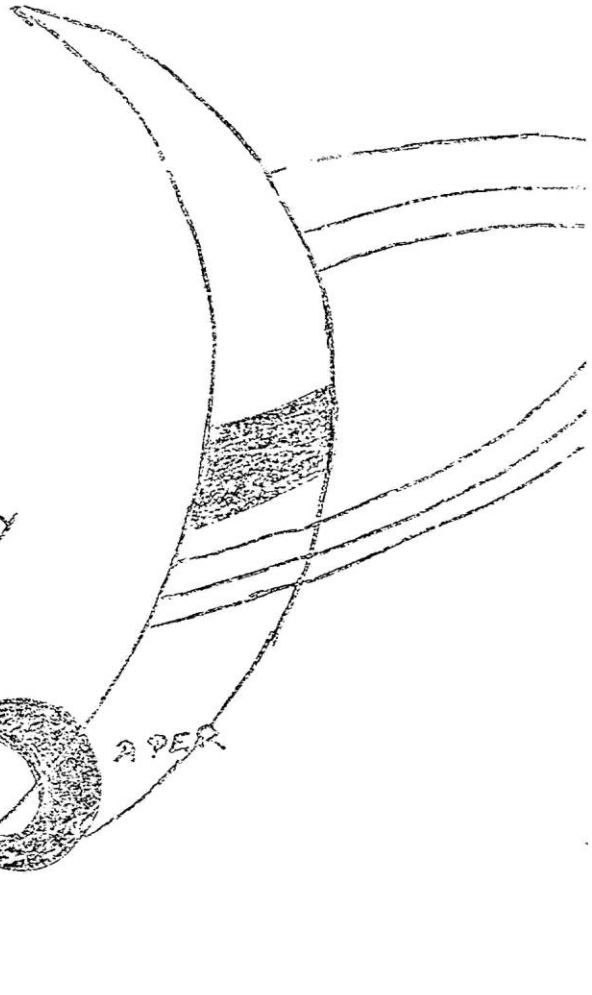
Dec 1697

The WARREN ASTRONOMICAL SOCIETY PAPER



1970

New Moon
First Quarter
Full Moon
Last Quarter

JANUARY

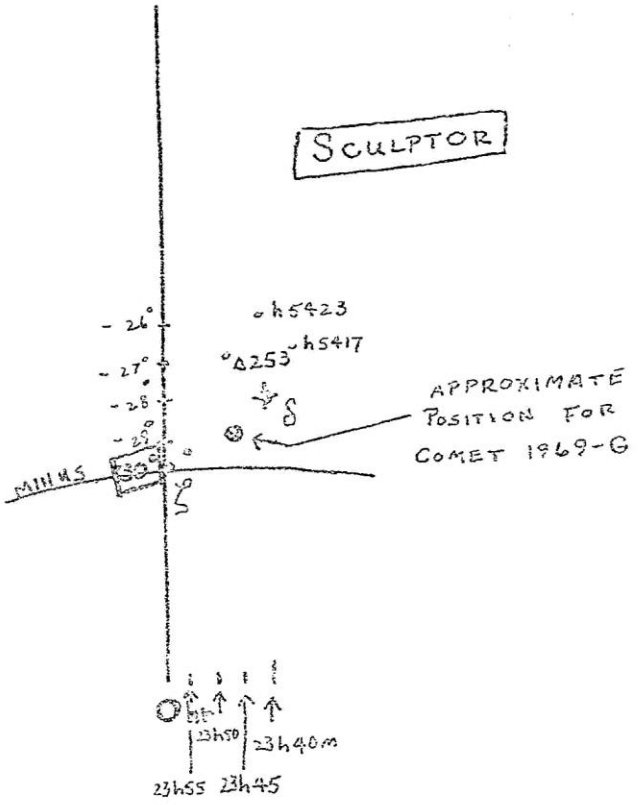
1970

SUN	MON	TUE	WED	THUR	FRI	SAT
1970 JANUARY Made in U.S.A.		DECEMBER 1969 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31	FEBRUARY 1970 S M T W T F S 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28	**1** Earth reaches Perihelion 91,000,000 miles from sun New Year's Day	**2**	**3** Quadrantid Meteor Shower
4 Quadrantid Meteor Shower	**5** Quadrantid Meteor Shower	**6**	**7** (M) N.M. MESSIER STUDY GROUP	**8** Moon at Perigee 5 am 221,463 miles from earth	**9**	**10**
11	**12** Mars Moves from Aquarius to Pisces this month and is 1° south of crescent moon	**13** Mercury Reaches inferior conjunction 62,000,000 mi. from Earth	**14** (A) F.Q. ASTROPHOTOGRAPHY AND PRESENTATIONS	**15** Saturn Lies in the Pisces, Centus & Aries regions & is about 7° south of the First Quarter Moon	**16**	**17** Cygnid Meteor Shower
18 Comet (1969g) (See below)	**19**	**20**	**21** (S) SOLAR OBSERVING -RADIO TELE. -SPECTROHELIO-GRAPH	**22** (O) F.M. OPTICS AND TELESCOPE MAKING Moon at Apogee 3p m. 252,710 miles	**23**	**24** Venus At Superior Conjunction 139,000,000 miles from Earth
25	**26**	**27**	**28** (G) W.A.S. GENERAL MEETING	**29**	**30** L.Q.	**31**

A - Astrophoto & Presentations - Larry Kalinowski 776-9720 or Dave Ther 777-1857
M - Messier Study Group - Frank McCullough 772-2011
O - Optics & Telescopes - Gerald Alyea SI4-2134
S - Solar Observing - Jim Trombly PR2-5635 or Gene Francis 751-2836

Comet (1969g) Tago-Sato-Kosaka Approx. Jan. 18, 23h46m, -28°.8, 3.0; Jan. 20, 0h12m, -20°.9, 3.2; Jan. 22, 0h35m, -12°.6, 3.3; Jan. 24, 0h55m, -4°.6, 3.6; Jan. 26, 1h13m, +2°.8, 3.9; Jan. 28, 1h29m, +9°.2, 4.2; Jan. 30, 1h43m, +14°.7, 4.5

Figure 1 FOR JANUARY 18TH 1970



STAR MAGNITUDES FOR FIGURE 1

ζ - STAR(A) MAGNITUDE 5 STAR(B) MAG. 6 OR UNDER

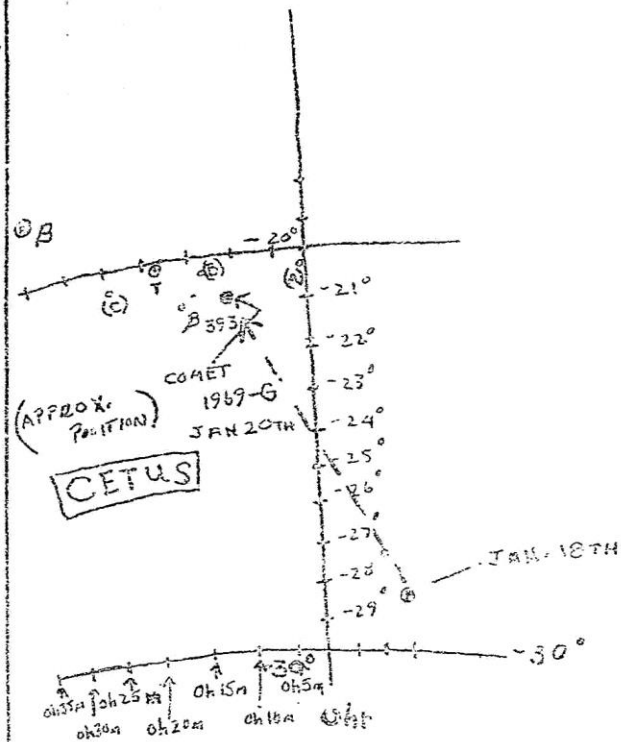
δ - MAG. 4.5

Δ253 - MAG. 6 OR LESS

h5417 - MAG. 6 OR LESS

h5423 - MAG. 6 OR LESS

Figure 2 FOR JANUARY 20TH 1970



STAR MAGNITUDES FOR FIGURE 2

(A) - MAG. 6 OR LESS

(B) - MAG 6 OR LESS

B 393 - MAG 6 OR LESS

T - VARIABLE STAR

(C) - MAG. 6 OR LESS

β - MAG. 2.5

MOVEMENT IN 2 DAYS FOR 1969-G

APPROX - 26 minutes EAST AND 27.9 DEGREES NORTH

COMET TAGO-SATO-KOSAKA

(1969-G)

FRANK McCULLOUGH

INTRODUCTION TO ASTROPHOTGRAPHY

By

Larry Kalinowski

PART II – F RATIOS AND SHUTTER SPEEDS

One of the most familiar terms used by the telescope builder is the phrase “F Ratio”. We all know that the F ratio of a telescope can be found by dividing your objective diameter into yur objective’s focal length. Most telescopes are usually around F8.

In photography, the term “F Stop” means the very same thing. However in the case of a camera, you have a choice of a number of F ratios. A sliding ring on the lens barrel has the ratios inscribed on it. You can pick the ratio needed by moving the proper ratio in front of an index. This ability to change values is accomplished by an ingenious device called a diaphragm. If you can imagine a round piece of cardboard that has a hole in the center capable of changing size, it will be easy to see how the diaphragm accomplishes its task.

The diaphragm on most cameras is mounted between the elements of the lens system. If there is only one lens, it is usually mounted behind. Generally, a lens system cannot change its focal length. The only way to change the F ratio of a lens, and do it as easily as possible, is to change its diameter. This is the job of the diaphragm. The size of the hole in the center of the diaphragm will determine how much of the lens is going to be used to produce the image. In effect we are changing the lens diameter simply by not using the outer most portion of it.

This is how the modern camera adjusts to the wide range of film available on the market. High ASA films need less light to record an image. So we adjust our diaphragm to produce a smaller lens opening. It’s easy to see that under low light conditions the diaphragm can be opened to its fullest extent, letting in as much light as possible, eliminating the need for flash.

The F ratios on many cameras can range from 1.4 through 22. The graduations running 1.4, 2, 2.8, 4, 5.6, 8, 11, 16, and 22. It is important to realize that each successive number will either let in twice as much light as the last, or half as much, depending on which direction you are moving through the F ratios.

You probably notice a drawback already. The diaphragm will let light through and since it’s set in one position for each picture, it has no way of stopping the light. This is where the shutter comes in.

The shutter can take more than one form. In less expensive cameras it is simply a thin blade mounted behind the lens diaphragm which moves out of the way for a split second. In the more expensive, it takes the form of a curtain, either cloth or metal, and sits in front of the film at the back of the camera. It too, moves away, or to the side, letting the film become exposed to oncoming light for a fraction of a second. The latter type is the one usually preferred by most photographers. Still another type resembles the lens diaphragm, but is capable of closing completely. It too is capable of opening and closing at split second rates.

On the better cameras you can dial your choice of shutter speeds. Shutter speeds also double or halve the oncoming light depending on which way you are moving through the range. Typical settings arc given here in seconds: 1, ½, ¼, 1/8, 1/15, 1/30, 1/60, 1/125, 1/250, 1/500, and 1/1000. The last shutter speed being capable of stopping or freezing the action of most moving objects.

How do we know which combination of shutter speed and F ratio to use? This is where the light meter comes in. It has the capability of measuring the amount of light falling on a subject. Quick examination of the device will show the user all the possible combinations of F ratio and shutter speeds to use in order to get your picture.

(Cont. next page)

We now have some idea how the camera functions mechanically, and what three variables, ASA, shutter speed, and F ratio, must be understood to produce a quality photograph.

Astrophotography goes one step further. It is really the teaming up of two instruments, the camera and telescope, to produce a superfine device capable of recording the tiny images we find in the skies. That is, tiny because of their extremely long distances. The three variables mentioned will change with the addition of a telescope to our photographic camera. How they change and why will be discussed in future issues.

In the next article we'll take a look at the prime focus method of though-the-telescope photography. ****

An interloper in the evening skies of January will make its appearance in the northern Hemisphere on Jan. 6. Comet Tago-Sato-Kosaka-1969-G is now visible in the Southern Hemisphere and will be readily visible in the Northern Hemisphere on Jan. 10, reaching best viewing on the night of Jan. 15, in the south. According to Richard Norton, curator of the University of Nevada's planetarium, "It will be seen about two hrs after the sun sets, and will continue to set later and later; so that by the end of January, it will be visible about, four hrs. after sunset." Comet 1969-G will have a short tail and a bright head and should be easily visible to the naked eye.

Even though the comet may be a naked eye object, for best viewing conditions a trip to Stoney Creek Park, Bald Mountain Camp-grounds, or Camp Rotary with the appropriate equipment "wide-field" binoculars (or RFT) would make the sight all the more enjoyable.

* * *

According to Rendezvous Magazine, published by Bell Aerosystems Company, there are at least ten natural satellites orbiting Earth with diameters over 100 ft. They may be remnants of a larger object which broke up in late 1955 period. By plotting backwards in time the orbits of these objects, it has been discovered that they were all in the same location on Dec. 10, 1955. The presence of such an object raises some interesting questions about its nature. Where did it originate? Is it only one of a number of similar objects nearly all of which had long ago disintegrated? And what caused the avalanche of events which must certainly have occurred to prompt the disintegration of such a massive object?

* * *

FLASH .. In July; America landed the first human being on another celestial body.

* * *

By GENE FRANCIS

USEFUL BOOKS ON ASTRONOMY FOR THE AMATEUR --- PART II

By David T. Ther

A star atlas provides the amateur with a means of readily locating any object in the sky. In addition to being able to locate objects, the amateur should have some sort of catalog or guidebook of the objects most readily and easily observable. Most amateurs consult the Messier Catalog as it contains nearly every easily observable object in the sky. Messier discovered all of these objects with telescopes no more efficient than a modern 4" refractor. Included with this issue of the WASP is a reproduction of the Messier Catalog as presented by Sky Publishing Corp. (the original, on an 11" x 8" card sells for 35¢) shows which objects are well placed at a given time. The reverse side lists the objects along with all the information necessary for determining what to expect to see.

Obviously the Messier Catalog contains only a small fraction of the objects worthy of amateur observation. Omitted are doubles, variables, and many of the brighter deep-sky objects. Recently published is a booklet listing all of these objects—"Beobachtungs-Objects für Vier- und Sechszöller" by Georg Henneges. Listing nearly of the objects of "Atlas Coeli", this booklet is unique in that the objects are listed in order of increasing right ascension. Ten columns of data are given, and much information is conveyed through the use of an elaborate key. Although 2346 objects are listed, the booklet is pocketsize and only ½" thick. Available from Germany, the price is 9.40DM ($2.35).

The most complete observing guide of all is Robert Burnham Jr.'s "Celestial Handbook". The handbook is published serially, and four of the eight proposed sections are now in print. Each section is about 250 pages, being published in a loose-leaf format for future additions and photographs. The sky is covered by constellations, arranged in alphabetical order. For each constellation are extensive lists of doubles, variables, nebulae and clusters. Following the lists of objects (which give excellent descriptions through the complex key) are written descriptions and photographs of all outstanding objects.

"Celestial Handbook" cannot be recommended for the average observer, because it is an expensive and very extensive reference book as well as an observing guide. Observers with telescopes smaller than 8" would not be able to use the Handbook to a great extent. For example, galaxies and nebulae are listed which are fainter than 12th magnitude and are difficult to observe, even in a 12" instrument. However, even those who do little observing might enjoy the Handbook's hundreds of photographs and descriptive notes.

The "Celestial Handbook" is available for $3.25 per section from R. Burnham Jr. at Celestial Handbook Publications, P.O. Box 614, Flagstaff, Arizona, 86001.