A A V S O   A B S T R A C T S

Edited by R. Newton Mayall

PAPERS PRESENTED AT THE NAHANT MEETING, OCTOBER 1 - 4, 1959

The 48th Annual Meeting of the AAVSO was held at Nahant, Massachusetts, on October 1 to 4, 1959. Nahant is a small island about 10 miles north of Boston. It is connected to the mainland at Lynn by a causeway which provides several miles of excellent beach from Nahant to Swampscott. Nahant is like a truncated cone rising about 75 feet above sea level. It is not a summer resort, but has a year round population of about 2,679. Near the top of the island, the Edgehill Inn provides an excellent view across the Harbor to Boston -- a particularly beautiful sight at night. Below, near shore, all manner of boats are moored all summer long.

The Edgehill Inn retains much of the flavor of the past, and is composed of three large separate three-story buildings. Because of the number of permanent residents at the Inn, some members had to be given living quarters in homes around town. All meals were taken at the Inn, and our Annual Dinner was made attractive with lobster thermidor in very festive array.

Nahant was selected for our meeting because it provided an uninterrupted view of the eastern horizon -- a wonderful spot to observe the eclipse. We were privileged to have the use of a part of the U.S. Army NIKE base, which is about 60 feet above sea level. The Army cooperated in every possible way, so that our members could set up their equipment for observing the eclipse.

Most of our members arrived on October 1 to rehearse, and examine the eclipse site. Others arrived at the site a little after 5:00 a.m. EDST. Hopes were high for a good view until the last few minutes before totality, when a heavy rainstorm swept down upon us from the northwest, completely spoiling any chance of a clear horizon. But everyone stayed at the site until the eclipse was over. All during totality, both instruments and humans were getting thoroughly wet.

Notwithstanding the great disappointment in not being able to have clear skies, the phenomenon as viewed through the rain and clouds was interesting -- the slow approach of darkness, followed by a rapid rise to brightness. Some photometric readings were obtained. As the clouds began to brighten after totality, a bedraggled group picked up their instruments and headed back to the Inn, where a crackling fireplace greeted us, and a good breakfast was had by all. It was a jolly gathering at breakfast; and as we ate, looking out over the harbor, the rain stopped and the sky began to clear -- the beginning of wonderful weather for our meeting, keeping up a long record of clear skies for AAVSO annual meetings. There is a conviviality about old New England inns that can't be found in hotels.

Friday afternoon many members visited the Boston Museum of Science where the Northeast Region of the Astronomical League was holding a post eclipse meeting. The AAVSO was asked to take charge of part of the session (reported on the last page).

Friday evening we gathered informally in a spacious and comfortable lounge to listen to Dr. Dorrit Hoffleit talk on the subject "Back to Variables." Following Dr. Hoffleit's talk, Edgar Paulton showed color slides of scenes near and far, and numerous photographs of flowers and insects.

If there was ever an excuse for distant members to come to New England, this was it, and they did come. The farthest distance was travelled by Father Ronald Royer, who flew in Thursday by jet from California and left Saturday afternoon to fly back by jet, to be on hand for masses on Sunday morning.

Recently elected members attending the meeting were Orin Kindt, Wisconsin, and Helen Underwood, Rosalie Kunstadt and Curtis Bight of New York. We were glad to see the Joseph Anderers of Illinois, Margaret Beardsley from Vermont, Carl Kurtz from New Jersey, Dr. and Mrs. E.C. Rademacher from Connecticut, Rev. and Mrs. C.J. Renner, from Michigan, Lawrence Yont from Boston, and Donald Zahner from Missouri, who have not attended meetings for some time. Tom Roderick and two friends drove in from Ohio. We hope that John Bibber (12 years old), who attended our meeting, will follow in the footsteps of his grandfather -- Leon Campbell, the first Recorder of the AAVSO.

The great exodus took place Sunday morning. About 25 members stopped at Headquarters for Open House, and many went on to visit Harvard Observatory's Agassiz Station.

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BACK TO VARIABLES, by Dorrit Hoffleit

Dr. Hoffleit's talk was apropos of the occasion, after a wet early morning eclipse of the sun; but she pointed out that the sun is a variable star, too. She recounted the stories of the first four variables to be discovered, and outlined the various methods by which variables can be discovered, other than visual.

Pickering used a system of a series of exposures that made the stars look like strings of beads. Another method is to place a negative plate over a positive plate taken at another time, so that the black images on the negative plate are centered on the white images of the positive plate. Then there is the method of using a prism over the objective, which indicates some variables by bright emission lines in their spectra. The blink microscope is used by observing two plates at the same time, by switching quickly back and forth from one to the other.

This was followed by a brief reference to the fact that 100 to 200-day periods often change over a period of time. She also referred to the work done by Bok, who noticed dark patches he called globules. These may be dust balls that may contract into stars. The Eta Carinae region contains many of these peculiar objects. Perhaps these globules are an example of evolution. Dr. Hoffleit pointed out that among Population I and II stars are two kinds of Cepheids. Population I stars are found only in spiral arms of galaxies, whereas the Population II stars are found in the galactic halo and nucleus.

Dr. Hoffleit is working in the Sagittarius region where a wide variety of variables of both Populations has been found. She is also interested in peculiar A-stars and has a list of bright ones suitable for those who observe by PEP. (A list of the A-stars may be obtained from Lewis Boss, 134 Loma Vista Drive, Burlingame, California.)

THE WORK OF THE SOLAR DIVISION, by Harry L. Bondy

The Solar Division's work in the past year followed essentially the same program we carried out in 1958. Our Sunspot-Number observations to obtain the American Relative Sunspot Number R_A' for the National Bureau of Standards continues to be compiled by 18 Standard or experienced observers. These members are mostly in the USA, but also in Canada, Peru, Brazil, Greece, England, South Africa and Japan. Eight additional observers participate in this work, two of whom will shortly become "standard" observers, namely Messrs. Wallbillich and Lorenz. Some members are from Germany and the Philippines. Two new observers joined our ranks last year, namely Messrs. Herman W. Lang of St. Louis, Missouri, and Patrick O. Parker of Griffin, Georgia.

Eight of our sunspot observers participate in a study to supply data for the East-West assymetry of sunspots for Prof. Gleissberg and Dr. Hotinli, of Turkey.

A small but very active and devoted group of our members is engaged in the only co-ordinated radio-astronomy program of amateurs, namely, in the "indirect flare patrol." This study is carried out for the NBS as part of the US-IGY and now IGC-59 program. Our work has been acknowledged through grants from the NBS and the National Science Foundation.

This program of recording "Sudden Enhancements of Atmospherics" on 27 kc/s is based on the Warshaw-type transistorized receiver and a recorder. The active members are David Warshaw, Brooklyn, New York; Walter A. Feibelman, Pittsburgh, Pennsylvania; C. H. Hossfield, Ramsey, New Jersey; Ralph N. Buckstaff, Oshkosh, Wisconsin; Justin Ruhge, China Lake, California, and Stanislaus Scharlach of Oakland, California. Harry L. Bondy is coordinating this study and analyzing the data, which are forwarded to the NBS. Summary reports are published each month.

The present Solar Division Committee consists of the following members: Ralph N. Buckstaff, Thomas A. Cragg, Sarah J. Hill, David W. Rosebrugh, Alan H. Shapley, David Warshaw, and Harry L. Bondy. We are very grateful to Dr. Sarah J. Hill for her reduction work of our sunspot observations and also for her preparation of the "large" summary sheets with individual sunspot observations.

1959 REPORT OF NOVA SEARCH DIVISION, by George Diedrich

During the past year our Nova Search program has received considerable impetus from two sources; increased observations from our Canadian friends in Montreal, and a whole new set of observers watching the southern skies in Australia. A summary of the observers and numbers of observations received during 1958 was published in the Journal of the Royal Astronomical Society of Canada, Vol. 53, no. 3. The statistics for the period from October 1958 to October 1959 is as follows:

Number of active observers	29	Areas observed at least once since 1955	100
Mailing list	136	Areas observed actively in the 1958-1959 period	53
Areas assigned	100		

This is the first time observed areas have been broken down into a general and an active list. It has taken a few years to determine whether certain areas, observers, or both, intend to continue in the "Active" list. It is planned to formulate a letter asking whether we can "have back" the areas not observed for some years. This, we hope, may remind some observers that they haven't checked their areas in some time and encourage them to rush right out and do so.

With the advent of satellites by the dozens, it behooves us to watch the skies in case someone sends up a satellite which is not announced -- it could happen! So all we can say to members of the AAVSO, particularly Nova Searchers, is--- Keep Looking.

ON THE OBSERVATION OF SHADOW BANDS, by Edgar M. Paulton

The strange phenomenon of the shadow bands which appear approximately two minutes before totality and for the same duration after totality at the time of a solar eclipse has never been satisfactorily explained.

So far, however, the accuracy of prediction of orientation and the direction of motion of the shadow bands has not been high enough or sufficiently extensive, and certain anomalies require explanations, but the fact that observations always show the bands parallel with the edge of the lunar shadow makes it look as though a more serious view should be taken of the diffraction ring hypothesis. More accurate data is essential and this should be presented in a manner which eliminates the confusion and ambiguities that have existed in nearly all the reports in the past.

Why should this confusion exist? Let us look for a moment at the nature of the phenomenon. Shadows are dim, diffuse, and in motion. Observations have been made on horizontal, inclined, vertical normal and oblique planes, speeds have been estimated (?), widths have been judged by persons of varying ability, and there has been no established point of reference other than compass directions for horizontal observations. To reduce these reports to the common factor that will make comparisons possible is a laborious if not impossible task, that might well set up complexes in an electronic computer. Of 60 reports examined, less than half a dozen have presented enough information. Here is good enough reason why reports have never seemed to have any relationship to each other.

Standardization is essential, not only for a single latitude, or a specific altitude of sun but for all observations. This can be achieved through the simple expedient of erecting a screen upon which the shadow bands are observed, and orienting it in such a manner that it is at right angles to the axis of the lunar shadow cone. This is possible for any observer at any latitude at any altitude of the sun. Observations thus obtained may be compared directly.

The projection screen is basically a framework about 1.5 meters square covered with white canvas, stretched taut. A rod about a foot long is fastened perpendicular to the screen at the point where the diagonals of the square frame cross. The screen is set up at the last few minutes before totality, so the protruding rod will not cast a shadow. The screen will then be, for all practical purposes, at right angles to the axis of the lunar shadow cone.

With construction completed, mark out a circle of 1.5 meters diameter and calibrate it in degrees clockwise along the perimeter. An indicator rod, the length of the circle's diameter should now be made to rotate about the center. (The protruding rod may be removed once the screen is set up in its correct position.) The screen should be adjusted so that 0° is at the top of the screen and the 0° - 180° line set with a plumb bob. The inclination of the screen will of course vary according to the latitude of the observer and the circumstances of the eclipse.

When the shadow bands first appear the orientation or angular position on the screen should be determined with the orienting rod and a reading taken in degrees. This angular position is not to be confused with the direction of the motion of the bands, which is generally normal or at right angles to the orientation. Readings of both orientation and direction of motion are taken at 30 second intervals both before and after, and even during totality if the bands are visible.

Band widths and speeds are determined with a stop watch by sighting on one of the dark bands at the edge of a circle about 1.5 meters in diameter drawn on the screen, following it across the diameter of the circle to the opposite side. The speed is obtained from the elapsed time for one of the dark bands to cross the circle. The number of dark bands which cross the perimeter of the circle at a given point is recorded. The speed and the width of the bands are simple calculations.

This system obviously requires rehearsals: each member of the observing team must know exactly what he is expected to do and he must be able to perform it without hesitation and with precision. It is hoped, with this standardized method of observing, an accumulation of data over the years will bring a clearer picture of the shadow band phenomenon and result in a more satisfying explanation of this unusual phenomenon. Report forms were available to all eclipse observers who wished to contribute shadow band reports for this eclipse or any future eclipse. (The construction details and use of the projection screen were shown by slides. A more detailed report will be published in "The Eye-Piece," the monthly bulletin of the Observing Group of the Amateur Astronomers Association. ED.)

SOLAR ECLIPSES, by Kenneth Weitzenhoffer

The appearance of the moon's shadow on a clear day was compared with the shadow on a cloudy day. The clouds (evident in Nahant) darkened in the manner of perspective of a railroad track. (ED.)

SUNSPOT PREDICTION POST MORTEM, by Leith Holloway

The smoothed American relative sunspot numbers reached a maximum of 188 about March 1st, 1958, or 1958.2. The smoothed Zurich definitive relative sunspot numbers attained a maximum of 202 on that same date. These values compare favorably with the value of 196 which I predicted as the maximum for the smoothed American numbers in the March to June 1956 issues of the Solar Division Bulletin. However, the maximum came eleven months after the date I had predicted for it. Other statistical predictions were also for an early maximum. For example, Dr. Waldmeier of the Zurich Observatory had predicted a maximum of 170 for 1957.1. One of the chief assumptions used in preparing my forecast was that the area under the curve of smoothed sunspot numbers from minimum to maximum is practically independent of the value of the maximum. This assumption was based on an equation in a paper by Waldmeier. However, the observed area for this sunspot cycle turned out to be about 35% higher than the formula predicts. Thus, the accuracy of my prediction of the value of the sunspot maximum appears to be no more than a fortuitous accident.

ANOTHER STAR ILLUSION, by Patrick Rizzo

Most observers of variable stars are familiar with certain optical illusions which involve some stars. Several of these illusions present special problems for observers; others are merely curiosities. The most famous one, of course, is the Purkinje phenomenon, which manifests itself in two ways. As a rule, two stars which appear of equal brightness when observed with a limited aperture, will no longer appear equal when the size of the aperture, or light grasp, is increased; provided one of the stars is more red than the other. The redder one will seem the brighter of the two in the latter instance. The second way the Purkinje phenomenon is evidenced is in the apparent increase in brightness of a red star as it is stared at for a period of a few seconds. All observers take this into account when making estimates.

Another illusion, often observed, has to do with two stars close enough to each other to be seen in the same field. If they appear to be equal in brightness when the imaginary line connecting them is horizontal, they will not necessarily appear equal when observed in such a way that the imaginary line connecting them is vertical. Usually, the lower of the two will seem brighter. Certain areas of the retina are more sensitive than others, and often a star observed with peripheral or averted vision will vary in brightness depending on what tiny patch of the peripheral retina the image falls on. Experienced observers, when using averted vision for very faint stars, will try to observe both the comparison star and the variable out of the same corner of the eye.

Next, there is the well known illusion of the apparent increase in size of an angular degree of sky when it is observed near the horizon. The distances between the stars as well as the size of the moon, seem larger as we look at them when they are near the horizon. This can sometimes be troublesome when we are in a hurry to locate certain stars usually observed higher in the sky. The naked eye judgment of angular distances between stars is then a bit confused.

Another illusion, referred to on page 222 of the Mayall edition of "The Field Book of the Skies," was noted by Herschel. It is the pendulum-like oscillation of a faint star in the same vertical with a brighter one, when the telescope is swung from side to side. Epsilon Pegasi is an example of this illusion.

Hans Wallach, in the July 1959 Scientific American discusses another famous sky illusion; the illusion of the sailing moon or stars. We have all watched the moon and stars, at one time or another, when they were surrounded by wind-swept broken clouds, which were scurrying across the face of the sky. To our gaze, however, it was the moon and stars which seemed to do the scurrying through the surrounding clouds. Wallach calls this illusion "the illusion of induced motion," and states that visual perception follows the rule that keeps the surrounding at rest and bestows motion upon the object surrounded.

An illusion I wish to describe was first brought to my attention on the evening of August 14, 1959, when a special moonwatch alert was held by the team of the Amateur Astronomers Association. The alert was held at the official station atop the RCA building in New York City.

Members had been looking down into their satellite telescopes for some time, when suddenly the faint object was sighted by one of them. After the fix had been made, some of the observers were asked to find it by naked eye observation. Three or four found the object immediately, while several others were misled by the illusion in question. There were no clouds in the sky, yet subsequent analysis led them to conclude that in the early twilight they had confused a star with the object they sought. In each case, the star had been seen to move up towards the zenith, with the slow, stately motion usually associated with artificial satellites. One or two immediately corrected themselves when they identified the star; others were fooled long enough to miss the object they were looking for.

There were evidences that part of the illusion was caused by the fact that the observers expected to see a star-like object moving in such a manner, and therefore suggested the motion to themselves as soon as they fixed their gaze on a sufficiently bright star. Yet, the fact that they all saw the apparent motion proceed in the same direction, warranted further investigation.

Subsequent experiments with various observers as subjects, observing from several different sites, have determined the elements that constitute the illusion. No wind-swept clouds are necessary or any "surroundings" in real motion across the face of the sky. However, there does have to be some object relatively near, like the side of a wall, a flagpole, roof, or some wires stretched across the field of view. This object should have no motion of its own -- the more stationary it seems, the more effective the illusion.

But the angular distance between it and the star should be changing slowly. Of course, the only way that can be achieved is by our own motion, but it should be a motion that seems motionless. This occurs when we stay rooted in one spot, yet slowly tilt the head sideward and upward by leaning back. Our movement is so slow, that the wall or pole appears not to have the parallactic motion that our shifting gaze has produced. The angular distance between star and object does change, so the motion is induced in the star and the consequent attempt to follow it with the eyes only adds to the illusion.

On the RCA roof two factors enhanced the illusion. The change from a strained, cramped position at the telescopes to an erect, uplifted gaze, and the great height above ground that the observational post entailed; both caused a slight unsteadiness or dizziness in some of the observers, resulting in the slight bodily sway conducive to the illusion.

Not all star illusions have been treated here. For instance, a variation of the Purkinje effect known as the Dove effect concerns red stars and the full moon. The veil of light produced on the sky by the moon exerts a contrast effect making red stars brighter.

VISUAL METEOR OBSERVING, by Arthur Pearlmutter

There is still room for the visual observation of meteors. It is all too frequently thought that the camera and radio telescope can do away with visual observing. Not so with meteors. To be sure, there is a limit to what the human eye and brain can accomplish in a night's observing, but there are also many disadvantages to the use of photographs and radio telescopes. For example, you can't get hourly rates from a photograph, nor can the radio telescope tell what it is seeing. Visual observing shouldn't be compared with other methods. (ED.)

FINE STRUCTURE OF THE SOLAR PHOTOSPHERE, by Constantin Chassapis

The following is the result of visual work I carried out during a complete solar cycle (1946-1958) concerning items of the fine structure of the solar photosphere as per Bulletin No. 11, AAVSO Solar Division. This work refers to statistical data resulting from 2204 observations of Pores, Veiled Spots, Faint Markings, Penumbral Wisps and Faculaeic Tracery; apparition, evolution and life-time of these items are the purpose of the present research.

A. PORES:

Pores are visible up to 58° from the solar disk's centre.
Pores, as a rule, appear under high dispersion between granulae.
Groups of 2 - 17 pores of the types A or B are recorded occasionally.
Groups of pores appear, as a rule, together with faculaeic tracery.
Groups ~~of more~~ than 4 pores develop, near maximum of solar activity, into groups of faint markings or sunspot groups.

CONT.

Dispersion of individual pores in groups of pores of the types A and B is twice as great as in groups of spots of the same types.

B. VEILED SPOTS:

Percentage: 3% with respect to sunspots; 0.9% with respect to veiled formation.
Lifetime: in general less than one day; in some cases (3%) up to 48 hours.
Veiled spots develop into regular spots in 48% of the cases.
Veiled spots appear in sunspot groups of the types E,F,G. In only 3 cases they were recorded in spots of the C type and only once in spots of the H type.
Tonality of their penumbra ranges between limits of visibility and a half-tone spot.
Their frequency does not seem to follow the 11 year solar cycle.
They usually appear (67% of the cases) in the area between the two main spots of the groups bridging over the former.
They appear in all the latitudes where sunspots are recorded.
They are recorded up to 20° out of the Central Zone.
Number of veiled spots in a single group does never exceed 8.

C. FAINT MARKINGS:

They appear in all types of sunspot groups; their number is proportionate to the type of group.
Their total number follows the 11 year solar cycle in a rate of 13% of the total number of formations having penumbra.
They especially appear during the breaking-up of one main spot of a group.
Their dispersion does not usually follow the inclination of the axis of the group; it takes place across an axis inclined up to 72° with respect to the axis of the group.
They develope into spots in 17% of the cases.
Lifetime up to 24 hours.
It has been ascertained that pores develop into faint markings.
Visibility of faint markings extend up to 3/4 of a solar radius.
Groups of faint markings are recorded in high latitudes at the limits of the spots' zones especially during the maximum of solar activity and near the equator during the minimum.
Percentage of faint markings is 5.63% with respect to the total number of spot-groups and 19.4% with respect to groups of the A type.
Number of faint markings per individual group of same ranges between 1 and 23.
Groups of faint markings follow up closely the 11 year solar cycle and are distinctly related with the 2nd law of distribution in latitude; they also appear at the solar equator.
Groups of faint markings belong to the type A in 82.37% of the cases and to the B type in 21.73% of the cases.
Groups of faint markings develop into groups of spots and vice-versa in 12% and 17% of the cases, respectively.

D. PENUMBRAL WISPS:

They are recorded in sunspot groups of the types F 74%, E 17% and G 9%.
They cover areas up to 2 square degrees in proportion: 1 or 2 square degrees 23%, less than 1 square degree 77%.
In 42% of the cases large penumbral wisps show a vertical shape; small penumbral wisps in 29% of the cases show a fibrous appearance, bridging sometimes over the space between spots.

CONT.

Their lifetime extends up to 4 days with gradual variation of their form.

E. FACULAEIC TRACERY:

They appear isolated or in groups in the Central Zone or out of the same up to 0.67 of a solar radius.
They are connected with the apparition of groups of pores or faint markings in 74% of the cases.
Lifetime: more than 24 hours in 11.53% of the cases.
Faculaeic Tracery cover areas up to 12 square degrees; usually up to 4 sq.degrees.
Faculaeic Tracery are not band-shaped like faculae; they are circular or elliptical, this last shape prevailing in 59% of the cases; their size can be limited up to the size of granulae with which they are sometimes confused.

MISCELLANY, by Margaret W. Mayall

Several years ago, nine long-period variables were selected for some special studies of their mean light curves. The sheet of curves I have here is to be printed in the December 1959 issue of the Journal of the Royal Astronomical Society of Canada (Vol. 53, No.6). It shows deviations from the mean for most of the variables, and proves our need for continued visual observations.

We have set up a number of special programs, many at the suggestion of our observers. For instance, Leif Robinson has always been particularly attracted to the many erratic nebular variables in the region of the Orion Nebula. He has made up a special chart of the region, with nearly 50 variables marked, and has enlisted several other California observers to help with simultaneous observations of the region.

Donald Engelkemeir has done some very successful work with his photoelectric photometer. He has made runs on a number of flare and suspected flare stars, and caught a beautiful flare of AD Leonis.

Andrew Young, a graduate student at Harvard Observatory, asked us to cooperate with him in a very difficult observing problem on CE Cas, a close double, both components of which are Cepheid variables, 11th magnitude, with periods near 5 days. Thomas Cragg has made some very useful observations of them, and several other observers are also starting work on the system. CE Cas a and b, and a third similar Cepheid, CF Cas, are members of a galactic cluster, NGC 7790, and are of great interest in the study of stellar evolution.

Special observing times have been set up for the peculiar variable V Sagittae. Robert Adams has been especially interested in it, and it is hoped that several observers, making simultaneous observations of it, will catch one of its rapid flare-ups.

Great emphasis continues to be put on observations of the fainter long period variables when they are near minimum phase. Our "Inner Sanctum" observers are doing some excellent work on these stars.

The bright, red irregular variables are still of great interest, and members with small telescopes and binoculars are doing valuable work on them. We hope to add a number more to our program, at the request of Dr. Jason Nassau, via the International Astronomical Union, as soon as we can get charts and sequences.

REPORT ON AAVSO AT DENVER CONVENTION, by Clinton B. Ford

The nationwide Amateur Astronomers Convention, when for the first time the AAVSO, the ALPO, the Astronomical League, the Western Amateur Astronomers and Unaffiliated Amateur Astronomers convened together, was held in Denver, August 28-31, 1959. Many AAVSO members attended. Mr. Ford gave a brief resumé of the activities of the convention and the part the AAVSO played in the proceedings. He was in charge of the AAVSO program, which was keynoted by a talk given by Dr. Gordon Newkirk. Other papers were presented by AAVSO members John J. Ruiz, William H. Glenn, Thomas A.Cragg, Walter L. Moore, David Warshaw, and Leif J. Robinson. It was obvious that everyone had a good time. (ED.)

FOLDING ASTRONOMY, by Newton Mayall

Not many authors have the opportunity of watching their "baby" go through all the processes necessary before it reaches the bookstore. Throughout the production of The Sky Observer's Guide, we had the opportunity to watch its progress. John Polgreen, Jerome Wyckoff, Margaret and myself, worked together to the bitter end, including an all-night vigil at the press in Poughkeepsie. If any book can be called an AAVSO book, the Sky Observer's Guide is it. All the authors have been members of the AAVSO for a long time. But the part of the book that I thought would interest you most is the printing. The entire book, all 128 pages of it, is printed on one sheet of paper. When you look at it, you wonder how the pages get to be folded in the right order. However, here is the printed sheet, and here is the book, to prove that it works. (The full size sheet 50 x 68 inches, the jacket sheet, signatures, and the final bound copy, were available for inspection. ED.)

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THE AAVSO AND THE NORTHEAST REGION OF THE ASTRONOMICAL LEAGUE

Concurrent with the 48th Annual Meeting of the AAVSO, the Amateur Telescope Makers of Boston were hosts to the Northeast Region of the Astronomical League at the Boston Museum of Science. The AAVSO was pleased to be invited to take charge of a part of the Friday afternoon session on October 2nd.

Our President, Ralph Buckstaff, was moderator. He opened our part of the program with a brief outline of the history of the AAVSO. Harry Bondy outlined the work of the Solar Division of the AAVSO, and its accomplishments. (See paper following.)

Dr. Everett Rademacher reported on his expedition to Bangkok to see the total eclipse of the sun in 1955. He and Mrs. Rademacher took many colored slides, which vividly portrayed the manners, customs and physical features of this mysterious land.

Father Ronald Royer showed colored slides of details of all the elements of Mount Wilson instruments. Following our part of the program, the Astronomical League held its eclipse sessions, after which everyone had an opportunity to see this newest of American planetariums in operation. The planetarium instrument was designed by Mr. Frank Korkosz, the AAVSO's friend and host to many of its annual meetings held in Springfield, Mass. Although the Boston Museum of Science is still under construction, one building houses numerous interesting exhibits, which were open for inspection by the members.

SOME REMARKS ABOUT THE AAVSO SOLAR DIVISION, by Harry L. Bondy

One of the byproducts of the Second World War was a realization of the importance of solar research. At this time even the proverbially practical-minded governments of both sides admitted that astronomy had a concrete offer to make if earthly communications (and other global aspects) should not be dependent on unknown chance events. Solar astronomy, more than any other branch, received an immense spurt with optical instrument (coronagraphs, monochromators) and radio-telescopes (radar).

Though the solar-terrestrial relationship had been known for almost a hundred years, there were some who found a sunspot-correlation (or dependency?) with practically everything, which in turn convinced others that this was "bunk," and that to count sunspots was silly. Fortunately, at the end of the '40's, radio-astronomy brought conclusive evidence that sunspot numbers were valid in giving us a fair indicator of "solar activity." (Somehow indirect radio techniques, which proved that the ionosphere - a region of our atmosphere - followed also the sunspot-cycle, seemed to the doubting Thomases another "mere chance rhythmic cycle.")

Since sunspot-number statistics were simple and efficient indicators of the overall behavior of the ionosphere, and thus able to give fair long-range advice, people concerned with worldwide communications in this country decided to secure a continuation of the Wolf Relative Sunspot Number regardless of our accessibility to Zurich, where these statistics had been compiled for almost a hundred years. Thus ill war-fortune was not to be permitted to ruin this valuable indicator.

Under the leadership of Neal J. Heines, the Solar Division of the AAVSO came into being in 1945. Its first task was to secure a sufficiently large number of devoted and experienced solar observers who could be depended upon to give us a reliable "sunspot-number" index, the American Relative Sunspot Number. To give you an idea that there is more to it than merely counting the spots one sees, let me point out that it takes an average of three years of careful observations before the National Bureau of Standards will accept an individual's reports for inclusion in the computation of the American Sunspot Numbers.

Soon after we began our program for the NBS, we were asked by Prof. W. Gleissberg, of Istanbul, Turkey, a recognized authority in the field of sunspot statistics, to gather observations for a study to assess the factors influencing the apparent foreshortening (perspective) of sunspots, and thus to get a better understanding of the reality of an inclination of the axis of sunspots. This study was continued under Dr. Hotinli, to give us a better understanding of East-West assymetry of sunspots.

In 1955, when worldwide preparations for the IGY were being made, we received information from Dr. M.A. Ellison of a fairly simple method of indirectly detecting solar flares by radio techniques. Thanks to Mr. David Warshaw, who developed a most ingenious and inexpensive radio receiver to detect Sudden Enhancements of Atmospherics on 27kc, several members of our group (see page 3) were able to participate in the US-IGY program. We had several other members who had to give up this work, for reasons of health, severe local interference, unreliable current conditions, or inability to adhere to minimum standards of objectivity. Once again our valuable contribution was recognized by the National Bureau of Standards and the National Science Foundation, in the form of specific grants to carry on this work.

One of the byproducts of the Second World War was a realization of the importance of solar research. At this time even the proverbially practical-minded governments of both sides realized that [illegible] had a concrete offer to make: if [illegible] communications (and other [illegible]) should not be dependent on unknown solar events. Solar astronomy, more than any other branch, received an immense spurt with [illegible] instrument (coronagraph, monochromator) and radio-telescope (radar).

Though the solar-terrestrial relationship had been known for almost a hundred years, there were some who [illegible] (or coincidence?) with a practical [illegible] everything, [illegible] others that [illegible] "think," and that [illegible] sunspots was [illegible]. Fortunately, at the end of the 1940's, radio-astronomy [illegible] conclusive evidence that sunspot numbers were valid in giving us a fair index of solar activity. [illegible] indirect radio techniques, which proved that the ionosphere [illegible] of [illegible] followed also the sunspot-cycle, seemed to [illegible] "homeless" [illegible] cycle.

Since sunspot-number statistics were simple and efficient indicators of the overall behavior of the [illegible], and thus able to give [illegible] people connected with [illegible] communications in this country [illegible] acute [illegible] of the Wolf Relative Sunspot Number regardless of our accessibility to Zurich, where these statistics had been compiled for almost a hundred years. Thus [illegible] a fortune was not to be [illegible] this valuable indicator.

Under the leadership of Neal J. Heines, the Solar Division of the AAVSO came into being in 1946. The first task was to secure a sufficiently large number of devoted and [illegible] observers who could be depended upon to give us a reliable "sunspot-number" index: the American Relative Sunspot Number. To give you an idea that the [illegible] than merely counting the spots one sees, let me point out that it takes [illegible] three years of careful observations before the National [illegible] putation of the [illegible] American Sunspot Numbers.

Soon after we began [illegible] for the IGY, we were asked by Prof. W. Gleissberg, of Istanbul, Turkey, [illegible] in the field of sunspot statistics, to gather observations for a study to [illegible] the factors influencing the apparent foreshortening (perspective) of sunspots, and thus to get a better understanding of the reality of an inclination of the axis of sunspots. This study was continued under Dr. Hotinli to give us a better understanding of East-West asymmetry of sunspots.

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