

SOLAR DIVISION Bulletin

JAN 20 1954

Harry L. Bondy, Editor

43-58 Smart St., Flushing 55, N. Y.

Editorial Advisory Committee: Neil J. Heines - Margaret W. Mayall - William A. Reid
David W. Rosebrugh - Alan H. Shapley (CRPL)

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Number 89. Page I

Dear Reader:

The SOLAR DIVISION - AAVSO, is again functioning. Thanks to your interest and devotion, and to the close cooperation of a small group of volunteers, our contribution to Science may continue to progress. We are not content to be mere "friends of the stars", or the sun, but are active amateurs participating in all fields of solar astronomy.

Although the SOLAR DIVISION has lost its financial support, due to budget cuts of the National Bureau of Standards; Central Radio Propagation Laboratory; by the government, we have not been forgotten. Thanks to our parental organization - the American Association of Variable Star Observers - we were able to reorganize under its auspices.

Mrs. Margaret W. Mayall, in particular, has been instrumental in organizing an important meeting in Meriden, Conn. on Dec. 12-13. We are greatly indebted to Mr. & Mrs. Rosebrugh for their warm hospitality in extending the facilities of their home to us for two days. This enabled us to lay the foundation for a new set-up of the SOLAR DIVISION. Together with Mr. & Mrs. Mayall, D. W. Rosebrugh, N.J. Heines, A.H. Shapley of CRPL, William A. Reid and H. L. Bondy, observational data for the American Sunspot Numbers - RA' - were reduced for July through October, 1953. All work in the near future will be done strictly on a voluntary basis.

While N.J. Heines will continue as our Chairman, he will, unfortunately, be able to devote very little time to the work of the SOLAR DIVISION. D.W. Rosebrugh, 66 Maple Ave., Meriden, Conn., has volunteered to carry out the most important job of the SOLAR DIVISION, namely, the reduction of our observations into RA'. This very essential work is done primarily for the CRPL program of long-period forecasting of ionospheric conditions for radio communications. W.A. Reid, 167 South Ave., Hawthorne, N.J., will continue as our Recorder of all our sunspot observations. The actual forms of the "American Sunspot Number Reductions", will be prepared by Mr. Reid, but due to lack of money, these will not be reproduced for mailing with the BULLETIN. These forms, however, will be available to anyone at cost price of reproduction, upon request to Mr. Reid. H.L. Bondy has volunteered to edit and publish this BULLETIN.

The S.D. BULLETIN will again be published monthly. It is your editor's intention to make this BULLETIN an open forum for all members and interested parties. We shall continue to publish RA'-RZ and sunspot areas of the US Naval Obs.

Current news and reviews of astronomical literature, dealing with solar matters of interest to us, will continue to be carried. It is hoped, however, that many of our members will contribute directly to our BULLETIN. Papers, studies, reports, experiences, ... all matters of interest to the rest of us, are highly welcome. A free exchange, in the form of a factual discussion, will be encouraged on the pages of our BULLETIN, whenever possible. It is your editor's wish to make the BULLETIN a true mirror of our work, studies and interests. Perhaps, on occasion, we shall also succeed to have professional astronomers addressing themselves directly to us. Many of us desire a closer cooperation with professional astronomers, cognizant of the fact, that such an endeavor will profit all concerned.

As your editor, I have ideas on how to enliven the BULLETIN. However, I most sincerely look forward to your comments, your ideas, suggestions and proposals. These are absolutely essential, if this BULLETIN is to reflect the interests of all of us and please most of us.

Together with the sun, we are now at "minimum". We are starting on a difficult road. On behalf of the BULLETIN's editorial Advisory Committee, I assure you that we shall do our best. With your help, this Bulletin shall become our pride.

HARRY L. BONDY
EDITOR

TO ALL OBSERVERS:

It is gratifying to state that a small group of observers have shown interest to the extent of enabling the Solar Division to carry on in a limited capacity.

In December, we had a "reduction session" and the American Sunspot Numbers will soon again be distributed. Those participating, were as follows:
A. Shapley, M. Mayall, N. Mayall, D. Rosebrugh, H. Bondy, . Reid and
H. Heines.

Our BULLETIN also is being revived by Bondy.

Your Chairman is greatly indebted to this energetic group, and I am sure that you are also. I invite your splendid cooperation.

Paterson, N.J. Jan. 12, 1954.

signed: NEIL J. HEINES
Chairman

TO ALL MEMBERS OF THE SOLAR DIVISION - AAVSO:

1) All Sunspot Number Reports are to be sent directly to: Recorder, AAVSO, 4 Brattle St., Cambridge 38, Mass.

It is of cardinal importance that standard observers mail in their reports regularly and as soon as possible.

2) Regarding 'RA', write to: D.W. Rosebrugh, 66 Maple Ave., Meriden, Conn.

3) Copies of the complete forms of "American Sunspot Numbers Reductions", will be available at cost price of reproduction from: W.A. Reid, 167 South Ave., Hawthorne, N.J. Information for non-standard observers and beginners, can also be obtained from Mr. Reid.

4) Regarding the BULLETIN, write to the editor: H.I. Bondy, 43-58 Smart St., Flushing 55, N. Y. Papers for publication in the BULLETIN, should be sent in duplicate form; this does not necessarily apply to graphs, pictures and photographs.

PLEASE NOTE: While all the work of the SOLAR DIVISION is contributed freely by your volunteers, expenses for mailing, recording and publishing are still with us. Donations for such expenses for the SOLAR DIVISION, are urgently needed. Kindly mail your contributions to: P.W. Witherell, Treasurer, 84 Prince St., Jamaica Plain 30, Mass. Make your check or money order payable to the AAVSO. Do not forget to identify your donations for the SOLAR DIVISION.

THE FIRST SUNSPOT OF THE NEW CYCLE:

It is well known that high latitude spots are typical for the commencement of a new sunspot cycle. Solar activity reached minimum proportions early in 1954; though a fair increase occurred during the summer. The few remaining spots of the old cycle appear only in low latitudes near the solar equator.

An unusually high latitude sunspot was discovered by Clifford Bennett and Helen Dodson of the McMath - Hulbert Observatory in Michigan on Aug. 13, 1953. This spot was first discovered at 12:45 U.T. (and seen until 1400 UT, when seeing deteriorated). At latitude 52°N and longitude 42° (Carrington's) or 12° E. of the central meridian. It had an approximate area of 10 millionths of the solar hemisphere. This solar region showed no calcium plages (i.e. chromospheric faculae) the day before. However, a Ca-plage was observed subsequently until Aug. 15, when it faded away shortly after 1315 UT.

A high latitude spot cannot be positively identified as a precursor of a new cycle from visual observations, only. The best proof can be supplied from evidence of a reversed magnetic polarity for the spot. Dr. G.E. Hale, who discovered the tremendous magnetic fields of sunspots through his spectroscopic observations of the so-called Zeeman-Effect of super-fine splitting of certain spectral lines, also discovered the laws governing magnetic polarities of sunspot groups during each solar cycle. Thus the polarities of the 1944 - 1954 (so-called 18th) cycle, are on the Northern Hemisphere "negative" for the preceding and "positive" for the following spots / the Southern Hemisphere has opposite polarities. Reversed polarities will characterize spots of the new cycle.

This is precisely what H.D. Babcock of Mt. Wilson Observatory found concerning this high latitude spot. This, then confirmed, that the high lat. spot of Aug. 13 belonged to the forthcoming 19th cycle. A photograph taken by S. B. Nicholson at Mt. Wilson, seems to suggest a still smaller spot behind. On Aug. 5, 1953 at 2200 UT, a similar, though less definite magnetic bipolar region of "new" polarity was observed in latitude 39N. and longitude 7'.

For more details concerning this unusual spot see Dodson's paper in the Publications of the Astronomical Society of the Pacific - Oct., 1953.

P.S. - Did any of our observers record this high lat. spot?

CONCERNING THE CURRENT MINIMUM:

According to sunspot statistics, both the Minimum and Maximum of a sunspot cycle, are determined from "smoothed sunspot numbers" (See SD BULLETIN # 83, Feb., '53 - Supplement). Thus we will have to wait several more months before we will know if the sunspot Minimum was reached during 1953.

Notwithstanding the exceptional high lat. spot of Aug. 13, 1953, the absence of additional high lat. spots seems to indicate, that we have not yet reached the turning point in spot activity (other solar phenomena such as plages, prominences and the Corona, indicated the new cycle's activity for quite some time already).

The last sunspot Minimum was reached in Feb./44. The mean spot distribution, according to Greenwich, was 8.9° for spots of the previous cycle and 26.1° for the new cycle in 1943; in 1944 it was 5.7° and 23.3° respectively, for the old and new spots, (data from Gleissberg's "Die Häufigkeit der Sonnenflecken; 1952). High lat. spots seldom occur in higher latitudes than 30° and rarely above 40°.

According to H.W. Newton, writing in The Observatory (Oct./53), the past cycles showed high lat. spots 1.7 years to 0.6 years before the actual frequency Minimum. Furthermore, the past 7 cycles had a mean sunspot number of 5.0 (range 1.4 to 9.6) for the Minimum year. The mean American RA' for 1953, (assuming even zero for December), will not be below 12.3. It now appears that we will reach Minimum in the next few months, most likely before summer. In any case, we will have to wait, the sun obviously does not read our prognosis.

POLAR FACULAE:

During the past year or two, most of us had, on occasion, observed polar faculae. While photospheric faculae in the vicinity of sunspot zone, show clearly a compact pattern of veins over fairly large areas, polar faculae appear as small, bright flecks or even dots, in the polar regions. At the Federal Observatory in Zurich areas of these faculae fields and their distribution are regularly recorded.

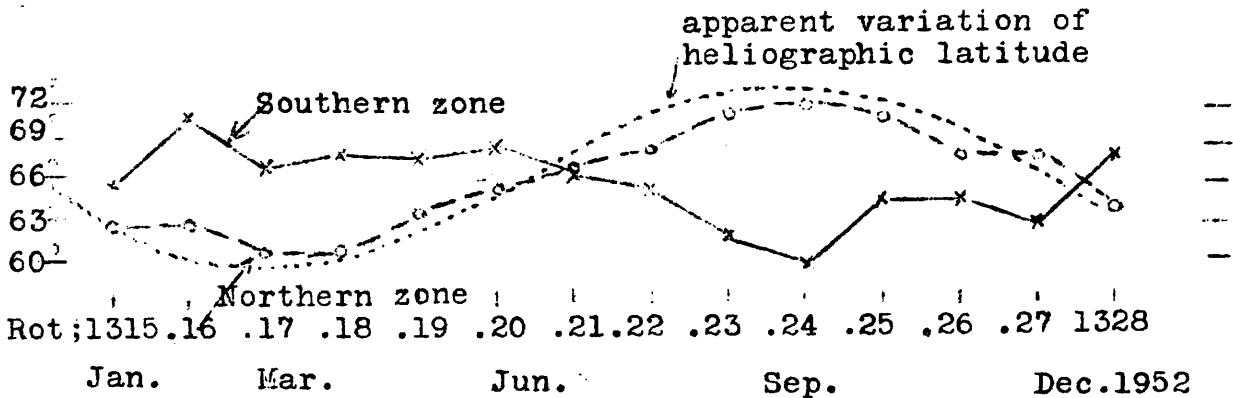
H. Waldmeier writes in the Astronomische Mitteilungen-No. 184 - (Die Sonnenaktivitat im Jahre 1952), concerning these polar faculae, as follows: free translation from German follows:

The polar zone of faculae which appeared in the previous year, showed a very strong development, whereby the Northern polar zone appeared much more prominently than the Southern already in 1951. The mean latitude of this zone for the Southern Hemisphere is 66.3° and for the Northern, 67.7°. In respect to 1951, this zone moved about 2 degrees toward the pole.

..... polar faculae consist of individual dots of a few second of arc in diameter, which appear over the entire zone with an almost random distribution. The gathering of such faculae dots into / separate / faculae-fields is quite arbitrary and thus also the areas of these faculae-fields. As a matter of fact, it is questionable, whether this readily observed Polar zone is real. As can be seen in Table V (see graph below), the apparent fluctuation of the lat. of this Polar zone, opposite on the two hemispheres, is due to the variation in the apparent inclination of the Solar axis in relation to the sun-earth line ; one is therefore inclined to speak rather of a Polar-Cap of faculae (Polar-kallote). The observed Polar zone thus comes about through the visibility function of faculae, which reaches a sharp Maximum some 70 from the center of the sun.

Mean latitude of Polar-zones of faculae in 1952

(Data from Astronomische Mitteilungen /Zurich/No.184; Table 5)



ATTENTION: MEMBERS OF THE SOLAR DIVISION -

Kindly answer by return post-card, the following questions which are needed by your Solar Division Council:

- A- Correct name and address.
- B- Occupation
- C- Instruments used for Solar Observations, and method
- D- Member of AAVSO?
- E- Member of other astronomical societies?
- F- Other fields of astronomical pursuit?

American Sunspot Numbers - RA' 1953 Zürich Provisional Sunspot Numbers RZ

	June	July	Aug.	Sep.	Oct.	Nov.		June	July	Aug.	Sep.	Oct.	Nov.
1.	14	0	0	2	0	13		15	0	0	0	0	12
2.	26	4	5	0	0	12		28	7	7	0	0	11
3.	24	0	13	0	4	13		23	0	12	7	7	10
4.	35	0	16	0	3	4		53	0	12	0	7	9
5.	34	0	14	1	1	1		35	0	11	7	0	0
6.	34	0	11	12	19	0		32	7	10	7	13	0
7.	32	0	12	14	18	0		36	7	16	9	13	0
8.	34	0	25	16	15	1		30	0	10	24	14	0
9.	30	8	32	17	17	0		28	9	29	23	11	0
10.	28	15	35	18	6	0		24	20	48	27	10	0
11.	17	15	72	19	8	0		18	22	73	32	9	0
12.	7	17	66	28	13	0		7	16	77	29	9	0
13.	3	17	67	20	18	0		0	23	73	18	8	0
14.	18	24	60	27	29	0		12	24	65	30	29	0
15.	21	21	52	44	24	0		24	40	62	43	22	0
16.	25	17	55	44	18	0		33	19	54	42	13	0
17.	21	17	43	40	4	0		33	16	47	38	9	0
18.	18	16	36	38	0	0		20	21	31	38	0	0
19.	26	13	31	20	0	0		25	11	26	34	0	0
20.	29	11	18	20	0	1		26	8	24	17	0	0
21.	18	4	14	15	0	0		22	14	17	25	7	0
22.	17	0	14	14	0	0		20	0	10	16	0	0
23.	13	0	3	11	1	0		10	0	8	9	0	0
24.	12	0	0	13	0	0		11	0	0	15	7	0
25.	17	0	0	18	0	3		10	0	0	14	7	0
26.	13	0	0	16	13	1		17	0	0	14	12	0
27.	5	0	1	2	4	2		21	0	0	0	7	0
28.	4	0	1	0	0	1		7	0	0	9	7	0
29.	7	0	0	0	0	0		8	0	0	7	0	0
30.	6	0	0	3	0	0		7	0	0	9	0	0
31.	-	0	0	-	7	-		-	0	0	-	8	-
19.6	6.4	23.1	15.7	7.2	1.7	-MEANS--		21.2	8.5	23.3	18.1	7.4	1.4

NOTE: The American Sunspot Number - RA' - being computed as a weighed mean from reports of its standard observers, does, on occasion, reach volumes of 1, 2, 3.... This may happen due to two circumstances. A- One or two observers report a single spot (Ri-11), which was very short-lived, while the other standard observers report Ri-0; this is wont to occur - the very short-lived spots during the Minimum just like during higher activity, when, however, such a spot appears less prominently in our statistic. B- Only a handful of observers are able to make reports (particularly during winter), one of which records a small spot, while the others report zero, for reasons of unfavorable visibility conditions. Zurich numbers can never fall below 7, because they are reduced to the Wolf Scale by a factor equal to 0.60 (thus Ri-11 multiplied by 0.60 gives 6.6, ergo RZ is 7. RZ is based only on observation at Zurich, Arosa and Locarno. RA', on the other hand, has observers in all parts of the globe; the weighed means may occasionally reflect a smoother evolution towards zero-spot- tedness. All considered, however, there is little significance in such border- line statistics.