DEPARTMENT OF TRANSPORT AND POWER
METEOROLOGICAL SERVICE

SOLAR RADIATION OBSERVATIONS AT VALENTIA OBSERVATORY AND KILKENNY METEOROLOGICAL STATION 1969

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CONTENTS

SOLAR RADIATION OBSERVATIONS AT VALENTIA OBSERVATORY

1969

1. Introduction

Solar Radiation observations were begun at Valentia Observatory in September, 1954. At that time a Moll thermopile pyranometer and a recording millivoltmeter were installed, and have, since then, provided a continuous record of Global Solar Radiation. A Linke-Feussner thermoelectric iron-clad Actinometer (Kipp and Zonen) was also brought into use at the same time and a schedule of routine observations on direct sunlight has been maintained, when weather conditions permitted. In 1962, a second Moll thermopile pyranometer, fitted with shading ring, was installed to provide a record of the Diffuse Solar Radiation. Data derived from the pyranograph and the results obtained from the direct sunlight observations for the period 1954 - 1959 have been published in [1]. The data for 1960 and subsequent years have been published in annual volumes. This volume contains the data for 1969.

2. Site of the Observatory

The Observatory, which is in the extreme South West of Ireland, (Lat. 51° 56' N; Long. 10° 15' W.), is situated on the South East side of the narrow estuary of Valentia River, which runs approximately North East - South West (Fig. 1). It is about 1·2 Km. to the South West of the town of Cahirciveen. To the North, across the river estuary, is a range of hills 120 to 360 m. high. To the North East, beyond the town of Cahirciveen, the estaury opens out considerably and the terrain is generally an open boggy basin with only a gentle gradient. To the South East, however, the ground rises rapidly again to a ragne of hills 270 to 360 m. high, the highest peak (Bentee 375 m.) being only 6·5 Km. from the Observatory. To the South, the country opens out to a distance of nearly 8 Km. from the Observatory, where the Kilkeaveragh range of hills runs East-West, varying in height from 120 to 390 m. There is an opening to the sea to the South West between the mainland and Valentia Island. The hills on the island rise to a height of 270 m. North of the island there is another opening to the sea, and the circle of hills is completed by a range to the North West, 120 to 270 m. high, separated by a narrow gulley from the range to the Northward.

3. Measurement of Global Solar Radiation

3.1. Exposure of the Pyranometer

The layout of the Observatory is shown in Fig. 2. The instrument is exposed on the roof of the Radiation House and the recording millivoltmeter mounted vertically below it inside the house. The pyranometer is at a height of 4 metres above ground level and 20 metres above Mean Sea Level. The nature of the exposure can be seen in Fig. 3, in which the outline of all obscuring objects is plotted on an Elevation-Azimuth diagram. Apart from one sector, the obscuring objects have an elevation of less than 5°, so that their effect on the Diffuse Radiation is negligible.

In the sector 080° to 150° E. from North, the elevation of the obscuring objects lies between 8° and 10·5° approximately. The loss of diffuse radiation according to Blackwell's formula [2] works out at approximately 1%. This is also very small, so no corrections have been made to the data to allow for this loss. The loss of radiation due to the obscuring of the direct solar beam occurs mainly in the same sector (080° to 150°). During the period, from the end of August to mid-April, the initial 30 to 70 minutes of the direct sun is cut off. This affects the hourly values given for the first and occasionally the second hour but

the effect on the total for the day is negligible. No attempt has been made to correct the radiation data for this loss of direct sunlight.

3.2. Pyranograph Used

The instrument in use during 1969 is the same as has been used since recordings began in 1954, namely a G_2 Solarimetric Thermopile by Kipp and Zonen, Serial No. 847. Recording millivoltmeter No. 29 (Kipp and Zonen) has been used since recordings began apart from a few months in 1963 when it was being overhauled.

The pyranometer consists of a special Moll thermopile mounted under two concentric hemispherical glass covers on a cast iron levelling base. At the bottom of the base of the pile, a tube is provided which communicates with the interior of the instrument. This tube is connected to a vessel containing silica gel, which keeps the air under the glass covers dry.

The recording millivoltmeter is of the intermittent dot type, a dot being made on the chart every half minute. The charts used are in rolls, each roll accomodating about two months record.

3.3. Calibration of the Pyranograph

The Pyranometer and Recording Millivoltmeter were calibrated by means of the Actinometer and Millivoltmeter, described in paragraphs 5.1. and 5.2. below. The calibration was done by comparing the intensity of the direct sunlight as measured by the Pyranograph with the corresponding intensity as measured by means of the Actinometer.

3.4. Tabulation of the Records

The records were tabulated by means of a glass scale calibrated directly in energy units. The hourly values tabulated are the mean values for the hour (Local Apparent Time) centred at the half hour. To facilitate accurate timing, time marks were made on the chart, automatically, by standard clock, at each hour L.A.T. This clock was adjusted daily to keep it within $\frac{1}{2}$ minute of true L.A.T.

4. Measurement of Diffuse Solar Radiation

4.1. Exposure of the Pyranometer

The Diffuse Pyranometer is mounted on the same site as the Global Pyranometer, at a distance of 3·1 metres North West of the latter. A description of the site is given in 3.1. above.

4.2. Pyranograph Used

The instrument in use is similar to that used for recording the Global Solar Radiation, i.e. a G_2 Solarimetric Thermopile (Kipp and Zonen) Serial No. 1387, and Recording Millivoltmeter (Kipp and Zonen) Serial No. 168. The width of the shading ring is 48 mm. and its diameter is 308 mm.

4.3. Calibration of the Pyranograph

The shadow ring was displaced below the horizontal position. The Pyranograph was then calibrated in exactly the same way as the Global Pyranograph. (para. 3.3. above).

4.4. Tabulation of the Records

The Records were tabulated in the same way as the Global Radiation Records (para. 3.4. above).

4.5. Shadow-Ring Correction

Corrections have been made to increase the values extracted from the charts to compensate for the diffuse energy intercepted by the ring simultaneously with the eclipsing of the sun's disc. Theoretical corrections were computed following the method described by Blackwell [2]. As a result of a series of comparisons, in overcast sky conditions, between the diffuse radiation and the corresponding global radiation, it was found that the shadow-ring corrections computed theoretically, had to be increased by an amount averaging 5% of the tabulated diffuse radiation.

5. Direct Sun Observations

5.1. Instruments Used

The Actinometer used for all direct sun observations was the Linke- Feussner thermoelectric iron clad actinometer (Serial No. 93) by Kipp and Zonen, provided with red and yellow filters. Millivoltmeter No. 233216, used in conjunction with the Actinometer was also supplied by Kipp and Zonen.

The Actinometer body consists of six massive copper rings, which are made to serve as diaphraghms. The openings of these diaphraghms decrease progressively towards the thermopile, and the chambers formed between them are specially shaped so as to eliminate turbulent air currents within the instrument. Felt lagging around the body shields the instrument thermally.

The detachable filter head consists of a heavy copper core, which is screwed on to the exterior ring and carries a filter disc. Only a very small segment of this disc protrudes from the head, so that the filters are kept at Actinometer temperature. The Moll Thermopile is divided into two equal sections, connected in opposition and each consisting of twenty constantan-manganin couples. One of the sections is screened from radiation and thus acts as a compensating device for the elimination of thermal effects associated with quasi-adiabatic pressure changes, occurring near the thermopile surface.

A thermometer for reading the temperature of the instrument is set inside the copper parts.

5.1.1. Filters Used

Up to and including 1967 two filters of Schott glass OG_1 and RG_2, received from the Radiation Commission of the International Association of Meteorology, were used for all the observations. These filters were tested at Davos Observatory and a certificate with the reduction factor (DR) supplied.

For filter OG_1, DR = 1·108

For filter RG_2, DR = 1·132

As from 1st. January, 1968, a third filter, RG_8, received from the same source was introduced. The Davos reduction factor for this filter is:

For filter RG_8, DR = 1·050

5.2. Calibration of the Actinometer

In 1961 an Angstrom Compensating Pyrheliometer (No. 548) was received, with calibration data, from Stockholm. This instrument is reserved as National Reference Standard.

The Actinometer and Millivoltmeter were calibrated by

reference to the Pyrheliometer. During 1965 comparisons showed that the calibration figure (1 scale division of the millivoltmeter = 1·571 mW/cm^2) used for the Actinometer was giving results 2·2% lower than the Pyrheliometer. In September, 1964, European (region VI) National Standard Pyrheliometers were compared with the Davos and W.M.O. Standards at Davos, Switzerland. According to this comparison Valentia Pyrheliometer No. 548 was giving results 1·3% too high. Thus the Actinometer data and Solarimeter data (based on Actinometer comparisons) given in this volume would appear to be 0·9% too low. Considering the nature of the data involved this small correction has not been applied.

5.3. Observational Routine

All observations were made at a site about 6 m. South East of the Radiation House (Fig. 2) and at a height of 15·5 m. above M.S.L. Observations were made three times daily, when sky conditions permitted, at approximately 1030, 1230 i.e. at approximately the average time of local noon, and at 1430 GMT. Each of the observations consisted of a double series of measurements in the order: Zero - RG_8 - Total - RG_2 - OG_1 - OG_1 - RG_2 - Total - RG_8 - Zero. Observations were made of the time G.M.T. of each of the individual settings, the temperature at the beginning and end of each set of observations, as indicated by the thermometer attached to the Actinometer, the cloud type and amount, visibility and weather.

5.4. Computation of the Sun's Zenith Distance (Z)

The Sun's Zenith Distance for each time of observation was obtained from a special table prepared for Valentia, based on Tables 5, 6 and 11 as given in Linke's "Meteorologisches Taschenbuch" Vol.IV (Leipzig, 1939 edition) and the "Alt Azimuth Tables, for Latitude Limits 30° to 64°, prepared by P.L.H. Davis and published by H.M. Stationary Office, London (1918 edition). The values are accurate to the nearest tenth of a degree.

5.5. Computation of the Optical Air Mass (m)

The Relative Air Mass (m_h) was obtained from the Sun's Zenith Distance (Z) by using Table 137, page 422 of "Smithsonian Meteorological Tables" (1951 edition). This Table is based on Bemporad's formula:

$$m_h = \frac{\text{Atmospheric refraction in seconds}}{58{\cdot}36 \sin Z}$$

The Optical Air Mass (m) was computed from the formula:

$$m = m_h \frac{P}{1000}$$ where P = the atmospheric pressure in millibars.

6. Notes on the Tables

(1) All the radiation values given in the following Tables are in the International Pyrheliometric Scale, 1956.

(2) When record was missing for any hour due to instrument defects or other cause, an interpolated (estimated) valus has, where possible, been entered in Tables 1 and 2. Such values are shown enclosed in brackets.

(3) In Table 3, the pressure, temperature and vapour pressure data were extracted from the routine meteorological records kept at the station. The cloud types and amounts were recorded by the observer during the Actinometer observations. The amounts of cloud are given in eights of sky covered.

(4) Prior to the 1963 publication the radiation data for the OG_1 and RG_2 filters given in Table 3 were published as observed, i.e. the filter corrections were not applied. As from and including the 1963 publication the data given for all filters have been corrected by means of the filter corrections given in para. 5.1.1. above.

References

[1] Solar Radiation Observations at Valentia Observatory, 1954 - 1959 (Meteorological Service, Department of Transport and Power, Dublin, 1961).

[2] Five Years Continuous Recording of Total and Diffuse Solar Radiation at Kew Observatory - By M. J. Blackwell. (Meteorological Research Committee, Air Ministry, London. M.R.P. No. 895, 1954).

TABLE 1 GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) JANUARY, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1						4	25	54	88	84	63	33	8						359
2						4	13	21	29	25	17	13	4						126
3						8	29	67	88	88	84	50	13						427
4						4	13	38	42	29	25	13	4						168
5						42	42	59	84	75	84	63	13						462
6						8	13	13	8	8	4								54
7						4	17	17	13	8	17	13							89
8						4	17	75	105	63	67	42	8						381
9							4	17	29	13	17	21	8						109
10						8	42	75	92	92	71	42	4						426
11						4	17	29	33	21	13	8	4						129
12						8	13	33	21	25	29	17	4						150
13						13	33	100	67	54	54	29	4						354
14						4	13	21	25	42	29	21	8						163
15						4	17	21	21	84	38	21	4						210
16						13	46	84	63	96	84	59	8						453
17						13	21	13	50	25	13	17	4						156
18						13	21	71	100	96	38	54	17						410
19						13	42	71	54	33	13								226
20							4	4	4	4	4	4	4						28
21						13	13	46	50	46	25	8							201
22						4	21	21	42	42	21	17	13						181
23						13	38	54	54	38	17	8	4						226
24						13	25	46	92	71	46	33	13						339
25						4	17	29	29	29	21	17	4						150
26						4	13	17	17	29	46	33	25						184
27						13	17	33	92	96	71	21	8						351
28					4	21	63	80	113	134	100	80	33	4					632
29					4	17	33	50	67	63	84	38	13	8					377
30						13	25	63	71	80	71	46	8						377
31					8	33	59	71	84	92	54	46	13						460
Total					16	319	766	1393	1727	1685	1320	867	253	12					8358
Mean					0·5	10·3	24·7	44·9	55·7	54·4	42·6	28·0	8·2	0·4					269·6

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) FEBRUARY, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1					4	8	29	54	105	84	75	29	25	4					417
2					4	38	38	80	67	113	117	80	34	4					575
3					4	8	21	38	38	42	63	54	42	4					314
4					8	25	59	113	138	126	84	67	17	4					641
5					4	25	46	50	42	84	142	59	17	4					473
6					4	34	67	67	142	155	105	84	25	4					687
7					4	29	50	84	126	122	109	75	21	4					624
8					8	46	67	84	168	113	80	71	50	4					691
9					4	29	84	134	109	122	109	46	21	4					662
10						4	21	38	46	59	101	75	25	4					373
11					4	13	29	67	96	88	71	50	21	4					443
12					4	21	29	50	63	67	63	34	54	13					398
13					8	46	96	134	159	155	147	113	67	17					942
14					8	71	105	126	184	50	159	84	17	4					808
15					8	63	117	151	172	176	155	126	63	17					1048
16					8	54	84	105	159	134	147	113	63	17					884
17					8	67	122	163	180	180	159	126	75	21					1101
18					8	50	101	138	126	105	80	50	25	8					691
19					4	8	13	8	8	17	29	29	13	4					133
20					4	8	13	17	42	67	63	29	4	4					251
21					4	13	50	29	34	34	17	13	8	4					206
22					4	4	13	13	17	21	29	21	13	4					139
23					4	38	75	126	109	101	105	42	54	13					667
24				4	29	84	88	168	117	188	147	126	75	21	4				1051
25				4	21	75	113	71	101	155	126	63	63	25	4				821
26				4	21	50	29	34	42	63	113	113	75	29	4				577
27					4	8	13	34	50	71	71	50	34	21	4				360
28					13	59	92	180	180	184	163	75	75	29	4				1054
Total				12	208	978	1664	2356	2820	2876	2829	1897	1076	295	20				17031
Mean				0·4	7·4	34·9	59·4	84·1	100·7	102·7	101·0	67·8	38·4	10·5	0·7				608·3

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) MARCH, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1				4	21	54	92	100	146	151	130	100	63	29	4				894
2				4	29	75	134	142	201	184	146	96	50	29	4				1094
3				4	38	71	130	172	209	234	193	151	109	8	4				1323
4				4	29	50	84	163	105	71	101	75	71	29	4				786
5				4	21	54	75	101	138	138	130	113	54	25	4				857
6				8	38	75	113	159	163	163	142	117	67	29	4				1078
7				8	59	121	151	188	205	205	188	155	101	42	8				1431
8				8	29	42	59	67	80	80	75	92	92	38	4				666
9				4	21	29	38	50	96	113	75	59	42	17					544
10				4	13	38	46	29	29	46	71	50	21	29	4				380
11				8	42	71	71	151	155	134	201	142	63	17	4				1059
12				4	17	50	84	88	167	138	109	75	71	17	4				824
13				4	29	59	88	75	54	25	25	25	21	8	4				417
14				13	38	42	38	50	50	92	88	92	59	42	13				617
15				13	29	25	46	109	101	96	67	34	29	17	8				574
16				4	17	50	80	42	17	84	193	50	17	13	8				575
17				13	42	101	80	59	54	50	71	46	21	8	4				549
18				4	13	17	21	29	63	113	67	46	21	13	4				411
19				13	33	54	88	88	109	243	230	167	138	75	21				1259
20				13	33	101	105	130	151	121	105	80	46	21	4				910
21				13	38	88	96	126	109	96	80	46	21	13	8				734
22				13	29	38	63	109	197	222	209	126	59	50	13				1128
23			4	17	63	126	180	218	243	243	209	163	113	67	13				1659
24			4	17	46	113	130	226	243	235	209	180	130	71	21				1625
25			4	21	46	84	239	247	176	230	126	117	63	42	8				1403
26			4	33	75	96	121	159	180	122	101	54	21	21	4				991
27			4	29	84	146	205	243	255	247	226	197	142	80	25				1883
28			4	29	75	92	126	138	92	130	218	172	84	46	17				1223
29			4	17	50	130	180	130	105	172	180	126	117	54	8				1273
30				4	21	25	54	75	92	142	88	167	54	17	4				743
31				13	42	92	109	117	201	268	251	218	176	59	21				1567
Total			28	347	1160	2209	3126	3780	4186	4588	4304	3331	2136	1026	256				30477
Mean			0·9	11·2	37·4	71·3	100·8	121·9	135·0	148·0	138·8	107·5	68·9	33·1	8·3				983·1

TABLE 1 (Contd,) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) APRIL, 1969

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1			4	34	59	142	213	247	280	276	260	222	167	109	46	4			2063
2				34	101	155	222	310	306	126	147	172	180	113	50	4			1920
3			4	46	101	159	222	239	272	259	239	213	167	109	46	4			2080
4			4	34	96	151	205	239	264	255	235	201	151	92	42	4			1973
5			4	29	75	134	188	218	251	251	235	201	147	96	34	4			1867
6			4	46	105	163	214	247	272	272	247	213	163	92	38	4			2080
7			4	21	42	80	126	172	222	247	142	188	147	101	42	8			1542
8			4	13	42	54	71	92	96	146	84	121	113	67	34	4			941
9				8	25	42	92	146	230	113	117	138	105	42	13	4			1075
10			4	21	63	117	205	201	251	167	155	126	88	67	29	4			1498
11				8	21	71	134	201	88	146	180	146	67	38	29	4			1133
12			4	38	88	96	109	142	314	314	297	239	138	84	50	4			1917
13			13	59	88	113	84	96	63	92	59	34	54	38	17				810
14				4	29	63	50	71	113	54	50	46	21	29	21	13			564
15				4	13	71	138	222	230	259	272	239	197	75	59	4			1783
16			4	17	42	46	46	50	42	42	34	42	50	21	13				449
17			8	21	38	88	113	142	247	243	289	209	130	75	34	4			1641
18			13	34	59	113	209	251	146	155	188	117	101	71	63	8			1528
19					13	50	197	105	142	126	134	138	92	54	50	17			1118
20			17	63	109	142	134	67	75	126	96	67	42	29	13				980
21			8	13	29	75	105	138	113	71	109	226	205	105	59	8			1264
22			8	13	34	29	100	272	209	335	251	259	126	59	50	13			1758
23			17	80	80	80	96	71	34	67	54	42	46	38	29	17			751
24			13	13	34	84	138	188	71	205	234	259	218	117	38	25			1637
25			25	63	101	88	167	138	239	352	314	134	172	167	88	25			2073
26			17	50	80	92	113	306	259	264	314	289	230	184	42	13			2253
27			17	50	80	84	176	222	268	264	280	193	167	80	25	25			1931
28			8	29	71	101	184	234	184	306	163	289	235	155	50	21			2030
29			32	88	151	255	272	197	105	105	113	218	63	38	46	32	4		1719
30			32	88	130	92	42	29	54	142	180	210	176	163	84	29			1451
Total			268	1021	1999	3030	4365	5253	5440	5780	5472	5191	3958	2508	1234	306	4		45829
Mean			8·9	34·0	66·6	101·0	145·5	175·1	181·3	192·7	182·4	173·0	131·9	83·6	41·1	10·2	0·1		1527·6

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) MAY, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for day
Day 1		4	34	88	80	218	268	209	126	109	75	63	80	109	75	29	4		1571
2		4	13	42	80	167	201	134	126	75	117	126	17	17	17	4			1140
3		4	17	42	134	205	264	314	339	310	285	243	197	134	67	21	4		2580
4		4	29	46	151	230	285	318	322	339	310	268	209	155	96	34	4		2800
5		4	17	42	146	105	180	151	88	117	105	71	42	54	42	13	4		1181
6		4	29	63	71	84	84	71	38	71	29	84	84	84	109	42	4		951
7		4	21	63	84	180	293	306	323	343	247	243	209	142	96	38	4		2596
8		4	17	96	63	92	268	306	323	184	180	163	213	155	109	34	4		2211
9		4	25	88	151	209	230	239	222	126	142	151	92	80	42	13	4		1818
10			8	21	50	113	163	151	188	251	209	243	201	151	121	25	4		1899
11		4	13	17	71	121	180	230	172	293	310	209	247	184	142	25	4		2222
12		4	8	8	17	38	67	167	251	113	126	84	105	67	50	8	4		1117
13		4	21	80	54	63	84	197	201	163	113	71	59	38	38	8	4		1198
14		8	25	63	71	180	264	130	230	347	251	218	239	117	121	42	8		2314
15		4	17	71	134	88	176	218	109	335	117	151	251	193	46	17	8		1935
16		8	25	92	193	230	201	163	234	343	331	226	243	146	42	21	4		2502
17		4	21	46	63	96	126	167	184	210	335	331	264	201	138	59	8		2253
18		8	34	67	109	117	121	122	155	285	251	251	251	172	117	54	8		2122
19		4	21	25	38	84	226	280	268	264	280	293	176	138	50	17	4		2168
20		4	8	13	21	42	42	63	193	335	318	268	239	142	117	50	8		1863
21		8	54	50	151	134	197	251	239	230	255	184	71	38	50	29	4		1945
22		4	4	21	34	38	54	172	163	138	138	54	101	134	63	29	8		1155
23			8	17	21	25	29	38	38	25	25	71	25	54	34	17	8		435
24		4	25	42	126	130	105	163	243	188	88	71	34	25	25	8	4		1281
25		4	8	17	34	84	168	172	335	368	352	339	222	146	75	67	13		2404
26		8	29	113	80	218	293	306	335	331	348	318	247	188	134	54	13		3015
27		8	21	54	146	230	293	343	306	251	151	113	96	100	59	59	17		2247
28		17	54	71	80	38	42	159	180	176	168	71	146	84	42	38	8		1374
29		8	38	88	92	84	54	29	46	113	126	101	63	50	105	59	17	4	1077
30		8	21	17	25	38	38	34	25	29	38	113	134	109	146	71	17	4	867
31		8	38	67	92	159	205	230	234	259	276	259	259	209	142	71	8		2516
Total		165	703	1630	2662	3840	5201	5833	6236	6721	6096	5451	4816	3616	2510	1056	213		56757
Mean		5·3	22·7	52·6	85·9	123·9	167·8	188·2	201·2	216·8	196·6	175·8	155·4	116·6	81·0	34·1	6·9	0·3	1830·9

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) JUNE, 1969

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1		8	34	71	205	255	306	326	280	339	322	276	251	155	54	38	13	4	2937
2	4	4	8	25	29	34	50	59	46	50	50	63	42	25	13	17	8	4	531
3	4	13	21	29	29	46	100	105	218	205	310	306	285	222	109	38	17	4	2061
4	4	25	80	92	126	151	130	142	88	142	180	146	88	63	88	38	4	4	1591
5	4	29	75	126	159	230	268	293	314	146	222	243	109	54	54	25	8	4	2363
6	4	13	25	50	80	92	117	138	146	209	188	247	176	172	122	59	21	4	1863
7	4	17	34	63	138	180	176	343	326	310	301	251	117	142	109	42	17	4	2574
8		17	42	96	159	209	264	318	218	318	293	260	222	159	113	54	17		2759
9	4	13	25	100	134	126	84	126	96	188	163	163	146	117	96	54	25	4	1664
10	4	13	38	96	138	193	226	306	293	184	272	255	222	180	122	59	17	4	2622
11	4	17	63	117	176	226	264	297	310	306	297	272	230	180	117	63	17	4	2960
12	4	21	63	117	172	226	264	297	314	314	297	268	230	172	109	54	8	4	2934
13		4	17	34	42	50	138	113	251	302	239	209	243	197	134	42	13	4	2032
14		4	13	50	71	122	159	159	268	255	205	222	213	167	63	21	8		2000
15		4	8	38	50	59	92	180	360	356	339	272	180	167	134	80	29	4	2352
16	4	13	21	71	142	113	117	109	193	306	272	230	259	180	121	42	13	4	2210
17		4	17	38	59	134	88	117	113	180	193	138	184	113	121	84	13	4	1600
18		13	46	63	121	209	259	197	172	117	126	92	134	113	38	29	8		1737
19		8	21	34	34	84	63	101	126	105	92	96	84	25	13	8	4		898
20		13	38	67	126	243	297	331	347	360	335	293	276	201	13	63	17	4	3024
21		8	84	38	42	50	75	80	59	63	71	88	54	34	21	29	17		813
22		4	31	50	100	121	176	322	230	360	218	255	88	109	100	75	25		2264
23		8	50	80	84	134	122	167	188	193	176	268	259	184	100	54	13		2080
24		13	38	42	100	67	109	130	134	80	96	100	142	117	121	54	21		1364
25		8	25	92	171	96	126	213	172	146	122	63	63	50	21	8	4		1380
26		4	8	17	17	21	54	80	159	176	326	301	280	218	146	71	21	4	1903
27		4	34	67	155	226	222	251	243	239	276	306	251	167	121	63	17	4	2646
28	4	21	50	109	142	109	147	151	151	180	151	142	172	80	59	25	4		1697
29		4	25	42	71	96	105	92	122	88	80	80	117	176	117	46	8		1269
30		4	17	25	25	46	59	134	122	113	96	100	92	75	121	54	4		1087
Total	48	331	1051	1939	3097	3948	4657	5677	6059	6330	6308	6005	5209	4014	2670	1389	411	72	59215
Mean	1·6	11·0	35·0	64·6	103·2	131·6	155·2	189·2	202·0	211·0	210·3	200·2	173·6	133·8	89·0	46·3	13·7	2·4	1973·8

TABLE 1 (Contd.) GLOBAL SOLAR RADOATION - MEAN HOURLY VALUES (J/cm^2) JULY, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1		4	13	54	46	59	75	75	84	105	63	63	42	29	21	17	8		758
2			8	17	42	29	54	50	88	142	243	268	197	126	130	71	17		1482
3		21	63	113	172	230	259	297	289	306	314	285	243	188	134	46	13		2973
4		4	8	17	42	96	38	29	29	38	42	46	71	59	42	25	4		590
5		4	17	50	75	130	159	151	213	264	314	306	255	100	54	21	8		2121
6		4	13	29	59	134	285	151	247	176	172	184	176	80	63	34	17		1824
7		17	38	54	63	134	109	209	163	167	272	180	117	109	50	17	4		1703
8		4	13	29	29	59	92	117	134	201	251	197	247	176	134	46	8		1737
9		8	25	29	21	59	96	201	205	126	101	92	75	34	21	8	4		1105
10		4	21	42	96	180	230	226	209	243	264	138	117	96	80	29	8		1983
11		8	25	50	109	159	172	193	209	151	151	113	92	88	59	29	8		1616
12		8	25	50	100	96	146	126	193	197	243	155	146	59	34	17	4		1599
13		4	25	59	100	134	180	301	322	322	251	268	230	180	121	63	17		2577
14		21	67	126	184	234	276	301	314	318	306	272	243	180	113	38	4		2997
15		13	59	113	176	222	260	293	301	285	234	134	117	167	75	38	8		2495
16			8	34	46	63	117	109	138	331	310	226	167	126	92	46	13		1826
17		8	42	63	134	184	218	226	243	193	168	205	176	96	59	38	4		2057
18		4	8	8	8	13	17	21	21	29	25	21	25	17	17	4			238
19			8	25	42	75	134	130	142	155	155	146	134	105	92	34	4		1381
20		4	13	38	46	67	109	146	109	88	54	84	75	42	29	17	4		925
21		8	38	42	71	63	67	42	38	25	38	34	21	21	8	4			520
22			8	21	17	21	25	21	42	42	21	25	21	21	21	17	8		331
23		4	21	21	92	109	155	159	230	213	243	142	239	176	113	54	8		1979
24		13	54	109	167	230	272	310	314	301	301	293	226	167	105	54	4		2920
25		8	25	42	109	134	142	146	159	109	126	17	13	8	4				1042
26			8	67	167	151	234	289	234	310	301	251	188	134	109	50	8		2501
27		4	34	29	63	167	176	184	247	352	335	176	109	50	13	8			1947
28		4	17	50	42	92	142	197	197	251	310	285	239	180	109	50	8		2173
29		4	17	50	84	218	167	213	234	301	230	159	126	130	92	50	13		2088
30		8	13	46	96	96	75	80	180	259	193	159	75	42	21	13	4		1360
31		5	31	53	147	144	147	125	162	192	123	175	104	89	39	14	4		1554
Total		196	765	1530	2645	3782	4628	5118	5690	6192	6154	5099	4306	3075	2054	952	214		52402
Mean		6·4	24·7	49·4	85·3	122·0	149·3	165·1	183·5	199·7	198·5	164·5	138·9	99·2	66·3	30·7	6·9		1690·4

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION -MEAN HOURLY VALUES (J/cm^2) AUGUST, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1			4	8	13	21	34	84	92	126	146	126	218	176	75	38	4		1165
2		4	13	75	167	230	264	301	331	180	251	280	222	167	105	42	4		2636
3			8	21	34	46	67	100	80	54	96	130	54	42	29	8	4		773
4		4	21	75	113	146	96	293	176	213	209	176	142	126	96	21	4		1911
5		4	17	54	88	92	280	197	276	343	280	117	205	147	50	25	4		2179
6		4	13	34	67	109	121	159	193	151	117	100	96	54	38	4			1260
7			4	8	13	17	21	38	54	50	63	34	25	17	8				352
8			13	38	71	80	92	226	247	322	285	205	176	63	34	29	4		1885
9		4	25	50	92	100	75	130	109	109	88	75	50	63	46	21	4		1041
10			8	21	38	67	105	109	96	151	96	84	63	42	21	4			905
11			8	63	88	96	113	117	121	134	126	172	180	46	75	38	4		1381
12		4	21	29	63	138	142	184	167	159	234	239	180	84	46	13			1703
13		4	8	92	105	96	268	234	117	176	347	222	113	80	46	17			1925
14		4	13	34	117	159	147	184	335	347	314	222	159	63	38	13			2149
15		4	13	25	71	117	155	272	306	297	289	230	193	138	71	21			2202
16		4	21	67	117	205	239	280	289	285	272	243	193	138	84	21			2458
17			8	34	63	59	63	54	42	21	59	50	29	8	8	4			502
18			4	21	59	159	213	264	293	293	276	259	146	117	50	8			2162
19			17	25	71	88	126	167	167	167	276	259	222	130	84	13			1812
20			8	42	117	146	159	163	176	193	176	130	113	63	54	13			1553
21			8	25	63	96	126	172	163	297	163	230	159	138	71	13			1724
22			13	29	63	117	142	163	268	126	126	134	130	88	54	8			1461
23			8	34	59	67	147	168	151	230	264	235	151	80	46	13			1673
24				8	13	21	34	38	63	54	54	46	50	34	13	4			432
25			8	34	88	176	239	272	264	272	293	251	75	50	34	8			2064
26				13	25	34	42	50	54	38	34	38	42	25	13	4			412
27				4	13	17	46	59	50	46	46	38	25	25	13				382
28			4	25	38	75	113	126	96	84	105	134	75	29	8				912
29			4	21	59	96	151	113	180	117	251	184	142	121	54	8			1501
30			4	50	96	163	210	243	234	255	251	205	155	130	75	4			2075
31			4	42	84	163	138	230	234	159	134	92	54	25	8				1367
Total		40	300	1101	2168	3196	4168	5210	5424	5449	5721	4940	3837	2509	1447	415	32		45957
Mean		1·3	9·7	35·5	69·9	103·1	134·5	168·1	175·0	175·8	184·5	159·4	123·8	80·9	46·7	13·4	1·0		1482·5

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) SEPTEMBER, 1969

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1			8	42	121	180	188	331	322	247	264	234	117	46	25	8			2133
2			8	42	80	159	197	138	113	176	197	180	92	96	42	4			1524
3			4	29	96	159	209	243	259	264	243	218	172	117	54	13			2080
4			8	25	38	88	122	176	264	260	247	205	176	105	54	8			1776
5			4	21	54	59	80	96	105	121	100	122	138	54	17	4			975
6			8	29	67	121	134	163	138	142	105	88	67	50	25	4			1141
7			4	13	29	59	96	151	126	100	109	113	142	105	38	4			1089
8			8	25	50	84	121	134	100	71	71	71	46	38	8	4			831
9			4	13	29	42	38	46	59	50	42	29	17	17	4				390
10			4	13	54	96	100	84	117	134	84	29	34	38	13	4			804
11			4	29	92	155	209	84	105	84	130	96	172	50	13	4			1227
12			4	21	38	84	218	247	264	167	146	88	84	59	17	4			1441
13			4	21	59	138	134	130	130	109	163	92	59	42	21	4			1106
14			4	29	88	151	201	230	222	113	105	71	80	29	8				1331
15				8	54	84	71	88	46	50	29	63	13	13	4				523
16				4	8	4	13	13	8	4	17	8	8	17	8				112
17				13	34	80	100	130	109	151	80	63	46	25	8				839
18				8	46	134	163	142	126	92	142	126	75	88	25	4			1171
19				13	29	67	59	88	130	184	213	172	126	71	13				1165
20				4	13	25	46	59	88	67	34	29	17	8	4				394
21				4	13	17	34	50	80	88	80	88	46	13	4				517
22				8	38	80	126	109	268	297	239	209	105	46	17				1542
23				4	21	54	63	75	92	117	130	146	155	54	17				928
24				4	17	63	134	209	193	92	21	21	29	34	13				830
25				8	29	84	105	109	163	121	92	63	54	63	13				904
26				4	17	25	50	50	59	75	84	50	29	8	4				455
27				13	46	109	122	155	222	230	201	167	92	63	13				1433
28				4	8	13	29	42	71	109	188	84	54	42	8				652
29				8	50	96	122	59	134	126	113	134	84	46	13				985
30				8	29	54	134	109	142	155	138	100	50	38	4				961
Total			76	467	1347	2564	3418	3740	4255	3996	3807	3159	2379	1475	507	69			31259
Mean			2·5	15·6	44·9	85·5	113·9	124·7	141·8	133·2	126·9	105·3	79·3	49·2	16·9	2·3			1042·0

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) OCTOBER, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1				13	42	71	100	117	84	126	146	84	113	25	8				929
2				4	34	71	75	100	54	92	67	34	70	13	4				618
3				4	13	38	63	84	84	80	117	63	38	25	4				613
4				4	17	50	80	117	126	122	92	38	29	13	4				692
5					4	17	17	34	21	8	8	13	54	29	8				213
6				4	34	105	126	142	138	109	130	92	46	13	4				943
7					38	50	88	172	134	117	134	100	59	13	4				909
8					4	8	25	29	38	38	29	25	13	4					213
9					8	13	38	59	80	100	88	63	50	17	4				520
10				4	21	80	122	151	172	176	163	126	84	38	4				1141
11				4	29	71	138	142	176	184	159	130	84	34	4				1155
12				4	13	8	8	50	92	84	122	92	42	8	4				527
13				4	17	59	63	75	67	34	13	13	8	4					357
14				4	8	42	67	105	155	163	100	67	67	8					786
15					4	13	21	34	42	21	34	21	13	4					207
16					4	8	8	13	17	25	17	17	8	4					121
17					4	8	13	42	63	54	34	21	8	4					251
18					4	4	4	21	34	38	59	37	21	8					230
19					13	38	46	67	34	84	92	71	46	8					499
20					8	8	13	59	84	138	71	25	17	4					427
21					4	25	63	130	159	126	121	92	54	13					787
22					8	29	54	42	42	38	34	80	71	13					411
23					4	4	8	13	29	25	109	105	29	13					339
24					8	42	75	71	71	54	42	34	29	4					430
25					4	8	17	25	42	29	25	29	13	4					196
26					8	34	34	67	80	54	42	29	13	4					365
27					8	29	54	59	84	75	67	54	17	4					451
28						8	25	46	42	50	38	42	21	4					276
29					8	46	96	134	155	155	138	109	63	17					921
30					4	25	42	54	63	59	59	63	25	4					398
31					4	13	17	21	34	42	42	59	13	4					249
Total				49	379	1025	1600	2275	2496	2500	2392	1828	1218	360	52				16174
Mean				1·6	12·2	33·1	51·6	73·4	80·5	80·6	77·2	59·0	39·3	11·6	1·7				521·7

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) NOVEMBER, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1					8	25	50	54	84	63	29	13	4						330
2					4	8	25	29	59	54	34	38	8						259
3					4	17	17	29	17	21	21	8	8						142
4					4	21	50	80	88	92	54	42	13	4					448
5					4	34	59	67	67	63	50	46	25	4					419
6					4	13	34	46	46	42	34	25	17	4					265
7					4	34	50	29	21	8	8	13	8	4					179
8					4	13	50	71	105	92	63	29	8						435
9					4	17	42	59	80	100	54	38	42	8					444
10					4	13	25	29	42	50	46	21	8						238
11						4	17	34	46	34	17	13	25	4					194
12					4	17	50	42	50	54	80	34	29						360
13					4	21	54	113	146	88	29	46	17						518
14					4	13	29	67	96	113	105	75	21						523
15					4	29	71	71	100	84	59	46	13						477
16						17	25	29	46	96	59	54	13						339
17						13	38	100	88	134	84	50	29	4					540
18						8	17	21	8	13	8	4							79
19						13	25	29	50	29	34	29	13						222
20						13	34	54	46	50	29	21	8						255
21						8	54	67	117	75	46	63	21						451
22						8	17	34	54	59	29	13	17						231
23						8	34	50	50	59	34	21	13						269
24						8	50	92	109	92	71	54	17						493
25						8	29	46	71	63	50	29	21						317
26						13	50	46	50	38	46	25	4						272
27						13	34	46	63	96	38	17	13						320
28						4	25	50	67	46	46	21	8						267
29						8	42	67	50	59	42	25	13						306
30						8	21	34	42	54	42	46	8						255
Total					60	429	1118	1585	1958	1921	1341	959	444	32					9847
Mean					2·0	14·3	37·3	52·8	65·3	64·0	44·7	32·0	14·8	1·1					328·2

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) DECEMBER, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1						4	8	42	50	29	42	25	8						208
2						4	25	21	29	17	13	8	4						121
3						4	8	17	25	17	17	13	4						105
4						8	25	59	67	92	50	54	4						359
5						4	13	21	21	17	17	13	8						114
6						4	13	21	34	34	34	25	4						169
7						8	17	29	25	21	17	8	4						129
8						4	25	29	29	29	29	17	4						166
9						8	17	29	38	54	34	17	8						205
10						4	17	29	34	42	21	8	4						159
11						13	42	34	88	88	54	29	4						352
12						13	34	71	84	88	59	21	4						374
13						4	8	13	17	17	13	13	4						89
14						8	29	38	50	67	38	21	8						259
15						8	29	46	46	34	46	34	8						251
16						4	8	13	17	17	13	8	4						84
17						8	34	59	46	34	21	25	8						235
18						8	25	38	25	50	25	8	4						183
19						8	13	54	80	63	59	29	8						314
20						4	8	13	17	21	8	4	4						79
21						4	17	13	8	29	34	17	4						126
22						8	29	42	50	67	54	13	4						267
23						8	25	42	54	42	54	25	4						254
24						8	21	59	80	59	71	38	8						344
25						8	13	46	46	54	42	34	8						251
26						13	34	71	75	88	75	46	13						415
27						8	17	29	42	46	38	21	8						209
28						8	17	42	50	67	57	29	8						278
29								8	21	25	13	13	4						84
30						8	25	63	80	80	59	29	17						361
31						8	25	38	50	67	29	21	8						246
Total						211	621	1129	1378	1455	1136	666	194						6790
Mean						6·8	20·0	36·4	44·5	46·9	36·6	21·5	6·3						219·0

TABLE 2 DIFFUSE SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) JANUARY, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1						4	25	38	27	28	28	21	8						179
2						4	13	21	29	25	17	13	4						126
3						8	15	28	30	40	36	21	9						187
4						4	13	38	42	28	25	13	4						167
5						42	36	54	57	46	37	25	6						303
6						2	13	13	8	8	4								48
7						4	17	17	13	8	17	9							85
8						4	16	44	65	43	37	28	8						245
9							4	17	29	13	17	21	8						109
10						6	12	15	20	32	23	15	4						127
11						4	17	29	34	21	13	8	4						130
12						8	13	34	18	25	29	17	4						148
13						13	29	61	50	54	54	27	4						292
14						2	13	21	25	42	29	21	8						161
15						4	17	21	21	60	26	19	4						172
16						9	18	28	27	38	26	29	8						183
17						13	21	13	45	25	13	17	4						151
18						13	21	35	39	51	38	26	9						232
19						13	34	50	46	34	13								190
20							4	4	4	4	4	4	4						28
21						13	13	46	50	46	25	8							201
22						4	21	21	42	42	21	17	13						181
23						13	38	54	54	38	17	8	4						226
24						9	23	46	67	61	46	34	13						299
25						4	17	29	29	29	21	17	4						150
26						4	13	17	17	29	46	34	15						175
27						13	17	27	31	61	59	21	8						237
28					4	13	24	42	26	45	45	26	13	2					240
29					4	17	22	54	56	45	44	30	13	8					293
30						13	25	57	62	69	60	36	8						330
31					8	15	35	59	79	47	53	46	13						355
Total					16	275	599	1033	1142	1137	923	611	204	10					5950
Mean					0·5	8·9	19·3	33·3	36·8	36·7	29·8	19·7	6·6	0·3					191·9

TABLE 2 (Contd.) DIFFUSE SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) FEBRUARY, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1					4	5	29	44	64	50	50	25	17	2					290
2					2	25	29	61	50	47	29	28	15	3					289
3					1	8	18	34	38	41	62	54	23	4					283
4					5	19	36	28	31	63	60	45	17	4					308
5					2	17	36	39	41	68	43	36	17	4					303
6					2	25	32	51	33	42	47	31	18	3					284
7					2	17	26	52	59	57	62	44	21	4					344
8					8	32	39	48	56	61	50	22	33	4					353
9					4	22	35	28	69	73	66	46	21	4					368
10						4	20	38	46	59	77	61	25	4					334
11					1	9	27	67	83	82	71	49	21	4					414
12					3	20	29	50	62	61	55	26	23	10					339
13					7	17	26	30	30	35	32	27	18	7					229
14					8	27	46	42	61	28	59	57	14	4					346
15					8	17	23	26	26	26	25	22	17	10					200
16					7	35	70	66	79	36	33	28	17	7					378
17					5	11	16	18	22	22	25	25	17	9					170
18					8	26	28	39	48	78	75	50	25	8					385
19					3	8	13	8	8	17	29	29	13	4					132
20					4	8	13	17	42	67	63	29	4	4					251
21					3	13	50	24	34	34	16	13	8	4					199
22					4	4	9	13	17	21	29	21	13	4					135
23					4	28	37	63	73	73	70	42	36	12					438
24					10	33	59	39	50	54	39	28	23	13					348
25				1	18	42	78	69	91	79	74	50	53	25	1				581
26				1	13	35	23	32	41	62	91	64	35	16	1				414
27					2	8	13	27	50	71	71	50	34	14	1				341
28					13	46	53	54	68	59	74	69	35	19	2				492
Total				2	151	561	913	1107	1372	1466	1477	1071	613	210	5				8948
Mean				0·1	5·4	20·0	32·6	39·5	49·0	52·4	52·7	38·2	21·9	7·5	0·2				319·6

TABLE 2 (Contd.) DIFFUSE SOLAR RADIATION -MEAN HOURLY VALUES (J/cm^2) MARCH, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1				2	18	38	68	93	106	78	73	63	42	21	3				605
2				3	18	35	54	66	82	72	92	54	50	29	4				559
3				4	30	44	52	53	68	101	73	94	73	8	4				604
4				2	18	31	46	86	90	71	71	58	41	19	1				534
5				2	19	54	75	101	120	120	102	85	53	23	3				757
6				3	30	56	84	97	103	91	75	64	40	23	2				668
7				7	25	40	34	37	46	47	48	40	36	20	4				384
8				4	29	42	59	67	80	80	69	59	47	25	4				565
9				3	20	29	38	50	96	113	75	59	42	17					542
10				4	13	38	46	29	29	46	71	50	21	29	4				380
11				8	42	56	66	115	123	117	94	61	63	17	4				766
12				2	17	50	84	88	97	109	109	71	71	17	4				719
13				4	29	59	88	75	54	25	25	25	21	8	1				414
14				4	22	40	32	50	50	92	80	85	59	42	11				567
15				13	29	25	43	96	96	96	67	34	29	17	8				553
16				4	9	42	65	40	16	81	117	47	15	10	4				450
17				11	40	85	68	59	54	49	71	46	21	8	4				516
18				1	12	17	21	29	63	113	67	46	21	13	4				407
19				10	34	54	87	79	89	58	51	54	28	21	12				577
20				9	30	80	87	117	126	122	105	80	46	21	4				827
21				12	36	88	96	126	109	96	79	42	21	13	9				727
22				12	29	38	63	103	123	105	104	83	53	43	12				768
23			1	15	32	49	61	73	75	78	86	68	64	47	11				660
24			1	16	46	93	111	113	81	78	76	76	56	38	14				799
25			1	18	43	66	80	77	101	90	98	82	63	41	8				768
26			1	24	44	85	102	90	104	107	101	54	21	21	4				758
27			1	15	28	37	43	47	49	56	54	55	46	34	17				482
28			2	16	51	87	105	138	92	113	79	104	83	40	17				927
29			1	12	44	94	115	115	105	102	96	105	90	40	2				921
30				4	21	25	54	75	92	142	88	118	54	17	4				694
31				13	42	92	105	102	101	73	67	63	48	46	21				773
Total			8	257	900	1669	2132	2486	2620	2721	2463	2025	1418	768	204				19671
Mean			0·3	8·3	29·0	53·8	68·8	80·2	84·5	87·8	79·5	65·3	45·7	24·8	6·6				634·5

TABLE 2 (Contd.) DIFFUSE SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) APRIL, 1971.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1			4	17	35	40	41	61	52	47	42	44	29	25	16	3			456
2				17	26	28	47	106	80	100	74	92	72	44	24	4			714
3			4	27	33	34	72	72	59	67	54	42	39	31	29	4			567
4			4	19	29	37	40	44	48	58	63	65	51	37	21	4			520
5			4	19	36	49	61	67	63	63	58	55	52	40	24	4			595
6			4	19	28	35	44	54	65	77	74	67	70	40	23	4			604
7			4	21	42	80	97	111	111	116	114	90	67	48	25	7			933
8			4	13	42	54	71	92	96	138	84	105	89	67	34	4			893
9				8	25	42	85	127	130	113	117	102	80	42	13	4			888
10			3	21	58	66	117	146	127	135	126	126	87	63	25	3			1103
11				8	21	71	96	121	88	107	118	99	67	38	28	4			866
12			4	30	48	82	109	133	121	86	84	115	94	48	28	4			986
13			9	34	71	100	84	96	63	92	59	34	54	38	17				751
14				4	29	63	50	71	113	54	50	46	21	29	21	13			564
15				4	13	71	129	104	108	82	57	44	41	41	24	4			722
16			4	17	42	46	46	50	42	42	34	42	50	21	13				449
17			8	21	38	88	113	123	122	151	78	114	107	69	34	4			1070
18			13	34	59	92	113	109	126	124	133	116	101	71	63	8			1162
19					13	50	115	98	122	119	118	137	92	54	41	12			971
20			11	41	87	96	89	67	75	126	96	67	42	29	13				839
21			8	13	29	75	105	130	113	71	109	111	72	68	34	8			946
22			8	13	34	29	101	123	110	117	124	90	85	59	34	13			940
23			17	49	80	80	96	71	34	67	54	42	46	38	29	17			720
24			13	13	34	70	99	122	96	138	104	96	74	67	35	21			982
25			17	48	50	67	93	85	107	119	122	107	95	78	55	21			1064
26			17	50	59	79	82	83	103	83	78	85	71	103	42	13			948
27			17	50	76	84	103	91	142	140	117	116	96	71	25	25			1153
28			8	29	71	101	100	114	125	116	99	117	96	59	41	18			1094
29			18	29	41	91	91	94	105	105	113	110	63	38	46	32	4		980
30			23	30	47	84	42	29	54	123	148	110	87	59	51	24			911
Total			226	698	1296	1984	2531	2794	2800	2976	2701	2586	2090	1515	908	282	4		25391
Mean			7·5	23·3	43·2	66·1	84·4	93·1	93·3	99·2	90·0	86·2	69·7	50·5	30·3	9·4	0·1		846·4

TABLE 2 (Contd.) DIFFUSE SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) MAY, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1		4	19	37	71	71	68	98	97	109	75	63	80	73	50	20	4		939
2		4	13	42	80	121	124	129	116	75	100	103	17	17	17	4			962
3		4	17	35	68	81	112	127	144	122	109	98	90	77	47	20	4		1155
4		4	29	46	60	66	70	70	54	75	60	48	43	40	36	19	4		724
5		4	17	42	103	97	135	132	88	117	105	71	42	54	42	13	4		1066
6		4	29	63	71	84	84	71	38	71	29	84	84	71	65	34	4		886
7		4	21	54	61	69	62	62	54	97	113	90	79	71	49	25	4		915
8		4	17	54	63	75	73	68	70	145	180	131	40	65	40	16	2		1043
9		4	25	35	49	65	79	115	115	118	142	139	86	80	42	13	4		1111
10			8	21	50	91	125	128	157	144	150	132	124	104	85	22	4		1345
11		2	13	17	71	122	79	118	130	123	117	147	77	57	85	24	4		1186
12		3	8	8	17	38	67	168	151	113	126	84	105	67	50	8	4		1017
13		2	21	46	54	63	84	173	168	163	113	71	59	38	38	5	4		1102
14		5	25	63	63	69	89	109	113	116	125	121	99	74	53	28	6		1158
15		2	17	40	74	77	79	123	81	94	82	123	102	77	46	15	8		1040
16		4	23	36	69	65	104	139	121	69	83	114	94	73	42	21	4		1061
17		4	21	46	63	96	126	150	145	94	85	98	67	51	43	29	7		1125
18		8	22	45	45	110	114	111	147	141	123	101	57	51	29	20	7		1131
19		2	21	25	38	84	132	126	143	168	168	145	29	85	50	17	4		1237
20			8	13	21	42	42	63	122	101	74	51	69	79	47	27	7		766
21		7	31	50	95	115	144	161	181	170	190	151	71	38	50	25	4		1483
22			4	21	34	38	54	170	165	138	138	54	95	94	55	29	6		1095
23			8	17	21	25	29	38	38	25	25	71	25	54	30	11	3		420
24		4	25	40	88	130	105	145	188	165	88	71	34	25	25	8	1		1142
25		4	8	17	34	84	168	172	159	85	104	104	118	85	57	35	12		1246
26		8	29	46	63	78	79	126	116	130	84	92	78	51	45	28	10		1063
27		6	21	51	95	103	104	104	128	169	132	112	96	101	48	48	17		1335
28		14	38	64	69	35	39	143	120	144	121	71	104	82	42	26	8		1120
29		8	20	45	80	84	54	29	46	113	126	101	63	50	68	35	12		934
30		8	21	17	25	38	38	34	25	29	38	113	105	91	61	35	17	1	696
31		8	38	67	86	93	147	200	180	133	196	163	89	51	49	33	8		1541
Total		135	617	1203	1881	2409	2809	3602	3600	3556	3401	3117	2321	2026	1486	693	187	1	33044
Mean		4·4	19·9	38·8	60·7	77·7	90·6	116·2	116·1	114·7	109·7	100·5	74·9	65·4	47·9	22·4	6·0	0·0	1065·9

TABLE 2 (Contd.) DIFFUSE SOLAR RADIATION -MEAN HOURLY VALUES (J/cm^2) JUNE, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1		8	34	71	83	65	71	95	189	66	76	71	71	68	54	38	13	4	1077
2		2	8	25	29	34	50	59	46	50	50	63	42	25	13	17	8		521
3		13	21	29	29	46	101	105	157	161	111	88	92	68	61	34	10		1126
4	1	12	25	67	118	124	130	129	88	142	146	136	88	63	88	38	4	4	1403
5	2	24	48	74	86	89	100	123	143	147	167	166	109	54	54	25	8	4	1423
6	4	13	25	50	80	92	117	138	147	210	173	165	140	113	66	44	21	2	1600
7	4	17	34	63	121	106	90	124	81	85	81	134	117	92	63	34	17	2	1265
8		17	40	60	75	81	102	124	120	107	93	96	100	81	56	33	17		1202
9	2	13	25	72	94	116	84	126	96	188	163	142	103	94	68	41	25	1	1453
10	1	13	38	72	83	101	121	126	133	141	97	111	71	44	38	25	15	2	1232
11	2	15	29	39	48	56	66	69	72	79	67	59	65	66	45	33	17	1	828
12	1	16	31	43	52	62	73	83	80	75	80	80	82	71	52	38	8	4	931
13		4	17	34	42	50	138	113	199	149	160	151	52	80	86	42	18	4	1334
14		4	13	50	71	114	145	149	182	154	157	112	87	84	62	21	8		1413
15		4	8	38	50	59	92	140	112	66	80	123	108	87	76	47	17	1	1108
16	1	13	21	48	91	99	117	109	155	116	127	126	80	78	60	35	13	4	1293
17		4	17	38	59	96	88	117	113	154	131	118	80	96	71	40	13	1	1236
18		13	37	53	78	89	118	162	168	117	126	92	134	98	38	29	8		1360
19		8	21	34	34	84	63	101	126	105	92	96	84	25	13	8	4		898
20		13	35	53	73	73	71	87	69	72	119	80	71	72	55	46	17	4	1010
21		8	41	38	42	50	75	80	59	63	71	88	54	34	21	29	7		760
22		4	31	50	76	98	138	125	164	129	140	143	94	106	82	48	15		1443
23		8	33	74	84	134	122	146	166	152	141	131	120	89	73	45	12	1	1531
24		13	38	42	101	67	109	130	134	80	96	101	123	90	57	37	21		1239
25		8	25	49	94	96	126	190	172	147	122	63	63	50	21	8	4		1238
26		4	8	17	17	21	54	80	159	120	123	106	96	75	56	41	17	4	998
27		4	34	67	72	85	97	174	210	203	172	94	85	80	53	33	17	4	1484
28	1	21	42	47	86	104	140	151	151	171	142	135	140	80	59	25	4		1499
29		4	25	42	71	96	105	92	122	88	80	80	113	119	73	34	8		1152
30		4	17	25	25	46	59	134	122	113	96	101	92	75	69	41	4		1023
Total	19	304	821	1464	2064	2433	2962	3581	3935	3650	3479	3251	2756	2257	1683	1009	365	47	36080
Mean	0·6	10·1	27·4	48·8	68·8	81·1	98·7	119·4	131·2	121·7	116·0	108·4	91·9	75·2	56·1	33·6	12·2	1·6	1202·7

TABLE 2 (Contd.) DIFFUSE SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) JULY, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1		4	13	54	46	59	75	75	84	105	63	63	42	29	21	17	8		758
2			8	17	42	29	54	50	88	142	161	142	111	109	55	28	17		1053
3		16	35	49	64	79	85	85	115	105	57	41	39	37	36	42	13		898
4		4	8	17	42	96	38	29	29	38	42	46	71	59	42	25	4		590
5		4	17	50	75	130	159	151	160	169	82	104	95	93	54	21	8		1372
6		4	13	29	59	134	120	133	173	152	161	137	112	80	63	34	17		1421
7		15	35	54	63	134	109	171	163	168	123	134	117	109	50	17	4		1466
8		4	13	29	29	59	92	117	134	185	194	145	115	72	35	28	8		1259
9		8	25	29	21	59	96	201	191	126	101	92	75	34	21	8	4		1091
10		4	21	42	96	148	128	183	206	183	173	138	117	96	80	29	8		1652
11		8	25	50	109	142	172	193	187	151	151	113	92	88	59	29	8		1577
12		8	25	50	101	96	147	126	193	197	155	128	80	59	34	17	4		1420
13		4	25	59	101	134	167	67	43	42	62	47	35	31	28	22	12		879
14		9	15	20	24	28	42	49	61	44	33	33	55	44	45	34	4		540
15		9	23	28	32	46	48	55	78	114	123	113	102	89	62	34	8		964
16			8	34	46	63	117	109	138	64	62	104	115	100	77	42	9		1088
17		8	29	61	77	83	159	95	100	154	159	149	125	91	59	36	4		1389
18		4	8	8	8	13	17	21	21	29	25	21	25	17	17	4			238
19			8	25	42	75	134	130	142	155	155	147	134	105	56	27	1		1336
20		4	13	36	46	67	109	147	109	88	54	84	75	42	29	17	4		924
21		8	21	30	71	63	67	42	38	25	38	34	21	21	8	4			491
22			8	21	17	21	25	21	42	42	21	25	21	21	21	17	8		331
23		4	21	21	76	88	104	149	171	171	143	122	43	29	27	21	8		1198
24		8	18	24	28	40	44	58	83	100	99	88	75	71	48	32	4		820
25		8	25	42	83	109	128	140	146	109	67	17	13	8	4				899
26			8	34	51	89	106	91	172	124	75	103	69	104	47	30	8		1111
27		4	34	29	47	87	95	123	127	123	104	123	109	50	13	8			1076
28		4	17	50	42	94	130	197	166	141	119	45	42	30	29	23	7		1136
29		4	17	50	84	94	154	142	193	95	166	142	105	95	55	24	6		1426
30		8	13	47	96	96	75	80	168	157	160	127	73	42	21	13	4		1180
31		5	31	53	128	144	147	125	162	168	123	99	99	62	39	14	4		1403
Total		170	580	1142	1846	2599	3143	3355	3883	3666	3251	2906	2402	1917	1235	697	194		32986
Mean		5·5	18·7	36·8	59·5	83·8	101·4	108·2	125·3	118·3	104·9	93·7	77·5	61·8	39·8	22·5	6·3		1064·1

TABLE 2 (Contd.) DIFFUSE SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) AUGUST, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1			4	8	13	21	34	84	92	31	139	126	91	37	38	22	4		744
2		4	13	30	34	38	31	38	59	110	123	61	31	29	25	19	4		649
3			8	21	34	46	67	101	80	54	90	120	54	42	29	8	4		758
4		4	21	37	54	88	85	122	147	167	167	131	106	99	64	21	4		1317
5		4	17	47	77	92	88	141	127	88	133	117	105	80	50	25	4		1195
6		4	13	34	67	109	122	143	152	151	117	101	96	54	38	4			1205
7			4	8	13	17	21	38	54	50	63	34	25	17	8				352
8			13	38	71	80	82	110	104	87	85	81	89	63	34	24	4		965
9		4	25	50	83	101	75	121	109	109	88	75	50	63	46	21	4		1024
10			8	21	38	67	105	109	96	151	96	84	63	42	21	4			905
11			8	49	88	96	113	117	122	134	126	106	90	46	33	9	4		1141
12		4	21	29	63	79	107	141	157	159	171	122	111	77	46	13			1300
13		4	8	23	73	79	61	82	96	141	108	143	105	69	42	17			1051
14		3	13	34	48	83	147	128	101	90	65	68	56	56	38	13			943
15		4	13	25	71	117	110	109	59	50	78	66	49	47	37	21			856
16		3	18	30	41	49	53	55	41	33	30	29	28	30	28	11			479
17			8	34	63	59	63	54	42	21	59	50	29	8	8	4			502
18			4	21	52	98	123	123	39	35	38	76	89	65	41	8			812
19			17	25	71	88	94	128	130	150	95	78	82	59	37	12			1066
20			8	40	59	78	113	145	138	161	129	117	103	63	27	13			1194
21			8	25	63	74	107	125	153	112	136	90	66	44	28	13			1044
22			13	29	55	88	107	146	122	118	109	119	99	61	41	8			1115
23			8	34	59	67	102	125	136	126	86	80	90	78	46	13			1050
24				8	13	21	34	38	63	54	54	46	50	34	13	4			432
25			8	34	47	49	56	61	83	73	86	70	65	50	34	8			724
26				13	25	34	42	50	54	38	34	38	42	25	13	4			412
27				4	13	17	46	59	50	46	46	38	25	25	13				382
28			4	25	38	75	113	126	96	84	105	125	75	29	8				903
29			4	21	59	96	73	113	92	111	121	87	38	24	16	7			862
30			4	20	33	35	43	42	61	50	62	47	47	37	30	4			515
31			4	32	61	85	118	158	155	142	122	92	54	25	8				1056
Total		38	297	849	1579	2126	2535	3132	3010	2926	2961	2617	2103	1478	940	330	32		26953
Mean		1·2	9·6	27·4	50·9	68·6	81·8	101·0	97·1	94·4	95·5	84·4	67·8	47·7	30·3	10·6	1·0		869·5

TABLE 2 (Contd.) DIFFUSE SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) SEPTEMBER, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1			8	19	28	47	104	140	102	97	85	55	97	46	25	8			861
2			8	26	40	74	78	99	113	100	122	118	81	58	30	4			951
3			4	18	28	32	38	34	31	30	28	28	26	22	18	7			344
4			8	25	38	88	106	111	75	43	58	50	56	40	18	8			724
5			4	21	54	59	80	96	105	122	101	122	105	45	17	4			935
6			7	29	63	100	123	146	138	142	105	88	67	50	25	4			1087
7			4	13	29	59	96	151	126	101	109	113	99	28	17	4			949
8			8	25	50	84	102	134	101	71	71	71	46	38	8	4			813
9			4	13	29	42	38	46	59	50	42	29	17	17	4				390
10			4	13	54	96	101	84	117	112	78	29	34	38	13	4			777
11			3	14	26	29	49	80	96	84	81	82	38	29	12	2			625
12			4	21	38	73	63	41	73	139	110	88	84	53	17	4			808
13			4	21	59	69	107	123	130	109	140	92	59	42	21	2			978
14			4	23	32	37	56	63	71	89	101	71	80	29	8				664
15				8	29	52	71	88	46	50	29	63	13	13	4				466
16				4	8	4	13	13	8	4	17	8	8	17	8				112
17				13	34	79	101	123	109	123	80	63	46	25	8				804
18				8	28	61	96	103	109	92	104	87	60	45	20	3			816
19				13	29	67	59	88	130	142	91	68	56	36	13				792
20				4	12	25	46	59	88	67	34	29	17	8	4				393
21				4	13	17	34	50	80	88	80	88	46	13	4				517
22				8	32	58	38	58	79	93	47	58	64	44	17				596
23				4	21	54	63	75	92	110	104	83	58	42	12				718
24				4	17	63	70	70	87	92	21	21	29	28	10				512
25				8	29	61	96	100	126	122	92	63	54	38	13				802
26				4	17	25	50	50	59	75	84	50	29	8	4				455
27				11	30	49	75	85	61	49	34	36	38	18	7				493
28				4	8	13	29	42	71	89	82	75	54	34	8				509
29				8	28	51	85	59	112	115	113	94	71	39	8				783
30				8	29	54	82	102	113	116	81	81	46	28	2				742
Total			74	394	932	1622	2149	2513	2707	2716	2324	2003	1578	971	375	58			20416
Mean			2·5	13·1	31·1	54·1	71·6	83·8	90·2	90·5	77·5	66·8	52·6	32·4	12·5	1·9			680·5

TABLE 2 (Contd.) DIFFUSE SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) OCTOBER, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1				12	42	64	81	87	84	126	118	84	58	25	8				789
2				4	34	43	75	101	54	92	67	34	17	13	1				535
3				2	13	38	63	84	84	80	92	63	38	25	3				585
4				4	17	47	66	92	94	92	83	38	29	13	1				576
5					4	17	17	34	21	8	8	13	51	29	8				210
6				4	18	46	63	73	93	100	104	81	39	13	2				636
7					30	50	57	75	101	103	102	79	59	13	3				672
8					4	8	25	29	38	38	29	25	13	4					213
9					8	13	38	59	80	85	78	63	36	17	1				478
10				3	17	31	39	42	44	45	52	44	32	18	4				371
11				4	23	44	62	64	79	62	42	39	29	18	4				470
12				2	13	8	8	50	80	77	75	73	37	8	4				435
13				2	17	54	57	75	67	34	13	13	8	4					344
14				4	8	42	67	58	83	88	86	63	54	8					561
15					4	13	21	34	42	21	34	21	13	4					207
16					4	8	8	13	17	25	17	17	8	4					121
17					4	8	13	42	63	54	34	21	8	4					251
18					3	4	4	21	34	38	59	38	21	8					230
19					13	38	46	67	34	84	87	54	46	8					477
20					8	8	13	59	84	94	71	25	17	4					383
21					4	25	63	76	43	64	62	54	47	13					451
22					8	29	54	42	42	38	34	56	34	13					350
23					4	4	8	13	29	25	65	68	28	13					257
24					8	24	55	71	71	54	42	34	29	4					392
25					3	8	17	25	42	29	25	29	13	4					195
26					8	34	34	67	80	54	42	29	13	4					365
27					8	29	54	59	67	75	67	54	17	4					434
28						8	25	46	42	50	38	42	21	4					276
29					8	15	22	26	27	28	27	23	16	7					199
30					4	25	42	54	63	59	59	60	25	4					395
31					4	13	17	21	34	42	42	47	13	4					237
Total				41	343	798	1214	1659	1816	1864	1754	1384	869	314	39				12095
Mean				1·3	11·1	25·7	39·2	53·5	58·6	60·1	56·6	44·6	28·0	10·1	1·3				390·2

TABLE 2 (Contd.) DIFFUSE SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) NOVEMBER, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1					6	18	36	54	76	63	29	13	4						299
2					4	8	25	29	59	54	34	38	8						259
3					4	17	17	29	17	21	21	8	8						142
4					4	19	36	44	36	52	46	28	13	3					281
5					4	34	59	67	67	63	50	46	25	3					418
6					4	13	34	46	46	42	34	25	17	4					265
7					4	34	50	29	21	8	8	13	8	3					178
8					4	13	37	55	66	52	61	29	8						325
9					4	16	33	42	54	56	47	31	28	7					318
10					4	13	25	29	42	50	46	21	8						238
11						4	17	34	46	34	17	13	25	3					193
12					4	14	37	35	50	54	47	27	10						278
13					4	18	29	41	57	50	29	46	17						291
14					1	13	29	67	64	39	26	16	9						264
15					4	17	40	46	56	43	51	39	13						309
16						17	25	29	46	43	46	33	10						249
17						13.	31	31	43	43	37	34	11	1					244
18						8	17	21	8	13	8	4							79
19						13	25	29	50	29	34	29	13						222
20						13	34	44	46	50	29	21	8						245
21						8	28	56	32	46	25	18	15						228
22						8	17	34	51	54	26	13	10						213
23						7	28	38	39	59	34	21	13						239
24						8	16	22	33	52	52	38	9						230
25						8	29	46	58	54	46	29	13						283
26						13	50	46	50	38	39	25	4						265
27						10	28	44	42	31	38	17	13						223
28						4	21	36	40	44	27	21	8						201
29						8	23	41	40	23	35	25	9						204
30						8	20	34	42	54	39	31	5						233
Total					55	397	896	1198	1377	1314	1061	752	342	24					7416
Mean					1·8	13·2	29·9	39·9	45·9	43·8	35·4	25·1	11·4	0·8					247·2

TABLE 2 (Contd.) DIFFUSE SOLAR RADIATION - MEAN HOURLY VALUES (J/cm^2) DECEMBER, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1						4	8	42	50	29	36	20	7						196
2						4	20	21	29	17	13	8	1						113
3						1	5	14	22	15	13	13	4						87
4						8	23	42	46	48	43	36	4						250
5						1	7	21	21	16	15	13	5						99
6						1	8	18	34	34	34	25	4						158
7						5	17	29	25	21	17	8	4						126
8						4	25	29	29	29	29	17	4						166
9						4	17	29	38	54	34	17	8						201
10						4	17	29	34	42	18	8	4						156
11						9	25	20	20	51	38	19	4						186
12						10	26	31	18	21	22	18	2						148
13						1	8	13	17	17	13	13	4						86
14						7	19	30	39	40	28	14	8						185
15						5	16	30	26	31	34	26	7						175
16						3	8	13	16	16	13	4	1						74
17						5	15	28	46	34	21	25	8						182
18						7	25	38	25	50	25	8	1						179
19						4	11	25	49	42	30	21	5						187
20						1	7	13	17	20	8	4	4						74
21						1	11	13	7	28	31	12	1						104
22						8	23	30	39	53	42	12	3						210
23						6	23	38	45	40	42	23	4						221
24						2	18	20	37	39	38	17	5						176
25						8	13	28	37	32	26	26	5						175
26						8	12	17	18	17	16	11	3						102
27						5	17	29	42	46	38	21	5						203
28						8	17	34	37	40	36	17	7						196
29								8	21	25	13	13	4						84
30						3	16	29	33	31	37	23	10						182
31						5	25	38	40	54	27	21	5						215
Total						142	482	799	957	1032	830	513	141						4896
Mean						4·6	15·1	25·8	30·9	33·3	26·8	16·5	4·5						157·9

TABLE 3 DIRECT SOLAR RADIATION AT NORMAL INCIDENCES
INSTANTANEOUS VALUES (mW/cm^2) 1969.

MONTH AND DAY	TIME L.A.T.	ZENITH DISTANCE (Z)	AIR MASS (m)	RADIATION				PRESSURE	TEMPERATURE	VAPOUR PRESSURE	VISIBILITY	CLOUD	
				CLEAR	RED (RG_2)	YELLOW (OG_1)	RED (RG_8)					TYPE	AMOUNT
				$x10^{-1}$	$x10^{-1}$	$x10^{-1}$	$x10^{-1}$	mb.	°C	mb.	Km		Okta
Jan													
10	1105	74·9	3·81	731	520	616	421	1000	8·5	8·3	48	Sc	Tr
28	1120	70·7	3·02	721	492	584	388	1005	7·8	9·6	32	CuSc	2
Feb.													
13	0943	71·7	3·20	623	482	544	394	1012	2·0	5·1	26	Cu	1
13	1124	65·7	2·45	764	544	632	449	1013	3·5	5·0	26	Cu	Tr
14	0939	71·8	3·21	758	530	618	439	1009	1·0	4·2	40	CuSc	1
15	1115	65·3	2·40	820	581	692	470	1009	1·0	4·1	48	CuScCi	Tr
15	1358	69·4	2·84	822	590	692	484	1009	2·6	4·0	48	CuCi	Tr
15	1518	77·4	4·58	647	514	574	429	1009	2·7	4·0	48	FcCiCs	1
17	0930	71·6	3·21	826	606	699	505	1014	2·0	3·5	32	Ci	Tr
17	1119	64·4	2·34	935	660	774	541	1014	4·7	3·8	48	Ci	Tr
17	1350	68·2	2·71	805	584	673	484	1012	5·8	3·0	48	NIL	-
17	1532	78·4	4·94	602	493	559	412	1012	5·4	2·1	48	Ci	1
24	1401	66·7	2·50	739	525	617	417	996	10·3	9·3	26	CuFc	3
Mar.													
3	1126	59·2	1·99	717	515	610	419	1024	5·7	5·5	13	CuScCi	5
7	0946	64·0	2·32	759	528	628	440	1018	4·0	6·4	11	Ci	2
7	1118	57·9	1·91	778	539	641	445	1019	7·4	6·9	13	Ci	Tr
7	1338	60·9	2·08	751	520	624	422	1018	8·4	8·3	13	FcCi	Tr
19	1350	57·4	1·86	840	532	648	429	1008	13·2	10·9	48	CuSc	2
23	0930	59·9	2·03	610	465	521	385	1022	5·8	6·3	10	NIL	-
23	1122	51·5	1·64	699	506	585	419	1022	7·3	6·2	10	Cu	Tr
24	1331	53·9	1·73	611	463	526	383	1023	6·9	5·9	6	Fc	2
25	0943	57·8	1·91	828	551	665	441	1023	8·0	6·7	40	ScCi	5
27	0932	58·3	1·95	788	548	646	451	1026	5·4	4·9	24	NIL	-
27	1011	50·5	1·61	853	584	695	481	1026	6·6	4·6	24	NIL	-
28	1336	52·8	1·69	787	551	650	445	1026	8·0	4·9	24	Fc	Tr
Apr.													
1	0942	55·3	1·78	854	561	676	446	1016	8·9	7·1	40	Cu	1
1	1358	53·3	1·70	872	576	697	454	1019	9·9	6·3	40	Cu	2
3	1347	51·6	1·65	834	545	659	437	1030	9·4	7·5	56	CuAcCiCs	5
4	0934	55·2	1·81	778	528	635	429	1033	9·1	7·7	40	Ci	Tr
4	1306	48·1	1·54	656	489	548	380	1032	12·8	6·9	40	FcCi	Tr
5	1132	46·2	1·49	738	518	610	413	1030	14·1	9·0	13	NIL	-
6	0951	52·7	1·68	788	552	641	436	1020	11·8	7·4	32	NIL	-
6	1140	45·6	1·46	744	553	672	446	1019	14·8	8·1	29	Fc	1
15	1418	50·6	1·61	835	537	658	427	1021	10·7	4·4	40	CuCi	5
24	1330	43·0	1·35	877	560	670	429	990	9·9	7·4	24	CuCb	3
May													
4	1148	36·0	1·24	930	592	722	448	1004	13·3	8·7	40	CuFc	2
7	1143	35·4	1·23	912	579	711	460	1000	12·2	9·4	48	CuCbAc	3
8	1127	35·5	1·23	894	567	691	452	998	12·7	9·8	40	CuCbSc	3
20	1350	38·4	1·30	878	551	676	422	1016	14·0	13·5	48	CuAcCi	4
June													
5	0934	40·6	1·35	619	415	501	324	1028	15·4	10·3	16	Ci	6
7	1127	29·9	1·18	803	546	640	430	1024	16·5	11·7	19	NIL	-
11	0934	40·2	1·34	747	501	609	408	1022	21·7	15·4	22	Fc	Tr
20	1032	33·1	1·20	900	556	695	446	1004	11·5	10·0	48	CuSc	4

DIRECT SOLAR RADIATION AT NORMAL INCIDENCES

TABLE 3 (Contd.) INSTANTANEOUS VALUES (mW/cm^2) 1969

MONTH AND DAY	TIME L.A.T.	ZENITH DISTANCE (Z)	AIR MASS (m)	RADIATION				PRESSURE	TEMPERATURE	VAPOUR PRESSURE	VISIBILITY	CLOUD	
				CLEAR	RED (RG_2)	YELLOW (OG_1)	RED (RG_8)					TYPE	AMOUNT
				$x10^{-1}$	$x10^{-1}$	$x10^{-1}$	$x10^{-1}$	mb.	°C	mb.	Km		Okta
July													
3	1502	45·2	1·45	841	527	655	416	1024	15·1	11·7	48	Cu	1
14	1008	37·2	1·28	867	540	667	431	1025	21·4	17·9	48	Ci	Tr
14	1034	34·5	1·24	827	538	652	426	1025	21·4	17·9	48	Ci	Tr
15	0911	44·6	1·43	791	519	638	408	1017	23·8	18·3	26	Fc	Tr
Aug.													
2	0930	45·2	1·44	926	583	732	463	1014	15·0	12·3	64	FcCi	Tr
16	1132	38·7	1·30	877	551	681	435	1019	18·0	15·8	32	CuFc	2
18	1234	39·5	1·32	918	570	699	450	1022	18·9	16·3	32	FcCi	1
30	0946	50·9	1·63	831	523	651	415	1027	14·6	15·2	32	FsCi	5
Sept.													
1	1434	53·9	1·74	847	539	667	432	1028	16·3	13·1	40	CuCi	3
3	0953	51·6	1·65	826	549	645	415	1026	16·0	14·7	24	CuCi	2
3	1110	45·6	1·47	878	551	685	438	1025	16·7	14·6	24	CuCi	1
3	1355	50·4	1·61	875	551	680	432	1025	18·3	14·5	32	FcCi	1
27	1135	53·9	1·74	689	434	539	354	1026	14·7	11·0	32	CuCi	6
Oct.													
10	1110	59·7	2·02	649	427	525	336	1022	20·0	17·0	19	Ci	1
10	1426	66·4	2·54	554	380	456	300	1022	19·7	16·8	19	Ci	4
11	1002	62·1	2·17	597	425	496	343	1018	18·0	14·6	11	Ci	5
11	1446	68·8	2·79	582	426	489	346	1015	20·0	14·0	11	CuAc	1
29	1038	67·9	2·73	768	515	621	413	1035	10·6	8·0	24	Sc	Tr
29	1406	70·9	3·14	712	489	586	387	1034	11·8	8·3	24	Sc	1
Dec.													
12	1131	75·3	4·00	719	517	613	414	1018	4·5	7·7	48	CbAcCi	4
26	1136	75·5	4·05	744	534	631	430	1022	6·3	7·1	64	Cu	1

TABLE 4 DAILY TOTALS OF GLOBAL SOLAR RADIATION (J/cm^2) YEAR 1969

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Day 1	359	417	894	2063	1571	2937	758	1165	2133	929	330	208
2	126	575	1094	1920	1140	531	1482	2636	1524	618	259	121
3	427	314	1323	2080	2580	2061	2973	773	2080	613	142	105
4	168	641	786	1973	2800	1591	590	1911	1776	692	448	359
5	462	473	857	1867	1181	2363	2121	2179	975	213	419	114
6	54	687	1078	2080	951	1863	1824	1260	1141	943	265	169
7	89	624	1431	1542	2596	2574	1703	352	1089	909	179	129
8	381	691	666	941	2211	2759	1737	1885	831	213	435	166
9	109	662	544	1075	1818	1664	1105	1041	390	520	444	205
10	426	373	380	1498	1899	2622	1983	905	804	1141	238	159
11	129	443	1059	1133	2222	2960	1616	1381	1227	1155	194	352
12	150	398	824	1917	1117	2934	1599	1703	1441	527	360	374
13	354	942	417	810	1198	2032	2577	1925	1106	357	518	89
14	163	808	617	564	2314	2000	2997	2149	1331	786	523	259
15	210	1048	574	1783	1935	2352	2495	2202	523	207	477	251
16	453	884	575	449	2502	2210	1826	2458	112	121	339	84
17	156	1101	549	1641	2253	1600	2057	502	839	251	540	235
18	410	691	411	1528	2122	1737	238	2162	1171	230	79	183
19	226	133	1259	1118	2168	898	1381	1812	1165	499	222	314
20	28	251	910	980	1863	3024	925	1553	394	427	255	79
21	201	206	734	1264	1945	813	520	1724	517	787	451	126
22	181	139	1128	1758	1155	2264	331	1461	1542	411	231	267
23	226	667	1659	751	435	2080	1979	1673	928	339	269	254
24	339	1051	1625	1637	1281	1364	2920	432	830	430	493	344
25	150	821	1403	2073	2404	1380	1042	2064	904	196	317	251
26	184	577	991	2253	3015	1903	2501	412	455	365	272	415
27	351	360	1883	1931	2247	2646	1947	382	1433	451	320	209
28	632	1054	1223	2030	1374	1697	2173	912	652	276	267	278
29	377		1273	1719	1077	1269	2088	1501	985	921	306	84
30	377		743	1451	867	1087	1360	2075	961	398	255	361
31	460		1567		2516		1554	1367		249		246
Total	8358	17031	30477	45829	56757	59215	52402	45957	31259	16174	9847	6790
Mean	269·6	608·3	983·1	1527·6	1830·9	1973·8	1690·4	1482·5	1042·0	521·7	328·2	219·0

TABLE 5 DAILY TOTALS OF DIFFUSE SOLAR RADIATION (J/cm^2) YEAR 1969

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Day 1	179	290	605	456	939	1077	758	744	861	789	299	196
2	126	289	559	714	962	521	1053	649	951	535	259	113
3	187	283	604	567	1155	1126	898	758	344	585	142	87
4	167	308	534	520	724	1403	590	1317	724	576	281	250
5	303	303	757	595	1066	1423	1372	1195	935	210	418	99
6	48	284	668	604	886	1600	1421	1205	1087	636	265	158
7	85	344	384	933	915	1265	1466	352	949	672	178	126
8	245	353	565	893	1043	1202	1259	965	813	213	325	166
9	109	368	542	888	1111	1453	1091	1024	390	478	318	201
10	127	334	380	1103	1345	1232	1652	905	777	371	238	156
11	130	414	766	866	1186	828	1577	1141	625	470	193	186
12	148	339	719	986	1017	931	1420	1300	808	435	278	248
13	292	229	414	751	1102	1334	879	1051	978	344	291	86
14	161	346	567	564	1158	1413	540	943	664	561	264	185
15	172	200	553	722	1040	1108	964	856	466	207	309	175
16	183	378	450	449	1061	1293	1088	479	112	121	249	74
17	151	170	516	1070	1125	1236	1389	502	804	251	244	182
18	232	385	407	1162	1131	1360	238	812	816	230	79	179
19	190	132	577	971	1237	898	1336	1066	792	477	222	187
20	28	251	827	839	766	1010	924	1194	393	383	245	74
21	201	199	727	946	1483	760	491	1044	517	451	228	104
22	181	135	768	940	1095	1443	331	1115	596	350	213	210
23	226	438	660	720	420	1531	1198	1050	718	257	239	221
24	299	348	799	982	1142	1239	820	432	512	392	230	176
25	150	581	768	1064	1246	1238	899	724	802	195	283	175
26	175	414	758	948	1063	998	1111	412	455	365	265	102
27	237	341	482	1153	1335	1484	1076	382	493	434	223	203
28	240	492	927	1094	1120	1499	1136	903	509	276	201	196
29	293		921	980	934	1152	1426	862	783	199	204	84
30	330		694	911	696	1023	1180	515	742	395	233	182
31	355		773		1541		1403	1056		237		215
Total	5950	8948	19671	25391	33044	36080	32986	26953	20416	12095	7416	4896
Mean	191·9	319·6	634·5	846·4	1065·9	1202·7	1064·1	869·5	680·5	390·2	247·2	157·9

PART 2

CONTENTS

PART 2

SOLAR RADIATION MEASUREMENTS AT KILKENNY METEOROLOGICAL STATION

1969

1. Introduction

Measurements of Global Solar Radiation were begun at Kilkenny towards the end of 1968 and the data given in the following pages represent the results of the first full year of observations.

2. Site of the Observations

The Meteorological Station is situated 2 Km. Northwest of the centre of Kilkenny at Lat. 52° 40' N; Long. 07° 16' W. Kilkenny is a mainly marketing town of population about 10,000, in which there are no major industries or sources of atmospheric pollution. To the East of the station the residential area of the town approaches to within half a kiolmetre. The surrounding country is flat open grassland. The nearest hills are 10 Km. to the East (See Fig. 1).

The Solarimeter is installed on a stand at the Southern edge of the flat roof of the station building 5 metres above ground level (Fig. 4).

The exposure is good, all effective obstruction being below 2° elevation except between 57° and 59° Azimuth where an anemometer mast obstructs to 65° elevation (See Fig. 5).

3. Pyranograph Used

The instrument in use was a CM_2 Solarimetric Thermopile by Kipp and Zonen, Serial No. 673014 together with Recording Millivoltmeter No. XR4550106 (Kipp and Zonen).

The instrument is similar to that in use at Valentia Observatory and was calibrated before installation, against the Valentia Standard.

4. Observing Procedure

The general procedure for maintaining the instrument, time-marking and tabulation of the records is the same as that already described for Valentia Observatory.

TABLE 1

GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES, (J/cm^2)

JANUARY, 1969

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1						4	13	17	25	25	17	13	4						118
2						4	29	46	46	50	54	34	13						276
3						4	13	38	42	54	67	42	13						273
4						8	17	54	38	46	38	25	8						234
5						8	25	75	88	92	71	50	13						422
6						4	8	8	13	8	8	4							53
7						4	8	13	8	8	4	8							53
8						8	42	67	29	63	75	50	17						351
9							4	8	13	13	8	4							50
10									13	46	34	42	13						148
11						4	50	54	38	38	46	25	8						263
12							4	13	17	17	25	38	17						131
13						8	42	38	46	34	38	13	4						223
14						4	13	29	71	42	75	17	8						259
15						8	29	25	42	67	46	50	17						284
16						4	8	34	75	84	63	59	21	4					352
17							17	63	80	25	25	46	8						264
18						13	50	84	80	75	63	29	13	4					411
19						13	42	84	75	50	63	42	13						382
20						4	4	13	17	17	17	8	4	4					88
21						4	17	34	38	46	29	17	4						189
22						4	21	50	84	54	42	38	17						310
23						4	17	34	29	46	25	13	8	4					180
24						4	8	46	67	84	50	50	25	4					338
25						4	8	8	8	17	29	17	4						95
26						4	8	8	8	13	8	8	17	4					78
27						25	46	59	80	54	54	29	8	4					359
28					4	13	34	71	96	67	59	38	17	4					403
29						(8)	29	54	92	54	46	21	8	4					316
30						13	50	38	96	80	59	71	29	4					440
31					4	34	71	109	113	113	105	50	21	4					624
Total					8	219	727	1274	1567	1482	1343	951	352	44					7967
Mean					0·3	7·1	23·5	41·1	50·5	47·8	43·3	30·7	11·4	1·4					257·0

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES, (J/cm^2) FEBRUARY, 1969

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1					4	13	21	17	59	130	71	54	25	4					398
2					4	29	29	21	80	109	109	63	42	8					494
3					4	17	29	96	101	101	113	84	42	8					595
4					4	34	80	75	67	71	84	71	29	4					519
5					4	17	42	63	71	84	75	63	17	4					440
6					4	25	84	109	134	96	113	88	42	8					703
7					4	42	71	84	105	117	134	96	46	8					707
8					8	50	88	126	147	142	130	84	54	8					837
9					13	59	92	134	142	147	130	96	29	8					850
10					4	17	38	50	54	29	29	25	17	4					267
11					4	21	80	105	117	109	75	67	34	13					625
12					8	25	21	25	71	50	63	88	38	13					402
13					13	54	96	134	147	147	126	96	54	13					880
14					4	21	75	142	163	163	147	92	67	17					891
15					8	67	109	138	159	159	142	109	67	21					979
16					17	59	105	138	159	159	147	113	71	21					989
17					17	71	122	117	113	147	134	88	59	17					885
18					17	59	92	113	92	109	105	50	13	13					663
19						13	25	42	50	59	21	13	13	4					240
20						4	8	13	13	13	17	21	17	8					114
21						4	21	46	25	25	46	29	13	4					213
22						4	8	13	17	21	8	17	13	4					105
23					17	63	63	50	80	54	21	21	21	4					394
24					8	25	25	46	50	38	42	21	13	8					276
25					4	17	21	75	50	50	38	75	50	17					397
26					13	34	59	88	59	63	42	42	21	8					429
27					8	42	96	134	50	50	59	54	34	17	4				548
28					21	71	75	88	109	84	42	63	21	4					578
Total					212	957	1675	2282	2484	2526	2263	1783	962	270	4				15418
Mean					7·6	34·2	59·8	81·5	88·7	90·2	80·8	63·7	34·4	9·6	0·1				550·6

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES, (J/cm^2) MARCH, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1				4	21	63	88	117	117	101	42	50	34	17	4				658
2					4	21	50	117	75	180	126	42	25	13					653
3				4	34	88	134	168	184	169	172	138	92	38	4				1245
4					8	46	126	147	159	142	159	67	46	13	4				917
5				4	42	92	134	176	201	201	184	147	105	42	4				1332
6				8	50	105	147	180	205	197	176	151	96	42	8				1365
7				8	59	109	138	168	193	197	180	151	92	46	8				1349
8				4	17	38	80	101	142	184	184	151	105	50	8				1064
9				4	25	46	92	88	113	138	96	59	42	38	8				749
10				4	17	38	38	42	34	34	34	25	13	8					287
11				4	13	17	34	50	42	50	88	29	25	8	4				364
12					8	17	59	63	50	92	59	42	59	25	8				482
13					8	17	29	38	42	38	29	21	17	8	4				251
14				4	29	38	50	88	88	80	63	46	29	13	4				532
15				8	34	50	84	147	147	84	184	101	67	42	13				961
16					4	4	8	8	13	13	17	13	8	4					92
17				4	8	13	25	38	50	25	21	17	13	8	4				226
18				4	4	13	25	46	59	34	46	25	17	8					281
19				4	13	21	21	25	42	46	38	38	25	8	8				289
20				8	13	25	75	96	54	63	155	189	38	71	17				804
21				4	17	21	21	13	34	42	71	42	34	13	4				316
22				4	13	42	59	126	214	201	201	168	138	84	25				1275
23				8	21	63	96	117	122	147	214	159	105	50	17				1119
24				8	21	42	75	193	239	230	189	130	50	29	13				1219
25				17	75	142	214	180	176	189	180	163	92	42	21	4			1495
26				29	50	105	184	197	92	84	88	71	59	38	21	4			1022
27				8	42	71	101	163	264	235	193	159	122	63	25	4			1450
28			4	34	96	142	159	113	63	42	59	63	38	25	8				846
29				8	54	71	54	84	84	109	105	71	46	34	8				728
30				8	50	50	42	71	80	151	222	59	75	67	34	4			913
31				8	34	29	71	80	122	226	176	84	96	42	8	4			980
Total			4	212	884	1639	2513	3240	3500	3744	3751	2671	1803	989	294	20			25264
Mean			0·1	6·8	28·5	52·9	81·1	104·5	112·9	120·8	121·0	86·2	58·2	31·9	9·5	0·6			815·0

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES, (J/cm^2) APRIL, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1			4	46	105	155	176	201	247	130	130	63	113	71	25	4			1470
2			8	46	109	163	218	251	247	218	247	218	138	92	42	8			2005
3			8	54	113	159	205	247	264	264	243	210	163	113	50	8			2101
4			8	50	113	163	210	243	260	256	230	197	159	109	50	8			2056
5			4	42	101	155	205	239	251	256	243	210	172	122	63	8			2071
6			8	54	113	168	218	247	268	268	247	222	168	109	54	8			2152
7			4	34	80	122	180	222	235	235	210	197	(159)	(105)	38	8			1829
8			4	46	101	155	210	243	264	264	256	218	168	122	50	8			2109
9			4	8	21	34	29	25	21	34	38	29	17	17	13	4			294
10			4	21	75	92	80	159	201	222	226	168	75	50	21	4			1398
11			4	17	25	46	113	159	159	176	205	75	67	59	17	13			1135
12			8	59	84	84	117	239	264	247	264	117	80	122	50	17			1752
13			8	54	96	155	230	226	277	226	210	214	159	101	54	13			2023
14			4	13	38	50	105	163	205	126	96	71	54	42	17	4			988
15				8	29	63	109	147	113	210	260	218	159	75	54	13			1458
16			13	29	105	138	172	176	197	88	142	84	46	63	17	8			1278
17			8	25	46	84	138	214	235	318	264	264	218	159	54	8			2035
18			17	59	130	159	168	193	159	201	205	151	126	130	80	21			1799
19			8	38	88	96	151	159	134	134	142	109	59	42	38	13			1211
20			13	63	122	176	172	168	180	281	260	230	193	130	80	21			2089
21			4	8	21	38	109	243	(251)	(272)	(247)	226	71	109	29	4			1632
22				21	25	21	84	105	88	126	84	84	42	42	25	8			755
23			17	42	101	163	193	218	243	176	180	50	34	25	21	8			1471
24			8	46	50	130	247	75	147	210	260	84	155	88	67	17	4		1588
25			13	29	59	130	105	168	268	172	180	117	172	105	92	29	4		1643
26			8	29	59	105	205	180	193	239	272	201	71	105	71	21			1759
27			17	67	122	130	151	147	151	201	134	105	105	96	54	29	4		1513
28		4	34	63	84	109	126	226	277	180	214	184	101	63	54	38	4		1761
29		4	34	88	151	214	264	281	247	151	96	130	130	151	54	29	4		2028
30		4	29	71	151	193	159	272	277	193	184	159	113	67	50	21	4		1947
Total		12	303	1230	2517	3650	4849	5836	6323	6074	5969	4605	3487	2684	1384	403	24		49350
Mean		0·4	10·1	41·0	83·9	121·7	161·6	194·5	210·8	202·5	199·0	153·5	116·2	89·5	46·1	13·4	0·8		1645·0

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES, (J/cm^2) MAY, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1		4	29	54	101	138	126	272	314	335	251	256	168	126	84	46	8		2312
2		4	21	67	113	151	201	142	138	168	184	109	50	54	25	4			1431
3			4	21	50	50	75	63	54	130	92	96	96	54	29	8	4		826
4			21	59	96	214	285	293	184	247	230	285	168	159	105	46	8		2400
5		4	46	96	197	205	205	272	214	239	172	155	138	96	38	21	4		2102
6			4	21	54	96	159	205	155	176	168	134	29	17	13	8	4		1243
7		8	42	88	147	117	84	130	96	75	75	75	46	42	46	21	8		1100
8		8	29	80	163	230	243	251	285	180	235	126	105	50	21	13	4		2023
9		4	38	80	168	176	210	201	251	251	235	210	205	151	59	29	8		2276
10			8	34	38	50	155	201	318	327	302	264	239	159	101	54	8		2258
11			8	17	21	59	84	126	180	134	272	138	180	122	113	46	8		1508
12		8	21	46	46	50	42	46	84	126	126	201	130	92	46	21			1085
13		,4	17	17	25	38	54	88	71	84	80	59	34	13	17	4			605
14		4	21	50	101	117	159	272	168	197	142	109	159	63	113	59	8		1742
15		8	46	113	159	180	75	268	151	29	210	159	50	25	8	13	4		1498
16		8	42	59	151	163	302	310	155	323	260	189	222	134	122	63	8		2511
17		4	21	34	75	63	88	122	147	80	230	180	197	147	63	54	17		1522
18		8	21	17	46	239	268	264	281	289	314	306	293	142	84	34	13		2619
19		4	25	109	155	113	130	168	155	88	88	88	63	54	50	25	4		1319
20		4	17	25	46	63	63	71	54	67	54	113	176	193	130	46	13		1135
21		8	46	75	105	210	230	247	235	281	159	168	163	71	50	25	13		2086
22		8	42	96	88	96	163	105	172	260	126	67	59	50	21	8	4		1365
23		8	29	80	96	80	88	34	34	21	21	25	17	21	17	17	4		592
24		4	38	71	67	84	256	289	264	67	96	230	205	138	84	59	21		1973
25		8	46	38	54	155	176	138	71	201	239	151	193	142	109	63	17		1801
26		8	17	29	38	54	109	151	126	134	84	63	155	155	134	75	21		1353
27		17	71	126	180	176	218	159	163	147	163	189	117	71	75	38	21		1931
28		8	42	117	189	180	214	260	159	239	201	122	113	84	88	54	25		2095
29		8	13	21	29	29	54	42	42	130	155	176	163	71	80	38	8		1059
30		4	8	8	17	29	92	142	67	126	109	117	159	105	138	50	25	4	1200
31		13	38	130	142	134	142	197	201	214	189	235	80	105	71	25	4		1920
Total		178	871	1878	2957	3739	4750	5529	4989	5365	5262	4795	4172	2906	2134	1067	294	4	50890
Mean		5·7	28·1	60·6	95·4	120·6	153·2	178·4	160·9	173·1	169·7	154·7	134·6	93·7	68·8	34·4	9·5	0·1	1641·6

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES, (J/cm^2) JUNE, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1		8	50	138	168	197	251	214	151	193	151	147	147	126	80	42	13		2076
2		8	38	38	71	59	96	101	80	80	50	59	71	71	50	17	8		897
3		4	17	50	155	210	222	159	247	251	243	134	80	159	75	42	17		2065
4		17	71	117	184	247	277	218	184	226	235	172	130	142	101	46	17		2384
5		21	75	134	193	251	306	327	297	222	226	138	214	126	71	59	21		2681
6		13	50	88	151	122	117	117	117	113	151	147	134	96	67	42	13		1538
7		8	34	126	210	247	247	310	306	297	297	277	247	188	134	75	25	4	3032
8		21	63	117	176	235	285	306	297	285	281	281	239	188	134	80	29		3017
9		21	50	92	147	193	117	256	297	268	256	168	138	105	71	25	13		2217
10		17	63	122	155	251	293	323	297	293	310	293	251	210	147	84	25	4	3138
11		25	75	130	189	239	281	306	310	306	314	289	243	193	134	75	25	4	3138
12		17	71	122	184	239	272	281	289	293	293	268	239	168	126	63	21		2946
13		17	50	122	184	247	188	184	251	281	218	151	88	75	113	67	17		2253
14		8	38	84	109	113	188	176	180	264	264	251	188	184	105	67	21		2240
15		4	21	42	54	67	59	101	63	50	88	101	42	54	25	25	21		817
16		8	67	105	159	260	289	348	230	297	318	197	193	134	80	50	17	4	2756
17		13	21	50	147	163	201	264	214	122	247	247	163	214	59	34	17	4	2180
18		17	38	117	163	201	134	268	168	210	214	214	155	92	46	38	8		2083
19		17	50	134	184	159	113	172	105	126	147	67	71	42	21	13	13		1434
20		8	38	84	180	251	210	256	243	306	318	235	201	84	105	92	29	4	2644
21		13	8	21	159	235	256	335	302	122	264	147	63	122	63	80	17	4	2211
22		13	29	50	101	230	222	226	314	105	126	134	272	109	67	63	13		2074
23		8	38	67	92	168	226	272	218	222	356	180	159	42	88	42	21	4	2203
24	4	17	42	71	126	188	235	251	230	285	180	134	75	80	42	25	25		2010
25		25	80	113	151	163	247	243	251	256	277	205	147	71	29	21	8		2287
26		8	34	67	96	63	113	71	59	42	71	109	134	147	159	88	29	4	1294
27	4	25	80	92	163	235	247	172	151	243	163	172	226	155	113	67	25	4	2337
28		25	38	92	168	243	272	285	272	243	188	147	151	180	163	75	25	4	2571
29	4	13	50	142	184	176	268	272	314	268	243	247	201	92	67	63	34	4	2642
30		21	25	42	117	163	247	218	180	130	147	134	126	92	88	38	13	4	1785
Total	12	440	1404	2769	4520	5815	6479	7032	6617	6399	6636	5445	4788	3741	2623	1598	580	52	66950
Mean	0·4	14·7	46·8	92·3	150·7	193·8	216·0	234·4	220·6	213·3	221·2	181·5	159·6	124·7	87·4	53·3	19·3	1·7	2231·7

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES, (J/cm^2) JULY, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1		8	25	54	96	113	168	126	117	109	239	247	159	122	67	34	13	4	1701
2		13	42	105	42	42	50	80	84	46	142	105	197	180	134	84	29	4	1379
3		13	42	101	176	239	268	226	226	297	289	264	222	168	122	67	25	4	2749
4		17	84	113	84	96	130	247	243	159	71	42	63	67	67	59	8		1550
5		8	29	50	63	96	180	205	205	210	176	176	159	134	84	46	21	4	1846
6		8	25	50	84	126	159	184	180	272	230	180	101	138	54	59	13	4	1867
7		13	75	130	197	226	226	268	260	251	226	163	155	88	59	38	17		2392
8		17	25	67	88	113	151	159	126	189	268	247	180	184	113	75	17	4	2023
9		4	21	38	101	138	96	180	189	138	101	138	134	109	80	42	17		1526
10		4	17	29	50	88	117	243	293	318	155	201	155	155	142	84	29	4	2084
11		8	25	63	205	256	260	239	184	260	230	210	205	134	101	54	8		2442
12		13	25	42	54	96	84	130	147	172	235	193	126	151	113	59	25	4	1669
13		8	21	50	88	92	122	147	222	297	289	293	268	176	84	80	34	4	2275
14		4	21	50	67	126	256	306	327	323	297	277	251	193	130	75	25	4	2732
15		13	59	117	180	222	251	277	289	289	281	260	205	130	105	38	13		2729
16			21	75	63	159	96	201	260	327	314	285	243	172	113	71	17		2417
17		8	63	130	184	122	109	193	105	188	222	251	201	117	109	54	13		2069
18		4	13	38	38	42	50	38	54	54	46	38	84	54	17	17			587
19		4	21	75	67	101	222	230	218	285	277	243	159	88	42	17	4		2053
20		4	21	67	75	138	122	126	281	222	226	147	168	105	80	50	17		1849
21		8	25	71	113	117	113	306	302	302	176	230	201	122	101	34	13		2234
22		4	17	34	29	50	63	63	113	138	113	147	96	63	21	13	4		968
23		13	67	117	101	193	193	168	180	201	172	122	50	25	25	13	17	4	1661
24		13	67	117	180	239	268	302	222	205	218	210	184	147	67	38	8		2485
25		13	59	113	168	230	260	243	235	214	142	193	176	109	46	17	4		2222
26			8	38	46	46	59	75	205	155	226	176	176	130	117	67	17		1541
27		13	59	80	168	226	251	272	293	272	176	155	163	163	126	34	8		2459
28		4	34	92	147	80	54	105	126	117	126	75	88	50	54	42	13		1207
29		8	54	117	113	193	214	235	138	172	138	109	96	71	42	25	8		1733
30		4	38	92	147	197	272	272	142	247	159	126	92	96	54	21	8		1967
31		13	42	130	205	218	297	247	201	239	138	168	117	50	38	21	8		2132
Total		264	1145	2445	3419	4420	5161	6093	6167	6668	6098	5671	4874	3691	2507	1428	453	44	60548
Mean		8·5	36·9	78·9	110·3	142·6	166·5	196·5	198·9	215·1	196·7	182·9	157·2	119·1	80·9	46·1	14·6	1·4	1953·2

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES, (J/cm^2) AUGUST, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1		4	42	88	84	138	71	71	184	71	151	46	21	13	13	4			1001
2		4	21	67	151	159	239	230	243	239	260	272	180	210	122	54	13		2464
3		4	50	92	75	75	142	75	80	67	75	29	38	21	17	8	4		852
4		4	13	54	126	205	218	176	239	272	314	281	189	122	109	50	4		2376
5		4	54	80	168	226	226	151	134	310	193	105	117	63	34	17	8		1890
6		4	46	75	138	189	163	142	142	176	193	180	134	109	96	29	8		1824
7		4	38	96	138	168	272	210	344	318	335	155	88	63	46	21	4		2300
8			13	21	50	59	126	230	260	109	126	134	130	113	42	29	4		1446
9		(4)	(21)	(50)	(101)	205	251	230	272	260	277	247	155	109	50	21	4		2257
10		4	29	84	130	117	201	222	176	184	151	105	71	75	21	25	4		1599
11		4	25	88	134	214	180	251	201	96	92	71	71	46	38	25	4		1540
12			8	29	54	122	122	142	122	105	42	42	34	21	13	8			864
13			4	13	17	29	63	50	75	71	63	50	38	34	21	8			536
14			8	25	46	46	67	117	155	159	84	151	117	109	75	29	8		1196
15			8	25	50	84	142	138	71	38	34	29	59	59	46	17	4		804
16			13	46	80	109	222	251	277	256	214	197	168	122	80	34	4		2073
17			21	58	147	193	210	222	163	172	142	75	46	46	29	17	4		1545
18			4	17	46	54	71	96	159	247	159	172	201	117	88	29	4		1464
19			13	75	96	168	210	168	239	230	205	205	180	138	63	21			2011
20			17	46	84	134	134	168	243	184	272	239	147	122	71	17	4		1882
21			13	38	96	138	243	289	277	264	222	189	193	88	80	29			2159
22			17	42	75	113	117	147	155	151	210	197	117	101	84	25	4		1555
23			29	92	151	197	251	285	184	189	168	197	168	88	63	25			2087
24			8	21	34	50	54	67	67	80	54	42	29	38	29	13			586
25			8	54	80	75	134	134	193	235	210	113	147	80	29	13			1505
26			4	17	38	63	117	226	222	251	264	235	197	122	80	29	4		1869
27			8	34	88	163	142	268	293	201	264	230	184	130	59	17			2081
28			4	34	84	63	142	147	147	96	122	142	109	63	34	17			1204
29			8	29	96	109	122	134	230	272	256	210	176	113	84	21			1860
30			4	29	50	50	84	126	210	226	264	235	180	75	50	8			1591
31			4	21	29	50	88	126	117	142	109	63	42	29	25	8			853
Total		40	555	1540	2736	3765	4824	5289	5874	5671	5525	4638	3726	2639	1691	668	93		49274
Mean		1·3	17·9	49·7	88·3	121·5	155·6	170·6	189·5	182·9	178·2	149·6	120·2	85·1	54·5	21·5	3·0		1589·5

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES, (J/cm^2) SEPTEMBER, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1			13	42	63	142	197	159	201	101	96	63	59	63	38	8			1245
2			4	17	46	147	201	117	151	138	122	92	96	67	50	13			1261
3			4	25	50	159	218	256	277	277	251	155	109	42	21	4			1848
4			4	21	38	63	63	75	75	105	92	71	38	21	13	4			683
5			4	17	71	59	96	134	71	67	80	75	38	25	17	4			758
6			4	50	71	88	113	251	285	281	243	172	155	105	46	4			1868
7			4	17	38	59	92	168	197	193	159	122	75	29	8				1161
8				8	46	80	163	172	92	113	96	155	159	109	46	4			1243
9			4	46	96	75	105	88	92	134	101	42	50	46	21	4			904
10				13	34	58	75	71	84	142	197	172	109	46	13	4			1018
11				4	21	54	105	113	130	80	159	155	101	50	21	8			1001
12			4	29	71	163	210	251	302	226	134	180	138	84	50	4			1846
13				13	29	67	109	134	210	201	168	122	80	105	38	4			1280
14				13	38	50	80	109	101	88	34	17	13	8	4	4			559
15				8	13	29	42	42	75	75	71	105	96	75	34	4			669
16				4	8	8	8	13	13	25	25	17	25	13	4				163
17				8	17	42	63	84	75	21	25	21	21	34	29	4			444
18				8	59	109	96	155	147	205	214	142	122	75	42	4			1378
19				4	13	29	71	159	105	109	193	163	130	75	29	4			1084
20				21	34	67	80	134	109	92	113	59	50	21	13				793
21				13	25	42	109	134	101	168	210	151	126	46	17				1142
22				21	80	130	105	113	235	134	163	168	113	58	17				1337
23				8	25	54	172	230	230	205	168	109	92	42	17				1352
24				4	13	63	105	105	46	193	126	54	54	25	13				801
25				17	38	54	163	142	201	172	138	84	63	29	13				1114
26				8	46	84	71	84	109	138	63	42	29	29	8				711
27				8	38	105	142	163	122	138	155	122	96	50	17				1156
28				4	71	109	88	63	63	50	71	189	109	42	17				876
29				13	59	113	163	193	96	168	109	96	113	42	13				1178
30				4	38	75	163	159	184	126	105	105	59	42	8				1068
Total			45	468	1289	2377	3468	4071	4179	4165	3881	3220	2518	1498	677	85			31941
Mean			1·5	15·6	43·0	79·2	115·6	135·7	139·3	138·8	129·4	107·3	83·9	49·9	22·6	2·8			1064·7

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES, (J/cm^2) OCTOBER, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1				8	42	71	101	159	159	151	117	75	34	34	4				955
2				4	21	29	105	142	105	50	80	92	54	34	8				724
3				4	17	(38)	(75)	(84)	(84)	71	84	54	29	17	4				561
4					13	38	80	92	142	189	80	50	59	58	13				814
5				4	17	46	59	80	122	50	75	54	25	17	4				553
6				4	25	63	122	176	197	201	130	71	54	17	4				1064
7				4	17	59	75	126	180	138	105	96	54	25	8				887
8				4	13	29	46	71	142	163	71	34	34	8					615
9					21	46	113	96	84	38	38	84	75	42	4				641
10				4	21	63	117	159	172	180	159	126	84	42	4				1131
11				4	34	67	92	138	155	168	151	113	71	34	8				1035
12				4	17	21	34	34	105	130	17	13	17	17	4				413
13				4	8	29	92	142	84	134	101	59	25	8					686
14				4	34	54	67	29	105	126	117	109	75	38	4				762
15					17	59	134	176	88	29	34	29	21	8					595
16					8	29	46	67	75	50	71	63	25	8					442
17					34	75	113	138	155	126	96	92	59	17					905
18					4	8	17	25	38	38	63	42	34	17					286
19					4	25	54	42	88	88	71	75	50	29	4				530
20					8	21	25	34	38	34	29	25	17	8					239
21					4	17	29	46	71	122	38	38	46	8					419
22					4	4	29	101	67	151	88	67	13	8					532
23					8	25	25	21	21	42	46	25	34	17					264
24					13	63	101	126	63	88	80	105	42	17	4				702
25					4	21	59	117	92	80	46	34	21	13					487
26					4	29	80	63	126	84	88	75	38	8					595
27					4	21	42	42	42	42	34	29	17	4					277
28					4	8	17	42	67	17	25	46	21	4					251
29					8	50	96	126	147	147	134	84	42	13					847
30					4	25	42	75	84	54	46	42	25	8					405
31					4	17	34	59	71	63	63	38	21	4					374
Total				52	436	1150	2121	2828	3169	3044	2377	1939	1216	582	77				18991
Mean				1·7	14·1	37·1	68·4	91·2	102·2	98·2	76·7	62·5	39·2	18·8	2·5				612·6

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES, (J/cm^2) NOVEMBER, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for Day
Day 1					8	38	67	134	96	122	96	71	34	4					670
2					4	17	54	63	105	71	63	80	34	4					495
3						8	21	25	25	21	17	13	4						134
4					4	34	67	122	138	168	101	92	54	13					793
5					8	42	88	75	122	126	109	46	21	4					641
6					4	17	38	46	88	117	105	67	17	4					503
7					8	29	67	59	117	59	21	17	17	4					398
8					4	29	59	105	126	126	117	75	25	4					670
9					4	13	46	71	54	117	96	71	38	4					514
10					4	29	63	67	71	67	50	42	21	4					418
11						4	13	17	21	25	25	25	13	4					147
12					4	13	29	59	42	134	75	50	25	4					435
13					4	29	59	80	84	96	105	71	25	4					557
14						13	29	38	34	38	34	17	8						211
15						17	29	63	122	117	96	50	25	4					523
16						4	4	17	17	21	29	25	21	4					142
17					4	13	25	38	113	96	71	54	13	4					431
18						8	8	13	29	50	46	25	17	4					200
19						13	8	21	67	63	67	34	8						281
20						17	46	88	92	67	63	21	8						402
21						13	38	29	25	25	25	8	4						167
22					4	8	38	50	88	80	63	21	8						360
23						8	34	59	59	67	34	25	8	4					298
24						13	54	42	80	88	54	21	8						360
25						8	29	63	88	84	59	34	17						382
26						8	25	59	63	59	34	13	8						269
27						8	29	54	63	101	101	50	17						423
28						17	50	80	96	101	71	50	21	4					490
29						17	50	80	92	96	80	46	17						478
30						8	42	46	92	96	63	29	13						389
Total					64	495	1209	1763	2309	2498	1970	1243	549	81					12181
Mean					2·1	16·5	40·3	58·8	77·0	83·3	65·7	41·4	18·3	2·7					406·0

TABLE 1 (Contd.) GLOBAL SOLAR RADIATION - MEAN HOURLY VALUES, (J/cm^2) DECEMBER, 1969.

HOUR L.A.T.	3 to 4	4 to 5	5 to 6	6 to 7	7 to 8	8 to 9	9 to 10	10 to 11	11 to 12	12 to 13	13 to 14	14 to 15	15 to 16	16 to 17	17 to 18	18 to 19	19 to 20	20 to 21	Total for day
Day 1						8	25	59	46	42	29	29	13						251
2						8	21	38	29	21	13	8	4						142
3						8	21	25	29	38	29	17	4						171
4						4	34	59	59	42	54	42	13						307
5						8	13	25	29	29	21	13	4						142
6						8	17	38	63	59	38	17	8	4					252
7						8	21	21	29	25	13	8	4	4					133
8						8	17	29	29	29	17	34	13						176
9						4	13	25	29	29	29	17	8						154
10						4	21	38	38	38	29	29	13						210
11						4	21	42	67	67	67	42	13						323
12						4	17	29	46	38	34	25	8	4					205
13						13	17	21	29	21	21	8	4						134
14						8	25	54	80	96	50	21	8						342
15						4	50	59	50	71	34	21	8						297
16						4	17	29	29	29	21	8	4						141
17							4	13	17	17	8	4							63
18							8	13	8	13	17	13							72
19						4	21	50	75	75	71	38	8						342
20						4	17	25	29	17	13	8							113
21						4	4	13	17	17	21	8							84
22						8	34	50	75	71	71	25	8						342
23						8	29	50	54	54	42	13	8						258
24						4	17	25	38	42	34	29	8						197
25						8	34	54	75	80	71	29	13						364
26						8	17	59	75	84	71	34	8						356
27						8	34	67	80	71	63	42	13						378
28						4	13	21	13	21	25	13	8						118
29							4	8	21	29	21	17	8						108
30						4	8	46	17	8	8	8	4						103
31						4	8	17	34	21	13	17	4						118
Total						173	602	1102	1309	1294	1048	637	219	12					6396
Mean						5·6	19·4	35·5	42·2	41·7	33·8	20·5	7·1	0·4					206·3

TABLE 2

DAILY TOTALS OF GLOBAL SOLAR RADIATION (J/cm^2)

1969.

Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
Day 1	118	398	658	1470	2312	2076	1701	1001	1245	955	670	251
2	276	494	653	2005	1431	897	1379	2464	1261	724	495	142
3	273	595	1245	2101	826	2065	2749	852	1848	561	134	171
4	234	519	917	2056	2400	2384	1550	2376	683	814	793	307
5	422	440	1332	2071	2102	2681	1846	1890	758	553	641	142
6	53	703	1365	2152	1243	1538	1867	1824	1868	1064	503	252
7	53	707	1349	1829	1100	3032	2392	2300	1161	887	398	133
8	351	837	1064	2109	2023	3017	2023	1446	1243	615	670	176
9	50	850	749	294	2276	2217	1526	2257	904	641	514	154
10	148	267	287	1398	2258	3138	2084	1599	1018	1131	418	210
11	263	625	364	1135	1508	3138	2442	1540	1001	1035	147	323
12	131	402	482	1752	1085	2946	1669	864	1846	413	435	205
13	223	880	251	2023	605	2253	2275	536	1280	686	557	134
14	259	891	532	988	1742	2240	2732	1196	559	762	211	342
15	284	979	961	1458	1498	817	2729	804	669	595	523	297
16	352	989	92	1278	2511	2756	2417	2073	163	.442	142	141
17	264	885	226	2035	1522	2180	2069	1545	444	905	431	63
18	411	663	281	1799	2619	2083	587	1464	1378	286	200	72
19	382	240	289	1211	1319	1434	2053	2011	1084	530	281	342
20	88	114	804	2089	1135	2644	1849	1882	793	239	402	113
21	189	213	316	1632	2086	2211	2234	2159	1142	419	167	84
22	310	105	1275	755	1365	2074	968	1555	1337	532	360	342
23	180	394	1119	1471	592	2203	1661	2087	1352	264	298	258
24	338	276	1219	1588	1973	2010	2485	586	801	702	360	197
25	95	397	1495	1643	1801	2287	2222	1505	1114	487	382	364
26	78	429	1022	1759	1353	1294	1541	1869	711	595	269	356
27	359	548	1450	1513	1931	2337	2459	2081	1156	277	423	378
28	403	578	846	1761	2095	2571	1207	1204	876	251	490	118
29	316		728	2028	1059	2642	1733	1860	1178	847	478	108
30	440		913	1947	1200	1785	1967	1591	1068	405	389	103
31	624		980		1920		2132	853		374		118
Total	7967	15418	25264	49350	50890	66950	60548	49274	31941	18991	12181	6396
Mean	257·0	550·6	815·0	1645·0	1641·6	2231·7	1953·2	1589·5	1064·7	612·6	406·0	206·3

Fig. 1 Maps showing site of (a) Kilkenny Meteorological Station and (b) Valentia Observatory.

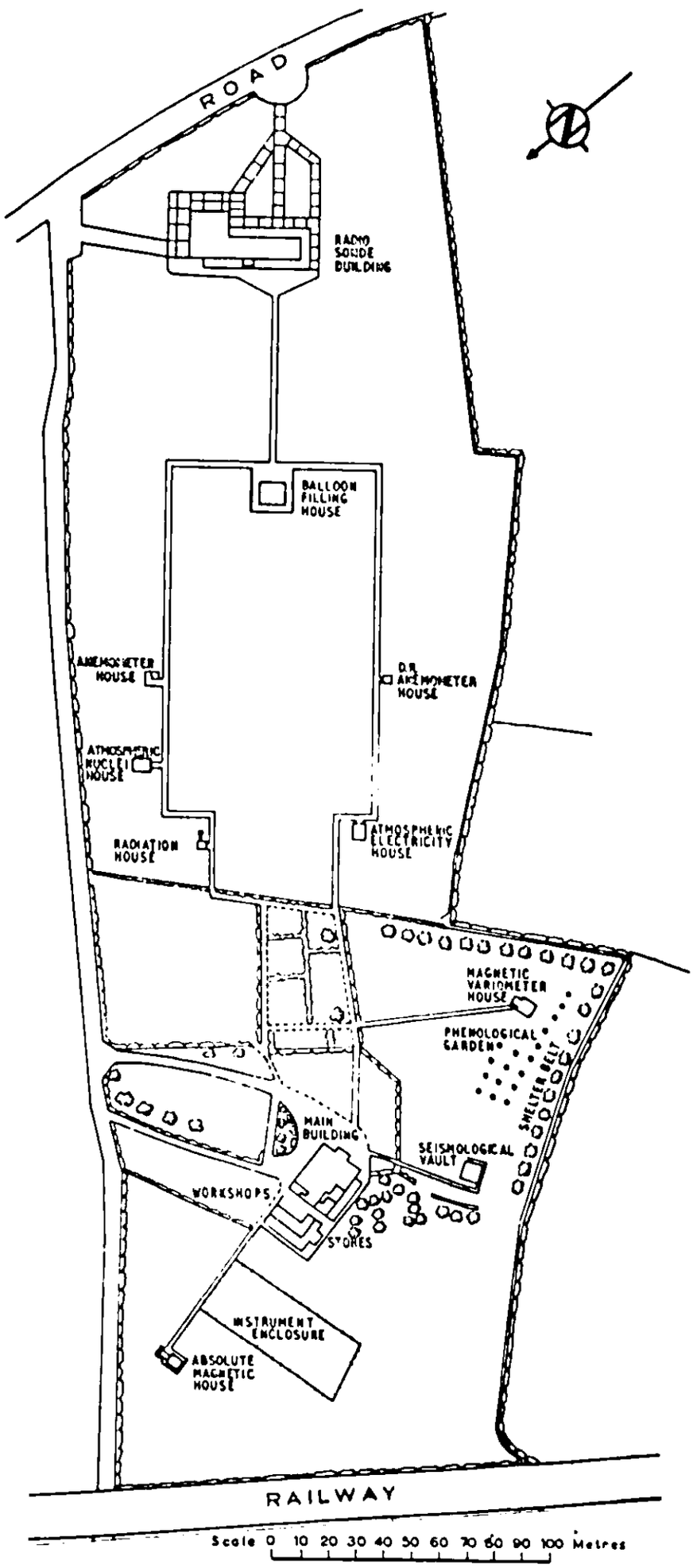


Fig. 2. General layout of Valentia Observatory

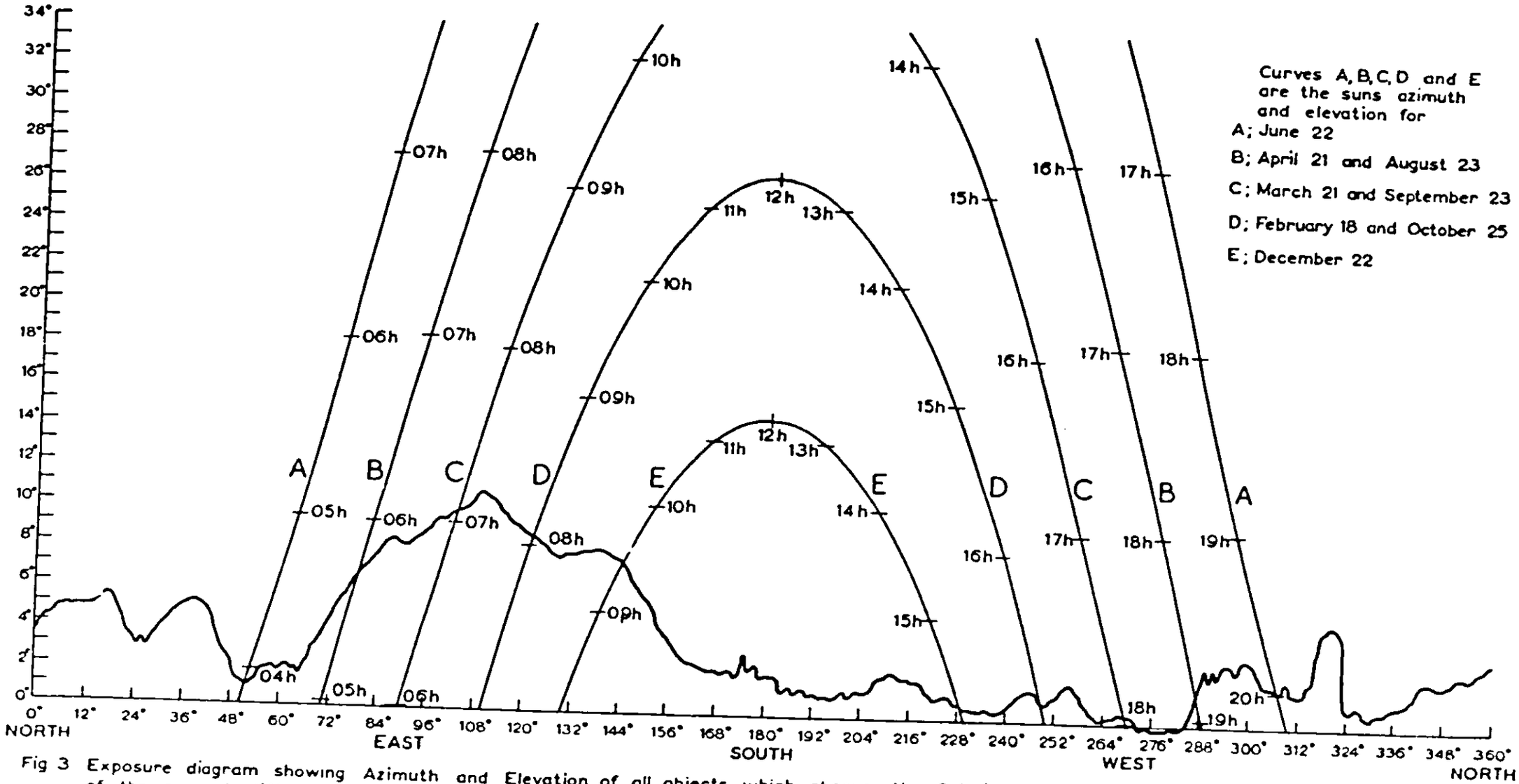
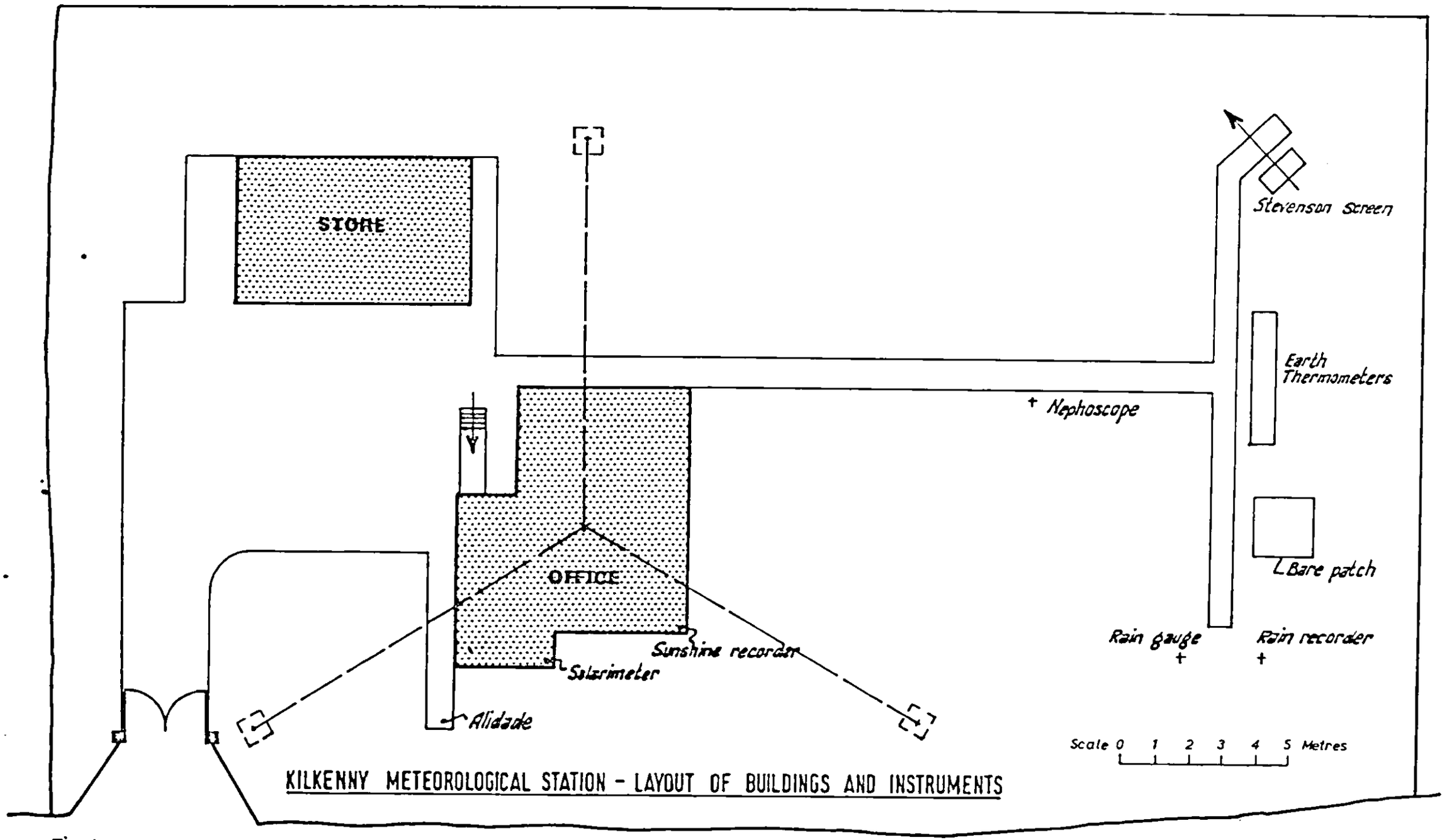
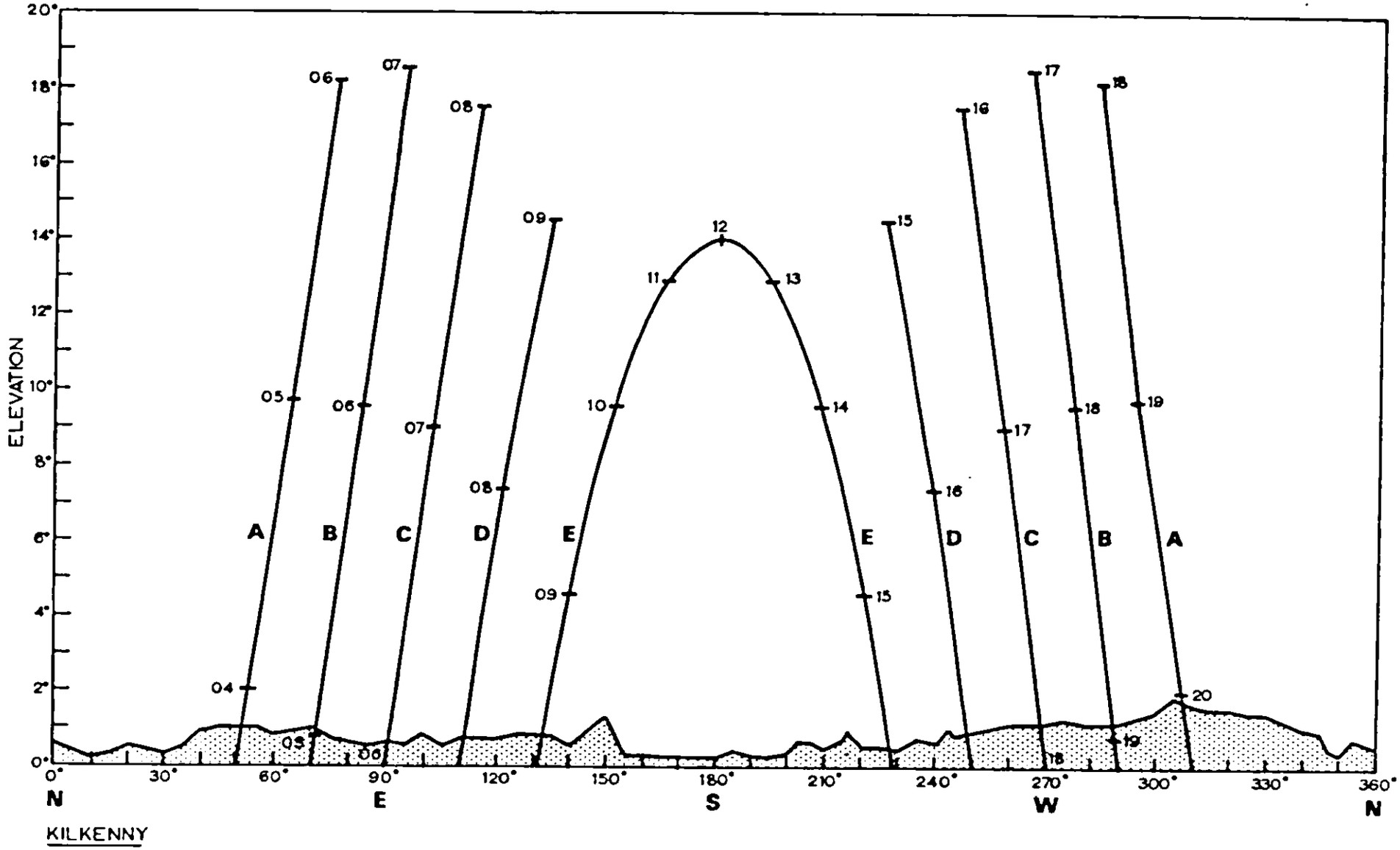


Fig 3 Exposure diagram showing Azimuth and Elevation of all objects which obscure the Solarimeter, together with Elevation and Azimuth of the sun at different times of the year.



KILKENNY METEOROLOGICAL STATION - LAYOUT OF BUILDINGS AND INSTRUMENTS

Fig. 4



KILKENNY

Fig. 5. Exposure diagram showing (1) azimuth and elevation of all objects which obscure solarimeter.
(2) azimuth and elevation of Sun at various times of year as follows; (A) June 22, (B) April 21, August 23, (C) March 21, September 23, (D) February 18, October 25, (E) December 22.