A.A.V.S.O.

SOLAR DIVISION BULLETIN.

Neal J.Heines,Editor.

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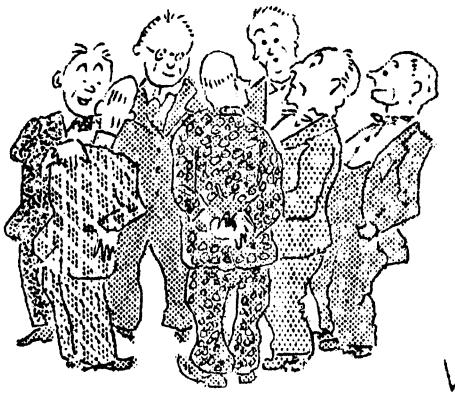

THE A.A.V.S.O.

Where old friends meet and new are

WELCOMED

The annual meetings of the A.A.V.S.O. to be held at Harvard College Observatory on October 12th., and 13th., when this organization will celebrate its FORTIETH ANNIVERSARY , promise to be very interesting.

Due to the many responsibilities of this office, at such a period, this bulletin will be a short one. The November issue will contain a complete report of the AAVSO Solar Division and general remarks concerning these meetings. Complete details will be published in the usual manner.

Observers and Research affiliates will be pleased to read "Leaflet" number 269 of the Publications of the Astronomical Society Of The Pacific, issued September 1951, containing facts relative to "THE SUNSPOT WITH THE LONGEST LIFE" contributed by Dr.Edison Pettit of Mount Wilson Observatory where it is revealed that, " The longest actually observed life time is 134 days and not eighteen months as released before in astronomical literature.

We have received a communication from Mr.T.P.Maher, of Heppner Oregon, one of our ardent observers, that up to and including September 10th, and due to the fine observing conditions there, that he has made 135 consecutive observations of the sun during the present year 1951. This is a record for the AAVSO Solar Division. The previous record was held by Mr.F.Trathen of, Napa,California who made 119 consecutive observations. Mr. Maher , also informed us that there is a possibility that these observation conditions may prevail for some time to come.

The observers of the "Foreshortning Project" of Prof.Gleissberg, will be please to learn that this project will be continued for some time to come. More about this later. We invite other observers to participate in this useful activity.

STATISTICS.

The total number of observed groups for the month of July was----- 23
" " " " " " " " " " Aug. " ----- 26
" " " " days with spots " " " " July " ----- 31
" " " " " " " " " " Aug " ----- 30
Zurich's Provisional Relative Sunspot number for July was ------ 61.5
" " " " " " " Aug. " ------ 61.0
Monthly mean sunspot area (US Naval Observatory) for April was --1611
" " " " " " " May " 2887

*The highest sunspot number as assigned at Solar Division Headquarters on September 14th., was 179. It represented a small spot near the east limb surrounded by faculae.
* Group counting reference for observers.

Predictions of smoothed Monthly Sunspot Numbers for the next six months are as follows;

Sept.	57	Dec.	54
Oct.	56	Jan.	52
Nov.	55	Feb.	50

Released by Prof. M.Waldmeier, Director Federal Observatory, Zurich, Switzerland, and transmitted by the Swiss Broadcasting Corporation.

Also released by Prof. Waldmeier; The Definitive Sunspot Number for the year 1950 is 83.9 .

Naked-eye sunspots were observed during the month of July on the 10th., 11-13-15-16-17-23-24;(nine days). Observers; Scott;Wright;Zorgo;Venor. Forthe month of August Scott reported spots on 9th., and 10th.,. All observers from Montreal Centre.

PUBLICATIONS.

The following publications were received from Prof. Waldmeier;

1. Sunspot Activity for the year 1950.
2. Catalogue of the Green Corona Line 5303, 1947-1949.
3. The new Corona Line 5445 Å .
4. The Pattern of the Monochromatic Corona.
5. Spectro-photometric Classification Of Solar Prominences.
6. Annual Report of the Federal Observatroy,Zurich, for the year 1950
7. Heliographische Karten der Photoshpere , 1950.

Also referenced was a Monograph - Waldmeier - "The Solar Corona", dealing with the observation during 139-1949.(Verlag Birkhauser,A.G.) Basel, Switzerland. It is well illustrated.

"A Modification of Long Period Predictions of Sunspot Epochs"-Gleissber "The former method is modified in such a manner that approximate values of the characteristics of the next cycle - instead of thier upper or lower limits with given Probabilities -- are obtained. W.G.

"The Sunspot With Longest Life" ----------Dr.Edison Pettit
Here is a very important release in sunspot statistical-history. Leaflet NO.269; Sept, 1951. Astronomical Society Of The Pacific; 675 Eighteenth Avenue, San Francisco, California.

REVISED PROCEDURES FOR REDUCING SUNSPOT NUMBER OBSERVATIONS

The sunspot number observations collected by the Solar Division, AAVSO, and others since 1945 have been combined into an "American" sunspot number, intended to be representative of sunspot activity on each day. From the beginning, the method has been to obtain a consensus of the various observations contributed, rather than to designate a standard observer for each day. Much of the Zürich results are based on the latter method. The original scheme (Popular Astronomy, Vol. 54, p. 351, 1946) was replaced in 1948 by a method wherein the weighted average of all observations contributed formed the American number for any day (Publications of the Astronomical Society of the Pacific, Vol. 61, p. 13, 1949). A new statistical method for computing observatory coefficients was introduced at that time, and the American number was cut loose from the statistics as of October 1945.

In the last few years, the American number has drifted away from the Zürich number, and the difference at the end of 1950 amounted to about 20 percent. Various workers, including Gleissberg and Luft, have pointed out reasons why the discrepancy is probably in the American number, rather than in Zürich. There seem three principal shortcomings in the procedures underlying the American number.

1. The 10-month interval during which the American number was tied to the Zürich scale was too short and at a time of the solar cycle when the range of sunspot numbers was small.

2. The American number included data supplied by inexperienced observers.

3. Observations made under fair and poor observing conditions were included with good observations.

To take into account these shortcomings and to simplify the procedure for reducing sunspot number data, certain changes were instituted for the 1951 data. These will, therefore, not be on the same scale as the published reports for the years previous to 1951. However, under the new scheme, the day-to-day and month-to-month fluctuations should be as well represented by the new American number as by the old, if the consensus-method is considered to be valid. The American number derived under the new scheme is designated by R_A' to distinguish it from R_A. The revised procedures were worked out by Neal J. Heines and Alan H. Shapley. The important points follow:

a) Only the reports of a set of experienced observers will be used to derive the American number. These observers are designated by the coordinator of the sunspot number program. In general, he will use the following criteria -- an observer must have had two years' experience, or otherwise demonstrate that he is apt to be a continuing stable observer.

b) The reports for the two years after an observer has been designated a standard observer will be used in deriving his "observatory coefficient." There must not be an instrument change in this period, and if there is later an instrument change, the coefficient

must be recomputed over a two-year interval. The coefficient is obtained by the method previously employed, except that the comparison is made with the Zürich numbers and only good quality observations are included. The interval must be at a time of the solar cycle when a wide range of sunspot numbers is reported. The observatory coefficient, once computed, is used for that observer's reports for an indefinite period, as long as there is no change of instrument.

c) The daily sunspot number is, as before, a weighted mean of the reports used. The weights are computed in the usual way. The standard observers are divided into two categories, according to their statistical weights. All observations by standard observers are classified by the coordinator of the program as high or low quality observations.

d) Whenever sufficient observations are available, the daily number is based on the reports of eight observers. Taken first are the high-quality observations of the high-weight standard observers. If more are needed to make the total of eight, the high-quality observations of low-weight standard observers are also used. If there are still not enough, then the low-quality observations of observers are taken in order of the observer's weights. Even then there will not be as many as eight observations on some days. In the event that there are more than eight high-quality, high-weight observations, then a maximum of 12 such observations are included in the weighted average.

For the reduction of 1951 observations, 23 observers have been designated as standard, with observatory coefficients computed for the years 1948-49 if possible, otherwise 1949-50. This number of observers has hardly proved sufficient to assure eight observations on most days, although the observers are distributed throughout the world. For instance, in February 1951, fewer than eight observations were available on five different days, and on two of these only four observations were contributed. In July, however, at least eight observations were available each day, and there were twelve good observations for each of twenty-four different days.

The new procedures for reducing sunspot number observations places a premium on lengthy series of consistent observations with a single instrument. The uses to which sunspot number statistics are put make the reasons for this requirement obvious. Consistent observations over a solar cycle or longer are necessary to measure the trends of solar activity and give meaning to correlations with associated geophysical phenomena. It takes time for a new observer to develop consistent judgment in this as in any other field of scientific work. It should be remarked, however, that the criteria mentioned above for judging the experience of an observer, is only a guide to the program coordinator. It does not mean that four-years' participation in the solar division work is a requirement; it does mean, however, that two-years' sunspot number data must be available after the time an observer is clearly accustomed to this kind of observing.

Although definite plans have not been made, it is intended to extend the series of R_A' to the years prior to 1951, so as to provide a longer series of data on this scheme. It would be preferable if this work could be done by someone with experience in sunspot number observing, inasmuch as the new scheme calls for an evaluation of the contributed reports in contrast to the earlier "brute force" method.

September 7, 1951 By ALAN H. SHAPLEY