
Merry Christmas &
Happy New Year
from The Wasp

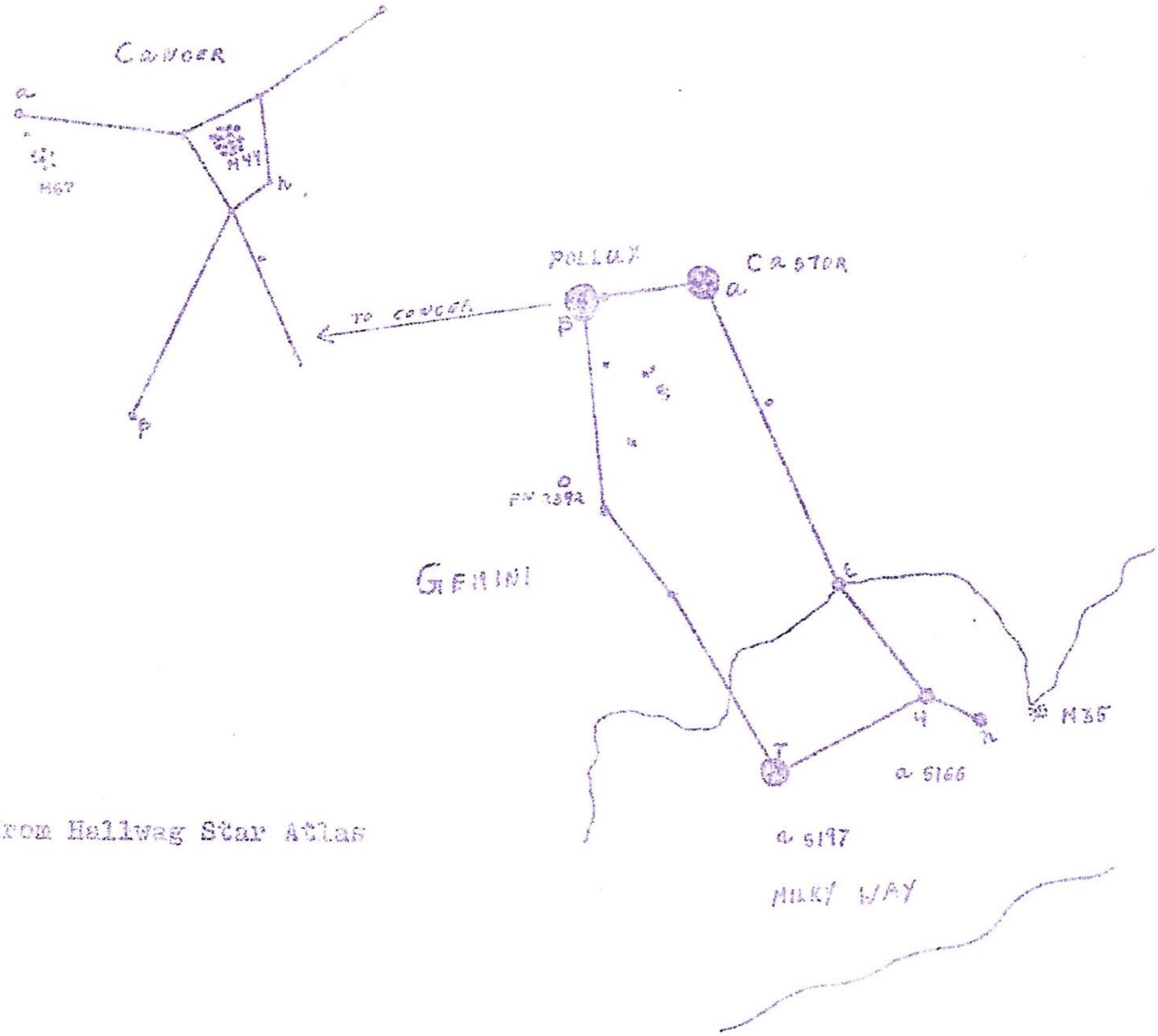
GEMINI: THE ZODIACAL WONDER

By Tim Skonieczny

Gemini is the first constellation that I've mentioned that lies in the Zodiac. As a result, it is susceptible to occultations and planetary passings. The Milky Way runs a path through Gemini, but leaves it with only a one Messier object. M35, a 6^{th} magnitude star cluster, is well worth trying for because it lies just at the naked eye limit, making it an easy object. Its beauty adds to its interest.

PN 1292 is an 8.3 magnitude planetary that is considerably smaller than the Ring Nebula. It has an unusually bright central star of the 10.5 magnitude. The central star is thus visible with a small refractor, although it might be lost in its filmy disk. A 5197 is a tight double of magnitude 2.0 and 2.8 that can be easily be resolved in a 3" telescope. The period of Castor is 477 years, so don't worry about the two stars becoming too close to resolve.

An inconspicuous but famous constellation next to Gemini is Cancer. I usually associate Gemini with cancer because Castor and Pollux point to cancer as if they were both the same constellation. Cancer is quite difficult to distinguish with the naked eye, but it does contain an extremely bright star cluster of the 4th magnitude, the Beehive or Praesepe cluster. This naked eye cluster carries the Messier number 44 and is extremely beautiful and very open. Cancer contains an additional Messier object, M67 is a 7th magnitude open cluster that is not especially unique.



*Taken from Hallwag Star Atlas

LETTER from the EDITOR:

Dear Readers:

I have been tossing a thought back and forth in my mind for quite some time.

Officially, I don't think the observatory has been named. I do not write this to be heckled at or make it as if it were a joke on my part.

Let us think for a moment. Who has put the time, labor, and most of all, money into this structure, of which we are proud, and further, proud for it to bear the identification to this club?

There are quite a few of us who feel a part of it, because we have either painted, nailed, welded, or did something to contribute to our monument, and we feel proud to have done so. Yet you know and I know there were certain people who have labored, scratched and scrounged, and made all this possible. There are a couple of people who committed to the additional problems of the dome. Now I am throwing aside our trivial contributions (yet helpful) to magnify the nucleus, the generator, the muscle of the whole system.

As you read, I hope certain people are coming into your mind. This though I have been pondering did not occur just over night. People have said we must chip in and give back money somehow, some way. These people are absolutely correct! BUT, I'm afraid this may take time. How can we repay three individuals whom I have been thinking of? We own one thing that is priceless to us. The OBSERVATORY! What happens to great astronomers who have contributed a great deal to astronomy? Some have observatories named after them, right!?! (Percival Lowell)

There are three fine gentlemen whose named I am going to mention. These people are Mr. Gerald Alyea, Mr. Richard Polus, and Mr. Larry Kalinowski. These we all know would practically break their backs to do a favor for us. If anyone does not know what they have done to deserve such recognition, please feel free to consult me, so myself and a few other people can do the best job we can in convincing you.

I have given you the run around long enough, it is time to give you my idea, if you have not guessed it all ready. Why not name the observatory after these three people? We could use the first initial of each of their last names. Our observatory could be named K.A.P. Observatory in their honor, or KAP Observatory, whichever looks better.

I write this only because I feel I can express myself much better than orally. Also I feel people can search and study their minds much better during or after they read something written by someone who is very sincere about this and not seeking the cornball award, or any recognition of being a thoughtful person. Most of the time I say what I feel, by reading some of my articles you should know that. I also write this to give the reader time to think about it and not to make a hasty decision at a club meeting where a group can be swayed for or against an idea like this.

I only ask that you consider it and hopefully we can reach a decision at the next meeting.

Thank you for listening,
Frank McCullough

REFLECTOR vs. REFRACTOR by Richard Hollifield

A refractor is a telescope which has a lens for its objective, while a reflector has a mirror, often called a primary, as there are usually one or more secondary mirrors. The lens in a refractor bends the light rays to form as image, whereas in the reflector they are formed by the curved surface of the mirror for the same purpose. My intention here is not to explain how the images are formed, since this has no bearing on the relative merits, but to consider the advantages and disadvantages of the two types.

Some of the features of a good astronomical telescope are (not in order):

1. Definition
2. Achromatism
3. Magnifying power
4. Light-gathering power
5. Resolving power
6. Size of image (usable field)
7. Flatness of field
8. Versatility
9. Economy and ease of construction
10. Convenience of handing and upkeep

This list is not complete, nor does it apply in every case, since for some particular purpose, many of these features may not be important. However, let us compare the average reflector and refractor according to these requirements.

1. Definition. The refractor is definitely superior in this aspect. A lens can be corrected to almost any desired degree (theoretically) for all the six primary (chromatic and spherical aberration, coma. distortion, astigmatism, and flatness of field) and many of the higher aberrations. The usual astronomical refractor has a lens of two components, comprising four surfaces, and we must accept the aberrations as they come. Each of the reflector types, Newtonian, Cassegrainian, and so forth, has its own degree of corrections for the various aberrations, beyond which no further correction

can be made. In certain cases, correcting lenses are placed in the optical system to correct for some aberrations, particularly coma, with which the reflector is especially afflicted.

Generally, refractors are more thoroughly corrected for aberrations than reflectors, with two exceptions: first the reflector is completely free from chromatic aberration, because the law of reflection is independent of the wavelength of light (but the law of refraction is not).

Second the parabolic mirror is completely free of all aberration on the optical axis. But this second point can be true for only a single geometric point that is for one star.

Obviously, any aberration reduces the quality of the image. Further, the reflector is subject to loss in definition because the blocking of light by the secondary, and because of diffraction from the legs of the secondary support.

Therefore, if excellent definition is the essential quality of a telescope, the choice of the refractor is indicated.

2. Achromatism is freedom from chromatic aberration, and here, as stated above, the reflector is superior, being completely free of this because of its operating principle. For spectroscopy, and any work involving the quantitative or qualitative analysis of light, the reflector is definitely superior.

3.-4.-5. Magnifying power depends upon the focal length, light gathering power, upon the area of the objective, and resolving power, upon the diameter of the objective. Theoretically, there is no choice between the two types for any of these factors. But in practice certain restrictions are present. Lenses can be only so big (forty inches is the largest considered practicable) because too large disks cannot be supported around the edges and still retain their shape. Therefore, telescopes of large size must be reflectors.

Magnifying power is the ratio of the focal lengths of objective and eyepiece. But the highest practicable magnifying power for a given telescope is dependent upon the resolving power of the telescope and the quality of the image (definition). The quality of the refractor image is slightly better, so it’s usually possible to use a greater magnifying power than in a reflector of comparable optical dimensions.

6. Size of image. Except for certain special types of work, it is usually desirable to have a large field of good definition. This is especially true in mapping the sky and star counting/ Here the refractor is immeasurably superior. The usable field of a reflector is limited both by the oblique aberrations and by the necessarily small size of the secondary mirror.

7. Flatness of field. Since much of modern astronomical work is photographic, flatness of field (that is of image surface) is imperative. Only the refractor can have a flat field over any relatively large area.

8. Versatility. Here the reflector comes into its own. Nearly all large telescopes can be converted to one form of reflector or another if provided for in the original design of the telescope. This cannot be done with a refractor.

9. Economy and ease of construction. Cost is usually not a prohibitive problem for an observatory instrument, but it is definitely a problem for us amateurs. Although the tube and mounting for a very small refractor would probably cost less than for a reflector of the same size, diameter for diameter

the refractor is a much longer instrument, as refractors are usually made with a focal ratio of f/15, whereas reflectors are f/8 or shorter. And the cost of the optical glass alone would make the refractor more expensive.

10. Convenience of handling and upkeep. Because of its shorter focal length, and because, in such forms as Cassegrainian, the tube is shorter than the focal length, the reflector is much easier to handle than a refractor of the same aperture. A twelve inch reflector may be carried in an automobile, but a twelve inch refractor is an enormous instrument requiring a twenty-foot dome to house it.

A mirror, being unprotected, requires more upkeep than a lens. It must be resurfaced from time to time, and frequently cleaned, when care must be taken to see that it is not scratched or damaged.

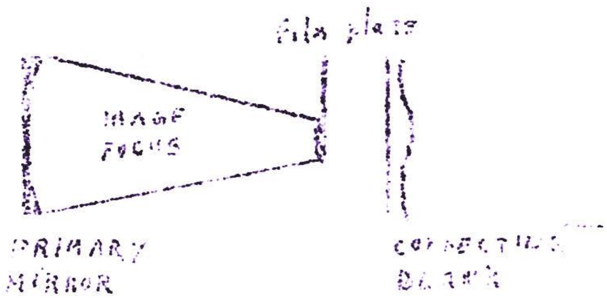
Certain types of telescopes have been designed that are neither refractors nor reflectors, but is a combination of the two, such as the Schmidt camera and Maksutov telescope. But the limitation on size of plate still holds true for these scopes. The field of the Schmidt is so curved that the photographic plate must be curved to make up of this.

Evidently, there is no answer to the question, which is better, refractor or reflector? Unless it be, well, that depends on whether …

TELESCOPES – PART TWO
By – T.D.S.

The catadioptric telescope can be built in many more ways than the Maksutov. One interesting type of catadioptric telescope is the Schmidt telescope. The only purpose this telescope has is strictly wide-field photography. In fact, the field can be so wide that it will easily fit Sagittarius and Scorpius all on the same photographic plate.

A Schmidt telescope is quite similar to the Maksutov in that the primary mirror is spherical and that it has a correcting plate. There are, however, 2 major variations. One is that the correcting plate is flat except the exterior side which has a deep convex curve at the center surrounded by a concave ring. The Schmidt telescope has no secondary mirror, but instead a plate holder. This film plate is located at the focal point of the telescope but must be convex pointing toward the mirror. This is a major difficulty concerning film shape for it must be round.



Schmidt
Telescope &
Labels

The Schmidt is not extremely easy to make, but the results are unbelievable. A 5” f/2 Schmidt telescope will vary easily show the Horsehead Nebula on a 15 minute exposure. Other faint nebula, difficult even with the largest amateur telescopes, show up very easily with short exposures. But, unfortunately, they are quite small owing to the low magnification of the telescope.

> “The constellation of O’Ryan ignorantly and
> falsely spelled Orion”
>
> Subtitle of poem
> Irish Astronomy

> “Astronomy compels the soul to look upwards
> and leads us from this world to another”
>
> Ibid. Book VII, S29

> “Still searching, like poor old astronomers
> who totter off to bed and to sleep
> To dream of untriangulated stars”
>
> Octaves XI

JANUARY SKY WONDERS

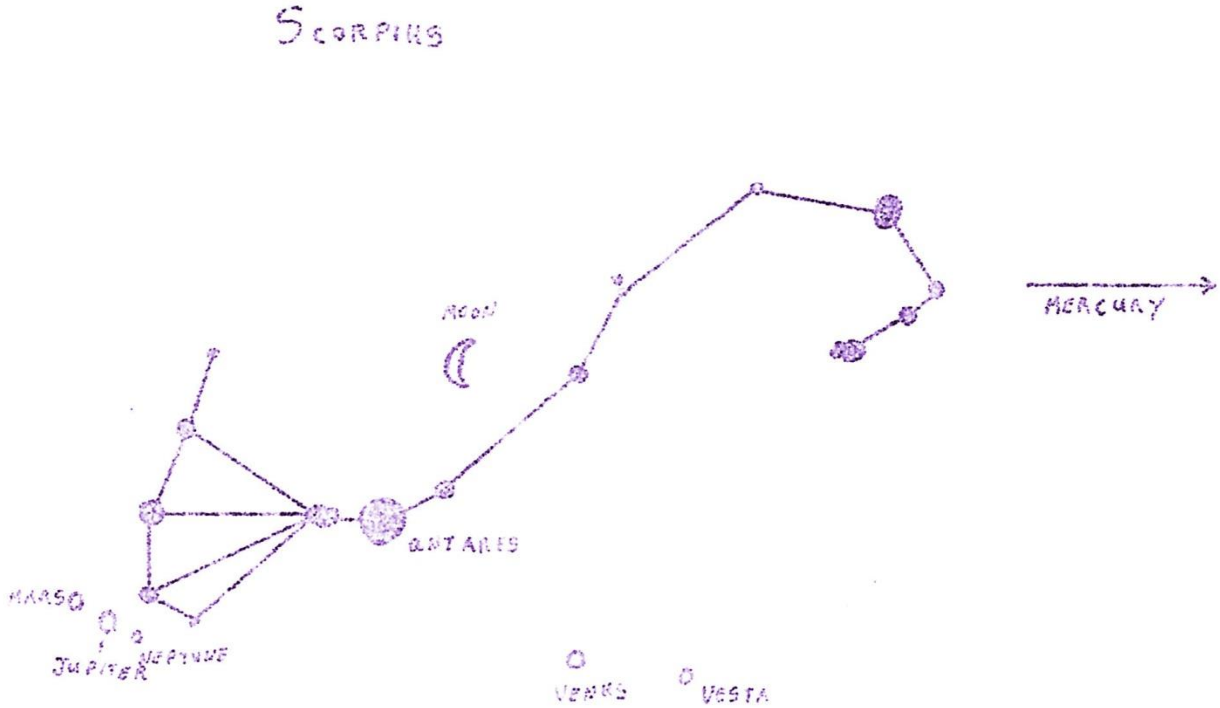
By: T.D.S.

Spring and summer observers were undoubtedly treated during 1970 with a beautiful solar eclipse, a transit of Mercury, and a fabulous display of Aurora. If you think all these celestial splendors are gone forever, you've got another thing coming. Don't think there is going to be another eclipse, but this January and February might be just as spectacular.

During January 3rd, the most unusual meteor shower of the year will occur, the Quadrantids. During the early evening, the shower will produce about a dozen meteors per hour. The shower's peak is so short, that by 8 or 9 o'clock, the shower will produce only about ½ as many as during sunset. A six day old moon will interfere greatly; cutting down the number of meteor counts that otherwise can be counted. The radiant will be at the Hercules, Bootes and Draco border.

A week before to a week after January 23, one of the most fantastic planetary groupings will occur. The moon, Venus, Neptune, Mars, Jupiter, and the minor planet Vesta will all gather in Scorpius during the early morning hours. Mercury will be quite nearby in Sagittarius. A short lunar eclipse will occur on February 21, but will only last 55 minutes. This eclipse will preview a 2 hour and 12 minute eclipse on August 17.

Although January skies are noted for their excellence, this January will probably be the most exciting month of the year for planetary observers and even for the casual observer.



Lunar and planetary configuration on January 23, 1970. For proper viewing, turn map upside down. Mercury can be seen in Sagittarius to the right.