BUFFALO ASTRONOMICAL ASSOCIATION INC.
BUFFALO MUSEUM OF SCIENCE
HUMBOLDT PARKWAY
BUFFALO NEW YORK 14211

the Spectrum

Editor:
Ernst E. Both

M A R C H - A P R I L 1 9 7 2

MARCH MEETING: For our meeting on March 10, 1972 (8:00 p.m., Club Room, Buffalo Museum of Science) we are happy to welcome back Mr. Ray Manners, whose lecture is entitled "Astrology: Your Life in the Stars." Mr. Manners is a Fellow of the Royal Astronomical Society and a member of the British Astronomical Association. He is well-known to our members as a frequent guest lecturer before our group. We are happy to welcome Mr. RAY MANNERS! Refreshments will be served after the lecture.

* * *

APRIL MEETING: Our meeting on April 14, 1972 (8:00 p.m., Club Room, Buffalo Museum of Science) will feature our own Dr. Fred Price, who will speak to us on "New Light on Some Lunar Problems." Dr. Price certainly needs no introduction: by vocation a biochemist, by avocation a student of the Moon, he is a past President of the B.A.A. and a current member of our Board of Directors. We welcome with pleasure DR. PRICE!

* *

* DEEP SKY OBSERVING * By John Riggs.

The great wealth of galaxies visible in the spring sky is readily apparent to anyone who has looked at the Skalnate Pleso Atlas in the region from Ursa Major south into Virgo. One can occasionally find accounts from other observers who have wandered into this area, of places where there were so many galaxies within a single field of view that accurate identification became difficult, if not impossible. To an amateur with the good fortune to observe under fairly good skies away from city lights, the realm of galaxies offers one of the finest observing experiences available. To a person trapped within city and suburbs, however, the region is a disappointment. I can remember vividly a clear late February night in which I was testing out a mounting for my 10-inch, f/7 reflector. I turned the telescope on the Owl Nebula (M 97), and the galaxy M 108, both of which are just visible within a single field of view under good conditions. The planetary nebula was faint, but the galaxy was completely invisible. In the country, M 108 is a fine example of an edge-on spiral with almost any telescope larger than two or three inches; in the city it can not be seen. Unfortunately, this applies to most members of the Coma-Virgo cloud as well.

Although I have not made an extended survey of which galaxies are visible from the suburbs and which are not, I do know of at least two such objects that can be picked up under mediocre sky conditions and that are worth-while looking at. The first of these is the many-armed spiral M 94 in Canes Venatici. Located about 2° northeast of the midpoint between alpha and beta CVn might pose some difficulty in finding. It would be a good idea to familiarize yourself as to the approximate position with binoculars before proceeding with a finder and then the telescope if you have trouble locating these objects. Another method would be to get beta CVn in a low power field and then sweep about three degrees eastward in R.A. to the

object. Once found, M 94 immediately presents itself as being much brighter and more conspicuous than most galaxies. With both my 6-inch and 10-inch reflectors it is a fairly bright, slightly elliptical, hazy glow that rises to a small, concentrated and brighter nucleus. What makes M 94 so outstanding is its nucleus. Look for it next time you are out with your telescope.

The other prominent galaxy I would like to draw attention to is the famous "Blackeye" spiral, M 64 in Coma Berenices. Long exposure photographs with large telescopes reveal a large, dark lane partly obscuring the nucleus, thus giving rise to its unusual nickname. It should be easier to find than M 94, since it is about one degree east of the fourth magnitude star 35 Com. Just get 35 in the field and move a little eastward and M 64 should come into view. Again, if you are not sure of the area, a check with binoculars will help. With a 10-inch it is a relatively large, moderately bright, slightly extended and hazy ellipse which rises to a small, bright nucleus. It is often stated that the dark lane can be seen visually with moderate apertures; I have seen a possible hint of it with the ten, but not without difficulty.

Both of these galaxies are fine sights and members of the observing section will view them in the coming months with the 12½-inch Newstead reflector, along with many other objects. Editorial Note: Those who read The Spectrum may have noted an omission of some greek letters in John Riggs' article in the January-February 1972 issue. For this omission, produced by an obstinate typewriter, I offer my apologies. Rather than print the corrections we are announcing a competition for the best solution. A look at a fairly detailed star map will show that several solutions are possible (even though John had not intended it this way). So, the best solution (to be judged by John Riggs) sent in before March 31 will be awarded a copy of Th. Page's NEIGHBORS OF THE EARTH, at the April meeting. GOOD HUNTING! and send your solutions to: E. Both, Curator of Astronomy, Buffalo Museum of Science, Buffalo, N.Y. 14211. eeb. *

* * *

* B.A.A. INSTRUMENT SECTION MEETING * By Warren Steinberg.

Another interesting meeting of our Instrument Section took place during the evening of January 28, 1972, at the Buffalo Museum of Science (this section meets on the fourth Friday of every month). Even though the attendance was relatively small, many important concepts in instrument making were discussed. A working display of finding the radius of curvature of a mirror by the rolling ball method (conceived by Bob Burdick) opened the meeting. As Darwin and Orrin Christy suggested various methods of its use, Bill Parker passed out computer programs which showed that one could obtain (with a one-inch steel ball) an accuracy of 1/1000 inch with this simple method. Most of the meeting was spent in testing Bob Burdick's 10-inch, f/3.3 mirror for his Labrecque camera (the design of which will, hopefully, be discussed at a regular meeting in the near future, eeb). Bob corrected his mirror to better than 1/50 of a wave (1/25 overall); therefore, when under test, observers not only had trouble finding the exact radius of curvature, but they also had trouble finding any imperfections on his mirror; the Ronchi lines were substantially the same inside the radius of curvature, close to the radius, and outside this radius.

Other important discussions were developed during this meeting: Rudy Buecking, Bill Parker and Warren Steinberg talked on the Ritchey-Chretien telescope, a design which, I believe, is the only one of its type perfectly free of coma and spherical aberration. Another excellent discussion was developed by Ed Lindberg, Rudy Neuhauser Donald Ortwein and Bob Burdick on the hardships in making the correctors for Maksutov telescopes, i.e., the susceptibility of scratching the crown glass corrector

and the problem of whether to grind out the scratches or to go on to polishing and correcting, with the scratches left in the corrector. Finally Tom Dessert told of his troubles in trying to buy one of those "STORE BOUGHT" telescopes (wouldn't it be easier to make one, Tom?); he also told of the enormous amount of work being done by a small number of B.A.A. members in trying to keep Newstead Observatory in "reasonable" repair.

One final point: Rick Janas (who has departed to Atlanta, Georgia, to join VISTA) and myself, while using the 12½-inch at Newstead, observed the companion of Sirius (we're serious), using a 4 mm. eyepiece at about 500 X. In the ensuing weeks at Newstead, Sirius B could not be found; has any other member seen this companion? (sound like another ghost story to me, eeb).

*

* POLISHING LAPS * By Darwin Christy (For the first part of this Contribution from the Honey-House Observatory see the January-February 1972 issue of Spectrum.)

There are numerous full-sized laps for correcting defects. One such lap is illustrated in figure 12. If a hyperbola has been created, one way to bring it back to a parabola is to shave certain facets down so that they do not make contact with the surface of the mirror. To bring back a deeper hyperbola, a lap with more depressions or larger depressed area,as shown in figure 13, should be made. The

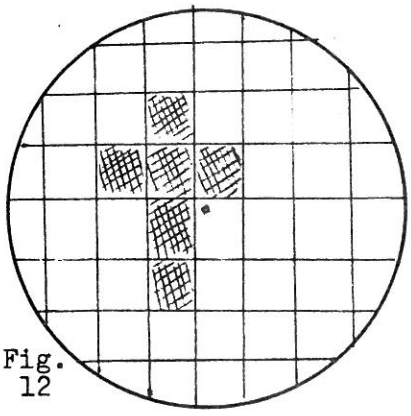


Fig. 12

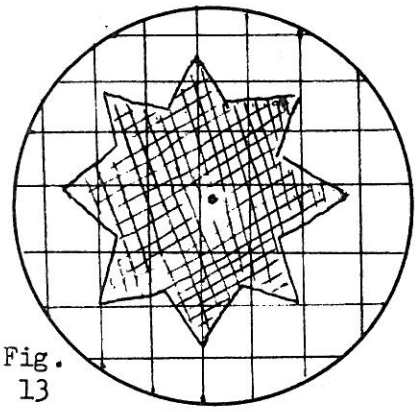


Fig. 13

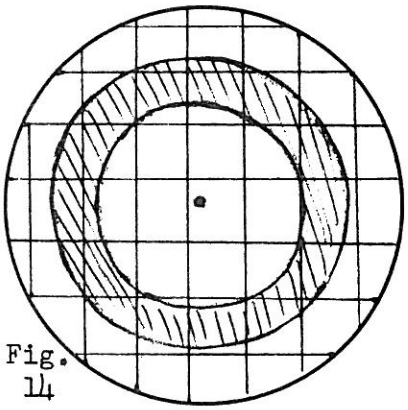


Fig. 14

facets can be shaved off with a razor blade or a sharp straight-edged knife. Or they can be depressed by using a sheet of plastic or wax paper cut in the shape illustrated. With it placed down as shown, coldpress with the mirror for a couple of hours. As polishing continues, the high facets will wear down to the depressed facets so the lap does not have to be redone. To bring up depressed doughnuts, a piece of wax paper can be cut in the shape of the doughnut and placed on the lap coinciding with that on the mirror and cold-pressed. This is illustrated in figure 14. All shaded areas shown in the illustrations are those of depression. To reduce a turned-down edge, figure 13 is very effective. The depressed area should be extended further toward the edge though, and then one quarter strokes should be used with frequent testing.

Correcting zonal defects with a honey comb foundation is just another way of reducing turned edge and raised zones. In figure 15 the position of the honey comb is suitable for reducing turned-down edge. The honey comb can be placed for reducing raised zones as illustrated in figure 16. Cut the honey comb into strips the width of the zonal defect and then place them parallel to each other on either side of

the lap. The strips do not have to be adhered to the lap, merely laid on and pressed with the mirror for about 15 minutes. Polishing should not exceed a couple of minutes since the action is extremely fast in these zones. Minute digs will appear in the Foucault test, but do not be alarmed for they will disappear or will blend out in the final parabolization. One thing not mentioned earlier about the honey comb foundation is that polishing on it produces slick-free mirror surfaces. These can be annoying and are produced by a dry lap which causes the rouge to bunch up and act as a cutter at the edge of the facets.

Next to the illustrations is an edge-on appearance of the mirror and the zone in question. When polishing with these strips, the third motion around the lap is eliminated. Strokes are made only in the direction of the placements of these strips. All that is required is rotating the mirror as well as back and forth motion of the mirror. One quarter strokes are generally used, although the one quarter " W " stroke can also be used.

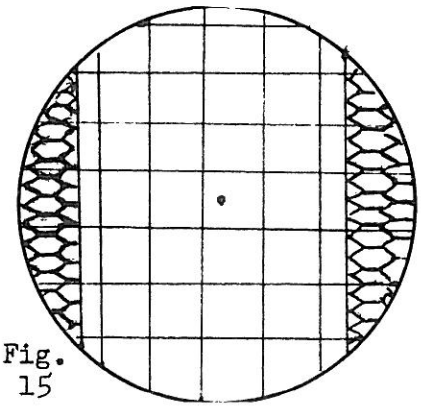
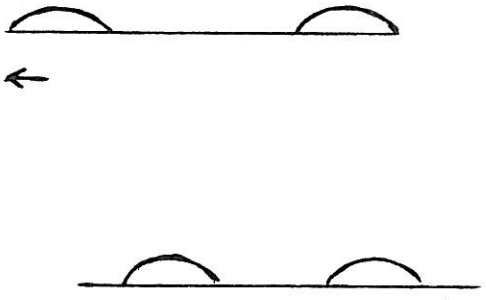


Fig. 15



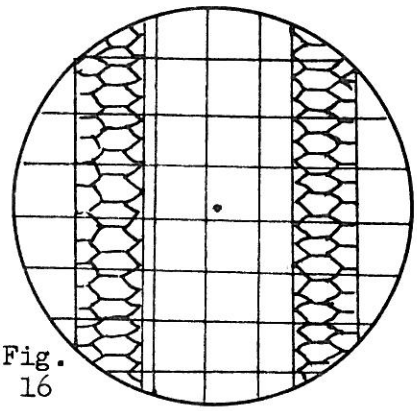
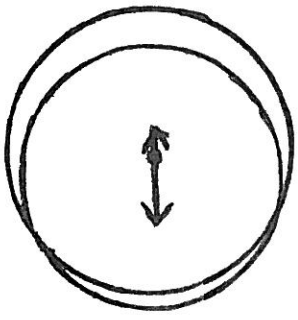


Fig. 16

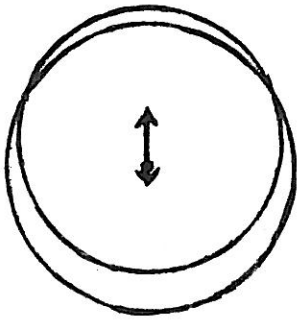
Polishing strokes are varied. For full-sized laps with the mirror on top there are: 1/3 stroke center over center; 1/3 "W" stroke, with both of these varied into 1/4 strokes. A 1/3 stroke is a motion where the center of the mirror moves forward and back one third the diameter of the mirror, while a 1/4 stroke moves the mirror one fourth the diameter. Elliptical strokes are used to some advantage, such as the prevention of symmetrical lap defects. To work into a parabola, the semi-stroke is used, or the blended overhang. Thse strokes are illustrated belwo.

Using a subdiameter lap requires different series of strokes. Among these are the normal "W" stroke, the depressed edge "W" stroke, and the compressed center "W" stroke. There is also the edge to edge stroke, where the lap is stroked from one edge of the mirror to the other edge, allowing only one third of the lap to overhang the edges. Finally there is the localized stroke where a certain area may be raised or depressed. This stroke may be considered to be a zonal reducing strokes.

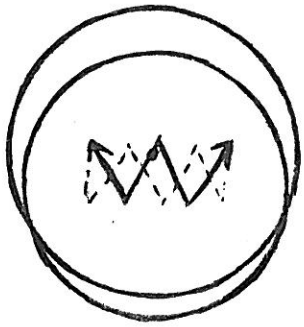
1/3 center over center



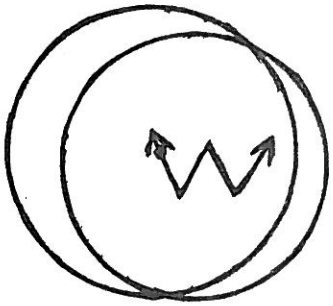
1/4 center over center



1/3 " W "

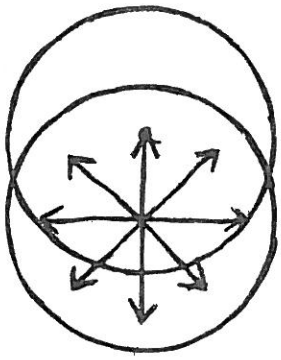


1/4 " W "



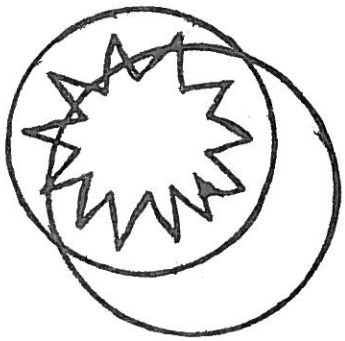
Normal polishing stroke
(6 point star or rosette)

Semi-stroke / one-half stroke

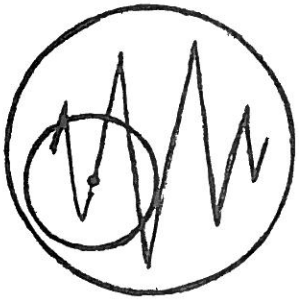


Parabolizing stroke
(5 or 6 point star, rosette)

Blended Overhang (1/4)



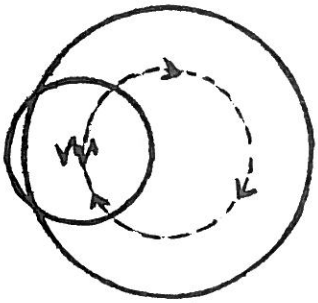
Hyperbola reducing stroke
(5 or 6 point star, rosette)

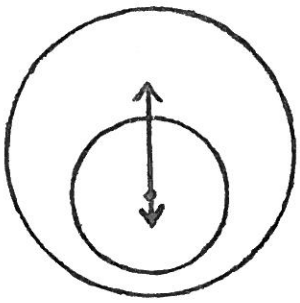


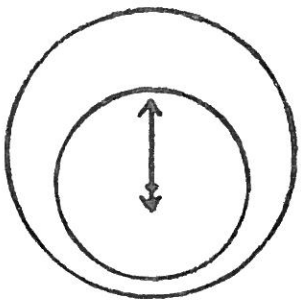
Zonal correcting (any point star, 4 point works best)

Edge to edge stroke
(Medium lap, 5 or 6 point)

Edge to edge, large subdiameter lap (6 point star, rosette.)







References and credits: Amateur Telescope Making, Books I/II/III; Sam Brown, "All About Telescopes," Edmung Scientific Co.; Jean Texereau, "How to Make a Telescope"; N. E. Howard, "Standard Handbook for Telescope Making." ..... For the encouragement of writing a paper I give credit to Ernst Both; for urging me to prepare a paper on laps I give credit to Warren Steinberg; for telling me that I should attempt the use of subdiameter laps, credit is due to Edward Lindberg; last but not least credit is due to Rudy Buecking for designing both full laps as well as subdiameter laps; to all the afore mentioned I give my sincere thanks. The author.

*

* TWO FULL MOONS IN ONE MONTH * By Kurt Erland.

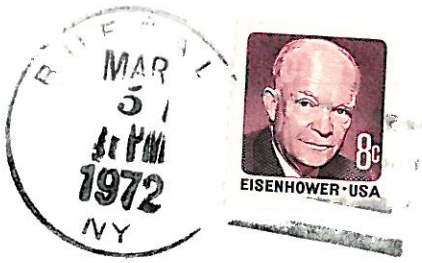
Since the Moon's synodic period (= 29½ days, the interval between successive

full moons) is somewhat shorter than the average duration of a month, it can happen for two full moons to occur in a single month. The last time this took place was this past December (December 2, December 31, 1971). For the remainder of this century at least some of us will be able to enjoy such an event ten more times, as follows: 1974 = October 1/31; 1977 = July 1/30; 1980 = March 1/31; 1982 = December 1/30; 1985 = July 2/31; 1988 = May 1/31; 1990 = December 2/31; 1993 = September 1/30; 1996 = July 1/30; 1999 = March 2/31. * * * * * * * * * * * * * * *

* SPY AND TELL * The Newstead Crew has been busy realigning the telescope and working on the dome drive (could we have a report sometimes, so that people know who works out there?) *** Tom Dessert's new 10-inch Dynascope has arrived (we think) *** Ron Poling, a student at Kenmore West Sr. High, was on WBEN-TV'S IT'S ACADEMIC and his team received the highest score; in his spare time he is working on a spectroscope; *** The Christy team has finished the 12½-inch mirror for its new telescope, and is busily trying to complete work on the mount. *** John Riggs has made the Dean's list at UB - Congratulations! *** Kermit Schlitzer is now a Fuller Brush Man - be prepared for a knock on your door. *** Newstead Observatory had a spectacular dust storm when Tom Dessert and John Riggs swept out 10 years of dirt from the observatory floor. *** How come we haven't heard of Ernst Both's trip to the Jet Propulsion Lab, and those Mars pictures??? (you will, someday. eeb). *** Our best wishes go with Richard Janas as he enters the services of VISTA. He left for Atlanta, Georgia, where he will undergo some training. Good Luck, RICK! *** So far only two members have submitted photographs for our ASTROPHOTOGRAPHY exhibit - looks like no exhibit this year. Hide your heads in shame! *** Edith Geiger's observatory is all but finished ***.

BAA ASTROPHOTOGRAPHY EXHIBIT: Due to the lack of interested people in submitting pictures, there will be no B.A.A. exhibit this year. Please claim pictures at meeting.

Buffalo Astronomical Association, Inc.
c/o Buffalo Museum of Science
Humboldt Park
Buffalo, N.Y. 14211



FIRST CLASS

Mr. Eugene Hazel
Mr. Larry Hazel
1234 - 89th St.
Niagara Falls, N. Y. 14304