KODAIKANAL SOLAR, GEOMAGNETIC AND IONOSPHERIC DATA APRIL—JUNE 1954

Curves showing (a) Kodaikanal daily relative sunspot numbers, (b) daily areas of calcium prominences and (c) daily areas of H-alpha dark markings are given on page 376. Tables 1 to 4 below summarise the data on solar and geomagnetic phenomena. The hourly median values of critical frequency and virtual height for the ionospheric layers are given in Table 5.

TABLE 1

Prominent sunspot groups

No prominent sunspot groups were observed during the period

TABLE 2

Solar Flares

No solar flares were observed during the period

TABLE 3

Sudden disappearance of prominences and H-alpha dark markings

No sudden disappearance of prominences or H-alpha markings were observed during the period

TABLE 4

Principal magnetic storms

Greenwich date 1954	Storm-time: GMT of beginning		Storm-time: GMT of ending [1]		Sudden Commencement: Type [2]	Sudden Commencement: Amplitude [3] D	H	Z	Degree of activity [4]	Maximal activity Greenwich day	Ranges D	H	Z
	h	*m*	*d*	*h*		′	γ	γ			′	γ	γ
April 11	16	14	12	22	...	...	...	...	m	12	4	142	43

The following symbols and conventions have been used according to recognised practice —

1. Approximate time of ending of storm construed as the time of cessation of reasonably marked disturbance movements in the traces
2. s.c. = sudden commencement ... = Gradual commencement
3. Signs of amplitudes of *D* and *Z* taken algebraically :
   (*D* — reckoned negative being westerly)
   (*Z* — reckoned positive being vertically downwards)
4. Storm described by three degrees of activity :
   m — for moderate (when range is less than 250 γ)
   ms — for moderately severe (when range is between 251 γ and 400 γ)
   s — for severe (when range is above 400 γ)

TABLE 5

Beginning from January 1952, systematic ionospheric observations are being made at Kodaikanal with the Automatic Multi-frequency Ionsophere Recorder (Type C-3) made by the National Bureau of Standards, U.S.A. The general electrical characteristics of the instrument are given below :

(*a*) Supply voltage—90 to 260 volts AC single phase

(*b*) Supply frequency—50 to 60 cps

(*c*) Power load—Approximately 30 amperes at 115 volts

(*d*) Pulse recurrence frequency—from 10 to 90 pps

(*e*) Frequency sweep time—7½, 15 or 30 seconds and 30, 60 or 120 seconds

(*f*) Frequency sweep range—1 to 25 megacycles

(*g*) Frequency sweep interval—5, 15, 30 or 60 minutes

(*h*) Height ranges—0-500, 0-1000, 0-4000 kilometres

(*i*) Peak-pulse power—approximately 10 kilowatts

The meanings of the symbols are as follows —

(1) foE — Ordinary-wave critical frequency for the E layer

(2) foF1 — Ordinary-wave critical frequency for the F1 layer

(3) foF2 — Ordinary-wave critical frequency for the F2 layer

(4) h'E — Minimum virtual height on the ordinary-wave branch for the E layer

(5) h' F1 — Minimum virtual height on the ordinary-wave branch for the F1 layer

(6) h' F2 — Minimum virtual height on the ordinary wave branch for the F2 layer

(7) fEs — Highest frequency on which echoes of the sporadic type are observed from the lower part of the E layer

(8) (M3000) F2 — Maximum usable frequency factor for a path of 3000 km for transmission by the F2 layer

Ionospheric data

(Median values)

Kodaikanal (10·2°N 77·5°E) — April 1954

Time (hrs)	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000) F2
07	260	6·6	220		110	2·5	6·0	3·4
08	300	7·6	205		105		9·0	2·9
09	325	7·3	200				11·0	2·6
10	355	6·9	190	4·3			12·0	2·6
11	355	7·1	190	4·4			12·0	2·6
12	350	7·2	195	4·4			11·9	2·6
13	340	7·7	185	4·3			12·0	2·7
14	325	8·4	200		105	3·2	11·0	2·8
15	300	9·3	200		105	3·1	8·6	2·9
16	280	9·7	220		105	2·8	7·0	3·0
17	260	9·9	235		115		6·4	3·1

Time : 75·0°E

Sweep : 1·0 Mc. to 25·0 Mc. in 30 seconds

May 1954

07	275	6·4	220		110	2·5	6·4	3·3
08	310	7·3	205		105	2·9	9·0	3·0
09	345	7·3	200	4·2	105		11·0	2·6
10	380	6·9	195	4·3	105		12·0	2·5
11	375	6·6	190	4·3	100		12·0	2·6
12	375	6·8	185	4·3	100		12·0	2·6
13	375	7·3	180	4·3	100		11·8	2·7
14	350	7·5	190	4·2	105		11·0	2·7
15	335	8·2	200	4·0	110	3·0	8·9	2·8
16	300	8·4	220		110	2·7	7·0	3·0
17	265	8·6	225		120	2·3	5·2	3·2

Time : 75·0°E

Sweep : 1·0 Mc. to 25·0 Mc. in 30 seconds

June 1954

07	285	5·6	220		115	2·4	5·9	3·2
08	325	6·3	210	3·9	105	2·8	8·7	2·9
09	365	6·3	195	4·1	100	3·0	10·2	2·9
10	400	6·4	185	4·2	100		11·2	2·6
11	405	6·1	185	4·2	100		11·4	2·6
12	415	6·1	185	4·2	100	3·3	11·6	2·5
13	415	6·3	180	4·2	100		11·4	2·5
14	380	6·3	185	4·1	105		10·6	2·7
15	360	6·5	195	4·0	110	2·9	9·0	2·8
16	325	7·2	210	3·8	115	2·6	7·4	2·9
17	280	7·4	225		120	2·2	6·0	3·2

Time : 75·0°E

Sweep : 1·0 Mc. to 25·0 Mc. in 30 seconds

Kodaikanal
30 July 1954

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MAGNETIC OBSERVATORY, ALIBAG (BOMBAY)

Three-hourly indices of Geomagnetic Activity

(K 9=300 γ)

(Scale values of variometers in γ/mm : D=11.3 ; H=4.4 ; Z=2.5)

Greenwich day	APRIL 1954 K-indices		Sum	Character of the day*	MAY 1954 K-indices		Sum	Character of the day*	JUNE 1954 K-indices		Sum	Character of the day*
1	2221	1223	15	Ca	2211	1001	8	Ca	1222	1111	11	S
2	1223	4434	23	S	2322	1121	14	S	1123	2111	12	S
3	2333	2233	21	Sa	1212	1222	13	Ca	2122	1112	12	S
4	3322	2223	19	S	2223	2323	19	S	2231	1231	15	S
5	2232	1112	14	S	3223	2211	16	S	1111	2212	11	Ca
6	2232	2222	17	Ca	2221	1111	11	Ca	2212	1212	13	Ca
7	1222	2241	16	S	2311	2221	14	Ca	2212	3232	17	S
8	2212	2243	18	S	2221	2344	20	S	2211	1112	11	Ca
9	2221	4422	19	S	2233	1222	17	S	2122	2211	13	Ca
10	2223	2422	19	S	1222	1232	15	S	3333	2221	19	S
11	1222	2445	22	Sa	3243	2232	21	S	1123	1111	11	Ca
12	6435	5323	31	M	2112	2222	14	S	0112	2431	14	S
13	2122	3333	19	Sa	2233	2222	18	S	2122	1332	16	S
14	2222	2222	16	S	2222	1120	12	Ca	1223	4222	18	Sa
15	2322	3332	20	S	1223	3211	15	S	2322	1122	15	S
16	2231	2231	16	Ca	1311	1121	11	Ca	1212	1111	10	Ca
17	1221	2132	14	Ca	1111	2112	10	Ca	1111	2122	11	Ca
18	2323	2333	21	S	3224	3232	21	Sa	0121	1342	14	M
19	2322	2332	19	S	3222	1232	17	S	2222	2222	16	Ca
20	2222	3442	21	S	2222	2233	18	S	2222	2111	13	S
21	2324	2321	19	Sa	2223	2321	17	S	2123	2123	16	S
22	2231	2101	12	Ca	1221	1122	12	Ca	2211	2212	13	Ca
23	1444	2243	24	M	2221	1111	11	Ca	2212	2232	16	S
24	2222	2322	17	S	1221	2131	13	S	2222	1112	13	Ca
25	2222	1122	14	Ca	1121	1131	11	Ca	2223	3112	16	S
26	2122	2332	17	S	1221	1121	11	Ca	2212	2232	16	S
27	2322	2232	18	S	1212	2222	14	Ca	2122	3233	18	S
28	1221	2222	14	Ca	1111	1122	10	Ca	4422	2221	19	S
29	2222	2222	16	Ca	2222	2212	15	S	2222	1111	12	Ca
30	2234	3222	20	S	2223	1211	14	Ca	1222	2213	15	S
31					2132	2221	15	S				

* At Bombay, since 1883, a day is classed as (1) a quiet day, or a day of (2) small, (3) moderate, (4) great or (5) very great disturbance, the letters distinguishing the respective classes being C, S, M, G and VG. For representing intermediate conditions of activity of the smaller period movements, sub-classifications Ca, Sa, Ma are used. Roughly speaking a storm having a range over 225γ in the variations of the horizontal force during the first twentyfour hours after its commencement is classed as "Very Great". It is "Great" if the range is between 150γ and 225γ, "Moderate" if the range is between 65γ and 150γ, "Small" if the range is less than 65γ. The range is however not the only criterion used in assigning the character of a storm. The oscillations in the magnetograms are duly taken into account in determining the class to which a particular storm should belong.

The corresponding international character figures can be determined from the following—

Bombay Character	International Character	Bombay Character	International Character
C, Ca	0	M, Ma	2
S, Sa	1	G, VG	2

Colaba, Bombay
24 August 1954

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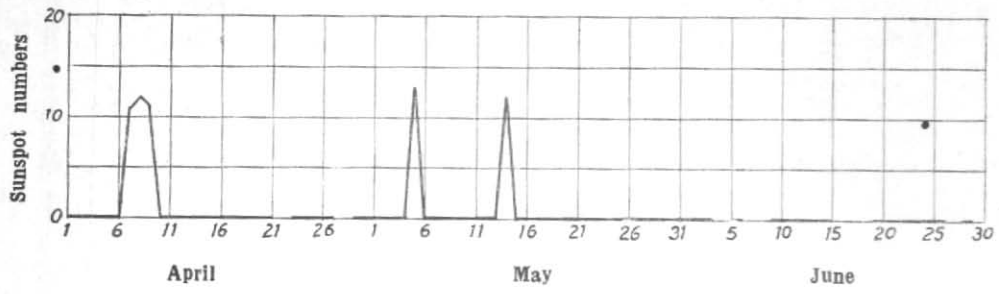

Fig. 1(a). Kodaikanal daily relative sunspot numbers

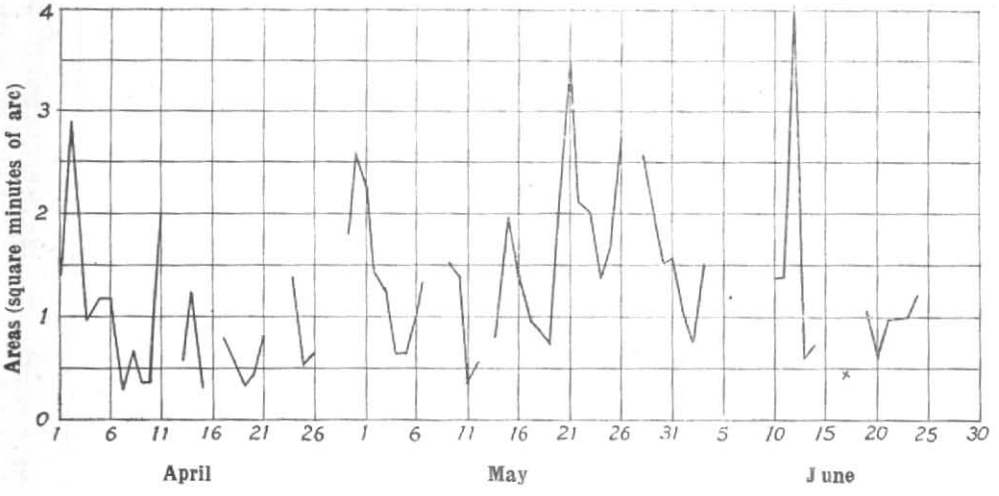

Fig. 1(b). Daily areas of calcium prominences

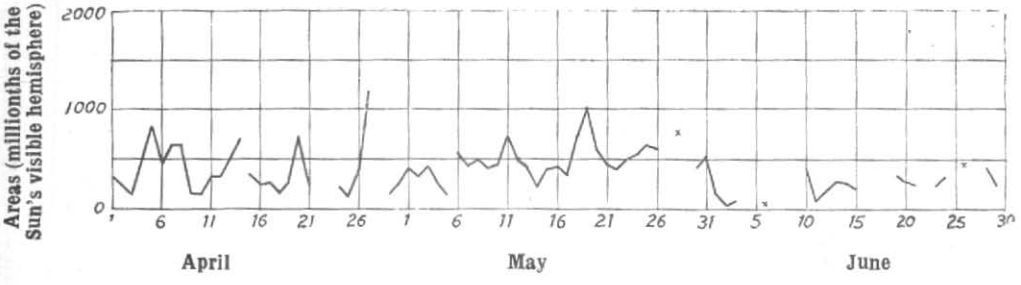

Fig. 1(c). Daily areas of H-alpha dark markings

Note : Breaks in the graphs are due to lack of observations