



THE AMERICAN ASSOCIATION OF VARIABLE STAR OBSERVERS

Solar Bulletin

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

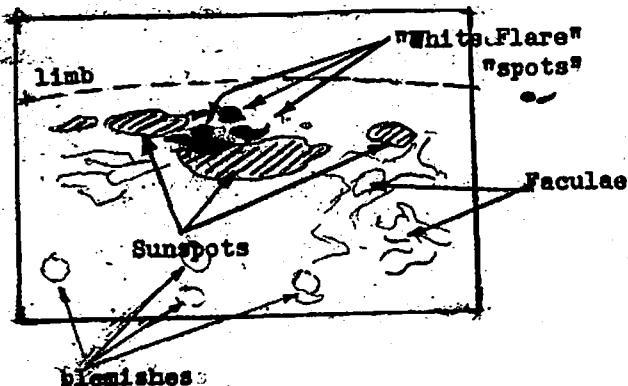
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Drawing of the photograph of the "white flare" photographed by S. CORTESSI, Locarno, 23 March 1958 10:11 UT, originally reproduced in *Zeitschrift für Astrophysik*, 46 (58) in M. Waldmeier's article.



WHITE FLARES

On 23rd March 1958, not quite one hundred years after the historic "white flare" seen by Carrington and Hodgson (1859), another spectacular "white flare" was observed.

This time several observers, independently and in different countries, witnessed this most rare of all solar phenomena.

One of them, Mr. S. Cortesi of the Zürich Federal Observatory station in Locarno succeeded to photograph this flare in integrated light.

His is the only known case of a "white flare" photographed in white light.

Since very little is known about these exceptional flares /most textbooks mention only the 1859 event/, the following text is an attempt to review some of the most recent cases.

Since these flares can be observed by amateurs as well as by professionals, and since there are so few well documented cases, we wish to stress the need for careful, well established observations of "white light flares".

(continued)

(Continued) "WHITE FLARES"

This bulletin carried already a number of notices and articles on "white flares". We suggest that the interested observer reread the following material:

- Solar Division Bulletin-July-Aug. 1956 (Carrington's observation)
- Solar Division Bulletin-Sept. Oct. 1956 (Mme d'Azambuja's article)
- Solar Bulletin - Mar-Apr. 1957 (white flare of 23 Feb. 1956)
- Solar Bulletin - Sep.-Oct. 1957 (white flare of 7 Sep. 1957)
- Solar Bulletin - Jan.-June 1958 (white flares of 23 and 30 Mar. '58)

It was in Mme d'Azambuja's article in L'ASTRONOMIE (April 1947), at the peak of the until then most intensive solar cycle, that the idea to "look out" for "white flares" was stressed. M.A. ELLISON photographed the continuum spectrum during the flares of 1946 July 25 and 1949 November 19, thus proving that these flares "could have been seen" in white light. Actually, the Swiss observer, MAURICE DU MARTHÉRAY saw a "white flare" on 5 March 1946 already. Mme M. d'Azambuja mentioned in her article all the known cases - five!. During a most remarkable resurgence of sunspot activity in 1951 (only five months after the first spotless days of the 18th cycle), G. and R. PORRET of France saw another "white flare" in the giant group on 18 May 1951.

The first "white flare" of the present cycle was seen on 23 February 1956 by M. Urago and M. Shimizu in Japan (see SB Mar-Apr. 1957, p. 15). The following accounts bring us up to June 1958. Most outstanding since 1859 seems to be the "white flare" of 23 March 1958. The following are excerpts from M. WALDMEIER's article in ZEITSCHRIFT FÜR ASTROPHYSIC, Vol. 46; pp. 92-107 (1958) /also "Astronomische Mitteilungen der Eidgenössischen Sternwarte Zürich No. 218"/ (Ed. note: this is a free translation from German by this writer.)

(p.93) "The white flare of 23 March 1958 was simultaneously seen at the Federal Observatory in Zürich (Observer I. IZSAK) and at its stations in Specola Solare in Locarno-Monti (Observer S. CORTESSI) and at the Astrophysical Observatory in Arosa (Observer M. WALDMEIER).

"It started at 09^h50 UT, at first rather slowly until around 10^h00 when its brightness increased rapidly. At 10^h05, simultaneously, I. IZSAK and S. CORTESSI discovered that the flare was visible in white light. While the "white flares" was visible in Zürich till 10^h21, in Locarno it was visible until 10^h55. In view of this extended period of visibility of almost one hour duration, this "white flare" is even a rarity among these flares, for all the known cases of such flares are limited mostly to 5 - 10 minutes duration. While I. Izsak observed the flare on a projection screen, S. Cortesi made 2 photographs of same; this is the first time that a "white flare" was photographed in white light.

"The flare consisted of very bright, individual, isolated "knots" of about 5000 km diameter, which were in part connected with less luminous threads and in part with threadlike runners.

(continued)

(continued M. Waldmeier's account of the 23 March 1958 flare)

"Noticeable changes of brightness, position or form, except for the gradual fading, were not detected. (Ed. note: underlined by this writer)

"This flare occurred in an E-type group and the heliographic coordinates: lat. $N12^{\circ}$, long. 80° , distance from the central meridian $75^{\circ}E$. With its position near the sun's limb, the limb darkening effect undoubtedly contributed greatly to the visibility of this flare.

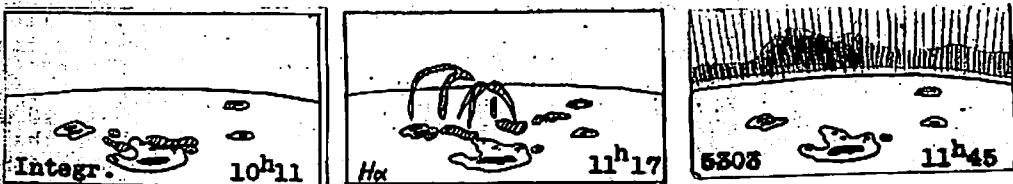
(Photometry of the flare)

"The photograph of the flare taken in white light was made with a solar-coudé refractor ($d=15\text{cm}$; $f=225\text{cm}$) of the Specola-Solare in Locarno-Monti; the film used was a blue-sensitive Typon Contaline FD, size $9 \times 12\text{ cm}$, and, with an enlarging system, the solar image had a diameter of 54 cm . (Waldmeier continues explaining details of the photometry and concludes that the luminosity excess of the flare /against the photosphere/ was 72%. In comparison, normal faculae have a luminosity excess of about 11%.)

"When I. Izsak began his observation at $10^h 05$, the sun was visible only through cloud spaces. Despite this, the flare was immediately noticed. At this moment, according to Izsak, it was certainly brighter than the center of the solar disk, probably even several times. This claim need not be in contradiction with the photographic evidence since the latter was taken at $10^h 11$ and the brightness decreased very rapidly, so that it was no longer visible in Zürich at $10^h 21$. According to Izsak, the flare was also "whiter" than the sun itself.

(Then the account continues in great detail about observations made in H_{α} light; about the coronal structure of the region in all three of the prominent coronal lines (including 5694), even the second yellow coronal line (5445) was seen, as were many chromospheric emission lines; a monochromatic photometry of the corona in 5303 was also made. Finally, solar-terrestrial effects, associated, were noted: a magnetic crochet, SEA, SWF and later on a magnetic storm followed /though nothing really spectacular here/; solar radio noise bursts on many frequencies were described.) The author then concludes:

"As the illustrations show, the flare appeared in the immediate vicinity of the penumbra; this is, as the author showed in 1938, (ZFA, 16: 289 /1938/) the preferred position relative to sunspots.."

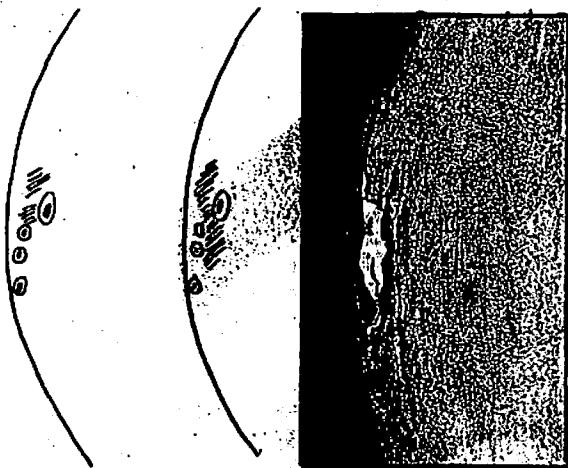


Copy of Waldmeier's illustrations (part) showing the flare as seen in integral (white) light, in Hydrogen (H_α) light and in the green coronal line of iron.

Another account of this great flare can be found also in the ZEITSCHRIFT FÜR ASTROPHYSIC, Vol. 45, 3, 1958, pp 168-175 (also in "Mitteilungen aus dem Fraunhofer Institut, Freiburg i. Br. No. 37) under the title "Beobachtungen von drei Eruptionen im Weissen Licht" and written by UDO BECKER. (This interesting article is also dealt with later on here.) The following are excerpts /free translation/:

"The "white flare" of 23 March 1958" (=Integraleruption)

"This flare was observed in white light independently at the Fraunhofer Institut's Observatory Anacapri (Italy) by GERTRUD KUENZER and at the Schauinsland Observatory (Germany) by UDO BECKER. A large sunspot group crossed the southeastern limb of the sun on 22 March. On 23 March this group was at 14° S, 74° E. A flare of 3+ importance began in this E-type group at $09^{\text{h}}50$ UT. It was observed with a spectrohelioscope at Schauinsland Observatory from $09^{\text{h}}58$ and the maximum widths of H α were measured. Around $10^{\text{h}}04$ the width of H α was so great that it was outside our limits of measurement, meaning that it was greater than 17 Å. An immediate control was undertaken to view the flare on a projection screen and it was noticed that the entire area seen in H α emission was also clearly visible /on the screen/ in white light. The color was a striking blueish-white, reminding one strongly of the bluish-white color of early B- or A-type stars. The phenomenon /white flare/ could be observed and drawn for about 4 minutes. The line-width of H α fell very rapidly then.



Copy of illustrations shown by U. Becker in his article: a according to Anacapri observations; b as seen in Schauinsland; c Lyot monochromator (H α) in Anacapri 1003 (c was a photograph), 23 March 1958.

"..During the sunspot count made on a projection screen (in Anacapri) it was suddenly noticed that, around $10^{\text{h}}01$ one of the faculae (underscored by Ed.) became much brighter than the others in this vicinity. A look through the Lyot-filter /monochromator/ showed that a bright flare was in progress in this area. Maximum brightness in H α and in white light was reached at $10^{\text{h}}04$. This time agrees exactly with observations made in Schauinsland. At $10^{\text{h}}07$ the "white flare" was still clearly visible (=mit Sicherheit). One can therefore with some certainty establish the end of the "white flare" (in agreement with both stations) at $10^{\text{h}}08$ to $10^{\text{h}}09$. The faculae, where the flare appeared, were brighter than others for another 1/2 hour, but could not be considered as a "white flare" any more.

"Again, in agreement with the Schauinsland observation, the blueish-coloring was noticed in Anacapri. While the observation in Schauinsland was made without (author's) a colored filter, the Anacapri telescope used a yellow filter (GG 11). Despite this, the blueish coloring was noted. This could happen only if the radiation in the blue region of the spectrum $\lambda > 4500 \text{ \AA}$ was considerably increased..."

The following table summarizes the main points made by the observers of this "white flare":

The 23, March 1958 "white flare"

Station	Observer	Beg.	Max.	End.	Notes:
Zürich	Izsak	10:05	(10:05)	10:21	seen in projection
Locarno	Cortesi	10:05	(10:05)	10:55	(direct visual obs.?) photographed at 10:11
Arosa	Waldmeier	x	x	x	x
Anacapri	Kuenzer	10:01	10:04	10:07	in projection, yellow filt.
Schauinsland	Becker	10:04	(10:04)	10:08/09	in projection, no filter

* * * * *

As mentioned earlier, UDO BECKER described in his article two other instances of "white flares" he observed. Excerpts follow:

"On 3. SEPTEMBER 1957, there was a class 3 flare at 24°N; 30°W from 14:12 to 16:30 UT, maximum at 14:28 UT. A photograph taken at 1425 (and reproduced in Becker's article) in the far wing region of H_α, the farthest position of the line shifter on our Lyot-filter in Anacapri, shows parts of the flare and its relation to the sunspot group. It appears that at this time the line width was greater than 7 or 8 Å..."

"A control observation on a projection screen, in white light, showed that immediately adjoining the penumbra of the large spot (Hoffleck) was an intensely bright spot. The /bright/ spot remained practically unchanged from 14:24 to 14:30, faded, however, rapidly after this; at 14:30 there was nothing left of this phenomenon. A second bright spot, also visible in white light, on the opposite side of the penumbra was only visible at 14:24 and not later. The illustration shows that the bright spots visible in white light were in the places where the H_α flare was also brightest. When we removed the yellow filter during the moment of best visibility, it was apparent that the "white flare" was emitted in blueish-white light, the light of a B- or early A-type star."

(Ed. note: the bright spots of this white flare were also fairly small, not larger than J-type spots.)

The "white flare" of 30. March 1958.

"The White flare" of 30. March 1958 occurred together with two other flares at the same time. (the author lists them; the flare

(continued)

(continued Udo Becker's account of the "white flare of 30, March 1958)

"seen in white light was at 34°N , 63°E and in $\text{H}\alpha$ light lasted from 08^h06 to 10^h01 UT.)

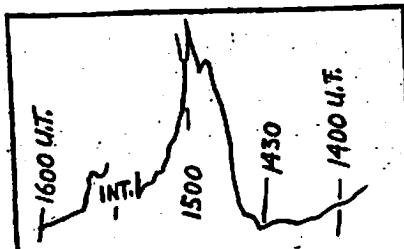
Udo Becker continues: "This flare shows a remarkable deviation in its light curve from usual flares /in as much as it had a slow start at 08^h06, faded somewhat then only to reach a sharp maximum at 08^h45/. According to its area , one would classify it as of importance 1, however because of its intense luminosity, it was called importance 1+. It is well known that small areas in some flares may become very bright at times."

This "white flare" was seen from 08^h44 to 08^h46 as "intensely white".

The "white flare" of 19. JUNE 1958, was described by THOMAS A. CRAGG, Mt. Wilson Observatory, in PUBLICATIONS OF THE ASTRO-NOMICAL SOCIETY OF THE PACIFIC in February 1959 (PASP Vol.71, No.418; pp 56-57). The following parts are quoted directly:

"On June 19, 1958 a flare estimated as of importance 1 was photographed by CARL SEYFERT, Jr. with the 18-foot spectroheliograph on Mount Wilson during regular morning observations. Two selector slits are available, and simultaneous photographs in a line /usually K_2 and $\text{H}\alpha$ / and in the continuum are commonly made. The slit on the "continuum" is set more or less at random, but always within a few angstroms of $\lambda 3832$ and $\lambda 6365$ when photographing K_2 and $\text{H}\alpha$ respectively. Since faculae can be photographed anywhere on the disk with the spectroheliograph set anywhere to the violet of $\lambda 4000$, faculae always show on the "continuum" plate near $\lambda 3832$ and have more contrast when the slit is on one of the strong lines in this region. Some 200 flares have been recorded on such spectroheliograms at Mount Wilson in the last 40 years, and until now no flare in the continuum has been obtained here." (Underlined by Ed.)

"Plates 1a and 1b (reproduced in PASP) show simultaneous spectroheliograms of the western half of the sun on JUNE 19 at 14:44 U.T. in K_2 and at $\lambda 3832$ respectively...Plate 1c is an enlargement from the K_2 image with the contrast increased to show the flare. Plate 1d is an enlargement from a spectroheliogram taken two minutes later (i.e. 14:46) which was properly exposed to show flares. The two brightest parts of the flare in Plate 1d correspond to the two bright spots in Plate 1b."



SEA recorded by David Warshaw on 19 June 1958 in Brooklyn, N.Y.

Additional notes: According to Mt. Wilson data this flare started in $\text{H}\alpha$ light around 14:42, reached maximum at 14:45 and ended at 15:18. It occurred in a very active E-type group at 15°N , 26°W , and produced a major shortwave fadeout (S-SMF 3+) and a major SEA (David Warshaw recorded the SEA starting at 14:38, max. 1450, end at 1522 - see illustration left).

More about "white flares".

In the previously cited article by UDO BECKER (ZfA, 46, 3, 1958), the author lists 17 known cases of "white flares" (see below) and concludes with giving the following characteristics:

1. The position of all "white flares" agrees with the position of the brightest portions seen in H α ,
2. In almost all cases the "white flare" occurs in the immediate vicinity of the penumbra of a large sunspot (= grosser Hinzel-fleck);
3. the usual color is "blueish-white";
4. several "white flares" were associated with straight, long surges (active, eruptive prominences);

UDO BECKER's list of "white flares":

No.	Date	Coordinates	Time*	Coloring	Notes	Ref.**
1	1,9,1859	20N 12W	11:18-24	intensely white, like Lyrae	expansion of bright spots at 245km/sec	A
2	13,11,1872	000 000	10:45-11:00	-	tongue of fire	B
3	17,6,1891	21N 80W	10:16-21	yellowish spot	-	C
4	15,7,1892	10N 90W	17:05-25	blinding white	observed by Hale in a spectrohelioscope	D
5	21,2,1921	78 42W	12:25-33	"rouge magenta"	-	E
6	22,9,1928	000 000	13:05-06	bright white	-	F
7	26,7,1937	32N 31E	~10 ^h	abnormally bright faculae	equally well visible through red, green and blue filters	G
8	31,3,1938	20S 86E	10:19-58	-	photographed near λ 3220 A $\Delta\lambda = 20-50$ A	H
9	5,3,1946	28N 10E	11:24-27	intensely white	-	I
10	11,12,1948	98 48E	08:18-30	intensely white	surge 250km/sec	J
11	18,5,1951	18N 35W	12:59	-	surge	K

(continued UDO BECKER's list of "white flares")

12	23,2,1956	23N 74W	03:45-50	intensely white, reddish-blue	surge, straight outstrectching	L very high speed
13	31,8,1956	15N 15E	12:45	-	surge	M
14	3,9,1957	24N 30W	14:24-43	blueish-white	surge	N
15	7,9,1957	18N 90W	08:09-11	intensely white	surge, straight, outstrectching,	O very high velocity
16	23,3,1958	14S 74E	10:01-09	blueish-white, blueish	surge, straight outstrectching	P 180km/sec
17	30,3,1958	34N 63E	08:44-46	intensely white	surge, straight outstrectching,	Q very high velocity

* * * * *

Ed. note: There seems little reason why the following cases should not be cited with Becker's listing:

(9b)	25,7,1946	22N 15E	16:27	-	continuum on spectrogram	R
					λ 6450 to 6000A	
(9c)	19,11,1949	28 70W	10 32	-	continuum on spectrogram	S
					surge to 560,000km	
(18)	19,6,1958	15N 26W	14:44	-	spectroheliogram	T
					λ 3832A	

* * * * *

Notes: * = time of visibility of "white flare", ** = references, sources

A=CARRINGTON, R.C., and HODGSON: M.N. 20, 12 (1859); B=FERRARI, P.: C.R.Acad.Sci. (Paris) 75, 1581 (1872); C=RUDAUX, L.: L'Astronomie 11, 342 (1892); D=TROUVELOT, N.: L'Astronomie 10, 287 (1891); E=MARTHERAY, G. du: Orion 18, 403, (1948); F=MARTHERAY, G.du: Orion 18, 403 (1948); G=WALDMAYER, M.: ZfA 20, 46 (1941); H=DOBBIE, J. C., MOSS and A.D. THACKERAY: MN 98, 606 (1958); I=MARTHERAY, G.du: Orion 11, 192 (1946); J=MULLER, R.: Naturwissenschaften 38, 545 (1951); K=PORRET, M.: L'Astronomie 66, 22 (1952); L=UMENO, W. and M.MOTURI: PASJ Japan 8, 1 (1956); M=WALDMAYER, M.: Quarterly Bul.; N=BECKER, U.: ZfA 46, 168 (1958); O=KIEPENHEUER, K.O. and G.KUENZLER: ZfA 44, 138, (1958); P=BECKER, U.: ZfA 46, 168, (1958); R=ELLISON, M.A.: MN 106, 500 (1946); S=ELLISON, M.A.: and M.CONWAY: The Observatory 70, 78, (1950); T=CHAGG, T.A.: PASP 71, 418 (59).

Note: E=F; N=P=Q

hb

"SOLAR ACTIVITY SUMMARY" by HIGH ALTITUDE OBSERVATORY,

A THIRD UNITED STATES PUBLICATION ON SOLAR ACTIVITY FOR THE I.G.Y.

Following our review of US publications on solar activity (see preceding issue), we wish to describe the material covered in the HIGH ALTITUDE OBSERVATORY of the University of Colorado reports called: SOLAR ACTIVITY SUMMARY. These reports were prepared and published since 21, May 1951 (covering the period after 1, January 1951) and were carried through the I.G.Y. period and later. They are prepared with the cooperation of Sacramento Peak Observatory and Harvard College Observatory and are sponsored by the National Bureau of Standards, Air Force Cambridge Research Center and National Science Foundation. These reports are published quarterly.

In the Introduction, the methods used in these reports are described. The period covered is listed in accordance with Carrington's solar rotation periods, e.g. the period from 12 October 1958 to 2, January 1959 covers solar rotations No. 1406-1408.

One of the main considerations is the distribution of the intensity of the emission lines of the solar corona. Isophotal contours of the 5303 green coronal line are given and the occurrence of the yellow coronal line 5694 is shown. The observations made at the Climax High Altitude Observatory and at Sacramento Peak Observatory are primarily used. Supplementary reports from Pic du Midi, France; Kanzelhöhe, Austria; Mt. Norikura, Japan and Kislovodsk, USSR were used during the I.G.Y.

Solar flares observed in H _{α} and listed in the "Solar Geophysical Data" (see preceding bulletin) are also plotted. For homogeneity of data, however, the flare activity index is computed on flares observed solely at Sacramento Peak. The maps also include sunspots and plages.

For major regions, i.e. centers of major solar acitivity, a list is compiled giving the following features:

- 1) area of plage; 2) area and spot count of sunspot group;
- 3) flare index; 4) major flares; 5) summary of minor flares; 6) major and major-plus solar radio noise bursts (from 9500 to 55 MHz);
- 7) high speed dark surges; 8) prominences: Looped coronal, surges, and sprays; 9) sudden disappearance of filaments; 10) λ 5694 emission.

Where possible the HAO Report endeavors to relate terrestrial magnetic disturbances and auroras to active centers on the solar disk. The "letter-titles" on the active regions are selected in an arbitrary manner, and are for the purpose of identification only.

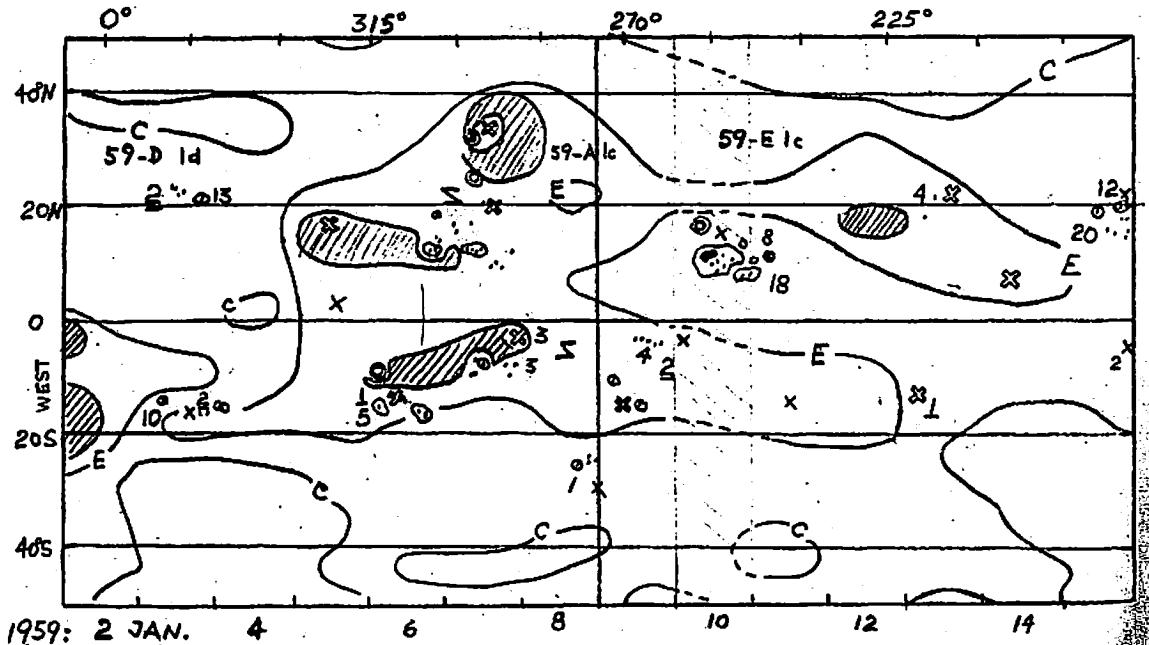
A general discussion of solar activity and related Terrestrial disturbances during the covered period is given. A graph shows the integrated extent of the green coronal line both for the visible disk and as an index for the whole sun. A table gives the mean index for each solar rotation period for the corona, flares and sunspots:

Rotation No. & Date	Corona green	flare	sunspots
1406 13 Oct - 8 Nov.	121	1098	181
1407 9 Nov - 5 Dec	124	816	154
1408 6 Dec - 1 Jan	116	652	177

Next follow fairly detailed accounts on more or less specific centers or regions of activity. These may include more than one plage or sunspot group, in fact they often do, however for all practical purposes (and since the intricate relationship of solar-terrestrial effects is not yet known well enough, this arbitrary division is very useful.

Tables listing all measurements of the green coronal line around the solar limb in 5° zones are presented, as well as those for the red coronal line (6374). A flare activity index table is given. This index depends on the following factors: brightness; area; duration and "portion that reaches maximum intensity". The time-sample factor is also accounted for. This table lists the date; the time in minutes of useful flare patrol at Sacramento Peak (only); number of flares recorded and the flare index for the day. The last table lists the positions and time where and when the yellow coronal line was recorded, and its intensity.

Finally, synoptic maps showing plage centers, sunspots, isophotes of the green coronal line, the yellow line; loop prominences; flares and those associated with fade-outs; aurorae and magnetic index is given.



Mirror copy (so that it may be compared with our last issue) from Report HAO - 46 (Jan.- Mar. 1959). Coronal East limb data were used. Extremely bright coronal regions are shaded, very bright are marked E, moderate C. Plages x, sunspots in outline and flares are shown, as is also the yellow coronal line Σ , in symbols.

SMALL FEATURES OF THE SOLAR PHOTOSPHERE - 1946 to 1958.by C. HASSAPIS

Penteli-Branch National Obs. of Athens, Penteli, Greece.

(This visual study of the "fine structure of the photosphere" for an entire solar cycle followed a program originally suggested by Neal J. Heines, former Chairman of the Solar Division-AAVSO, in the S.D. Bulletin No. 11, page 20 (Aug. 1946). Heines' definitions will be given with each phenomenon listed. Ed.)

A. PORES: (small, short-lived spots, visible only under very good seeing conditions)

Pores are visible up to 58° from the center of the solar disk; they are highly dispersed between granules. Groups of 2 to 17 pores in unipolar or bipolar configuration appear occasionally. Groups of 4 or more pores may develop into "faint markings" or regular sunspots during solar maximum.

B. VEILED SPOTS: (similar to pores but hazy)

Generally, their life-times are less than one day, only 3% lasted 48 hours. In 48% of all veiled spots sunspots develop. They appear usually only in the vicinity of largest sunspots (E,F,G) and between the main components. They can be seen only up to 20° from the center. The highest number seen was 8 in one group.

C. FAINT MARKINGS: (small penumbral areas or tiny spots close together)

They appear in all groups and are proportional to the group types. They usually appear when larger sunspots break up. Their distribution in a group does not follow the major axis of the sunspots. In 17% of cases they develop into spots again; have life-times of up to 24 hours and may be seen up to $3/4$ of the solar radius. There may be as many as 23 of these "faint markings" in a group. 82% appear as type A (unipolar). More spots (3:2) turn into "faint markings" than the reverse.

D. PENUMBRAL WISPS: (isolated penumbral patches)

74% of all "penumbral wisps" belong to F-type groups; 17% to E- and 9% to G-types. 42% show a vertical shape and have life-times up to four days, gradually changing shape.

E. FACULACIC TRACERY: (this term was coined by Heines; it should suggest "traces of faculae". /Ed. most likely this is not a true phenomenon but rather an effect of seeing/)

Visible up to $2/3$ of the solar radius, associated with pores or faint markings; life: more than 24 hours, covering areas up to 4° square degrees; are not band-shaped like faculae, but circular or elliptical; their size reaches the limit of granules with which they are sometimes confused.

Penteli, Greece,

31 May 1959.

AMERICAN SUNSPOT OBSERVATIONS

MEAN MONTHLY RAINFALL = 200.9

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

ADVERSE SEEING
RECEIVED LATE
* *

AAVSO - SOLAR DIVISION

AMERICAN SUNSPOT NUMBER OBSERVATIONS

MONTHLY MEAN RA' = 165.9 OCTOBER 1958

MONTHLY MEAN RZ = 173.1

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	.96																															
Archer	.06	10.02	2.09	18.77	12.31																											
B. G. C.	.64																															
Bandy	.89																															
von Brunn																																
Buckstaff	1.11																															
Craig	.82	9.68	11.67	14.87	15.59	9.32																										
Deitrich	.50	12.71	13.87	1.39																												
E. H. C.	.73	12.88	14.31	4.44	12.43	14.66	9.19	6.59	6.69	5.89	10.74	9.74	8.65	8.74	8.65	8.74	8.65	8.74	8.65	8.74	8.65	8.74	8.65	8.74	8.65	8.74	8.65	8.74	8.65	8.74		
Ferris	.022																															
Fisher																																
Gibson																																
Lorenz																																
Lord																																
Moore	.78																															
Nicollin																																
P. J. North	.86	14.60	14.71	14.83	14.85																											
Roseborough	.68																															
Trotter	.28	12.79	13.35	10.27	12.24	7.12	6.47	7.12	5.48	5.15	5.13	8.71	7.51	7.19	8.31	9.26	8.23	11.36	11.39	10.57	11.36	9.26	10.88	9.26	10.88	9.26	10.88	9.26	10.88			
Wester	.28																															
W. W. Williams																																
Wells																																
W. M. Wilson																																
Z. L. Z. Z. Z. Z.																																
RA'	197	2.09	1.82	1.82	1.82	1.03	7.79	11.3	12.7	11.5	12.8	14.6	16.2	18.0	2.6	2.9	2.02	2.02	1.63	2.14	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63	1.63		
R2	210	217	200	193	192	120	117	117	105	117	105	117	105	117	105	117	105	117	105	117	105	117	105	117	105	117	105	117	105	117		

ADVERSE SEEING
* RECEIVED LATE

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

AAVSO - SOLAR DIVISION
AMERICAN SUNSPOT NUMBER OBSERVATIONS
MONTHLY MEAN RA' = 126.7 NOVEMBER 1958 MONTHLY MEAN RA' = 141.7

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
Alderman	18.83	13.51	8.57	6.40	6.32	6.27	6.30	7.47	8.22	7.22	6.21																					
Albert	8.75	8.86	7.73	5.67	5.76	6.24	6.25	6.25	6.25	6.23	6.16	6.23	4.79	6.41	4.30	3.33	6.47	7.61	7.72													
B. Lude	8.73	12.36	9.33	6.76	6.76	7.71																										
Buchanan	12.51	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36	12.36			
Campbell	9.22	12.44	9.10	12.44	10.66	10.66	9.91	7.65	2.58	9.49	8.26	8.18	6.14	5.13	5.14	5.15	3.6	6.17	7.24	8.49	8.59	11.71										
Davidson	10.0	9.62	11.16	12.08	9.97																											
E. J. King	7.3	13.19	7.94	8.27	7.16	8.27	7.16	10.22	9.23	8.47	8.47	8.47	8.47	8.47	8.47	8.47	8.47	8.47	8.47	8.47	8.47	8.47	8.47	8.47	8.47	8.47	8.47	8.47				
Farnell	12.02	12.21	8.38	9.10	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27	8.27				
Fishback	10.41	10.42	11.02	8.72	9.54	10.95	10.95	10.95	10.95	10.95	10.95	10.95	10.95	10.95	10.95	10.95	10.95	10.95	10.95	10.95	10.95	10.95	10.95	10.95	10.95	10.95	10.95	10.95	10.95	10.95		
Genz	10.81	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43	10.43			
Lufit	5.8	10.48	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41	7.41				
Moore	.28	10.81	9.24	10.72	6.93	6.31	6.36	7.32	5.10	5.92	5.8	3.6	5.15	8.30	5.20	4.16	4.13	5.12	7.44	8.57	8.58	8.97										
Nicolini	10.72	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81	10.81			
Pilbeam	8.16	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49	10.49			
Rosebridge	6.9	10.72	9.54	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46	8.46			
Thomas	8.44	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45	8.45			
Tresselt	1.45	6.97	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36	6.36			
Tristram	6.38	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37	6.37			
Westerh	6.28																															
Wesslitch	8.44																															
Wells	6.97																															
Wombley																																
RA'	170	196	173	87	108	99	75	86	69	73	59	66	39	57	73	83	105	118	135	179	197	202	200	219	222	215						
R2	217	201	179	173	138	131	98	114	85	89	76	84	91	93	90	72	67	92	111	161	161	161	161	161	161	161	161	161	161			

NUMBER BEFORE COMMA = TOTAL GROUPS
 NUMBER AFTER COMMA = TOTAL SPOTS
 # ADVERSE SEEING
 * RECEIVED LATE

AAVSO - SOLAR DIVISION

AMERICAN SUNSPOT NUMBER OBSERVATIONS

MONTHLY MEAN $R_A = 172.5$ DECEMBER 1958

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	.96	191.55	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00	211.00		
Arber	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15		
B. Lee	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10	149.10		
Bandy	.59																																	
Buckett	144.11																																	
Camp	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12	142.12		
Desiderio	80.30	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00	132.00		
Elliott	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33	143.33		
Estremaduro	140.30																																	
Fernandez	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22	144.22		
Heath	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95	138.95		
Lobach	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30	142.30		
Lyon	.18																																	
Moor	.78																																	
Mullin	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15	144.15		
Pilsworth	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66	144.66		
Reed	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68	144.68		
Thomas	.81																																	
Thomasson	144.71	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70	144.70		
Transeau	144.8	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	144.87	
Werner	12.61																																	
Wells	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	144.11	
Weller	144.13	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	144.67	

ADVERSE SEEING
* RECEIVED LATENUMBER BEFORE COMMA = TOTAL GROUPS
NUMBER AFTER COMMA = TOTAL SPOTS

AAVSO - SOLAR DIVISION
AMERICAN SUNSPOT NUMBER OBSERVATIONS
MONTHLY MEAN RA = 199.3
JANUARY 1959

OBSERVER	K _i	MONTHLY MEAN R _A = 199.3												MONTHLY MEAN R _Z = 210.3																				
		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	77	200.0	201.0																															
Arter	100																																	
Bieda																																		
Bonney	87																																	
von Braunarts	6.38																																	
Burkhardt	6.61																																	
Craig	92	198.65	199.11	199.25	199.16	199.55	199.55	199.45	199.45	199.45	199.45	199.45	199.45	199.45	199.45	199.45	199.45	199.45	199.45	199.45	199.45	199.45	199.45	199.45	199.45	199.45	199.45	199.45	199.45	199.45	199.45			
Dickinson	80																																	
Farnold	5.91																																	
Ishibashi	88																																	
Kerr-McDowell	.86	199.72	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51			
Lamont	23.75	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50			
Moore	78																																	
Nichols	55																																	
Pitmead	80																																	
Rogers	48																																	
Thomas	39	199.79	199.51	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50	199.50			
Throssell	147																																	
Trotter	11.8	199.59	199.50	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51	199.51		
Whittle	16.55																																	
Wittig	11.14																																	
Womeldorf	6.3																																	
Watson	9.8																																	
R _A	234	224	226	223	223	223	223	223	223	223	223	223	223	223	223	223	223	223	223	223	223	223	223	223	223	223	223	223	223	223	223	223		
R _Z	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120	120

† ADVERSE SEEING
* RECEIVED LATE

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

AAVSO - SOLAR DIVISION
AMERICAN SUNSPOT NUMBER OBSERVATIONS
MONTHLY MEAN RA = 158.3 MARCH 1959 MONTHLY MEAN RZ = 181.4

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	96	15.52																																						
Archer	112	7.79																																						
Blaauw	6.53	9.45	7.17																																					
Bonney	89																																							
von Brueggen																																								
Buckstaff	111																																							
Craig	92	11.69	9.58	11.89	11.78	11.67	9.59	11.63	11.53	11.28	11.57	11.33	11.23	11.23	11.05	11.35	11.89	11.61	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51	11.51						
Dekker	30	11.44	11.67	11.63																																				
Estrada	110	7.33	4.57																																					
Fernando	102																																							
Graham	88	10.54	9.59	11.58	11.62	11.70																																		
Lorenz	228																																							
Lutz	28																																							
Moore	78																																							
McCollum	95	5.18	9.25																																					
Pilbeam	156	10.70	9.42																																					
Rosenberg	68	7.12	10.58																																					
Thomas	85	7.45	11.46	8.46	8.46	7.45																																		
Throssell	11	5.26	3.25																																					
Trotter	128	10.22	8.23	7.15	8.16	5.16	3.19	8.16	11.25	11.14	9.14	10.77	9.19	10.26	8.29	10.54	11.43	7.94	9.44																					
Walsh																																								
Werner	111	7.47	7.35																																					
RA		143.106	143.150	143.164	143.170	143.174	143.178	143.182	143.186	143.189	143.193	143.196	143.199	143.202	143.205	143.208	143.211	143.214	143.217	143.220	143.223	143.226	143.229	143.232	143.235	143.238	143.241	143.244	143.247	143.250	143.253	143.256	143.259	143.262						
RZ		158.149	158.153	158.157	158.159	158.160	158.161	158.162	158.163	158.164	158.165	158.166	158.167	158.168	158.169	158.170	158.171	158.172	158.173	158.174	158.175	158.176	158.177	158.178	158.179	158.180	158.181	158.182	158.183	158.184	158.185	158.186	158.187	158.188	158.189	158.190				

ADVERSE SEEING
* RECEIVED LATE

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

MOUNT WILSON SUNSPOT CLASSIFICATION AND NOTATIONS.

A full account on the method and procedure used at MOUNT WILSON for their classification of sunspots can be found in the MAGNETIC OBSERVATIONS OF SUNSPOTS by GEORGE E. HALE and SETH B. NICHOLSON, published by the Carnegie Institution of Washington in 1938. Complete monthly tables were formerly published in the "Publications of the Astronomical Society of the Pacific" (PASP) from May 1920 to April 1959. (See notation in our last issue on page 20.)

Starting with our last issue, the following tables list the Mt. Wilson sunspot groups. The first column gives the Mt. WILSON GROUP NUMBER. The second column gives the group's Central Meridian Passage (CMP), which is equivalent to giving a group its "longitude". The center of "gravity", dependent on the size of the sunspots in the components, determines this CMP figure. The third column lists the latitude of the group (again its center of "gravity"). The fourth column expresses in units of 100 Gausses the maximal magnetic field strength of this group.

The next two columns show the time of "first seen" and "last seen" date. (Of course only Mt. Wilson observation are used here too). The final column gives the Mt. Wilson Group description and type.

First comes a notation showing whether this group came over the limb by noting it with a letter "l" for limb. If the group was born on the visible disk a letter "d" is used. This same applies to the last notation, i.e. if the group disappeared over the western limb a letter "l" follows, if it died on the disk, the letter "d" is listed.

α = stands for unipolar groups (Zürich classification for A, H, J)

β = stands for bipolar groups (Zürich: B, C, D, E, F, G)

γ = stands for groups with mixed polarities; complex polarities

$\beta\gamma$ = mixed polarities with characteristics of a bipolar group

αp = unipolar group with polarities of the "preceding" component (leader) of a normal bipolar group

αf = unipolar group with polarities of the "following" component (follower) of a normal bipolar group

βp = bipolar group where the preceding component is stronger

βf = bipolar where the following component is stronger

x = group observed but no polarities were measured

Examples: $l\alpha pd$ = group came over eastern limb; unipolar with polarities of the preceding component of a bipolar group.

$d\beta\gamma l$ = born on disk; bipolar with mixed polarities; went over western limb

MAGNETIC OBSERVATIONS OF SUNSPOTS OBSERVED AT MT. WILSON
DURING MARCH AND APRIL, 1959

13960	Mar.	5.2	-17°	12	March	1	March	9	4βpd
13961		5.5	+ 8	(2)		2		2	dad
13962		7.5	-11	18		2		13	4βpl
13963	Feb.	25.9	+ 8	(2)		3		3	dopl
13964	Mar.	2.5	- 2	4		3		5	dopd
13965		9.5	+25	10		3		14	1αpd
13966		10.7	+24	5		4		12	1βpd
13967		5.8	-18	(5)		5		11	4βpl
13968		6.6	+15	(2)		5		8	dard
13969		7.7	+ 9	5		5		11	αpd
13970		11.2	-16	(2)		5		6	dαpd
13971		11.4	+ 9	(2)		5		10	1αpd
13972		5.2	+10	(10)		6		8	4βpl
13973		7.1	+16	(2)		6		8	dad
13974		12.1	-15	10		6		15	4pd
13975		12.3	+ 8	14		6		15	1αd
13976		5.0	+25	(10)		7		10	4βpl
13977		13.2	+18	(10)		7		15	1αpd
13978		13.5	+24	18		7		19	1αpl
13979		15.0	+10	25		8		20	1αpl
13980		15.8	- 6	13		9		19	1αpd
13981		11.5	-22	(2)		10		11	4βpd
13982		8.7	+14	(5)		11		12	4βd
13983		17.7	+23	17		11		23	1β1
13984		16.6	+27	(25)		11		24	1βγ1
13985		16.1	+24	5		12		16	4βpd
13986		15.2	-14	4		12		18	4βpd
13987		17.3	-17	(5)		12		21	dαpd
13988		18.0	-17	9		13		19	αpd
13989		19.5	+34	8		13		16	1βd
13990		14.3	-14	5		14		14	dαpd
13991		16.8	+ 9	(1)		14		14	dad
13992		20.6	+16	32		14		26	1βpl
13993		21.2	+16	13		14		26	1αpl
13994		18.4	-13	7		15		18	4βpd
13995		18.4	+12	(15)		15		23	4βl
13996		19.7	+ 7	(3)		15		17	4βd
13997		21.4	+11	28		15		27	1αpl
13998		19.4	+27	(8)		16		16	4βd
13999		17.8	- 9	10		17		23	4βl
14000		25.7	+19	8		17		23	1αpd
14001		24.4	+17	(15)		18		30	1βpl
14002		15.9	-13	(2)		19		19	dad
14003		26.4	-33	13		19	April	1	1αpl
14004		26.3	+24	18		19		1	1pl
14005		18.4	+17	(2)		20	March	20	4βd
14006		25.6	+11	(1)		21		24	dαpd
14007		27.5	- 6	20		21	April	1	4βpl
14008		19.2	+23	(4)		22	March	25	4βl
14009		24.8	-17	(2)		22		22	dad
14010		24.6	-17	(2)		22		22	dad
14011		29.6	+ 9	32		23	April	4	1αpl
14012		30.5	- 4	6		24	March	31	4βpd
14013		30.9	+23	(2)		24		24	dad

MOUNT WILSON MAGNETIC OBSERVATIONS OF SUNSPOTS DURING
MARCH AND APRIL, 1959 (CONT'D.).

14014	Mar.	31.2	+25°	30	March	24	April	6	1pp1
14015		21.1	-31	(2)		25	March	25	dad
14016		31.7	+12	15		25	April	5	lop
14017	Apr.	1.1	+17	(15)		25		5	1pfl
14018	Mar.	28.8	+20	(10)		26		2	dpl
14019	Apr.	1.2	+22	(2)		26		3	dudf
14020		1.1	+15	15		26		5	1p71
14021		5.1	-10	(7)		27		2	lop1
14022	Mar.	31.5	-4	(5)		28		1	dppd
14023		29.0	+13	(5)		29	March	30	dpd
14024		30.2	+21	(1)		29		30	dad
14025		30.5	+12	(7)		29	April	1	dpl
14026	Apr.	1.8	+27	(2)		29	March	30	dopd
14027	Mar.	30.6	-12	(7)		30	April	3	dppd
14028	Apr.	4.3	+15	(7)		30		5	dppd
14029	Mar.	29.1	-2	(5)		31		1	dppd
14030		31.4	+5	(5)		31		3	dpl
14031	Apr.	2.1	-26	(2)		31	March	31	dad
14032		6.4	+10	(10)		31	April	4	dpl
14033		3.2	-17	(3)	April	2		2	dpl
14034		3.7	-9	7		2		3	dpl
14035		6.2	+14	13		4		16	1pfl
14036		9.5	+26	(2)		4		5	dpl
14037		10.6	+14	13		4		16	1pfl
14038		11.1	+23	10		4		16	lop1
14039		2.6	+31	(2)		5		5	dxd
14040		5.8	+17	(5)		5		10	dpl
14041		7.4	-20	(8)		5		9	dpla
14042		4.2	+20	(2)		7		7	dpl
14043		6.3	+9	(7)		7		9	dopd
14044		9.8	-21	16		7		15	dpp1
14045		14.1	-16	(20)		7		20	1pp1
14046		15.7	+10	(18)		7		18	1p4
14047		4.8	+16	(12)		8		10	dpp1
14048		12.8	+1	(10)		8		18	dpp1
14049		13.3	-23	(3)		8		14	dppd
14050		15.0	+26	(15)		8		20	171
14051		15.6	-24	(5)		9		11	lop1
14052		14.8	+17	(2)		10		15	dudf
14053		15.3	-9	(10)		10		21	dpl
14054		9.3	+25	(10)		11		18	dppd
14055		14.1	-15	(2)		11		12	dxd
14056		17.2	+18	(20)		11		25	lop1
14057		17.9	+12	(15)		11		23	lup1
14058		10.1	-5	(2)		12		12	dad
14059		10.6	-5	(2)		12		12	dxd
14060		12.7	+11	(1)		12		12	dxd
14061		13.0	-23	(1)		12		12	dad
14062		14.1	+17	(1)		12		12	dad
14063		13.2	+34	(2)		13		24	dad
14064		17.3	+25	(3)		13		13	dppd
14065		16.6	> 2	(8)		15		19	dpl

MOUNT WILSON MAGNETIC OBSERVATIONS OF SUNSPOTS DURING
MARCH AND APRIL, 1959 (OCT'D.)

14066	Apr.	15.6	-12°	(10)	April 16	April 19	dppd
14067		21.7	-14	(5)	16	18	dppd
14068		14.2	+26	(10)	17	20	dprl
14069		23.0	+18	(12)	17	26	dpd
14070		18.6	+18	(20)	18	24	dpl
14071		24.0	+ 2	(10)	18	24	dpd
14072		23.5	+17	(2)	18	18	dad
14073		20.3	+ 7	(10)	19	26	dpl
14074		24.8	+21	12	19	28	dppd
14075		25.4	+12	(5)	19	21	lapd
14076		26.0	+ 8	19	19	May 2	lapl
14077		27.8	+22	(5)	21	April 28	lad
14078		19.2	+28	(2)	22	23	dad
14079		21.1	+18	(15)	22	27	dpl
14080		24.2	+18	(2)	22	24	dxd
14081		26.2	+22	18	22	30	dpy
14082		28.4	+16	(2)	22	30	lapd
14083		28.7	+11	27	22	May 4	lpyl
14084		21.4	+11	(1)	22	April 22	dud
14085		22.8	-11	(4)	22	26	dppd
14086		23.7	- 8	15	22	29	dpl
14087		23.8	-25	(2)	23	23	dxd
14088		25.3	-18	(2)	23	23	dad
14089		27.6	-14	(5)	23	24	dpa
14090		29.8	+14	14	24	May 5	dprl
14091		30.1	+30	14	24	5	lpyd
14092		23.9	+52	(2)	26	April 26	dad
14093		27.4	+10	9	26	29	dppd
14094		28.8	+30	(2)	26	28	dxd
14095	May	1.4	+17	16	26	May 5	18d
14096		1.5	- 7	15	26	8	pl
14097	Apr.	25.2	+25	(2)	28	April 29	dppd
14098		25.8	-16	5	28	29	dppd
14099	May	3.3	+14	(2)	28	29	dppd
14100		5.0	- 9	(10)	29	May 9	dppd
14101	Apr.	28.5	+22	(2)	30	April 30	dad

NOTES

- 13964 Irregular polarities.
- 13965 A return of 13921.
- 13966 Possibly a return of 13922.
- 13968 Not seen on March 6.
- 13969 Irregular polarities.
- 13970 Not seen on March 6 and 7.
- 13971 Not seen on March 8.
- 13973 Not seen on March 7.
- 13979 A return of 13929.
- 13984 Possibly a return of 13941.
- 13986 Not seen on March 18.

Continued notes for March and April 1959 sunspot groups:

- 13989 Irregular Polarities.
 13992 A return of 13936.
 13996 Not seen on March 16.
 13997 A return of 13936 which was a return of 13833.
 13999 Not seen on March 16.
 14000 Not seen on March 21, and not seen on March 21.
 14003 A return of 13943.
 14004 A return of 13946.
 14006 Not seen on March 22 and 23.
 14011 A return of 13972.
 14019 Not seen on March 26.
 14021 A return of 13962.
 14024 In the same position as 14018.
 14030 Not seen on April 1.
 14038 A return of 13978; perhaps a new group on April 7.
 14041 Not seen on April 7.
 14046 A return of 13985.
 14049 Not seen on April 11.
 14050 A return of 13984 which was possibly a return of 13941.
 14051 Probably a return of 14008.
 14052 Not seen on April 13.
 14056 A return of 13992 which was a return of 13936.
 14057 A return of 13997 which was the subsequent returns of 13938 and 13683.
 14076 A return of 14011 which was a return of 13972.
 14077 A return of 14014.
 14082 A return of 14020; and not seen on April 29.
 14094 Not seen on April 27.
 14095 Probably a return of 14047.
 14098 Close to 14088 but considered new.
 14100 Not seen on May 7 and 8.
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MAGNETIC OBSERVATIONS OF SUNSPOTS AT MT. WILSON DURING
MAY AND JUNE, 1959

14102	May	9.1	-13°	(2)	May	2	May	3	lapd
14103		8.9	+13	17		2		14	lapl
14104		2.9	-15	(8)		3		6	dapd
14105		7.3	+ 8	(8)		4		4	dppd
14106		9.6	-15	15		4		15	dppl
14107		2.7	+10	(3)		5		5	dppd
14108		8.5	+ 9	(1)		5		5	dprd
14109		7.3	+15	(1)		5		6	dxd
14110		10.1	-22	7		5		10	dppd
14111		10.6	+10	15		5		16	dppl
14112		11.1	-18	18		5		17	1β1
14113		11.3	+13	13		5		12	1βpd
14114		12.0	+25	14		5		17	1βγ1
14115		11.7	- 9	(2)		5		16	lad
14116		2.6	+12	(2)		6		6	dad
14117		11.7	-12	(2)		6		8	dapd
14118		12.6	+30	6		6		12	1βpd
14119		9.6	+27	(4)		7		7	dapd
14120		12.7	+11	(10)		8		14	dβ1

Mount WILSON MAGNETIC OBSERVATIONS OF SUNSPOTS DURING
MAY AND JUNE 1950 (Cont'd)

14121	14.8	-16	(15)		8	21	1 β p1
14122	14.9	-8	(15)		8	20	1 γ d
14123	4.3	+8	(5)		9	10	dapl
14124	8.7	-12	(2)		9	9	d β d
14125	16.1	+17	(85)		9	21	1 α p1
14126	18.1	+8	(10)		10	14	d β d
14127	18.3	-19	(8)		10	13	d α d
14128	14.2	-24	(4)		11	12	d β p δ
14129	17.7	+15	(8)		11	18	1 α p δ
14130	8.2	+17	(2)		12	15	d α d
14131	12.8	+25	(2)		12	14	d β p δ
14132	13.9	+11	(2)		13	13	dxd
14133	19.6	+19	(8)		13	13	1 α p δ
14134	9.8	-19	(5)		14	15	d β l
14135	11.8	+10	(7)		14	16	d α p δ
14136	14.5	+35	(2)		14	14	d β p δ
14137	26.0	+26	(2)		14	16	d α p δ
14138	20.3	-6	(15)		14	24	1 α p δ
14139	21.0	+16	(15)		15	26	d β p δ
14140	21.7	+19	(5)		15	21	1 α p δ
14141	16.0	+18	(15)		16	21	d β y1
14142	13.6	-27	(10)		17	19	d β p1
14143	17.3	+9	(2)		17	17	dxd
14144	18.0	-9	(15)		17	23	d β p1
14145	18.4	+18	(2)		17	19	d β p δ
14146	19.2	-5	(2)		17	17	dxd
14147	22.9	+20	(12)		17	25	d β p δ
14148	23.3	+24	(15)		17	26	1 β d
14149	20.0	-4	(8)		18	21	d α d
14150	20.6	+23	(15)		19	26	d β p δ
14151	20.9	-24	(5)		19	20	d α d
14152	25.6	+11	12		19	29	1 α p δ
14153	24.6	+12	(1)		20	20	d β d
14154	25.6	+15	(2)		20	20	d α d
14155	May	26.0	+2*	28	May	20	May
		26.2	+14	(7)		20	31
		26.7	-16	34		20	1 β p1
		26.4	+22	(10)		22	25
		24.0	+10	(10)		24	May
		24.9	+18	16		24	31
		26.1	+21	(2)		24	1 β d
		25.7	+20	(5)		25	26
		26.7	+11	12		25	d β p δ
		30.0	+14	14		25	June
		24.1	+24	(2)		26	5
		25.6	+24	(2)		26	May
		27.6	+36	(1)		26	26
		27.9	+9	(2)		26	d α d
		29.0	+11	(2)		26	27
		30.7	-34	2		27	d α p δ
		25.6	-11	23		28	28
		24.2	+17	2		28	29
	June	4.5	-11	23		29	June
		5.5	-10	16		30	10
		5.2	+15	7		30	5
	May	26.9	+15	(3)		31	1
							d β p δ

MOUNT WILSON MAGNETIC OBSERVATIONS OF SUNSPOTS DURING
 MAY AND JUNE 1959 (Cont'd)

14177	June	1.2	+ 6	2	31	1.	dad
14178		1.5	+15	5	31	2	dpd
14179		6.1	+ 6	16	31	11	1pp1
14180		6.6	+11	12	31	6	1opd
14181		7.1	+14	18	31	12	1opl
14182	May	29.3	+15	(3)	June 1	2	dp
14183		30.6	+10	9	1	3	dpp1
14184	June	6.1	-14	6	1	6	dppd
14185	May	31.7	+ 4	5	3	6	dpp1
14186		31.8	+32	2	3	4	dpa
14187	June	1.0	+32	5	3	7	dpl
14188		7.4	+21	1	3	4	dad
14189		7.8	+10	10	3	12	1pp1
14190		7.9	+10	11	3	9	1ppd
14191		9.8	-22	22	3	16	1opl
14192		6.2	-14	5	4	9	dpyd
14193		5.2	+15	(2)	5	7	dad
14194		5.4	+ 0	(1)	5	5	dpl
14195		7.2	+16	(2)	5	9	dxd
14196		9.1	+27	(2)	5	5	dpl
14197		12.7	+18	15	6	18	1al
14198		12.5	+10	10	6	17	1pp1
14199		13.0	+22	15	7	17	1ppd
14200		8.8	+ 6	(3)	8	10	dppd
14201		12.6	+15	17	8	17	dpa
14202		13.2	+16	(2)	8	17	dpa
14203		11.4	+ 7	13	9	16	dpp1
14204		15.4	- 5	18	9	19	1opd
14205		10.3	+16	(2)	10	15	dxl
14206		11.3	+16	(2)	10	12	dpl
14207		16.7	+21	15	10	21	1opd
14208		8.7	+25	(2)	11	12	dxd
14209	June	9.1	+30°	(1)	June 11	June 11	dad
14210		10.8	- 6	(2)	11	11	dad
14211		17.5	+17	23	11	23	171
14212		7.7	+10	(5)	12	13	dpl
14213		18.6	-16	3	12	14	1opd
14214		19.3	+ 9	13	12	24	1opl
14215		10.6	-11	5	13	16	dpp1
14216		11.8	+22	2	13	13	dad
14217		16.1	+ 8	3	13	14	1ppd
14218		20.7	+12	(5)	14	17	1opd
14219		12.9	+ 7	(5)	15	17	dppd
14220		21.9	+ 4	(10)	15	25	1opd
14221		15.4	+16	(5)	16	16	dxd
14222		21.7	+20	(5)	16	20	dxd
14223		21.9	-16	(5)	16	18	1pp1
14224		22.9	+ 9	36	16	28	dxd
14225		18.3	+23	(2)	17	17	dad
14226		21.0	+18	(2)	17	17	dad
14227		21.1	-13	(5)	17	19	1ppd
14228		23.7	-20	(7)	17	24	1ad
14229		18.3	+ 1	(5)	18	20	dppd
14230		18.6	-15	(5)	18	20	dxd
14231		22.0	- 5	(2)	18	22	dppd
14232		23.6	+24	(10)	19	28	dppd

**MOUNT WILSON MAGNETIC OBSERVATIONS OF SUNSPOTS DURING
MAY AND JUNE 1959 (Cont'd)**

14233	24.2	-18	(2)	19	19	dad
14234	25.6	+ 8	(15)	19	July 1	1βpl
14235	26.9	+12	(10)	20	2	1βr1
14236	20.8	- 2	(2)	21	June 21	dβpd
14237	21.4	+18	(2)	21	21	dβrd
14238	26.1	- 7	(7)	21	26	dβpd
14239	27.8	+19	22	21	July 3	1βpl
14240	19.2	+17	(2)	22	June 22	dxd
14241	24.9	+22	(2)	22	23	dad
14242	26.9	+ 9	(2)	22	22	dad
14243	28.2	-17	12	22	July 4	1βpl
14244	20.0	- 9	(10)	23	June 25	dβf
14245	21.0	+10	10	23	27	dul
14246	23.4	+ 4	(2)	23	25	dγpd
14247	27.5	+34	(5)	24	27	dβd
14248	27.6	+15	(5)	25	30	dβd
14249	July 1.5	-23	(10)	25	29	1βfd
14250	1.3	-15	10	25	July 6	1βpd
14251	1.6	+17	10	25	7	1αpl
14252	June 21.9	- 9	(2)	26	June 26	dβd
14253	23.7	-17	3	26	30	dβd
14254	26.4	-10	(2)	26	26	dad
14255	27.0	+18	(2)	26	26	dxd
14256	July 1.5	+ 8	(2)	26	29	dαpd
14257	June 23.2	-15	(1)	27	27	dαpd
14258	27.2	+25	15	27	July 2	dβpl
14259	29.5	+35	(10)	27	5	dβpl
14260	July 1.9	-12	(2)	28	June 26	dad
14261	3.8	+ 7	7	28	July 5	1αfd
14262	June 26.5	+15	2	29	June 30	dβd
14263	July 4.2	+ 7	(15)	29	July 10	dβpl
14264	5.1	+19	(5)	30	4	dppd
14265	6.4	+16	(15)	30	12	1βpl

NOTES

- 14112 A return of 14045.
 14114 A return of 14050 which was a return of 13984 and the possible return of 13941.
 14115 Probably a return of 14053 and not seen on May 14 and 15.
 14120 Not seen on May 10 and 11.
 14121 A return of the region containing groups 14056, 13992, and 13986.
 14122 A return of the region containing groups 14057, 13997, 13938, and 13883.
 14125 A return of 14070.
 14127 Not seen on May 12.
 14129 Probably a return of 14079.
 14138 A return of 14086.
 14139 Not seen on May 16.
 14152 A return of 14083.
 14156 A return of 14090.
 14160 Not seen on May 25.
 14173 Probably two groups.
 14175 A return of 14105.
 14180 A return of 14111.

Continued notes on sunspots during May and June 1959

- 14193 Same position as 14175.
 14195 Not seen on June 6 and 7.
 14197 A return of 14141.
 14202 Not seen on June 10, 11, 14, and 15.
 14205 Not seen on June 13 and 14.
 14207 A return of 14150.
 14211 A return of 14139 with considerable change on the invisible hemisphere.
 14212 Close to 14190, but judged a new group.
 14215 Not seen on June 15.
 14218 A return of 14160.
 14220 A return of 14155.
 14221 Not seen on June 17.
 14222 Not seen on June 18 and 19.
 14231 Not seen on June 20 and 21.
 14235 Possibly a return of 14169.
 14237 Same position as 14218.
 14253 Not seen on June 27 and 28.
 14256 Not seen on June 28.
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MAGNETIC OBSERVATIONS OF SUNSPOTS OBSERVED AT
MT. WILSON DURING JULY AND AUGUST, 1959

14266	June 27.8	+35°	(3)	July 1	July 1	dad
14267	28.7	+10	(2)		3	dβrd
14268	July 2.0	- 9	(2)	1	1	dad
14269	4.9	+13	(20)	1	11	dβl
14270	1.1	-11	(5)	2	3	dβd
14271	3.4	+26	(2)	3	3	dβd
14272	4.6	+27	(2)	4	4	dod
14273	6.3	+ 9	(2)	4	7	dod
14274	10.2	+17	(3)	4	8	dβpd
14275	5.8	- 9	(4)	5	6	dβpd
14276	9.7	-11	(7)	5	14	dβpl
14277	7.3	-25	(2)	6	7	dxd
14278	7.8	+17	(2)	6	6	dxd
14279	7.8	+ 6	(2)	6	6	dxd
14280	12.5	+16	(7)	7	14	dpd
14281	3.6	+19	(2)	8	9	dxd
14282	13.1	+17	(2)	8	14	dupd
14283	13.6	- 1	(3)	8	8	dβpd
14284	14.7	-17	27	8	20	171
14285	13.8	+20	13	9	20	dβpl
14286	13.2	- 5	10	9	19	1cpd
14287	7.8	- 8	11	10	13	dβpl
14288	12.5	-14	17	10	17	dβpl
14289	12.0	- 8	(2)	11	11	dβd
14290	17.4	-25	7	11	13	1ad
14291	17.6	+10	14	11	23	1al
14292	13.8	+14	(2)	12	16	dad
14293	13.6	- 5	(2)	12	12	dad
14294	19.8	+23	22	12	25	1βpl
14295	17.6	+20	17	13	20	dpd
14296	19.8	+11	20	13	25	1cpd
14297	14.2	+28	(2)	14	15	dxd

MAGNETIC OBSERVATIONS OF SUNSPOTS OBSERVED AT MT. WILSON
DURING JULY AND AUGUST 1959 (Cont'd)

14298	20.0	+14	(7)	14	21	dpd
14299	19.7	-35	2	15	20	dad
14300	21.6	+ 9	11	15	26	lapd
14301	12.1	- 5	(2)	16	16	dapd
14302	21.6	+26	12	16	23	dppd
14303	17.0	- 9	(2)	18	18	dad
14304	17.6	+12	2	18	19	dpl
14305	24.6	+23	10	18	27	lapd
14306	24.9	+19	21	18	31	lapl
14307	19.4	+ 5	(2)	19	19	dad
14308	20.4	+20	(2)	19	20	dppd
14309	25.3	-16	(4)	19	21	lapd
14310	22.6	+10	(2)	21	21	dxd
14311	24.1	+21	(2)	22	22	djd
14312	20.0	+18	(2)	22	24	dopd
14313	28.5	-15	15	22	31	lapd
14314	29.4	+24	20	22	Aug. 5	lapl
14315	19.4	+ 1	(2)	23	July 23	dapd
14316	20.5	-12	(5)	23	24	djjpd
14317	21.9	+31	(2)	23	24	dad
14318	30.5	+27	13	24	30	lapd
14319	31.0	+ 5	9	24	Aug. 1	lapd
14320	31.5	+11	22	24	6	lp71
14321	July 31.8	+36°	15	July 24	Aug. 5	171
14322	24.7	- 4	15	24	July 30	dppf1
14323	25.9	-15	1	24	26	dapd
14324	30.6	+23	1	24	26	dpl
14325	24.8	-21	(5)	27	30	djl
14326	Aug. 1.7	+12	8	27	Aug. 6	djjpd
14327	2.8	+ 6	(10)	27	6	lppl
14328	July 28.3	+17	(1)	28	July 28	dad
14329	29.0	+12	(1)	28	28	dad
14330	Aug. 3.4	+ 5	17	28	Aug. 9	lppl
14331	July 27.7	+ 6	6	29	2	dppl
14332	Aug. 3.9	-13	11	29	9	dpl
14333	July 30.0	+14	(5)	30	July 31	djd
14334	Aug. 4.0	-22	6	30	Aug. 8	djd
14335	July 23.4	+28	(2)	31	July 31	dxd
14336	29.2	+16	(3)	Aug. 1	Aug. 4	dppd
14337	Aug. 3.8	+20	(2)	1	1	dxd
14338	3.8	+11	(2)	1	1	dad
14339	6.5	+10	16	1	12	dapl
14340	7.1	+18	7	1	6	dppd
14341	8.2	+14	13	2	13	lapl
14342	9.0	- 9	18	2	14	lppl
14343	9.8	+20	26	3	15	lppl
14344	9.9	+26	10	3	14	lpd
14345	July 31.1	+25	(2)	4	5	djd
14346	Aug. 6.5	+30	3	4	6	dpl
14347	7.7	+ 1	21	4	13	djjpl
14348	11.3	+14	15	4	15	lxz
14349	4.8	-12	(2)	5	5	dad
14350	9.2	+15	(5)	5	9	djd
14351	10.6	+20	(3)	6	8	dxt
14352	6.8	+19	2	6	9	dad
14353	10.7	+18	6	9	15	dxd
14354	12.7	-20	5	9	12	dppd

MAGNETIC OBSERVATIONS OF SUNSPOTS OBSERVED AT MT. WILSON
DURING JULY AND AUGUST 1959 (Cont'd)

14355	15.4	+ 8	8	9	11	1βrd
14356	16.0	+12	(15)	9	22	1βl
14357	16.7	+15	(15)	9	22	1βpl
14358	15.3	+16	1	10	11	dul
14359	10.3	+ 9	2	10	11	dxd
14360	12.5	+16	(10)	10	18	dβpl
14361	7.2	-20	(3)	11	12	dβpl
14362	15.6	+20	(2)	11	11	dxd
14363	13.9	+11	(2)	12	15	4βd
14364	14.1	- 7	(10)	12	18	dβpl
14365	20.1	+12	(7)	13	15	1βrd
14366	20.1	+ 6	(20)	13	26	1βl
14367	16.7	+30	(2)	14	14	dad
14368	18.8	+ 6	(5)	14	16	dβd
14369	20.0	- 7	(3)	14	17	dαpd
14370	15.5	+ 4	(2)	15	18	lad
14371	15.5	+22	(7)	15	21	dβl
14372	20.5	- 6	(10)	15	22	dβpd
14373	21.6	+18	(10)	15	18	lad
14374	22.0	+ 9	(10)	15	23	1βrd
14375	Aug. 17.0	+22	(2)	Aug. 17	Aug. 17	dad
14376	22.1	+29	(10)	17	25	dβpd
14377	23.9	-10	(2)	17	18	lxd
14378	23.2	+16	(25)	18	31	1βpl
14379	15.4	-17	(10)	20	21	dβpl
14380	19.0	+30	(5)	20	22	dβpd
14381	21.5	-24	(10)	20	27	dβpl
14382	26.0	+16	(12)	20	26	1βd
14383	13.9	- 7	(2)	21	21	dud
14384	21.1	-13	(3)	21	26	dβl
14385	21.1	+10	(2)	21	21	dud
14386	27.3	+18	11	21	Sept. 2	dβf1
14387	23.2	+ 6	16	21	3	lαpl
14388	23.2	+12	(15)	22	2	dβf1
14389	23.8	-12	14	22	4	1βpl
14390	24.9	+22	(2)	23	Aug. 23	dαd
14391	25.0	+ 6	(2)	23	23	dud
14392	26.8	+14	(2)	23	23	dud
14393	29.2	+ 4	20	23	Sept. 2	l-βpd
14394	30.7	-12	(6)	24	1	lαpd
14395	27.4	+ 8	(2)	25	Aug. 26	dxd
14396	27.4	+24	(25)	25	Sept. 5	dβpl
14397	28.8	+11	(10)	25	Aug. 31	dβpd
14398	31.6	- 5	(15)	25	Sept. 6	1βpl
14399	Sept. 1.0	+ 9	18	25	7	1β71
14400	2.0	+11	11	26	7	1βpl
14401	Aug. 27.8	+15	(3)	27	Aug. 27	dβfd
14402	30.2	+28	(3)	27	27	dβd
14403	31.0	+18	(15)	27	Sept. 4	dβpd
14404	Sept. 3.3	+17	32	27	9	1βpl
14405	Aug. 31.2	-19	(3)	28	Aug. 28	dβd
14406	29.8	+10	(5)	29	Sept. 2	dud
14407	29.3	+14	(2)	30	Aug. 30	dud

MAGNETIC OBSERVATIONS OF SUNSPOTS OBSERVED AT MT. WILSON
DURING JULY AND AUGUST 1959 (Cont'd).

14408	Sept.	1.8	+20	(2)	30	30	dad
14409		4.6	+26	(5)	30	Sept. 3	dßpd
14410		4.7	-21	(3)	30	3	1ßpd
14411		5.3	-12	(20)	30	10	1ßpd
14412	Aug.	27.7	+ 6	(2)	31	Aug. 31	dad,d
14413		31.4	-21	11	31	Sept. 1	ðßrd
14414	Sept.	5.2	+13	(5)	31	7	ðßd
14415		5.6	+15	(2)	31	Aug. 31	dad,d
14416		6.6	+20	13	31	Sept. 10	lupd

NOTES

- 14276 Not seen on July 10.
 14284 A return of 14211 which was a return of 14139.
 14285 Not seen on July 12, or 16.
 14291 Possibly a return of 14245.
 14296 A return of 14224.
 14298 Not seen on July 19.
 14299 Not seen on July 16, 17, or 19.
 14304 Irregular polarities.
 14305 A return of 14258.
 14306 A return of 14239.
 14309 A return of 14243.
 14319 A return of 14263.
 14341 A return of 14288.
 14344 Not seen on August 12.
 14348 A return of the region of 14284 which was the subsequent return of 14211 and 14139. Also not seen on August 13 or 14.
 14356 A return of the region of 14296 which was a return of 14224.
 14363 Not seen on August 13 or 14.
 14371 Not seen on August 17.
 14373 A return of 14306 which was a return of 14239.
 14374 Not seen on August 21.
 14384 Not seen on August 23.
 14394 Probably a return of 14352 and not seen on August 30.
 14406 Not seen on August 30 and September 1.
 14410 Not seen on September 2.
 14412 In the same position as 14295.
 14414 Not seen on September 3 and 4.
 14416 A return of 14343.

Ed. Note: The Number of Sunspot Groups observed daily at Mt. Wilson Observatory during the entire year 1959 will be published in the next issue.

AMERICAN SUNSPOT NUMBERS - RA: -

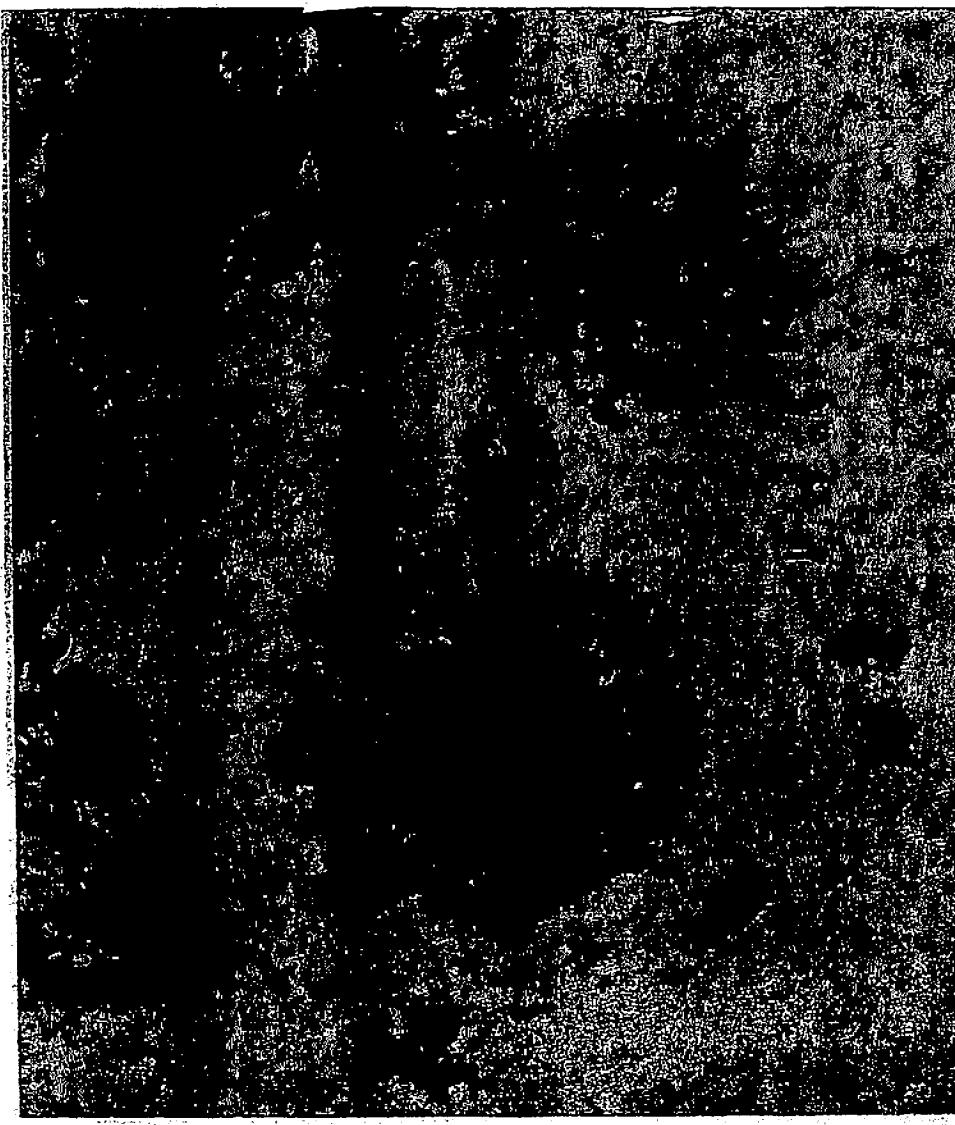
	1959	May	Jun.	Jul.	Aug.	Sep.	
1	117	130	163	183	287		
2	119	137	121	214	236	1	108
3	103	148	145	204	193	2	112
4	97	162	118	179	160	3	113
5	90	146	121	194	151	4	148
6	128	148	113	167	162	5	96
7	131	146	113	173	161	6	162
8	129	156	102	141	140	7	180
9	173	169	100	147	132	8	177
10	220	152	84	161	141	9	252
11	199	168	102	144	136	10	268
12	240	164	123	136	153	11	295
13	234	163	152	106	162	12	285
14	197	164	152	106	158	13	265
15	182	152	150	134	146	14	240
16	142	162	197	145	111	15	204
17	157	137	209	122	81	16	172
18	159	166	178	141	105	17	187
19	125	111	154	162	123	18	198
20	137	115	143	160	127	19	185
21	114	138	109	164	126	20	173
22	118	129	104	195	129	21	151
23	121	181	106	192	96	22	165
24	134	163	117	153	114	23	149
25	138	169	133	193	101	24	163
26	129	148	156	228	96	25	188
27	137	169	176	253	86	26	177
28	93	156	178	259	91	27	132
29	80	135	164	273	99	28	160
30	80	134	197	285	90	29	181
31	104	191	261	191	31	30	182
Mean:		139.6	150.7	141.6	179.8	136.4	
Mean:		173.0	167.6	149.3	198.0	142.2	

ZÜRICH PROVISIONAL SUNSPOT NUMBERS

	1959	May	Jun.	Jul.	Aug.	Sep.	
1	1	108	152	142	177	290	
2	2	112	133	118	210	256	
3	3	113	148	138	213	202	
4	4	105	166	158	225	161	
5	5	96	162	136	212	148	
6	6	138	180	127	207	164	
7	7	156	181	110	179	135	
8	8	188	177	131	175	136	
9	9	252	172	129	157	157	
10	10	268	160	127	155	141	
11	11	295	172	133	180	155	
12	12	285	176	125	160	170	
13	13	265	165	160	125	148	
14	14	240	170	180	139	151	
15	15	204	158	185	129	168	
16	16	182	172	190	151	130	
17	17	187	161	193	158	87	
18	18	198	174	195	174	100	
19	19	185	182	186	182	120	
20	20	187	173	160	180	143	
21	21	151	162	132	200	132	
22	22	165	170	94	200	155	
23	23	149	188	113	205	136	
24	24	163	157	105	217	155	
25	25	178	184	118	212	105	
26	26	188	184	220	106		
27	27	177	184	156	231	92	
28	28	132	160	181	274	87	
29	29	181	182	182	301	80	
30	30	106	147	193	292	76	
31	31	130	190	284			
Mean:		173.0	167.6	149.3	198.0	142.2	

The finest sunspot photograph ever. . . .

This photograph was taken by Dr. MARTIN SCHWARZSCHILD's, Princeton University Observatory, PROJECT STRATOSCOPE on 17th August 1959. Taken from a height of over 25 km it shows more detail than any other.



REPRINT OF A PHOTOGRAPH TAKEN BY THE PROJECT STRATO-
SCOPE FLIGHT OF AUG. 17, 1959: 11:01 AM CDT
COURTESY AAVSO - SOLAR DIVISION