



THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS

Solar Bulletin

HARRY L. BONDY, EDITOR

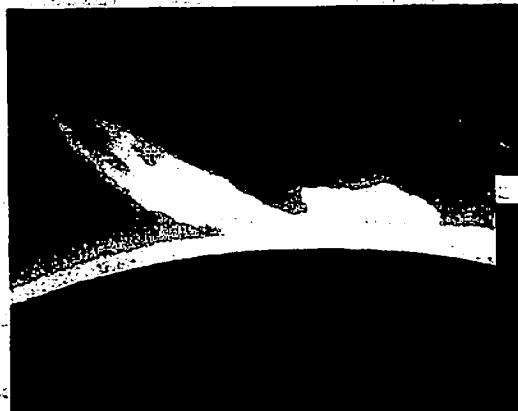
61-30 157 ST., FLUSHING 67, N. Y.

SOLAR DIVISION COMMITTEE: RICHARD W. HAMILTON, AAVSO PRESIDENT; H. L. BONDY, CHAIRMAN
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JULY - SEPTEMBER 1958

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One of the most outstanding amateur solar observers today is unquestionably WALTER J. SEMERAU of Kenmore, N.Y. Mr. Semerau built his own solar telescopes including a monochromator - coronograph; a spectroheliograph and -scope and time-sequence cinematographic equipment with an automatic follower. "Scientific American" carried several articles about Mr. Semerau's work (see S.A. Sept. 1955; Sept. 1956; April 1958). In a future Solar Bulletin we hope to describe in detail Mr. Semerau's outstanding work. Here are two fine examples of Mr. Semerau's photographs.



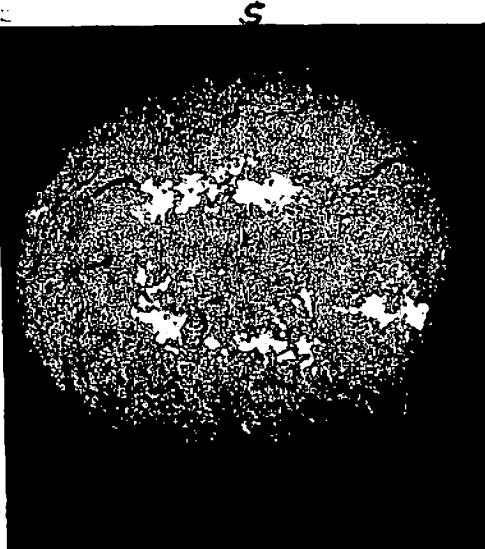
JUNE 7-58 1442 U.T. N.W. LIMA

A spectroheliogram by

WALTER J. SEMERAU

23 August 1958 →

An active prominence (surge)
photographed by W.J. SEMERAU
on 7 June 1958 1442 U.T.



MAY 19 1959

Summary* of sunspot observations by members of the Solar Division AAVSO.

The tables on the following pages have been kindly prepared by Miss Rosemary Farren, student assistant of Dr. Sarah J. Hill, Wellesley College, Mass.. We are very grateful to Miss Farren and to Dr. Hill for these summaries which enable us to check our observations.

The classic Wolf formula for the socalled "Relative Sunspot Number" "R" is:

$$R = k(g + s)$$

where g equals the total number of spot groups;

s equals the total number of individual umbrae counted even when surrounded by one penumbral field;

k is the observer's correction coefficient, i.e. a statistical factor employed to bring an individual's count to the scale used by Zürich.

The socalled k-factor accounts more or less for the following effects:

- a) variation in instrument properties; size, magnification, mode;
- b) the individual's seeing acuity and homogeneous efforts;
- c) meteorological conditions affecting seeing;
- d) evolutionary changes in spots;
- e) miscellaneous.

What can an observer do to get systematically reasonable values?

First a) use always the same instrument, magnification, diaphragm and sun glass (if used) and mode of observation i.e. direct visual or projection;

- b) only experience and the frequency of careful observations help here; careful, preferably projection drawings should be used to follow the sunspot evolution and thus to enable one to make the proper group divisions(counts);
- c) observe, when ever possible, under the best seeing conditions, usually early mornings or late in the afternoon; use observations made under adverse seeing conditions only as a guide for next days observations;
- d) you can do nothing about this one; however it is such changes that also account for variations in spot counts;
- e) minimize all adverse conditions such as unclean optical surfaces (particularly important with reflectors); frail mountings; looking over heated rooftops, etc, etc.

Many people want to know why there are differences between Zürich Sunspot Numbers and American ones (R_A). The great advantage of the relative ease which permits one to evaluate overall solar activity from this solar index is also responsible for the discrepancies in R-numbers. Zürich computes "Provisional" sunspot numbers from observations secured at Zürich, Locarno and Arosa, all in Switzerland. Final, or socalled "definitive" Zürich Numbers, are available only at the end of each year. A comparison between the two series shows that some differences cannot be avoided. However, since it is only monthly

*) SEE FOOTNOTE ON PAGE 10.

(Sunspot Numbers)

mean values that are used in solar research, and for the overall study of the solar cycle, even these are smoothed, minor discrepancies do not matter. (In the January 1953 S.D.Bulletin Bondy showed that there were discrepancies in the yearly mean values between the sunspot area measures made at Greenwich and the US Naval Observatory amounting to more than 10%). The final Zürich Numbers include all Zürich observations made under good seeing conditions, while for the other days values from other stations all over the world are weighed to give the definitive number. The socalled American Relative Numbers are based on observations made in all parts of the globe and computed as a weighed mean. The various k-factors of participating stations are computed each year at Zürich to keep their scale more or less constant and they vary in value $\pm 10\%$. The k-factors of "American" observers are computed on a logarithmic scale, and they are kept, together with another factor (w) , which expresses more or less how an observer's estimates fluctuate, for several years constant.

How can an observer compute his own k-factor? Since the standard sunspot number R (Zürich scale) should theoretically follow the equation: $R = kR_1$ where R_1 is the individual's "number", it follows that:

$$k = R : R_1$$

To give k a meaningful statistical value, it is necessary to employ the sum total of great many numbers. It is advisable to use at least 200 observations and reject all observations made under adverse seeing conditions. The following is only a poor example how this is done by using parallel observations.

date:	R_1	R_Z provision.	R_Z definitive
1957			
Jan.5	238	217	226
13	139	123	134
18	144	126	143
27	186	134	150
28	153	125	141
Mar.2	166	164	164
3	122	137	137
10	208	186	186
13	196	228	228
14	166	164	175
16	128	146	146
17	177	155	150
18	160	148	147
May 3	123	123	118
5	105	92	92
7	143	136	140
8	158	150	150
9	174	162	162
10	153	195	195
12	179	207	204
TOTALS:	3218	3118	3188

$$k = R_{Zp} : R_1$$

$$\text{Total } R_{Zp} = 3118$$

$$\text{Total } R_1 = 3218$$

$$k = 0.97$$

(With R_{Zdef} . $k=0.99$)

(The provisional values are adequate)

AAVSO - SOLAR DIVISION
AMERICAN SUNSPOT NUMBER OBSERVATIONS
 MONTHLY MEAN RA' = 117.3 MAY 1956
 MONTHLY MEAN R7 = 13.60

ADVERSE SEEING
RECEIVED LATE

NUMBER BEFORE COMMA = TOTAL GROUPS
NUMBER AFTER COMMA = TOTAL SPOTS

AAVSO - SOLAR DIVISION
AMERICAN SUNSPOT NUMBER OBSERVATIONS

MONTHLY MEAN $R_A^1 = 10.6.0$ JUNE 1956

OBSERVER	Ki	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	0.70	7.61	7.43	6.62	-	-	-	-	-	4.31	5.20	6.18	6.25	6.39	-	6.46	-	6.61	6.59	-	6.74	7.29	6.60	-	6.17	-	7.74	9.62	-	-				
Bessell	1.04	7.86	6.52	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60	7.60			
Bellinger	1.18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Bandy	1.22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
von Bremert	0.97	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Brown	5.20	5.55	-	-	-	-	-	-	-	7.20	6.22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Buchsbaum	1.11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Chapais	0.79	5.43	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Craig	0.52	6.64	7.74	6.62	7.49	7.49	6.38	6.40	6.19	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15	6.15		
Crookshank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Dekker	0.82	7.38	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
Elias	0.61	7.60	5.91	5.57	5.41	6.73	7.02	7.46	4.53	5.28	6.37	8.48	6.27	7.37	9.41	9.70	7.63	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79
Estremadurov	0.40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Ferrari	1.02	6.33	6.26	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Hicks	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Iacobini	5.61	6.53	7.53	6.73	7.02	7.46	4.53	5.28	6.37	8.48	6.27	7.37	9.41	9.70	7.63	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	6.79	
Lombardi	1.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Luft	0.78	5.78	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Mader	1.90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Menzel	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62	11.62		
Nichols	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Roberts	0.69	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Sparks	0.76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Walter	1.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Wentz	1.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Winn	1.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Wolfe	1.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Womble	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27	1.27
Zumwalt	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45

ADVERSE SEEING
* RECEIVED LATE

SOLAR BULLETIN

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July-September 1959

NUMBER BEFORE COMMA = TOTAL GROUPS
NUMBER AFTER COMMA = TOTAL SPOTS

AAVSO - SOLAR DIVISION		NUMBER OBSERVATIONS	MONTHLY MEAN	R7 = 128.5
AMERICAN SUNSPOT	MONTHLY MEAN			
RA' = 117.9	JULY 1956			

[REDACTED] ADVERSE SEEING
[REDACTED] RECEIVED LATE
* *

AAVSO - SOLAR DIVISION

AMERICAN SUNSPOT NUMBER OBSERVATIONS

MONTHLY MEAN RA' = 15.5.7 AUGUST 1956

MONTHLY MEAN R_Z = 17.1

NOTE: R_A = AMERICAN SUNSPOT NUMBER AND IS COMPUTED FROM OBSERVATIONS MADE BY MEMBERS OF THE SOLAR DIVISION OF THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS. R_A IS COMPUTED FOR THE INDIVIDUAL OBSERVERS.

RZ = ZURICH PROVISIONAL SUNSPOT NUMBER, AND IS DEPENDENT ON OBSERVATIONS MADE AT THE FEDERAL OBSERVATORY IN ZURICH AND ITS STATIONS IN

LOCANDO AND AMESA: THE WOLF RELATIVE SUBSPOT NUMBER R IS BASED ON THE FORMULA:

$$R = k(100 + r) \cdot \text{vegmin} \quad K = \text{carries} \quad B = \text{Biomass} \quad E = \text{Element}$$

100

1000

SOLAR BULLETIN

July-August 1962

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AAVSO - SOLAR DIVISION
AMERICAN SUNSPOT NUMBER OBSERVATIONS

MONTHLY MEAN RA=159.5 SEPTEMBER 1956 MONTHLY MEAN RZ=18.22

OBSERVER	KI	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	0.04	1.25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Aitken	0.27	1.35	0.57	0.49	0.40	0.31	0.29	0.28	0.27	0.26	0.25	0.24	0.23	0.22	0.21	0.20	0.19	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.10	0.09	0.08	0.07	0.06	
Bartels	0.04	0.73	0.61	0.56	0.52	0.49	0.45	0.42	0.40	0.38	0.36	0.34	0.32	0.30	0.28	0.26	0.24	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.06	0.04	0.02	0.01		
Bentley	0.07	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Birch	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Brueckner	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Carrington	0.40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Chapman	0.30	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	
Crone	0.72	0.70	0.55	0.51	0.49	0.47	0.45	0.43	0.41	0.39	0.37	0.35	0.33	0.31	0.29	0.27	0.25	0.23	0.21	0.19	0.17	0.15	0.13	0.11	0.09	0.07	0.05	0.03	0.01		
Davidsen	0.50	0.70	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10	0.05	0.00	-0.05	-0.10	-0.15	-0.20	-0.25	-0.30	-0.35	-0.40	-0.45	-0.50	-0.55	-0.60	-0.65	-0.70	-0.75	-0.80	
Ellis	0.73	0.50	0.45	0.42	0.40	0.38	0.35	0.32	0.30	0.28	0.26	0.24	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.06	0.04	0.02	0.00	-0.02	-0.04	-0.06	-0.08	-0.10		
Extremozky	0.60	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Fox	1.16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Ford	0.62	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Gibson	0.50	0.70	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10	0.05	0.00	-0.05	-0.10	-0.15	-0.20	-0.25	-0.30	-0.35	-0.40	-0.45	-0.50	-0.55	-0.60	-0.65	-0.70	-0.75		
Goodrich	0.50	0.70	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10	0.05	0.00	-0.05	-0.10	-0.15	-0.20	-0.25	-0.30	-0.35	-0.40	-0.45	-0.50	-0.55	-0.60	-0.65	-0.70	-0.75		
Landolt	0.52	0.74	0.60	0.48	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Leverett	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Lind	0.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Mack	0.50	0.70	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10	0.05	0.00	-0.05	-0.10	-0.15	-0.20	-0.25	-0.30	-0.35	-0.40	-0.45	-0.50	-0.55	-0.60	-0.65	-0.70	-0.75		
McKee	0.50	0.70	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10	0.05	0.00	-0.05	-0.10	-0.15	-0.20	-0.25	-0.30	-0.35	-0.40	-0.45	-0.50	-0.55	-0.60	-0.65	-0.70	-0.75		
McNutt	0.50	0.70	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10	0.05	0.00	-0.05	-0.10	-0.15	-0.20	-0.25	-0.30	-0.35	-0.40	-0.45	-0.50	-0.55	-0.60	-0.65	-0.70	-0.75		
Moore	0.72	0.50	0.45	0.42	0.40	0.38	0.35	0.32	0.30	0.28	0.26	0.24	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.06	0.04	0.02	0.00	-0.02	-0.04	-0.06	-0.08	-0.10		
Nichol	0.50	0.65	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Pfleiderer	0.50	0.70	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10	0.05	0.00	-0.05	-0.10	-0.15	-0.20	-0.25	-0.30	-0.35	-0.40	-0.45	-0.50	-0.55	-0.60	-0.65	-0.70	-0.75		
Rosenblum	0.49	0.60	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10	0.05	0.00	-0.05	-0.10	-0.15	-0.20	-0.25	-0.30	-0.35	-0.40	-0.45	-0.50	-0.55	-0.60	-0.65	-0.70	-0.75		
Thomas	0.67	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10	0.05	0.00	-0.05	-0.10	-0.15	-0.20	-0.25	-0.30	-0.35	-0.40	-0.45	-0.50	-0.55	-0.60	-0.65	-0.70	-0.75			
Throssel	0.57	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
Tucker	0.50	0.60	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10	0.05	0.00	-0.05	-0.10	-0.15	-0.20	-0.25	-0.30	-0.35	-0.40	-0.45	-0.50	-0.55	-0.60	-0.65	-0.70	-0.75		
Verner	0.50	0.60	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10	0.05	0.00	-0.05	-0.10	-0.15	-0.20	-0.25	-0.30	-0.35	-0.40	-0.45	-0.50	-0.55	-0.60	-0.65	-0.70	-0.75		
Weller	0.50	0.60	0.55	0.50	0.45	0.40	0.35	0.30	0.25	0.20	0.15	0.10	0.05	0.00	-0.05	-0.10	-0.15	-0.20	-0.25	-0.30	-0.35	-0.40	-0.45	-0.50	-0.55	-0.60	-0.65	-0.70	-0.75		
Young	0.51	0.59	0.57	0.53	0.51	0.49	0.47	0.45	0.43	0.41	0.39	0.37	0.35	0.33	0.31	0.29	0.27	0.25	0.23	0.21	0.19	0.17	0.15	0.13	0.11	0.09	0.07	0.05	0.03	0.01	
Zwicky	0.50	0.58	0.56	0.54	0.52	0.50	0.48	0.46	0.44	0.42	0.40	0.38	0.36	0.34	0.32	0.30	0.28	0.26	0.24	0.22	0.20	0.18	0.16	0.14	0.12	0.10	0.08	0.06	0.04	0.02	

† ADVERSE SEEING
* RECEIVED LATE

NUMBER BEFORE COMMA = TOTAL GROUPS
NUMBER AFTER COMMA = TOTAL SPOTS

AAVSO - SOLAR DIVISION

AMERICAN SUNSPOT NUMBER OBSERVATIONS

MONTHLY MEAN RA = 13.9.9 OCTOBER 1956

MONTHLY MEAN RZ = 160.8

OBSERVER	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	1.76	1.71	1.71	1.70	1.70	1.72	1.72	1.72	1.73	1.74	1.74	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75		
Aitzen	1.71	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	
Bailey	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	1.74	
Bartko	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Bandy	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Brennan	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
von Braun	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Buckstaff	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Craig	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Dekinder	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Ellis	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Estrada-Gutierrez	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Evans	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Fernholz	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Itashashi	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Lambach	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Leibnitz	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Lutz	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Mabie	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Monteiro	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Moore	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Nicolini	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Pilsworth	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Rosebrugh	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Thomas	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Throssell	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Trotter	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Vanier	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Wells	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
Womelsdorf	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	1.71	
	RA	1.71	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72
	R2	1.70	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72	1.72

NUMBER BEFORE COMMA = TOTAL GROUPS
 NUMBER AFTER COMMA = TOTAL SPOTS

- 9 -

ADVERSE SEEING

RECEIVED LATE

BULLETIN

SOLAR

JULY-SEPTEMBER 1956

AAVSO - SOLAR DIVISION
AMERICAN SUNSPOT NUMBER OBSERVATIONS

MONTHLY MEAN $R_A^1 = 17.3.1$ NOVEMBER 1956 MONTHLY MEAN $R_Z = 20.2.7$

OBSERVER KI	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	12.27	13.05	12.47	11.89	12.72	12.65	14.86	13.78	14.26	14.72	14.62	14.62	14.72	14.72	14.72	14.72	14.72	14.72	14.72	14.72	14.72	14.72	14.72	14.72	14.72	14.72	14.72	14.72	14.72	14.72		
Adams	6.76																															
Bardley	6.75																															
Bentley	4.64																															
Bonney	6.89																															
Brown	6.69																															
Buckstaff	6.61																															
Cahn	4.12																															
Clegg	5.72	5.64	5.62	5.52	5.36	5.11	4.89	4.62	4.31	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25	4.25		
DeWitt	6.60																															
Ellis	6.73	12.73	12.53	12.51	12.71	12.62	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52	12.52	
Estramendia, V.	6.80																															
Feltus	6.16																															
Fernau	4.82																															
Gebelki	4.45																															
Landolt	4.82																															
Lauritsen	6.04	6.04	6.07	6.75	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47	10.47		
Levit	6.78																															
Mather	6.70	6.42	6.42	6.42	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70	12.70		
McDonald	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45	6.45		
Moore	6.78	12.62	12.34	12.33	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62	12.62		
Nicolini	5.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71	4.71		
Pillsworth	6.56																															
Rosenberg	6.48																															
Thomas	6.86																															
Throssell	1.97																															
Trotter	1.18	1.18	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22	1.22		
Westerh	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18	4.18		
Wells	2.46																															
Womble	2.41																															
RA	12.3	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1	17.1		
RZ	16.7	17.5	17.7	17.8	20.9	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6	

JANUARY - FEBRUARY 1959 IN O. D. BULLETIN FOR MARCH-APRIL 1956
 MARCH - APRIL 1959 * * * * * MAY-JUNE 1959

MAY TO DECEMBER 1958 IN THIS ISSUE FOR JULY-SEPTEMBER 1957
 JANUARY TO JUNE 1957 IN G. D. BULLETIN FOR JULY-SEPTEMBER 1957
 JULY 1957 * * * * * SEPTEMBER-OCTOBER 1957

SEPTEMBER TO NOVEMBER 1957 IN THIS ISSUE - JULY-SEPTEMBER 1958
 DECEMBER 1957 PORTION OF AUGUST AND DECEMBER 1957 PORTIONING
 MISSING TABLES FOR AUGUST AND DECEMBER 1957 PORTIONING.

THE FOLLOWING SPREAD SHEETS OF AMERICAN SUNSPOT NUMBER OBSERVATIONS
 ARE A CONFIRMATION FROM EARLIER SOLAR DIVISION BULLETTES. FOR
 CONFIRMERS NOTE THAT THESE SUMMARIES WERE PUBLISHED REGULARLY

JUNE 1956, STARTING WITH 1956 THE FOLLOWING TABLES WERE PRINTED:
 JUNE 1956
 JULY 1956
 AUGUST 1956
 SEPTEMBER 1956
 OCTOBER 1956
 NOVEMBER 1956
 DECEMBER 1956

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AAVSO - SOLAR DIVISION
AMERICAN SUNSPOT NUMBER OBSERVATIONS

MONTHLY MEAN RA' = 159.8 DECEMBER 1956

MONTHLY MEAN RZ = 185.5

OBSERVER	KI	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					
Ahern	W. G.	32.81																																			
Adams	0.76	14.68																																			
Bentley	1.01	19.05																																			
Bundy	1.89	12.44																																			
Brennan	0.63																																				
von Braun		14.63																																			
Buckstaff	L/I																																				
Cain	14.12	15.10	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71						
Clegg	6.72	12.26	13.71	10.46	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58	14.58					
Dunn	10.24	14.53																																			
East Indian	0.16																																				
Elliott	0.18	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74					
International C.	4.63	8.10	7.77	6.32	6.66																																
Fernald	14.23	14.65																																			
Habicht	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18	14.18					
Landolt	-1.2	12.35	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85	12.85					
Lamb																																					
Levit	0.91	1.80	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73	1.73			
Melcher	1.57																																				
McDonald	0.18																																				
Moore																																					
Muzatkin																																					
Pitcairn	0.05	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74	14.74				
Rosenblum	0.18	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32	12.32					
Thomas	0.57																																				
Thompson	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71	14.71			
Trotter	14.21	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37	13.37			
Wester	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25	1.25		
Willis	1.38	1.38																																			
Winnipeg	0.30	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68	14.68		
Extreme/Perih.	0.01	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67	11.67		
R ₁	1/2	102	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106	106
R ₂	1/3	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100

NUMBER BEFORE COMMA = TOTAL GROUPS
 NUMBER AFTER COMMA = TOTAL SPOTS

† ADVERSE SEEING
 * RECEIVED LATE

AAVSO - SOLAR DIVISION
AMERICAN SUNSPOT NUMBER OBSERVATIONS
 MONTHLY MEAN RA' = 207.2 SEPTEMBER 1957 MONTHLY MEAN RZ = 244.3

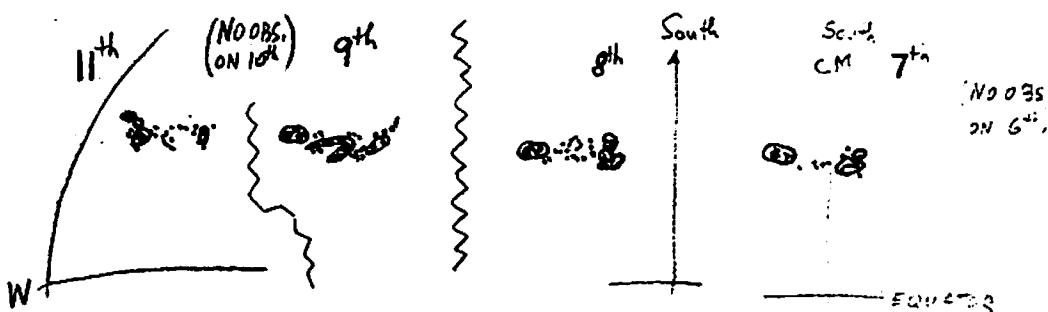
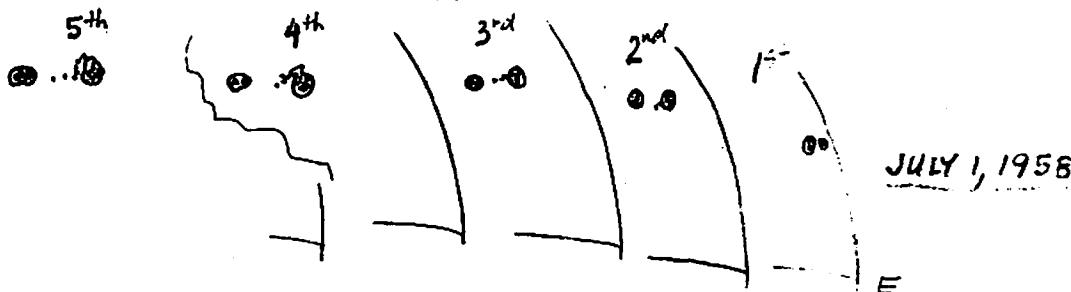
ADVERSE SEEING
RECEIVED LATE

NUMBER BEFORE COMMA = TOTAL GROUPS
NUMBER AFTER COMMA = TOTAL SPOTS

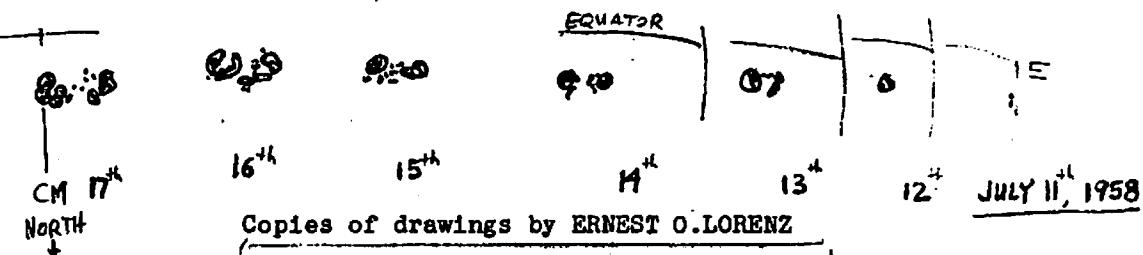
SOLAR BULLETIN

-15-

July-September 1958

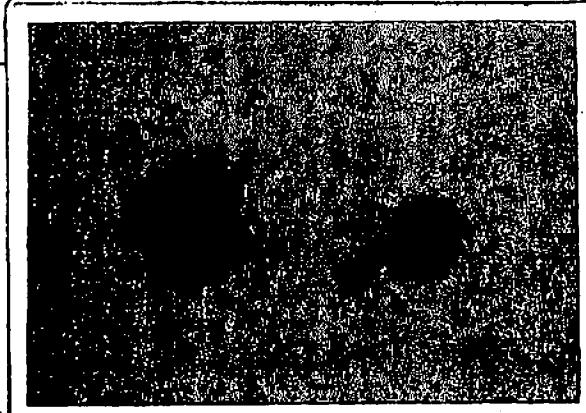


Copies of PROJECTION DRAWINGS by ERNEST O. LORENZ



Copies of drawings by ERNEST O. LORENZ

19 JULY 1958



This is the same
group as drawn by
Ernest O. Lorenz
(July 11th - 17th)

Photograph by Dr. HUBERTA VON BRONSART,
Stuttgart, Germany.

Sunspot Drawings by Ernest O. Lorenz.

On this and the opposite page you may see some copies of sunspot drawings made by Mr. ERNEST O. LORENZ, Lakewood, California. This writer had the privilege to examine several notebooks of drawings and sunspot records made by Mr. Lorenz in 1957 and 1958. These notebooks are among the most carefully prepared ones by amateur observers.

In addition to showing the relative positions on a solar coordinate grid and their proper areas, Mr. Lorenz notes the group count and spot count in each quadrant and totals in the N-S and E-W hemispheres. A detailed report on his findings was presented to the WAA convention in August 1958. Among other things, Mr. Lorenz wrote:

"My telescope is a general purpose 6-inch, f.8 reflector with a clock drive, circles, rotating tube and slow motions on both axes. I have an aperture stop made from a piece of sheet metal that stops my scope down to one and five-eights inches. Even stopped this far I use a number ten welders filter over the eyepiece."

Mr. Lorenz first secures the overall positions and shape of sunspots and then, with the use of direct vision examination, he draws in the details on his projection drawing. His drawings are on 5" discs.

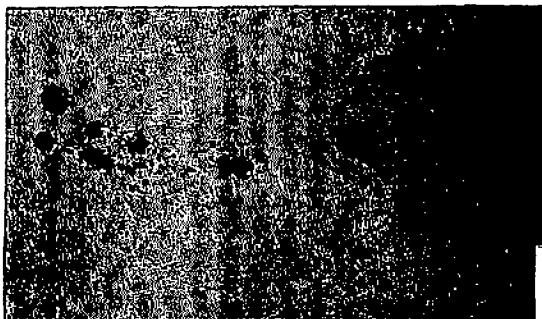
Notes on a possible case of "rejuvenation growth" in a sunspot group shown on the following page from Mr. Lorenz's drawings. This rising group (July 1st) seems to be at first a G-type with a larger p-component (GP-5) as recorded by Lorenz. On the next two days (2nd and 3rd) it appears as a fairly uniform G-group with the f-component (follower) having minute precursor spots; on the fourth the f-component is larger; on the fifth the spot count grows to 21 and the overall length is over 12° ; on the 7th the group crosses the Central Meridian at a mean latitude of 25° South; length about 17° . Though it still appears more like a G-group the intermediate spots, still very small, bring it into the E-type class; maximum growth seems to be reached on the 8th and particularly 9th; on the 11th there are signs of disintegration. This group seems to have returned on July 28, as a J-type and died on August 4th. In June there was a medium size group in this general region, though in somewhat lower latitude, which died on the visible disc on June 15th.

An interesting "compact bipolar group" -July 11 to 23rd, 1958. (See opposite page). This low latitude group $N8^{\circ}$ came over the eastern limb on July 11, seemingly as a B-type (Lorenz's sketch); on the 12th it appeared as an H-group with an area of about 250 millionths of the solar hemisphere according to the U.S. Naval Observatory's Preliminary Measures. On the 18th it was a D^p-group with an area of 569×10^{-6} ; on the 15th it reached an area of almost 1300×10^{-6} ; on the 18th it reached maximum area of 1400 and then it receded and set with an area of about 1000×10^{-6} . Dr. Huberta von BRONSART's (Stuttgart, Germany) fine photograph of July 19th shows detail in the filamentary structure of the penumbras, several light bridges and associated pores.

Continuing some of the fine drawings of sunspots made by Mr. Ernest O. Lorenz, we can follow an interesting evolution of three sunspot groups. Starting with July 20th we see three groups in the SE quadrant Leading (i.e. westernmost) is is an H-group in lat. 82° , then follows a B-type group (816°) and just rising we see a fairly large group (possibly an E-type). The following are Mr. Thomas A. Cragg's notes (Mt. Wilson Solar Observatory Assistant):

"Toward the end of July we had another classical example of the forward movement of a developing group. On July 21st there were three groups in the southeast, an H, C and E group. Ed. note: Lorenz's B-group of the preceding day already grew into a C-type). The C group (Shown as a Cⁱ-type by Lorenz because its f-component was more prominent) is the one to which I refer. By July 24th its very ragged nature is apparent. On the 25th and 26th the forward march is made with great rapidity, in fact virtually enveloping what has now become a J group (formerly B), which originally was leading the procession. By the 28th the J-group had become so immersed in the following group (now a voracious E or even F-type) that without previous history of the affair one could have never desciphered to true nature of what happened. Incidentally, the growing group was a beta-gamma (i.e. it had mixed polarities) from the 24th on."

Two very fine photographs by Dr. Huberta von Bonsart, Stuttgart, Germany, show us some detail of this complex on the 26th July, just when the rapidly advancing p-spot of the expanding E-group began to overtake the old J-group. The other photo shows the complex just when it approached the western limb surrounded with the weird network of faculae. Dr. von Bonsart photographs very successfully sunspots in the limb regions. We have received a number of excellent photographs from her for which we are very grateful. (There is a suggestion of rotation in the p-spot of the eastern-most group in an ENW direction which only careful measurements could confirm. Ed.)



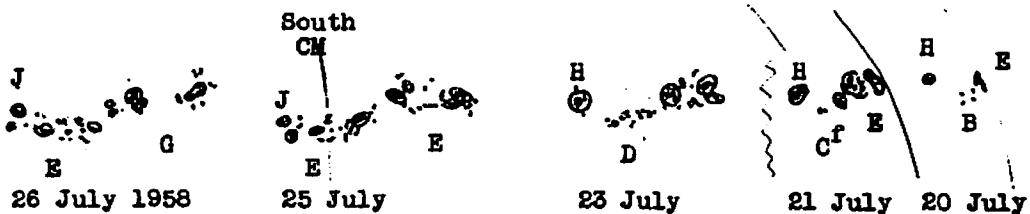
26 July 1958 photograph by Dr. Huberta von Bonsart.



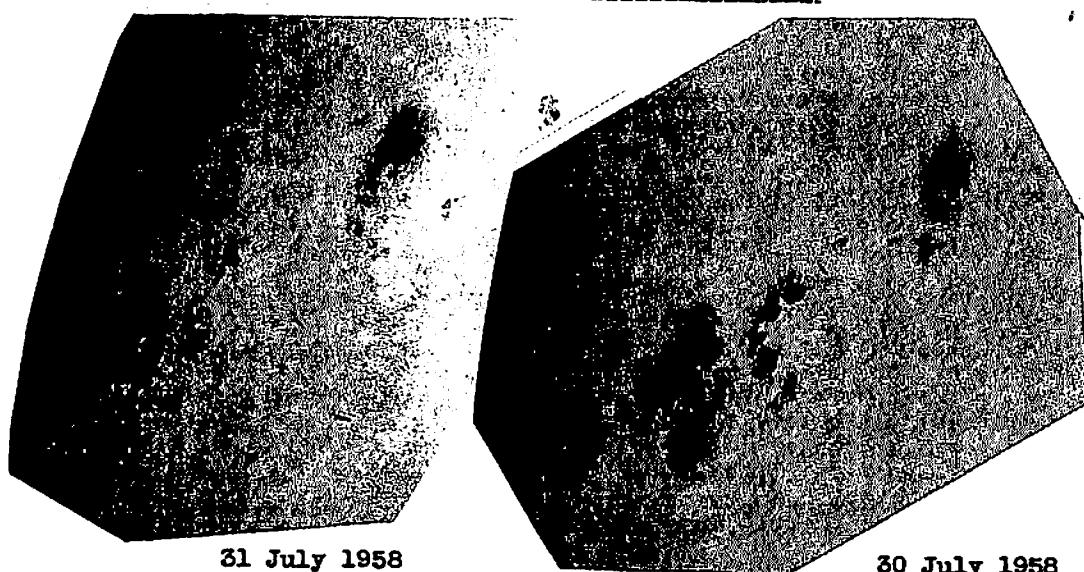
The pE₂₈ component which seems to show rotation in the east-north-west direction.

(see photographs and drawings on the next page)

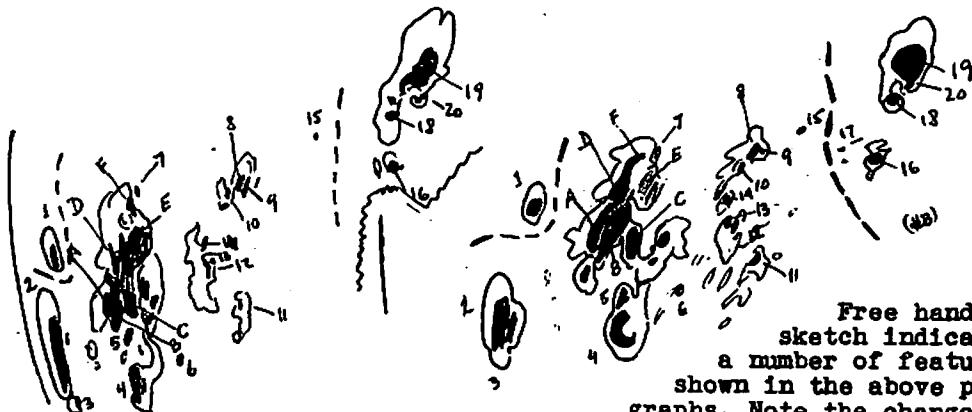




Copies of Sunspot drawings by ERNEST O. LORENZ.



Photographs by Dr. HUBERTA VON BRONSART



Free hand
sketch indicating
a number of features
shown in the above photo-
graphs. Note the changes.

Editorial notes.

The balance of the 1958 Solar Bulletins is being considerably delayed for several reasons. First a personal one. This editor has suffered a grievous loss in the death of his mother. It was his mother who taught him early to love the wonders of nature and who brought him, particularly, into the realm of astronomy. Is it a consolation that others have recovered from this tragedy?

The other major reason for the great delay was the work this editor and chairman of the Solar Division had to devote to our new, yet major, effort for the IGY in the form of indirect flare patrol by means of recording "Sudden Enhancements of Atmospherics" (SEA's). The October-December 1958 Solar Bulletin will carry a detailed report on this first effort of amateurs in a coordinated program over a whole continent to use radio-astronomy techniques and get results on a level of professionals.

Last but not least, it must be remembered that this editor and chairman is but an amateur who can devote only his free time to this work.

Harry L. Bondy.

* * * * *

Correction: In our last issue (Jan.-June) Mr. Frank De Kinder's name was not shown with an asterix. We regret this omission. Indeed, Mr. De Kinder is one of our "standard" observers from the beginning (1948). His monthly reports are regularly received and used in the reduction of the American Relative Sunspot Number.

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Three new STANDARD OBSERVERS.

Mr. R. W. WOMELSDORFF, Lake Charles, La., reported to the Solar Division his sunspot observations regularly since February 1955. He uses a 4" reflector with a filter for direct sunspot observations.

Mr. SHINTARO ITABASHI, Tokyo, Japan, has contributed his sunspot observations to us since June 1955. He uses a 50 mm refractor.

Mr. JEAN NICOLINI, Sao Paulo, Brazil, has forwarded to us his sunspot observations since March 1956. He uses a 56 mm refractor. Recently Mr. Nicolini started quite successfully to photograph the sun.

We wish to thank as well as congratulate these observers for their contributions and hope that they will collaborate with us for many more years.

Several other Solar Division members are reporting their sunspot observations to us for a number of years. However, either the number of their monthly reports is too small for a reliable evaluation or they use two or more telescopes in their estimates. Both reasons prevent us to get satisfactory coefficients (k and w values) from their observations.

DAILY AMERICAN RELATIVE SUNSPOT NUMBERS - R_A -

for JUNE, JULY, AUGUST and SEPTEMBER 1958.

day	Jun.	Jul.	Aug.	Sep.	day	Jun.	Jul.	Aug.	Sep.
1	139	180	240	227	16	65	127	198	184
2	115	168	240	204	17	86	147	177	214
3	148	192	216	218	18	96	142	149	189
4	202	206	178	226	19	127	176	136	175
5	216	225	217	229	20	126	187	142	175
6	185	223	238	234	21	135	204	161	158
7	165	185	235	186	22	175	158	174	164
8	182	162	211	164	23	195	185	190	173
9	161	185	225	167	24	164	198	185	175
10	189	175	240	205	25	162	162	195	192
11	172	149	192	230	26	205	188	161	153
12	162	120	189	262	27	175	181	175	190
13	180	135	180	271	28	181	189	184	228
14	115	104	155	233	29	133	206	166	180
15	86	132	191	202	30	121	250	193	165
					31		283	209	

Mean: JUNE:152.1 JULY:178.2 AUGUST:192.0 SEPT.:198.4

Note: The American Sunspot Numbers as well as the Zürich Provisional Sunspot Numbers are regularly published in SKY & TELESCOPE.

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ZURICH PROVISIONAL SUNSPOT NUMBERS for JUNE, JULY, AUGUST and SEPTEMBER 1958 - dependent on observations made at Zürich Observatory and its stations in Locarno and Arosa (Switzerland).

day	June	Jul.	Aug.	Sep.	day	Jun.	Jul.	Aug.	Sep.
1	200	180	879	200	16	100	144	177	206
2	154	164	250	221	17	113	160	163	189
3	181	190	210	230	18	100	181	152	205
4	195	213	177	240	19	114	196	128	187
5	195	222	198	206	20	107	192	131	163
6	176	240	209	220	21	141	208	145	156
7	185	231	223	175	22	148	184	160	172
8	200	218	230	160	23	184	178	200	175
9	209	207	265	166	24	189	170	177	174
10	200	219	255	219	25	199	179	207	161
11	193	165	271	245	26	183	213	180	169
12	193	137	228	268	27	178	238	196	177
13	176	149	220	265	28	174	250	202	208
14	160	143	202	233	29	200	274	238	218
15	131	142	190	230	30	159	280	238	189
					31		263	220	

Mean: JUNE: 167.9 JULY: 197.7 AUGUST: 203.9 SEPTEMBER: 200.9