

Amateur Telescope Making—Advanced

Reviewed by SCOTT HOUSTON

In this new book Ingalls has produced another work that will be epoch making in the most literal sense of the words. Two-thirds are filled with refined accounts of the very latest in telescope design, theory, analysis, small lenses, casting, machining, mountings, drives, Schmidt cameras, covering almost every problem that may arise. More important though, more significant, is the last third which is devoted to observing techniques. Here there is an increasing realization that the art of observing is just as profound as the art of construction, and these latter chapters alone are more than worth the price of the book.

Edward Halbach presents the useful and serious possibilities of scientific contribution via the AAVSO, the AMS, and the AAAA. Millman has several brilliant pages on meteor photography. Then comes material on important observational problems—a classical paper by Professor Douglas on seeing; Dall on limitations of vision; remarks on tube currents, spider diffraction, richest field telescopes. Finally comes an incomparable paper on the characteristics of reflectors and refractors by that dean of visual observers, Prof. William H. Pickering.

The rise of amateur observing is one of the highlights of the twentieth century. Its contributions are increasingly regarded with respect by professionals. Telescope making has added much to the movement, home made instruments having added thousands of valuable observations. This last despite the fact that the great majority of amateur lenses contribute little or nothing. To one man, Albert G. Ingalls, must go the credit for these amateur 'scopes and their many observations.

His job is not complete, however, for many of the pages may eventually need revision and addition, but, whatever the shortcomings of this volume the great wonder is that so much material actually has been gathered between two covers. That outweighs all minor criticisms. In general, however, the material is not mere opinion; the various authors are all learned and accomplished. The greater bulk of the text is soundly scientific.

As we said before, this latest volume is epoch making, and, while Ingalls may not realize it, American amateur astronomy must count him along with Pickering, Olivier, Olcott, and Campbell as one of its patron saints.

807 East Otjen Street, Milwaukee, Wis.

Solar Section

Introducing Stonyhurst Sun Disks

MAUDE S. WIEGEL, Director

To spend five years vainly striving to pin down on paper the smiling face of Old Sol with nothing more formidable than a sharpened lead pencil is discouraging to say the least. One wanders along a seemingly deserted road; yes, there are dim footprints of those gone on, and a few scattered houses upon which one raps timidly, but the folks have gone off, or are too busy to heed.

All unexpectedly one comes upon a fellow worker who lingers, possibly to understand better the complex mechanics of the universe, and is lost; but his loss is our gain. Experiences are exchanged, and from his store of knowledge is produced a net, with which to snare the sun, and this net is nothing else than the Stonyhurst sun disks. A network of lines in latitude and longitude upon cardboard squares on which we project the sun's image, together with the American Ephemeris, in which is given the tables of position angle of the axis or rotation, and the heliographic latitude and longitude of the center of the disk enables us to make accurate reading of sunspots well within the reach of the amateur interested in solar observing.

Stonyhurst sun disks are made only in England by C. F. Casella & Co., 11-15 Rochester Row, Victoria St., London, S.W., and are priced at \$2.50 per set. The disks may be used with either refractors or reflecting telescopes of about 5-inch diameter lens or mirror, to be held in a light home-made frame. The 6-inch circle of the disk is placed in position according to directions, the solar image held in the circle and the spots drawn in, detail to be filled in later. With the accurate location of spots, we now begin the study of the sun in earnest.

Tables from the Ephemeris might be printed in periods of a month in advance in this magazine if enough members requested it; the writer would be glad to furnish the tables. We have Bert Topham of Canada, to thank for this big step forward in introducing the disks, and their great value is affirmed in a recent communication from A. F. Newbegin of the solar section of the B.A.A. Mr. Newbegin remarks, "These disks are almost indispensable to the solar worker."

Observations on Jan. 30, disclosed an immense sunspot group just passing over the meridian. The group was visible to the naked eye at times as thin clouds filtered out the sun's light. This complex group was extremely active, flying

Variable Star Section

D. W. ROSEBRUGH, Director

Name	Variables Seen	No. of Obs.
Louise Ballhausen, N. Y.	40	57
Bouton, Fla.	71	129
Brocchi, Seattle	17	24
Fairbanks, Waterloo, Ia.	11	14
Hartmann, N. Y.	128	243
Jones, N. H.	86	373
McNabb, Acton, Ont.	2	5
Rosebrugh, N. Y.	29	95
Smith, Vineland, N. J.	1	3

Given below is the monthly summary of the variable star observations made by the members of the A.A.A.A. We wish to thank these members for submitting their reports and ask that they continue this practice and that those who are not doing so commence reporting their observations for inclusion in this column.

Miss Ballhausen says that this is her biggest month to date. It is indeed a showing to make us all look to our laurels.

The Rev. T. C. Bouton states that on Julian Day 558 (Jan. 24) he observed a rapid rise to maximum of the U Geminorum type variable star 060547 SS Aurigae. On 552 it was below 13.8, on 558 it was 11.0 and on 564 it was 13.8 Now it is below 14.0. Nice work Mr. Bouton!

Mr. Hartmann comments on the rapid rise of 115158 Z UMa from 8.8 on 537 to 7.3 on 566 and remarks that Nova Lacertae has fallen to 9.8 on 564.

Mr. Jones says that SS Cygni is still very irregular. His comments on the cloudy observing weather in the east echo our sentiments while from the west Mr. Brocchi frigidly remarks that his home shutters are frozen closed.

We welcome Neil McNabb, Acton, Ontario, a new member of the AAVSO, who is making his first report to A.A.A.A. this month. He says that α Ceti is waning rapidly.

Roy A. Seely has just moved to 16 Sutton Place, New York, where he hopes to unlimber his new 10-inch reflector shortly.
Poughkeepsie, N. Y.

AMS Meteor Notes

WISCONSIN-NORTHERN ILLINOIS REGION

L. E. ARMFIELD

It is very gratifying to report that the members of the Wisconsin-Northern Illinois region increased observing time from a total of 23,344 minutes in 1935 to a total of 32,078 minutes in 1936. It is interesting also, to note that while this represents an increase of nearly 27% in observing time, the total number of meteors observed during the year 1936, including both recognized AMS shower meteors and those occurring during the O-H watches decreased from 2,818 in 1935 to 2,665 in 1936 or approximately 9.5%. The apparent reduction in the total number of meteors observed during 1936 is still more evident when consideration is given only to those occurring during the O-H periods of observation. Recognized AMS shower epochs are not included in O-H program. In 1935, 2,443 meteors were observed in the O-H program during 22,079 minutes of observing, while in 1936 only 1,709 meteors were witnessed in 24,739 minutes of observing time. In other words, the observing time increased approximately 10.75%, while the number of meteors seen decreased approximately 30.05%. As this is merely a preliminary analysis of only the results obtained by this region, it is not known as yet whether the periods of observing before and after midnight are comparable during the two years in question, whether such factors as time devoted to plotting the meteors or recording the times of occurrences; whether the average magnitude of the faintest star easily visible was greater or less in one year than in the other, as well as

other considerations, tend to reduce the number of meteors recorded during 1936 or, if the reduction is real. At any rate, the O-H program is truly an interesting project and the continuation of the program during the coming years seem to be well warranted. Your recorder for this region sincerely hopes that the members will continue their splendid contributions to the program with unabated vigor throughout the year.

Kenworth Kendall, Milwaukee, Wis., achieved first place honors in the number of minutes observed during 1936, having accumulated the large total of 10,342 minutes. Mary E. Trimmier, Chicago, Ill., is second with the fine total of 5,107 minutes. Miss Trimmer deserves special mention as every one of the 308 meteors which she observed in that time was neatly plotted on an AMS chart. Also, her neatly typed reports are a joy to behold. Richard Abrahams, Milwaukee, Wis., who exceeded the number of minutes which won him first honors in 1935, came third with the good total of 4500 minutes. Schmid, Keuziah and Diedrich of Milwaukee, and Joseph E. Boehm of Chicago, followed in the order given with 2,384, 1,930, 1,683 and 1,293 minutes respectively. These seven persons contributed approximately 35% of the total observations obtained in the region. The other members listed in the summary deserve much credit for their worthy contributions to the observing programs and the AMS extends its sincere appreciation to each and every contributor.

Observer	Residence Location	No. of Nights	O-H Program		Shower Meteors		
			Minutes	Meteors	No. of Nights	Minutes	Meteors
Abrahams	Milwaukee	35	4375	335	2	125	11
Boehm	Chicago	5	842	73	4	451	74
Cooke	Milwaukee	---	---	---	1	70	2*
Diedrich	Milwaukee	17	1091	73	5	592	55
Doolittle	So. Norwalk	1	60	4	---	---	---
Feinsilber	Green Bay	1	90	15	1	55	4
Gale	Des Moines	4	244	15	---	---	---
Halbach	Milwaukee	1	60	1	2	325	32*
Kendall	Milwaukee	36	8279	690	10	2063	254
Ketarkus	Racine	5	409	15	---	---	---
Keuziah	Milwaukee	20	1563	115	4	367	68
Klezjewski	Chicago	---	---	---	1	58	17
Knott	Milwaukee	4	240	23	2	120	25
Loepfe	Milwaukee	2	135	13	2	180	33*
McNeill	Chicago	---	---	---	2	310	70
Mittendorf	Chicago	1	210	16	2	164	20
Moore	Milwaukee	1	60	8	---	---	---
Needham	Milwaukee	---	---	---	1	133	18
Oakley	Milton	---	---	---	2	325	29*
Peck	Milwaukee	---	---	---	1	220	16*
Rich	Milwaukee	1	60	5	---	---	---
Schmid	Milwaukee	24	2317	101	1	67	2
Schultz	Milwaukee	6	442	26	---	---	---
Sidoff	Milwaukee	3	180	13	1	120	21
Strelitzer	Milwaukee	---	---	---	2	228	26
Taylor	Milwaukee	1	60	2	---	---	---
Trimmier, M.	Chicago	37	4022	166*	7	1085	142*
Trimmier, V.	Chicago	---	---	---	1	101	19
Wight	Milwaukee	---	---	---	1	120	3*
Wilke	Milwaukee	---	---	---	1	60	15
30 observers		205	24739	1709	56	7339	956
			* Plotted				

TOTALS

Program	Nights	Minutes	Meteors
Olivier-Hoffmeister	207	24739	1709
Shower	54	7339	956
	261	32078	2665

1410 N. Marshall Street,
Milwaukee, Wisconsin.

AAVSO Nova Program Notes

L. E. ARMFIELD

Nova program contributors will note with interest the three new names appearing in the columns below, which list the observations received for the month of January. In far off Japan, Hideo Inouye, a veteran meteor observer whose name has often appeared in Dr. Olivier's accounts of meteor observations, extends his hand across the wide Pacific to contribute his initial report to the nova program. From our northern neighbor, Neil McNabb, Jr., of Acton, Ontario, Canada, we have received a fine report of his first observations. Mr. McNabb is rapidly extending the survey of his region down to the seventh magnitude through the use of opera glasses. Coming closer to home, E. H. Olson, 10156 Yates Avenue, Chicago, Ill., has submitted an unusually good report in that on three evenings he extended the survey of his region down to the eighth magnitude. A scrutiny of all the stars in an area of sky 10° square to this low magnitude represents much effort and painstaking care for which he deserves much credit.

Richard Abrahams, 5064 N. 39th St., Milwaukee, Wis., one of our regular and reliable contributors to these columns is most emphatically living up to his New Year's resolutions for bigger and better monthly nova program reports. Mr. Abraham's splendid contribution of observations on 11 regions for a total of 96 nights during January is truly a record breaker. Such assiduous observing certainly merits being rewarded with the discovery of a brand new nova.

Observer	Location	Region	Magnitude of faintest star easily visible								Total Nights
			8	7	6	5	4	3	2		
Abrahams	Milwaukee	56	6	13	6	25
		65	5	1	1	7
		66	3	3	1	7
		67	3	3	1	7
		68	3	2	1	1	7
		69	3	1	1	2	7
		80	3	3	1	7
		81	3	4	1	8
		82	2	1	3	1	7
		91	3	3	1	7
		92	3	3	1	7
Ballhausen	Scarsdale	12	....	3	4	....	....	....	....	7
		33	....	3	2	2	....	....	1	8
		55	....	2	2	1	2	....	1	8
Cushman	Poughkeepsie	57	....	....	....	....	1	....	....	1
		56	....	....	4	....	1	1	....	6
Diedrich	Milwaukee (Dec.) (Jan.)	16	....	....	4	....	1	1	....	6
		43	....	....	3	2	2	4	....	11
Halbach	Milwaukee	43	....	....	3	3	2	5	....	13
		49	....	....	3	3	1	1	....	8
		50	....	....	3	3	1	1	....	8
		71	....	....	5	1	1	....	....	7
Inouye	Atsuta, Japan	35	....	....	....	....	2	....	....	2
		80	....	....	....	....	2	....	....	2
Keuziah	Milwaukee (Nov.) (Nov.) (Dec.) (Dec.) (Jan.)	15	....	....	....	2	....	....	....	2
		40	....	....	....	2	....	....	....	2
		15	....	....	....	....	2	....	....	2
		40	....	....	....	8	....	....	....	8
McNabb	Acton, Canada	40	....	....	....	5	....	....	....	5
		8	....	1	3	1	....	....	....	5
Moore	Milwaukee	72	....	....	4	1	....	....	....	5
		26	....	....	2	5	4	1	....	12
Olson	Chicago	51	3	2	....	1	....	1	....	7
Rosebrugh	Poughkeepsie	1	....	2	7	1	1	....	....	11
		52	....	5	5	1	....	....	....	11
Thomas	Cambridge	3	....	....	....	3	2	5	1	11

1410 N. Marshall Street,
Milwaukee, Wis.

Milwaukee News Notes

By M. N. FISHER

Ralph Buckstaff of Oshkosh, widely known in Wisconsin for his work in amateur astronomy and in meteorology, gave an illustrated talk on Mars at the February meeting of the Milwaukee Astronomical Society at the public museum.

Among the slides were several showing Mr. Buckstaff's own globe of Mars. An ordinary globe similar to those which can be purchased in department stores was covered with thin coats of red ochre. Over this the maps of the observations made by Lowell and Schiaparelli were traced and colored. Mr. Buckstaff also described some of the notable features of the planet—the polar caps which retreat in the Martian summer and expand in winter; the red coloring of the regions other than those at the poles; the celebrated canals and the clouds.

On Feb. 8, Herbert W. Cornell, President of the Milwaukee Astronomical Society, visited the Hayden Planetarium in New York City, and was most agreeably received by Director Clyde Fisher. On Feb. 10 he visited the Fels Planetarium in Philadelphia and had an interesting discussion with Director James Stokley. On Feb. 12 he attended a dinner and meeting of the Rittenhouse Astronomical Society in Philadelphia.

When the Milwaukee Astronomical society met at the Milwaukee Public Museum Mar. 4, Mr. Cornell repeated the lecture he heard Dr. Stokley give in Philadelphia on "Stars and Nebulae of Special Interest to the Amateur Astronomer." The Milwaukee group heard another talk on astronomy that week also. On Mar. 3 Dr. G. A. Parkinson spoke on comets in the museum lecture hall.

836 N. 14th Street,
Milwaukee, Wis.

Calendar of Events

GEORGE DIEDRICH
(All times C.S.T.)

- MARCH, 1937**
- Mon. 8 Conjunction of Jupiter and the moon at 3:11 A.M. Jupiter 2° 40' south.
- 10-12 Zeta and Kappa Bootied meteors.
- Thu. 11 Conjunction of Mercury and the moon at 9:53 P.M. Mercury 7° 43' south.
- Fri. 12 New moon at 1:32 P.M. Venus at greatest brilliancy. (—4.3^m)
- Mon. 15 Conjunction of Venus and the moon at 7:38 A.M. Venus 2° 11' north.

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Affiliated Societies

- Astronomical Society of Rutherford, N. J.
Amateur Astronomers Association of Pittsburgh, Pennsylvania.
Astronomers Guild of Jamestown, New York.
Chicago Amateur Astronomical Association, Chicago, Ill.
Eastbay Astronomical Association, Oakland, Calif.
Long Island Telescope Makers, Wantagh, N. Y.
Louisville Astronomical Society, Louisville, Ky.
Madison Astronomical Society, Madison, Wis.
Metropolitan Astronomical Society, New York, New York.
Milwaukee Astronomical Society, Milwaukee, Wis.
New Jersey Astrophysical Society, Woodbridge, N. J.
Norwalk Astronomical Society, Norwalk, Conn.
Optical Division of the AAA, New York, N. Y.

Editorial Staff

- Miss Elizabeth Wight, Editor
Mrs. A. K. Fisher Miss Carolyn Nickels
E. A. Halbach H. L. Grunwald

Advisory Editors

- Prof. Leon Campbell — Variable Stars.
Prof. Charles P. Olivier — Meteors.
Prof. George Van Biesbroeck — Asteroids, comets, and double stars.

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including subscription.

Send all communications to the above address.

- Tue. 16 Conjunction of Saturn and the sun.
- Fri. 19 First quarter at 5:46 A.M. Alpha and Beta Ursa Majorid meteors.
- Sat. 20 Sun enters Aries. Spring commences at 6:45 P.M.
- Fri. 26 Full moon at 5:12 P.M.
- Wed. 31 Conjunction of Mars and the moon at 3:22 P.M. Mars 2° 7' north.
- APRIL, 1937**
- Thu. 1 Venus 20°.2 north declination.
- Sat. 3 Last quarter at 9:53 P.M.
- Sun. 4 Conjunction of Jupiter and the moon at 8:01 P.M. Jupiter 3° 18' south.
- Wed. 7 Conjunction of Mercury and Venus at 9:00 A.M. Mercury 6° 49' south.
- Sat. 10 New moon at 11:10 P.M.
- Sun. 11 Lambda Serpentid meteors.
- Mon. 12 Conjunction of Mercury and the moon at 5:30 A.M. Mercury 1° 13' south.

3331 W. National Avenue,
Milwaukee, Wis.

of beautiful objects that we have felt rich indeed.

"The writer of these notes is one of the school teachers and the maker of the reflector. He is now riding a hobby which has had to wait since he was a boy in grammar school. He was first fired with a love of the starry skies when he was privileged to look through a 2-inch refractor a friend possessed. It is now his wish to spread the knowledge of the beauties that lie just beyond the unaided human eye and will feel that he has labored in a good cause if a few boys and girls may lift their eyes and behold the glory of the heavens. In a sense, this is the most serious work we have done with our equipment. We ourselves, may not be Peltiers, yet who knows but we may discover a comet?"—*Arthur L. Pursell, President, Tulare Astronomical Club, 738 E. King St., Tulare, Calif.*

4917 Mountain Blvd.,
Oakland, Calif.

Obituary

On last December 31, at 23 hours, 59 minutes, 59 seconds, sidereal time, in the last lingering moments of the year 1936, the Amateur Telescope Makers of New York, passed away. It had been in ill health for a period of two years, being homeless and too proud to go on relief. Its passing left New York again without a telescope making organization, a calamity of calamities.

Birth Notices

Mr. Lou Lojis and Mr. Robert G. Cox, are happy to announce the birth of their new brain (?) child, the Optical Division of the Amateur Astronomers Association. The Optical Division was born on January 1, 1937 at 0 hours, 0 minutes, 1 second, sidereal time. Mr. Charles A. Federer Jr., secretary of the Amateur Astronomers Association, acted as M.D., and is fully responsible for bringing the Optical Division into the world. It was named by its god father, Edward Hanna, and is thriving heartily on a diet of carbo, emery and pitch, with a teaspoon of rouge for dessert. Its nursery is the Optical Workshop in the basement of the Hayden Planetarium, famed house of the stars in New York City, where it is resting quietly as it grows larger and stronger daily.

Metropolitan Notes

ASTRONOMICAL SOCIETY OF
RUTHERFORD, N. J.

JAMES S. ANDREWS, President
33 Franklin Place, Rutherford, N. J.

The second meeting of January was a joint session with the Amateur Astronomers Association of Bergen County at Teaneck, N. J. Samuel E. Haines lectured on the solar system.

Our first February meeting was led in a discussion by Paul J. Hagar, vice-president, Willard Savary and Theodore Treadwell, on "The Chemical Composition of the Solar System."

Several of our members report regularly on variable stars and observations of the minor planets.

Our President is giving a series of illustrated lectures in the Montclair Y.M.C.A. Monday evenings on "Astronomy—Exploring the Universe."

METROPOLITAN ASTRONOMICAL SOCIETY
JAMES S. ANDREWS,
Regional Organizer

Mirror grinding demonstrations are being held at the New York Museum of Science and Industry on Saturdays. Many and varied are the questions asked. A 6-inch Pyrex is now in the stage of 220 carborundum grinding.

LONG ISLAND TELESCOPE MAKERS
E. CHRISTMAN, Correspondent

Pressure of business and other activities have compelled our busy president, Al Luehringer to assign this contribution to your correspondent.

L.I.T.M. has resumed its study program which consists of a series of papers based upon Vol. II of Russell, Dugan, and Stewart's "Astronomy". Members take turns in the preparation of this material and must be prepared to conduct a general discussion after its presentation.

We heartily recommend this plan for "Self Teaching" to other groups as it seems to be the most successful method for promoting interest and keeping every member on his toes.

Fred Schmid spoke on "The Stars" with special reference to their spectral classes. Let us hope that every paper is as well prepared!

90 Nelson Street,
Farmingdale, N. J.

AMATEUR ASTRONOMY

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Ten Cents.

Purkinje Is Still With Us

HANS D. GAEBLER

To compensate in a measure for our inattention to what the foreign amateur is doing, the Purkinje phenomenon in its relation to variable star observing is offered as a subject which has lately occupied the front page in foreign amateur journals.

The scientific study of star colors is quite new and we all recall the fantastic nomenclature, such as "Cor Caroli . . . , a fine double, flushed white . . . and pale lilac" (Gibson) in our star lists of a few years ago. Also, our "hints to observers" from our AAVSO contained suggestions almost bordering on a controversy, telling us to observe red variables by staring at the star for some time, or, as some claim, to merely glance at it hurriedly. In the "gay nineties" when psychologists were determining the "limen" by estimating small differences in star magnitudes, came also the study of color sensitiveness.

Due to the red sensitive cones at the center, and the blue-green sensitive rods at the margin of our retina, we have, so to speak, a daylight eye and a night eye combined in one. As Miss Furness in "Introduction to the Study of Variable Stars" (p. 198) illustrates it: "In a light room red objects appear brighter than green ones but in dim light the reverse is true." The day eye is sensitive to a maximum wave length of 555 microns, the night eye to 520 microns. To take this factor into account in observing red stars is the subject of great interest in recent foreign literature.

The Russian amateur journal "*Die Veruenderlichen Sterne*", Sept. 1936 issue, contains an article by W. W. Scharonow which suggests an ingenious procedure. "Faint red stars," says the writer, "lose in apparent brightness relative to white stars, which is, properly speaking, the Purkinje effect." He suggests placing a small yellow filter in the focal plane of the telescope and observing some well-known star field, the stars being brought in turn behind the filter and compared by the usual methods of variable star observing with those whose light is unobstructed by the filter.

"Since this filter absorbs the violet portion of the spectrum it cuts off a much larger portion from the night visibility curve than from the day visibility curve. Thus a filter transmitting light up to 540 microns wave length, the apparent absorption will be 0m.5 for bright light, and 1m.5 for faint light. The absorption will remain constant for bright stars but will change rapidly when passing to fainter stars."

In the January number of "Die Sterne" (a German amateur journal) G. R. Miczaika reviews the above Russian article. He calls attention to errors which creep into estimates of variables when comparing red stars with white stars. Not only is the human eye more sensitive to red at maximum but the same observer using telescopes of different power will experience this also. In the Vatican publication on this subject by Osthoff he mentions the fact that red appears brighter to the eye in youth than at old age, and is brighter for women than for men.

Independently of this German's review of the Russian paper, another German, Fr. Lause, gives much space to the subject in the Jan. 1937 number of "Die Himmelswelt." He observes that the ordinary spectrum appears brightest at the light green end. While sensitiveness of the rods of the retina does not vary greatly in individuals, sensitiveness of the cones does vary. Therefore, various observers differ greatly in their estimates of red variables. Lause illustrates the Purkinje effect by assuming a comparison of two stars of equal brightness, one blue and one red. If the brightness of both diminishes, the blue will appear brighter than the red, but if the light gradually decreases, the red appears brighter, as we should expect. The remarkable thing is, however, that Lause mentions two Frenchmen (no names are given) who claim that blue appears brighter. Purkinje is still with us.

404 Eighth Street,
Watertown, Wis.

AAVSO Nova Program Notes

L. E. ARMFIELD

Richard Abrahams continued his good work during February as will be noted in the columns below. Epepe Loreta, who is rapidly becoming one of the most famous amateur astronomers in the world through his excellent work on variable stars and meteors, contributed a fine report from sunny Italy. Miss Louise Ballhausen, our ever faithful contributor, extended her survey to the seventh magnitude on many evenings through the use of binoculars. Neil McNabb, Jr., our Canadian neighbor, deserves much credit for reviewing his regions with binoculars on all but two evenings.

Grateful appreciation is hereby tendered to all members of the nova search program for their good work.

Observer	Location	Region	7	Magnitude of faintest star easily visible						Total Night
				6	5	4	3	2	1	
Abrahams	Milwaukee	59	13	1	...	...	...	...	...	14
		65	...	7	6	...	...	...	...	13
		66	...	5	8	...	...	...	...	13
		67	...	5	8	...	...	...	...	13
		68	...	5	6	1	...	...	...	12
		69	...	8	4	1	...	...	...	13
		80	...	6	6	1	...	...	...	13
		81	...	8	5	...	...	...	...	13
		82	...	6	5	2	...	...	...	13
		91	...	6	6	1	...	...	...	13
92	...	8	5	...	...	...	...	13		
Ballhausen	Scarsdale	12	4	2	...	1	1	...	...	8
		33	3	...	2	2	1	1	...	9
		55	2	3	1	...	2	...	1	9
		57	...	...	2	...	...	...	...	2
Halbach	Milwaukee	49	...	...	2	...	4	...	...	6
		50	...	...	2	...	6	...	...	8
		71	...	2	2	1	3	...	...	8
Jones	Goffstown, N. H.	14	...	...	10	...	...	...	...	10
Kirkpatrick	New York	92	1	...	3	...	...	...	...	4
Loepfe	Milwaukee	42	...	...	3	1	...	...	...	4
Loreta	Bologna, Italy	17	...	5	3	...	...	...	...	8
		112	...	4	3	...	...	...	...	7
McNabb, Jr.	Acton, Canada	8	4	5	...	...	...	...	...	9
		72	3	8	...	...	...	...	...	11
Moore	Milwaukee	54	...	6	8	...	...	2	...	16
Olson	Chicago	51	6	1	3	...	...	...	...	10
Thomas	Cambridge, Mass.	3	...	...	1	4	5	1	...	11
Rosebrugh	Poughkeepsie	1	3	3	2	...	...	...	...	8
		52	5	2	1	...	...	...	...	8
Treadwell	Arlington, N. J.	47	...	...	4	2	...	...	...	6
		103	...	...	3	2	...	...	...	5

13 Observers 32 Regions 3200 square degrees of sky reviewed.

The following observers reviewed their regions with binoculars or low powered finders: Ballhausen, Kirkpatrick, McNabb, Jr., Moore, Olson and Rosebrugh. 1410 N. Marshall Street, Milwaukee, Wisconsin.

Variable Star Section

D. W. ROSEBRUGH, Director

Listed below are the observations for the month. Please keep up the good work of reporting these and especially your interesting comments as to unusual happenings in the sky.

Name	Variable Stars Seen	No. of Obs.
Louise Ballhausen, Scarsdale, N. Y.	23	30
Callum, Chicago	7	7
Hartmann, Springfield Gardens, N. Y.	124	231
McNabb, Acton, Ont.	3	7
Peters, Victoria, B. C.	3	6
Rosebrugh, Poughkeepsie, N. Y.	33	66
Smith, Vineland, N. J.	2	3

We welcome Wm. Callum as a new contributor to this column though he is well known in the AAVSO. Mr. Robert Peters is doubly welcome as he is a new contributor to both the AAVSO and the AAAA. He is a neighbor of the Dominion Astrophysical Observatory, Victoria, B. C. with its fine 72" reflector.

Mr. Brocchi, Seattle, says that on 577 which was the one really clear night all month, he found the U Gem. type variable star, SU Ursae Majoris at a maximum of 113 and the irregular variable star RR Tauri at 137, the faintest minimum since 1933. What would he not have discovered if it had been a clear month?

Mr. McNabb says that o Ceti fell below 6.8 before it became lost in the sunset. Nighthawks will find it visible again before sunrise about July 1.

The Milwaukee Astronomical Society forwards the following fine series of observations made by their members on the U Gem. type variable star SS Aurigae whose maximum of 110 on 558 was reported by Mr. Bouton last month.

Julian Day	Mag.	Julian Day	Mag.
546	145	562	125
550	146	565	144
556	124	566	145
557	115	574	143
559	113	579	145
560	119	581	135
561	126	593	140

Good news! The Spring Convention of the AAVSO will be held May 22 at Syracuse University, Syracuse, N. Y., at which we all hope to meet our old friends and make new ones.

Hints On Variable Star Observing

D. W. ROSEBRUGH

A celebrated old recipe for rabbit pie is said to start "First you must catch your rabbit". The author of this aphorism apparently wished to give instructions on the conduct of life as well as upon cooking. Taking this advice to ourselves as especially directed to variable star observers it is evident that a variable star must be "caught" before an estimate of its brightness can be made. We can identify a nebula, star cluster or double star for which we are seeking, by the appearance in the telescope, but with a variable star we have no such adventitious aid. The star when found looks just like dozens of its fellows in the same field and can only be identified by its location on the chart with regard to the stars surrounding it.

Instructions as to how to locate and observe variable stars are contained in Circular No. 1, General Instructions to Ob-

servers which Prof. Leon Campbell, Recorder, American Association of Variable Star Observers, Harvard College Observatory will be glad to send to any one on request, but the following suggestions gleaned from discussions with experienced amateur observers may be of general help.

Finder or "f" charts can be secured from the Chart Curator, Mr. F. Hartmann, 171-25 144th Ave., Springfield Gardens, L. I., N. Y. A finder chart is available for each variable star and these charts are invaluable aids in locating the variable stars. To use a finder chart one should have as a minimum a good inverting finder telescope with a 1¼-inch objective, magnifying six times and with a corresponding field of about seven degrees. If well made such a finder will show eighth magnitude stars which will enable one to start ones search for the

variable star at some naked eye star shown on the "f" chart and also in a good atlas like the new AAVSO atlas. From the naked eye star one should jump from eighth magnitude star to eighth magnitude star until the location of the variable star is found. After this the variable star can be identified with the larger telescope by its position with regard to the surrounding stars in the same field. The author's recent experience with a 1½-inch finder magnifying 12 times with a field of about 3½° seems to indicate that this size is better for variable star work than either a smaller or larger finder.

Akin to the above method of locating variable stars by using the finder charts is a scheme evolved for beginners by the Milwaukee Astronomical Society. They have issued a list of variable stars located so near bright naked eye stars that when the telescope is pointed at the bright star the variable star near it will be found in the same field of view. The author is indebted to Walter S. Houston, 807 E. Otjen Street, Milwaukee, Wis., for calling his attention to this list. Beginners, especially those without adequate finders should ask him for a copy of the list which will enable them to start work on these stars which can be so readily located. As a supplement to this method and also as a general assistance in finding any variable star with facility one may well follow the practice of Louise Ballhausen, 1 Gilmore Ct., Scarsdale, N. Y., which is to mark all variable stars on ones atlas in red ink.

Observers who have setting circles on their telescopes should ask Leon Campbell for a copy of the list prepared by E. H. Christman, 90 Nelsen St., Farmingdale, N. Y., showing the distances in R.A. and Declination of each variable star from the nearest naked eye star. For an amateur this different method is faster than attempting to locate a variable star directly from its R.A. and Declination. Even if the circles are badly out of adjustment this method will suffice to point the finder telescope at the variable star field.

So much for instructions as to how to "catch the rabbit". Having found the variable star its magnitude is determined by comparing its brightness with comparison stars of known magnitude as shown on the AAVSO charts. This method of determining the brightness of a variable star was developed by the German astronomer Argelander (1799-1875). It is fully described in the AAVSO Circular No. 1 referred to above but some suggestions as to how to secure accuracy in ones observations may

be of use.

As far as possible every observation should be an interpolation between the comparison stars which are nearest the variable star in brightness though if one of these lies outside of the telescope field it is sometimes more accurate to use a star lying in the field of view even though it is farther removed from the variable star in brightness.

As Dr. Caroline E. Furness stated in her book "An Introduction to the Study of Variable Stars" the lower portion of the eye, that is the part used most in reading a book, seems more sensitive to light than the upper part. To obtain a true comparison between the brightness of a variable star and a comparison star of nearly equal brightness it is sometimes necessary to twist the head so that the line between the two stars appears horizontal to the eye. It is preferable also to move the telescope so that each star is equally distant from the center of the field of view as, at any rate to some eyes, stars appear brighter when near the edge of the field of view than they do near the center.

Sometimes a variable star is so nearly the same brightness as a nearby comparison star that one cannot decide between them. As the stars twinkle, first one, then the other appears the brighter. Under these circumstances remember the advice of Sir William Herschel and report them as being equally bright. In such cases some amateurs determine which star is the brighter by slowly racking the eyepiece in and out noting which of the two out-of-focus images of the two stars first disappears. Obviously this method can only be applied to fairly bright stars as of course the faint stars at the limit of vision can only be seen if the telescope is perfectly focussed.

Owing to the wealth of information which is available as to how best to observe variable stars next month's article will also be devoted to this subject. The writer is indebted to various members of the AAVSO, particularly Mr. Brocchi of Seattle, for information upon the use of telescopes which they have kindly sent him for next month's article, but in the meantime if anyone has some specially useful method of procedure, especially in the use of reflectors, please send it in so that others may reap the benefit of it. It is hoped to make this column a clearing house of information of real worth to variable star observers.

3 Yates Boulevard,
Poughkeepsie, N. Y.

Editor's Note

It should be noticed that this issue contains comparatively few news notes. This is due to the fact that the news notes were not received in time to be included. In fact, the editors have held the copy for ten days after the deadline, which was the 15th of March.

For several months Amateur Astronomy has been put in the mail quite late in the month of its issue. It should be sent out on the first of the month, or at least during the first week, but because news notes in so many cases have been so late in receipt, the issue has not at times been mailed until towards the middle of the month.

May we ask for cooperation from the units in that the secretaries send news notes to arrive in Milwaukee on or about the 15th of the month previous to publication. We know it is often difficult to accomplish this, but we want to send out our publication on time. So hereafter, when news notes are not received at deadline, they will either be published the following month, or omitted, as the senders desire.

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Send all communications to the above address

Calendar of Events

GEORGE DIEDRICH

APRIL, 1937

- Thu. 1 Venus 20°.2 north in declination.
Sat. 3 Last quarter at 9:53 P.M.
Sun. 4 Conjunction of Jupiter and the moon at 8:01 P.M. Jupiter 3° 18' south.
Wed. 7 Conjunction of Mercury and Venus at 9:00 A.M. Mercury 6° 49' south.
Sat. 10 New moon at 11:10 P.M.
Sun. 11 Lambda Serpentiid meteors.
Mon. 12 Conjunction of Mercury and the moon at 5:30 A.M. Mercury 1° 13' south.
Fri. 16 Quadrature of Jupiter and the sun.
Sat. 17 First quarter at 2:34 P.M. Inferior conjunction of Venus and the sun.
Mon. 19 Mercury at greatest elongation (20° 2') east of the sun.
20-24 Lyrid meteor shower. Maximum on the 21 (AMS shower).

- Sun. 25 Full moon at 9:24 A.M.
Tue. 27 Conjunction of Mars and the moon at 7:51 A.M. Jupiter 3° 45' south.
MAY, 1937
Sun. 2 Conjunction of Jupiter and the moon at 7:51 A.M. Jupiter 3° 45' south.
2-6 Eta Aquarid meteor shower. Maximum on the 4th (AMS shower).
Mon. 3 Last quarter at 12:36 P.M.
Wed. 5 Theta Ophiuchid meteors.
Sat. 8 Conjunction of Venus and the moon at 9:12 A.M. Venus 2° 35' south.
Mon. 10 New moon at 7:18 A.M.
Tue. 11 Transit of Mercury across the sun. Inferior conjunction of Mercury and the sun at 4:00 A.M.
Fri. 14 Gamma Delphinid meteors. 3331 W. National Avenue, Milwaukee, Wis.

Milwaukee News Notes

M. N. FISHER, Correspondent

George Diedrich, president of the junior auxiliary of the Milwaukee Astronomical society, has recently received a 6-inch reflecting telescope from the AA VSO for carrying on his observations of variable stars.

Jack Schmid is busily engaged in mounting the 7-inch mirror which has been loaned to him by the Milwaukee Y.M.C.A. Jack will use this telescope for observing variable stars.

Walter Krutz has completed a 10-inch reflector, with a Springfield type mounting, which he will use this summer for public demonstration. The mirror is the handiwork of Joe Loepfe. The Krutz home is next door to Bay View High school and scores of students have already made informal plans to attend Walter's illustrated tours of the heavens.

Messrs. Cooke, Halbach, Phillips and Schmitz devoted a recent Sunday to installing the radio apparatus used in duplicate observations of meteors for real heights at Mr. Phillip's farm in Waukesha county.

Miss Elizabeth Wight, editor of Amateur Astronomy, recently had a brief visit with D. F. Brocchi of Seattle, Wash. Brocchi's telescope, which he made, is placed in the back yard of his home in Seattle. His scope is a reflector, and its finder is also a reflector. He reports that he figured the number of observing nights per month to average two! He is not doing work of particular importance now, he says, except transferring Durchmusterung magnitudes to Harvard plates for comparison purposes. Space limitation in the shelter required construction of an unusual mounting of his instrument, a description of which we hope will come from Mr. Brocchi for publication in the near future.

L. E. Armfield spoke at the Lutheran Reformed church in March on the heavens as seen through great telescopes. Edward Halbach gave a Sunday afternoon talk recently to a forum group at the Y.M.C.A. His subject was "Assembling the Universe."

The Milwaukee Astronomical Society again participated in a hobby show sponsored by the Milwaukee Hobby Clubs Council in connection with the annual Home Show at the Milwaukee Auditorium. Due to limited space the exhibit included only one small reflecting telescope and a number of star charts, photographs and publications. The central theme "Make Science Your Hobby" combined the exhibits of the geological, entomological and astronomical groups in the city.

836 N. 14th Street,
Milwaukee, Wis.

Optical Division of the Amateur Astronomers Association

HAYDEN PLANETARIUM, N. Y.

LEW LOJAS, President

Although a number of the members of this group, formerly The Amateur Telescope Makers of New York, have been members of the Amateur Astronomers Association of New York, difficulty arose because an active telescope making group was lacking. Hence it was decided upon by Charles A. Federer, Jr., secretary of the AAA, that an active group was essential to the organization and for the encouragement of a still greater interest of this hobby in New York. The proposal was suggested, and immediately a special meeting was called which resulted in a pro and con discussion, that made inevitable the change of this society's former name to the Optical Division of the AAA.

Under this new arrangement a most promising future is evident, and the member derives a number of various privileges which are at his disposal as follows:

Classes in elementary or advanced mathematics

Classes in elementary or advanced astronomy

Classes in constellation study

Bi-monthly lectures with moving pictures and slides by the most eminent authorities in astronomical or other allied scientific fields.

During the past month two interesting lectures were heard:

Dr. Charles P. Olivier on "Double Stars"
Dr. A. M. Skelton on "The Solar Corona"

In addition to the above benefits each member receives a monthly copy of the magazine, "The Sky", published by the Hayden Planetarium staff, which covers a wide field of astronomical and scientific subjects for interesting and instructive reading.

However, to the charge of the Carbo Brigade, the above has been more or less forsaken as the planetarium workshop has become a beehive of activity and a curious mixture of little Telescope Nuts pushing big mirrors and big T. N'S. sweating over little sizes, neither knowing when to quit until the lights are suddenly turned out leaving them in the dark (as usual).

Another oddly curious and observed fact is that most rabid mirror makers here are gluttons for eating hamburger sandwiches and devouring them voraciously. From the looks of things the pitch stove will be doing double duty.

Wonder what Everest thrives on?

1510 White Plains Road,
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