A.A.V.S.O.

SOLAR DIVISION BULLETIN.

Neal J.Heines , Editor.

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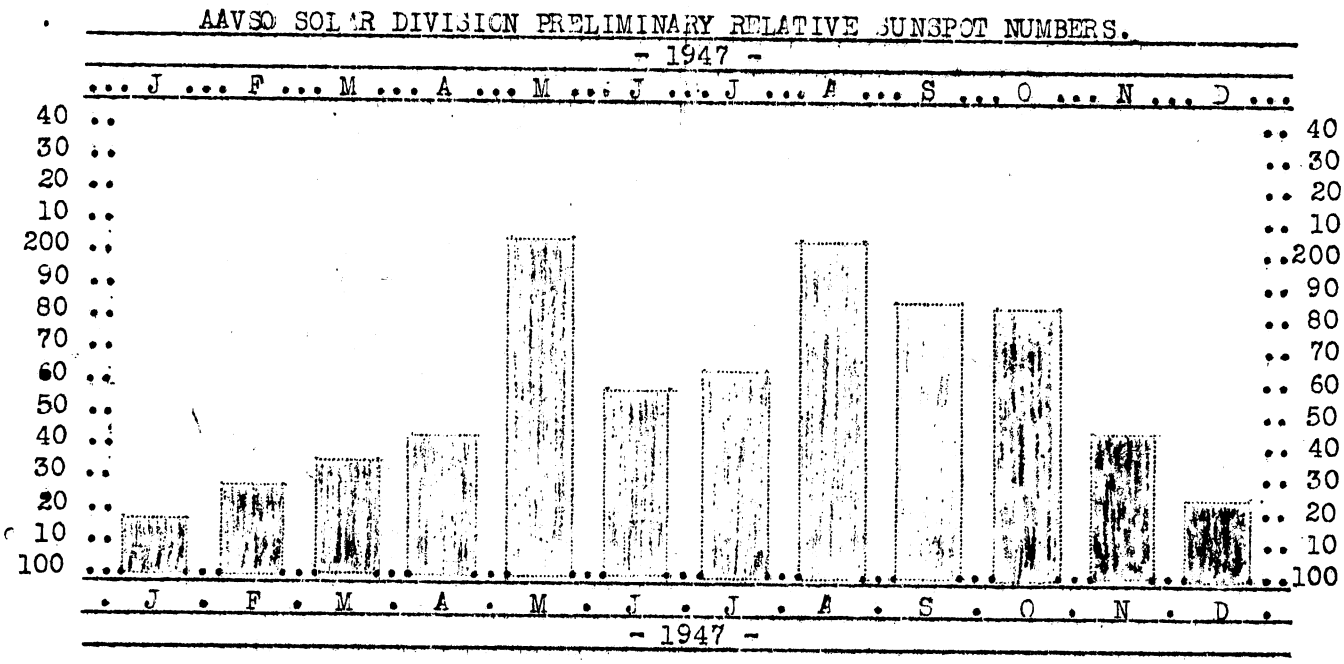
AAVSO SOLAR DIVISION PRELIMINARY RELATIVE SUNSPOT NUMBERS.



Jan. 118.1	Jul. 163.4
Feb. 128.4	Aug. 205.2
Mar. 135.5	Sep. 184.6
Apr. 142.1	Oct. 182.6
May. 205.1	Nov. 144.1
Jun. 159.6	Dec. 125.6

If we count the sunspot groups and spots new each day, as in the Wolfer method, then for 1947, we have the following; (as observed here)

Number of groups Whole Disc	3275
" " sunspots " "	35322
" " groups Central Zone	1295
" " sunspots " "	19111
" " groups North of Equator*	1466
" " groups South of Equator	1809
" " sunspots North " "	15460
" " " South " "	19862

* Solar Equator.

General Data. (as observed here)

Number of Days with sunspots	365
Number of Days without "	0
" " Solar observations 1947	689
" " Observing days for 1947	308
" " Groups Gone	577
" " New Groups	580

SUNSPOT GROUP HISTORY.

This information differs from the Wolfer Method in that it counts each group but once, gives its place of origin as observed, and, it's place of disappearance, to all of which time values are shown. (579 groups were observed here in 1947).

Total of all north groups ---------- 275
" " " South " ---------- 304- Combined total 579
" " " Minus Groups, ie. groups having died on the visible solar hemisphere ---------- 328
" " " Plus groups. ie. groups that have passed on , to the invisible solar hemisphere ------- 251- Combined totals 579
" " " Groups giving their visibla period in terms of days. North groups above line , south groups below.

Terms of days	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
North belt count	6	46	27	18	21	17	13	7	21	18	13	13	20	24	9
South " "	4	51	22	27	19	17	17	16	14	15	15	18	29	30	8

Terms of days	16
North belt count	2
South belt count	2

Total Count for both belts ---------- 579.

Total of groups born on the visible northern hemisphere	---- 197
" " " " " " " southern "	---- 190
" " " " " " invisible northern "	---- 78
" " " " " " " southern "	---- 114
Combined totals --------	579

Total of groups born on the north visible hemisphere and died on same	134
" " " " " " south " " " " " "	136
" " " " " " N. visible hemisphere and passed to N. Invis.	63
" " " " " " S " " " " " S. "	55
" " " " " " N invisible " and died on north visible	34
" " " " " " S " " " " " south "	37
" " " " " " N. " and passed on to the N Invis. again	45
" " " " " " S. " " " " " " S " "	75

Combined total of 134,136,63,55,34,37,45,75 - 579

The above totals were arrived at from records of daily data, some of which, will be distributed in the future.

Recently, because of newer observers, there has beeen a demand for the clarification of the "k" factor in the reductions of observations, for the determination of the Relative Sunspot Number. We repeat this material for the benefit of all concerned.

" Sunspot periodicity was exhaustively studied by Wolf at Zurich, who represented the spottedness by a system now called, Wolfs sunspot relative numbers. These are computed by the formula:

$$r = k\,(10\,g + f).$$

in which r is Wolf's number, g the number of groups and single spots observed, f the total number of spots which can be counted in these groups and single spots combined, and k the multiplier which depends upon the condition of observation and the telescopes employed. Wolf took k as unity for himself when observing with a three inch telescope with a power of 64. A less favored or less assiduous observer would receive k greater than unity and one with a larger telescope and good opportunities for observing would receive a fractional value of k . Wolf's numbers seem arbitrary, but are found by photographic comparisons to be closely proportional to the spotted sreas on the sun. One hundred as a sunspot number corresponds to about 1/500 of the sun's visible disc covered by spots, including umbra and penumbras. "

Our own values , for the "A" observers group in our monthly reductions report are determined by a different formula. The full explanation, and the formula itself, can be foundmin the August issue of Popular Astronomy 1946; Vol. 54, No. 7, pp 351 - 358, under the title; " AMERICAN OBSERVATIONS OF RELATIVE SUNSPOT NUMBERS IN 1945 FOR APPLICATION TO IONOSPHERIC PREDICTION ".

We restate an instruction given in our last bulletin (No.26) concerning multiple observations of sunspots in one day. When more than one observation of sunspots is made during the period of one day, indicate the one chosen for the monthly report, by underscoring the time given for that observation in heading column " e" as follows;

1330
1700
2110

Thus the noon observation was selected for the monthly report form.

Dr. William F.Peterson's book, " MAN WEATHER SUN " is available for immediate delivery. See Bulletin Number 25, p.50. It can be procured from, Mr.Charles C. Thomas, Springfield , Illinois. 500 pages; 300 illustrations supplemented by many graphs and tables useful for research purposes. The price of this book is $10.00. This book is a must for the library of anyone interested in things solar.

We wish to gratefully acknowledge a second gift,of Brunner sunspot Classifications charts, from Mr.Ralph N.Buckstaff of Oskosh, Wisconsin. Thank you so much Mr.Buckstaff.

The Codex Book Company of Norwood, Massachusetts, is the country's laggest printer of Graph Paper. This is high class material. They have a very convenient catalogue which will simplify your selections.

We will again need photos from the newer members of themselves with their instrument. This is always a great source of interest at the AAVSO meetings. Send them to this office as soon as possible.

SPECIAL FEBRUARY SOLAR DIVISION SUPPLEMENT

ON

GRAPHS.

In a seperate mailing you will soon receive a set of graphs delineating some sunspot activity as observed here, by Heines.

Here are a few notes concerning the graphs.

SUN'S "C" ACTIVITY. (Group count only)

Each sunspot group is given a number upon its appearence which it retains until gone, either by disintegration or rotation of the sun.
Arrangements for this printing took some time hence some of the latest data is lacking. For your convenience here is the remaining data for 1947.

August 58, September 46, October 48, November 46, December 37.

These values can be inked in to complete your graph for 1947.

SUNSPOTS FARTHERVTHAN 35°FROM THE SOLAR EQUATOR.
The height of each bar either north or south latitude can be read from the ordinates at the left or right given in degrees. The number on top of the bar is the greenwich number, the number in the circle lenght of time the group lasted, in days and the number beneath the bar the area of the group in millionths of the sun's surface. Abscissa time.

SUNSPOTTEDNESS
This shows the shift of the days with and without spots oneyear prior to minimum, minimum, and one year after mimimum.

Daily OBSERVATIONS OF HEINES.
Three curves, count of spots in Central Zone, count of spots Whole Disc, and Group count whole disc. 1936 - 1947. Ordinates are the number of spots or groups each day. Abscissae time, ie the earth's calander and the solar rotation periods indicated by hanging tick marks under neath the calander dates. The Sanford - Losh - Heines extra activity zones are plainly in evidence on part of 1936 activity, all of 1937 activity and part of 1938. It will be interesting to see what rythms this cycle brings. Breaks in the curve indicate no visibility for observations. 1947 graphs to be sent later.

SUNSPOT FREQUENCY FOR THE YEARS 1749 to latest available date.

Taken from the Zurich tables as found in ASTRONOMISCHE MITTEILUNGEN from Zurich . Monthly values , not smoothed. Supplementary data will be given later as soon as received.