

SOLAR, GEOMAGNETIC, IONOSPHERIC AND OZONE DATA

KODAIKANAL SOLAR, GEOMAGNETIC AND IONOSPHERIC DATA

(OCTOBER—DECEMBER 1960)

Tables 1 to 5 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 6.

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)
12007	20°N	Oct 21	1267
12025	27°N	Nov 12	1455

TABLE 2

Solar Flares

Date	Time in GMT			Co-ordinates		Importance	H-alpha line width Å	Remarks
	Beg. h m	Max. h m	End. h m	Mean latitude	Mean longitude			
Oct 11	*05 54	06 01	06 30	13°S	35°W	2	—	Observed in filtergram and spectroheliogram
Dec 30	03 52	04 06	04 15	15°N	23°E	3	1.88	Do.

*First observation of the flare and not the beginning of the flare

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	
Prominence	Nov 30	0313	19°N	90°W	Most of the prominence disappeared by 0504 U.T.
Prominence	Dec 12	0305	51°N	90°W	Prominence disappeared be- tween 0305 and 0311 U.T.

No sudden disappearance of H-alpha dark marking was observed

TABLE 4
Daily Solar Data

Date	OCTOBER 1960			NOVEMBER 1960			DECEMBER 1960		
	(a)	(b)	(c)	(a)	(b)	(c)	(a)	(b)	(c)
1	—	—	—	—	—	—	—	—	—
2	—	—	—	86	—	—	71	4500	1
3	—	—	—	92	—	2	—	2781	3
4	40	6906	6	—	—	—	81	3344	7
5	105	4000	5	—	—	—	102	6156	7
6	140	4094	6	89	—	1	114	4750	4
7	158	4312	4	—	—	—	88	5594	7
8	170	4781	9	—	—	—	92	6531	7
9	150	4813	6	—	—	—	72	—	6
10	184	5531	7	—	—	—	—	—	—
11	166	8344	5	—	—	—	73	4000	8
12	126	5656	3	65	—	—	104	5000	4
13	130	5906	4	—	—	—	—	—	—
14	140	7063	6	—	—	—	128	6156	2
15	119	4406	6	—	—	—	98	4781	3
16	99	4219	6	—	—	—	153	6344	3
17	117	4500	7	—	—	—	117	4563	6
18	113	3625	5	—	—	—	102	3281	11
19	—	—	—	54	3594	4	106	3750	11
20	74	1313	3	56	1688	1	102	2500	6
21	72	—	—	—	—	—	93	1250	15
22	45	2781	5	—	—	—	60	1406	6
23	—	—	—	48	2906	6	48	3000	3
24	—	—	—	39	—	—	47	2688	2
25	69	—	—	65	—	5	47	2156	5
26	79	2688	4	75	4062	6	39	2625	4
27	58	4344	6	66	3031	9	72	2625	6
28	51	—	—	65	3719	6	—	—	—
29	64	—	—	49	4000	5	110	3844	4
30	90	3219	5	37	4844	6	139	3594	5
31	—	—	—	—	—	—	170	3781	4

— N: observation

(a) Relative sunspot number

(b) H-alpha dark markings (Areas in millionths of the sun's visible hemisphere)

(c) Calcium prominence (Areas in square minutes of arc)

TABLE 5
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	
	h	m	d	h		D	H						Z
					'					γ	γ	'	
Oct 6	02	36	7	23	s.c.	1	46	15	s	6	9	458	121
Oct 24	14	52	26	16	s.c.	<1	33	13	ms	25	6	316	72
Nov 12	13	45	14	11	s.c.	2	48	24	s	13	9	487	127
Nov 15	13	02	16	18	s.c.	<1	27	11	ms	16	5	305	92
Nov 21	06	31	22	09	s.c.	1	37	13	ms	21	4	264	39
Nov 30	19	08	1 Dec	23	s.c.	1	31	20	ms	1 Dec	5	289	68
Dec 7	18	02	8	16	s.c.	<1	28	14	m	7	4	170	36

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 251γ and 400γ)
s—for severe (when range is above 400γ)

TABLE 6

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 instruments 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— $7\frac{1}{2}$, 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 1961

Time (hrs)	h'F2	foF2	h'F foF1	h'E foE	foEs (M3000)	F2
00	11.2	245	..	..	..	3.00
01	11.0	240	..	..	..	3.05
02	8.4	235	..	..	..	3.10
03	6.8	240	..	..	..	3.15
04	5.9	240	..	..	..	3.20
05	4.6	250	..	..	..	3.20
06	7.2	270	..	..	2.4	3.05
07	10.4	245	..	120 2.8	6.7	3.00
08	12.0	235	..	120 ..	10.0	2.70
09	12.8	220	..	120 ..	11.0	2.40
10	11.9	215	..	120 ..	12.0	2.35
11	11.4	220	..	..	12.0	2.30
12	11.5	220	..	..	12.0	2.35
13	11.8	220	..	120 ..	12.0	2.40
14	12.6	220	..	120 ..	11.2	2.40
15	12.8	230	..	120 ..	10.3	2.40
16	12.8	250	..	120 ..	9.0	2.40
17	12.6	270	..	..	7.5	2.35
18	11.8	320	..	..	..	2.20
19	11.3	360	..	..	..	2.25
20	11.6	320	..	..	..	2.55
21	11.5	280	..	..	..	2.70
22	12.2	260	..	..	3.6	2.85
23	11.4	250	..	..	5.6	3.00

Ionospheric data (Median values)

Kodaikanal (10.2°N, 77.5°E) November 1960

Time (hrs)	h'F2	foF2	h'F foF1	h'E foE	foEs (M 3000)	F2
00	9.8	235	..	..	..	3.10
01	9.0	230	..	..	..	3.20
02	8.0	225	..	..	..	3.30
03	6.5	225	..	..	..	3.30
04	5.0	225	..	..	..	3.30
05	3.2	240	..	..	..	3.40
06	6.3	260	..	..	..	3.05
07	9.7	235	..	11.5	2.7	6.4 3.00
08	11.4	225	..	..	..	8.0 2.80
09	11.4	220	..	..	..	9.2 2.60
10	11.3	210	..	..	..	9.0 2.50
11	11.2	200	..	..	..	9.2 2.50
12	11.4	200	..	..	..	9.2 2.45
13	11.8	210	..	..	..	9.2 2.40
14	12.2	210	..	..	..	9.6 2.40
15	12.2	220	..	..	..	7.2 2.45
16	11.9	240	..	..	..	7.6 2.45
17	11.8	260	..	..	..	2.40
18	11.0	310	..	..	..	2.40
19	10.1	320	..	..	..	2.45
20	10.6	295	..	..	..	2.60
21	10.8	260	..	..	..	2.75
22	9.8	250	..	..	..	3.00
23	9.9	240	..	..	..	3.00

Kodaikanal (10.2°N, 77.5°E) December 1960

Time (hrs)	h'F2	foF2	h'F foF1	h'E foE	foEs (M3000)	F2
00	7.8	235	..	..	..	4.0 3.15
01	6.8	240	..	..	..	3.20
02	6.1	225	..	..	..	3.25
03	5.8	230	..	..	..	3.25
04	5.1	230	..	..	..	3.30
05	4.0	235	..	..	..	3.35
06	5.2	245	..	..	..	3.15
07	8.3	230	..	..	..	G 3.20
08	10.0	210	..	100	..	6.8 2.85
09	10.6	200	..	..	..	7.4 2.65
10	10.4	200	..	..	..	9.2 2.60
11	10.6	200	..	..	..	9.4 2.55
12	10.8	200	..	..	..	9.6 2.50
13	11.1	195	..	..	..	8.6 2.50
14	11.1	200	..	100	..	8.4 2.50
15	11.2	210	..	..	..	G 2.50
16	11.2	220	..	110	..	3.9 2.50
17	10.6	245	..	..	..	2.50
18	9.9	275	..	..	..	2.50
19	9.4	305	..	..	..	2.50
20	9.2	280	..	..	..	2.60
21	8.7	240	..	..	..	2.85
22	8.2	240	..	..	..	2.95
23	8.2	240	..	..	..	3.10

Time : 75.0°E

Sweep: 1.0 Mc. to 25.0 Mc. in 27 seconds

Astrophysical Observatory, Kodaikanal
 1 February 1961

M. K. VAINU BAPPU
 Director, Astrophysical 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)

MAGNETIC OBSERVATORY, ALIBAG (BOMBAY)

Three-hourly indices of Geomagnetic Activity

(Scale values of variometers in γ/mm : $D=11.3$; $H=4.4$; $Z=3.0$)(K 9=300 γ)

Greenwich day	OCTOBER 1960				NOVEMBER 1960				DECEMBER 1960			
	K-indices	Sum	Character of the day*		K-indices	Sum	Character of the day*		K-indices	Sum	Character of the day*	
1	3335	5445	32	Ma	2332	3322	20	S	5654	6565	42	G
2	3323	5422	24	Sa	1342	3223	20	S	3423	3332	23	S
3	1224	3222	18	S	2233	3333	22	S	2222	2211	14	Ca
4	1322	3564	26	G	3333	5442	27	Sa	1222	2321	15	Ca
5	3232	3435	25	M	2232	2111	14	Ca	1124	3232	18	S
6	4657	7677	49	G	0122	3132	14	Ca	2234	4343	25	S
7	6445	5644	38	G	1222	1110	10	Ca	2333	2355	26	Sa
8	4234	3243	25	Sa	0233	2122	15	Ca	3543	3212	23	Sa
9	4324	4343	27	S	1122	1111	10	Ca	3323	3332	22	S
10	3111	1122	12	Ca	0033	2222	14	Ca	2212	2233	17	Ca
11	2442	2122	19	S	3456	3232	28	G	2222	2323	18	Ca
12	1111	2223	13	Ca	2222	5677	33	G	1222	2353	20	M
13	2221	2113	14	Ca	7787	7774	54	G	2222	3112	15	Ca
14	2222	1111	12	Ca	4444	3443	30	Sa	2334	3311	20	S
15	2334	3443	26	S	3333	5557	34	G	2354	5445	32	M
16	2221	2112	13	Ca	7534	5332	32	G	3343	3212	21	Sa
17	2322	2221	16	Ca	2233	3432	22	S	1222	1223	15	S
18	3243	3453	27	Sa	2220	2210	11	Ca	2443	3532	26	M
19	1222	1223	15	Ca	1324	4113	19	S	2333	3322	21	S
20	1232	3423	20	S	3433	2312	21	S	3222	3353	23	Sa
21	2332	2223	19	Ca	1354	3663	31	G	2222	4344	23	Sa
22	0111	1221	9	Ca	2344	3232	23	Sa	2223	3223	19	S
23	1222	2222	15	Ca	2222	2222	16	Ca	2223	4312	19	S
24	2223	4752	27	G	2232	3333	21	S	2223	3223	19	S
25	2454	5664	36	G	4344	4533	30	M	3222	1131	15	Ca
26	3334	5442	28	M	2332	2232	19	Ca	3423	3332	23	S
27	3335	5354	31	M	2232	3344	23	S	2345	5653	33	G
28	3333	3542	26	Sa	2333	4321	21	S	3235	4431	25	M
29	3335	3442	27	Sa	2222	2222	16	Ca	2233	3322	20	Ca
30	3234	4432	25	Sa	1222	2344	20	S	1323	3441	21	S
31	2233	4442	24	S					1332	3332	20	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 24 hours after its commencement is classed as "Very Great". It is "Great" if the range is between 150γ and 225γ , "Moderate" when it 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 the 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	0	M	2
Ca		Ma	
S		G	
Sa	1	VG	2

Colaba, Bombay
27 February 1961

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 1960			NOVEMBER 1960			DECEMBER 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	0800	0.246	Clear	1544	0.254	Clear	1500	0.237	(Ci, Cs) 1
2	1600	0.237	Sc 2, Cu 4	1533	0.254	"	1506	0.239	"
3	No observation		Raining	0846	0.242	"	1534	0.237	Cs 8
4	"	"	"	1539	0.233	"	1518	0.238	Cs 8
5	"	"	"	1536	0.235	"	1513	0.234	Clear
6	"	"	"	1533	0.251	"	1525	0.246	Sc 2, Ac 5
7	1600	0.245	Cu 4, sun clear	1531	0.223	Very hazy	1523	0.249	Clear
8	1600	0.238	Cloudy	0841	0.241	Clear	1521	0.246	"
9	1600	0.251	Clear	1527	0.239	"	1521	0.245	Cu, Ac 4
10	0800	0.242	Cu 1, sun behind Cu	No observation		Instrument defective	1519	0.253	Clear
11	1630	0.239	Clear	1516	0.238	Clear	1500	0.241	"
12	1600	0.243	"	1534	0.245	"	1509	0.250	Ac 7
13	1600	0.250	"	1554	0.245	"	0913	0.243	Cloudy
14	1600	0.257	Cu 1	0845	0.237	Very hazy	1500	0.253	Clear
15	1600	0.278	Clear	0836	0.249	Clear	1500	0.253	Cu 4, Ac 2
16	1600	0.238	"	0518	0.238	"	1450	0.265	Clear
17	0800	0.223	"	0846	0.249	Ci T	1453	0.242	Ac 4
18	1600	0.251	"	1516	0.229	Clear	1500	0.239	Partly cloudy
19	0800	0.219	"	1530	0.238	"	1450	0.234	(Ci, Cs) 6
20	0800	0.226	"	1532	0.219	Ci 2	1521	0.227	Sc 3, Ac 3
21	0800	0.233	"	1515	0.243	Ci 3, sun behind Ci	1520	0.250	Hazy
22	1530	0.222	"	1516	0.246	Clear	1524	0.265	Ci T
23	0827	0.245	"	1513	0.251	"	1528	0.239	Clear
24	0835	0.246	"	1517	0.235	"	1535	0.229	Clear
25	1600	0.266	"	0850	0.251	"	1510	0.230	Ac 2
26	1536	0.249	"	1524	0.230	(Ci, Cs) 1	1516	0.223	(Ci, Cs) 1
27	1541	0.253	"	1500	0.250	Sl. hazy	0951	0.226	Clear
28	1540	0.257	"	1500	0.238	"	0956	0.235	"
29	1600	0.271	"	1500	0.250	Clear	1515	0.233	"
30	1536	0.261	"	1500	0.247	"	No observation		Cloudy
31	1539	0.263	"				0953	0.266	Cu 1, As 2, Cc 2

NOTE—The cloud amounts are in oktas

SOLAR GEOMAGNETIC IONOSPHERIC AND OZONE DATA

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

AHMEDABAD

(Lat. 23°04' N, Long. 72° 38' E)

Date	OCTOBER 1960			NOVEMBER 1960			DECEMBER 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	17	0.257	Clear	09	0.249	Clear	16	0.234	Clear
2	09	0.262	"	09	0.242	"	17	0.231	"
3	09	0.254	"	09	0.239	"	09	0.228	"
4	09	0.256	"	16	0.237	"	No observation		
5	16	0.256	"	09	0.231	"	09	0.220	Clear
6	09	0.258	"	09	0.233	"	09	0.230	"
7	16	0.260	"	09	0.239	"	09	0.245	"
8	09	0.252	"	09	0.238	"	09	0.238	"
9	No observation			No observation			09	0.237	"
10	16	0.253	Clear	09	0.245	Clear	09	0.234	"
11	09	0.250	"	09	0.250	"	No observation		
12	16	0.253	"	09	0.246	"	16	0.233	Overcast
13	17	0.258	"	No observation			09	0.224	Mainly overcast
14	17	0.264	"	09	0.238	Clear	10	0.231*	"
15	09	0.264	"	09	0.245	"	09	0.238	"
16	16	0.264	"	09	0.243	"	16	0.245*	"
17	17	0.252	<i>Cu 2, Cs</i>	09	0.239	"	09	0.237	Clear
18	17	0.258	Clear	09	0.233	"	No observation		
19	09	0.253	"	09	0.231	"	09	0.220	Clear
20	No observation			09	0.212	"	16	0.226	"
21	"	"	"	09	0.226	"	16	0.225*	Overcast
22	"	"	"	09	0.218	"	09	0.216	Clear
23	"	"	"	09	0.226	"	16	0.222	"
24	09	0.254	Clear	09	0.219	"	09	0.215	"
25	17	0.250	"	09	0.233	"	09	0.214	"
26	09	0.252	"	09	0.218	"	09	0.211	"
27	09	0.254	"	16	0.230	"	09	0.214	"
28	09	0.260	"	16	0.230	"	16	0.217	"
29	09	0.260	"	16	0.230	"	16	0.213*	Overcast
30	09	0.253	"	16	0.230	"	09	0.215	Clear
31	09	0.252	"				09	0.220	"

NOTE—The cloud amounts are in oktas

*Cloudy zenith sky observations

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 1960			NOVEMBER 1960			DECEMBER 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, rain	No observation		Overcast	No observation		Ac 7
2	"		"	"		Overcast, rain	08	0.227	Cs 4
3	"		Overcast	"		"	No observation		Overcast
4	08	0.253	Ci 1	"		"	"		Sc 7
5	No observation		Sc 3, Ac 2, Ci 2	"		"	09	0.233	Cu 2, Sc 5
6	"		Overcast	"		Overcast	No observation		Sc 7
7	08	0.261	Sc T, Ci T	"		Overcast, drizzle	09	0.234	Clear
8	No observation		Cs 4, Ci 2 (thick)	"		Overcast, rain	10	0.235	Sc 3
9	"		Cs 4, Ci 3 (thick)	"		Overcast, drizzle	No observation		Overcast, drizzle
10	"		"	"		Overcast, rain	"		"
11	08	0.249	Cs 2	"		"	08	0.222	Cs 3
12	No observation		Overcast	"		"	09	0.225	Cu T, hazy
13	"		Cu 4, Sc 3	"		Overcast, drizzle	No observation		Overcast, drizzle
14	07	0.243	Cu 3, Cs 2	"		Overcast, rain	16	0.231	Cu 1, Ac 1
15	No observation		Cu 3, Sc 4	"		Overcast, drizzle	16	0.229	Cu T, hazy
16	"		Overcast, rain	"		Overcast, rain	16	0.227	Cu 2, hazy
17	10	0.249	Cs 3	"		Overcast, drizzle	09	0.223	Cs 3
18	08	0.251	Ci T	"		Overcast	09	0.226	Cu T, hazy
19	No observation		Overcast, rain	09	0.230	Sc 2, Ac 1, Ci 1, Cs 3	09	0.237	"
20	"		Overcast	No observation		Overcast, drizzle	09	0.231	Cs 5
21	"		"	"		Overcast, rain	No observation		Cs 7 (thick)
22	"		"	"		"	08	0.219	Cs 3
23	"		Overcast, rain	09	0.235	Cu 1, Sc 2, Ac 3, Ci 1	09	0.219	Cs 5
24	"		"	08	0.227	Cu 1, Sc 1, Cs 1	09	0.219	Cs 3
25	"		"	No observation		Overcast	09	0.218	Ci 1, Cs 1
26	"		"	"		"	09	0.222	Cs 3
27	"		"	08	0.223	Cs 1	09	0.223	Cs 5
28	"		"	09	0.227	Cs 2	No observation		Overcast
29	"		"	08	0.226	Cs 3	10	0.226	Cu T, Cs 3
30	"		Overcast	16	0.233	Ac 1, Cs 2	09	0.227	Cs 4
31	"		Overcast, rain				09	0.219	Cu 2, Cs 4

NOTE—The cloud amounts are in oktas

SOLAR GEOMAGNETIC IONOSPHERIC AND OZONE DATA

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 1960			NOVEMBER 1960			DECEMBER 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			12	0.302	Sc 2, hazy	12	0.290	Ac T, hazy
2	„			12	0.307	Cu 1	12	0.273	Thick haze
3	09	0.275	Hazy	12	0.296	Cu 1, hazy	10	0.260	„
4	14	0.287	Cu 1, Sl 2	11	0.291	Cs 2, thick haze	12	0.261	Sc 4
5	14	0.291	Cu 2	No observation			10	0.250	Thick haze
6	11	0.272	Cu T, sl. haze	13	0.290	Hazy	12	0.294	„
7	13	0.279	Cu 1, hazy	12	0.292	Thick haze	11	0.325	„
8	13	0.279	Sl. hazy	13	0.286	Nearly overcast	11	0.336	Cu 2, As 4, hazy
9	12	0.279	Cu 1, sl. haze	14	0.305	„	10	0.299	Thick haze
10	08	0.261	Hazy	10	0.276	Thick haze	11	0.299	„
11	12	0.291	Cu 2, hazy	13	0.273	As 5	13	0.292	Cu 2, Ac 2
12	12	0.279	Hazy	11	0.286	Mainly overcast	13	0.301	As 3, thick haze
13	13	0.287	Cu 1, hazy	10	0.284	Cu 1, Sc 2	14	0.284	Cu 1, Sc 4, hazy
14	14	0.284	Cu 2, sl. haze	10	0.276	Cu T, hazy	14	0.304	Ac 2, As 2, thick haze
15	12	0.288	Cu 2, As 2, hazy	14	0.279	Sl. haze	15	0.294	Overcast
16	12	0.282	Cu 2, hazy	12	0.291	„	No observation		
17	12	0.279	Thick haze	11	0.299	„	14	0.299	Overcast
18	12	0.269	Hazy	12	0.280	„	No observation		
19	14	0.267	Sl. haze	12	0.287	Hazy	„		
20	12	0.262	Hazy	No observation			„		
21	12	0.269	Sl. haze	10	0.265	Cu 2, Sc 3, hazy	„		
22	12	0.261	„	13	0.286	Cu 4, Sc 2	„		
23	16	0.250	Ac 1, sl. haze	14	0.277	Cu 2, Sc 3	14	0.276	Cu 1, Sc 2, hazy
24	12	0.271	Sl. haze	10	0.272	Cu 1, thick haze	No observation		
25	12	0.267	Hazy	12	0.280	Sl. haze	„		
26	12	0.282	Sl. haze	16	0.291	As 5	15	0.276	Cu 1, Sc 4
27	12	0.292	Cu 1, hazy	13	0.312	Mainly overcast	No observation		
28	12	0.295	Sl. haze	No observation			„		
29	11	0.299	Cu 1, Sc 2	11	0.283	Cu 1, hazy	„		
30	11	0.295	Cu 1, hazy	10	0.287	Thick haze	„		
31	11	0.306	Hazy				„		

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 1960			MAY 1960			JUNE 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	17	0.293	Cu 3, hazy	14	0.295	Cu 2, Ac 2	07	0.280	Hazy
2	17	0.287	Ac 3	16	0.286	Cu 2, Ac 3	No observation		
3	12	0.297	Cs 2	16	0.299	Sc 4	12	0.325	Cu 2, sl. haze
4	13	0.303	Cu 3	09	0.313	Overcast	07	0.298	Hazy
5	17	0.308	Ac 3	No observation			No observation		
6	13	0.298	„	18	0.304	Mainly overcast	„		
7	09	0.302	Ac 2	17	0.312	Sl. haze	„		
8	No observation			17	0.301	Ac 2	13	0.310	Sl. haze
9	17	0.342	Cu 2	17	0.294	Hazy	16	0.269	Cu 4, Ac 2, hazy
10	17	0.310	Cu T	17	0.298	„	14	0.299	Cu 2, Ac 2, hazy
11	12	0.315	Ac 4	17	0.296	„	14	0.299	Mainly overcast
12	16	0.305	Cu 2	17	0.301	Sl. haze	10	0.292	Cu 1, Ac 2, hazy
13	15	0.287	Ac 4	17	0.306	Cu T	17	0.294	Overcast
14	13	0.298	Ac 4	10	0.317	Hazy	09	0.314	Mainly overcast
15	08	0.310	Mainly overcast	10	0.326	Cu 1, hazy	10	0.315	(Cu, Ac) 2, sl. haze
16	17	0.291	„	11	0.315	Mainly overcast	09	0.321	Cu 2, Ac 2
17	No observation Overcast			17	0.295	„	10	0.321	Hazy
18	09	0.295	Ac 2	09	0.317	Sc 1, Ac 2	13	0.332	(Cu, Ac) 2
19	13	0.305	Mainly overcast	14	0.307	Clear	11	0.318	Hazy
20	17	0.295	Cu 3	12	0.310	„	10	0.299	„
21	09	0.297	„	15	0.302	Cu 2, Ac 3	10	0.296	Mainly overcast
22	No observation Overcast			No observation			11	0.288	Cu 1
23	„ „			13	0.332	Cu 1, sl. haze	10	0.284	Cu 1, sl. haze
24	13	0.315	Cu 3	17	0.309	Cu 1, sl. haze	12	0.310	Cu 1, sl. haze
25	No observation			13	0.329	Cu 1	16	0.304	Cu 1, As 2
26	12	0.305	Cu 1, Cs 4	No observation			13	0.323	Cu 4
27	17	0.324	Ac 1	„			12	0.314	Cu 2, Ac 2
28	08	0.326	Ac 2	13	0.340	Cu 1, Sc 3	18	0.269	Ac 1, sl. haze
29	17	0.324	Ac T	12	0.326	Sc 1, hazy	18	0.268	(Cu, Ac) 2
30	17	0.303	Sl. haze	14	0.314	Ac 2, sl. haze	11	0.299	Cu 2, Ac 2, hazy
31				15	0.309	Ac 1, sl. haze			

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	JULY 1960			AUGUST 1960			SEPTEMBER 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	14	0.304	Cu 3	13	0.279	Cu 3, Sc	13	0.277	Cu 1
2	11	0.296	Cu 2, Ac 1	13	0.291	Cu 2, Sc 2	12	0.283	Mainly overcast
3	10	0.283	Cu 2, Sc 2	13	0.291	Cu 2	16	0.290	„
4	15	0.331	Cu 1	13	0.282	Cu 3	09	0.287	Sc 3, hazy
5	13	0.310	Cu 4	13	0.287	Cu 2, Sc 2	16	0.286	Cu 2, Sc 1
6	13	0.313	Cu 2, Sc 2	13	0.283	Sc 2	13	0.296	Cu 1, sl. haze
7	13	0.305	Hazy	13	0.283	Cu 1, sl. haze	13	0.284	„
8	12	0.301	Cu 2, Ac 1	13	0.276	Cu 2, Ac 2	11	0.272	Cu 2, Ac 1
9	11	0.262	Cu 2, Sc 2	15	0.279	Cu 2, Sc 3	13	0.280	Cu 1, hazy
10	17	0.273	Overcast	No observation			14	0.286	Cu 2, As 3
11	17	0.275	Mainly overcast	11	0.286	Cu 2	13	0.286	Cu 2
12	14	0.312	Cu 2	10	0.279	„	12	0.280	Cu 1, sl. haze
13	14	0.305	Cu 2, Ac 1	No observation			12	0.284	Hazy
14	09	0.279	Cu 2, Ac 3	„			13	0.276	„
15	14	0.307	„	„			13	0.275	Cu 3, Ac 2, hazy
16	13	0.309	Cu 1	„			13	0.276	Sc 1, Ac 2
17	15	0.290	Cu 3	16	0.286	Mainly overcast	13	0.275	Cu 2, Ac 3
18	No observation			No observation			12	0.279	Cu 1, hazy
19	14	0.315	Cu 2, Sc 2	10	0.277	Cu 5, hazy	13	0.273	As 1, hazy
20	13	0.323	Cu 1	13	0.292	Cu 2, Sc 2	13	0.265	Cu 1, hazy
21	14	0.301	„	No observation			13	0.265	Hazy
22	10	0.292	Sl. haze	16	0.279	Cu 3, hazy	12	0.272	Cu 1, hazy
23	13	0.321	Cu 1, sl. haze	No observation			13	0.276	„
24	13	0.302	„	14	0.283	Cu 1, Sc	No observation		
25	13	0.294	Cu 2, hazy	13	0.294	Cu 1, sl. haze	11	0.284	Cu 2, sl. haze
26	13	0.283	Mainly overcast	13	0.275	„	11	0.286	Cu 1, sl. haze
27	12	0.291	Cu 1, Ac 2	13	0.279	Mainly overcast	13	0.282	Hazy
28	No observation			13	0.275	Cu 2, Sc 2	No observation		
29	13	0.280	Cu 3	No observation			12	0.280	Sl. haze
30	12	0.290	Cu 1, sl. haze	15	0.257	Sl. haze	13	0.282	„
31	13	0.292	Cu 2	13	0.276	Cu 1, hazy			

NOTE—The cloud amounts are in oktas