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ROYAL OBSERVATORY, GREENWICH.

Comparison
of
Magnetic Storms and Sunspots

DERIVED FROM GREENWICH OBSERVATIONS

1874-1927

GREENWICH PHOTO-HELIOGRAPHIC RESULTS 1927

COMPARISON OF MAGNETIC STORMS AND SUNSPOTS

DERIVED FROM GREENWICH OBSERVATIONS, 1874 to 1927

The Greenwich observations contain the material for a comparison to be made over an interval of more than 50 years between magnetic storms and sunspots.

For the purposes of a comparison, the original magnetograph sheets* were first examined for every day from 1874 April 17 (the date at which regular solar observations were commenced), to 1927 December, and two lists were prepared containing :—

- (1) The greater magnetic storms, for which the ranges were equal to or greater than 60' in Declination or 300 γ in Horizontal Force (or North Force for the years 1916 to 1925) or Vertical Force.
- (2) The lesser magnetic storms, for which the range in D was between 30' and 60', or that for H (or N) or V between 150 γ and 300 γ . This second list includes a few storms which exceeded by a small amount the limit for the greater storms in one element only and that by virtue of a single swing, such storms not having been included in the first list.

The number of storms listed is 60 greater storms and 343 smaller storms, of which details are given in Catalogues I and II respectively.

The *Greenwich Photo-heliographic Results* were also examined from 1874 to 1927 and lists were prepared comprising :—

- (a) The spot of largest mean area within 4 days (53° of solar longitude) of the sun's central meridian at the time of commencement of each storm.
- (b) The spot of largest mean area between 4 and 6 days (53° – 79° of longitude) east or west of the central meridian at the time of commencement of each storm.

Furthermore, a list of magnetically "quiet" days was compiled from the De Bilt circulars, by selecting the two days in each month of smallest total character figure over the period 1914 to 1924 inclusive, *i.e.*, over one complete sunspot cycle. For

* The traces registered at Abinger, Surrey, were used from 1926 January onwards.

each of these days at noon, a tabulation was made as in (a) and (b) of the group of spots of largest mean area within 4 days of the central meridian and between 4 and 6 days east or west of the central meridian.

The results of the comparison have been given in *Monthly Notices* **89**, 84–92, 1928, and include a table of results identical* with Table I given below. In this table, column 1, gives the limits of magnitude of the storms divided into groups according to their intensity. In the case of the 343 smaller storms given in Catalogue II, the intensity of each storm was taken as being represented by the mean of the ranges in D, H (or N), and V. Of the 60 greater storms given in

TABLE I.
*Average Areas of Largest Sun Spots at Time of Commencement of
Magnetic Storms.*

Limits of Storm.	Spots near Centre of Disc 53° E. to 53° W.		Spots near Sun's Limbs 53° to 79° E. and W.		Number of Storms.
	Average Area.	Relative Values.	Average Area.	Relative Values.	
"Quiet Days" ..	244	1.0	167	1.0	264 (Quiet Days.)
<120 γ	260	1.1	181	1.1	42
120–150 γ	282	1.2	165	1.0	122
150–180 γ	318	1.3	211	1.3	91
180–210 γ	390	1.6	302	1.8	52
>210 γ	462	1.9	189	1.1	36
Great Storms ..	691	2.8	251	1.5	43
Very Great Storms..	1,116	4.6	181	1.1	17

(Areas are corrected for Foreshortening.)

Catalogue I, 43 form a group designated "Great Storms"; and the remaining 17 storms, consisting of those known to possess ranges equal to or greater than 90' in D or 500 γ in either other element, constitute a further group designated "Very Great Storms." The averages of the mean areas of the spots (selected as explained

* Apart from some small computational errors which have now been corrected. The effect of these corrections is trivial; in one case one of the relative values, is increased by 0.1.

above in (a) and (b)) for each group are given in columns 2 and 4. The areas in these columns are not directly comparable, as those in the central zone refer to a zone of 106° of heliographic longitude and those near the limb to a zone of 52° heliographic longitude. Columns 3 and 5 give, however, the relative values of the numbers tabulated in columns 2 and 4, the result for "quiet" days being taken as unity in each case.

Table II shows the annual distribution of the storms listed in Catalogues I and II. Against each month is written down the total number of storms occurring in that month throughout the period 1875 January to 1927 December. It has been pointed out by several authors that the times of greatest frequency coincide with those at which the heliographic latitude of the earth is numerically greatest.

TABLE II.

Annual Distribution of Magnetic Storms, 1875-1927.

Month.	Number.	Month.	Number.
January ..	33	July ..	19
February ..	35	August ..	31
March ..	43	September ..	45
April ..	33	October ..	50
May ..	34	November ..	36
June ..	23	December ..	20

The particulars of the magnetic storms which have been discussed are given in the two following Catalogues. Catalogue I contains the greater storms for which the range in $D \geq 60'$, or in H (or N) or $V \geq 300\gamma$. Column 1 gives a reference number in order of occurrence; Column 2, the year; Column 3, the duration of the storm, in civil reckoning; Column 4, the Greenwich Mean Time (midnight = 0^h) of the commencement of the storm given to the nearest tenth of a day. Those storms which commenced with the characteristic rapid movement, known as a "sudden commencement," are denoted by the letters "S.C." Columns 5, 6 and 7 give the measured ranges in D , H (or N for the years 1916-25), and V respectively. The ranges in D are given in minutes of arc; for the other elements the unit is one gamma. The sign $>$ denotes that the trace passed off the recording sheet.

Columns 8–11 give particulars, abstracted from the Ledgers of the *Greenwich Photo-heliographic Results*, of the group of spots of largest mean area within 4 days— 53° of solar longitude—of the sun's central meridian at the time of commencement of each storm. Column 8 gives the Greenwich number of the group; Column 9, the mean area, corrected for foreshortening and expressed in millionths of the sun's hemisphere; Column 10, gives the heliographic distance of the group from the centre of the disc at the time of central meridian passage, *i.e.*, the latitude of the group *minus* the heliographic latitude of the earth at the time. The last column gives the Greenwich Mean Time (midnight = 0^h) to the nearest tenth of a day of the central meridian passage of the group; this was usually computed from the two tabulated longitudes of the group measured when nearest the central meridian.

Catalogue II contains those storms with ranges between $30'$ and $60'$ in D, or between 150γ and 300γ in either H (or N) or V. The tabulation and headings are the same as in Catalogue I, except that an extra column (Col. 8) is added, giving the mean value of the three ranges of D, H (or N), and V, the range of D being converted into force for this purpose.

CATALOGUE I.—CATALOGUE of the GREATER MAGNETIC STORMS RECORDED at the ROYAL OBSERVATORY, GREENWICH,
from 1874 APRIL to 1927 DECEMBER.

MAGNETIC STORM.							LARGEST GROUP OF SUNSPOTS WITHIN 4 DAYS OF THE CENTRAL MERIDIAN AT TIME OF COMMENCEMENT.			
Reference No.	Year.	Date of Storm.	Time of Commencement.	RANGES.			Group Number.	Mean Area.	Heliographic Distance from centre of disc at C.M.P.	Time of Central Meridian Passage.
				Declina- tion.	Horiz- ontal Force.*	Vertical Force.				
1	1874	Oct. 3—4	Oct. 3·6 S.C.	57	>237 γ	325 γ	127	984	-20°	Oct. 4·5
2	1880	Aug. 12—14	Aug. 12·5 S.C.	66	>300	385	343	273	+18	Aug. 14·0
3	1881	Jan. 31	Jan. 31·0	75	330	365	412	418	-7	Jan. 30·0
4	1881	Sept. 12—13	Sept. 12·5	65	335	345	566	519	+7	Sept. 10·0
5	1882	April 17	Apr. 17·0 S.C.	>59	>455	>1040	729	1744	-23	Apr. 19·1
6	1882	Apr. 20	Apr. 20·2 S.C.	>68	>300	>340	729	1744	-23	Apr. 19·1
7	1882	June 24	June 24·5 S.C.	50	325	236	781	86	+13	June 22·5
8	1882	Aug. 4—5	Aug. 4·7 S.C.	36	335	262	808	350	-18	Aug. 1·5
9	1882	Nov. 17—18	Nov. 17·4 S.C.	115	>565	>1060	885	1711	+17	Nov. 18·9
	1882	Nov. 20	Nov. 20·0	85	>1090	>1040	885	1711	+17	Nov. 18·9
10	1883	Apr. 3—5	Apr. 3·4 S.C.	58	192	315	987	536	+20	Apr. 3·3
11	1883	Sept. 16—17	Sept. 16·1 S.C.	52	345	>240	1114	920	-29	Sept. 13·9
12	1884	July 2—4	July 2·8 S.C.	41	330	294	1419	428	-16	July 2·1
13	1885	Mar. 15—16	Mar. 15·4 S.C.	54	170	370	1622	232	+13	Mar. 16·2
14	1885	May 25—26	May 25·6 S.C.	31	360	125	1672	516	+15	May 24·3
15	1886	Mar. 30—31	Mar. 30·3 S.C.	73	>335	286	1860	487	-10	Mar. 30·8
16	1891	May 13—16	May 13·3 S.C.	52	340	>330	2211	231	-22	May 10·7
17	1892	Feb. 13—14	Feb. 13·2 S.C.	>73	>540	>635	2421	2402	-22	Feb. 11·9
18	1892	Mar. 6—7	Mar. 6·4 S.C.	49	>290	325	..	0	..	..
19	1892	Mar. 11—13	Mar. 11·9 S.C.	74	296	375	2440	386	-21	Mar. 10·6
20	1892	Apr. 25—27	Apr. 25·6	58½	390	395	2486	560	+15	Apr. 23·9
21	1892	May 18—19	May 18·4 S.C.	75	299	480	2515	742	-12	May 16·7
22	1892	June 27	June 27·2 S.C.	36	305	>315	2567	337	+9	June 25·0
23	1892	July 12—14	July 12·7 S.C.	34½	520	285	2581	1591	+7	July 10·2
24	1892	July 16—17	July 16·5 S.C.	89	590	370	2583	829	-35	July 14·1
25	1892	Aug. 12—13	Aug. 12·5 S.C.	75	540	405	2615	277	-37	Aug. 11·5
26	1893	Aug. 18	Aug. 18·0 S.C.	34	248	>345	3135	309	-26	Aug. 21·9
27	1894	Feb. 22—24	Feb. 22·9 S.C.	52	>262	390	3412	1208	-25	Feb. 22·5
28	1894	Feb. 25—26	Feb. 25·3 S.C.	74	400	>272	3412	1208	-25	Feb. 22·5
29	1894	Feb. 28—Mar. 1	Feb. 28·6 S.C.	49	340	>229	3413	205	-19	Feb. 25·2
30	1894	Mar. 30—31	Mar. 30·7	57	325	470	3464	926	+28	Apr. 2·5
31	1894	July 20—21	July 20·3 S.C.	63	690	>520	3624	553	-17	July 17·2
32	1894	Aug. 20	Aug. 20·1 S.C.	66	>445	>530	3668	1246	0	Aug. 17·2
33	1894	Sept. 14—15	Sept. 14·0 S.C.	40	299	430	3701	430	-22	Sept. 12·3
34	1894	Nov. 13—14	Nov. 13·6 S.C.	50	350	500	3793	147	-25	Nov. 10·5
35	1898	Mar. 15—16	Mar. 15·0 S.C.	83	>345	>520	4702	970	-6	Mar. 11·5
36	1898	Sept. 9	Sept. 9·5 S.C.	57	>365	480	4781	1556	-19	Sept. 9·2
37	1900	May 5	May 5·1 S.C.	30½	208	370	4924	137	-3	May 2·5
38	1903	Oct. 31—Nov. 1	Oct. 31·3 S.C.	119	1175	1440	5098	466	-24	Oct. 31·8
39	1903	Dec. 13—14	Dec. 13·5 S.C.	60	>136	>355	5129	307	+20	Dec. 14·1
40	1907	Feb. 9—10	Feb. 9·6 S.C.	95	>225	>460	6108	1619	-10	Feb. 12·4
41	1908	Sept. 11—12	Sept. 11·9 S.C.	84	>355	>445	6520 & 22†	701	+6	Sept. 10·0
42	1908	Sept. 29—30	Sept. 29·6 S.C.	65	400	380	6533	399	+3	Sept. 26·8
43	1909	Jan. 3—4	Jan. 3·5 S.C.	71	>118	151	6591	641	+12	Jan. 3·2
44	1909	May 14—15	May 14·2 S.C.	50	430	>355	6669	681	-13	May 13·8
45	1909	Sept. 25	Sept. 25·5 S.C.	193	1710	>1080	6728	605	-12	Sept. 23·8
46	1915	June 17—18	June 17·1 S.C.	71	>375	>295	7304	767	+16	June 21·0
47	1917	Aug. 9—10	Aug. 9·2 S.C.	55	315	225	8181	2389	+9	Aug. 10·1
48	1917	Aug. 13—15	Aug. 13·6 S.C.	40½	380	335	8181	2389	+9	Aug. 10·1
49	1918	Aug. 15—16	Aug. 15·7 S.C.	30	370	157	8631	933	+3	Aug. 16·7

* For the years 1916 to 1925 inclusive, North Force was registered in place of Horizontal Force.

† From the photographs it is evident that these two groups are an entity.

CATALOGUE I.—CATALOGUE of the GREATER MAGNETIC STORMS RECORDED at the ROYAL OBSERVATORY, GREENWICH,
from 1874 APRIL to 1927 DECEMBER—*continued*.

MAGNETIC STORM.							LARGEST GROUP OF SUNSPOTS WITHIN 4 DAYS OF THE CENTRAL MERIDIAN AT TIME OF COMMENCE- MENT.			
Refer- ence No.	Year.	Date of Storm.	Time of Commencement.	RANGES.			Group Number.	Mean Area.	Heliographic Distance from centre of disc at C.M.P.	Time of Central Meridian Passage.
				Declina- tion.	Hori- zontal Force.*	Vertical Force.				
50	1919	Aug. 11—12	Aug. 11·3 S.C.	58'	>360 γ	>720 γ	8994	543	—13°	Aug. 9·2
51	1920	Mar. 4—5	Mar. 4·5 S.C.	64	240	282	9136	157	+23	Mar. 7·6
52	1920	Mar. 22—23	Mar. 22·4 S.C.	86	730	>490	9143	1966	+2	Mar. 21·6
53	1921	May 13—17	May 13·6 S.C.	>100	>740	>460	9334	1324	+3	May 14·7
54	1926	Jan. 26—27	Jan. 26·7 S.C.	62	>420	>203	9861	3285	+26	Jan. 24·5
55	1926	Feb. 23—25	Feb. 23·7	60	305	>203	9884	403	+19	Feb. 20·7
56	1926	Apr. 14—15	Apr. 14·6 S.C.	60	455	>203	9923	193	—24	Apr. 18·4
57	1926	Oct. 13—16	Oct. 13·8 S.C.	111	>430	>580	10062	986	+12	Oct. 11·1
58	1927	July 21—22	July 21·9 S.C.	60	315	335	10342	185	—17	July 19·1
59	1927	Aug. 19—21	Aug. 19·5	>73	170	205	10362	221	+4	Aug. 20·9
60	1927	Oct. 12	Oct. 12·4 S.C.	55½	>350	230	10406	334	—19	Oct. 10·5

* For the years 1916 to 1925 inclusive, North Force was registered in place of Horizontal Force.

CATALOGUE II.—CATALOGUE of the SMALLER MAGNETIC STORMS RECORDED at the ROYAL OBSERVATORY, GREENWICH,
from 1874 APRIL to 1927 DECEMBER.

Reference No.	Year.	Date of Storm.	Time of Commencement.	MAGNETIC STORM.				LARGEST GROUP OF SUNSPOTS WITHIN 4 DAYS OF THE CENTRAL MERIDIAN AT TIME OF COMMENCEMENT.			
				RANGES.				Group Number.	Mean Area.	Heliographic Distance from Centre of Disc at C.M.P.	Time of Central Meridian Passage.
				Declination.	Horizontal Force.	Vertical Force.	Mean.				
1	1875	Feb. 26—27	Feb. 26.5 S.C.	51	180 γ	269 γ	239 γ	145	648	+26°	Feb. 24.6
2	1875	May 6—7	May 6.6 S.C.	30½	142	150	151	..	0	..	..
3	1876	Feb. 19—20	Feb. 19.2 S.C.	49½	219	190	223	196	557	-6	Feb. 16.7
4	1876	Mar. 25—26	Mar. 25.0 S.C.	35½	96	166	149	204	352	+22	Mar. 25.1
5	1876	Nov. 10—11	Nov. 10.9	31½	68	104	112	(227)	(28)	(-9)	(Nov. 14.1) †
6	1876	Dec. 10—11	Dec. 10.0 S.C.	31½	100	67	111	..	(0)	..	.. †
7	1877	Jan. 6—7	Jan. 6.6 S.C.	33½	150	77	134	231*	58	+11	Jan. 9.9
8	1877	May 28—29	May 28.8 S.C.	39	173	206	194	..	0	..	..
9	1878	Jan. 24	Jan. 24.0 S.C.	30	105	62	108	266	115	+13	Jan. 22.8
10	1878	May 14—15	May 14.3 S.C.	26	159	128	141	..	0	..	..
11	1878	June 3—4	June 3.3 S.C.	43	173	196	198	272	198	+9	May 31.8
12	1880	Mar. 17—18	Mar. 17.5	34	128	116	141	316	53	-9	Mar. 18.9
13	1880	Aug. 18—20	Aug. 18.6 S.C.	27	164	200	169	348	462	+16	Aug. 17.5
14	1880	Sept. 15—17	Sept. 15.0	28	158	195	167	357	699	-24	Sept. 11.2
15	1880	Oct. 25—28	Oct. 25.4	31	69	93	108	382A	299	-26	Oct. 25.4
16	1880	Nov. 3—4	Nov. 3.0	31½	113	179	152	385	61	-21	Nov. 3.7
17	1881	Nov. 8—10	Nov. 8.5	34	147	149	158	598	101	+11	Nov. 8.0
18	1882	Jan. 19—20	Jan. 19.7	36	122	139	150	650	131	+20	Jan. 17.8
19	1882	Feb. 1—3	Feb. 1.5	40½	140	162	172	658	272	+22	Jan. 30.7
20	1882	Feb. 20	Feb. 20.2	42	176	105	167	672	234	-12	Feb. 18.0
21	1882	July 31—Aug. 1	July 31.0 S.C.	36	192	165	182	808	350	-18	Aug. 1.5
22	1882	Sept. 11—13	Sept. 11.9 S.C.	22½	214	No Trace	166	835	31	+4	Sept. 15.2
23	1882	Oct. 2—3	Oct. 2.4 S.C.	59	248	No Trace	279	846	984	-28	Sept. 30.6
24	1882	Oct. 5—6	Oct. 5.8	34½	226	193	200	848	529	-29	Oct. 1.8
25	1882	Nov. 12—15	Nov. 12.0 S.C.	54	220	262	255	876	740	-22	Nov. 9.9
26	1882	Dec. 20—22	Dec. 20.6	34	174	124	159	913	100	+12	Dec. 19.9
27	1883	Feb. 1—4	Feb. 1.2	35	156	97	146	955	184	-17	Feb. 4.6
28	1883	Feb. 24—25	Feb. 24.6 S.C.	64	282	230	283	971	93	-5	Feb. 26.7
29	1883	Feb. 27—Mar. 3	Feb. 27.6	33½	120	139	145	971	93	-5	Feb. 26.7
30	1883	Mar. 26—30	Mar. 26.8	31½	131	143	147	984	251	-17	Mar. 25.7
31	1883	Apr. 24—26	Apr. 24.6	40	231	116	186	1008	134	+12	Apr. 27.7
32	1883	May 20—23	May 20.7	27½	176	135	152	1033	36	-20	May 16.8
33	1883	July 8—12	July 8.5	39	202	75	161	1066	490	-26	July 9.5
34	1883	Oct. 5—6	Oct. 5.5	41	235	140	197	1130	189	-13	Oct. 7.8
35	1883	Oct. 16—17	Oct. 16.7 S.C.	31	127	108	132	1144	1121	-15	Oct. 18.6
36	1883	Nov. 1—3	Nov. 1.7	37½	180	140	173	1156	402	-14	Oct. 31.6
37	1883	Nov. 22—23	Nov. 22.1 S.C.	34	154	168	166	1181	624	+16	Nov. 19.8
38	1884	Feb. 23—24	Feb. 23.6	32	114	77	120	1288	284	+21	Feb. 21.5
39	1884	Feb. 29—Mar. 3	Feb. 29.7 S.C.	30½	138	114	138	1301	458	+18	Mar. 2.8
40	1884	Apr. 24—25	Apr. 24.4 S.C.	31	139	98	134	1371	867	-7	Apr. 27.7
41	1884	Oct. 1—3	Oct. 1.9 S.C.	31	197	164	175	1497	283	-20	Sept. 30.3
42	1884	Nov. 2—4	Nov. 2.5	44	227	230	230	1526	131	+6	Nov. 2.3
43	1885	Jan. 22	Jan. 22.1	40½	141	103	153	1573	515	-1	Jan. 18.7
44	1885	May 10	May 10.3 S.C.	15	164	64	102	1661	284	+18	May 7.3
45	1885	May 13—14	May 13.3 S.C.	41	243	156	205	1662	130	+7	May 9.4
46	1885	June 24—26	June 24.9 S.C.	31	222	188	191	1706	1321	+9	June 21.5
47	1886	Mar. 19—20	Mar. 19.8	33	182	67	141	1857	24	-6	Mar. 16.0
48	1886	Apr. 11—21	Apr. 11.6 S.C.	32	161	142	157	1867	23	-19	Apr. 13.6
49	1886	May 8—15	May 8.6	44	212	191	212	1880	763	+12	May 8.2
50	1886	June 29—July 3	June 29.6	30½	176	108	148	..	0	..	..

† No photograph available for 1876 Nov. 10 and Dec. 10.

CATALOGUE II.—CATALOGUE of the SMALLER MAGNETIC STORMS RECORDED at the ROYAL OBSERVATORY, GREENWICH,
from 1874 APRIL to 1927 DECEMBER.—*continued.*

MAGNETIC STORM.								LARGEST GROUP OF SUNSPOTS WITHIN 4 DAYS OF THE CENTRAL MERIDIAN AT TIME OF COMMENCEMENT.			
Reference No.	Year.	Date of Storm.	Time of Commencement.	RANGES.				Group Number.	Mean Area.	Heliographic Distance from Centre of Disc at C.M.P.	Time of Central Meridian Passage.
				Declina- tion.	Horiz- ontal Force.	Vertical Force.	Mean.				
51	1886	July 27—28	July 27·6	47	243 γ	272 γ	255 γ	1912	163	+11°	July 31·0
52	1886	Sept. 7—15	Sept. 7·6	25	190	111	144	1920	196	+5	Sept. 4·7
53	1886	Oct. 6—11	Oct. 6·5	41½	141	146	169	1930	72	-22	Oct. 5·1
54	1886	Nov. 2—6	Nov. 2·7	35	139	108	144	..	0	..	..
55	1886	Nov. 29—Dec. 3	Nov. 29·6	36	103	78	124	..	0	..	..
56	1887	Sept. 25—28	Sept. 25·7	47	169	210	209	..	0	..	..
57	1887	Nov. 21—22	Nov. 21·4	42	171	68	154	..	0	..	..
58	1888	Jan. 13	Jan. 13·5	44	176	95	168	2029	128	-5	Jan. 16·7
59	1888	Jan. 23—24	Jan. 23·5	37	131	135	154	2031	53	-5	Jan. 22·9
60	1888	Apr. 11—14	Apr. 11·2	34	146	104	143	..	0	..	..
61	1888	May 20—21	May 20·4 S.C.	29	168	161	161	2052	443	-6	May 17·9
62	1888	June 3—6	(Loss of trace.)	31	115	147	142	..	0	..	..
63	1888	Oct. 30—Nov. 1	Oct. 30·8 S.C.	41	126	37	127	..	0	..	..
64	1889	Mar. 17—18	Mar. 17·8	35	114	67	122	..	0	..	..
65	1889	July 17	July 17·2 S.C.	24½	270	60	153	2092	318	-13	July 18·8
66	1889	Sept. 8—11	Sept. 8·8	23	151	75	116	..	0	..	..
67	1889	Oct. 5—8	Oct. 5·7	31	97	68	110	..	0	..	..
68	1889	Nov. 1—3	Nov. 1·2	24	177	166	157	..	0	..	..
69	1889	Nov. 26—29	Nov. 26·6	53	140	61	161	..	0	..	..
70	1890	Nov. 7—8	Nov. 7·9	33½	138	99	138	..	0	..	..
71	1891	Feb. 11—15	Feb. 11·8	26	161	121	140	2179	216	+22	Feb. 12·0
72	1891	Mar. 2—6	Mar. 2·1 S.C.	36	168	179	179	2186	74	+32	Feb. 26·1
73	1891	Mar. 31—Apr. 2	Mar. 31·6 S.C.	27	161	148	151	2195	237	+26	Apr. 4·5
74	1891	Apr. 7—9	Apr. 7·6 S.C.	37½	141	108	149	2195	237	+26	Apr. 4·5
75	1891	Apr. 12—13	Apr. 12·5	34½	178	128	163	2198	51	-10	Apr. 10·9
76	1891	Sept. 8—12	Sept. 8·7	36	147	177	172	2294	366	+19	Sept. 7·0
77	1891	Sept. 27—29	Sept. 27·8	34½	142	92	139	2306	269	+17	Sept. 30·4
78	1891	Oct. 8	Oct. 8·5 S.C.	30½	85	41	96	2315	516	-21	Oct. 8·0
79	1891	Oct. 23—26	Oct. 23·8	29	164	77	132	2325	228	+12	Oct. 19·8
80	1891	Nov. 19—22	Nov. 19·9	41	140	92	150	2349	681	-22	Nov. 21·6
81	1891	Dec. 7	Dec. 7·0	23½	164	176	155	2360	43	-17	Dec. 8·7
82	1892	Jan. 4—6	Jan. 4·8 S.C.	45	207	145	197	2376	434	+25	Jan. 4·6
83	1892	Feb. 20—21	Feb. 20·8 S.C.	30½	132	84	126	2429	404	+24	Feb. 19·4
84	1892	Feb. 26—27	Feb. 26·0	32	127	74	124	2434	185	+32	Feb. 25·5
85	1892	Feb. 29—Mar. 5	Feb. 29·9	41	251	178	216	..	0	..	..
86	1892	Mar. 24—26	Mar. 24·8	28	155	121	142	2454	478	+35	Mar. 27·2
87	1892	Apr. 30—May 3	Apr. 30·9	45	178	231	216	2496	323	-22	May 3·9
88	1892	May 19	May 19·6 S.C.	14	156	52	94	2515	742	-12	May 16·8
89	1892	June 2—3	June 2·6	41	292	193	234	2534	1000	-18	May 30·1
90	1892	July 26—29	July 26·0 S.C.	29½	191	176	175	2596	63	-26	July 22·6
91	1892	Aug. 3—5	Aug. 3·6 S.C.	25½	197	148	160	2611	654	+3	Aug. 5·6
92	1892	Oct. 17—20	Oct. 17·5	31½	162	96	142	2694	139	-18	Oct. 14·4
93	1892	Nov. 4—5	Nov. 4·1 S.C.	47	200	228	226	2716	691	-33	Nov. 1·2
94	1892	Dec. 4—6	Dec. 4·8 S.C.	37½	282	>296	>259	2757	291	+17	Dec. 3·7
95	1893	Feb. 4—5	Feb. 4·8	37½	180	151	177	2831	84	+31	Feb. 1·2
96	1893	Apr. 26	Apr. 26·7 S.C.	29	245	60	153	2931	386	+26	Apr. 23·1
97	1893	June 9—11	June 9·5 S.C.	23½	178	69	124	3005	247	-13	June 11·8
98	1893	June 18—20	June 18·3 S.C.	22½	193	99	137	3015	408	-21	June 14·5
99	1893	July 15—16	July 15·9	47	214	176	214	3067	398	+12	July 14·3
100	1893	Aug. 6—8	Aug. 6·2 S.C.	27	278	162	195	3106	1594	-24	Aug. 7·5

CATALOGUE II.—CATALOGUE of the SMALLER MAGNETIC STORMS RECORDED at the ROYAL OBSERVATORY, GREENWICH,
from 1874 APRIL to 1927 DECEMBER—continued.

MAGNETIC STORM.								LARGEST GROUP OF SUNSPOTS WITHIN 4 DAYS OF THE CENTRAL MERIDIAN AT TIME OF COMMENCEMENT.			
Reference No.	Year.	Date of Storm.	Time of Commencement.	RANGES.				Group Number.	Mean Area.	Heliographic Distance from Centre of Disc at C.M.P.	Time of Central Meridian Passage.
				Declina- tion.	Hori- zontal Force.	Vertical Force.	Mean.				
101	1893	Sept. 26—27	Sept. 26.5	30½	159γ	104γ	142γ	3203	313	+ 6°	Sept. 30.4
102	1893	Sept. 29—30	Sept. 29.6 S.C.	33	164	81	140	3206	598	+ 1	Sept. 28.7
103	1893	Nov. 1—3	Nov. 1.6	41½	164	175	187	3258	72	- 5	Oct. 29.1
104	1894	Jan. 3—4	Jan. 3.7	37	152	85	145	3325	346	- 4	Dec. 31.3
105	1894	Jan. 11—12	Jan. 11.8 S.C.	27	184	40	123	3345	232	-10	Jan. 9.2
106	1894	Feb. 20—21	Feb. 20.8 S.C.	38	236	157	199	3412	1208	-25	Feb. 22.5
107	1894	Apr. 17—18	Apr. 17.5	43	176	189	198	3486	270	- 8	Apr. 20.8
108	1894	May 13—17	May 13.5	25	192	93	139	3518	1101	-12	May 15.8
109	1894	June 8—11	June 8.9 S.C.	31	241	233	213	3559	391	-18	June 11.7
110	1894	July 1—3	July 1.9 S.C.	38	156	47	135	3590	155	-15	June 28.4
111	1894	Sept. 18—23	Sept. 18.6	27	146	179	156	3720	136	-16	Sept. 19.0
112	1894	Oct. 16—20	Oct. 16.1	32	100	80	117	3744	67	+16	Oct. 13.3
113	1895	Feb. 9—10	Feb. 9.6	36	162	132	162	3892	434	+21	Feb. 8.4
114	1895	Mar. 8—10	Mar. 8.6	32	99	68	113	3934	223	+19	Mar. 12.5
115	1895	Mar. 13—18	Mar. 13.5	36	180	136	169	3934	223	+19	Mar. 12.5
116	1895	Apr. 10—14	Apr. 10.6	30½	173	140	159	3970	144	+11	Apr. 7.6
117	1895	May 10	May 10.3 S.C.	29	162	66	128	4005	260	-11	May 8.5
118	1895	Oct. 12—17	Oct. 12.5	36	189	132	171	4195	23	-23	Oct. 12.3
119	1895	Nov. 9—13	Nov. 9.5	41	184	155	186	..	0	..	..
120	1895	Dec. 7—9	Dec. 7.3 S.C.	33	131	73	127	4238	83	-15	Dec. 11.2
121	1896	Jan. 2—8	Jan. 2.9	37½	155	72	142	4262	199	+15	Jan. 2.2
122	1896	Jan. 29—Feb. 5	Jan. 29.8	30½	152	93	136	4279	150	-13	Jan. 31.1
123	1896	Feb. 28	Feb. 28.5	43½	215	119	189	4296	574	- 7	Feb. 25.7
124	1896	May 2—4	May 2.5	46	232	313	264	4348	114	- 8	Apr. 30.9
125	1896	May 17—18	May 17.7	26½	162	144	149	4355	42	- 5	May 20.5
126	1896	Aug. 1—3	Aug. 1.5	24½	188	73	131	4405	72	-14	Aug. 1.4
127	1896	Sept. 17—18	Sept. 17.8 S.C.	35	252	132	190	4428	1731	+ 6	Sept. 16.7
128	1896	Sept. 20	Sept. 20.1	39	163	82	151	4428	1731	+ 6	Sept. 16.7
129	1896	Oct. 8—13	Oct. 8.5	35½	198	167	185	..	0	..	..
130	1896	Nov. 5—9	Nov. 5.8	35½	164	112	155	4456	710	-19	Nov. 8.7
131	1896	Dec. 3—5	Dec. 3.7	50	126	111	168	4472	238	+ 9	Dec. 4.8
132	1897	Jan. 1—3	Jan. 1.8	40	161	192	189	4491	133	- 9	Jan. 4.4
133	1897	Apr. 1—2	Apr. 1.8	27	184	106	145	4554	131	+11	Apr. 3.2
134	1897	Apr. 19—21	Apr. 19.7 S.C.	32½	177	174	175	4567	153	+11	Apr. 16.3
135	1897	Apr. 23—25	Apr. 23.3 S.C.	29	184	93	144	..	0	..	..
136	1897	Dec. 10—11	Dec. 10.9	46	139	139	175	4665	886	+13	Dec. 13.3
137	1897	Dec. 20—21	Dec. 20.5	47½	234	170	219	4670	43	+ 5	Dec. 20.9
138	1898	Oct. 25—26	Oct. 25.7	32	111	62	115	4801	614	+11	Oct. 28.7
139	1899	Feb. 11—13	Feb. 11.9	44	165	119	173	..	0	..	..
140	1899	Mar. 21—22	Mar. 21.7	32	147	98	139	4845	438	- 2	Mar. 21.0
141	1899	May 15—16	May 15.0 S.C.	30½	103	64	110	4856	21	- 6	May 17.5
142	1899	June 29—30	June 29.8 S.C.	37	171	131	167	4863	440	+ 3	June 29.4
143	1899	Oct. 23—24	Oct. 23.6	35	95	56	113	..	0	..	..
144	1900	Mar. 12—14	Mar. 12.9	27½	172	230	183	..	0	..	..
145	1901	May 10	May 10.3 S.C.	32	132	55	120	..	0	..	..
146	1902	Apr. 10—11	Apr. 10.4 S.C.	28½	178	41	124	..	0	..	..
147	1902	Aug. 21—22	Aug. 21.6	32	88	58	106	..	0	..	..
148	1903	Apr. 6	Apr. 6.0 S.C.	26	188	122	150	5017	416	-14	Apr. 8.7
149	1903	Apr. 9	Apr. 9.0	18	152	24	91	5017	416	-14	Apr. 8.7
150	1903	Oct. 12—14	Oct. 12.4	40	187	176	193	5093	1726	-27	Oct. 11.6

CATALOGUE II.—CATALOGUE of the SMALLER MAGNETIC STORMS-RECORDED at the ROYAL OBSERVATORY, GREENWICH,
from 1874 APRIL to 1927 DECEMBER—continued.

MAGNETIC STORM.								LARGEST GROUP OF SUNSPOTS WITHIN 4 DAYS OF THE CENTRAL MERIDIAN AT TIME OF COMMENCEMENT.			
Reference No.	Year.	Date of Storm.	Time of Commencement.	RANGES.				Group Number.	Mean Area.	Heliographic Distance from Centre of Disc at C.M.P.	Time of Central Meridian Passage.
				Declina- tion.	Hori- zontal Force.	Vertical Force.	Mean.				
151	1903	Dec. 30—Jan. 1	Dec. 30.1 S.C.	37	84 γ	99 γ	127 γ	5140	99	-18°	Jan. 2.8
152	1904	June 15—16	June 15.5	32	216	153	180	5252	78	-18	June 19.4
153	1904	Oct. 21—22	Oct. 21.6	31	149	102	139	5331	116	-28	Oct. 20.5
154	1905	Jan. 5—6	Jan. 5.6	32	123	61	119	5416	77	-14	Jan. 8.3
155	1905	Feb. 3—4	Feb. 3.1 S.C.	47	250	83	195	5441	2500	-9	Feb. 4.2
156	1905	Mar. 2—3	Mar. 2.6 S.C.	29	202	99	152	5471	934	-10	Mar. 3.5
157	1905	Apr. 1—6	Apr. 1.1 S.C.	38 $\frac{1}{2}$	247	84	180	5489	406	-9	Mar. 31.2
158	1905	June 9	June 9.6	11	164	38	87	5550	123	-17	June 12.9
159	1905	June 22—23	June 22.5	17	156	52	100	5564	724	+4	June 25.8
160	1905	July 5—9	July 5.9 S.C.	25 $\frac{1}{2}$	156	113	135	5577	154	-16	July 7.8
161	1905	July 23—24	July 23.4 S.C.	13 $\frac{1}{2}$	159	62	98	5595	230	+3	July 22.7
162	1905	Aug. 2—4	Aug. 2.0 S.C.	19 $\frac{1}{2}$	157	75	112	5607	173	+10	Aug. 5.8
163	1905	Aug. 28—Sept. 1	Aug. 28.6	21	150	66	110	5638	181	+9	Aug. 30.2
164	1905	Nov. 12—13	Nov. 12.3 S.C.	46	220	141	203	5706	721	+3	Nov. 13.3
165	1905	Nov. 15—17	Nov. 15.6 S.C.	60	280	176	260	5706	721	+3	Nov. 13.3
166	1906	Feb. 24—26	Feb. 24.5	49	142	133	180	5803	234	+20	Feb. 22.6
167	1906	May 15	May 15.2	20	151	84	114	5869	545	+17	May 15.9
168	1906	June 1—4	June 1.8 S.C.	18	155	73	108	5871	528	+13	May 28.9
169	1906	July 11—12	July 11.6	29 $\frac{1}{2}$	222	78	153	5908	124	+15	July 10.3
170	1906	July 29—31	July 29.8 S.C.	15 $\frac{1}{2}$	156	44	95	5933	901	-21	July 30.4
171	1906	Aug. 7—8	Aug. 7.6	22	173	87	126	..	0	..	..
172	1906	Sept. 22—23	Sept. 22.7	32	208	164	181	5969	82	-26	Sept. 20.6
173	1906	Dec. 21—23	Dec. 21.8	43 $\frac{1}{2}$	149	118	167	6046	848	-15	Dec. 18.6
174	1907	Jan. 14—15	Jan. 14.8 S.C.	36	209	40	148	6076	553	-9	Jan. 14.8
175	1907	Feb. 7—9	Feb. 7.3 S.C.	28	151	86	129	6103	650	-7	Feb. 10.0
176	1907	Mar. 10—11	Mar. 10.2 S.C.	31	96	98	120	6140	572	-9	Mar. 11.5
177	1907	Mar. 11—12	Mar. 11.7 S.C.	38 $\frac{1}{2}$	112	123	148	6140	572	-9	Mar. 11.5
178	1907	Mar. 21—22	Mar. 21.6 S.C.	33	164	106	149	6150	133	+15	Mar. 19.6
179	1907	Apr. 15—16	Apr. 15.9	17	151	61	101	6168	282	-4	Apr. 13.0
180	1907	May 18—20	May 18.6 S.C.	25	170	102	136	6187	72	-10	May 15.1
181	1907	July 10—11	July 10.6 S.C.	27	200	106	151	6211	379	0	July 7.1
182	1907	Sept. 10—13	Sept. 10.1 S.C.	38 $\frac{1}{2}$	125	103	145	6252	312	-13	Sept. 12.3
183	1907	Nov. 21	Nov. 21.4 S.C.	32	117	126	139	6308	118	-12	Nov. 20.0
184	1908	Mar. 1—5	Mar. 1.5	33 $\frac{1}{2}$	134	89	135	..	0	..	..
185	1908	Mar. 26—Apr. 1	Mar. 26.5	46	> 172	192	> 204	..	0	..	..
186	1908	May 25—26	May 25.8	27	204	131	160	6439	12	-21	May 27.3
187	1908	July 15—17	July 15.6	25 $\frac{1}{2}$	170	67	125	6480	117	-19	July 13.6
188	1908	Aug. 9	Aug. 9.0 S.C.	28	215	105	157	6494	512	-13	Aug. 7.6
189	1908	Aug. 12—14	Aug. 12.6 S.C.	25	170	69	125	..	0	..	..
190	1908	Aug. 19	Aug. 19.0 S.C.	25 $\frac{1}{2}$	156	145	146	6503	205	-22	Aug. 19.9
191	1908	Sept. 4—6	Sept. 4.8	34	257	177	206	6517	324	-14	Sept. 3.3
192	1908	Sept. 9—11	Sept. 9.5	23	175	73	124	6519	494	-13	Sept. 9.0
193	1908	Oct. 12—14	Oct. 12.5	34	106	122	137	6547	26	0	Oct. 13.4
194	1908	Oct. 31—Nov. 1	Oct. 31.3 S.C.	27	175	46	122	6558	54	+9	Nov. 3.2
195	1908	Nov. 7—11	Nov. 7.8	32	138	145	152	6564	622	+8	Nov. 11.3
196	1908	Nov. 17—18	Nov. 17.0 S.C.	36	149	201	181	6569	337	+9	Nov. 19.1
197	1908	Dec. 4—6	Dec. 4.5	32 $\frac{1}{2}$	143	88	135	6577	596	+12	Dec. 8.3
198	1909	Jan. 1—2	Jan. 1.5 S.C.	30	149	174	162	6591	641	+12	Jan. 3.2
199	1909	Jan. 29—Feb. 1	Jan. 29.5	44 $\frac{1}{2}$	238	153	210	6607	489	-4	Jan. 29.4
200	1909	Mar. 19	Mar. 19.5	45 $\frac{1}{2}$	185	294	241	6641	55	-5	Mar. 16.1

CATALOGUE II.—CATALOGUE of the SMALLER MAGNETIC STORMS RECORDED at the ROYAL OBSERVATORY, GREENWICH,
from 1874 APRIL to 1927 DECEMBER—continued.

Reference No.	Year.	Date of Storm.	Time of Commencement.	MAGNETIC STORM.				LARGEST GROUP OF SUNSPOTS WITHIN 4 DAYS OF THE CENTRAL MERIDIAN AT TIME OF COMMENCEMENT.			
				RANGES.				Group Number.	Mean Area.	Heliographic Distance from Centre of Disc at C.M.P.	Time of Central Meridian Passage.
				Declination.	Horizontal Force. North Force.*	Vertical Force.	Mean.				
201	1909	Mar. 27—29	Mar. 27·7	37	195 γ	186 γ	193 γ	6642	704	+18°	Mar. 24·6
202	1909	May 18—19	May 18·2 S.C.	31	254	196	206	6670	44	+15	May 18·4
203	1909	Aug. 28—Sept. 1	Aug. 28·7 S.C.	25½	157	79	124	..	0	..	..
204	1909	Sept. 21—22	Sept. 21·5 S.C.	30½	140	122	142	6728	605	-12	Sept. 23·8
205	1909	Sept. 30	Sept. 30·2 S.C.	31	265	196	209	6732	19	-3	Sept. 30·8
206	1909	Oct. 18—19	Oct. 18·7	41	173	196	197	6746	125	-11	Oct. 20·7
207	1909	Oct. 23	Oct. 23·0 S.C.	25	133	232	167	6746	125	-11	Oct. 20·7
208	1909	Oct. 24—25	Oct. 24·5	34½	124	72	127	6746	125	-11	Oct. 20·7
209	1909	Nov. 30—Dec. 2	Nov. 30·1	31	205	76	149	6774	742	+12	Nov. 27·8
210	1910	Mar. 27—29	Mar. 27·8	51	297	272	281	6828	110	+22	Mar. 29·7
211	1910	Mar. 30—Apr. 2	Mar. 30·8	28½	166	136	152	6828	110	+22	Mar. 29·7
212	1910	June 20—22	June 20·1	38½	276	81	188	..	0	..	..
213	1910	Aug. 21—22	Aug. 21·5	24½	212	147	164	..	0	..	..
214	1910	Aug. 28—30	Aug. 28·6	23½	164	100	130	..	0	..	..
215	1910	Sept. 29	Sept. 29·5	46	177	100	175	6894	717	-21	Oct. 3·0
216	1910	Oct. 5—6	Oct. 5·8	32½	129	81	129	6894	717	-21	Oct. 3·0
217	1910	Oct. 19—22	Oct. 19·3 S.C.	32	84	51	103	6897	509	0	Oct. 21·8
218	1910	Oct. 25—28	Oct. 25·5	29½	154	109	141	6897	509	0	Oct. 21·8
219	1910	Dec. 28—30	Dec. 28·5	35	100	55	115	..	0	..	..
220	1911	Jan. 24—27	Jan. 24·5	37	142	75	139	..	0	..	..
221	1911	Feb. 21—24	Feb. 21·5	35	205	96	163	..	0	..	..
222	1911	Mar. 20—29	Mar. 20·0 S.C.	33½	131	90	134	..	0	..	..
223	1911	Apr. 8—9	Apr. 8·8	38½	158	113	160	6940	144	-2	Apr. 9·3
224	1911	May 14—16	May 14·7	18	151	95	114	..	0	..	..
225	1911	Oct. 10—11	Oct. 10·7	47	137	132	174	..	0	..	..
226	1912	Aug. 5—6	Aug. 5·7	19	173	91	122	..	0	..	..
227	1912	Sept. 17—18	Sept. 17·6	43½	160	63	153	6999	108	-15	Sept. 15·3
228	1912	Oct. 14—16	Oct. 14·7	32	114	53	113	..	0	..	..
229	1914	Apr. 6—7	Apr. 6·3 S.C.	32½	146	120	147	7030	425	+34	Apr. 5·3
230	1915	Sept. 22—30	Sept. 22·5	32½	151	129	152	7445	52	+15	Sept. 24·1
231	1915	Oct. 14—16	Oct. 14·6	34	118	133	145	7467	326	+3	Oct. 13·6
232	1915	Oct. 22—26	Oct. 22·5	47½	160	142	186	7475	516	-20	Oct. 20·1
233	1915	Oct. 31—Nov. 1	Oct. 31·8	36½	148	83	142	7488	229	+16	Oct. 30·1
234	1915	Nov. 5—6	Nov. 5·6 S.C.	46½	235	121	202	7492	131	-25	Nov. 2·3
235	1915	Nov. 15—22	Nov. 15·8	38	125	109	146	7517	114	+10	Nov. 19·4
236	1915	Dec. 6—7	Dec. 6·5	47½	207	116	193	7550	46	+20	Dec. 8·2
237	1916	Jan. 10—13	Jan. 10·6	37	198	48	148	7595	236	+16	Jan. 12·0
238	1916	Mar. 9—10	Mar. 9·3	39	187	253	216	7650	524	-10	Mar. 7·9
239	1916	Mar. 16—21	Mar. 16·8	31	165	127	153	7664	47	+43	Mar. 14·4
240	1916	Mar. 29—Apr. 1	Mar. 29·2	31	136	103	135	7671	558	+21	Mar. 26·3
241	1916	Apr. 25—27	Apr. 25·2	28	172	171	164	7702	298	-22	Apr. 26·6
242	1916	Apr. 27—29	Apr. 27·6 S.C.	28	183	148	160	7702	298	-22	Apr. 26·6
243	1916	May 21—25	May 21·0 S.C.	34	153	115	150	7725	54	+16	May 23·3
244	1916	Aug. 22—24	Aug. 22·8 S.C.	42	229	No trace	228	7800	41	+2	Aug. 19·9
245	1916	Aug. 26—27	Aug. 26·8 S.C.	29	239	258	218	8411	1	+6	Aug. 30·2
246	1916	Sept. 2—5	Sept. 2·9	31	172	86	141	7811	20	+5	Aug. 31·0
247	1916	Sept. 30—Oct. 2	Sept. 30·5	33	172	97	149	7839	10	+16	Sept. 30·0
248	1916	Oct. 5—14	Oct. 5·5	49	192	227	227	7844	72	-29	Oct. 4·0
249	1916	Nov. 3—9	Nov. 3·4	35½	156	60	136	7864	112	+11	Nov. 3·4
250	1916	Nov. 11—13	Nov. 11·8	20	152	30	96	7871	250	+6	Nov. 8·8

* From 1916 January to 1925 December inclusive, North Force was registered in place of Horizontal Force.

CATALOGUE II.—CATALOGUE of the SMALLER MAGNETIC STORMS RECORDED at the ROYAL OBSERVATORY GREENWICH,
from 1874 APRIL to 1927 DECEMBER—*continued*.

MAGNETIC STORM.								LARGEST GROUP OF SUNSPOTS WITHIN 4 DAYS OF THE CENTRAL MERIDIAN AT TIME OF COMMENCEMENT.			
Reference No.	Year.	Date of Storm.	Time of Commencement.	RANGES.				Group Number.	Mean Area.	Heliographic Distance from Centre of Disc at C.M.P.	Time of Central Meridian Passage.
				Declina- tion.	North Force.	Vertical Force.	Mean.				
251	1917	Jan. 4—5	Jan. 4.2 S.C.	45	170 γ	250 γ	221 γ	7926	1396	+18°	Jan. 3.6
252	1917	Feb. 15—16	Feb. 15.6 S.C.	37½	134	160	165	7990	182	—11	Feb. 17.0
253	1917	June 23—25	June 23.0	33	143	93	138	8124	419	+11	June 23.4
254	1917	July 31—Aug. 1	July 31.5	28½	153	168	158	8171	373	—20	July 28.7
255	1917	Aug. 20—23	Aug. 20.3 S.C.	46	235	280	254	8207	671	—30	Aug. 18.9
256	1917	Aug. 25—26	Aug. 25.7	30½	161	111	145	8215	493	—24	Aug. 27.1
257	1917	Sept. 5	Sept. 5.3 S.C.	33	164	74	138	8228	312	—22	Sept. 4.9
258	1917	Sept. 29—Oct. 6	Sept. 29.5	31	125	81	124	8270	363	—24	Oct. 1.0
259	1917	Oct. 28—Nov. 1	Oct. 28.4	30	165	80	135	8296	276	—26	Oct. 25.1
260	1917	Dec. 16—17	Dec. 16.3 S.C.	59	175	262	251	8352	408	—12	Dec. 16.5
261	1918	Jan. 29—Feb. 1	Jan. 29.5	45	171	103	172	8421	144	—12	Jan. 26.9
262	1918	Feb. 9—15	Feb. 9.8	36	192	93	159	8428	101	—2	Feb. 12.7
263	1918	Mar. 7—9	Mar. 7.9 S.C.	45	180	231	218	8446	73	—5	Mar. 4.2
264	1918	Apr. 10—12	Apr. 10.9 S.C.	27½	137	165	150	8486	120	+22	Apr. 9.7
265	1918	May 16—21	May 16.8	41	184	202	202	8528	128	—19	May 17.5
266	1918	June 9—12	June 9.7	23½	181	155	154	8549	282	+17	June 5.8
267	1918	Sept. 16—23	Sept. 16.0	37	190	143	177	8676	631	—19	Sept. 14.8
268	1918	Oct. 15—20	Oct. 15.5	34½	177	219	194	8709	635	+10	Oct. 17.7
269	1918	Nov. 10—17	Nov. 10.5	37½	130	92	141	8732	90	+5	Nov. 6.9
270	1918	Nov. 24	Nov. 24.5	30½	87	33	95	8756	663	—11	Nov. 26.9
271	1918	Nov. 29—Dec. 1	Nov. 29.8	37	175	96	157	8756	663	—11	Nov. 26.9
272	1918	Dec. 7—11	Dec. 7.8	44½	168	163	190	8765	179	—14	Dec. 4.0
273	1918	Dec. 25—26	Dec. 25.2 S.C.	43	181	212	208	8775	575	—6	Dec. 23.7
274	1919	Jan. 3—7	Jan. 3.8 S.C.	38	155	125	161	8788	82	—9	Dec. 30.8
275	1919	Jan. 16—23	Jan. 16.5	31½	149	73	130	8798	205	—3	Jan. 17.0
276	1919	Jan. 31—Feb. 5	Jan. 31.4 S.C.	38½	105	44	119	8817	120	+30	Jan. 29.3
277	1919	Feb. 13—16	Feb. 13.5	32	158	58	129	8833	982	+16	Feb. 14.5
278	1919	Feb. 21—24	Feb. 21.0	36	167	91	150	8834	147	+2	Feb. 21.1
279	1919	Feb. 27—Mar. 6	Feb. 27.8	31	152	121	146	8842	235	+14	Mar. 2.7
280	1919	Mar. 19—23	Mar. 19.8	37	179	134	171	8855	444	+24	Mar. 16.3
281	1919	Mar. 27—31	Mar. 27.5	34	128	96	136	8862	451	—13	Mar. 29.5
282	1919	May 1—3	May 1.9 S.C.	44	275	183	231	8890	362	—15	May 3.3
283	1919	Aug. 18—20	Aug. 18.9	21½	188	78	127	9005	1099	—2	Aug. 19.5
284	1919	Sept. 18—21	Sept. 18.9	38½	175	212	198	9034	6	—18	Sept. 19.9
285	1919	Oct. 1—3	Oct. 1.7 S.C.	36½	225	188	203	9041	283	—15	Oct. 1.9
286	1919	Oct. 4—6	Oct. 4.2 S.C.	42	210	245	227	9041	283	—15	Oct. 1.9
287	1919	Oct. 28—29	Oct. 28.2	31	124	121	137	9059	138	—19	Oct. 30.3
288	1919	Nov. 16—18	Nov. 16.5	31	93	35	98	9068	29	+2	Nov. 18.0
289	1919	Dec. 14—16	Dec. 14.2	33	215	73	155	9083	223	+5	Dec. 15.1
290	1920	Feb. 16—18	Feb. 16.4	39	158	60	142	9119	258	+11	Feb. 13.9
291	1920	Feb. 24—25	Feb. 24.4	30½	149	180	164	9128	147	+23	Feb. 22.4
292	1920	Apr. 15—16	Apr. 15.0	33	129	139	148	9157	542	—1	Apr. 16.9
293	1920	May 13—16	May 13.0 S.C.	20½	156	78	115	9178	199	+18	May 9.3
294	1920	June 9—11	June 9.6	21	186	107	135	9193	251	+13	June 12.0
295	1920	Sept. 3—5	Sept. 3.2	25	197	98	143	9227	1114	—21	Sept. 2.9
296	1920	Sept. 22—23	Sept. 22.1 S.C.	36	126	84	134	..	0	..	..
297	1920	Sept. 28—29	Sept. 28.5	46	190	139	192	9235	532	—18	Sept. 28.6
298	1921	May 19—21	May 19.8 S.C.	53	228	77	197	9338	10	—6	May 16.0
299	1921	Sept. 2	Sept. 2.1	27½	156	106	137	..	0	..	..
300	1921	Oct. 7—9	Oct. 7.8	28½	190	78	140	..	0	..	..

CATALOGUE II.—CATALOGUE of the SMALLER MAGNETIC STORMS RECORDED at the ROYAL OBSERVATORY, GREENWICH,
from 1874 APRIL to 1927 DECEMBER—*continued*.

MAGNETIC STORM.								LARGEST GROUP OF SUNSPOTS WITHIN 4 DAYS OF THE CENTRAL MERIDIAN AT TIME OF COMMENCEMENT.			
Reference No.	Year.	Date of Storm.	Time of Commencement.	RANGES.				Group Number.	Mean Area.	Heliographic Distance from Centre of Disc at C.M.P.	Time of Central Meridian Passage.
				Declina- tion.	North Force* Horizontal Force.	Vertical Force.	Mean.				
301	1921	Nov. 16—18	Nov. 16.3	34	129 γ	71 γ	128 γ	9399	457	+10°	Nov. 18.3
302	1922	Jan. 8—10	Jan. 8.7	36	162	No Trace	178	9412	33	+11	Jan. 10.1
303	1922	Jan. 24—26	Jan. 24.5	32	163	99	145	..	0	..	..
304	1922	Mar. 12—14	Mar. 12.5	30½	160	86	136	9432	566	+2	Mar. 12.1
305	1922	Apr. 8—10	Apr. 8.5	21½	158	72	115	..	0	..	..
306	1922	Sept. 7—9	Sept. 7.3	29	155	88	133	922a	3	-18	Sept. 7.8
307	1922	Sept. 14—15	Sept. 14.0	38	196	153	184	..	0	..	..
308	1922	Oct. 4—9	Oct. 4.8	27½	181	160	163	..	0	..	..
309	1922	Oct. 30—Nov. 3	Oct. 30.8	34	159	68	136	..	0	..	..
310	1923	Mar. 24—27	Mar. 24.5	48	228	146	210	9492	27	+13	Mar. 21.2
311	1923	Sept. 26—28	Sept. 26.1	36	154	148	165	9511	168	-24	Sept. 30.0
312	1923	Oct. 14—18	Oct. 14.9	35½	181	161	177	9513	78	-2	Oct. 14.8
313	1924	Jan. 29—30	Jan. 29.6	41	135	214	190	..	0	..	..
314	1924	June 9—11	June 9.6 S.C.	35	172	188	183	..	0	..	..
315	1924	Oct. 23—25	Oct. 23.0	24½	157	78	122	9576	495	+17	Oct. 19.9
316	1925	June 22—25	June 22.7	31	165	113	148	9673	43	-30	June 20.1
317	1925	Sept. 1—2	Sept. 1.7 S.C.	33½	186	85	150	9708	240	+16	Aug. 29.0
318	1925	Sept. 21	Sept. 21.1 S.C.	16	181	62	110	9741	331	-20	Sept. 23.1
319	1925	Oct. 8—12	Oct. 8.8	31	208	57	144	9751	54	+14	Oct. 7.6
320	1925	Oct. 23—24	Oct. 23.4	35½	172	142	168	9760	815	-25	Oct. 20.5
321	1925	Nov. 8—11	Nov. 8.8	30½	94	87	115	9778	50	-19	Nov. 11.4
322	1925	Dec. 27—29	Dec. 27.6 S.C.	29	154	86	132	9830	2587	+25	Dec. 28.6
323	1926	Jan. 12—16	Jan. 12.8	29	182	67	135	9842	229	+29	Jan. 13.4
324	1926	Jan. 22—23	Jan. 22.6 S.C.	33	177	159	171	9861	3285	+26	Jan. 24.5
325	1926	Mar. 5—6	Mar. 5.4 S.C.	53	229	> 149	> 221	9885	1579	-21	Mar. 3.9
326	1926	Mar. 9—12	Mar. 9.5	45	162	160	188	9891	342	+29	Mar. 10.0
327	1926	Mar. 17—23	Mar. 17.9	24½	167	110	136	9899	401	-13	Mar. 18.6
328	1926	Apr. 5—10	Apr. 5.8	22	153	55	109	9914	81	-3	Apr. 5.0
329	1926	May 3—13	May 3.9 S.C.	32	167	130	157	9938	872	-16	May 5.9
330	1926	June 1—2	June 1.5 S.C.	41	302	> 106	> 210	9964	242	-16	June 4.3
331	1926	Sept. 14—17	Sept. 14.4	30½	166	No Trace	165	10040	251	+12	Sept. 16.3
332	1926	Sept. 19—22	Sept. 19.6	53	297	276	286	10041	1881	+17	Sept. 19.7
333	1926	Oct. 24—25	Oct. 24.1	32	156	112	147	10072	169	-21	Oct. 22.4
334	1927	Jan. 4—6	Jan. 4.8	32½	112	32	107	10138	866	-10	Jan. 8.5
335	1927	Jan. 7—8	Jan. 7.3	31	151	84	134	10138	866	-10	Jan. 8.5
336	1927	Mar. 26—28	Mar. 26.0	36	112	94	133	10231	31	-2	Mar. 25.0
337	1927	Apr. 9	Apr. 9.3	30½	108	96	123	10239	697	+19	Apr. 6.9
338	1927	Apr. 14—15	Apr. 14.0 S.C.	52½	113	161	186	10248	541	-12	Apr. 12.8
339	1927	May 3—5	May 3.5	54	148	142	194	10275	240	-15	May 2.0
340	1927	May 27—29	May 27.2 S.C.	31	71	72	103	10307	114	-18	May 29.7
341	1927	Aug. 29—Sept. 1	Aug. 29.0 S.C.	30½	96	84	115	10366	642	-24	Aug. 28.7
342	1927	Oct. 22—24	Oct. 22.3 S.C.	48	298	110	222	10423	344	-10	Oct. 20.5
343	1927	Dec. 13—14	Dec. 13.5	30½	129	72	122	10465	146	+6	Dec. 14.4

* From 1916 January to 1925 December inclusive, North Force was registered in place of Horizontal Force.