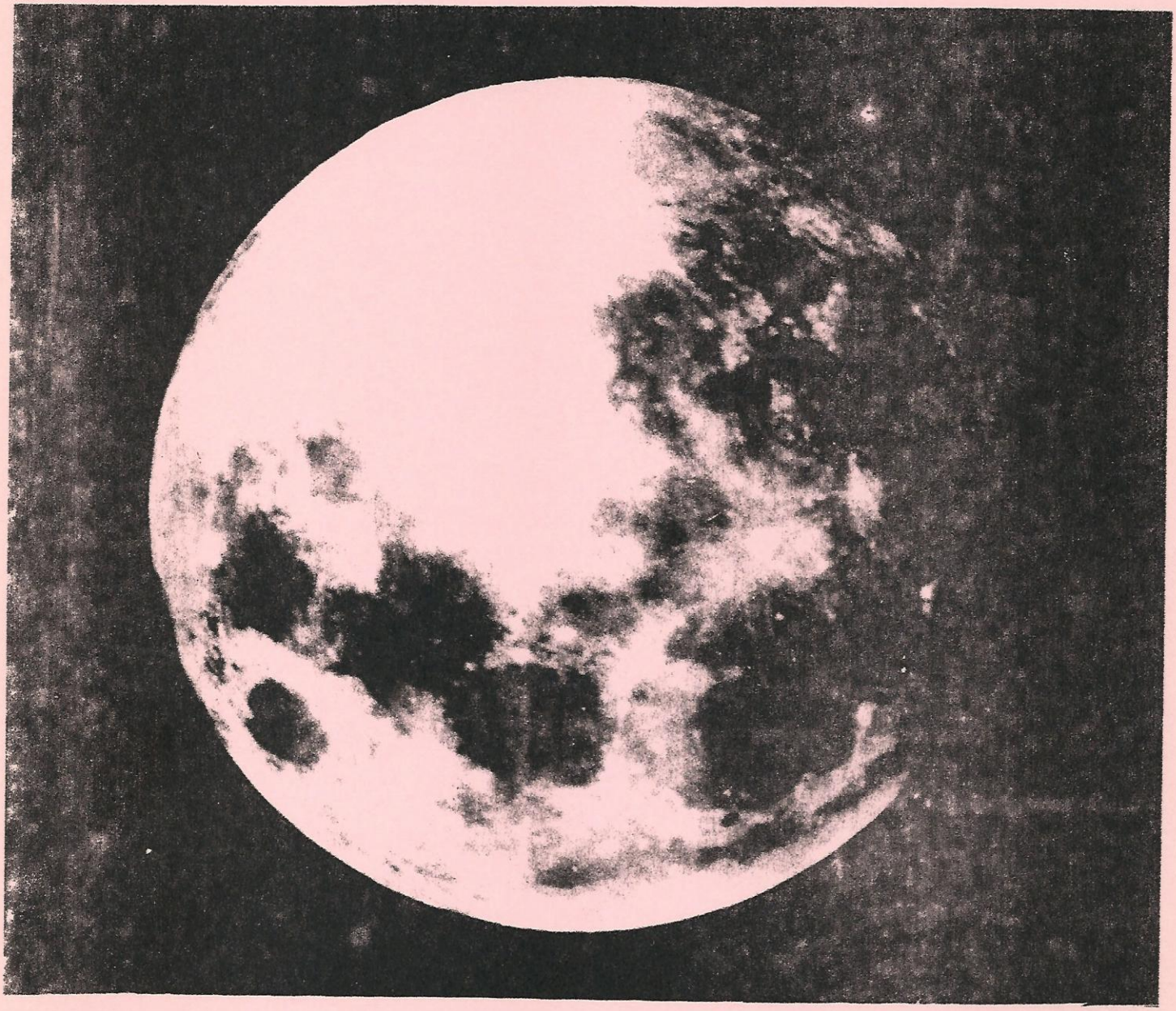
The Wasp

THE MONTHLY JOURNAL OF THE WARREN ASTRONOMICAL SOCIETY



MAY 1975

The Warren Astronomical Society is a local, nonprofit organization of amateur astronomers. Membership is open to all interested persons. Annual dues are as follows- $2 for Student (K through college) Membership, $4 for General Membership, and $5 for a Family Membership. Add $5 for a one year subscription to Sky & Telescope Magazine. General meetings are held on the third Thursday of every month at Macomb County Community College in room 311 of "B" building, at 8 p.m.

The Warren Astronomical Society Paper (W.A.S.P.) is published monthly by and for the members of the Warren Astronomical Society. Subscriptions are free to all Warren Astronomical Society members. Personal advertisements by Warren Astronomical Society members are also free. Non-member subscriptions and advertisements are available upon arrangement with the editors. Contributions, literary or otherwise, are always welcome. Contributions to the W.A.S.P. should be submitted to either of the editors listed below.

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The editors of the W.A.S.P. will exchange copies of this publication with other club publications on an even exchange basis. The Warren Astronomical Society maintains correspondence, sometimes intermittent, with the following organizations:

THE ASTRO-GATOR ASTRONOMY CLUB

THE ASTRONOMICAL LEAGUE

THE DETROIT ASTRONOMICAL SOCIETY

THE DETROIT OBSERVATIONAL AND ASTROPHOTOGRAPHIC ASSOCIATION

THE FORT WAYNE ASTRONOMICAL SOCIETY

THE GRAND RAPIDS AMATEUR ASTRONOMICAL ASSOCIATION

THE KALAMAZOO ASTRONOMICAL SOCIETY

THE MIAMI VALLEY ASTRONOMICAL SOCIETY

THE OLGELTHORPE ASTRONOMICAL SOCIETY

THE OLYMPIC ASTRONOMICAL SOCIETY

THE ORANGE COUNTY ASTRONOMICAL SOCIETY

Other organizations are invited to join this list.

THIS MONTH'S COVER BY: Ken Wilson. This photograph is to remind you of the total lunar eclipse this month (see articles elsewhere in this issue). The cover photo was taken by Ken Wilson, prime focus through a 6" f/8 reflector on High Contrast Copy Film.

THIS MONTH'S STAFF includes: Carl Noble, Louis Faix, Larry Kalinowski

. . . . . Cosmic Calendar by Ken Wilson . . . . . .

MAY	EVENT
1	Messier Club Meeting at 8 p.m., contact Frank McCullough, 791-8752, for details
2-3	Sixth Annual Great Lakes Astronomy Symposium, hosted by Adams Astronomical Society. Guest speakers will include Dr. Donald H. Menzel (speaking on why "Black Holes Cannot Exist" and Jim (Breccias) Loudon.
3	Last Quarter Moon
8	Astrophotography Meeting at 8 p.m., contact Larry Kalinowski, 776-9720 for details.
9	M.I.T. research team flashes first MASER on the moon in 1962.
11	New Moon (Partial Solar Eclipse visible over N. Canada).
14	Skylab, first orbiting space laboratory, launched in 1973.
15	Warren Astronomical Society monthly general meeting at 8 p.m. at Macomb County Community College (South Campus on Twelve Mile Road near Schoenherr) in room B 311.
18	First Quarter Moon.
25	Full Moon (Total Lunar Eclipse visible from Michigan).
30	Free Warren Astronomical Society Astronomy Class meets at 8:00 p.m. at St. Paul's United Church of Christ, 31654 Mound Road in Warren. Speaking will be Larry Kalinowski (on Astrophotography) and Ken Wilson (on Meteors and Comets)

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FOR SALE: One 6 X 30mmCriterion finder scope. Coated lenses and helical focusing. Includes adjustable mounting rings. $15. Call 268-9337, ask for Ken.

WANTED: One 1¼" prism diagonal; one tube for a six-inch RFT (7¼" O.D. and at least 28" long; one aluminum tube for an eight-inch f/6 telescope (at least 50" long); diagonals and spiders for 6" f/4 or 8" ,f/6. Call 268-9337, ask for Ken or send details to: Ken Wilson, 11157 Grenada, Sterling Heights, Michigan 48077.

WANTED: More articles for the W.A.S.P., submit to any editor or staff member of the W.A.S.P.

A Guide for the Summer Convention Goer

by

Kenneth Wilson

Summer is quickly approaching, despite any indications of the present weather to the contrary. To the Michigan amateur astronomer this means clearer skies, warmer (mosquito infested) nights and the inevitable host of amateur conventions. This summer's crop is a pretty good one. Listed below are four of these conventions that may be of particular interest to W.A.S. members. If you're planning to attend any of them, I suggest that you try to find someone else that wants to go and form a car pool. This will not only save on the high cost of gas, but you'll have someone to talk to along the way,

1.) MAY 2, 3. This summer's conventions get started early with the sixth annual Great Lakes Astronomy Symposium (no connection with the Great Lakes Region of the Astronomical League). This gathering is sponsored by the Adams Astronomical Society. Since it's just a stone's throw across the Ohio boarder (no, you don't need a passport), you can easily drive there in a couple hours. This year's speakers include Dr. Donald H. Menzel of the Harvard College Observatory (speaking on "Recent Developments in Space Astronomy" and "Why Black Holes Cannot Exist") and Jim Loudon (speaking on Lunar Geology). Awards will be given for the best student-made astronomical instruments, so bring that 'multi-channel, ion powered, AC-DC cold camera that you've been working on. For further information, write to: Adams Astronomical Society, Rogers High School, 5539 Nebraska Ave., Toledo, Ohio, 43615.

2.) JUNE 13, 14. You can "kill two birds with one stone" on this one because the Regional Convention of the Great Lakes Region of the Astronomical League will be held along with the fifth annual Apollo Rendezvous in Dayton, Ohio this year. Included will be: papers, door prizes, awards for best ATM instruments, a flea market, and maybe even (negotiations are still underway) a lecture by Isaac Asimov! This event is hosted by the Miami Valley Astronomical Society at the Apollo Observatory in Dayton. For more information write to: Roger Hoefer, 2629 Ridge Avenue, Dayton, Ohio 45414.

3.) JULY 28-AUG 1. The Third Congress (the first ever held in North America) of the International Union of Amateur Astronomers will be held at McMaster University, just across the border in Hamilton, Ontario. In addition to papers, exhibits and tours, I wouldn't be surprised if Patrick Moore showed up (since he's very active in the IUAA). Write: Kenneth Chilton, 93 Currie St., Hamilton, Ont , L8T 3N1, Canada.

4.) AUG. 13-16. The 1975 National Convention of the Astronomical League will be held in Atlanta, Georgia at the Ramada Inn Central this year. Those of you who were on hand at the W.A.S. hosted convention last year in East Lansing, know how good these get-togethers are (that is, unless you were on the Convention Committee!). You get to meet so many interesting people at these things (e.g. Robert E. Cox, Walter Scott Houston, Wilma Cherup and Ernest Robeson), Fortunately the Atlanta group has decided to carry over the idea of a social hour from last year's convention, but I think they'll have to go some to beat a D.O.A.A. blast. Additional attractions include: field trips to the Fernbank and Bradley observatories, a dinner at Stone Mountain Park and guest speaker, Dr. Gerald A. Soffen (Project Scientist for the N.A.S.A Viking Project Office). All in all, this should be a very worthwhile convention for any of you that can make it. For further information, write: Bob Hayward, Chairman of the Astronomy Department, Fernbank Science Center, 156 Heaton Park Drive, Atlanta, Georgia 30307.

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Astro-Quiz

by

Kenneth Wilson

1.) What's the fourth brightest (apparent visual magnitude) star in the Sky? _____

2.) How many known moons does Jupiter have? _____

3.) What's the largest crater on the Moon? _____

4.) What's the official name for the largest volcano on Mars? _____

5.) What NASA spacecraft is now on its way to Saturn? _____

6.) What planetary satellite (moon of a planet) is larger than the planet Mercury? _____

7.) What planet has a density less than that of water? _____

8.) What does the star name Betelgeuse mean in Arabic?_____

ANSWERS:

1.) Arcturus = 0.06 My (Sun -26.73, Sirius -1.4 2, Canopus -0.72) 2.) 13 (the 13th was discovered last September) 3.) Mare Imbrium (approx. 800 mi. in dia.) 4.) Olympus Mons (formerly Nix Olympica) 5.) Pioneer 11. 6.) Jupiter's moon, Ganymede is 5,020 km. in dia. (Mercury is only 3,476 km. in dia.) 7.) Saturn (0.69 if the density of water is taken as equal to one) 8.) Either "Armpit of the Giant" or "Armpit of the Mighty One," depending on your translation.

SCORE: 7-8 right = you cheated; 5-6 right = very good; 3 right = Not so hot; 1-2 right = You'd better brush up on your astronomy.

My Friend the Barlow

by Lou Faix

Probably one of the handiest, and least understood, accessories in the telescope box of any amateur astronomer is the Barlow lens. They're particularly useful to the more mature (sometimes called middle aged) observer.

Very simply, a Barlow lens is a piece of glass, concaved on one or both surfaces, which is used to increase the magnification. You may wonder and say, “Well, so what? I can do that by changing the eyepiece to one of a shorter focal length.” The advantage of using a Barlow rather than a shorter focal length eyepiece lies in the fact that we can retain the greater eye relief and exit pupil provided by the longer focal length eyepiece. This is a great advantage to people who wear spectacles or who are a little older and have lost some of the youthful flexibility in the cornea of their eyes. It is possible just to stand back away from the short eyepiece, but this results in seeing a greatly reduced field of view. In general, a long eyepiece combined with a Barlow lens provides more comfortable viewing than the same magnification achieved with a shorter eyepiece.

Some of the commonest uses of Barlow lenses include:

1. Observing lunar craters and small detail.
2. Planetary observing - especially surface detail on Mars and Jupiter.
3. Close double stars.
4. Small globular clusters.
5. Photography of the planets and moon.
6. In a guide scope for deep space astrophotography.
7. Observing sunspots.

Barlow lenses are usually advertised as some magnification power, such as 2X, 2½X or 3X. Don't be misled into thinking that this is the magnifying factor that the lens will provide for all eyepieces or with a camera. The advertised "X" rating is only an approximation of the ratio. Typically, a 2½X Barlow will be about 2¼X with a 25 mm eyepiece and nearly 3X with a 6 mm eyepiece. With a camera, it may be as much as 4X. This can be critical when figuring exposure times. The variation can be easily explained. (See fig. 1.)

The true magnifying ratio (M) is the ratio between the distance between the new image plane and the Barlow (B) and the original image plane and the Barlow (A).

M - B/A

Since the new image plane must coincide with the focal plane of the eyepiece, (Fe) which is a fixed distance from the optical center of the eyepiece, we can see that dimension B is set when we install the eyepiece into the Barlow tube. It is also apparent that as longer focal length eyepieces are used, dimension B becomes shorter. Hence, for a fixed tube Barlow, short eyepieces obtain greater magnification than long eyepieces.

The effect really becomes pronounced when we use our Barlow for negative projection photography. (See fig. 2.) Now we're moving the new image plane completely out of the Barlow tube and all the way to the rear of the camera. Essentially, we're putting the new image plane on the film surface. Dimension B becomes greatly extended so the magnification ratio (M) becomes much larger than the rated value. Frankly, I prefer the negative projection method of high power photography over the eyepiece projection method. No special camera to eyepiece adapters are required - only a standard Tee adapter. The exact magnifying ratio, hence efl and exposition times, can be predetermined by adjusting only one dimension. The magnify ratio for your camera can be preset without determining dimension A if the focal length (F) of the Barlow lens is known.

$$M = \frac{F+B}{F} \text{ and } B = (M-1) \times F$$

The focal lengths of a Barlow are usually given as a negative value, but ignore that sign when using the above equations. Before loading the film, simply assemble the camera and Barlow tube and measure the distance between the lens and the film plane (B). Adjust to the desired setting by adding extension tubes or by sliding the lens up and down in its tube.

When performing deep space astrophotography, it is desirable to use a guide scope several times more powerful than the telescope being used to take the picture. This is done to assure that any visual guiding error is not seen on the final picture. For reasons that will take another whole article to explain, it is desired to obtain the high power of the guide scope by using an objective lens with a very long focal length rather than by using a high power eyepiece. Without the help of our friend the Barlow, that could become a bit troublesome. In my own case, I use a 58" focal length telescope for photography. A guide scope three times as powerful would be almost sixteen feet long if it weren't for the Barlow. In reality, I use a simple three foot long refractor with a 5.5X Barlow to produce an effective focal length of 200 inches. The resulting image is poor since the practical limit of fifty power per inch of aperture has been exceeded. However, a high quality image is not required for guiding. It's a relatively simple matter to build your own Barlow lens system. The tubes can be made from standard 1¼" drain pipe extensions. A 10-32 nut soldered on the expanded end provides a simple eyepiece or camera lock. The lens holder can be filed down from a short length of 1¼" wood dowel which has been step drilled with an auger. A touch of Duco Cement or clear nail polish carefully applied holds the lens securely. A wide variety of simple plano-convex lenses are available from Edmunds for under a dollar. The color distortion is tolerable so long as you pick a lens with a fairly long focal length (greater than f/5). If the lens is to be used only for black and white

photography or for a guide scope, the color distortion can be eliminated with the use of a red filter. For better quality observing an achromatic or color corrected lens will be desired. An average quality two element lens can be purchased for about six dollars. A complete Barlow tube assembly with that same quality lens sells for about ten dollars. The more discriminating observer will discover that color corrected Barlows of the highest quality are priced between $30 and $40.

In general, the Barlow lens is a handy little device, easy to make and inexpensive to own. It can enhance your viewing, make those in-close astro photos and create a high power guide scope of compact size. Every amateur should have one.

Let me know how you use your Barlow.

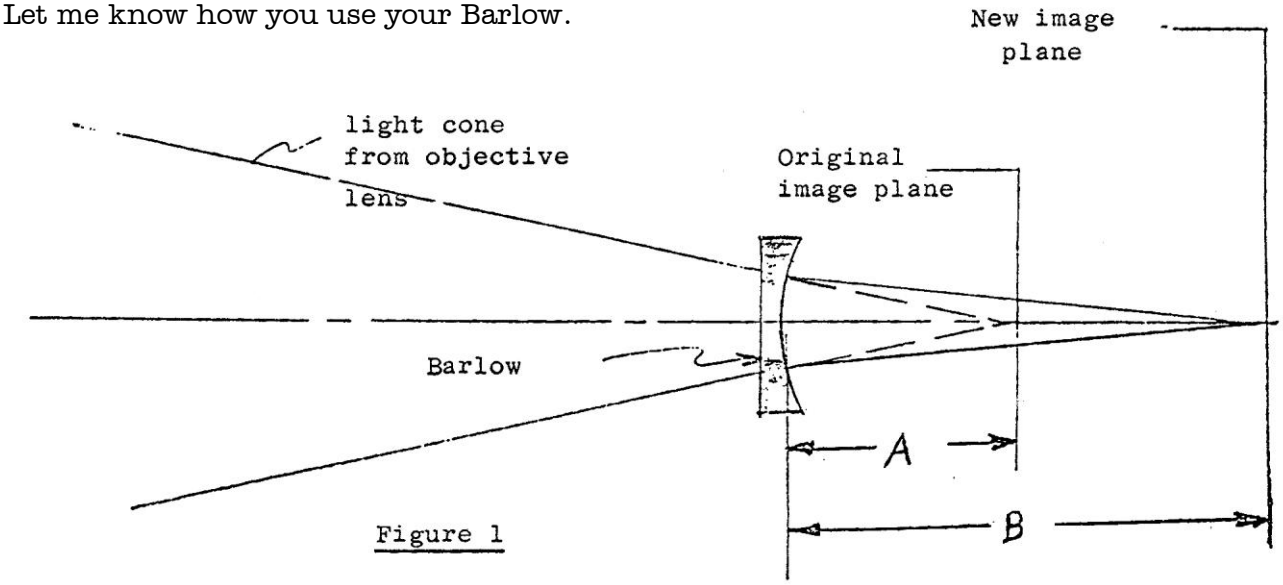
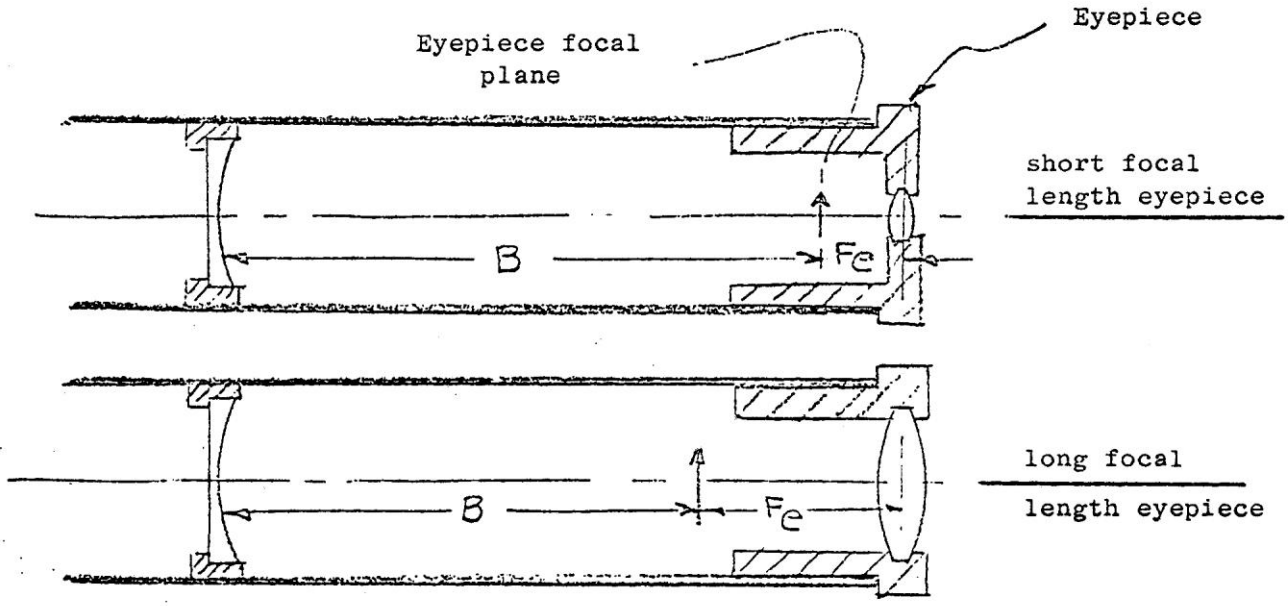


Figure 1



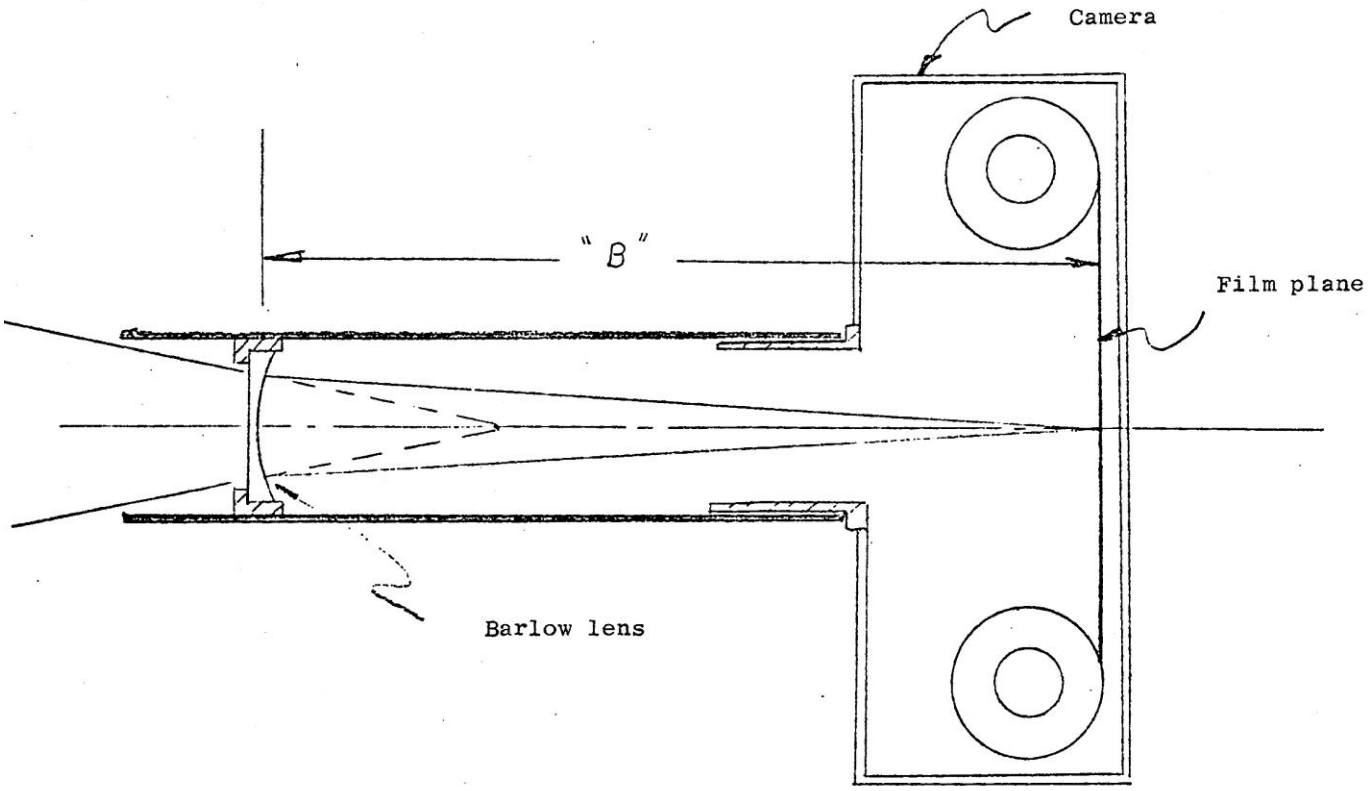


Figure 2

A DARKNESS AT MIDNIGHT

by

Kenneth Wilson

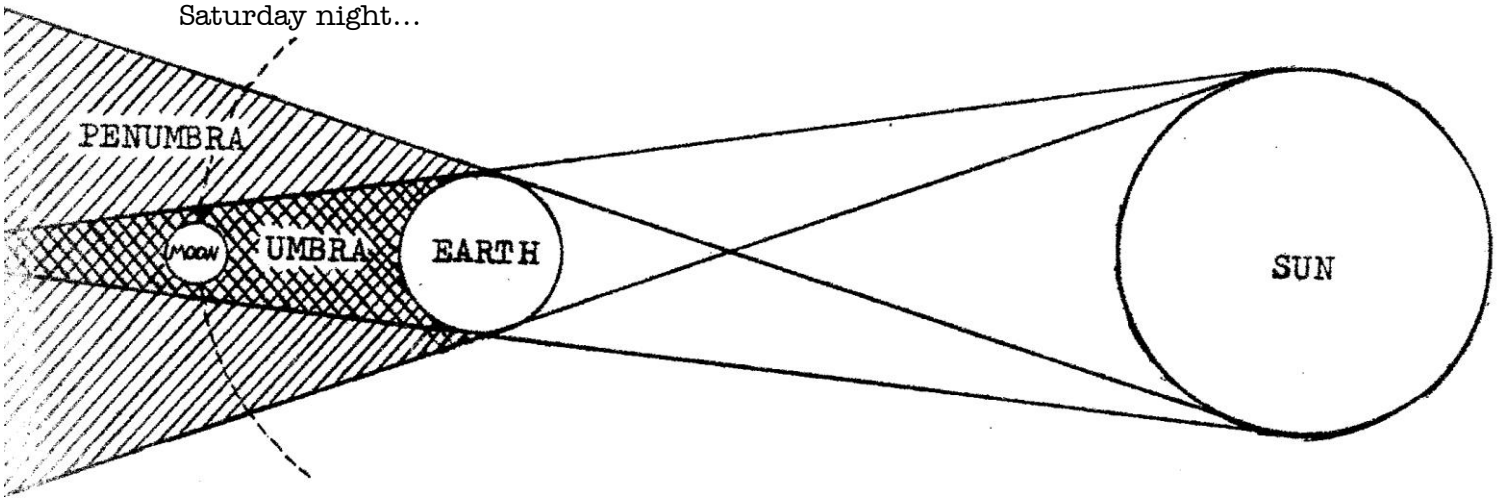
If you happen to be out on the town Saturday night, May 24th, and the moon seems to grow dark around midnight, it won't be because you've had too much to drink. Even tea-totaling night owls will be seeing this, the first total eclipse of the moon visible from Michigan in over three years.

Lunar eclipses occur whenever the moon, in its orbit around the earth, happens to enter the earth's shadow. There are two parts to this shadow: the outer part (the Penumbra) where some, but not all, of the sun's rays are cut off by the earth and, the inner part (the umbra) where all of the direct sunlight is absent. When only a part of the moon's disc enters the umbra, the eclipse is a partial one. A 'total' lunar eclipse is one in which the entire lunar disc enters the umbra. There can be as many as three or as few as none lunar eclipses (partial and total) in any one year.

Saturday night's eclipse will begin at 10:58.5 p.m. Eastern Daylight Time (EDT) when the moon first touches the penumbra. At 12:00.0 midnight, the bright full moon will begin to grow noticeably darker as it enters the umbra where it will remain until 3:35.9 a.m. (May 25th), when it makes its last umbral contact. The moon will be totally immersed in the umbra from 1:03.4 a.m. to 2:32.5 a.m. Sunday morning.

Unlike a solar eclipse, a lunar one is perfectly safe to watch, and often quite spectacular. Actually the moon doesn't disappear altogether during the umbral phase, but glows yellow, orange or even brick red. This light comes from the small percentage of sunlight that gets bent through the atmosphere of the earth and makes it to the lunar surface. On rare occasions, such as the December 19th eclipse of 1964, the lunar disc will completely disappear to the unaided eye. This was caused by an unusual amount of volcanic dust in air from recent eruptions in the East Indies.

There are several historical anecdotes connected with lunar eclipses, the most famous of which concerns Christopher Columbus. It seems that Chris had run out of food in Jamaica and the local natives wouldn't give him any. He remembered that there was a lunar eclipse coming up on March 1, 1504, and threatened to deprive the natives of their moon. When the eclipse began, the terrified natives brought Columbus all the food he wanted and begged him to return the moon. So, if you want a free meal Saturday night...



The configuration of a total lunar eclipse (Nothing drawn to scale).