

ANNUAL REPORT  
OF THE  
METEOROLOGICAL  
AND THE  
SEISMOLOGICAL OBSERVATIONS  
MADE AT THE  
INTERNATIONAL LATITUDE OBSERVATORY  
OF MIZUSAWA  
FOR  
THE YEAR 1931.

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LATITUDE  $39^{\circ} 8' N.$ , LONGITUDE  $141^{\circ} 8' E.$ ,  
HEIGHT ABOVE MEAN SEA LEVEL 61 METRES.

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PUBLISHED BY THE INTERNATIONAL LATITUDE OBSERVATORY  
OF MIZUSAWA.

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1932.

The present report gives the results of the meteorological and seismological observations made at this observatory during the year 1931. No alteration has been made in the nature and methods of observation. The observations and the calculations were made by Messrs. M. Uchida, S. Satô, I. Kumagai, and G. Obata under the superintendence of Dr. T. Ikeda.

The followings are to be noted with respect to the meteorological observations :

*Hours of observation*—*Japanese Central Standard Time* (i. e. mean time of the meridian 9h east from Greenwich) is adopted.

*Air Pressure*.—The barometric readings in millimetres are reduced to the freezing point of water, the corrections to sea level and to standard gravity are given at the bottom of the page for each month.

*Air and Earth Temperatures*.—The degrees are given in Centigrade.

\**Wind*.—The velocity is expressed in metres per second. The direction was observed relative to the sixteen points of the compass.

*Cloud*.—The amount is estimated by the scale 0-10, the forms are those of the *International classification*, and the direction of motion is indicated relative to the sixteen points of the compass.

*Tension of Water Vapour*.—is given in millimetres.

*Relative Humidity*.—is given in percentages.

*Precipitation*.—The amount is given in millimetres.

*Clear and Cloudy Days*.—The amount of cloud is less than 2 exclusive, for the former ; and more than 8 inclusive, for the latter.

*Duration of Sunshine*.—is recorded by a Jordan sunshine-recorder.

*Amount of Evaporation*.—is given in millimetres, for each day,—that is from 10h of the preceding day to 10h of the day in question, according to the instruction of the Central Meteorological Observatory in Tôkyô.

*The heights of the meteorological instruments* are as follows,

*Barometer*—63.1m above sea level.

*Air temperature thermometer*.—1.3m above the ground.

*Anemometer*.—15.4m above the ground.

*Wind vane*.—16.6m above the ground.

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\* Note:—The wind velocity is measured by the Robinson anemometer. Since January first of the year 1925 a new factor for this instrument has been used. The ratio of new factor to the old one is 0.7/1.0.

In recording meteorological phenomena the following symbols are used :—

●	Rain	+	Snow drift	C	Cirrus
×	Snow	←	Ice crystal	CS	Cirro-stratus
⊠	Thunder storm	⊙	Solar corona	CK	Cirro-cumulus
⊥	Thunder without lightning	⊕	Solar halo	KC	Alto-cumulus
<	Lightning without thunder	∪	Lunar corona	SC	Alto-stratus
△	Graupel	∩	Lunar halo	SK	Strato-cumulus
▲	Hail	✓	Gales	N	Nimbus
≡	Mist, fog	∩	Rainbow	K	Cumulus
⊐	Hoar frost	⊎	Aurora	KN	Cumulo-nimbus
∧	Dew	∞	Dust haze	S	Stratus
∨	Silver thaw	⊞	Snow lying	∩	Wave cloud
~	Glazed frost	⊔	Ice Column in the ground	⊎	Zodiacal light

The descriptions of the meteorological instruments are found in the annual reports for the years 1902, 1904, 1905, 1910, and 1916.

The seismological instruments in use are two Omori's horizontal pendulums, of the same type as that described in p. 8 of No. 5, "Publication of the Earthquake Investigation Committee in Foreign Language," one serving to register the EW component, and the other the NS component, of seismological movements.

The time adopted in the Seismological observations is *Greenwich Local Time*.

	EW Component Apparatus	NS Component Apparatus
Period of free oscillation	16 seconds	36 seconds
Multiplication of the pointer	100 times	20 times
Weight of heavy cylinder	45.0 kilograms	17.6 kilograms
Horizontal distance of the centre of the cylinder from the point of support.	20 Centimetres	75 Centimetres
Vertical distance between the points of support and suspension.	104 Centimetres	104 Centimetres

April, 1932

H. KIMURA, *Rigakuhakushi*

Director of the International Latitude Observatory  
in Mizusawa.

# SEISMOLOGICAL OBSERVATIONS



## EARTHQUAKES, 1931.



No.	Date 1931	P				S				L				Duration of Total Earthquake (mean)	Maximum Range of Motion				Character of Motion	Intensity	Remarks
		E	W	N	S	E	W	N	S	E	W	N	S		E	W	N	S			
56	Mar. 1	h m s		m s	m s	m s	m s	m s	m s	m s			m	mm	mm	Slow	Feeble				
57	2	14 24 50		24 51	26 12	26 11							6.8	0.13	0.15	"	"				
58	3	2 29 19		29 20	38 04	38 02			49 41				42.3	?	?	"	"				
59	3	3 31.4		- -	32.0	- -			- -				?	0.01	-	"	"				
60	3	20 39.9		- -	40.4	- -			- -				?	0.07	-	"	"				
	5	1 46 47		?	47 43	?			- -				5.9	0.04	0.02	"	"				
61	5	20 50.3		- -	51 06	- -			- -				?	0.01	-	"	"				
62	6	12 24 53		24.9	25 24	25 27			- -				5.0	0.07	0.05	"	"				
63	6	16 14 26		14.4	15 19	15 37			- -				7.2	0.03	0.03	"	"				
64	6	16 54 40		54.7	55 28	55 36			- -				5.6	0.06	0.04	"	"				
65	6	20 ?		- -	52 00	- -			- -				?	0.00	-	"	"				
66	8	2 02.8		02.7	14.2	14.9			?	34.2			?	?	?	"	"				
67	9	3 49 18		49 18	?	49 48			- -	- -			100.2	?	?	Quick	Weak	Felt			
68	9	4 ?		- -	11 11	- -			- -	- -			?	0.01	-	Slow	Feeble				
66	9	4 ?		- -	23 07	- -			- -	- -			?	0.01	-	"	"				
70	9	4 ?		- -	42 13	- -			- -	- -			?	0.00	-	"	"				
71	9	4 ?		?	44 06	?			- -	- -			?	0.02	?	"	"				
72	9	5 ?		- -	28 14	- -			- -	- -			?	0.01	-	"	"				
73	9	5 ?		- -	59 56	- -			- -	- -			?	0.01	-	"	"				
74	9	7 ?		- -	46 12	- -			- -	- -			?	0.01	-	"	"				
75	9	7 ?		- -	56 22	- -			- -	- -			?	0.01	-	"	"				
76	9	10 26 03		26.0	26 31	26 30			- -	- -			4.4	0.05	0.05	"	"				
77	9	10 31.7		?	32 16	32 16			- -	- -			?	0.01	?	"	"				
78	9	11 08.6		- -	09 11	- -			- -	- -			?	0.00	-	"	"				
79	9	12 38 22		38.4	38 46	38 46			- -	- -			4.5	0.11	0.14	Quick	Weak	Felt			
80	9	12 ?		- -	?	- -			- -	- -			?	0.00	-	Slow	Feeble				
81	9	14 55.1		- -	55 28	- -			- -	- -			?	0.01	-	"	"				
82	9	17 29 15		29 15	29 37	29 39			- -	- -			6.2	0.15	0.17	Quick	Weak	Felt			
83	9	17 56 36		56 37	56 58	57 01			- -	- -			8.7	0.51	0.76	"	"				
84	9	18 41.8		?	42 26	?			- -	- -			?	0.01	?	Slow	Feeble				
85	9	19 54.1		?	54 42	?			- -	- -			?	0.01	?	"	"				
86	10	6 19.1		- -	19 31	- -			- -	- -			?	0.02	-	"	"				
87	10	11 37.9		- -	38 24	- -			- -	- -			?	0.01	-	"	"				
88	10	14 ?		- -	06 24	- -			- -	- -			?	?	-	"	"				
89	11	0 ?		19.9	?	20 24			- -	- -			?	0.03	0.03	"	"				
90	11	2 ?		- -	43 56	- -			- -	- -			?	0.01	-	"	"				
91	11	4 49.4		- -	49 45	- -			- -	- -			?	0.01	-	"	"				
92	11	5 00 45		00.8	01 13	01 17			- -	- -			8.7	0.17	0.15	"	"				
93	11	6 ?		- -	?	- -			- -	- -			?	?	-	"	"				
94	11	12 30 30		30 32	33 36	33 42			34 23	34 32			31.4	0.15	0.30	"	"				
95	11	19 20 18		20 19	20 27	20 30			- -	- -			5.2	0.31	0.24	Quick	Weak	Felt			
96	12	5 ?		- -	07 24	- -			- -	- -			?	0.01	-	Slow	Feeble				
97	12	7 23.1		23.0	23 35	23 30			- -	- -			?	0.02	0.03	"	"				
98	12	10 44 36		- -	47 44	- -			- -	- -			14.8	0.03	-	"	"				
99	12	18 24.5		?	25 10	?			- -	- -			?	0.02	?	"	"				
100	12	19 11.0		10.9	16 00	15 56			?	?			?	0.02	?	"	"				
101	12	21 02.8		03.0	05 31	05.3			?	?			?	?	?	"	"				
102	12	22 32.5		- -	32 55	- -			- -	- -			?	0.01	-	"	"				
103	13	18 35 29		35.5	35 56	35 56			- -	- -			4.2	0.04	0.04	"	"				
104	13	18 54 07		?	54 30	?			- -	- -			3.6	0.02	?	"	"				
105	15	16 34 05		34 07	34 29	34 29			- -	- -			12.3	0.93	1.00	Quick	Weak	Felt			
106	15	16 57 59		?	58 29	?			- -	- -			4.2	0.02	?	Slow	Feeble				
107	15	21 03 04		- -	03 28	- -			- -	- -			2.4	0.01	-	"	"				
108	16	0 23.6		?	24 06	?			- -	- -			?	0.01	?	"	"				
109	17	11 10.0		- -	10 31	- -			- -	- -			?	?	-	"	"				
110	18	6 36 39		- -	37 10	- -			- -	- -			2.5	0.01	-	"	"				

# EARTHQUAKES, 1931.

No.	Date 1931	P				S				L				Duration of Total Earthquake (mean)	Maximum Range of Motion				Character of Motion	Intensity	Remarks
		E	W	N	S	E	W	N	S	E	W	N	S		E	W	N	S			
111	Mar. 18	h	m	s	m	s	m	s	m	s	m	s	m	s	m	mm	mm	Slow	Feeble		
112	19	20	20	43	20	42	26	11	26	08	30	43	30	36	37.5	?	?	"	"		
113	19	6	30	50	30	50	35	37	35	31	41	27	41	36	27.2	?	?	"	"		
114	20	17	37.1	-	-	37	49	-	-	-	-	-	-	-	?	0.01	-	"	"		
115	21	22	19	42	19	44	19	52	19	53	-	-	-	-	2.4	0.10	0.06	"	"		
116	22	5	12	00	12.0	12	15	12	16	-	-	-	-	-	2.6	0.07	0.05	"	"		
117	22	3	34.4	-	-	37	41	-	-	-	-	-	-	-	?	0.01	-	"	"		
118	27	10	?	-	-	41	20	-	-	-	-	-	-	-	?	0.00	-	"	"		
119	27	21	20	20	20.4	20	46	20	45	-	-	-	-	-	5.6	0.05	0.05	"	"		
120	28	21	41.5	-	-	41	53	-	-	-	-	-	-	-	?	0.01	-	"	"		
121	28	12	47	08	47	10	53	52	53	53	61	33	61	31	38.8	?	?	"	"		
122	29	15	52.5	-	-	53	17	-	-	-	-	-	-	-	?	0.01	-	"	"		
123	31	17	52	53	52	54	53	39	53	41	-	-	-	-	17.8	0.72	0.65	Quick	Weak	Felt	
124	31	23	37.5	-	-	37.9	-	-	-	-	-	-	-	-	?	0.02	-	Slow	Feeble		
125	Apr. 1	23	58.7	-	-	58.9	-	-	-	-	-	-	-	-	?	0.02	-	"	"		
126	1	8	?	-	-	55	33	-	-	-	-	-	-	-	?	0.01	-	"	"		
127	2	12	?	-	-	51	51	-	-	-	-	-	-	-	?	0.01	-	"	"		
128	3	2	?	-	-	00	12	-	-	-	-	-	-	-	?	0.01	-	"	"		
129	6	23	29	26	29	26	37	38	37	39	?	-	?	-	?	?	?	"	"		
130	6	4	05	55	05	55	06	15	06	15	-	-	-	-	4.2	0.11	0.12	"	"		
131	8	5	40	13	40.2	40	37	40	36	-	-	-	-	-	3.1	0.04	0.02	"	"		
132	9	19	?	-	-	11	26	-	-	-	-	-	-	-	?	0.01	-	"	"		
133	9	14	03.0	-	-	03	55	-	-	-	-	-	-	-	?	0.01	0.02	"	"		
134	13	23	02	39	02	39	03	39	03	40	-	-	-	-	16.6	0.82	0.35	Quick	Weak	Felt	
135	13	8	28.9	-	-	29	18	-	-	-	-	-	-	-	?	0.00	-	Slow	Feeble		
136	14	12	04.8	-	-	05	32	-	-	-	-	-	-	-	?	0.01	0.01	"	"		
137	14	22	25	23	?	-	26	06	?	-	-	-	-	-	4.9	0.01	0.01	"	"		
138	18	1	27.4	-	-	28	13	-	-	-	-	-	-	-	?	0.02	0.02	"	"		
139	18	12	59	54	-	-	60	34	-	-	-	-	-	-	4.3	0.00	-	"	"		
140	19	2	35	16	?	-	?	-	?	-	-	-	-	-	20.9	?	0.00	"	"		
141	20	12	52.8	-	-	53	09	-	-	-	-	-	-	-	?	0.01	-	"	"		
142	20	10	01	51	01	51	02	01	02	01	-	-	-	-	6.6	0.36	0.44	Quick	Weak	Felt	
143	21	0	03	28	03	29	04	33	04	32	-	-	-	-	7.3	0.16	0.19	Slow	Feeble		
144	23	5	12	45	12.8	13	09	13.1	-	-	-	-	-	-	4.3	0.03	0.01	"	"		
145	24	3	34	05	?	-	34	24	34	23	-	-	-	-	5.3	0.07	0.05	"	"		
146	24	17	30	55	31.6	37	40	37	44	44	26	44	28	46.1	0.01	0.08	"	"			
147	24	19	56	21	-	-	56	51	-	-	-	-	-	-	4.5	0.01	-	"	"		
148	26	7	31	27	-	-	31	38	-	-	-	-	-	-	1.9	0.02	-	"	"		
149	27	17	01	57	?	-	11	10	?	-	?	-	-	-	41.8	?	?	"	"		
150	27	18	17.8	-	-	18	17	-	-	-	-	-	-	-	?	0.01	?	"	"		
151	May 3	12	?	-	-	22	35	-	-	-	-	-	-	-	?	0.01	-	"	"		
152	4	14	?	-	-	49	42	-	-	-	-	-	-	-	?	0.01	-	"	"		
153	4	15	?	-	-	?	-	-	-	-	-	-	-	-	?	0.00	-	"	"		
154	5	13	04	20	04	22	04	46	04	48	-	-	-	-	7.0	0.22	0.23	"	"		
155	7	16	10	35	-	-	11	06	-	-	-	-	-	-	?	0.02	-	"	"		
156	10	12	?	-	-	41	41	-	-	-	-	-	-	-	?	0.03	0.02	"	"		
157	11	3	?	-	-	32	22	-	-	-	-	-	-	-	?	0.01	-	"	"		
158	11	18	27	03	27	02	27	23	27	22	-	-	-	-	9.6	0.28	0.32	Quick	Weak	Felt	
159	12	1	41	08	41	09	44	24	44	24	-	-	-	-	16.2	0.05	0.07	Slow	Feeble		
160	13	8	?	-	-	32	57	-	-	-	-	-	-	-	?	0.01	-	"	"		
161	13	8	40	17	40.2	41	23	41.4	-	-	-	-	-	-	9.2	0.02	?	"	"		
162	13	15	?	-	-	23.8	-	-	-	-	-	-	-	-	?	0.00	-	"	"		
163	13	15	?	-	-	33	45	-	-	-	-	-	-	-	?	0.00	-	"	"		
164	14	23	?	-	-	09	30	-	-	-	-	-	-	-	?	0.01	-	"	"		
165	14	23	23	22	23	23	23	54	23	54	-	-	-	-	9.6	0.30	0.30	"	"		





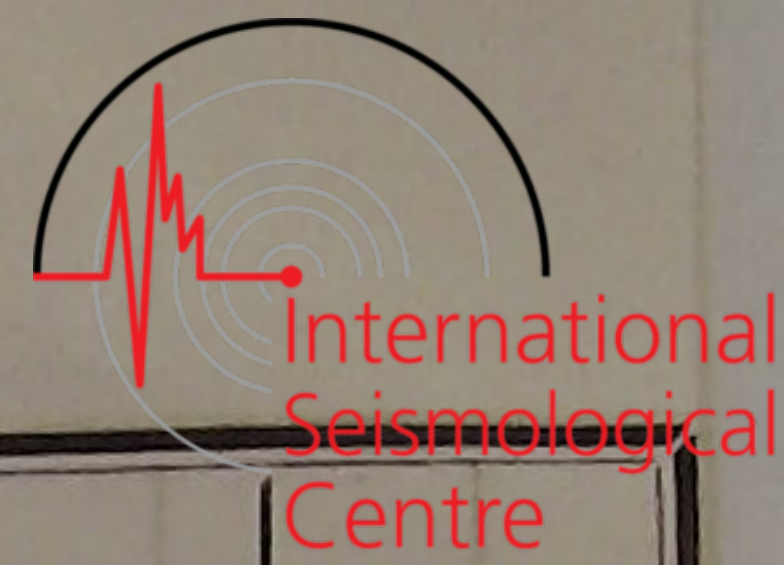


## EARTHQUAKES, 1931.



No.	Date 1931	P				S				L				Duration of Total Earthquake (mean)	Maximum Range of Motion				Character of Motion	Intensity	Remarks
		E	W	N	S	E	W	N	S	E	W	N	S		E	W	N	S			
276	Aug. 17	h	m	s	m	s	m	s	m	s	m	s	m	s	m	mm	mm	Quick	Weak	Felt	
277	17	15	17	07	17	08	17	19	17	20	-	-	-	-	4.7	0.10	0.10	Slow	Feeble		
278	17	17	51.5		?		52	31	?		-	-	-	-	?	0.01	?				
279	18	5	41	01	41	00	41	34	41	35	-	-	-	-	13.5	0.48	0.61	"	"		
280	18	14	28	17	28	18	34	10	34	20	40	07	40	16	55.7	0.22	0.43	"	"		
	20	0	07.6		-	-	08.4		-	-	-	-	-	-	?	0.01	-	"	"		
281	21	8	?		?		10	24	?		-	-	-	-	?	0.01	0.02	"	"		
282	21	8	31	43	?		32	27	32	29	-	-	-	-	4.9	0.03	0.02	"	"		
283	23	14	54.3		?		54	39	?		-	-	-	-	?	0.01	0.01	"	"		
284	24	21	45	33	45	36	53	41	53	39	61	14	60	19	53.3	0.01	0.08	"	"		
285	25	3	29.8		?		30	32	30	33	-	-	-	-	?	0.02	0.02	"	"		
286	25	3	?		?		52	03	?		-	-	-	-	?	0.00	0.01	"	"		
287	26	8	10.1		?		10	54	10	51	-	-	-	-	?	0.01	0.01	"	"		
288	27	15	37	23	37	36	45	41	45	39	52	25	52	20	77.1	0.07	0.47	"	"		
289	29	16	33.8		-	-	34	09	-	-	-	-	-	-	?	0.01	-	"	"		
290	30	7	02.1		-	-	02	38	-	-	-	-	-	-	?	0.00	-	"	"		
291	30	14	41	42	?		41	55	?		-	-	-	-	2.2	0.02	?	"	"		
292	31	3	?		-	-	?		-	-	-	-	-	-	?	?	-	"	"		
293	31	6	?		-	-	40	47	-	-	-	-	-	-	?	0.00	-	"	"		
294	31	11	?		-	-	05	32	-	-	-	-	-	-	?	0.01	-	"	"		
295	Sept. 1	5	31.7		-	-	32	24	-	-	-	-	-	-	?	0.01	-	"	"		
296	1	13	37	26	37	27	37	43	37	44	-	-	-	-	5.4	0.47	0.50	Quick	Weak	Felt	
297	1	15	?		-	-	10	05	-	-	-	-	-	-	?	0.01	-	Slow	Feeble		
298	1	19	10	43	-	-	10	59	-	-	-	-	-	-	2.5	0.02	-	"	"		
299	2	9	42.3		-	-	42	50	-	-	-	-	-	-	?	0.01	-	"	"		
300	2	18	51.3		?		51	56	?		-	-	-	-	?	0.02	?	"	"		
301	5	4	14.7		?		15	23	15.7		-	-	-	-	?	0.02	0.01	"	"		
302	6	20	35	51	?		36	29	36	31	-	-	-	-	4.2	0.02	0.01	"	"		
303	7	0	01	51	?		02	08	-		-	-	-	-	2.2	0.01	?	"	"		
304	8	19	09	44	09	44	10	15	10	17	-	-	-	-	18.2	1.26	1.17	"	"		
305	9	20	42	50	42	51	46	40	46	31	?		?		36.7	0.68	1.11	"	"		
306	10	16	19.8		-	-	20	05	-	-	-	-	-	-	?	0.01	-	"	"		
307	11	1	23	48	?		24	28	?		-	-	-	-	14.5	0.01	0.01	"	"		
308	11	3	20.6		?		21	02	?		-	-	-	-	?	0.01	0.01	"	"		
309	11	23	13.2		?		13	22	?		-	-	-	-	?	?	?	"	"		
310	12	1	49	52	50.1		54	04	54.0		?		?		13.0	?	0.03	"	"		
311	12	10	26	32	?		27	28	?		-	-	-	-	4.8	0.02	?	"	"		
312	13	7	40	56	?		41	18	?		-	-	-	-	2.4	0.01	?	"	"		
313	16	12	44	09	44	10	45	00	45	07	-	-	-	-	14.6	0.32	0.35	"	"		
314	17	11	08	22	-	-	08	35	-	-	-	-	-	-	1.5	?	-	"	"		
315	17	18	08	48	-	-	08	56	-	-	-	-	-	-	1.0	0.01	-	"	"		
316	18	6	14	37	?		15	29	15	28	-	-	-	-	5.6	0.03	0.04	"	"		
317	20	15	14	27	14.5		14	46	14	46	-	-	-	-	4.1	0.10	0.12	"	"		
318	21	2	20	53	20	55	21	40	21	44	-	-	-	-	36.5	?	5.80	Quick	Weak	Felt	
319	21	3	?		-	-	13	18	-	-	-	-	-	-	?	0.01	-	Slow	Feeble		
320	21	3	?		-	-	27	42	-	-	-	-	-	-	?	0.01	-	"	"		
321	21	6	?		-	-	23	04	-	-	-	-	-	-	?	0.01	-	"	"		
322	21	6	49.9		?		50	39	50.6		-	-	-	-	?	0.02	0.02	"	"		
323	21	7	?		-	-	08	59	-	-	-	-	-	-	?	0.00	-	"	"		
324	21	9	51.2		?		51	59	?		-	-	-	-	?	0.01	0.01	"	"		
325	21	10	33	39	33.8		38	49	39.3		44	28	44	01	33.5	0.01	0.23	"	"		
326	21	13	?		-	-	46	48	-	-	-	-	-	-	?	0.01	-	"	"		
327	21	17	?		-	-	52	56	-	-	-	-	-	-	?	0.01	-	"	"		
328	23	12	47	03	?		47	38	?		-	-	-	-	3.7	0.01	?	"	"		
329	23	16	23	28	?		24	07	?		-	-	-	-	3.7	0.01	0.02	"	"		
330	24	4	27.1		?		27	41	?		-	-	-	-	?	0.01	0.01	"	"		

## EARTHQUAKES, 1931.



No.	Date 1931	P				S				L				Duration of Total Earthquake (mean)	Maximum Range of Motion				Character of Motion	Intensity	Remarks
		E	W	N	S	E	W	N	S	E	W	N	S		E	W	N	S			
331	Sept. 24	10	55	58	-	56	20	-	-	-	-	-	-	2.9	0.01	-	Slow	Feeble			
332	24	12	12	12	?	12	58	?	-	-	-	-	3.6	0.01	?	"	"				
333	24	23	57.7		?	58	19	?	-	-	-	-	?	0.00	?	"	"				
334	25	6	09	36	09	17	35	17	17	27.6	26.8	-	54.0	0.02	0.26	"	"				
335	27	19	51	19	51.4	51	54	51	52	-	-	-	3.3	0.05	0.05	"	"				
336	28	4	55	12	55	51	55	49	-	-	-	-	5.3	0.11	0.10	"	"				
337	28	18	?		-	30	57	-	-	-	-	-	?	0.01	-	"	"				
338	28	23	14	36	14.5	15	02	14	58	-	-	-	3.5	0.08	0.13	"	"				
339	28	23	?		?	19	33	?	-	-	-	-	?	0.02	0.02	"	"				
340	29	5	22	11	22	11	28	15	28	?	?	-	14.6	?	?	"	"				
341	30	12	?		?	30	16	?	-	-	-	-	?	0.01	0.01	"	"				
342	Oct. 2	17	37	41	37	38	22	38	22	-	-	-	6.7	0.11	0.14	"	"				
343	3	19	22	37	22	30	29	30	08	36	26	36	?	?	?	"	"				
344	3	21	27	47	-	35	22	-	-	41	38	-	?	?	-	"	"				
345	3	22	05	12	-	12	44	-	-	19	06	-	?	?	-	"	"				
346	3	22	57	14	57	65	57	64	48	72	13	70	68.1	0.02	0.41	"	"				
347	4	17	34.8		-	35	01	-	-	-	-	-	?	?	-	"	"				
348	5	20	31	39	?	32	31	?	-	-	-	-	3.8	0.01	?	"	"				
349	5	22	40	26	?	41	21	?	-	-	-	-	5.2	0.01	?	"	"				
350	9	10	57	20	57.4	57	42	57.7	-	-	-	-	3.6	0.03	0.02	"	"				
351	10	0	28.7		29	36	31	36	28	40	46	40	196.6	?	4.11	"	"				
352	10	16	41	39	40.9	45	46	45.6	-	48	25	47	18.7	?	0.09	"	"				
353	11	16	26.1		-	26	20	-	-	-	-	-	?	0.01	-	"	"				
354	12	13	32.1		-	33.2	-	-	-	-	-	-	?	0.00	-	"	"				
355	13	13	?		-	54	40	-	-	-	-	-	?	?	-	"	"				
356	17	15	36	58	37.0	39	44	39	48	-	-	-	6.8	0.08	0.06	"	"				
357	18	0	48.9		?	?	-	?	-	?	62	13	?	?	0.04	"	"				
358	18	4	41	25	40.6	50	42	50.4	-	?	-	-	?	?	?	"	"				
359	19	20	18	09	?	18	24	?	-	-	-	-	2.5	0.03	?	"	"				
360	22	11	24.3		?	24	44	24.6	-	-	-	-	?	0.01	0.01	"	"				
361	23	20	15.6		?	23.3	-	?	-	31.9	-	-	?	?	0.03	"	"				
362	23	23	30.7		?	31	15	?	-	-	-	-	?	0.01	?	"	"				
363	25	13	45	15	45	45	23	45	26	-	-	-	7.5	0.92	0.89	Quick	Weak	Felt			
364	27	11	08.5		?	09	00	08	59	-	-	-	?	0.03	0.03	Slow	Feeble				
365	27	18	30.6		?	31	07	?	-	-	-	-	?	0.02	0.01	"	"				
366	28	5	40.9		40.1	?	45.6	?	49	58	-	-	?	?	0.02	"	"				
367	29	8	44.0		43.5	47	17	46.9	-	-	-	-	?	0.02	0.02	"	"				
368	29	18	53	58	53.9	54	21	54	17	-	-	-	6.5	0.08	0.09	"	"				
369	Nov. 1	18	55.7		55.8	58	25	58	27	-	-	-	?	0.01	0.09	"	"				
370	2	8	?		-	43.7	-	-	-	-	-	-	?	0.00	-	"	"				
371	2	10	05	33	05	08	30	08	13	-	-	-	?	?	?	"	"				
372	2	11	?		02.9	?	05.7	-	-	-	-	-	?	?	0.38	"	"				
373	3	2	40	53	40.9	44	58	45.6	-	?	-	-	10.9	?	?	"	"				
374	3	16	20	07	20	20	14	20	15	-	-	-	?	?	?	Quick	Weak	Felt			
375	3	16	?		-	?	-	-	-	-	-	-	?	?	-	"	"				
376	3	16	?		-	53	12	-	-	-	-	-	?	0.01	-	Slow	Feeble				
377	3	17	25	59	26	26	08	26	11	-	-	-	4.3	0.19	0.50	Quick	Weak	Felt			
378	3	17	38	33	?	38	44	38	44	-	-	-	1.5	0.01	0.02	Slow	Feeble				
379	3	17	44.7		?	44	54	44	54	-	-	-	?	0.02	0.09	"	"				
380	3	18	?		-	03	45	-	-	-	-	-	?	0.01	-	"	"				
381	3	19	?		-	01	52	-	-	-	-	-	?	0.00	-	"	"				
382	4	2	37.1		?	37	15	37	15	-	-	-	?	0.02	0.05	"	"				
383	4	3	19.1		?	19	15	19	21	-	-	-	?	0.02	0.04	"	"				
384	4	9	32	10	?	32	17	32	17	-	-	-	2.4	0.11	0.10	Quick	Weak	Felt			
385	4	15	32	36	32.7	32	46	32	49	-	-	-	1.8	0.03	0.04	Slow	Feeble				



## PULSATORY OSCILLATIONS, 1931 (EW Component.)

International  
Seismological  
Centre

No.	Beginning			Ending			Maximum				Double Amplitude
	Date			Date			Date				
	Month	Day	Hour	Month	Day	Hour	Day	Hour	Day	Hour	
1	December (1930)	29	20	January (1931)	1	6	31	20	1	0	3
2	January (1931)	1	9		4	1	2	18	3	0	11
3		4	9		6	2	5	10	5	13	6
4		9	0		11	21	10	11	10	14	30
5		13	12		17	20	14	19	14	21	3
6		19	10		21	22	20	13	20	16	4
7		22	22		25	2	23	21	24	0	7
8		25	17		28	20	26	20	26	22	5
9		29	8		30	23	30	5	30	7	4
10	February	4	22	February	11	1	8	12	8	17	5
11		13	23		16	9	14	13	14	16	9
12		23	1		25	19	23	19	23	23	4
13		26	5		27	18	26	18	26	21	6
14		28	9	March	3	14	1	6	1	9	9
15	March	4	11		6	8	4	22	5	0	6
16		6	11		9	17	7	12	7	14	8
17		11	18		16	1	13	2	13	5	5
18		17	7		19	11	18	0	18	1	20
19		19	20		22	11	20	14	20	16	10
20		22	21		25	21	23	23	24	2	10
21		26	5		29	1	26	22	27	1	10
22		29	17	April	3	12	1	22	2	1	11
23	April	5	6		9	21	5	13	5	15	16
24		10	10		12	12	11	6	11	9	9
25		21	1		23	6	22	10	22	11	13
26		24	16		26	2	25	3	25	6	7
27		27	17		30	22	28	16	28	18	11
28	May	7	2	May	10	10	8	0	8	2	5
29		14	20		18	16	16	23	17	1	7
30		21	16		26	7	22	22	23	1	12
31	June	11	17		15	21	12	22	13	1	13
32	July	11	2		15	8	13	23	14	2	3
33		26	3		27	20	26	20	26	22	5
34	August	27	11	August	29	10	28	9	28	11	5
35		31	13	September	6	3	4	2	4	5	3
36	September	17	4		19	2	17	22	18	0	3
37		26	10		29	21	27	21	28	0	13
38	October	8	2	October	11	19	10	16	10	18	4
39		13	12		15	14	14	8	14	10	31
40		17	1		18	10	17	15	17	18	4
41		25	14		29	13	26	18	26	20	5
42	November	7	2		8	14	7	10	7	13	12
43		10	1		12	9	10	18	10	21	4
44		14	16		17	4	16	7	16	10	6
45		17	15		20	22	18	9	18	12	10
46		29	21	December	2	2	1	6	1	9	8
47	December	3	17		6	10	4	14	4	17	4
48		7	6		8	12	7	21	7	23	9
49		9	4		10	23	9	21	10	0	6
50		11	18		14	14	12	16	12	18	14
51		15	5		17	17	16	15	16	17	8
52		24	18		27	10	25	17	25	20	11
53		28	1		29	21	28	20	28	22	33