SOLAR, GEOMAGNETIC, IONOSPHERIC AND OZONE DATA

KODAIKANAL SOLAR, GEOMAGNETIC AND IONOSPHERIC DATA

(JANUARY—MARCH 1960)

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 310. 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

Kodaikanal serial No. of spotgroup	Mean latitude	Date of central meridian passage	Total area (millionths of the Sun's visible hemisphere at central meridian passage)
11751	18° S	Jan 10	940
11777	07° N	Jan 29	1173
11789	23° N	Feb 11	730
11793	12° N	Feb 15	945
11825	13° N	Mar 31	1348*

*Increased in area after central meridian passage

TABLE 2

Solar Flares

Date	Time in GMT						Co-ordinates		Importance	H-alpha line width	Remarks
	Beg.		Max.		End.		Mean latitude	Mean longitude			
	h	*m*	*h*	*m*	*h*	*m*				Å	
Feb 4	08	45*	08	45	08	58	10° N	37° W	1+	2·0	Flare in progress observed both in spectrohelioscope and in spectroheliogram
Feb 20	03	07*	03	07	03	13	20° S	63° E	1	1·6	Observed both in spectrohelioscope and in spectroheliogram
Mar 29	08	35*	08	37	08	45	12° N	30° E	2	1·8	Do.

*Time of first observation of the flare and not the beginning

TABLE 3

Sudden disappearance of prominences and H-alpha dark markings

Phenomenon	Date and time (GMT) of phenomenon when last seen	Co-ordinates of phenomenon		Remarks
		Mean latitude	Mean longitude	
Dark marking	Feb 4 0549	42°N	02°E	The disappearance of the dark marking was observed in the spectroheliogram at 0857 U.T.
Prominence	Feb 18 0430	26°S	90°E	Prominence was seen till 0430 U.T. It was not seen at 0500 when observations were commenced
Prominence	Mar 24 0310	19°S	90°E	The prominence observed till 0310 U.T. was found to have suddenly changed its shape at 0400 U.T. and disappeared by 0415 U.T.

TABLE 4

Principal magnetic storms

Greenwich date 1960	Storm-time				Sudden commencement				C-figure degree of activity[4]	Maximal activity Greenwich day	Ranges		
	GMT of beginning		GMT of ending[1]		Type[2]	Amplitude[3]							
						D	*H*	*Z*			*D*	*H*	*Z*
	h	*m*	*d*	*h*		′	γ	γ			′	γ	γ
Jan 10	07	15	11	17	s.c.	3	18	37	ms	10	4	282	58
Jan 13	19	01	15	16	s.c.	<1	38	17	m	14	7	218	67
Jan 17	12	27	18	22	...	—	—	—	ms	18	8	280	52
Jan 21	00	32	22	11	...	—	—	—	m	21	6	210	53
Feb 16	09	20	18	10	...	—	—	—	m	16	6	247	69
Mar 15	12	25	16	23	...	—	—	—	m	16	3	213	52
Mar 31	08	43	Apr 2	13	...	—	—	—	s	Apr 1	16	649	144

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 250γ)
   ms — for moderately severe (when range is between 251γ and 400γ)
   s — for severe (when range is above 400γ)

TABLE 5

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*) Frequecy 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

Ionospheric data (Median values)

Kodaikanal (10·2°N, 77·5°E) January 1960

Time (hrs)	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000) F2
00		9·2	240				4·2	2·95
01		8·6	240				..	3·05
02		7·7	230				..	3·10
03		6·8	230				..	3·10
04		5·6	225				..	3·20
05		4·8	230				..	3·25
06	..	4·8	260	..	..	..	..	2·90
07	..	8·8	250	..	115	2·5	3·2	2·95
08	..	11·0	230	..	110	3·1	9·8	2·75
09	..	11·5	220	..	[illegible]	..	11·0	2·50
10	..	11·0	210	..	..	..	12·2	2·40
11	..	11·0	200	..	[illegible]	..	12·4	2·35
12	..	11·4	200	..	[illegible]	..	12·2	2·30
13	..	11·4	200	..	..	..	12·0	2·20
14	..	11·6	210	..	105	3·8	12·0	2·30
15	..	11·8	220	..	110	3·5	10·8	2·30
16	..	12·1	240	..	110	..	9·2	2·30
17	..	11·8	260	..	120	..	7·5	2·25
18		11·5	300		..	..	..	2·20
19		10·0	380				..	2·10
20		9·8	330				[illegible]	2·20
21		10·0	290				..	2·65
22		9·6	270				4·3	2·70
23		9·5	255				..	2·85

Ionospheric data (Median values)

Kodaikanal (10·2°N, 77·5°E) February 1960

Time (hrs)	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000) F2
00		10·7	235				..	2·90
01		10·6	230				..	3·00
02		10·0	225				..	3·10
03		8·5	230				..	3·15
04		7·3	220				..	3·15
05		5·4	225				..	3·25
06		5·0	250				..	3·05
07	..	8·9	245	..	115	2·5	G	3·00
08	..	11·3	230	..	105	..	9·7	2·80
09	..	12·3	220	..	..	..	11·4	2·50
10	..	11·9	210	..	..	..	12·6	2·40
11	..	11·3	200	..	..	..	12·6	2·40
12	..	11·1	200	..	..	..	12·2	2·35
13	..	11·4	205	..	..	..	12·3	2·30
14	..	11·6	205	..	..	..	11·9	2·30
15	..	11·6	215	..	..	..	11·0	2·30
16	..	11·8	230	..	..	..	10·8	2·30
17	..	11·6	255	..	115	..	8·0	2·30
18		11·0	285				..	2·25
19		9·6	390				..	2·05
20		U 9·4	360				..	U2·20
21		U 9·6	310				..	U2·40
22		10·4	270			..	..	2·55
23		10·7	240				..	2·70

Kodaikanal (10·2°N, 77·5°E) March 1960

00		10·8	235				3·9	3·10
01		10·8	235				..	3·10
02		9·4	230				..	3·15
03		8·2	235				..	3·10
04		7·2	230				..	3·20
05		6·1	225				..	3·30
06		6·3	260			..	..	3·10
07	..	9·9	240	..	115	2·6	G	3·10
08	..	11·6	225	..	110	..	9·4	2·80
09	..	12·3	215	..	..	..	11·4	2·50
10	..	11·7	205	..	..	..	12·4	2·35
11	..	10·8	200	..	..	..	12·4	2·35
12	..	10·8	200	..	..	..	12·2	2·35
13	..	11·2	200	..	..	..	12·0	2·30
14	..	11·7	200	..	115	..	11·2	2·35
15	..	12·2	210	..	110	..	10·5	2·35
16	..	12·5	230	..	110	..	10·0	2·35
17	..	12·6	250	..	120	..	8·0	2·35
18		12·0	280				..	2·25
19		10·0	400				..	2·10
20		10·6	400				..	2·25
21		U11·4	310				..	U2·50
22		11·6	260				..	2·75
23		12·4	240				..	2·90

Time : 75·0°E

Sweep : 1·0 Mc to 25·0 Mc. in 27 seconds

Kodaikanal Observatory, Kodaikanal
2 May 1960

M. K. VIUNU BAPPU
Director, Kodaikanal Observatory

The symbols and terminology used are in accordance with the recommendations of the Special Committee on World-wide Ionospheric Soundings to the U.R.S.I./A.G.I. in its first report (Brussels, 2 September 1956)

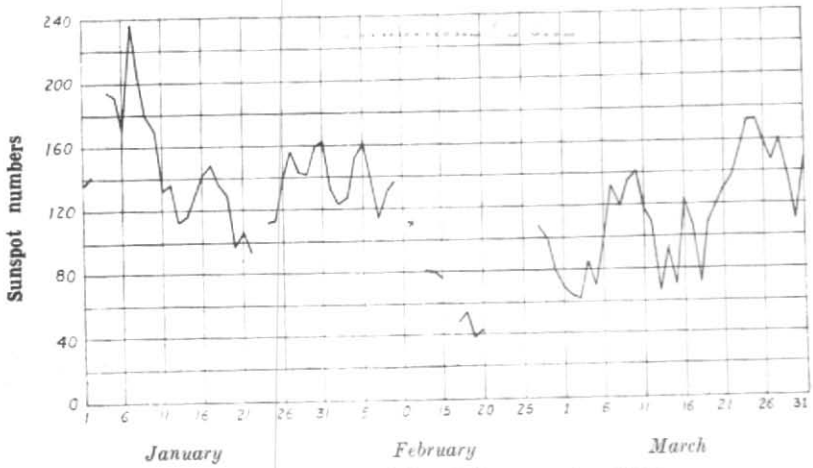

Fig. 1 (a). Kodaikanal daily relative sunspot numbers

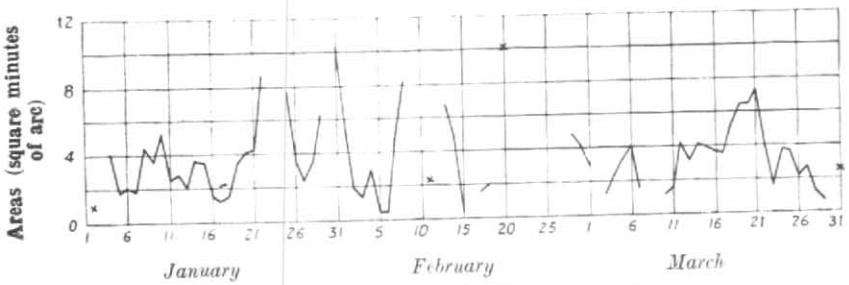

Fig. 1 (b). Daily areas of calcium prominences

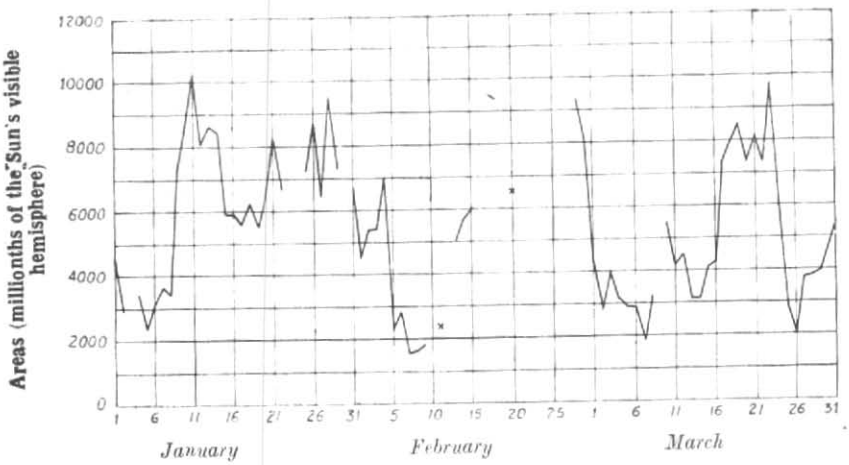

Fig. 1(c). Daily areas of H-alpha dark markings

NOTE—Breaks in the graphs are due to lack of observations

MAGNETIC OBSERVATORY, ALIBAG (BOMBAY)

Three-hourly indices of Geomagnetic Activity

(K 9 = 300 γ)

(Scale of variometers in γ/mm: D=11.3; H=4.4;Z=3.0)

Greenwich Day	JANUARY 1960 K-indices		Sum	Character of the day*	FEBRUARY 1960 K-indices		Sum	Character of the day*	MARCH 1960 K-indices		Sum	Character of the day*
1	1111	0000	4	Ca	1233	2232	18	S	2333	2343	23	S
2	0110	1111	6	Ca	3222	4453	25	M	3333	3334	25	Sa
3	1222	2222	15	Ca	2222	3342	20	S	2334	5422	25	Sa
4	2232	3221	17	S	3333	2343	24	Sa	1222	3444	22	Sa
5	2423	4433	25	Sa	2235	3423	24	M	1233	3343	22	S
6	3221	2221	15	S	2332	2433	22	S	3322	2331	19	S
7	2222	2221	15	S	2422	1222	17	S	1212	1111	10	Ca
8	1211	1222	12	Ca	2333	4322	22	S	1324	3333	22	Sa
9	1111	1111	8	Ca	2223	2232	18	S	2334	3222	21	S
10	2476	5454	37	G	2423	2221	18	S	2254	2242	23	Sa
11	3233	5422	24	M	1223	1432	18	S	2325	3432	24	Sa
12	2222	4424	22	Sa	3122	2111	13	Ca	2223	2321	17	S
13	2222	2354	22	M	1232	2354	22	M	2221	1232	15	S
14	4355	6365	37	G	2312	3462	23	Ma	2223	2312	17	Sa
15	4443	3221	23	Sa	1121	4442	19	Sa	3232	4543	26	Sa
16	1111	1203	10	S	2325	6533	29	G	4453	4464	34	Ma
17	2212	5322	19	Sa	4353	5433	30	Ma	2233	1232	18	Sa
18	3475	5332	32	G	3333	3332	23	Sa	2332	2112	16	Sa
19	2222	3322	18	S	2332	2454	25	M	1222	2321	15	S
20	2434	4533	28	Ma	3333	2322	21	S	1112	1211	10	Ca
21	4435	3453	31	Ma	2333	2432	22	Sa	1222	3211	14	S
22	1234	3221	18	Sa	1222	2231	15	S	2222	2122	15	S
23	2222	3432	20	Sa	1222	2321	15	S	1122	1113	12	Ca
24	2332	3322	20	S	1221	0111	9	Ca	2222	1223	16	S
25	1322	2321	16	S	1121	1223	13	Ca	1222	2122	14	Ca
26	1222	1211	12	Ca	1213	3322	17	Sa	2222	2211	14	Ca
27	1232	1101	11	Ca	2343	3433	25	Sa	2222	2111	13	Ca
28	1222	2131	14	S	2322	2211	15	Sa	1334	4543	27	M
29	4432	3222	22	Sa	3322	3332	21	Sa	2352	2222	20	S
30	3222	2211	15	Ca					2223	2433	21	Sa
31	1222	2322	16	Ca					3336	6867	42	VG

*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 and Ma are used. Roughly speaking a storm having a range of over 225γ in the variations of the horizontal force during the first 24 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
28 April 1960

P. R. PISHAROTY
Director, Colaba and Alibag Observatories

DAILY OZONE DATA—INDIA

(From direct sun observations on 3112/3323 Å and 4536 3323 Å)

Assumed $\alpha(3112) = 1{\cdot}233$ and $\alpha'(3323) = 0{\cdot}071$

NEW DELHI

(Lat. 28°35′N, Long. 77°12′E)

Date	JANUARY 1960			FEBRUARY 1960			MARCH 1960		
	Hours (IST)	Ozone amount (cm-atmos)	State of sky	Hours (IST)	Ozone amount (cm-atmos)	State of sky	Hours (IST)	Ozone amount (cm-atmos)	State of sky
1	15	0·307	*Sc* 3, *Ac* 3	No observation		Cloudy	16	0·294	Hazy
2	15	0·282	*Sc* 3, *Ac* 3	15	0·271	Clear	16	0·283	(*Ci*, *Cs*)2
3	15	0·277	*Cu* 1, *Ci* 1	15	0·279	,,	08	0·270	*As* 2, (*Ci*, *Cs*)5, mist
4	15	0·262	Sl. hazy	15	0·277	,,	16	0·254	*Sc* 3, *As* 3
5	15	0·275	Clear	15	0·271	,,	09	0·267	*Sc* 1, *Ac* 2
6	No observation		Cloudy	15	0·262	,,	16	0·266	*Cu* 1
7	15	0·294	Hazy	15	0·271	*Ci* 2	09	0·275	(*Sc*, *Cu*) 6, *Ac* 1
8	15	0·275	,,	16	0·270	Clear	16	0·294	*Sc* T, (*Ci*, *Cs*) 3
9	15	0·286	Clear	15	0·257	*Ci* 3	09	0·275	(*Ci*, *Cs*) 1
10	15	0·290	(*Ci*, *Cs*) 6	15	0·250	(*Ci*,*Cs*) 3	No observation		Cloudy
11	15	0·277	*Ac* 3, (*Ci*, *Cs*) 3	16	0·253	*Sc* 2	16	0·269	(*Sc*, *Cu*) 5
12	09	0·254	(*Sc*, *Cu*) 5, *Ac* 2	16	0·242	Clear	16	0·250	*Sc* 2, *Ac* 3
13	15	0·279	(*Sc*, *Cu*) 4, *Ac* 2	16	0·238	(*Ci*, *Cs*) 3	16	0·267	(*Sc*, *Cu*) 2
14	09	0·273	*Ac* 6	16	0·246	Clear	16	0·258	*Ci* 2
15	15	0·262	Clear	16	0·258	(*Ci*, *Cs*) 2	16	0·261	*Sc* 3, *Ac* 3
16	15	0·275	*Sc* 3, *Ac* 4	16	0·242	Clear	16	0·262	*Cu* 3, *Ac* 2
17	15	0·262	*Sc* 1	16	0·247	(*Sc*, *Cu*) 1	No observation		Cloudy
18	15	0·265	Clear	16	0·274	(*Sc*, *Cu*) 2, *Ac* 1	16	0·269	(*Ci*, *Cs*) 4
19	15	0·246	,,	16	0·254	Clear	16	0·287	Clear
20	09	0·283	(*Sc*, *Cu*) 5, *Ac* 1	16	0·261	,,	17	0·283	Hazy
21	15	0·267	*Cu* 4, *Ac* 2	16	0·254	,,	16	0·303	*Cu* 5
22	15	0·297	Clear	16	0·258	,,	16	0·282	(*Sc*, *Fc*) 2
23	15	0·277	,,	16	0·262	,,	16	0·281	Hazy
24	15	0·310	,,	16	0·270	,,	16	0·269	Clear
25	15	0·259	,,	16	0·250	,,	17	0·266	(*Ci*, *Cs*) 6
26	09	0·235	,,	16	0·258	,,	09	0·273	*Ci* 5
27	15	0·278	(*Ci*, *Cs*) 2	16	0·277	,,	08	0·274	*Sc*, 4, *Ac* 2
28	15	0·277	(*Ci*, *Cs*) 4	16	0·285	,,	17	0·273	*Ac* 1, (*Ci*, *Cs*) 2, (*Sc*, *Cb*) 5, thundering
29	15	0·267	(*Ci*, *Cs*) 5	16	0·297	,,	08	0·265	*Ac* 1, hazy, mist
30	15	0·254	*Ci* 2				17	0·257	Clear
31	15	0·262	*Ac* 2, (*Ci*,*Cs*, *Cc*)4				17	0·267	,,

NOTE—The cloud amounts are in oktas

DAILY OZONE DATA—INDIA

(From direct sun observations on 3112/3323 Å 4536/3323 Å)

Assumed α (3112) = 1·233 and α' (3323) = 0·071

Date	JANUARY 1960 (MT. ABU)			FEBRUARY 1960 (AHMEDABAD)			MARCH 1960 (AHMEDABAD)		
	Hours (IST)	Ozone amount (cm-atmos)	State of sky	Hours (IST)	Ozone amount (cm-atmos)	State of sky	Hours (IST)	Ozone amount (cm-atmos)	State of sky
1	16	0·259	Clear	16	0·250	Clear	09	0·265	Clear
2	16	0·255	,,	16	0·251	,,	09	0·263	Thin *Ci*
3	10	0·262	,,	No observation			09	0·257	,,
4	16	0·241	(*Ci, Cs*) 2	09	0·252	Clear	09	0·255	(*Ac, Ci, Cs*) 3
5	10	0·238	(*Cu, Ci, Cs*) 2	09	0·245	,,	09	0·253	Thick *Ci*
6	16	0·247	(*Ac, Ci, Cs,*) 3	09	0·245	,,	No observation		
7	10	0·247	Thin *Ci*	10	0·247	,,	09	0·271	Mainly overcast
8	10	0·242	(*Ac, Cs*) 2	10	0·250	,,	No observation		
9	10	0·245	,,	16	0·246	,,	,,		
10	No observation		Overcast	No observation			,,		
11	16	0·247	(*Ac. Cs*) 2	10	0·227	Clear	09	0·249	Clear
12	16	0·246	*Cs* T	17	0·237	Clear, dusty	09	0·251	(*Cu, Ci, Cs*) 2
13	10	0·242	*Cu* 2, *Cs* 1	10	0·231	,,	09	0·251	Clear
14	No observation		Overcast	16	0·243	,,	09	0·254	,,
15	16	0·247	Clear	09	0·239	Clear	09	0·250	Thin *Ci*
16	16	0·250	,,	09	0·237	,,	09	0·251	Clear
17	16	0·251	,,	09	0·237	,,	No observation		Overcast
18	No observation		Dobson instrument transferred to Ahmedabad	09	0·243	,,	,,		,,
19	,,		,,	10	0·249	,,	,,		,,
20	,,		,,	10	0·251	,,	09	0·258	*Cs* 2
21	,,		,,	10	0·263	,,	09	0·258	Clear
22	,,		,,	10	0·267	,,	09	0·262	Very hazy
23	,,		,,	No observation			09	0·265	Clear
	AHMEDABAD*								
24	09	0·245	Clear	,,			09	0·262	,,
25	09	0·240	,,	10	0·263	Clear	09	0·257	,,
26	No observation			10	0·266	,,	09	0·261	,,
27	,,			09	0·270	,,	09	0·263	,,
28	09	0·251	Clear	No observation			09	0·266	,,
29	09	0·255	,,	09	0·263	Clear	09	0·267	,,
30	No observation						09	0·269	,,
31	,,						09	0·255	Clear, sl. hazy

NOTE—The cloud amounts are in oktas

*Dobson Instrument No. 54 was shifted to Ahmedabad (Lat. 23° 04′ N, Long. 72° 38′E) from Mt. Abu (Lat. 24°36′ N, Long. 72°43′E) on 18 January 1960 and observation at Ahmedabad started from 24 January 1960

DAILY OZONE DATA—INDIA

(From direct sun observations on 3112/3323 Å and 4536/3323Å)

Assumed α (3112) =1·233 and α' (3323) =0·071

SRINAGAR

(Lat. 34°05'N, Long. 74°50'E)

Date	JANUARY 1960			FEBRUARY 1960			MARCH 1960		
	Hours (IST)	Ozone amount (cm-atmos)	State of sky	Hours (IST)	Ozone amount (cm-atmos)	State of sky	Hours (IST)	Ozone amount (cm-atmos)	State of sky
1	15	0·300	Hazy	No observation			16	0·316	*Cu* 1, *Ci* 5
2	15	0·276	,,	15	0·290	*Sc* 3	12	0·295	Mainly overcast
3	15	0·261	*Cs* 1	No observation		Overcast	No observation		Overcast
4	15	0·272	*Ac* T	,,		,,	15	0·282	*Ac* 6
5	15	0·298	*Fc* 4	,,		,,	08	0·262	*Cu* 1, *Ac* 6
6	15	0·318	*Cs* T	,,		,,	16	0·300	*Sc* 2, *Ac* 1
7	10	0·327	*Cs* 3, hazy	,,		,,	No observation		Rain
8	15	0·294	*Fc* 1, *Ac* 3	,,		,,	,,		,,
9	15	0·274	Mainly overcast	,,		,,	,,		,,
10	15	0·297	,,	,,		,,	,,		,,
11	15	0·274	,,	,,		,,	16	0·303	*Sc* 3
12	15	0·297	,,	,,		,,	No observation		Overcast
13	12	0·313	*Cu* 1, *Sc* 6	15	0·278	*Sc* 5	,,		,,
14	15	0·308	*Cu* 3, *Ac* 1	No observation		Overcast	16	0·269	*Cu* 2, *Sc* 1, *Ci* 2
15	15	0·286	*Sc* 5	15	0·287	*Fc* 8	No observation		
16	15	0·293	*Ac* 2	16	0·269	*Cu* 4	,,		
17	15	0·313	*Ac* 1	15	0·310	*Ac* 3, *Cs* 4	14	0·315	*Sc* 2, *Ac* 2
18	15	0·294	Mainly overcast	15	0·314	*Sc* 4, *Ac* 2	16	0·315	*Ac* 3, *Ci* 3
19	No observation		Snowfall	16	0·283	*Sc* 3	16	0·297	Mainly overcast
20	,,		,,	16	0·295	*Sc* 3	09	0·335	*Sc* 5
21	15	0·322	*Sc* 1, *Fc* 7	15	0·310	*Cu* 2, *Sc* 4	14	0·350	*Ac* 5
22	15	0·299	*Fc* 1, *Ac* 1	09	0·315	Mainly overcast	16	0·355	*Cu* 2, *Ac* 1
23	15	0·282	*Sc* 3, hazy	16	0·282	Hazy	16	0·334	*Ac* 3
24	15	0·265	*Sc* 3	16	0·272	*Ci* 4	16	0·323	*Cs* 1
25	No observation		Overcast	16	0·276	*Ac* 2, *Ci* 3	16	0·278	*Ac* 6
26	,,		,,	16	0·271	*Sc* 2, *Ac* 3	13	0·291	Mainly overcast
27	,,		,,	16	0·276	*Sc* 1, *Ac* 2	13	0·286	*Ac* 5
28	15	0·258	Mainly overcast	16	0·332	*Cu* 2, *Ac* 1	17	0·284	*Ac* 7
29	No observation		Overcast	16	0·308	*Ac* 3	No observation		Overcast
30	,,		,,				16	0·255	*Sc* 7
31	,,		,,				15	0·270	*Ci* 8

NOTE—The cloud amounts are in oktas

DAILY OZONE DATA—INDIA

(From direct sun observations on 3112/3323 Å and 4536/3323Å)

Assumed α (3112) =1·23 and α' (3323) =0·08

KODAIKANAL

(Lat. 10°14′N, Long 77°28′E)

Date	JANUARY 1960			FEBRUARY 1960			MARCH 1960		
	Hours (IST)	Ozone amount (cm-atmos)	State of sky	Hours (IST)	Ozone amount (cm-atmos)	State of sky	Hours (IST)	Ozone amount (cm-atmos)	State of sky
1	No observation		Overcast	No observation		Thick *Ci* 7	No observation		*Cu* 3, *Sc* 4
2	,,		,,	09	0·233	*Cs* 2	,,		Overcast
3	,,		,,	09	0·231	Clear	,,		Overcast, rain
4	10	0·235	*Cu* 1, *Ci* 3	09	0·241	*Cs* 4	10	0·253	*Ci* 6
5	No observation		*Cu* 3, *Sc* 4	09	0·237	*Cs* 4, hazy	16	0·258	*Sc* 2, *Ci* 2, *Cs* 4
6	09	0·231	*Ci* 2, hazy	09	0·234	Clear	09	0·250	Hazy
7	09	0·230	*Sc* 1	10	0·233	Hazy	09	0·245	*Sc* 1, hazy
8	09	0·230	*Ci* 2	08	0·234	*Cu* 1, *As* 2, *Cs* 2	09	0·245	*Cu* 2, *Sc* 1
9	09	0·234	*Ci* 4	09	0·234	*Sc* 4, *Cs* 2	No observation		Overcast
10	09	0·235	*Ac* 1	No observation		Overcast	09	0·242	*Cu* 1, *Ci* 1
11	09	0·231	*Ci* 1, hazy	09	0·230	Hazy	09	0·246	*Ac* 3, *Ci* 2
12	09	0·230	*Ci* 4, *Cs* 4	No observation		Overcast	09	0·251	*Ci* 1, hazy
13	16	0·229	*Sc* T, *Ci* 5	09	0·241	*Ci* 1, hazy	08	0·242	*Sc* 1, *Ci* 2, *Cs* 4
14	No observation		*Ci* 6, thick *Cs* 1	08	0·235	*Cs* 2, *Ci* 4	10	0·253	*Ci* 3
15	09	0·227	*Cu* 2, *Cs* 2	No observation		Overcast	10	0·257	*Ac* T, *Ci* 3
16	08	0·221	*Cs* 4	,,		,,	No observation		*Cu* 3, *Sc* 4
17	09	0·223	*Ci* 1	,,		Thick *Cs* 7	08	0·247	*Cs* 4
18	09	0·226	*Sc* 1	10	0·254	*Ci* 3, *Cs* 3	09	0·250	Hazy
19	09	0·225	*Ci* 1, hazy	No observation		Overcast	09	0·247	*Ci* 1
20	09	0·227	*Ci* 1	,,		*Sc* 3, *Ac* 2, *Ci* 2	No observation		*Cu* 2, *Sc* 5
21	08	0·223	*Ac* 2, hazy	,,		Overcast	08	0·251	*Cu* 1, *Ci* 2
22	No observation		*Cu* 4, *Sc* 3	,,		,,	10	0·262	*Ac* 1, *Ci* 3
23	,,		Overcast	,,		,,	No observation		*Sc* 4, thick *Ci* 3
24	,,		,,	,,		,,	08	0·243	*Cs* 3
25	,,		,,	,,		,,	10	0·251	*Ac* 1, *Ci* 3
26	10	0·230	*Ci* 4	,,		Overcast, drizzle	16	0·259	*Ci* 6
27	09	0·229	*Ci* 1	,,		*Ac* 7	08	0·250	*Ci* 3
28	09	0·230	*Ci* 1, hazy	08	0·227	*Sc* 3, *Ac* T, hazy	No observation		Overcast
29	10	0·233	*Ci* 4	08	0·231	*Ci* 2, *Cs* 4	09	0·251	*Ac* 1, *Ci* 3
30	No observation		*Sc* 7				No observation		Overcast
31	09	0·227	*Sc* 1, *Ac* 1				09	0·243	*Cu* T, *Ci* 4

NOTE—The cloud amounts are in oktas

DAILY OZONE DATA—INDIA

(From direct sun observations on 3112/3323 Å and 4536/3323Å)

Assumed α (3112) —1·233 and α' (3323) —0·071

SRINAGAR

(Lat. 34°05'N, Long. 74° 50'E)

Date	JULY 1959			AUGUST 1959			SEPTEMBER 1959		
	Hours (IST)	Ozone amount (cm-atmos)	State of sky	Hours (IST)	Ozone amount (cm-atmos)	State of sky	Hours (IST)	Ozone amount (cm-atmos)	State of sky
1	17	0·270	*Ci* 2	08	0·250	*Ci* 8	12	0·258	Hazy
2	17	0.269	Mainly overcast	16	0·262	*Cu* 3, *Ci* 4	17	0·261	*Sc* 3
3	No observation		Rain	12	0·257	Clear	17	0·267	*Ci* T
4	„		„	16	0·267	Mainly overcast	16	0·269	*Cu* 4
5	17	0·266	*Cu* 4, *Ci* 5	13	0·254	*Cu* 3	17	0·265	Hazy
6	14	0·259	*Cu* 2, *Ci* 3	12	0·257	Mainly overcast	16	0·257	*Ac* 2
7	08	0·275	*Cu* 3	16	0·262	Overcast	17	0·253	*Sc* 5
8	17	0·243	*Sc* 2	16	0·255	*Cu* 4, *Ci* 2	17	0·281	Mainly overcast
9	12	0·263	Hazy	16	0·265	*Cu* 4, hazy	17	0·272	*Ac* 2, *Ci* 3
10	12	0·270	„	17	0·263	Sl. hazy	17	0·262	Hazy
11	13	0·276	*Ac* 2, hazy	17	0·259	Clear	17	0·253	Clear
12	13	0·272	„	14	0·250	„	17	0·264	„
13	13	0·281	Hazy	11	0·249	*Cu* 2	17	0·257	„
14	13	0·278	„	15	0·259	Mainly overcast	12	0·254	Hazy
15	12	0·269	*Ac* 3	No observation		Overcast, drizzle	No observation		
16	17	0·249	*Cu* 4	08	0·253	Overcast	„		
17	17	0·253	*Ac* 4	08	0·253	*Cu* 5, *Ci* 3	„		
18	16	0·249	*Cu* 3, *Ci* 2	08	0·255	Hazy	„		
19	17	0·270	*Ci* T	08	0·251	*Cu* 3	„		
20	08	0·257	*Cu* 4, hazy	08	0·255	Very hazy	12	0·246	Hazy
21	16	0·258	Hazy	08	0·265	Hazy	16	0·261	„
22	13	0·243	*Cu* 4	16	0·259	Mainly overcast	17	0·262	„
23	No observation		Rain	16	0·257	*Cu* 4, *Ci* 3	17	0·245	„
24	16	0·249	*Ac* 3, hazy	16	0·255	*Cu* 4, *Ci* 3	08	0·243	Sl. hazy
25	17	0·261	*Ac* 2	08	0·246	Mainly overcast	12	0·242	*Cu* 2, hazy
26	08	0·251	*Cu* 5	17	0·261	„	12	0·257	Very hazy
27	17	0·263	*Cu* 3	12	0·254	„	17	0·270	„
28	17	0·258	*Ac* 2, hazy	12	0·254	Overcast	12	0·253	„
29	17	0·255	*Ac* 2	12	0·247	„	08	0·246	*Cu* 3, hazy
30	17	0·262	*Cu* 3	17	0·261	„	16	0·254	Hazy
31	12	0·255	Hazy	12	0·253	Mainly overcast			

NOTE—The cloud amounts are in oktas

DAILY OZONE DATA—INDIA

(From direct sun observations on 3112/3323 Å and 4536/3323 Å)

Assumed α (3112)=1·233 and α' (3323) =0·071

SRINAGAR

(Lat. 34°05′N. Long. 74°50′E)

Date	OCTOBER 1959			NOVEMBER 1959			DECEMBER 1959		
	Hours (IST)	Ozone amount (cm-atmos)	State of sky	Hours (IST)	Ozone amount (cm-atmos)	State of sky	Hours (IST)	Ozone amount (cm-atmos)	State of sky
1	08	0·247	Hazy	08	0·247	Mainly overcast	09	0·251	Hazy
2	08	0·243	Sl. hazy	17	0·246	,,	16	0·263	Mainly overcast
3	08	0·246	*Ac* 3	13	0·255	,,	16	0·253	,,
4	15	0·255	*Cu* 4	17	0·238	,,	12	0·243	*Cu* 4, *Ci* 2
5	No observation		Rain	16	0·242	,,	16	0·298	Overcast
6		,,	,,	17	0·251	,,	14	0·278	,,
7	12	0·257	*Cu* 3	17	0·259	,,	14	0·245	,,
8	No observation			No observation		Rain	14	0·288	*Sc* 5
9	08	0·242	Sl. hazy	16	0·254	*Cu* 4, *Ci* 4	13	0·276	Mainly overcast
10	08	0·259	Very hazy	09	0·260	Overcast	12	0·275	,,
11	09	0·259	Hazy	08	0·274	*Cu* 4, hazy	17	0·283	,,
12	17	0·255	,,	16	0·286	*Cu* 2, *Ci* 4	17	0·283	,,
13	17	0·253	,,	16	0·274	Hazy	16	0·297	Hazy
14	12	0·253	,,	12	0·271	,,	11	0·284	*Cu* 4, *Ci* 3
15	17	0·233	,,	16	0·257	,,	15	0·302	*Cu* 3, *Ci* 2
16	08	0·234	,,	16	0·254	Overcast	15	0·272	Mainly overcast
17	17	0·239	,,	08	0·255	Hazy	15	0·293	,,
18	17	0·235	,,	17	0·278	*Cu* 4, hazy	15	0·284	Hazy
19	17	0·221	,,	11	0·269	Hazy	12	0·290	Overcast
20	12	0·239	Mainly overcast	09	0·257	Very hazy	15	0·306	*Cu* 4, *Ci* 3
21	08	0·243	Sl. rain	16	0·257	Hazy	13	0·261	Mainly overcast
22	08	0·259	Hazy	12	0·266	,,	13	0·283	*Cu* 3, *Ci* 4
23	08	0·258	,,	17	0·267	*Ci* T, hazy	08	0·258	Hazy
24	08	0·249	*Cu* 4	09	0·254	Thin *Ci*	14	0·271	*Cu* 4, *Ci* 4
25	08	0·247	*Ci* 3	09	0·269	,,	15	0·287	Hazy
26	08	0·257	Mainly overcast, rain	17	0·257	,,	15	0·275	,,
27	16	0·251	Mainly overcast	11	0·262	,,	15	0·274	,,
28	09	0·259	,,	16	0·261	Overcast	15	0·327	*Cu* 6, *Ac* 2
29	12	0·262	*Cu* 3, *Ci* 2	11	0·235	,,	15	0·319	Hazy
30	12	0·266	Hazy	13	0·259	*Cu* 4	15	0·308	,,
31	17	0·265	*Ci* 4				15	0·302	,,

NOTE—The cloud amounts are in oktas