



A Dart Board for the Bored

An eye opening offer from the editors of the WASP

We've come up with the perfect solution for all those times when you're so bored you can't possibly concentrate on reading, this beautiful dart board. It's perfectly safe when taken as directed

and it shouldn't take long for it to do its good work. Just about long enough for you to throw a few rounds of darts at this beautiful dart board. Very soon you should be able to return to the dullest, most difficult WASP articles with renewed mental vigor.

The President's Page

by

Larry Kalinowski

Welcome to the first meeting of the 1970-'71 season. If this is your first visit to the general meetings of the Warren Astronomical Society, make yourself comfortable and feel free to participate in any of the discussions that may crop up during the course of the evening. Our group is now your group and I know that I'm speaking for all the members when I say that we will be more than happy to give you a helping hand in any endeavor you may be contemplating in the ever expanding field of astronomy.

To all the returning "old" members, let me say that it's great to have you back. I hope this new season will have more to offer than the last and that your interests will ever continue to expand.

Last year will be hard to beat, simply because there was so much activity, both in the sky and among our membership. The heavens brought forth two eclipses, a major comet, a transit of the planet Mercury and a fantastic display of northern lights. Group activities included the completion of the WAS observatory, the introduction of photographic, Messier, solar and optical meetings, including an effort at the Great Lakes Regional Convention that netted a first prize in the junior division for papers.

We've lost a few of our members to the institutions of higher learning all around the Michigan area. Members that have played an important role in the building of this society. Without a doubt, they'll be missed, not only by myself, but by all the members of this society. If possible, we must not lose touch with our wandering membership and it is hoped they will continue to keep us in mind throughout their academic endeavors.

On August 26, 1970, the W.A.S. observatory was officially opened for inspection. The first group to pass through its doors were the many officers of the Rotary clubs in and around Macomb County. Unfortunately, the sky did not lend itself to observing and the visitors had to be satisfied with a sound-slide show brought along just in case the sky wouldn't co-operate. All were impressed with the building and its instrument and all indicated a desire to return to the observatory at their earliest convenience. In short, the opening was quite a success in spite of the weather.

Because of a permanent change in schedule, the general meetings of the W.A.S. will have to be changed from the fourth Wednesday of the month to the third Thursday. The third Thursday has been chosen arbitrarily. If objections ensue, further study will be needed to find a new meeting date. The astrophotography group is also affected, however, no date has been chosen as yet.

It has been brought to my attention (by the president of the Great Lakes Region of the Astronomical League...no less) that the W.A.S. has not been a member of the league for the past two years. Technically we had no right to the junior award that the region presented to us. However, they saw fit to override that technicality provided corrections were made as soon as possible.

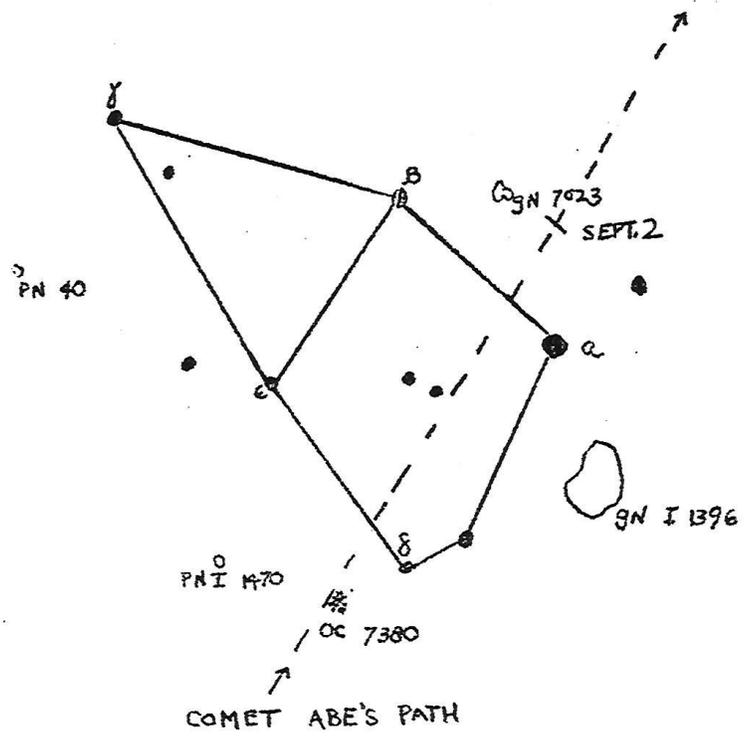


THE CONSTELLATION OF THE MONTH: CEPHEUS

by: Timothy Skonieczny

Other than Ursa Minor, Cepheus is the most northerly circum-polar constellation, having a boundary less than two degrees from the true North Pole. Because of this, it can be seen all night and all year round. The two brightest stars of Cassiopeia point to Alderamin, the brightest star in Cepheus. Although the Milky Way runs slightly through Cepheus, it contains no Messier objects or other interesting deep sky objects. A star cluster and four nebulas appear in the constellation, but they are faint, however, it does contain a recent visitor to our solar system, Comet Abe. As shown on the map, Comet Abe's path runs right through Cepheus. Comet Abe shows no large tail, but its nucleus is easily recognized in a small telescope. Its magnitude will just reach naked eye limit, and will just be visible until the middle of October.

I viewed Comet Abe through a 2.4" refractor and the 12.5" reflector at Camp Rotary. In my 2.4", it appears like H 13 does in the same telescope, about the same magnitude but larger. In the 12.5", it showed a very distinct nucleus, but no tail. I also viewed the comet in 7x35 binoculars, but it only looked like a slightly oval fuzzy star. Best observing can be done during September.



•Taken from Hallwag Star Atlas

THE DALL-KIRKHAM TELESCOPE DESIGN

by D. T. Ther

Although interest in telescope design and construction within the W.A.S. is quite low (with the exception of Mr. Alyea and myself), I submit this article as a reference for anyone who may someday consider a Cassegrainian telescope in defiance of the neck-ringing contortions associated with Newtonian observing, and also to help thicken the WASP. I have chosen to make one myself because I suspect that such a long focal length is ideal for lunar and planetary photography without the complex arrangements of eyepiece projection and afocal photography,

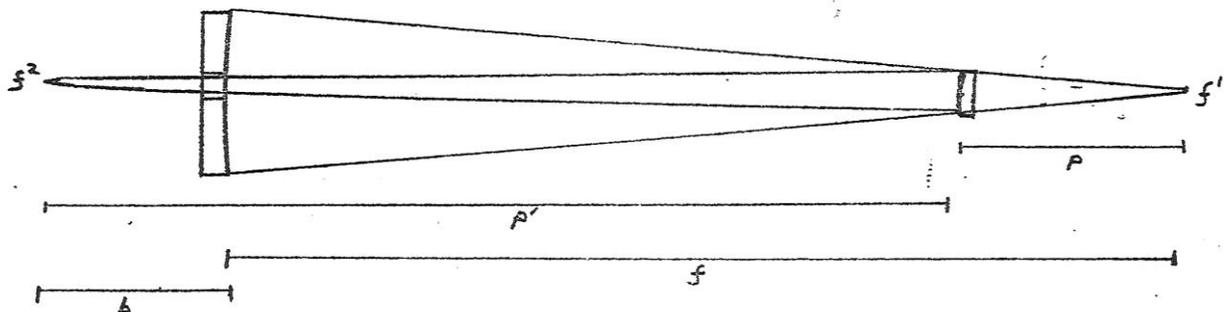
In my case, the primary mirror is of 8" aperture and has a 31" focal length (roughly f4). The secondary is 2 1/4" diameter and amplifies the primary to f 15.2 of 121.5" f.l. While polishing the primary, I realized that the standard Cassegrain design of parabolic primary and hyperbolic secondary would be quite difficult to figure (as the W.A.S. 12 1/2" has proven) and chose Dall-Kirkham as an easy alternative. In this system the secondary is conveniently left spherical and the primary is a highly eccentric ellipsoid which can also be considered as an under-corrected parabola. The secondary is tested through the rear side as a concave surface and the primary is null tested by placing the light source at the nearer of the two foci of the ellipse and the knife-edge at the second focus. Practically however, the testing is not easy — the secondary must be tested in monochromatic light due to refraction effects and the second focus of the primary is usually so distant that a small telescope is needed to view the test, Although I checked my primary at a distance of 31', I had no trouble viewing the mirror's figure without a telescope.

The design of the Dall-Kirkham system involves considerably more mathematical calculation than either the Newtonian or Cassegrainian designs but anyone with some experience in high school algebra should perform the calculations without difficulty. Basically, all calculations depend on 1) the focal length of the primary, 2) the amplifying ratio. 3) the distance from the surface of the mirror to the final focus behind it.

To calculate a system (diagram), one first determines p , which is equal to

$\frac{f + b}{A + 1}$ where f = focal length of primary, b = distance to focus from rear of primary, and A = amplification. The radius of curvature of the secondary

$= \frac{2 p p'}{p' - p}$ where p' = the distance of the focus from the secondary.



With the above calculations performed, the eccentricity of the primary and the positions of its foci can be determined as follows: first determine C , which is the ratio of correction of the ellipse to that of the normal parabola and is equal to

$$C = \frac{1 - 4p^2(p + p')^2}{p'^2 R R_s}$$

R = radius of curve of primary
 R_s = " " " " " secondary

the eccentricity e , is simply the square root of C and the foci are found by dividing R by $1 + e$ and $1 - e$ respectively.

For the purpose of illustration, my system has the following values:

Diameter of primary	8"	p = 8.2"	b = 8.0"
Diameter of secondary	2¼"	p' = 31.1"	A = 3.8
Radius of curvature of primary	62.7"		
Radius of curvature of secondary	22.1"		

C = .691 translating to 69.1% of parabolic correction

Eccentricity = .831

Foci of primary at 34.2" and 37.1"

A prospective maker of a Dall-Kirkham system should read "The Compound Telescope" of ATM Book One and the article by Horace Dall in "gleanings" of Sky & Telescope for January '66.

At present, my system is in the final stages of figuring and should be in use within a month. I'll comment on its performance in a future WASP issue.

Deep-Sky Challenges

For anyone wishing to try finding very difficult deep-sky objects, here are a few to invigorate their ambitions.

NOC 729, the great Helical Nebula in Aquarius, is a planetary of magnitude 6.5 and is 12' x 16', or nearly half the size of the full moon. Low power is essential, and binoculars or an RFT will most likely succeed. At 22h 27m R.A. s21.f° NGC 7293 is not in Norton's but is plotted in Atlas Coeli.

NGC 6822 is Barnard's galaxy at 19h44m R.A. and -15°dec. It is of 9th mag. but spread over an area 16' x 11' making it difficult in narrow field instruments« At only 1 ½ million light years, It is a member of the local group.

NOC 7789 is a very rich galactic cluster in Cassiopeia, about 4 degrees southwest of Beta. It is nearly half a degree in diameter and contains hundreds of stars of 11th mag. or fainter.

D.T.T.