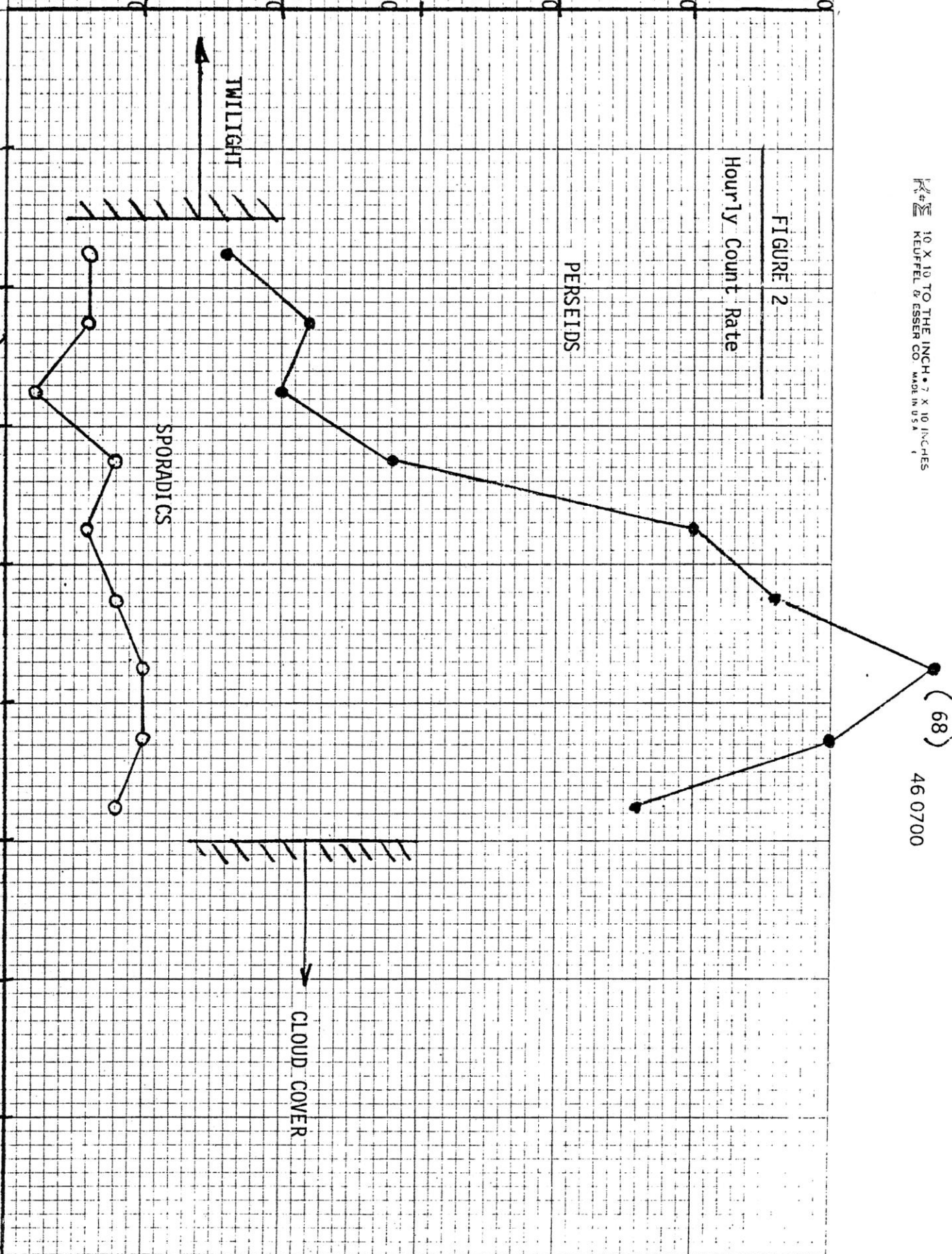
SPORADICS

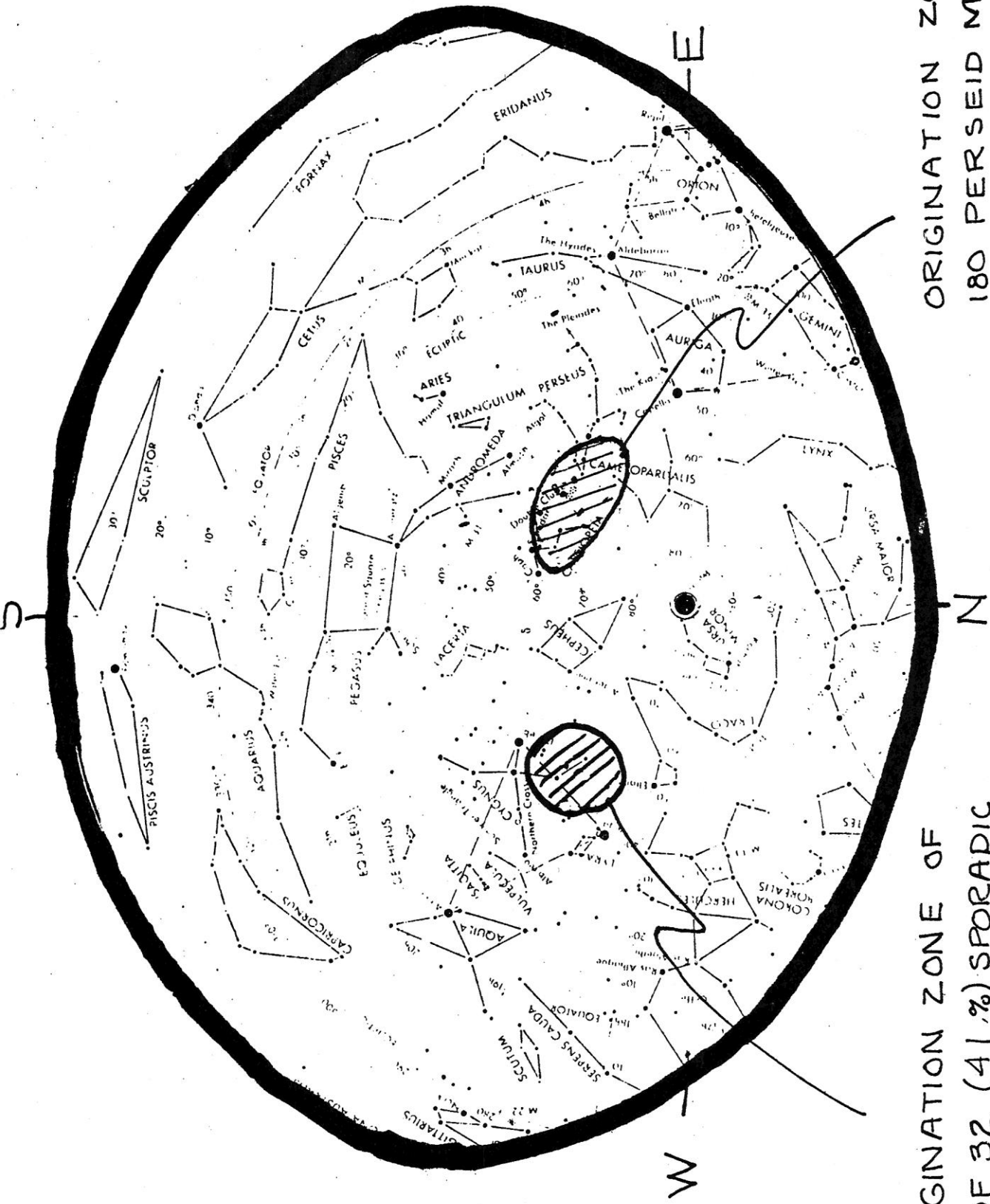
TWILIGHT

CLOUD COVER

9 PM 10 11 12 1 AM 2 3 4 5 AM

TIME - EDT AUG. 11-12





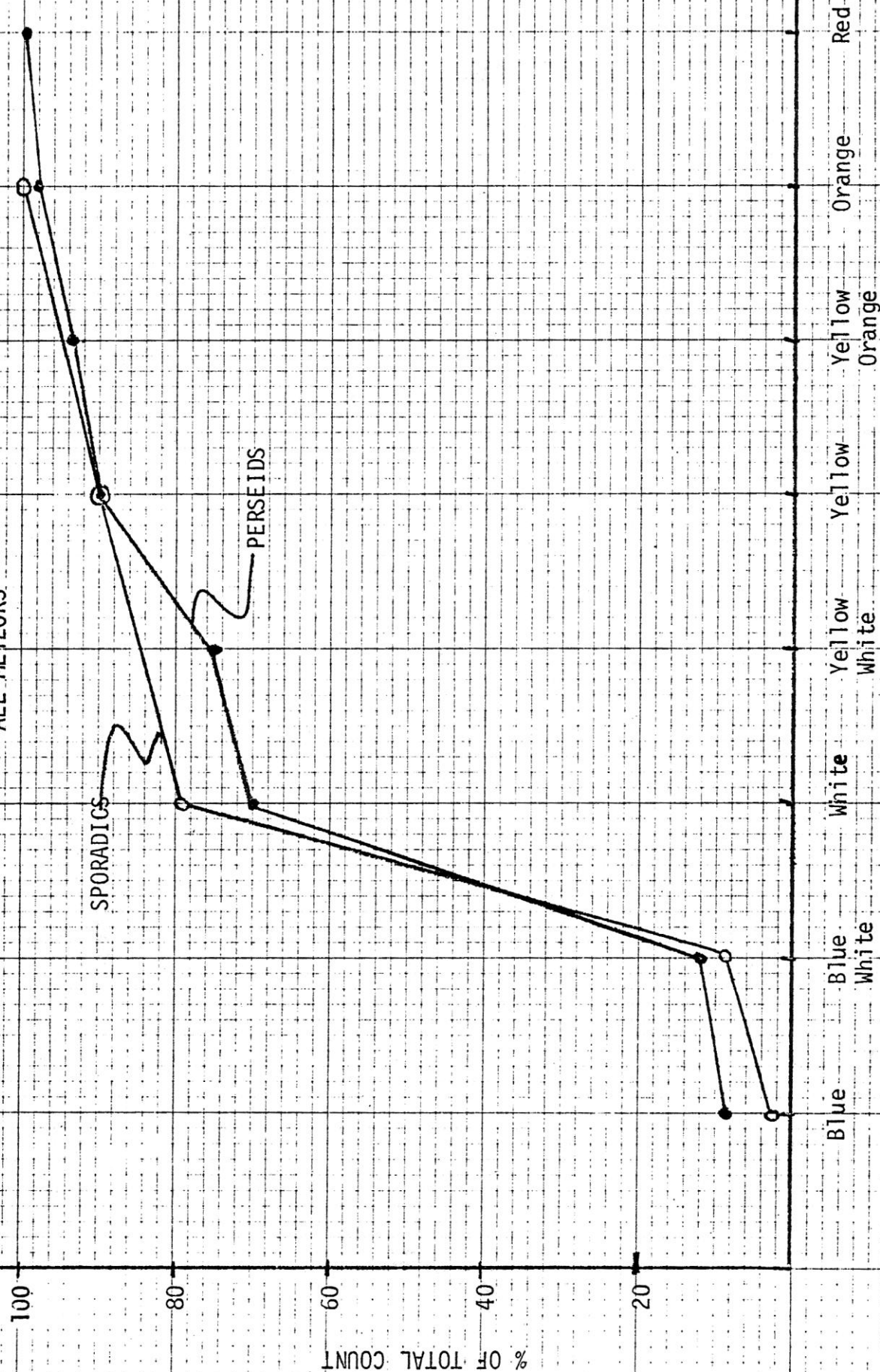
ORIGINATION ZONE OF
180 PERSEID METEORS

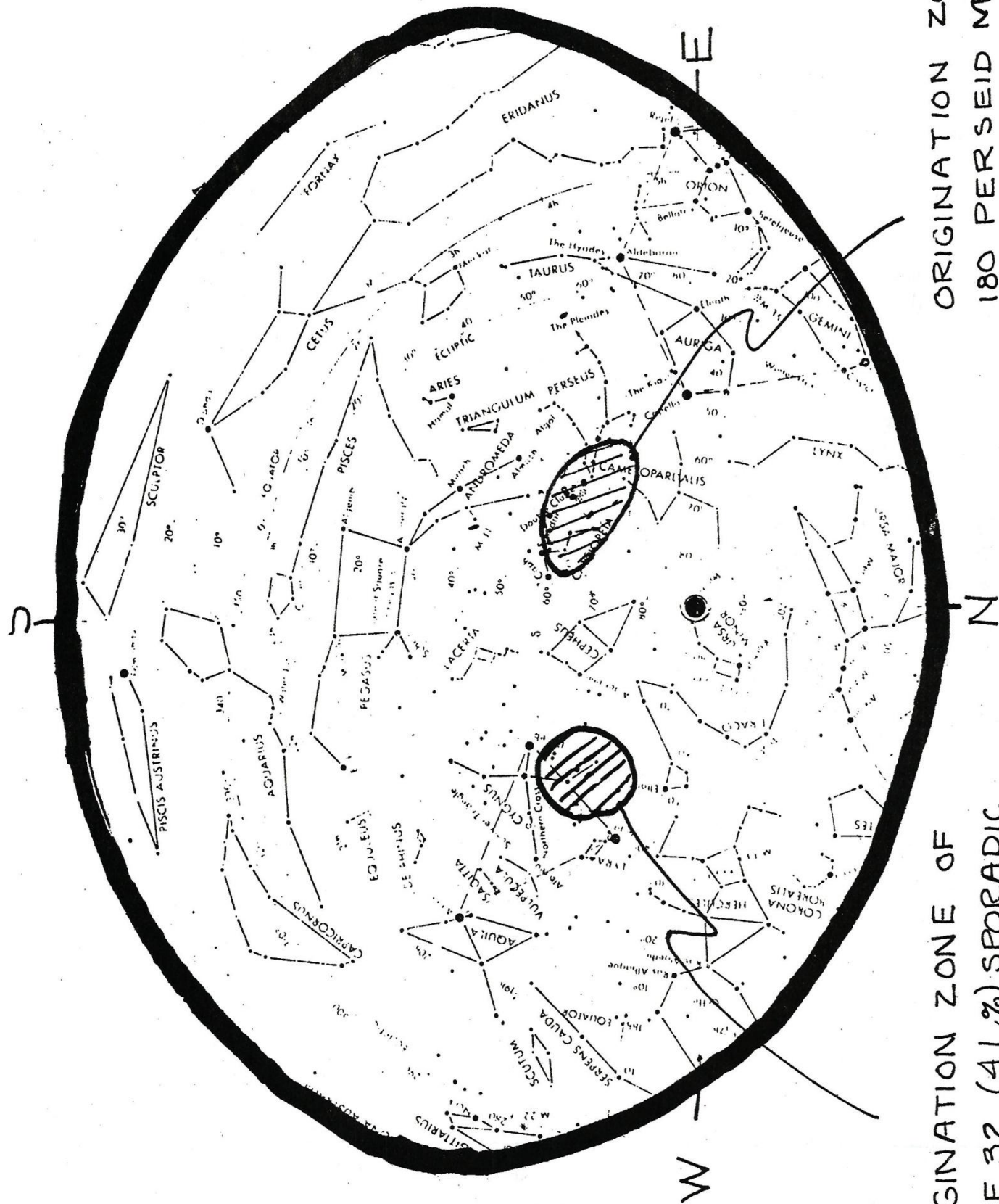
ORIGINATION ZONE OF
13 OF 32 (41%) SPORADIC
METEORS

Figure No 3

FIGURE 4

COLOR-CUMULATIVE FREQUENCY DISTRIBUTION
ALL METEORS





ORIGINATION ZONE OF
180 PERSEID METEORS

ORIGINATION ZONE OF
13 OF 32 (41%) SPORADIC
METEORS

Figure No 3

FIGURE 4

COLOR-CUMULATIVE FREQUENCY DISTRIBUTION
ALL METEORS

SPORADICS
PERSEIDS

% OF TOTAL COUNT

Blue Blue White Yellow White Yellow Orange Red

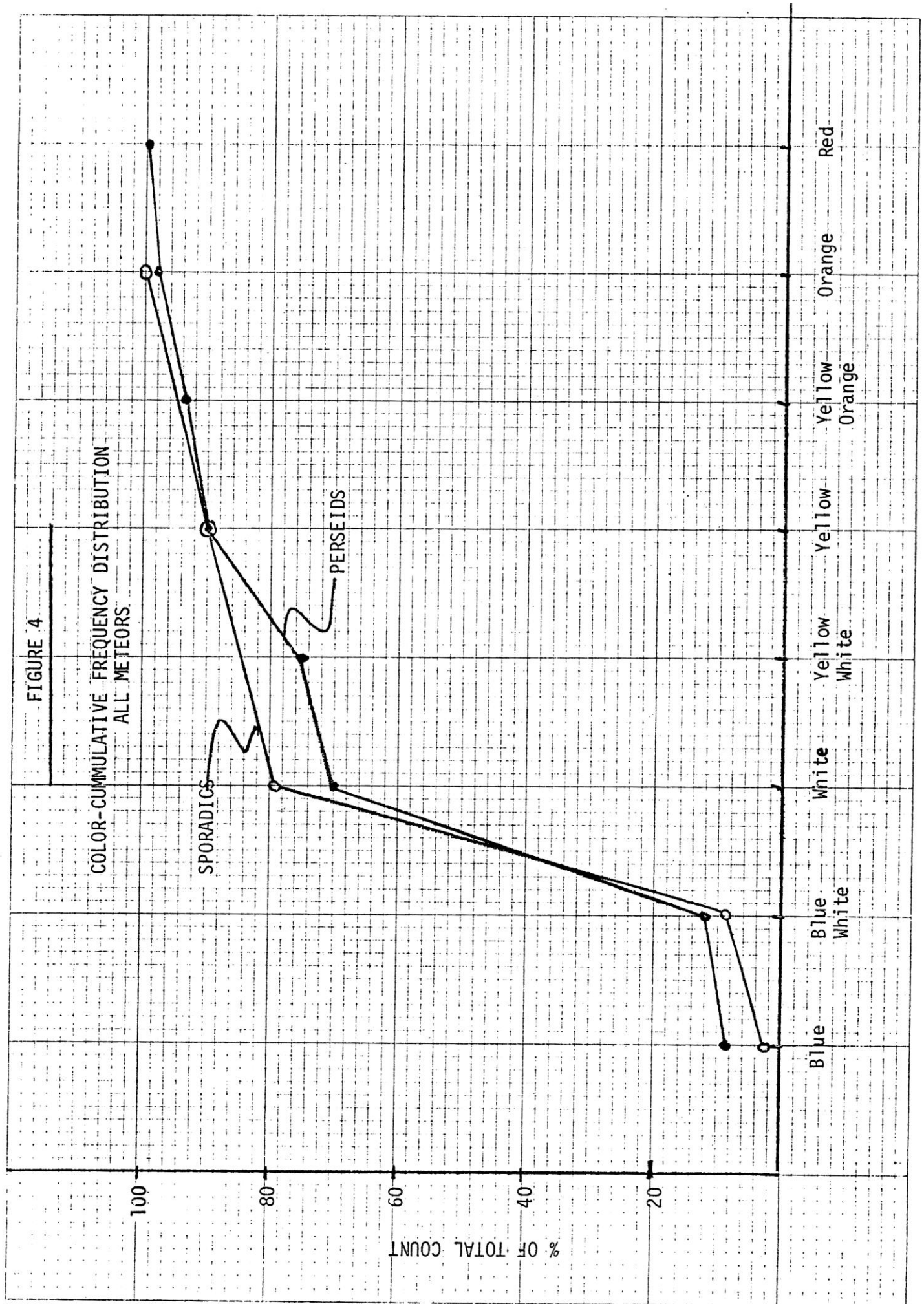


FIGURE 5

PERSEIDS
Color/Trail Analysis

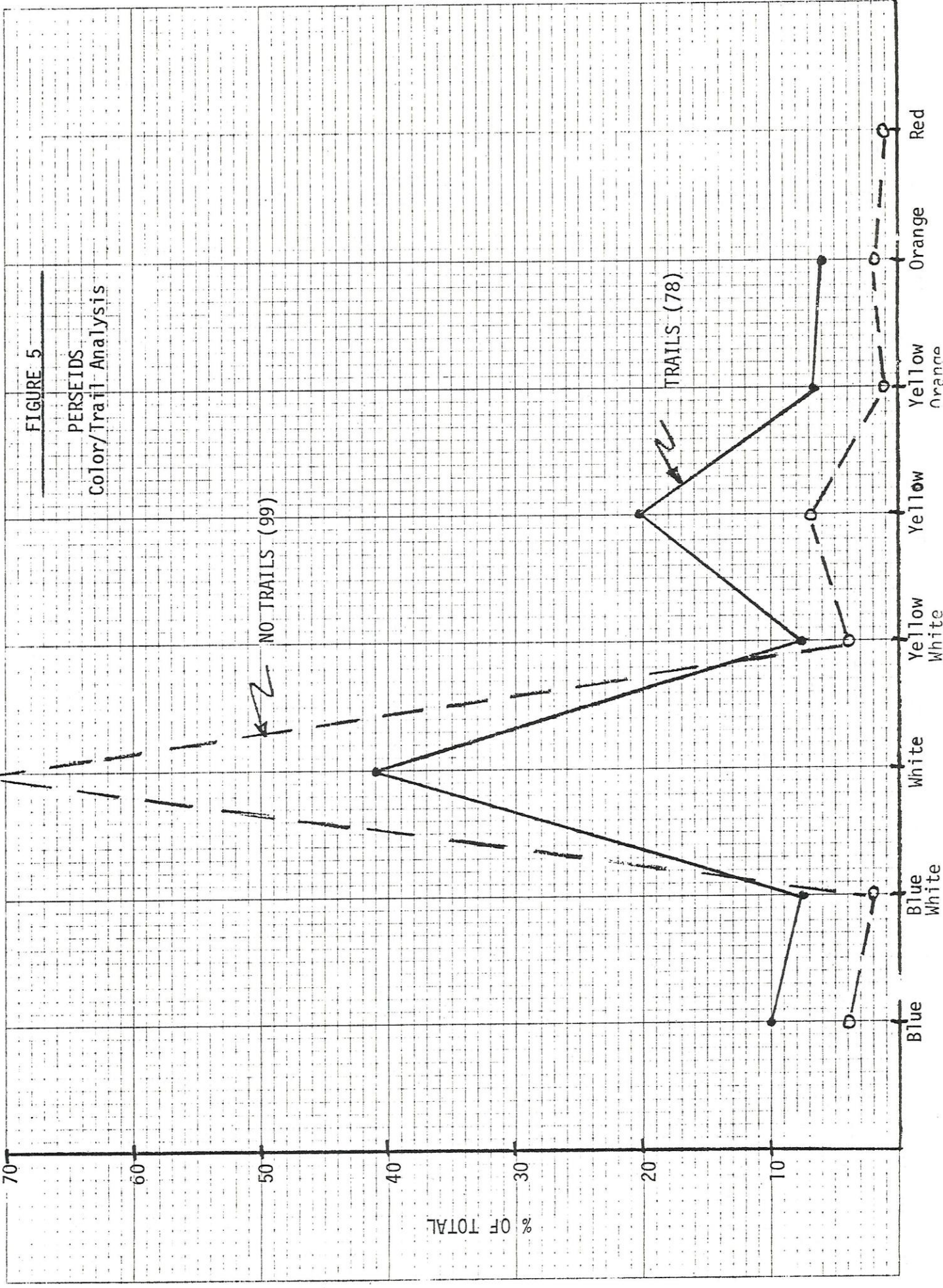
73%

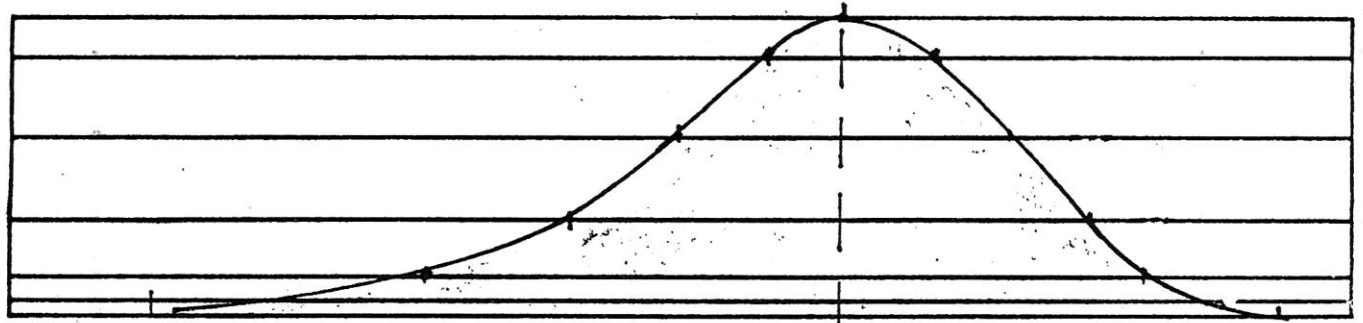
NO TRAILS (99)

TRAILS (78)

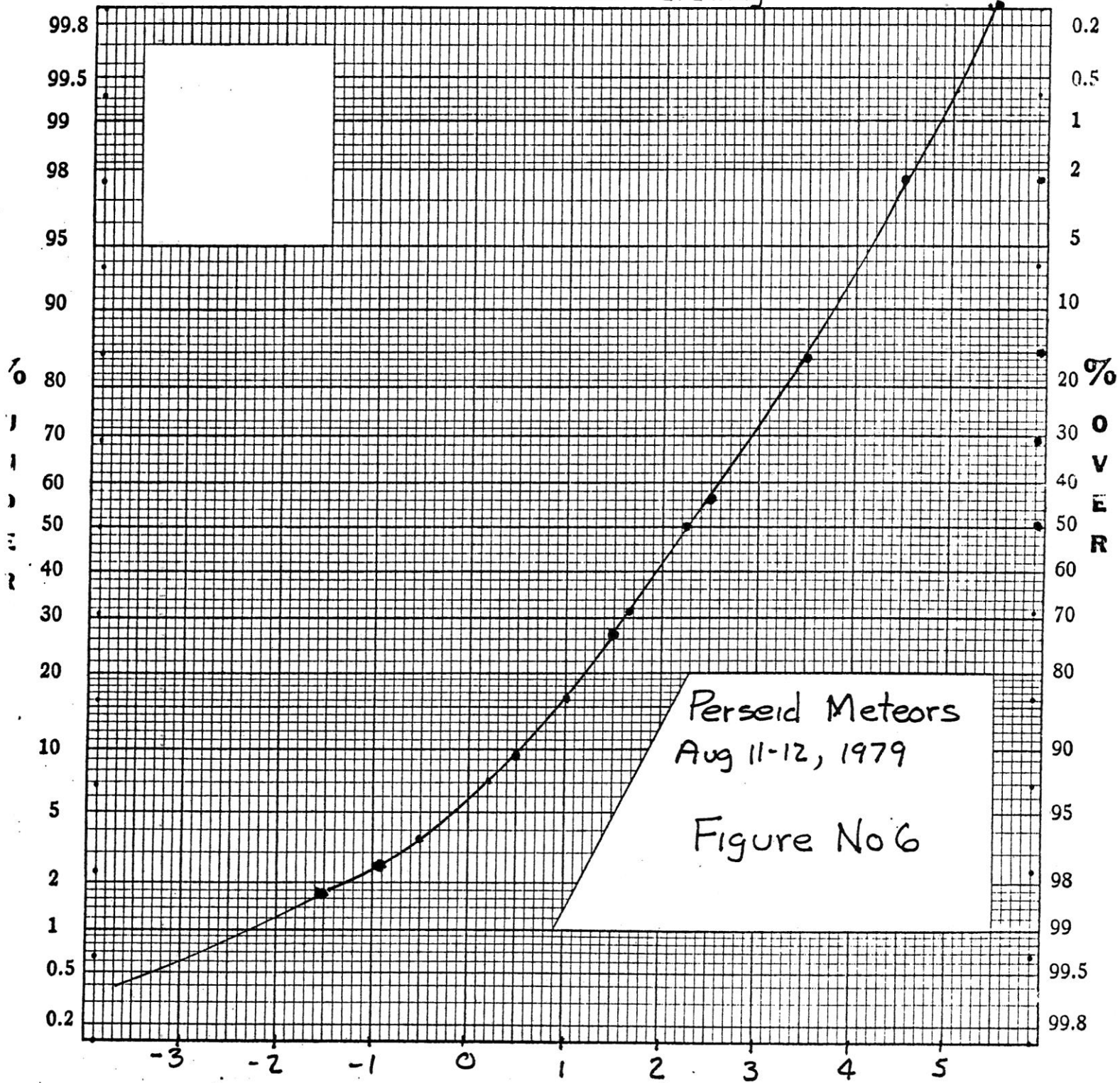
Blue Blue White Yellow White Yellow Orange Red

% OF TOTAL





Mean = 2.2 mag



The Economical ATM

by Brad Vincent

3. Pipe Mounts

Once you get your telescope assembled, it seems a bit awkward to play Columbus and aim and hold it by hand. Thank goodness for mountings. It would be a difficult hobby without them. The only problem is choosing the right type of mount and then picking among the many models available.

The grapevine and those who narrate it, say the alt-azimuth is the best bet for the beginner. When I hear that, I try to think of anyone I know who made the first telescope they ever owned! I can't think of any. Since you would be better off learning the celestial coordinates in the beginning, you might as well get used to a mount that makes it easier to follow these coordinates. The equatorial is convenient for this and easy to use even if you use the hunt-end-peck method.

Unless you plan on jumping right in at the word "GO", I would suggest holding off on getting setting circles. They are difficult to apply on a simple homemade mount and unless you take pains in the building, won't be deadly accurate. What type of pipe mount? An inexpensive one, of course. I can think of two books that give a nice assortment of pipe mounts to fit any budget. These are "All About Telescopes" by Sam Brown (\$6.50 from Edmund Scientific Co.) and "Making Your own Telescope" by Allyn J. Thompson (\$5.00 from Sky Publishing Corp.). Each gives good diagrams and tells what type of fittings to buy.

This is the hard part. Where to buy and not get ripped off. First of all, go to friends and neighbors to find out if they are doing any plumbing in the house. Old pipes work fine even if they leak, who wants a water tight mount? Contrary to popular belief, the dew around here isn't that bad. If you haven't any free sources, there are a few used pipe dealers in the area. The pipe may be dirty on the inside but a little chipping and washing should clean it up. Very few cases require blasting. The fancy folk who want their mount to last until they get a better one (?) may want to use new pipe. People like things better if it looks new should you decide to sell it.

I went to Warren Pipe and Supply Co. on Hoover below Stephens. My bill came to slightly over \$40.00 for 1½" fittings and cut and threaded pipe. My design can't be found in the books mentioned above since I designed it myself to use less parts and save money. However, I used heavy pipe to be sure it was steady. I suggest 1½" for a six inch and 2" for an eight inch scope to be on the safe side. You needn't be classy and get galvanized pipe, it's expensive. Just get black pipe and give it a coat of a nice color Rust-Oleum to keep it from rusting out. Unless you have access to bearings, I recommend a simple pipe thread joint. Lap the fittings with lapping compound or a fine grade of grinding compound left over from mirror grinding. Then

clean the threads completely and apply a fine oil or silicon lubricant. They work smoothly and the parts are already there. Nothing else to buy.

To attach the tube to the mount, there are a few alternatives. Some prefer a metal saddle to a wooden one since the dew can cause the wood to swell and crack. Not if it's waterproofed! If you've got any shellac left from treating the tube (if cardboard) or waterproofing the top of the grinding stand, use that. Better yet, let's assume you made your mirror and for some reason decided it would be your last. (Who said that??) Take the wooden top off the barrel, if you used one, and cut it to size for the saddle. It is already waterproofed from its original use. Use a good size wood screw to attach it to the flange on top of the mount.

To strap the tube on the saddle; steel bands, rubber straps, or elastic tie downs for closing a trunk can be used. Adjust the size as needed and attach the ends to eye hooks, clips or what-have-you. A few wedges placed at the ends of the saddle will assure you that the tube won't roll all over the place. After assembly, give it a coat of shellac to seal all openings caused by joints, screws or whatever.

By recycling the parts left over by mirror grinding and getting common items for a mounting, substantial savings can be realized. One thing about homemade pipe mounts, unless you use fancy bearings or want to lock the scope in one place, you haven't any thumb screws or allen wrenches lying about to worry about losing.

Next month: *

* Due to recent full-time employment, all but a small portion of my time can be devoted to my telescope project. The estimated time of completion has been set way in the future for the moment. Therefore I have to call it quits until I make some more economical discoveries. But fear not, when anything comes up, I'll let you know through this publication. I hope the articles I've written so far have been of some service to my fellow economical ATM's.