KODAIKANAL SOLAR, GEOMAGNETIC AND IONOSPHERIC DATA OCTOBER—DECEMBER 1953

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 197. 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 large sunspots 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 1953	Storm-time: GMT of beginning h	m	GMT of ending[1] d	h	Sudden commencement: Type[2]	Amplitude[3] D′	H γ	Z γ	Degree of activity[4]	Maximal activity Greenwich day	Ranges D′	H γ	Z γ	Remarks
October	15	08	42	22	15	s.c.	...	+16	+10	m	15	4	240	79	Crochet observed between 0540 and 0610 hrs on the 14th
November	12	12	10	21	13	...	...	...	...	m	13	6	140	44	

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 between 150 γ and 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

Ionospheric data

(Median values)

Beginning from January 1952, systematic ionospheric observations are being made at Kodaikanal with the Automatic Multi-frequency Ionosphere 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

Kodaikanal (10·2°N 77·5°E) October 1953

Time (hrs)	h'F2	foF2	h'F1	foF1	h'E	foE	fEs	(M3000) F2
07	260	7·1	220		115	2·5		3·3
08	290	8·2	200		105		8·2	2·9
09	315	8·3	200	4·4	105		10·0	2·6
10	320	7·8	200	4·4	105		10·8	2·7
11	335	7·5	190	4·4	105		11·2	2·6
12	340	7·9	195	4·5	105		11·6	2·7
13	325	8·3	200	4·4	105		10·2	2·7
14	310	9·0	200	4·2	105		9·6	2·7
15	300	9·5	200		105		8·2	2·8
16	280	9·5	225		115		7·4	2·9
17	240	9·7			120	2·1	5·0	2·9

Time : 75·0° E

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

November 1953

07	265	6·5	225		110	2·4	5·8	3·2
08	290	7·6	210		105	2·8	8·0	2·9
09	315	7·5	200		105		9·0	2·8
10	330	7·2	195	4·3	105		9·6	2·7
11	335	7·4	200	4·4	105		10·0	2·8
12	320	8·0	185	4·4	105		9·6	2·8
13	320	8·4	200	4·3	105	3·3	9·0	2·8
14	305	8·6	200		105	3·1	8·6	2·8
15	300	8·6	205		105	2·8	7·7	2·8
16	280	8·7	220		115	2·5	6·8	2·9
17	240	8·5			120	2·0		2·9

Time : 75·0°E

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

December 1953

07	260	5·9	225		115	2·3		3·3
08	300	7·0	215		105	2·7	7·0	3·0
09	315	7·3	200	4·1	105		9·0	2·8
10	340	7·1	200	4·2			9·4	2·8
11	350	6·8	195	4·3			10·2	2·7
12	345	7·1	200	4·3	105		10·6	2·7
13	345	7·1	195	4·2	105		10·0	2·7
14	320	7·3	200	4·2	105	3·1	8·6	2·8
15	310	7·6	200		105	2·9	7·8	2·8
16	295	7·6	215		110	2·5	6·7	2·8
17	240	7·4	235		120	1·9	3·0	2·9

Time : 75·0°E

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

Kodaikanal

29 January 1954

A. K. DAS

Director, Solar Physics Observatory

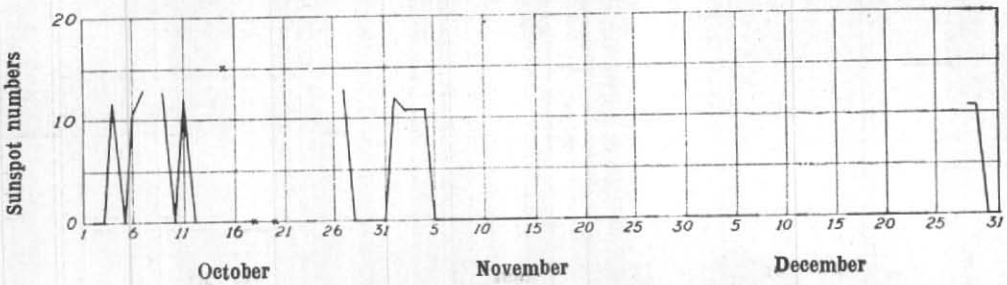

Fig. 1(a) Kodaikanal daily relative sunspot numbers

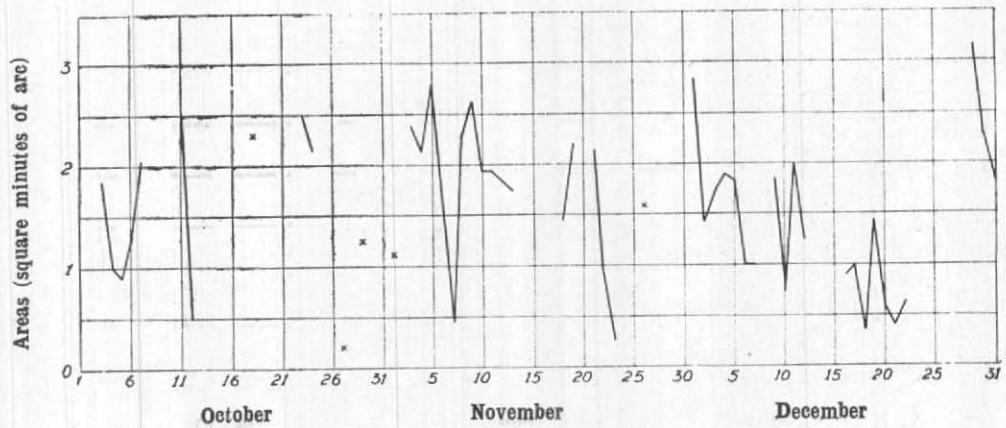

Fig. 1(b) Daily areas of calcium prominences

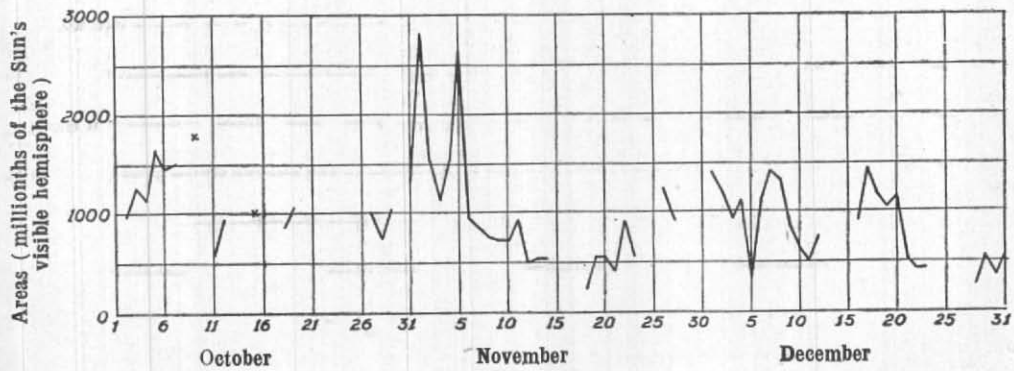

Fig. 1(c) Daily areas of H-alpha dark markings

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

MAGNETIC OBSERVATORY, ALIBAG (BOMBAY)

Three-hourly indices of Geomagnetic Activity

(K 9 = 300γ)

(Scale values of variometers in γ/mm : D = 11·3 ; H = 4·4 ; Z = 2·5)

Greenwich day	OCTOBER 1953 K-indices		Sum	Character of the day*	NOVEMBER 1953 K-indices		Sum	Character of the day*	DECEMBER 1953 K-indices		Sum	Character of the day*
1	2322	3241	19	S	1112	2131	12	S	0121	1212	10	Ca
2	2112	1321	13	S	2221	1222	14	S	1231	1121	12	Ca
3	1222	3222	16	Sa	3222	2321	17	S	1111	2223	13	S
4	2211	1232	14	S	2221	1112	12	Ca	3222	2232	18	S
5	2112	1121	11	S	1333	3331	20	M	1221	1211	11	S
6	1221	1123	13	S	1122	2221	13	S	1113	4221	15	Sa
7	2242	3112	17	Sa	1222	1231	14	S	2212	1111	11	Ca
8	1212	2334	18	S	1101	1222	10	Ca	1211	2223	14	S
9	2341	1112	15	Sa	2220	0111	9	Ca	2111	1242	14	S
10	2221	2342	18	S	1122	1111	10	Ca	2112	1222	13	S
11	1222	3421	17	Sa	1112	3232	15	S	3324	5333	26	M
12	1121	1121	10	Ca	2223	5444	26	Sa	3433	2442	25	Sa
13	1111	1221	10	Ca	3434	5453	31	M	2122	2232	16	S
14	1121	1211	10	Ca	2324	5443	27	M	2211	1221	12	S
15	1113	6654	27	G	2344	5451	28	M	0122	1121	10	S
16	4321	3455	27	Ma	3222	2322	18	Sa	1112	1112	10	S
17	4344	5644	34	Ma	2223	3433	22	Sa	1121	1313	13	S
18	3233	6563	31	Ma	2224	3222	19	Sa	2111	2212	12	Ca
19	3345	4542	30	M	3223	4343	24	Sa	1121	2322	14	S
20	2333	4544	28	M	2332	2333	21	Sa	1111	2322	13	S
21	2254	4211	21	M	1223	3131	16	Sa	2121	1113	12	S
22	1332	2431	19	Sa	2121	2221	13	S	1223	3341	19	Sa
23	1233	3321	18	S	1244	2454	26	Ma	1111	2232	13	S
24	1133	4311	17	S	4422	1222	19	Sa	1221	0121	10	Ca
25	1212	2221	13	Ca	1222	3222	16	Sa	1221	2223	15	S
26	1241	1021	12	S	2222	1221	14	Ca	2112	1122	12	S
27	1232	3333	20	Sa	1132	2212	14	S	2223	2223	18	S
28	2201	1222	12	S	1222	1111	11	Ca	2121	2322	15	S
29	1122	2333	17	Sa	2223	1111	13	S	2112	2333	17	S
30	2122	2121	13	Ca	1122	2121	12	S	1213	2122	14	S
31	1221	1110	9	Ca					1222	1111	11	Ca

* At Bombay, since 1883, a day is classed as (1) a quite day, or a day of (2) small, (3) moderate, (4) great or (5) very great disturbance, the letters for 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 and 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
19 February 1954

S. L. MALURKAR
Director, Colaba and Alibag Observatories

GOLDEN JUBILEE OF THE ALIBAG MAGNETIC OBSERVATORY

The magnetic observatory at Alibag which commenced regular observations in April 1904 has just completed fifty years of its existence. Located on the coast 18 miles south of Bombay, the observatory is the successor to the Colaba magnetic observatory which was started in 1840 but had to be transferred to Alibag to be outside the sphere of magnetic disturbances due to the introduction of electric traction in Bombay.

The Alibag Magnetic Observatory is at present the only long standing magnetic observatory in India doing work in terrestrial magnetism in a rigorous scientific manner. On account of its position within a few degrees of the Geomagnetic Equator, it is one of the primary magnetic observatories of the world. The observatory has contributed its share to the world's programme of magnetic work by half a century of continuous observations in a science essentially requiring continuity. The long series of magnetic records maintained by this observatory provide valuable information for the study of secular variation of the magnetic elements.

The magnetic data collected at the Alibag observatory have been published annually by the India Meteorological Department in a publication entitled " Magnetic, Meteorological, Atmospheric, Electric, Seismographic observations made at the Government Observatories, Bombay and Alibag". Since 1951 three-hourly indices of geomagnetic activity based on observations recorded at the Alibag Observatory are being published quarterly in this Journal.

The principal instruments at present functioning regularly at this observatory are—

S. No.	Name of Instrument	Year in which installed or brought into use
1.	H.F. Magnetograph (*Watson*)	1904
2.	V.F. Magnetograph (*Watson*)	1904
3.	Declination Magnetograph (*Watson*)	1904
4.	La Cour Declination Magnetograph	1936
5.	La Cour H.F. & V.F. Magnetograph	1946
6.	Magnetometer by T. Cooke & Sons, York (Improved Survey Pattern)	1904
7.	Kew Magnetometer by Dover Charlton, Kent	1904
8.	Earth Inductor by Schulze (with Galvanometer)	1908
9.	Earth Inductor by Otto Toepfer (with Galvanometer)	1906
10.	Kew H.F. Magnetometer (*eye-reading*)	1904
11.	Kew V.F. Magnetometer (*eye-reading*)	1904
12.	Large D Magnetometer (*eye-reading*)	Before 1904
13.	Helmholtz Coil by Andersen & Sorensen	1946
14.	Quartz Horizontal Magnetometer (QHM) by La Cour	1950
15.	Balance Magnetometric Zero (BMZ) by La Cour	1950