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International
Seismological
Centre

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ANNUAL REPORT

OF THE

METEOROLOGICAL

AND THE

SEISMOLOGICAL OBSERVATIONS

MADE AT THE

INTERNATIONAL LATITUDE OBSERVATORY

OF MIZUSAWA

FOR

THE YEAR 1951.



LATITUDE 39° 08' N., LONGITUDE 141° 08' E.,
HEIGHT ABOVE MEAN SEA LEVEL, 62 METRES.



PUBLISHED BY THE INTERNATIONAL LATITUDE OBSERVATORY
OF MIZUSAWA.

1959

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Introduction

This annual report gives the results of the meteorological and seismological observations made at the International Latitude Station of Mizusawa during 1951 which may serve to investigate the meteorological effect on the latitude observations. The majority of the meteorological instruments are situated in the observation field about 10 meters north of the zenith telescope room. In this field there are the motor-driven aspiration psychrometer, maximum and minimum thermometers, thermograph, hygrograph, pluviograph, Hellman's chionograph, rain gauges, evapometer, L-tube earth thermometers, Simon's earth thermometers, and snow measuring plates. The Fortin's mercurial barometer, three barographs, and anemograph are set in the seismograph room where is placed about 100 meters NNE of the zenith telescope room. The Robinson's anemometer, recording wind vane and Jordan's sunshine recorder are fixed on the roof of the observing tower above the seismograph room. Observations are made generally six times a day, that is, at 2^h, 6^h, 10^h, 14^h, 18^h and 22^h of J. S. T. (9^h east from Greenwich). This distribution of time of observation seems to be convenient for the purpose of discussing the meteorological effect on the latitude variation, since the latitude observations are made on the average between 22^h and 2^h. The followings are to be noted as regards the meteorological observations.

Air Pressure.—The barometric readings in the unit of millibars are corrected for the freezing point of water and standard gravity (980.616 dynes). The observed gravity at Mizusawa is 980.16 dynes. These corrected values are defined as the station pressure. Moreover those reduced to mean sea level (M. S. L. Pressure) are given in the next columns.

Air Temperature.—The dry-bulb thermometer of the motor-driven aspiration psychrometer is adopted as standard. The variability of daily mean air temperature is defined as follows.

$$V = \frac{\sum_{i=1}^n |t_i - t_{i-1}|}{n},$$

where $| \quad |$ denotes the absolute value, t_i the daily mean air temperature of i -th day and n the number of the days in a month.

Wind.—The wind velocity in this report means the ten minutes' mean velocity before the time of observation and then that multiplied by the constant C determined by the following formula; $\log C = 0.3411 - 0.2151 \log (V + 10)$, where V represents the wind velocity. This formula has been derived experimentally from the wind-tunnel at the Central Meteorological Observatory of Japan.

Relative Humidity and Vapour Pressure.—The motor-driven aspiration psychrometer is used. Sprung's psychrometric formula is applied to derive the vapour pressure (in mb).

Cloud.—The cloud forms are observed separately according to the high (H), middle (M) and low (L) clouds. They are denoted according to the International Classification (Ten genera of cloud forms).

Duration of Sunshine.—It is recorded with Jordan's sunshine recorder and given in the unit of hour.

Amount of Evaporation.—It is observed with the evapometer with 20 cm diameter at 10^h once a day. The bracket represents the day with precipitation.

Earth Temperature.—The earth-surface thermometer, L-type thermometers of 0.05, 0.1, 0.2 and 0.3 meters depth and Simon's earth thermometers of 0.5, 1.0, 2.0, 3.0, 5.0 and 6.0 meters depth are employed.

Clear and Cloudy Days.—The cloud amount is less than 2 exclusive for the former and

more than 8 inclusive for the latter.

Sunless Days.—It means the days not recorded on Jordan's sunshine recorder throughout whole day.

Horizontal Visibility.—Maximum visible distances are divided into the International Classification (0-9). The frequencies of each class in a month observed six times every day are given as for the four cardinal points.

The heights of the meteorological instruments are as follows:

Barometer.—63.7 m above mean sea level.

Air Temperature Thermometer.—1.3 m above the ground.

Anemometer.—16.5 m above the ground.

Anemoscope.—16.6 m above the ground.

Rain Gauge.—0.6 m above the ground.

On recording the meteorological phenomena, the following weather symbols are used:

●	Rain	⊏	Hoar frost	♌	Zodiacal light
*	Snow	⊏	Ice columns	♍	Red sky
9	Drizzle	⊏	Air hoar	○	Clear
△	Grain of ice	∨	Soft rime	⊙	Fine (partly cloudy)
△	Granular snow	∨	Hard rime	⊙	High cloud overcast
↔	Ice needles	~	Glaze	⊗	Middle cloud overcast
≡	Fog	⊠	Snow coverage	⊙	Low cloud overcast
≡	Fog in the neighbourhood	⊠	Thunder and lightning	⊙	Earthquake
≡	Ice fog	⊠	Lightning	~	Undulatus
=	Mist, damp haze	⊠	Thunder	∩	Mammatus
∞	Haze	○	Pure air	⊖	Lenticularis
∞	Haze in the neighbourhood	⊙	Solar corona	Ci	Cirrus
∇	Showers	⊏	Lunar corona	Cs	Cirro-stratus
⊗	Soft hail	⊏	Iridescence	Cc	Cirro-cumulus
△	Small hail	⊕	Solar halo	Ac	Alto-cumulus
▲	Hail	⊖	Lunar halo	As	Alto-stratus
⊗	Dust storm	∩	Rainbow	Sc	Strato-cumulus
⊕	Blowing snow	⊠	Yellow sand	Ns	Nimbo-stratus
⊕	Drifting snow	⊠	Freezing	Cu	Cumulus
⊕	Snow storm	ε	Dust devil	Cb	Cumulo-nimbus
∩	Dew	⊏	Land-spout	St	Stratus
∩	Gale	∩	Aurora		

The seismological instruments in use are two Omori's horizontal seismographs.

Constants of two seismographs are given as follows:

	EW-Component	NS-Component
Proper Period	16 sec.	36 sec.
Dinamical magnification	100	20
Mass of Weight	45.0 kg	17.6 kg
Horizontal distance of the center of the cylinder from the pivot	20 cm	75 cm
Vertical distance between the point of support and suspension	104 cm	104 cm

The pulsatory oscillations are observed only with EW-Component seismograph. The observations and computations are worked out by Messrs, S. Sato, I. Kumagai, K. Suzuki and Mrs. M. Yunome under the superintendence of Mr. C. Sugawa.

Jun. 1959

T. Ikeda

Director of the International Latitude Observatory
of Mizusawa.



METEOROLOGICAL OBSERVATIONS

DATE		AIR TEMPERATURE												SEA SURFACE TEMPERATURE												WIND DIRECTION AND VELOCITY												SEA STATE											
Year	Month	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12
1950	12	24	26	28	29	30	31	32	33	34	35	36	24	26	28	29	30	31	32	33	34	35	36	12	15	18	20	22	25	28	30	32	35	38	40	1	2	3	4	5	6	7	8	9	10	11	12		
1951	1	24	26	28	29	30	31	32	33	34	35	36	24	26	28	29	30	31	32	33	34	35	36	12	15	18	20	22	25	28	30	32	35	38	40	1	2	3	4	5	6	7	8	9	10	11	12		

JANUARY, 1951.



Table with columns: Day, VAPOUR PRESSURE (mb), AMOUNT OF CLOUD (0-10), FORMS OF CLOUD (2, 6, 10, 14, 18, 22), Mean, H, M, L. Rows 1-31 and a Mean row.

Table with columns: Day, Duration of Sunshine (in hours), Amount of Evaporation (mm), RELATIVE HUMIDITY (%), PRECIPITATION (mm), REMARKS (A. M., P. M.). Rows 1-31 and a Mean row.

FEBRUARY, 1951.



Main meteorological data table with columns for Day, Vapour Pressure (mb), Amount of Cloud (0-10), and Forms of Cloud (2, 6, 10, 14, 18, 22). Rows include daily observations from Day 1 to 28, and a final row for Mean values.

Secondary meteorological data table with columns for Day, Duration of Sunshine (in hours), Amount of Evaporation (mm), Relative Humidity (%), Precipitation (mm), and Remarks. Rows include daily observations from Day 1 to 28, and a final row for Mean values.

MARCH, 1951.



Table with columns for Day, Station Pressure (1000mb +), M.S.L. Pressure (1000mb +), and Air Temperature (°C). Rows include daily data from 1 to 31 and a Mean row at the bottom.

Table with columns for Day, Air Temperature (°C) (Max., Min., Mean, Range), and Direction and Velocity (m.p.s.) of the Wind (2, 6, 10, 14, 18, 22, Mean 6 obs., 24 h). Rows include daily data from 1 to 31 and a Mean row at the bottom.

APRIL, 1951.



Day	STATION PRESSURE (1000mb +)							M.S.L. PRESSURE (1000mb +)							AIR TEMPERATURE °C						
	2	6	10	14	18	22	mean	2	6	10	14	18	22	Mean	2	6	10	14	18	22	Mean
1	16.4	15.9	13.4	8.9	6.8	6.1	11.3	24.5	24.6	21.1	16.5	14.5	13.9	19.2	-0.7	-0.2	11.2	14.5	10.7	8.1	7.3
2	4.9	6.8	8.1	6.2	8.1	10.2	7.4	12.8	14.6	15.8	13.8	15.9	18.0	15.2	6.2	8.1	10.4	13.0	9.1	6.7	8.9
3	11.5	13.4	14.2	12.8	12.4	13.8	13.0	19.4	21.2	22.0	20.7	20.3	21.8	20.9	5.6	4.6	6.9	7.9	4.5	0.7	5.0
4	10.0	8.3	8.8	6.3	6.7	9.0	8.2	17.9	16.4	16.7	14.1	14.6	16.9	16.1	0.7	1.3	3.3	5.1	4.9	3.7	3.2
5	9.7	13.3	18.3	17.6	19.3	21.7	16.7	17.5	21.2	26.2	25.3	27.1	29.7	24.5	2.9	2.9	6.5	11.0	8.3	2.9	5.8
6	22.5	23.3	22.4	18.4	17.6	16.5	20.1	30.5	31.3	30.3	26.0	25.3	24.3	28.0	3.6	3.4	10.1	13.3	9.9	9.1	8.2
7	13.5	10.6	6.5	0.6	997.9	999.7	4.8	21.2	18.3	14.2	8.3	5.5	7.4	12.5	8.7	7.7	8.6	9.9	11.2	9.9	9.3
8	999.4	0.9	3.1	3.9	5.0	6.3	3.1	7.1	8.7	10.7	11.5	12.7	14.1	10.8	7.9	8.5	12.1	12.5	10.1	4.7	9.3
9	7.1	7.1	4.7	0.8	5.6	8.0	5.6	15.1	15.0	12.3	8.4	13.3	16.0	13.4	3.3	4.1	14.5	14.8	8.4	4.8	8.3
10	8.2	9.3	11.5	13.0	15.8	16.7	12.4	16.2	17.1	19.4	20.8	23.8	24.7	20.3	3.2	4.5	7.9	8.5	4.9	2.1	5.2
11	17.1	16.6	16.2	12.9	11.0	8.1	13.7	25.2	24.7	24.0	20.7	18.9	15.9	21.6	-0.1	-0.3	7.7	7.5	5.7	5.7	4.4
12	2.0	997.0	992.7	994.1	995.3	997.8	996.5	9.8	4.7	0.4	1.9	3.0	5.6	4.2	5.5	5.9	6.3	4.8	5.3	3.9	5.3
13	998.4	4.4	10.9	13.3	16.6	19.1	10.5	6.2	12.3	18.6	21.1	24.4	27.1	18.3	3.1	3.7	8.7	8.8	8.3	4.3	6.2
14	19.4	20.8	19.7	16.7	15.4	15.8	18.0	27.5	28.8	27.6	24.5	23.3	23.8	25.9	1.5	2.9	7.7	9.7	7.5	3.5	5.5
15	15.6	15.6	16.0	14.8	15.0	17.6	15.8	23.6	23.6	23.8	22.4	22.9	25.5	23.6	0.7	2.3	10.9	12.9	8.2	4.7	6.6
16	16.7	16.3	14.4	9.2	7.0	5.7	11.6	24.7	24.4	22.0	16.8	14.6	13.4	19.3	1.0	0.4	12.3	14.2	11.8	9.0	8.1
17	4.0	4.7	4.3	2.4	2.7	4.3	3.7	11.8	12.4	11.9	10.0	10.5	12.1	11.5	7.3	9.7	12.7	12.9	8.6	6.8	9.7
18	5.8	8.2	9.6	10.1	12.0	14.8	10.1	13.7	16.0	17.2	17.6	19.9	22.8	17.9	6.3	6.8	10.3	13.3	9.1	2.1	8.0
19	15.4	17.3	16.0	12.0	10.7	8.2	13.3	23.5	25.5	23.7	19.7	18.4	15.9	21.1	-1.1	0.3	12.9	15.7	12.7	11.4	8.7
20	5.8	4.7	4.0	1.5	999.5	999.0	2.4	13.6	12.3	11.7	8.9	7.1	6.7	10.1	10.4	10.7	13.6	17.1	15.2	9.9	12.8
21	997.0	996.7	994.4	993.7	994.4	996.7	995.5	4.7	4.4	1.9	1.1	2.1	4.4	3.1	9.4	7.8	13.4	13.5	8.5	5.3	9.7
22	998.8	1.8	3.5	4.2	5.3	5.4	3.2	6.6	9.7	11.1	11.8	13.1	14.6	11.2	6.0	6.6	9.9	11.9	8.3	3.5	7.7
23	5.1	3.5	0.2	996.8	996.0	997.9	999.9	13.0	11.3	8.0	4.3	3.7	5.7	7.7	4.3	5.1	8.9	12.8	8.3	4.7	7.4
24	997.7	999.5	2.5	3.4	7.0	7.9	3.0	5.5	7.4	10.4	11.2	14.7	15.8	10.8	3.2	3.7	6.2	6.6	5.3	4.1	4.9
25	7.9	11.7	14.0	14.8	16.7	19.1	14.0	15.8	19.6	21.9	22.5	24.5	27.1	21.9	5.7	6.2	7.9	11.0	8.4	2.8	7.0
26	19.0	19.7	19.8	19.0	20.1	21.5	19.9	27.1	27.7	27.5	26.7	27.9	29.4	27.7	0.2	2.8	13.6	15.8	11.5	6.6	8.4
27	22.0	22.7	22.8	18.7	17.2	17.3	20.1	30.1	30.8	30.5	26.1	24.9	25.1	27.9	3.3	2.4	13.7	20.1	14.6	9.4	10.6
28	15.8	15.8	13.5	11.6	9.8	8.2	12.5	23.6	23.5	21.1	19.1	17.3	15.8	20.1	8.8	8.9	14.6	17.6	14.9	12.5	12.9
29	3.6	0.6	997.3	991.3	994.2	995.9	997.2	11.3	8.3	4.8	998.7	1.6	3.5	4.7	11.6	11.4	13.3	15.8	15.8	10.3	13.0
30	994.0	994.0	995.6	998.5	1.7	4.4	998.0	1.6	1.5	3.1	6.1	9.4	12.1	5.6	11.1	13.3	14.6	14.3	9.9	9.0	12.0
Mean	8.8	9.4	9.3	7.6	8.1	9.1	8.7	16.7	17.2	17.0	15.2	15.8	17.0	16.5	4.7	5.2	10.4	12.2	9.3	6.1	8.0

Day	AIR TEMPERATURE °C				DIRECTION AND VELOCITY (m.p.s.) OF THE WIND											Mean				
	Max.	Min.	Mean	Range	2	6	10	14	18	22	Mean									
											6 obs.	24 h								
1	15.1	-0.6	7.3	15.7	—	0.2	—	0.4	SE	2.4	NW	2.6	NNE	2.0	W	2.4	1.7	2.0		
2	13.5	5.4	9.5	8.1	—	0.0	NW	2.6	NW	8.2	NW	7.3	NNW	5.0	NNE	1.3	4.1	4.0		
3	9.2	0.7	5.0	8.5	NE	1.5	WNW	1.1	SW	0.7	SE	5.2	S	7.3	SSW	2.0	3.0	3.0		
4	5.5	0.3	2.9	5.2	NW	2.4	—	0.0	NNW	3.8	NNW	3.4	NNW	3.0	NW	1.7	2.4	2.7		
5	12.3	2.2	7.3	10.1	NW	2.2	NNW	5.4	NNW	5.4	NW	6.9	W	3.2	SSE	4.0	4.5	4.1		
6	14.1	2.3	8.2	11.8	SSE	4.0	—	0.0	SSE	3.0	SSE	7.6	SE	5.0	SSE	4.8	4.1	4.3		
7	11.5	7.7	9.6	3.8	SSE	4.6	S	2.4	NW	2.0	NNW	3.0	NW	2.8	NE	0.7	2.6	3.4		
8	13.5	3.2	8.4	10.3	ENE	1.5	ENE	2.4	NW	3.8	NW	2.6	W	2.6	—	0.4	2.2	2.5		
9	16.7	2.6	9.7	14.1	—	0.0	NNW	1.5	SSE	7.3	SSE	5.7	WSW	9.4	W	8.0	5.3	6.1		
10	9.3	1.3	5.3	8.0	W	19.6	W	24.4	W	13.5	W	11.3	NW	6.7	NW	3.8	13.2	11.9		
11	9.1	-1.4	3.9	10.5	NNE	2.4	—	0.4	S	4.4	SE	10.3	S	2.4	SSW	3.4	3.9	4.0		
12	7.6	3.1	5.4	4.5	NNW	0.9	NW	1.7	NW	7.3	NNW	10.0	NNW	7.1	NNW	8.0	5.8	5.7		
13	10.3	2.4	6.4	7.9	N	5.4	NNW	4.8	SSW	6.9	NNW	5.7	W	5.5	E	1.7	5.0	5.1		
14	10.9	0.9	5.9	10.0	SSE	0.9	S	3.0	S	7.4	SSE	7.1	SSE	7.3	WSW	2.0	4.6	4.6		
15	13.5	0.1	6.8	13.4	E	2.6	S	1.7	W	3.4	WNW	11.2	NNW	5.2	WSW	1.7	4.3	5.1		
16	15.1	-1.0	7.1	16.1	—	0.0	SE	0.9	SE	4.0	SE	10.8	SSE	5.9	SSE	7.1	4.8	4.5		
17	14.2	5.2	9.7	9.0	W	2.2	SW	3.8	NW	5.7	WNW	7.4	WNW	3.8	N	5.4	4.7	4.9		
18	14.3	1.3	7.8	13.0	NNW	8.5	NNW	9.1	NW	7.3	W	7.3	WNW	3.8	—	0.0	6.0	4.5		
19	17.0	-1.7	7.7	18.7	—	0.2	—	0.0	—	0.4	SSE	9.3	SSE	10.8	SE	11.2	5.3	5.2		
20	17.4	9.4	13.4	8.0	SSE	11.0	S	6.5	SSE	7.1	NNW	2.8	—	0.4	N	5.4	5.5	5.7		
21	16.6	5.3	11.0	11.3	NNE	3.4	—	0.0	WSW	6.1	W	5.4	W	16.1	W	11.8	7.1	8.6		
22	12.3	3.1	7.7	9.2	NE	6.1	NNE	6.7	NNW	12.0	NW	9.4	NW	4.6	E	1.1	6.7	7.0		
23	12.9	2.7	7.8	10.2	S	7.4	SSE	3.4	SSE	6.1	S	8.9	WSW	11.3	W	13.9	8.5	7.0		
24	9.4	2.5	6.0	6.9	WSW	10.5	NE	8.2	NNW	7.4	NW	9.3	N	4.0	W	5.4	7.5	7.2		
25	12.7	3.1	7.9	9.6	WNW	5.4	NW	6.9	NW	9.1	WNW	7.8	WNW	5.2	E	1.3	6.0	6.1		
26	16.5	0.1	8.3	16.4	NE	1.3	—	0.2	W	1.5	WNW	10.8	WNW	5.5	NE	2.0	3.6	4.5		
27	20.6	0.9	10.8	19.7	SE	2.8	ENE	1.3	SE	1.1	SSE	5.4	SSE	6.1	—	0.0	2.8	2.8		
28	18.7	8.2	13.5	10.5	N	1.7	SW	1.3	NNE	0.7	N	2.2	NW	1.7	WNW	1.3	1.5	1.6		
29	18.2	8.5	13.4	9.7	—	0.0	—	0.0	SSE	8.7	SSE	4.8	NE	1.1	NNW	5.5	3.4	4.0		
30	15.4	6.2	10.8	9.2	SW	2.8	WSW	5.7	W	12.5	W	14.9	W	10.8	NNE	6.5	8.9	10.5		
Mean	13.4	2.8	8.1	10.6		3.7		3.5		5.6		7.2		5.5		4.1		5.0		5.1



AUGUST, 1951.

Main table with columns: Day, VAPOUR PRESSURE (mb), AMOUNT OF CLOUD (0-10), FORMS OF CLOUD (2, 6, 10, 14, 18, 22). Includes mean values at the bottom.

Table with columns: Day, Duration of Sunshine (in hours), Amount of Evaporation mm, RELATIVE HUMIDITY %, PRECIPITATION mm, REMARKS. Includes mean values at the bottom.

OCTOBER, 1951.

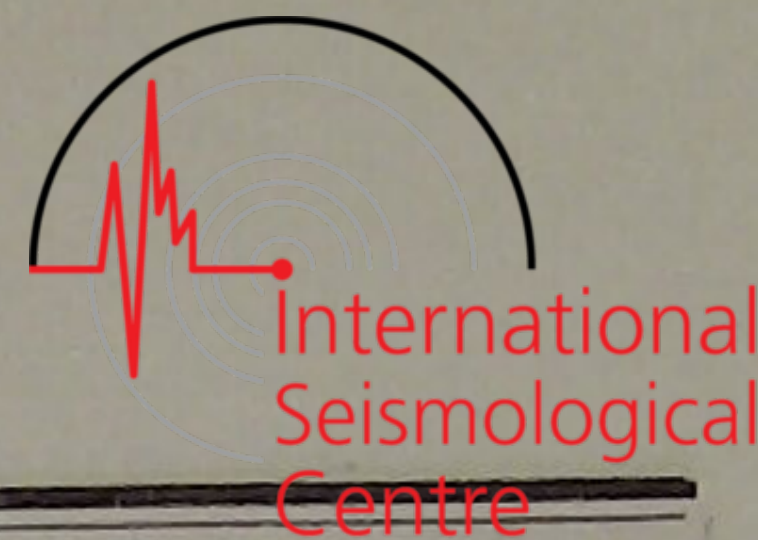


Table with 22 columns: Day, Station Pressure (1000mb +), M.S.L. Pressure (1000mb +), and Air Temperature (°C). Rows include daily data from Day 1 to 31 and a Mean row.

Table with 17 columns: Day, Air Temperature (°C) (Max, Min, Mean, Range), and Direction and Velocity (m.p.s.) of the Wind (2, 6, 10, 14, 18, 22, Mean 6 obs., 24 h). Rows include daily data from Day 1 to 31 and a Mean row.

DECEMBER, 1951.



Table with columns for Day, Vapour Pressure (mb), Amount of Cloud (0-10), and Forms of Cloud (2, 6, 10, 14, 18, 22). Rows 1-31 and a Mean row.

Table with columns for Day, Duration of Sunshine, Amount of Evaporation, Relative Humidity (%), Precipitation (mm), and Remarks. Rows 1-31 and a Mean row.

1951.



Month	AIR PRESSURE (STATION) 100 mb+										AIR PRESSURE (Mean sea Level) 1000 mb+											
	2	6	10	14	18	22	Mean	Max.	Date	Min.	Date	2	6	10	14	18	22	Mean	Max.	Date	Min.	Date
January	10.6	10.7	11.6	10.2	11.4	11.3	11.0	23.8	15	990.5	21	18.8	18.6	19.7	18.2	19.5	19.4	19.0	32.1	15	998.4	21
February	9.5	9.6	10.2	8.2	9.4	9.7	9.4	27.6	27	985.9	10	17.6	17.8	18.3	16.1	17.4	17.8	17.5	35.8	27	993.7	10
March	8.8	9.5	9.7	8.0	8.8	9.4	9.0	26.1	6	993.4	7	16.8	17.5	17.7	15.8	16.7	17.4	17.0	34.5	6	1.2	7
April	8.8	9.4	9.3	7.6	8.1	9.1	8.7	23.9	6	991.3	29	16.7	17.2	17.0	15.2	15.8	17.0	16.5	31.9	6	998.7	29
May	4.9	5.5	5.0	3.5	3.8	5.2	4.7	17.9	21	991.2	31	12.7	13.2	12.5	10.8	11.4	12.7	12.2	25.8	21	998.6	31
June	1.0	1.6	1.4	0.4	0.8	2.0	1.2	12.7	3	987.8	22	8.5	9.1	8.8	7.7	8.2	9.5	8.6	20.2	3	995.0	22
July	3.9	4.1	4.1	2.8	3.4	4.4	3.8	9.9	10	991.7	13	11.3	11.6	11.4	10.1	10.7	11.8	11.2	17.3	10	999.0	13
August	4.6	5.3	5.2	3.6	3.8	4.9	4.6	11.5	11	996.7	24	12.0	12.6	12.4	10.8	11.1	12.3	11.9	19.0	11	3.8	24
September	6.5	6.8	6.5	5.4	6.1	7.3	6.4	18.1	29	993.9	1	14.1	14.5	14.0	12.7	13.6	14.9	14.0	26.0	29	1.0	1
October	10.4	10.7	10.9	8.7	9.6	10.4	10.1	23.0	28	974.6	15	18.0	18.6	18.5	16.2	17.2	18.1	17.8	30.9	28	981.8	15
November	9.8	10.0	10.3	8.4	9.5	9.8	9.6	20.7	5	985.8	26	17.8	17.9	18.1	16.1	17.3	17.7	17.5	28.7	5	993.4	26
December	9.5	9.5	10.3	8.3	9.2	9.5	9.4	24.0	30	988.4	27	17.5	17.5	18.2	15.8	17.1	17.5	17.3	32.2	30	996.3	27
Annual	7.4	7.7	7.9	6.2	7.0	7.8	7.3	27.6	II27	974.6	X15	15.2	15.5	15.6	13.8	14.7	15.5	15.0	35.8	II27	981.8	X15

Month	AIR TEMPERATURE °C												VAPOUR PRESSURE mb								
	2	6	10	14	18	22	Mean	Mean			Absolute				2	6	10	14	18	22	Mean
								Max.	Min.	Range	Max.	Date	Min.	Date							
January	-5.5	-5.8	-2.8	-1.4	-3.7	-5.1	-4.1	0.0	-8.5	8.4	4.4	16	-16.3	15	3.5	3.4	3.8	4.0	3.7	3.6	3.7
February	-4.0	-4.6	-0.7	1.3	-0.9	-2.8	-1.9	2.8	-6.6	9.4	10.3	22	-13.0	1	4.0	4.0	4.4	4.6	4.6	4.3	4.3
March	0.0	-0.5	3.7	5.4	2.5	0.6	2.0	6.9	-2.0	8.9	15.7	18	-7.7	9	5.3	5.2	5.6	6.0	5.7	5.4	5.5
April	4.7	5.2	10.4	12.2	9.3	6.1	8.0	13.4	2.8	10.6	20.6	27	-1.7	19	7.5	7.5	8.3	8.8	8.1	7.7	8.0
May	9.6	10.6	17.5	20.1	16.0	12.0	14.3	21.3	7.7	13.6	29.2	30	-1.9	3	11.0	11.3	12.8	13.1	12.5	12.2	12.2
June	14.9	15.6	20.3	22.4	19.9	16.4	18.2	23.4	13.3	10.1	29.5	2	8.4	27	15.8	15.9	17.2	17.5	16.8	16.4	16.6
July	18.5	18.9	23.3	25.5	23.0	19.9	21.5	26.5	17.4	9.1	32.7	25	9.6	3	20.6	21.0	22.4	23.3	22.8	21.5	21.9
August	21.0	21.3	26.7	28.9	25.7	22.6	24.4	30.0	20.1	9.9	33.4	13	15.1	30	23.8	24.4	26.5	26.9	26.4	25.1	25.5
September	13.2	13.4	19.0	21.2	17.1	14.3	16.4	22.1	11.6	10.5	27.3	1	4.5	24	14.8	15.0	16.5	16.7	16.4	15.3	15.8
October	10.2	9.4	14.1	17.0	13.2	10.6	12.4	18.2	7.9	10.3	25.7	1	0.2	23	11.8	11.0	12.5	12.8	13.0	12.0	12.2
November	3.4	3.0	6.5	9.4	6.5	4.6	5.6	10.4	1.2	9.2	17.5	4	-9.5	28,29	7.3	7.0	7.8	8.4	8.1	7.9	7.8
December	0.3	0.0	2.8	4.6	2.8	1.3	2.0	5.8	-1.8	7.6	14.5	13	-11.2	2	5.5	5.5	6.3	6.6	6.3	5.8	6.0
Annual	7.2	7.2	11.7	13.9	11.0	8.4	9.9	15.1	5.3	9.8	33.4	VIII13	-16.3	I15	10.9	10.9	12.0	12.4	12.0	11.4	11.6

Month	PRECIPITATION mm								RELATIVE HUMIDITY %									
	2	6	10	14	18	22	Sum	Maximum				2	6	10	14	18	22	Mean
								24 h	Date	4 h	Date							
January	15.1	14.0	9.9	2.7	3.0	7.7	52.4	10.2	1	5.5	22	85	85	77	72	80	84	80
February	10.3	11.6	4.8	1.9	7.2	6.9	42.7	6.6	26	4.7	26	86	88	74	68	79	84	80
March	6.9	4.8	8.4	33.8	41.4	15.6	110.9	32.7	1	19.8	1	84	85	69	66	76	83	77
April	13.6	18.7	22.1	18.5	6.3	7.6	86.8	18.2	12	8.5	12	86	84	66	62	68	81	75
May	21.9	20.7	5.1	3.0	3.9	21.6	76.2	19.3	9	10.6	28	89	86	63	56	67	84	74
June	16.1	11.4	20.2	11.1	7.7	6.7	73.2	18.2	10	15.0	10	93	89	72	66	73	88	80
July	4.5	14.1	17.3	29.2	69.3	4.5	138.9	67.6	11	65.6	11	95	95	78	71	81	91	85
August	5.8	17.2	36.4	21.6	5.2	7.0	93.2	38.6	6	25.9	23	95	95	76	68	80	91	84
September	1.6	11.5	9.7	22.1	32.6	15.8	93.3	34.5	9	15.5	11	96	96	75	67	83	92	85
October	27.7	15.7	10.9	6.3	14.7	30.7	106.0	27.2	15	11.2	23	93	92	77	66	84	92	84
November	24.4	31.3	21.6	18.9	15.3	28.0	139.5	21.5	27	10.1	13	91	91	80	71	82	89	84
December	13.1	7.0	13.7	16.8	15.3	11.4	77.3	19.3	31	9.3	27	87	88	83	77	82	84	84
Annual	161.0	178.0	180.1	185.9	221.9	163.5	1090.4	67.6	VIII11	65.6	VIII11	90	89	74	67	78	87	81

1951.



Month	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
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MONTHLY MAXIMUM DAILY RANGE (WITH DATE) OF AIR TEMPERATURE (°C)

Max. Date	16.1 16	18.6 22	16.8 17	19.7 27	24.1 7	17.6 27	17.2 4	14.5 11	16.5 24	16.4 8	16.0 20	13.7 13	24.1 V 7
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VARIABILITY OF DAILY MEAN AIR TEMPERATURE (°C)

Mean	2.1	2.1	2.6	1.7	1.7	1.8	1.2	1.2	1.4	1.9	2.2	2.0	1.8
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FREQUENCY OF VARIATION

Rise	< 2°	2° - 4°	4° - 6°	6° - 8°	8° - 10°	10° - 12°	12° - 14°	14° - 16°	16° - 18°	18° - 20°	20° - 22°	22° - 24°	24° - 26°	26° - 28°	28° - 30°	Annual
	Sum	8	3	3	—	—	8	7	12	7	15	11	9	11	12	8
Sum	14	13	18	16	18	15	18	14	12	14	17	16	185			

MONTHLY MAXIMUM (WITH DATE) MINIMUM (WITH DATE) AND RANGE OF VAPOUR PRESSURE (mb)

Max. Date	6.2 25	7.7 22	14.0 1	16.9 29	21.4 27	22.8 30	32.7 23	33.9 24	26.3 1	21.2 1	14.9 2	10.0 20.22	33.9 VIII 24
Min. Date	1.8 15	2.2 1, 6	3.2 4, 9	3.9 10	5.0 3	11.3 27	11.2 3	17.2 30	9.0 22	6.1 23	3.5 28	2.4 2	1.8 I 15
Range	4.4	5.5	10.8	13.0	16.4	11.5	21.5	16.7	17.3	15.1	11.4	7.6	32.1

MONTHLY MINIMUM (WITH DATE) OF RELATIVE HUMIDITY (%)

Min. Date	52 20	42 27	34 25	30 19	25 3	38 27	34 4	36 11	42 23	33 4	47 4	48 9	25 V 3
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VELOCITY (m.p.s.) OF WIND

CLOUD AMOUNT (0-10)

Hour	VELOCITY (m.p.s.) OF WIND									CLOUD AMOUNT (0-10)											
	2	6	10	14	18	22	Maximum			Mean of 24 h	No. of Days with Gale.				2	6	10	14	18	22	Mean
Month	Vel.	Dir.	Date	Vel.	Dir.	Date	Vel.	Dir.	Date		m.p.s. 10-15	m.p.s. 15-29	m.p.s. ≥29	Sum							
January	3.1	2.7	2.7	4.3	3.7	2.3	18.0	W	5	2.9	5	2	—	7	7.3	8.0	7.8	7.7	7.2	7.5	7.6
February	2.2	2.1	2.5	3.7	3.6	2.5	16.5	W	10	3.0	6	1	—	7	7.6	8.5	8.2	8.6	6.0	6.4	7.6
March	2.8	2.9	3.5	5.6	3.3	2.5	16.9	SE	1	3.5	8	3	—	11	6.6	7.4	7.9	7.9	7.5	6.8	7.3
April	3.7	3.5	5.6	7.2	5.5	4.1	26.1	W	21	5.2	8	7	—	15	6.2	7.8	8.1	8.2	7.5	6.0	7.3
May	2.1	1.6	4.0	5.1	4.3	2.3	14.5	W	4	3.4	4	—	—	4	7.1	6.8	6.2	6.9	7.7	6.9	6.9
June	1.4	1.8	2.7	4.2	4.2	2.8	12.9	NNW	18	3.1	6	—	—	6	6.8	7.6	7.3	7.2	6.1	6.2	6.9
July	1.2	1.1	2.5	3.7	3.8	1.9	10.3	SSE	7	2.3	1	—	—	1	7.2	8.6	8.5	8.4	7.7	6.1	7.7
August	1.2	1.0	1.9	3.4	3.1	1.7	10.3	SE	23	2.1	1	—	—	1	6.8	8.4	7.7	7.1	6.8	6.5	7.2
September	1.0	1.4	2.4	3.7	2.3	1.6	11.8	WSW	3	2.1	3	—	—	3	7.4	8.8	8.3	7.9	7.0	6.5	7.6
October	1.4	1.8	1.9	2.7	2.3	1.4	13.2	NNW	15	2.0	2	—	—	2	6.7	8.2	7.3	7.4	5.6	6.2	6.9
November	2.2	2.2	2.2	2.8	2.3	1.9	16.5	WNW	5	2.4	7	1	—	8	6.1	7.7	7.8	7.7	6.7	6.5	7.1
December	2.6	2.1	2.4	3.2	3.0	2.7	11.7	W	23	2.6	4	—	—	4	6.5	8.1	8.2	7.8	7.2	6.3	7.3
Annual	2.1	2.0	2.9	4.1	3.4	2.3	26.1	W	IV21	2.9	55	14	—	69	6.9	8.0	7.8	7.7	6.9	6.5	7.3

1951.



NUMBER OF OBSERVATIONS OF THE WIND FROM

Month	Dir.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Calm
January		21	4	6	5	8	4	9	5	4	1	1	2	26	16	24	33	17
February		13	3	6	4	1	4	7	12	4	3	2	6	19	17	18	24	25
March		7	3	4	3	5	1	9	14	10	2	5	6	14	20	36	29	18
April		6	7	7	3	4	—	10	23	10	3	4	7	21	11	24	21	19
May		5	3	6	1	8	4	15	31	12	4	7	7	12	13	16	17	25
June		10	—	3	2	6	10	15	29	18	3	1	7	6	10	14	21	25
July		6	4	8	3	4	3	12	35	18	8	4	3	6	6	8	22	36
August		6	1	7	2	5	1	20	37	6	1	5	5	9	5	11	16	49
September		8	2	3	4	4	5	14	16	10	7	8	5	12	10	30	14	28
October		8	7	4	2	7	3	7	15	2	1	4	7	9	18	18	27	47
November		7	6	2	3	4	8	7	5	4	1	3	4	14	16	23	23	50
December		7	7	10	2	3	3	8	12	4	3	2	2	11	23	33	19	37
Annual		104	47	66	34	59	46	133	234	102	37	46	61	159	165	255	266	376

MONTHLY MEAN VELOCITY (m.p.s.) OF THE WIND FROM

Month	Dir.	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW
January		3.4	1.6	1.7	1.8	2.1	1.1	2.3	2.4	2.5	1.3	1.1	1.0	4.3	3.8	4.4	4.0
February		2.8	4.4	1.3	1.5	0.7	1.9	2.7	3.3	3.2	1.6	2.2	2.8	4.1	2.8	3.8	4.3
March		3.3	1.6	2.9	1.0	2.5	2.2	3.9	3.5	3.1	1.5	4.5	3.0	4.6	5.2	3.5	4.3
April		4.0	3.3	3.0	1.7	1.7	—	5.4	6.2	5.1	4.1	2.2	6.7	9.3	5.8	4.9	5.6
May		2.3	2.3	3.4	2.2	1.2	1.9	3.3	5.3	4.0	2.4	1.4	5.4	4.3	3.8	3.3	4.0
June		2.9	—	2.0	3.2	1.4	2.0	4.6	4.2	3.1	1.7	1.5	3.0	4.4	3.1	4.0	2.9
July		2.0	1.7	1.8	1.0	1.2	3.3	3.0	4.3	3.7	1.9	2.3	0.8	1.9	1.4	3.4	2.6
August		2.5	0.7	1.3	1.8	1.1	0.7	3.8	3.8	4.4	0.7	1.1	3.2	1.4	1.2	1.5	2.6
September		1.8	1.6	1.4	1.7	1.0	2.6	2.3	3.6	2.6	1.4	2.5	3.3	2.9	2.8	2.4	1.7
October		1.9	1.4	1.2	1.7	1.6	1.7	1.7	2.9	3.6	1.3	1.9	2.3	2.0	2.4	3.2	3.4
November		1.6	2.1	2.3	0.8	1.3	1.9	2.1	2.9	5.0	3.2	3.3	2.5	4.0	4.6	3.5	3.0
December		2.3	3.0	2.1	0.7	1.7	1.3	2.6	3.3	3.3	1.5	2.6	1.3	3.6	4.5	3.6	4.0
Annual		2.7	2.3	2.0	1.5	1.5	1.9	3.3	4.2	3.6	1.9	2.3	3.4	4.4	3.7	3.5	3.6

DIRECTION AND INTENSITY (m.p.s.) OF THE RESULTANT WIND COMPUTED WITH THE VELOCITY

Month	Hours	2	6	10	14	18	22	General
January		N 42° W 1.6	N 33° W 1.6	N 41° W 1.9	N 48° W 3.1	N 41° W 2.4	N 36° W 0.9	N 42° W 1.9
February		N 53° W 1.4	N 48° W 1.5	N 30° W 1.7	N 66° W 1.4	N 45° W 1.1	N 76° W 1.2	N 52° W 1.3
March		N 58° W 0.9	N 50° W 0.9	N 70° W 1.6	N 70° W 3.1	N 49° W 2.3	N 44° W 1.1	N 59° W 1.6
April		S 88° W 0.8	N 64° W 1.4	N 88° W 2.1	N 88° W 2.5	S 86° W 2.6	N 77° W 1.2	N 86° W 1.7
May		N 18° W 0.7	N 87° W 0.5	S 35° W 0.8	S 34° W 2.1	S 21° W 1.1	S 23° E 1.0	S 33° W 0.7
June		N 22° E 0.0	N 36° W 0.6	S 51° E 0.4	S 30° W 1.6	S 26° E 1.5	S 4° W 0.8	S 4° W 0.5
July		S 10° W 0.3	S 43° W 0.1	S 20° E 1.2	S 9° E 1.0	S 16° E 1.8	S 21° E 0.6	S 14° E 0.8
August		S 7° W 0.1	S 46° E 0.1	S 44° E 0.9	S 1.3	S 24° E 1.5	S 29° E 1.2	S 22° E 0.8
September		N 88° W 0.3	N 57° W 0.4	S 83° W 0.5	S 75° W 0.9	S 38° W 0.9	S 15° W 0.3	S 69° W 0.5
October		N 60° W 1.0	N 35° W 1.3	N 26° W 1.1	N 72° W 1.1	S 86° W 0.3	N 14° W 0.4	N 48° W 0.8
November		N 43° W 1.6	N 41° W 1.6	N 68° W 1.2	N 83° W 1.2	N 63° W 0.9	N 63° W 0.8	N 58° W 1.2
December		N 40° W 1.4	N 42° W 1.2	N 68° W 1.1	N 49° W 1.7	N 51° W 1.5	N 46° W 1.6	N 48° W 1.4
Annual		N 52° W 0.8	N 46° W 0.9	N 72° W 0.7	S 89° W 1.3	S 82° W 0.7	N 86° W 0.4	N 74° W 0.7

1951.



NUMBER OF DAYS WITH PRECIPITATION (Separated by Amount)

Month Amount	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
	<0.1 mm	3	2	4	2	1	1	3	6	1	3	1	5
0.1— 1	13	7	9	8	4	3	3	4	7	5	5	11	79
1— 3	4	7	2	5	2	7	3	2	4	1	2	5	44
3— 5	1	5	1	—	1	—	—	2	—	2	1	3	16
5— 10	3	1	1	2	3	4	3	1	3	1	3	—	25
10— 15	1	—	—	3	1	1	1	—	1	2	4	2	16
15— 20	—	—	1	1	2	1	—	—	—	—	2	1	11
20— 25	—	—	1	—	—	—	—	—	—	—	1	—	2
25— 30	—	—	1	—	—	—	1	—	—	1	—	—	3
30— 35	—	—	1	—	—	—	—	—	1	—	—	—	2
35— 40	—	—	—	—	—	—	—	2	—	—	—	—	2
40— 45	—	—	—	—	—	—	—	—	—	—	—	—	—
45— 50	—	—	—	—	—	—	—	—	—	—	—	—	—
50— 60	—	—	—	—	—	—	—	—	—	—	—	—	—
60— 70	—	—	—	—	—	—	1	—	—	—	—	—	1
70— 80	—	—	—	—	—	—	—	—	—	—	—	—	—
80— 90	—	—	—	—	—	—	—	—	—	—	—	—	—
90— 100	—	—	—	—	—	—	—	—	—	—	—	—	—
100≤	—	—	—	—	—	—	—	—	—	—	—	—	—
Annual	25	22	21	21	14	17	15	17	18	17	19	27	233

EARTH TEMPERATURE °C

Month	Surface						Mean	Depth (m)									
	2	6	10	14	18	22		0.05	0.1	0.2	0.3	0.5	1.0	2.0	3.0	5.0	6.0
January	-0.8	-0.8	-0.4	0.0	-0.3	-0.7	-0.5	-0.2	-0.1	1.3	2.5	3.6	6.5	11.6	13.4	13.6	13.4
February	-0.9	-0.9	-0.1	0.6	-0.2	-0.5	-0.3	-0.4	-0.6	0.6	1.6	2.6	5.1	10.1	12.2	13.1	13.3
March	1.4	1.2	6.4	10.3	4.4	2.2	4.3	3.3	3.5	3.4	3.7	3.5	4.8	8.8	11.2	12.5	12.9
April	5.8	5.7	13.4	15.7	10.2	7.3	9.7	8.9	9.0	8.5	8.4	7.6	7.2	8.7	10.5	11.9	12.6
May	12.0	12.0	20.8	23.1	17.1	13.8	16.5	15.4	15.4	14.5	13.9	12.6	10.9	9.6	10.4	11.5	12.3
June	17.0	17.4	24.4	26.3	21.2	18.4	20.8	19.9	19.9	19.1	18.5	17.2	14.9	11.3	11.0	11.4	12.0
July	20.4	20.9	27.6	30.0	24.6	21.9	24.2	23.3	23.2	22.4	21.7	20.1	17.6	13.1	12.0	11.6	11.9
August	23.6	23.7	30.7	32.8	27.3	24.8	27.1	26.5	26.4	25.7	25.1	23.1	20.8	14.8	13.2	12.1	12.1
September	16.9	16.7	22.7	25.0	19.7	17.5	19.7	19.7	20.0	20.2	20.6	20.5	20.2	16.4	14.3	12.7	12.3
October	12.4	12.0	17.7	19.1	14.7	12.9	14.8	14.9	15.3	15.7	16.2	16.4	17.3	16.2	15.0	13.4	12.7
November	5.7	5.2	9.2	11.1	7.6	6.4	7.5	7.9	8.3	9.2	10.2	10.9	13.2	15.1	15.0	13.6	13.1
December	1.9	1.6	3.6	5.7	3.2	2.3	3.0	3.4	3.6	4.4	5.3	6.0	8.8	13.2	14.2	13.7	13.3
Annual	9.6	9.5	14.7	16.6	12.5	10.5	12.2	11.9	12.0	12.1	12.3	12.0	12.3	12.4	12.7	12.6	12.7

Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Annual
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MONTHLY TOTAL DURATION OF SUNSHINE (in hours)

113.70	113.60	148.61	155.82	212.03	187.60	164.74	189.24	135.68	128.34	99.90	84.60	1733.86
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RATE OF SUNSHINE (%)

38	38	40	39	48	42	36	45	37	37	34	29	39
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AMOUNT OF EVAPORATION (mm)

OPEN AIR

2.2	2.4	2.4	3.8	4.7	4.5	4.2	5.0	3.0	2.1	1.4	1.1	3.1
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IN THE SHELTER

1.1	1.1	1.2	1.7	2.0	1.7	1.4	1.5	1.1	0.9	0.9	0.8	1.3
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1951.



NUMBER OF OBSERVATIONS OF THE HORIZONTAL VISIBILITY FROM

Dir.	Class	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Sum
N	0	—	—	—	—	—	—	—	—	—	—	—	—	—
	1	1	—	—	—	—	—	1	1	2	5	3	—	13
	2	—	—	—	—	—	1	1	5	4	3	2	2	18
	3	7	3	3	1	—	—	1	1	2	1	5	6	30
	4	7	4	2	—	1	1	2	6	1	3	7	1	35
	5	20	7	9	6	10	5	14	4	4	5	10	6	100
	6	25	12	7	12	11	24	23	15	20	9	16	15	189
	7	48	38	42	29	47	35	57	51	40	41	36	48	512
	8	61	73	82	87	91	61	52	52	56	77	69	87	848
	9	17	31	41	45	26	53	35	51	51	42	32	21	445
E	0	—	—	—	—	—	—	—	—	—	—	—	—	—
	1	1	—	—	—	—	—	1	1	2	5	3	—	13
	2	—	—	—	—	—	1	1	5	4	3	2	2	18
	3	7	3	3	1	—	—	1	1	2	1	5	6	30
	4	7	4	2	—	1	2	2	6	1	3	7	1	36
	5	19	7	9	6	10	5	14	5	4	5	10	6	100
	6	19	11	6	11	11	22	25	14	21	10	16	12	178
	7	50	37	39	27	42	35	49	48	40	40	29	41	477
	8	66	75	86	89	96	62	57	55	56	75	76	96	889
	9	17	31	41	46	26	53	36	51	50	44	32	22	449
S	0	—	—	—	—	—	—	—	—	—	—	—	—	—
	1	1	—	—	—	—	—	1	1	2	5	3	—	13
	2	—	—	—	—	—	1	1	5	4	3	2	2	18
	3	7	3	3	1	—	—	1	1	2	1	5	6	30
	4	7	4	2	—	1	1	2	6	1	3	7	1	35
	5	19	7	9	6	10	5	15	5	4	5	10	6	101
	6	20	12	7	11	12	23	23	13	21	10	16	13	181
	7	50	37	40	29	42	36	52	48	37	40	32	41	484
	8	66	74	84	87	95	61	55	56	59	75	73	96	881
	9	16	31	41	46	26	53	36	51	50	44	32	21	447
W	0	—	—	—	—	—	—	—	—	—	—	—	—	—
	1	1	—	—	—	—	—	1	1	2	5	3	—	13
	2	—	—	—	—	—	1	1	5	4	3	2	2	18
	3	7	3	3	1	—	—	1	1	2	1	5	6	30
	4	7	4	2	—	1	1	2	6	1	3	7	1	35
	5	20	7	9	6	10	5	15	3	4	5	10	6	100
	6	24	12	8	11	11	25	24	14	21	11	15	13	189
	7	51	41	49	36	46	33	54	52	38	41	32	48	521
	8	61	72	77	80	94	63	54	53	59	76	74	92	855
	9	15	29	38	46	24	52	34	51	49	41	32	18	429

NUMBER OF DAYS WITH

Month	●* △▲ 0.1≤	* 0.1≤	△ ※	▲	☐	☐ 0-2	Clear	Cloudy	Sunless	☐	☐	Min. Temp. <0°	Mean Temp. <0°	Max. Temp. <0°	Min. Temp. ≥25°	Mean Temp. ≥25°	Max. Temp. ≥25°	Max. Temp. ≥30°
January	22	23	—	—	—	2	1	19	3	7	9	31	30	17	—	—	—	—
February	20	20	—	—	—	1	—	14	4	7	11	28	21	4	—	—	—	—
March	17	13	1	—	—	—	1	12	4	11	8	21	6	2	—	—	—	—
April	19	2	—	—	2	—	1	14	5	15	6	4	—	—	—	—	—	—
May	13	—	—	—	—	—	4	14	4	4	2	1	—	—	—	—	7	—
June	16	—	—	—	—	2	1	14	6	6	—	—	—	—	—	—	10	—
July	12	—	—	—	2	5	—	19	4	1	—	—	—	—	—	7	17	9
August	11	—	—	—	1	6	—	13	2	1	—	—	—	—	—	16	30	20
September	17	—	—	—	—	9	—	17	7	3	—	—	—	—	—	—	5	—
October	14	—	—	—	—	9	1	14	6	2	3	—	—	—	—	—	2	—
November	18	6	—	—	—	5	2	16	10	8	10	12	3	1	—	—	—	—
December	22	8	1	—	1	6	1	14	4	4	8	19	7	1	—	—	—	—
Annual	201	72	2	—	6	45	12	180	59	69	57	116	67	25	—	23	71	29

1951.



GENERAL REMARKS

	First Day (last year) 1950	Last Day (this year) 1951	First Day (this year) 1951
Min. Air Temp. below 0° :	Oct. 25	May 3	Nov. 6
Mean Air Temp. below 0° :	Nov. 29	Mar. 9	Nov. 27
Max. Air Temp. below 0° :	Dec. 25	Mar. 5	Nov. 28
Max. Air Temp. above 25° :		Sep. 8	May 7
Mean Air Temp. above 25° :		Aug. 25	Jul. 23
Max. Air Temp. above 30° :		Aug. 27	Jul. 12
Hoar Frost :	Oct. 25	May 7	Oct. 22
Snow :	Nov. 15	Apr. 4	Nov. 25
Snow on Ground :	Nov. 15	Apr. 4	Nov. 26

Max. Continuance of Days with Min. Temp. below 0° is 73 Days : from Dec. 18 to Feb. 28
 Max. Continuance of Days with Mean Temp. below 0° is 37 Days : from Dec. 23 to Jan. 28
 Max. Continuance of Days with Max. Temp. above 30° is 10 Days : from Aug. 13 to Aug. 22
 Max. Continuance of Days with Precipitation is 17 Days : from Dec. 17 to Jan. 2
 Max. Continuance of Days without Precipitation is 8 Days : from Sep. 22 to Sep. 29

Continuance of more than 5 Days with Precipitation are :

17 Days : from Dec. 17 (1950) to Jan. 2	6 Days : from May 15 to May 20
6 Days : from Jan. 9 to Jan. 14	7 Days : from Jun. 4 to Jun. 10
10 Days : from Jan. 20 to Jan. 29	8 Days : from Sep. 14 to Sep. 21
9 Days : from Feb. 7 to Feb. 15	9 Days : from Nov. 23 to Dec. 1
6 Days : from Mar. 3 to Mar. 8	7 Days : from Dec. 15 to Dec. 21
5 Days : from Apr. 9 to Apr. 13	7 Days : from Dec. 26 to Jan. 1 (1952)

1951.



FIVE-DAY MEANS

Month	Five-day Period	Air Pressure 100 mb+	Air Temperature °C	Vapour Pressure mb	Relative Humidity %	Amount of Clouds (0-10)	Velocity of Wind m.p.s.	Precipitation (Total) mm
January	1-5	19.7	-5.7	3.3	84	6.9	3.7	21.1
	6-10	25.0	-4.2	3.6	80	9.2	3.3	1.3
	11-15	23.4	-5.3	3.6	84	7.7	1.8	3.8
	16-20	20.8	-3.2	3.7	77	7.3	2.5	0.3
	21-25	7.7	-3.3	3.9	82	7.8	4.0	24.9
	26-30	16.9	-2.5	3.9	75	7.3	2.5	1.0
February	31-4	13.6	-3.7	3.8	82	5.6	3.2	6.2
	5-9	14.7	-2.7	4.1	81	6.7	1.6	2.8
	10-14	12.5	-2.5	4.1	78	7.9	3.7	11.5
	15-19	16.2	-2.7	4.1	82	7.8	3.0	8.1
	20-24	22.5	-0.5	4.5	74	7.4	3.6	2.2
	25-1	25.6	1.8	6.1	83	9.6	3.6	44.6
March	2-6	22.1	-2.6	4.2	82	7.7	2.5	17.2
	7-11	16.3	1.3	5.3	79	7.3	2.3	3.1
	12-16	17.0	2.3	5.2	71	5.7	4.6	1.5
	17-21	12.1	3.2	6.1	76	6.7	2.9	0.9
	22-26	18.8	3.4	5.5	71	8.2	4.0	25.1
	27-31	16.4	3.0	6.0	80	8.0	3.5	30.4
April	1-5	19.2	6.0	7.4	80	9.0	3.1	17.6
	6-10	17.0	8.1	8.5	78	7.5	5.6	16.2
	11-15	18.7	5.6	7.1	80	6.8	4.9	18.6
	16-20	16.0	9.4	8.4	71	7.0	5.0	10.1
	21-25	10.9	7.3	7.2	70	6.7	7.2	7.4
	26-30	17.2	11.4	9.3	69	6.7	4.6	16.9
May	1-5	14.7	12.1	8.2	60	5.5	4.2	0.6
	6-10	12.3	12.7	10.4	72	5.5	3.5	19.4
	11-15	14.4	14.6	11.8	71	7.4	3.0	7.0
	16-20	8.1	11.7	11.4	83	7.5	2.9	13.5
	21-25	19.1	15.2	12.6	74	6.1	3.6	—
	26-30	7.0	18.8	17.3	81	9.1	2.5	23.9
June	31-4	10.3	18.8	17.0	80	5.3	3.3	25.7
	5-9	5.9	18.4	17.5	83	8.8	3.2	14.0
	10-14	12.7	16.0	15.2	84	7.1	3.1	20.6
	15-19	8.6	18.0	16.2	79	8.6	3.9	12.0
	20-24	3.1	18.4	15.9	77	6.3	2.5	10.2
	25-29	8.8	19.2	17.6	80	6.7	2.6	2.5
July	30-4	11.3	18.7	16.7	78	5.4	2.9	1.3
	5-9	12.0	18.3	18.3	87	8.8	2.4	9.9
	10-14	9.2	20.8	21.6	89	9.2	2.6	96.7
	15-19	9.9	19.9	20.5	88	8.7	2.2	20.7
	20-24	15.1	24.7	26.8	87	7.1	2.1	9.9
	25-29	9.8	25.3	25.9	81	6.9	1.9	0.4
August	30-3	12.9	22.9	22.5	81	7.1	2.6	—
	4-8	10.4	24.8	25.8	84	6.4	1.3	38.6
	9-13	14.3	25.5	26.8	83	6.6	1.4	2.0
	14-18	11.1	25.8	27.7	84	7.8	1.3	0.0
	19-23	13.0	25.4	27.2	85	6.8	4.0	39.8
	24-28	10.3	24.6	25.7	84	7.4	1.7	4.2
September	29-2	7.8	20.3	20.5	86	8.0	2.9	15.9
	3-7	11.7	17.9	16.4	82	6.4	2.2	16.0
	8-12	12.5	17.9	18.0	89	8.8	2.0	51.7
	13-17	12.6	17.1	17.3	90	9.4	1.2	9.2
	18-22	14.4	15.0	14.5	85	6.8	2.0	8.7
	23-27	18.7	13.7	12.1	79	6.8	2.2	—
October	28-2	17.9	15.9	14.7	82	7.8	2.4	4.1
	3-7	19.7	12.7	11.6	80	5.8	2.2	0.2
	8-12	16.8	16.0	15.3	85	5.7	1.7	—
	13-17	13.1	14.1	13.5	85	7.2	2.6	41.4
	18-22	17.4	11.2	11.8	88	6.9	2.4	25.9
	23-27	18.7	9.2	9.9	85	8.6	1.7	34.8
November	28-1	23.1	8.1	9.0	84	6.7	1.2	0.0
	2-6	16.1	9.9	9.5	76	7.5	3.7	20.2
	7-11	18.3	6.8	8.2	83	6.5	1.9	8.7
	12-16	19.3	6.5	8.5	87	7.9	2.0	32.9
	17-21	23.1	4.6	6.6	79	2.7	2.1	—
	22-26	13.7	5.2	7.7	87	8.4	2.6	24.3
December	27-1	14.7	-1.2	5.0	90	9.2	2.4	49.0
	2-6	21.5	-0.6	5.0	85	7.1	1.9	3.1
	7-11	19.0	1.8	5.8	84	6.2	1.9	3.7
	12-16	8.6	2.9	6.2	82	6.2	2.6	4.8
	17-21	16.1	5.5	7.4	81	8.7	3.2	9.9
	22-26	16.3	3.8	6.9	85	8.1	2.8	18.6
27-31	20.8	-1.2	5.0	88	8.2	2.7	37.1	
Mean		15.0	10.0	11.7	81	7.3	2.9	14.9

SEISMOLOGICAL OBSERVATIONS

Remarks:—

1. The seismic intensity is divided into the following eight classes according to the scale of the Central Meteorological Observatory of Japan (1949).

Unfelt	0
Felt	1. Slight
	2. Weak
	3. Rather strong
	4. Strong
	5. Very strong
	6. Disastrous
	7. Very disastrous

2. The time adopted in the seismological observations is Japanese Central Standard Time 9^h east from Greenwich.

3. Symbols and Notations.

- i*: Sudden beginning of motion.
- e*: Gradual beginning of motion.
- ?: Doubtful phase.
- +: Out of order of the instrument.
- ⊕: Out of the range of the instrument.
- []: Depth of focus in the unit of km.
- [S]: Shallow-focused earthquakes.
- A.S.: After-shock

4. The sign of maximum amplitude: + towards E and N.
— towards W and S.

EARTHQUAKES, 1951.



No.	Date 1951	P				S				L				Maximum Range of Motion			Duration of Total Earth- quake	Intensity	Remarks
		E	W	N	S	E	W	N	S	E	W	N	S	E	W	N			
1	Jan. 1	h	m	s	m	s	m	s	m	s	m	s	μ	μ	m	s	0		
2	2	e 3	10	13	—	—	10	34	—	—	—	—	+	9	—	—	3 52	0	
3	5	18	44	13	—	—	44	29	e 44	30	—	—	+	22	—	—	3 12	0	
4	6	0	—	—	—	—	30	06	—	—	—	—	+	5	—	—	—	0	
5	6	14	26	26	e 26	26	33	41	e 33	42	—	—	—	—	—	—	13 52	0	
6	9	3	33	26	e 33	23	34	06	34	06	—	—	+	190	-290	15 16	0	35.4N. 140.1E. [40]	
7	9	e 12	41	34	—	—	42	00	—	—	—	—	+	3	—	2 37	0		
8	10	23	08	03	—	—	08	29	e 08	29	—	—	+	9	—	3 41	0	42.1N. 144.0E. [80]	
9	11	13	35	38	? 35	40	37	34	37	36	—	—	-	28	-25	6 54	0		
10	15	13	22	28	22	25	29	59	e 30	00	—	—	—	—	—	19 53	0		
11	17	8	21	17	21	18	21	26	21	26	—	—	-	61	+215	3 22	I	39.2N. 141.8E. [60]	
12	17	e 12	48	12	—	—	48	39	—	—	—	—	—	—	—	3 09	0		
13	19	e 17	33	16	—	—	33	43	—	—	—	—	+	5	—	2 32	0		
14	22	21	—	—	—	—	e 28	43	—	—	—	—	—	—	—	—	0		
15	24	15	07	43	—	—	08	14	e 08	16	—	—	+	35	-15	3 55	0	41.2N. 143.0E. [40]	
16	26	19	38	16	—	—	38	39	38	38	—	—	-	19	+25	2 40	0	37.2N. 140.1E. [S]	
17	28	19	01	20	—	—	e 01	35	—	—	—	—	-	2	—	1 21	0		
18	30	e 7	57	10	—	—	57	18	—	—	—	—	—	—	—	0 59	0		
19	31	17	56	53	—	—	57	31	—	—	—	—	+	7	—	3 50	0	35.5N. 140.3E. [50]	
20	Feb. 3	6	03	32	03	32	03	55	03	54	—	—	-	149	-300	19 15	0	37.1N. 141.5E. [40~50]	
21	6	11	—	—	—	—	06	06	e 06	07	—	—	-	6	—	—	0		
22	7	12	40	41	e 40	41	41	58	41	58	—	—	+	26	+25	7 53	0	31.2N. 140.4E. [100]	
23	8	6	37	22	e 37	22	37	31	e 37	33	—	—	+	8	—	2 21	0		
24	10	17	39	47	e 39	49	40	36	40	36	—	—	-	56	+33	8 18	0	43.5N. 146.4E. [60]	
25	12	5	59	23	59	23	59	46	59	47	—	—	-	22	+18	5 15	0		
26	13	2	27	46	e 27	42	32	19	32	20	36	13	e 36	14	-32	-35	22 14	0	
27	14	7	21	04	21	04	27	33	e 27	35	33	36	e 33	23	+5	+45	57 32	0	
28	15	e 18	24	14	—	—	25	06	—	—	—	—	+	9	—	4 01	0		
29	16	18	57	39	e 57	39	58	17	58	18	—	—	+	10	—	4 18	0	36.1N. 139.5E. [90]	
30	18	6	15	18	e 15	17	21	50	21	51	—	—	+	73	—	20 15	0		
31	21	e 0	43	04	—	—	44	06	e 44	09	—	—	+	6	—	5 13	0		
32	23	6	—	—	—	—	e 15	48	—	—	—	—	—	—	—	—	0		
33	25	21	51	52	51	52	52	16	e 52	16	—	—	+	231	-485	12 16	I	37.0N. 141.9E. [40~50]	
34	27	e 18	10	05	—	—	10	30	e 10	32	—	—	+	6	—	5 13	0		
35	28	7	59	38	59	38	60	05	60	05	—	—	-	42	+32	6 20	0	41.1N. 142.6E. [40]	
36	28	17	—	—	—	—	? 52	33	—	—	—	—	—	—	—	—	0		
37	Mar. 5	0	18	41	e 18	37	e 19	27	e 19	25	—	—	-	21	-13	15 14	0		
38	5	9	—	—	—	—	10	53	—	—	—	—	-	3	—	—	0		
39	6	5	15	13	15	11	17	57	17	53	—	—	-	33	+125	24 07	0	28.3N. 129.3E. [200]	
40	8	3	33	10	e 33	11	e 34	09	e 34	09	—	—	-	69	+83	7 13	0	35.5N. 142.1E. [30]	
41	8	21	16	14	—	—	16	34	—	—	—	—	+	5	—	2 51	0	37.2N. 141.6E. [40]	
42	9	e 13	16	53	—	—	17	20	—	—	—	—	+	4	—	3 56	0		
43	9	16	12	06	e 12	07	12	46	e 12	44	—	—	+	18	-8	6 27	0	35.5N. 140.2E. [40~50]	
44	10	4	53	22	e 53	22	e 60	37	? 60	45	—	—	—	—	—	25 14	0		
45	11	7	04	18	04	16	04	44	04	44	—	—	+	333	+625	34 39	II	41.5N. 142.3E. [80]	
46	11	23	—	—	—	—	27	44	—	—	—	—	—	—	—	—	0		
47	12	19	19	50	—	—	19	57	—	—	—	—	—	—	—	1 44	0		
48	14	14	—	—	—	—	30	06	—	—	—	—	—	—	—	—	0		
49	14	19	32	05	—	—	32	23	32	20	—	—	+	6	—	2 58	0	40.2N. 142.5E. [40]	
50	15	15	—	—	—	—	28	30	—	—	—	—	—	—	—	—	0		
51	16	e 22	04	15	—	—	04	37	—	—	—	—	+	4	—	3 22	0		
52	17	? 13	36	10	? 36	16	? 46	42	? 46	45	—	—	—	—	—	19 29	0		
53	23	14	00	08	—	—	01	46	01	45	—	—	+	6	—	5 29	0		
54	25	13	33	56	—	—	34	07	—	—	—	—	-	5	—	1 14	0		
55	29	3	28	11	—	—	e 28	54	—	—	—	—	-	15	—	4 02	0		

EARTHQUAKES, 1951.



No.	Date 1951	P				S				L				Maximum Range of Motion		Duration of Total Earth- quake	Intensity	Remarks		
		E	W	N	S	E	W	N	S	E	W	N	S	E	W				N	S
		h	m	s	m	s	m	s	m	s	m	s	m	s	μ	μ	m	s		
56	Mar. 29	9	57	02	—	—	57	12	—	—	—	—	—	—	—	—	1	25	0	
57	29	16	07	00	—	—	e 07	14	—	—	—	—	—	—	—	—	1	14	0	
58	Apr. 1	7	43	43	—	—	44	07	e 44	08	—	—	—	—	+ 6	—	2	27	0	36.7N. 139.7E. [10]
59	1	8	35	28	—	—	35	52	—	—	—	—	—	—	- 5	—	2	48	0	
60	3	7	17	55	e 17	55	e 23	28	e 23	27	—	—	—	—	- 16	—	14	03	0	
61	4	11	38	44	—	—	39	14	e 39	13	—	—	—	—	- 9	—	2	56	0	
62	5	0	22	21	—	—	22	36	—	—	—	—	—	—	- 5	—	2	30	0	
63	5	3	56	18	e 56	19	56	35	56	34	—	—	—	±128	+503	10	54	I	37.9N. 142.0E. [70]	
64	5	18	11	45	—	—	12	14	e 12	13	—	—	—	—	- 8	—	4	57	0	
65	7	7	55	56	55	53	57	14	57	14	—	—	—	—	+ 55	+ 25	7	50	0	46.6N. 142.4E. [320]
66	9	e 6	34	02	—	—	e 34	22	—	—	—	—	—	—	—	—	1	43	0	
67	13	4	—	—	—	—	09	48	—	—	—	—	—	—	—	—	—	—	0	
68	14	22	37	59	38	02	42	02	e 44	56	e 44	52	—	—	+938	-428	27	38	0	60N. 120E. [100]
69	15	20	26	34	—	—	27	01	—	—	—	—	—	—	- 9	—	5	32	0	
70	17	1	50	48	—	—	51	08	—	—	—	—	—	—	+ 6	—	2	11	0	
71	17	4	55	00	54	59	56	36	56	35	—	—	—	—	- 98	- 80	10	52	0	31.2N. 138.0E. [470]
72	19	10	23	00	—	—	23	15	—	—	—	—	—	—	+ 6	—	2	31	0	
73	21	e 0	13	41	—	—	e 14	15	—	—	—	—	—	—	—	—	2	41	0	
74	23	13	—	—	—	—	30	01	—	—	—	—	—	—	—	—	—	—	0	
75	24	15	—	—	—	—	25	57	—	—	—	—	—	—	—	—	—	—	0	
76	25	13	42	44	42	42	43	02	e 43	02	—	—	—	—	+ 6	—	2	37	0	
77	30	22	57	42	—	—	58	34	—	—	—	—	—	—	—	—	2	43	0	43.0N. 144.2E. [60]
78	May 1	e 14	15	47	? 15	39	? 25	43	? 26	13	—	—	—	—	—	—	51	23	0	
79	1	e 15	14	11	—	—	14	31	—	—	—	—	—	—	—	—	2	49	0	
80	2	e 6	35	59	—	—	36	23	—	—	—	—	—	—	- 7	—	2	38	0	
81	2	e 16	18	46	—	—	19	06	—	—	—	—	—	—	—	—	1	49	0	
82	4	i 20	54	32	i 54	31	i 55	32	55	29	—	—	—	—	-309	+478	16	02	0	44.4N. 142.2E. [240]
83	6	14	—	—	—	—	33	07	33	11	—	—	—	—	—	—	—	—	0	
84	10	7	24	50	—	—	25	01	25	01	—	—	—	—	± 85	±233	5	33	II	38.5N. 142.0E. [55]
85	13	10	52	20	—	—	52	41	52	40	—	—	—	—	+ 11	—	3	54	0	
86	14	23	28	00	e 27	57	28	16	e 28	15	—	—	—	—	- 18	—	3	46	0	
87	15	18	52	48	52	47	56	19	e 56	24	—	—	—	—	- 15	—	8	16	0	
88	21	e 17	35	34	e 35	38	? 41	45	? 42	07	—	—	—	—	—	—	16	55	0	
89	25	0	11	44	—	—	12	16	e 12	14	—	—	—	—	- 16	—	7	15	0	41.3N. 143.1E. [60]
90	28	3	12	12	—	—	12	22	—	—	—	—	—	—	- 9	—	3	05	0	
91	28	5	54	33	—	—	54	46	—	—	—	—	—	—	+ 5	—	2	26	0	
92	29	10	06	29	06	29	06	54	—	—	—	—	—	—	- 9	—	5	28	0	
93	30	17	—	—	—	—	31	42	—	—	—	—	—	—	—	—	—	—	0	
94	Jun. 1	6	01	34	e 01	33	06	03	e 05	56	—	—	—	—	—	—	17	47	0	19N. 121E.
95	2	15	55	31	e 55	31	e 61	35	61	31	—	—	—	—	—	—	10	50	0	
96	6	2	00	39	00	38	03	46	03	45	07	12	—	—	+ 50	-673	32	28	0	29.8N. 131.7E. [90]
97	6	14	43	18	43	18	43	36	43	35	—	—	—	—	±220	-463	9	51	I	37.8N. 142.0E. [60]
98	6	19	10	18	e 10	23	10	41	10	40	—	—	—	—	- 14	—	5	32	0	40.9N. 143.0E. [60]
99	6	23	52	36	—	—	52	45	—	—	—	—	—	—	- 4	—	3	14	0	
100	7	7	10	50	10	52	11	11	11	14	—	—	—	—	+ 16	—	5	54	0	37.3N. 141.3E. [45]
101	7	e 13	07	43	—	—	07	58	—	—	—	—	—	—	+ 10	—	3	08	0	
102	10	2	42	19	42	19	42	40	42	40	—	—	—	—	+ 50	- 20	7	31	0	39.1N. 143.4E. [S]
103	10	21	59	03	—	—	59	21	—	—	—	—	—	—	+ 11	—	6	47	0	
104	18	5	55	46	55	47	56	03	56	03	—	—	—	—	-101	+110	6	25	0	40.1N. 142.5E. [0~10]
105	20	7	—	—	—	—	09	50	—	—	—	—	—	—	—	—	—	—	0	
106	21	1	49	37	—	—	49	54	e 49	54	—	—	—	—	- 26	—	5	29	0	40.1N. 142.4E. [40]
107	22	17	00	56	e 00	54	01	08	01	06	—	—	—	—	± 25	—	4	05	0	38.1N. 141.4E. [60]
108	23	10	15	04	15	03	15	25	15	24	—	—	—	—	+ 53	+ 55	9	43	0	37.2N. 141.2E. [45]
109	23	16	16	18	16	19	17	20	e 17	20	—	—	—	—	+ 42	+ 75	12	46	0	
110	24	20	00	32	e 00	32	04	07	e 04	03	—	—	—	—	—	—	18	01	0	18.0N. 144.5E.

EARTHQUAKES, 1951.



No.	Date 1951	P				S				L				Maximum Range of Motion		Duration of Total Earth- quake	Intensity	Remarks		
		E	W	N	S	E	W	N	S	E	W	N	S	E	W				N	S
		h	m	s	m	s	m	s	m	s	m	s	m	s	μ	μ	m	s		
111	Jun. 28	3	11	48	11	47	12	15	e 12	07	—	—	—	—	- 20	- 25	6	46	0	37.2N. 141.9E. [60]
112	Jul. 1	8	45	28	—	—	45	42	—	—	—	—	—	- 5	—	3	13	0		
113	2	13	19	12	—	—	19	22	—	—	—	—	—	—	—	1	31	0		
114	4	17	22	32	e 22	30	22	44	—	—	—	—	—	- 6	—	4	02	0		
115	8	14	51	06	e 51	10	e 58	19	? 58	21	—	—	—	—	—	30	11	0	10N. 124E	
116	9	10	32	33	32	32	33	38	33	38	—	—	—	+ 35	+ 30	7	37	0	33.0N. 139.3E. [180]	
117	12	2	52	34	—	—	52	55	—	—	—	—	—	+ 3	—	2	48	0		
118	12	3	24	27	24	26	26	25	26	27	—	—	—	—	—	40	39	I	28.3N. 139.9E. [460]	
119	14	5	02	16	—	—	02	38	—	—	—	—	—	+ 13	—	4	00	0		
120	14	e 16	23	21	—	—	e 23	51	—	—	—	—	—	- 5	—	4	28	0		
121	14	e 18	58	16	—	—	e 58	49	—	—	—	—	—	+ 4	—	3	11	0		
122	14	i 22	18	43	18	44	i 19	02	18	58	—	—	—	±105	- 88	7	05	II	37.7N. 141.4E. [100]	
123	16	19	48	29	e 48	27	55	00	e 54	58	—	—	—	- 26	—	16	52	0	4S. 143E.	
124	19	? 3	09	10	? 09	10	e 12	10	e 12	09	—	—	—	—	—	8	03	0		
125	20	18	—	—	—	—	36	11	—	—	—	—	—	—	—	—	—	0		
126	21	12	—	—	—	—	52	16	—	—	—	—	—	—	—	—	—	0		
127	21	19	—	—	—	—	54	30	—	—	—	—	—	- 4	—	—	—	0		
128	23	13	31	40	31	47	33	03	33	03	—	—	—	+ 7	—	5	40	0		
129	24	14	28	33	—	—	28	55	—	—	—	—	—	+ 6	—	3	30	0		
130	24	21	—	—	—	—	09	39	—	—	—	—	—	+ 8	—	—	—	0		
131	24	23	00	44	—	—	01	14	01	13	—	—	—	- 19	—	5	47	0	36.3N. 141.2E. [50]	
132	26	i 2	14	34	—	—	i 15	22	15	24	—	—	—	-100	+140	7	27	0	42.5N. 143.7E. [S]	
133	26	5	—	—	—	—	36	53	—	—	—	—	—	—	—	—	—	0		
134	26	6	06	14	—	—	06	24	—	—	—	—	—	—	—	1	37	0		
135	26	6	34	47	—	—	e 35	09	—	—	—	—	—	—	—	1	40	0		
136	26	e 18	47	23	—	—	47	44	—	—	—	—	—	—	—	2	43	0		
137	26	i 19	00	33	i 00	32	i 00	54	i 00	54	—	—	—	+684	-753	22	11	I	40.7N. 143.5E. [60]	
138	27	e 10	01	24	—	—	02	26	e 02	27	—	—	—	- 5	—	8	41	0		
139	29	e 3	43	36	—	—	44	32	—	—	—	—	—	—	—	4	05	0		
140	29	4	18	23	—	—	e 19	01	—	—	—	—	—	—	—	4	16	0		
141	29	5	59	48	e 59	45	63	49	e 63	50	—	—	—	+ 16	—	13	45	0		
142	29	8	05	13	05	13	05	56	05	56	—	—	—	-713	-110	—	—	0	37.5N. 143.5E. [0~10]	
143	29	8	15	07	15	04	15	49	15	50	—	—	—	+106	+170	17	47	0		
144	30	8	41	03	41	03	107	39	107	37	—	—	—	+ 10	+ 23	12	49	0	3S. 127E.	
145	30	13	24	42	—	—	e 25	59	—	—	—	—	—	—	—	4	55	0		
146	30	22	05	32	05	32	05	57	05	58	—	—	—	- 25	- 25	6	48	0		
147	31	18	56	50	56	50	57	42	57	41	—	—	—	+ 15	- 25	6	48	0	43.6N. 145.0E. [20~30]	
148	31	22	—	—	—	—	37	53	—	—	—	—	—	+ 4	—	—	—	0		
149	Aug. 1	0	—	—	—	—	36	39	—	—	—	—	—	- 3	—	—	—	0		
150	2	12	48	07	e 48	07	54	04	e 54	10	—	—	—	+ 5	- 20	15	47	0	3S. 154E. [300]	
151	2	18	58	06	58	06	58	47	58	47	—	—	—	- 17	- 25	8	51	0	37.1N. 138.5E. [0~10]	
152	3	23	15	05	e 15	05	15	29	e 15	33	—	—	—	- 5	—	3	47	0		
153	6	16	29	43	29	43	30	35	e 30	33	—	—	—	+ 18	+ 23	7	26	0		
154	7	21	03	13	e 03	10	03	39	03	38	—	—	—	- 46	+ 40	6	56	0	41.5N. 142.4E. [S]	
155	8	5	—	—	—	—	40	06	—	—	—	—	—	—	—	—	—	0		
156	8	22	52	38	—	—	52	50	—	—	—	—	—	—	—	1	50	0		
157	9	20	43	16	—	—	43	33	—	—	—	—	—	—	—	1	51	0		
158	11	i 8	02	05	i 02	05	i 03	21	e 03	22	—	—	—	-150	-163	11	31	0	45.7N. 143.5E.	
159	11	e 17	30	39	—	—	31	01	—	—	—	—	—	+ 3	—	2	11	0		
160	12	11	13	35	—	—	13	49	—	—	—	—	—	+ 6	—	2	07	0		
161	13	15	31	44	—	—	32	18	e 32	28	—	—	—	+ 27	—	4	12	0	42.2N. 142.2E. [50]	
162	14	21	13	23	13	24	13	52	13	53	—	—	—	- 12	- 5	5	11	0	39.1N. 144.7E. [80]	
163	16	1	15	59	—	—	16	30	—	—	—	—	—	- 3	—	4	42	0		
164	17	e 4	34	47	—	—	35	00	—	—	—	—	—	—	—	2	36	0		
165	18	21	—	—	—	—	58	08	—	—	—	—	—	+ 7	—	—	—	0		

EARTHQUAKES, 1951.



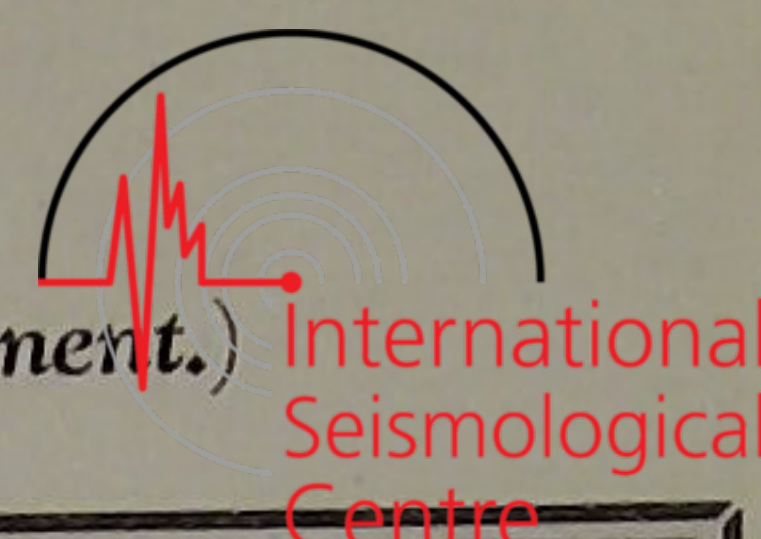
No.	Date 1951	P				S				L				Maximum Range of Motion		Duration of Total Earth- quake	Intensity	Remarks
		E	W	N	S	E	W	N	S	E	W	N	S	E	W			
166	Aug. 20	h	m	s	m	s	m	s	m	s	m	s	μ	μ	m	s	0	
167	24	22	—	—	—	—	01	47	—	—	—	—	—	—	—	—	0	
168	24	3	—	—	—	—	12	51	—	—	—	—	—	—	—	—	0	
169	24	e 20	37	47	—	—	e 38	19	—	—	—	—	—	—	2	41	0	
170	24	23	23	58	e 24	00	25	42	25	40	—	—	-46	-35	9	20	0	45.5N. 150.8E. [200]
	25	8	01	35	01	37	01	56	01	57	—	—	-134	+208	10	06	I	37.3N. 141.6E. [50]
171	27	e 6	23	13	—	—	23	25	e 23	24	—	—	—	—	2	19	0	
172	28	18	22	21	e 22	19	22	34	22	32	—	—	+22	—	3	50	0	
173	30	16	—	—	—	—	18	17	—	—	—	—	-4	—	—	—	0	
174	30	18	—	—	—	—	51	15	—	—	—	—	-5	—	—	—	0	
175	31	e 5	49	28	e 49	26	49	45	e 49	44	—	—	-9	-15	3	59	0	35.7N. 140.6E. [S]
176	Sep. 3	11	59	50	59	50	60	08	60	09	—	—	-153	-355	7	09	0	40.7N. 142.3E. [50]
177	3	e 15	26	00	—	—	26	22	e 26	22	—	—	+5	—	3	14	0	36.8N. 140.4E. [80]
178	4	e 8	20	36	e 20	37	21	14	e 21	15	—	—	+4	—	4	21	0	36.6N. 139.6E. [10]
179	12	6	25	11	e 25	13	25	26	e 25	29	—	—	+8	—	3	10	0	37.8N. 142.0E. [50]
180	12	13	40	34	—	—	40	45	40	45	—	—	±20	—	3	43	0	
181	12	22	—	—	—	—	58	53	—	—	—	—	—	—	—	—	0	
182	13	0	12	44	e 12	43	14	24	e 14	24	—	—	+15	+25	12	14	0	43.8N. 151.7E. [150]
183	13	e 15	44	33	—	—	44	49	e 44	53	—	—	+6	—	4	05	0	
184	16	7	25	03	25	04	25	34	25	35	—	—	±13	-20	4	36	0	36.5N. 140.5E, [80]
185	21	e 5	58	00	—	—	58	13	—	—	—	—	—	—	1	23	0	
186	22	e 5	55	22	e 55	24	56	31	56	34	—	—	-11	+18	6	16	0	
187	24	3	30	31	—	—	30	42	—	—	—	—	-3	—	2	10	0	
188	24	e 22	14	45	?14	39	17	47	?17	32	—	—	—	—	28	43	0	49.5N. 156E. [100]
189	25	12	—	—	—	—	50	02	—	—	—	—	—	—	—	—	0	
190	28	6	—	—	—	—	30	45	e 30	47	—	—	-4	+13	—	—	0	
191	29	4	18	34	18	34	18	50	e 18	53	—	—	+23	+15	5	55	0	38.0N. 141.9E. [45]
192	29	12	55	31	e 55	30	55	40	55	40	—	—	—	—	1	38	0	
193	Oct. 1	2	09	12	09	13	09	47	09	45	—	—	-46	+18	6	37	0	36.2N. 139.9E. [30]
194	1	16	—	—	—	—	52	12	—	—	—	—	—	—	—	—	0	
195	2	e 5	15	25	—	—	15	32	—	—	—	—	-7	—	1	41	0	
196	3	6	03	06	—	—	03	37	—	—	—	—	-5	—	4	29	0	35.8N. 140.9E. [40]
197	4	3	39	03	39	03	39	10	e 39	14	—	—	+16	—	2	47	0	
198	9	i 12	28	11	28	11	28	48	28	49	—	—	-33	+18	8	04	0	36.2N. 140.3E. [60]
199	11	e 5	52	25	—	—	52	33	—	—	—	—	+5	—	1	58	0	
200	11	10	45	54	—	—	46	20	—	—	—	—	+4	—	8	48	0	
201	11	13	53	49	e 53	51	54	28	54	30	—	—	+40	-35	12	28	0	
202	11	14	07	33	—	—	08	07	08	07	—	—	+3	—	4	11	0	
203	11	14	47	47	e 47	45	48	31	48	30	—	—	-12	—	8	18	0	
204	11	20	04	11	04	11	05	01	e 04	56	—	—	-23	—	9	04	0	
205	11	23	09	11	—	—	09	52	e 09	54	—	—	-5	—	4	43	0	
206	17	e 3	54	31	—	—	55	37	e 55	35	—	—	-11	+25	7	56	0	34.9N. 142.7E. [40]
207	18	i 17	27	04	i 27	02	27	32	27	33	—	—	—	±3605	28	02	III	41.4N. 142.1E. [40]
208	19	23	52	12	52	12	52	37	52	36	—	—	-327	-713	16	59	I	41.3N. 142.3E. [40]
209	20	13	08	30	—	—	08	43	—	—	—	—	-5	—	1	19	0	
210	20	e 17	29	03	—	—	29	29	?29	34	—	—	-10	—	5	46	0	36.05N. 141.05 [30]
211	21	e 12	12	44	—	—	e 13	11	—	—	—	—	+3	—	2	40	0	
212	21	20	—	—	—	—	23	35	—	—	—	—	—	—	—	—	0	
213	22	i 3	34	21	34	22	i 34	41	34	43	—	—	+66	+173	7	34	0	37.7N. 142.0E. [40]
214	22	6	39	22	39	22	43	33	e 43	40	e 49	04	-80	-1615	65	52	0	24N. 122E.
215	22	e 7	10	30	—	—	11	51	11	52	—	—	+5	—	4	39	0	
216	22	10	—	—	—	—	14	23	—	—	—	—	—	—	—	—	0	
217	22	12	34	33	34	34	38	34	38	36	43	00	-730	—	53	04	0	24N. 122E. (Formosa)
218	22	13	32	15	?32	17	37	02	37	01	41	18	+8	+373	34	37	0	"
219	22	14	22	47	?23	04	27	36	27	32	—	—	—	—	23	47	0	"
220	22	14	48	07	48	08	52	31	e 52	43	56	49	+116	+958	47	04	0	"

EARTHQUAKES, 1951.



No.	Date 1951	P				S				L				Maximum Range of Motion		Duration of Total Earth- quake	Intensity	Remarks		
		E	W	N	S	E	W	N	S	E	W	N	S	E	W				N	S
221	Oct. 22	h 20	m 16	s 10	e 16	m 10	m 20	s 31	m 20	s 36	m 24	s 42	m 24	s 29	+ 4	- 9	m 21	s 35	0	(Formosa)
222	22	? 21	53	53	54	06	? 57	50	59	13	? 61	15	? 62	00	-	-	-	-	0	//
223	22	? 22	06	41	? 06	43	e 10	25	e 10	30	15	34	-	-	-	+ 4	22	06	0	//
224	23	0	34	53	? 34	43	38	42	38	42	42	18	-	-	-	+ 12	20	59	0	//
225	23	10	24	37	e 24	40	e 28	39	? 28	43	32	52	32	45	+ 5	+ 50	24	54	0	//
226	23	18	00	17	e 00	25	e 04	19	e 04	25	08	01	08	11	+ 3	+ 38	36	36	0	//
227	24	10	49	11	-	-	49	45	49	43	-	-	-	-	- 12	-	7	31	0	42.1N. 144.0E. [60]
228	24	12	-	-	-	-	e 52	07	-	-	-	-	-	-	-	-	-	-	0	
229	25	i 4	24	11	24	10	24	42	24	43	-	-	-	-	+ 163	+ 335	13	46	0	41.8N. 142.6E. [20]
230	25	8	48	33	-	-	48	56	-	-	-	-	-	-	± 10	-	5	32	0	36.6N. 141.1E. [40]
231	25	14	32	50	32	51	33	12	33	13	-	-	-	-	+ 42	-	7	00	0	
232	25	e 21	25	15	e 25	14	e 29	48	e 29	45	e 33	20	e 32	29	- 6	+ 35	24	50	0	
233	26	12	43	37	-	-	43	50	-	-	-	-	-	-	-	-	2	08	0	
234	28	17	41	18	-	-	41	38	-	-	-	-	-	-	+ 3	-	3	14	0	
235	31	16	06	02	e 06	10	e 13	45	e 13	37	-	-	-	-	-	-	42	11	0	3 N. 101E.
236	Nov. 31	21	59	19	e 59	20	59	49	e 59	49	-	-	-	-	+ 4	-	4	10	0	
237	3	e 22	44	22	e 44	25	45	02	45	04	-	-	-	-	+ 48	+ 28	7	36	0	35.8N. 140.8E. [60]
238	4	e 13	16	24	-	-	17	10	-	-	-	-	-	-	- 5	-	5	39	0	
239	4	? 18	02	34	-	-	? 08	48	-	-	-	-	-	-	-	-	14	40	0	
240	4	? 20	16	12	? 16	12	? 22	02	? 22	17	-	-	25	57	-	-	25	32	0	12N. 125E.
241	5	e 14	19	28	e 19	30	19	47	19	44	-	-	-	-	- 7	-	5	04	0	
242	7	0	00	12	00	12	02	22	02	25	-	-	-	-	+ 10	- 10	11	02	0	46.0N. 154.0E. [S]
243	7	1	43	08	43	07	45	26	45	24	48	45	-	-	- 372	+ 803	115	13	0	47.0N. 154.0E. [S]
244	7	3	53	28	e 53	26	55	38	55	38	-	-	58	47	+ 21	-	34	06	0	46.0N. 154.0E. [S]
245	7	5	47	57	-	-	48	18	-	-	-	-	-	-	+ 3	-	5	04	0	
246	7	6	29	28	e 29	27	29	51	29	50	-	-	-	-	± 7	-	3	39	0	42.3E. 144.9E. [50~60]
247	7	13	21	52	-	-	22	44	-	-	-	-	-	-	-	-	5	12	0	
248	7	17	-	-	-	-	47	06	-	-	-	-	-	-	-	-	-	-	0	
249	8	9	29	20	e 29	19	29	49	29	50	-	-	-	-	+ 16	-	5	39	0	41.5N. 142.0E. [40]
250	9	17	02	36	02	34	03	51	03	49	-	-	-	-	- 6	- 10	6	42	0	
251	9	17	30	02	-	-	30	37	30	38	-	-	-	-	- 4	-	4	46	0	
252	10	e 7	27	41	-	-	e 28	12	-	-	-	-	-	-	-	-	4	47	0	
253	10	13	11	39	e 11	40	12	11	12	11	-	-	-	-	- 17	-	6	19	0	
254	11	7	15	58	15	56	16	24	e 16	23	-	-	-	-	- 18	- 20	5	17	0	41.1N. 142.5E. [40]
255	11	e 21	17	56	e 17	56	19	32	19	32	-	-	-	-	- 11	-	12	14	0	45.0N. 154.0E.
256	12	e 13	03	31	e 03	33	04	09	04	07	-	-	-	-	- 3	-	4	15	0	
257	12	17	12	21	-	-	14	33	-	-	-	-	-	-	+ 29	-	17	29	0	
258	12	? 17	27	25	-	-	? 29	36	-	-	-	-	-	-	-	-	-	-	0	
259	12	17	53	12	-	-	55	11	-	-	-	-	-	-	- 4	-	6	24	0	
260	12	18	52	55	-	-	53	17	-	-	-	-	-	-	-	-	3	58	0	
261	13	e 4	26	48	-	-	27	15	e 27	18	-	-	-	-	- 7	- 10	5	19	0	
262	15	17	30	10	30	10	33	45	33	47	-	-	-	-	-	-	13	09	0	52.5N. 160.5E.
263	15	? 17	43	31	-	-	e 46	17	-	-	-	-	-	-	-	-	13	27	0	
264	15	? 18	21	59	-	-	? 22	49	-	-	-	-	-	-	-	-	3	45	0	
265	15	19	07	01	-	-	? 10	44	-	-	-	-	-	-	-	-	12	49	0	
266	15	19	35	57	35	58	e 40	09	e 40	14	-	-	-	-	-	-	20	49	0	
267	15	20	05	36	-	-	09	12	-	-	-	-	-	-	-	-	6	06	0	
268	16	0	07	07	-	-	-	-	-	-	-	-	-	-	-	-	6	43	0	
269	16	1	16	38	-	-	? 20	45	-	-	-	-	-	-	-	-	7	13	0	
270	16	2	49	25	-	-	? 53	52	-	-	-	-	-	-	-	-	6	54	0	
271	16	4	46	28	e 46	29	50	00	? 49	55	-	-	-	-	+ 11	-	32	10	0	53N. 161E.
272	16	5	24	41	-	-	-	-	-	-	-	-	-	-	-	-	5	02	0	
273	16	5	39	30	-	-	40	53	-	-	-	-	-	-	-	-	6	13	0	
274	16	7	03	38	? 03	44	? 07	23	? 07	19	-	-	-	-	- 8	-	6	13	0	33.4N. 138.5E. [270]
275	16	e 10	43	40	-	-	e 44	41	-	-	-	-	-	-	+ 5	-	18	00	0	
																	6	30	0	

PULSATORY OSCILLATIONS, 1951. (EW Component.)

International
Seismological
Centre

No.	Beginning			Ending			Maximum				Double Amplitude μ
	Date			Date			Date				
	Month	Day	Hour	Month	Day	Hour	Day	Hour	Day	Hour	
1	Jan.	4	9	Jan.	7	1	5	9	6	2	6
2		11	2		14	16	13	0	13	12	10
3		20	5		22	8	21	7	21	23	10
4		22	9		27	8	24	5	24	20	5
5	Feb.	2	21	Feb.	6	2	3	9	3	21	6
6		8	22		9	17	9	6	9	12	5
7		10	9		11	23	10	17	11	15	9
8		12	17		14	1	12	23	13	1	3
9		14	22		17	2	15	5	15	19	10
10		17	2		18	23	17	9	18	2	9
11		19	7		20	20	19	16	20	2	5
12		22	3		25	2	22	20	23	18	14
13		25	9		27	10	25	22	26	18	7
14		28	8	Mar.	3	20	28	14	2	10	11
15	Mar.	6	13		8	22	6	22	7	20	10
16		12	7		13	13	12	9	12	17	5
17		15	4		16	15	15	11	16	2	10
18		19	2		20	22	19	8	19	16	7
19		21	12		22	8	21	17	21	23	4
20		26	11		28	9	26	14	27	12	31
21		28	9		31	10	28	23	30	2	21
22	Apr.	1	13	Apr.	3	11	2	1	2	22	4
23		4	1		5	20	4	6	4	23	7
24		7	6		9	5	7	12	8	10	8
25		9	15		11	3	9	18	10	6	10
26		11	20		15	23	12	12	13	22	23
27		17	9		18	10	17	15	18	1	6
28		20	1		21	9	20	12	21	1	6
29		21	9		23	2	21	17	22	1	8
30		23	12		25	18	23	19	24	9	9
31		28	18	May	2	18	29	14	1	1	7
32	May	5	9		6	22	5	16	6	1	6
33		9	5		11	2	9	12	10	2	6
34		11	11		12	12	11	14	11	23	4
35		13	17		14	10	13	20	14	2	3
36		16	10		18	22	16	19	17	20	3
37		24	12		25	11	24	16	24	23	2
38		28	9		29	10	28	16	29	1	3
39		31	8	Jun.	1	21	1	1	1	9	3
40	Jun.	4	13		6	13	4	21	5	5	4
41		10	9		13	18	11	5	11	19	5
42		16	1		18	22	16	9	17	23	10
43		22	14		23	9	23	1	23	6	3
44	Jul.	2	20	Jul.	3	22	3	9	3	18	3
45		13	11		17	23	13	12	14	13	9
46	Aug.	24	0		25	1	24	9	24	17	2
47	Sep.	2	2	Sep.	4	7	3	1	3	19	3
48		9	16		11	10	10	12	10	22	10
49		19	13		21	11	20	1	20	15	6
50		26	13		29	1	26	22	27	12	2
51		30	6	Oct.	2	23	30	10	30	21	6
52	Oct.	6	3		7	18	6	6	6	16	4
53		9	17		11	20	10	21	11	3	5
54		15	6		18	2	15	22	16	12	72
55		20	5		23	7	20	8	20	15	6
56		24	2		26	3	24	5	24	12	3
57		26	9		27	19	26	16	27	1	3
58	Nov.	2	22	Nov.	5	21	3	14	4	6	16
59		7	10		9	20	8	2	8	22	10
60		13	3		15	13	13	6	14	9	8
61		15	13		18	12	16	15	17	2	10
62		23	14		25	15	24	3	24	17	14
63		25	22		29	5	26	14	27	1	10
64		29	5	Dec.	1	14	29	13	29	18	8
65	Dec.	5	11		7	9	5	17	6	3	2
66		8	3		9	23	8	14	9	6	6
67		11	5		12	14	11	17	12	1	3
68		13	1		14	17	13	15	14	9	7
69		15	1		16	9	15	9	15	22	5
70		16	9		18	8	17	3	17	22	7
71		18	9		20	11	18	16	19	4	8
72		23	17		24	20	23	20	24	3	4
73		25	5		30	11	26	10	27	20	25
74		31	12	Jan. (1952)	2	10	31	22	1	13	7