THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS

Solar Division BULLETIN

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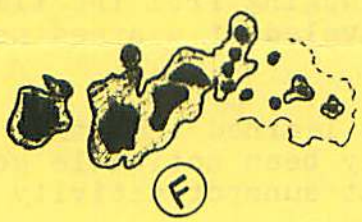
FEBRUARY 1956 — Number 114

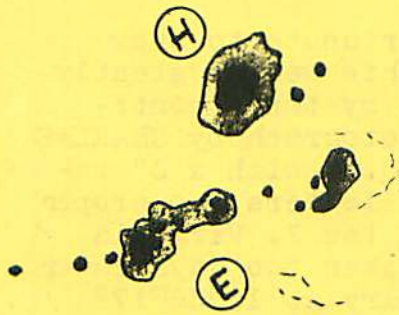
by CHARLES CUEVAS
16 January 1956
1715 U.T.
(New York City)

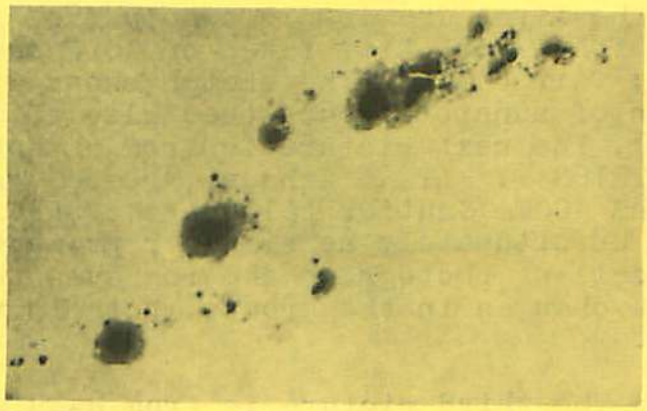


PREVIEW OF
SUNSPOT MAXIMUM

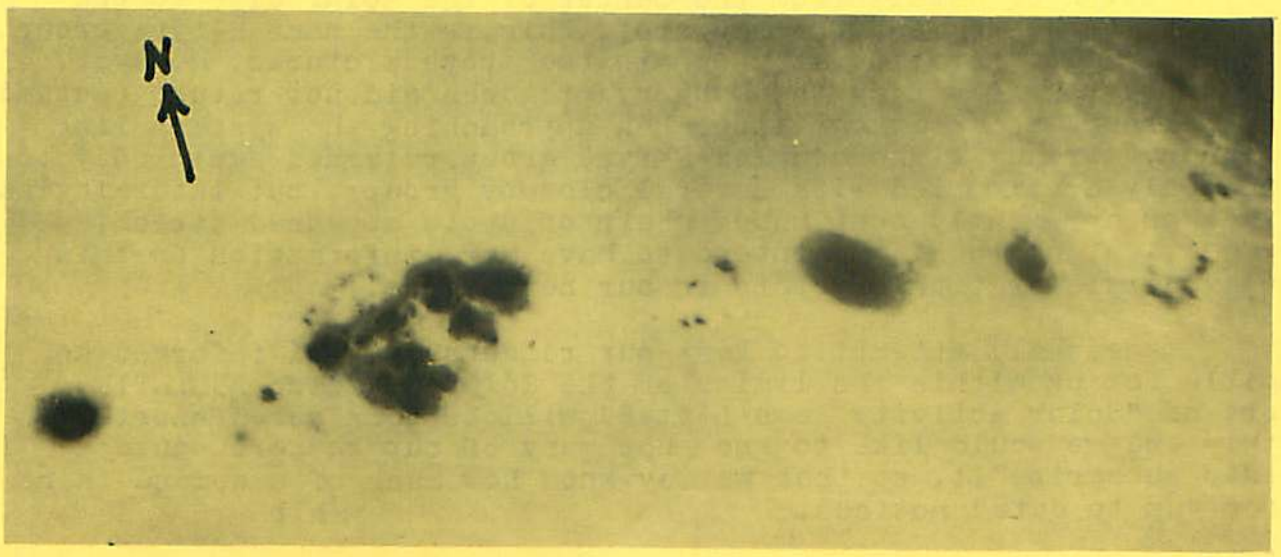
(Text on page 2)

by DEMETRIUS P. ELIAS
18 January 1956 - $13^h38^m17^s$
(Athens, Greece)





by HANS ARBER
15 February 1956
0500 U.T.
(Manila, Philippines)



PREVIEW OF SUNSPOT MAXIMUM

The first two months of 1956 brought clear evidence that we are rapidly approaching the period of sunspot maximum. Even to the naked /but protected/ eye giant sunspots were visible showing us the centers of very high solar activity.

On 23 February 1956 at about 0345 U.T. an exceedingly large increase in "cosmic rays" was recorded in all parts of the globe. Very little is as yet known about such bursts of what is called "solar component of cosmic rays". Previously only three similar bursts were known. This exceptional phenomenon was preceded, as is wont to, by an immense solar flare (imp.3) recorded at Kodaikanal, India at 0330 U.T. and also in Tokyo, Japan, accompanied by ionospheric storms /fade outs/ and later by the most intense geomagnetic storm of the current cycle. (Judging from the time intervals, the cosmic particles must have traveled at a speed nearly one half that of the velocity of light!)

From George Warren we have learned that the "10-meter radio transmission-reception has not only been noticable good but almost fantastically good" since the great sunspot activity began.

On page one of this issue we are very fortunate to show the recent examples of sunspot activity and for this we are greatly indebted to three of our active members separated by three continents. The first drawing is a copy from a fine photograph by CHARLES CUEVAS of New York City taken on 16 January 1715 U.T. with a 3" refractor; fair seeing. The sketch shows with three letters the proper division of sunspot groups (see also the Note by Miss J. Virginia Lincoln). The next picture is from a photograph taken two days later by DEMETRIUS P. ELIAS, Athens, Greece, on 18 January at $13^h38^m17^s$ using the 400mm Gautier telescope of the National Observatory of Athens. Unfortunately no simple reproduction can do any justice to this excellent photograph showing even the granulation clearly. Note the changes in the groups, both in their evolution and proper motions.

The third picture is from HANS ARBER, Manila, Philippines, taken on 15 February at 0500 U.T. with a 4" refractor. The photograph shows a wealth of detail from the center of the solar disc to the limb. Note here the western-most spot. This is the same H-type group of the preceding rotation as shown in the above pictures. However, the E-type group shown on the January pictures did not return (actually this group was desintegrating when approaching the western limb... in January already). The complex F-type group returned again only to be not only accompanied with several closeby groups, but intermingled so that an apparently continuous chain of spots appeared streching over 60° in longitude. (We intend to have more information on this complex conglomeration of spots in our next issue.)

We shall attempt to keep our readers as well informed as possible for us within the limits of the Solar Division BULLETIN. A sort of "Solar Activity News Letter" will be considered shortly. To this end we would like to know how many of our readers would like to subscribe to it, so that we may know how much of a demand there is for "up to date" notices.

hlb

Note for SUNSPOT OBSERVERS:

Now that solar activity is increasing very rapidly, we are again faced with the problem of grouping sunspots when they are quite close together. The visual observer does not have the help of knowing the magnetic polarities of individual spots, which is the most unambiguous indication. He must rely on the general appearance, on the prior history of the groups and on the estimates of position of the larger individual spots. In order to avoid the tendency to group too many spots together (and thereby significantly reduce the daily number of groups and therefore the daily relative sunspot number), the visual observer should bear in mind the following principles:

For a number of spots to be considered one group, they should string out along a narrow latitude belt , usually less than 5°. For giant groups the longitude spread can be up to about 20°. Therefore when spots appear in belts differing by the order of 5° in latitude, the configuration should be studied carefully to decide whether to place them in one or more groups.

A good example of a situation which might have been /and was;hlb/ confused is the northern belt of spots January 13 - 25, 1956. Actually these were in three groups with coordinates as follows.

Date	Latitude	Longitude	Brunner Classification
January 17, 1956	N28°	E19°	E
	N24	E25	H
	N21	E35	F

Therefore careful judgement is necessary at all times so that the sunspot number reports from various observers will be consistent -- and the largest source of error is in grouping.

J. Virginia Lincoln
National Bureau of Standards

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AMERICAN SUNSPOT NUMBERS for JANUARY 1956

1... 48	6... 44	11... 49	16...115	21...100	26... 57
2... 42	7... 47	12... 59	17...108	22... 89	27... 41
3... 52	8... 57	13... 78	18... 97	23... 86	28... 43
4... 55	9... 52	14... 69	19... 95	24... 79	29... 57
5... 42	10... 46	15... 97	20...106	25... 81	30... 52
					31... 41

Monthly mean R_A 67.2

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ZURICH PROVISIONAL SUNSPOT NUMBERS for JANUARY 1956

1... 54	6... 47	11... 38	16...118	21...110	26... 69
2... 49	7... 52	12... 35	17...126	22...100	27... 48
3... 44	8... 52	13... 78	18...127	23... 91	28... 45
4... 38	9... 52	14... 80	19...128	24... 87	29... 43
5... 49	10... 32	15... 90	20...120	25...103	30... 45
					31... 36

Monthly mean R_Z 70.5

AMERICAN SUNSPOT NUMBER OBSERVATIONS

AAVSO — SOLAR DIVISION

MONTHLY MEAN R_A = 82.0 — November 1955 — MONTHLY MEAN R_Z = 90.2

OBSERVER	KL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Adams	070			6,22	4,9	4,8			6,28	7,24	7,18	7,43	6,12	4,50						6,23	4,16			4,17		4,25	4,24					
Arber		6,22		7,18	7,8	6,8	8,8	5,12	5,15	8,22	6,22			6,31	5,38		6,31			4,20			5,9	5,13	5,13	5,20	5,15					
Beetle	106	4,26	4,23	4,20	5,14		5,14	5,11	6,24			8,17	6,40	4,44		5,17				6,22	5,24				4,22	4,28	4,28			6,29		
Bullmeyer	021	5,29	5,31						6,30		6,43					6,56																
Bundy	122	7,37	6,27				5,11		6,28				7,64			6,18									5,17		5,18		7,31			
vanBrunsvelt	088						3,11	5,24			12,46	3,35	8,102							6,66									7,51	7,42	
Buckstaff	111	6,25		5,8	4,7	4,8			6,21	9,25		6,27			6,44			9,22		6,17	5,15			5,11		5,26	7,22				
Cragg	092	7,16	7,37	6,24	6,16	4,8	5,11	7,26	7,16	8,55	9,31		7,133	4,64	5,29	5,12	4,48	4,47	5,28	6,28	5,20		3,17	5,29	5,37		6,27	7,24		7,27	8,51
DeKinder	080			6,8							8,55			4,71		5,46							3,6								
Elias	049	7,43			4,10	4,8	3,10	5,10	6,28	7,48	8,67			7,113					5,43	5,30				5,33	5,34	6,42		6,40	7,28	8,43		
Extremadurex	080	9,60		6,29		6,24	5,21	6,29	6,46	7,42		6,48	9,57	9,46	8,85	6,55	6,50		6,36		5,25	5,15	6,26	6,29	6,27		6,34	6,42	7,37	7,45	7,46	
Evans		8,17				4,8		5,8					7,30	7,27	6,29		7,23			6,11	5,12	3,5										
Fernald	102							6,21	11,45		11,19			6,77		5,43		8,32							5,15	5,22			8,28			
Itabasai		7,11	6,30	5,21	5,12	5,12	3,9	5,12	6,22	8,43	8,58	7,67	8,76	6,76	5,65	5,100		6,58			6,27		4,16	4,21		4,28	4,40		6,38	6,33		
Kayama	070	6,52	6,50	5,28	5,23	5,16	3,11		6,31	7,66	9,84	7,101	8,109	7,158		5,104		5,65		5,44	6,26		6,29	6,35		6,74	6,81					
Lockwick	102									5,54		4,62	4,55			5,69		4,30	4,30		4,18				5,26		5,31	5,40	7,10		6,41	
Loehde		9,23	4,17				5,15		6,18		8,16	5,49		4,57	6,40	6,25	6,70	4,50	4,22		4,15	6,18	3,22	1,1	4,30	4,39		7,39	7,35		6,42	
Lurt	098	9,35	8,45			4,12	5,16		7,44		9,35	9,82	3,69			6,94		4,26	4,24		4,31	4,18		5,23			5,44			5,26		
Macris	077	7,42	6,35			5,13	3,9	5,20		7,56	8,78	7,82		7,96	6,109			5,84	5,50	5,45		5,13	4,20	5,23	5,37	5,43		6,42	7,38	7,47		
Maher	090				4,12		6,13	6,30	7,40	8,45												5,13						5,25			5,23	
Mandrioli		4,17	4,15			4,8	5,16		6,11		8,44	5,57	4,13	4,77		7,104	6,20	4,47	4,28	6,22	4,9	5,18	5,31	1,1	4,23	4,37	4,25	4,12	7,31		6,32	
Moore	076	7,53		5,14	5,12		5,10	6,14	6,29	7,65	9,76	8,50			6,65	5,96	6,37	4,37			6,28	6,22			5,29		5,45		7,28		7,32	
Olson	068								6,39		8,71		7,96	6,113													5,42	7,31				
Pierson	083	7,43	6,34				4,16		6,24												5,26				6,29			6,41				
Pilsworth	086					4,48		6,19				6,58	7,107								5,10		4,9		5,34	5,25	6,41					
Rosebrugh	068	7,33	6,20				4,9	5,6	6,20	6,22	8,51		7,67	4,68		5,64		4,31	4,21		6,19	6,18	4,5		6,24	5,12	5,36	6,31		7,21	7,22	
Ruhge													5,36		4,39						4,16				2,11	3,15				4,11	
Thomas	084	3,9					5,12				9,61	7,55	6,38		5,66	7,73					2,3										
Thrussell	147	6,19			4,7	4,6		5,11	6,14		5,29		6,26			6,31								4,12	4,14					7,23	
Trethen	128	8,15	8,13	7,8	4,4	3,4	4,5	4,5	7,11	7,9	7,10	7,16	7,19			8,27		5,10		6,11		5,4	3,5			4,15	5,17	6,15	7,17	7,14	6,13	
Venter	128				3,6	3,6	4,8	6,16	6,29	8,41	7,44	5,45		4,37				4,38	5,29	4,19		3,10			4,14	4,18					6,35	
Warren	110	4,22	5,20			3,8	3,9					4,10	4,13	5,24								2,3			4,10		4,18	4,16			5,26	
Wendelsdorf				4,4	3,3	3,6		5,6			8,18			9,37						5,15	5,7	6,5				3,7		5,13	6,11			
R_A'		103	88	66	58	53	51	64	85	105	125	122	121	98	108	108	81	74	71	84	67	54	40	68	68	67	78	80	90	88	95	
R_Z		106	92	77	58	51	38	71	84	115	133	155	152	142	132	122	105	95	75	55	60	60	61	63	70	77	81	90	97	95	93	

AMERICAN SUNSPOT NUMBER OBSERVATIONS

AAVSO — SOLAR DIVISION

MONTHLY MEAN R_A = 67.5 — December 1955 — MONTHLY MEAN R_Z = 77.2

OBSERVER	KL	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Adams	070		3,30	2,25	4,37			5,28		5,18					4,49		4,30	6,28	6,37			4,30		4,28	5,14			5,22			4,20	3,21
Arber		9,21		5,17	6,19	7,20	7,20	7,28			5,13	6,17				5,12	6,17	5,21	6,24	8,25	11,22	9,17		6,15	6,11	7,16	7,12		13,17	11,16		
Beardsley	074																4,28	6,49		5,14	7,36	5,25					4,14		6,27		4,17	
Beetle	106		4,46	2,29	3,35	4,36		6,27			3,22			5,17	4,14	5,45		6,44			8,26											3,10
Bundy	122			2,22						5,21	4,25							6,40	6,26		6,18				4,14		4,11					
vanBrunsvelt	088		4,51		4,53										6,29													5,20				
Buckstaff	111					6,28		4,25		7,23	4,18	3,20	4,15		5,13	5,24		6,20							3,10				6,11	4,10	3,18
Cragg	092		5,35					5,41	5,27		6,34		3,30	4,33	4,46	4,43	4,43		6,34		8,41	7,29	6,23							5,33	3,23
DeKinder	080							6,15	5,19	5,15	5,12	3,21	4,9	5,14			3,24		3,11		5,24	3,11		2,14					5,27	6,14		4,20	3,19
Elias	049	6,46	4,60	2,91	4,35		5,48	5,36	4,44	6,54		5,61	3,53	5,43				4,52	4,52	5,58	8,45	7,44	7,37	5,40	5,27		5,45			6,17	6,45	4,48
Extremadurex	080	6,39	4,37		5,47	7,52			5,49	7,40	6,16		4,23	5,26	5,26	6,38		5,33				5,25	2,12	4,18	3,13		3,11	5,23	6,22	7,35		4,22
Evans			4,15									4,10	4,8				3,18															
Fernald	102	6,21					5,30	6,14	5,27			5,25		5,30	5,22				6,26					3,9						4,12		
Kayama	070		6,40	4,95			5,48	7,91		7,85	6,59	6,79		5,70	5,66	4,61		4,63	5,57		7,81		8,46	5,42	6,36	4,26		4,17	5,32	3,28	3,38	
Lockwick	102	4,32					5,50		4,21		2,16	3,26														1,5		4,19	4,18				
Loehde			3,15			5,69	6,62	4,48	4,15	6,22		3,42		4,31	3,19	3,45	1,49		5,45		4,26	5,27		1,10			3,41		6,17	5,10	4,37	4,25
Macris	077	6,34	5,28	2,45	3,68	4,70	5,62	5,50	4,51	6,68		3,38	3,39	6,48		4,50		4,54	5,47	5,61		8,57	8,28		6,22		4,13			6,26	7,49	4,40
Maher	090				5,40		6,40	4,31					4,21	5,24														5,22		6,13	4,16		
Mandrioli				3,11		5,78	5,85	6,59	4,14	6,58	4,27	4,53		4,37	5,47	5,24	4,34	6,25	4,24		5,32	4,27	2,9	2,8			4,20		3,7	6,16	4,25	4,43
Moore	076				4,53	6,56	5,46		6,40	6,28		3,25	8,44	8,38		4,30	4,27				9,37	7,38				5,15		5,24				2,19	
Pilsworth	086				5,62		6,40					5,40			3,7			4,26	5,37	6,53					3,7	5,13	6,33				2,28	
Rosebrugh	068	7,29				6,21	6,23		5,25		5,23	4,13	2,16	4,18	4,16			6,40	5,26	6,53	6,20	8,45	7,30	4,14	5,22	7,17	5,14	6,35	5,18	6,21	4,26	3,21
Ruhge					3,18		4,11			5,10										3,12				2,8							3,9	2,18
Thomas	084												2,28	5,19				4,10					2,9				5,23	6,27	7,29	5,32		
Trethen	128	7,19	5,18	4,18	5,15		6,18	4,16		3,5	4,12	3,12	4,7	4,9											3,6	4,6	6,7	6,13	5,15	6,9	4,12	
Venter	128	6,29	5,31	2,35		2,5		5,49		5,22	6,20	4,20	3,18					3,8	3,9	6,30	6,29	5,25		3,16	3,14	4,10	5,12	4,13				
Warren	110		4,19	4,21		3,11					3,14	4,22					3,10	3,11	3,9						1,4	1,6						3,14
Wells			1,2																										3,4			
Wendelsdorf					4,32		4,20	6,12	5,12		2,7		2,7	3,11	3,15	2,3			5,23				2,11	1,6	4,7			4,18	4,10		4,14	3,12
Itabasai [1]			5,41	2,53		4,65	5,43	5,47	4,44	5,39	6,37	4,44	5,32	5,29	5,39	4,44	4,37	4,29	4,37	5,42	6,56			4,33	4,17	4,16	4,10	4,19	5,21	6,18	5,24	4,23
R_A'		80	83	71	74	75	85	80	67	79	63	57	60	63	57	75	54	70	63	54	31	78	62	44	47	45	54	64	62	72	63	48
R_Z		99	87	75	86	100	100	84	72	60	74	86	79	71	63	75	76	70	85	83	92	105	85	64	51	53	61	62	65	72	81	70
Thrussell [1]	147		4,18	2,25	2,20						3,11	3,20					3,16		4,10					3,9		4,8		6,15		4,13		3,19
Luft [1]	098	7,38		4,13		6,88					5,29	3,41	4,29	5,29			5,30	6,34	6,52							3,10		3,15				

[1] = RECEIVED LATE

NOTE: R_A' STANDS FOR AMERICAN RELATIVE SUNSPOT NUMBER. R_A' IS COMPUTED FROM OBSERVATIONS MADE BY MEMBERS OF THE SOLAR DIVISION—AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS. R_A' IS COMPUTED FOR THE NATIONAL BUREAU OF STANDARDS.

R_Z STANDS FOR ZÜRICH PROVISIONAL SUNSPOT NUMBERS AND IS DEPENDENT ON OBSERVATIONS MADE AT THE FEDERAL OBSERVATORY IN ZÜRICH /SWITZERLAND/ AND ITS STATIONS IN LOCARNO AND AROSA.

THE WOLF RELATIVE SUNSPOT NUMBER R IS BASED ON THE FORMULA:

$R = K/10G+F/$ WHEREBY K STANDS FOR THE OBSERVATORY COEFFICIENT, G IS THE TOTAL NUMBER OF GROUPS AND F IS THE TOTAL NUMBER OF SPOTS /UMBRAE/.

/ OBSERVATIONS MADE UNDER ADVERSE SEEING CONDITIONS

NUMBER BEFORE COMMA INDICATES TOTAL GROUPS
NUMBER AFTER COMMA INDICATES TOTAL SPOTS