SOLAR, GEOMAGNETIC, IONOSPHERIC AND OZONE DATA

KODAIKANAL SOLAR, GEOMAGNETIC AND IONOSPHERIC DATA

(OCTOBER—DECEMBER 1959)

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 p. 195. 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)
11688	19° S	Nov 11	925*
11699	15° N	Nov 26	519**
11705	5° N	Dec 1	1232†
11708	7° N	Dec 5	1008
11716	18° N	Dec 15	901

* Area as measured on 10 November 1959. ** It was larger in area before central meridian passage.
† Area as measured on 3 December 1959.

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	
Oct 7	05	00*	—		05	10	35° N	55° E	2	2·2	The flare in progress was first observed at 0500 UT in spectrohelioscope
Dec 4	08	45	08	55	09	20	07° N	36° W	2	1·9	Observed both in spectrohelioscope and in spectroheliogram

* Time of commencement of observation and not beginning of flare

TABLE 3

Sudden disappearances of prominences and H-alpha dark markings

No sudden disappearance of prominences and H-alpha dark markings was observed

TABLE 4

Principal magnetic storms

Greenwich date 1959	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
Oct 3	07	22	4	14	...	—	—	—	m	4	3	197	66
Oct 5	12	11	6	22	...	—	—	—	m	6	4	206	50
Oct 29	23	49	31	23	s.c.	1	29	15	ms	31	5	282	55
Nov 1	03	21	3	22	...	—	—	—	m	2	5	220	69
Nov 27	23	52	28	21	s.c.	1	28	16	s	28	10	402	92
Nov 30	05	31	Dec 1	19	...	—	—	—	ms	30	6	298	63
Dec 5	06	57	7	05	s.c.	2	80	26	ms	5	8	398	81

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*) 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

Ionospheric data (Median values)

Kodaikanal (10·2°N, 77·5°E) October 1959

Time (hrs)	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000) F2
00		11·7	240				4·9	2·95
01		11·1	230				..	3·05
02		9·9	230				..	3·10
03		8·1	240				..	3·10
04		6·8	240				..	3·20
05		5·9	240				..	3·25
06		7·8	260		..	..	..	3·05
07	..	11·0	240	..	115	2·8	7·5	2·90
08	..	12·7	230	..	110	..	11·0	2·65
09	..	13·0	220	..	..	..	12·0	2·35
10	..	12·0	210	..	..	..	13·0	2·30
11	..	11·7	205	..	..	..	13·0	2·30
12	..	11·8	210	..	..	..	13·0	2·25
13	..	12·2	215	..	..	..	12·8	2·25
14	..	12·6	220	..	..	..	11·9	2·30
15	..	12·9	225	..	115	..	10·8	2·30
16	..	13·1	245	..	120	..	10·0	2·30
17	..	12·8	270	..	..	..	7·0	2·25
18		11·5	340					2·10
19		U10·5	395					U2·10
20		11·6	345				2·1	2·20
21		11·7	310				3·8	2·50
22		12·0	280				4·3	2·70
23		12·2	260				7·1	2·75

Ionospheric data (Median values)

Kodaikanal (10·2°N, 77·5°E) November 1959

Time (hrs)	h'F2	foF2	h'F	foF1	h'E	foE	foEs	(M3000) F2
00		11·5	240				5·2	3·00
01		10·6	240				..	3·05
02		9·5	220				4·3	3·15
03		7·7	230				..	3·10
04		6·4	220				..	3·20
05		5·5	220				..	3·30
06		7·4	260		..	..	..	3·05
07	..	10·7	240	..	110	2·8	7·6	2·95
08	..	12·3	220	..	110	..	10·0	2·65
09	..	12·7	220	..	..	..	11·6	2·50
10	..	12·0	205	..	..	..	12·6	2·35
11	..	11·6	200	..	..	..	12·8	2·35
12	..	11·7	205	..	..	..	12·4	2·30
13	..	11·8	210	..	..	..	12·6	2·30
14	..	12·3	215	..	..	..	12·0	2·30
15	..	12·4	220	..	110	..	10·3	2·30
16	..	12·3	240	..	110	2·9	9·2	2·30
17	..	12·4	270	..	..	..	6·0	2·35
18		11·6	340				..	2·20
19		10·3	380				..	2·10
20		10·2	355				..	2·25
21		11·1	300				..	2·40
22		11·6	260				4·5	2·65
23		11·8	240				6·2	2·80

Kodaikanal (10·2°N, 77·5°E) December 1959

00		9·4	260				6·7	2·80
01		9·2	250				4·0	2·85
02		8·8	240				4·1	3·00
03		7·6	230				4·0	3·10
04		6·6	230				..	3·15
05		5·5	220				..	3·30
06	..	6·0	265	..			..	2·90
07	..	9·6	245	..	110	2·6	6·9	2·90
08	..	11·4	230	..	110	..	10·0	2·70
09	..	11·8	220	..	..	..	11·6	2·50
10	..	11·7	210	..	..	..	12·4	2·40
11	..	11·4	210	..	..	..	12·2	2·35
12	..	11·6	210	..	..	..	12·2	2·30
13	..	11·5	200	..	..	..	12·2	2·30
14	..	11·8	215	..	..	..	12·0	2·25
15	..	11·8	230	..	..	..	11·0	2·25
16	..	11·6	240	..	110	..	9·2	2·30
17	..	11·6	265	..	120	..	7·0	2·30
18		10·9	310		..	..	..	2·25
19		9·8	360				..	2·20
20		9·4	350				..	2·20
21		9·2	310				3·8	2·40
22		9·0	275				6·0	2·50
23		9·2	270				5·1	2·60

Time : 75·0°E
Sweep : 1·0 Mc. to 25·0 Mc. in 27 seconds

Kodaikanal Observatory, Kodaikanal
30 January 1960

A. K. DAS
Deputy Director General of Observatories

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

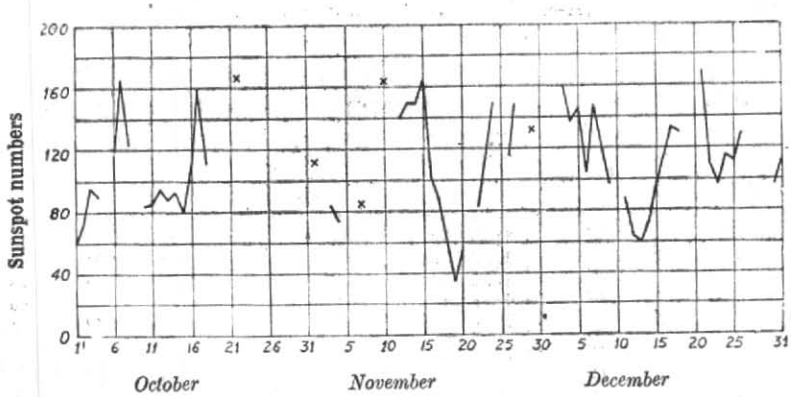

Fig. 1 (a). Kodaikanal daily relative sunspot numbers

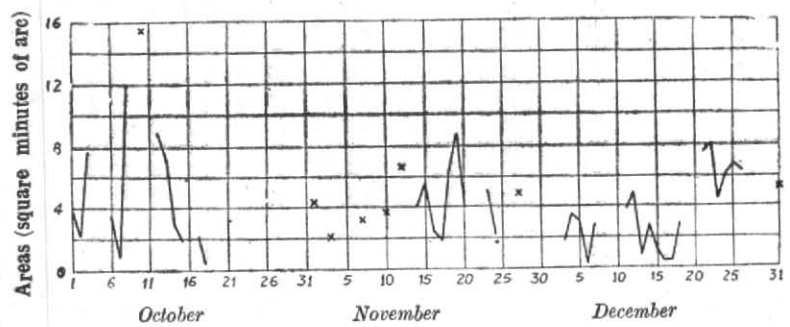

Fig. 1 (b). Daily areas of calcium prominences

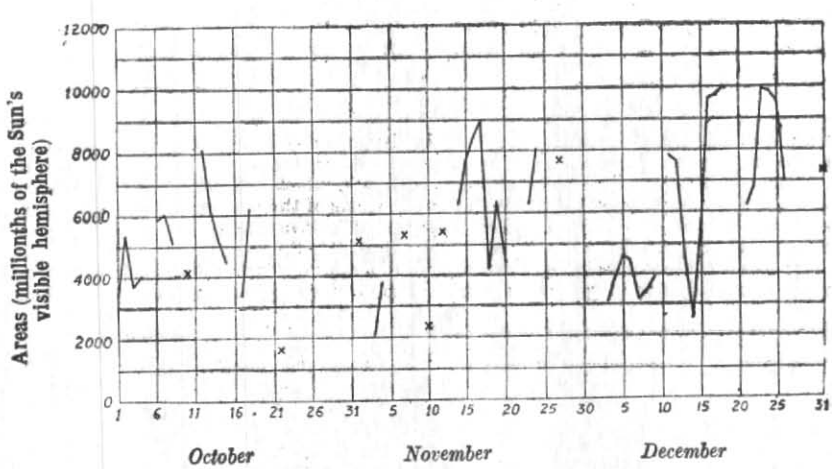

Fig. 1 (c). Daily areas of H-alpha dark markings

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

MAGNETIC OBSERVATORY, ALIBAG (BOMBAY)

Three-hourly indices of Geomagnetic Activity

(K 9=300γ)

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

Greenwich day	OCTOBER 1959				NOVEMBER 1959				DECEMBER 1959			
	K-indices		Sum	Character of the day*	K-indices		Sum	Character of the day*	K-indices		Sum	Character of the day*
1	2335	2535	28	M	3455	3333	29	M	2424	3422	23	S
2	3333	1221	18	S	3453	5553	33	Ma	2235	5433	27	M
3	1333	4343	24	Sa	3333	3543	27	M	2234	4544	28	M
4	2344	5342	27	M	2334	4352	26	Sa	4422	2222	20	Sa
5	3223	4454	27	M	2344	4332	25	S	1166	7674	38	G
6	3434	4554	32	M	2224	2434	23	Sa	3444	3343	28	Sa
7	2223	3222	18	Ca	1221	2242	16	S	2211	2211	12	Ca
8	2222	2211	14	Ca	2223	2232	18	Ca	1221	1223	14	Ca
9	1222	1131	13	Ca	1322	2443	21	S	2222	3222	17	Ca
10	1211	2321	13	Ca	2222	2123	16	Ca	2222	2222	16	Ca
11	1111	1131	10	Ca	2222	2222	16	Ca	1322	2222	16	Ca
12	2111	2322	14	Ca	2212	2233	17	Ca	2232	2233	19	S
13	1222	2112	13	Ca	2222	4222	18	S	3221	2344	21	S
14	2324	3223	21	S	3335	4542	29	M	4354	5643	34	G
15	3322	2322	19	S	1221	1211	11	Ca	3232	2334	22	S
16	2211	1221	12	Ca	2233	3322	20	S	3232	3423	22	S
17	2335	3333	25	Sa	2424	3111	18	S	2223	2232	18	Ca
18	3345	4433	29	M	2232	3442	22	S	2233	3222	19	S
19	2222	1232	16	Ca	2343	2312	20	S	2233	3321	19	S
20	1323	2111	14	Ca	2311	1021	11	Ca	1222	2332	17	S
21	0222	2313	15	Ca	1223	6542	25	G	1222	1111	11	Ca
22	3534	3432	27	M	3432	3343	25	Sa	1212	2222	14	Ca
23	2234	2120	16	S	4433	3351	26	M	2332	2543	24	M
24	2132	3211	15	Ca	2323	3321	19	S	2233	3223	20	Ca
25	1333	3323	21	S	2224	3213	19	S	2223	1222	16	Ca
26	2343	5323	25	M	2224	4223	21	Sa	3333	4433	26	Sa
27	2342	2421	20	Sa	3222	2234	20	S	2425	3442	26	M
28	1222	2211	13	Ca	4767	4332	36	G	3324	4542	27	M
29	1222	2115	16	Ca	2114	3232	18	S	3323	2322	20	Ca
30	4343	4454	31	M	2355	4633	31	G	1333	3232	20	Ca
31	3345	3545	32	Ma					1222	2231	15	Ca

* 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 over 225γ in the variations of the horizontal intensity 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 character or 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
29 January 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 α (3112) = 1·233 and α' (3323) = 0·071

NEW DELHI

(Lat. 28° 35′N, Long. 77°12′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	09	0·259	(*Sc, Cu*)5, *Ac* 1	No observation			15	0·242	Clear
2	16	0·269	(*Sc, Cu*) 3, (*Ci, Cs*) T	,,			15	0·235	(*Ci, Cs*) 1
3	16	0·254	(*Sc, Cb*) 2	,,			16	0·233	Clear
4	09	0·247	*Ac* 1	,,			15	0·235	,,
5	No observation			,,			14	0·213	(*Ac, As*) 6
6	,,			,,			15	0·231	Clear
7	,,			,,			15	0·235	,,
8	,,			,,			15	0·258	,,
9	,,			,,			15	0·259	(*Ci, Cs*) 6
10	,,			,,			14	0·275	Hazy
11	,,			,,			14	0·270	(*Ci, Cs*) 6
12	,,			,,			15	0·267	(*Ci, Cs*) 5
13	,,			,,			15	0·257	*Cu* 2, *Ci* 3
14	,,			,,			14	0·261	(*Sc, Cu*) 3, *Ac* 1
15	,,			,,			14	0·254	*Ac* 5, (*Ci, Cs*) 2
16	,,			15	0·263	*Ac* 1	14	0·263	(*Sc, Cu*) 3, *Ac* 1, *Ci* 1
17	,,			15	0·262	Clear	14	0·279	*Ci* 2, hazy
18	,,			15	0·257	,,	14	0·274	(*Ci, Cs*) 3
19	,,			15	0·265	,,	14	0·275	(*Ci, Cs*) 4
20	,,			15	0·262	,,	14	0·265	Clear
21	,,			14	0·258	*Ci* 2	14	0·257	,,
22	,,			15	0·250	Clear	15	0·255	,,
23	,,			15	0·263	(*Ci, Cs*) 4	14	0·253	,,
24	,,			15	0·253	(*Ci, Cs*) 3	14	0·246	,,
25	,,			15	0·254	Hazy	15	0·246	,,
26	,,			15	0·242	,,	14	0·285	,,
27	,,			15	0·250	Clear	15	0·287	(*Ci, Cs*) 4
28	,,			14	0·250	(*St, Cu*) 2, *Ci* T	16	0·290	(*Ci, Cs*) 3
29	,,			14	0·267	Clear	15	0·278	Very hazy
30	,,			15	0·234	Clear	14	0·293	Clear
31							15	0·283	,,

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

MT. ABU

(Lat. 24° 36′ N, Long. 72° 43′ 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	10	0·253	*Ac* 3	No observation		Nearly overcast	16	0·217	Clear
2	No observation		Overcast	,,		,,	16	0·217	,,
3	,,		,,	15	0·241	*Ac* 2, *Ci* 2	15	0·223	*Ci* 2
4	,,		,,	10	0·239	,,	No observation		
5	,,		,,	No observation			15	0·233	*Cu* 3, *Ci* 2
6	10	0·252	Nearly overcast	16	0·237	*Cu* 2, *Ci* 2	16	0·225	Clear
7	No observation		Overcast	10	0·229	Clear	09	0·217	,,
8	10	0·247	*Ci* 2, hazy	10	0·237	,,	15	0·230	,,
9	10	0·249	*Ci* 2	16	0·237	,,	15	0·235	,,
10	No observation		Overcast, raining	16	0·239	,,	15	0·246	,,
11	,,		,,	16	0·243	*Cu* 2, *Ci* 2	15	0·242	*Cu* 3, *Ci* 2
12	,,		,,	16	0·237	Thin *Ci* all over the sky	15	0·245	*Cu* 2, *Ci* 2
13	,,		,,	16	0·239	Clear	15	0·239	*Ac* 2, *Ci* 2
14	,,		,,	16	0·246	,,	15	0·243	*Cu* 2, *Ci* 3
15	15	0·223	Clear	16	0·238	,,	No observation		
16	15	0·245	*Ci* 2	16	0·245	,,	15	0·238	*Cu* 3, *Ci* 4
17	No observation		Overcast	09	0·250	,,	09	0·238	*Ci* all over sky
18	10	0·242	Clear	No observation			15	0·241	Thin *Ci*
19	16	0·251	*Ac* 2, *Ci* 2	16	0·242	Clear	09	0·239	*Cu* 3, *Ci* 3
20	16	0·250	(*Cu*, *Ci*) 2	No observation			15	0·249	Clear
21	10	0·253	*Cs* 2	,,			15	0·238	,,
22	16	0·251	Clear	16	0·241	Clear	15	0·239	,,
23	10	0·255	,,	10	0·239	Thin *Ci*	15	0·238	,,
24	16	0·242	,,	14	0·247	Clear	15	0·237	,,
25	16	0·250	,,	16	0·231	,,	15	0·249	,,
26	16	0·247	,,	16	0·231	,,	09	0·249	,,
27	10	0·249	,,	16	0·229	*Ci* 2	09	0·261	,,
28	16	0·247	,,	16	0·234	Clear	09	0·263	*Cu* 3, *Ci* 3
29	No observation			16	0·222	Sl. haze	15	0·271	Clear
30	16	0·250	Clear	10	0·221	Thin *Ci*	15	0·269	,,
31	No observation						15	0·271	,,

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) = 1·23 and α' (3323) = 0·08

KODAIKANAL

(Lat. 10° 14′N, Long. 77° 28′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	No observation		Overcast	No observation		Overcast	No observation		Overcast, rain
2	08	0·266	*Cu* 2, *Ci* 2	,,		,,	,,		Overcast, drizzle
3	No observation		Overcast, rain	09	0·243	*Cs* 4, *Ci* 4	10	0·235	*Cu* 1, *Ac* 3, *Ci* 1
4	,,		*Ac* 2, *As* 3, *Ci* 2	No observation		Overcast	09	0·237	*Ac* 1, *Ci* 1
5	,,		Overcast, drizzle	,,		,,	No observation		*Ac* 6, *Cu* 1
6	08	0·258	*Cs* 2	,,		Overcast, rain	09	0·235	*Cs* 4, *Ci* 4
7	08	0·257	*Cu* 1, *Cs* 1	09	0·241	Passing *Sc*, *Ci* 2	08	0·235	*Ci* 1
8	08	0·259	*Sc* 3, *Cu* 2, *Ci* 1	No observation		Overcast	No observation		Overcast
9	No observation		*Cu* 4, *Sc* 3	,,		*Sc* 3, *Ci* 4	08	0·231	*Cu* 2
10	09	0·263	*Sc* 3, *As* 2	08	0·235	*Ci* 3, *Cs* 3	No observation		Overcast, drizzle
11	No observation		Overcast	No observation		Overcast	,,		*Cu* 3, *Sc* 4
12	08	0·253	*Ac* 1	08	0·243	*Sc* 4, *Ci* 2	09	0·231	*Ac* T, *Ci* 2
13	08	0·253	*Cu* 2	No observation		Overcast	16	0·227	*Cu* 1, *Cs* 2
14	08	0·254	*Cu* 2, *Sc* 1, *Ci* 1	07	0·233	*Ac* 1, *Ci* 3	09	0·234	*Ci* 4
15	07	0·245	*Cu* T, *Ci* 1	08	0·238	*Ci* 1	09	0·222	*Ac* 1, *Ci* 2
16	No observation		Overcast	09	0·243	*Ci* 1, *Cs* 3	09	0·230	*Ac* T, *Ci* 1
17	,,		,,	09	0·239	*Sc* 2, *Ci* 4	09	0·223	*Cu* T, *Ci* 3
18	,,		,,	09	0·243	*Ci* 1	09	0·230	*Ci* 4
19	,,		,,	08	0·234	*Cu* 1, *Cs* 2	No observation		Overcast, drizzle
20	,,		Overcast, rain	09	0·238	*Ci* 4	,,		,,
21	,,		,,	No observation		Overcast	10	0·231	*Cu* 1, *Cs* 1
22	,,		Overcast, drizzle	,,		,,	09	0·229	*Ci* 4
23	,,		,,	08	0·226	*Cs* 4, *Ci* 4	09	0·227	*Ci* 1
24	,,		Overcast	09	0·227	*Ac* 4, *Ci* 1	09	0·230	*Cs* 2
25	,,		Overcast, drizzle	No observation		Overcast, rain	No observation		*Sc* 7
26	,,		Overcast	,,		Overcast	09	0·234	*Cu* T, *Sc* 1, *Ci* 2
27	,,		Overcast, drizzle	,,		,,	No observation		Overcast
28	,,		Overcast, rain	,,		Overcast, rain	,,		Overcast, drizzle
29	,,		Overcast	,,		Overcast	,,		Overcast
30	,,		,,	,,		,,	,,		,,
31	,,		Overcast, rain				,,		,,

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	JANUARY 1959			FEBRUARY 1959			MARCH 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	No observation		Rain or snow	No observation		Heavy snowfall	No observation		Overcast
2	,,		,,	,,		,,	16	0·271	*Cu* 5
3	,,		,,	,,		,,	16	0·280	Almost overcast
4	,,		,,	,,		,,	16	0·282	,,
5	16	0·259	*Cu* 3, *Ci* 4	,,		,,	16	0·313	*Cu* 5, *Ci* 3
6	16	0·280	*Cu* 2, *Ac* 3	16	0·288	*Cu* 5, *Ci* 3	16	0·303	*Cu* 2, *Ci* 2
7	No observation		Overcast	16	0·281	Almost overcast	10	0·290	*Cu* 4, hazy
8	10	0·291	Nearly overcast	16	0·276	*Cu* 2, very hazy	16	0·282	,,
9	15	0·279	*Cu* 2, hazy	12	0·267	*Cu* 3, *Ci* 2	16	0·298	*Ci* 7, hazy
10	15	0·283	,,	No observation		Snowfall	16	0·294	Thick haze
11	No observation		Overcast	,,		,,	16	0·286	*Cu* 2, *Ci* 2
12	,,		,,	12	0·319	*Cu* 3, *Cs* 5	16	0·300	*Cu* 2, hazy
13	,,		,,	14	0·276	Nearly overcast	16	0·299	Hazy
14	,,		,,	14	0·319	,,	16	0·287	*Ci* 2, hazy
15	,,		,,	16	0·330	*Ac* 3, *Ci* 2	16	0·331	*Cu* 2, hazy
16	15	0·275	Nearly overcast	16	0·298	Nearly overcast	13	0·321	*Cu* 6
17	No observation		Heavy snowfall	16	0·282	,,	16	0·305	*Ac* 3, *Ci* 2
18	,,		,,	No observation		Overcast	16	0·303	*Ac* 3, hazy
19	,,		,,	16	0·294	*Cu* 3, *Ci* 2	16	0·300	*Cu* 2, *Ci* 3
20	,,		,,	No observation		Almost overcast	16	0·280	Nearly overcast
21	,,		,,	16	0·305	Nearly overcast	16	0·302	*Cu* 2, *Ci* 3
22	,,		,,	16	0·291	,,	16	0·291	Hazy
23	,,		,,	16	0·311	*Cu* 4, *Ci* 3	16	0·300	*Cu* 2, *Ci* 3
24	,,		,,	16	0·284	*Cu* 4, hazy	15	0·283	Almost overcast
25	,,		,,	16	0·276	*Cu* 4, hazy	No observation		Raining
26	,,		,,	16	0·282	*Cu* 2, *Ci* 3	16	0·293	*Cu* 4, *Ci* 3
27	12	0·288	Nearly overcast	16	0·270	*Cu* 3, *Ci* 2	16	0·283	*Ci* 4, hazy
28	No observation		Snowfall	16	0·256	Hazy	No observation		Drizzle or rain
29	16	0·314	Nearly overcast				,,		,,
30	15	0·299	,,				16	0·276	Overcast
31	15	0·310	*Cu* 4, hazy				11	0·294	*Cu* 3, *Ci* 3

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	APRIL 1959			MAY 1959			JUNE 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	0·286	Sl. haze	09	0·282	Nearly overcast	17	0·273	Hazy
2	08	0·270	*Cu* 2, haze	09	0·264	,,	17	0·290	,,
3	11	0·272	Nearly overcast	09	0·262	Overcast	08	0·262	,,
4	08	0·303	,,	No observation		Rain, stormy weather	09	0·276	,,
5	17	0·315	*Cu* 2, *Ci* 4, hazy	,,		,,	09	0·279	,,
6	17	0·294	*Cu* 3, *Ci* 2	10	0·284	Overcast	17	0·260	*Ac* 2
7	17	0·286	Hazy	09	0·298	,,	08	0·262	Sl. haze
8	16	0·267	Nearly overcast	No observation		Overcast, rain	16	0·266	*Cu* 2, *Ci* 3
9	16	0·262	Overcast	09	0·293	Nearly overcast	12	0·267	Hazy
10	10	0·276	Hazy, *Cu* 4	10	0·287	Thin *Ci*	18	0·273	*Cu* 2, *Ci* 2
11	08	0·274	*Cu* 2, hazy	No observation		Rain	10	0·267	,,
12	08	0·290	*Ac* 2	,,		,,	08	0·282	,,
13	08	0·295	Hazy	09	0·255	Hazy	12	0·271	*Cu* 3
14	17	0·295	,,	13	0·269	,,	16	0·277	*Cu* 2, *Ci* 3
15	17	0·293	,,	09	0·295	Nearly overcast	17	0·269	Hazy
16	08	0·280	*Ci* 3, hazy	No observation		Rain	17	0·283	*Cu* 1, hazy
17	17	0·282	*Cu* 3, hazy	,,		,,	08	0·275	Nearly overcast
18	08	0·287	Hazy	09	0·284	Hazy	17	0·267	*Cu* 3, hazy
19	09	0·288	Clear	09	0·284	Clear	18	0·274	*Ac* 3, hazy
20	08	0·278	Nearly overcast	08	0·241	,,	07	0·273	Hazy
21	09	0·297	Sl. rain, overcast	09	0·259	,,	18	0·277	*Ac* 2, hazy
22	09	0·284	Rain, overcast	17	0·263	,,	12	0·283	Hazy
23	10	0·305	Overcast	No observation			07	0·259	,,
24	09	0·286	Nearly overcast, rain	,,			13	0·270	*Ac* 2, hazy
25	09	0·275	Overcast	,,			16	0·282	Hazy
26	08	0·278	Nearly overcast	,,			18	0·275	*Cu* 3, hazy
27	09	0·278	Hazy, nearly overcast	,,			16	0·274	*Cu* 2, hazy
28	09	0·286	Nearly overcast	,,			16	0·273	Hazy
29	09	0·281	,,	,,			15	0·257	Thin *Ci*
30	No observation			,,			15	0·264	*Ci* 4
31				17	0·269	Hazy			

NOTE—The cloud amounts are in oktas